



ANAND AGRICULTURAL UNIVERSITY

16th Annual Report

2019-20





ATAL RANKING OF INSTITUTIONS
ON INNOVATION ACHIEVEMENTS

Certificate of Achievement

This is to certify that

Anand Agricultural University, Anand

is ranked '4th' in category of 'Govt. and Govt. Aided Universities & Deemed to be Universities' in Atal Ranking of Institutions on Innovation Achievement (ARIIA) 2020 announced on 18th Aug 2020.

Dr. Anil D Sahasrabudhe
Chairman, AICTE

Sh. Amit Khare
Secretary (HE), MHRD

Dr. Abhay Jere
Chief Innovation Officer
MHRD's Innovation Cell



Anand Agricultural University

16th Annual Report 2019-20

From **01-04-2019** to **31-03-2020**

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Anand Agricultural University
Anand - 388110, Gujarat, India

Our Symbol



This is our Emblem;

One Square, One Leaf
with "AAU" firmly embedded

The Square with lighter and darker shades of green
Stands for Lusciousness, Fertility and Abundance of this land.
This is our Mother Land
With all the three elements abounding

Among the entire world, there is only one thing
That Could photo synthesize solar rays
into biomass i.e., the LEAF.
Hence, the LEAF stands as our symbol
Which could transform sun rays i.e. energy into matter

Thus leaf as a symbol of our commitment;
Our Dream
to make our Country
abundant in agriculture

Leaf is our tribute to
Our Mother Land
Our pledge to make Country prosperous

Our Motto is :

कृणवन्तो राष्ट्रं कृषिसंपन्नम्

Means

We, the Scientists, Students and
all the employees of AAU unitedly
stand to make the solemn pledge
that we enrich and glorify
the grandeur of our Country
and make it agriculturally prosperous



ANAND AGRICULTURAL UNIVERSITY ANAND

From VC's Desk



The Iron Man of India and first Home Minister, Sardar Vallabhbhai Patel had thought for this Institution and Dr. K. M. Munshi established the 'Institute of Agriculture' in 1947 which was started at “*Krushhi-Go-Vidhya Bhavan*” is now Anand Agricultural University. It is a matter of pride and privileged for me to be the part, of this one of the oldest prestigious agricultural institutions of Western India, over decades in different capacity. I am incredibly happy to present 16th Annual Report of University. I am pleased to affirm that our university is prominently concerned with this prime endeavor of agricultural and allied sciences education. It is the education that empowers us to carve our very own path to convert many unwanted endings into benefitting beginnings.

As of now, there are nine degree colleges and 1 P.G. Institute belonging to seven faculties, 25 on-campus and 23 off-campus research stations, 5 polytechnics and 11 extension education units including extension education institute and 3 KVKs under AAU functioning in 9 districts of Central Gujarat, are the sources of agricultural knowledge generation and dissemination for the benefit of the students and farmers. Since its inception in 2004, AAU has been contributing to all three mandated frontiers: Education, Research and Extension Education.

Research has always been an activity of prime importance at AAU. The university has been working through its multiplication research stations, Gol sponsored research projects by DBT, DST, ICAR etc., sub centers on various crops and testing centers to develop location specific production technologies. Moreover, the university is also rendering farmers services by analyzing soil, water samples, pesticides residues and food analysis through NABL accredited labs.

During the year, seven new improved high yielding varieties, viz. Gujarat Castor Hybrid 10 (GCH 10: Charutar Gold), Gujarat Anand Pop Corn Hybrid 21 (GAPCH 21: Mahashweta), Gujarat Anand Sweet Corn Hybrid 11 (GASCH 11: Madhuram), Gujarat Anand Brinjal 6 (GAB 6: Anand Doli), Kufri Sadabahar (Potao), Gujarat Garlic 7 (GG 7: Anand Kesari) and Gujarat Anand Desi Cotton 3 (GADC 3: Wagad Gaurav) have been released. In addition to this, 48 technologies have been recommended for farmers/entrepreneurs and 30 technologies for scientific community as well as for entrepreneurs. These technologies will lead to better agricultural outputs with scientifically proved methodologies and inputs yielding better economic returns to farmers. We are also commercializing key techniques to entrepreneurs under PPP mode and also supporting startups to uplift agricultural GDP as a part of our Agri & Food incubation programme.

Providing services to the farmers for encouraging them to use modern technologies and sustainable farming techniques is of key focus of AAU. On campus as well as off campus training programmes are carried out based on the needs and interest of the stakeholders. Field Level Demonstrations, Certificate courses, Literature for farmers etc are also developed. During the year, 17440 farmers, 5313 farm women and 278 rural youth have been trained through On-Campus and Off-Campus training programmes. Total 2454 extension personnel were trained by Extension Education Institute under T&V Scheme.


The NIRF ranking framework released in the year 2019 by the Ministry of Human Resource Development, Government of India outlines a methodology to rank institutions across the country. The parameters broadly cover “Teaching, Learning and Resources,” “Research and Professional Practices,” “Graduation Outcomes,” “Outreach and Inclusivity,” and “Perception”. AAU has been ranked at 67 position under University category and thereby maintained its place in top 100 universities of India consecutively during last three years. AAU is amongst the very few agricultural universities in the country to make extensive use of automation in its administrative functions by using various ICT tools.

With the blessings of Hon. Governorshri and the Chancellor of our University, constructive support from the State and the Central Governments, and the enthusiastic involvement of our officers, scientists, faculty and supporting staff, AAU will continue to attain better progressive elevations. The contributions made during 2019-20 by the staff of AAU under the leadership of Dr. N. C. Patel as the Vice Chancellor (up to 06.08.2019) are significant and deserve due appreciation. We will continue fine tuning of our research, elevating educational standards to meet upcoming National Education Policy 2020 and efficiently educating farmers also, so that the food security is achieved in the country and also for supporting excellent livelihood of the farmers.

I am sure, the growing recognition of AAU at the national and international levels along with its glorious history will pave the way for building up better institutional capacity for exploring new horizons of academic excellence and still better contribution to farmers' welfare.

I heartily congratulate the entire AAU team for their persistent efforts in bringing our University to this level. I am sure that this marvel of success would continue for all epoch to come.

Place : Anand
Date : 06-11-2020



(R. V. VYAS)
Vice Chancellor

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Our Song

हो संस्कृति कृषि वत्सलम्, कल्याण कीर्णे मंगलम्
कृषावन्तो राष्ट्रं कृषिसंपन्नम् कृषावन्तो राष्ट्रं कृषिसंपन्नम्
कृषावन्तो राष्ट्रं कृषिसंपन्नम्

सरदार गाथा गुर्जरी, याइ अमुल यरोतरी,
क्षीर संस्कृति महीसागरी, आतिथ्य आदर से भरी,
कृषावन्तो राष्ट्रं कृषिसंपन्नम्

डाडोर श्रीठाडोर डा, कायावरोहण कलिडा,
वडताल लाल गुलाल, सून करताल धून नारायणी,
कृषावन्तो राष्ट्रं कृषिसंपन्नम्

संतराम ओडाणा श्रीमद्, हरि मारगी जेधन लगत,
दिल के दिये जलते किये, गुंशु गीरा रविशंकरी,
कृषावन्तो राष्ट्रं कृषिसंपन्नम्

सरदार रास अडासमें, आपु यले थे साथ में,
विधानगर आणंद में, विज्ञान ज्ञान गंगोतरी,
कृषावन्तो राष्ट्रं कृषिसंपन्नम्

- डॉ. जालकृष्ण जेधी

Chapter - 1

INTRODUCTION

In central region of Gujarat State, the agricultural education was started way back in 1938 through establishment of *Krushi-Go-Vidya Bhavan* at Anand, the milk city of India. This Institute was popularly known as *Khetiwadi* or the Institute of Agriculture. Later on, in 1947, with the establishment of B. A. College of Agriculture, which was initially affiliated to Bombay University until 1956 then to Gujarat University until 1962 and subsequently to Sardar Patel University, became integral institution of Gujarat Agricultural University in 1972 along with Sheth M.C. College of Dairy Science and the Government College of Veterinary Science and Animal Husbandry, Anand.

Anand Agricultural University came into existence with effect from 01 May, 2004 by enactment of Gujarat Agricultural Universities Act, 2004 (Gujarat Act, No.5 of 2004) with transfer of the activities of the Anand zone of the erstwhile Gujarat Agricultural University. This resulted in greater autonomy for regional agriculture development, and as it had inherited such a well-developed infrastructure with vibrant activities, AAU used this strength as a force multiplier to enlarge its vision, adding momentum to its efforts in fulfilling its mandate.

AAU and its progenitor Gujarat Agricultural University, always have dominant presence in Indian agricultural education system, ever since 1972. Prime institutions/colleges like B. A. College of Agriculture, Sheth M. C. College of

Dairy Science and College of Veterinary Science & A.H. had their reputed presence even from 1947, 1961 and 1964 respectively to undertake useful interventions related to agricultural education and research, which later contributed significantly in paving a path for many revolutions (green revolution, white revolution and many other historic agricultural innovations). These historic institutions continue to remain prime faculties of present days AAU, which along with the subsequently added new faculties and colleges have gained increasing importance as well as higher status across the nation even though the AAU is in its second decade of existence.

AAU has now 10 constituent colleges, including three colleges for Agriculture, and one each for Veterinary Science and Animal Husbandry, Dairy Science, Agricultural Information Technology, Food Processing Technology and Bio Energy, Agricultural Engineering, Horticulture and Agricultural Business Management Studies. It also has 25 on campus and 23 off-campus research centres, 1 Extension Education Institute and 22 Extension Education centres. The districts of Ahmedabad, Anand, Botad, Chhotaudepur, Dahod, Kheda, Mahisagar, Panchmahal and Vadodara are covered under territorial jurisdiction of the university comprising nearly 17.41 per cent (3.413 million ha) area of Gujarat State (19.60 million ha). The headquarter of University is Anand, Milk City- famous for the Amul Dairy, located in Agro-climatic Zone-III. It is on the Ahmedabad-Mumbai railway line, 65 km from Ahmedabad and 40 km from Vadodara railway

station and connected by express highway on Golden quadrilateral. The city is located at 22.56 °N Latitude and 72.95 °E Longitude.

AAU has passed several notable milestones and consistently improved on many fronts that have a bearing on achieving academic excellence. Successful attempts have been made to establish the university as a great center for the purpose to create the wealth of knowledge in its domain area. It has endeavoured to create a highly inspiring atmosphere and learning environment in a beautiful and green campus. Apart from quality education, AAU shoulders the responsibility of agricultural research of par excellence meeting the escalating demands of food grains and animal products as well as successful transfer of technologies through a strong network of extension education imparted to the farmers. Combined efforts have escalated the decadal agricultural growth of the state.

AAU is committed to develop competent human resource to serve the society in general and farmers and food industry in particular for sustainable livelihood, efficient use of natural resources, ensuring food security and safety for the nation. AAU believes in harnessing the power of science and innovation for increasing the prosperity of the society. The Emblem symbolizes our commitment to make our country abundant in agriculture and pay tribute to our mother land and our pledge to make country prosperous. Our Motto is *“Krunvanto Rastram Krushi Sampannam”* which means that we, the scientists, students and all the employees of AAU unitedly stand to make the solemn pledge that we enrich and glorify the grandeur of our country and make it agriculturally prosperous.

Considering the strengths acquired by AAU and opportunities looming large for further achievements and progress, the University is

rightly set not only to continue its ongoing success stories but is also positioned rightly to usher in to next phase of excellence and contribution for agriculturally prosperous Gujarat and India.

1.1 Vision

Agriculturally Prosperous Gujarat and India

1.2 Mission

The mission of the Anand Agricultural University is to provide teaching, research and extension education services related to Agriculture, Dairy, Veterinary and Allied Sciences including newer sciences like Agricultural Information Technology, Agricultural Engineering Technology, Food Processing Technology, Agricultural Business Management, Horticulture etc. and thereby develop excellent human resource and innovative technologies to serve the farming community with the motto of making Gujarat and India agriculturally prosperous.

1.3 Goals and Objectives

- ◆ Make provision to impart education and thereby develop quality human resources
- ◆ Furthering the advancement of learning through research
- ◆ Passing the knowledge gained through research to the stake holders – the farmers, through extension education
- ◆ Promoting partnership and linkages with national and international institutions
- ◆ Budding cutting edge technologies for national and international arena/markets

1.4 Education

- ◆ To impart education in agriculture and allied sciences at undergraduate and post graduate levels leading to Bachelor's, Master's and Doctorate degrees in various colleges of Agriculture, Dairy, Veterinary, Agril. Engineering, Agril. Information Technology, Food Processing Technology & Bio-Energy, International Agribusiness Management, Horticulture and leading to diploma in various Polytechnics in Agriculture, Horticulture, Food Science & Home Economics and Agricultural Engineering
- ◆ To provide integrated agricultural education at different levels to increase efficiency and effectiveness of skill of students
- ◆ To upgrade the technical competence of teachers by redesigning course curriculum as suggested by ICAR/Dean's Committee/VCI and coordinating the teaching with research in the field of agriculture
- ◆ To organize vocational courses to educate rural youth in various disciplines of agriculture and allied sciences with intention to develop self-employment
- ◆ To provide consultancy and advisory services to the industry, government and non-government sectors
- ◆ To architect agribusiness professionals for Agricultural, Agri. food firms, rural and allied sectors
- ◆ To encourage entrepreneurial spirit and develop qualified entrepreneurs for rural development

- ◆ To cater the needs of enterprises and cooperatives in agribusiness at national and international level

1.5 Research

- ◆ Evolving new varieties and breeds and developing technologies for increasing agricultural and animal productivity with a view to improve socio-economic status of farmers of Gujarat and India
- ◆ Develop package of practices for cultivation of various crops and cropping systems of middle Gujarat
- ◆ Develop integrated farming system, Integrated Pest and Disease Management Systems, Organic farming and Biological control
- ◆ Develop cutting edge technologies in the field of Nanotechnology pertaining to agriculture, Animal husbandry and Food sciences
- ◆ Develop technologies in the field of Milk production, Food processing and Bio-energy
- ◆ Develop specific indigenous and cross breeds suitable to agro-climate zone of Middle Gujarat

1.6 Extension Education

- ◆ Impart training to the officers and extension workers of line departments of Government of Gujarat and India, field functionaries, staff of the University, NGOs, farmers, entrepreneurs etc
- ◆ Conduct short and long duration vocational trainings for farmers, farm women, farm youth, entrepreneurs and tribals

- ◆ Assess, refine and demonstrate latest agricultural technologies of University through front line demonstrations for their wider adoption
- ◆ Transmit agricultural technologies to the farmers and rural masses of Gujarat through mass media, information technologies and video conferencing

1.7 University Organization

As per the GAU Act-2004, the Chancellor, Vice Chancellor, Director of Research & Dean Post Graduate Studies, Dean Faculty of Agriculture, Dean Faculty of Dairy Science, Dean Faculty of Veterinary Science & Animal Husbandry, Dean Faculty of Food Processing Technology and Bio-energy, Dean Faculty of Agricultural Engineering & Technology, Dean Agricultural Information Technology, Dean, International Agri-business Management Institute, Dean Faculty of Horticulture, Director of Extension Education, Registrar, Comptroller, University Librarian, Executive Engineer, Director of Students' Welfare and Director of Information Technology are Officers of the University. The detailed organizational set-up as well as administrative and functional aspects are given in Chapter 2.

Hon'ble Governorshri of Gujarat acts as the Chancellor of the University. During the period under report, Hon'ble Governorshri of Gujarat, Shri O.P.Kohli was the Chancellor (Upto 16-07-2019) and Shri Acharya Devvrat ji, Chancellor; (From Dtd: 17-07-2019). Dr. N. C. Patel, Vice Chancellor (Upto 06-08-2019) & Dr. K. B. Kathiria, I/c. Vice

Chancellor (07-08-2019 to 31-08-2019) & Dr. R. V. Vyas, I/c. Vice Chancellor (From 01-09-2019); while Dr. M. N. Brahmhatt (Upto 30-05-2019) and Dr. M. M. Trivedi (From Dtd: 01-06-2019) as the Registrar of the University.

1.8 Power and Functions of the University

Under Section 6 of the GAU Act, 2004, the University is empowered to exercise the following powers.

- ◆ Provide education and instruction in agriculture and allied sciences and in such other branches of learning as the University may deem fit;
- ◆ Make provision for research in agriculture and allied branches of learning; Make provision for dissemination of the findings of research and technical information through extension education programmes;
- ◆ Make such provision which would enable affiliated colleges and recognised institutions to undertake specialisation in different fields of studies;
- ◆ Institute degrees, diplomas and other academic distinctions;
- ◆ Lay down courses of study and instruction for various examinations;
- ◆ Hold examinations and confer degrees, diplomas and other academic distinctions and confer certificates to persons who -
 - a) have pursued approved courses of study at the University or at a college unless exempted there

- from, in the manner prescribed and have passed the examinations prescribed by the University or
- b) have carried on research under conditions prescribed;
- ◆ Withdraw or cancel any degree, diploma or certificate conferred or granted by the University in such manner as may be prescribed;
 - ◆ Confer Honorary degree and other distinctions in the manner prescribed;
 - ◆ Provide lectures, instructions and training to persons who are not enrolled students of the University and grant such certificates to them as may be prescribed;
 - ◆ Co-operate with any other University or authority in such manner and for such purpose as the University may determine;
 - ◆ Establish and maintain colleges for imparting education in agriculture and allied sciences;
 - ◆ Establish and maintain classrooms, laboratories, libraries, English language laboratory, research stations, institutions and museums with latest technology for teaching, research and extension education;
 - ◆ Create such teaching, administrative and other posts as the University may deem necessary from time to time and make appointments thereto;
 - ◆ Institute and award fellowships, scholarships and prizes in accordance with the Statutes;
 - ◆ Associate or admit educational institutions imparting education in agriculture and allied sciences with, or to the privilege of the University by way of affiliation or recognition;
 - ◆ Withdraw or modify, either in whole or part, affiliation or recognition of educational institutions;
 - ◆ Inspect colleges and recognised institutions and take necessary measures to ensure that proper standards of instruction, teaching and training are maintained in them and that adequate library and laboratory provisions are made therein;
 - ◆ Lay down and regulate the salary scales, allowances and other service conditions of the members of teaching, other academic and non-teaching staff of the University;
 - ◆ Lay down and regulate the salary scales, allowances and other conditions of service of the members of the teaching, other academic and non-teaching staff in the affiliated colleges and recognised institutions to,
 - control and co-ordinate the activities of, and to give financial aid to, affiliated colleges and recognised institutions; and
 - regulate fees to be paid by the students in affiliated colleges and recognised institutions;
 - ◆ Institute and maintain residential accommodation for students and staff of the University;
 - ◆ Fix demand and receive or recover

such fees and other charges as may be prescribed;

- ◆ Supervise, regulate and control the residence, conduct and discipline of the students of the University, make arrangements for promoting their health and general welfare;
- ◆ Conduct, co-ordinate, supervise, regulate and control post-graduate teaching and research work at the University departments and affiliated colleges and recognised institutions;
- ◆ Co-ordinate, supervise, regulate and control conduct of undergraduate teaching and instruction in the affiliated colleges and undertake the same in University colleges;
- ◆ Make special provision for agricultural education, research and extension in relation to arid areas and areas prone to scarcity in the University area;
- ◆ Perform all such other acts and things whether incidental to the powers aforesaid or not, as may be requisite in order to further the objectives of the University.

1.9 Focus and Thrust Areas

AAU's activities have expanded to span newer commodities and other sectors such as soil health card, plant tissue culture, plant bio-technology, medicinal plants, liquid biofertilizer, location specific micronutrient status, pesticide residue, genomics, probiotic food, interface between industry and scientists, distance education etc., apart from the mandatory ones like research

focus on rice, maize, tobacco, vegetable crops, fruit crops, forage crops, animal breeding, nutrition and dairy products etc. The core of AAU's operating philosophy however, continues to create partnership between the rural people and committed academia as the basis for sustainable rural development. In pursuing its various programmes, AAU's overall mission is to promote continuous process of development of sustainable growth and economic independence in rural society. AAU aims to do this through education, research and extension education. Thus, AAU works towards the empowerment of the farmers.

AAU has taken a lead in agricultural education, research and extension education in the Country. The University is committed to frontier areas of research and formulate the programmes as per the need of the farmers. So far, 1244 technologies have been recommended for farmers/scientists/entrepreneurs including 75 crop varieties. About 631 projects pertaining to education, research and extension education are underway in different areas of agriculture, veterinary, dairy, food processing technology, agricultural engineering and horticulture. We have shown our strength in the areas of Liquid biofertilizer, Pesticide residue analysis, Soil health card, Astrometeorology calendar, Micro-propagation, Bio-diesel, Animal genomics, Rumen metagenomics, Modern surgical tools, Probiotic and Prebiotic fermented food products, post harvest value addition, ICT tools etc.

1.10 Accreditation

The Accreditation Board of ICAR, New Delhi has granted reaccrreditation to Anand Agricultural University for a period of five years w.e.f. 2016-17 to 2020-21.

1.11 Recognitions

AAU was ranked 67 in University category and 96 in overall ranking by National Institutions Ranking Framework (NIRF) India Ranking 2019 done by Ministry of Human Resource Development, Government of India. In central to Gujarat, only placed under top 100 positions at National level.

Indian Council of Agricultural Research (ICAR) accredited AAU and its colleges, which indicates the higher standards of education and research

maintained by the university. In 2017, AAU was ranked 28 in ICAR ranking of agricultural universities in India done by ICAR.

AAU has signed memorandum of understanding with reputed foreign universities viz, Lund University, Sweden; Copenhagen University, Denmark; University of Alberta, Canada; and Florida Agricultural and Mechanical University, USA. In addition, AAU has 53 other MoUs including generic MoU with ICAR institutions and specific MoUs with other universities/institutes/ NGOs in Gujarat and India. Apart from national projects, AAU has handled and still operating collaborative projects funded by European Union, Swedish International Development Agency, Government of Australia for exchange of students, faculty as well as conducting high end research.



B. A. College of Agriculture

Chapter - 2

MANAGEMENT AND ADMINISTRATION

Agricultural Universities are mainly working on three aspects, i.e., teaching, research and extension education. Teaching imparts knowledge, while research provides wisdom, which ultimately leads to strengthening of extension activities in agriculture sector. Manpower at the University is broadly divided into two categories, i.e., technical and non-technical. Technical manpower includes staff involved in teaching, research and extension education activities. They are Professor, Associate Professor, Assistant Professor, Research Scientist, Associate Research Scientist, Assistant Research Scientist, Extension Educationist, Associate Extension Educationist, Assistant Extension Educationist, etc. Non-Technical personnel are concerned with administrative and allied activities.

2.1 Management

Authority to govern the affairs of Anand Agricultural University flows from the GAU Act, 2004.

AAU was established under GAU Act, 2004 (Gujarat Act No. 5 of 2004) and functions under due authority of Chancellor, Vice Chancellor, Board of Management, Academic Council and Officers of the University. It has a territorial jurisdiction of nine districts of Gujarat namely Ahmedabad, Anand, Botad, Chhotaudepur, Dahod, Kheda, Mahisagar, Panchmahal, and Vadodara.

Functioning of the Authority

During the year under report, following authorities, as provided in Section-17 of the GAU Act, 2004 were functional.

- ◆ Board of Management
- ◆ Academic Council
- ◆ Faculties
- ◆ Board of Studies of different groups of subjects from different faculties
- ◆ Research Council
- ◆ Extension Education Council

The organizational set-up and decision making channel are given in [chart-1](#) and [chart-2](#).

Board of Management

The Board of Management considers and decides matters of general policies relating to the progress and development of the University. The list of Hon'ble members of the Board of Management is given in [Annexure-2](#).

During the year under report, Dr. N. C. Patel, Vice Chancellor (Upto 06-08-2019) & Dr. K. B. Kathiria, I/c. Vice Chancellor (07-08-2019 to 31-08-2019) & Dr. R. V. Vyas, I/c. Vice Chancellor (From 01-09-2019); while Dr. M. N. Brahmhatt (Upto 30-05-2019) and Dr. M. M. Trivedi (From Dtd: 01-06-2019) as the Registrar meetings of Board of Management were held under the Chairmanship of Vice Chancellor, Anand Agricultural University.

Sr. No.	Meeting Number		Date	Place	Chairman
1	50 th	Regular	02-05-2019	Anand	Dr. N. C. Patel
2	5 th	Joint Regular	02-05-2019	Anand	Dr. N. C. Patel
3	24 th	Circulation	14-06-2019	-	Dr. N. C. Patel
4	51 st	Regular	23-07-2019	Anand	Dr. N. C. Patel
5	25 th	Circulation	30-11-2019	-	Dr. R. V. Vyas
6	52 nd	Regular	18-01-2020	Anand	Dr. R. V. Vyas

Academic Council

Academic Council has been constituted under Section-21 of GAU Act, 2004. Academic Council is responsible for the maintenance of standard of teaching and examinations in the University by controlling and regulating the quality of teaching, education and examinations in the University.

During the year under report, Dr. N. C. Patel, Vice Chancellor (Upto 06-08-2019) & Dr. K. B. Kathiria, I/c. Vice Chancellor (07-08-2019 to 31-08-2019) & Dr. R. V. Vyas, I/c. Vice Chancellor (From 01-09-2019); while Dr. M. N. Brahmhatt (Upto

30-05-2019) and Dr. M. M. Trivedi (From : 01-06-2019) Dr. M. M. Trivedi, I/c. Registrar acted as Member Secretary of the Academic Council. The list of members of the Academic Council is given in [Annexure-3](#).

During the year under report, two regular meetings, two special regular and two circulation meetings of Academic Council were held to consider various issues pertaining to improvement of education, course curricula, course credits and recruitment rules for teachers and such other matters/concerns. Besides making recommendations to the Board of Management as mentioned above, the Academic Council also took various important decisions.

Sr. No.	Meeting Number		Date	Place	Chairman
1	6 th Special	Regular	06-05-2019	Anand	Dr. N. C. Patel
2	1 st	Circulation	01-07-2019	-	Dr. N. C. Patel
3	2 nd	Circulation	05-07-2019	-	Dr. N. C. Patel
4	7 th Special	Regular	31-07-2019	Anand	Dr. R. V. Vyas
5	52 nd	Regular	22-11-2019	Anand	Dr. R. V. Vyas
6	53 rd	Regular	13-01-2020	Anand	Dr. R. V. Vyas

Meetings of the Board of Post Graduate Studies

During the year under report, no meeting of Board of Post Graduate Studies was held.

Faculties

As per the Section-23 of the GAU Act, 2004, faculties are the authorities within the University. As per Statute S.9.0 the following

faculties in the University are constituted:

- ◆ Faculty of Agriculture
- ◆ Faculty of Veterinary Science & Animal Husbandry
- ◆ Faculty of Dairy Science
- ◆ Faculty of Food Processing Technology & Bio-energy

- ◆ Faculty of Agricultural Engineering and Technology
- ◆ Faculty of Agricultural Information Technology
- ◆ Faculty of Agri-business Management
- ◆ Faculty of Horticulture
- ◆ Faculty of Post Graduate Studies

Officers of the University, Members of Board of Management, Members of Academic Council and the Heads of Departments of various faculties are listed in Annexure-1, 2, 3 and 4 respectively.

Faculties consider all administrative and academic matters pertaining to their respective previews and make recommendations to the Academic Council. The faculty either initiates the matters on its own or receives recommendations from the Board of Studies of group of subjects of the respective faculty.

As per Statute S. 17.0, the following Boards of Studies have been constituted

- (a) Board of Studies of the Faculty of Agriculture
- (b) Board of Studies of the Faculty of Veterinary Science and Animal Husbandry
- (c) Board of Studies of the Faculty of Dairy Science
- (d) Board of Studies of the Faculty of Agricultural Engineering and Technology
- (e) Board of Studies of the Faculty of Food Processing Technology and Bio-energy
- (f) Board of Studies of the Faculty of Agri-business Management
- (g) Board of Studies of the Faculty of Agricultural Information Technology

- (h) Board of Studies of the Faculty of Post Graduate Studies

As per Statute S. 19.0, the following Constitution of Board of Studies other than Board of the Post Graduate Studies

- (a) The Dean of the Faculty
Chairman
- (b) The Heads of the Department and Professors teaching subjects assigned to that faculty
- (c) The Director of Extension Education or his representative
- (d) The Director of Research and Dean Post-graduate studies or his representative
- (e) Five Co-opted members
- (f) The Assistant Registrar (Academic)
Secretary

Board of Studies

As provided in Section-24 of the GAU Act, 2004 and as per Statute S.21.0, functions of the Board of Studies are as follows;

- (1) To propose the establishment of such departments as deemed best and the scope of work to be done by the department and various other departments and submit the plans thereof to the Academic Council through the Faculty.
- (2) To develop department course outlines to meet the degree and diploma requirements of the University.
- (3) To perform such other functions as may be assigned by the Vice Chancellor or the Dean.

As per Statute S. 22.0, the following Duties of the Board of Studies

- (1) To consider and make recommendations to the Academic Council on all the matters pertaining to academics

- (2) To propose to the Academic Council, the courses of study for the various programmes of instructions offered in respective faculty of the University
- (3) To propose to the Academic Council, the curricula of the Department and advise in regard to all questions related to the syllabi for various under graduate courses and all other functions, referred to it by the Faculty
- (4) To recommend to Academic Council, the establishment of new Department, abolition / sub-division / or otherwise re-constitution of existing Department or Departments
- (5) To recommend text books and reference books, courses of studies relating to the subjects under the Board of Studies
- (6) To give a shape to the development of the subject or group of subjects on the Board of Studies
- (7) To report on all matters referred to it by the Faculty, Academic Council or the Board of Management

As per Statute S.24.0, the following Constitution of the Board of Post Graduate Studies

The Board of Post Graduate Studies shall comprise of the following members:

- (1) Dean of Post Graduate Studies
Chairman
- (2) The Registrar
- (3) All Deans / Principal
- (4) The Director of Extension Education
- (5) All Associate Director of Research
- (6) Three Research Scientists and three Post Graduate teachers of the University to be nominated by the Dean of Post

Graduate Studies with the approval of the Vice Chancellor

- (7) The Assistant Registrar (Academic)
Secretary

As per Statute S. 27.0 Constitution of the Research Council

The Research Council shall consist of the following members:

- (1) The Vice chancellor
Chairman
- (2) The Deans of the Faculties
- (3) The Director of Extension Education
- (4) The Conveners of the Agresco sub-committees
- (5) Two Eminent Scientists outside the University nominated by the Vice Chancellor in consultation with Director of Research
- (6) Five Professors or their equivalent from the University nominated by the Vice Chancellor in consultation with Director of Research
- (7) One progressive farmer to be nominated by the Vice Chancellor in consultation with Director of Research
- (8) The Directors of Agriculture/Horticulture/Animal husbandry
- (9) All Associate Director of Research
- (10) The Director of Research
Member Secretary

As per Statute S. 29.0 Functions and Duties of the Research Council

The function and duties of the Research Council shall be as under:

- (1) To monitor and determine the research priorities of the University area.
- (2) To be responsible for Agriculture and Allied Sciences Research in the University.
- (3) To advise the Board of Management on policy matters of research.
- (4) To plan, execute and manage the research activities in the University efficiently.
- (5) To organize and co-ordinate research programmes on Agriculture and Allied Sciences in the University.
- (6) To review critically ongoing research programmes and make suggestions to the Board of Management to continue or to abandon or to modify the ongoing scheme.
- (7) To approve Research Projects and consider Intellectual Property Rights (IPR) issues submitted by the Research Scientists / Institutions / Departments.
- (8) Public private partnership mode in research.
- (9) To make recommendations in respect of the following :-
 - (i) Transfer of research recommendations to the Scientists / Farming Community and Industry through the Extension Agencies.
 - (ii) Allocation of funds to Research Schemes and Projects.
 - (iii) The terms and conditions for acceptance of the Research Projects / Consultancy Projects and funds thereof.
 - (iv) Formulation of research programmes and projects under taken or to be undertaken by the University.
 - (v) Physical and fixed facilities required for implementing research projects.
- (vi) Integration of research with extension education and teachings in the University and participation of research workers in teaching and extension education.
- (vii) Orienting research to meet farmers' needs.
- (viii) To give advice and accept the reports of on-going / completed research schemes.
- (10) To perform such other duties and functions as may be referred to from time to time by the Board of Management and the other authorities of the University as well as the Council of State Agricultural Universities.

As per Statute S. 31.0 Constitution of the Extension Education Council

The Extension Education Council shall consist of the following members:

- (1) The Vice chancellor
Chairman
- (2) The Director of Research and Dean P.G.
- (3) Deans of the Faculties
- (4) Five Extension Education specialists to be nominated by the Vice Chancellor in consultation with Director of Extension Education from amongst the following:-
 - (i) Professor of Extension Education
 - (ii) Agricultural Extension Educationist, Polytechnic
 - (iii) Programme Coordinator/Senior Scientist & Head, Krushi Vigyan Kendra.
 - (iv) Other Extension Specialists / Farm Manager
- (5) Three eminent Extension Education specialists concerned with farmers' training,

from outside the University to be co-opted by the Organization.

- (6) The Directors of Agriculture / Horticulture / Animal Husbandry
 - (7) Two progressive farmers to be nominated by the Vice Chancellor in consultation with Director of Extension Education
 - (8) The Associate Director of Extension Education
 - (9) The Director of Extension Education
- Member Secretary**

As per Statute S.33.0 Functions and Duties of Extension Education Council

In addition to the functions laid down under sub-section (3) of Section-27 of the Act, the functions and duties of the Extension Education Council shall be as under:

- (1) To formulate extension education policies and annual extension education programmes of the University
- (2) To make recommendations for preparation of extension educational material and aids.
- (3) To review critically ongoing Extension Education programme and make suggestions to Board of Management to continue or to abandon or to modify the ongoing scheme.
- (4) To impart training to college students in Extension Education.
- (5) To prepare materials for cultivators.
- (6) To formulate short term courses for rural and urban people and field extension personnel in the areas of agriculture and allied sectors.
- (7) To arrange training programmes on Agricultural Production, Processing and Marketing.

(8) To formulate programmes for cultivators, their families and rural youth.

(9) To recommend for:

- (a) Co-ordination of extension education programmes and projects of the University with the Other Agricultural Universities / Institutions.
- (b) Coordination and co-operation of extension educational activities of various agencies.
- (c) Development of farmers' education, training and advisory services for identification and resolution of field problems and transfer of information.
- (d) Methodology of extension education activities of the University area.
- (e) Integration of extension education with teaching and research in the University and participation of extension workers teachers in the field of research programmes and education for their work.

(10) To perform such other duties and functions as may be referred to from time to time by the Board of Management and the other authorities of the University and Council of State Agricultural Universities.

2.2 Administration

Anand Agricultural University was formed from erstwhile Gujarat Agricultural University during May 2004 with three colleges for Under Graduate & Post Graduate programme and for imparting education in agricultural and allied sciences. Presently, Anand Agricultural University has 9 Degree colleges, 5 Polytechnics and 1 Post-graduate Institute imparting education in agricultural and allied sciences. The University has a total of 1679

sanctioned posts, out of which 994 are filled and 685 posts are vacant.

Technical personnel included the staff at the main campus as well as 48 research stations, who carried different activities like crop improvement, crop protection, crop production, live stock management and improvement practices etc. under their domain of work. Our research endeavours have not only targeted excellence in agriculture but also other allied sectors like dairy science, veterinary science and animal husbandry, agricultural engineering and food processing technology etc.

AAU organizes various programmes and activities to expand knowledge of its scientists,

faculty and students. During the year under report, various programmes including conferences/trainings/workshops/seminars/winter schools/group meetings were organized by the University.

Human Resource Development at Anand Agricultural University receives top priority. Managerial trainings taken by Anand Agricultural University employees are given in the following table. The changing global scenario demands traditional research be sharpened based on market driven economy. Therefore, AAU scientists are encouraged to update their knowledge and improve their skills. Need of the day is search for newer technologies with cutting edge research so that new generation young farmers and women are enlightened.

Human Resources :

The Staff position as on 31-03-2020 in the Anand Agricultural University is given as under :

Sr. No.	Cadres	Sanctioned post	Filled up post	Vacant post
1	University Officers			
	Director of Research & Dean P.G.	1	0	1
	Director of Extension Education	1	1	0
	Director (I.T.)	1	0	1
	Registrar	1	0	1
	Comptroller	1	1	0
	Total	5	2	3
2	Teaching/Research/Extension- Class-I & II			
	Principal	9	4	5
	Associate Director of Research	2	2	0
	Professor & its equivalent	60	33	27
	Associate Professor & its equivalent	169	114	55
	Assistant Professor & its equivalent	350	271	79
	Total	590	424	166
3	Administration Group No. 1			
	Assistant Registrar (Academic/ Administration)	2	1	1
	Account Officer (Cash)	1	0	1
	Account Officer (PF/Cash)	1	1	0
	Assistant Administrative Officer	6	2	4
	Audit Officer	1	0	1
	Office Superintendent	9	6	3

Sr. No.	Cadres	Sanctioned post	Filled up post	Vacant post
	Head Clerk	17	17	0
	Senior Clerk	86	53	33
	Junior Clerk	135	52	83
	Hostel Assistant Warden	7	7	0
	Hostel Warden	1	0	1
	Total	266	139	127
4	Administration Group No. 2			
	Steno Grade-I	3	3	0
	Steno Grade-II	6	5	1
	Steno Grade-III	4	1	3
	Total	13	9	4
5	Engineering Group			
	Executive Engineer	1	1	0
	Deputy Engineer	1	1	0
	Junior Engineer (Civil/Electric)	3	1	2
	Total	5	3	2
6	Technical Group No.1			
	Agri. Officer/SRA (Agri.) & its equivalent	87	33	54
	Senior Research Assistant (Agri. Engg.)	11	10	1
	Senior Technician	1	1	0
	Agril. Supervisor & its equivalent	12	8	4
	Agril. Asstt. & its equivalent	166	99	67
	Foreman Instructor	2	2	0
	Supervisor Instructor	1	1	0
	Total	280	154	126
7	Technical Group No.2			
	Programme Assistant (KVK)	9	7	2
	Programmer	3	3	0
	Computer / Computer Operator	1	1	0
	Data Entry-cum-Disk Librarian	1	0	1
	Total	14	11	3
8	Technical Group No.3			
	Wireman	1	0	1
	Junior Wireman/Sr.Wireman	2	0	2
	Total	3	0	3
9	Isolated Group (Details given separately)	167	80	87
10	Class- IV Group (Regular)	220	56	164

Sr. No.	Cadres	Sanctioned post	Filled up post	Vacant post
11	Supernumary Posts (Class-III & IV)			
	Class-III (Jr.Clerk/Agril.Asstt./Driver/Tractor Driver)	6	6	0
	Class-IV	110	110	0
	Total	116	116	0
	Grand Total	1679	994	685
Details of Isolated Group (As mentioned at Sr. No.10 above)				
1	Senior Research Assistant (Dairy) / Dairy Supervisor	14	2	12
2	Veterinary Officer & its equivalent	8	1	7
3	Instructor (Baking/Science)	3	0	3
4	Assistant Instructor	1	0	1
5	Lab Technician & its equivalent	48	30	18
6	X-ray Technician	1	1	0
7	Junior Instructor	2	0	2
8	Mechanic-cum-Draftsman	1	1	0
9	Stockman/Livestock Assistant	7	7	0
10	Black Smith	2	1	1
11	Carpenter	1	0	1
12	Compounder	2	0	2
13	Junior Mechanic-cum-Wireman	1	1	0
14	Mechanic/Sr.Mechanic/Jr. Mechanic	4	4	0
15	Boiler Attendant	2	2	0
16	Compressor Attendant	2	0	2
17	Fitter	1	0	1
18	Bakery Operator	1	1	0
19	Balwadi Teacher	1	1	0
20	Sewing Teacher	1	0	1
21	Driver	42	17	25
22	Tractor Driver	14	4	10
23	Plumber	1	1	0
24	Tracer/Draftsman Tracer	2	2	0
25	Craftsman (Welder,Fitter, Turner,Electrician)	4	4	0
26	Junior Research Assistant (Dairy)	1	0	1
	Total	167	80	87

New Appointments / Promotions :

During the year under report, following

posts were filled up by direct recruitment/

promotion under various cadres.

Appointments during the year (01-04-2019 to 31-03-2020)

Sr. No.	Cadre	Promotion	Total
1.	Agriculture Supervisor	05	05
2.	Head Clerk	08	08
Total			13

Retirement

Voluntarily / Resignation / Death / Appointed

Following Teaching & Non-teaching staff in other University during the period under retired from the University by Superannuation/ report.

Teaching & Non-teaching staff retired by Superannuation/Voluntarily/Resignation/ Death/ Appointed in other University during the year (01-04-2019 to 31-03-2020).

Sr. No	Cadre	No. of persons					Total
		Super-annuation	Voluntarily	Resignation	Death	Appointed in other University	
1	Director of Research	01	0	0	0	0	01
2	Principal	01	0	0	0	0	01
3	Professor	04	0	0	0	0	04
4	Associate Professor	06	0	0	01	0	07
5	Assistant Professor	01	01	01	0	0	03
6	Account Officer (Cash)	01	0	0	0	0	01
7	Office Supdt	01	0	0	0	0	01
8	Head Clerk	07	0	0	0	0	07
9	Senior Clerk	02	0	0	0	0	02
10	Agri. Officer/SRA	0	01	0	0	0	01
11	Agri. Supervisor	09	0	0	0	0	09
12	Agri. Assistant	04	0	0	0	0	04
13	Driver/Tractor Driver	01	0	0	0	0	01
14	Lab Technician	01	0	0	0	0	01
15	Deta Entry Opretor	01	0	0	0	0	01
16	Statistical Assistant / Junior Res.Assistant	01	0	0	0	0	01
17	Programme Assistant (KVK)	0	0	01	0	0	01
18	Mechanic	01	0	0	0	0	01
19	Class-IV (Regular)	06	0	0	01	0	07
20	Class-IV(Supreme)	10	0	0	03	0	13
Total		58	2	2	5	0	67

2.3 Finance & Accounts

As per the Gujarat Agricultural Universities Act 2004, Chapter XI the University has established the Anand Agricultural University Fund. The contribution or grant by the State Government, the income of the University from all the sources including the income from fees and charges, bequest, donations, endowments and other grants are the part of, or be paid into the University Fund. The Comptroller act as financial adviser to the Vice Chancellor regarding all financial matters of the University and keep the Vice Chancellor informed from time to time about the financial position of the university. The Comptroller is responsible for supervising the quality of accounting and financial reporting to the Vice Chancellor of the University, Board of Management and State Government.

The Comptroller prepares the financial plans for development of the university in consultation with the concerned officers of the

University and under the guidance of the Vice Chancellor. The Comptroller ensures the grants are received in time from the Government of India, State Government and other aid-granting agencies. The Comptroller ensures that the University Fund is maintained and that a detailed and proper account of all credits into and withdrawals from the said fund is kept by the all offices of University. He also prepares the Annual Accounts of the university and renders necessary assistance to the auditor appointed by the State Government for the audit of the University.

Grant received, Income of University and Expenditure during the F.Y. 2019-20:

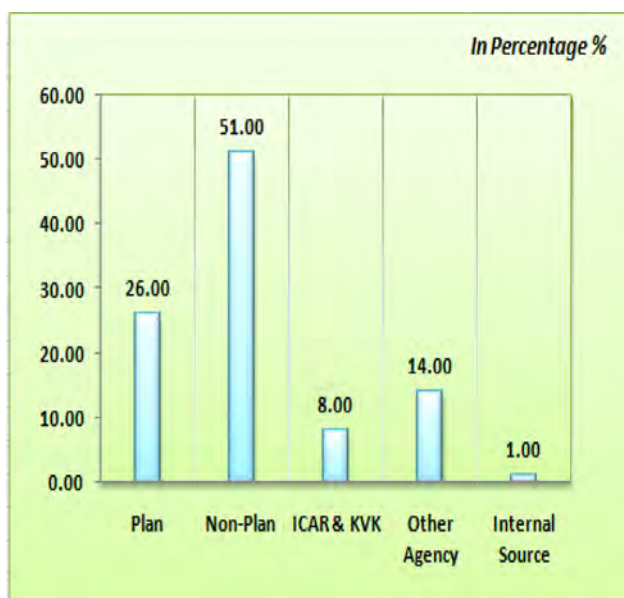
Anand Agricultural University has received the grants from State Government, Central Government, ICAR, Government Departments, Industries and Other Agencies under the various Schemes / Projects of Education, Research and Extension Education during the financial year 2019-20 as below:

(₹ in Crore)

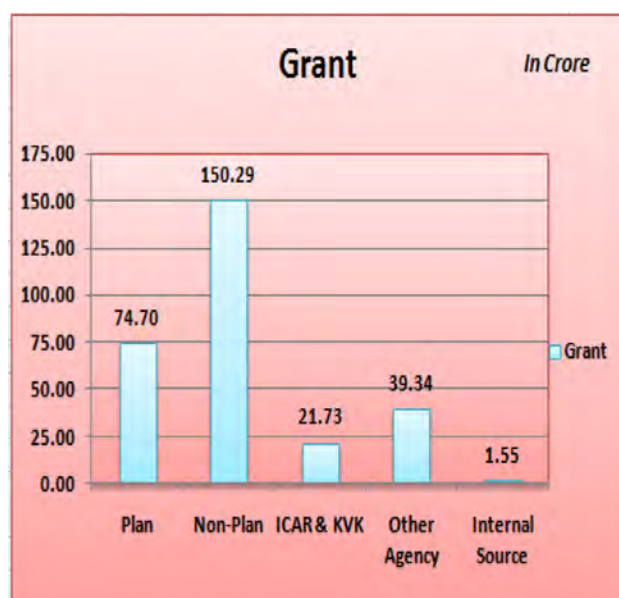
Particulars	Income	Grant	Expenditure
State Govt. Grant			
Plan Scheme	3.68	74.70	78.56
Non Plan Scheme	6.50	150.29	143.47
ICAR&K.V.K.	0.19	21.73	15.72
Other Agencies Scheme	0.27	39.34	32.42
Internal Source			
University Development Fund	0.51	1.55	3.41
Total	11.14	287.61	273.59

ANAND AGRICULTURAL UNIVERSITY, ANAND

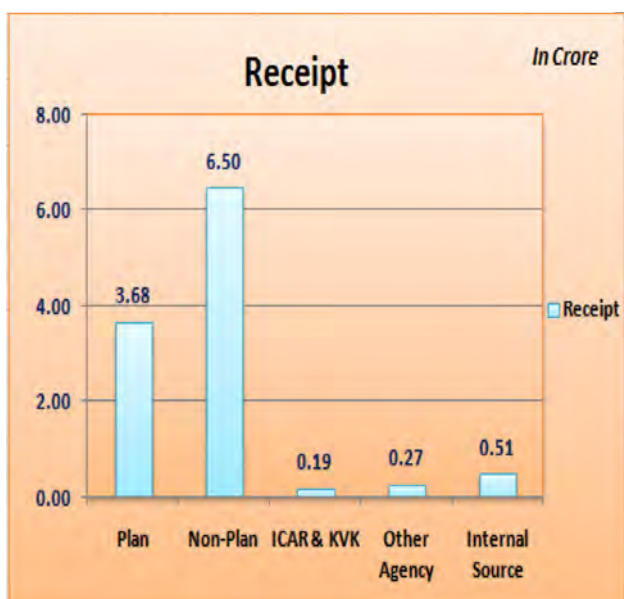
Funding Agency Wise Grant for the year 2019-20



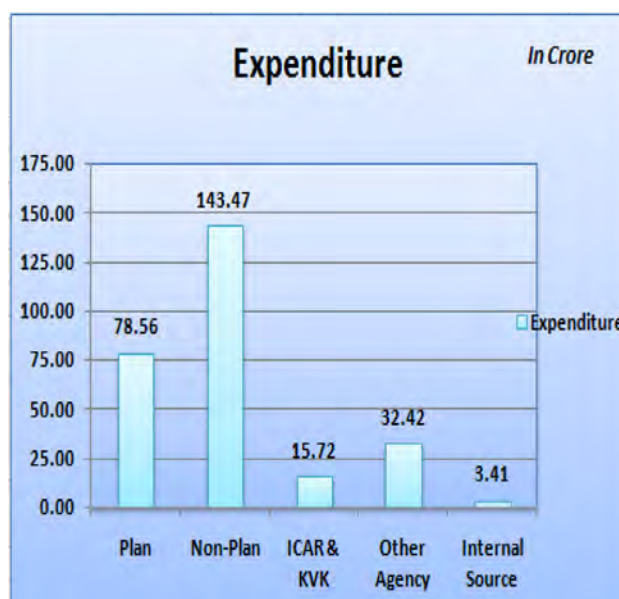
Grant for the year 2019-20



Receipt for the year 2019-20



Expenditure for the year 2019



Audit

(i) Internal Audit

The internal audit of the all the offices of the University has been carried out by the Chartered Accountant on the quarterly based for the F.Y. 2019-20.

(ii) Local Fund Audit by State Government :

Local Fund Audit by the State Government up to 2016-17 has been carried out and the Audit for the F.Y. 2017-18 is being carried out in the next year.

(iii) A.G. Audit

A.G. Audit for the Financial Year 2013-14 has been carried out by office of the Accountant General, Ahmadabad.

Store Verification

Physical Store Verification has been conducted during the F.Y. 2018-19.

Resources of Income and Financial Estimates

The revenue generated by the University

during 2019-20 is mainly through sale of farm produces, milk & milk products, poultry products i.e. egg, bakery products & guest house services, examination fee, tuition fee, hostel revenue, tender fee, house rent deductions, library fee, etc.

Financial Estimates

Following are the plan and non-plan budget estimates for 2019-20, as approved by the State Government.

Sr. No.	Details of Head	Estimates for 2019-20 (Rs. in Crore)			
		Original		Revised	
		Plan	Non-Plan	Plan	Non-Plan
1.	Education	40.49	114.51	41.29	131.50
2.	Research	28.78	17.22	29.05	18.37
3.	Extension Education	4.25	0.38	4.36	0.42
Total		73.52	132.11	74.70	150.29

Pension

Details of pension cases during 2019-20.

- (1) Final pension cases
- (2) Revised pension cases
- (3) Restoration pension cases

No. of cases finalized

- 62
416
42

Provident Fund (PF)

Details of P.F. cases disposed during 2019-20.

- (1) No. of Final withdrawal cases
 - (2) No. of Part-final withdrawal cases
- 58
172

In addition the monthly PF accounts subscription, withdrawals & balancing for university employees in form of broad

sheet and ledger were maintained. Initial P. L. accounts with Anand Treasury is opened and maintained.

Annexure-1

Officers of the University (01-04-2019 to 31-03-2020)

Hon'ble Governor Shri O. P. Kohli (upto 16-07-2019) Shri Acharya Devvratji Joining Date: 17-07-2019 to Continue	
Vice Chancellor Dr. N. C. Patel (upto 06-08-2019) I/c. Vice Chancellor Dr. K. B. Kathiria (From 07-08-2019 to 31-08-2019) I/c. Vice Chancellor Dr. R. V. Vyas (From 01-09-2019)	
Director of Research & Dean, P. G. Studies Dr. K. B. Kathiria (upto 31-08-2019) I/c. Director of Research & Dean, P. G. Studies Dr. R. V. Vyas (From 01-09-2019)	Director of Extension Education Dr. Arun A. Patel
I/c. Dean B. A. College of Agriculture Dr. M. V. Patel	Dean Veterinary Science & A. H. Dr. A. M. Thaker (upto 31-05-2019) I/c. Dean Veterinary Science & A. H. Dr. M. N. Brahmbhatt (From 01-06-2019)
Dean Sheth M. C. College of Dairy Science Dr. J. B. Prajapati	I/c. Dean Food Processing Technology & Bio-energy Dr. R. F. Sutar (upto 17-09-2019) I/c. Dean Food Processing Technology & Bio-energy Dr. K. B. Kathiria (From 18-09-2019)
Dean Agricultural Engineering & Technology Dr. R. Subbaiah	I/c. Dean Agricultural Information Technology Dr. D. R. Kathiriya (upto 30-09-2019 In-charge) Dean Agricultural Information Technology Dr. Y. R. Ghodasara (From 01-10-2019)
Principal International Agri-business Management Institute Dr. Y. C. Zala	I/c. Dean Horticulture Dr. H. C. Patel
I/c. Director Information Technology Dr. D. R. Kathiriya	I/c. Director of Students' Welfare Dr. M. M. Trivedi (upto 30-05-2019) I/c. Director of Students' Welfare Dr. D. H. Patel (From 30-05-2019)
I/c. Comptroller Shri R. H. Gondaliya	I/c. Librarian Dr. Y. R. Ghodasara
Executive Engineer Shri B. N. Bhalia (upto 30-06-2019) I/c. Executive Engineer Shri H. R. Patel (From 01-07-2019)	Registrar Dr. M. N. Brahmbhatt (upto 30-05-2019 after noon) I/c. Registrar Dr. M. M. Trivedi (From 30-05-2019 before noon Continue In-charge)

Annexure-2

Members of the Board of Management (01-04-2019 to 31-03-2020)

<p>Vice Chancellor Dr. N. C. Patel (upto 06-08-2019)</p> <p>I/c. Vice Chancellor Dr. K. B. Kathiria (From 07-08-2019 to 31-08-2019)</p> <p>I/c. Vice Chancellor Dr. R. V. Vyas (From 01-09-2019)</p>
<p>Additional Chief Secretary</p> <p>Agriculture, Farmer Welfare & Co-operation Department Shri Sanjay Prasad (I.A.S.) Shri Punamchand Parmar (I.A.S.)</p>
<p>Deputy Secretary Education Department Shri Ashoksinh T. Parmar (Higher Education) Shri Ronak M. Mehta (Higher Education)</p>
<p>Secretary Finance Department Shri Milind Torvane (I.A.S.) Shri Roopwant Singh (I.A.S.)</p>
<p>Director of Agriculture Shri B. M. Modi</p>
<p>Director of Animal Husbandry Dr. A. J. Kachhiapatel Dr. F. S. Thakar</p>
<p>Director of Horticulture Dr. P. M. Vaghasiya</p>
<p>Dean Nominated by Vice Chancellor Dr. R. Subbaiah Agricultural Engineering & Technology, Godhra (upto 27-08-2019)</p> <p>Director Agricultural Technology Management Agency (ATMA) & SAMETI Shri K. D. Panchal Gujarat State, Gandhinagar (From 31-12-2019 to 30-12-2022)</p>
<p>One Director, to be nominated by the Vice Chancellor from amongst the Director of Research and Dean of Post-graduate Studies or the Director of Extension Education</p>
<p>Nominated by Vice Chancellor Director of Research & Dean P. G. Studies Dr. K. B. Kathiria (upto 31-08-2019)</p> <p>Director of Extension Education Dr. Arun A. Patel (From 01-09-2019)</p>

**Two Agricultural Scientist having background of Agricultural Research or Education
Nominated by the State Government**

Former Vice Chancellor

Dr. A. M. Shekh
Anand Agricultural University, Anand (From 31-12-2019)

Retd. Associate Director of Research (Ani.Sci.)

Dr. K. S. Patel
Gujarat Agricultural University, Ahmedabad (From 31-12-2019)

One farmer nominated by the State Government

One Farmer

Shri Dilipkumar Pratapsinh Dhanga
Village: Moti Bandibar (From 16-10-2019)

One eminent women social worker having experience in rural development

Smt. Shruti A. Shroff

Managing Trustee
Shroff's Foundation Trust, At. Kalali (From 01-10-2019)

One distinguished Agro-industrialist

Shri Chandreshbhai A. Shah

Managing Director
Madhav Agro Foods Pvt. Ltd., At. Dabhasa (From 01-10-2019)

**One representative Nominated by the
Director General of Indian Council of Agricultural Research**

Nominated by Indian Council of Agricultural Research (I.C.A.R.)

Dr. Kanchan K. Singh
Assistant Director General (Farm Engineering)
Indian Council of Agricultural Research, New Delhi-110012

Registrar & Member Secretary

Dr. M. N. Brahmhatt (upto 30-05-2019 after noon)

I/c. Registrar & Member Secretary

Dr. M. M. Trivedi (From 30-05-2019 before noon Continue In-charge)

Annexure-3

Members of the Academic Council (01-04-2019 to 31-03-2020)

Vice Chancellor Dr. N. C. Patel (upto 06-08-2019) I/c. Vice Chancellor Dr. K. B. Kathiria (From 07-08-2019 to 31-08-2019) I/c. Vice Chancellor Dr. R. V. Vyas (From 01-09-2019)	
Director of Research & Dean, P. G. Studies Dr. K. B. Kathiria (upto 31-08-2019) I/c. Director of Research & Dean, P. G. Studies Dr. R. V. Vyas (From 01-09-2019)	Director of Extension Education Dr. Arun A. Patel
I/c. Dean B. A. College of Agriculture Dr. M. V. Patel	Dean Veterinary Science & A. H. Dr. A. M. Thaker (upto 31-05-2019) I/c. Dean Veterinary Science & A. H. Dr. M. N. Brahmbhatt (From 01-06-2019)
Dean Sheth M. C. College of Dairy Science Dr. J. B. Prajapati	I/c. Dean Food Processing Technology & Bio-energy Dr. R. F. Sutar (upto 17-09-2019) I/c. Dean Food Processing Technology & Bio-energy Dr. K. B. Kathiria (From 18-09-2019)
Dean Agricultural Engineering & Technology Dr. R. Subbaiah	I/c. Dean Agricultural Information Technology Dr. D. R. Kathiriya (upto 30-09-2019 In-charge) I/c. Dean Agricultural Information Technology Dr. Y. R. Ghodasara (From 01-10-2019)
Dean International Agri-business Management Institute Dr. Y. C. Zala	I/c. Dean Horticulture Dr. H. C. Patel
Professor & Head Dr. R. F. Suthar (Nominated) Post-Harvest Engineering & Technology Food Processing Technology & Bio-Energy, Anand (From 01-01-2018 to 31-12-2020)	Research Scientist (P) Dr. D. M. Mehta (Nominated) I.C.A.R., Unit, A.A.U., Anand (From 01-08-2018 to 31-07-2021) Retire Date: 28-02-2020 Professor (P) Dr. M. S. Kulshreshtha (Nominated) Basic Sciences and Humanities, B. A. College of Agriculture, Anand (From 01-03-2020 to 28-02-2023)
Professor & Head Dr. M. M. Trivedi (Nominated) Animal Science, B. A. College of Agriculture, Anand (From 01-03-2019 to 30-02-2022)	Professor & Head Dr. N. B. Chauhan (Nominated) Extension Education, B. A. College of Agriculture, Anand (From 01-10-2018 to 30-09-2021)

<p align="center">Professor</p> <p align="center">Dr. K. M. Panchal (Nominated) Veterinary Anatomy, Veterinary Science & A. H., Anand (From 01-06-2017 to 31-05-2020)</p>	<p align="center">Professor (Horti.) & I/c. Principal</p> <p align="center">Dr. H. C. Patel (Nominated) Fruit Science, College of Horticulture, Anand (From 01-06-2018 to 31-05-2021)</p>
<p align="center">I/c. Director of Students' Welfare</p> <p align="center">Dr. M. M. Trivedi (Co-opt) (From 01-03-2019 to 30-05-2019 In-charge)</p> <p align="center">I/c. Director of Students' Welfare</p> <p align="center">Dr. D. H. Patel (Co-opt) (From 30-05-2019 to Continue In-charge) (From 01-12-2019 to 30-11-2022)</p>	<p align="center">I/c. Librarian</p> <p align="center">Dr. M. D. Patel Regional e-Library Dr. Y. R. Ghodasara (Co-opt) (From 01-12-2019 to 30-11-2022)</p>
<p align="center">Professor</p> <p align="center">Dr. D. B. Choksi (Co-opt) Post Graduate Computer Science Sardar Patel University, Vallabh Vidyanagar (From 01-12-2016 to 30-11-2019)</p> <p align="center">Principal, Professor & Dean</p> <p align="center">Dr. Atul M. Patel (Co-opt) Smt. Chandaben Mohanbhai Patel, Institute of Computer Application, Charotar University of Science & Technology, Charusat Campus, Changa (From 01-12-2019 to 30-11-2022)</p>	<p align="center">Principal & Dean</p> <p align="center">Dr. R. K. Jain (Co-opt) ADIT College, New Vallabh Vidyanagar (From 01-12-2016 to 30-11-2019)</p> <p align="center">Director</p> <p align="center">Dr. Gaurav Mishra (Co-opt) Sardar Patel Renewable Energy Research Institute, Near B. V. M. Engineering College, Vallabh Vidyanagar (From 01-12-2019 to 30-11-2022)</p>
<p align="center">Retd. Research Scientist & Head</p> <p align="center">Dr. M. B. Pande (Co-opt) Animal Nutrition, Anand (From 01-12-2016 to 30-11-2019)</p> <p align="center">Retd. Professor & Head (Pathology)</p> <p align="center">Dr. K. S. Prajapati (Co-opt) 19, Himalaya Retrit, 100 ft. Road, Near Indira Gandhi Statue, Anand (From 01-12-2019 to 30-11-2022)</p>	<p align="center">Former Dean (Agril. Engg.) & Director</p> <p align="center">Dr. R. C. Purohit (Co-opt) Planning & Monitoring, Maharana Pratap University Agriculture & Technology, Udaipur (Rajasthan) (From 01-02-2019 to 31-01-2022)</p>
<p align="center">Retd. Principal & Dean</p> <p align="center">Dr. B. P. Shah (Co-opt) Sheth M. C. College of Dairy Science 101, Radha Swami, 'Suman' Flat, Beside Patel Sadi Centre, Near Gamdivad, Anand (From 01-06-2017 to 31-05-2020)</p>	<p align="center">Retd. Principal</p> <p align="center">Dr. Jivanbhai G. Patel (Co-opt) C. P. College of Agriculture, S.D.A.U., Sardar Krushinagar 54/55, Mangal Nagar, Vidya Dairy Road, Anand (From 15-09-2017 to 14-09-2020)</p>

Retd. Professor & Head (Horticulture)

Dr. C. K. Dixit (Co-opt)
B-88, Umianagar Society,
Berna Road, (Gokul Nagar),
At. & Post: Himmatnagar
(From 01-06-2017 to 31-05-2020)

Retd. Principal (Basic Science & Humanities)

Dr. Ghanshyambhai M. Patel (Co-opt) S.D.A.U.,
Sardar Krushinagar
A-23, Karnavatinagar Society,
Opp. Sarvoday Vibhag-3,
Near K. K. Nagar Char Rasta,
At. & Post:Ghatlodia, Ahmedabad
(From 01-06-2017 to 31-05-2020)

Registrar & Member Secretary

Dr. M. N. Brahmbhatt (upto 30-05-2019 after noon)

I/c. Registrar & Member Secretary

Dr. M. M. Trivedi (From 30-05-2019 before noon Continue In-charge)

Annexure-4

Heads of the Departments

(1) FACULTY OF AGRICULTURE, ANAND

I/c. Principal & Dean, Dr. M. V. Patel (01-10-2016 to 30-09-2019)

I/c. Principal & Dean, Dr. M. V. Patel (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. M. V. Patel	Professor	Agronomy (Upto 30-06-2020)
	Dr. B. D. Patel	Professor (P) & Agronomist in AICRP on Weed Control Management	Agronomy (From 01-11-2018)
2	Dr. R. V. Vyas	Professor (P)	Agricultural Microbiology (01-07-2017 to 30-06-2020)
3	Dr. J. J. Dhruve	Associate Professor	Bio-chemistry (01-10-2018 to 30-09-2021)
	Dr. P. K. Borad	Professor (P)	Agricultural Entomology (01-07-2017 to 30-06-2020)
4	Dr. B. A. Patel	Professor (P)	Nemaology (01-07-2017 to 30-06-2020)
5	Dr. D. H. Patel	Professor (P)	English (01-07-2017 to 30-06-2020)
6	Dr. N. B. Chauhan	Professor	Extension Education (01-07-2017 to 30-06-2020)
7	Dr. K. S. Jadav	Associate Professor	Agricultural Economics (01-07-2017 to 30-06-2020)
8	Dr. P. R. Vaishnav	Professor	Agricultural Statistics (01-07-2017 to 30-06-2020)
9	Dr. V. J. Patel	Associate Professor	Polytechnic in Agriculture, Anand (01-07-2017 to 30-06-2020)
10	Dr. A.B.Brahmbhatt	Associate Professor	Plant Pathology (01-04-2018 to 31-03-2021)
11	Dr. Kalyanrao Patil	Assistant Professor	Seed Science & Technology (01-11-2017 to 31-10-2020)
12	Dr. M. M. Trivedi	Professor (P)	Animal Science (01-11-2017 to 31-10-2020) (Six Nominated Member by Academic Council) (01-03-2019 to 30-02-2022)
13	Dr. N. I. Shah	Professor	Horticulture (01-10-2015 to 30-09-2018) (Ten Co-opted Member by Academic Council) (01-06-2020 to 31-05-2023)
14	Dr. B. D. Patel	Agronomist	AICRP on Weed Control Weed Control Project (01-07-2014 to 30-06-2017)
15	Dr. S. J. Macwan	Assistant Professor	Plant Physiology (01-10-2018 to 30-09-2021)
16	Dr. M. M. Lunagaria	Associate Professor	Agricultural Meteorology (15-02-2019 to 14-02-2022)
17	Dr. N. J. Jadav	Professor (P)	Soil Science & Agricultural Chemistry (01-06-2018 to 31-05-2021)

Sr. No.	Name and Designation of the Teacher		Department
18	Dr. D. A. Patel	Associate Professor	Genetics & Plant Breeding (01-07-2018 to 30-06-2021)
19	Dr. M. S. Kulshreshtha	Professor (P) (Mathematics)	Basic Science and Humanities (01-01-2019 to 31-12-2022)
20	Dr. V. B. Bhalodiya	Associate Professor	Agricultural Engineering (15-02-2019 to 14-02-2022)

(2) FACULTY OF DAIRY SCIENCE, ANAND

Principal & Dean, Dr. J. B. Prajapati (01-10-2016 to 30-09-2019)

Principal & Dean, Dr. J. B. Prajapati (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. J. B. Prajapati	Professor	Dairy Microbiology (01-07-2017 to 30-06-2020)
2	Dr. J. B. Upadhyay	Professor	Dairy Engineering (01-07-2017 to 30-06-2020)
3	Dr. A. K. Makwana	Associate Professor	Dairy Business Management (01-07-2017 to 30-06-2020)
4	Dr. Sunita V. Pinto	Professor (P)	Dairy Technology (01-08-2018 to 31-07-2021)
5	Dr. Atanu Jana	Professor (P)	Dairy Processing & Operations (01-08-2018 to 31-07-2021)
6	Dr. B. M. Mehta	Associate Professor	Dairy Chemistry (01-07-2018 to 30-06-2021)

(3) FACULTY OF VETERINARY SCIENCE & ANIMAL HUSBANDRY, ANAND

Principal & Dean, Dr. A. M. Thaker (01-10-2016 to 30-09-2019)

(Retired Date: 31-05-2019)

I/c. Principal & Dean, Dr. M. N. Brahmhatt (01-06-2019 to 30-09-2019)

I/c. Principal & Dean, Dr. M. N. Brahmhatt (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. D. M. Bhayani	Professor (P)	Veterinary Anatomy (01-11-2018 to 31-10-2021)
2	Dr. S. P. Mudhira	Assistant Professor	Veterinary Physiology & Biochemistry (01-01-2020 to 31-12-2022)
3	Dr. S. K. Bhavsar	Professor	Veterinary Pharmacology & Toxicology (01-10-2017 to 30-09-2020)
4	Dr. B. C. Parmar	Associate Professor	Livestock Products Technology (01-10-2017 to 30-09-2020)
5	Dr. J. B. Nayak	Associate Professor	Veterinary Public Health & Epidemiology (01-10-2017 to 30-09-2020)
6	Dr. D. J. Ghodasara	Professor (P)	Veterinary Pathology (01-11-2018 to 31-10-2021)
7	Dr. J. J. Hasnani	Professor	Veterinary Parasitology (01-07-2017 to 30-06-2020)

Sr. No.	Name and Designation of the Teacher		Department
8	Dr. S. K. Raval	Professor	Veterinary Medicine (01-07-2017 to 30-06-2020)
9	Dr. P. V. Parikh	Professor	Veterinary Surgery & Radiology (01-11-2018 to 31-10-2021)
10	Dr. A. J. Dhami	Professor	Veterinary Gynecology & Obstetrics (01-07-2017 to 30-06-2020)
11	Dr. K. N. Wadhvani	Associate Professor	Livestock Production & Management (01-07-2017 to 30-06-2020)
12	Dr. D. N. Rank	Professor	Animal Genetics & Breeding (01-07-2017 to 30-06-2020)
13	Dr. C. G. Joshi	Professor	Animal Bio-technology (Ani. Sci.) Deputation Date: 07-08-2018 Director, GBRC, Gandhinagar (01-07-2017 to 30-06-2020)
14	Dr. D. M. Patel	Professor	Veterinary Clinic Complex (01-07-2017 to 30-06-2020)
15	Dr. N. P. Sarvaiya	Professor (P)	Reproductive Biology Research Unit (01-02-2018 to 31-01-2021)
16	Dr. S. V. Shah	Research Scientist	Livestock Research Station (01-07-2017 to 30-06-2020)
17	Dr. F. P. Savaliya	Associate Professor	Poultry Research Station (01-07-2017 to 30-06-2020)
18	Dr. V. P. Belsare	Research Scientist	Kapila Go Sanshodhan Kendra, Minawada / Ramna Muvada (01-07-2017 to 30-06-2020)
19	Dr. B. B. Bhanderi	Assistant Professor	Veterinary Microbiology (01-07-2019 to 30-06-2022)
20	Dr. U. M. Patel	Associate Professor	Veterinary and Animal Husbandry Extension Education (23-07-2019 to 22-07-2022)
21	Dr. P. R. Pandya	Professor (P)	Animal Nutrition (01-05-2017 to 30-04-2020)

(4) FACULTY OF FOOD PROCESSING TECHNOLOGY & BIO-ENERGY, ANAND
I/c. Principal & Dean, Dr. R. F. Sutar (01-09-2018 to 30-09-2019)
Principal & Dean, Dr. K. B. Kathiria (18-09-2019 to 17-09-2020)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. R. F. Sutar	Professor	Post Harvest Engineering & Technology (01-07-2017 to 30-06-2020)
2	Dr. S. S. Kapdi	Professor	Bio-Energy (01-07-2017 to 30-06-2020)
3	Dr. R. V. Prasad	Professor	Food Quality Assurance (01-07-2017 to 30-06-2020)
4	Dr. H. G. Bhatt	Associate Professor	Food Safety and Testing (01-07-2017 to 30-06-2020)

Sr. No.	Name and Designation of the Teacher		Department
5	Er. H. Pandey	Associate Professor	Food Processing Technology (01-07-2017 to 30-06-2020)
6	Dr. A. K. Sharma	Associate Professor	Food Engineering (01-07-2017 to 30-06-2020)
7	Dr. Samip Dutta	Associate Professor	Food Business Management (01-07-2017 to 30-06-2020)
8	Dr. S. H. Akbari	Associate Professor	Food Plant Operations (01-02-2019 to 31-01-2022)

(5) FACULTY OF AGRICULTURAL ENGINEERING & TECHNOLOGY, GODHRA

Principal & Dean, Dr. R. Subbaiah (01-10-2016 to 30-09-2019)

Principal & Dean, Dr. R. Subbaiah (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. R. Swarnkar	Professor	Farm Machinery and Power (01-07-2017 to 30-06-2020)
2	Dr. Navneet Kumar	Associate Professor	Processing & Food Engineering (01-07-2017 to 30-06-2020)
3	Dr. Kapil Mandloi	Associate Professor	Basic Engineering and Applied Science (01-07-2017 to 30-06-2020)
4	Dr. Mukesh Tiwari	Associate Professor	Irrigation and Drainage Engineering (01-07-2017 to 30-06-2020)
5	Dr. Pankaj Gupta	Professor	Soil & Water Engineering (01-12-2016 to 30-11-2019)
	Dr. Pankaj Gupta	Professor	Soil & Water Conservation Engineering (SWCE) (01-12-2019 to 30-11-2022)
6	Dr. D. K. Vyas	Associate Professor	Renewable Energy Engineering (REE) (01-12-2016 to 30-11-2019)
	Dr. D. K. Vyas	Associate Professor	Renewable Energy Engineering (REE) (01-12-2019 to 30-11-2022)

(6) AGRICULTURAL INFORMATION TECHNOLOGY, ANAND

I/c. Principal & Dean, Dr. D. R. Kathiriya (01-10-2016 to 30-09-2019)

I/c. Dean, Dr. Y. R. Ghodasara (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. Y. R. Ghodasara	Professor (P)	Agricultural Information Technology (01-07-2018 to 30-06-2021)
2	Dr. V. B. Darji	Associate Professor	Agricultural Science (01-07-2017 to 30-06-2020)

(7) INTERNATIONAL AGRI-BUSINESS MANAGEMENT INSTITUTE, ANAND

Principal, Dr. Y. C. Zala (01-10-2016 to 30-09-2019)

Principal, Dr. Y. C. Zala (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. Y. A. Lad	Associate Professor	HRD & Personnel Management (01-07-2017 to 30-06-2020)
2	Dr. M. R. Prajapati	Assistant Professor	Financial Management (01-07-2017 to 30-06-2020)
3	Dr. D. R. Vahoniya	Assistant Professor	Project Management (01-07-2017 to 30-06-2020)
4	Dr. R. S. Pundir	Professor (P)	Agri-business Economics & Policies (01-04-2018 to 31-03-2021)
5	Dr. S. R. Panigarhy	Assistant Professor	Production Management (01-04-2018 to 31-03-2021)
6	Dr. Chetan Dudhagara	Assistant Professor	Communication & Information Technology (01-04-2018 to 31-03-2021)
7	Dr. Ashish B. Mahera	Assistant Professor	Marketing Management (10-01-2017 to 09-01-2020)

(8) COLLEGE OF HORTICULTURE, ANAND

5th Dean's New HOD Period (01-03-2020 to 28-02-2023)

I/c. Principal & Dean, Dr. H. C. Patel (01/03/2019 to 30-09-2019)

I/c. Principal & Dean, Dr. H. C. Patel (01-10-2019 to 30-09-2022)

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. D. D. Parekh	Assistant Professor	Fruit Science (01-03-2020 to 28-02-2023)
2	Dr. B. N. Satodia	Associate Professor	Vegetable Science (01-03-2020 to 28-02-2023)
3	Prof. R. R. Gajera	Associate Professor	Post-Harvest Technology (01-03-2020 to 28-02-2023)
4	Prof. D. R. Paradva	Assistant Professor	Floriculture and Landscape Architecture (01-03-2020 to 28-02-2023)
5	Dr. A. H. Barad	Assistant Professor	Plant Protection (01-03-2020 to 28-02-2023)
6	Dr. C. H. Raval	Assistant Professor	Natural Resources Management (01-03-2020 to 28-02-2023)
7	Dr. Prity Kumari	Assistant Professor	Basic Science (01-03-2020 to 28-02-2023)
8	Dr. B. L. Dudhat	Assistant Professor	Social Science (01-03-2020 to 28-02-2023)

(9) COLLEGE OF AGRICULTURE, VASO
New HOD Period (01-07-2018 to 30-06-2021)
I/c. Principal & Dean, Dr. M. V. Patel (01/03/2019 to 30-09-2019)
I/c. Principal, Dr. Y. M. Shukla

Sr. No.	Name and Designation of the Teacher		Department
1	Dr. Y. M. Shukla	Professor	Biochemistry / Plant Physiology / Plant Molecular Biology (01-07-2018 to 30-06-2021)
2	Dr. S. B. Patel	Associate Professor	Soil Science & Agricultural Chemistry + (Agricultural Meteorology) (01/05/2019 to 30/04/2022)
3	Dr. N. B. Patel	Associate Professor	Entomology (08/03/2019 to 07/03/2022)
4	Dr. G. R. Patel	Associate Professor	Agricultural Engineering (01-07-2018 to 30-06-2021)
5	Dr. B. C. Patel	Associate Professor	Genetics & Plant Breeding + Seed Science & Technology (01-07-2018 to 30-06-2021)
6	Dr. Kurjibhai M.Patel	Associate Professor	Horticulture (01-07-2018 to 30-06-2021)
7	Dr. Manoj Dohat	Assistant Professor	Agronomy (01-07-2018 to 30-06-2021)
8	Dr. Nilesh B. Pawar	Assistant Professor	Plant Pathology / Nematology / Microbiology (01-07-2018 to 30-06-2021)
9	Dr. Bindu M. Christian	Assistant Professor	Agricultural Extension & Communication + English (01-07-2018 to 30-06-2021)
10	Dr. M. N. Jegoda	Assistant Professor	Animal Science (01-07-2018 to 30-06-2021)

Chart-1

ORGANIZATIONAL SET-UP

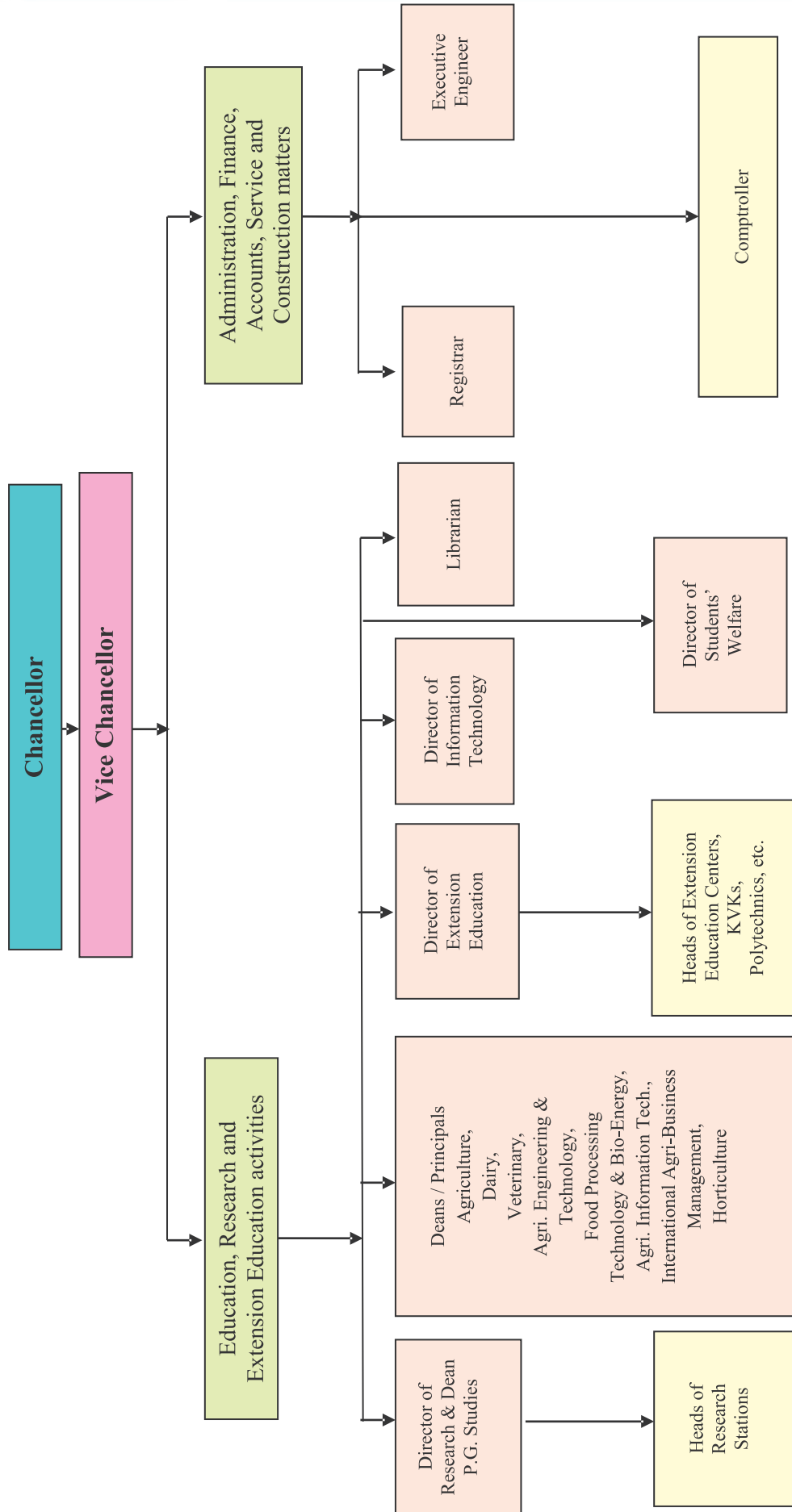
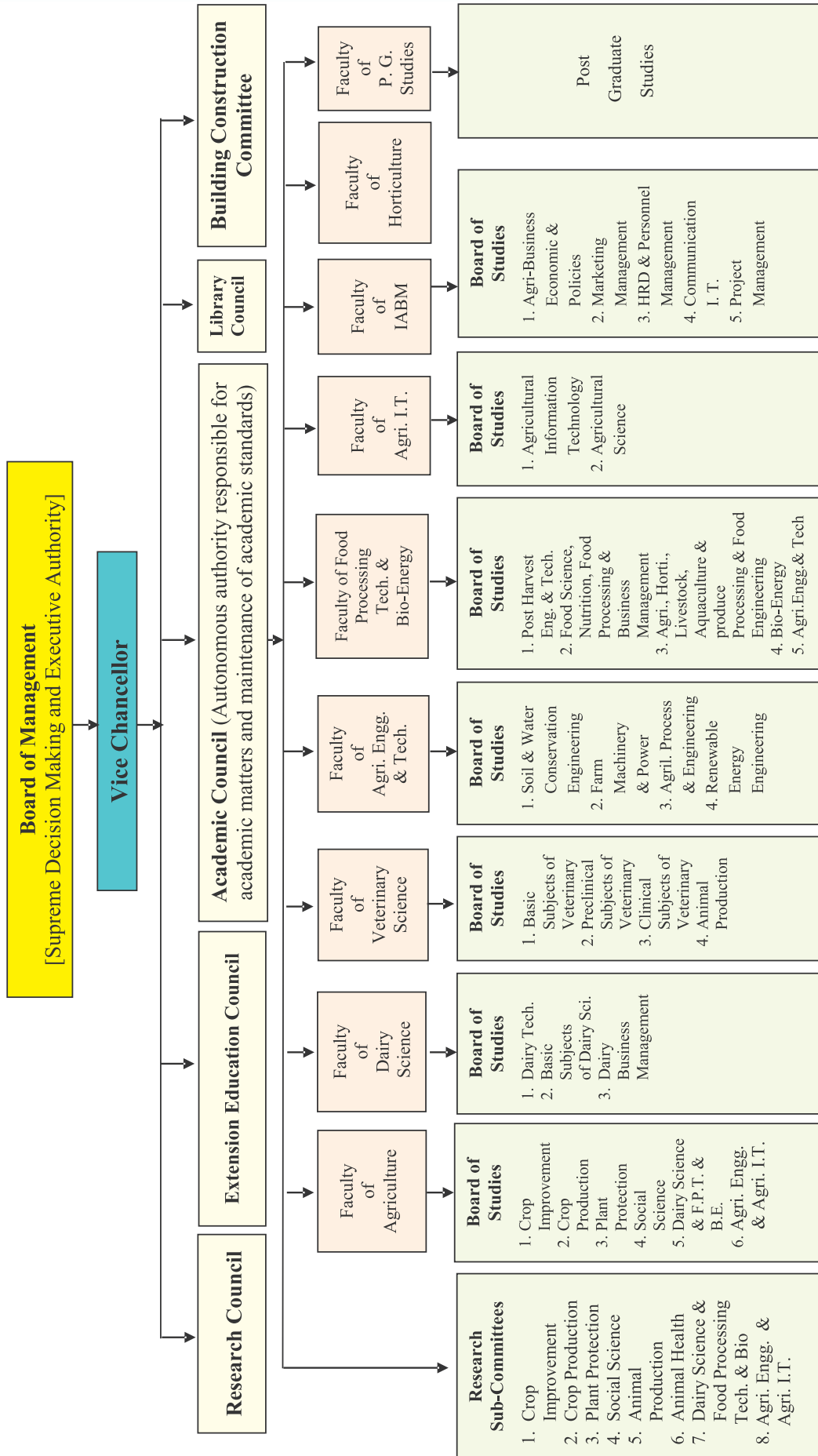


Chart-2 ORGANIZATIONAL CHART & DECISION MAKING CHANNELS





College of Agriculture, Jabugam



Sheth M.C. Polytechnic in Agriculture, Anand

Chapter - 3

EDUCATION

Centralized Admission Process

Under Section 25 (7) (g) of the GAU Act, 2004, the function of supervising and coordinating the centralized admission to various degree courses at the University has been assigned to the Council of State Agricultural Universities. The Council has nominated Vice Chancellor of Anand Agricultural University as the Nodal Officer for carrying out function of the centralized admission for all SAUs of Gujarat.

Nodal Officer

As a Nodal Officer for Academic and Examination, Vice Chancellor Dr. R. V. Vyas successfully conducted an important exercise of centralized admissions at Diploma, UG and PG levels for four State Agricultural Universities of Gujarat. As the Nodal Officer, he convened meeting of the Registrars and Deans of four SAUs and arranged for smooth conduct of examinations and paper evaluation.

3.1 Under Graduate Courses

Admission Procedure

AAU is a residential university and follows semester system. Courses of B.Sc. (Hons.) Agriculture, B.Sc. (Hons.) Horticulture, B.Tech. (Dairy Technology), B.Tech. (Agricultural Engineering), B.Tech. (Food Technology), B.Tech. (Agricultural Information Technology) are of four years duration divided into eight semesters, while B.V.Sc. & A.H. course is of five and half years duration. The medium of instruction is English. The University imparts

resident instruction for the graduate programmes at their constituent colleges with the eligibility and admission requirements as given in **Table 3.1**. Under the Semester system of education, all students are compulsorily required to stay in a University hostel, except otherwise permitted. Through online receipt of applications, a common merit list is prepared on the basis of Academic Regulations. Girl students are exempted from tuition and hostel fees.

3.1.1 Diploma to Degree Programme (D to D)

Admission Procedure

10% seats of degree programme are kept reserved in Agriculture, Horticulture, Agricultural Engineering & Food Processing Technology for Diploma to Degree programme. Based on the common entrance test, the qualifying students are admitted directly in the third semester of the concerned degree programme.

3.1.2 Polytechnic Programme

Admission Procedure

Students who have passed Secondary School Certificate Examination with English as compulsory subject are eligible for admission to three years (six semesters) Diploma programme in various subjects run at the Polytechnics of the University. The medium of instruction is English.

The details of number of seats and actual admitted students in different polytechnics during the year 2019-20 are given in **Table 3.3**.

Table 3.1 Eligibility criteria for admission in various degree programmes

Name of the graduate programme	Category wise minimum % requirement of marks in theory subjects in Physics, Chemistry and Biology of HSSCE examination			
	Category			
	General	SC	ST	SEBC
B.Sc. (Hons.) Agriculture	40	35	35	40
B.Sc.(Hons.) Horticulture	40	35	35	40
B.Tech. (Agricultural Information Technology)	40	35	35	40
Admission is considered on the merit basis of 60% of PCM/PCB theory and 40 % of GUJCET marks.				
B.V.Sc. & A.H.	50	47.50	47.50	47.50
	A candidate under General Category must have passed in each of the subjects (Physics, Chemistry, Biology & English), obtaining 50 % aggregate marks in these subjects at the qualifying examination. The students are admitted only on the basis of merit in GUJCET marks.			
Name of the graduate programme	Category wise minimum % requirement of marks in theory subjects in Physics, Chemistry and Mathematics of HSSCE examination			
	Category			
	General	SC	ST	SEBC
B.Tech. (Agricultural Engineering)	40	35	35	40
B.Tech. (Agricultural Information Technology)	40	35	35	40
B.Tech. (Food Technology)	40	35	35	40
B.Tech. (Dairy Technology)	40	35	35	40
Admission is considered on the merit basis of 60% of PCM/PCB theory and 40 % of GUJCET marks.				

The college wise details i.e., number the academic year 2019-20 are given in of seats and actual admitted students for [Table 3.2](#).

Table 3.2 Students intake and admitted in different graduation programmes (2019-20)

Degree	Name of the College	Admission Capacity		No of students
		Total Seat	ICAR/VCI	Admitted
B.Sc. (Hons.) Agriculture	B. A. College of Agriculture, Anand	149	20	134
	College of Agriculture, Vaso	66	-	62
	College of Agriculture, Jabugam	55	-	47
B.V.Sc.& A.H.	College of Veterinary Sci. & A. H., Anand	80	12	80
B.Sc.(Hons.) Horticulture	College of Horticulture, Anand	77	-	45
B.Tech. (DT.)	Sheth M. C. College of Dairy Science, Anand	72	10	72
B.Tech. (AET)	College of Agril. Engineering & Technology, Godhra	55	08	35
B.Tech. (AIT)	College of Agricultural Information Technology, Anand	44	-	42
B.Tech. (FT)	Food Processing Technology & Bio-Energy, Anand	55	08	55

Table 3.3 Students intake and admitted in different Polytechnic Programmes for academic year 2019-20

Name of the Diploma Programme	Name of the Polytechnic College	Admission capacity	No. of students
		Total Seat	Admitted
Agriculture	Sheth M.C. Polytechnic College of Agriculture, Anand	44	40
	Polytechnic College of Agriculture, Vaso	44	42
Agricultural Engineering	Polytechnic College of Agricultural Engineering, Dahod	44	33
Nutrition & Dietetics	Polytechnic College of Food Science & Home Economics, Anand	44	37
Horticulture	Polytechnic College of Horticulture, Vadodara	44	42

3.2 Post Graduate courses

Admission Procedure

A candidate aspiring to get admission in PG studies should have a graduate degree of the related field with an OGPA of not less than 6.00/10.00. Entrance test and personal interview are conducted and admission is given on the basis of merit and as per the intake capacity.

For admission in International Agri. Business Management Institute, graduates of Agriculture and its allied science are eligible. Selection is made on the basis of merit in Entrance Test, Group Discussion and Personal Interview.

Two academic years (four semesters)

are required for the course work, research and thesis preparation and examination leading to the Master's Degree. A minimum period of three academic years (six semesters) is required for the Ph.D. degree.

Intake Capacity

Intake capacity for Post Graduate programmes in a particular discipline is fixed on the basis of infrastructure of the concerned department and the availability of experts / recognized teachers in the department. On the basis of the decision taken by the Admission Committee, the intake capacity was fixed as

shown in **Table 3.4**.

Table 3.4 Intake capacity in different faculties for the year 2019-20

Agriculture Faculty

Sr. No.	Subject	M. Sc. (Agri.)	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Agronomy	10+4	5+2	21
2	Soil Science & Agril. Chemistry	7+3	2+1	13
3	Biochemistry	2+1	1+0	04
4	Genetics & Plant Breeding	15+5	4+2	26
5	Agril. Entomology	9+3	2+0	14

Sr. No.	Subject	M. Sc. (Agri.)	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
6	Agril. Statistics	4+1	1+0	06
7	Plant Pathology	6+2	2+0	10
8	Agril. Economics	4+2	1+1	08
9	Agricultural Extension & Communication	7+2	3+1	13
10	Crop/Plant Physiology	1+1	1+0	03
11	Agril. Meteorology	2+0	0+0	02
12	Nematology	2+0	0+0	02
13	Agril. Microbiology	2+0	1+1	04
14	Plant Molecular Biology & Biotechnology	4+1	1+1	07
15	Seed Science & Technology	2+0	1+0	03
Total		77+25	25+09	136

Horticulture Faculty

Sr. No.	Subject	M. Sc. (Horti.)	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Fruit Science	6+2	1+1	10
2	Vegetable Science	6+2	2+0	10
Total		12+4	3+1	20

Veterinary Science Faculty

Sr. No.	Subject	M.V.Sc.	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Veterinary Anatomy & Histology	2+1	0+1	04
2	Veterinary Physiology	2+0	0+0	02
3	Veterinary Biochemistry	1+0	0+0	01
4	Veterinary Pharmacology & Toxicology	2+0	1+1	04
5	Veterinary Parasitology	2+1	0+1	04
6	Veterinary Microbiology	4+2	1+0	07
7	Veterinary Pathology	2+1	1+0	04
8	Veterinary Public Health	2+1	1+0	04
9	Animal Nutrition	5+2	1+0	08
10	Animal Genetics Breeding	4+2	0+0	06
11	Animal Biotechnology	2+1	0+0	03
12	Livestock Production Management	3+1	1+1	06
13	Livestock Products Technology	2+0	1+0	03
14	Animal Reproduction Gynecology and Obstetrics	3+1	1+0	05
15	Veterinary Surgery & Radiology	3+1	1+0	05
16	Veterinary Clinical Medicine, Ethics and Jurisprudence	4+1	1+0	06
17	Veterinary Animal Husbandry Extension	1+0	0+0	01
18	Poultry Science	4+1	1+0	06
Total		48+16	11+4	79

Dairy Science Faculty

Sr. No.	Subject	M. Tech	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Dairy Technology	8+3	1+1	13
2	Dairy Engineering	3+1	1+0	05
3	Dairy Microbiology	4+2	2+1	09
4	Dairy Chemistry	7+2	1+0	10
Total		22+8	5+2	37

Food Processing Technology

Sr. No.	Subject	M. Tech. (FT)	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Food Processing Technology	10+3	2+0	15
2	Food Processing Engineering	7+2	2+2	13
3	Food Safety and Quality Assurance	7+3	1+0	11
Total		24+8	5+2	39

Agri-Business Management Faculty

Sr. No.	Subject	MBA	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	International Agribusiness	34+11	5+0	50
Total		34+11	5+0	50

Agricultural Engineering & Technology Faculty

Sr. No.	Subject	M.Tech. (Agril. Engg.)	Doctorate	Total
		Regular + ICAR	Regular + ICAR	
1	Farm Machinery & Power Engineering	8+3	1+1	13
2	Soil & Water Engineering	3+1	1+0	05
3	Processing & Food Engineering	4+1	1+0	06
4	Irrigation and Drainage Engineering	5+0	1+1	07
5	Renewable Energy Engineering	1+1	0+0	02
Total		21+6	4+2	33

Admission and Output

The advertisement was published in leading daily news papers for the admission. The applications were processed and entrance tests were conducted through on line computer OMR system and merit list was prepared and

declared on website to call candidates for personal interview/counselling.

Details of students passed out in different faculties at Graduate, Masters and Doctorate levels are given in **Table 3.5.**

Table 3.5 Passed out students (Graduates and Post Graduates) of AAU (2019-20)

Sr. No.	Degree	First Class with Distinction	First Class	Second Class	Pass Class	Total
1	B.Sc. (Hons.) Agri.	100	87	14	1	202
2	B. Sc. (Hons) Horti.	15	26	4	3	48
3	B.V.Sc.& A.H.	2	15	39	19	75
4	B.Tech. (DT)	22	28	5	0	55
5	B.Tech. (Agri.Engg)	16	22	4	0	42
6	B.Tech. (FPT)	11	20	9	0	40
7	B.Tech. (AIT)	4	17	1	0	22
UG Total						484
8	M.Sc. (Agri)	29	40	2	0	71
9	M.Sc. (Horti)	2	12	0	0	14
10	M.V.Sc.	13	24	0	0	37
11	M.Tech. (DT)	8	8	2	0	18
12	M.Tech. (FPT)	2	5	4	0	11
13	MBA-IAB	6	16	5	0	27
14	M.Tech. (Agri. Engg.)	7	8	0	0	15
15	M.Sc. Agri.(Journalism)	1	2	2	0	5
16	M.Sc Agri. (Marketing)	0	2	1	0	3
17	Ph.D.	0	0	0	0	34
Master & Ph.D. Total						235
Grand Total						719

Annual Convocation

16th Annual Convocation of AAU was held on 24th January 2020, in the presence of Hon. Governorshri of Gujarat and the Chancellor of this University, Shri Acharya Devvrat; the Hon. Chief Guest of Convocation Dr. Rakesh Chandra Agrawal, Deputy Director General (Agril. Edn.), ICAR, New Delhi; Shri Jaydrathsinhji Pamar, Hon. Minister of State for Agriculture, Panchayat, Environment (Independent Charge), Govt. of Gujarat, Dr. R. V. Vyas, Hon. Vice Chancellor, A.A.U. and Vice Chancellors of other State Agricultural Universities.

Parekh Sonalilen Lalitkumar, a Ph. D. student of Faculty of Dairy Science; Bhavsar Prakrutik Prafulchandra, a M.V.Sc. student of College of Veterinary Science & Animal Husbandry and Sawant Shraddha Bhaskar, a M.Sc. student of Faculty of Agriculture were awarded Chancellor's Gold Medals.

Anjaliben Jamanbhai Kachhadia, a student of B. A. College of Agriculture; Ashutosh Kumar Singh, a student of College of Veterinary Science & Animal Husbandry; Rajendra Mamodia, a student of SMC College of Dairy Science; Ramani Uttam Shaileshbhai, a student of College of Agricultural Engineering & Technology; Piyush Thakur, a student of College of Food Processing Technology & Bio-Energy; Patel Mansiben Rameshbhai, a student of College of Agricultural Information Technology; Patel Shreya Mayur, a student of College of Horticulture were awarded Vice Chancellor's Gold Medals. The details of medals and prizes are shown in [Annexure-A](#) and [Annexure-B](#).

Hon. Governorshri of Gujarat and Chancellor of AAU, Anand, Shri Acharya Devvrat conferred the degrees to the graduates and post-graduates in person and in absentia. Total **484** graduate and **235** post-graduate candidates received the degrees at the Convocation.



**Shri Acharya Devvratji, Hon. Chancellor & Governer Shri of Gujarat State
addressing the audience during convocation**



**Dr. Rakesh Chandra Agrawal, Deputy Director General (Agril. Edn.),
ICAR, New Delhi addressing the audience during the convocation**



Shri Jaydrathsinhji Parmar, Hon. Minister of State for Agriculture, Panchayat, Environment (Independent Charge), Govt. of Gujarat addressing the audience during the convocation



Address by Dr. R.V.Vyas, Hon. Vice Chancellor of Anand Agricultural University during the convocation

Annexure-A

List of PG Gold Medals/Gold Plated Medals/Cash Prizes Awards for 16th Annual Convocation

Sr. No.	Name of Medal	Gold Medal	Gold Plated Medal	Cash Prize	Name of Student
1	Chancellor's Gold Medal (Ph. D.)	1	-	-	Parekh Sonaliben Lalitkumar
2	Chancellor's Gold Medal (PG Agri.)	1	-	-	Sawant Shraddha Bhaskar
3	Chancellor's Gold Medal (PG Vet.)	1	-	-	Bhavsar Prakrutik Prafulchandra
4	Dr. Davabhai Jethabhai Patel Medal	-	1	-	Sawant Shraddha Bhaskar
5	Late Shri Sadhubhai Vallabhbai Desai Medal	-	1	-	
6	Dr. C. B. Shah Medal	-	1	-	Manas Mohan Setha
7	Late Dr. Diwaker. R. Patel Medal	-	1	-	Solanki Gautamkumar Veljibhai
8	Dr. C. A. Patel Cash Prize(Soil Science and Agricultural Chemistry PG)	-	-	1	Chaudhary Radhaben Viraji
9	PG Students Dr. K. P. Kikani Sponsored Dr. K. P. Kikani Gold Plated Silver Medal (Horticulture)	-	1	-	Macan Jinny Joyrajesh
10	Late Shri K. K. Shukla Medal	-	1	-	Patel Ajaykumar Anilbhai
11	Golden Jubilee Medal	-	1	-	Golaviya Akash Vinubhai
12	Shri Kamendu. C. Vasavada Memorial Medal	-	1	-	Deepti Suman
13	Amul Gold Plated Silver Medal	-	1	-	
14	Dr. J. M. Dave Gold Plated Silver Medal	-	1	-	
15	Shri Kamendu. C. Vasavada Memorial Medal	-	1	-	Akash Patel
16	Amul Gold Plated Silver Medal	-	1	-	Panchal Manjiram Devilal
17	Late Dr. R. S. Sharma Gold Medal	1	-	-	
18	Amul Gold Plated Silver Medal	-	1	-	Baldha Kinjalben Govindbhai
19	Amul Gold Plated Silver Medal	-	1	-	
20	Shri Kamendu. C. Vasavada Memorial Medal	-	1	-	
21	Devidayal (Sales) Limited Medal	-	1	-	D. Gayathri
22	Arun Iyer Gold Plated Silver Medal	-	1	-	
23	Smt. Venkata Seethamma Siripurapu Memorial Gold Medal	1	-	-	Snigdha Bhardwaj
Total		5	17	1	

Annexure-B

List of UG Gold Medals/Gold Plated Medals/Cash Prizes Awards for 16th Annual Convocation

Sr. No.	Name of Medal	Gold Medal	Gold Plated Medal	Cash Prize	Name of Student
B.Sc.(Hons.) Agriculture					
1	VC Gold Medal	1	-	-	Anjaliben Jamanbhai Kachhaia
2	Dr. M.V. Desai Medal	-	1	-	
3	Dr. Z.B. Patel Medal	-	1	-	
4	Late Shri Dahyabhai Ambalal Patel Gold Medal	1	-	-	
5	Shri Babubhai Jashbhai Patel Shashtipurti Smruti Gold Medal	1	-	-	
6	Gujarat State First Batch Agricultural Graduates Goldben Jubilee (1960-2010) Memorial Gold Medal	1	-	-	
7	Shri Satyendrabhai K. Patel of Dabhau Gold Medal	1	-	-	
8	Smt. Surajben Jethabhai Patel Gold Plated Silver Medal	-	1	-	
9	Dr. Ranchhodbhai M. Patel Gold Medal	1	-	-	
10	Dr. B.V. Mehta Medal	-	1	1	
11	Dr. Ravjibhai Chhotabhai Patel Medal	-	1	-	
12	Prof. H.N. Patel Memorial Medal	-	1	-	
13	Dr. Sureshbhai N. Patel Memorial Medal	-	1	-	
14	Dr. C.A. Patel Gold Plated Silver Medal	-	1	-	
15	Late Shri Jashbhai J. Patel Medal	-	1	-	
16	Memon Trust Dr. M.D. Patel Cash Prize	-	-	1	
17	American Spring and Pressing Works Pvt. Ltd. Cash Prize	-	-	1	
18	Dr. Mrinal Kanti Chakraborty Medal	-	1	-	Visakh R.L.
19	Shri Jethabhai Dayaljibhai Patel Gold Plated Silver Medal	-	1	-	
20	Dr. Harikaka Medal	-	1	-	
21	Dr. Ramjibhai M. Patel	-	1	-	
22	Dr. Purachand D. Mistry Medal	-	1	-	Harshita Agrawal
23	Shri. Natwarbhai Bababhai Patel Gold Plated Silver Medal	-	1	-	Pallavi Mishra
Total		6	15	3	

Sr. No.	Name of Medal	Gold Medal	Gold Plated Medal	Cash Prize	Name of Student
B.V.Sc. & A.H.					
1	VC Gold Medal	1	-	-	Ashutosh Kumar Singh
2	Dr. R.K. Shukla Medal	-	1	-	Neha Sharma
3	S.J.C. Veterinary College Anand Medal (Anatomy, Biochemistry, Physiology & Pharmacology)	-	1	-	
4	V.C. Desai Charities Medal	-	1	-	
5	Dr. A.D. Dave Medal	-	1	-	
6	Dr. K. Jankiraman Gold Plated Silver Medal	-	1	-	
7	Dr. K.N. Vyas, Gold Plated Silver Medal	-	1	-	
8	S.J.C. Veterinary College Anand Medal (Surgery, Medicine, Gynaecology And Veterinary Public Health)	-	1	-	
9	Prof. M.R. Varia Gold Plated Silver Medal	-	1	-	
10	Dr. M.N. Mannari Gold Medal	1	-	-	
11	Late Shri Shailesh Rameshbhai Patel Shakti Group Sarsa Gold Medal	1	-	-	
12	Shri Jivanlal G. Parmar Gold Plated Silver Medal Only For Girls	-	1	-	
13	Dr. S.B. Kodagali Gold Plated Silver Medal	-	1	-	
14	Dr. M.M. Jani And Mrs. Manjula M. Jani Gold Plated Silver Medal	-	1	-	
15	Memon Trust Dr. N.C. Buch Cash Prize	-	-	1	
16	Memon Trust Dr. T.N. Vaishnav Cash Prize	-	-	1	
17	Poshak Poultry & Cattle Feed Pvt. Ltd. Sarsa Medal	-	1	-	
18	Dr. B.P. Pandya Cash Prize	-	-	1	
19	Dr. Smt. Ramaben B. Awasthi Gold Plated Silver Medal	-	1	-	
20	IX th ISVPT Anand Medal	-	1	-	
Total		03	14	03	

Sr. No.	Name of Medal	Gold Medal	Gold Plated Medal	Cash Prize	Name of Student
B.Tech. (DT)					
1	VC Gold Medal	1	-	-	Rajendra Mamodia
2	Sheth Mansukhlal C. Desai Medal	-	1	-	Akshay Dubey
3	Late Dr. Jashbhai Ranchhodbhai Patel	-	1	-	
4	Late Smt.Kapilaben Babubhai Patel Medal	-	1	-	
5	Late Shri Shankarlal Ratilal Shah Medal	-	1	-	
6	Sheth Mansukhlal C. Desai Medal	-	1	-	
7	Sheth Mansukhlal C. Desai Medal	-	1	-	
8	Smt. Taraben Maganlal Khatri Medal	-	1	-	
9	Shreshth Milk Gamdiwala Dairy Medal	-	1	-	
10	Shri Indubhai R. Patel Medal	-	1	-	
11	Sheth Mansukhlal C. Desai Medal	-	1	-	
12	B.Tech. (DT)-1995 Batch Gold Plated Silver Medal	-	1	-	
13	Late Shri R.J. Patel Medal	-	1	-	
14	Shri Ramanbhai Dahyabhai Patel of Vaghasi Cash Prize	-	1	-	
15	Late Shri Kanubhai Chhotabhai Patel Medal	-	1	-	Rohit Shraddhaben Gopalbhai
16	Memon Trust Dr. B.M. Patel Cash Prize	-	-	1	
17	Memon Trust Dr. V. Kurien Cash Prize	-	-	1	
18	Late Bhogibhai V. Patel Medal	-	1	-	Dhirubhai Joshi
Total		1	15	2	

Sr. No.	Name of Medal	Gold Medal	Gold Plated Medal	Cash Prize	Name of Student
B.Tech.(FPT)					
1	VC Gold Medal	1	-	-	Piyush Thakur
2	Professor S.C. Bose Siripurapu Gold Medal	1	-	-	Patel Akbarhusen Mahamadali
3	Sia & Rhea Siddhartha Bhesaniya Medal	-	1	-	
4	Memon Trust Dr. K.M. Munshi Cash Prize	-	-	1	
Total		02	01	01	

B.Tech.(Agri.Engg.)					
1	VC Gold Medal	1	-	-	Ramani Uttam Shaileshbhai
2	Shri Venkata Subbaiah Siripurapu Memorial Gold Medal	1	-	-	
3	Late Bhagwan Harji Bhesania Medal	-	1	-	
4	Ornate Godhra Cash Prize (PFE Subject)	-	-	1	
5	Indian Trading Cash Prize (FMP Subject)	-	-	1	
6	Ornate Godhra Cash Prize (SWE Subject)	-	-	1	
Total		02	01	03	
B.Tech. (AIT)					
1	VC Gold Medal	1	-	-	Patel Mansiben Rameshbhai
2	Designtech Systems Gold Medal	1	-	-	Patel Shainee Nitinbhai
Total		02	-	-	
B.Sc.(Hons.) Horticulture					
1	VC Gold Medal	1	-	-	Patel Shreya Mayur
2	Dr. N.S. Parekh Gold Plated Silver Medal	-	1	-	
3	Gujarat Bagayat Vikash Parishad Gold Plated Silver Medal	-	1	-	
Total		01	02	-	





Chapter - 4

RSEARCH

Research and development in agriculture has a wide scope in addressing key issues in the society such as, achieving sustainability in production, ensuring nutritional security of the rural population, adoption and mitigation of climate change and also energy conservation. Agricultural research has dramatically broadened its scale and scope, becoming multidisciplinary and more inclusive and integrative.

Anand Agricultural University has become entrusted with the triple function of imparting agricultural education, research and extension. Considerable emphasis has been given on expanding its research activity so as to enable agricultural scientists to tackle the production constraints faced by farmers of the state in doubling their income. Anand Agricultural University has made impressive progress in the field of research under different faculties.

Anand Agricultural University has a strong base to cater the need of the farmers of the state. The primary goal of research in the university is to generate technologies for augmenting agricultural productivity and farm returns synchronizing with the states objectives, socio economic and cultural need of the farming community on a sustainable basis. The university mainly undertakes research on the various crops grown in major area of Gujarat

state. Apart from this, university also undertakes research on soil and water management, Organic farming, bio fertilizer, bio pesticides, post harvest technology, value addition, animal husbandry, animal biotechnology, plant bio technology, tissue culture, distance hybridization, climate change and agriculture, soil health, forage crops, food quality and food testing, residue analysis, nutritional security besides good quality seed production for farmer of the state.

Anand Agricultural University has a mission to develop and disseminate modern agricultural technologies which are location specific, cost effective and suitable for wide acceptance by farming community of the state. To achieve holistic goal in proper manner, the Agricultural Research Council act as a apex body for planning and implementing long, medium and short term research programmes and guidelines. The Director of Research and Dean, P. G. Studies under the guidance of Vice Chancellor coordinates, monitors, evaluates and lays future plans in consultation with experts and scientists of the university for research to be implemented at main stations and sub centres as well as with other SAUs of the state as and when required.

Anand Agricultural University gives priority to undertake the research, based on

challenges faced by the farmers of the Gujarat state. Therefore, New Technical Programme are formed and proposed to respective research sub-committees for further discussion, deliberation and approval on the basis of the feedback of line department and farmers as well.

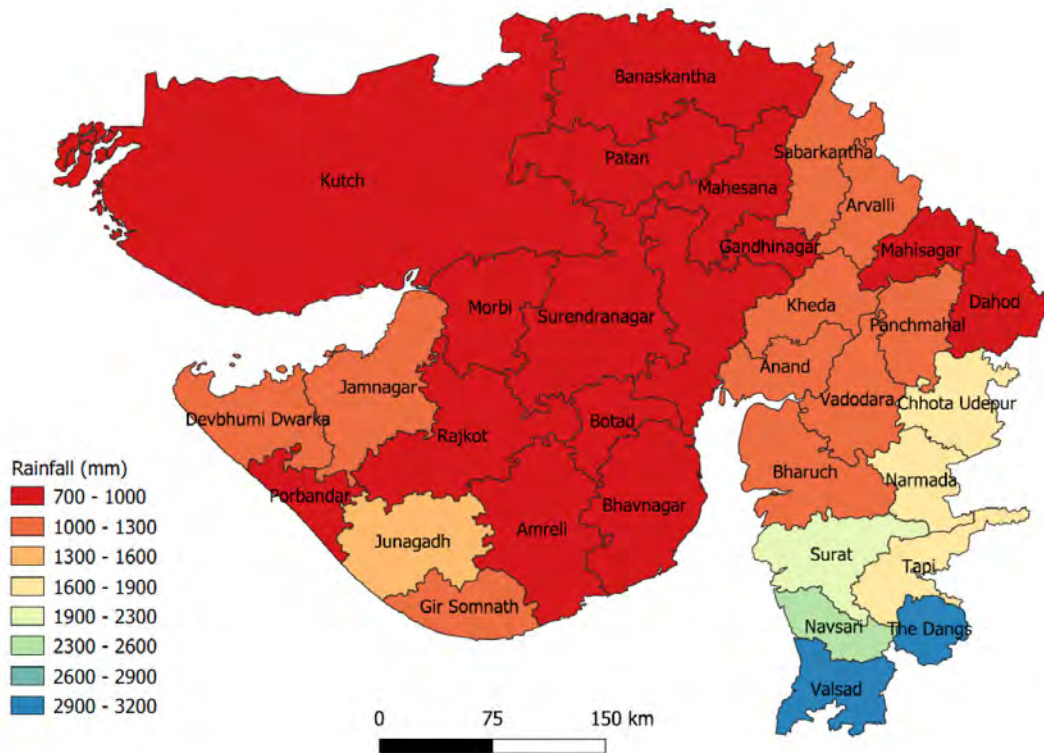
Sincere efforts have been made by the scientists/teachers of Anand Agricultural University associate with research in different disciplines to achieve the desire goal as per the objectives to make agriculture locally adoptable and globally competitive. This chapter highlights the research output carried out by the scientific community of Anand Agricultural University during the year 2019-20.

Seasonal weather features of year 2019

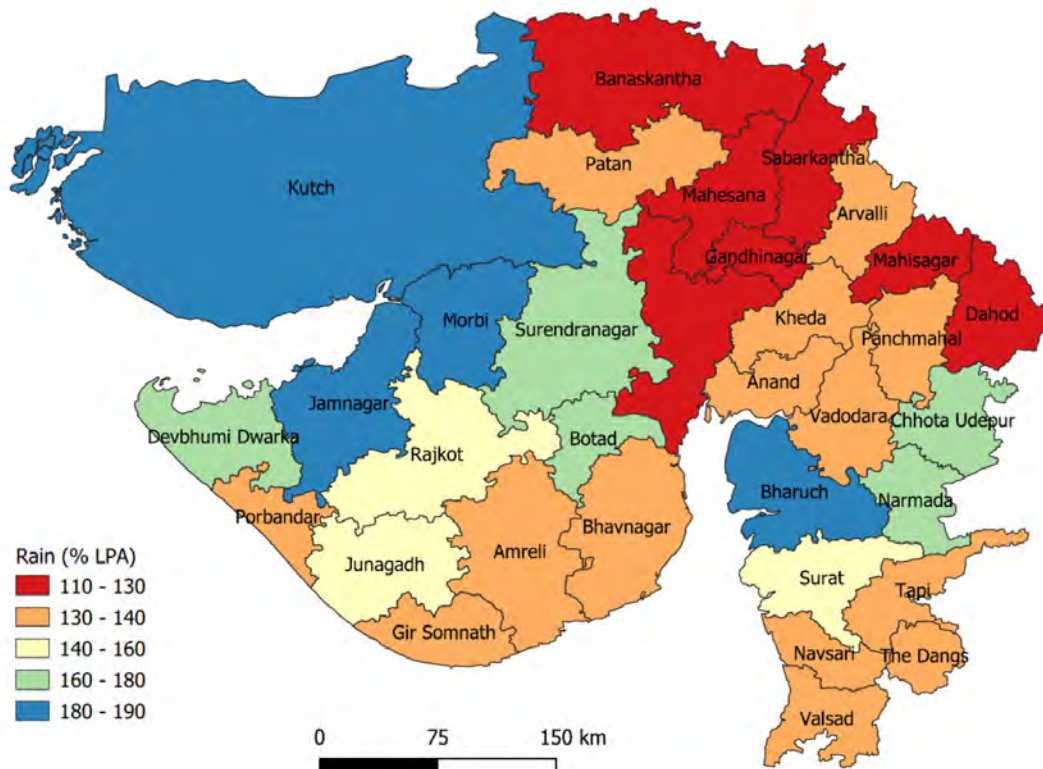
During monsoon 2019, Gujarat state has received 1193 mm which is 146% deviations from long period averages (LPA). At most places of the state, onset of monsoon was in last week of June month and withdrawn in first week of October. District wise rainfall received and percent against long period average (LPA) depicted in Map 1 and Map 2, respectively. Most districts of Saurashtra, North Gujarat and Kutch received 700-1000 mm rainfall. Which is 180-190% against long period average for districts (Morbi and Jamnagar) of North Saurashtra and Kutch. In middle Gujarat, more districts had 1000-1300 mm rainfall. Rainfall receipt increased progressively towards south. Maximum rainfall amounts (2900-3200 mm) were recorded in Valsad and Dangs districts. Most part of the state had above normal rainfall (110-190% of LPA). Many parts of Gujarat state experienced rainfall activities also during October

month which led to damage of kharif crops at maturity and post-harvest.

Onset of Soth-West monsoon at Anand took place during the 26th meteorological standard week (MSW) with 94.2 mm rainfall (Table 1), followed by 62.8 mm rainfall in subsequent week. The onset was delayed by only about 10 days from its normal. During the month of June total rainfall was 94.4 mm in only 5 rainy days against normal of 109 mm. During July month rainfall receipt was 182.6 mm in 10 rainy days against the normal of 319 mm. Rainfall receipt during August month was 614.2 mm compared to 252 mm of normal in 13 rainy days. In September month rainfall had good temporal distribution (18 rainy days) and high quantum i.e. 288 mm as compared to 115 mm normal rainfall. The kharif crops were favoured by distributed rainfall with seasonal rainfall amount of 1299 mm (147% of LPA) in 48 rainy days. The comparison between normal and actual of rainfall, temperature and relative humidity are presented in Fig. 1. The weekly maximum temperature varied near normal during most weeks of the year except post monsoon and winter. During post monsoon and winter, most weeks had slightly lower maximum temperature than normal. Minimum temperature was remained close to its normal during summer and monsoon. Post-monsoon and winter seasons minimum temperature was slightly lower than normal during most weeks. Except during post monsoon, relative humidity was varied near normal. Sunshine hours and evaporation rate were also lower than normal during post monsoon and winter seasons. In general, all the weather variables prevailed during post monsoon season were distinctly deviated from their normal.



Map 1: Rainfall received during monsoon 2019



Map 2: Percentage of rainfall received against normal during monsoon 2019

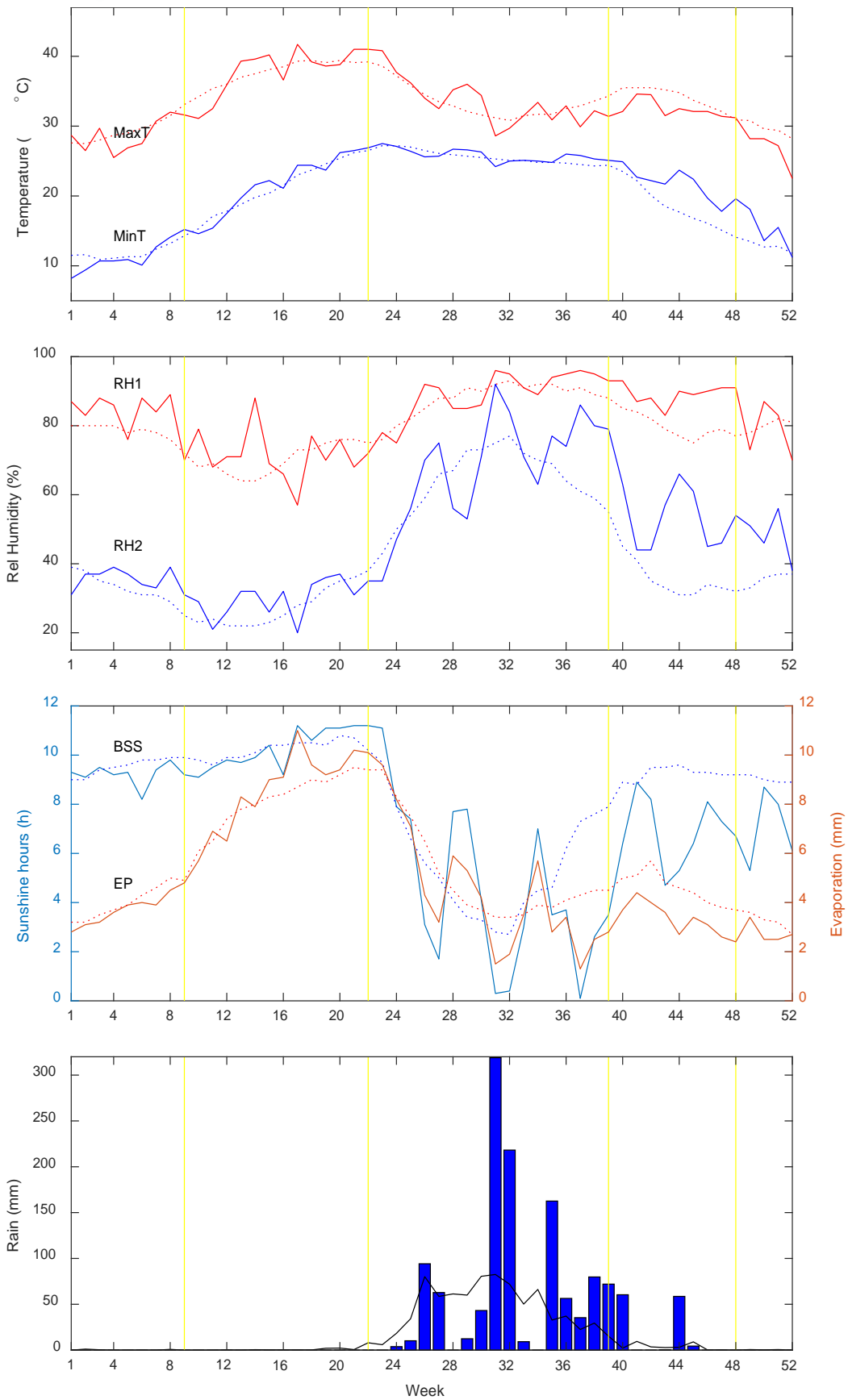


Fig. 1: Normal and actual weekly weather parameters prevailed during 2019 at Anand

Dotted line is normals to the respective parameters. MaxT-Maximum Temperature, MinT-Minimum Temperature, RH1-Morning relative humidity, RH2-Afternoon relative humidity, BSS-Bright sunshine hours, EP-Evaporation

Table 4.1: Daily rainfall distribution during June to September 2019 at Anand

Date	June	July	August	September	October
1	0.0	13.8	53.0	0.0	59.8
2	0.0	0.0	42.0	44.4	0.0
3	0.0	0.0	12.0	16.6	0.0
4	0.0	11.2	152.0	0.0	0.0
5	0.0	2.4	9.6	10.6	0.6
6	0.0	0.0	6.0	20.6	0.0
7	0.0	49.2	0.0	2.2	0.0
8	0.0	0.0	2.4	6.0	0.0
9	0.0	0.0	26.4	0.4	0.0
10	0.0	0.0	164.4	20.6	0.0
11	0.0	0.0	16.6	4.0	0.0
12	0.0	0.0	2.4	0.0	0.0
13	0.4	0.0	0.0	4.2	0.0
14	0.0	0.0	0.0	6.6	0.0
15	0.0	0.0	0.8	0.0	0.0
16	2.0	0.0	2.2	0.0	0.0
17	1.4	0.0	6.2	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0
19	10.2	0.0	0.0	12.2	0.0
20	0.0	0.0	0.0	3.6	0.0
21	0.0	5.0	0.0	56.4	0.0
22	0.0	7.4	0.0	0.0	0.0
23	0.0	0.0	0.0	7.6	0.0
24	0.0	0.0	0.0	9.2	0.0
25	29.2	26.0	0.0	0.0	0.0
26	2.4	8.6	0.0	26.4	0.0
27	0.0	2.0	30.2	3.4	0.4
28	5.8	0.0	58.0	12.8	0.0
29	30.0	6.6	0.0	0.0	0.6
30	13.0	29.0	30.0	20.2	58.0
31		21.4	0.0		0.0
Total	94.4	182.6	614.2	288.0	119.4
Rainy Days	5	10	13	18	2

RESEARCH COUNCIL

The Research Council (as per following table) has been constituted as per the provision

of Gujarat Agricultural Universities Act-5 of 2004, under section-26 and Common Statutes for Agricultural Universities of Gujarat 2011, Section -26, S-27.

Sr.No.	Name, Designation & Address		
1	<p>Dr. N.C. Patel, Vice Chancellor, AAU, Anand (From 1-04-2019 to 06-08-2019)</p> <p>Dr. K.B. Kathiria, Vice Chancellor, AAU, Anand (From 7-08-2019 to 31-08-2019)</p> <p>Dr. R. V. Vyas, Vice Chancellor, AAU, Anand (From 1-09-2019 onwards)</p>	Chairman	
2	Deans of the Faculties		
	i.	Dr. M. V. Patel, Dean, Faculty of Agriculture, AAU, Anand	Member
	ii.	Dr. J. B. Prajapati, Dean, Faculty of Dairy Science, AAU, Anand	Member
	iii.	Dr. A. M. Thaker, Dean, Faculty of Vety. Science, AAU, Anand (From 1-04-2019 to 31-05-2019) Dr. M. N. Bhrahmbhatt, Dean, Faculty of Vety. Science, AAU, Anand (From 1-06-2019 onwards)	Member
	iv.	Dr. R. F. Sutar, Dean, Faculty of Food Processing Tech. & Bio-energy, AAU, Anand (From 1-04-2019 to 17-09-2019) Dr. K.B. Kathiria, Dean, Faculty of Food Processing Tech. & Bio-energy, AAU, Anand (From 18-09-2019 onwards)	Member
	v.	Dr. R. Subbaiah, Dean, Faculty of Agril. Engineering and Technology AAU, Godhra	Member
	vi.	Dr. D. R. Kathiriya, Dean, Faculty of Agril. Information Technology, AAU, Anand (From 1-04-2019 to 30-09-2019) Dr. Y. R. Ghodasara, Dean, Faculty of Agril. Information Technology, AAU, Anand (From 1-10-2019 onwards)	Member
	vii.	Dr. Y. C. Zala, Dean, IABMI, AAU, Anand	Member
	viii.	Dr. H. C. Patel, Dean, Faculty of Horticulture, AAU, Anand	Member
3	Dr. Arun Patel, Director of Extension Education, AAU, Anand		Member
4	The Conveners of the AGRESCO Sub-committees		
	i.	Dr. R. Swarnakar, Convener of Agricultural Engineering & Technology and Agricultural Information Technology Research Sub Committee and Professor and Head, Dept. of Farm Machinery and Power Engineering, CAET, AAU, Godhra	Member
	ii.	Dr. H. L. Dhaduk, Convener of Crop Improvement Research Sub Committee and Associate Research Scientist, Medicinal and Aromatic Plant Research Station, ICAR Unit-9, AAU, Anand	Member
	iii.	Dr. N. J. Jadav, Convener of Crop Production Research Sub Committee and Professor & Head, Dept. of Soil Science and Agril. Chem., BACA, AAU, Anand	Member
	iv.	Dr. A. B. Brahmbhatt, Convener of Plant Protection Research Sub Committee and Professor & Head, Dept. of Plant Pathology, BACA, AAU, Anand (From 1-04-2019 to 31-12-2019) Dr. R. G. Parmar, Convener of Plant Protection Research Sub Committee and Associate Professor & Head, Dept. of Plant Pathology, BACA, AAU, Anand (From 1-01-2020 onwards)	Member

Sr.No.	Name, Designation & Address		
	v.	Dr. R. S. Pundir, Convener of Social Science Research Sub Committee and Professor & Head, Dept. of Agribusiness Eco. and Policy, IABMI, AAU, Anand	Member
	vi.	Dr. A. K. Makwana, Convener of Dairy Science and Food Processing Technology & Bio-energy Research Sub Committee and Professor and Head, Dept. of DBM, Dairy Science College, AAU, Anand	Member
	vii.	Dr.D.J. Ghodasara, Convener of Animal Health Research Sub Committee and Professor, Dept. of Vety. Pathology, Veterinary College, AAU, Anand	Member
	viii.	Dr.R. S. Joshi, Convener of Animal Production and Fisheries Research Sub Committee and Professor, Dept. of AGB, Veterinary College, AAU, Anand	Member
5	Two Eminent Scientists outside the university nominated by the Vice Chancellor in consultation with Director of Research		
	i.	Head, ICAR-Indian Institute of Soil and Water Conservation, Research Centre, Vasad	Member
	ii.	Dr. H. R. Patel, Retd. Associate Director of Research, AAU, Anand	Member
6	Five Professors or their equivalent from the university nominated by the Vice Chancellor in consultation with Director of Research		
	i.	Dr. B. D. Patel, Agronomist, AICRP on Weed Control, BACA, AAU, Anand	Member
	ii.	Dr. K. N. Wadhvani, Research Scientist, TRTC, AAU, Devagadh Baia	Member
	iii.	Dr. Atanu Jana, Prof. & Head, Dept. of Dairy Productions and Operations, DSC, AAU, Anand	Member
	iv.	Dr. R. V. Prasad, Prof. & Head, Dept. of Food quality Assurance, College of FPT & BE, AAU, Anand	Member
	v.	Dr. R. Swarnkar, Prof. & Head, Dept. of FMPE, College of Agril. Engg., AAU, Godhra	Member
7	One Progressive Farmer nominated by the Vice Chancellor in consultation with Director of Research		
	i.	Shri. Ravat Rupsingbhai Ratansingbhai, At. Agara, Ta. Limkheda, Dist. Dahod	Member
8.	The Director of Agriculture/Horticulture/Animal Husbandry		Member
9	The Associate Directors of Research (Agriculture and Animal Science)		
	i.	Dr. V. P. Ramani, Associate Director of Research, (Agriculture), AAU, Anand	Members
	ii.	Dr. M. K. Jhala, Associate Director of Research (Animal Science), AAU, Anand	Member
10	Dr. K.B. Kathiria, Director of Research & Dean, PG Studies, AAU, Anand (From 1-04-2019 to 31-08-2020) Dr. R. V. Vyas, Director of Research & Dean, PG Studies, AAU, Anand (From 1-09-2019 onwards)		Member Secretary

RESEARCH SUB-COMMITTEES

To evaluate the research work and to finalize the technical programmes for future research, the research areas of different subjects have been sub-grouped in 8 research sub-committees, as follows.

Faculty of Agriculture/Horticulture

1. **Crop Improvement Research Sub-Committee** : Genetics & Plant Breeding, Plant Biotechnology, Nanotechnology, Plant Physiology and Biochemistry
2. **Crop Production Research Sub-Committee** : Agronomy, Soil Science, Horticulture, Meteorology and Agril. Microbiology
3. **Plant Protection Research Sub-Committee: Entomology, Plant Pathology and Nematology**
4. **Social Science Research sub-committee** : Agril. Statistics, Agril. Economics, Extension Education and International Agril. Business Management

Faculty of Veterinary Science

5. **Animal Production Research Sub-Committee** : Animal Biotechnology, Animal Breeding and Genetics, Animal Physiology & Bio-chemistry, Livestock Production and Management, Animal Nutrition, Reproductive Biology, Poultry Science and Anatomy
6. **Animal Health Research Sub-Committee:** Vet. Medicine, Vet. Microbiology, Vet.

Pharmacology, Vet. Parasitology, Vet. Surgery, Vet. Pathology, Gynaecology & Obstetrics, Veterinary Public Health, Vet. Clinics

Faculty of Dairy Science and Food Processing Technology & Bio-Energy

7. **Dairy Science and Food Processing Technology & Bio-Energy Research Sub Committee** : Dairy Microbiology, Dairy Engineering, Dairy Technology, Dairy Business Management, Food Biotechnology, Dairy Chemistry

Post Harvest Technology, Food Processing Technology and Bio-Energy

Faculty of Agril. Engineering and Agril. Information Technology

8. **Agril. Engineering and Agril. Information Technology Research Sub Committee** : Soil and Water Conservation, Farm Power Machinery, Agril. Product Processing and Renewable Energy, Agril. Information Technology

4.1 NEW CROP VARIETIES, FARM IMPLEMENTS AND VARIOUS AGRICULTURAL AND ALLIED SCIENCE TECHNOLOGIES DEVELOPED

Research Sub-Committees met and finalized different research programmes considering the feedback received from farmers through extension machinery and educational needs as per the requirement. As a result of sincere efforts of the scientists, the research accomplishments made are given below.

Name of the sub-committee	Date of Meeting	No. of recommendations finalized	
		For farmers	For scientific community
Crop Improvement	05-06 March, 2019		
◆ Genetics & Plant Breeding		07	-
◆ Basic Science		-	01
Crop Production	01-02 March, 2019		
◆ Cultural Practices		05	-

◆ Nutrient Management		07	02
◆ Weed Management		02	01
Plant Protection	25-26 February, 2019		
◆ Insect Pest Management		05	05
◆ Disease Management		01	02
Dairy Science, Food Processing	19-20 February, 2019	19	04
Agril. Engineering & Agril. IT	22 February, 2019	-	01
Animal Health	12-13 February, 2019	01	04
Animal Production & Fisheries		07	06
Social Science	07-08 February, 2019	01	04
Joint AGRESCO, AAU, Anand	12-13, March, 2019	55	30
Combined AGRESCO of SAU's at AAU, Anand	29 April-1 May, 2019	55	30

The details of recommendations of AAU, Anand approved in the combined AGRESCO meeting of SAUs of Gujarat held at AAU, Anand are given below.

4.1.1 RECOMMENDATIONS FOR FARMING COMMUNITY

4.1.1.1 CROP IMPROVEMENT

I CROP IMPROVEMENT

Varieties Released

1. Crop : Castor

Variety : Gujarat Castor Hybrid 10 (GCH 10: Charutar Gold)



This castor hybrid GCH 10 (Charutar Gold) gave 3894 kg/ha seed yield which was 9.05% higher than check GCH 7 (3571 kg/

ha) under irrigated condition of Gujarat. This hybrid found resistant to wilt under sick plot and artificially inoculated soils under pot method. Days to maturity of primary raceme is quite earlier (99 days) as compared to check GCH 7 (111 days). This indicates early maturity of hybrid as compared to check GCH 7. The 100 seed weight of this newly developed hybrid is 35.35 g as compared to 31.79 g of check GCH 7. The oil content of proposed hybrid is 50.03 per cent which is higher than check GCH 7 (49.38%). The proposed hybrid is recommended for release under irrigated condition in Gujarat.

2 Crop : Maize

Variety : Gujarat Anand Pop Corn Hybrid 21 (GAPCH 21- Mahashweta)



The popcorn single cross hybrid GAPCH 21 (Mahashweta) is recommended for *rabi* cultivation in middle Gujarat. This hybrid gave average 3669 kg/ha kernel yield and recorded 53.96 per cent higher yield than check Amber popcorn. This hybrid having high popping (92%) and popping volume (213 ml/cm³). It is medium maturing, orange flint kernels and high test weight (190 g). This hybrid is resistant against *Curvularia* Leaf spot and *Puccinia* rust as well as moderately resistant against stem borer.

3. Crop : Maize

Variety : Gujarat Anand Sweet Corn Hybrid 11 (GASCH 11: Madhuram)



The sweet corn single cross hybrid GASCH 11 (Madhuram) is recommended for *rabi* cultivation in middle Gujarat. This hybrid gave green cob yield of 13273 kg/ha which is 46.82 per cent higher than check Win Orange Sweet Corn. This hybrid revealed superiority in quality parameters viz., total soluble solids (18.40 Brix), total soluble sugar (7.58%) and protein (4.96%) over check Win Orange Sweet Corn. The hybrid is resistant against *Turicum* leaf blight and stem borer.

4. Crop : Brinjal

Variety : Gujarat Anand Brinjal 6 (GAB 6: Anand Doli)



The Gujarat Anand Brinjal 6 variety gave 634.90 q/ha fruit yield which is 44.70, 38.82, 17.72, 26.28, 40.74 and 40.20 per cent higher over the checks GOB 1, GBL 1, GJB 2, GJLB 4, Doli 5 and Punjab Sadabahar, respectively in middle Gujarat condition. This variety has dark pink fruit skin colour with strong glossiness, club shaped fruit with medium size and cluster fruiting pattern. It has erect plant growth habit and dentate leaf margin. This genotype has less prevalence of little leaf disease reaction and lower or comparable number of jassids and whitefly as well as fruit borer damage as compared to the checks GJB 2, GJLB 4, Doli 5 and Punjab Sadabahar. This variety contains higher dry matter (14.32%), total phenol (0.087%) and protein (0.82%) as compared to the check varieties GJB 2, GJLB 4, Doli 5 and Punjab Sadabahar. This variety is recommended to release in middle Gujarat for Kharif-Rabi season under irrigated condition.

5. Crop : Potato

Variety: Kufri Sadabahar



The potato variety Kufri Sadabahar (MS/93-1344) is developed by ICAR-Central Potato Research Institute, Shimla by clonal selection from the cross MS/81-145-638 x PF/F-1545. The variety Kufri Sadabahar depicted superior performance for total tuber yield (312.78 q/ha) in 75 days harvesting at Anand for early bulking and manifested 13.20, 10.86 and 7.79 per cent higher tuberyield over Kufri Badshah, Kufri Lauvkar and Kufri Pukhraj, respectively. While, in case of 90 days harvest at Anand, this variety gave tuber yield of 354.54 q/ha which is 17.51, 14.27 and 10.08 per cent higher over the checks Kufri Badshah, Kufri Lauvkar and Kufri Pukhraj, respectively. It has comparatively higher average tuber weight against all the checks. The tuber has oblong shape, smooth and white skin, predominantly apical shallow eyes and white flesh with mealy texture. Kufri Sadabahar has less prevalence of early blight, late blight, leaf curl and white fly as compared to all the checks. Kufri Sadabahar is already notified, hence endorsed for cultivation and harvesting at

75 days (immature) or 90 days (fully mature) after sowing during rabi season in middle Gujarat.

6. Crop : Garlic

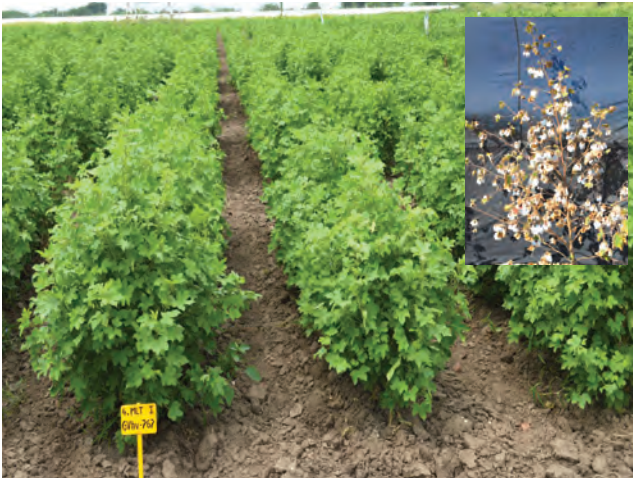
Variety: Gujarat Garlic 7 (GG 7: Anand Kesari)



The garlic variety Gujarat Garlic 7 (GG 7: Anand Kesari), which is developed through clonal selection. It revealed bulb yield of 79.00 q/ha which is 16.00, 11.65, 15.13 and 14.00 per cent higher over the check varieties GG 4, GJG 5, GAG 6 and G 282, respectively in the Gujarat state. The variety has dark green leaves, strongly concave shape in cross section of leaf, medium density of leaves with erect foliage attitude, radial distribution of cloves, purple colour of dry external scales and purple scale colour of cloves. In quality attributes, the variety showed higher pyruvic acid (80.05 $\mu\text{mol/g}$), carotenoids (7.75 mg/100g), total soluble solids (21.82oBrix), reducing sugar (2.23%) and total antioxidant activity (0.118%) as compared to check varieties. The variety also reported low incidence of thrips as compared to check varieties. The garlic variety is recommended for rabi cultivation in the garlic growing areas of Gujarat.

7. Crop : Cotton

Variety : Gujarat Anand Desi Cotton 3
(GADC 3 : Wagad Gaurav)



The Gujarat Anand Desi Cotton 3 variety gave higher seed cotton yield(2233 kg/ha) over check varieties G. Cot. 21, ADC 1 and GADC 2 by 34.02, 15.01 and 27.54%, respectively. It has recorded 44.8 per cent ginning out turn, 22.7 mm upper half mean length, 5.1 micronaire value and 22.5 g/tex tenacity (HVI mode). This variety is recommended for release in desi cotton area of North West Agro-climatic Zone - V as well as Bhal and Coastal Agro-climatic Zone-VIII of Gujarat.

II BASIC SCIENCE

---NIL---

4.1.1.2 CROP PRODUCTION

I CULTURAL PRACTICES

1. Effect of spacing and topping on yield of summer sesame (*Sesamum indicum* L.)

The farmers of middle Gujarat agro-climatic zone growing summer sesame are recommended to follow 45 cm spacing between two rows along with topping

(removal of terminal bud) during 25 to 35 days after sowing for securing higher yield and net return.

2. Varietal performance of pearl millet under varying transplanting period in semi *rabi* season

The farmers of middle Gujarat agro-climatic zone are recommended to adopt semi *rabi* pearl millet by transplanting one month old seedlings of GHB 744 or GHB 732 during 20th to 30th September for getting higher grain and dry fodder yield as well as net return.

3. Standardization of crop spacing and its effect on yield and fibre quality of desi cotton under rainfed condition

The farmers of North - West Agro-climatic Zone-V cultivating rainfed desi cotton are recommended to sow cotton variety G Cot 21 at 60 x 30 cm spacing to get higher seed cotton yield and net return



G Cot 21 at 60 x 30 cm spacing

4. Effect of different plant spacing on growth and yield of capsicum under open ventilated polyhouse

The farmers of middle Gujarat growing capsicum under naturally ventilated polyhouse are advised to transplant

capsicum at 45 × 30 cm spacing in raised beds for getting higher yield and net return. The beds should be prepared 40 cm apart with 90 cm base width, 75 cm top width and 45 cm height.

5. Performance of different varieties of potato under different spacing for middle Gujarat

The farmers of middle Gujarat growing potato are advised to grow Kufri Pukhraj variety at 45 x 20 cm spacing for getting higher yield and net realization.

II NUTRIENT MANAGEMENT

6. Evaluation of efficacy of sulphur and zinc containing complex fertilizer for maximizing yield and quality through balanced nutrition of groundnut crop

The farmers of middle Gujarat Agro-climatic Zone growing summer groundnut having S and Zn deficient soil are recommended to apply recommended dose of 25 kg N and 50 kg P₂O₅/ha through S (5.6 kg/ha) and Zn (1.1 kg/ha) containing fertilizers for getting higher yield and better quality.

7. Evaluation of efficacy of sulphur and zinc containing complex fertilizer for maximizing yield and quality through balanced nutrition of mustard crop

The farmers of middle Gujarat Agro-climatic Zone growing mustard in S and Zn deficient soil are recommended to apply recommended dose of 50 kg N and 50 kg P₂O₅/ha through S (5.6 kg/ha) and Zn (1.1 kg/ha) containing fertilizers for getting higher yield and better quality. Further, an application of recommended dose of

50 kg N and 50 kg P₂O₅/ha along with either 10 t FYM/ha or 40 kg S and 5 kg Zn/ha is equally effective.

8. Effect of cutting management and fertility status levels on growth and seed yields of multicut forage sorghum [Sorghum bicolor (L.) Moench] var. CoFS-29

The farmers of middle Gujarat agro-climatic zone growing multicut forage sorghum variety CoFS29 for seed production purpose are recommended to apply 40 kg N/ha and 40 kg P₂O₅/ha as basal and 120 kg N/ha in three equal splits at 30 days after sowing, after first cut (50 DAS) and at 30 days after first cut for obtaining higher seed yield and net return.

9. Effect of different levels of phosphorus, potassium and sulphur on growth, yield and quality of Bt Cotton Var.G.Cot.Hy.8 (BG II) under middle Gujarat conditions.

The farmers of middle Gujarat Agro-climatic Zone growing Bt. cotton (G Cot Hy 8 BG II) are recommended to apply 20 kg P₂O₅/ha, 80 kg K₂O/ha and 20 kg S/ha besides RDN 240 kg N/ha for getting higher yield and net return.

10. Effect of organic manures, bio-fertilizers, levels of nitrogen and phosphorus on soybean (Glycine max (L.) Merrill) and their residual effects on rabi maize

The farmers of middle Gujarat agro-climatic zone growing *rabi* maize (Gujarat Maize 3) after *kharif* soybean (NRC 37) are recommended to apply 10 t FYM/ha along with 45 kg N/ha and 60 kg P₂O₅/ha before sowing, besides seed treatment of biofertilizers (*Rhizobium japonicum* 5 ml/kg

seed) + PSB (*Bacillus coagulans* 5 mL/kg seed). It is also recommended to apply 75% recommended dose of fertilizer (90 kgN/ha and 45 kg P₂O₅/ha) to the succeeding *rabi* maize crop for obtaining higher yield and net return.

11. Effect of different levels of nitrogen, phosphorus and bio-fertilizer on yield of irrigated wheat (*Triticum aestivum* L.) in Bhal region

The farmers of *Bhal* and coastal agro-climatic zone growing wheat (GW 496) under restricted irrigation condition are recommended to apply 60 kg N/ha and 60 kg P₂O₅/ha as a basal and 60 kg N/ha in two equal splits at 30 and 45 DAS for obtaining higher grain yield and return.

12. Effect of nitrogen and phosphorus on growth, flowering and yield of gladiolus (*Gladiolus grandiflorus* L.) cv. “American Beauty” under middle Gujarat Agro-climatic conditions

The farmers of middle Gujarat growing gladiolus cv. “American beauty” are advised to apply 250 kg N /ha in three equal splits each at basal, 30 and 45 days after planting of corms along with 50 kg P₂O₅/ha as basal for getting longer spike of gladiolus and net return. Moreover, 10 t FYM/ha as basal and 100 kg K₂O/ha apply in two equal splits each at basal and 45 days after planting of corms.

III WEED MANAGEMENT

13. Management of complex weed flora in garlic (*Allium sativum* L.)

The farmers of middle Gujarat Agro-climatic Zone growing garlic are recommended to apply paddy straw mulch 5 t/ha followed

by hand weeding at 30 and 60 days after planting (DAP) for effective management of complex weed flora and higher net return.



Paddy straw mulch 5 t/ha fb hand weeding at 30 & 60 DAP

14. Bio-efficacy of new molecules of herbicides for weed management in soybean [*Glycine max* (L.) Merrill]

The farmers of middle Gujarat Agro-climatic Zone growing soybean are recommended to adopt any of the following orders

Post-emergence (15-20 DAS) application of fluazifop-p-butyl 11.1%w/w + fomesafen 11.1% w/w SL 250 g a.i./ha (premix)

OR

Post-emergence (15-20 DAS) application of propaquizafop-p-butyl 2.5% + imazethapyr 3.75% w/w ME 125 g a.i./ha (premix)

OR

Post-emergence (15-20 DAS) application of imazethapyr 10% SL 100 g a.i./ha followed by IC + HW at 30 DAS

OR

Pre-emergence (2-3 DAS) application

of pendimethalin 30% EC 750 g a.i./ha followed by IC + HW at 30 DAS

or

Pre-emergence (2-3 DAS) application of diclosulam 84% WDG 25.2 g a.i./ha followed by IC + HW at 30 DAS

or

Pre-emergence (2-3 DAS) application of pendimethalin 30% + imazethapyr 2% EC 960 g a.i./ha (premix) followed by HW at 30 DAS for effective management of complex weed flora and higher net return without any herbicide residues in produce and soil. There was no adverse effect of herbicide applied in soybean on succeeding crops.

4.1.1.3 PLANT PROTECTION

I AGRICULTURAL ENTOMOLOGY

1. Evaluation of pre-harvest spray of insecticides for control of pulse beetle, *Callosobruchus* spp. in green gram

Green gram seed producers of middle Gujarat Agro-climatic Zone are advised to spray indoxacarb 14.5 SC, 0.012 % (8 ml/10 L water) at pod maturity stage to check the infestation of pulse beetle during storage up to two months without adverse effect on seed germination.

2. Biorational management of cumin pests

Farmers of middle Gujarat Agro-climatic Zone are advised to spray neem oil, 1% (100 ml/10 L water) or garlic extract, 5% at appearance of pest and secondspray at 10 days after first spray for effective control of aphid and thrips in cumin. For preparation of 5% garlic extract, 500 g garlic cloves to be crushed in required quantity of water

followed by filtration and dilution in 10 litres of water.

3. Efficacy of insecticides against fall armyworm, *Spodoptera frugiperda* (J. E. Smith) infesting maize

Spinetoram 11.7 SC, 0.0117% (10 ml/10 L water) or emamectin benzoate 5 SG, 0.0025% (5 g/10 L water) or chlorantraniliprole 18.5 SC, 0.006% (3 ml/10 L water) or chlorantraniliprole 0.4% G (whorl application, 20 kg/ha), or poison bait consisting maize flour 25 kg + jaggery 5 kg + thiodicarb 75 WP 250 g/ha (for preparation of poison bait, dissolve 5 kg jaggery in 5litre of water and add in 25 kg rice bran/maize flour 10- 12 hrs in advance before its application, add 250 g thiodicarb in this bait and mix properly) or spray *Bacillus thurengiensis* 0.5 WP (108 cfu /g) @20 g/10 L of water or *Metarhizium (Nomuria) rileyii* 1.15 WP (2 x 10⁶ cfu/g) 40 g/10 L of water were found effective in checking the population and damage caused by *Spodoptera frugiperda* in maize.

4. Study on foraging activities of honeybees in Middle Gujarat on various crops

Farmers interested to start the bee keeping are advised to grow following various crops in different seasons to settle bee colonies in their area.

Season	Crops
Kharif	<i>Shankhavali</i> , sesame, sunflower, golden rod, bajara, green gram, cowpea, maize, pigeon pea, <i>senna</i> , castor, <i>damaro</i> , cotton, water lily, <i>rudrakh</i> , basil and gallardia
Rabi	<i>Shankhavali</i> , fennel, mustard, lucerne, coriander, sunflower, maize, fenugreek, water lily, <i>damaro</i> and gallardia
Summer	Sesame, sunflower, <i>Shankhavali</i> , green gram, bajara and maize

These crops should be grown periodically to provide pollen and nectar to bees.

5. Bio-efficacy of different insecticides against serpentine leaf miner, *Liriomyza trifolii* (Burgess) on watermelon

Farmers of middle Gujarat Agro-climatic Zone growing watermelon are advised to spray cyantraniliprole 10 OD, 0.01% (10 ml/10 L water) at 40 days after sowing and second spray at 15 days after first spray for effective management of serpentine leaf miner, *Liriomyza trifolii*. Interval between last spray and harvest should be minimum 5 days.

II PLANT PATHOLOGY AND NEMATODOLOGY

6. Efficacy of bio agents in the management of *Meloidogyne* species in bitter gourd

For effective management of root-knot nematode, *Meloidogyne* spp. infecting bitter gourd, farmers of middle Gujarat Agro-climatic Zone are advised to apply 2.5 tons of vermicompost/ha enriched with *Purpureocillium lilacinum* @ 2.5 kg/ha before sowing.

4.1.1.4 DAIRY SCIENCE / FPT&BE

I DAIRY SCIENCE

1. Technology development for Moraiyo (*Panicum miliare*) Kheer

A technology developed by Anand Agricultural University, Anand for manufacture of moraiyo kheer involves use of standardized milk (4.5 per cent fat, 8.5 per cent SNF), addition of 3.0 per cent of moraiyo and 6.0 per cent of sugar (w/w of milk), concentrating the milk 2 times and adding 0.05 per cent cardamom powder (w/w

of *kheer*). This method is recommended for dairy/food industry and entrepreneurs. The moraiyo kheer has a shelf-life of 8 days when packed in pre-sterilized polypropylene cups and stored at $7\pm 1^{\circ}\text{C}$.



Technology for manufacture of carrot rabri

A technology developed by Anand Agricultural University, Anand for manufacture of carrot *rabri* using full cream milk (6.0 per cent fat, 9.0 per cent SNF) added with 8.0 per cent carrot shreds, 7.5 per cent sugar and 0.1 per cent sodium alginate (w/w of milk) and concentrating milk 2 times is recommended for dairy/food industry and entrepreneurs. Carrot *rabri* prepared using this method contains 0.34 per cent crude fiber and 1.0 mg β -carotene/100g product. The carrot *rabri* had a shelf-life of 10 days when stored in polypropylene cups at $7\pm 1^{\circ}\text{C}$.



Carrot rabri

2. Technology for manufacture of extended shelf-life dietetic *Basundi*

A technology to manufacture of extended shelf-life dietetic *Basundi* has been developed by Anand Agricultural University, Anand. The standardized process involves vacuum concentration of milk, replacing sucrose with intense sweetener, followed by in-bottle heat processing using rotary sterilizer at 110°C for 15 min. The heat processed *Basundi* has a shelf life of 90 days when stored at 37±2°C.



3. Application of Infrared spectroscopy in detection of foreign fats and oils in ghee

FT NIR spectroscopy based method coupled with chemometrics is developed by Anand Agricultural University, Anand for detection and identification of common foreign oils and fats mixed in ghee. The limit of detection is 2% for oils/fats, while the minimum limit of identification varies from 5 to 10% depending on type of oil/fat mixed in ghee. The developed method is simple, convenient and efficient analytical tool to solve the problems in detection of adulterations in ghee.

4. Development of probiotic smoothie enriched with finger millet (*Eleusine coracana*)

A method for preparing Finger millet

(*Eleusine coracana*) smoothie enriched with probiotic has been standardized at Anand Agricultural University, Anand. The product is made using toned milk, malted ragi flour and fermented with *Streptococcus thermophilus* MTCC 5460 and probiotic *Lactobacillus helveticus* MTCC 5463 and subsequently incorporated with strawberry crush. The product has a shelf life of 20 days, when packaged in pre-sterilized PET bottles and stored at 7±1°C. The probiotic count in the product was more than 9 log cfu/g at the end of shelf life.

5. Development of Greek yoghurt type probiotic fermented milk

A method is developed by Anand Agricultural University, Anand for manufacturing Greek yoghurt type probiotic fermented product using indigenous cultures. The product can be made using standardized milk, fermentation by indigenous cultures (*Streptococcus thermophilus* MTCC 5460 + *Lactobacillus delbreuckii* subsp. *bulgaricus* NCIM 2358+ *Lactobacillus helveticus* MTCC 5463), straining of curd and addition of pickle masala. The product has a shelf life of 21 days in polypropylene cups when stored at 7±1°C. Probiotic count in the product at the end of shelf life was more than 9 log cfu/g.

6. Application of solar energy in unit operations for milk and milk product processing

Anand Agricultural University, Anand recommends Dairy entrepreneurs to utilise the solar power generated through solar photo voltaic (PV) panel system of 1KW capacity, to carryout various unit operations for milk processing like, chilling of milk, manufacture of khoa and manufacture of

ice cream using equipment having less than 1KW power requirement. The power generated from the solar photo voltaic system helps for sustainable processing with reduction in cost of processing.

7. Design, development and performance evaluation of a solar thermal system assisted double pipe heat exchanger for heating of milk for preparation of paneer

Double pipe four pass heat exchanger equipped with helical coil in the annular space and assisted by Evacuated Tube Collector (ETC) solar thermal water heating system as heating source and PNG water heating system for backup heating is designed and developed at Anand Agricultural University, Anand is recommended for small scale dairy entrepreneur/industry for heating of milk for the preparation of the paneer. The energy saving for heating of milk was found in the range of 62.0 to 96.0 per cent with counter current flow pattern and 20 liters per minute hot water flow rate and 1 liter per minute chilled milk flow rate during January to April by this heat exchanger.

II FOOD PROCESSING TECHNOLOGY

8. Production of premium quality powder with maximum retention of essential oil using cryogenic grinding of carom (ajwain) and black pepper

The entrepreneurs and agro-processing units involved in grinding of spices are advised to use the technology of cryogenic grinding developed by Anand Agricultural University for high quality ajwain and black pepper powder with higher retention of volatile oil content of 74.36 and 71.31 per cent respectively. For higher retention of volatile oil, the cryogenic grinding of ajwain seeds at

temperature of -60°C, sieve size of 0.8 mm and feed rate of 8 kg/h and for black pepper at temperature of -60°C, sieve size of 1.5 mm and feed rate of 10 kg/h is recommended. The processing cost of the optimized operating conditions for cryogenic grinding of ajwain and black pepper is ₹. 33.00 and ₹. 25.00 per kg respectively.

9. To formulate and standardize the process of micronutrient rich powder for women

The entrepreneurs and food processors interested in manufacture of nutraceutical food products are advised to adopt the production technology of micronutrient rich malted food developed by Anand Agricultural University, Anand. The technology involves malting of mothbean and ragi grains for 48 h and 36 h respectively and sand roasting at 150°C and 160°C respectively for 60 seconds. The moth bean malt flour (22 per cent) and *ragi* malt flour (19.5 per cent) are mixed in skim milk (38.5 per cent) and barley malt extract (20 per cent) and cooked for 5 minutes. The mixture is then dried under vacuum and milled. This product provides 16.75 per cent protein, 5.7 mg/100g iron, 285.0 mg/100g calcium and 1.8 mg/100g zinc. The product can be stored for 6 months at ambient temperature.

10. Extension of shelf life of bread using suitable ingredients

The entrepreneurs and bakery industry interested in manufacture of extended shelf life bread are advised to use the technology developed by Anand Agricultural University, Anand. It involves addition of 1.0 per cent xanthan gum, 1.0 per cent potato peel fiber and 7.0 per cent soy flour in the bread recipe and coating of the bread loaf at the rate of 4.35 mg natamycin/kg of bread. The bread

duly packed in polyethylene package can be safely stored up to 7 days at ambient temperature.

11. Development of functional low calorie muffins

Bakery entrepreneurs interested in production of muffins are advised to use the technology developed by Anand Agricultural

University, Anand. The technology involves incorporation of 15.0 per cent of erythritol and 7.5 per cent of orange peel powder in the formulation of muffins. The muffin packed in polypropylene bags had 21 days shelf life at ambient temperature. There is reduction in calorific value by 10.12 per cent as compared to traditional muffin.



12. Technology for development of Ready-to-Rehydrate type of rice and pulses (Subtitle: Technology for development of Ready-to-Rehydrate type of rice)

The entrepreneurs and food processors interested in manufacture of Ready-to-Rehydrate Rice (RTRR) are advised to adopt the technology developed by Anand Agricultural University, Anand. The technology involves various processing operations including soaking, cooking and dehydration under specific conditions. The final product is a pre-cooked and dried rice, which can be easily rehydrated within 6 min with addition of hot (90°C) water (1:2.5 w/v, RTRR: Water).

13. Super critical extraction of essential oil from Ajwain (Carom seed) and Black pepper

◆ Entrepreneurs and Agro-processing units

involved in production of superior quality pepper essential oil are advised to use the supercritical fluid extraction technology developed by Anand Agricultural University, Anand. This technology involves use of carbon dioxide supercritical fluid extraction at controlled pressure of 245 bar and temperature of 47°C which yields 5.6 per cent pepper essential oil. The essential oil had 1.3 per cent piperine.

◆ Entrepreneurs and Agro-processing units involved in production of superior quality ajwain essential oil are advised to use the supercritical fluid extraction technology developed by Anand Agricultural University, Anand. This technology involves use of carbon dioxide supercritical fluid extraction at controlled pressure of 300 bar and temperature of 35°C which yielded 3.9 per cent ajwain essential oil. The essential oil had 60.8 per cent thymol.

14. Production technologies for value added products from pumpkin seeds

The entrepreneurs and food processors interested in manufacture of roasted salted pumpkin seed snacks are advised to adopt the production technology of roasting of pumpkin seed developed by Anand Agricultural University, Anand. The technology involves dehulling of whole pumpkin seed, conditioning to moisture content of 12.0 per cent using 20.0 per cent salt solution, roasting the pumpkin seed in halogen roaster at 190°C for 6 min. The product prepared was highly acceptable, possessing adequate hardness, fracturability and had reasonable keeping quality (up to 90 days).

15. Evaluation of combined effect of gamma irradiation and edible coating on shelf-life of sapota fruit (Sub-title: Evaluation of independent effect of gamma irradiation and edible coating on shelf-life of sapota fruit)

- ◆ Entrepreneurs interested in enhancement of shelf-life of sapota fruit cv. Kalipatti are advised to use the edible coating (blend of pectin, polyvinyl alcohol and glycerol) technology developed by Anand Agricultural University, Anand. The shelf life of coated sapota fruit was 11 days at ambient temperature, with minimal physiological weight loss (18.51 per cent) and retaining the firmness (0.16 N) of fruit.
- ◆ Entrepreneurs interested in enhancement of shelf-life of sapota fruit cv. Kalipatti are advised to use gamma irradiation (0.3 kGy) technology developed by Anand Agricultural University, Anand. The shelf life of irradiated sapota fruit was 10 days with minimal physiological weight loss

(15.60 per cent) and retaining the firmness (0.19 N) of fruit.

16. Study on energy assessment in selected food processing plants

The units manufacturing food products are advised to carry out energy audit of their plants periodically to conserve electrical energy. Plant producing bakery (2800MT/year) and chocolates (12000MT/year) products showed average specific electrical energy consumption of 121 kWh/MT and 310 kWh/MT respectively. Energy conservation measures have shown potential in saving electrical energy by about 36.0 per cent.

17. Development of irradiation technology for agricultural, animal, dairy and food products. (Sub-title: Effect of gamma radiation on peanut storage and its oil quality)

Entrepreneurs and oilseed processors are advised to use gamma irradiation technology developed by Anand Agricultural University, Anand for microbial decontamination and insect disinfestation of peanut. The technology results in safe storage of packaged (polypropylene, 55 µm) and irradiated (2.5 kGy) peanut kernels in ambient condition for up to 6 months.



Control

2.5 kGy

18. Development of antidiabetic and antioxidant rich cookies and health drink using Garden Cress Seed (*Lepidium Sativum L.*)

The bakery industry and entrepreneurs interested in production of cookies with higher antioxidant and antidiabetic activities are recommended to use the formulation developed by Anand Agricultural University, Anand. The formulation involves use of garden cress seed powder to replace 10.0 per cent of refined wheat flour. The resultant cookies had 112.0 and 147.0 per cent increase in antioxidant (FRAP, per cent inhibition) and antidiabetic (NGH, per cent inhibition) activities respectively over conventionally prepared cookies. The cookies packed in aluminum foil had ambient storage life of up to 2 months.



Cookies with 10% GCSP

4.1.1.5 AGRICULTURAL ENGINEERING AND AIT

--NIL--

4.1.1.6 ANIMAL PRODUCTION AND FISHERIES

1. Effect of tannin as phytonutrient on growth performance and health of Surti kids

The goat keepers are advised to feed total mixed ration containing 18% babul pods to growing Surti male kids during 7-12 months

of age to improve body weight gain and feed conversion efficiency with 23.7% reduction in feed cost per kg gain.

2. Effect of tannin as phytonutrient on growth performance and health of Surti kids

The goat keepers are advised to feed total mixed ration containing 18% babul pods to growing Surti male kids during 7-12 months of age to improve general health and reduce parasitic load.

3. Methane mitigation in calves through dietary interventions and its effect of performance of animals

Feeding of Total Mix Ration containing 15% Babul pods with roughage to concentrate ratio 50:50 increases growth rate by 17.68% and decreases daily methane emission by 16.22% in crossbred calves.

4. Methane mitigation in calves through dietary interventions and its effect of performance of animals

Feeding of Total Mix Ration (25% pigeon pea straw, 25% wheat straw and 50% concentrates) increases growth rate by 32.59% and decreases daily methane emission by 10.53% in crossbred calves.

5. Performance of Indigenous Goats and Sheep of Gujarat State under different watering frequencies

The sheep and goat keepers of water scarcity areas of middle Gujarat maintaining animals under intensive production system are advised to give *ad lib* water to their animals at an interval of less than 12 hrs in order to increase feed and nutrients intake.

6. Development of area-specific mineral mixture formulations for Chhotaudepur district

Based on the prioritization of limiting minerals in Chhotaudepur district, the following area specific mineral mixture is formulated to make up the deficiency when fed @ 30g/head/day to cattle & buffalo in addition to the current feeding practices.

Sr. No.	Mineral element	Requirement (%)
1	Calcium	20.000
2	Phosphorus	12.00
3	Magnesium	5.00
4	Sulphur	1.80-3.00
5	Copper	0.10
6	Zinc	1.41
7	Manganese	0.12
8	Iron	0.40
9	Cobalt	0.012
10	Iodine	0.026

Study on performance of Holstein Friesian x Kankrej (HF X K) crossbred cows under intensive production system

The HF x K (50%) crossbred cows performed better under intensive production system. However, production and reproduction performance declined in *inter se* as compared to half bred HF x K (50%).

4.1.1.7 ANIMAL HEALTH

7. Effect of Peripartum Nutritional (multi-minerals and bypass fat) Supplementation on Uterine Involution, Postpartum Fertility and Reproductive Peridata in Jaffarabadi Buffaloes

Jaffarabadi buffalo owners are recommended to provide additional nutrients supplementation over routine feeding during transitional period from 45

days prepartum till 60 days postpartum (50 g chelated Area Specific Mineral Mixture and 150-200 g bypass fat daily) to improve the postpartum fertility and reduce calving interval for better economic return.

4.1.1.8 SOCIAL SCIENCE

1. Impact assessment of drip irrigation technology in banana in middle Gujarat

In middle Gujarat, drip cultivated banana is about 38 per cent more profitable than traditional grown banana by receiving 19 per cent higher production. The banana productivity could be increased by about 20 per cent if the farmers switch over from traditional method to drip method with the same level of resource use.

4.1.2 RECOMMENDATIONS FOR SCIENTIFIC COMMUNITY

4.1.2.1 CROP IMPROVEMENT (BASIC SCIENCE)

1. Development of tissue culture protocol for mass multiplication of seedless Lemon

Micro-propagation protocol for seedless lemon variety Konkan Lemon involves in vitro multiplication of cultures obtained on Murashige and Skoog (1962) (MS) medium supplemented with BA (0.2 mg/l), Kn (1.0 mg/l) and IBA (0.5 mg/l) with the highest number of multiple shoots (4.20) which was found to be consistent for four sub-culturing on same medium. In vitro rooting was found maximum in MS medium supplied with auxins IBA (1.0 mg/l) and NAA (0.2 mg/l) inducing highest rooting (100 %) and number of roots (2.69). Primary hardening was achieved when Cocopeat alone used as substrate leading to least mortality (3.12 %) and better growth characteristics.

4.1.2.2 CROP PRODUCTION

1. To find out critical limit of Ni for soil

The critical limit of DTPA extractable nickel in soil is 0.50 mg/kg.

2. Management of complex weed flora in garlic (*Allium sativum L.*)

For effective and economical management of complex weed flora in garlic, it is recommended to adopt any one of the below mentioned weed management practices.

Pre-emergence (2-3 DAP) application of oxyfluorfen 23.5% EC 240 g a.i./ha fb paddy straw mulch 5 t/ha fb hand weeding at 60 DAP

or

Early post-emergence (8-10 DAP) application of pendimethalin 30% EC 500 g a.i./ha + oxyfluorfen 23.5% EC 120 g a.i./ha (tank mix) fb paddy straw mulch 5 t/ha

or

Pre-emergence (2-3 DAP) application of pendimethalin 30% EC 500 g a.i./ha + oxyfluorfen 23.5% EC 120 g a.i./ha (tank mix) fb paddy straw mulch 5 t/ha

or

Pre-emergence (2-3 DAP) application of pendimethalin 30% EC 500 g a.i./ha fb paddy straw mulch 5 t/ha fb hand weeding at 60 DAP.

No residues of the applied herbicide were found in the garlic bulb. There was no adverse effect of herbicide applied in garlic on succeeding crops.

3. Effect of secondary and micro nutrients on growth, yield and quality of tobacco

Tobacco crop is not responding to application

of secondary and micronutrients on the loamy sand soil having medium to sufficient status of these nutrients.

4.1.2.3 PLANT PROTECTION

I AGRICULTURAL ENTOMOLOGY

1. Establishment of processing factor for different pesticides in chilli fruits

Foliar application of acephate, chlorpyrifos, carbendazim, azoxystrobin and ethion in chilli at red chilli fruiting stage at double the recommended dose resulted in built up of residues in red chilli powder to the tune of 1.11, 3.45, 2.88, 1.46 and 3.26 times, respectively compared to fresh red chilli fruits. As no MRLs of these pesticides are available for red chilli powder, respective processing factors can be adopted in extrapolating MRLs from green chilli fruits to red chilli powder.

2. Bio-efficacy of insecticides against pest complex in greengram

Seed treatment in greengram with imidacloprid 48 FS, 5 ml/kg and spray of flubendiamide 48 SC, 0.01% (2 ml/10 L water) at 50% flowering stage can effectively manage thrips, spotted pod borer and pod borer.

3. Screening of greengram genotypes against insect pests and diseases under natural conditions

Out of 17 greengram genotypes screened, VMG-67 was found resistant against insect pests viz., whitefly, aphid, jassid, thrips, spotted pod borer (*Maruca vitrata*) and yellow mosaic disease and gave higher grain yield under field conditions. The scientists working in breeding programme are advised to utilise genotype VMG-67 for resistance breeding programme.

4. **Screening of blackgram genotypes against insect pests and diseases**

Out of 20 blackgram genotypes screened, VUG-07 was found resistant against insect pests viz., whitefly, aphid, jassid, thrips and spotted pod borer, Marucavitrata and gave higher grain yield under field condition. The scientists working in breeding programme are advised to utilise genotype VUG-07 for resistance breeding programme.

5. **Bio-efficacy of different insecticides against serpentine leaf miner, *Liriomyza trifolii* (Burgess) on watermelon**

Two sprays, first at 40 days after sowing and second at 15 days after first spray of deltamethrin 2.8 EC, 0.0028% (10 ml/10 l water) or flonicamid 50 WG, 0.015% (3 g/10 l water) found effective against serpentine leaf miner, *Liriomyza trifolii* infesting watermelon.

II **PLANT PATHOLOGY**

6. **Detection of seed borne nature of Mungbean Yellow Mosaic Virus (MYMV) in urdbean and Bean Common Mosaic virus (BCMV) in mungbean**

Mungbean yellow mosaic virus was not detected as seed borne in urdbean, while bean common mosaic virus detected as seed borne in mungbean.

7. **Management of early blight of potato**

For the effective management of early blight disease of potato, dry seed (cut tubers) treatment with 5 kg talc powder followed by 1 kg mancozeb 75 WP for 100 kg potato seed tuber before 12 hrs. of planting followed by three foliar sprays viz., first spray of propiconazole 25 EC, 0.025% at disease initiation, second of azoxystrobin 23

SC, 0.023% and third of propiconazole 25 EC, 0.025% at 15 days interval were found effective.

4.1.2.4 **DAIRY SCIENCE and FPT & BE**

I **DAIRY SCIENCE**

1. **Purification and characterization of ACE-inhibitory peptides derived from fermented Camel milk**

A protocol is developed by Anand Agricultural University, Anand for the production of antihypertensive peptides i.e. GPPYQPLVPR, CISSSTPPYDLNRFK, VCNYSVSWIK and MDTIEPVSACIS from camel milk by fermenting it using selected *Lactobacillus* cultures (*L. acidophilus* NCDC015, *L. fermentum* LBF, *L. rhamnosus* NS4 and *L. delbreuckii* sub sp. *bulgaricus* 09) added at 2.0 per cent and incubating at 37°C for 12h.

II **FOOD PROCESSING TECHNOLOGY**

2. **Study on decontamination of pesticides in selected Spices, vegetable and fruits using γ -irradiation, UV radiation and Ozonation Techniques**

(Sub Title: Degradation of pesticide in red chili powder using gamma irradiation)

Gamma irradiation of red chilly did not show any effect on the degradation of pesticides such as for chlorpyrifos, ethion, triazophos, trifloxystrobin, azoxystrobin, cypermethrin, acetamiprid, carbendazim, imidacloprid, thiachloprid, chlorantraniliprol, fipronil, fipronil-sulfone, profenophos and flubendamide.

3. **Bio-chemical characterization of *Moringa oleifera* leaves and pods**

◆ Biochemical characterization of tender

moringa leaves was evaluated in two seasons i.e. Nov. –May and June – October. The biochemical characterization of tender moringa pod was evaluated in Nov. -May.

- ◆ GCMS analysis of moringa leaves led to identification of four compounds viz., phytol acetate, 2,4-Di-tert-butylphenol, 1-Tetradecanol and Neophytadiene
- ◆ GCMSQTOF analysis of moringa pods showed presence of fifteen compounds viz., 2,4-Di-tert-butylphenol; 1-Undecanol; 1-Hexadecanol; bis-4,4'-(1-methylethylidene) Phenol; Nonacos-1-ene; 2-Dodecylcyclohexanone; Glycidyl palmitate; (Z)-9, 17 - Octadecadienal; N-heptafluorobutyryl-1, 2, 3, 4- Tetrahydro-1-naphthylamine; L-Norvaline, N-decyloxycarbonyl-, undecyl ester; Dodecanoic acid, 2,4,6-trimethyl-, methyl ester; Glycidyl palmitate; Octadecanoic acid 2,3-dihydroxypropyl ester; Glycidyl oleate and Glycidyl palmitate
- ◆ LCMSQTOF analysis of moringa pods showed presence of thirty five compounds viz., (S)-Angelicin; trans-Zeatin; N-stearoyl tryptophan; Citpressine I; Trp-Ala-Pro; Trp-Ser-Pro; His-HoPhe-OH; His-Ser-OH; His-TyrMe-OH; Lactococcin; 4-Fluoro-L-threonine; Cinnassiol D4; Lys-Trp-OH; Avenanthramide 1s; PE-Cer(d14:1(4E)/21:0); 2-glyceryl-PGE2; Caohuoside D; Ambofuracin; Caohuoside D; Evasterioside D; TyrMe-Phe-OH; 15-Acetoxyascirpene-3,4-diol 4-O-a-D-glucopyranoside; D-Glucosaminide; (+)-Syringaresinol O-beta-D-glucoside; Trypanothione disulfide; Tyr-Gly-OH; Theobromine; Ile Asn-Phe; 4(Hydroxymethyl) benzenediazonium(1+); (+)-Mayurone; Asp-Asp-His; and 2E,6E-Octadienal

4. Evaluation of purity of silver foil used on sweets in rural area

- ◆ 50 silver foil coated sweet samples from unorganized sector were analyzed for silver and aluminum content. None of the samples contained pure silver.
- ◆ Analysis of few samples for presence of heavy metals and other elements revealed that cadmium, cobalt, chromium, lead, nickel, iron, copper, manganese, phosphorus and zinc were present in samples as undesirable elements.

4.1.2.5 AGRICULTURAL ENGINEERING and AIT

I AGRICULTURAL ENGINEERING

---NIL---

II AGRICULTURAL INFORMATION TECHNOLOGY

1. Student Information Management System (SIMS) for School of Bakery

A web-app “SIMS” is recommended for short term course of Bakery offered by Polytechnic in Food Science and Home Economics, AAU, ANAND to record details of admission, fees, attendance and result. It generates reports like Attendance, Fee Receipt, Deposit, Stipend, Result, Mark sheet and Certificate.

4.1.2.6 ANIMAL PRODUCTION AND FISHERIES

1. Effect of SSF biomass supplementation of growth performance of crossbred calves

Supplementation of Solid State Fermentation Biomass (SSF) @ 3% in the wheat straw based TMR (50% roughage: 50% concentrate) significantly improves growth

rate by 23.68%, reduces daily methane emission by 7.08%, dietary energy loss through methane by 13.72 % and increases microbial proteins synthesis by 29.03% in crossbred calves.

2. **Effect of tannin as phytonutrient on growth performance and health of Surti kids**

Surti male kids during growing stage of 7-12 months of age, when fed total mixed ration containing 3.06% tannin (18% babul pods) resulted in significant increase in average daily gain by 27.7%, feed efficiency in terms of DM, CP, DCP and TDN by 18.35, 18.12, 17.78 and 19.71 %, respectively.

3. **Effect of tannin as phytonutrient on growth performance and health of Surti kids**

Surti male kids during growing stage of 7-12 months of age fed with total mixed ration containing 3.06% tannin (18% babul pods) resulted in lower nematode (Trichostrongylid group and Trichuris Spp.) ova count, oocysts of coccidia and plasma A:G ratio by 73.69, 43.68 and 31 percents, respectively, and increased plasma total protein, globulin, Catalase activity and SOD activity by 15.33, 38.14, 16.34 and 300 percents, respectively reflecting healthy status of kids.

4. **Methane mitigation in calves through dietary interventions and its effect of performance of animals**

Feeding of Total Mixed Ration containing 15% Babul pods with roughage to concentrate ratio 50:50 increases growth rate by 17.68%, rumen microbial protein synthesis by 42.28 %, while decreases methane emission (g/kg DDMI) by 10.10 % and reduces dietary

energy loss through methane as % of MEI (Mcal/d) by 10.55%. The loss of dietary energy saved through methane mitigation was utilized by the calves for weight gain.

5. **Methane mitigation in calves through dietary interventions and its effect of performance of animals**

Feeding of Total Mixed Ration containing 25% pigeon pea straw, 25% wheat straw and 50% concentrate to crossbred calves increases growth rate by 32.59 %, rumen microbial protein synthesis by 37.44 %, while decreases methane emission (g/kg DDMI) by 16.12 % and reduces dietary energy loss through methane as % of MEI (Mcal/d) by 16.46 %. The loss of dietary energy saved through methane mitigation was utilized by the calves for weight gain.

6. **Effect of supplementing Fenugreek (*Trigonella foenum-graecum*) seeds in the ration of crossbred cows on nutrient utilization and milk production**

Supplementation of fenugreek seeds @ 1 % in the ration of lactating crossbred cows increases the digestibility of crude protein, crude fibre and feed efficiency with respect to DCP intake by 14.54% with reduction in number of services per conception.

4.1.2.7 ANIMAL HEALTH

1. **Effect of Piperine Pre-treatment on Pharmacokinetics of Gemifloxacin in Layer Birds**

Simultaneous single oral administration of piperine and gemifloxacin (each at 10 mg/kg) enhances oral bioavailability of gemifloxacin (F: 25.79%) as compared to gemifloxacin given alone (F: 15.50%) in layer birds.

2. Studies on renoprotective effect of aqueous and alcoholic biherbal Extracts of *Vigna unguiculata* and *Hordeum vulgare* in Wistar Rats

The herbal alcoholic extract of Horse gram and Barley (1:1(at the dose rate of 300mg/kg body weight orally once in a day for five weeks has nephroprotective effect on 0.75% v/v ethylene glycol and 2 % w/v ammonium chloride induced urolithiasis in wistar rats.

3. Effect of Peripartum Nutritional (multi-minerals and bypass fat) Supplementation on Uterine Involution, Postpartum Fertility and Reproductive Peridata in Jaffarabadi Buffaloes

Jaffarabadi buffaloes supplemented with area specific chelated mineral mixture (50 g/h/d) and bypass fat (150-200 g/h/d) over routine farm feeding during from 45 days prepartum till 60 days postpartum, together with intramuscular injection of micro-minerals, 5 ml (Se 25 mg, Zn 200 mg, Cu 75 mg and Mn 50 mg) around 45 days prepartum and again on the day of calving optimized the plasma metabolites, minerals and hormonal profile, and reduced the period of placental expulsion time, enhance uterine involution and service period/ calving interval with improved postpartum fertility status.

4. Evaluation of Reproductive Metabiota in Various Patho-Physiological Conditions in Dairy Animals

Metagenomically, the genital microbiota first ever explored in HF crossbred cows of different reproductive status revealed dynamic and a rich bacterial diversity comprising 21 Phyla, 543 Genera and 1720 Species. The most abundant phyla were Firmicutes, Bacteroidetes Fusobacteria and Actinobacteria and genera Peptoniphilus

Porphyromonas, Arcanobacterium, and Bacteroides in higher frequency in cyclic and endometritic cows than the pregnant and acyclic ones. Pseudomonas was higher in acyclic cattle. Plasma progesterone favoured Phylum Acidobacteria ($r=0.83$) and Genus Clostridium and Corynebacterium ($r=0.79, 0.74$), while estrogen Phylum Nitrospirae in the vaginal microbiota of crossbreds.

4.1.2.8 SOCIAL SCIENCE

1. Study on variability and development of yardstick for reliability of the experimental results of sugarcane crop

The yard stick of CV% for accepting the results of agronomy experiments for sugarcane crop conducted in south Gujarat region is 12 per cent for yield character.

2. Study on variability and development of yardstick for reliability of the experimental results of sugarcane crop

The yard stick of CV% for accepting the results of plant breeding experiments for sugarcane crop conducted in south Gujarat region is 10 per cent for yield character.

3. Prediction of monthly rainfall from June to September by Double Fourier Series and Artificial Neural Networks

To predict the monthly rainfall with greater accuracy from June to September in middle Gujarat using 55 years of weather data in two non linear models. It is recommended to use Double Fourier Series with two inputs monthly mean Maximum air temperature and relative humidity whereas four inputs namely, Maximum air temperature of May, monthly mean Relative humidity, monthly rainfall and monthly wind speed of previous year in Artificial Neural Network.

4. Development and standardization of scale to measure the attitude towards Yoga as a tool of human resource development

A scale was developed to measure the attitude towards Yoga as a tool of human resource

Final selected statements to measure attitude towards yoga as a tool of human resource development

development. The scale consists of twelve statements. This, scale is recommended for Scientific community of the state and country for measuring the attitude towards Yoga as a tool of human resource development.

No.	Statements	SA	A	UD	DA	SDA
1	Yoga is an original tool of meditation to develop human as resource (+)	5	4	3	2	1
2	(-) I doubt that Yoga develops intelligence of human being	1	2	3	4	5
3	I think yoga enhances the efficiency of internal glands of body (+)	5	4	3	2	1
4	(-) I feel that practicing Yoga is wastage of time	1	2	3	4	5
5	(+) I believe that Yoga refreshes mind	5	4	3	2	1
6	(-) I feel that Yoga is impractical to develop human employability	1	2	3	4	5
7	(+) I am convinced that the Yoga helps in reviving human power	5	4	3	2	1
8	I feel that Yoga is useless in developing managerial ability of human (-)	1	2	3	4	5
9	(+) I believe exercising yoga helps in staying lively	5	4	3	2	1
10	(-) I think that yoga increases instability of human mind	1	2	3	4	5
11	(+) I understand that Yoga provides the strength to the human heart	5	4	3	2	1
12	(+) I believe that Yoga makes total development of human	5	4	3	2	1

4.2 AGRICULTURAL CROPS

4.2.1 CEREALS

4.2.1.1 Rice

Crop Improvement

- Rice is the predominant cereal crop of central Gujarat. A large number of varieties have been developed by the Main Rice Research Station, Nawagam, Gujarat. Presently, the centre is working for the development of new varieties/hybrids in rice. In addition, various breeding activities like development of fresh crosses, handling of segregating generations, screening of germplasm and different categories of

varietal trials are regularly conducted at the station.

- During the year 2019-20, a total of 39 trials were successfully conducted in Crop Improvement department viz; transplanted trials of state, AICRIP trials, IRRI Nursery, AICRIP hybrid rice trials and other agency trials.
- In *Kharif-2019*, a total 1694 genotypes were evaluated during *Kharif-2019*
- In *Kharif-2019*, a total of 1769 plant progenies of different generations were evaluated from which 1511 IPS and 155 bulks were made in crop Improvement department.

State Transplanted Trials

- ◆ During *Kharif-2019*, 13 transplanted trials were conducted at Nawagam, Dabhoi, Navsari and Vyara centers of Middle Gujarat.

AICRIP Trials

- ◆ During *Kharif-2019*, 10 AICRIP trials at Nawagam and Dabhoi centres were conducted. Likewise, under AICRIP, hybrid rice 4 trials were conducted at Nawagam and Dabhoi locations.

State Drilled Rice Trials

- ◆ A total of 05 trials at Derol, Dabhoi and Thasra were successfully undertaken during *Kharif-2019*.

AICRP Drilled Rice trials

- ◆ A total of 04 trials at Derol were successfully undertaken during *Kharif-2019*.

Rice Trials: (ARS, Derol)

- ◆ In LSVT-E, total 22 genotypes including five checks were evaluated. out of the 22 genotypes NWGR-2011 and NVSR-2601 found promising.
- ◆ In LSVT-Aerobic, the total 09 genotypes and two checks were evaluated in this trial. Out of the 11 genotypes NVSR-391 and NVSR-2285 were recorded significantly higher yield as compared to best check GNR 3.
- ◆ In PET Aerobic, 12 genotypes evaluated including two checks. Out of 12 genotypes three genotypes i.e NWGR-13031, NWGR-13041 and NWGR-16030 gave significantly higher yield as compared to best check NAUR 1.
- ◆ In PET – Drilled of paddy, out of 26 genotypes evaluated two genotype NWGR-15018 and NWGR-16035 gave significantly higher yield as compared to check PURNA.

- ◆ In PYT- Drilled of paddy, out of 37 genotypes evaluated including five check genotype NWGD-1803, NWGD-1806, NWGD-1822 and NWGD-1822 gave significantly higher yield as compared to check PURNA.
- ◆ In AVT 1 E DS trial, 22 entries were tested. Among all the entry tested entry 109 and 111 found significantly superior over best check GR 9.
- ◆ Total 8 entries including one check were evaluated in kharif 2019 in AVT 1 Aerobic trial, entry 3817 was found superior than best check GR 9.
- ◆ 64 entries were tested in IVT Aerobic trial, among all the entry tested, entry 3916 was found significantly superior over best check GR 9.
- ◆ In IVTE DS trial, 29 genotypes with one check were evaluated, entry 221 was significantly superior over local check GR 9.

Rice Trials: (ARS, Dabhoi)

At Dabhoi, following experiments on transplanted paddy were conducted under state and AICRP trials.

State Trials

- ◆ In LSVT-E-CO transplanted paddy NVSR -467, NVSR -2638 and NWGR -13041 genotypes produced significantly higher yield as compared to best check.
- ◆ In LSVT-E-M transplanted paddy NWGR – 14005, NWGR – 8001 and NVSR-413 genotypes produced significantly higher yield as compared to best check.
- ◆ In LSVT-E-F transplanted paddy NWGR-15022, NWGR-13139 and NWGR-14059 genotypes produced significantly higher yield as compared to best check.

- ◆ In LSVT-ML-F transplanted paddy NWGR – 14072, NWGR –15026, NWGR-15056 genotypes produced significantly higher yield as compared to best check.
- ◆ In LSVT-ML-C transplanted paddy NWGR-13055, NVSR-6209 and NWGR-13052 genotypes produced significantly higher yield as compared to best check.
- ◆ In LSVT-ML-M transplanted paddy NWGR – 15028, NVSR-481 and NVSR-6190 genotypes produced significantly higher yield as compared to best check.
- ◆ In SSVT-E transplanted paddy NWGR-16033, NWGR-16034 and NWGR-16035 genotypes produced significantly higher yield as compared to best check.
- ◆ In SSVT-ML transplanted paddy NWGR-16009, NWGR-16059 and NWGR-16018 genotypes produced significantly higher yield as compared to best check.
- ◆ In PET-AROM transplanted paddy NWGR-17015, NWGR-17135 and NWGR-17067 genotypes produced significantly higher yield as compared to best check.
- ◆ In PET-E transplanted paddy NWGR-17142, NWGR-17037 and NWGR-17124 genotypes produced significantly higher yield as compared to best check.
- ◆ In PET-E transplanted paddy NWGR-17053, NWGR-17130 and NWGR-17096 genotypes produced significantly higher yield as compared to best check.
- ◆ In IHRT-M transplanted paddy IHRT-M 3216, IHRT-M 3208 and IHRT-M 3207 genotypes produced significantly higher yield as compared to best check.
- ◆ In IHRT-ME transplanted paddy IHRT-ME 3107, IHRT-ME 3101 and IHRT-ME 3108 genotypes produced significantly higher yield as compared to best check.
- ◆ In IHRT-MS transplanted paddy IHRT-MS-3310, IHRT-MS-3306 and IHRT-MS-3301 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-E-TP transplanted paddy IVT-E-TP-1033, IVT-E-TP-1026 and IVT-E-TP1027 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-IME transplanted paddy IVT-IME-1222, IVT-IME-1201 and IVT-IME-1204 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-IM transplanted paddy IVT-IM-1458, IVT-IM-1462 and IVT-IM-1459 genotypes produced significantly higher yield as compared to best check.
- ◆ In AVT-IMS transplanted paddy AVT-IMS -4102, AVT-IMS-4114 and AVT-IMS-4115 genotypes produced significantly higher yield as compared to best check.

AICRP trials

- ◆ In IHRT-E transplanted paddy IHRT-E 3008, IHRT-E3016 and IHRT-E3001 genotypes

produced significantly higher yield as compared to best check.

- ◆ In IHRT-ME transplanted paddy IHRT-ME 3107, IHRT-ME 3101 and IHRT-ME 3108 genotypes produced significantly higher yield as compared to best check.
- ◆ In IHRT-MS transplanted paddy IHRT-MS-3310, IHRT-MS-3306 and IHRT-MS-3301 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-E-TP transplanted paddy IVT-E-TP-1033, IVT-E-TP-1026 and IVT-E-TP1027 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-IME transplanted paddy IVT-IME-1222, IVT-IME-1201 and IVT-IME-1204 genotypes produced significantly higher yield as compared to best check.
- ◆ In IVT-IM transplanted paddy IVT-IM-1458, IVT-IM-1462 and IVT-IM-1459 genotypes produced significantly higher yield as compared to best check.
- ◆ In AVT-IMS transplanted paddy AVT-IMS -4102, AVT-IMS-4114 and AVT-IMS-4115 genotypes produced significantly higher yield as compared to best check.

Crop Production

- ◆ Apart from Main Rice Research Station, Nawagam, two other centres Dabhoi and Thasra also conducted research experiments on transplanted and drilled paddy.
- ◆ During the reporting period, total 11 experiments (AICRP 6 + State 5) were conducted on different agronomical aspects.

In AICRP trials, different varieties were tested with various nitrogen doses, sowing dates in transplanted and aerobic rice as well as on cropping system and weed management. In state trials, research was carried out on response of rice to nitrogen, phosphorus and biofertilizers.

Plant Protection

For plant protection in rice, 14 experiments (State as well as AICRIP) were successfully conducted by Entomology department and 18 experiments (State trials as well as AICRIP) were conducted by Pathology department.

A total of 433 genotypes at Nawagam and 258 genotypes at Navsari including local checks were screened for their reactions against important insect-pests of rice. Among all the tested genotypes only 5 genotypes at Nawagam found resistant against leaf folder and 68 genotypes at Navsari found superiorly most promising against leaf folder (0 DS). There were, total 17 entries at Navsari found promising against yellow stem borer (0 DS). Moreover, 23 genotypes at Nawagam showed 1 DS and 98 genotypes at Navsari found 1 DS against yellow stem borer. Among all tested entries only 20 entries were found promising against WBPH at Nawagam location and 45 entries were found superior against sheath mite, showed 0 DS at Navsari location.

Screening of paddy genotypes was done for their resistance to major pests, monitoring of pests and their natural enemies, monitoring the activity of insect pests through light trap and evaluation of newer insecticides for the management of paddy pests. Moreover, studies were also conducted on pathological screening of genotypes for their resistance to leaf blight, blast and sheath rot diseases, field monitoring of virulence of major causal organisms and evaluation of newer fungicides against major diseases of paddy.

4.2.1.2 Maize

Crop Improvement

Rabi 2018-19

Testing of hybrids/varieties

Testing of hybrid/varieties developed by different centers of AICRP on Maize and Private sectors across the country. To be decided by Director (Maize), Indian Institute of Maize Research, (ICAR), Ludhiana. Total 06 trials were conducted successfully to test 115 hybrids of different maturity groups and results were submitted.

Station (Location Specific) programme

Research programme was conducted for testing hybrids/varieties developed by Godhra centre. Trials were taken at Godhra, Dahod, Jabugam and Bhiloda and Waghai center for evaluation of single cross hybrids and varieties of Normal maize and Specialty corn. Total 31 trials were conducted successfully at five locations to test 107 hybrids in normal and specialty corn.

Total 303 inbred lines in yellow maize were maintained, multiplied in winter maize nursery programme and these lines were used directly for developing single cross hybrids. Total 151 single cross hybrids were developed in normal yellow and white maize, 33 hybrids in QPM, 20 hybrids in sweet corn and 20 hybrids in popcorn were developed to evaluate in *kharif* and *rabi* season multi location trials.

Under project CRMA (Climate Resilience maize for Asia) total 611 hybrids were evaluated in 12 trials for identifying hybrids for drought condition.

Kharif 2019

Testing of experimental hybrids/varieties:

Testing of hybrid/varieties developed

by AICRP on maize Centers and private sectors across the country as decided in 62nd Annual Maize Workshop meeting held from 5-7th April, 2019 at Bajaura, Himachal Pradesh. Total 10 trials were conducted successfully comprising of normal maize and specialty corn. Total 254 hybrids were evaluated in 10 trials.

Station (Location specific) programme:

Research programme was conducted on Heterotic breeding and composite breeding and trials were conducted for testing hybrids/varieties developed by this center. Trial were taken at Godhra, Dahod, Khedbhrama, Bhiloda, Devagadh Bria and Derol and Jabugam centre for its multilocation evaluation. Total 31 trials were conducted successfully at different location of Anand Agricultural University and SDAU including MMRS, Godhra to test 75 hybrids.

White Breeding materials

- ◆ Total 45 inbred lines were maintained. Moreover, 42 fresh crosses were made for White Normal Maize, 16 fresh crosses were made for White Quality Protein Maize Maize and 21 composite culture were maintained by seed matting.

Yellow Breeding materials

- ◆ Total 303 inbred lines were maintained. Moreover, 36 fresh crosses were made for White Normal Maize, 17 fresh crosses were made for White Quality Protein Maize Maize, 20 crosses were made for sweet corn and pop corn each. 11 varieties were maintained along with 177 germplasm.

Crop Production

The experiment of pre-released baby corn hybrids early and medium maturing hybrids and rainfed early and late maize hybrids were tested with different nutrients and density experiment was allotted to this station under AICRP (ICAR)

on Maize project by IIMR, Ludhiana. While in station research the experiments of baby corn in kharif and rabi on spacing, nutrients and bio fertilizer were also taken at the station. The other experiment on effect of organic manure, Bio NPK consortium and chemical fertilizer on yield of hybrid maize in kharif and rabi season were also taken during 2018-19. Front line demonstrations on bio fertilizers were also taken on farmer's field of Panchmahal, dahod and Mahisagar district. Thus new technology demonstrated to the farmers for more production of maize crop.

Plant Protection

Agri. Entomology

The different experiments on serious pest as fall armyworm, *Spodoptera frugiperda* of maize crop were carried out viz. Survey and Surveillance of maize pests in different localities of Gujarat states, to screen out different germplasm line in maize pest in *kharif* and *rabi* season. Following entomological work was carried out during the year

- ◆ Whorl application of soil @ 5 g/plant or sand @ 5 g/plant at 30 and 45 days after sowing for effective and economical control of fall armyworm, *S. frugiperda* infesting maize.
- ◆ Spray spinetoram 11.7 SC, 0.0117 % (10 ml/ 10 litre of water) or emamectin benzoate 5 SG, 0.0025 % (5 g/ 10 litre of water) or chlorantraniliprole 18.5 SC, 0.006 % (3 ml/ 10 litre of water) or thiodicarb 75 WP, 0.11 % (15 g/ litre of water) first at initiation of pest and second at 15 days interval for effective and economical control of fall armyworm, *Spodoptera frugiperda* infesting maize.
- ◆ Whorl application of chlorantraniliprole 0.4% CG and fipronil 0.6% CG @ 20 kg/ha first at appearance of pest and second after 15 days of

first application were found effective against fall armyworm in maize.

- ◆ Spray *Nomuraea rileyi* 1% WP (40 g/10 litre water) or *Bacillus thuringiensis* WG (20 g/10 litre water) first at initiation of pest and second and third at 10 days' interval for effective and economical control of fall armyworm, *Spodoptera frugiperda* infesting maize.
- ◆ Apply poison baits having: Rice bran 25 kg + jaggery 5 kg + thiodicarb 75 WP 250 g/ha or Maize flour 25 kg + jaggery 5 kg + thiodicarb 75 WP 250 g/ha or Rice bran 25 kg + jaggery 5 kg + emamectin benzoate 5 SG 125 g/ha. First at initiation of pest and second at 15 days' interval for effective and economical control of fall armyworm in maize.
- ◆ Note: Dissolve 5 kg jaggery in 5 litres of water, mix 25 kg of bran/flour in to it and keep it overnight, next day add insecticide in baits before application.

Plant Pathology

Following pathological work was carried out in maize during the year

- ◆ Among the treatments IDM module (Seed treatment with *T. viride* @ 10g/kg seed and Thiram 75 WS @ 3g/kg seed; Soil application of *T. viride* @ 10g/100g FYM/m²; One foliar application of Azadirachtin 1500 ppm @ 4ml/lit of water @ 35 DAS; and One foliar application Azoxystrobin 18.2% + Difenoconazole 11.4% (29.6 SC) @ 1 ml/litre of water @ 50 DAS) was observed best in checking banded leaf and sheath blight (BLSB) disease severity (19.88%) resulted in highest grain (4999 kg/ha) and fodder yield (5687 kg/ha) over unprotected inorganic check.
- ◆ Out of 19 entries of white inbreds/hybrids, 17 entries were found resistant and 2

moderately resistant whereas, Out of 27 entries of yellow inbreds/hybrids, 23 entries were found resistant, 3 moderately resistant and 1 moderate susceptible against turicum leaf blight of maize disease.

- ◆ The disease incidence was recorded 2-7.5 rating scale on different maize inbred lines grown on our centre. The different inbred lines were exhibited low to high incidence as per their genetic ability to tolerant and resistant with pathogen.
- ◆ The treatments T4 (Azoxystrobin 18.2 w/w + Difenoconazole 11.4% w/w SC @ 0.10% spray at 3 days and 18 days after inoculation) was observed best in checking turicum leaf blight (TLB) disease severity (24.11%) resulted in the highest grain (54.58 q/ha) with 44.97% yield increase over untreated control.
- ◆ Among modules, the IDM module T3 (Seed treatment with *T. viride* @ 10g/kg seed and Thiram 75 WP @ 3g/kg seed; One foliar application of Nimbicidine 5ml/litre of water @ 35 DAS and one foliar application Azoxystrobin 18.2% + Difenoconazole 11.4% (29.6 SC) @ 1 ml/litre of water @ 50 DAS) was observed best in checking curvularia leaf spot (CLS) disease severity (26.72%) resulted in the highest grain (53.64 q/ha) with 36.38% yield increase over unprotected organic check.
- ◆ In pot experiments, among the treatments Tebuconazole 50% + Trifloxystrobin 25% (75% WG) (T2) was observed significantly control against charcoal rot disease of maize at 0.075% concentration with the lowest disease severity 10.75% as well as the highest disease control (79.97%) over control treatment (53.69%).

4.2.1.3 Wheat

Crop Improvement

Triticum aestivum

RRS, Anand

Total seven trials were conducted at the centre

- ◆ Under AVT-RI-TS-TAD trial, total six entries were evaluated with three check varieties. The genotypes DBW 277 found promising.
- ◆ The experiment was conducted with 13 genotypes including 4 checks under AVT-IR-TS-TAD. The genotype GW 1348 (d) and DDW 49 (d) were found significantly superior in yield than best check HI 8713(d).
- ◆ AVT-IR-TS-TAD trial was conducted with ten genotypes including 4 check varieties. The genotype CG 1029 was found promising.
- ◆ Under LST-TS (*T. aestivum*), total 8 genotypes including five checks were evaluated. The genotype GW 513 was found significant superior against check GW 366.
- ◆ LST-LS (*T. aestivum*) trial was conducted with 11 genotypes including 5 checks. None of the genotype were found promising.
- ◆ Under SST-TS, total 23 genotypes including five checks were evaluated. The genotype VA 2017-09 was found significant superior against best check GW 366.
- ◆ Total seven entries, were evaluated with three check varieties in PET (*T. aestivum*). The genotype GAW 16-21 was found significant superior than best check GW 451.

Triticum durum

- ◆ At ARS Dhandhuka, 83 new crosses were attempted for development of high yielding varieties suitable under rainfed conditions. Out of 735 progenies, 675IPS were selected.

- ◆ At ARS Dhandhuka, total 10 different trials viz. AVT (RI) A+D, NIVT-5B (RI) A+D, LST(RF)d, SST(RF)d, SST(RI)d, PYT(RF)d, PET(RF)d, PYT (RI)d, SST-RI-TS-A & Row trial on Pro. Bulks d on Durum Wheat were allotted and conducted successfully
- ◆ At RRS, Anand, The Large Scale Trial-durum experiment was conducted with 7 genotypes including 3 check varieties. The genotypes GW 1348 and GW 1352 were found promising
- ◆ At ARS, Arnej, 7 experiments viz., LST(RF) *Triticum durum*, SST(RF) *T durum*, SST(RI) *T durum*, PYT(RF) *T durum*, PYT(RI) *T durum*, PET(RI) *T durum* and NIVT-5B-RI-TS-TDM were conducted successfully.
- ◆ At ARS, Arnej in wheat, total 124 entries including checks were tested in different seven trials including co-ordinated, state and station trial. Among them, 32 genotypes / entries of Arnej centre were found promising and will be promoted in respective trial.

Crop Production

At ARS, Arnej, following research experiments for production technology in wheat were conducted during the reporting period.

- ◆ Nutrient management through organic sources in wheat (GW-496) in *Bhal* region
- ◆ Nutrient management through organic sources in wheat (GW-1) in *Bhal* region:
- ◆ Effect of nitrogen levels & seed rate on growth and yield of *durumwheat* (GADW 3) under *Bhal* region
- ◆ Effect of different multi-micronutrient mixture grade application on growth yield and quality of chickpea under unirrigated condition in *Bhal* region.

- ◆ Effect of different sources and levels of sulphur on growth, yield and quality of dill seed under restricted irrigation (RI) in *Bhal* region
- ◆ Effect of nitrogen, phosphorus and bio-Fertilizer on growth and yield of chickpea under restricted irrigation in *Bhal* region.

Crop Protection

At ARS, Arnejin the year 2019-20, seed treatment with thiamethoxam 30 FS @ 0.144 kg a.i./ha and soil application of chlorantraniliprole 0.4% G @ 0.1 kg a.i./ha and fipronil 0.3% G @ 0.1 kg a.i./ha were found effective in protecting un-irrigated wheat crop against stem borer and wireworm by recording higher plant population at initial and harvest, minimum plant population reduction (%) in plant population as well as dead heart (%) at 30, 45, 60 and 75 days after sowing which reflected on grain and straw yield.

4.2.1.4 Bajra

Crop Improvement

Summer – 2019

- ◆ In LSHT trial, total 24 hybrids including six checks were evaluated. Seven hybrids viz., GHB 1268, GHB 1231, GHB 1242, GABH 1650, GHB 1252, GHB 1245 and GABH 1631 were found significantly superior than the check GHB-732.
- ◆ In the coordinated hybrid trial SHT, 21 hybrids were evaluated including one local check hybrid GHB-732. Among the hybrids evaluated, seven hybrids viz., SHT-102, SHT-106, SHT 114, SHT-120, SHT-110, SHT 118 and SHT 113 gave significantly higher yield than the check hybrid GHB-732.
- ◆ In the PHT, total 13 hybrids were evaluated for yield performance in comparison to four checks viz., GHB-538, GHB-558, GHB-732 and Pioneer 86M11. Among the hybrids evaluated, six hybrids were recorded significantly higher yield over the best check hybrid GHB-732.
- ◆ In ZHT, total 11 hybrids were evaluated for yield performance against four checks viz., GHB-538, GHB-558, GHB-732 and 86M11. Among tested hybrids, four entries viz., GABH 1611, GABH 1631, GABH 1650 and GABH 1718 were out yielded over the best check Pioneer 86M11.

ARS, Sansoli

- ◆ Seven entries against four checks were evaluated for their grain yield performance. Among 7 hybrids, 5 hybrids viz., GABH 1718, GABH 1701, GABH 1650, GABH 1646 and GABH 1703 had recorded significant higher grain yield than best check GHB 732.

Kharif-2019 (RRS, Anand)

- ◆ In LSHT trial, total 21 hybrids including eight checks were evaluated for grain yield performance. Among the tested hybrids, GHB-1234 gave higher yield than the best state check GHB-1225 by 3.69 per cent.
- ◆ Total 48 hybrids including 7 checks were evaluated for grain yield in SSHT trial. Three hybrids viz., GHB, GHB 1282 and GHB 1278 recorded significantly higher yield over the best state check hybrid GHB-1225 and best private check hybrid Pioneer 86M84.
- ◆ Total four EDV hybrids were evaluated for their yield performance against check GHB- 538. The genotypic differences for grain yield were found non-significant. However, all the EDV varieties are found promising.
- ◆ Total 5 hybrids were evaluated in AHT- M trial for their yield performance against check

GHB- 732. Hybrids AHT-501 A and AHT 503-A were recorded significantly higher yield and exhibited superiority over the check hybrid GHB-732.

- ◆ In IHT-M trial, Total 37 hybrids including one check GHB-732 were evaluated for their grain yield performance. Seven hybrids viz., IHT-204, IHT-231, IHT-202, IHT-223, IHT-207, IHT-228 and IHT-230 were found promising than GHB-732.
- ◆ Total 35 hybrids were evaluated along with check hybrid GHB-732 in IHT (L) Among the hybrids evaluated, twenty hybrids were statistically superior to the best check GHB-732. The hybrids IHT-310 recorded the highest seed yield than the check GHB 732.

Crop Protection

- ◆ In population dynamics trial of different insect pest in pearl millet, population of lepidopteron pest viz. shoot fly and stem borer coleopteran pest viz. Flea beetle, blister beetle, chaffer beetle and grass hopper found throughout crop period.
- ◆ In survey of insect's pests of bajra, blister beetle, grass hopper, grey weevil, leaf binder, lady bird beetle and *Helicoverpa armigera* were found the entire surveyed village. Maximum insects' incidence was observed leaf binder and minimum insect's incidence observed *Helicoverpa armigera*. Fall armyworm incidence was not observed.
- ◆ In downy mildew sick plot, total 449 pearl millet hybrids were screening against downy mildew (DM) disease compiled experiment of AICRP 4 trial, state 2 trial, ICRI SAT 2 trial. Out of which, 130 were free from DM disease. The disease occurrence was 100% in infector and Indicator rows. In collaboration trial of AICRP and ICRI SAT against blast

disease out of 64 entries only 20 entries were found disease free. In survey of pearl millet disease on 15 farmers field, DM range 05 to 10 per cent and blast rating was 3 to 5.

- ◆ In varietal / hybrid trials of state and AICRP, 205 entries were screened against DM and Blast, out of which 173 and 170 entries found disease free for DM and Blast disease, respectively in natural condition.

4.2.1.5 Finger Millet and Kodo Millet

Crop Improvement

Kharif-2019

- ◆ At Hill Millet Research Station, Dahod, seven experiments of finger millet were conducted under AICRP, state and station trials. Total 87 genotypes of finger millet were evaluated. Out of these, 07 genotypes viz., WN 591, WN 559, WN 550, WN 630, WN 586, DN 13 and DN 14 were found promising for grain yield.
- ◆ Six varietal trials were conducted under AICRP, state and station trials in Kodo Millet and 37 genotypes were tested. Out of these, 08 genotypes viz., GK 4, DK151, DK 124, DK 163, DK 158, DK 140, DK 178 and GAK 3 were found promising for grain yield.

4.2.2 PULSES

4.2.2.1 Mungbean

Crop Improvement

RRS, Anand

Summer 2019

- ◆ In ZVT trial, total 13 genotypes of mungbean were evaluated including five check varieties viz; GM 4, Meha and GAM 5, GM 6 and GM 7. The genotypes ANDGG-13-01 recorded 13.50% higher yield than the best check variety GM 7. All the test entries were recorded less than 10% YMV disease.

- ◆ Total 14 genotypes were evaluated including three check varieties viz; GM 4, Meha and GAM 5 in PET. The genotypes ANDGG 1811, ANDGG 1810 and ANDGG 1801 were found promising against check variety Meha.

Kharif 2019

- ◆ In LSVT, total 8 genotypes including four checks i.e Meha, GM 4, GAM 5 and GM 6 were evaluated. None of the genotypes were found promising.
- ◆ In ZVT, total 13 genotypes were evaluated including five check varieties viz; GM 4, Meha, GAM 5, GM 6 and GM 7. The genotypes VMG62 were found promising.
- ◆ Total 14 genotypes were evaluated including three check varieties viz; GM 4, Meha and GAM 5 in PET. None of the genotypes were found promising.
- ◆ 182 germplasm lines were maintained. 08 fresh crosses were made.

Pulse Research Station, Vadodara

Summer- 2019

- ◆ In AVT trial, total 06 entries were tested including local check GAM 5. Among the them, genotypes SM-19-88 found promising. All test entries performed highly resistant reaction against YMD.
- ◆ In SSVT trial, Total 14 promising culture along with four check varieties viz., GM-4, Meha, GM-6 and GAM-5 were tested. The genotypes VMG-30 and SKNM 1605 were shown significant yield superiority over best check GM-6. The VMG-30 and SKNM 1605, both entries were performing resistant reaction against YMD.
- ◆ Under Preliminary Evaluation Trial, total 08 promising entries along with five check

varieties viz., GM-4, Meha, GAM-5, GM-6 and GM-7 were tested. The genotype VMG-91 was found superior than best check GM-6.

- ◆ In Zonal Varietal Trial, total 08 promising genotypes along with five check varieties viz., GM-4, Meha, GAM-5, GM-6 and GM-7 were tested. None of the genotype were found promising
- ◆ In summer 2019, 4 new crosses were attempted for development of high yielding varieties. Total 65 plant progenies of various generations were raised. Out of these progenies, 31 IPS were selected.

Kharif-2019

- ◆ In PET trial, among the tested 17 genotypes of mungbean, the genotype VMS-19-03 was found promising.
- ◆ In ZVT trial, among the tested 08 genotypes of mungbean, the genotype VMG-30 was found promising.
- ◆ In SSVT trial, among the tested 18 genotypes of mungbean, the genotypes VMG-30 and GJM-1821 was found promising.
- ◆ In LSVT trial, among the tested genotypes of mungbean, none of the genotypes were found promising.
- ◆ In *kharif* 2019, 4 new crosses were attempted for development of high yielding varieties. Total 31 plant progenies of various generations were raised. Out of these progenies, 43 IPS were selected.

ARS, Derol

Summer-2019

- ◆ In ZVT, during summer 2019, 13 genotypes evaluated including five checks, none of the genotype was found promising.

Kharif-2019

- ◆ In LSVT, 8 genotypes including three checks were evaluated. None of the genotypes was found promising.
- ◆ In SSVT, 22 genotypes including four checks were evaluated. None of the genotype was found promising.

TRTC, Devagadh Baria

Summer-2019

- ◆ Under ZVT, total eight genotypes including five checks Meha, GM-4, GAM-5, GM-6 and GM-7 were evaluated for their seed yield performance. None of the genotype was found promising.

Crop Protection

Pulse Research Station, Vadodara

Summer-2019

- ◆ **Screening of mungbean genotypes against insect pests and diseases, summer-2019.**

Among the seventeen genotypes/variety, GAM-5, VMG-03 and VMG-31 found considerably less susceptible to the insect pests of mungbean.

- ◆ **Screening of mungbean genotypes against insect pests and diseases, Summer-2019.**

Among the 17 tested genotypes / varieties, GAM-5 recorded lowest (1.29%) yellow mosaic disease at harvest. GM-4 recorded significantly highest (38.82%) YMD.

4.2.2.2 Pigeon Pea

Crop Improvement

Pulse Research Station, Vadodara

- ◆ In PET trial, total 13 genotypes including five checks viz., AGT-2, BDN-2, Vaishali, GT 104 and GJP 1 were tested, the entries VPG-288, VPG -665 and AAUVT-18-2 were found promising.

- ◆ In PET(EE) trial, total 10 genotypes including three checks viz., PA 16, UPAS 120 and ICPL 87 were tested, the entries UPAS 120, ICPL 20325 and PAU 881 were found promising.
- ◆ In ZVT trial, the entries AAUVT-13-20 and AAUVT-17-02 were found promising.
- ◆ In SSVT-M trial, total 12 genotypes including four check varieties viz., AGT-2, GJP-1, BDN-2 and GT 104 were tested. the entries GJP 1820, BP-16-273 and AAUVT 17-02 were found promising.
- ◆ In LSVT-ME trial, total 09 genotypes including three check varieties viz., GT-103, GT-101 and BDN 711 were tested. the entries SKNP 1408, SKNP 1701 and SKNP 1783 were found promising.
- ◆ In IVT-Midlate Pigeon pea trial, the entry 21 were tested.

ARS, Derol

- ◆ In LSVT (M) total 11 genotypes including checks were tested, among them PLM 405 was found promising.
- ◆ In SSVT (M) total 16 genotypes including checks were tested, among them PSM 306 was found promising.
- ◆ In ZVT total 13 genotypes were evaluated for yield performance against three checks among all the genotypes AAUVT 17-02, AAUVT 13-35 and AAUVT 13-20 were found promising.

HMS, Dahod

- ◆ At Hill Millet Research Centre, Dahod, three experiment of pegionpea was conducted under state trial. Total 28 genotypes of pegionpea were evaluated. Out of these, 6 genotypes viz., PLME 211, PLME 210, PLME 212,

AAUVT 13-20, AAUVT 13-35 and AAUVT 15-6 were found promising.

Crop Production

Pulse Research Station, Vadodara

♦ Study of pigeonpea based relay cropping system

T₁ (Greengram + Pigeonpea variety AGT-2) recorded higher plant height, branches/plant, pods/ plant, pod length and seeds/pod, grain yield of pigeonpea. Grain yield of pigeonpea, intercrops and pigeonpea equivalent were significantly influenced by the treatments. Treatment T₁ (Greengram + Pigeonpea variety AGT-2) recorded significantly higher grain and straw yield of pigeon pea and pigeonpea equivalent yield while Treatment T₇ (Soybean + Pigeonpea variety AGT-2) recorded significantly higher grain and straw yield of intercrops.

♦ Assessment of organically managed pigeonpea based cropping sequence.

Pigeon pea grain yield and equivalent yield were significantly influenced by the treatments. Treatment T2 (100% N through Vermicompost) was recorded significantly highest pigeonpea grain yield (1665). CIT2 (Greengram + 100% N through Vermicompost) recorded significantly highest (153596) pigeonpea equivalent yield.

ARS, Derol

♦ Surveillance programme of *H. armigera* in pigeonpea

Insect pest surveillance study in pigeonpea revealed that *H. armigera* first appeared in the 46th standard week in both the protected and unprotected plots. Under unprotected conditions, its population increased rapidly and reached the maximum value in the 48th

std. week. The larval population was above Economic Threshold Level (ETL) from 48th to 50th standard week. The larval population was below ETL from 51st standard week. Grain damage due to pod fly under unprotected condition was 13.30 per cent in 50th std. week. Then it showed increasing trend up to 3rd std. week. Maximum grain damage (30.81 %) was revealed in the 3rd std. week.

♦ Screening of pigeonpea genotypes against sterility mosaic disease

The population of *H. armigera* was appeared in all the entries. Significantly lower population was recorded in AAUVT-18-1 and it was at par with AGT 2, BDN 2, VPG 126-1324. Significantly higher population observed in AAUVT 18-3. The significantly lowest population of *Maruca vitrata* was noticed in AAUVT 18-1 and it was at par with VPG 126-1324, VPG 665-1574, GJP 1, GT 104, Vaishali, AGT 2 and BDN 2. Significantly higher population recorded in AAUVT 18-3 (2.17 larvae/plant). Among all the entries AAUVT 18-1 found lowest pod damage and higher pod damage recorded in AAUVT 18-3. VPG 17 has recorded significantly lowest grain damage and higher grain damage recorded in VPG 430-1338. Significantly maximum per cent plant of SMD was recorded in VPG 438-1273 (11.22%). In all the entries two times SMD infected leaves inoculated by stapling method even though SMD was not got.

♦ Efficacy of different botanicals against pod borer complex of pigeonpea

The significantly lower larval population of *H. armigera* was observed in the treatment T1 (Neem seed kernel water extract 5%) and it was at par with T9 (Azadirachtin 1500 ppm). The larval population of *Lampides boeticus*

was significantly lower recorded in treatment azadirachtin 1500 ppm and it was at par with neem oil. The lowest larval population of *Exelastis atomosa* was recorded in the treatment of azadirachtin 1500 ppm it was followed by neem seed kernel water extract 5 per cent and neem oil 0.5 per cent. Minimum larval population of *M. vitrata* was recorded in the treatment T1 (Azadirachtin 1500 ppm) and it was at par with neem seed kernel water extract 5 per cent.

♦ **Screening of pigeonpea genotypes against insect pests and diseases under natural conditions**

Significantly lower population of *H. armigera* was recorded in VPG 39 and it was at par with AGT 2, VPG 522 and VPG 41. Lower population of *L. boeticus* larvae was recorded in VPG 21. Overall, the damage due to pod borer at green pod stage ranged from 2.92 to 7.97 per cent in different genotypes of pigeonpea. Grain damage due to pod fly at green stage vary from 10.51 to 33.18 per cent. Lowest grain damage was recorded in VPG-297. The range of Sterility Mosaic Disease incidence was found vary from 0.00 to 3.66 per cent.

4.2.2.3 Chickpea

Crop Improvement

- ♦ At ARS, Derol, in LSVT, none of the genotypes recorded significantly higher yield than the best check GG-5.
- ♦ At ARS, Derol, in SSVT, 13 genotypes with three check tested among all the genotypes none of the genotypes recorded significantly higher yield than the best check GG-1.
- ♦ At ARS, Arnej, in chickpea, total 143 entries including checks were tested in different seven trials including co-ordinated,

state and station trial. Among them, 33 genotypes /entries of Arnej centre were found promising and will be promoted in respective trial.

- ♦ At Hill Millet Research Station, Dahod, 6 experiments of chickpea were conducted under state trial. Total 90 genotypes were evaluated. Out of these, 6 genotypes viz., GJG 1506, GJG 1316, GJG 1721, GJG 1712, GJG 1812 and GJG 1818 were found promising.
- ♦ A Station Trial (Rainfed) of Chickpea conducted at PRS, Vadodara consisted twenty-six promising rainfed chickpea genotypes along with three check varieties viz., GG2 and GJG6. The genotype ACP 1082 genotype was shown 10.6 per cent numerically yield superiority over best check GJG 6 due to bold seed size.
- ♦ Large Scale Varietal Trial (Irrigated) of Chickpea conducted at PRS, Vadodara consisted thirteen promising irrigated chickpea genotypes along with three check varieties viz., KAK-2, JGK-1, GG 1 and GG 5. None of the genotype was shown yield superiority over best check GG 5.

Crop Protection

ARS Derol

♦ **Determination of economic threshold level for gram pod borer in chickpea**

The per cent pod damage significantly increased with rise larval population per plant during the year. The per cent pod damage in control plot was recorded 11.96 per cent whereas lowest pod damage 2.00 per cent was recorded in treatment T₁ (0.25 larva per plant). Significantly higher grain yield was recorded in treatment T₁ (0.25 larva per plant).

- ◆ **Surveillance programme of *Helicoverpa armigera* in chickpea**

During *rabi* 2018-19, *H. armigera* first appeared in chickpea crop in the 48th standard week. Its population was very low from 47 to 52nd standard week. The maximum larval population (17 larvae/20 plants) was recorded in the 3rd standard week. The higher larval population showed from 1st to 6th standard week.

4.2.2.4 Soybean

Crop Improvement

TRTC, Devgadh Baria

Kharif 2019

- ◆ 152 germplasm lines were evaluated and maintained.
- ◆ Under LSVT (early group), total ten varieties including checks were evaluated. Significantly maximum seed yield was recorded in the variety NRC-37 in middle maturity group, while variety JS 20-34 was recorded in early maturity group.
- ◆ Under PET, total fourteen promising entries along with one check variety NRC-37 were tested. Genotype DBSGP-91 and DBSGP-63 were found promising.
- ◆ Under IVT, total forty-five genotype were evaluated for their seed yield performance. The significantly maximum seed yield was recorded under coded variety IVT-19-28.
- ◆ Under IVT (early), total thirty-one genotype were evaluated for their seed yield performance. The significantly maximum seed yield was recorded under coded variety IVT-E-19-5.
- ◆ Under AVT-I, total thirteen genotypes along with five checks were evaluated for their seed

yield performance. The experiment results showed that the genotype Himso 1689 found promising.

- ◆ Under AVT-II, total seven genotype were evaluated for their seed yield performance. The experiment results showed that the none of the genotype was found promising.

Crop Production

TRTC, Devgadh Baria

- ◆ The results of an experiment on 'Evaluation of partial factor productivity for soybean' clearly highlighted the fact that among all the treatments, T₁ [Full Package- (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge furrow)] showed best in growth parameters (pods per plant) and also yield and yield parameters (seed index, seed yield and straw index) highest soybean yield and highest net returns and B: C ratio.
- ◆ The experiment on system intensification for soybean productivity augmentation under Ridge Furrow Planting. The results of the experiment clearly indicated that the the treatment V₁S₂ [Variety JS 20-34 with spacing of 10 cm between plants] recorded highest soybean yield and net return.

4.2.2.5 Clusterbean

Crop Improvement

ARS, Derol

- ◆ In SSVT/LSVT of guar, total 18 genotypes including two checks were evaluated. Among all the entries total 2 entries i.e DRLGG 13-7 and GG 1612 recorded significantly higher yield as compare to best check GG 1.
- ◆ In summer 2019 ZVT (Branching) of cluster bean with total 13 genotypes including two checks were evaluated. None of the entry

were found higher yield as compare to best check GG 2.

- ◆ In summer 2019 ZVT (Single stem) of cluster bean with total 10 genotypes including two checks were evaluated. DRLGG 13-28, DRLGG 13-39 and DRLGG 16-19 were found promising.
- ◆ In *kharif* 2019 ZVT (Branching) of cluster bean with total 13 genotypes including two checks were evaluated. BG 1 (1694 kg/ha) entries higher yield as compare to other entries.
- ◆ In *kharif* 2019 ZVT (Single stem) of cluster bean with total 10 genotypes including two checks were evaluated. DRLGG 13-28 and DRLGG 13-39 was found promising.

HMRS, Dahod

- ◆ At Hill Millet Research Centre, Dahod, three experiment of clusterbean was conducted during summer season under state trial. Total 14 genotypes were evaluated. Out of these, 6 genotypes viz., RCG 1002, RCG 1033, DRLGG 16-7, DRLGG 13-28, DRLGG 13-23 and DRLGG 16-19 were found promising.

ARS, Sansoli

Summer 2019

- ◆ In summer cluster bean, the experiment was conducted to evolve 6 genotypes of branching type cluster bean against 2 checks. None of the entry was found promising.
- ◆ In summer cluster bean (single stem type), eight entries against two checks were evaluated for their seed yield. The entries viz., DRLGG 13-28, DRLGG 13-2, DRLGG 16-24, GRLGG 13-14 and DRLGG 13-23 was found promising.

Kharif 2019

- ◆ In *kharif* cluster bean (branching type), six entries against two checks were evaluated for their seed yield performance. None of the entry was found promising.
- ◆ In *kharif* cluster bean, 8 genotypes of single stem type cluster bean against 2 checks was tested. The entries DRLGG 13-39 and DRLGG 16-7 was found promising

4.2.2.6 Blackgram

Crop Improvement

PRS, Vadodara

Summer 2019

- ◆ In ZVT trial, on overall basis, genotype, JAUG-2, DBUGP-6-1, VUG-113 was shown 20.9, 5.17 and 4.6 per cent significantly higher yield than GU-1.

Kharif 2019

- ◆ In SSVT + LSVT trial, on average performance of the genotypes viz., SKNU 1806, JAUG-2, SKNU 1801, NUK-17-01, and SKNU 1810 were exhibited > 25% per cent yield advantage over best check GU-1
- ◆ In ZVT trial, on overall basis, genotype JAUG-2, PANT U 31, MASH 338, DBUGP-16-01 and DBUGP-6-1 were found promising.

ARS, Derol

- ◆ In ZVT (Summer 2019) total 9 genotypes were evaluated. Among all genotypes DBUGP 6-1 and JAUG 2 was found promising.
- ◆ In ZVT (*kharif* 2019) total 8 genotypes were evaluated, among all genotypes JAUG 2 was found promising.

HMS Dahod

- ◆ During summer 2019, one experiment on blackgram was conducted under state

trial, wherein, total 07 genotypes were tested, of which, 1 genotype viz., JAUG 2 was found promising.

- ◆ During *kharif* 2019, two experiments on blackgram was conducted under state trial, wherein, total 20 genotypes were tested, of which, 8 genotypes viz., SLKU 312, SLKU 310, SLKU 313, SLKU 302, SLKU 306, JAUG 2, DBUGP 6-1 and DBUGP 16-1 were found promising.

Devgadh Baria

- ◆ Under Zonal Varietal Trial, total eight genotype including two checks T-9 and GU-1 were evaluated for their seed yield performance. The genotype PANT U 31 at par with JAUG-2 and YVM resistance genotype during the *kharif*-2019.
- ◆ Under SSVT + LSVT trial, total fourteen genotype including two checks were evaluated. The genotypes SLKU-304 and SLKU-305 recorded maximum seed yield during the *kharif*-2019.

Crop Protection

PRS, Vadodara

Summer-2019

- ◆ Among the twenty genotypes /variety, VUG-33 and VUG-31 were found considerably less susceptible to the insect pests of urdbean. VUG-45 found as susceptible
- ◆ Among the twenty tested genotypes /varieties, the range of YMD was found 1.31% (VUG-31) to 11.05% (VUG-45) and it was found significant.

4.2.3 OILSEEDS

4.2.3.1 Castor

Crop Improvement

RRS, Anand

Kharif 2019-20

- ◆ Total 235 lines were maintained and used for breeding work.

- ◆ Total 63 new crosses were made using three pistillate lines i. e. SKP 84, Geeta and ANDCP 1601 with different inbred lines for new hybrid.
- ◆ Eight experiments including coordinated, state and station trials on castor were conducted.
- ◆ The IVHT-I trial was conducted with 15 hybrids/varieties including three check hybrids/ variety viz., DCS-107, DCH-177 and GCH-8 for their yield performance in irrigated condition. None of the hybrids recorded significantly higher seed yield than the best check GCH-8.
- ◆ Total 14 hybrids were tested along with three checks in IVHT-II trial. The yield differences showed significant difference and hybrid YRCH 16001 exhibited significantly superior than best check GCH-8.
- ◆ In LSHT trial, five hybrids were evaluated against three check hybrids viz., GCH 7, GCH 8 and GCH 9. None of the hybrids showed significantly higher seed yield than the best check GCH-8.
- ◆ In state PHT –I trial, total 20 hybrids were tested against three check hybrids viz., GCH 7, GCH 8 and GCH 9 under irrigated condition. The hybrids JHB 1074 and SHB 1047 were found significantly superior than best check GCH 9. In State PHT II trial, total 18 hybrids were tested against three check hybrids. None of the hybrids were found significantly superior than best check GCH 9.
- ◆ The ZT trial was conducted with inclusion of twelve hybrids and three checks. Hybrid ANDCH 1601 recorded significantly higher yield than the check GCH-9.
- ◆ In Preliminary Hybrid Trial (PHT-1) conducted with inclusion of 35 hybrids and

one check GCH 7. Six hybrids viz., ANDCH 1714, ANDCH 1608, ANDCH 1642, ANDCH 1703, ANDCH 1709 and ANDCH 1702 recorded significantly higher yield than the best check GCH-7. In PHT- II trial 30 hybrids tested against GCH 7. Three hybrids viz., ANDCH 1736, ANDCH 1737 and ANDCH 1735 recorded significantly higher yield than the best check GCH-7.

- ◆ At Derol station under irrigated condition, in LSHT trial, total ten genotype including checks were evaluated. Among the hybrids evaluated, LSHT 1901 found promising.
- ◆ At Derol in ZHT, total 17 hybrids including four checks were evaluated for yield performance. Among all the hybrids evaluated four hybrids SCH 123, ANDCH 1735, ACH 127 and ANDCH 1507 were found promising.

ARS, Sansoli

- ◆ Total 15 new crosses were made using three pistillate lines.
- ◆ In castor, total 68 entries were tested in different state/PHT trials.
- ◆ Sixty germplasm lines of castor were evaluated and maintained.
- ◆ Five stable castor inbreds identified were grown for IPS. Four stable pistillate lines were grown for IPS.

4.2.3.2 Mustard

Crop Improvement

RRS, Anand

Rabi-2019-20

- ◆ In IVT-IR, total twenty-seven genotypes including three checks i.e., GDM-4, Bio 902 and Kranti were evaluated under irrigated condition. None of the entry exhibited

significantly superiority in yield than best check GDM-4.

- ◆ In AVT-IR, total eight genotypes including three checks i.e., GM-2, Bio 902 and Kranti were evaluated under irrigated condition. Among all the entries, only one entry i.e., NPJ 203 gave significantly higher seed yield than best check variety *Kranti*.
- ◆ In LSVT- Medium, total twelve genotypes including two checks i.e., GDM-4 and Kranti were evaluated under irrigated condition. None of the entry exhibited significantly superiority in yield than best check Kranti. However, the genotype SKM-1611 and SKM-1517 showed numerically higher yield than the best check variety *Kranti*.
- ◆ The trial SSVT-Early was conducted with total twelve genotypes tested against two checks. The genotypes ANDM 14-09 (2598 kg/ha) and SKM-1731 gave significantly higher seed yield than best check variety GM-1.
- ◆ In SSVT-Medium, total 14 genotypes including two checks viz., GDM-4 and Kranti were evaluated under irrigation condition. None of the genotypes were found promising.
- ◆ Total ten genotypes including three checks i.e., GM-3, GDM-4 and Kranti were evaluated in PET under irrigated condition. Among all the entries, only one genotype ANDM-18-3 recorded significantly higher yield than best check variety *Kranti*.
- ◆ At Derol in LSVT (Early) on Mustard (Irrigated) ten genotypes were evaluated for yield performance. The grain yield difference was found significant and RSK 1916 found superior.

- ◆ At Derol station under irrigated condition, total seven genotypes were evaluated against three check varieties under the Large Scale Varietal Trial (Irrigated). The grain yield difference was found significant and RSK 1908 found superior.

4.2.3.3 Groundnut

Crop Improvement

At RRS, Anand

Summer-2019

- ◆ Under initial varietal Trial-I, total 18 coded entries including one local check GG-34 were evaluated for their pod yield performance. Among all the tested entries, none of the entry exhibited superiority in yield than best check GG-34.
- ◆ In IVT-II total 17 coded entries were evaluated against local check GJG-31. Among the tested entries, only one entry INS-I-2017- found promising.
- ◆ Total fourteen genotypes were evaluated against four check varieties under LSVT-SB. AG-2015-10, AG-2013-14, J-101, JB-1432, JB-1442 and J-97 were found significant superiority in yield than best check TG-26.
- ◆ In SSVT-SB total 14 genotypes including three checks were evaluated. AG-2015-07, JB-1474, JB-1475, JB-1464 and JB-1461 were found significant superiority in yield than best check GG-34.
- ◆ In ZVT include 10 entries with three checks. Among the tested entries none of the entry found promising.
- ◆ Total 8 genotypes including two checks were evaluated under PET. None of the entry found promising.

Kharif 2019

- ◆ The trial LSVT was conducted with total eight genotypes tested against four checks. Four entries were found significant superiority in yield than best check TG-37A.
- ◆ Total 24 entries including three checks viz., GJG-32, GJG-9 and TG-37A were evaluated for their pod yield performance under SSVT trial. Four entries were found significant superiority in yield than best check TG-37A.
- ◆ Total 21 genotypes including five checks were evaluated under PET. In Large seeded, none of the entry found promising.
- ◆ At Derol under LSVT-SB trial, total 12 genotypes were evaluated, among the genotype J – 96 recorded the highest pod yield compared to best check GG 7.
- ◆ At Derol under SSVT-SB trial, total 24 genotypes were tested. Among the genotype TG –88 recorded the highest pod yield compared to best check GJG 32.

4.2.4 FIBRE CROPS

4.2.4.1 Cotton

Crop Improvement

RRS, Anand

Kharif 2019

- ◆ Nation PHT trial is comprised of 6 hybrids including checks. The trial is comprised of 6 coded hybrids including checks. Among the six coded test hybrids, hybrid 335 had recorded the highest seed cotton yield followed by entry no. 333 and 331. The lint yield was ranged from 412 to 689 kg/ha.
- ◆ In CHT of inter specific (*G. hirsutum* x *G. barbadense*) hybrids under irrigated trial, total five hybrids were evaluated. The comparisons

of data revealed that the coded hybrid 9162 had yielded the highest seed cotton yield and lint yield.

- ◆ Total eight coded *G. barbadense* genotypes were evaluated in PVT. The results revealed that the genotype 9157 yielded the highest seed cotton yield and lint yield followed by genotypes 9154 for seed cotton yield and 9158 for lint yield.

ARS, Viramgam

During Kharif 2019-20, total 23 trials of *G. herbaceum* were conducted including national, state and station trials for yield, yield contributing characters and fibre quality evaluation under rainfed situation of Gujarat.

Total 298 entries were evaluated among different trials.

Total 1092 progenies were sown of various generations (F1-F6) and promising individual plants were selected from 1066 progenies of segregating materials.

Centre has maintained and characterizing 367 germplasm lines of cotton. Two agronomical trials viz., limited irrigation and paired row planting were conducted.

Plant Protection

Studies on population dynamics of key pests of cotton, surveillance of lepidopterous pests through sex pheromone, survey of insect pests in *Bt* as well as non-*Bt* cotton and screening of *deshi* cotton varieties for their resistance to key pests under rainfed conditions were carried out at Viramgam.

Similarly, survey of diseases of *deshi* as well as *Bt* cotton and screening of *deshi* cotton varieties for resistance to various diseases under rainfed conditions were also carried out at Viramgam.

4.2.5 CASH CROPS

4.2.5.1 Bidi Tobacco

Kharif-2017

Crop Improvement

- ◆ In IVT, ABD 190 showed significant superiority for cured leaf yield over better check.
- ◆ In AHT, All the hybrids showed significant superiority for cured leaf yield over MRGTH 1.
- ◆ In AVT-I, none of the entry showed significant superiority for cured leaf yield over check GT 7.
- ◆ In AVT-II, none of the entry showed significant superiority for cured leaf yield over check GT 7.
- ◆ In breeding trial for normal planting I, none of the entries showed significant superiority for cured leaf yield over better check GT 7.
- ◆ In normal planting II, none of the entries showed significant superiority for cured leaf yield over better check GT 7.
- ◆ In variety assessment trial, GABT 11 gave significant superiority for yield than rest of the varieties and hybrid.
- ◆ In screening of advanced breeding materials for root knot in light soils of Gujarat, the line ABD 200, ABD 202 and ABD 203 showed significant superiority for yield over resistant check ABT 10. None of the entries was free from tobacco mosaic (except ABD 200 & ABD 201) and root knot (except ABT 10) diseases.
- ◆ Breeding for resistance to drought trial, none of the entry showed significant superiority for cured leaf yield over better check GT 7.

- ◆ In evaluation of bidi tobacco hybrids, BTH 362 recorded numerical maximum cured leaf yield.

Rustica Tobacco

- ◆ In initial varietal trial, none of the entries showed significant superiority over better check GCT 2.
- ◆ In Station Varietal Trial-I, none of the entries showed significant superiority over better check GCT 3.
- ◆ In Station Varietal Trial-II, Line AR 121 showed significant superiority over better check GCT 3.
- ◆ In Station Varietal Trial-II, Line AR 125 showed significant superiority for cured leaf yield over better check GCT 2.
- ◆ In breeding trial for normal planting I, the entries AR 158 showed numerical higher yield over checks.

Crop Production

- ◆ The results on “Effect of long term manuring on yield and quality of bidi tobacco and soil productivity” revealed that yield and yield attributing characters of tobacco variety GABTH 2 was not changed significantly due to different treatments of bulky manures as well as manurial combinations.
- ◆ An experiment carried out on “Effect of nitrogen and topping levels on yield and quality of bidi tobacco hybrid varieties” indicated that variety GABTH 2 recorded significantly the highest tobacco cured leaf yield, leaf size and dry weight per unit leaf area compared to variety MRGTH 1. In view of nitrogen levels, only leaf length and width were changed due to nitrogen application. Whereas, different topping levels altered the

tobacco yield and yield attributing characters of bidi tobacco hybrid varieties.

- ◆ Studies on “Feasibility of vegetable intercropping in *rustica* tobacco (*Nicotiana rustica* L.) under middle Gujarat conditions” revealed that intercropping of tobacco with fenugreek established its superiority over treatment of tobacco alone, tobacco + cabbage and tobacco + spinach intercropping by producing the maximum tobacco equivalent yield. Even though it was statistically at par with treatment tobacco + onion, tobacco + garlic, tobacco + radish and tobacco + coriander intercropping systems. Maximum net realization was recorded under the tobacco + fenugreek intercropping system.
- ◆ An experiment planned on “Effect of integrated nutrient management on yield, chemical composition and soil status in *rustica* tobacco under middle Gujarat condition” indicated that significantly the highest tobacco yield was noticed in variety DCT 4. While tobacco morphological characters were not changed significantly due to different *rustica* varieties and INM practices except, plant height.
- ◆ Research work carried out on “Effect of integrated nutrient management on yield, chemical composition and soil status in bidi tobacco under middle Gujarat condition” indicated that tobacco variety GT 7 gave significantly the highest tobacco cured leaf yield, leaf length and plant height than variety A 119. Different manuring treatments with 75 % RDN through urea had significant effect on tobacco wherein, treatments F₅ (25% PM + 75% Urea) recorded significantly the highest tobacco cured leaf yield.
- ◆ Experimental results on “Effect of transplanting date on yield and insect-pest incidence in calcutti tobacco (*Nicotina*

rustica L.) Varieties” indicated that variety GC 1 recorded significantly the highest cured leaf yield than GCT 3. Significantly the highest values of leaf width and plant height were noticed in varieties GC 1 and GCT 3, respectively. While, tobacco transplanted in 47th Standard week (D₃) gave significantly higher cured leaf yield compared to 43rd (D₁) and 49th (D₄) Standard week of transplanting.

Crop Protection

Entomological Research

- ◆ Establishment of entomophage bio-diversity park revealed that activity of various natural enemies like spider, coccinellids, *Nesidiocoris tenuis*, *Geocoris ochropeterus* and *Rhinocoris* sp, were found on different crops raised under entomophage park. The population of spiders were present in all the crops raised under entomophage bio-diversity park. Out of various bio agents’ maximum activity of *N. tenuis* was found in tobacco.
- ◆ Studies on population dynamics of the important insect pest revealed that rove beetle and leaf eating caterpillar were found under nursery conditions. The population of whiteflies continued throughout the crop season in field. Under field conditions whitefly, *Spodoptera litura* and *Helicoverpa armigera* established correlation with weather parameters.
- ◆ Pooled results on evaluation of spraying schedule of insecticides for the management of leaf eating caterpillar, *Spodoptera litura* (F) in bidi tobacco nursery revealed that schedule spray of NSKE 5% at 30 DAS coupled with synthetic insecticide either Chlorpyrifos 50% + Cypermethrin 5% EC or Emamectin 5 SG at 45 DAS proved to be the best sequence in managing leaf eating caterpillar with maximum transplantable seedlings.
- ◆ Screening of different *rustica* tobacco lines, against leaf eating caterpillar showed that the population of leaf eating caterpillar was not sufficiently build up and for the reason nursery remained free from infestation of *Spodoptera litura* (F).
- ◆ Screening of different 691 bidi tobacco cultures / genotypes raised under nursery conditions was carried out. The results revealed that none of the cultures / genotypes was found free from infestation due to *S. litura* under natural infestation.
- ◆ Effect of transplanting date on yield and insect-pest incidence in calcutti tobacco (*Nicotiana rustica* L.) varieties revealed that he variety GC 1 recorded significantly the highest cured leaf yield than GCT 3. Minimum incidence of leaf curl and mosaic in both the varieties of *rustica* tobacco were registered when crop transplanted in 47th Standard week (19-25th November).

Plant Pathology and Nematology

- ◆ In a trial on monitoring resistance development in *Pythium aphanidermatum* to metalaxyl MZ in nursery conditions. 23 per cent damping-off disease incidence in comparison with control was recorded in the treatment of metalaxyl MZ.
- ◆ In a trial on search for resistance to damping-off and root-knot in tobacco, results revealed that out of 14 genotypes/lines, all the lines showed moderately susceptible reaction to damping-off disease in the nursery conditions. Out of 20, the lines/varieties none was resistant except ABT 10 (Check) to root-knot disease in pots.
- ◆ In a trial on monitoring resistance development in *Pythium aphanidermatum* to azoxystrobin in nursery conditions. 26 and

19 per cent damping-off disease incidence in comparison with control was recorded in the treatment of azoxystrobin and azoxystrobin + difenoconazole, respectively.

- ◆ In a trial on screening of advanced breeding materials /introductions for leaf curl and *Cercospora* leaf spot diseases under field conditions, out of one hundred one bidi tobacco entries, twenty-one entries were found free from leaf curl infection during 2018-19. Among the *rustica* tobacco entries, sixteen entries were found free from leaf curl. During the year leaf spot disease was noticed negligible or not noticed.
- ◆ In a trial on breeding for resistance to tobacco mosaic in bidi tobacco, 96 (including twenty-four mosaic resistant cultures) entries grown in different generations were artificially inoculated with tobacco mosaic virus and evaluated for resistance to mosaic. Out of these, 66 entries including segregation materials showed resistance to the disease and these materials are maintained by plant breeding section for further breeding work.
- ◆ Efficacy of different oils for the management of damping-off disease caused by *Pythium aphanidermatum* in bidi tobacco nursery. Application of oil treatments had no any effect on seed germination, rove beetle and fresh weight. Neem oil and castor oil as such or nano particulate significantly reduced the damping-off disease compared to control while neem oil as such or nano particulate increased the transplants compared to control.

4.2.6 FORAGE CROPS

Crop Improvement

Rabi-2019-20

4.2.6.1 Oat (AICRP Trials)

- ◆ Under IVT (single cut),total fourteen entries

were tested, the entry IVTOSC-2 gave significantly higher GF yield, DM yield, per day GF and per day DM.

- ◆ Under First Advance Varietal Trial (Single cut)-1, thirteen entries were evaluated. The entry AVTOSC3 were found significantly superior for GF, DM and CP yield.
- ◆ Under Second Advance Varietal Trial (Single cut)-2, eight entries were evaluated for their yield performance. The entry AVTO2SC-2 stood first for GF yield, DM yield, per day GF yield and per day DM yield. The entry AVTO2SC-3 ranked on top for tiller per m. row
- ◆ Under Second Advance Varietal Trial (Single cut) (Seed). In this trial 08 entries evaluated. The entry AVTO2SCS-5 ranked on top for seed yield and per day seed yield. Whereas, the entry AVTO2SCS-8 stood first for straw yield, per day straw yield. No. of tillers/m. row found the highest in entry AVTO2SCS-4.
- ◆ Under Initial Varietal Trial (Multicut), total nine entries were evaluated in this trial. The entry IVTOMC-7 ranked first for GF and DM yield, CP yield, per day GF yield and per day DM yield. Whereas, the entry IVTOMC-2 gave the highest and tillers/m. row.
- ◆ In Initial Varietal Trial (Dual purpose), total eleven entries were evaluated in this trial. The entry IVTOD-7 was found on top for GF yield, DM yield, per day productivity of GF and DM. Whereas, the ebtry IVTOD-6ranked first for CP yield. The plant height recorded higher under IVTOD-9. The entry IVTOD-8 ranked on top for seed yield and straw yield.
- ◆ Under First Advance Varietal Trial on Forage Oat (Multi cut)-1, total five entries were evaluated in this trial. The entry AVTO1MC-1 stood on top for yield data viz. GF yield, DM

yield, CP yield, per day GF yield and per day DM yield. The entry AVTO1MC-2 gave the highest CP %, leaf stem ratio and tiller/m. row length.

- ◆ Under Second Advance Varietal Trial on Forage Oat (Multi cut). The entry AVTO2MC-3 stood on top for yield data viz. GF yield, DM yield, CP yield, per day GF yield and per day DM yield. The entry AVTO2MC-2 gave the highest CP % and tiller/m. row length. In case of leaf stem ratio, the entry AVTO2MC-3 was the best. The entry AVTO2MC-4 found the tallest.
- ◆ Under First Advance Varietal Trial on Forage Oat (Dual), total nine entries were evaluated in this trial. The entry AVTO1D-1 ranked first for yield data viz., GF, DM, CP, per day GF and per day DM. The entry AVTO1D-4 and AVTO1D-9 stood on top for plant height and leaf stem ratio, respectively. The entry AVTO1D-6 and AVTO1D-9 gave higher seed yield and straw yield, respectively.
- ◆ Under Second Advance Varietal Trial on Forage Oat (Dual), total seven entries were evaluated in this trial. The entry AVTO2D-6 ranked first for yield data viz., GF, DM, CP, per day GF and per day DM. The entry AVTO2D-7 and AVTO2D-4 stood on top for plant height and leaf stem ratio, respectively. The entry AVTO2D-1 and AVTO2D-4 gave higher seed yield and straw yield, respectively.

4.2.6.2 Lucerne

AICRP Trials

- ◆ Under Initial Varietal Trial in Lucerne Annual, total eight entries including two national checks and one local check were evaluated. The local check AL 3 ranked first for GFY, DMY and CPY. The check variety AL 3 also ranked top for per day GF and DM yield.

STATE Trials

- ◆ In LSVT trial, twelve entries were evaluated along with three checks. None of the entries were found promising.
- ◆ In SSVT trial, twelve entries were evaluated along with three checks. None of the entries were found promising.
- ◆ In PYT trial, nine entries were evaluated along with three checks. None of the entry was found promising.

Kharif-2019

4.2.6.3 Forage Maize

AICRP Trials

- ◆ In Initial Varietal Trial, total 19 coded entries were tested. The entry IVTM-14 was ranked first for green forage yield, dry matter yield and crude protein yield. The said entry also recorded the highest per day productivity for green forage and dry matter.

STATE Trials

- ◆ In Small Scale Varietal Trial, total ten entries were tested. The entry AFM-22 recorded the highest yield viz. GFY, DMY and CPY with the tune of 92.99, 144.31 and 141.73% increment over the check variety African tall, respectively.
- ◆ In Preliminary Yield Trial, total five entries including one check variety African Tall were tested. The composite entry AFMC-2 found promising.

4.2.6.4 Forage Pearl millet

AICRP Trials (Summer-2019)

- ◆ In IVT, total five entries were evaluated along with 3 checks viz., Giant Bajra, Moti Bajra and BAIF Bajra-1. Total three cuts were harvested. The hybrid entry 16ADV0055

ranked first for green forage yield, dry matter yield and crude protein yield. For forage production potential, both GFY and DMY, entry 16ADV0055 ranked first.

- ◆ In AVT trial, total total six entries were evaluated including 3 checks viz., Raj Bajra-1, Giant Bajra and Moti Bajra. Total three cuts were taken. The hybrid entry HTBH-4902 ranked first for GF yield, which gave significantly higher GF yield than all other entries. The hybrid entry HTBH-4902 ranked first for both DMY and CPY. For forage per day productivity, both GFY and DMY, hybrid entry HTBH-4902 stood first.

AICRP Trials(Kharif-2019)

- ◆ In IVT, total eleven entries including three checks, were evaluated in this trial. The entry IVTPM-7 produced significantly higher green forage yield than remaining entries being at par with entry IVTPM-3. The said entry also gave the significantly higher dry matter yield except IVTPM-3; it also got ranked one for crude protein yield and per day production of dry matter.

STATE Trials

- ◆ In SSVT, the entry AFB-53 exhibited 17.09%, 29.03% and 36.39% superiority over the best check variety GAFB-4 (GFY: 658.3 q/ha, DMY: 127.8 q/ha and CPY: 8.41 q/ha) for the green forage yield, dry fodder yield and crude protein yield, respectively. The same entry, AFB-53 ranked on top in per day productivity for dry fodder yield.

4.2.6.5 Forage Sorghum

AICRP Trials

- ◆ In IAVHT (Multicut), eighteen entries were tested. The entry 5008, 5006, 5068, 5109 and 5102 were found promising.

- ◆ In Advance Varietal Hybrid Trial (Single cut), sixteen entries were tested. The entries, 6003, 6057 and 6060 were found promising.

STATE Trials

- ◆ In Large Scale Varietal Trial (SC), twelve entries were tested. Entry SRF-64 produced significantly higher GF and DM yield.
- ◆ Under Small Scale Varietal Trial (SC), twelve entries were tested. The entry DSF-192 was yielded the significantly higher GFY. None of the entry gave significantly higher DM and CP yield than the best national check variety CSV-21F.
- ◆ In PYT, fourteen entries including four checks were evaluated for single cut. The entry AFS-87 stood at the top for GFY with yield and exhibited marginal higher yield GFY than the best check variety GAFS-12. The entry AFS-86 ranked first for both DMY and CPY. This entry also recorded the highest per day productivity for dry fodder.

4.2.6.6 Forage Cowpea

AICRP Trials

- ◆ In Initial Varietal Trial-1, nine entries were tested. The entry IVTC-3 and IVTC-5 were found promising.
- ◆ In Advance Varietal Trial, six entries were tested. The entry AVTC-1-3, AVTC-1-4 and AVTC-1-6 were found promising.

4.2.6.7 Cenchrus ciliaris

AICRP Trials (Kharif-2019)

- ◆ The trial was established in 2019 with ten entries. First year was considered as establishment year.

4.2.6.8 *Cenchrus setigerus*

AICRP Trials

- ◆ The trial was established in 2019 with ten entries. First year was considered as establishment year.

4.2.6.9 *Pennisetum hybrid*

AICRP Trials

- ◆ The trial was established in 2019 with ten entries. First year was considered as establishment year.

4.2.6.10 *Dichanthium*

- ◆ In PYT, total eight entries keeping the three varieties as checks. None of the entry found superior than the best check variety VTD-1 for yield. However, entries VTD-3 and MGS-5 found promising for green forage yield and dry fodder yield. The entry MGS-4 stood first for synthetization of maximum crude protein content.

Crop Production

AICRP trial

Following experiments were taken as under

- ◆ Biofortification of annual cereal fodder crops for enhancing zinc and iron content (Fodder Sorghum: GAFS 12).
- ◆ Biofortification of annual cereal fodder crops for enhancing zinc and iron content (Fodder Maize: African tall).
- ◆ Response to nitrogen application by different varieties of marvel grass.
- ◆ Enhancement of seed setting in lucerne through foliar spray.
- ◆ Nutrient management for productivity enhancement in dual purpose oat.

- ◆ Effect of N levels on forage yield of promising entries of Dual Purposed oat Forage Oat (Dual).
- ◆ Effect of N levels on forage yield of promising entries of Multi cut oat.
- ◆ Effect of N levels on forage yield of promising entries of single cut oat.
- ◆ Effect of different potassic fertilizer sources on green fodder production and quality of fodder maize.

STATE trials

- ◆ Performance of dual purpose barley under different nitrogen levels and cutting management.

4.3 HORTICULTURAL CROPS

4.3.1 VEGETABLES

Kharif – Rabi : 2019-20

4.3.1.1 Brinjal

Crop Improvement

- ◆ In brinjal crop, 11 experiments were conducted (six trials of state and five trials of AICRP) during *kharif* and *rabi* seasons. So far as evaluation of germplasm is concerned, 201 germplasms were maintained and 36 new germplasms were collected.
- ◆ For heterosis breeding, 02 fresh crosses were made as well as 11 crosses were made for ongoing programme. Total 237 germplasms were evaluated and maintained. Moreover, 386 segregating progenies were evaluated and individual plant selection was made for the next year.

4.3.1.2 Chilli

Crop Improvement

- ◆ Seven trials (Four trials of state and three

trials of AICRP) were conducted during *kharif* and *rabi* seasons. So far as evaluation of germplasm is concerned, 75 germplasms were maintained and 146 new germplasms were collected.

- ◆ For heterosis breeding, 03 fresh crosses were made as well as 05 crosses were made for ongoing programme. Total 221 germplasm lines were maintained. Threeback crosses were made for conversion of CMS line. Total 1046 segregating progenies were evaluated and individual plant selection was made for the next year, out of which 1 CMS line was maintained.

4.3.1.3 Tomato

Crop Improvement

- ◆ In tomato, 09 experiments were conducted, which include five state trials and four AICRP trials.
- ◆ Total 59 germplasm lines were maintained and evaluated. 11 fresh crosses were made as well as 08 crosses were made for ongoing programme. In all 570 progenies of segregating materials were evaluated and individual plant selection was made for the next year.

4.3.1.4 Potato

- ◆ Two state trial was conducted during *rabi* season.
- ◆ Total 68 germplasm lines were maintained and evaluated including 03 new collected germplasm.

4.3.1.5 Onion

- ◆ One state trial was conducted during *rabi* season.
- ◆ Total 23 germplasm lines were maintained and evaluated including 02 new collected germplasm.

Summer and Kharif-2019

4.3.1.6 Bottle gourd :

- ◆ Total 423 germplasm lines were maintained and evaluated including three varieties.

4.3.1.7 Muskmelon :

- ◆ Total 106 germplasm lines were maintained and evaluated including one variety.

4.3.1.8 Ridge gourd :

- ◆ In Ridge gourd, 03 experiments were conducted, which include one state trial and two AICRP trial.
- ◆ Total 223 germplasm lines were maintained and evaluated including 01 variety.

4.3.1.9 Sponge gourd :

- ◆ Six trials were conducted including two state trials and four AICRP trials during *kharif* and summer season.
- ◆ Total 137 germplasm lines were maintained and evaluated.

4.3.1.10 Cucumber :

- ◆ Three trials were conducted including two state trials and one AICRP trial during summer season.
- ◆ Total 117 germplasm lines were maintained and evaluated including 15 new collected germplasm.

4.3.1.11 Pumpkin

- ◆ Total 113 germplasm lines were maintained and evaluated including 10 new collected germplasm.

4.3.1.12 Okra :

- ◆ Nine trials were conducted including seven state trials and two AICRP trials during *kharif* and summer season.

- ◆ Total 405 germplasm lines were maintained and evaluated including 24 new collected germplasm. Twenty-nine crosses were made for hybrid evaluation including 18 new crosses. Total 716 segregating progenies were evaluated and individual plant selection was made for the next year.

4.3.1.13 Pulses :

- ◆ Two state trials of clusterbean were conducted during *kharif* season.
- ◆ Two state trials of cowpea were conducted during *kharif* season.
- ◆ Three state trials of indianbean were conducted during *rabi* season
- ◆ Total 79 germplasm lines of cowpea were maintained including 10 new germplasm during *kharif* season, where as 47 and 36 germplasm lines of Indian bean and valor respectively were maintained and evaluated during *rabi* 2019-20.

4.3.2 MEDICINAL AND AROMATIC PLANTS

Crop Improvement

4.3.2.1 Isabgol

- ◆ In isabgol 150 germplasm were maintained for crop improvement programme.

Following experiments in isabgol were conducted during the year 2017-18

State trial

- ◆ Evaluation of early maturing isabgol genotypes

4.3.2.2 Ashwagandha

- ◆ In *Ashwagandha* 144 germplasm were maintained for crop improvement programme.

4.3.2.3 Alovera

Crossing programme in *Aloe vera*

In *Aloe vera*, different 59 accessions were maintained.

4.3.2.4 Safed musali

- ◆ For evolution of promising lines of Safed Musli, 26 accessions were maintained.

4.3.2.5 Turmeric

- ◆ In turmeric, different 40 accessions were maintained.
- ◆ A state trial on Evaluation of turmeric genotypes for yield and quality during the year 2019-20 was conducted.

4.3.2.6 Asalio

- ◆ In asalio, different 34 accessions were maintained.

STATE trials

- ◆ In asalio, a trial on AVT-III: Evaluation of promising lines of asalio was taken during the year

4.3.2.7 Basil

AICRP trials

- ◆ AVT-II: Evaluation of promising lines of basil for high yield and quality (AB-1 to AB-20)
- ◆ AVT-III: Evaluation of promising lines of basil (seed purpose) for high yield and quality (OB-1 to OB-24)
- ◆ AVT-I: Evaluation of promising lines of tulsi basil (seed purpose) for high yield and quality (AB-1 to AB-20)

STATE trials

During the year 2019-20, one experiments were taken.

- ♦ AVT-III: Evaluation of promising lines of basil for high yield, quality and DUS characters

4.3.2.8 Kalmegh

- ♦ In kalmegh, different 65 accessions were maintained.

4.3.2.9 Charoli

- ♦ Collection, conservation and establishment of Charoli (*Buchanania lanzan* Spreng) genotypes at Anand Collection of charoli germplasm was carried out during July-2019.

Under physiological research

Following experiments were conducted on different aspect on different crops during the year 2019-20.

- ♦ **Enhancement of seed germination in Charoli (*Buchanania lanzan*)**

Significant differences were observed among the different physical and chemical treatments on various seed germination parameters of charoli. Significantly the highest germination percentage (86.7%), germination index (1.07), root length (9.80 cm), vigour Index-I (1015.38) and vigour index-II (5354.98) was observed in the treatment T₁₂ [Alternate wetting (24 hrs.) and drying (24 hrs.)]. Whereas, the treatment T₂₁ (Dipping in GA₃ @900 mg/l for 24 hrs.) exhibited significantly higher shoot length (10.85 cm). In case of shoot dry weight, the treatment T₁₉ (Dipping in GA₃ @900 mg/l for 24 hrs.) depicted significantly higher value (72.45 mg) while, the treatment T₁₅ (Dipping in Conc. H₂SO₄

(5%) for 5 min.] was observed significantly superior for root dry weight (15.27 mg).

- ♦ **Standardization of soil less culture in *Stevia rebaudianabertoni***

Significantly the highest plant height was observed in half Hoagland solution during the 1st (27.89 cm) and 3rd harvesting (63.30 cm) while, at 2nd harvesting half MS media was found significantly highest plant height (52.60 cm). Half Hoagland solution exhibited significantly maximum number of leaves per plant, *i.e.*, 38.26 at 1st harvesting and 162.94 at 2nd harvesting but at 3rdharvesting, significantly higher value was found in half MS media (263.20). At 1st harvesting, there was no primary branch in plant except half MS media, while at 2nd and 3rd harvesting time it started developing of primary branches in all the nutrient solution. In case of chlorophyll content, significantly maximum chlorophyll content was recorded in half MS media (38.70, 47.90 and 44.46 SPAD value) at 1st, 2nd and 3rd harvesting, respectively. Significantly maximum leaf area was observed in full Hoagland solution (16.89 cm²) at 1st harvesting. At 2nd and 3rd harvesting, half Hoagland and half MS media was registered significantly maximum leaf area (15.54 and 14.09 cm²), respectively. With respect to the leaves fresh weight per plant, half Hoagland solution was found significantly higher weight (24.75 and 25.64 g) at 1st and 2nd harvesting, respectively while at 3rd harvesting, half MS media exhibited significantly higher fresh weight (42.54 g). Similarly, significantly higher dry weight per plant was recorded under the half Hoagland solution (5.36 g) at 1st harvesting. However, half MS media was observed significantly higher dry weight *i.e.*, 6.09 and 7.57 g at 2nd and 3rd harvesting, respectively.

- ◆ **Comparative field study of growth of Safed musli planting materials generated through conventional and tissue culture method**

Significantly maximum plant height was observed in conventional planting materials (29.63 cm) at 60 days after transplanting (DATP). Conventional planting materials recorded highly significant differences in relation to the number of leaves per plant (25.33) at 30 DATP. With respect to the chlorophyll content, significant differences were found at 30 and 60 DATP in the plants raised from the conventional planting materials *i.e.*, 27.62 and 27.08 SAPD value, respectively. Maximum leaf area (24.56 cm²) was recorded in conventional planting materials at 30 DATP but tissue culture raised plantlets exhibited significantly higher leaf area (28.46 cm²) at 60 DATP. Days to flower initiation parameter showed the highly significant difference and took minimum days for flower initiation (22 days) in conventional planting materials as compared to the plants raised from the tissue culture (37 days).

Crop production

Following experiments were conducted on different crops during the year 2019-20.

- ◆ **Effect of different date of transplanting and spacing on herbage yield and quality of Basil (*Ocimum basilicum L.*)**

Significantly higher dry herbage yield of basil (7.09 t/ha) was obtained with planting during 3rd week of July with spacing of 60 x 45 cm.

- ◆ **Effect of different organic manures and Bio NPK consortium on yield and quality of Isabgol (*Plantago ovata Forsk.*)**

Significantly higher values of seed yield (682

kg/ha 1st year) and (687 kg/ha 2nd year) was found with application of treatment M₁ (FYM @ 4.0 t/ha). Significantly higher seed yield (681 kg/ha 1st year) and (688 kg/ha 2nd year) was recorded with application of treatment B₁ (Seed Treatment @ 5ml/kg seeds)

- ◆ **Effect of different organic manures and Bio NPK consortium on yield and quality of Asalio (*Lepidium sativum L.*)**

Significantly higher seed yield (1556 kg/ha) of *Asalio* was obtained with application of organic manure FYM 10 t/ha + Bio NPK. Whereas significantly lower seed yield (1246 kg/ha) of *Asalio* was recorded with application of FYM 5 t/ha

4.3.3 FRUIT CROPS

Department of Horticulture, BACA

In research front efforts are being made to concentrate on Hi-Tech recent advances in the field of horticulture including basic and applied research. These are being carried out separately by the department and with the collaboration of other departments. The department having about 25-hectare land for research and demonstration activities for fruit, vegetable and flower crops.

Following ten field trials were conducted successfully during the year 2019-20 on different horticultural crops. Out of these, two trials were on flower crops.

- ◆ Evaluation of red flesh guava
- ◆ Effect of rejuvenation on growth, yield and quality in old orchard of mango cv. Rajapuri under Middle Gujarat agroclimatic conditions
- ◆ High density plantation and canopy management in mango cv. Kesar

- ◆ High density plantation and pruning in guava cv. Allahabad Safeda
- ◆ Study on intercropping in aonla base cropping system
- ◆ Effect of transplanting time and spacing on growth and flower yield in gaillardia cv. Local
- ◆ Effect of transplanting time and spacing on growth and yield of summer African marigold (*Tagets erecta* L.) cv. Punjab Genda-1
- ◆ Standardization of suitable time of softwood grafting guava cv. Allahabad Safeda
- ◆ Evaluation of red flesh guava hybrids
- ◆ Evaluation of white flesh guava hybrids

College of Horticulture

Following experiments were conducted during the year 2019-20

- ◆ Evaluation of vegetables during different season under different shade net condition
- ◆ Effect of different organic manures and PGPR consortium on growth, yield and quality of sapota (*Manilkara zapota* L.) cv. Kallipatti
- ◆ High density plantation and canopy management in mango cv. Kesar
- ◆ Effect of spacing and nitrogen on growth, flowering, yield and shelf life of desi rose under middle Gujarat conditions
- ◆ Evaluation of different chrysanthemum genotypes (loose flower) for yield and growth parameters
- ◆ Feasibility of use of Reverse Osmosis (RO) waste water in gaillardia
- ◆ Nutrient management through organics in broccoli (*Brassica oleracea* var.italica L.)

Crop Protection

- ◆ Bio-efficacy of botanicals against powdery mildew of fenugreek.
- ◆ Evaluation of insecticides against aphid infesting in chrysanthemum
- ◆ Validation and promotion of sustainable and adaptable IPM technology for brinjal crop
- ◆ Management of aphid in coriander through insecticidal seed treatments and bio-pesticides
- ◆ Survey and identification of causal organism of Mango malformation

Crop Improvement

- ◆ Induction of mutation in rose and lilly

Post Harvest Technology

- ◆ Technology for production of Indian gooseberry (aonla) murabba
- ◆ Development of production technology for vegetable based juice from carrot and tomato
- ◆ Standardization of moringa pulping technique using brush type pulper

Basic Science Dept.

- ◆ Comparison of Different Statistical Models to forecast the Area, Production and Productivity of Major Fruit Crops of Gujarat
- ◆ Modeling of area, production and productivity of castor crop for Anand/Kheda district using statistical data mining techniques

4.4 FORESTRY

--NA--

4.5 CENTRE FOR PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Work carried out at Department of Agricultural Biotechnology during the year 2019-20 is summarized below:

Okra, Brinjal, Chilli, Guar, Desi Cotton,

Custard apple, Ocimum, Tomato, Cucumber, Castor, Cowpea, Mustard, Rice, and Saffron are the crops in which research was carried out. The planning was done to carry out crop based research for improvement of yield and quality. The work pertaining to breeding varieties/hybrids for resistance to various biotic (disease and insect resistance) and abiotic stresses (drought and salinity resistance), identification and molecular characterization, cloning of genes for economic traits and development of transgenic plants was done. Crop-wise research activities carried out at this department under various schemes are given below:

Desi Cotton

- ◆ Development of colchicoid in desi Cotton
- ◆ Interspecific hybridization in Cotton
- ◆ Five and Eleven interspecific lines of cotton having fiber length more than 28 mm have been included in PET trial at Dhandhuka and Viramgam, respectively.

Maize (*Zea mays* L.)

- ◆ Maize inbred line IGI-1101 was grown in greenhouse and was selfed to get immature embryo.
- ◆ Immature zygotic embryos were excised at 12 DAP.
- ◆ Immature embryos of 12DAP with and without scutellum were inoculated on callus induction medium at 28 °C.
- ◆ Yellowish and globular shaped callus was observed after 15 days of inoculation, whereas further regeneration of the callus was not observed on different combinations of media. Optimization of media for regeneration of plantlets from callus is under process.

Okra

- ◆ In the *kharif* season, total 182F₅, 3F₇, 4F₈, 16F₉ and 9F₁₀ segregating lines were raised while in the *summer* season 36F₄, 18F₅, 9F₆, 4F₇, 9F₈ and 16F₁₀ lines were raised with 16 parents for screening against YVMV. A total of 228 IPS were made in okra
- ◆ Total 87 lines of diverse germplasm of okra were Screened and evaluated for nematode resistance under microplot condition.

Tulsi (*Osimum* spp.)

- ◆ LC/MSMS based identification and quantification of major bioactive compounds from essential oil derived from three species of tulsi (*O. santum*, *O. bacilicum* & *O. gratissium*).
- ◆ Highly sensitive and solvent saving methods have been developed to detect and quantify the eugenol, methyl eugenol, methyl chevicol, methyl cinnamate and linalool.

Tomato

- ◆ In tomato, a total of 64 entries involving 37 parents (11 cultivated, 17 wild species and 9 cherry type), 16 selections and 11 TGRC lines were raised and evaluated for TLCV and other yield and related attributes.
- ◆ Total 3520 direct crosses, 279 backcrosses and 226 three-way crosses were made utilized inbred lines of tomato which was imported from TGRC, California, and AVRDC, Taiwan.
- ◆ In the different generation of tomato, a total 80F₃, 7F₄, 18BC₁F₄, 1TF₄, 20F₅, 60BC₁F₅, 8BC₁F₅ and 41F₆ IPS were made in the cherry and cultivated type.
- ◆ F₃ population of SL-120 × LA-4440 was raised under sick plot condition. A total 157

F₃ lines derived from F₂ were analyzed for the QTL mapping against nematode resistance.

- ◆ In an experiment related to identification of linked markers associated with shelf life and lycopene content in tomato, 500 F₂ plants of tomato (LA-4440 × ATL-10-7) were grown in the field.
- ◆ DNA of good quality was isolated successfully in the sufficient quantity from 450 plants.
- ◆ The tomato fruits were harvested separately from 450 plants and seed was extracted, which will be used in the *kharif rabi* 2020 to raise F_{2,3} populations for phenotyping.
- ◆ Screening of primers is going on in the genomic DNA isolated from F₂ plants.
- ◆ Ploidy analysis of callus obtained from anther culture of tomato was carried out using flow cytometry.

Pegion pea

- ◆ DNA was extracted from a set of 96 genotypes of pigeonpea.
- ◆ Previously reported RAPD marker OPA 18 amplified in DNA bulked from resistance and susceptible genotypes of pigeonpea.
- ◆ Elution of ~800 bp amplicon obtained only in resistance bulk was done.
- ◆ This amplicon was cloned in pTZ vector and was sequenced by vector specific sense and antisense M13 primers.
- ◆ The obtained sequence was searched for homology in NCBI BLAST online tool.
- ◆ The sequence was found matched with database showing 99 % identity with SMD linked marker.
- ◆ New set of SCAR marker was developed from the confirmed sequence.

- ◆ Validation of SCAR marker on different set of pigeonpea genotypes alongwith their phenotype will be further carried out.

Rice

- ◆ Identification of markers associated with Bacterial Leaf Blight (BLB) resistance in Rice
- ◆ Previously made three cross combinations namely GR-11 × RP Bio 226, IRBB 60 × GR 11 and IRBB 66 × GR 11 were advanced to develop mapping populations to map QTL for BLB resistance.
- ◆ DNA was isolated from 195 F₂ plants from GR-11 × RP Bio 226.
- ◆ Out of 70 SSR primers surveyed, five primers were found polymorphic.

Mango

- ◆ Genetic diversity among 32 mango genotypes / varieties was evaluated using 20 SSR markers.
- ◆ Out of 20 primers, 15 were amplified successfully. Of 15, 7 primers were found monomorphic while remaining 8 were recorded polymorphic.
- ◆ The maximum genetic dissimilarity (0.90) was recorded between ‘Kesar and Amrutang’; ‘Neelum and Badshah Pasand’, and ‘Doodhpenda and Badshah Pasand’.
- ◆ Mangiferin and amino acid content in kernel was analyzed in 10 genotypes using LC-MS.
- ◆ Total mangiferin content in mango seed is found to be varied from 0.27-4.88 mg/g DW.
- ◆ The cultivar Mallika recorded significantly higher mangiferin content (4.88 %), whereas Kesar showed the lowest percentage of mangiferin content (0.27 %).

- ◆ Amino acid profiling suggested that valine, threonine, leucine, isoleucine, phenyl alanine were found in higher amount in kernal. Leucine (143-379 mg/100g) and isoleucine (60.4-224 mg/100g) were found to be highest in Langra cultivar.
- ◆ To confirm the causal organism of mango malformation, sequencing of ITS region of three *Fusarium* isolates was performed on DNA analyzer 3500 (Sanger sequencing).

Custard Apple (*Annona species*)

- ◆ In the *Annona* species, new crosses were made in custard apple taking fourcross combinations viz., *A. reticulata* × *A. atimoya*, *A. reticulata* × Balanagar (*A. squamosa*), *A. reticulata* × *A. cherimoya* and *A. reticulata* × Red (*A. squamosa*).
- ◆ Interspecific hybrids of custard apple will be evaluated at morphological level during the *kharif* 2020.

Castor

- ◆ In an experiment pertaining to development of male sterile line in castor through intergeneric hybridization in Castor and *Jatropha*, new crosses were attempted.
- ◆ In another experiment, cross was made between JI-35 (wilt susceptible) and 48-1 (wilt resistant) genotypes to develop mapping population for identification of QTL controlling wilt resistance in castor.
- ◆ Out of 50 SSR, 10 markers were found polymorphic between both parental genotypes

Mustard

- ◆ Evaluation of interspecific inbreds developed through *B. napus*, *B. carinata*, *B. rapa* and *B. juncea*, and 5 private hybrids along with 3 local checks GM-2, GM-3 and GM-4 in

mustard was done in a replicated trial.

Cucumber

- ◆ Different interspecific generations viz., F_{12} , BC_1F_{10} and BC_1F_{11} were raised and 10 lines were found promising. All promising lines were evaluated through organoleptic test.
- ◆ Thirteen promising interspecific lines of cucumber were included under PET trial at MVRS, AAU, Anand.

Cowpea and Yard Long Bean (*Vigna unguiculata* subsp. *sesquipedalis*)

- ◆ In *kharif*, $11F_{10}$, $16BC_1F_9$, while in summer $11F_9$, $16BC_1F_8$ and 10 varieties (Table.7 & 8) were raised and 20 and 5 lines were found promising for YVMV and yield respectively, while seed of 27-yard-long bean lines procured from NBPGR, Thrissur was multiplied successfully and new crosses were attempted between Cowpea and Yard Long Bean.
- ◆ Five promising lines of Cowpea were included under PET at MVRS, AAU, Anand.

Pumpkin

- ◆ Genetic diversity among 34 pumpkin genotypes was evaluated using five SSR and five SRAP markers.
- ◆ The total number of amplified loci were 38, of which 35 (95.24 %) were polymorphic displaying PIC values ranging from 0.29 (CMTm80) to 0.85 (SRAP 7) with an average of 0.60.
- ◆ Out of 20 primers, 15 were amplified successfully. Of 15, 7 primers were found monomorphic while remaining 8 were recorded polymorphic.
- ◆ The highest (0.75) genetic distance was

observed between GPPK 59 and Arka Chandan, and GPPK 90 and Arka Chandan genotypes while it was lowest between GPPK 100 and GPPK 105.

Tobacco

- ◆ F₂ mapping population of cross ABT-10 X A119 was raised in nursery followed by transplantation in field.
- ◆ Young leaves were collected for isolation of DNA from F₂ mapping population.
- ◆ 1500 SSR markers were screened on both parents for identification of polymorphism.
- ◆ Out of 1500 SSR marker, 55 were found polymorphic.
- ◆ These polymorphic SSR markers were amplified in F₂ mapping population.
- ◆ The Allelic data has been recorded and their single marker analysis is under process.
- ◆ F₂ derived F₃ seeds were raised in nursery and transplanted in field.
- ◆ Phenotypic observation was made in March 2020 from randomly selected 5 plants for nematode indexing (gall index) by uprooting the complete plant.
- ◆ 50 Leaf disc from each plants were made and weighed. The leaf thickness for each plant was recorded.
- ◆ Association of phenotypic and genotypic data is under progress.

Chilli

- ◆ 49 F₆ interspecific lines of Chilli and Capsicum (Capsicum X GVC 131) were raised and IPS was made.
- ◆ Trueness of the F₁ was tested by polymorphic SSR marker in cross made between p-08-

11 (LCV resistant) and AVNPC-13 (LCV susceptible).

- ◆ Screening of 467 SSR markers on parents was carried out. Out of 467 SSR markers, 67 were found polymorphic.
- ◆ F₂ population of 300 individuals was raised in field and DNA has been isolated successfully.
- ◆ Good quality of DNA (OD = ~1.8) with sufficient quantity (500- 1000 ng/ul) was obtained.

Guar

- ◆ LC-MS based mannose/galactose ratio was quantified in 21 genotypes of guar under irrigated and drought condition.
- ◆ In all genotypes, M:G ratio was found around 2 - 2.8 in both irrigated and drought conditions.
- ◆ Further, galactomanan responsive gene expression study was carried out by Real Time PCR in four promising genotypes (GG1, DRLG4, DRLG9 and DRLG46).
- ◆ A total of six genes (GDP-D-mannose-pyrophosphorylase, Mannosyl- transferase, β-1,4 mannan synthase, Galactosyl transferase, 1-4 β mannan endohydrolase/ Mannase and UDP galactose 4 epimerase) were targeted for expression study.
- ◆ Maximum expression, under drought compared to control, was detected for Galactosyl transferase (22.27 fold) in DRLG-9.

Germplasm collection

- ◆ Germplasm collection of different crops was done from Jammu & Kashmir (Cucumber, Turnip, Knol khol and Apple) and Bharuch District (Seed less lemon, Guava, Dragon fruit, Tomato and Okra).

DNA fingerprinting

- ◆ A total of 25 DNA fingerprints of released or pre-released varieties were generated using different marker systems.
- ◆ Robust and polymorphic markers were selected for generating successful DNA fingerprints.
- ◆ Total 11 SRAP and 5 AFLP markers were used for generating crop specific DNA fingerprints.
- ◆ DNA fingerprinting profile of these crops was sent to their respective Research Stations for further use.

Table 4.2: Summary of DNA fingerprint profile generated in various crops in the year 2019-20

Crops	Number of varieties	Fingerprints	
		SRAP	AFLP
Guava	5	3	-
Cotton	4	-	1
Sorghum	3	-	1
Potato	4	-	1
Maize	3	-	1
Brinjal	5	-	1
Okra	1	5	-
Kodomillet	4	3	-
Total	25	11	5

MAS in Rice (For BLB resistance)

Total three (3) cross combinations viz. GR 11 x RP Bio 226, IRBB 60 x GR 11 and IRBB 66 x GR-11 including one BLB susceptible line GR-11 were made. The DNA was isolated from the 195 F₂ plants derived from cross combination GR 11 x RP Bio 226 through CTAB method (Doyle and Doyle, 1978).

Agarose gel electrophoresis was carried out to test the quantity and quality of DNA. Out of total 70 SSR primers surveyed, 5 primers found to show polymorphism between the parents whereas 17 primers generated the monomorphic bands. DNA was isolated from 157 F₂ plants raised at MRRS, Nawagam Farm in *Kharif* 2018. Total 70 SSR primers were used for screening the parental polymorphism between Pusa Basmati X GAR 13. Out of total 70 SSR primers surveyed, 5 primers found to show polymorphism between the parents whereas 17 primers generated the monomorphic bands. The screening of the 157 plants of F₂ population through primers generating polymorphism is under process

Distant hybridization

Okra

- ◆ In summer most of the segregating lines viz., F₄, F₅, F₆, F₇, F₈ and F₁₀ lines did not show the proper growth and expression for the different traits and incidence of YVMV, due to very high infestation of nematodes. So these were resown in the *kharif* season. There were 30, 14, 07, 01, 08 and 16 IPS made from F₅, F₆, F₇, F₈, F₉ and F₁₁.
- ◆ In *kharif*, total 88 germplasms were sown. Out of total 88 germplasms, 5 did not germinate. As a whole, there was very less incidence of YVMV in this season, so all the accessions showed no symptoms of YVMV due to insufficient selection pressure. Out of 16 parents, all the parents showed 0 % YVMV incidence.
- ◆ In *kharif*, segregating lines including 182F₅, 3F₇, 4F₈, 16F₉ and 9F₁₀ were sown. All segregating lines showed good germination. There was no incidence of YVMV in the *kharif* season and all the segregating materials

showed no symptoms of YVMV due to very low selection pressure. There were 156, 22, 08, 03, 15 and 08 IPS made from F_6 , F_7 , F_8 , F_9 , F_{10} and F_{11} . Total 33 new crosses including 16 three-way crosses and 17 direct crosses were attempted. The seed material and ovules obtained from such crosses were kept for germination and embryo rescue process, respectively.

- ◆ Total 3 attempts were made at Microplot, Dept. of Nematology, BACA, AAU, Anand for germination of all lines, but most of lines did not show germination.

Tomato

- ◆ A total of 64 entries involving 37 parents (11 cultivated, 17 wild species and 9 cherry type), 16 selections and 11 TGRC lines were evaluated for TLCV and other yield and related attributes.
- ◆ Total 13 F_1 's was sown during *kharif-rabi-2018-19*. Out of these, there were only 4 entries having plant stand, while remaining 9 entries did not show germination. Out of 4 entries only 3 entries having plant stand equal to 5 or above, hence, only those were considered for TLCV observation. Total 23 BC_1F_1 were sown, out of which all entries had plant stand equal to 5 or above except one entry i.e. (H-24 × LA0-2127) × H-24. Five entries of three-way F_1 were sown in *kharif-rabi-2018-19*, out of which 03 entries did not show germination.
- ◆ Total $12F_2$, $4F_3$, $9BC_1F_3$, 1 three-way F_3 , $1BC_2F_3$, $17F_4$, $31BC_1F_4$ and $20F_5$ were raised. There were $3F_5$ raised for heat tolerance. On the basis of observation for TLCV resistance, intensity of fruit bearing, Plant growth habit, early maturity, number of fruits per cluster

and fruit characters (Size, Shape, Color and Taste), there were $80F_3$ IPS, $7F_4$ IPS, $7BC_1F_4$ IPS, 1 Three way F_4 IPS, $0BC_2F_4$ IPS, $13F_5$ IPS, $68BC_1F_5$ IPS, $39F_6$ IPS and $3F_5$ IPS (Heat Tolerant) selected from $12F_2$, $4F_3$, $9BC_1F_3$, 1 Three way F_3 , $1BC_2F_3$, $17F_4$, $31BC_1F_4$, $20F_5$ and $3F_4$, respectively.

- ◆ Total 20 direct crosses, 2 backcrosses and 7 three-way crosses were attempted utilizing tomato lines imported from TGRC, California, and AVRDC, Taiwan during *Kharif-Rabi-2019-20*.

QTL for Nematode

- ◆ In the *kharif-rabi* (2019-20), F_3 population of SL-120 X LA-4440 was raised in nematode sick plot. There were 157 F_3 lines derived from F_2 taken under this study. The observations were taken for 10 plants under each F_2 line. During this season the phenotyping (Morphological character) is going on. Moreover, for the identification of quantitative trait loci associated with root knot nematode, the observation regarding gall index required is to be taken in the F_3 population and plant population is standing in the field. So, it will be done within month.

Identification of linked markers (shelf life and lycopene content)

- ◆ The F_1 developed in *kharif-rabi-2017-18*, using the parents LA-4440 and ATL-10-7 was raised in *kharif-rabi*, 2018-19 to harvest the seeds for F_2 mapping population. The F_2 population was transplanting on 11/01/2020 and DNA isolated from 500 plants of F_2 population.
- ◆ Each of the 500 F_2 plants were labelled from 1 to 500 and were selfed to produce F_2 derived F_3

population ($F_{2,3}$) to be used for phenotyping in coming *rabi* 2020. The isolated DNA from the 450 F_2 plants will be subjected to genotyping/screening through molecular markers.

Cotton

- ◆ Out of the total 40 parents, the minimum days to flowering was 67 days and was reported by PA-402, AKA-5, AKA-7, AKA-8 and AKA-8401. The maximum bolls producing top five (5) lines were Gbhv-280 (99.4), 4011 (95.1), Gvhv-721 (81.7), Gvhv-544 (78.9) and DDK lintless (78.2) with 176, 200, 141, 165 and 63 gm yield per plant, respectively. The top four high yielders were 4011 (200), Phule anmol (193), PA-402 (182) and Gbhv-280 (176).
- ◆ Out of the total 09 three way F_5 lines selected, seven (07) lines were having fibre length more than 28 mm. Total number of lines selected to be advanced as BC_1F_5 from BC_1F_4 was 39, out of which 30 lines had fiber length equal or more than 28 and one line from single cross (V-797 X PA-255) X PA-255 had 29.2 mm fiber length. There was found a single line having fiber length 29.8 mm (cross between Phule anmol X 4011). Out of all F_7 lines, 32 lines found to have fiber length more than 29 mm.

Colchiploid in Cotton

- ◆ A total of 29 plants survived after subjecting 250 seeds each of V-797, 4011 and ALF 1027 to colchicine treatment with three different concentrations (0.2%, 0.4%, 0.6%) using seed soaking method. Out of all colchicine treated plants, 26 plants survived and established in the field. After the year of establishment of plants only seven (07) plants showed characteristic of a colchiploid according to plant morphology, among all the treatments.

While, cytological study of this work is in progress.

Custard apple

- ◆ The new crosses were attempted in custard apple taking five combinations viz., *A. reticulata* × *A. atimoya*, *A. reticulata* × Balanagar (*A. squamosa*), *A. reticulata* × *A. cherimoya* and *A. reticulata* × Red (*A. squamosa*).
- ◆ The observations regarding the quantitative quality and morphological traits could not be taken because fruit bearing was very less due to climate disturbance.

Castor

- ◆ The female line of castor hybrid GCH-7, variety GAC-11 and cultivated genotype of *Jatropha* were used as parents for intergeneric hybridization. All the lines of castor and *Jatropha* were grown at the farm under rainout shelter as well as green house. The male flowers from castor plant were eliminated every day, if found on the plant to avoid any chance of pollination with the castor pollen. Each inflorescence was covered with a pollen-proof bag. The *Jatropha* inflorescences were also covered with pollen-proof bags as protection against pollen contamination from other *Jatropha* plants.
- ◆ About 638 Castor (SKP-84) X *Jatropha* Wild, 627 Wild *Jatropha* X Castor (SKI-215), 402 Castor (SKP-84) X *Jatropha curcas* (Cultivated) and 21 *Jatropha curcas* (Cultivated) X Castor (SKI-215) intergeneric crosses were made, but only few crosses were set and were used for *in-vitro* culture. None of the embryos kept in the culture media responded positively.

Germplasm collection

- ◆ Germplasm collection of different crops (Cucumber, Turnip, Knol khol and Apple



etc.) was done from Jammu & Kashmir and seedless lemon, Guava, Dragon fruit, Tomato and Okra was done from Bharuch District.

Tissue culture work carried out during the year 2019-20 is summarized below:

- ◆ Optimization of tissue culture protocol in Oil palm (*Elaeis guineensis*)
- ◆ Development of micropropagation protocol for large scale multiplication of Guava (*Psidium guajava* L.)
- ◆ Studies on anther culture in tomato (*Solanum lycopersicum* L.)
- ◆ Development of gender specific SCAR (Sequence Characterized Amplified Region) marker in date palm.
- ◆ Development of regeneration protocol for large scale production of Coconut (*Cocos nucifera* L.)
- ◆ Refinement of date palm micropropagation protocol for early callus induction and for other stages.
- ◆ Technology development for micropropagation of Indian sandalwood (*Santalum album* L.)
- ◆ Technology development for mass multiplication using tissue culture and sex determination using molecular markers in papaya
- ◆ Development of cell lines resistant to Alternaria blight (*Alternaria burnsii* var. *cumini*) of cumin (*Cuminum cyminum* L.) using in vitro techniques

Nanotechnology

Nanotechnology is a quickly rising invigorating multidisciplinary field of

science, endowed with several potentialities and multiple applications. Nanotechnology has emerged as a technological advancement that could develop and transform the entire agri-food sector, with the potential to increase agricultural productivity, food security and economic growth for industries. The development of nano biotechnology provides a novel method and protocol for life science. Nanoparticles as gene carriers become popular in the mammalian cultured cells, whereas its application in plant cells is still very limited. Minimizing the evaporation of soil water by using special matrix based material which will retain the water inside the soil and also do not interfering with the other physiological activity forming a permeable membrane. The water loss due to transpiration can also be minimize using such biological activity permeable membrane. Formulating novel nanoparticle hybrid materials to control spoilage-related microflora can significantly have decreased the loss due to spoilage generally take place during long distance transportations of nutritive goods.

Nanotechnology work carried out during the year 2019-20 summarized below:

- ◆ Green synthesis of metallic nanoparticles and their antimicrobial activity against plant pathogens.
- ◆ Synthesis and characterization of hydroxyapatite nanoparticles and its potential applications as phosphorous fertilizers.
- ◆ Characterization of zinc and iron oxide nanoparticles and its effect on artificially aged soybean seeds.
- ◆ Synthesis and characterization of sulphur

nanoparticles and study of its anti-fungal activity against phytopathogens.

- ◆ Evaluation of efficacy of zinc nanoparticles for its enhancement of growth of groundnut crop
- ◆ Stabilization and characterization of multiwalled carbon nanotubes (MWCNTs) and its effects on maize, tomato, Soybean seeds.
- ◆ Green synthesis of silver nanoparticles and assessment of its anti-fungal activity against early blight disease causing *Alternaria solani* in Tomato

4.6 PLANNING AND MONITORING

Planning and development committee was constituted as per Common Statutes for Agricultural University of Gujarat, 2011 under section-III of statutes No. 48 to 51.

- ◆ The financial provision made by project-in-charge was scrutinized, compiled and prepared plan budget. This budget proposal was put up in Planning and Development Committee, Finance committee and Board of Management. Thereafter, it was submitted to Government of Gujarat for provision in budget for the year 2019-20.
- ◆ An Annual plan of ₹ 7352.23 Lakhs was approved by Government of Gujarat for Agricultural Research and Education where as, revised budget of ₹ 7469.73 Lakhs was approved and released the grant accordingly by state Government during the year 2019-20. The detail provision of plan projects is as follow.

Head	Provision (₹ In Lakhs)	Revised Provision (₹ In Lakhs)
Education	4048.69	4128.69
Extension Education	425.68	435.68
Research	2877.86	2905.36
Total	7352.23	7469.73

- ◆ Review meetings were conducted in November, 2019 and February, 2020 with concern scheme-in-charge. After that, grant was reallocated as per the demand and utility in the project.
- ◆ A correspondence review meeting was held in March, 2020, necessary action related to grant had been taken up.
- ◆ Monthly, Quarterly and Annual progress reports of plan schemes were prepared and submitted to Government of Gujarat.
- ◆ Liaisoning work for Legislative Assembly Question (LAQ), Rajysabha Starred Question (RSQ) and Loksabha Starred Question (LSQ) raised during the year were taken up.

Indian council of Agricultural Research (ICAR) Development Grant :

“Strengthening and Development of Agricultural Education in SAUs

- ◆ The demand of ₹ 1915.00 Lakhs for “Strengthening and Development of Agricultural Education in SAUs” was submitted to the Indian Council of Agricultural Research (ICAR) after scrutinised the demand received from the University Officers and Principal/Deans of Colleges.
- ◆ The grant of ₹ 255.00 lakhs was released by the ICAR for “Strengthening and Development of Higher Agricultural Education in India”.

“Student READY”

- ◆ The demand of ₹66.06 Lakhs for “Student

READY” was uploaded in the educational portal of Indian Council of Agricultural Research (ICAR) as per the demand received from Dean’s of various faculties. The grant of ₹ 66.06 lakhs was released by ICAR for “Student READY”. Annual Utilization Certificate (AUC) of said grant was also uploaded in the portal of ICAR, New Delhi for the financial year 2019-20.

“National Talent Scholarship”

- ◆ The demand of ₹72.42 Lakhs for “National Talent Scholarship” was uploaded in the portal of Indian Council of Agricultural Research (ICAR) as per the demand received from Director of student welfare. The grant of ₹ 71.21 lakhs was released by ICAR for “National Talent Scholarship”. Annual Utilization Certificate (AUC) of said grant was uploaded in the portal of ICAR, New Delhi for the financial year 2019-20.
- ◆ The demand of ₹103.50 Lakhs for “Library Strengthening in Agricultural Universities” was uploaded in the portal of Indian Council of Agricultural Research (ICAR) as per the demand received from University Librarian. The grant of ₹ 20.00 Lakhs was released by ICAR for the “Library Strengthening in Agricultural Universities”. Annual Utilization Certificate (AUC) of said grant was uploaded in the portal of ICAR, New Delhi for the year 2019-20.
- ◆ Annual Progress Report for the year 2019-20 were submitted to ICAR as per the activities carried out during the year.

- ◆ Review meeting for progress of ICAR Development grant were conducted in November, 2019 and January, 2020 during the year 2019-20.

4.7 WATER TECHNOLOGY

Considering the importance of irrigation in Agriculture, Agricultural Research Station for irrigated crops, Thasra, conducted some experiments as listed below:

- ◆ **Nitrogen management in Tomato (*Lycopersicon esculentum* L.) under drip irrigation system in goradu soil of Middle Gujarat conditions**

Significantly higher no. of fruits, weight of fruits and fruit yield of tomato yield (48.11, 86.67 g and **40733** kg/ha, respectively) were recorded in treatment I₃ (1.0 PEF) but it was at par with treatment I₂ (0.8 PEF).

Significantly higher no. of fruits, weight of fruits and fruit yield of tomato yield (47.22, 86.44 g and **40042** kg/ha, respectively) were recorded in treatment N₁ (100% RDN) but it was at par with treatment N₂ (80% RDN).

Extension and demonstration schemes for irrigation funded by Sardar Sarovar Narmada Nigam Limited at sub center of Anand Agricultural University viz. Thasra, Dhandhuka, Dabhoi and Khandha, organized 58 training programmes on campus and off campus on the subject of irrigation scheduling, method of irrigation and related aspects. In all 1714 farmers attended the training programme.

4.8 AGRICULTURAL RURAL DEVELOPMENT STUDIES

Rural development programme revolves around raising economic and social level of the rural people as the main objective.

Research in context with the above said objectives can throw some light in the direction of bringing rural development. Keeping this in view, research in extension education was conducted in the broad areas of: Adoption and diffusion of innovations, transfer of technology, role of mass media in dissemination of technology, impact of different programmes and centres on rural development, communication behavior of rural people/farmers, bench mark surveys etc.

4.9 AGRI-BUSINESS DEVELOPMENT

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4.10 VETERINARY SCIENCE AND ANIMAL HUSBANDRY

Research endeavor of various research projects under Veterinary Science & Animal Husbandry faculty has focused on two broad areas viz. Animal Production and Animal Health.

Animal Production Group

Animal Genetics & Breeding :

- ◆ The department is known at national level for its contribution in molecular characterization of indigenous livestock breeds. The department is actively engaged since 1995 in molecular analysis of various livestock species by micro satellite and SNP genotyping and its association with the milk production and reproduction traits related to fertility and infertility. Currently it is known for NGS (Next generation sequencing) and Whole Genome sequencing using GSFLX, Ion torrent and Illumina sequencer. It is also known for Gir cattle and Jaffarabadi buffalo whole genome sequencing and A1A2 genotyping.
- ◆ The department is doing cytogenetic screening for chromosomal aberration and

also doing molecular screening of breeding bulls for genetic diseases viz. BLAD, Bovine Citrulinaemia, DUMP, CVM and Factor XI deficiency as per the request from Department Animal Husbandry, Gujarat State (Gujarat Livestock Development Board), Co-operative dairies (AMUL, Dudhsagar, Banas dairies), NGOs and progressive farmers. The department contributed in recently recognized different livestock breeds viz. Dagri Cattle, Panchali Sheep, Kahmi Goat, Kachchhi-Sindhi Horse, Halari and Kachchhi Donkey by National Bureau of Animal Genetic Resources (NBAGR), Karnal.

Work carried out during the year 2019-20

- ◆ 60 animals (44 cattle/bulls + 16 buffalo/calves/buffalo bulls) including breeding bulls screened through chromosomal analysis (Karyotyping). A total of 180 blood samples (including cattle, bulls, buffalo, buffalo bulls) of indigenous as well as crossbreds screened for genetic defects (BLAD, Citrulinaemia, Factor – XI, DUMP and CVM).
- ◆ Carried out genetic characterization of 60 blood samples and phenotypic characterization (phenotypic measurements) of 700 animals of “Dagri cattle” breed and got registered as distinct new cattle breed.
- ◆ Carried out A1A2 screening for 200 samples of indigenous as well as crossbred cattle.

Department of Animal Biotechnology,

Department of Animal Biotechnology, College of Veterinary Science and Animal Husbandry, AAU, Anand has carried our research work under following area;

- ◆ Evaluation of carbohydrate active enzymes obtained from rumen through metagenomic analysis

- ◆ One Health Poultry Hub
- ◆ Assessing the effect of Herbal material/compounds on semen quality with respect to percentage motility and viability of X- and Y-bearing spermatozoa
- ◆ Identification of “Molecular Portraits” in Squamous Cell Carcinoma of Horn in Kankrej (*Bos indicus*) Bullocks.
- ◆ Cloning, Characterization and Functional Screening of Industrially Important Novel Cellulose Encoding Genes from the Bovine Rumen Microbial Community using Metagenomic Approach.
- ◆ Functional metagenomics of camel rumen microbiome for novel key glycoside hydrolases (GH) to benefit animal nutrition and biofuels
- ◆ Microsatellite and SNP Genotyping of elite Gir animals of Gujarat

Poultry Research Station:

Poultry Research Station was established during the year 1964 under Institute of Agriculture. Since then the centre is actively engaged in Poultry Research, Extension and Education activities. Apart from this the centre is having poultry feed manufacturing unit which caters the need of experimental feed required for Anand centre. The centre is also imparting Poultry Training to unemployed youth for self employment. Poultry training centre is conducting three courses of 10 weeks duration in a year starting from first Monday of July, October & January. Since 1978 the activities of the research station have increased tremendously on account of establishment of ICAR project on A.I.C.R.P. on Poultry Breeding. Now, the centre is able to cater the need of the poultry farmers of Gujarat State on various aspects

of poultry farming through Poultry Training Centre, correspondence and advisory services provided to the farmers when they visit to the centre. The research station is also providing facilities and technical guidance for under graduate & post graduate students of various departments of the college and other Agricultural University of the State.

Following research work was carried out during the year :

- ◆ Effect of tryptophan supplementation at two levels of crude protein in layer ration on production performance of White Leghorn birds
- ◆ Study on the growth, production and carcass evaluation of Kadaknath, Rhode Island Red and their process
- ◆ Phenotypic characterization of native chicken of North Gujarat
- ◆ Evaluation of physical and economical characteristics of Inbred stock of native chicken
- ◆ Optimization of dietary energy and protein level of native chicken of North Gujarat (Aravali)

Reproductive Biology Research Unit

The department has farm of Surti buffaloes and RIA and ETT laboratory. Research work on endocrinology of reproduction, *in vitro* production of embryos and augmenting fertility in buffaloes through better managerial practices are carried out. Extension activities on large scale are performed through; “Mahila Pashupalan Talim Yojna” (funded by GCMMF) and “Surti Buffalo Breeders Association” project (financed by the Department of A.H., Government of Gujarat). The department

has animal science museum also. Every year more than 1500 farmers/farm women are visiting the department to gain the scientific knowledge for profitable buffalo rearing as an entrepreneurs. Such unique facilities are here only among the four SAUs.

Work carried out during year 2019-20

- ◆ To maintaining buffaloes under optimum management and nutritional status. A large number of livestock owners/ farm women were trained on scientific buffalo management.
- ◆ In the *embryo transfer project* research work on capacitation of spermatozoa using additives in media was studied and attempts were made to find the difference in capacitated spermatozoa by staining fluorescent dye.
- ◆ Study on effect of bypass fat on production and reproductive performance of post-partum Surti buffaloes found beneficial effects. In second experiment all the parameters of uterine fluids collected from slaughtered buffaloes during different stages of reproduction were reported. In third study effect of season on milk progesterone level for early PD in buffaloes revealed non-significant effect, i.e. samples can be collected any time throughout the year.
- ◆ Under “Mahila Pashupalan Talim Yojna” a total of 28 one-week residential training programmes were conducted and 732 women were trained during the year

The work on “Surti Buffalo Breeders Association” scheme was reported in details in the respective report. Total 1376 owners/beneficiaries were included in during the year (6 awareness programme, 9 on campus training, 8 *prerna pravas* and 9 heifer rally conducted leading to 312, 255, 211, and 598 beneficiaries/ participants respectively).

Ongoing experiment conducted during the year 2019-20

- ◆ Effect of feeding by pass fat on reproductive and productive performance of Surti buffaloes.
- ◆ Study on progesterone profile (blood/ milk) in buffaloes for early pregnancy diagnosis under Farm and Field
- ◆ Study on uterine environment of buffaloes during different reproductive phases
- ◆ To study capacitation of spermatozoa for *IVF* using different media
- ◆ Optimization the age at maturity in Surti buffalo heifers supplemented with bypass protein and bypass fat.

Animal Nutrition Research Station

The major research areas of the center are: Animal Nutrition Survey in different districts of Gujarat state, fodder production and utilization, nutrient requirements of animals, utilization of agro-industrial byproducts and waste materials, studies on evolving area specific mineral mixtures and strategies for feeding of livestock during scarcity period.

Currently the department is engaged in research work on formulation and evaluation of crop residue based total mixed rations for various categories of livestock, development of area specific mineral mixtures to correct deficiencies and Bypass Nutrient Technology, estimation of methane production and to develop feeding strategies for mitigation of methane emission in ruminants and to develop the feeding strategies to minimize the effect of heat stress in animals.

The work carried out during the year 2019-20 includes

- ◆ Supplementation of bypass fat for fattening of Surti male goats
- ◆ *In-vitro* evaluation of different variety of paddy straw of Main Rice Research Station, Nawagam
- ◆ Dietary interventions for designer milk production in dairy cattle
- ◆ Effect of betaine supplementation on milk production and heat stress in crossbred cows
- ◆ Methane mitigation in crossbred cows under different feeding regimes
- ◆ Methane mitigation in crossbred bullocks by dietary interventions
- ◆ Studies on aflatoxin M₁ level in milk of dairy animals in Anand District
- ◆ Analysis of Macro and Micro Mineral Content in Mineral Mixture marketed by different Companies
- ◆ Assessment of Quality of Compound Cattle Feed (Proximate Analysis) available in Market

Pashupalan Sanshodhan Kendra, Ramna Muvada & Kapila Gou Sanshodhan Kendra, Minawada

During the year, around 279 goats were maintained at the center. One research experiment was carried out at the centre.

- ◆ Efficiency of oestrus synchronization protocol and buck effect in Surti goat

During the entire study, 12 goats were selected for the experiment and equally divided into two groups entitled as Double PGF₂ α protocol (Group-I) and Buck effect (Group-II) . Oestrus response, time to onset

of oestrus and pregnancy diagnosis at day 60 by USG were studied in all goats under both groups.

Pashupalan Sanshodhan Kendra, Ramna Muvada has two ongoing research schemes entitled

- ♦ Study on applied reproduction in Surti and Marwari goats of Gujarat state.
- ♦ Research on silvipasture system and forage crops.

Kapila Gau Sanshodhan Kendra, Minawada has one project entitled

- ♦ Research on silvipasture system and forage crops.

During the year, seed and fodder production was undertaken. A total of 14.6 hector land was cultivated. One research experiment entitled as “Preliminary Yield Trial in Forage Maize” was carried out at the centre. Fodder production of four different varieties of maize (AFMC-1, AFMC-2, AFMC-3, AFMC-4) were compared with the African Tall (Control) variety.

Livestock Research Station:

Livestock Research Station, BVSc & AH, AAU, Anand working on to develop crossbred dairy herd with 75% HF and 25% Kankrej inheritance, management problems of such crossbred, to generate reliable data and to supply superior genetic materials to breeding agency. Introduction of mechanization on dairy farm, Conservation and improvement of Kankrej cattle along with innate immunity, disease resistance and to identify β -casein variant (A1 & A2) in indigenous cattle of Gujarat are major area of work. Control of TB and JD diseases, adaptation of indigenous cattle to pipeline milking machine,

development of mechanized dairy farm with new scheme “Mechanized dairy cattle breeding farm” under Rashtriya Krishi Vikas Yojna are salient activities of LRS.

Animal Health Group

Veterinary Parasitology :

Following work was carried out during the year

A total of 6048 samples have been examined. This included 1819 blood smears, 138 skin scrapings, 3996 faecal samples, 63 intestines with intestinal contents of goat, poultry and other animals as well 32 others. A total of 3996 faecal samples were received from the University Farms, Departments, Hospitals, Gaushalas, Field and from zoo and other Agencies, 942 were positive for parasitic infection.

A total of 83 faecal samples of captive wild animals and birds were received from Sayajibaug Zoo, Vadodara out of which in 16 faecal samples showed parasitic infections viz. Ova of *Ancylostoma* spp. 3 (3.61%), *Trichuris* spp. 1 (1.20%), Trichostrongyliid group 1 (1.20%), *Ascaridia galli* 1 (1.20%), *Oxyurid* spp. 1 (1.20%), *Spirometra* spp. 1 (1.20%) and *Coccidia* 8 (9.64%),

A total of 146 faecal samples of captive wild animals and birds were received from Rajkot Zoological Park, Rajkot out of which in 41 faecal samples showed parasitic infections viz. Ova of *Ancylostoma* spp. 2 (1.37%), Trichostrongyliid group 1 (0.68%), *Toxocara* spp. 2 (1.37%), *Spirometra* spp. 15 (10.27%), Cyst of ciliates 7 (4.79%) and *Coccidia* 14 (9.59%).

Department of Veterinary Microbiology

The following research work was carried out

under three AAU funded Research Schemes viz., Central Disease Research Station (Bacterial), Diagnostic Centre for Mastitis and Research Centre for Viral Diseases and two other reschemes.

- ◆ **Research Centre for Viral Diseases**

During the period, total 50 samples comprised of IBR-49 and Rabies-1 were processed for diagnosis of viral disease in animals. For IBR, 19 samples were found to be positive while one sample was negative for rabies.

- ◆ **Central Disease Research Station–Bacterial**

Under the Central Disease Research Station–Bacterial scheme, 1020 samples/animals comprising of 215 for cultural isolation, 22 for microscopic examination, 401 sera samples for diagnosis of Brucellosis and 382 for tuberculosis diagnosis were received/carried out and processed. Among 215 samples for cultural isolation, 120 microbial isolates were obtained and their antibiogram was determined. Among the isolates, Staphylococci (37), Gram negative bacilli (23), *E. coli* (18), Streptococci (12), *Pseudomonas* spp. (9), *Corynebacterium* spp. (9), Gram positive rods (9) and *Proteus* spp. (3) were isolated. Considering more than 25 isolates, the antibiotic sensitivity pattern of the isolates found to be sensitive to Ceftriaxone (70.00%), Amoxyclav (59.25%), Gentamicin (55.77%), Amikacin (53.19%), Enrofloxacin (40.00%) and Ampicillin (37.50%).

- ◆ **Diagnostic Centre for Mastitis**

Under the diagnostic centre for mastitis, 14 milk samples were received and processed and 12 were culturally positive. Among 12 culturally positive milk samples Staphylococci (3), Streptococci (8) and Gram positive bacilli (1) could be isolated.

- ◆ **DBT Network programme on bovine tuberculosis control: Mycobacterial diseases in animals Network (MyDAN) programme**

During the period a total of 382 animals including 367 cattle and 15 buffaloes of Anand district were screened by SICCT and 1.83% (7/382) animals found to be reactor for bovine TB. Out of seven animal reactors, six HF cross bred cows and one Murrah male buffalo were positive. Among the cattle all were adult stage and, three cows in milking and three cows in non-milking stage. The sera samples of animals found positive in SICCT (7) were also tested for the presence of antibodies against *Mycobacterium tuberculosis* complex by LFA and, among them three samples found to be reactor. Analysis of SIT revealed 57 animals found to be positive for bovine tuberculosis.

- ◆ **Pharmacokinetics of phage therapy: A step forward in the treatment of subclinical mastitis in Gir cattle**

The change of Co-Principal Investigator of the centre was finalized by GSBTM, Gandhinagar in the month of February 2020 and consumables were purchased for the research work.

Veterinary Medicine

Work carried out during year 2019-20:

- ◆ During the period of 2019-20, research work on bovine brucellosis was carried out. In bovine brucellosis, Total 165 sera samples tested by i-ELISA and 6 (3.64 %) samples were found positive for Brucellosis.
- ◆ Hematological analysis indicated significant increase in level of TLC and lymphocyte count in affected group of camel as compared to healthy group

- ◆ Serum biochemical parameters reveals significant increase ($P < 0.05$) in Cholesterol and CK level was observed in affected group of camels as compared to healthy group of camels.
- ◆ The UG and PG students had been brought for the vaccination in different villages of Anand district and 1435 animals were vaccinated against HS. & 11652 (Cattle 3949, Buffaloes 6032, Goats 1500 and Sheep 171) animals were vaccinated against FMD.
- ◆ Research work on prevalence of gastrointestinal parasites in goats was carried out. Out of 175, 72 (41.14%) fecal samples of goats were found positive for helminthic infection. Amongst different parasitic species identified, high prevalence of *Trichostrongyles* spp. and *Amphistome* spp. observed. Parasitism was found higher in goat at the age group of 0-6 month as compared to 6-12 month and 1-3 years. Hematobiochemical pattern of goats affected with parasitic infection revealed lower values of Hb, TEC, PCV, total protein, calcium and phosphorus as compared to normal healthy goats.
- ◆ The temperature and humidity data were collected from 22 village of middle Gujarat and the average temperature humidity index was 82.50. The average cortisol level of animals of Aniyad and Changa villages was 21.01 and 19.50ng/ml respectively.
- ◆ *Bryophyllum calycinum* and *Achyranthes aspera* were selected for their scientific evaluation of therapeutic efficacy on adenine induced chronic kidney disease in Wistar rats. Aqueous extract of *Bryophyllum calycinum* and *Achyranthes aspera* mixture was formulated for oral dose administration in 0.5% sodium bicarbonate in water. Aqueous extract of *Bryophyllum calycinum* and *Achyranthes aspera* mixed in 3:1 ratio and administered by oral route using sterile one ml syringe with oral rat gavage needle. Dose was calculated according to body weight of rat and administrated as per concentration strength of formulation. Same procedure was followed for preparation of biherbal alcoholic extract.
- ◆ Blood and serum samples were collected thrice, first day 0, after 28th days of induction of CKD and then on 70th days (after treatment) of experimental periods for the evaluation of biochemical parameters. All the rats were kept in metabolic cages and 24 hours urine samples were collected and analyzed after induction of CKD. A drop of concentrated hydrochloric acid was added to the collected urine before being stored at -20°C . The collected samples were subjected for the estimation of pH, Specific Gravity, Calcium (mg/dl), Phosphorous (mg/dl), Uric Acid (mg/dl), and Total Protein (g/dl).
- ◆ On 70th day the abdomen was cut open to collect both kidneys from each rat and dried for the kidney homogenate evaluation. From it calcium, phosphate, magnesium and oxalate were determine. The RAT KIM 1 ELISA was performed before and after treatment. Ultrasonography was performed. Gross and histopathological study was also carried out. The result provides base for application of this plant extract preparations for the treatment of chronic kidney disease (CKD).
- ◆ Treatment with biherbal extract of *Bryophyllum calycinum* and *Achyranthes aspera* significantly restored the adenine induced biochemical changes in different parameters of urine analysis, serum, and kidney homogenate towards the normal

ranges. The biherbal alcoholic extract of *Bryophyllum calycinum* and *Achyranthes aspera* 3:1 at the dose rate of 300mg/kg body weight orally once in a day for six weeks has nephroprotective effect on adenine induced CKD in Wistar rats.

Livestock Production Management

The Livestock Farm Complex farm is a unique of its own kind where 7 Livestock species and 24 breeds of Gujarat Agro climatic condition, totaling 150-200 animals are being maintained viz (Cattle-Gir, Kankrej, Sahiwal, Tharparkar, Rathi and Crossbred; Buffaloes- Surti, Jaffarabadi, Meshani and Banni; Sheep- Marwari, Patanwadi, Deccani, Magra, Avikalin and P X M crossbred, Goats- Marwari, Zalawadi, Kutchi, Sangamneri and Surti, Rabbit- New Zealand White and Horse-Kathiawadi) for imparting practical training to students. The farm has 10 hac. irrigated land for growing green fodders which are suitable for local agro climatic condition to meet the requirement of these farm animals. The farm generates a sizeable income of Rs. 12 -14 lakhs per annum.

Veterinary Public Health :

Work carried out during year 2019-20:

- ◆ During the period under report, a total of 160 raw milk samples, and 350 chicken meat samples were processed.
- ◆ 160 raw milk samples were tested for presence of *Extended Spectrum beta-lactam E. coli* using microbiological and molecular techniques. Out of 160 raw milk samples a total 103 (64.37%) greenish metallic sheen producing isolates on EMB agar and based on biochemical tests were confirmed as *E. coli* isolates. Out of those 36 (22.67%) of the samples were found positive for

ESBL through E-test, which was confirmed genotypically through PCR of *blaCTX M3*, *blaCTX M9*, *blaSHV*, *blaTEM*.

- ◆ 200 chicken meat samples were tested for presence of *Bacillus cereus* based on microbiological activity. The samples were also subjected to antibiotic sensitivity test. All the positive samples for *B. cereus* were subjected to genotypical identification through PCR of various genes. Out of 200 isolates, 40 were found to be positive for *B. cereus*. Out of all 40, 100% showed presence of *groEL* gene, 45% showed presence of *gyrB* gene, 40% showed presence of *bceT* gene, 17.5% showed presence of *hblA* gene, 7.5% were found with *cytK* genes.
- ◆ A total of 150 poultry meat samples were collected. Isolation of *Salmonella* spp. was done as per the standard reported protocol IS 5887 (Part III). Isolates were subjected to in vitro ABST, with 0.5 McFarland standard broth. Isolates presumptively confirmed through biochemical tests, were subjected to PCR and LAMP. A total of 40 (26.67%) isolates were found positive for *Salmonella* spp. through microbiological and biochemical tests. Samples were found most susceptible to Ceftriaxone (100%) and Amikacin (81%), while most resistant to Trimethoprim (100%) and Ampicillin (93.75%). Out of these, 32 (21.33%) samples were found positive by PCR technique. 36 (26.67%) samples were found positive by LAMP technique. It was found that enrichment of samples increased the reproducibility of the results than direct DNA isolation from samples, using commercial DNA isolation kits.

Veterinary Pharmacology & Toxicology:

To conduct research on following areas

- ◆ Indigenous medicinal plants

- ◆ Toxicology of xenobiotics
- ◆ Pharmacokinetics of drugs
- ◆ To provide guidance and information to field veterinarians.

Evaluation of *in vitro* antibacterial activity of clove oil (*Syzygium aromaticum*) and lemon grass oil (*Cymbopogon flexuosus*) were carried out. Discs of the clove oil and lemon grass oil were prepared and tested against standard strains of *Staphylococcus aureus* (ATCC 6538P), *Escherichia coli* (ATCC 10799), *Streptococcus agalactiae* (ATCC 13813), *Listeria Monocytogenes* (ATCC 1911), *Pseudomonas aeruginosa* (ATCC 19154) and *Salmonella typhimurium* (ATCC 23564). Result revealed that the clove oil showed good antibacterial activity against all test bacteria whereas, lemon grass oil showed antibacterial activity only against *Staphylococcus aureus* (ATCC 6538P), *Escherichia coli* (ATCC 10799), *Streptococcus agalactiae* (ATCC 13813) and *Salmonella typhimurium* (ATCC 23564).

The effects of repeated oral administration of clove oil (*Syzygium aromaticum*) at three different doses 50, 100 and 200 mg/kg daily once for 28 days on haemato-biochemical parameters and histopathology of organs in male and female rats were studied. Forty rats were divided into eight groups, each group contains 5 males and 5 females. The rats of all the groups were observed daily for clinical signs and mortality. Body weight and feed consumption of animals were monitored at weekly interval. At the end of experiment on 29th day, various haematological (Haemoglobin, Total R.B.C. count, Packed cell volume, Total leukocyte count) and serum biochemical parameters (Serum Creatinine, BUN, AST / SGOT, ALT / SGPT, Total Cholesterol, Total bilirubin,

Total protein, Total albumin) were analyzed. Histopathological examination of various tissue was also carried out. There were no adverse clinical signs and mortality observed in all control and clove oil treated male and female rats. There were no significant differences observed in body weight and feed consumption in clove oil treated rats as compared to respective control rats. No significant changes have been observed in haematological as well as biochemical parameters in clove oil treated rats as compared to control rats at the end of experiment on 28th day. Histopathology of kidney, liver, spleen and heart from clove oil treated rats did not show any marked gross or histopathological changes. Clove oil was found safe following repeated oral administration @ 50, 100 and 200 mg/kg b.wt. for 28 days in male & female wistar rats.

Department of Animal Reproduction, Gynaecology and Obstetrics

Under 'Cattle Infertility Scheme' studied the causes of infertility in bovine by attending 99 cases at College Clinic. The portable USG Unit was used for diagnosis of early pregnancy in cattle and buffaloes as well as for diagnosis of pregnancy/pseudo-pregnancy/pyometra in canine/goat/mares with the total of 198 cases examined. Under the scheme 'Imparting Education on Semenology & Frozen Semen Technology to the Students and Field Veterinarians, a total of 663 semen ejaculates were obtained from 10 bulls (4 Gir; 3 Surti and 3 Murrah buffalo) and were evaluated macro- and micro-scopically. Findings of the research project entitled 'AICRP on Nutritional and Physiological Interventions for Enhancing Reproductive Performance in Animals, the research works approved include (i) Study the causes of non-infectious infertility & its ameliorative measures in dairy animals

of Gujarat, (ii) Molecular approaches to identify specific gene markers for infertility in dairy animals, (iii) Validation of biherbal formulation in treatment of infertility in dairy bovines, and (iv) Validation of synchronization protocols: Ovsynch, DoubleSynch, CIDR and CIDR+PMSG in anoestrus and/or repeat breeding dairy animals. The results are presented in the report. According to results on 273 animals (Gir, Kankrej and CBHF cattle and Surti, Jaffarabadi and Mehsani buffalo) for SNP genotyping and fertility related 6 genes, only LHCGR3 showed appreciable difference in gene frequencies between fertile and infertile crossbred cattle, but not in indigenous cattle or buffalo. 'T' allele was more prevalent in infertile and 'C' allele in fertile crossbred cattle. This gene was further studied in 83 crossbred calves below 1 year of age to predict their future fertility. Use of biherbal pulverized formulation of leaves of *Aegle marmelos* and *Murraya koenigii* in anestrus, repeat breeder and endometritic bovines modulated cyclicity/infection and improved conception rate to almost double than controls. Both the CIDR and Ovsynch protocols were efficacious in terms of estrus induction and conception in infertile cattle and buffaloes. For treatment of crossbred cows with follicular cysts, Ovsynch + CIDR protocol appeared to be promising than Ovsynch alone (70 vs 60% CR), and for luteal cysts Modified Ovsynch protocol was promising than double PG (69 vs 56% CR).

Veterinary Clinical Complex

During the year total of 16909 cases were treated under Veterinary Clinical Complex (VCC). Out of total cases treated, 9252 (54.72%) were freshly registered cases and rest were the repeat cases. The daily OPD case average in the hospital was 58.51 per working day during the year under report.

The species-wise case distribution was: 5129 (55.43%) Canine, 2634 (28.47 %) Caprine, 316 (3.42%) Equine, 217 (2.35%) Bovine, 202 (2.18%) Avian, 215 (2.32%) Bubaline, 98 (1.06%) Ovine, 11 (0.12%) Cameline and 430 (4.65 %) other species. Total of 1268 laboratory samples were examined in the diagnostic laboratory of VCC. They were fecal – 483 (38.09 %), whole blood 285 (22.48 %), blood smears 348 (27.44 %), skin scrapping 142 (11.20 %). A total of 134 cases were given treatment under emergency after office hours and during holidays at VCC. Fifty-eight major surgical operations and 107 minor surgical operations were performed during the year.

Veterinary Pathology

Following Work carried out during the year

- ◆ Under Etiopathological studies on mortality in broilers. The above scheme is aimed to identify the important prevailing diseases of broilers in the state as well as to provide guidelines to the poultry farmers for the prevention, treatment and control of diseases in broilers. During the year 2019, 6440 carcasses of broiler birds were received for the post mortem diagnosis. These data were analyzed and major disease conditions recorded were Colisepticaemia, Low Pathogenic Avian Influenza and its concurrent infections with *E. coli* and *Mycoplasma*, Infectious Bursal Disease Mycotoxicosis, CCRD, Yolk sac infection, Salmonellosis and
- ◆ Under Carcass Collection Scheme. During the year 2019, total 108 carcasses of animals and 2655 carcasses of layer type birds were received for post mortem examination. Disease conditions recorded were classified. During the year 530 tissue specimens from various parts of Gujarat state were received for histopathological diagnosis and the

results were classified. It also provided useful material for undergraduate and postgraduate teaching for better understanding of the subject of Veterinary Pathology

Veterinary Surgery and Radiology

A total of 1864 major / minor surgical interventions / radiographic examinations/ Wild life/ emergency/ambulatory treatment were done in the Department of Surgery & Radiology. 131 Surgical indoor cases were admitted for pre and post operative treatment and management at surgical indoor ward of Surgery Department. Camps and expertise services were provided to Panjarapoles, farmers of different districts, A. H. Department, Gujarat State and Co-operative dairies and forest department as and when required.

4.11 DAIRY SCIENCE

Dairy Technology Department

The Dairy Technology department is involved in teaching undergraduate B.Tech. (Dairy Technology) students as well as PG courses in the subject of Dairy Technology and guiding M.Tech. (Dairy Technology) and Ph.D. (Dairying) students. The department submitted three recommendations at the 15th combined Agresco, meeting which was held at Anand from 29 April to May 1st, 2019 viz. Technology development for Moraiyo (*Panicum miliare*) Kheer, carrot rabdi and extended shelf life dietetic basundi. The dairy technology department has focused research on value addition to dairy products through use of fruits, vegetables and cereals and other functional ingredients and extension of shelf-life of dairy products.

The department also conducted analysis of milk and products on payment basis and provided technical assistance for

manufacture of milk and milk products to industry as and when required. The department conducted trials for development of camel milk kulfi, goat milk Feta cheese and Camel and goat flavoured milk for Access Livelihoods Consulting India Limited, Hyderabad, Telangana, India. A one-day demonstration of the product recipes to the 30 members of pastoral community entrepreneurs was organized and generated revenue for the University through consultancy. The department involved in carrying out research projects funded by GOG through Plan schemes as well as for the departmental research viz. Development of Dairy Starter cultures and value added dairy products; Preparation of dairy/non dairy analogue cheese of processed cheese and Mozzarella type and Enhancement of shelf life of indigenous milk products.

Output during the year 2019-20

Technology for development of fermented milk powder

Variation in the fat (thus TS) content of milk had a significant influence on the proximate composition and physico-chemical properties of the feed mixes; such change led to significant effect on the composition of resultant spray dried *Fermented Milk Powder* (FMP). Double toned milk *dahi* based FMP scored maximum for flavor (powder and reconstituted) as well as for total sensory score and had acceptability comparable to market samples of *chaas*. Thus, DTM based FMP was selected for further study. Investigation for optimization of drying parameters and incorporation of bulking ingredients was done this year.

Technology for manufacture of milk based multigrain Ladoo

- ◆ Open pan roasting method was concluded to

be superior compared to microwave roasting for preparation of multigrain Ladoo.

- ◆ Milk based multigrain *Ladoo* made using 60 per cent *Khoa* (w/w of flour) and 80 per cent ghee (w/w of flour) had superior sensory scores.
- ◆ The recommended recipe for multigrain *Ladoo* includes 15% ragi, 54.79% pearl millet, 30.21% chickpea flour on weight by weight basis and 80% sugar by weight of flour.

Evaluating Mango Leather as a Natural Adjunct Flavouring for ‘Mango Tid-Bits Ice Cream’

Trials for development of a technology for preparing ‘Mango Tid-Bits’ ice cream utilizing Alphonso mango pulp and mango leather as an adjunct flavouring were carried out during the year. It was found that the presence of mango leather particulates in mango based ice cream enhances the acceptability of the resultant ice cream.

Value addition to Mozzarella Cheese Analogue through incorporation of Whey Protein and Vitamin A

Trials for development of Mozzarella cheese analogue utilizing palm oil based fat, enriched with whey protein and vitamin A, having desired baking qualities as pizza topping were carried out during the year.

Process optimization for manufacture of ready-to-reconstitute *kheer*

A technology developed by Anand Agricultural University for manufacture of ‘ready-to-reconstitute *kheer*’ by employing vacuum tray drying for quick cooking rice and spray drying for Pre-mix formulation. The developed ‘ready-to-reconstitute *kheer*’

has a shelf life of up to 6 months at 37±2°C when packaged in Met-PET/PE pouches.

Dairy Chemistry Department

The Dairy Chemistry department is working on following main three research areas:

Developments of Methods for Detection of Adulterants in Milk and Milk Products.

Development of nitrogen distribution based approach to detect adulteration of milk with non-protein nitrogenous compounds. The methodology was developed for detection of adulteration of non-protein nitrogenous compounds in milk

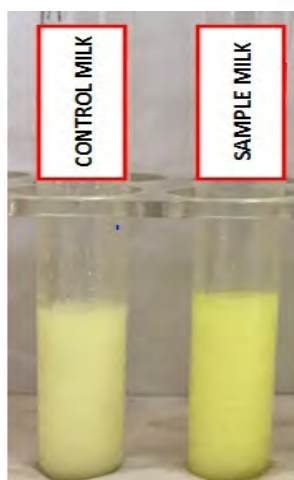
Evaluation of selected natural food additives for their suitability to enhance the quality of dairy products.

- ◆ Evaluation of selected herbs as natural antioxidant for ghee. The reduction of oxidative deterioration of ghee can be achieved by incorporating dried betel leaves particles during ghee preparation.
- ◆ Evaluating selected spices for extending shelf life of cultured buttermilk. A cultured buttermilk was developed from fermentation of paneer whey.

Utilization of whey in dairy and food products

Utilization of whey in common bakery products. The whey was used by replacing some of the quantity of water in preparation of common bakery products.

- ◆ Methodology developed by Anand Agricultural University for detection of adulteration of non-protein nitrogenous compounds in milk based on ratios of nitrogen fractions (TPN/NPN and CN/ NPN) is recommended.



Urea



Ammonium sulphate

Validation of approach for urea and ammonium sulphate containing milk

- ◆ Anand Agricultural University recommends addition of dried coarse particles of betel leaves @0.3% of the expected yield of ghee at the final stage of heat clarification process during the preparation of ghee for reducing oxidative deterioration of ghee.
- ◆ Anand Agricultural University has developed

a cultured buttermilk by blending 60% dahi with 40% paneer whey fermented by *L. helveticus* MTCC 5463 and added with 1% cumin powder and 0.02 % cumin oleoresin. It can be stored up to 7 days at refrigerated ($7 \pm 1^\circ\text{C}$) in PET bottles.



Cultured buttermilk prepared using fermented whey

- ◆ Anand Agricultural University recommends use of whey in place of water in making the dough/batter for the bakery products. Cheddar cheese whey can be used upto 50% for toast and cake, 75% for bun and 100% for



Biscuits with and without whey

pitza base, while paneer whey upto 50% for *khari* and 100% for biscuits. Incorporation of whey improved the sensory attributes of these bakery products without affecting their keeping quality.



Bun with and without whey

Common bakery products prepared using whey

Dairy Microbiology Department

- ◆ The Dairy Microbiology Department is a partner in a collaborative project on Development of Technology for the preparation of Fermented Rice Beverage in Meghalaya and evaluation of its functional properties, DBT, GOI.
- ◆ 25 well characterized LAB cultures isolated from traditional fermented milk products were submitted to NCVTC for accession numbers as part of ICAR funded NCVTC project.
- ◆ Research findings from ICAR sponsored NCVTC project was presented during the Ninth International Conference on “Fermented Foods, Health Status and Social Well-being” during Dec 13-14, 2019 held at AAU, Anand.
- ◆ Research findings from GSBTM sponsored project was selected by eminent jury members for presentation in the research work in competitive category in the 10th India Probiotic Symposium “Cutting edge science applications: Intestinal Microbiota and

Probiotics” organized by the Gutmicrobiota and Probiotic Science Foundation (India), at the Suryaa, New Delhi on 29th February and 1st March, 2020.

- ◆ Research findings from DBT funded Twining project was selected by eminent jury members for presentation in the research work in competitive category in the 10th India Probiotic Symposium “Cutting edge science applications: Intestinal Microbiota and Probiotics” organized by the Gutmicrobiota and Probiotic Science Foundation (India), at the Suryaa, New Delhi on 29th February and 1st March, 2020.
- ◆ Nine research papers were awarded the best poster/oral awards presented in various national and international seminars/conferences from different research projects in the Dairy Microbiology Department.

Dairy Engineering Department

- ◆ The R&D activities of Dairy Engineering Department are directed towards process mechanization of Indigenous Dairy products, mathematical modelling for many unit

operations and many need based research projects. Some of the important Technologies/ equipment developed are indicated below.

- ◆ Development of technology to utilise the solar power generated through solar PV panel system of 1kw capacity, to carry out various unit operations for milk processing like, chilling of milk, manufacture of *khoa* and manufacture of Ice cream through equipments having less than 1kw power consumption. The power generated from the solar system will help for sustainable processing and saves money.
- ◆ Development of double pipe four pass heat exchanger equipped with helical coil in the annular space and assisted by Evacuated Tube Type (ETC) solar thermal water heating system as heating source and PNG water heating system for back up heating.

4.12 ENGINEERING AND TECHNOLOGY

The six departments of the college, i.e., Soil & Water Conservation Engineering (SWE), Farm Machinery & Power Engineering (FMPE), Renewable Energy Engineering (REE), Processing & Food Engineering (PFE), Irrigation & Drainage Engineering and Basic Engineering & Applied Sciences are working to develop site specific or area specific technologies for progressive farming with enhanced returns through efficient management & utilization of natural resources (land, water, vegetation and energy), agricultural mechanization, agricultural processing and post-harvest technology. During the year all the six departments carried out research work on different topics. Following implements/ technologies were developed by different departments.

- ◆ Development and evaluation of mini tractor operated strip till multi crop planter cum fertilizer applicator
- ◆ Development of tractor drawn simple and low cost combined tillage tool
- ◆ Development of battery operated cutter
- ◆ Design and Development of Tractor-drawn Potato Harvester with Integrated Cart Elevator
- ◆ Development of electric motor operated maize cob dehusker
- ◆ Modification of Bullock Drawn Indigenous Wooden Plough For Tribal Region of Middle Gujarat
- ◆ Design and development of mini tractor drawn two row automatic potato planter cum fertilizer applicator
- ◆ Conjugate Assessment of Drip Lateral Spacing and Irrigation Regimes on Productivity of *Rabi* Maize
- ◆ Estimation of Evapotranspiration Using MODIS and Landsat-8 Dataset in a Selected Semi-Arid Region of Middle Gujarat
- ◆ Development of rapid measurement system for angle of repose of grains
- ◆ Evaluation & Modification of sun drying practices for maize cobs
- ◆ Development of perforated storage bin for garlic
- ◆ Optimization of process parameters for protein fortified Kesar Mango Leather.
- ◆ Drying of beetroot (*Beta vulgaris L.*) and Tomatoes (*Lycopersicum esculentum*)
- ◆ Design and development of multipurpose solar food processor

- ◆ Effect of Light Intensity and Color on growth performance of rose in net house
- ◆ Performance evaluation of ARDUINO Based Wireless Soil Moisture Sensor
- ◆ Evaluation of different types of ground wheel for sowing and planting machine.
- ◆ Quality assessment of water samples (pre and post monsoon season) of open wells of CAET campus
- ◆ Development of ro-procating sprayer for weedicides
- ◆ Online Leave Management System

4.13 FISHERIES SCIENCE

In order to create awareness among the farmers for adopting fish farming and to utilize available resources in a fruitful manner for generating employment opportunities in rural youths, a systematic full-fledged training cum demonstration centre can play a vital role in enhancement of fresh water fish production and therefore, to cover all the basic requirements of fish farming strengthening of training cum demonstration centre has been envisaged at KVK, AAU, Devataj with following objectives.

- ◆ To impart training on methods of site selection, fish pond construction and economics.
- ◆ To conduct demonstration on fresh water Fish/Prawn cultivation techniques.
- ◆ To organize training on Aquarium fish culture and breeding techniques.
- ◆ To impart the scientific technical knowledge on village tank fish culture through training.

The trainings have been carried out at grass root level by identified fisheriesthrust areas

on the basis of Inland Fisheries Resources and fish production of middle Gujarat. It has been found out the needs of the training and encourage farmers for fish farming through Fish seedrearing at village tank, Carp breeding and hatchery management, Composite fish culture through village pond and Fresh water prawn culture management. One training programme was conducted in the subjects of Fresh water prawn culture management in which total 28 farmers were trained.

Under extension activities, celebration of National Fish farmers' Day, participation in Gosthi, one Exhibition, 19 field & diagnostic visits, 38 farmers visit to center, 3 Lectures delivered, 2 Press note and 93 Advisory Services have been carried out in this year. Also one publication leaflet was made on "Breeding and seed production of Gold fish" in vernacular language.

4.14 HOME SCIENCE

Polytechnic in Food Science and Home Economics is actively involved in research work apart from teaching and extension. During the year, three ongoing research projects were carried out by the polytechnic as follows.

Ongoing projects

- ◆ Development of omega rich cake using omega rich raw materials
- ◆ Development of soya milk bread
- ◆ Assessment of eating attitude among AAU students residing in hostel

4.15 OTHER AREAS / LABORATORIES

(A) Pesticide Residues

Following trials were conducted by Pesticide

Residue Laboratory during the year 2019-20.

Work carried out during year 2019-20 (in brief)

I Other Agency Trials Routed Through ICAR

1. Residues and persistence of fluopicolide 4.44 + fosetyl Al 66.67 WG (Profiler) (2nd season)in citrus
2. Residues and persistence of acetamiprid 25 + bifenthrin 25 WG (GPI 515)in soybean
3. Residues and persistence of flubendiamide 90 + deltamethrin 60 SC (Fenos quick 150 SC)in chilli
4. Residues and persistence of metalaxyl-M 31.8 ESin chilli
5. Residues and persistence of azoxystrobin 18.2 + difenoconazole 11.4 SCin banana
6. Residues and persistence of fluopyram 400 SC (2nd Season)in banana
7. Residues and persistence of metalaxyl-M 31.8 ESin maize
8. Residues and persistence of clodinafop 12.25 + oxyfluorfen 14.7 (UPH 716)in onion
9. Residues and persistence of metalaxyl-M 3.9 + mancozeb 64 WG (GPF 616)in potato
10. Residues and persistence of fosetyl Al 80 WP (Aliette)in bengal gram
11. Residues and persistence of mancozeb 52.6 + hexaconazole 2.4 WG (UPF 209b)in chilli
12. Residues and persistence of novaluron 9.45 + lambda-cyhalothrin 1.9 ZC (GPI 1316)in redgram
13. Residues and persistence of tebuconazole 50 + trifloxystrobin 25 WG (Nativo)in okra
14. Residues and persistence of tebuconazole 430 SCin tomato
15. Residues and persistence of trifloxystrobin 3.5 + propineb 61.3 WG (Flint Pro)in tomato
16. Residues and persistence of beta-cyfluthrin 90 + imidacloprid 210 OD (Solomon)in onion
17. Residue and persistence of carbendazim 12 + mancozeb 63 WP (SAAF) in soybean
18. Residues and persistence of azoxystrobin 4.7 + mancozeb 59.7 + tebuconazole 5.6 WG (GPF 215) in cucumber

II. GAP Trials

- NIL -

III. NABL activities (ISO/IEC 17025:2005): The NABL accreditation of the laboratory is granted up to 29-06-2020. Online application for the Renewal of Accreditation has been submitted with revised scope.

- ♦ Studies on the estimation of pesticide residues for agricultural commodities at Anand: Plan Project, Govt. Of Gujarat
- ♦ Studies on pesticide residue analysis from food, feed, water and soil for food safety in Gujarat :Plan Project, Govt. Of Gujarat
- ♦ Monitoring of surface and ground water for pesticide residues in the SSP command Phase-I area: Project Sponsored by SSNNL
- ♦ Monitoring of surface and ground water for pesticide residues in the SSP command Phase -II area: Project Sponsored by SSNNL
- ♦ Monitoring of pesticide residues at national level : Project Sponsored by Ministry of Agriculture & Family Welfare, Govt. of India

(B) Agril Ornithology

Following research work was carried out in the project of Agril. Ornithology

Predation of insect pests by cattle egret in chickpea agroecosystem.

The observation on cattle egret distribution and its abundance was conducted in AAU campus during October 2019 to January 2020. The relative abundance of cattle egret was highest (78.92 %) in bird community followed by Common myna (12.91 %) and Red naped ibis (5.40 %). The cattle egret (78.92 %) was found dominant in bird community. Overall mean number of birds observed in community was highest of common myna 14.00 birds followed by cattle egret and black headed ibis. Over all mean number birds observed in various crops was highest in castor crop (24.50 birds) followed by Ragi and Tomato where it was 21.00 birds. The success strike was observed highest in cattle egrets foraging in weed plot (5.80 strikes/min) followed by beet root, castor, lucerne and musk melon crops where it was 4.00 strikes per minute.

Estimation of damage caused by Rose- Ringed Parakeet (*Psittacula krameri*) in pomegranate

The depredations of rose-ringed parakeet (*Psittaculakrameri*) on Pomegranate in farmer's field, Average 17.57 birds were recorded in pomegranate orchard during morning while it was recorded average 11.59 birds during evening. Difference in bird visitation during evening and morning period was found statistically significant ($P > 0.01$). The fruit damage was recorded 0.88 % and 0.55 % in morning and evening period, respectively. Parakeet depredation was found statistically significant differences ($P > 0.01$) by t-test. Out of 20 sampled trees tested, 2300

number of total fruit, 111 was damaged and 2187 number were healthy. Average per cent fruit damage was 4.84 while fruit yield was 95.06 per cent. Total weight of damaged fruit and healthy fruit was 17.68 kg and 346.86 kg, respectively.

Assessment of Rose- Ringed Parakeet (*Psittacula krameri*) depredations to guava fruits

The depredations of rose-ringed parakeet (*Psittacula krameri*) on guava orchard was conducted at AAU campus during year 2019. The mean number of parakeets recorded was 87.85 birds during morning and 62.92 birds in evening hours. The parakeet number observed during morning was significantly than it was recorded in evening hours. During study period, total damaged fruit recorded was 8.10 fruits per tree and yield loss recorded was 1.28 kg/tree and 16.65 per cent.

Effectiveness of egg solution to deter birds visiting musk melon crop fields

The experiment was conducted at Main Vegetable Research Station, Anand during May 2019. Total 1000 sq. m. area of musk melon crop was protected by spraying fermented egg solution @ 0.05 per cent and second plot was as control. The bird visiting treatment plot was recorded and presented here. Total 34 observations were recorded for number bird visited treatment plots. The mean number of birds visited egg solution treated musk melon field (2.27 birds) was significantly low compare to it was observed in control plot (29.00 birds) ($t = 7.02$, $df = 33$, $P < 0.01$). The egg solution has effectively deterred the birds visiting the crop field.

Role of insectivorous birds in suppression of fruit borer, *Helicoverpa armigera* (Hubner) in tomato

Total 11 insectivorous bird species was recorded in experimental plot. Mean number of insectivorous birds recorded in open area was (40.63) in morning, (28.45) in afternoon and (31.45) in evening. Mean number of insectivorous birds recorded in perch area was (44.54) in morning, (36.45) in afternoon and (37.27) in evening hours. Red vented bulbul (*Pycnonotus cafer*) observed in higher average number (44.67), (49.33) while Pigeon (*Columba livia domestica*) observed in lowest average number (26.33), (34.33) in open and perch plot, respectively. Highest average number of larvae (10.77) observed in net plot while lowest average number of larvae per ten plants (6.63) was observed in perch plot. So, all the treatments were differing from each other and statistically best treatment was perch plot which have 7.44 kg average healthy fruits were observed while 0.63 kg damaged fruits were recorded. Foraging activity of birds was recorded during October-2018 to March-2019. Highest successful number of attempt was observed by common Myna (*Acridothera tristis*) (26) while lowest successful number of attempt was observed by Red vented bulbul (*Pycnonotus cafer*) (13) out of six bird spp.

Evaluation of nest box design (Entrance hole size) for various cavity nesting birds

Out of 72 nests, the nesting activity of Indian monitor, Squirrel, Rose-ringed parakeet, Common myna, House sparrow and Spotted owl was recorded in nest boxes. Out of 72 nest box 2 nest were occupied by Indian monitor, 24 by Squirrel, 18 by Rose-ringed parakeet, 37 by Common myna, 1 by House sparrow, 8 by Spotted owl and 1 by Bank

myna, out of total 72 nests observed all (100%) nest was occupied in the second year of installation. The number of nest occupied by birds were increase with progression of breeding season.

Ecological significance of wild fleshy fruit trees for conservation and management of depredatory and predatory birds

Total 8 species of birds and 195 birds were recorded on fleshy fruit tree located at Anand Agricultural university campus in year 2019. Results presented in table reveal that coppersmith barbet (30.26 %) was dominant bird species and it followed by yellow footed pigeon (20.00%) and Asian koel (15.38 %).

Identification of breeding colonies of Painted stork in Gujarat

Total 64 nesting sites were surveyed during October-January 2019. Total 27 colonies of painted storks were identified and it is reported here. Total 4122 nests were recorded; the highest number of nest were recorded in Pil garden (Bhavnagar) (817 nests) followed by Charal (537 nests). It is revealed that distribution pattern of nesting sites is random. Colony distribution map is prepared. Most of the colony were having successful colonies breeding and raised chicks successfully.

Identification of breeding colonies of Open-billed stork in Gujarat

Total 32 nesting sites from Gujarat was reported and presented in GIS map (Figure). Out of 32 sites visited, 12 sites having an active nest and successfully raised the young ones. Total number of nests of Open-billed Stork recorded was 1697 nests. Highest number of nests in colony was recorded at Madhi (500 nest) followed by Chalthana (300) sites. It is revealed that distribution pattern of nesting sites was random.

(C) Micronutrients Research Project

Brief results of the work carried out during the period under report are given below.

- ◆ Delineate and reassess the changes in secondary and micronutrient fertility in soils of predominant cropping system based on soil and plant analyses was started to know the depletion or build up over the years and also for updating the maps for the different micro and secondary nutrients in soils of Gujarat. Surface soil samples were collected using GPS and following standard sampling protocol from different villages of Narmada (177) and Vadodara (333) districts. Analytical work of collected soil and plant samples is under progress.
- ◆ Study was undertaken to find out micronutrients distribution in soil profiles of major soil orders of Gujarat under different land uses for a very long period (>30 years) for soils. Total 14 profile soil samples have been collected from 0-20, 20-40, 40-60, 60-80, 80-100 cm depth from grazing land (2), forest land (2) and agriculture / horticulture land (10). Analytical work of collected profile soil samples is under progress.
- ◆ To establish the critical limits of S in soil, fifteen (15) fields from different villages of Dediapada taluka of Narmada district were identified on the basis of low, medium and high S status of soil. It is found that the critical limit of 0.15 % CaCl₂ extractable sulphur in soil was 10.6 mg kg⁻¹ by graphical procedures and 10.5 mg kg⁻¹ by the statistical procedure for chickpea crop.
- ◆ Organic manure is important in maintenance of micronutrient status under continuous cropping in loamy sand soils of Anand and also significantly improved grain, straw and total yields of bajri, mustard and cowpea crops due to FYM application.
- ◆ Experiment on to determine the rate and frequency of Zn application of maize-wheat cropping system in loamy sand soil has been completed. The compilation of the six years' data for pooled analysis and fraction study of Zn in soil after completion of the experiment is under progress.
- ◆ Application of either 1.5 kg B ha⁻¹ every year or application of 2.0 kg B ha⁻¹ / 1.5 kg B ha⁻¹ alternate year was found beneficial (5th year) under the phasing of B application on fate of B pools in groundnut-cabbage cropping system in loamy sand soils of middle Gujarat.
- ◆ Under the study to assess the efficacy of heavy metals tolerant native bacterial culture for bioremediation of heavy metals using multi-cut forage sorghum, results revealed that an application of different bacterial culture significantly affected the dry matter yield at 1st, 2nd, 3rdcut as well as total dry matter yield of sorghum crop. The significantly higher dry matter yield at 1st, 2nd, 3rdcut as well as total dry matter was observed in M5 (Consortium (combination of 1 to 4) followed by M4 (Micrococcus terreus) and M2 (Bacillus infantis) culture as compared to no culture.
- ◆ The investigation was undertaken to study the effect of different macronutrients and foliar spray of micronutrient on growth, yield attributes and yield of Bt cotton on heavy black soil of middle Gujarat with the collaboration of Narmada Irrigation Research Project, Khandha, Vadodara.
- ◆ Impact assessment of bio fortification method of farming on rise of haemoglobin among school going girls fed with meal prepared

by using enriched soil for food grains in Vansada taluka of South Gujarat, India. The results concluded that such a trial over a larger sample with a range of biofortified food over a reasonably longer period is needed to detect changes in objective outcome such as laboratory finding in case of gain in haemoglobin and several other haematological indices. Similarly, still longer duration is needed to anticipate gain in BMI values of school going girls from rural families.

- ◆ To assess the heavy metals contamination in agricultural produce in peri urban areas of Gujarat, different soil (44), grain (25), plant (42), fruit (3), water (10) samples were collected from surrounding areas of Anand and Kheda district. The comparison of average content of nutrients in soil of two locations using effluent or tubewell revealed that, higher nutrient contents were observed in soil where effluent water was used for irrigation over tubewell water except cobalt.
- ◆ Different vegetable samples (51) were collected from agricultural market of Anand (Dist. Anand) and Padra (Dist. Vadodara). Comparison of different vegetable families from various locations revealed that Ni, Cr and Co contents found higher in Leguminosae family of vegetables whereas Pb and Cd were found higher in Malvaceae family of vegetables. The contents derived from various vegetables revealed that micronutrient and heavy metal contents from different locations found below permissible limits of European Union Standard and Indian Standard.
- ◆ To assess the effect of organic manure on crop, cropping system/pattern various crop produce and input materials have been tested for micronutrient and heavy metal contents. Application of Anubhav bacterial

biodegradable consortium (ABBC) to various crop residues has beneficial effect and nutrient contents in compost increased over control. The heavy metal contents found in compost were below the permissible limit of FCO standard. The effect of organic manure on various crop derived that addition of organic manure i.e. FYM or vermicompost increased the micronutrient and heavy metal contents in soil, grain and fodder samples.

- ◆ The application of sulphur @ 20 kg ha⁻¹ improved chickpea grain and stover yield as well as sulphur contents in both in all the experiments of chickpea in Narmada district. Therefore, farmers are recommended to apply sulphur @ 20 kg/ha alongwith NPK RDF as basal.
- ◆ Total 5770 soil /plant /feed /fodder /blood /effluent /fertilizers samples have been analysed and recommended/suggested to the farmers/ PG students/ entrepreneurs/ private agencies etc. accordingly.

(D) Agril. Entomology, BACA, AAU, Anand and Vaso

Following research work has been carried out during the year.

- ◆ Neem seed kernel extract 5 %, neem oil 0.5 % and neem leaf extract 10 % were more effective in reducing mango hoppers incidence. However, *Beauveria bassiana* 5 % WP, *Lecanicillium lecanii* 1.15 % WP and *Metarhizium anisopliae* 1.15 % WP @ 40 g were found mediocre in their effectiveness against *Amritodus atkinsoni*. The treatments, ginger rhizome extract 5 % and garlic bulb extract 5 % were found least effective in reducing the incidence of *A. atkinsoni* infesting mango.

(E) Plant Pathology, BACA, AAU, Anand

Following research work has been carried out during the year.

Achievements

◆ Evaluation of efficient *T. asperellum* (Ta1 AAU isolate) against wilt and root rot in chickpea

All the treatments gave significantly higher germination percentage as compared to treated check T₆ (Treated check with *M. phaseolina*) and T₅ (Treated check with *Foxysporum* f.sp. *ciceri*) which gave the lowest germination percentage (77.53%) and (77.73%), respectively. Significantly highest root length (9.07 cm), shoot length (23.37cm) and highest vigour index (2863) was recorded in Treatment T₄ (Seed bioprimering for 10 hrs. with suspension of solid talc based bioformulation (2x10⁸ cfu/g) of *T. viride* @ 50g in 250ml of water/kg of seed + soil application of *T. viride* enriched FYM (10g *T. viride* /kg FYM) @ 100 g/m² of soil/furrow) as compared to T₆ (Treated check with *M. phaseolina*) and T₅ (Treated check with *F.oxysporum* f.sp. *ciceri*). Lowest wilt (6.82%), root rot (9.67 %) incidence and highest grain yield (1353 kg/ha) was observed in treatment T₂.

The result revealed significant lower disease intensity of early and late tikka *i.e.* 31.31% and 31.36% , respectively in case of plants treated with Pyraclostrobin 13.3% + Epoxiconazole 5% SE, whereas other treatments were found at par with each other.

Maximum pod yield (2472 kg/ha) was recorded in plot treated with Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.075%

followed by plot treated with Pyraclostrobin 13.3% + Epoxiconazole 5% SE which yielded 2374 kg/ha. Minimum yield was recorded in control plot (2052 kg/ha).

◆ Management of foliar diseases of turmeric through fungicides

Result revealed that among all the treatments, treatment T₅*i.e.* Azoxystrobin 18.2% + Difenconazole 11.4% SC, 0.030% @ 10 ml in 10 L of water recorded lowest disease intensity of 22.22% and 14.44% with highest disease control of 73.33% and 69.06% for leaf blotch and leaf spot diseases, respectively which was at par with treatment T₆*i.e.* Azoxystrobin 18.2% + Difenconazole 11.4% SC, 0.038% (24.44%, 16.67% DI) and treatment T₇*i.e.* Azoxystrobin 18.2% + Difenconazole 11.4% SC, 0.023% (25.56%, 18.89% DI). The control treatment recorded highest disease intensity of 83.33% and 46.67% for leaf blotch and leaf spot diseases, respectively. The rhizome yield of turmeric is yet to be obtained.

◆ Survey of pulse crop for viral diseases and characterization of viruses infecting urdbean, mungbean, mothbean, soybean, clusterbean and pigeon pea in Kheda, Vadodara, Panchmahals and Ahmedabad districts.

A random survey was conducted in urdbean and mungbean sowing areas of Ahmedabad, Mehsana, Banaskantha and Tapi districts. The incidence of ULCV and MYMV was ranged from 0.0 to 8.0 % and 0.0 to 5.0, respectively.

Soybean varieties JS 9041, JS 1, JS 2 , NRC 37 and JS 335 cultivated in certain pockets of Anand, Dahod and Vadodara districts were monitored for the incidence of soybean mosaic virus (SMV) disease. Among the 19 farmers' fields surveyed, none of the farmer's field found infected with SMV.

- ♦ **Monitoring and detection of rice bunt in processed, unprocessed and farmers' seed sample, and bacterial leaf blight & bacterial panicle blight at farmer's field**

Samples of bunt infection from 104 farmers was ranged from 0 to 3 % whereas, in unprocessed seed was observed in the range of 0 to 5 %. BLB and Panicle blight were not observed in any of the field surveyed.

- ♦ **Studies on seed health status of farmers own saved seed of rice**

Standard NaOH seed soak method was used to detect bunt in paddy seed samples; blotter plate test revealed seed discolouration (0-10%), seed rot (0-7%), seedling rot (3-30%) and associated mycoflora (0-40%).

- ♦ **Standardization of methods of detection of seed borne pathogens of significance**

NaOH seed soak method was found best method for detection of bunt in rice seeds.

(F) Food processing Technology and Bio Energy

Developed production technologies/processes of premium quality powder of carom (ajwain) and black pepper by using cryogenic grinding, process of micronutrient rich powder production, extension of shelf life of bread using suitable ingredients, functional low calorie muffins, Ready-to-Rehydrate type of rice, super critical extraction of essential oil from Ajwain (Carom seed) and Black pepper, technologies for value added products from pumpkin seeds, gamma irradiation on keeping quality of groundnut and sapota fruit, antidiabetic and antioxidant rich cookies and health drink using Garden Cress Seed. And effect edible coating on

shelf-life of sapota fruit; γ -irradiation, UV radiation and Ozonation techniques were studied on decontamination of pesticides in selected crops, bio-chemical characterization of *Moringa oleifera* leaves and pods, energy use assessment in selected food processing plants and also evaluated purity of silver foil used on sweets in rural area.

Following ongoing research work has been carried out during the year.

- ♦ Studies on Quality Changes and Aging Effect in Selected Rice Varieties under Different Storage Conditions
- ♦ Development of a Portable Ripening System for Selected Fruits
- ♦ Varietal evaluation of selected fruits and vegetables for respiration rate under the steady state storage condition
- ♦ Effect of Different Pretreatments on Mature Banana for increasing the shelf life
- ♦ Technology for Production of Indian Gooseberry (Aonla) Murabba
- ♦ Development of Production Technology for Vegetable Based Juice from Carrot and Tomato
- ♦ Process development of cereals based product enriched with garden cress for lactating women
- ♦ Standardization of moringa pulping technique using brush type pulper
- ♦ Screening, Characterization and Identification of Conjugated Linoleic Acid Producing Lactic Acid Bacteria
- ♦ Development of Analytical Protocol for Detection of Aflatoxins in Selected Foods
- ♦ Technology for Extraction of Carvone and Limonene rich Essential Oil from Dill Seed

- ◆ Super Critical Fluid Extraction of Essential Oil from Fennel Seed
- ◆ 13 Development of irradiation technology for agricultural, animal, dairy and food products. (SubTitle: Technology for continuous microwave (Irving of Moringa oleiferu (Drumstick) leaves)
- ◆ Study of temperature and velocity distribution in a beat pump assisted dryer by computational fluid dynamics
- ◆ Study on performance of grid connected 20 kW solar Photo-Voltaic system
- ◆ Development of fuzzy logic controller for effective garden irrigation

(G) Agricultural Information Technology

This institute prepares human resources in the field of Agriculture Information Technology (AIT) as a tool to sharpen the edges of the agriculture structure in the country. It takes the onus to develop and hone the sector and its changing environment. College/Faculty is equally involved in IT related agricultural research projects and carried out research as under.

- ◆ Effect of magnetic field on germination and seedling growth of cumin
- ◆ Interface Module for Inversion of Canopy Radiative Transfer Model PROSAIL
- ◆ Web based Climate Data Processing and Analysis Tools
- ◆ Atmospheric correction module with standalone interface for GeoTIFF imagery using SixS(6S) model
- ◆ Transformation of Information through Multimedia based Interactive media for Castor Crop
- ◆ Transformation of Information through

Multimedia based Interactive media for Organic Farming

Information Technology Center

The Information Technology Center caters the demand for the use of Information Technology at Anand Agricultural University. The Director, IT took the measures to carry forward the IT activities like hardware and software at various levels. During the year, substantive work was done related to the technical, administrative matters and also pertaining network problems at university.

Different online projects of AAU have been maintained and updated regularly by the IT Center. Some of the projects are listed below:

- ◆ AAU web application (<http://www.aau.in/>)
- ◆ AAU web Mail (<http://mail.aau.in>)
- ◆ Online Tour programme (<http://tour.aau.in>)
- ◆ Online billing system (<http://account.aau.in/>)
- ◆ Payroll application and Tally
- ◆ Smart Classroom - Virtual classroom
- ◆ Live streaming of the different event of the AAU

Projects developed/recommended during the year

- ◆ Breeder Seed Management System for Government of Gujarat
- ◆ Online Repository and Analysis of Fall Armyworm (FAW) for Government of Gujarat

(H) Agricultural Meteorology

The following research work was carried out during the reporting period.

Agro-climatic resource characterization

Climatic rainfall data of 26 stations were used to determine normal onset, cessation and length of rainy season. Onset can be considered as normal period for starting of *kharif* season and may helpful to planning and decision making for *kharif* season. The agroclimatic onset is determined by defining onset date as the first wet day of the 3 days' spell receiving at least 20 mm after 1st June and not followed by 10 day dry spell ($<2.5 \text{ mm day}^{-1}$). Cessation date of rainy season at a station is taken as the date after 1 September which followed by a 15-day dry spell. Year wise onset and cessation dates were determined over the time series of each stations.

- ◆ Agroclimatic onset for *kharif* season is in progression from South East to North West of the state with time and vice versa in cessation.
- ◆ South Gujarat has early onset from 8th June and it cover the entire state with last onset in Kutch on 6th July with large variation.
- ◆ Station wise end date of rainy season ranges from 6th September to 21st September in Gujarat. In general, 13th September can be considered as cessation date of rainy season for Gujarat state.
- ◆ Length of rainy season at different stations prevail from 66 days (at Bhachau) to 96 days (at Ubharat) with mean period of 81 days.

Crop weather relationship and Crop growth simulation modelling of *kharif* pearl millet

Crop weather relationship and simulation modeling of *kharif* pearl millet was studied using experimental data of year 2019 under rainfed condition. The experiment involves three cultivars of pearl millet viz; GHB 538, GHB 558 and GHB 744 with three sowings during onset of monsoon to twenty days after monsoon onset.

- ◆ Sowing of pearl millet at onset of monsoon provides favourable growing environment compared to late sowing.
- ◆ Cultivar GHB-744 performed better than other tested cultivars (GHB 558 and GHB-338) in all the growing environment under the study.
- ◆ Heat unit requirement of pearl millet is 1428-1455 °C day to complete its life cycle.
- ◆ The model simulation was relatively accurate for almost all the tested parameters.
- ◆ Growth of the crop was adversely affected by heavy rainfall events during *kharif* 2019. So experimental result do not include inferences from the *kharif* 2019 experiment

Development of weather based models for predicting outbreak of mustard aphids

Mustard aphid index and weather relation studied using experimental data of 16 years (2002-03 to 2018-19). The field experiments were conducted on cultivar Mustard GM-2 under four sowings during period of 10 October to 10 November of year.

- ◆ Flowering to seed development phase is the most crucial time for aphid infestation.
- ◆ Aphid occurrences observed during flowering to seed development phase might be associated with prevailing high humidity condition for 1-5 days.
- ◆ High temperature may lower aphid intensity/infestation which occurs after 9-10 days in mustard.
- ◆ Mustard yield restricted to $<1500 \text{ kg ha}^{-1}$ when aphid population crosses aphid index value 1.7.

Crop weather relationship of mustard

Crop weather relationship of mustard was studied using field experimental data of

*rabi*2018-19. Three cultivars, BIO 902, GM 3 and GDM 4 were considered in experiments with four sowings during period of 10th October to 10th November in a year.

- ◆ Sowing of mustard on 10th October provides favourable growing environment for compared to late sowing.
- ◆ Cultivar GM3 perform better than Bio 902 and GDM 4 in all the growing environments under the study.
- ◆ Mustard requires 1516-1666 °C day heat units to complete its life cycle.
- ◆ Early vegetative to flowering initiation and seed development to physiological maturity are longer phenophases with heat unit requirement of >558 °C day and >427 °C day, GDD respectively.
- ◆ Seasonal photothermal quotient (PTQ) for mustard crop is 1.03 MJm⁻² day⁻¹ °C⁻¹.

AICRP- NICRA

Project activities were not carried out at any of the NICRA villages during year 2019 due to insufficient grant and non-availability of contractual staff (Young Professional-II and FIFs). Though, as second phase of the project ended with year 2019, project activities and achievements were compiled and reported to ICAR.

IMD-FASAL

Development of yield forecasting models based on weather parameters Techniques applied for development of district wise statistical models

◆ Mustard

The F2 stage crop yield forecasting models were developed for mustard using the weather data up to 31st January, 2020 for

Banaskantha, Mehsana and Patan districts. A strong relationship was found between actual yield and weather variables for the various districts. The coefficient of determination (R²) for Banaskantha, Mehsana and Patan were 0.81, 0.75 and 0.72 respectively. The mustard yield predicted of *Rabi*2019-20 for Banaskantha district is 1246 kg/ha while that for Mehsana district is 1914 kg/ha and for Patan district 1790 kg/ha.

Calibration and validation of SUBSTOR model (DSSAT 4.6) for three cultivars of potato under different sowing time.

Pre harvest forecast of agricultural production is essentially required for food security point of view. In this objective developed model for forecasting the yield of potato for three major potato growing district of middle Gujarat using regression technique. The actual yield data for the crops for which forecast was supposed to issue was collected for Directorate of Agriculture, Gandhinagar and weather data from the agro-meteorology surface observatories situated in respective districts. The mid-season and pre-harvest crop yield forecast of potato for Anand, Kheda and Vadodara was given.

Results

◆ Mid- season stage (F2) for potato (2017-18)

Crop yield forecasting models were developed during the *rabi* season 2017-18 using the weather data up to 12th February 2018 for Anand, Kheda and Vadodara. The R² was 0.68 for Anand, 0.60 for Kheda and 0.57 for Vadodara district (Table 1). In mid- season stage (F2) yield forecasting no model were found reliable for yield prediction of potato.

District wise yield forecasting for potato at mid- season stage (F2) for 2017-18

Sr. No.	Districts	Regression equation	R ²
1	Anand	$Y=23186.66+Z170*(4.12727)+Z21*918.0653+Z61*1266.199$	0.68*
2	Kheda	$Y=2689.730+Z11*2067.048+Z21*270.538+Z451*2.396$	0.60*
3	Vadodara	$Y=26820.3+Z131*66.9042+Z241*3.5661$	0.57**

Mid- season stage (F2) for potato (2018-19)

Again the crop yield forecasting models were developed during the *rabiseason* 2018-19 using the weather data up to 12th February 2019. The R² was 0.71 for Anand

0.67 for Kheda and 0.62 for vadodaradistrict (Table 2). The predicted yield of potato was 21184 kg/ha for Anand district for other two districts the models were not performing well.

Development of district wise yield forecasting for potato atmid-seasonstage (F2) for 2018-19

Sr. No.	Districts	Regression equation	R ²
1	Anand	$Y=64861.856+1021.264*Z11+1329.583*Z21-12.75*Z40+95.153*Z51$	0.71*
2	Kheda	$Y=74212.718+13.505*Z241+864.608*Z11$	0.67**
3	Vadodara	$Y=64212.319+1124.505*Z241+684.608*Z240$	0.62

Weather variable affected the tuber yield of Potato.

For Anand, Kheda and Vadodara districts the variables coefficients weighted Tmax (Z11), Tmax(Z11), RF (Z31) weighted rainfall*RH2 (Z351), rainfall*RH1 (Z341), RH2*RH2 (Z451) and Tmin*RH1 (Z241) were found to be significant.

forecast is received on every Tuesday and Friday for five days. Based on weather forecast, weather based advisories are pared for each districts of middle Gujarat and disseminated through various mass media viz. email, newspapers, AAU website /IMD website/ Farmers portal/ TV Channel / DD Girnar etc.

IMD- Gramin Krishi Mausam Sewa (GKMS)

Under GKMS Project district wise weather

- ◆ Times weather forecast received during the year : **102**
- ◆ AAS bulletins (7 districts and 4 Blocks) prepared and disseminated : **102**
- ◆ Mode of Mass communication: **AIR, TV and Newspaper, web site and SMS**
- ◆ Number of AAS bulletins published:

NayaPadkar	:	102
DivyaBhashkar	:	102
Sandesh	:	102
Gujarat Samachar	:	102
PratahKaal	:	102
SardarGurjari	:	102
- ◆ Number of sms sent through m-kisan portal : **52**

- ◆ Forecast received: **Biweekly (Tuesday and Friday)**

- Details of broadcast on AIR and TV: Biweekly on KrishiDarshan program on DD Girnar, Durdarshan at 5:55 PM

(I) Seed Production

Ensuring quality of seeds to farmers, Anand Agricultural University has registered its trademark and logo of “ANUBHAV SEED” with the Trademark Registration Authority of India. All the seed producing centres/units of Anand Agricultural University, Anand are well equipped with seed production machineries required for all operations starting from land preparation to harvesting. The total seed production of the year 2018-19 is **6313.88** quintals. The seed processes and seed testing facilities have been made available, which has boosted the efforts of seed quality assurance.

Seed production by AAU, 2019-20(in q.)

Sr. No.	Crop	Nucleus/ Parent	Breeder	Foundation	Certified	T/L	Total
Cereals							
1	Paddy	3.71	122.50	555.60	913.05	871.77	2466.63
2	Maize	0.50	3.98	0.00	0.00	0.00	4.48
	Maize (Rabi)		72.30	0.00	0.00	53.00	125.30
3	Wheat		561.00	127.00	799.10	351.00	1838.10
Pulses							
4	Greengram	1.15	2.75	0.00	8.00	4.54	16.44
	Greengram(R/S)		35.00	0.00	0.00	3.10	38.10
5	Gram		30.00	30.00	0.00	185.20	245.20
6	Pigeon pea	0.35	17.00	0.00	0.00	1.50	18.85
7	Blackgram	0.10	0.00	0.00	0.00	0.00	0.10
Oil seeds							
8	Castor		3.00	0.00	15.00	169.00	187.00
9	Groundnut	7.00	94.25	0.00	0.00	4.20	105.45
	Groundnut (S)		60.37	0.00	0.00	5.40	65.77
10	Soybean	0.11	49.85	18.00	34.00	21.50	123.46
Cash/ Other Crops							
11	Cotton (Desi)	2.60	50.45	0.00	0.00	29.50	82.55
12	Tobacco (Bidi)		0.00	0.00	0.00	24.75	24.75
	Tobacco (Rustica)		0.00	0.00	0.00	12.10	12.10
13	Cluster bean (Seed)		0.00	0.00	0.00	5.40	5.40
14	Sunhemp		0.00	0.00	0.00	22.00	22.00
Forage crops							
15	Lucerne		5.50	0.00	0.00	15.20	20.70
16	Oat		45.50	0.00	0.00	20.00	65.50
17	Fodder Bajra	0.06	0.05	0.00	0.00	5.53	5.64

Sr. No.	Crop	Nucleus/ Parent	Breeder	Foundation	Certified	T/L	Total
18	Fodder Sorghum	0.17	0.00	0.00	0.00	1.71	1.88
Vegetable crops							
19	Okra	0.10	0.30	0.00	0.00	8.60	9.00
20	Cowpea	0.17	0.40	0.00	0.00	3.00	3.57
21	Pigeonpea	0.05	0.00	0.00	0.00	0.00	0.05
22	Drumstick	0.00	0.00	0.00	0.00	0.45	0.45
Vegetable Crops							
23	Brinjal	0.020	0.000	0.000	0.000	1.810	1.830
24	Tomato	0.011	0.000	0.000	0.000	0.210	0.221
25	Chilli	0.034	0.010	0.000	0.000	1.100	1.144
26	Onion	0.080	0.000	0.00	0.00	0.200	0.280
27	Clusterbean	0.150	0.500	0.00	0.00	1.200	1.850
28	Pumpkin	0.025	0.000	0.00	0.00	0.170	0.195
29	Cucumber	0.025	0.000	0.00	0.00	0.350	0.375
30	Bottle gourd	0.025	0.005	0.000	0.000	0.370	0.400
31	Ridge gourd	0.020	0.000	0.00	0.00	0.290	0.310
32	Musk melon	0.020	0.000	0.00	0.00	0.070	0.090
33	Indian bean	0.150	0.000	0.000	0.000	0.000	0.150
34	Dill seed	0.010	0.000	0.000	0.000	0.000	0.010
Spices							
35	Cumin					5.00	5.00
36	Dill seed					8.75	8.75
M & A crop (Seeds)							
37	Kalmegh					0.18	0.18
38	Ashwagandha					1.10	1.10
39	Isabgol					0.75	0.75
40	Asaliyo					1.20	1.20
41	Linseed					0.65	0.65
42	Mustard (Small)					4.50	4.50
43	Kali jiri					1.50	1.50
44	Tulsi varg					0.05	0.05
45	Shankphuspi					0.10	0.10
Grand Total		16.6395	1154.715	730.60	1769.15	1848.00	5519.105
Total of Hybrids		0	0	0	0	222.26	222.260
Total of Varieties		16.6395	1154.715	730.60	1769.15	1625.74	5296.845

Planting material production of AAU, 2019-20

Seedlings and Planting materials (Lakhs)		Nos.
1	Tobacco	880000
2	Hybrid Napier/ Gajraj	500000
Total		1380000
Tissue culture plants (Nos.)		
1	Parvar	3500
2	Kankoda	2700
3	Stevia	2500
4	Pomegranate	8000
5	Seedless Lemon	600
Total		17300
Vegetable Seedlings/ Planting materials (Lakhs)		
1	Brinjal	481750
2	Chilli	476500
3	Tomato	97850
4	Onion	440000
Total		1496100
Horticultural Seedlings/ Planting materials (Nos.)		
Fruit Planting material (Nos.)		
1	Sapota grafted	762
2	Mango grafted	1566
3	Custard apple grafted	5899
4	Jambu / Bijora grafted	147
5	Guava grafted	1866
6	Mulberry grafted	64
7	Fig	536
8	Aonla grafted	2000
9	Chandan/ Rayan plant	698
10	Kagzi Lime/ Sarbati lime plant	16352
11	Cashewnut plants	636
12	Phalsa plants	3868
13	Drumstick plants	9672
14	Jackfruit plants	526
15	Karamada/ Gunda plants	2582
16	Fruit plants bud sticks	1015
17	Other plants of fruits	789
Total		48978

Flowers and Ornamental plants (Nos.)		
1	Rose (Deshi)	17329
2	Mogara	2346
3	Ixora	1756
4	Bogain vellia	2476
5	Chrysanthemum	886
6	Jasud	1161
7	Palm different types	711
8	Climbers different types	1209
9	Seasonal flower seedling	1208
10	Seasonal seed packet	531
11	Plants of different types	30747
12	Trees of different types	11134
13	Potted plant (big)	670
14	Potted plant (medium)	435
15	Hanging Basket	64
16	Plastic pot (big size)	12
17	Plastic pot (medium size)	1
18	Chrysanthemum seedling	6800
19	Marigold seedling	30613
20	Seasonal seedling others	23000
21	Bouquets	342
22	Loose flowers (kg)	132.5
23	Cut flowers	300
Total		133731

Medicinal & Aromatic plants (Nos.)					
1	Madhunasini	16	40	Nagod	140
2	Jammulemon grass	643	41	Gugul	14
3	Tulsi	861	42	Vetivar grass	458
4	Parnfuti (Big & Small)	232	43	Dodi (Moti)	251
5	Cuttings	123	44	Garmado	61
6	Dodi	20559	45	Rasna	2
7	Shatavari	552	46	Damro (Basil)	209
8	Rajani gandha	8	47	Borsalli	150
9	Galo	61	48	Safed Agathiyo	19
10	Kuvarpanthu	2085	49	Kevado	19

Medicinal & Aromatic plants (Nos.)					
11	Hadsakal	374	50	Lasanvel	315
12	Putranjiva	33	51	Ankol	1
13	Sindur	29	52	Sevan	2
14	Mithi limadi	277	53	Gajpipar	20
15	Citronella grass	9	54	Gundo	16
16	Chaivs	276	55	Ramfal	171
17	Dam Vel	178	56	Kanji	12
18	Karmada	228	57	Bijoru	272
19	Fudino	51	58	Marda sing	8
20	Closimum	42	59	Bhrungraj	17
21	Aradusi	660	60	Mal kangni	1
22	Riceplant	506	61	Kanchnar	18
23	Safed chitrak	263	62	Jamaroja grass	1
24	Safed musali	153	63	Jambu	5
25	Ajamapan	307	64	Seed Sample Set	54
26	Lindipipar	35		Total	88539
27	Ashwgandha	255			
28	Brahmi	665			
29	Kalmegh and Tulsi Seedling	55000			
30	Lajavanti	230			
31	Arjun	142			
32	Safed Shankhavali	1			
33	Bili	140			
34	Alcho	111			
35	Nagarvel	660			
36	Radhavad	34			
37	Chanothi	379			
38	Coleaus (garmar)	118			
39	Ashok	7			

Total number of seedlings/ planting materials and plants : 31,64,648



College of Agriculture, Vaso



College of Food Processing Technology & Bio-Energy

Chapter - 5

EXTENSION EDUCATION

The Directorate of Extension Education has to plan, coordinate, organize and guide the extension education programmes in the University and to ensure efficient working of the extension education activities in close coordination with the development departments, voluntary and private organizations. Moreover, this Directorate encourages, guides and supports the extension education centers of the University to organize different extension education activities for the benefit of the farming community.

Extension Education Council

The Extension Education Council has been constituted to consider and recommend the extension education programmes/activities of the University. The twelfth meeting of the Extension Education Council was held on 06/02/2019 at Yagnyavalkya Hall, AAU, Anand under the chairmanship of Dr. N. C. Patel, Ex. Vice-Chancellor, AAU, Anand. The thirteenth meeting of the Extension Education Council was postponed due to the COVID-19 pandemic. The following members of the Extension Education Council actively participated in the twelfth meeting.

Sr. No.	Name, Designation & Address	Position
1	Dr. N. C. Patel, Vice-Chancellor, AAU, Anand	Chairman
2	Dr. K. B. Kathiria, Director of Research & Dean, PG Studies, AAU, Anand	Member
3	Dr. K. P. Patel, Dean, Faculty of Agriculture, AAU, Anand	Member
4	Dr. A. M. Thaker, Dean, Faculty of Vet. Science, AAU, Anand	Member
5	Dr. Y. C. Zala, Principal & Dean, International Agri-Business Management Institute, AAU, Anand	Member
6	Dr. J. B. Upadhyay, Representative of Dean, Faculty of Dairy Science, AAU, Anand	Member
7	Dr. K. P. Patel, Principal & Dean, College of Horticulture, AAU, Anand	Member
8	Dr. R. F. Sutar, Dean, Faculty of Food Processing Tech. & Bio-energy, AAU, Anand	Member
9	Dr. R. Swarnakar, Representative of Principal & Dean, College of Agricultural Engineering & Technology, AAU, Godhra	Member
10	Dr. D. R. Kathiriya, Principal & Dean, Agricultural Information Technology, AAU, Anand	Member
11	Dr. N. B. Chauhan, Professor & Head, Extension Education Dept. BACA, AAU, Anand	Member
12	Dr. Arun Patel, Director, Extension Education Institute, AAU, Anand	Member
13	Smt. Kamala Chhaiya, Representative of Director of Agriculture, Gujarat State, Gandhinagar	Member
14	Dr. H. B. Patel, Associate Director of Extension Education, DoEE, AAU, Anand	Member
15	Dr. B. M. Mehta, Senior Scientist, KVK, Mangalbharati, Dist.Chhotaudepur	Member
16	Shri P. K. Sharma, Senior Scientist & Head, KVK, Dethali, Dist.Kheda	Member
17	Dr. Girish G. Patel, Senior Scientist & Head, KVK, Devataj	Member

18	Dr. Girish J. Patel, Training Organiser, Tribal Research cum Training Centre, AAU, Devgadbaria	Member
19	Dr. V. J. Patel, Asso. Professor, Polytechnic in Agri., AAU, Anand	Member
20	Sh. P. R. Dave, Dy. Director, Farmer Training Centre, Thasara, Dist. Kheda	Member
21	Shri Devesh Rameshbhai Patel, Progressive Farmer, Boriavi, Ta & Dist: Anand	Member
22	Shri Parmar Kamlsinh Chandrasinh, Progressive Farmer, Sardiya, Ta: Sankheda, Dist; Chhota Udepur	Member
23	Dr. Arun Patel, Director of Extension Education, DoEE, AAU, Anand	Member Secretary
24	Dr. M. N. Brahmhatt, Registrar, AAU, Anand	Invitee Member
25	Dr. D. D. Patel, Technical officer, VC Office, AAU, Anand	Invitee Member
26	Shri. P. C. Patel, Assistant Professor, DoEE, AAU, Anand	Invitee Member
27	Shri. J. D. Desai, Assistant Professor, DoEE, AAU, Anand	Invitee Member

Zonal Research and Extension Advisory Committee (ZREAC)

The Committee consists of Director of Research, Deans of the faculty, representatives of line departments, centers of extension education, crop and subject matter specialists, co-operative sectors, industries and progressive farmers. Meetings are conducted regularly twice in a year (*kharif* and *rabi* season). The committee discusses in depth about the adoption and its feedbacks on

research recommendations and existing transfer of technology programmes. The approved recommendations are then passed on to the concerned. The ZREAC meeting was held for *Kharif* season on 26/09/2019 for and *Rabi* season on 16/01/2020.

Centers of Extension Education

Under the aegis of Directorate of Extension Education, following centers/ activities are functioning:



Sr. No.	Type	Name of Centre / Training	Location
1	Certificate Course	Training in Baking Technology	Anand
		Training in Commercial Poultry Farming / Advanced Training in Commercial Poultry Technology	
		Training in Gardening, Landscaping and Nursery Management	
2	Special training programmes	Training Programme on Food Processing Technology	
		Training Programme on Organic Farming	
		Training Programme on Weed Management	
		Training Programme on Integrated Pest Management	
		Training Programme on Medicinal and Aromatic Plants	
		Training Programme on Seed Production	
3	Training Centres for Extension Functionaries	Extension Education Institute (EEI)	Anand
		Training and Visit Training Centre (T&V)	
4	Training Centers for Farmers/ Farm Women/ Rural Youth	Sardar Smruti Kendra (SSK)	Anand
		Krushvi Vigyan Kendra (KVK)	Arnej (Dist. Ahmedabad)
		Krushvi Vigyan Kendra (KVK)	Dahod
		Krushvi Vigyan Kendra (KVK)	Devataj (Dist. Anand)
		Tribal Training Centre (TTC)	Dahod
		Tribal Research cum Training Centre (TRTC)	Devgadh Baria
		Tribal Farm Women Training Centre (TFWTC)	Dist: Dahod
		Dairy Vigyan Kendra (DVK)	Vejalpur Dist: Panchamahals
		Pashu Vigyan Kendra (PVK)	Limkheda, Dist: Dahod
		Transfer of Technology Centre for Tribal (TOT)	Godhra Dist: Panchamahals
		Farm Technology Training Centre (FTTC)	Sansoli Dist: Kheda
Training Center (TC)	Jabugam Dist: Chhotaudepur		
Demonstration cum Training Center for Inland Fish Culture (DTCIF)	Devataj Dist: Anand		

Sr. No.	Type	Name of Centre / Training	Location
5	Advisory Services	Agricultural Technology Information Centre (ATIC)	Anand
		Transfer of Technology Centre (TOT)	Arnej Dist: Ahmedabad
		Agri Polyclinic Centre (APC)	Dahod
		Publication Unit (PU)	Anand
		Sardar Patel Agricultural Educational Museum (SPAEM)	Anand
6	Others	NARP Extension Scheme (MMRS)	Godhra Dist: Panchmahals
		NARP Extension Scheme (ARS)	Arnej Dist: Ahmedabad
		<i>Krushhi Mahotsav</i>	Anand
		Kisan Call Centre (KCC)	
		<i>Krushhi Library</i>	
<i>Mera Gaon Mera Gaurav</i> (MGMG)			

Extension Education Schemes

Under the Directorate of Extension Education, Twenty-two plan schemes, seven non-plan schemes, five ICAR schemes and six other agencies schemes are running and the details are given in Annexure 5.1.

Front Line Demonstrations, On-Farm Trials and Case Studies Conducted by Extension Education Centers

(i) Front Line Demonstrations (FLDs)

The FLDs are aimed to demonstrate the production potentialities of newly released and pre-released production technologies on farmers' fields. The KVKs and other extension education centers had organized a total of 1007 FLDs on various crops, farm implements, livestock and fishery during Kharif, Rabi and Summer seasons. The details of FLDs conducted during the year 2019-20 are given in Tables 5.1 to 5.7.



Table 5.1 FLDs conducted by KVK, Arnej (Dist. Ahmedabad)

(A) Oilseeds/Pulses/Cereals/Horticulture Crops/Commercial Crops

Sr. No.	Crop	Technology demonstrated	Variety	No. of Farmers	Area (ha)	Average yield of the demo. Plot (q/ha)	Local yield (q/ha)	Yield Increase (%)
1	Castor	Wilt resistant variety	GAC 11	10	4	24.30	19.50	24.62
2	Chilli	Introduction of improved variety-GAVC-112	GAVC-112	10	4	106.00	94.20	12.52
3	Chilli	Artificial defoliation	GAVC-112	10	4	99.00	92.10	7.49
4	Cumin	Azoxistrobin 23SC 0.23% 10 ml/lit water	GC 4	10	4	6.70	6.20	8.06
5	Cumin	Introduction of improved variety	GC 4	10	4	6.60	6.10	8.20
6	Desi Cotton	Introduction of improved variety	GADC 2	10	4	16.50	14.80	11.49
7	Dilseed	Introduction of new crop and variety	GAD 1	10	4	8.30	7.00	18.57
8	Gram	Seed treatment	GJG 3	10	4	11.80	10.10	14.41
9	Gram	Fertilizer and Biofertilizer	GJG 3	10	4	11.50	10.00	13.04
10	Gram	Bioagent	GJG 3	10	4	12.10	10.10	16.53
11	Okra	Introduction of new variety-GAO-5	GAO-5	10	4	95.00	83.00	14.45
12	Okra	For jassid Thiamithoxam 25WG	GAO-5	10	4	97.00	87.00	11.49
13	Paddy	Leaf color Chart	Mahisagar	10	4	55.50	49.40	12.34
14	Tomato	Introduction of a new variety	GT 5	10	4	284.00	270.00	5.18
15	Wheat	Use of Thiourea 500 ppm	GADW 3	10	4	14.00	12.50	12.00

Table 5.2 FLDs conducted at KVK, Dahod

(A) Pulses/ Cereals/ Horticulture Crops

Sr. No.	Crop/ Enterprise	Technology demonstrated	Variety	No. of Farmers	Area (ha)	Average yield of the demo. Plot (q/ha)	Local yield (q/ha)	Yield increase (%)
1	Maize	Introduction of new hybrid Variety + Biofertilizer	GAYMH 1	57	20	16.10	14.25	12.98
2	Pigeon pea	Introduction of new Variety + Biofertilizer	AGT-2	25	10	9.10	7.20	26.39
3	Wheat	Introduction of new Variety + Biofertilizer	GW-451	25	10	27.85	23.50	18.51
4	Tomato	Introduction of new Variety + Bio	GAT 5	20	04	254.12	229.14	10.90
5	Chilli	Introduction of new Variety + Bio	GVCH 1	20	04	83.25	70.00	18.93
6	Brinjal	Introduction of new Variety + Bio	GAOB 2	20	04	153.30	131.96	16.17
7	Gram	Chlorantranilliprole	-	25	10	14.85	12.60	17.86
8	Gram	Trichoderma	-	25	10	13.90	12.15	12.58
9	Green Gram	Flubendiamide	-	10	04	7.56	7.13	6.03
10	Soybean	Chorantranilliprole	-	25	10	13.20	12.15	8.64

(B) Livestock

Sr. No.	Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No. of Units (Animal/ Poultry/ Birds, etc per farmer)	Major parameters			Other parameters			
						Name of Parameters	Demo	Check	% change in major parameter	Name of Parameters	Demo	Check
11	Cattle	Management of Disease	Deworming and Disinfestation	50	1	Milk yield L/ ani./day	5.27	4.55	15.79	Fat corrected milk	15.79% higher Compare to check	-
12		Fertility in heifers	Mineral Mixture	20	1	Fertility rate %	13	0	-	Fertility	65%	-
13		Feeding management	Probiotic feeding	20	1	Unit of increase in body weight is gram/day/ animal	109.35	89.64	21.99	Incidence of calf scours	2	6
14	Buffalo	Fertility Management	Ovsynch Protocol	20	1	Fertility rate %	60%	10%	50.00	Fertility	60%	-

Table 5.3 FLDs Conducted at KVK, Devataj (Dist. Anand)

(i) Cereals / Oilseeds /Pulses

Sr. No.	Crop/ Enterprise	Technology demonstrated	Variety/Breed	No. of Demo.	Area (ha)	Production of demonstration plot (q/ha)	Local Production (q/ha)	Production increase (%)
1	Paddy	Varietal Introduction	GAR 14	10	4.0	52.0	44.80	16.07
2	Paddy	Management of Paddy leaf folder	Gurjari	10	4.0	56.00	52.00	7.69
3	Wheat	Varietal Introduction	GW-451	10	4.0	38.40	31.20	23.07
4	Castor (CFLD)	Seed + Trichoderma viridi + Bio fertilizers + Sulphur	GAC-11	75	30	28.00	24.00	16.60
5	Greengram (summer) CFLD	Varietal Introduction	GAM-5	75	30	11.20	9.60	16.70
6	Chickpea	Management of chickpea pod borer	GC 2	10	4.0	14.00	11.00	27.30

(ii) Horticultural Crops

7	Brinjal	Management of brinjal shoot and fruit borer	Doli 5	10	4.0	295.00	240.00	22.92
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(iii) Livestock & Fisheries

8	Fodder	Sorghum	Sorghum COFS 29	20	-	740	480	35.13
9	Fodder	Guinea Grass (GG 3)	Guinea Grass (GG 3)	10	02	620	490	20.96
10	Anubhav Chelated Mineral Mixture	Buffalo	Anubhav Chelated Mineral Mixture	20	20	7.8 litre/day 7.0 % Fat	7.0 litre/day 6.0 % Fat	10.25 14.28
11	Fishery	Fry to fingerling production	Carps	10	05	7.80	7.56	3.17

Table 5.4 FLDs Conducted at TRTC, Devgadhi Baria

Sr. No.	Crop	Technology Demonstrated	Variety	No. of Demo.	Area (Ha)	Yield (kg/ha)		Yield increases(%)
						Demo	Local	
Kharif Season								
1	Soybean-Maize	Soybean-Maize intercrop	NRC-37 and Maize: GAYMH-1	04	02	22720/- ₹ (Profit in soybean-maize intercrop)	20930/- ₹ (Profit in sole soybean crop)	1790/- ₹ ha (Over sole soybean crop)
2	Soybean	Girdle beetle management	-	6	3	1230	930	24.39 %
3	Soybean	Sucking pest management		04	2	1090	840	22.94 %
4	Soybean	Improved variety	NRC 37	20	10	1260	890	29.36 %
5	Soybean	Weed management		04	2	1140	910	20.17 %
6	Soybean	Sowing distance		04	2	1180	900	20.17 %
7	Soybean	Seed rate		04	2	1310	980	23.72 %
8	Maize	Hybrid variety	GAYMH-1	04	2	3420	2410	29.53 %
9	Maize	Hybrid variety	GAWMH-2	02	1	3250	2380	26.77 %
10	Maize	Nutrient management	GAYMH-1	02	1	3720	2460	33.87 %
11	Maize	Nutrient management	GAWMH-2	02	1	3390	2420	28.61 %
Rabi Season								
12	Chickpea	Improved variety	JG-14	08	4	1930	1340	30.57 %
13	Wheat	Monocult and dicot weeds management in an improved variety	GW-451	12	6	4990	3870	22.44 %
14	Maize	Hybrid variety	GAYMH-1	04	2	3770	2500	33.69 %
15	Maize	Hybrid variety	GAYMH-2	02	1	3510	2520	28.21 %
16	Maize	Hybrid variety	GAWMH-3	02	1	3495	2540	29.32 %
17	Maize	Nutrient management	GAYMH-1	02	1	4010	2550	36.41 %
18	Maize		GAYMH-2	02	1	3725	2610	29.93 %
Semi Rabi								
19	Mung bean	Improved variety	GAM-5:	04	1	1235	790	36.03 %

Table 5.5 FLDs Conducted at ARS, Sansoli

Sr. No.	Crop	Technology Demonstrated	Variety	No. of Demo.	Area (ha.)	Yield of Demo. (kg/ha)	Yield of Check (kg/ha)	% Increase
1	Castor	Varietal Introduction	GCH 10	15	03	3377	2750	22.80
2	Castor	Varietal Introduction	GAC 11	133	53	2897	2780	04.20
3	Wheat	Varietal Introduction	GW 451	12	04	4327	3460	25.08

Table 5.6 FLDs Conducted (Area-specific Mineral Mixture) at DVK, Anand

Sr. No.	No. of Demonstrations conducted (Area specific mineral mixture)				Average production of an animal after three months of demonstration
	No. of demonstrations	No. of beneficiaries farmers	Kg mineral mixture allotted to the individual farmer	Average production of an animal before the demonstration	
1	90	90	3 kg per farmer	2.85lit/day	3.02 lit/day

Table 5.7 FLDs conducted at Training Centre for Tribal Farmer, Dahod

Sr. No.	Crop & Variety	Technology Demonstrated	No. of Farmers	Average Demo. Yield (Kg ha ⁻¹)	Average Grain Yield of local check (Kg ha ⁻¹)	Grain Yield over local Variety (%)
1	Soybean (NRC-37)	New Variety	25	1650	1275	29.41
2	Maize (GAYMH-1)	Recommended Fertilizer (160:60:00 kg NPK ha-1) management in Maize	15	4850	3475	39.56
3	Maize (GAWMH-2)	Recommended Fertilizer (160:60:00 kg NPK ha-1) management in Maize	15	4525	3350	35.07
4	Green Gram (GAM-5)	New Variety	18	1295	975	32.82

(ii) On-Farm Trials (OFTs)

The aim of the On-Farm Trials (OFTs) was to conduct On-Farm Testing for identifying technologies in terms of location-specific sustainable land-use systems. The KVKs had organized a total of 145 OFTs on various crops/enterprises. The details of the OFTs conducted during the year 2019-20 are given in Table 5.8 to 5.10.

Table 5.8 OFTs conducted at KVK, Arnej (Dist. Ahmedabad)

(A) Cereals and Vegetable Crops

Sr. No	Crop / Enterprise	Title of OFT	Technology Assessed	No. of Trials	Yield kg/ha	Net Return (Profit) in ₹/unit	BC Ratio	Results of Assessment	Feedback from the Farmer
1	Paddy	Varietal assessment of Mahisagar paddy	T1.Cultivation of local variety of Paddy (Gurjari) (Farmers Practice)	05	5550	41,125	2.97	Mahisagar variety had higher yield compared to GAR 13 and Gurjari variety as no. of tillers were higher. The net return was also very high.	<ul style="list-style-type: none"> • High yielding variety • No lodging • Good quality of rice • Fetch more market price as good milling and cooking quality
			T2.Cultivation of Mahisagar variety		5675	46,148	3.14		
			T3.Cultivation of GAR – 13 variety		5570	41,840	3.07		
2	Wheat (Durum)	Assessment of recommended dose of fertilizer and micronutrient in GW-1	T1. Injudicious use of fertilizer and no use of micronutrient (Farmers Practice)	05	577	14425	2.81	Seed treatment with Azotobactor @ 10 ml/kg seed + 20 kg phosphorus + 25 kg Zinc Sulphate in durum wheat gives higheryields	
			T2. 20kg phosphorus + 20kg Zinc Sulphate (as a basal dose) + 20kg Nitrogen given at the 1st irrigation after 21 DAS + 2 nd irrigation given at 40-45 DAS		632	15800	2.93		
			T3. Seed treatment with Azotobactor @ 30 gm/kg seed+ 20kg Phosphorus + 25kg Zinc Sulphate (as a basal Dose)		603	15075	2.87		

Sr. No	Crop / Enterprise	Title of OFT	Technology Assessed	No. of Trials	Yield kg/ha	Net Return (Profit) in ₹/unit	BC Ratio	Results of Assessment	Feedback from the Farmer
3	Wheat (Durum)	Assessment of seed treatment for control of Termite in wheat	T1. Farmers practice (No seed treatment)	05	558	14130	2.62	Seed Treatment with Chlorpyrifos 20 EC @ 4 ml / kg seed (0.8 gm ai / kg seed) or Fipronil 5 SC @ 5 ml / kg seed (0.025 gm ai/kg seed) 24 hours before sowing with one irrigation at grain formation stage gives higher yield and higher net return and less percentage of the infected plant.	Seed treatment with Chlorpyrifos is feasible and easy to adopt for controlling the termite in goradu soil.
			T2. Seed Treatment with Chlorpyrifos 20 EC @ 4 ml / kg seed (0.8 gm ai / kg seed) or fipronil 5 SC @ 5 ml / kg seed (0.025 gm ai / kg seed) 24 hours before sowing		598	15230	2.67		
4	Paddy (Kharif)	Assessment of recommended practices for control of Stem Borer in rice	T3. T2 + One irrigation is given at a grain or mation stage	05	617	15995	2.86	Pheromone trap @ 30 trap/ha kept in after 30 days of transplanting of paddy with equal distance gives higher production with net return and less percentage of the infected plant.	Use of pheromone trap in paddy is not feasible
			T1. Farmers practice		4840	51,335	2.80		
			T2. Cartap Hydrochloride 4G 25 kg/ha (1 kg ai/ha)		5510	60,865	3.02		
			T3. Pheromone trap @ 30 trap/ha kept in after 30 days of transplanting of paddy with equal distance	05	5300	57,090	2.88		

Sr. No	Crop / Enterprise	Title of OFT	Technology Assessed	No. of Trials	Yield kg/ha	Net Return (Profit) in ₹/unit	BC Ratio	Results of Assessment	Feedback from the Farmer
5	Isubgul (Rabi)	Varietal assessment of isubgul cv.GI-4	T1. Cultivation of local variety of Isubgul (Farmers Practice)	05	960	4900	3.15	Cultiva Isubgul cv.GI-4 gave higher yield and it matures earlier than the local variety	No shedding was found in GI-4
			T2. Cultivation of Isubgul cv.GI-4		1032	53600	3.29		
6	Coriander (Rabi)	Varietal assessment of coriander cv. GC-3	T1. Cultivation of local variety (Farmers Practice)	05	880	41000	3.09	GC-3 coriander variety gave higher yield and higher profit	The aroma is good and resistant to
			T2. Varietal evaluation of coriander cv. GC-3		1250	66000	4.20		
7	Wheat (Rabi)	Assessment of seedbed preparation implements in the wheat crop in the <i>Bhal</i> region	T1. Farmers practices (2 Cultivator + 2 Bhal Kaliyu)	05	1240	-	-	Use of Zero-till drill for direct sowing of wheat after rice was found to be advantageous in terms of 50-60% saving in time and 35-40% saving in the cost of sowing as compared to the conventional practice of seedbed preparation and sowing with seed-cum-fertilizer drill. The machine saves about Rs. 1500-2000/ha	1. Good practice to reduce seedbed preparation operation cost in wheat crops. 2. Saves energy
			T2. Cultivator + Rotavator +Seed drill		1310	-	-		
			T3. Zero Till Drill		1235	-	-		

Sr. No	Crop / Enterprise	Title of OFT	Technology Assessed	No. of Trials	Yield kg/ha	Net Return (Profit) in ₹/unit	BC Ratio	Results of Assessment	Feedback from the Farmer
8	Tomato	Assessment of the different type of hand operated wheel hoe in tomato crop in Bhal region	T1. Use of Sickle (Farmers practice) T2. Use of Wheel hoe (CIAE Bhopal) T3. Use of push and pull-type wheel hoe (CAET-Godhra)	05	- - -	- - -	- - -	The maximum weeding efficiency with 'Sickle' was observed because of the capability of this hand tools to work between plant to plant spaces in a row. Push type cycle weeder and push and pull type wheel hoe cannot be used for closer plants. This may be the reason for low weeding efficiency. As weeding is a labor-consuming process and because of the minimum field capacity of 'Sickle' operation 'Sickle' for weeding was maximum.	1. Good practice to reduce weeding operation cost in tomato crops. 2. Save time 3. It is effective for inter-culturing and weeding. 4. Less time consuming during weeding operation 5. Suitable for men, farm women and rural youth. 6. Reduce drudgery.
9	Fruits and Vegetables	Shelf life assessment of fruits and vegetables using vegetable preservative	T1. Farmer's entrepreneur practice	05	-	-	-		

Table 5.9 OFTs conducted by KVK, Dahod

Sr. No.	Crop/ Enterprise	Title of OFT	No. of Trials	Technology Assessed	Parameters of Assessment	Data on the Parameter	Net Return (Profit) in ₹ / unit	BC Ratio	Results of Assessment	Feedback from the Farmer
1	Maize	Varietal Testing of Maize	04	T ₁ : Composite (GM-6) T ₂ : CO 6 T ₃ : GAYHM-1 (Assessment) T ₄ : GAWHM-2 (Assessment)	Cost of cultivation and yield	Cost of cultivation T ₁ : 16059 T ₂ : 17843 T ₃ : 18143 T ₄ : 18143 Grain yield (q/ha) T ₁ : 14.25 T ₂ : 16.85 T ₃ : 17.35 T ₄ : 17.85	T ₁ : 11229 T ₂ : 18637 T ₃ : 19419 T ₄ : 20502	T ₁ : 1.67 T ₂ : 2.04 T ₃ : 2.07 T ₄ : 2.13	The yield increased over control (T ₁) was 18.24, 21.75 and 25.26 percent in T ₂ , T ₃ and T ₄ respectively.	White seeded GAWMH-2 variety is suitable for cultivation and fodder purposes.
2	Green gram	Varietal Testing of Green gram	03	T ₁ : Local-GM 4 (Farmers practices) T ₂ : Meha (Assessment) T ₃ : GAM-5 (Assessment)	Cost of cultivation and yield	Cost of cultivation T ₁ : 21936 T ₂ : 24088 T ₃ : 24263 Grain yield (q/ha) T ₁ : 5.47 T ₂ : 6.35 T ₃ : 7.75	T ₁ : 10884 T ₂ : 14012 T ₃ : 22237	T ₁ : 1.49 T ₂ : 1.58 T ₃ : 1.91	The yield increased over control (T ₁) was 16.08 and 41.68 percent in T ₂ and T ₃ respectively	GAM-5 variety is suitable for cultivation purposes.

Sr. No.	Crop/ Enterprise	Title of OFT	No. of Trials	Technology Assessed	Parameters of Assessment	Data on the Parameter	Net Return (Profit) in ₹ / unit	BC Ratio	Results of Assessment	Feedback from the Farmer
3	Tomato	Varietal Testing of Tomato	03	T ₁ : Local (Farmers practices) T ₂ : GT-2 T ₃ : AT-3 T ₄ : Kashi Aman	Yield Cost of Cultivation	T ₁ : 131.96 T ₂ : 156.4 T ₃ : 163.82 T ₄ : 161.24	T ₁ : 158352 T ₂ : 187680 T ₃ : 196584 T ₄ : 193488	T ₁ : 2.73 T ₂ : 3.10 T ₃ : 3.12 T ₄ : 3.07	AT-3 Variety of Tomato gave higher yield and net realization	Less infestation of tomato leaf curl virus and early blight disease
4	Brinjal	Varietal Testing of Brinjal	03	T ₁ : Local (Farmers practices) T ₂ : GAOB-2 T ₃ : GABH-3 T ₄ : Kashi Sandesh	Yield Cost of Cultivation	T ₁ : 153.25 T ₂ : 157.3 T ₃ : 182.12 T ₄ : T ₄ : 173.2	T ₁ : 123900 T ₂ : 125360 T ₃ : 152444 T ₄ : 141315	T ₁ : 3.06 T ₂ : 2.98 T ₃ : 3.30 T ₄ : 3.12	Higher production observed in GABH-3	High Yielding Variety, Less infestation of sucking pest.
5	Pigeon Pea	Management of wilt in Pigeon Pea	03	T ₁ : Farmer practices (No insecticide use) T ₂ : carboxin 37.5 % + thirum 37.5 % @ 3g/kg seed followed by seed treatment with Trichoderma viride @ 10g/kg seed T ₃ : T ₂ + Trichoderma viride @ 1 kg/100 kg seed FYM at the time of sowing	Grain Yield and percent disease & Cost of cultivation	Grain yield T ₁ : 8.10 T ₂ : 8.65 T ₃ : 9.10 Plant Damage (%) T ₁ : 6.4 T ₂ : 4.4 T ₃ : 3.1	T ₁ : 11540 T ₂ : 13950 T ₃ : 15400	T ₁ : 1.39 T ₂ : 1.47 T ₃ : 1.51	T ₃ encountered minimum disease incidence as well as given maximum yield	Carboxin 37.5% + thirum 37.5% and seed treatment with <i>Trichoderma viride</i> helps in reducing wilt incidence

Sr. No.	Crop/ Enterprise	Title of OFT	No. of Trials	Technology Assessed	Parameters of Assessment	Data on the Parameter	Net Return (Profit) in ₹ / unit	BC Ratio	Results of Assessment	Feedback from the Farmer
6	Castor	Management of Spodoptera in castor	03	T ₁ : Farmer practices (No insecticide use) T ₂ : Quinalphos 25 EC @ 20 ml per 10 liters water T ₃ : Chlorantraniliprole 18.5 SC @ 3 ml per 10 litre water	Grain yield and larval population per plant	Grain yield T ₁ : 16.50 T ₂ : 17.80 T ₃ : 18.70 Plant Damage (%) T ₁ : 4.2 T ₂ : 3.8 T ₃ : 2.1	T ₁ : 27150 T ₂ : 32600 T ₃ : 35550	T ₁ : 1.57 T ₂ : 1.68 T ₃ : 1.73	T ₃ encountered minimum Spodoptera larval population as well as given maximum yield	Very good molecule to combat the pest.
7	Animal Science	Improving milk production in low producing buffaloes	30	T ₁ : Farmer's practices T ₂ : Mineral mixture (area-specific) supplementation @ 30 g/day T ₃ : Chelated Mineral mixture supplementation @ 30 g/day	Milk Production & Cost of Production	Milk yield in kg per day per animal T ₁ : 3.71 T ₂ : 4.35 T ₃ : 4.93	T ₁ : 5220 T ₂ : 6630 T ₃ : 8780	T ₁ : 1.37 T ₂ : 1.41 T ₃ : 1.51	Chelated Mineral mixture supplementation resulted in higher yield and income.	Chelated Mineral Mixture is costlier. Animal shows severe reluctance to consume the mineral mixture.
8	Animal Science	Poultry breed testing	30	T ₁ : Kadaknath poultry breed T ₂ : North Gujarat poultry breed T ₃ : South Gujarat poultry breed	Monthly body weight, Mortality and Economics					

* Detailed results are presented in the table given below.

Performance traits	Breed name			
	Kadaknath	North Gujarat	South Gujarat	Triple cross
No. of pullets	179.00	168.00	172.00	175.00
Age at first egg (days)	180.00	180.00	178.00	172.00
Body weight (g) at 16 weeks of age	690.00	730.00	710.00	790.00
Body weight (g) at 40 weeks of age	1180.00	1210.00	1240.00	1320.00
Eggs produced (nos.) up to 40 weeks of age	42.00	44.00	48.00	58.00
Mortality (%)	22.00	36.00	32.00	31.00
No. of eggs sat on by the broody hen	1008.000 (72)	2100.000 (100)	1900.000 (100)	2600.000 (100)
Hatchability (%) TES	64.290	80.950	78.950	84.620
Total cost	76920.00	76920.00	76920.00	76920.00
Sold (Egg + Birds) (₹)	83440.00	52320.00	64280.00	73040.00
Valuation of remaining birds, chicks	50000.00	40000.00	40000.00	40000.00
Total income	133440.00	92320.00	104280.00	113040.00
Net income	56520.00	15400.00	27360.00	36120.00
BCR	1.73	1.20	1.36	1.47

Table 5.10 OFTs Conducted at KVK, Devataj (Dist. Anand)

Sr. No	Crop/ Enterprise	Title of OFT	Technology Assessed	No. of Trials	Production (q/ha)	Net Return in ₹/unit	B:C Ratio	Result of Assessment	Feedback from the Farmer
1	Wheat	Assessment of different Weedicides effects in Wheat (GW-451)	Farmers' practices (Pendimethaline 30 EC, PE)	03	36.00	45120	2.94	Weed population was found lower i.e. 27 and 21 per meter square in T ₂ and T ₃ respectively as compared to farmers practice having weed population 118/m ²	T3 gave higher yield than other treatments and more control of monocot and dicot weeds in the field.
			Sulfosulfuron (75%) + Metsulfuron methyl 5% WG (PoE)		37.60	47540	2.99		
			Clodinafop propargyl 15% + Metsulfuron methyl 1% WP (PoE)		40.00	52100	3.18		
2	Wheat	Management of Termite in wheat crop (GW-496)	T1: Farmer's practice	5	31.0	32700	2.63	The assessed technology T2 had recorded the highest yield (39 q/ha), BC ratio 3.08 and gave 25.81 % higher yield over T1 with higher net returns (Rs 44800) as compared to farmer practices.	With the use of recommended practices for Management of termite 25.81 % increase in yield and 21 % reduction in termite infestation of was found
			T2: Soil application of Neem cake 1 ton/ha + Seed treatment of Fipronil 5 SC 500 m/ 100 kg seed		35.5	38850	2.81		

Sr. No	Crop/ Enterprise	Title of OFT	Technology Assessed	No. of Trials	Production (q/ha)	Net Return in ₹/unit	B:C Ratio	Result of Assessment	Feedback from the Farmer																																														
3	Buffalo	Improvement of reproductive status of buffalo by feeding bypass fat after deworming	4 to 5 kg concentrate mixture + 10-15 kg dry fodder Concentrate mixture + Bypass fat @ 100gm+ after deworming	10	7.00	94260	3.13	Milk yield and conception rate are used as an indicator of improvement in reproductive status. Milk yield is increased (17.14%) over farmers' practice and the animal was conceived in three inseminations over the five farmers practice.	Progressive livestock farmers are convinced to use bypass fat feeding after deworming due to improvement in milk yield and conception rate in bypass fat-fed animals.																																														
					8.2	152564	3.54			4	Fisheries	Assessment of Hapa system for spawn to fry production in village ponds	Direct Stoking in the pondw	03	30	5850	1.35	The survival of fry was better (46%) in the Hapa method over farmers' practice and the biomass of rohu fry was also found higher in the Hapa method with a higher net return of farmers.	Stocking of rohu spawn in the hapa system gives higher survival and more biomass than stocking directly in the village pond.	Survival (%)	Total Biomass (g/m ²)	60				Stocking in Hapa @ 750 no.s /m ³		46	28675	2.60								Survival (%)										Total Biomass (g/m ²)							
4	Fisheries	Assessment of Hapa system for spawn to fry production in village ponds	Direct Stoking in the pondw	03	30	5850	1.35	The survival of fry was better (46%) in the Hapa method over farmers' practice and the biomass of rohu fry was also found higher in the Hapa method with a higher net return of farmers.	Stocking of rohu spawn in the hapa system gives higher survival and more biomass than stocking directly in the village pond.																																														
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					Total Biomass (g/m ²)																																																		
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(iii) Production of seeds and planting material and by-products

The details of seeds and planting materials produced by KVKs of AAU during 2019-20 are given in Table 5.11 and 5.12.

Table 5.11 Production of seeds by the KVKs of AAU during 2019-20

Name of KVK	Crop	Name of the Variety	Quantity of Seed (q)	Value (₹)
KVK, Arnej (Ahmedabad)	Wheat	GADW 3	8720.00	551104
	Gram	GJG 3	5260.00	483920
	Dilseed	GAD 1	320.00	25600
	Cumin	GC 4	360.00	104400
KVK, Dahod	Soybean (breeder)	NRC -37	16.00	186000
	Soybean (Certified)	NRC -37	18.00	108000
	Gram	GJG - 3	17.50	143500
	Wheat	GW - 451	20.80	73320
KVK, Deavataj (Anand)	Paddy	GR-7	41.50	139440
	Paddy	Gurjari	82.75	266455
	Wheat	GW-451	38.00	73340
TRTC, Devgadha Baria	Maize (<i>Rabi</i>)	GM-4	08.00	28000
	Wheat (<i>Rabi</i>)	GW-451	34.00	119850
	Gram (<i>Rabi</i>)	JG-14	09.50	57000
	Soybean (<i>Kharif</i>)	NRC-37	12.20	141825

Table 5.12 Production of planting materials by KVKs of AAU during 2019-20

Crop	Name of the Crop	Name of the Variety	Name of the Hybrid	Number of Seedlings	Value (₹)	Number of Farmers
Vegetable seedlings	Chilli	GVC-111	-	3200	1280	5
		AVNPC-131	-			
	Brinjal	-	GAOB-2	2300	1000	4
	Drumstick	-	-	14	20	3
Fruit	Aonla	--	-	02	20	2

(iv) Impact of KVKs of AAU

The details of the impact of KVKs of AAU during 2019-20 are given in Table 5.13.

Table 5.13 Impact of KVKs of AAU on specific technology/skill transferred during 2019-20

Sr. No.	Name of specific technology/skill transferred	No. of participants	Production increase %	Change in income (₹/ha)	
				Check	Demo
(A) KVK, Arnej (Ahmedabad)					
Cereals					
1	Use of Thiourea 500 ppm in wheat GADW 3	10	12.00	24100	26800
2	Use of leaf colour Chart in paddy	10	12.34	48300	67400
Pulses					
3	Seed treatment in gram	95	14.41	24700	27200
4	Use of Fertilizer and Biofertilizer in gram	95	13.04	24200	28100
5	Use of Bio-agent in gram	95	16.53	25500	27600
Oil Seed					
6	Wilt resistant variety, castor GAC 11	35	24.62	63400	81200
Horticultural crops					
7	Introduction of improved variety- GAVC-112, chilli	10	12.52	115300	133200
8	Artificial defoliation, chili	10	7.49	110000	113500
9	Azoxistrobin 23SC 0.23% 10 ml/lit water, cumin	10	8.06	46400	48900
10	Introduction of improved variety, cumin GC 4	10	8.20	45250	49675
11	Introduction of new crop and variety, Dilseed GAD 1	10	18.57	43245	35325
12	Introduction of new variety-GAO-5, okra	10	14.45	104050	125000
13	Introduction of a new variety, tomato GT 5	10	5.18	188750	208000
14	For jassid Thiamithoxam 25WG in okra	10	11.49	105350	121400
Commercial crop					
15	Introduction of improved variety, desi cotton GADC 2	10	11.49	67500	76850

Sr. No.	Name of specific technology/skill transferred	No. of participants	Production increase %	Change in income (₹/ha)	
				Check	Demo
(B) KVK, Dahod					
1	Varietal replacement- Maize	57	12.98	7489	18145
2	Varietal replacement -Wheat	25	19.48	25252	31381
3	Varietal replacement – Pigeon pea	25	26.39	14043	21353
4	Varietal replacement -Green gram	70	17.92	7572	9164
5	Varietal replacement -Gram	50	33.16	19972	22808
6	Varietal replacement –Soybean	50	19.00	29186	37345
7	Varietal replacement –Chilli, Okra, Tomato	60	15.33	98600	127735
8	Dairy management - Buffalo/ Cow	20	21.99	89.64	109.35
9	Nutrition and Health management in Heifer(Cow)	20	60 unit success rate		
(C) KVK, Devataj (Anand)					
1	Varietal Introduction GAR-13	75	11.92	18600	24600
2	Varietal Introduction GW-366	80	11.33	8900	12500
3	Varietal Introduction Mustard NRCHB-101	60	17.22	8866	24756
4	Production technology of Mung bean	70	32.67	36000	48600
5	Use of biofertilizers	80	13.73	48000	51500
6	Use of mineral mixture	80	15.00	4700	5900
7	Composite fish culture in village ponds	60	25.00	41500	72500

NB : The data were based on the actual study, questionnaire/group discussion, etc. with exparticipants.

Extension Education Programmes

15 days certificate course on “Integrated Nutrient Management” for Fertilizers Dealers was held during November 5-21, 2019

1. Certificate Courses for Farm Youths/ Farmers/Input Dealers

Anand Agricultural University conducts 7 certificate courses on various subjects. Under these courses, a total of 268 farm youths/farmers/input dealers completed the courses during the year 2019-20 the details are given in Table 5.14.

Table 5.14 Details of the Students/Farmers/Input Dealers who Completed the Certificate Course during 2019-20

Sr. No.	Name of Certificate Course	Center	Duration	No. of Training (batch per year)	No. of Farm Youths/ Farmers/Input Dealers Completed the Course
1	Training in Baking Technology	College of FPT & BE, AAU, Anand	20 Weeks	02	53
2	Training in Commercial Poultry Farming / Advanced Training in Commercial Poultry Technology	Poultry Research Station, AAU Anand	10 Weeks	03	58
3	Training in Gardening, Landscaping and Nursery Management	Dept. of Horticulture BACA, AAU, Anand	6 Months	01	22
5	Certificate Course on Soil and Water Testing for Agriculture for farmers	Dept. Agril. Chem. & Soil Sci., BACA, AAU, Anand	3 Weeks	03	48
6	Certificate in Agricultural Extension Services for Input Dealers	SSK, DoEE Anand	6 Months	01	39
7	Diploma in Agricultural Extension Services for Input Dealers	IDEA, AAU Anand	1 Year	01	48



2. Special Training Programmes for Farmers/ Rural Youth

Special training programmes on various subjects for farmers and rural youth

were organized by AAU. The details of 67 special training programmes carried out under these schemes are given in Table 5.15.

Table 5.15 Special Training Programmes Conducted by Various Training Centers

Sr. No.	The subject of Training Programmes	Center/Place	No. of Trainings	No. of Beneficiaries
1	Food Processing Technology(FPT)	College of Food Processing and Bio-Energy, AAU, Anand	07	291
2	Organic Farming(OF)	Department of Agronomy, BACA, AAU, Anand	13	475
3	Weed Management(WM)	AICRP-Weed Management, BACA, AAU, Anand	09	417
4	Integrated Pest Management(IPM)	Department of Agricultural Entomology, BACA, AAU, Anand	17	586
5	Medicinal and Aromatic Plants (MAP)	Medicinal and Aromatic Plants Research Station, AAU, Anand	08	256
6	Seed Production(SP)	Department of Seed Science & Technology, BACA, AAU, Anand	08	256
7	Importance of farm mechanization in maize crop	College of Agricultural Engineering & Technology, AAU, Godhara	01	90
8	Food Nutrition, Quality and Safety		01	76
9	10 days ICAR Short Course Training Programme on “Renewable Energy for Environmental Protection and Energy Conservation”		01	17
10	Importance and Utilization of Biogas		01	60
11	Role of Renewable Energy in Agriculture		01	50



3. Training Programmes for Extension Functionaries

(a) Extension Education Institute

The Extension Education Institute, Anand caters to the extension training needs of middle-level functionaries of various line departments of Western Zone States viz; Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Maharashtra, Goa

and UTs of Diu, Daman and Dadra Nagar Haveli. The aim is to improve their job performance, wherever, they are working in different capacities. The Management Committee of EEI approves the action plan and reviews the progress of EEI activities. A total of 109 training courses were conducted for 2888 trainees by the EEI, Anand during the year as shown in Table 5.16.

Table 5.16 Training Programmes Conducted during the Year 2019-20

Sr. No.	Type of Courses/Workshops	No. of Courses	No. of Participants
1	On-Campus	38	794
2	Peripatetic (Off-Campus)	39	1400
3	Consultancy/ Sponsored (On-Campus)	28	626
4	Skill Training Programme	04	68
Total		109	2888

(b) Training & Visit Scheme

The Anand Agricultural University has taken up the task of training for the extension personnel of the Department of Agriculture through the Training and Visit Scheme at Anand. The details about bi-monthly

workshops, pre-seasonal training and special training programmes organized for the extension personnel of the Department of Agriculture and the number of SMSs/AEOs attended the programmes during 2019-20 is given in Table 5.17.

Table 5.17 Training Programmes Organized by T&V during the Year 2019-20

Sr. No.	Type of Programmes	No. of Training Programmes	No. of Extension Personnel
1	Bi-Monthly Workshops	04	141
2	Pre-seasonal Training	02	63
3	Greenhouse/Nethouse Training	02	93

4 Training Programmes for Farmers / Farm Women / Farm Youths/Extension Workers and Others

Training is essential to increase the efficiency of the farmers, farm women and farm youths and extension workers. On-campus, as well as off-campus training programmes, are organized based on the needs and interests of the stakeholders

through the Front Line Transfer of Technology (TOT) Centres. Total 584 (On-campus-399 and Off-campus-185) training programmes were organized by extension education centers of AAU for 19709 beneficiary farmers and extension workers during 2019-20. The center wise details of the training programmes and their beneficiaries are given in Table 5.18.

Table 5.18 Training Programmes Organized by TOT Centers during 2019-20

Sr. No.	Name of TOT Center	No. of Training Programmes	Farmers	Farm Women	Extension Workers/ Other	Total
1	SSK, Anand	A 52	1133	966	104	2203
2	KVK, Arnej (Dist.Ahmedabad)	A 43	552	278	-	830
		B 64	1333	654	44	2031
3	KVK, Dahod	A 27	373	219	-	569
		B 50	753	605	-	1358
4	KVK, Devataj (Dist.Anand)	A 73	1255	202	162	1619
5	TRTC, Devgadbaria	A 14	328	281	-	609
		B 03	20	45	-	65
6	TFWTC, Devgadbaria	A 17	98	570	-	668
		B 10	13	227	-	240
7	DVK, Vejalpur	A 09	461	-	-	461
		B 24	1399	-	-	1399
8	PVK, Limkheda	A 19	289	457	-	746
		B 08	69	143	-	212
9	FTTC, Sansoli	A 12	856	-	-	856
		B 06	228	-	-	228
10	TC, Jabugam	A 15	651	-	-	651
11	ATIC, Anand	A 24	780	348	48	1176
		B 03	86	-	06	92
12	APC, Dahod	A 18	797	-	-	797
		B 11	249	-	-	249
13	TTF, Dahod	A 05				
		B 05				
13	NARP Extension Scheme MMRS, Godhra	A 13	639	-	-	639
		A 07	396	-	-	396
14	School of Baking, Anand	A 50	1443	-	-	1443
		B 01	114		-	114
15	KCC, Anand	A 01			58	58
Total A		A 399	10051	3321	372	13721
Total B		B 185	4264	1674	50	5988
Grand Total (A+B)		584	14315	4995	422	19709

A = On-campus B = Off-campus

5. Extension Education Activities

The KVKs, TOT centers as well as the Advisory service centers and other centers had also planned and organized extension education activities. More than 1,49,811 beneficiary farmers were benefitted through various extension education activities conducted by various

extension, education and research centers of AAU whereas, 2,24,293 beneficiary farmers were benefitted by providing mobile advisory services (Voice and Text both) through KVKs of AAU during 2019-20. The details of the extension education activities organized under various centers/schemes are given in Tables 5.19 to 5.22.



Table 5.19 Extension Education Activities carried out by KVKs of AAU during 2019-20

Activities	No. of Programmemes	No. of Farmers	No. of Extension Personnel
Advisory services	129	79045	05
Kisan Mela	01	100	18
Diagnostic visits	201	559	05
Field days	28	541	05
Group discussions	100	1675	-
<i>Kisan ghosthis</i>	60	2868	53
Film shows	138	3771	00
Self Help Groups (SHGs)	01	35	-
Exhibition	01	425	04
Ex-trainees <i>Sammelan</i>	01	33	-
Lectures delivered	168	25990	05
Method demonstrations	58	1317	-
Celebration of important days	06	321	243
Farmers visit the KVK	227	2553	16



Table 5.20 Mobile Advisory Services provided by KVKs of AAU during 2019-20

Name of KVK	Message Type	Type of Messages						Total Beneficiaries
		Crop	Livestock	Marketing	Awareness	Other Enterprise	Total	
Arnej (Dist.Ahmedabad)	Text only	42	58	6	247	53	406	
Dahod	Text only	4	2	1	3	2	107225	
Devataj (Dist.Anand)	Text only	00	00	03	02	02	116662	
	Total	46	60	10	252	57	224293	

Table 5.21 Extension Education Activities Carried Out in Tribal Area by TOT Centers during 2019-20

Sr. No.	Activities	TTF Dahod	APC Dahod	TRTC Devgadhbaria	TFWTC Devgadhbaria	PVK Limkheda	TOT Godhra	TC Jabugam	DVK Vejalpur
1	Khedut shibirs/Pashupalan shibirs/Krushi gothis/Group discussion	-	-	02 (400)	01 (267)	03 (667)	07 (393)	02 (60)	-
2	Guidance to farmers	206	255	05	10	289	584	107 (1487)	-
3	Films/Video shows	-	-	10 (793)	07 (285)	20 (797)	25 (1196)	12 (485)	-
4	Guidance through letters/ Telephone/SMS	228	250	339	185	200	207	123 (205)	-
5	Field visit/ Crop diagnostic services	12	07 (94)	03 (57)	00	03 (107)	09 (09)	52 (233)	22 (220)
6	Cattle health camps	-	-	-	-	-	-	-	10 (688)
7	Lectures delivered for new Technology	-	-	00	00	36 (1287)	13 (Mass)	1 (600)	-
8	Pressnote	-	-	-	-	02	03	-	-
9	Educational tour	-	01 (51)	-	-	-	-	-	-
10	Tick Control Programme	-	-	-	-	-	-	-	-
11	Deworming Programme	-	-	-	-	-	-	-	10 (361)
12	Crop Demo/Int.Demo	-	-	94	00	260	-	-	90

Note: Figures in parentheses indicate numbers of participants/beneficiaries

Table 5.22 Extension Education Activities Carried Out by TOT Centers during 2019-20

Sr. No.	Activities	SSK Anand	SPAEM Anand	ATIC Anand	PUB Anand	TOT Arnej	FTTC Sansoli
1	Trainings/Khedut shibirs/Pashupalan shibirs/ <i>Krushhi goshtis</i>	52 (2203)	-	27 (1268)	-	2 (80)	18 (1084)
2	Group discussions	46 (3158)	-	21 (314)	-	39 (639)	05 (111)
3	Guidance to farmers	3906	-	1501	2520	1027	181
4	Films/Video/TV/Radio shows	73 (3154)	-	-	-	-	3 (Mass)
5	Guidance through letters/ Telephone/SMS	498	-	269	2460	719	197
6	Field visit/ Crop diagnostic services	81 (3389)	-	09 (330)	-	75 (885)	61 (112)
7	Newspaper coverage/Press Note	--	-	-	157		03
8	Lectures delivered for new Technology	47 (2027)	-	-	-	17 (478)	8 (250)
9	Escorting the visitors	3833	17919	-	93	280	364
10	Crop Demo / Interactive Demo	-	-	-	-	10	160

Note: Figures in parentheses indicate numbers of participants/beneficiaries

6. Workshop on Subhash Palekar Natural Farming for Master Trainers

AAU has organized one day workshop on SPNF for master trainers under the guidance of the Department of Agriculture, Farmers' Welfare and Co-operation in collaboration with ATMA and Anand Agricultural University, Anand on 13 February 2020. The programme was inaugurated

by Hon. Governershri Acharya Devvratji. In this programme, Hon. Governershri of Gujarat, Officials from state Government, Scientists from Anand Agricultural University, Officials from Agricultural Technology and Management Agency (ATMA) and more than 5000 Master Trainers from different districts of Gujarat were remained present and share their views regarding SPNF.



7. Publications

(i) Farm Magazine

The publication unit publishes the monthly farm magazine 'Krushigovidya' regularly since May 1948. The main objective of this farm magazine is to disseminate and to popularise improved and scientific methods of agricultural and allied subjects in a very digestible and easily understandable manner for the farming community. There were 2,01,691 copies of krushigovidya distributed during the year 2019-20.

Best Article Award

The AAU gives the Uttam Lekh Awards (Best Articles Awards) for authors whose articles publishes in Krushigovidya farm magazine since 2004-05. These awards were given to 39 authors for their published 13 articles in 12 issues of the 71st volume of Krushigovidya farm magazine. Among them, 39 AAU scientists (55.07 %) received the Uttam Lekh Awards. The detail is given in Annexure 5.2

(ii) AAU Newsletter

The Directorate of Extension Education publishes a quarterly 'AAU Newsletter' regularly. The AAU newsletter gives research highlights, technical events/news, extension activities and noteworthy work done by the scientists of AAU.



(iii) Books

The publication unit has published 04 books during 2019-20 for sale on various subjects for the benefit of the farming community. The details of literature published & distributed during 2019-20 is given in Table 5.23 & 5.24.



Table 5.23 Books published and sold by Publication Unit, DoEE, AAU, Anand during 2019-20

Sr. No.	Name of Book	No. of Copy Sold
1	<i>Krushi Margdarshika</i>	726
2	<i>Jamin Swasthy ane krushi</i>	1761
3	<i>Hydroponics and Aeroponics</i>	16
4	<i>Pashupaalan: Bamni Aavakano Strot</i>	2584
Total		5087

Table 5.24 Farm Literature Published and Distributed by Publication Unit, DoEE, AAU, Anand during 2019-20

Sr. No.	Name of Publication	Type of Publication	No. of Copy Published	No. of Copy Distributed
1	<i>Khedutopayogi Sansodhan Bhalamano - 2019</i>	Booklet	2000	2000
2	AAU Newsletter (Quarterly)	Newsletter	3000	3000
3	<i>Krushigovidya Farm Magazine (Monthly)</i>	Farm Magazine	201691	201691
Total			206691	206691



A total of 2,06,691 copies of different farm literature were distributed by publication unit to farming and scientific community during 2019-20.

(iv) Agricultural Literature

The books, booklets, folders, brochures, reports, directory, worksheets, training and practical manuals, diary, etc. on various subjects were published by different extension, education and research centers of AAU during the year under report. More than, 14,750 copies of books, 20,280 copies of booklets, 66,100 copies of folders, 2,02,441 copies of magazines and more than 10,700 copies of other literature were published and distributed to beneficiaries by AAU in all, list of 87 publications are given in Annexure 5.3

8. Mass Media

(v) Radio Talks

During the year, 15 scientists of AAU has delivered 24 radio talks on different topics related to agriculture, horticulture, animal husbandry on all India Radio, Vadodara and Godhra. The details of radio talks are given in Annexure 5.4

(i) TV Programmes

30 TV talks on different aspects covering agriculture, horticulture, animal husbandry, home science, etc. and 7 phone-in-live programmes were telecast through Doordarshan Kendra, Ahmedabad. The details of TV programmes are given in Annexure 5.5.

(ii) Kisan Call Centre

The Kisan Call Centre (free call Service-1800-180-1551) for the State of Gujarat and U.T. of Dadra and Nagar Haveli has been functioning effectively from 1.11.2004 at Ahmedabad. Since 10th June 2004, the Call Centre service has been made available right from 6 a.m. to 10 p.m.

Directorate of Extension Education, AAU, Anand acts as a nodal agency for KCC of the Gujarat State. The Director of Extension Education looks after and monitors the system in the entire Gujarat State. The Directorate of Extension Education imparts training to Level- I and Level - II officers of KCC.

9. Coordination with line Departments

The AAU has planned and organized various extension education programmes/activities in close coordination with line departments of the state. The structural linkages exist under the Training and Visit scheme by way of constituting technical committees at the district, zonal and state levels.

The functional linkages also exist under the T&V Scheme through bi-monthly workshops, pre-seasonal trainings, diagnostic team, and state-level crop seminars/ workshops etc. The coordination exists in a follow-up programme as well as planning of farm trials. In AGRESCO, the officers of the line departments are the members and they generously contribute to the formulation of technical programmes as well as in finalizing recommendations for the farmers.

The interface of AAU scientists with functionaries of the departments of the state, NGOs and other agencies was organized at state as well as at campus levels during the year of the report.

The agricultural programmes of All India Radio, as well as Doordarshan, were finalized by coordinated efforts. For transfer of technologies to the farmers at large, farmers' day, *Krushi Mela*, farmer-scientist interactions, group discussions etc. were organized through collaborative efforts.

10. Krishi Kalyan Mahotsav Programme

Krishi Kalyan Mahotsav is a knowledge sharing rendezvous event for the farming community of Gujarat. Looking to the grand success of the previous year's *Krushi Mahotsav*

in the transfer of agricultural technologies, developing awareness among farmers, planning for ensuing Kharif crops and to make familiar with various government schemes for the benefit of the farming community, a state-level *Krishi Kalyan Mahotsav* was organized on 16th June 2019 by the Government of Gujarat. Under this programme, a Seminar – cum – Exhibition and State Level Programme was organized at Morva(H.) town of Panchmahals District.

Hon. Chief Minister of Gujarat, Shri Vijaybhai Rupani, inaugurated the State Level Programme. Several State and Cabinet Ministers of Gujarat, Legislative Assembly Members, District Panchayat/Taluka Panchayat Presidents, Directors of various Dept. of Gujarat State; Ex. Vice-Chancellor of AAU, Dr. N. C. Patel and many other dignitaries remained present and graced the occasion.



Table 5.26 Brief description of *Krishi Kalyan Mahotsav 2019-20*

Sr. No.	District	No. of Scientists attended the programme	No. of officers/ delegates attended the programme	No. of farmers
1	Ahmedabad	56	27	9194
2	Mahisagar	12	35	2329
3	Botad	09	10	2484
4	Anand	52	28	8401
5	Panchmahal	37	65	9786
6	Vadodara	45	26	9321
7	Dahod	20	27	6233
8	Kheda	16	23	3247
9	Chhotaudepur	12	20	2350
Total		259	261	53345

Impacts/Benefits of Krushi Mahotsav

➤ Direct interaction of farmers with Agricultural scientists/Officers and intimacy between the

farmers and Agricultural Scientists/Officers increased

➤ Farmers started their interaction with

Agricultural Scientists/Officers without any hesitation for their questions/information/technology.

- Farmers started adopting the new techniques that in turn increased their income.
- Due to systematic cultivation and use of proper inputs, their cultivation cost reduced and hence their income increased.
- Water accumulation/storage, the water level came up due to which the irrigation area increased.
- Farmers started growing new crops so, the loss due to the growing of routine types of crops, risk reduced.
- State border level farmers also adopted the New Agriculture Technology system.
- Due to the easy availability of information of State/Central Govt. schemes, farmers came forward to take benefits of Assistance Schemes

Subhash Palekar Natural Farming Training Cum Shibir

A 7 day Subhash Palekar Natural Farming (SPNF) Training cum Shibir Programme was organized under the guidance of the Department

of Agriculture, Farmers' Welfare and Co-operation in collaboration with ATMA and Anand Agricultural University, Anand at Vadtal Swaminarayan Temple, Vadtal, Ta. Nadiad, Dist. Kheda from 5 December 2019 to 11 December 2019. The programme was inaugurated by Hon. Governershri Acharya Devvratji. In this programme, Hon. Governershri of Gujarat, Hon. Cheif Minister of Gujarat, Shri Vijaybhai Rupani, the originator of SPNF farming Shri Subhash Palekarji, Officials from state Government, Scientists from Anand Agricultural University, Official from Agricultural Technology and Management Agency (ATMA) and more than 5000 farmers from different districts of Gujarat remained present. In this programme, Hon. Governershri of Gujarat, Shri Acharya Devvratji highlighted the importance of the SPNF model of farming and change their life. Hon. Cheif Minister of Gujarat, Shri Vijaybhai Rupani pinpointed out the efforts carried out by the Government of Gujarat to encourage SPNF and motivated the farmers to step out towards SPNF and improve their health as well as their family. He also urged that farmers of Gujarat make the state as "Role model" in India by adopting Subhash Palekar Natural Farming. The entire programme was ended with great success.



Annexure 5.1

Extension Education Schemes

Sr.No.	Scheme	Center
A	Plan Schemes	
1	Training Programmeme on Food Processing Technology	Anand
2	Training Programmeme on Organic Farming	
3	Training Programmeme on Weed Management	
4	Training Programmeme on Integrated Pest Management	
5	Training Programmeme on Seed Production	
6	Training Programmeme on Medicinal and Aromatic Plants	
7	Training in Gardening, Landscaping and Nursery Management	
8	Training in Baking Technology	
9	Training in Commercial Poultry Farming / Advanced Training in Commercial Poultry Technology	
10	Strengthening of Directorate of Extension Education	
11	Agricultural Technology Information Centre	
12	Upgrading of existing Sardar Smruti Kendra	
13	Establishment of Technological Resource Centre and Educational Museum	
14	Establishment of Transfer of Technology Centre	Arnej
15	Establishment of Agri Poly Clinic for Tribal Farmers	Dahod
16	Strengthening of Demonstration cum Training Centre for Fish Culture	Devataj
17	Establishment of Tribal Farm Women Training Centre	Devgadhbaria
18	Transfer of Technology Centre	Godhra
19	Training Centre	Jabugam
20	Pashu Vigyan Kendra	Limkheda
21	Farm Technology Training Centre	Sansoli
22	Dairy Vigyan Kendra	Vejalpur
B	Non-Plan Schemes	
1	Directorate of Extension Education	Anand
2	Publication Scheme	
3	Establishment of Sardar Smruti Kendra Museum	
4	Farm Advisory Scheme	
6	Tribal Training Centre	
7	Tribal Research cum Training Centre	
7	Tribal Research cum Training Centre	
C	ICAR Schemes	
1	Overseeing of KVKs through Directorate of Extension Education	Anand
2	Krushi Vigyan Kendra	Arnej
3	Krushi Vigyan Kendra	Dahod
4	Krushi Vigyan Kendra	Devataj
5	<i>Mera Gaon Mera Gaurav Programme</i>	
D	Other Agency Schemes	
1	<i>Krushi Mahotsav</i>	Anand
2	Training and Visit Scheme (Plan)	
3	NARP Extension Scheme	Arnej
4	NARP Extension Scheme	Godhra
5	<i>Krushi Library</i>	Anand

Annexure 5.2

Details of AAU Scientist Receiving Best Article Award

Sr. No.	Name of Scientist	Designation & Address	Year	Issue No.	Month-Year	Page No.
1	Dr. R. K. Thumar	Associate Professor, Entomology Department, BACA, AAU, Anand	71	1	May-2018	19-20
2	Dr. C. C. Patel	Associate Professor, Entomology Department, BACA, AAU, Anand	71	1	May-2018	19-20
3	Dr. P. K. Borad	Professor and Head, Entomology Department, BACA, AAU, Anand	71	1	May-2018	19-20
4	Dr. A. B. Brahmhatt	Professor and Head, Plant Pathology Department. BACA, AAU, Anand	71	1	May-2018	32-33
5	Dr. N. M. Gohel	Associate Professor, Plant Pathology Department. BACA, AAU, Anand	71	1	May-2018	32-33
6	Shri Keyurkumar A. Patel	Food Processing Technology & Bio-Energy College, AAU, Anand	71	2	June-2018	24-25
8	Dr. R. A. Mathakiya	Assistant Professor, Microbiology Department, Veterinary College, AAU, Anand	71	2	June-2018	32-34
11	Dr. F. P. Sawaliya	Principal Scientist & Head, Poultry Complex, AAU, Anand	71	7	Nov-2018	35-41
12	Dr. R. M. Rajpura	Assistant Professor, Animal Science,	71	7	Nov-2018	35-41
13	Dr. D. B. Sisodiya	Associate Professor, Entomology Department, BACA, AAU, Anand	71	7	Nov-2018	42-43
14	Dr. Raghunandan B. L.	Assistant Research Scientist, Biocontrol Department, AAU, Anand	71	7	Nov-2018	42-43
17	Dr. P. K. Borad	Professor and Head, Entomology Department, BACA, AAU, Anand	71	7	Nov-2018	42-43
18	Shri M. J. Vasani	Research Associate, Agriculture Meteorology Department, BACA, AAU, Anand	71	8	Dec-2018	11-14

Sr. No.	Name of Scientist	Designation & Address	Year	Issue No.	Month-Year	Page No.
19	Dr. N. D. Patel	Assistant Professor, Basic Science & Humanities Department, BACA, AAU, Anand	71	8	Dec-2018	11-14
21	Dr. R. R. Gajera	Associate Professor & Head, Post-Harvest Technology Department, Horticulture College, AAU, Anand	71	8	Dec-2018	18-22
22	Dr. K. D. Mevada	Associate Professor, Agronomy Department, BACA, AAU, Anand	71	11	March-2019	17-23
25	Dr. Jitendrakumar Chaudhary	Veterinary Public, Health & Epidemiology, Veterinary College, AAU, Anand	71	11	March-2019	31-33
26	Dr. S. G. Vohra	Research Scientist, Animal Nutrition Research Station, Veterinary College, AAU, Anand	71	11	March-2019	41-43
27	Dr. B. R. Devalia	Assistant Research Scientist, Animal Nutrition Research Station, Veterinary College, AAU, Anand	71	11	March-2019	41-43
28	Dr. P. R. Pandya	Research Scientist and Head, Animal Nutrition Research Station, Veterinary College, AAU, Anand	71	11	March-2019	41-43
29	Smt. Meeral D. Suthar	Assistant Professor, Entomology Department, BACA, AAU, Anand	71	12	April-2019	29-34
30	Dr. P. K. Borad	Professor and Head, Entomology Department, BACA, AAU, Anand	71	12	April-2019	29-34
31	Minaxi R. Prajapati	Assistant Professor, Polytechnic in Food Science and Home Economics, AAU, Anand	71	12	April-2019	43-45
32	Dr. K. B. Kamaliya	Principal, Polytechnic in Food Science and Home Economics, AAU, Anand	71	12	April-2019	43-45
33	Dr. D. H. Patel	I/C. Director of Student Welfare, AAU, Anand	71	12	April-2019	43-45

Annexure 5.3

Publication of Agricultural Literature during 2019-20

Sr. No.	Name of Publication	Publication Series No./ ISBN/ ISSN No.
Books		
1	Growth and Prospects of Export	EDU-1:26:2020:500
2	<i>Ksetriya Pakoma Sankalit Jivat Vyavasthapan</i>	EDU-1:29:2020:1000
3	Activities and Achievements Diploma in Agricultural Extension Services for Input Dealers	EDU-8:20:2019:250
4	<i>Jamin Swasthya ane Krushi</i>	EXT-1:25:2020:2000
5	<i>Hydroponics ane Aeroponics</i>	EXT-5:34:2019:1000
6	<i>Falo ane Shakhajinu Parirakshan</i>	EXT-5:35:2019:1000
7	<i>Pashupaalan: Bamni Aavakano Strot</i>	EXT-5:36:2019:5000
8	<i>Vaigyanik Dhabe Pashupaalan: Bamani Aavakano Upay</i>	EXT-6:2:2020:1000
9	<i>Khedut Mitra Handbook: Yojanao ane Karyakram Varsh 2019-20 (Online)</i>	EXT-17:1:2019:0000
10	<i>Poshanlakshi Suraksha mate Kitchen Garden</i>	EXT-21:3:2020:1000
11	<i>Aadarsh Pashupaalan: Pashupaalakoni Aavak Vadharavaano ek Prayas</i>	EXT-22:28:2020:2000
Booklets		
12	<i>Jivatnashak Rashayano</i>	EDU-1:25:2019:5000
13	An Overview of Processes/Technologies Developed	EDU-6:31:2019:500
14	An Overview of Machines Developed	EDU-6:32:2019:500
15	FPTBE Annual Report 2019-20	EDU-6:33:2019:50
16	AAU Regulations for Post Graduate Programmes through Distance Mode	EDU-8:21:2019:500
17	<i>Gujaratani Khetima Gaun tatha Sukshma Tatvonu Mahatva ane Prabandhan</i>	RES-1:13:2019:3000
18	Research Accomplishment and Recommendations (2019)	RES-1:14:2019:500
19	Booklet on “Agri – Startup during 2019-20”	RES-1:15:2019:200
20	Package of Practices for Paddy in Gujarat	RES-27:8:2020:2000
21	<i>Beej Masala Pakoni Vaigyanik Kheti Paddhati</i>	RES-47:5:2020:2000
22	<i>Khedutopayogi Sansodhan Bhalamano 2019</i>	EXT-3:17:2019:2000
23	<i>Karya Matsyabeejno Uccher</i>	EXT-22:27:2019:30
24	16 th Convocation: Programme & Procedure	GEN-1:25:2020:1000
25	16 th Convocation: Welcome Address	GEN-1:26:2020:1000
26	16 th Convocation: Atithi Visheshanu Mangalik Pravachan	GEN-1:27:2020:1000
27	16 th Convocation: Convocation Address	GEN-1:28:2020:1000
Practical Manuals		
28	“GPB 1.1: Introductory Biology”	EDU-1:22:2019:350
29	Ground Water wells and Pumps	EDU-4:29:2019:200
30	E.E.2.3.9 Electrical Machines and Power Utilization Subject	EDU-4:30:2019:100
31	Watershed Hydrology (SWCE-2.4.6)	EDU-4:31:2019:200
32	Soil and Water Conservation Engineering (SWCE-3.5.5)	EDU-4:32:2019:200

Sr. No.	Name of Publication	Publication Series No./ ISBN/ ISSN No.
33	Watershed Planning and Management	EDU-4:34:2019:200
34	Water Harvesting and Soil Conservation Structures	EDU-4:35:2019:200
35	Practical Manual for FPT123 – Post Harvest Engineering	EDU-6:35:2019:200
36	Practical Manual of FPT 243 – Processing Technology of Legumes and Oilseed (As per ICAR 5 th Deans’ Committee Recommendations)	EDU-6:36:2019:200
Training Manuals		
37	Animal Husbandry in Respect to WTO	EDU-1:30:2020:500
38	15 Divasiy Training Manual “Integrated Nutrient Management for Fertilizer Dealers”	EXT-22:26:2019:60
39	Training Manual “Integrated Nutrient Management for Fertilizer Dealers”	EXT-23:15:2019:60
Modules		
40	<i>Khetima Havaman ane Jaminani Bhumika</i>	EDU-8:22:2019:50
41	<i>Pak Utpadan</i>	EDU-8:23:2019:50
42	<i>Beej Utpadan</i>	EDU-8:24:2019:50
43	<i>Sankalit Poshan Vyavasthapan (IMN)</i>	EDU-8:25:2019:50
44	<i>Piyat Vyavasthapan (Water Management)</i>	EDU-8:26:2019:50
45	<i>Pak Sanrakshan</i>	EDU-8:27:2019:50
46	<i>Farm Yantrikaran ane Kapani Pachhini Tantrikatao</i>	EDU-8:28:2019:50
47	<i>Vistran Vyavastha ane Vyaktitva Vikas</i>	EDU-8:29:2019:50
48	Input dealer course Module-1	EXT-2:2:2019:50
49	Input dealer course Module-2	EXT-2:3:2019:50
50	Input dealer course Module-3	EXT-2:4:2019:50
51	Input dealer course Module-4	EXT-2:5:2019:50
52	Input dealer course Module-5	EXT-2:6:2019:50
53	Input dealer course Module-6	EXT-2:7:2019:50
54	Input dealer course Module-7	EXT-2:8:2019:50
55	Input dealer course Module-8	EXT-2:9:2019:50
Folders		
56	<i>BT Kapasani Gulabi Iyal ane tenu Sankalit Vyavasthapan</i>	EDU-1:20:2019:10000
57	<i>Sangrahit Anajama Jivat Vyavasthapan</i>	EDU-1:21:2019:5000
58	<i>Titighoda ane Rantidni Samasya ane tenu Sankalit Vyavasthapan</i>	EDU-1:23:2019:5000
59	<i>Krusha Kshetre Nikasani Tako ane Karyavahi</i>	EDU-1:27:2020:2000
60	Agri-Export from India: Prospects and Procedure	EDU-1:28:2020:2000
61	Departmental Profile Processing and Food Engineering	EDU-4:26:2019:100
62	Pravahi Jaivik Khatar : Color	RES-12:12:2020:10000
63	Pravahi Jaivik Khatar : Black & White	RES-12:13:2020:10000
64	G. A. R. 14: Sugandhit ane Madhyam Patlo Dano Dharavati Dangarani Sudhaareli Jat	RES-27:7:2019:2000
65	<i>Sendriy Khetima Pak Paddhatio</i>	RES-41:7:2020:2000
66	<i>Badalata Vatavaranani Jivato par Thati Asaro</i>	RES-41:8:2020:2000
67	<i>Anand Krushi University Dvara Sendriy Poshan Vyavasthaa Anvaye Thayel Bhalamano</i>	RES-41:9:2020:2000

Sr. No.	Name of Publication	Publication Series No./ ISBN/ ISSN No.
68	<i>Jaivik Krushi Upajani Reet ane Pramanani Jaruriyato</i>	RES-41:10:2020:2000
69	<i>Sendriy Kheti Mateni Sahay Yojanao</i>	RES-41:11:2020:2000
70	<i>Gujarat Rajyama Sendriy Kheti Karta Kheduto Farmani Sampark Yadi</i>	RES-41:12:2020:2000
71	<i>Sendriy Kheti Karata Khedutoni Safalya Gatha</i>	RES-41:13:2020:2000
72	<i>Diwelani Vaigyanik Kheti Paddhati</i>	RES-45:12:2019:1500
73	<i>Ghauni Vaigyanik Kheti Paddhati</i>	RES-45:13:2019:1500
74	<i>Deshi Kapasani Navi Jato ane Kheti Paddhati</i>	RES-47:4:2020:3000
Leaflets		
75	<i>Goldfishnu Prajanan ane Bacchano Uchher</i>	EXT-34:2:2019:1000
Souvenir		
76	Souvenir of Agrivision 2019 Programme	EDU-1:24:2019:50
Brochure		
77	Placement Brochure 2020	EDU-4:33:2019:150
78	Placement Brochure 2019 (For College)	EDU-6:34:2019:200
Magazine		
79	“ <i>Krushigovidhya</i> ” Magazine (Monthly)	Year:71:No.12:Vol.852:21000 Year:72:No.01:Vol.853:20700 Year:72:No.02:Vol.854:20700 Year:72:No.03:Vol.855:20500 Year:72:No.04:Vol.856:18500 Year:72:No.05:Vol.857:17000 Year:72:No.06:Vol.858:16500 Year:72:No.07:Vol.859:16800 Year:72:No.08:Vol.860:14991 Year:72:No.09:Vol.861:12500 Year:72:No.10:Vol.862:11000 Year:72:No.11:Vol.863:11500
80	Rivista-2019 A magazine from SRC- CAET, Godhra	EDU-4:25:2019:300
81	Food Technica (College Magazine)	EDU-6:30:2019:300
82	AIT College Magazine	EDU-7:1:2020:150
Newsletter		
83	AAU Newsletter (Quarterly)	Vol.15 No.4: 1000 Vol.16 No.1: 1000 Vol.16 No.2:1000 Vol.16 No.3: 1000
Reports		
84	Annual Progress Report-2018-19 (Volume-9)	EDU-4:27:2019:200
85	15 th AAU Annual Report 2018-19	GEN-1:24:2020:300
Technical Bulletin		
86	Renewable Energy for Environment Protection & Energy Conservation	EDU-4:28:2019:30
Handout		
87	Diwelani Navi Jaat (GAC 11)	RES-45:14:2019:1500

Annexure 5.4

Radio Talks Delivered during 2019-20

Sr. No.	Name of Scientist	Topic	Date
1	Dr. M. B. Patel	<i>Chomasu Makaini Kheti Paddhati</i>	29/04/2019
2	Dr. R. R. Gajera	<i>Soyabinma Mulya Vardhan</i>	14/05/2019
3	Dr. R. R. Acharya	<i>Shakbhaji Pakoni Vaigyanik Kheti Paddhati</i>	17/05/2019
4	Dr. K. V. Patel	<i>Mag ane Tuverani Kheti Paddhati</i>	21/05/2019
5	Dr. S. K. Raval	<i>Pashuoma Jivanu Vishanu thi Thata Rogo, Nidan ane Sarvar</i>	11/06/2019
6	Dr. G. J. Patel	<i>Soyabinni Vaigyanik Kheti Paddhati</i>	05/07/2019
7	Dr. K. C. Patel	<i>Khetima Sukshm Tatvoni Upyogita</i>	06/08/2019
8	Dr. S. D. Patel	<i>Kathol Pakoma Sankalit Jivat Niyantran</i>	13/08/2019
9	Dr. G. G. Patel	<i>Kheti Kharch Gatadava ane Gunvatta Sabhar Utpadan Melavava Sajiv Kheti</i>	20/08/2019
10	Dr. N. I. Shah	<i>Falo Upar Kothali Chadavavana Fayda</i>	23/08/2019
11	Dr. R. J. Modi	<i>Adarsh Pashu Rahethan</i>	13/09/2019
12	Dr. M. B. Patel	<i>Siyalu Makaini Vaigyanik Kheti</i>	14/10/2019
13	Dr. D. B. Sisodiya	<i>Makaini Navi Jivat: Tapkavali Lashkari Iyal ane Tenu Vyavasthapan</i>	21/10/2019
14	Dr. K. V. Patel	<i>Chana Ni Vaigyanik Kheti</i>	28/10/2019
15	Dr. R. R. Acharya	<i>Shakbhaji Pakoni Vaigyanik Kheti</i>	08/10/2019
16	Dr. S. D. Patel	<i>Chanana Pakma Sankalit Jivat Vyavasthapan</i>	29/10/2019
12	Dr. M. B. Patel	<i>Siyalu Makaini Vaigyanik Kheti</i>	11/11/2019
13	Dr. D. B. Sisodiya	<i>Makaini Navi Jivat: Tapkavali Lashkari Iyal ane Tenu Vyavasthapan</i>	18/11/2019
14	Dr. K. V. Patel	<i>Chana Ni Vaigyanik Kheti</i>	25/11/2019
15	Dr. R. K. Thumar	<i>Kapasama Gulabi Iyal ane Tenu Sankalit Vyavasthapan</i>	26/11/2019
16	Er. Rajesh S. Godhani	<i>Greenhouse Technology na Prakaro ane Upayogita</i>	02/12/2019
17	Dr. R. J. Modi	<i>Pashu Vyandhtva ane Tenu Niyantran</i>	16/12/2019
18	Dr. K. L. Dabhi	<i>Krushima Yantrikikaran ane tena Fayda</i>	23/01/2020
19	Dr. K. C. Patel	<i>Jamin-Chhod-Poshan Vyavasthama Sukshm Tatvonu Mahatva</i>	04/02/2019
20	Er. Khyati Vyas	<i>Varsadi Paninu Vyavasthapan</i>	04/02/2020
21	Dr. R. R. Gajera	<i>Bagyati Pakoma Processing ane Mulyavardhan</i>	07/02/2020
22	Dr. R. R. Acharya	<i>Velavala Shakbhajini Kheti Paddhati</i>	18/02/2020
23	Sh. K. V. Vala	<i>Khadya Padarthoni Vikiran (Irradiation) Prakriya</i>	17/03/2020
24	Dr. P. M. Lunagariya	<i>Pashu Prajanan Samsya ane Tenu Niavaran</i>	27/03/2020

Annexure 5.5

Television Programmes Telecasted during 2019-20

Sr. No.	Name of Scientist	Topic	Date
1	Dr. H. L. Dhaduk	<i>Aushadhiya ane Sugadhit Pakoni Kheti</i>	22/04/2019
2	Dr. M. B. Patel	<i>Chomasu Makaini Vaigyanik Kheti Paddhati</i>	30/04/2019
3	Dr. M. B. Parmar	<i>Chomasu Dangarni Kheti Paddhati</i>	30/04/2019
4	Dr. R. R. Gajera	<i>Soyabinma Mulya Vardhan</i>	11/06/2019
5	Dr. R. R. Acharya	<i>Shakbhaji Pakoni Vaigyanik Kheti Paddhati</i>	17/04/2019
6	Dr. K. V. Patel	<i>Mag ane Tuverani Kheti Paddhati</i>	08/05/2019
7	Dr. D. P. Gohil	<i>Ghascharani Kheti</i>	22/05/2019
8	Dr. D. D. Chaudhari	<i>KhariPakoma Sankalit Nindan Vyavasthapan</i>	12/06/2019
9	Dr. S. K. Raval	<i>Pashuoma Jivanu Vishanu thi Thata Rogo, Nidan ane Sarvar</i>	19/06/2019
10	Dr. Manoj Lunagariya	<i>Chomasu Alnino ane Khetima Aaksmik Ayojan</i>	26/06/2019
11	Dr. P. K. Borad	<i>Kapasama Gulabi Iyal ane Makaima Fallarmyworm Jivatonu Sankalit Niyanttran</i>	10/05/2019 (Phone in Live)
12	Dr. Dhaval R. Kathiriya	<i>Krushikshetre Information Technology no Upyog</i>	14/06/2019 (Phone in Live)
13	Dr. G. J. Patel	<i>Soyabinni Ganishth Kheti Paddhati</i>	01/07/2019
14	Sh. K. V. Vala	<i>Fal-Shakbhajini Eco Friendly Lari</i>	16/09/2019
15	Dr. S. D. Patel	<i>Kathol Pakoma Sankalit Jivat Niyanttran</i>	16/07/2019
16	Dr. N. I. Shah	<i>Falvadima Falo Upar Kothali Chadavavana Fayda</i>	06/08/2019
17	Dr. R. J. Modi	<i>Adarsh Pashu Rahethan</i>	21/08/2019
18	Dr. K. C. Patel	<i>Khetima Sukshm Tatvoni Upyogita</i>	04/09/2019
19	Dr. A. B. Brahmhatt & Dr. R. K. Thumar	<i>Dangarma Pak Sanvrakshan</i>	26/07/2019 (Phone in Live)

Sr. No.	Name of Scientist	Topic	Date
20	Dr. B. D. Patel & Dr. R. A. Patel	<i>Ravi Pakoma Piyat ane Nindan Vyavasthapan</i>	06/09/2019
21	Dr. D. B. Sisodiya	<i>Makaini Tapkavali Lashkari Iyal (Fall Armyworm)</i>	22/10/2019
22	Dr. P. M. Patel	<i>Sajivkhetima Poshan Vyavasthapan</i>	12/11/2019
23	Dr. K. V. Patel	<i>Chana Ni Vaigyanik Kheti</i>	17/12/2019
24	Dr. R. R. Acharya	<i>Shakbhaji Pakoni Vaigyanik Kheti</i>	16/10/2019
25	Dr. M. B. Patel	<i>Siyalu Makaini Vaigyanik Kheti</i>	06/11/2019
26	Dr. D. D. Chaudhari	<i>Ravi Pakoma Sankalit Nindan Vyavasthapan</i>	27/11/2019
27	Dr. K. D. Parmar	<i>Jantunashak Avasheshoni Aadasar</i>	18/12/2019
28	Dr. R. K. Thumar & Dr. D. B. Sisodiya	<i>Kapasani Gulabi Iyal tatha Makaima Fallarmywormnu Sankalit Vyavasthapan</i>	04/10/2019 (Phone in Live)
29	Dr. K. K. Hadiya & Dr. R. J. Modi	<i>Pashu Vyandhtva ane Tenu Niyantaran</i>	13/12/2019 (Phone in Live)
30	Dr. R. R. Gajera	<i>Bagyati Pakoma Processing ane Mulyavardhan</i>	21/01/2020
31	Dr. K. C. Patel	<i>Jamin-Chhod-Poshan Vyavasthama Sukshm Tatvonu Mahatva</i>	24/03/2020
32	Dr. S. D. Patel	<i>Ravi Pakoma Sankalit Jivat Vyavasthapan</i>	22/01/2020
33	Sh. K. V. Vala	<i>Khadya Padarthoni Vikiran (Irradiation) Prakriya</i>	05/02/2020
34	Dr. J. H. Chudhari	<i>Pashuomathi Manavima Prasarata Rogo ane Teni Savcheti</i>	26/02/2020
35	Dr. R. R. Acharya	<i>Velavala Shakbhajini Kheti Paddhati</i>	18/03/2020
36	Dr. R. K. Thumar & Dr. R. G. Parmar	<i>Ravi Pakoma Sankalit Rog-Jivat Vyavasthapan</i>	17/01/2020 (Phone in Live)
37	Dr. K. K. Hadiya & Dr. P. M. Lunagariya	<i>Pashu Prajanan Samsya ane Tenu Niavaran</i>	13/03/2020 (Phone in Live)

Chapter - 6

STUDENTS' WELFARE

The office of Director, Students' Welfare, Anand Agricultural University was established with effect from 01/05/2004. This office is looking after students' activities/facilities such as housing, sports, cultural events, fellowships, recreation, health, adventure, counseling, NSS, NCC, placement etc. Moreover, dignitaries of different fields are invited to share their thoughts, experiences and views among staff and students.

6.1 Students Representative Council

All the constituent colleges of the University have the Students Representative Council (SRC) formed as per University rules by the Principal/Dean of the respective colleges by selecting the sincere and leading students. The Council is formed with a view to representing students' problems through their representatives. The SRC organizes and monitors various extracurricular activities of students like planning forum, sports, debate and elocution, preparation of college magazine, cultural programmes, NSS, NCC etc. in collaboration with Directorate of Students' Welfare.

Apart from this, Alumni Associations in all the nine colleges have been formed. One day seminars are organized for strengthening the professional alliance and creating the spirit of oneness amongst alumni.

6.2 Students' Amenities

Hostel

Hostel environment plays an important role in the development of personality and character of the students. Good hostel facilities are provided to all the polytechnic, under-graduate and post-graduate students of the University as a residential university along with mess. facility. In some of

the hostels, self-managed messes are governed by the students while some are managed through contract system under the supervision of Rector/Asst. Rector/Asst. Warden. Library facility is also available for the students. The other facilities for day-to-day requirements like laundry, tailor, canteen, cycle store, provision store, telephone, post office, bank, ATM etc. are also available in the university premises. The Rector, Asst. Rectors and Asstt. Wardens are appointed in each college to look after the facilities available and to solve the residential problems of the students.

Health Facilities

Anand Agricultural University has signed MOU with Charutar Arogya Mandal, Karamsad, for providing better health facility to students, staff, labours, pensioners since April 1, 2008. Special facility of doctors for various specialties like Dental, Skin, Physiotherapy, Ayurvedic, Homeopathy and other disciplines is made available on campus.

The number of cases registered under various medical treatments at University Health Center during the year is as under:

Sr. No.	Test/ Treatment	No. of cases/ patients turned up
1	Allopathic	13,072
2	Dental	222
3	Homeopathic	1926
4	Physiotherapy	1398
5	Blood Sugar BS/FBS/PP2bBS test, Lipid Profile, Creatinine, Jaundice/S.G.P.T/SGOT/ Albumin, Uric Acid, Blood group & Laboratory test in Health Center.	3221

Sr. No.	Type of Patients	No. of cases/ patients Turned up for the treatment mentioned in above table
1	University Employee	4947
2	Family members of University Employee	882
3	Students	3016
4	Farm labours	2322
5	Pensioners	3938

Placement Cell

Anand Agricultural University has an excellent placement record with top-notch organizations in Banking sector, Agriculture, Irrigation, Tractor manufacturing, Dairy and Food Processing Information Technology, Pharmaceuticals, NGOs, and Semi Government organizations with a strong and supportive

alumni network holding prime position in reputed companies. We not only ensure a job for the deserving students but also instill a lifetime confidence and growth. Our dedicated placement cell is constantly in touch with the industries. The Student Counseling & placement Cell looks after students' well-being, Placement and Campus-Interview.

Statement showing the details of students' placement (2019-20)

Name of the Faculty	Name of the College	Name of Company	No. of Candidates offered Job		
			U.G.	P.G.	Total
Agriculture	B. A. College of Agriculture	1) Rallis India Ltd. Mumbai	24	30	54
		2) Coastal Salinity Prevention Cell, A'bad			
		3) GSFC Agrotech Ltd. Vadodara			
		4) Agrostar Pvt. Ltd. Government			
		Total	26	33	59
	College of Agriculture, Jabugam	GATL	05	-	05
		Agrovikas	02	-	02
AGRO Star		01	-	01	
	Total	08	-	08	
Veterinary Science	College of Veterinary Science & Animal Husbandry	Cooperative Dairies	16	10	26
		Vadodara Municipal Corporation (VMC)	01	-	01
		GVK / EMRI (Karuna Animal Ambulance Service-1962)	10	06	16
		MVD	12	-	12
		NGO	03	-	03
		Private Practice	03	-	03
			Total	45	16
Dairy Science	SMC College of Dairy Science	Vidya Dairy, Anand	04	-	04
		Amul Dairy, Anand	10	04	14
		GCMF Ltd., Anand	03	05	08
		Dudhdhara Dairy, Bharuch	08	01	09
		Sursagar dairy, Surendranagar	05	-	05
		Adare Foods, VU Nagar	01	01	02
		IDMC Ltd., VU Nagar	02	-	02
		Panchamrut Dairy, Godhra	03	-	03
		AmulFed Dairy, Gandhinagar	07	-	07
		Jamnagar DCMF, Jamnagar	01	01	02
		Sonam Industries, Goa	01	-	01
		Gujarat Enterprise, Ahmedabad	01	-	01
		Banas Dairy, Palanpur	13	02	15
			Total	59	14

Name of the Faculty	Name of the College	Name of Company	No. of Candidates offered Job		
			U.G.	P.G.	Total
Food Processing Technology & Bio Energy	College of Food Processing Technology & Bio Energy	Patson Foods, Navsari	01	-	01
		Accurate Lab, Rajkot	01	-	01
		Flourish Pure Foods Ltd., Ahmedabad	02	-	02
		Balaji Wafers Pvt Ltd, Rajkot	01	-	01
		FPTBE, AAU, Anand	02	-	02
		Junagadh Agricultural University, Junagadh	01	-	01
		Chhajed Foods Pvt. Ltd., Ahmedabad	01	-	01
		King Dehydration, Mahuva	03	-	03
		Phoenix Frozen Foods India Pvt Ltd, Mogar, Anand	01	-	01
		Soniya Foods Pvt Ltd, Ahmedabad	01	-	01
		Wholesome Foods, Kheda	02	-	02
		Maharaja Dehydration, Mahuva	01	-	01
		Jayant Snacks & Foods, Rajkot	01	-	01
		RPA Foods Pvt Ltd., Surat	-	01	01
		Rai University, Ahmedabad	-	01	01
		IFFCO Group, Dubai	-	01	01
		Balaji Foods Pvt Ltd, Anand	-	01	01
		Parul University, Vadodara	-	01	01
		NDDDB, Anand	-	01	01
		Kirtiraj Snacks Pvt Ltd., Anand	-	01	01
		Total	18	07	25
Agricultural Information Technology	College of Agricultural Information Technology	Purplebits Infosystems Pvt. Ltd., Baroda	01	-	01
		Virtual Reality System, Gandhinagar	04	-	04
		TatvaSoft, Ahmedabad	01	-	01
		WeCREATE DESIGN, Ahmedabad	03	-	03
		Zealous system pvt. ltd., Ahmedabad	01	-	01
		Sarjen Systems Pvt. Ltd., Ahmedabad	01	-	01
		NULL Innovation, Ahmedabad	01	-	01
		KNC Surprises Inside Private Limited, Ahmedabad	01	-	01
		Croods Consolidates Pvt Ltd, Ahmedabad	01	-	01
		Coaspect Solutions, Ahmedabad	01	-	01
		Nice Software Solutions, Anand	01	-	01
		SMG Infosolutions Pvt. Ltd, Ahmedabad	02	-	02
		Shree Design, Junagadh	01	-	01
				Total	19

Name of the Faculty	Name of the College	Name of Company	No. of Candidates offered Job		
			U.G.	P.G.	Total
Horticulture	College of Horticulture	Gujarat Environmental Service Society	01	-	01
		Total	01	-	01
Agribusiness Management	International Agribusiness Management Institute	Reliance Fresh Pvt Ltd	-	05	05
		Rasi Seeds Pvt Ltd	-	02	02
		HDFC Bank Ltd	-	02	02
		Adama Agrisolution Ltd	-	01	01
		NAB Kishan Pvt Ltd	-	01	01
		Sumitomo Chemical India Ltd	-	01	01
		Nandu Poultry Pvt Ltd	-	01	01
		Cotton Corporation India Ltd	-	01	01
		Bayer Cropscience Pvt Ltd	-	01	01
		Godrej Agro Vet Pvt Ltd	-	01	01
		IDMC	-	01	01
		Bank of Baroda	-	01	01
		Sowbhagya Bio Tech Pvt Ltd	-	01	01
		Suguna Foods Pvt Ltd	-	01	01
		Netafim Irrigation Pvt Ltd	-	01	01
		Govt. of Tamil Nadu	-	01	01
Global Gourmet Pvt Ltd	-	02	02		
		Total	-	24	24
Agricultural Engineering	College of Agricultural Engineering & Technology, Godhra	Captain Tractors Pvt Ltd.	02	-	02
		Total	02	-	02

6.3 Physical Education Programme

Physical Education and Sports play vital role in the development and maintenance of personality, physical fitness, health and body build up of the students. Along with the development of academic career of the students, this university also strives hard to take care of physical fitness and personality development of the students by

involving them in physical education, sports, cultural events, adventurous activities etc. at college level under the direct guidance and support of Director of Students' Welfare.

(a) Sports Activities & Cultural Events

The students of the university are also trained for the development of skills and excellence in various sports activities. Inter-Collegiate competitions for various games like Chess,

Table-tennis, Badminton, Kabbadi, Volleyball, Basketball, Kho-kho, Cricket, Cultural activities like Folk Dance, One Act Play, Mono Acting, Mime and Literary activities like Essay, Debate, Extempore etc. are organized at various colleges.

The selected students from Inter-Collegiate competitions are nominated for Inter-University participation. During the year, the following Inter-Collegiate competitions were held.

Inter Collegiate Sports & Cultural Competitions: 2019-20

Sr. No.	Game	Organizing College	Date of Tournament	Position	
				Champion	Runners-up
1	Mime	CoA, Vaso	September 21, 2019	Horti.	B.A.C.A.
2	Mono-Acting	CoA, Vaso	September 21, 2019	B.A.C.A.	Vety.
3	Drama	CoA, Vaso	September 21, 2019	B.A.C.A.	Horti.
4	Folk Dance	CoA, Vaso	September 21, 2019	B.A.C.A.	Dairy
5	Debate (For)	CoA, Vaso	September 21, 2019	B.A.C.A.	Dairy
6	Debate (Against)	CoA, Vaso	September 21, 2019	Vety.	B.A.C.A.
7	Extempore	CoA, Vaso	September 21, 2019	Horti.	CoA, Vaso
8	Table-Tennis (M)	I.A.B.M.I.	August 26-27, 2019	B.A.C.A.	CoA., Jabugam
9	Chess	CoA, Jabugam	August 13, 2019	B.A.C.A.	CoA., Jabugam
10	Table-Tennis (W)	I.A.B.M.I.	August 26-27, 2019	Horti.	B.A.C.A.
11	Badminton (M)	B.A.C.A.	August 28-29, 2019	Horti.	Vety.
12	Badminton (W)	B.A.C.A.	August 28-29, 2019	B.A.C.A.	Dairy
13	Volleyball (M)	C.A.I.T.	October 03, 2019	B.A.C.A.	CoA, Vaso
14	Volleyball (W)	C.A.I.T.	October 03, 2019	B.A.C.A.	Horti.
15	Basketball	Vety.	September 11-12, 2019	B.A.C.A.	Vety.
16	Kabaddi	Horti.	January 18, 2020	Horti.	Dairy
17	Kho-kho	FPT & BE	January 17-18, 2020	B.A.C.A.	C.A.E.T., Godhra
18	Football	B.A.C.A.	January 28-28, 2020	Vety.	Dairy
19.	Cricket	C.A.E.T., Godhra	February 04-08, 2020	Dairy	Vety.



Folk Dance



Drama



Mime



Mono Acting



Cricket



Volleyball



Table Tennis



Kho-kho



Badminton



Kabaddi



Chess



Basketball

9th Inter-Polytechnic Sports

9th Inter-Polytechnic Sports was organized during November 21-22, 2019 at Polytechnic in

Agriculture, Vaso. Honorable Vice Chancellor Dr. R. V. Vyas presided over the function. 118 students from five Polytechnic participated in Volleyball, Kho-kho, Chess & Table Tennis.

Sr. No.	Organizing Polytechnic	Date of Tournament	Game	Position	
				Champion	Runners-up
1	Polytechnic in Agriculture, Vaso	November 21-22, 2019	Volleyball	PAE, Dahod	Poly Agri, Anand
2			Kho-kho	Poly. Agri., Anand	Poly. Agri., Vaso
3			Table Tennis	Poly. Agri., Anand	Poly. Agri., Vaso
4			Chess	Poly. Agri., Anand	Poly. Agri., Vaso



9th Inter Polytechnic Sports

Gujarat State Inter Agricultural University Cultural & Literary Competition 2019-20

Gujarat State Inter Agricultural University Cultural & Literary Competition 2019-20 was organized by Anand Agricultural University. Dr. A.A. Patel, Director of Extension Education presided over the inaugural function.

120 Participants from State Agricultural

Universities i.e. Anand Agricultural University, Anand, Junagadh Agricultural University, Junagadh, Navsari Agricultural University, Navsari & Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar participated in various events. AAU became Champion in Folk Dance, Mime, Extempore and Debate, while Runners-up in One Act Play and Debate. Anand Agricultural University, Anand won the Overall Championship Trophy.



Gujarat State Inter Agricultural University Cultural & Literary Competition 2019-20



Result of Gujarat State Inter-Agricultural University Sports, Cultural & Literary Events held during the year:

Sr. No.	Name of the host University	Date of Event	Name of Event	AAU Position
1	AAU	01/10/2019	Folk Dance	First
			Mime	First
			Debate (Against)	First
			Extempore	First
			Drama	Second
			Debate (Favour)	Second
			Overall	First

Sr. No.	Name of the host University	Date of Event	Name of Event	AAU Position
2	JAU	05/10/2019	Volleyball (W)	First
			Basketball (M)	First
			Badminton (W)	Second
3	SDAU	29/02/2020	Volleyball (Polytechnic)	First
			Table Tennis (Polytechnic)	First

AGRIUNIFEST 2019-20

20th All India Inter Agricultural Universities Youth Festival-2020 was organized by Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh during 08 to 12 February 2020. 72 universities participated in AGRUNIFEST. Anand Agricultural University, Anand participated in various events like Folk Dance, One Act Play,

Skit, Mono Acting, Mime, Debate, Extempore, Light Vocal, Quiz, On The Spot Painting, Collage, Poster Making, Clay Modeling, Cartooning etc. Anand Agricultural University, Anand got Gold Medal in Debate and Collage, Bronze Medal in Extempore and Clay Modeling. Anand Agricultural University secured overall Runner-up position in literary events.



AGRIUNIFEST 2019-20 at IGKV, Raipur (Chhattisgarh)



AGRIUNISPORTS 2019-20

19th All India Inter-Agricultural Universities Games and Sports Meet 2019-20 was organized by Sri Venkateswara Veterinary

University, Tirupati (A.P.) during 1 to 5 March, 2020. 42 players participated in various tournaments like Volleyball, Basketball, Table Tennis, Badminton etc. AAU performed well in all tournaments.



AGRIUNISPORTS 2019-20 at Sri Venkateswara Veterinary University, Tirupati (A.P.)

Gujarat State Inter-University Staff Cricket Tournament (2019-20) at Gujarat Vidyapith, Sadra

AAU staff team participated in the Gujarat State Inter-University Staff Cricket Tournament organized by Gujarat Vidyapith, Sadra during 09

to 12 January, 2020. 16 Universities from Gujarat state participated in the tournament. AAU won four matches and reached to the semi final. AAU got 3rd position. Dr. R.V. Vyas, Hon'ble Vice Chancellor and Dr. Dinesh H. Patel, Director, Students' Welfare congratulated the team AAU.



Gujarat State Inter University Staff Cricket Tournament (2019-20) at Gujarat Vidyapith, Sadra

Gujarat State Inter-University Staff Badminton, Table-tennis and Carom tournament at SDAU, Sardarkrushinagar (2019-20)

AAU staff team participated in the Gujarat State Inter-University Staff Badminton, Table-tennis and Carom tournament at

Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during 9 to 10 November 2019. 8 universities participated in the tournament. Dr. R. V. Vyas, Hon'ble Vice-Chancellor and Dr. Dinesh H. Patel, Director, Students' Welfare congratulated the team AAU.



Gujarat State Inter-University Staff Badminton, Table-tennis and Carrom tournament at SDAU, Sardarkrushinagar

(b) National Cadet Corps (NCC)

(i) For Boys Cadet :

It is a voluntary organization helping India in nation-building. NCC plays a vital role in national integration through interaction among different caste, creed and culture. With a view to giving a boost to the youth in the positive direction, NCC has been included in the course curriculum. The NCC unit of BACA is attached with 4 Gujarat Battalion, NCC, Vallabh Vidyanagar. The unit consists of two platoons of 100 cadets. The cadets participated in various camps during the year.

- ◆ 50 cadets attended CATC camp at Thamna and the cadets got first prize in various competitions like Quiz, Volleyball, Tug of cord, Best Cadet.
- ◆ 06 cadets participated in Army attachment camp at Gandhinagar.
- ◆ 24 cadets passed B certificate examination with A and B Grade.
- ◆ 48 cadets passed C certificate examination.

3 cadets got 'A' grade and 45 cadets got 'B' Grade.

- ◆ 02 cadets participated in Advanced Leadership Camp at Thamna organized by Assistant Directorate General of NCC, Gujarat.
- ◆ Sgt. Hardipsinh Mori participated in SSB capsule course at Officer Training Academy, Kampti (MT) from April 28 to May 8, 2019 organized by Directorate General of NCC, New Delhi.
- ◆ Sgt. Hardipsinh Mori participated in central level SSB capsule course at Delhi from October 5-18, 2019 organized by Directorate General of NCC, New Delhi.
- ◆ SUO. Ghanghar Sindhabhai participated in Rock climbing and tracking camp at Pithoragarh, Uttarakhand from December 21-31, 2019 organized by Directorate General of NCC, New Delhi and received Runners up trophy (Gujarat Directorate) in Volleyball tournament.



NCC Cadets with Hon. Vice Chancellor and Director, Students' Welfare



Map Reading Group



Medal received in All India RCTC Camp



Weapon Training

(ii) For Girls Cadet:

“NCC provides a platform to strengthen the spirit of discipline, determination and devotion towards the nation” – this was the statement of Hon. Prime Minister Sh. Narendra Modi while addressing NCC rally on NCC day in January 2020 at New Delhi. NCC has provided numerous opportunities to the youth of the nation where both girls and boys are getting equal platform. NCC girls unit was started in October 2017 under 4 GUJ Girls Battalion of Vallabh Vidyanagar Group with 32 girl cadets enrolled in first year and 28 girl cadets enrolled in 2018-19 and 17 cadets in 2019-20 as per available vacancy. Total 78 cadets from all the colleges of AAU were on roll in 2019-20 .

This year girl cadets have shown incredible interest by participating in various social and adventurous activities carried out by 4 Guj Girls

BN, Vallabh Vidyanagar Group throughout the year. Girl cadets have participated in Pan India cycle rally, environment awareness rally, plastic use awareness lecture, swachhata pakhvadiya, tree plantation programme, statue cleaning programme, nukkad natak, Army attachment camp, Combined Annual Training camp. They have not only participated but also have secured medals during camps for sports, cultural and adventure competitions including rifle shooting.

(1) Awareness Lecture on Pollution

As a part of celebration of ‘Awareness on Pollution’ pakhwada by 4 GUJ Girls BN NCC, Girls NCC of B. A. College of Agriuculture arranged a lecture on July 11, 2019 at PG seminar Hall, BACA, AAU, Anand on Pollution by Shri Dhaval Patel, Managing Trustee of Vidhyanagar Nature Club, Vidhyanagar.

(2) NCC Day celebration

77 cadets performed Nukkad Natak on NCC Day on November 26, 2019 at AAU campus on the theme 'Role of NCC in Personality Development and Nation Building'. They highlighted the importance of various activities by NCC.

(3) Combined Annual Training Camp

- (i) 36 cadets participated in Combined Annual Training camp (CATC) for 10 days (September 15-26, 2019) at Thamna, Anand. They participated in various activities like rifle shooting, map reading, and cultural activities. Cadets also secured 46 medals in various group and solo activities.
- (ii) 16 cadets participated in CATC for 10 day (November 03-12, 2019) at Mogri, Anand. They participated in various activities organized by camp and secured total 11 medals in cultural, cyclathon and other activities.

(4) Army Attachment Camp

5 cadets participated in 14 day (29 July to 12 Aug, 2019) Army Attachment camp with 3rd BN of 1st Gorkha Rifles (3/1GR) at Army cantonment Area, Chiloda, Gandhinagar, Gujarat. 30 cadets from various NCC groups of Gujarat participated in the camp. Cadets participated in weapon training, map reading, tent pitching, rifle shooting by INSAS and LMG rifles, Ambush demo, night navigation, point to point march, drill, first aid training, adventurous activities like

slithering, rappelling, artificial rock climbing.

(5) Anand Run

41 cadets participated in 'Anand Run' organized by IRMA on 19 January, 2020 and successfully completed the run.

(6) Achievements

- (i) Cdt. Urja Kotadiya of 3rd Semester, BACA was selected to represent Gujarat state during Pan India Cycle Rally at New Delhi and interacted with Defense Minister of India during September, 2019.
- (ii) Two cadets- UO Dhara Gadhiya and Cdt. Divya Patel received scholarship of Rs. 6000/- from 'Cadet welfare scholarship (CWS)' for academic year 2019-20 from NCC.
- (iii) 4 cadets- Urja Kotadiya, Rishika Gupta, Shrutiba Zala and Mandakini Jani received medals for their notable contribution to NCC activities.
- (iv) Lt. Rucha Dave, ANO attended CATC camp during November 03-12, 2019 at Mogri, Anand. She received appreciation letter and certificate from 4 Guj. Girls BN NCC for participating actively and conducting the camp effectively.
- (v) 9 cadets secured A grade and 16 cadets secured B grade in B certificate exam conducted during 2018-19.



Awareness Lecture on Pollution



Cadet-participation in Cycle Rally at Delhi



Cadets Receiving Medals in Camp



Nukkad Natak

6.4 National Service Scheme (NSS)

The Department of Youth Affairs and Sports, Ministry of Human Resources Development, New Delhi had started the National Service Scheme in 1969-70. The basic purpose of this scheme is to develop responsibility through social services and realization of work and discipline. National Service Scheme is functioning in all the UG colleges and Polytechnics of Anand Agricultural University. During the year under report, volunteers registered for regular activity and for special camp are as under;

Sr. No.	Activity	No. of registered volunteers
1	Regular activities	1400
2	Special camp activities	700

During the spare time of academic programme the volunteers are directly involved in the activities related to the problems and requirements of the society and its development through various fields of N.S.S. They are also inspired to work for Environment, Health, Family welfare, Hospitals and other organizations during natural calamity for the benefit of society and to work with people in the village and slums.

The social activities carried out by N.S.S. are divided in two groups.

4. (A) Regular activities

The regular activities carried out by the university during the reporting year include:

- ◆ Celebration of the Independence day and Republic Day
- ◆ Celebration of 'Matrubhasha Divas'
- ◆ Eye Check up Camp
- ◆ Celebration of NSS Day
- ◆ Blood Donation Camp
- ◆ Thalassemia Screening Programme
- ◆ Tree Plantation Programme
- ◆ Celebration of International Day of Yoga
- ◆ Celebration of Nashabandhi Week
- ◆ Celebration of International Women's Day
- ◆ Celebration of Swaschhta Pakhwada
- ◆ Rashtriya Poshan Maah
- ◆ Health awareness Programme
- ◆ Fit India Plogging Run
- ◆ Lecture on Food loss
- ◆ Celebration of Van Mahostav
- ◆ Celebration of Teacher's day

- ◆ Voter Awareness Programme
- ◆ Pre RD Parade Camp
- ◆ Celebration of Red Cross Day
- ◆ Celebration of Agricultural Education Day
- ◆ National Youth Festival
- ◆ Celebration of Ozone Day
- ◆ Kidney Awareness Programme
- ◆ Lecture on Stress Management

- ◆ Lecture on Art of Mind Control
- ◆ National Girl Child Day
- ◆ National Integration Camp
- ◆ Celebration of *Kargil Vijay Divas*
- ◆ National De-worming Day
- ◆ *Gandhi Jayanti*
- ◆ *Swachhata Hi Sewa*
- ◆ *Sawchchh Bharat Abhiyan*



Tree Plantation



Thalassemia Screening Programme



Blood Donation Camp



Swachh Bharat Abhiyan



Fit India Movement



Rashtriya Poshan Maah



Election Awareness Programme



Celebration of Constitution Day



Lecture on Yoga



Celebration of Rakshabandhan

4 (B) Special Camp

Special Camping forms an integral part of National Service Scheme. It has special appeal to the youth as it provides unique opportunities to the students for group-living, collective experience sharing and constant interaction with community. Special Camping are organized generally on various developmental issues of

national importance. Every year 50 percent of the volunteers of each NSS unit are expected to participate in special camps which is of ten day duration. Various NSS units of Anand Agricultural University adopt a village or group of villages/ urban slums for intensive social development, where special camps are organized year after year to create tangible and durable community assets.

Sr. No.	Name of College	Duration	Village	Total Volunteers
1	College of Veterinary Science & A.H.	January 06-12, 2020	Navli	70
2	College of Food Processing Technology and Bio Energy	January 29 to February 04, 2020	Khadol	46
3	College of Agricultural Information Technology	March 07-13, 2020	Vaghasi	39
4	College of Agricultural Engineering and Technology, Godhra	February 27 to March 04, 2020	Doctor na Muvada	42
5	College of Agriculture, Vaso	March 01-07, 2020	Run	50
6	College of Agriculture, Jabugam	March 02-08, 2020	Anyadri	50

Sr. No.	Name of College	Duration	Village	Total Volunteers
7	Polytechnic in Agriculture, Anand	January 28 to February 03, 2020	Navli	35
8	Polytechnic in Food Science and Home Economics, Anand	January 29 to February 04, 2020	Khadol	28
9	Polytechnic in Agriculture, Vaso	March 01-07, 2020	Run	35
10	Polytechnic in Horticulture, Vadodara	February 10-16, 2020	Thuvavi	27

Several activities were carried out during Special camps, viz.

- ◆ Different kinds of Shram-yagna
- ◆ Survey of villagers to know their social, educational, economical and health status along with the epidemiological surveillance of important diseases in animals
- ◆ Writing of slogans on walls
- ◆ Creative painting
- ◆ Indoor and outdoor games
- ◆ *Prabhatpheri*
- ◆ Tree plantation
- ◆ Distribution of sparrow nest
- ◆ Collection of Plastic & Gutka pouches for plastic free village
- ◆ Drama on Andhashradha & Nashabandhi
- ◆ *Bhajan Sandhaya*
- ◆ Village Cleaning Programme
- ◆ Visit to progressive farmer's field, green house, poultry farm and anganvaadi
- ◆ Rangoli, Poster making, Musical chair, Quiz, Cartooning etc.
- ◆ School sports programme to motivate students for regularity and sports activity
- ◆ School cultural programme
- ◆ *Jagruti Abhiyan Rally*
- ◆ Demonstration for preparing of Bakery products like biscuits and other products
- ◆ Demonstration of dairy products
- ◆ Panel discussion on 'Women Empowerment' among NSS volunteers
- ◆ *Beti Bhachavo, Beti Padhavo Rally*
- ◆ *Vyasan Mukti Rally*
- ◆ Food Rally on World Food Day
- ◆ Awareness for cashless transaction, Net banking
- ◆ A lecture on 'Gandhian Philosophy and NSS'
- ◆ Help to homeless people
- ◆ Lecture on Disaster management
- ◆ Eye check-up camp for school students
- ◆ Distribution of mineral mixture powder to needy people
- ◆ Demonstration of Deworming in animals
- ◆ Lecture on 'Water Conservation'

The villagers also actively participated and got benefited from these programmes. Students participated and gained knowledge on various aspects like health, development of spiritual

and cordial relationship, preservation of natural resources and conservation of cultural /historical

heritage, animal health, dairy products, etc and strengthened their creativity.



Special Camp at Navali



Special Camp at Navali



Special Camp at Khadol



Special Camp at Run



Special Camp at Anyadri



Special Camp at Doctor na Muvada

National Integration Camp

National Integration Camp was organized during January 20-26, 2020 at The Maharaja Sayajirao University of Baroda, Vadodara under National Service Scheme. 225 volunteers from different Universities of 8 states participated in

the camp. 10 volunteers of Anand Agricultural University with Mr. Nilesh Vegad, NSS Program officer, College of Agricultural Information Technology participated in the camp. The volunteers have participated in various activities such as Yoga, Cultural Programmes and Lecture Series.



National Integration Camp at Vadodara



23rd National Youth Festival

Every year the youth week was celebrated during 12-19 January, 2020. 2 NSS Volunteers- Divya Dabhi, B.A. College of Agriculture and Pranav Padhiyar, College of Dairy Science

participated in 23rd National Youth Festival from 12-16 January, 2020 at Lucknow, Uttarpradesh. Both volunteers represented Gujarat state for the national youth convention, youth for nation building and took part in cultural programmes and other activities.



23rd National Youth Festival, Lucknow

6.5 Other Activities of Directorate of Students' Welfare

(1) Yoga Camp

As a part of celebration of International Day of Yoga, a two day yoga camp was organized

during June 19-20, 2019. University Officers, employees, students and university residents participated. Mrs. Monika Patel, Yoga Teacher of Art of living, Anand demonstrated the benefits of Yoga through *Asana*, *Pranayama* and *Dhyan* during the camp.



Yoga Camp



(2) International Day of Yoga

June 21 is declared as 'International Day of Yoga' by the United Nations. 5th International Day of Yoga was celebrated at the University Bhavan on June 21, 2019. All the unit/sub-unit officers, employees, students, NSS volunteers,

NCC cadets and university residents participated. Yoga was performed through a video of Common Yoga Protocol by ministry of AYUSH on LED Screen. Dr. Dinesh H. Patel, Director, Students' Welfare Co-ordinated the programme.



International Day of Yoga



International Day of Yoga

(3) Eye Check up Camp

Anand Agricultural University and Sankara Eye Hospital, Mogar jointly organized Free Eye Check up Camp on September 18, 2019 at Health Center, Anand Agricultural University, Anand. University officers, staff members, students and labours participated in the camp. Retina Check

up, Color Vision, Refraction, Cataract and Glaucoma tests were done by Expert Doctor. Cataract Operation of 11 eye patients was carried out free of charge at Sankara Eye Hospital, Mogar. Dr. Dinesh H. Patel, Director, Students' Welfare co-ordinated the camp.



Eye Check up Camp



(4) Celebration of 73rd Independence Day

Anand Agricultural University celebrated 73rd Independence Day on August 15, 2019 at University Bhavan. All university officers, staff members, students of different faculties and

family members of staff remained present to grace this yearly celebration. Dr. K.B. Kathiria, Hon. Vice Chancellor hoisted the flag and delivered a speech. Tree plantation was organized at the end of the programme. Dr. Dinesh H. Patel, Director, Students' Welfare co-ordinated the programme.



Celebration of 73rd Independence Day



(5) Orthopedic Camp

Anand Agricultural University and Charutar Arogya Mandal, Karamsad jointly organized Free Orthopedic Camp on July 10, 2019 at Health Center, Anand Agricultural University, Anand.

University officers, staff members, students and labours participated in the camp. Dr. Saranjit Singh, an Orthopedic Surgeon of Charutar Arogya Mandal, Karamsad examined Muscle Pain, Joint Pain, Back Pain etc. Dr. Dinesh H. Patel, Director, Students' Welfare co-ordinated the camp.



Orthopedic Camp



(6) Celebration of 71st Republic Day

Anand Agricultural University celebrated 71st Republic Day on January 26, 2020. All University Officers, staff, students of different faculties and



family members of staff remained present to grace this yearly celebration. Dr. R.V. Vyas, Hon. Vice Chancellor hoisted the flag and delivered a speech. Dr. Dinesh H. Patel, Director, Students' Welfare co-ordinated the programme.



Celebration of 71st Republic Day



(7) Celebration of Anti Addiction Week

2nd October is the birth anniversary of 'Father of the Nation' Gandhiji. The Inaugural programme of 'Anti Addiction Week' of Anand district was organized by Anand Agricultural University in association with Anti Addiction and Excise Superintendent Office, Anand.

Dr. R. V. Vyas, Hon'ble Vice Chancellor, AAU, Dr. Dinesh H. Patel, Director, Students' Welfare, AAU, Shri S.P. Sisodiya, Superintendent, Anti Addiction and Excise Superintendent Office, Anand, Shri H.G. Masani, Sub Inspector, Anti Addiction and Excise Superintendent Office, Anand graced the function. Elocution Competition on 'Anti Addiction' was organized on the day.



Celebration of Anti Addiction Week

(8) Fit India Plogging Run

Fit India Plogging Run Programme is a part of the Hon'ble Prime Minister Narendra Modi's vision of the Fit India Movement. Plogging, as a concept brings together fitness and cleanliness, as participants in this Fit India Plog Run will pick up plastic and other waste from the road while jogging. Anand Agricultural

University organized Fit India Plogging Run Programme on 2nd October, 2019 to celebrate 150th birth Anniversary of Mahatma Gandhi as per the guideline of Government of India. NSS Volunteers of Anand Agricultural University participated in the programme and collected plastic garbage from homes, streets and on the route of the Plogging Run.



Fit India Plogging Run

6.6 Student Magazine

Student magazine is published by every college of this university with the aim to bring out the hidden talent and expression of the students. Teachers, staff members and students of the college provide the crucial link for the overall development of the students through various articles, poems and interesting agricultural information useful to farmers and scientific community. The detailed report on extra-curricular activities in addition to educational activities is included in the Magazine.

6.7 Educational Tour

Educational tour is considered as a part of academic curriculum of the degree courses of this university. The duration of educational tour is of 2-3 weeks, which comprises the visits of reputed institutes of Gujarat and outside Gujarat.

The basic purpose of the tour is to gain knowledge and information regarding the study by personal visit to the concerned institutes, industries, organization, farms, research centres etc. Students gain important and interesting

information regarding the developments of agriculture, veterinary and industrial growth by visiting the research centers of Agricultural Universities and other places through shall educational tours.

6.8 Student Discipline

The virtue of discipline is year of report.

6.9. Donation received for Gold Medal/Gold Plated Silver Medal

Sr. No.	Donation Recieved (₹)	Name of the Donor	Name of the Medal and Criterion
1	3,50,000/-	Mr. Ashok Paul, B-14, Shiv Tower, Nr. Sangam Apt., Ramdev Nagar, Satellite, Ahmedabad-380 015.	Dr. Preeti Paul, Gold Medal for Postgraduate student securing highest OGPA in the subject of M.Tech. in Dairy Technology in the Sheth M.C. College of Dairy Science, AAU, Anand
2	Gold Plated Silver Medal will be prepared by Aspee Agricultural Research & Development Foundation, Mumbai	Aspee Agricultural Research & Development Foundation, P.O.7602, Aspee House,, B.J. Patel Road, Opp. SNDDT Mahila College, Malda (W) Mumbai-400 064.	ASPEE Gold Plated Silver Medal for the Undergraduate student securing highest CGPA in the subject of Crop Protection (Entomology, Plant Pathology, Nematology and Weed Control) in the B.A. College of Agriculture, AAU, Anand
3	1,00,000/-	Dr. Sunil R. Patel, 25/ Krishna-2, Bunglows, Near Sarathi Hospital, Aannd-Sojitra Road, Anand-388 001	Late Smt. Sumitraben Rambhai Patel Gold Plated Silver Medal for the best Undergraduate student on the basis of academic performance as well as extra curricular activities in College of Agriculture, AAU, Jabugam
4	1,00,000/-	Smt. Sudhaben J. Purohit, Pranav-7, Rajvi Park, Vaidya Dairy Road, Anand-388 001.	Dr. J.H. Purohit Gold Plated Silver Medal for Undergraduate students securing highest OGPA in the subject of Veterinary Microbiology in the College of Veterinary Science and A.H., AAU, Anand
5	1,00,000/-	Dr. A.R. Pathak, C-14, Anuradha Society, Kabir Anclave, Vibhusha Road, Bopal, Ahmedabad	Ex. VC, NAU & JAU, Dr. A.R. Pathak's Late parents Taraben & Ramkrishna Pathak Memorial Gold Plated Silver Medal for Undergraduate student securing highest GPA in the subject of Genetetic & Plant Breeding in the Faculty of Agriculture, AAU, Anand

being inculcated in students through Sports, NCC, NSS, Adventure activities, Cultural and Literary activities etc. to maintain cordial atmosphere among students, teachers and staff members of this university. No serious case of misbehavior by the students occurred during the

The university appreciated and noted the kind gesture of the donors and heartily thanked the donors for their generous donation.

6.10 Financial Assistance to the Students

University provides scholarship and financial assistance on merit basis. Moreover scholarship, Government Scholarship and Fellowship etc. are also provided to the students of all the faculties on merit basis as under:

- (1) AAU U. G. Fellowship ₹ 6,000/- per year to the students of all faculties
- (2) Merit Scholarship Scheme for Economically Poor UG Scholarship ₹ 6,000/- per year to the students of all faculties
- (3) National Talent Scholarship (ICAR) ₹ 36,000/- per year to UG students of the faculties of Agriculture, Dairy, Veterinary,

Agricultural Engineering and Technology, F.P.T. & B.E.

- (4) National Talent Scholarship (ICAR) ₹ 60,000/- per year to PG students of the faculties of Agriculture, Veterinary, Dairy, Agricultural Engineering and Technology, F.P.T. & B.E. and Agri Business Management
- (5) AAU Merit fellowship ₹ 18,000/- per year for the first rank holder from the faculties of Agriculture, Veterinary, Dairy, F.P.T. & B.E., Agricultural Engineering and Technology and Agri Business Management for Master studies
- (6) AAU Merit fellowship ₹ 24,000/- per year for the first rank holder from the faculties of Agriculture, Veterinary, Dairy, F.P.T. & B.E., Agricultural Engineering and Technology for Ph.D. studies

Number of NTS, UG and PG Fellowship awarded is as under

College Name	NTS Scholarship		UG Fellowship	UG Economic Poor Scholarship	PG Fellowship
	UG	PG			
B.A. College of Agriculture, Anand	41	36	42	03	05
College of Veterinary Science, Anand	11	29	46	09	06
College of Dairy Science, Anand	17	11	23	11	06
College of Food Processing Technology & Bio-Energy, Anand	08	02	14	-	05
College of Agricultural Information Technology, Anand	-	-	18	09	-
College of Agricultural Engineering & Technology, Godhra	15	10	04	-	05
College of Agriculture, Vaso	01	-	26	16	-
College of Horticulture, Anand	-	-	18	03	-
International Agri Business Management of Institute, Anand	-	04	-	-	06
College of Agriculture, Jabugam	-	-	20	09	-
Total	93	92	211	60	33

Chapter - 7

UNIVERSITY LIBRARY

Dr. M. D. Patel Regional e-Library is functioning independently as a separate unit with great pride as 'University Library'. Presently, the library provides access to 24 foreign journals, 60 indian journals, 101 indian e-journals, 28 popular magazines, 14 news papers, 80525 Barcoded Books, 2367 e-books, 11850 Reports, 13803 Back Volumes, 5597 M.Sc. and Ph.D. theses, 280 DVDs, 99 digitized rare books, and several e-resources for the utility of the users. Moreover, Library activities like acquisition, circulation, searching etc. are carried out with Koha Library Software integrated with RFID System, which has fortified the library system. Cyberary, a hub of e-activities, is also a part of library providing internet services to users with 36 computers and 125 mbps internet connectivity. This year, more efforts were put in by the library for the development of learning resources, infrastructure, library service innovations, information and communication technology and human resource from the grant given by the state government and the ICAR.

Library Management

The University Library functions under the overall supervision of the University

Library Services

- ◆ Circulation
- ◆ Reprographic
- ◆ Reference
- ◆ Document Delivery Request (CeRA)
- ◆ Inter Library Loan
- ◆ Internet Access (Web Surfing)
- ◆ Online Catalogue
- ◆ News Clipping (via e-mail)
- ◆ Question Papers (online)

Librarian, who is one of the Statutory Officers of the University, directly answerable to the Vice Chancellor. The Library Committee of the University consisting of the following members is constituted under Section-20 (4) of the Act to manage the library and render suggestions to the Board of Management on any matter related to the library.

Library Committee

- (1) The Vice Chancellor - Chairman
- (2) The Director of Research and Dean of Post Graduate Studies
- (3) The Director of Extension Education
- (4) The Deans of Faculties
- (5) Five Heads of the University Departments of different faculties nominated by the Vice Chancellor
- (6) The Registrar
- (7) The Accounts Officer of the University
- (8) The Director of Students' Welfare
- (9) One P.G. Student from each faculty nominated by the Vice Chancellor
- (10) The University Librarian - Secretary

- ◆ Food For Thought (via e-mail)
- ◆ New Arrivals
- ◆ News Papers and Periodicals
- ◆ Digitization (*Krishikosh*)
- ◆ Electronic Resources (Databases, Journals, e-Books etc.)
- ◆ Technical Support
- ◆ Teaching and Training

Grant allotted and expended during the year of Report

Sr. No.	Type of Grant	Allotment (Rs.Lakh)	Expenditure (Rs.Lakh)
1	State Government	54.75	51.44
2	ICAR Development	13.00	11.66

Resources available during the year of report

Resource Type	Number added during the year	Total
Text Books/Reference Books	989	80525
e-books	-	2367
Journals	Foreign	24
	Indian	60
	e-journals	101
Back volumes	-	13803
Theses	246	5597
DVDs	-	280
Online Resources	1. Indianjournals.com 2. Indiastat.com 3. CMIE(Commodities) 4. Krishikosh 5. J-Gate 6. Consortium of e-Resources in Agriculture(CeRA) 7. e-Books and Encyclopedias 8. Online Question Papers 9. DELNET	
<i>Krishikosh</i> Repository (http://krishikosh.egranth.ac.in)	M.Sc./Ph.D. Dissertations : 4850+ Digitized Rare Books : 99 Digitized Question papers : 4000+ Practical Manuals : 62 Annual Reports : 16	

Library activities during the year of report

User Statistics

During the year of report, there were 15129 Library transactions. Library is visited by 280 users per day on an average basis.

CeRA

Consortium for e-Resources in Agriculture is a repository of e-resources provided by the ICAR. The DDS service is being provided on time by Dr. M. D. Patel Regional e-Library. This year, the CeRA

user statistics indicate 35655 hits and 243 Document Delivery Requests are catered to different users.

KrishiKosh

‘KrishiKosh’- an Institutional Repository has been created under the National Agricultural Innovation Project (NAIP) to provide online access to researchers and scientists all over the world. Since the launching of the Project, AAU has been actively contributing vast material to this repository. Total 4850+ M.Sc./Ph.D.

Dissertations are uploaded on Krishikosh. In addition to that historical photographs, digitized rare books (99), digitized Question Papers(4000+), Marketable Technologies, Instructional Manuals(62), Convocational addresses, Annual Reports(16), *Krishi Mahotsav* Model and other institutional publications of AAU are available for open access.

JGate@CeRA Award

Anand Agricultural University has received western region “JGate@CeRA” award given by DKMA(Directorate of Knowledge Management in Agriculture - ICAR) for best resource sharing in CeRA(Consortia for e-Resources in Agriculture) platform on December 28, 2019. AAU is selected for this award from 37 institutions in Western Region.

Workshop cum Training

Library has organized three different Workshops cum Training programs for faculty members and post graduate students.

- (1) CMIE Training(Date: 15.11.2020, 50 participants)
- (2) MATLAB Awareness Training(Date: 05.02.2020, 26 participants)
- (3) URKUND Plagiarism Detection System(Date: 05.03.2020, PG Coordinators)

Library Committee Meeting

The Ninth Library Committee meeting after implementation of common statutes for Agricultural Universities of Gujarat was held on 14.06.2019 in the University Bhavan, AAU, Anand and various library related issues were discussed at length.

Digital Library Services

Presently, the Library successfully renders following services to the users:

- (1) **News Clipping:** This library service is now provided as an attachment in e-mail.
- (2) **Food For Thought:** Library has started to circulate good reading articles to the library users as an attachment in e-mail.
- (3) **Online Question Papers:** Students and Faculties can access old question papers in pdf format.
- (4) **AAU in Media:** News and Coverage of Anand Agricultural University from different print and electronic media are uploaded in the media section of AAU website.

Learning and Infrastructure Facilities

- ◆ Print text books and reference books were procured for the benefit of the scientists and students of the University to keep them updated with current developments in agricultural sciences.
- ◆ CD-ROM Library Section has been developed in the library to display different CD-ROMs available in library. User can issue-return CD-ROM and view contents in viewing room.
- ◆ Cloud based KOHA library management system has been extended to sub libraries of Anand Agricultural University. Libraries of different centers namely Library of Agriculture College-Vaso, Library of Agriculture Engineering College-Godhra and Library of Veterinary College-Anand were integrated in existing KOHA LMS, which enables them to use library

management system in different library related activities.

- ◆ RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. RFID system has been implemented in the library which simplifies patron's self check-in / check-out, anti theft detection etc., making it virtual

digital library.

- ◆ Library has become DELNET member. DELNET is the largest network of libraries in South Asia and provide various library related services like interlibrary loan, document delivery services, reference services, professional services, software development and training.



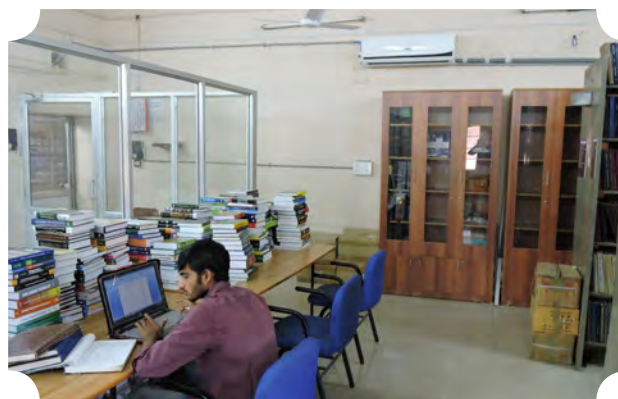
University Library



Cyberary



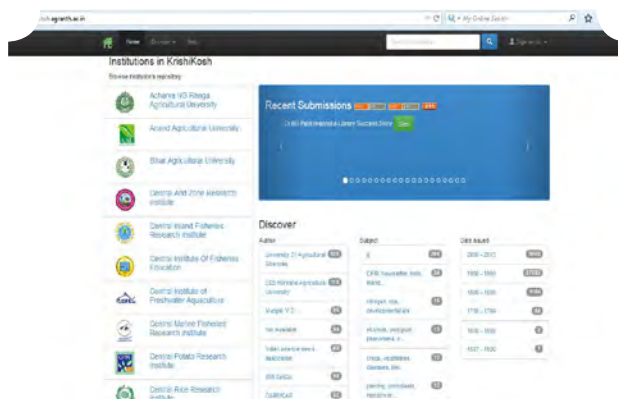
Periodical Room



Air conditioned Theses Room



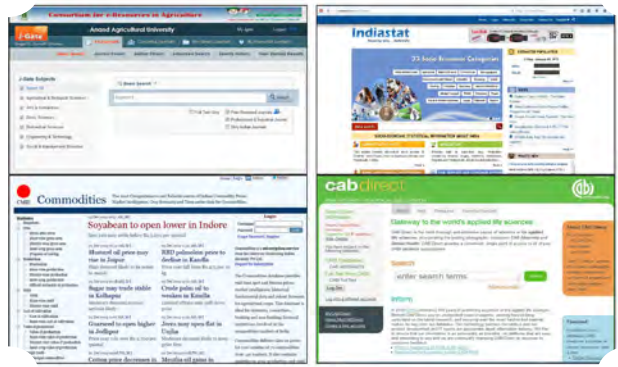
Library Committee Meeting



Krishikosh Repository



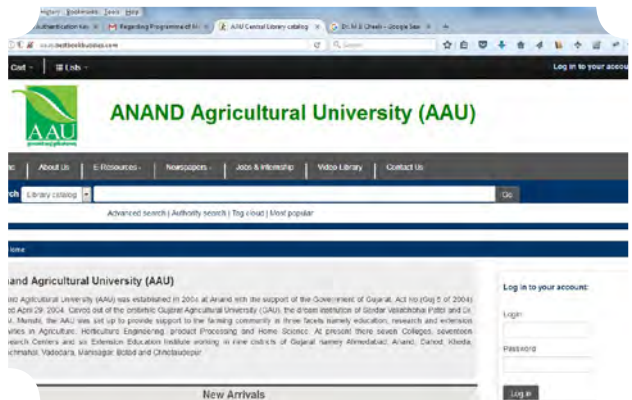
Air conditioned Reading Room



e-Resources



RFID based self check-in/check-out Kiosk



Library KOHA OPAC



CD-ROM Library



Workshop cum Training



Cyberary



College of Veterinary Science & Animal Husbandry, Anand

Appendix - 1

CIVIL WORK COMPLETED

Sr. No.	Name of Work
1	Construction of protection wall to North Side of RRS Navli Farm at Anand Agricultural University, Anand.
2	Strengthening to Micronutrient at Anand Agricultural University, Anand.
3	Renovation of Remaining Toilet in Girls Hostel of DSC at Anand Agricultural University, Anand.
4	Providing Creamped Jali to Crop Museum of Agronomy Farm at Anand Agricultural University, Anand.
5	Upgradation of Animal Bio Technology Laboratory at Anand Agricultural University, Anand.
6	Razor Wire Fencing on compound wall of Agronomy Farm at Anand Agricultural University, Anand.
7	Plastering in Laboratory building at Anand Agricultural University, Dabhoi.
8	Repairing in Toilets of New C type Quarters at Anand Agricultural University, Anand.
9	Raising of Compound Wall B/H Hostel in Veterinary College Campus at Anand Agricultural University, Anand
10	Renovation of Toilets of New B1 To B10 at Anand Agricultural University, Anand.
11	Additional Work in Ambika Ground at Anand Agricultural University, Anand.
12	Addition & Alteration for attached toilet For Research Scientist office, at Anand Agricultural University, Sansoli farm.
13	Renovation of old A type Quarters at Anand Agricultural University, Anand.
14	Construction of Security Cabin at Vaso road gate Entry at Anand Agricultural University Vaso.
15	Providing & Fixing of Gate to New Road at Anand Agricultural University, Vaso
16	Additional Work in Girls Hostel building at Anand Agricultural University, Vaso.
17	Repairing in E type (Dit) Quarters at Anand Agricultural University, Anand.
18	Providing Plinth Protection to Micronutrient building at Anand Agricultural University, Anand
19	Providing Rolling Shutter in Animal Bio Technology Laboratory at Veterinary College at Anand Agricultural University, Anand.
20	Approach Road to B1 type Quarters from main road at Agri. Engineering Polytechnic College at Anand Agricultural University, Dahod.
21	Strengthening of Resi. Quarters at Anand Agricultural University, Dahod
22	Providing Chajjah to Old-B Quarters at Anand Agricultural University, Anand.
23	Strengthening of compound wall from main gate to Gayatri Mandir t Anand Agricultural University, Anand.

Sr. No.	Name of Work
24	Repairing of Segregation Quarters behind Poultry at Anand Agricultural University, Anand
25	Approach to gate from Vaso-Pij Road at Agri. College at Vaso, Anand Agricultural University, Vaso
26	Extension of Existing Stage at open to sky area of College building at Anand Agricultural University, Jabugam
27	Construction of falled down compound wall at Veterinary campus main gate near Amul Parlour at Anand Agricultural University, Anand
28	Construction of overhead Water Tank for Polytechnic in Agriculture Engineering at Anand Agricultural University, Dahod.
29	Renovation of Gents Toilet Block of BTRS farm, Anand Agricultural University, Anand.
30	Repairing in Current Periodical Room of M. D. Patel Library at Anand Agricultural University, Anand.
31	Strengthening of Processing Plant of Bij Shrushti of RRS building at Anand Agricultural University, Anand
32	Construction of Soak Well for office building at Ramna Muvada farm, Anand Agricultural University, Anand
33	Addition and Alteration in Guest House Room No. 7 and Kitchen Block, Anand Agricultural University, Anand.
34	Providing & Fixing of Sign Board for Different Quarters at Anand Agricultural University, Anand.
35	Upgrading for New Computer Lab at Horticulture College, at Anand Agricultural University, Anand.
36	Providing & Fixing Chain Link Jali to organic plot of Agronomy farm at Anand Agricultural University, Anand.
37	Providing Toilet Facility in Post Office building, Anand Agricultural University, Anand.
38	Strengthening of falled down compound wall behind Aniket Hostel on Vidhya Dairy Road at Anand Agricultural University, Anand
39	Drilling of Borewell With Electrification in Plot No. B-3 at Anand Agricultural University, Viramgam.
40	Contruction of Implement Shed at Btrs Farm, Anand Agricultural University, Anand.
41	Renovation of Cupboard in P.G. Laboratory of Veterinary College at Anand Agricultural University, Anand.
42	Construction of protection wall to Girls Hostel at Anand Agricultural University, Jabugam.
43	Strengthning of office cum Lab building at Anand Agricultural University, Dhandhuka.
44	Construction of Crop Cafeteria at Anand Agricultural University, Jabugam.
45	Renovation For Ladies Toilet for Exam Branch of Registrar office at Anand Agricultural University, Anand.,
46	Construction of office cum Laboratory building at Anand Agricultural University, Dhandhuka
47	Construction of Quarters for Agriculture College at Anand Agricultural University, Jabugam.
48	Construction of Various Laboratory for Dairy Engineering Department at Anand Agricultural University, Anand.
49	Upgrading drinking water facility at Muvalia farm, Anand Agricultural University, Dahod.

Appendix - 2

CIVIL WORK ON HAND

Sr. No.	Name of Work
1	Construction of Exam Hall for FPT & BE College at Anand Agricultural University, Anand.
2	Expansion of Girls Hostel for Polytechnic in Agricultural Engineering at Anand Agricultural University, Dahod
3	Expansion of Laboratory building for Animal Biotechnology under Semen Sexing of Cattle Project for Veterinary Science College, Anand Agricultural University, Anand.
4	Extension of F.F. on Existing G.F. of Boys Hostel at Muvalia farm, Anand Agricultural University, Dahod
5	Construction of grass godown under RKVY at Anand Agricultural University, Arnej.
6	Construction of seed godown under RKVY at Anand Agricultural University, Arnej.
7	Construction of Vermi Compost Shed under RKVY at Anand Agricultural University, Arnej
8	Remaining work of Providing and Laying Drainage Line for Residential & College Campus of Model farm at Anand Agricultural University, Vadodara.
9	Renovation of Sheep and Goat Shed in Instructional farm of Veterinary College at Anand Agricultural University, Anand.
10	Construction of Animal Shed under RKVY at Anand Agricultural University, Arnej.
11	Construction of Farm Protection Wall To Boundary of Main Rice Research Station under RKVY at Anand Agricultural University, Navagam.
12	Expansion of First Floor of Laboratory Building of Nanotechnology At Anand Agricultural University, Anand
13	Mosquito Net in P.G. Boys Hostel for BACA at Anand Agricultural University, Anand
14	Construction of Protection Wall to Plot No I-2, J and Plot Near TCD farm of Agri Research Station Under RKVY at Anand Agricultural University, Thasara.
15	Construction of RCC overhead Water Tank at Anand Agricultural University, Thasara
16	Renovation of Hostel (Munshi) Canteen for Sheth M.C. College of Dairy Science at Anand Agricultural University, Anand.
17	Repair and Renovation of Periodical Room of M.D. Patel Library at Anand Agricultural University, Anand.
18	Construction of Seed Storage Godown Under RKVY At Anand Agricultural University, Khandha
19	Repairing of Ceiling in Laboratory In Dairy Engineering Dept At SMC Dairy College, Anand Agricultural University, Anand.,
20	Upgrading of Cage House-2 at Poultry Dept. at Anand Agricultural University, Anand.
21	Strengthening of Cage House-2 at Poultry Dept. at Anand Agricultural University, Anand

Sr. No.	Name of work
22	Providing Drinking Water Pipe Line Parallel To Double Track Road at Anand Agricultural University, Anand.
23	Renovation in Stack Room of M. D. Patel Library at Anand Agricultural University, Anand
24	Renovation of Flooring for Agronomy and Horticulture Dept. of BACA at Anand Agricultural University, Anand.
25	Construction of Protection to Farm Boundary of Horticulture Research Station at Anand Agricultural University, Khambholaj.
26	Levelling of Farm of Horticulture Research Station at Anand Agricultural University, Khambholaj.
27	Providing Protection to Lobby for BACA at Anand Agricultural University, Anand.
28	Construction of Girls Hostel for BACA under ICAR at Anand Agricultural University, Anand.
29	Repair and Renovation of Gents Toilet in M. D. Patel Library at Anand Agricultural University, Anand
30	Extension of Shed for Student Sitting near examination hall for BACA at Anand Agricultural University, Anand
31	Repair And Renovation of Ladies Toilet in M.D. Patel Library at Anand Agricultural University, Anand
32	Construction of RCC Approach Road to seed godown under RKVY at Anand Agricultural University, Thasara.
33	Construction of shed over Terrace of Bio Fertilizer Building at Anand Agricultural University, Anand.
34	Construction of Protection Wall To Plot No J-1 For Jitodiya Farm of Forage Research Station At Anand Agricultural University, Anand.
35	Renovation of Lal Bunglow Under RKVY at Anand Agricultural University, Baroda
36	Construction of Asphalt Approach Road under RKVY at Anand Agricultural University, Derol
37	Construction of Toilet Block for Labours and Farmers under RKVY for Main Vegetable Research Station at Anand Agricultural University, Anand.
38	Providing & Fixing Razor Wire Fencing to Existing Compound Wall of MVRS Farm under RKVY at Anand Agricultural University, Anand.
39	Construction of Asphalt Approach Road with RCC Box Culvert for Double Track from Dairy SC College to University Bhavan at Anand Agricultural University, Anand
40	Construction of Gazebo under RKVY for Main Vegetable Research Station at Anand Agricultural University, Anand.
41	Renovation of Lab. in Micro. Dept. of Dairy Science College Anand Agricultural University, Anand.
42	Strengthening of Compound Wall Parellel to Railway Line at Anand Agricultural University, Anand.
43	Construction Work of Sales office and Implement Shed at M. & AP. at Anand Agricultural University, Anand
44	Construction of Fodder & Implement Shed under RKVY for Main Vegetable Research Station at Anand Agricultural University, Anand.
45	Construction of Implement Shed For Hill Millet Research Station at Dahod Farm, Anand Agricultural University, Anand.

Appendix - 3

DETAILS OF UNIVERSITY SCHEMES

Sr. No.	Budget Head	Name of the Scheme	Center
(1) Plan Schemes			
(I) EDUCATION			
(A) Education schemes in Normal Area			
(i) Agriculture			
1	12134-00	Expansion of Planning & Evaluation Cell	Anand
2	12136-00	Library facilities at AAU	Anand
3	12711-00	Project for Library	Anand
4	12712-02	Landscaping at AAU	Anand
5	12712-03	Creating of the Computer & Communication facilities	Anand
6	12926-00	Modernization of department of Agriculture Colleges	Anand
7	12929-01	Strengthening of the facility of bio-agents at department of Plant Pathology.	Anand
8	12930-00	Addition of the facilities for organizing Rural Agricultural Work Experience (RAWEX) programme	Anand
9	12931-00	Strengthening facilities for Sericulture, Apiculture and Mushroom cultivation	Anand
10	12931-01	Strengthening of Modern Green house facilities	Anand
11	12946-00	Strengthening of WTO Cell	Anand
12	12947-00	Strengthening of New Department of seed science and technology	Anand
13	12947-01	Strengthening of Department of Nano technology	Anand
14	12947-02	Centre for Weather forecasting and climate change	Anand
15	12948-00	Strengthening of College of Agricultural Information Technology	Anand
16	12949-00	Strengthening of College of MBA (International Agri. Business)	Anand
17	12950-00	Strengthening of College of Food Processing Technology and Bio-energy	Anand
18	12957-00	Strengthening of Polytechnic in Food Science and Home Economics	Anand
19	12957-01	Strengthening of Polytechnic in Agriculture	Anand
20	12957-02	Strengthening of Polytechnic in Horticulture	Vadodara

Sr. No.	Budget Head	Name of the Scheme	Center
21	12958-00	Strengthening of Institute of Distance Education	Anand
22	12969-01	Strengthening of Students training centre for food processing	Anand
23	12969-02	Strengthening of Student's Training cum Coaching Centre (STCC)	Anand
24	12969-03	e-Education Solution	Anand
25	12984-00	Strengthening of Polytechnic in Agriculture	Vaso
26	12986-00	Strengthening of Teaching in Agricultural Economics	Anand
27	12987-00	Vocational Course of Land Scape Gardening	Vadodara
28	12987-02	Strengthening of Horticulture Wing	Anand
29	12987-03	Strengthening of Agriculture Wing	Vaso
30	12987-07	Certificate Course of Soil and Water Testing for Sustainable Agriculture	Anand
31	12987-08	Strengthening of Department of Animal science	Anand
Sr. No.	Budget Head	Name of the Scheme	Center
32	12987-10	Strengthening of department of plant physiology	Anand
33	12987-11	Establishment of Department of Food Safety and Testing	Anand
34	12987-14	Establishment of Instructional Processing facilities for students	Anand
35	12987-15	Upgrading of the Agriculture wing to College of Agriculture at AAU	Anand
36	12987-16	Upgrading of the Horticulture wing to College of Horticulture at AAU	Anand
(ii) Common and Student facilities			
37	12703-00	Scheme for the award of GAU fellowship for PG studies in various faculties	Anand
38	12865-00	Upgrading of the Student facilities at different colleges of AAU	Anand
39	12967-00	Modernizing the student facilities at different colleges of AAU	Anand
40	12967-01	Scheme for Fellowship for UG Students of various faculties	Anand
41	12967-02	The schemes for Strengthening of Office of the Directorate of Students Welfare, Counseling and Placement Cell at AAU	Anand
42	12967-03	Strengthening of Health Centre	Anand
43	12968-00	Strengthening of a Central Instrument Centre with heavy duty generator set	Anand
44	12987-12	Student and faculty exchange programme under national and international collaboration	Anand
45	12987-13	Merit Scholarship Scheme for economically poor under graduate student at Anand Agricultural University	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
(iii) Veterinary Science			
46	12303-08	Imparting education on semen logy and frozen semen technology to the students and field veterinarians	Anand
47	12909-00	Strengthening at College of Veterinary Science & Animal Husbandry- Livestock Production Technology, Veterinary Clinics and Animal Bio-technology	Anand
48	12910-01	Strengthening of the Post-graduate Department at Veterinary College	Anand
49	12911-00	Strengthening of New Department at Veterinary Science College. (i) Vety. Epidemiology & Preventive Medicine, (ii) Vety. Extension	Anand
50	12981-00	Upgrading of College of Veterinary Science and Animal Husbandry as per Veterinary Council of India regulations	Anand
51	12992-01	Strengthening of Entrepreneur programme as per VCI (2008) at Veterinary College	Anand
52	12351-00	Strengthening and Modernization of Dairy Science for Under graduate and post graduate Teaching	Anand
53	12951-02	Modernization of Student Training Dairy (STD)	Anand
54	12987-09	Modernization of Department of Dairy Engineering	Anand
(B) Extension Education Schemes in Tribal Area			
55	12975-00	Strengthening of College of Agricultural Engineering and Technology	Godhra
56	12976-00	Strengthening of Agricultural Engineering Polytechnic	Dahod
57	12987-01	Vocational Courses on Agricultural Engineering and Technology	Godhra
58	12987-04	Strengthening of Agriculture Wing	Jabugam
59	12987-17	Upgrading of the Agriculture wing to College of Agriculture at AAU	Jabugam
(II) Extension Education			
(i) Agriculture			
1	12505-00	Strengthening of the Directorate of Extension Education at AAU	Anand
2	12507-00	Upgrading of Existing Sardar Smruti Kendra	Anand
3	12508-00	Strengthening of Mali Training Centre at AAU	Anand
4	12942-01	Strengthening of Transfer of Technology Centre	Arnej
5	12943-00	Agricultural Technology Information Centre (ATIC)	Anand
6	12988-00 to 12988-05	Training Programme (Weed Management, Seed Production, Organic Farming, Integrated Pest Management, Medicinal & Aromatic Plants and Food Processing Technology)	Anand
7	12993-00	Strengthening of Farm Technology Training Centre	Sansoli

Sr. No.	Budget Head	Name of the Scheme	Center
8	12994-01	Strengthening of Technological Resource Centre and Educational Museum at AAU	Anand
(ii) Veterinary Science			
9	12315-00	Upgrading of Poultry Training Centre	Anand
10	12315-01	Strengthening of Demonstration-cum-Training Centre for inland fish culture	Devataj
(B) Extension Education Schemes in Tribal Area			
(iii) Dairy Science			
11	12977-00	Strengthening of Tribal Women Training Centre	Devgadhbaria
12	12978-00	Strengthening of Agro-Polyclinic for Tribal Farmers	Dahod
13	12987-05	Strengthening of Training Centre	Jabugam
14	12993-01	Strengthening of Dairy Vigyan Kendra	Vejelpur
15	12993-02	Strengthening of Transfer of Technology Centre for Tribal	Godhra
16	12993-03	Strengthening of Pashu Vigyan Kendra	Limkheda
(III) Research			
(A) Research Schemes in Normal Area			
(i) Agriculture			
1	12002-00	Strengthening of Research in Millet	Anand
2	12003-00	Strengthening of Research in Rice	Nawagam & Dabhoi
3	12004-00	Strengthening of Research in Wheat	Anand & Dhandhuka
4	12006-00	Strengthening of Research in Sorghum	Viramgam
5	12007-00	Strengthening of Research in Pulses	Vadodara
6	12008-00	Strengthening of Research in Oilseed (Groundnut)	Anand
7	12009-00	Strengthening of a centre of excellence for Cotton Research	Dhandhuka & Viramgam
8	12010-00	Strengthening of Research in Tobacco	Anand & Dharmaj
9	12012-00	Strengthening of Research in Forage crops	Anand
10	12016-01	Strengthening of Research in Medicinal & Aromatic Plants	Anand
11	12018-00	Expansion of Research in Agricultural Economic	Anand
12	12027-00	Scheme for Management of salt affected soil & poor quality of underground water	Thasra
13	12027-04	Application of Remote Sensing Technique	Anand & Nawagam
14	12041-00	Statistical evaluation of experimental variability and Strengthening research in Agricultural Statistics	Anand
15	12075-00	Development of various Bio-gas Plants to use vegetative wastes	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
16	12078-00	Strengthening of Research in Dry-farming	Dhandhuka
17	12092-00	Strengthening of Tissue culture Research & Development at AAU	Anand
18	12131-00	Research on Eco-friendly Biological Fertilizer	Anand
19	12906-00	Centre of Excellence for Soil & Water Management Technology	Anand
20	12907-00	Strengthening of Agrometeorology at AAU	Vadodara
21	12011-00	Centre of Excellence on Agril. Biotechnology	Anand
22	12933-00	Research on Hybrid Development in paddy	Nawagam
23	12937-00	Strengthening Adaptive Research in Agro-climatic zones of AAU	Anand
24	12938-00	Monitoring of heavy metal contamination in agricultural produce in peri urban areas of Gujarat	Anand
25	12959-00	Research on Horticultural fruit and flower Crops	Anand
26	12960-00	Post Harvest Management of some important crops of Middle Gujarat.	Anand
27	12962-00	Strengthening of Intellectual property rights cell	Anand
28	12963-00	Genetic enhancement and production technologies of Pulses, Oilseeds and Cereals	Anand
	12963-01	Genetic enhancement and production technologies of Pulses, Oilseeds and Cereals	Vadodara
	12963-02	Genetic enhancement and production technologies of Pulses, Oilseeds and Cereals	Derol
29	12963-03	Research and Enhancement of Quality Seed Production of Major Crops of Middle Gujarat	Anand
30	12964-00	Insect Pest Management through Bio-control Agents	BACA, Anand
31	12964-01	Insect Pest Management through Bio-control Agents	Dept. of Bio-control
32	12965-00	Establishment of Organic Farm at different centres	Anand
	12965-01	Establishment of Organic Farm at different centres	Vadodara
	12965-02	Establishment of Organic Farm at different centres	Arnej
	12965-03	Establishment of Organic Farm at different centres	Dhandhuka
	12965-04	Establishment of Organic Farm at different centres	Khambholaj
33	12966-00	Strengthening of Centers of Excellence - Medicinal & Aromatic Plants	Anand
34	12969-00	Development of irradiation technology for Agricultural, Animal Dairy and Food products	Anand
35	12970-00	Studies on the estimation of pesticides residues for agriculture commodities	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
36	12985-00	Development of Potato varieties and its agro technologies for Miide Gujarat	Khambholaj
37	12985-01	Research on Papaya crops	Khambholaj
38	12989-00	Establishment of Research Centre of Seed Spices for Development of Production Technology	Sanand
39	12989-02	Veritable Development of Chickpea in residue moisture condition of Bhal region	Arnej
40	12989-06	Allele Mining for Fragrance and Colour Principles from Saffron and Sandal Wood	Anand
40	12989-06	Allele Mining for Fragrance and Colour Principles from Saffron and Sandal Wood	Anand
41	12993-04	Study on Pesticides residues Analysis from Food, Feed, Water and Soil for food safety in Gujarat	Anand
42	12993-05	Development of varieties in Vegetable crops	Anand
43	12993-07	Research Centre for Distant Hybridization in field and fruit crops	Anand
44	12993-08	Development of early maturing and High yielding Castor Hybrids /Varieties suitable to cropping systems in irrigated area of middle Gujarat	Sansoli
45	12993-09	Evolving Suitable Rice Genotypes for Rabi & Summer Cultivation for Enhancing the Production and Productivity in Middle Gujarat of Agro-climatic Zone-III	Nawagam
46	12993-15	Screening and management of root-knot nematodes in important crop of Gujarat	Anand
47	12993-16	Genetic enhancement and production technologies of clusterbean (Guar) for yield and quality	Derol
48	12993-17	Centre for Advance Research in Plant Tissue culture	Anand
49	12993-18	Centre for Advanced Research on Plant Viruses	Anand
50	12993-19	Research on Organic Farming	Anand
51	12993-20	Advanced Research on Pest Management through birds	Anand
52	12993-21	Development of food decontamination technology for safety and quality of fresh and minimally processed fruits and vegetables	Anand
53	12993-22	Research on supply chain and market integration for key agro commodities for farmer's awareness and income enhancement in middle Gujarat	Anand
(ii) Veterinary Science			
54	12303-06	Research on Embryo Transfer in Buffaloes	Anand
55	12303-07	Introduction of Mechanization on Dairy Farms	Anand
56	12303-10	Strengthening of R.B.R. Unit	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
57	12313-00	Study on applied reproduction in Surti & Marwadi Goats of Gujarat State.	Ramna Muwada
58	12928-00	Centre of Excellence in Animal Biotechnology	Anand
59	12353-00	Strengthening of Livestock Research Station	Anand
60	12388-00	Development and maintenance of different population of Poultry	Anand
61	12990-00	Cytogenetic and Cell culture studies in Cattle and Buffaloes	Anand
62	12992-00	Etiopathological studies on mortality of Broilers	Anand
63	12953-00	Strengthening of Livestock & Veterinary component	Anand
64	12956-00	Diagnosis, epidemiology and management of diseases of Live stock	Anand
65	12971-00	Centers of Excellence for Animal Nutrition	Anand
66	12972-00	Modernization of diagnostic facilities - Zoonotic disease and compylobacteriosis	Anand
67	12973-00	Conservation and improvement of indigenous cattle	Anand
68	12989-03	Research on Silvi pasture systems and forage crops	Ramna Muwada
69	12989-04	Research on Silvi pasture systems and forage crops	Meenawada
70	12993-06	Effect of phytochemicals on nutrient utilization, health attributes and production of ruminants	Anand
71	12993-23	Strengthening of Research and Animal Feed Testing Laboratory	Anand
(iii) Dairy Science			
72	12351-02	Development of Dairy Starter Cultures and Value added Dairy Product	Anand
73	12351-03	Development of methods for detection of adulteration in Milk and Milk products	Anand
74	12351-05	Enhancing Self Life of Indigenous Milk product	Anand
75	12951-01	Evaluation of selected natural food additives for their suitability to enhance the quality of dairy products	Anand
76	12951-04	Plasmid profile of lactic acid bacteria and their use as Bio-medical agents	Anand
77	12951-05	Manufacture of Dairy/Non Dairy Processed Cheese and Mozzarella Cheese Analogues	Anand
78	12974-00	Utilization of whey in dairy and food products	Anand
(B) Research Schemes in Tribal Area			
(i) Agriculture			
79	12005-00	Improving Research facilities for Maize	Dahod
80	12007-00	Strengthening of Research in Pulse	Dahod
81	12917-00	Research and demonstrations of bio-fertilizers in Tribal areas of Gujarat	Anand & Godhara

Sr. No.	Budget Head	Name of the Scheme	Center
82	12979-00	Genetic enhancement and production technologies of major crops grown in tribal areas	Dahod
	12979-01	Genetic enhancement and production technologies of major crops grown in tribal areas	Devgadbaria
83	12979-03	Development of Garlic and Ginger varieties suitable for value addition and its production and protection technologies	Dahod
84	12979-04	Maize productivity enhancement through single cross hybrid(s)	Godhra
85	12979-05	Varietal development in Chickpea for Tribal area	Dahod
86	12987-06	Production Potential and Value Addition of Banana Grown in Tribal area of Chhota Udaipur region of Middle Gujarat through multiple approaches	Jabugam
87	12993-10	Advanced centre for research and trainers training on agricultural engineering based interventions	Godhra
88	12993-11	Developing a watershed based conclave for experimental learning at kakanpur	Kankanpur
89	12993-13	Tailoring Maize for Specific uses thereby nutritional enrichment and security-A better alternatives for Rainfed Farming, particularly Tribal Areas of Gujarat State	Godhra

(2) Non-Plan Schemes

(I) Education

1	1311-00	Zonal Engineering Construction Unit	Anand
2	1312-00	North Cattle Breeding Farm, (Vety. College)	Anand
	1312-0A	North Cattle Breeding Farm	Sansoli
	1312-0A	North Cattle Breeding Farm	Jabugam
	1312-0C	North Cattle Breeding Farm	Vegtable
3	1314-00	Institute of Agriculture Veterinary College, Breeding Research Station	Anand
4	1315-00	Institute of Experiment, Dairy Science College	Anand
5	1317-00	Institute of Programme Extension Education	Anand
6	1318-00	Institute of I.D.C. Project	Anand
7	3126-02	B.A. College of Agriculture	Anand
	3126-2L	B.A. College of Agriculture-Library	Anand
8	3248-00	Establishment of Extension Wing	Anand
9	4280-00	Strengthening of Under Graduate Teaching	Anand
10	4500-00	Vice Chancellor Office & Registrar Section	Anand
11	4501-00	Director of Research	Anand
12	4502-00	Comptroller Section	Anand
13	4504-00	Director of Student Welfare	Anand
14	4504-01	Director of Information Technology	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
15	4505-00	Director of Extension Education	Anand
16	4571-03	Executive Engineer & Guest House	Anand
17	4571-3D	Executive Engineer & Guest House	Devataj
18	4571-04	Medical Unit Centre	Anand
19	4807-00	Inter University Cultural Activities (FPT&BE College)	Anand
20	4808-00	Inter University Cultural Activities (DSW)	Anand
21	4862-00	Inter University Cultural Activities (DSW)	Vaso
22	4862-00	Inter College & Inter University Sports & Quize (BACA)	Anand
23	4862-0A	Inter Colleges & Schools Sports & Student Welfare	Vaso
24	4862-0B	Planning of Sports Game, Maintenance of Ground and Students DA, etc. (IABMI, Veterinary College & Agri. Engg. College, Godhra)	Anand
25	4864-00	Parvatarohan (DSW)	Anand
26	5106-00	Strengthening of department by providing additional equipment in view of Semester System	Anand
27	5116-00	Establishment of Sardar Smruti Kendra, Museum Information Centre	Anand
28	5228-00	Polytechnic in Agriculture	Anand
	5228-00	Polytechnic in Horticulture	Vadodara
	5228-00	Polytechnic in Agricultural Engineering & Technology	Dahod
	5228-0A	Horticultural Research Station (Vegetable)	Khabholaj
	5228-0B	Polytechnic in Agriculture	Vaso
	5228-0C	Agricultural Research Station	Jabugam
29	5229-00	Establishment of Polytechnic in Home Science & Economics	Anand
30	5711-0L	Establishment of Library	Anand
31	5810-00	Project for Health Centre	Anand
32	6110-01	Strengthening of P.G. Teaching	Anand
33	6119-00	Scheme for Instructional Farm	Anand
34	6502-03	Department of Agricultural Product Process Engineering	Anand
35	6503-02	Department of Nematology	Anand
36	6503-03	Department of Horticulture	Anand
37	6503-04	Department of Bio-chemistry	Anand
38	7712-01	Establishment of Meteorology department	Anand
(II) Extension			
39	3315-00	Poultry Feeding Manufacturing Unit	Anand
40	5255-00	Strengthening of Poultry Training Centre	Anand
41	5301-00	Project for Investigation & Research, Veterinary Science & Animal Husbandry	Anand
42	5309-00	Project for Veterinary Science & Animal Husbandry	Anand
43	5311-00	Project for Reproductive Biological Research Unit	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
44	5353-00	Livestock Research Station	Anand
45	6309-00	Scheme for increasing the admission capacity in Degree Course of B.V.Sc. & A.H.	Anand
46	6374-00	Study on Correlated Response to Selection in Patanwadi & Cross Breed Sheep	Anand
47	7228-01	School of Baking	Anand
48	7303-07	Import & Establishment of Exotic Cattle, HF Project	Anand
49	5351-00	Project for the Department of Dairy Science College	Anand
50	5351-0T	Project Dairy Science College (Dept of Biotechnology)	Anand
(III) Research			
51	3226-00	Scheme of Design Experiment	Anand
52	5002-00	Scheme for Research in Bajara	Anand
53	5003-00	Scheme for Research in Paddy	Nawagam, Dabhoi, Derol & Vadodara
54	5004-00	Scheme for Research in Wheat	Dhandhuka
55	5006-00	Scheme for Research in Jowar	Viramgam
56	5007-00	Scheme for Research in Pulses (Cereals)	Vadodara, Dahod & Arnej
57	5008-00	Scheme for Research in Oilseed	Derol
58	5009-00	Strengthening Research in Cotton	Anand, Thasara, Dhandhuka & Viramgam
59	5010-00	Research in Tobacco	Anand & Dharmaj
60	5010-00	Research in Castor & Seed Spices	Sanand
61	5011-00	Scheme for Research in Sugarcane	Thasara
62	5012-00	Scheme for Research in Grasses	Anand
63	5013-00	Scheme for Research in Vegetable Tuber (Tomato)	Anand
64	5014-00	Scheme for Research and Improvement in Fruit Crops	Anand
65	5018-00	Strengthening of Research in Agricultural Economics	Anand
66	5020-00	Scheme for Research in Agriculture Chemistry & Soil Science	Anand
67	5025-00	Scheme for Expansion Mechanical Commercial Farm	Anand
68	5026-00	Scheme for Research in Pest Control & Plant Disease	Anand
69	5026-01	Project for Research in Pest Control & Plant Disease	Anand
70	5029-00	Western Regional Animal Nutrition Station	Anand
71	5042-00	Strengthening of Dry Farming Research Station	Dhandhuka
72	5044-00	Project for Expansion of Plant Pathology Research	Anand
73	5046-0B	Study of Biology Inteer control of White Gurb	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
74	5073-00	Establishment of Agricultural Product Process Engineering	Anand
75	7078-00	National Agricultural Research Project	Arnej
76	8091-0A	National Agricultural Research Project	Anand
	8091-AB	National Agricultural Research Project (Bio-technology)	Anand
	8091-0B	National Agricultural Research Project	Godhra
	8091-0C	National Agricultural Research Project (RRS, UNIT-5)	Anand
	8091-0C	National Agricultural Research Project	Derol
77	9091-10	National Agricultural Research Project (Scheme Phase-II)	Anand, Sansoli & Khambholaj
	9091-10A	National Agricultural Research Project (Scheme Phase-II)	Jabugam and Vadodara
78	5002-03	Strengthening of Research in Hill Millet	Dahod
79	5704-00	Tribal Research-cum-Training Centre	Devgadhbaria
80	6005-00	Strengthening Research in Maize	Devgadhbaria
81	6009-00	Strengthening Research in Budded Cotton	Devgadhbaria
82	6704-06	Training of Tribal Farmer Women & Farm Youth	Dahod
83	7007-00	Strengthening of Research in Pulses	Dahod
(3) I.C.A.R.			
(a) I.C.A.R. CO-ORDINATED SCHEMES (25:75%)			
1	2003-00	All India Coordinated Research Project on Rice	Nawagam
2	2005-00	All India Coordinated Research Project on Maize	Godhra
3	2010-04	All India Network Research Project on Tobacco	Anand
4	2012-00	All India Coordinated Research Project on Forage Crops and utilization	Anand
5	2020-00	All India Coordinated Research Project on Micro & Secondary Nutrients & Pollution Elements in Soil & Plants	Anand
6	2025-00	All India Coordinated Research Project on Integrated Farming System: On Farm Research	Devgadhbaria
7	2026-01	All India Coordinated Research Project on Nematode Agriculture	Anand
8	2028-00	All India Coordinated Research Project on Nutritional and Physiological approaches for enhancing Reproductive performance in Animals cattle and Buffalo	Anand
9	2043-00	All India Coordinated Research Project on Medicinal & Aromatic Plants	Anand
10	2044-00	All India Coordinated Research Project on Biological Control of Crop Pests	Anand
11	2046-00	All India Coordinated Research Project on Weed Management	Anand
12	2080-00	All India Coordinated Research Project on National Seed Project (crops) - Seed Technology Research	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
13	2084-00	AINP on Agricultural Ornithology	Anand
14	2093-00	All India Coordinated Research Project on Aro-meteorology	Anand
15	2095-00	All India Coordinated Research Project on Pesticide Residues	Anand
16	2305-00	All India Coordinated Research Project on Poultry for Eggs	Anand
(b) I.C.A.R. AH-HOC SCHEME (100%)			
1	2002-02	Need based contingency for conducting coordinated trials of Finger Millet	Dahod
2	2003-01	Insecticide Testing Fee for cooperative centre	Nawagam, Derol & Dabhoi
3	2003-02	Network programme of Haemorrhagic Septicemia	Anand
4	2003-04	FLD Promote Non-Hybrid Rice Technology	Nawagam
5	2004-01	Frontline Demonstration in Wheat	Anand, Arnej & Dhandhuka
6	2005-01	FLD's Training programme under Accelerated maize improvement	Godhra
7	2005-02	Frontline Demonstration on Maize	Godhra
8	2005-07	AICRP on Maize Contingencies for TSP Project	Godhra
9	2005-08	AICRP on Maize Contingencies for Testing Fee	Godhra & Dahod
10	2005-09	AICRP on Maize Operational Expenses for NICRA (National Initiative on Climate Resilient Agriculture) Project	Godhra
11	2005-10	Climate Resilient Maize for Asia	Godhra
12	2005-11	AICRP on Maize-SCSP	Godhra
13	2006-01	District Agriculture Contingency plans for Gujarat State	Anand
14	2007-01	Need based contingency for conducting coordinated trials of Soybean	Devgadbaria
15	2008-1H1	Frontline Demonstration on Oilseeds Castor	Anand
16	2008-02	Conducting the Co-ordinated Trials of AICRP on Castor	Anand, Sanand, Derol & Sansoli
17	2008-03	AICRP on Spices for Voluntary Centre	Sanand
18	2008-04	AICRP on Sorghum Voluntary Centre	Anand & Viramgam
19	2008-16	AICRP on Rapeseed - Mustard	Anand
20	2008-17	AICRP on Pearl-Millet / Bajra	Anand
21	2008-20	AICRP on Groundnut Conducting trials	Anand
22	2009-02	Conducting trials on Cotton crops	Anand & Viramgam
23	2010-4 A	AINP on Tobacco TSP Project	Anand
24	2010-4 B	XXIV Tobacco Workshop of All India Network Project on Tobacco	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
25	2012-02	Barley AICW & BIP trials	Anand
26	2012-07	Forage Technology Demonstrative for Kharif 2010-11	Anand
27	2020-01	AICRP on Micro & Secondary Nutrients & Pollution Elements in Soil & Plants for TSP Project	Anand
28	2020-02	AICRP on Micro & Secondary Nutrients & Pollutant Elements in Soil & Plants for SCSP Project	Anand
29	2020-03	SPAH Study in Tribal Area	Anand
30	2025-02	AICRP on Integrated Farming System (TSP & FLD)	Devgadhbaria
31	2026-1B	AICRP on Nematode Pest TSP	Anand
32	2026-1A	AICRP on Nematode Pest	Anand
33	2028-01	Establishment of Core Laboratory under Network Programme NBAGR-Karnal	Anand
34	2028-17	Determining population structure & Identification of SNPs associated with milk traits in kachchi & Marwari camel	Anand
35	2028-18	Organization of 21 days Summer/Winter school on “Agri-business & marketing information system”.	Anand
36	2028-19	New frontiers in hybrid seed production & genetic purity testing	Anand
37	2028-20	Numerical Technique & its Application to Agricultural & Food Engineering Problems	Anand
38	2028-21	Techniques for estimation of nutraceutical properties form crops	Anand
39	2029-00	Estimation of Methane emission under Different Feeding Systems and Development of Mitigation Strategies	Anand
40	2030-01	Semen sexing in cattle	Anand
41	2030-02	Entrepreneurship Oriented Male Weiner Goats Rearing & Selling Unit	Anand
42	2030-08	Network Project on Ethno-Veterinary Medical under A. P. Cess Fund	Anand
43	2030-10	Seed Production in Agricultural Crops and Horticulture Crops (Field Crops)	Sanand, Vadodara, Derol & other Farms
44	2030-19	National Initiative on Climate Resilient Agriculture (NICRA)	Anand
45	2030-20	Niche Area Project “ Metagenomic Analysis of Ruminant Microbes	Anand
46	2030-21	Movement of Dairy Professionals in Western India (Graduates, Post-Graduates & Doctorates)-A Career Path Analysis	Anand
47	2030-22	Assessment of Present Examination system & its suitability in Dairy Science Colleges of India	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
48	2032-00	Production & demonstration of tissue culture raised plants under three locations & collection & maintenance of elite germplasm of date palm	Anand
49	2033-00	NFBSFARA project-Development of solar-hybrid refrigeration technology for on-farm (or in production catchment) safe transient storage of horticultural produce	Anand
50	2034-00	Establishment of Agro Processing Centre for Gourd, Aloe-vera etc.	Anand
51	2035-00	Supply-Demand Analysis of Professional Human Resource in terms of Dairy Technologists in India	Anand
52	2036-00	Development of Non Thermal Plasma (NTP) Decontamination Technology for Fruits & Vegetables	Anand
53	2037-00	Establishing Centre for Agricultural Market Intelligence	Anand
54	2044-01	AICRP on Biological Control of Crop Pests (TSP)	Anand
55	2044-15	Emeritus Scientist Scheme-Calibration & validation of CROPGRO-Cotton, CROPGRO-Pigeon pea, SUBSTOR-Potato & CANEGRO-sugarcane models for different crops of Gujarat for climate change impact studies & yield forecasting	Anand
56	2044-16	ICAR-Emeritus Professor Scheme	Anand
57	2046-01	Development of Integrated pest management (IPM) packages under selective crop conditions, Anand (Tribal Sub Plan)	Anand
58	2076-03	Central Sector Special Food grains Production of Breeder Seed	Godhara, Nawagam
59	2076-05	Research & Development efforts on Hybrids in selected crop Millet Cotton Castor	Anand
60	2080-02	AICRP on National Seed Project (TSP)	Anand
61	2080-03	ICAR Seed Project-Development of serological & molecular diagnostic kit for seed health assessment of rice & cotton (Crops)	Anand
62	2084-01	AINP on Agricultural Ornithology (TSP)	Anand
63	2093-01	AICRP on Agro-meteorology TSP	Anand
64	2095-02	AINP on Pesticide Residue (SCSP)	Anand
65	2096-00	All India Coordinated Vegetable Improvement Project (Voluntary Centre)	Anand
66	2305-02	AICRP Poultry Scheme Income-Department Share	Anand
67	2305-07	Conservation of Ankleshwar Chicken	Anand
68	2374-01	Conducting the Co-ordinated Trials under AICRP on Chickpea	Anand
69	2704-10	Kisan Sammelans, Krishi Melas, Kisan Ghosties, Group Meeting & Displaying Exhibitions & Demonstrations of Technologies during pre-Kharif	Devataj, Dahod & Arnej
70	2704-25	Cluster Frontline Demonstrations of Rabi Pulses 2016-17	Dahod, Devataj & Arnej

Sr. No.	Budget Head	Name of the Scheme	Center
71	2704-26	Organizing Trainings for creation of awareness among the farmers & other stakeholders about the provisions of the protection of plant varieties & Farmers Right Act 2001	Dahod & Arnej
72	2704-27	Soil Testing Kit (International Soils Day)	Dahod,Devataj & Arnej
73	2704-28	Kisan Sammelans, Krishi Melas, Kisan Ghosties, Group Meeting & Displaying Exhibitions & Demonstrations of Technologies during pre-Rabi	Dahod,Devataj & Arnej
74	2704-29	Exposure visits for the Farmers & Extension Workers of Gujarat State under National Food Security	Godhara & Devataj
75	2704-32	Strengthening & setting up of Tissue culture facilities for Date palm and other tissue culture protocols for its commercial cultivation	Anand
76	2704-33	Farmers Fair/Programmes on Pradhan Mantri Fasal Bima Yojna	Dahod,Devataj & Arnej
77	2704-34	Annual Zonal Workshop of KVKs of Zone VI	Anand
78	2704-34A	Cluster Frontline Demonstrations of Rabi Oilseeds for 2016-17	Anand
79	2704-35	Conducting at least two Skill Development Training courses of 200 hours duration through KVK for pulse Cultivator & Micro Irrigation Technician	Anand
80	2704-36	Creation of Seed-Hubs for increasing indigenous production of pulses in India	Anand
81	2704-37	Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojan	Anand, Derol & Devataj
82	2704-38	Paramparagat Krishi Vikas Yojna (PKVY)	Anand
83	2704-51	Trial During Kharif under AICRP (Mullarp)	Vadodara
84	2704-52	Production Oriented survey	Nawagam
85	15121-00	Strengthening & Development of Agricultural Education (AUs)	Anand & Godhra
86	15124-00		
87	15132-00		
88	15133-00		
89	15211-00		
90	15231-00		
91	15711-00		
92	15911-00		
93	15912-00		
94	15913-00		
95	15921-00		
96	15922-00		
97	15923-00		

Sr. No.	Budget Head	Name of the Scheme	Center
98	18311-04	ICAR-Merit-Cum-means	Godhra
99	18311-07	ICAR-PG Scholarship	Anand & Godhra
100	18311-08	ICAR-Internship Allowances to Veterinary graduates	Anand
101	18457-35	ICAR-Senior Research Fellowship for Ph.D. Student	Anand
102	15630-00	Library Strengthening in Agricultural Universities	Anand & Godhra
103	15657-00	Student READY Programme	Anand & Godhra
104	15658-00	National Talents Scholarship	Anand & Godhra
(c) Krushi Vigyan Kendra at AAU			
1	2704-04	Krushi Vigyan Kendra	Dahod
2	2704-07	Krushi Vigyan Kendra	Devataj
3	2704-08	Krushi Vigyan Kendra	Arnej
4	2704-09	Director of Extension Education Office	DEE, Anand
(4) Other Agency Scheme			
(a) Government of India			
1	18005-01	Agro-Meteorological Advisory Services	Anand
2	18005-03	Forecasting of Agricultural out put Using Space, Agro-Meteorology and Land based observations (FASAL)	Anand
3	18246-04	Training Programme on Kissan Call Centre	Anand
4	18246-97	Agro-Meteorological Advisory Services	Arnej
5	18246-98	Mission for Integrated Development of Horticulture	Anand, Arnej & Sansoli
6	18248-00	National Agricultural Extension Project-I (Non-plan)	Anand
7	18252-08	Imparting Training on officers of Semen Stations in the country : as a collaborative Project	Anand
8	18310-00	Monitoring of Pesticide Residue at National Level	Anand
9	18311-7H	Indo-Africa Action Plan 2010-11	Anand
10	18311-07J	Fellowship to Afghan Students	Anand
11	18311-7C	Award of INSPIRE Fellowship at B. A. College of Agriculture, Veterinary Science College & Dairy Science College	Anand
12	18311-08	Apprenticeship/Internship Scholarship for Veterinary Students (ICAR)	Anand
13	18476-04	Pashupalan Shibir at Borsad by Veterinary Science College	Anand
14	18457-34	Cloning, characterization and functional screening of industrially important novel cellulose encoding genes from the bovine rumen microbial community using met genomic approach	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
15	18457-49	“Identification of “Molecular Protraits” in Squamous Cell Carcinoma of Horn in Kankrej (<i>Bos indicus</i>) Bullocks”	Anand
16	18457-74	Development of Technology for the preparation of Fermented Rice Beverage in Meghalaya and evaluation of its functional properties	Anand
17	18557-01	Functional metagenomics of camel rumen microbiome for novel key glycoside hydrolyses (GH) to benefit animal nutrition and bio fuels	Anand
18	18557-02	Biotransformation and bioavailability of soy is flavones in a fermented soy beverage	Anand
19	18557-06	Native methanotrophic bacterial consortium for mitigation of methane flux from rice ecosystems	Anand
20	18557-29	Skill Development Training Programmes	Anand
21	18557-50	Study the residues and dissipation of ME 5382 (10% Suspension Concentrate) on Paddy Rice	Anand
22	18557-51	Study the residues and dissipation of ME 5382 (2% Granular) on Paddy Rice	Anand
23	18557-52	Krusha Kalyan Abhiyan	Anand
24	18557-55	Study the residues and dissipation of Metalaxyl-M 31.8% ES on Maize and Chilli	Anand
25	18557-60	Evaluation of existing plantation, establishment of agro forestry trials and capacity building to promote Sandal wood (<i>Santalum album</i>) cultivation in Gujarat and Rajasthan	Anand
26	18557-61	Skill Development Training Programmes 2018-19	Anand, Sansoli & Dahod
27	18557-62	Evaluation of Bt cotton hybrids and varieties revived through CICR Coimbatore under AICAR on Cotton	Anand
28	18557-66	Quality Seed Production Technology of Arid Crops	Anand
29	18557-72	DBT Network programme on bovine tuberculosis control: Mycobacterial diseases in animals Network (MyDAN) programme	Anand
30	18557-73	Biotechnological approaches for conservation and Eco-restoration of Paris Polyphylla and Kaempheria parviflor-A highly traded endangered medicinal plant species in Arunachal Pradesh	Anand
31	18557-77	Green Energy Initiatives In Agricultural to Combat Climate Change Training	Godhra

Sr. No.	Budget Head	Name of the Scheme	Center
32	18557-82	(1) To study the residue and dissipation of Fluopyram 200g/L + Tebuconazole 200g/L SC (Luna experience) on Rose (2) To study the residue and dissipation of Fluopyram 200g/l + Tebuconazole 200g/l SC (Luna experience) on Banana (3) To study the residue and dissipation of Fluopyram 250g/l + Trifloxystrobin 250g/l SC (Luna sensation) on Chilli (4) To study the residue and dissipation of Fluopyram 250g/l + Trifloxystrobin 250g/l SC (Luna sensation) on Onion (5) To study the residue and dissipation of Spirotetramat 150g/l OD (Movento) on Cabbage (6) To study the residue and dissipation of Beta-cyfluthrin 90g/l + Imidacloprid 210g/l OD (Solomon) on Cucumber (7) To study the residue and dissipation of Fosetyl AI 80 % WP (Aliutte) on Bengal gram (8) To study the residue and dissipation of Fosetyl AI 80 % WP (Aliutte) on Banana (9) To study the residue and dissipation of Fluopyram 400 g/l (Valum prime) on Chilli (10) To study the residue and dissipation of Fluopyram 400 g/l (Valum prime) on Brinjal	Anand
33	18557-83	(1) To study the persistence and dissipation of Cyantraniliprole 8% + Diafenthiuron 40% W/W SC on Brinjal (2) To study the persistence and dissipation of Cyantraniliprole 8% + Diafenthiuron 40% W/W SC on Okra and (3) To study the persistence and dissipation of Cyantraniliprole 8% + B369Diafenthiuron 40% W/W SC on Tomato	Anand
33	18557-84	Demonstration of efficacy of Nimitz 2GR in different crops (Tomato, Guava and Pomegranate)	Anand
34	18557-85	Validation and Promotion of Sustainable and Adaptable IPM Technology for Brinjal Crop	Anand
35	18557-86	XXV meeting of ICAR Regional Committee No.VI	Anand
36	18557-87	To Study the persistence and dissipation of insecticide Acephate 75% SP in cotton	Anand
37	18557-88	Establishment of Demonstration units on Micro Irrigation Systems (Drip/Sprinkler)	Dahod
38	18557-89	District Kisan Mela	Dahod
39	18557-90	Atmosphere and Climate Research-Modelling Observing Systems and Services (Across) (0335)	Dahod
40	18557-94	INSA Fellowship	Anand
41	18557-95	Creation of mass production facility of bio-pesticides for plant disease management	Devataj
42	18557-97	Mission for Clean India (Swacchha Bharat Abhiyan)	Anand
43	18557-98	“R-ABI, College of Food Processing Technology & Bio-Energy	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
44	18454-23	Evaluation of performance of Maize [Corn]	Derol
45	15457-78	Mission for Sustainable Agriculture	Anand
46	18557-64	Recent Agricultural Practices for Cereal & Spice Crops	Anand
47	18557-65	Value Addition and Marketing of Tomato, Chili, Cauliflower & Other Cereal & Spice Crops	Anand
48	18557-74	Recent Management Practices for Crops and Animals	Anand
(b) Government of Gujarat			
1	18023-00	Narmada irrigation Research Project	Khandha,
2	18023-11	Sardar Sarovar Narmada Irrigation Research Project	Thasra & Dabhoi
3	18023-12	Sardar Sarovar Narmada Irrigation Research Project	Dhandhuka
4	18053-00	Cost of Cultivation Scheme	Anand
5	18095-00	Surti Buffalo Breeders Association of Gujarat	Anand
6	18246-00	T. & V. Benor Scheme (Plan)	Anand
7	18246-03	T. & V. Scheme (Non-plan) under Benor System	Anand
8	18246-05	Green House/Net House Training to Farmers at DEE	Anand
9	18258-01	Krusha Mahotsav - 2011	Anand
10	18258-02	Organized Shibirs during Krushi Mahotsav-2011	Anand
11	18273-00	National Service Scheme	Anand
12	18299-03	Evaluation of Bt. Hybrid	Anand & Dhandhuka
13	18396-00	Monitoring of Surface and Ground water for Pesticide Residue in the SSP Command Phase-I Area	Anand
14	18396-01	Monitoring of Surface and Ground water for Pesticide Residue in the SSP Command Phase-II Area	Anand
15	18405-00	Soil Health Card programme for state farmers	Anand
16	18454-31	Identification & Molecular Characterization and Documentation of Crops specific Efficient and Agrochemical Tolerant Strains of <i>Trichoderma spp.</i> For Sustainable and Eco-friendly Management of Plant Pathogens/Diseases	Anand
17	18457-28	Quality Seed Production in fodder crops under fodder development programme	Anand
18	18457-55	Scheme for promotion of organic farming	Anand
19	18457-68	Certificate in Agricultural extension services for input dealers	Anand
20	18457-71	Bioprospecting of oxalate degrading lactic acid bacteria to develop a functional product with potential in preventing kidney stone disease	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
21	18457-75	Genetic diversity analysis and development of molecular Markers for drought tolerance in Teak (<i>Tectona grandis</i> L.F) populations of Gujarat	Anand
22	18457-83	Women Law Awarnes Shibir	Anand
23	18457-42-1	Establishment of Model Organic Farm cum Training Centre	Devataj
24	18457-42-2	Establishment of Model Organic Farm cum Training Centre	Sansoli
25	18457-42-3	Establishment of Model Organic Farm cum Training Centre	Arnej
26	18457-88	Development, validation & technology transfer of microbial consortium of bioagents in sustainable management of biotic & abiotic stresses in crops	Anand
27	18557-16	Student startup and innovation policy	Anand
28	18557-38	Strengthening of Pesticide Residue Laboratory as per NABL-17025	Anand
29	18557-40	Screening for polymorphism(s) in the selected candidate genes involved in the pathogenesis of Steroid Resistant Nephrotic Syndrome	Anand
30	18557-59	Doubling the farmers income by 2022-A Strategic Initiative	Anand
31	18557-63	For organic farming demonstration	Anand
32	18557-69	Demonstration on Hydroponics and Soil Less Culture	Anand
33	18557-70	Experiential Learning Unit on Plant Propagation and demonstration of nursery management techniques under greenhouse environment	Vaso
34	18557-71	Green House facility for mass multiplication and demonstration of interspecific hybrid of fruits and vegetables	Anand
35	18557-75	Establishment of mass production laboratory of native biocontrol for insect pest management	Anand
36	18557-76	Integrated Farming System Model for sustainable livelihood for tribal farmers	Dahod
37	18557-78	Mechanized Dairy Cattle Breeding Farm	Anand
38	18557-79	Minimal Processing unit to enhance quality of fruits and vegetables	Anand
39	18557-91	Facility Creation at Pulse Research Station	Vadodara
40	18557-92	Strengthening of Krishi Vigyan Kendra	Arnej
41	18557-93	Strengthening of Commercial Tissue Culture Laboratory	Anand
42	18557-96	ARYA Project at KVK	Anand
43	18557-99	Hi-Tech Demonstration for propagation and production of quality planting materials of Horticulture plants under protected condition	Vadodara

Sr. No.	Budget Head	Name of the Scheme	Center
(c) NGO & Private Agencies			
1	18284-00	Mahila Pashupalan Talim Karyakram at Veterinary Science College	Anand
2	18299-00	Evaluation of Bt. Cotton Hybrid Trials (approved by GEAC)	Anand, Viramgam & Dhandhuka
3	18309-00	Monitoring Cell: MLT & LST trials Monitoring charges	Anand
4	18457-13	Testing the Bio-efficacy and Phytotoxicity of Chlorantriliprole 35% WG against Lepidopteran Pests of Okra and Tomato at MVRS	Anand
5	18457-16	Bioefficacy and Phytotoxicity of Bio-pesticides (Brahmastra, Agniastra and Neemastra) against Sucking Insect Pests of Cotton and Okra	Anand
6	18457-18	Testing Bio-efficacy and Phytotoxicity of HGW86 10% OD (Cyantranilipole) against Sucking and Lepidopteran Pests of Potat	Anand
7	18457-19	Testing of Cumacin and Florigen in Chilli	Anand
8	18311-07I	NARC Fellowship - Mr. Jeet Narayan Chaudhari, M.Sc. (Agri.) at B. A. College of Agriculture, Asian-Pacific Association of Agricultural (APAARI) scholarship	Anand
9	18411-1(3)	Evaluation of Performance of Maize Hybrids	Jabugam
10	18411-05	Evaluation of Performance of Maize Hybrid	Sansoli
11	18447-08	(1)Testing the Bioefficacy of Jumpstart in soyabean (2) Testing the Bioefficacy Optimize 400 in Soyabean; & (3) Testing the Bioefficacy Taegro in Soyabean	Anand
12	18447-16	Supervised Field Trial on Residue and Persistence Study of Monocrotophos on Pigeonpea	Anand
13	18447-20 (3)	Supervised Field Trial on Residue and Persistence Study of Imidacloprid 75 WG on Cotton; Spirotetramat 150 OD on Brinjal & Imidacloprid 350 SC on Chilli	Anand
14	18447-28	Evaluation of Performance of Pearl Millet Hybrids	Anand
15	18454-18	Testing of Zineb 68% + Hexaconazole 4% WP (AVTAR) against Diseases of Cotton and Maize	Anand
16	18454-19	Evaluation of Carbendazin 25% + Mancozeb 50% WS (SPRINT) against Diseases of Maize and Onion Bulb	Anand
17	18454-21	Bioefficacy and Phytotoxicity Evaluation of CHA 1322 (Flutriafol 250 g/L SC) against Tikka Disease (Early and Late Leaf Spot) of Groundnut	Anand
18	18454-32	Evaluation of Bio-efficacy and Phytotoxicity of Movento 150 OD (Spirotetramat 15% w/v OD) against Sucking Pest Complex of Cotton	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
19	18454-32 (1)	Bio-efficacy and Phytotoxicity of Imidacloprid 200 SL (Imidacloprid 17.1% w/w SL) against Insect Pest of Cotton at B. A. College of Agriculture,	Anand
20	18454-32 (2)	Bio-efficacy and Phytotoxicity of Solomon 300 OD (Betacyfluthrin 9% +Imidacloprid 21% w/v OD) against Sucking Insect Pest in Cotton	Anand
21	18454-32 (3)	Bio-efficacy and Phytotoxicity of Combi Product SLR-525 against Sucking Insect Pest in Cotton	Anand
22	18476-05	Evaluation of Everest Milk Analyzer and Adulteration Detection Strips for their Efficacy in Analysis of Milk	Anand
23	18502-01	Calibration and Validation of SMAP Soil Moisture over Semi-Arid Agricultural Patches in Gujarat	Anand
24	18505-00	Development of Recombinant Poultry Vaccine with HVT (<i>Herpes Virus Turkey</i>) as Backbone	Anand
25	18802-0F	Diploma in Agricultural Extension Services for Input Dealer	Anand
26	18457-21	Bioefficacy of RDS63 35% WG against <i>Helicoverpa armigera</i> in tomato	Anand
27	18457-21 (1)	Bioefficacy of RDS63 35% WG against <i>Spodoptera litura</i> in chilli	Anand
28	18457-21 (2)	Bioefficacy of RDS63 35% WG against lepidopteran Pests of cabbage	Anand
29	18457-21 (3)	Efficacy of RDS63 20 SC (Dicloromezotiaz) against lepidopteran pests of pigeonpea	Derol
30	18457-22	Hybrid Rice Coded SAU trial	Nawagam
31	18457-24	Evaluation of MAIRM-08 (Difenthrin 47% + Bifenthrin 9.4% SC) against sucking pests (Jassid, Whitefly, Aphid & Thrips) & Bolloworms in Cotton	Anand
32	18457-24 (1)	Evaluation of Buprofezin 15% + Acephate 35% WP against Sucking Pests in Cotton	Anand
33	18457-25	Bioefficacy & Phytotoxicity evaluation of carboxin 75% WP against angular leaf spot [<i>Xanthomonas axonopodis pv-malvacearum</i> (smith) Dye] of Cotton	Anand
34	18457-27	Bioefficacy & phytotoxicity of Flonicamid 50% WG against sucking pests of Brinjal	Anand
35	18457-27 (1)	Bioefficacy & phytotoxicity of Flonicamid 50% WG against sucking pests of Okra	Anand
36	18457-27 (2)	Bioefficacy & phytotoxicity of Flonicamid 50% WG against sucking pests of Okra	Anand
37	18457-29	Evaluation of performance of Maize Hybrids	Derol
38	18457-30	Magnitude of residues of Cyantraniliprole 10.26 10% OD in Chilli	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
39	18457-31	Bioefficacy and phytotoxicity evaluation of Tebuconazole 10% + Sulphur 65% WG (XLC 750) against powdery mildew (<i>Oidium mangiferae</i> Bert.) of mango (<i>Mangifera indica</i> L.)	Anand
40	18457-32	Field evaluation of fungicide Pyraclostrobin 20% WG on early blight disease of tomato crop	Anand
41	18457-33	Evaluation of efficacy of Sulphur and Zinc containing Complex Fertilizers for maximizing yield through balanced nutrition of different crops in India	Anand
42	18457-36	To promote assistance to State Farmers for Organic Farming-2015-16	Anand
43	18457-37	Bagayat Khedut Sammelan	Anand
44	18457-23 (1)	Molecular characterisation of lesser known livestock population of Gujarat	Anand
45	18457-40	Bayer Fellowship Program	Anand
46	18096-00	Measurement to Management M2M : Improved Water Use Efficiency & Agricultural Productivity through Experimental Sensor Network	Godhra
47	18457-41	Providing expert services regarding agriculture crops/ Fodder in setting up of 1 MW Grid Connected Distributed Solar PVPilot Project at Amrol	Anand
48	18457-43	Bioefficacy evaluation of new insecticide molecule PII 8007 20% SC on insect pests of Pomegranate	Anand
49	18457-44	Feasibility study for enrichment of hygienised dry sewage sludge with Plant Growth Promoting Bacterial consortium (Anubhav Bio-NPK) and to assess its efficacy in potato, tomato and Wheat	Anand
50	18457-46	Management of pink bollworm, <i>Pectinophora gossypiella</i> (Saunders) using PB Rope Land its impact on sucking insect pests and beneficial Fauna in Bt cotton	Anand
51	18457-47	Bio-efficacy evaluation of a combination product PCT-16 for seed treatment in Cotton crop.	Anand
52	18457-48	Bio-efficacy evaluation of a combination product PCT-16 for seed treatment in Groundnut crop.	Anand
53	18457-50	Effects of Novozymes products on yield and its attributes in chilli	Anand
54	18457-51	Bio-efficacy and Phytotoxicity of Flonicamid 50% WG against sucking insect pests in Bt. Cotton	Anand
55	18457-52	Bio-efficacy and Phytotoxicity of Spiromesifen 22.9% SG against whitefly and mites in Bt. Cotton	Anand
56	18457-53	Bio-effocacy cum Phytotoxicity study of Spiromesifen 22.9% SG against brinjal mite	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
57	18457-54	Agronomic Field Studies with various products of novozymes Pvt. Ltd. N yield of cotton	Anand
Sr. No.	Budget Head	Name of the Scheme	Center
58	18457-57	Field Bio-efficacy cum phytotoxicity evaluation of Pyraclostrobin 20% WG against Soybean-Cercospora (frog eye) & Alternaria leaf spot	Anand
59	18457-58	Evaluation of bio-efficacy and phytotoxicity of Pyraclostrobin 20% WG against Alternaria leaf spot/blight disease of cotton	Anand
60	18457-59	Evaluation bio-efficacy and phytotoxicity of Pyraclostrobin 20% WG against early blight disease of tomato	Anand
61	18457-60	Bio-efficacy evaluation of Pyraclostrobin 20%WG against Turcicum leaf blight (<i>Exserohilum turcicum</i>) of Maize	Godhra
62	18457-62	Evaluation of in-vitro and in-vivo efficacy of a formulation containing nanotechnology based alkyl polyglycosides of herbs against mastitis pathogens and its post-exposure effect on gene expression of certain bacteria	Anand
63	18457-63	To study the persistence and dissipation of the (1) Flonicamid 50% WG on Cotton, (2) Flonicamid 50% WG on Paddy. (3) Spiromesifen 22.9% SC on Cotton, (4) Spiromesifen 22.9% SC ON Brinjal and (5) Thiocyclam Hydrogen Oxalate 4% G on Paddy	Anand
64	18457-64	Chlorothalonil 40% + Difenconazole 4% w/w SC (Bravo Top 550 w/v SC) against Groundnut disease	Anand
65	18457-65	Evaluation of Pydiflumetofen 7.5% + Difenconazole 12.5 w/v (200 sc) against Groundnut diseases	Anand
66	18457-66	Bio-efficacy and Phytotoxicity of Power oil Garnet AG (2.5% v/v) against sucking pests and pink bollworm in Bt. Cotton”	Anand
67	18457-69	To study the residue and dissipation of (1) Flupyram 400 SC (Velum) in Banana (2) Imidacloprid 600 FS (Gaucho) in Bengal Gram, (3) Flupyram 400 SC (Velum) in Cucumber, (4) Spirotetramat 150 OD (Movento) in Citrus, (5) Fluopicolide 4.44% + Fosetyl AL 66.67% WG (Profler) in Citrus, (6) Betacyfluthrin 90 + Imidacloprid 180 SC WS (Solomon) in Citrus and (7) Fosetyl AL 80 WP (Aliette) in Tomato	Anand
68	18457-72	To study the persistence and residues of (1) Carbendazim 12% + Mancozeb 63% WP in cotton and (2) Carbendazim 12% Mancozeb 63% WP in Soyabean	Anand
69	18457-73	Efficacy of Q8U80 500 SC for the management of root knot nematodes on multiple crops (Tomato, Brinjal, Cucumber and Capsicum)	Anand
70	18457-76	Evaluation of different Organic Products in Moong crop	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
71	18457-77	Estimation of Methane Emission in cattle and Dietary interventions for its Mitigation	Anand
72	15457-78	Mission for Sustainable Agriculture	Anand
73	18457-79	Impact of Climate on Epidemiology of Major Important Diseases of cattle and Buffalo in Middle Gujarat	Anand
74	18457-84	Evaluatuion of performance of pearl millet viz PB 1728 (9428) and 9461	Anand
75	18457-85	Forecasting sugarcane Production at mill catchment in Bharush, Gujatat with remote sensing and ancillary information	Anand
76	18457-86	Development of a Decision Support System (DSS) Planning storage infrastructures and supply chain logistics	Anand
77	18457-87	SCATSAT-1 Utilization project on Rice Productivity from Scatsat-1 Data	Anand
78	18457-89	Field bio-efficacy & phytotoxicity evaluation of Sulfentrazone 39.6% SC against weed complex of Soybean	Anand
79	18457-90	Field bio-efficacy & phytotoxicity evaluation Diclosulam 84% WG against weed complex of Soybean	Anand
80	18457-91	Field bio-efficacy & phytotoxicity evaluation Diclosulam 84% WG against weed complex of Groundnut	Anand
81	18457-94	Land surface albedo retrieval using GISAT data	Anand
82	18457-95	Gross Primary Productivity from Agriculture using GISAT data	Anand
83	18457-96	Crop discrimination & soil fertility assessment using AVIRIS-NG data	Anand
84	18457-97	Bio-efficacy cum phyto-toxicity field evaluation of insecticide Lufenuron 5.4% EC against American bollworm, Helicoverpa armigera (Hubner) Hardwick in cotton	Anand
85	18457-98	Bio-efficacy & phyto-toxicity study of Flubendiamide 20% WG tomato fruit borer	Anand
86	18457-99	Bio-efficacy & phyto-toxicity study of Lufenuron 5.4% EC against chilli fruit borer	Anand
87	18557-00	Evaluation of Bio-efficacy and phytotoxicity of Flubendiamide 20 WG (New Source) against stem borer and leaf folder infesting rice	Sansoli
88	18557-03	Integrated Nutrient and Water Management in Crops & Animals	Anand
89	18557-05	Standardzation of PB Rope L required for the management of pink ballorm pectinophora gossypiells (Saunders) in Bt. cotton	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
90	18557-07	(1) Tebuconazole 50% + Trifloxystrobin 25% WG(Nativo) on Green Peas (2) Tebuconazole 50% + Trifloxystrobin 25% WG(Nativo) on Okra (3) Imidacloprid 600 FS (Gaucho 600 FS) on Green Peas (4) Flubendiamid 240 + Thiacloprid 240 SC (Belt Expert) on Bengal Gram (5) Flubendiamide 90 and + Deltamethrin 60 SC (Fame Quick) on Chilli (6) Betacyfluthrin 90 + Lmidacloprid 210 OD Onion	Anand
91	18557-08	To study the persistence & residues of Mancozeb 52.6% + Hexzconazole 2.4% WG(UPF 209b) on Chilli	Anand
92	18557-09	Evaluation MCW-2 (2%GR) against Root Knot Nematode (Meloidogyne incognita) in Capsicum (under polyhouse condition)	Anand
93	18557-10	Nutrient & management to Increase efficiency in Crops & Animal	Anand
94	18557-11	(1) Study the residues of lifenuron 5.4% EC on cotton (2) Study the residues of flubendiamide 20%WG on tomoto (3) Study the residues of lifenuron 5.4%EC on chillies (4) Study the residues of flubendiamide 20% WG on on paddy	Anand
95	18557-12	(1) Study the persistence & residues of Acetamiprid 25% + Bifenthrin 25% WG on (GPI 515) Soybean crop	Anand
96	18557-13	(1) Study the persistence & residues of Novaluron 9.45% + Lambda cyhalothrin 1.9% ZC(GPI 1316) on red gram (2) Study the persistence & reslducs of Zxoxystrobin 8.3% + Mencozeb 66.7% WG (Avancer glow) on soybean	Anand
97	18557-15	Evaluation of Efficacy of Homeopathic formulation in Clinical/Subclinical Mastitis in cattle	Anand
98	18557-17	Evaluating L & S band SAR date for estimation of crop biophysical parameters and soil moisture	Anand
99	18557-20	ASPEE Scholarship	Anand
100	18557-21	Bio-Efficacy of Vellum Prime 400 SC against root-knot nematode infecting Brinjal	Anand
101	18557-22	Bio-Efficacy of Vellum Prime 400 SC against root-knot nematode infecting Chilli	Anand
102	18557-23	(1) To Study the Persistence & residues of Pendimethalin 38.7% CS (Dost Super) on Cumin (2) To Study the Persistence & residues of Pendimethalin 38.7% CS (Dost Super) on Chick Pea	Anand
103	18557-26	Study the Persistence & residues of Ipencarbazone 25% SC (w/v) on Rice	Anand
104	18557-27	Evaluation of bio-efficacy of Thiamethoxam 12.6% + Lamda cyhalothrin 9.5% ZC (Alika 247 ZC) against cumin pests	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
105	18557-31	Study the residue of Azoxystrobin 18.2% + Difenoconazole 11.4% w/w SC on Banana	Anand
106	18557-32	Study the persistence and residues of Oxyfluorfen + Clonidafop Propargyl (UPH 716) on Onion	Anand
107	18557-33	Study the persistence and residues of Azoxystrobin 4.7% + Mancozeb 59.7% + Tebuconazole 5.6% WG (GPF 215) on Cucumber	Anand
108	18557-34	Study the persistence and residues of Metalaxyl-M 3.9% + Mancozeb 64% WG (GPH 616) on Potato	Anand
109	18557-41	Evaluation of sulphur and Zinc based fertilizers on periodic availability and leaching of sulphur and zinc in soils and its effect on yield, nutrients content and quality parameters in kharif paddy and summer Green gram	Thasara
110	18557-42	Center for Development of Advance Computing (C-DAC), Hyderabad	Anand
111	18557-43	Bio-efficacy of Glufosinate Ammonium 13.5% SL against major weeds, its effect on succeeding crop and its phytotoxicity on cotton	Anand
112	18557-44	Bio-efficacy and Phytotoxicity evaluation of Myclobutanil 10% WP against Alternaria blight in Cotton	Anand
113	18557-45	Bio-efficacy and Phytotoxicity of Cyantraniliprole 200 g/l SC against insect pests of Chilli when applied as Nursery Tray Drench Application	Anand
114	18557-46	Bio-efficacy and Phytotoxicity of Cyantraniliprole 200 g/l SC against insect pests of Capsicum when applied as Nursery Tray Drench Application	Anand
115	18557-47	Bio-efficacy and Phytotoxicity of Cyantraniliprole 200 g/l SC against insect pests of Tomato when applied as Nursery Tray Drench Application	Anand
116	18557-48	Bio-efficacy and Phytotoxicity of Cyantraniliprole 200 g/l SC against insect pests of Cucumber when applied as Nursery Tray Drench Application	Anand
117	18557-49	Bio-efficacy and Phytotoxicity of Cyantraniliprole 200 g/l SC against insect pests of Watermelon when applied as Nursery Tray Drench Application	Anand
118	18557-53	Effect of Krishisol on Growth, Yield and Quality of Chickpea (<i>Cicer arietinum</i> L.)	Derol
119	18557-54	Efficacy of Ani Guard-O on Bovine Ticks	Anand
120	18557-56	Evaluation of bio-efficacy of SYN 547407 100 DC against pests complex in Redgram	Anand
121	18557-57	Evaluation of bio-efficacy of SYN 547407 10 % W/v DC against pests complex in Cotton	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
122	18557-58	Evaluation of bio-efficacy of Spiropidion 30%+Acetamipride 24% WG against Cotton pests	Anand
123	18557-67	Bhutan Students Hostel Fees	Anand
124	18557-68	Swadeshi Science Movement	Anand
125	18557-80	Effect of Krishisol on Growth, Yield and Quality of Onion (<i>Allium cepa</i> L.)	Anand
126	18557-81	Evaluate the efficiency of potassium thiosulphate and calcium thiosulphate on yield, nutrient uptake and quality of potato and cabbage and changes in soil properties under middle Gujarat conditions	Anand
127	18558-01	Efficacy of Fluazaindolizine (Q8U80) 500 SC for the management of root knot nematode on multiple crops (Okra, Water melon and Ridge gourd)	Anand
128	18558-02	Development of Active-Passive algorithm for High Resolution Soil Moisture over Bare and Vegetation Covered Soil	Anand
129	18558-03	Spectral library Development and Spectral Sensitivity Analysis for Multi Crops and Growth Stages	Anand
130	18558-05	Bio-effect of DAH-307 17.18% EC against weeds, its phytotoxicity on groundnut and effect on succeeding crop	Anand
131	18558-06	Bio-efficacy field trial of insecticide against fall armyworm, <i>Spodoptera frugiperda</i> (J.E. Smith) infesting maize	Anand
132	18558-07	Evaluation of performance of Maize Hybrids	Godhra
133	18558-08	Creation of Seed Storage Godown Facility”	Khandha
134	18558-09	Establishment of Advanced Laboratory in Nanotechnology for Evolving Novel Applications in Agricultural Sciences”	Anand
135	18558-10	Establishment of infrastructure for seed processing and abiotic stress screening of desi cotton”	Viramgam
136	18558-11	Evaluation of premix herbicide RIL-202/F1 35.9% SE for its bio-efficacy and phytotoxicity on soybean as pre-emergence and its effect on succeeding crop”(Flag-B)	Anand
137	18558-12	Evaluation of premix herbicide RIL-202/F1 35.9% SE for its bio-efficacy and phytotoxicity on soybean as pre-plant incorporation and its effect on succeeding crop”(Flag-B)	Anand
138	18558-13	Evaluation of RIL-165/F1 (30% SE) against <i>spodoptera litura</i> , <i>helicoverpamrigera</i> , semilooper and girdle beetle infesting soybean”	Anand
139	18558-14	Evaluation of RIL-173/F1 (22.5% SE) against sucking pests (aphid, jassid, whitefly, thrips and mealvbug) in cotton”	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
140	18558-15	Evaluation of bio-efficacy of SYN 547407 10% w/v DC against pests complex in Groundnut	Anand
141	18558-16	Effect of organic product Denicotinised Tobacco Dust (DTD) on plant growth and fruit yield of Okra in Kharif season	Anand
142	18558-17	Efficacy of Fluazaindolizine (Q8U80) 500 SC for the management of root knot nematode on Bottle gourd	Anand
143	18558-18	Bio-efficacy of ULALA (Flonicamid 50% wg) against insect pest of Soybean	Devgadhbaria
144	18558-20	Renewable Energy for Environmental Protection and Energy Conservation”	Anand
145	18558-21	1. To Study the residue and dissipation of vayego (Tetraniliprole 200 g/l SC) in / on Maize 2. To Study the residue and dissipation of Larvin (Thiodicarb 75% WP) in / on Maize”	Anand
146	18558-23	Research infrastructure for modernization of Main Vegetable Research Station	Anand
147	18558-24	To develop the model farm at Thasra in Kheda district of Middle Gujarat”	Thasra
148	18558-25	Facilitates creation at agricultural research station”	Derol
149	18558-26	To develop the model farm in Vadodara district of Middle Gujarat”	Derol
150	18558-27	Creation of Facilities for Farmers Training Under WTO Cell”	Anand
151	18558-28	Development of Horticultural Research Station”	Khambholaj
152	18558-29	Ceration of infrastructure facilities at AAU, Khandha in Vadodara district of middle Gujarat”	Khandha
153	18558-30	Strengthening of infrastructure facilities for seed production at Main Rice Research Station, AAU, Navagam, Ta. & De. Kheda (Gujarat)”	Navagam
154	18558-32	New Developments in Dairy Sector: Issues and Strategies for increasing Income of Rural Milk Producer of India”	Anand
155	18558-33	Training Programme on “Good Animal Husbandry and Veterinary Practices for Doubling of Animal Owner Income”	Anand
156	18558-34	Subhash Prakrutik Krushi (SPNF)”	Anand
157	18558-39	Pharmacokinetics of page therapy: A step forward in the treatment of sub clinical mastitis in Gir Cattle	Anand
158	18558-41	Crop Protection in Horticultural Crops” under NHM	Anand

Sr. No.	Budget Head	Name of the Scheme	Center
159	18558-43	1. To Study the residue and dissipation of Fluopyram 400g/l SC (Velum Prime) in/on Pomegranate (Two Season-Soil Drenching) 2. To Study the residue and dissipation of Fluopyram 400g/l SC (Velum Prime) in /on Pomegranate (Two Season-Drip) 3. To Study the residue and dissipation of Tetraniliprole 120 g/l + Thiacloprid 360 g/l DC in/on Brinjal (one Season) 4. To Study the residue and dissipation of Tetraniliprole 120 g/l + Fipronil 240 g/l FS (Reatis Plus) in/on Maize (One Season)	Anand
160	18558-44	1 To Study the residue and dissipation of Fluopyram 400g/l SC (Velum Prime) in/on Cucumber (Two Season-Drip), 2. To Study the residue and dissipation of Fluopyram 400g/l SC (Velum Prime) in/on Tomato (Two Season-Drip) 3. To Study the residue and dissipation of Spirotetramat 30 g/l + Difenthiurom 120 g/l SC in/on Chilli (One Season)	Anand
161	18558-45	Evaluaton of Health Promoting Schemes Jointly offered by Government and Dairy Co operatives of Gujarat	Anand
162	18558-46	To Evaluate Various Socio-Economic Upliftment Schemes Provided to Member Farmers by Gujarat Dairy Cooperatives	Anand
163	18558-47	Comparative Analysis of Dairy Business Models Existing in Gujarat: Study of Selected Districts and Exploring Possibility of Implementing New Models	Anand
164	18558-48	Animal Disease Control	Devataj, Arnej & Dahod
165	18558-49	Fertilizer Application Awarness Campaign	
166	18558-50	Microbial based Agricultural Waste Management using Vermi-composting under SWAACHHTA ACTION PLAN (SAP)	
167	18558-51	Tree Plantation Campaign	
168	18558-00	Efficacy of Fluazaindolizine (Q8U80) 500 SC for the management of root knot nematode on Bottle gourd	Anand
169	18802-0F	Diploma in Agricultural Extension Services for Input Dealer at Director, IDEA	Anand

Appendix - 4

LIST OF RESEARCH PAPER PUBLISHED

(I) FACULTY OF AGRICULTURE/HORTICULTURE

- 1 Akasthan N., Panchal B. H., and Mahida S. V. (2019). Study the effect of different dates of transplanting and spacing on yield and quality of broccoli (*Brassica oleracea* var. italica) cv. Palam samridhi in middle Gujarat condition. *International Journal of Chemical Studies*, 7(4): 1736-1738.
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- 5 Barad A. J., Singh S. K., Bhagora G. J. and Patel M. B.(2019).*In vitro* evaluation of different fungicides and bioagents against *E. turcicum* causing Turcicum Leaf Blight disease of maize. *International Journal of Chemical Studies*, 7(4): 682-686.
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- 13 Borad M.G., Patel H. P., Damor M. P., Pipaliya G.K. and Aniyaliya M. D. (2020). Population dynamics of aphid, *Aphis craccivora* Koch on cowpea ecosystem in middle Gujarat. *Journal of Entomology and Zoology studies*, 8(1): 805-810.
- 14 Borad M.G., Patel H. P., Patel N. K. and Borad P. K. (2019). Bio-efficacy of different botanicals against aphid, *Aphis craccivora* Koch infesting cowpea *Vigna unguiculata* (L.) Walp. *International Journal of Chemical Studies*, 7(6): 2730-2736.
- 15 Chandravadia K. and Makwan A.R.(2019). Use of information and communication technologies by the tribal farmwomen. *Gujarat Journal of Extension Education*, 30(1): 58-59.
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(VII) FACULTY OF AGRICULTURAL BUSINESS MANAGEMENT

- 1 Desai Siddharth Dineshbhai and Singh Ritambhara (2019). A Study of Farmers' Purchasing Behaviour towards Hybrid Cotton Seed in Gujarat. *Indian Journal of Economics and Development*, 15 (3):443-448.
- 2 Dhamsaniya Priyaben Paragbhai and Singh Ritambhara (2019). Assessment of Agricultural Activities and Market for Local Crops under Changing Climate Conditions in Gujarat. *Indian Journal of Economics and Development*, 15(3):351-359.
- 3 Mahera A. B. and Dudhagara C.R. (2020). Scope and market opportunities of organic farming in India. *International Journal of Agriculture Sciences*, 12(6): 9655-9657.
- 4 Panigrahy S. R., and Vahoniya D. (2019). Pashu Haat to E-Pashuhaat-An era of transformation in livestock marketing. *Livestock Technology*, 9(3): 18.
- 5 Parmar H.C., Zala Y.C., Parmar D. J. and Khorajiya M. T. (2019). Technical efficiency of rain-fed maize farms in tribal area of Central Gujarat. *International Journal of Chemical Studies*, 7(1): 1719-1723.
- 6 Parmar H.C., Zala Y. C. and Mor Vinod (2019). Economic analysis of rainfed maize production in central Gujarat, India. *International Journal of Current Microbiology and Applied Sciences*, 8(08): 2420-2428.
- 7 Patel Janki and Lad Yogesh (2019). Market potential and farmer purchasing behaviour of makhana product for paddy crop in selected villages of Anand District. *International Journal of Agriculture Sciences*, 11(23): 9242-9244.

Appendix - 5

LIST OF THESIS SUBMITTED

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
(A) FACULTY OF AGRICULTURE				
1	Influence of Chemicals and Plant Growth Regulators on Germination and Morpho-Physiological Parameters of Ashwagandha (<i>Withania somnifera</i> (L.) Dunal)	M. Sc. (Agri.)	Abhishek S.	Dr. Ashwin Trivedi
2	Performance of Dual Purpose Barley (<i>Hordeum vulgare</i> L.) Under Different Nitrogen Levels and Cutting Management	M. Sc. (Agri.)	Patel Riddhiben Maheshbhai	Dr. J. C. Shroff
3	A Study of Self Help Group Dynamics of Women in Gujarat	M. Sc. (Agri.)	Chethan Patil N. D.	Dr. J. K. Patel
4	Comparison of Selection indices using different weights in maize (<i>Zea mays</i> L.)	M. Sc. (Agri.)	Patel Himanshukumar Vaktabhai	Dr. A. D. Kalola
5	Role Assessment of Scientists working in KVKs of Gujarat	M. Sc. (Agri.)	Rahul Dundesh Bellagi	Dr. H. B. Patel
6	Development of scale to measure attitude of farmers towards DD Kisan Channel	M. Sc. (Agri.)	Pithiya Neetaben Devashibhai	Dr. N. B. Chauhan
7	Development of test to measure level of knowledge of banana growers about integrated pest management	M. Sc. (Agri.)	Meenu Maheswaran	Dr. M. R. Patel
8	Awareness of members of Farmers' Interest Group about Significance of Agricultural Technology Management Agency (ATMA)	M. Sc. (Agri.)	Ghetiya Nisha Girdharlal	Dr. J. B. Patel
9	An Economic Analysis of Eucalyptus Plantation in Middle Gujarat	M. Sc. (Agri.)	Changela Priyanka Subhashbhai	Dr. Ganga Devi
10	Effect of Biochar and FYM on Yield, Chemical Composition of Fodder Sorghum (<i>Sorghum bicolor</i> (L.) Moench) and Properties of Salt Affected Soil	M. Sc. (Agri.)	Astha Pandey	Dr. M. S. Jakasaniya

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
11	Integrated Nutrient management in Summer Blackgram (<i>Vigna mungo</i> L.) Hepper)	M. Sc. (Agri.)	Manas Mohan Setha	Dr. G. J. Patel
12	In Vitro degradation of bifenthrin in different soils and water	M. Sc. (Agri.)	Premlata Meena	Dr. P. G. Shah
13	Effect of methods of sowing and weed management practices on Productivity of Chicory (<i>Chicorium intybus</i> L.)	M. Sc. (Agri.)	Patel Keyurkumar Dharmeshbhai	Dr. M. V. Patel
14	Fitting of the distribution for CV value of field experiments	M. Sc. (Agri.)	Chaudhari Rajubhai Harjibhai	Dr. A. N. Khokhar
15	Isolation and efficiency of native bacterial and fungal biodegraders for decomposition of cotton (Bt) waste	M. Sc. (Agri.)	Patel Harshkumar Jitendrakumar	Dr. R. V. Vyas
16	Molecular characterization and variability of <i>Alternaria burnsii</i> (Uppal, Patel and Kamat) causing blight of cumin	M. Sc. (Agri.)	Sawant Shraddha Bhaskar	Dr. R. G. Parmar
17	Determination of Infrared thermometry based Indices for crop water status monitoring in rainfed pearl millet	M. Sc. (Agri.)	Ratiya Puja Bhimabhai	Dr. M. M. Lunagaria
18	Effect of zinc nano-fertilizer on growth, yield and Zn content in maize (<i>Zea mays</i> L.)	M. Sc. (Agri.)	Patel Rajalben Pramodbhai	Dr. V. P. Ramani
19	Studies on Root Rot [<i>Macrophomina phaseolina</i> (Tassi) Goid.] of Soybean [<i>Glycine max</i> (L.) Merr.] and its Management	M. Sc. (Agri.)	Patel Purvi Subhashchandra	Dr. R. G. Parmar
20	Amelioration of sodic soils by using different amendments and its effect on soil properties and yield of wheat (<i>Triticum aestivum</i> L.)	M. Sc. (Agri.)	Chaudhary Radhaben Viraji	Dr. K. C. Patel
21	Role of dairy cooperatives in empowering farmwoman as perceived by their woman members	M. Sc. (Agri.)	Katara Priyankaben Ramubhai	Dr. M. R. Patel
22	Analysis of livelihood security of tribal farmers in Chhota Udepur district	M. Sc. (Agri.)	Patel Hetalbahen Mukeshbhai	Dr. Sunil R. Patel
23	Feasibility of twin row production system under varying levels of nitrogen in rabi maize (<i>Zea mays</i> L.)	M. Sc. (Agri.)	Dankhra Minal Laxmanbhai	Dr. V. J. Patel

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
24	Nitrogen management through organic and inorganic sources in popcorn (<i>Zea mays everta</i>)	M. Sc. (Agri.)	Rathod Apexaben Mahendrakumar	Dr. P. M. Patel
25	Price forecasting of <i>Brinjal</i> and <i>Chilli</i> (green) - A statistical evaluation	M. Sc. (Agri.)	Vikash Pal	Dr. V. B. Darji
26	A study on factors affecting entrepreneurial behaviour of the cattle owners in Anand district	M. Sc. (Agri.)	Bhojani Savan Vipulbhai	Dr. A. R. Makwan
27	Nutraceutical and molecular characterization of pumpkin (<i>Cucurbita moschata</i> Duch. Ex. Poir)	M. Sc. (Agri.)	Zala Dimpalben Mansinhbhai	Dr. J. J. Dhruve
28	Population dynamics and management of termite in cotton	M. Sc. (Agri.)	Channabasava	Dr. P. K. Borad
29	Effect of chemical fertilizer, organic manure and bio-fertilizers on growth and yield of summer cowpea [<i>Vigna unguiculata</i> (L.) Walp]	M. Sc. (Agri.)	Dhwani Rajesh Bartwal	Dr. R. A. Patel
30	Diallel analysis of fruit yield and its Component traits in tomato (<i>Solanum lycopersicum</i> L.)	M. Sc. (Agri.)	Mayur Kumar Sonagara	Dr. J. N. Patel
31	Effect of clipping and plant growth regulators on growth and yield of summer sesame (<i>Sesamum indicum</i> L.)	M. Sc. (Agri.)	Monika Ranva	Dr. H. K. Patel
32	Studies on turcicum leaf blight of maize and it's management	M. Sc. (Agri.)	Alpeshkumar Barad	Dr. S. K. Singh
33	Effect of staggered sowing and foliar spray of fertilizer on synchronization of parents in pearl millet (<i>Pennisetum glaucum</i> L.) hybrid GHB 905	M. Sc. (Agri.)	Khair Alpeshkumar Narayanbhai	Dr. A. S. Bhanvadia
34	Bio-intensive integrated nutrient management in summer groundnut (<i>Arachis hypogaea</i> L.)	M. Sc. (Agri.)	Priya Kantha J L	Dr. G. G. Patel
35	Genetic variability analysis in rice (<i>Oryza sativa</i> L.) genotypes under aerobic condition and their molecular analysis	M. Sc. (Agri.)	Nikki Kumari	Dr. M. B. Parmar
36	Population dynamics and management of leaf miner, <i>Liriomyza trifolii</i> (Burgess) on watermelon	M. Sc. (Agri.)	Rohit Ramesh	Dr. M. R. Dabhi
37	Diallel analysis for fruit yield and its component traits in okra [<i>Abelmoschus esculentus</i> (L.) Moench]	M. Sc. (Agri.)	Sidapara Mayankkumar Pravinbhai	Dr. D. P. Gohil

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
38	Status of seed mycoflora of brinjal (<i>solanum melongena</i> L.) cultivars and their management under in vitro conditions	M. Sc. (Agri.)	Girishkumar Bhagora	Dr. V. R. Gohel
39	Genetic variability and identification of wilt resistance through artificial screening and molecular markers in pigeonpea (<i>Cajanus cajan</i> (L.) Millsp.)	M. Sc. (Agri.)	Shridevi B Teli	Dr. K. V. Patel
40	Soil macroinvertebrate diversity in Anand district	M. Sc. (Agri.)	Aniyaliya Manisha Dhirubhai	Dr. C. K. Borad
41	Comparative biology, biopesticidal management of pulse beetle, <i>Callosobruchus maculatus</i> (Fabricius) and varietal susceptibility in chickpea during storage	M. Sc. (Agri.)	Kopparthi Amrutha Valli Sindhura	Dr. P. H. Godhani
42	Evaluation of biomass yield and growth performance of oat (<i>Avena sativa</i> L.) and lucerne (<i>Medicago sativa</i> L.) intercropping	M. Sc. (Agri.)	Ninama Sandip Dilipbhai	Dr. J. C. Shroff
43	Effect of transplanting date on yield and quality of calcutti tobacco (<i>Nicotiana rustica</i> L.) varieties under middle Gujarat conditions	M. Sc. (Agri.)	Chaudhary Milankumar Abherajbhai	Dr. K. M. Gediya
44	Phytostabilization of chromium by organic amendments in chromium spiked loamy sand soil using fodder maize (<i>Zea maize</i> L.)	M. Sc. (Agri.)	Roy Mansi Govindbhai	Dr. J. K. Parmar
45	Effect of Physical, chemical and temperature treatments on seed quality enhancement in senna (<i>Cassia angustifolia</i> Vahl.)	M. Sc. (Agri.)	Patel Jay Rajeshkumar	Dr. Kalyanrao
46	Effect of mechanical, chemical, growth hormone and biofertilizer treatments on seed quality enhancement in Ashwagandha (<i>Withania Somnifera</i> Dunal)	M. Sc. (Agri.)	Sapra Narendrakumar Chandubhai	Dr. Sasidharan N.
47	Line x tester analysis for yield and quality characters in interspecific hybrids of cotton (<i>G. hirsutum</i> L. x <i>G. barbadense</i> L.)	M. Sc. (Agri.)	Maria Varghese	Dr. M. P. Patel

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
48	Population dynamics and management of hopper, <i>Amritodus atkinsoni</i> Lethierry infesting mango	M. Sc. (Agri.)	Mohapatra Atul Rangunath	Dr. R. K. Thumar
49	Characterization of soils and under ground water quality of Mahisagar district of Gujarat	M. Sc. (Agri.)	Paragi Nileshkumar Shantilal	Dr. M. B. Viradiya
50	Morphological, biochemical and molecular profiling of pumpkin [<i>Cucurbita moschata</i> Duch. Ex Poir.]	M. Sc. (Agri.)	Sharma Deepak Dinesh	Dr. H. L. Dhaduk
51	Heterosis and combining ability in wheat (<i>Triticum aestivum</i> L.)	M. Sc. (Agri.)	Patel Parthik Umeshbhai	Dr. B. C. Patel
52	Management of sucking pest complex of potato, <i>Solanum tuberosum</i> L.	M. Sc. (Agri.)	Patel Nikunj Kiritbhai	Dr. H. P. Patel
53	Population dynamics, avoidable losses and management of pink stem borer, <i>Sesamia inferens</i> Walker infesting durum wheat	M. Sc. (Agri.)	Timbadiya Brazilkumar Govindbhai	Dr. D. B. Sisodiya
54	Effect of zinc nano-fertilizer on growth and yield of wheat (<i>Triticum aestivum</i> L.) under saline irrigation condition	M. Sc. (Agri.)	Prajapati Bhavikkumar Jayantibhai	Dr. S. B. Patel
55	Effect of integrated phosphorus management on growth and yield of summer Sesame (<i>Sesamum indicum</i> L.)	M. Sc. (Agri.)	L Peace Raising	Dr. A. C. Sadhu
56	An economic analysis of production and marketing of eggs in Anand district of Gujarat	M. Sc. (Agri.)	Garval Anilbhai Shamjibhai	Dr. A. S. Shaikh
57	Population dynamics of various insect pests and management of Pod borers in Indian bean, <i>Lablab purpureus</i> L.	M. Sc. (Agri.)	Bhagora Jitendrakumar Kantibhai	Dr. R. M. Patel
58	Epidemiology and management of early blight [<i>Alternaria solani</i> (Ellis and Martin) Jones and Grout] in Tomato (<i>Solanum lycopersicum</i> L.)	M. Sc. (Agri.)	Parmar Tanviben Dhirajkumar	Dr. N. M. Gohel
59	An economic analysis of pigeon pea (<i>Cajanus cajan</i> L.) based intercropping system in the tribal area of middle Gujarat	M. Sc. (Agri.)	Patel Devakiben Dineshbhai	Dr. K. S. Jadav
60	Comparison of uniformity trial data with experimental data for plot technique	M. Sc. (Agri.)	Bhavikaben Damor	Dr. V. B. Darji
61	Protocol development for protoplast isolation in Coconut (<i>Cocos nucifera</i> L.)	M. Sc. (Agri.)	Bhalodia Sachin Kiranbhai	Dr. G. B. Patil

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
62	Development of micropropagation protocol for little ground under in vitro condition	M. Sc. (Agri.)	Patel Didhitee Dineshbhai	Dr. A. P. Trivedi
63	Comparative economics and farm sustainability of organic v/s conventional farming in middle Gujarat	M. Sc. (Agri.)	Roshni Bhoi	Dr. V. K. Gondalia
64	Microclimate in pearl millet crop under different planting geometries	M. Sc. (Agri.)	Pandya Harshkumar Ramshankarbhai	Dr. M. M. Lunagaria
65	Studies on root-knot nematodes (<i>Meloidogyne</i> spp.) in papaya (<i>Carica papaya</i> Linn.)	M. Sc. (Agri.)	Patel Nesalben Ashvinkumar	Dr. B. A. Patel
66	Seed kernel biochemical characterization and SSR based diversity analysis of different mango (<i>Mangifera indica</i> L.) varieties	M. Sc. (Agri.)	Patel Sneha Dineshbhai	Dr. N. J. Patel
67	Identification and classification of various OYVMV (Okra Yellow Vein Mosaic Virus) isolates from different agro-climatic zones of Gujarat using next generation sequencing	M. Sc. (Agri.)	Solanki Gautamkumar Veljibhai	Dr. Akarsh Parihar
68	Molecular studies for aphid [<i>Lipaphis erysimi</i> (Kalt.)] resistance in advanced generation (F4) of Brassica interspecific hybrid GM-3 x Pusa Swarnim	M. Sc. (Agri.)	Desai Pallavi Kumari Onkarnath	Dr. Sasidharan N.
69	Effect of fruit bagging on quality and pest-disease occurrence of mango (<i>Mangifera indica</i> L.) cv. Langra and custard apple (<i>Annona squamosa</i> L.) cv. Balanagar.	M. Sc. (Horti.)	D Monika Roja	Dr. N. I. Shah
70	Effect of biofertilizer, manures and chemical fertilizers on growth, yield and quality of Guava (<i>Psidium guajava</i> L.) cv. Allahabad Safeda	M. Sc. (Horti.)	Lodaya Bimal Prakashbhai	Dr. M. M. Masu
71	Effect of foliar application of humic acid, salicylic acid and novel liquid on fruit yield and quality of mango (<i>Mangifera indica</i> L.) cv. Amrapali	M. Sc. (Horti.)	Patel Shivaniben Jitubhai	Dr. D. D. Parekh
72	Effect of integrated nutrient management on growth and yield of brinjal (<i>Solanum melongena</i> L.) cv. GABH-3	M. Sc. (Horti.)	Komal Thakur	Dr. B. N. Satodiya

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
73	Effect of organic, inorganic and bio-fertilizer on growth and yield of onion (<i>Allium cepa</i> L.) cv. GJRO-11	M. Sc. (Horti.)	Vaghela Kalpeshbhai Shivabhai	Dr. K .M. Patel
74	Effect of plant growth regulators on growth, yield and quality of sweet orange [<i>Citrus sinensis</i> (L.) Osbeck] cv. Phule mosambi	M. Sc. (Horti.)	Macwan Jinny Joyrajesh	Dr. M. J. Patel
75	Effect of integrated nutrient management on fruit yield and quality of aonla (<i>Embllica officinalis Gaertn.</i>) cv. Gujarat Aonla-I	M. Sc. (Horti.)	Aal Jigarkumar Mavajibhai	Dr. K. M. Patel
76	Effect of different organic manures and PGPR consortium on growth, yield and quality of bottle gourd (<i>Lagenaria siceraria</i> MOL. STANDL.) cv. Anand Bottle Gourd-1	M. Sc. (Horti.)	Nadoda Sunilkumar Ramabhai	Dr. A. V. Kotecha
77	Effect of plant growth regulator and calcium chloride on growth, yield and quality of custard apple (<i>Annona squamosa</i> L.) cv. Balanagar	M. Sc. (Horti.)	Sandeep M.D.	Dr. Ankur P Patel
78	Study the effect of different dates of transplanting and spacing on growth and yield of Broccoli cv. Palam Samridhi in middle Gujarat condition	M. Sc. (Horti.)	Akshatha N	Dr. B. H. Panchal
79	Effect of seed treatments on germination and seedling growth of Karonda (<i>Carissa carandas</i> L.) cv. Local.	M. Sc. (Horti.)	Mistry Jankiben Maheshbhai	Dr. H. H. Sitapara
80	Effect of plant geometry and integrated nutrient management on growth, yield and quality of cluster bean (<i>Cyamopsis tetragonoloba</i> L. Taub) cv. Pusa Navbahar	M. Sc. (Horti.)	Parmar Sidhharth Kalidas	Dr. B. N. Satodiya
81	Effect of synthetic auxin, humic acid and zinc sulphate on yield, quality and shelf life of acid lime (<i>Citrus aurantifolia Swingle</i>)	M. Sc. (Horti.)	Rathod Kiran Hiralal	Dr. Vimlesh K. Patel
82	Effect of GA ₃ , NAA and biofertilizers on seed germination and seedling growth of custard apple (<i>Annona squamosa</i> L.) cv. Local	M. Sc. (Horti.)	Raut Hinaben Manilal	Dr. A. V. Kotecha

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
83	Calibration of InfoCrop Model (V 1.2) for Soybean (<i>Glycin max L.</i>) Cultivars under varying Plant Spacing in Middle Gujarat Condition	Ph. D. (Agri.)	Miss Vibha Tak	Dr. M. M. Lunagaria
84	Interspecific Hybridization for YVMV Resistance in Okra Through Embryo Rescue and Somatic Hybridization	Ph. D. (Agri.)	Mariya Shabbir Zaman	Dr. Akarsh Parihar
85	Bio-efficacy and persistence of diclosulam and sulfentrazone in sandy loam soil under soybean cultivation	Ph. D. (Agri.)	Chaudhary Dilipkumar Govindbhai	Dr. P. G. Shah
86	Genetic architecture studies for heat and moisture stress tolerance in maize (<i>Zea mays L.</i>)	Ph. D. (Agri.)	Kuchhadiya Gopal Vasharam	Retd. Dr. S. M. Khanorkar
87	Isolation, Characterization and co-inoculation Effect of Root Nodule Non Rhizobial Endophytes and Rhizobium in Green Gram (<i>Vigna radiata L.</i>)	Ph. D. (Agri.)	Dhole Archana Maruti	Mrs. H. N. Shelet
88	Phenotyping of maize (<i>Zea mays L.</i>) Inbred lines for DUS Parameters and their Genotyping using Biochemical and molecular markers	Ph. D. (Agri.)	Smt. Manisha Satyawar Mote	Dr. R. S. Fougat
89	Targeted Grain Metabolite Based Genome Wide Association Studies Among Rice (<i>Oryza Sativa L.</i>) Genotypes	Ph. D. (Agri.)	Adinath Shivaji Palve	Dr. R. S. Fougat
90	Genetic variation in cluster bean [<i>Cyamopsis tetragonoloba (L.) Taub</i>] through induced mutations	Ph. D. (Agri.)	Rupal Dhoot	Dr. H. L. Dhaduk
91	Effect of sequential and tank mix application of herbicides against complex weed flora in Kharif maize and their residual effect on succeeding crops	Ph. D. (Agri.)	Patel Priyaben Kirtikumar	Dr. B. D. Patel
92	Performance of Chickpea as influenced by inorganic fertilizer, biofertilizers and micronutrients and their residual effects on succeeding fodder sorghum under middle Gujarat conditions	Ph. D. (Agri.)	Chaudhari Jayshrikrushn Harisinh	Dr. A. C. Sadhu
93	Elucidation of metabolic pathway for expression of saffron genes involved in biosynthesis crocin and safranal using tobacco as a model system	Ph. D. (Agri.)	Sakure Amar Ashok	Dr. R. S. Fougat

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
94	Study of nitrogen management in Wheat (<i>Triticum aestivum</i> L.) using leaf colour chart and Chlorophyll meter	Ph. D. (Agri.)	Vipen Bhadu	Dr. K. D. Mevada
95	Effects of bio NPK consortium (PGPR) on micronutrients availability in soil and it's translocation in rice	Ph. D. (Agri.)	Gohil Nareshkumar Bhurabhai	Dr. V. P. Ramani
96	Time-lag in adoption of drip irrigation system	Ph. D. (Agri.)	Raghuvansh Shakti Kalabhai	Dr. J. K. Patel
97	Investigations on bioefficacy of <i>Trichoderma asperellum</i> and <i>Pseudomonas fluorescens</i> in suppression of biotic and abiotic stresses in chickpea [<i>Cicer arietinum</i> L.] and mungbean [<i>Vigna radiata</i> (L.) Wilczek]	Ph. D. (Agri.)	Jaisani Pratik Prem	Dr. N. M. Gohel
98	Influence of legume crop residues and nitrogen management on productivity of maize (<i>Zea mays</i> L.) in legume-maize cropping system under middle Gujarat conditions	Ph. D. (Agri.)	Monika Shukla	Dr. A. C. Sadhu
99	Poverty and its determinants among farm sector in tribal and non-tribal area of central Gujarat	Ph. D. (Agri.)	Macwan Jigneshkumar Dayaldas	Dr. Y. C. Zala
100	Interspecific hybridization in cotton (<i>Gossypium</i> spp.) through embryo rescue	Ph. D. (Agri.)	Bhutaka Kinjalben Haribhai	Dr. Akarsh Parihar
101	Diallel analysis in interspecific lines of mustard (<i>Brassica</i> spp.) and identification of molecular markers linked to aphid resistance	Ph. D. (Agri.)	Rukhsar	Dr. Akarsh Parihar
102	Transcriptome analysis for nematode resistance in cultivated and wild tomato	Ph. D. (Agri.)	Kinjal Kulshrestha	Dr. Akarsh Parihar
103	Effect of foliar application of plant growth regulators and mulching on fruit yield, quality and shelf life of custard apple (<i>Annona squamosa</i> L.) cv. Sindhan	Ph. D. (Horti.)	Patel Dharmishta Dhirajlal	Dr. H. C. Patel
104	Effect of wax coating, different packaging materials and storage conditions on extending the shelf life of acid lime (<i>Citrus aurantifolia</i> Swingle) cv. Kagzi	Ph. D. (Horti.)	Kadu Rahul Balasaheb	Dr. M. J. Patel

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
(B) FACULTY OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY				
105	Etiopathological and Molecular Studies on Infectious Bursal Disease in Commercial Poultry	M. V. Sc.	Macwan Terrance Satish	Dr. C. J. Dave
106	Characterization of β -Casein Gene Variants in Cattle	M. V. Sc.	Patel Shiven Surendrabhai	Dr. D. N. Rank
107	Assessment of Oxidative Stress and Biochemical Profiles in Crossbred Cows During Peripartum Period	M. V. Sc.	Yadav Anjukumari Jagdishbhai	Dr. A. M. Pande
108	Comparative efficacy of different levels of antioxidant sericin in egg yolk tris extender for cryopreservation of bovine semen	M. V. Sc.	Patel Tapasvikumar Mahendrabhai	Dr. A. J. Dhami
109	Uterine torsion in buffaloes: Evaluation of clinico-haemato-biochemical and endocrine alterations	M. V. Sc.	Pateliya Chintankumar Sardarbhai	Dr. J. A. Patel
110	Performance of indigenous sheep under different Watering Frequencies	M. V. Sc.	Sahana M	Dr. M. M. Trivedi
111	Knowledge and adoption of scientific horse rearing practices of horse owners of middle Gujarat	M. V. Sc.	Barasara Bhaumikkumar Raghavajibhai	Dr. A. C. Vaidya
112	Cystic ovarian degeneration in crossbred cattle: Clinical ultrasound and hormone based diagnosis and therapeutic management	M. V. Sc.	Chauhan Jaykumar Himmatlal	Dr. K. K. Hadiya
113	Effect of supplementation of chelated mineral mixture to anoestrus and repeat breeder buffaloes in tribal areas of Dahod district	M. V. Sc.	Joshi Prakash Mulajibhai	Dr. D. C. Patel
114	Identification of sex and species of meat origin by DNA based technique	M. V. Sc.	Bhavsar Prakrutik Pratulchandra	Dr. M. N. Brahmbhatt
115	Isolation and Molecular Characterization of extended spectrum beta lactamase producing Escherichia coli from chicken	M. V. Sc.	Gida Harpalbhai Kanubhai	Dr. M. N. Brahmbhatt
116	Isolation and molecular Characterization of extended spectrum beta lactamase producing Escherichia coli from milk	M. V. Sc.	Paghdar Dharaben Mansukhbhai	Dr. J. B. Nayak
117	Pathological studies on Escherichia coli infection in broilers with special reference to antibiotic resistance genes	M. V. Sc.	Surjagade Sagar Raghunath	Dr. B. P. Joshi

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
118	Anti-bacterial, Anti-inflammatory and safety studies of clove oil in rats	M. V. Sc.	Humbal Brijesh Rajeshbhai	Dr. K. A. Sadariya
119	Anti-bacterial, Anti-inflammatory and safety studies of cinnamon oil in rats	M. V. Sc.	Prajapati Jaiminkumar Arvindbhai	Dr. A. M. Thaker
120	Performance of Surti goats under different watering frequencies	M. V. Sc.	Patel Arunaben Daljibhai	Dr. K. N. Wadhvani
121	Estimation of breeding value for energy corrected test day milk yield in cattle	M. V. Sc.	Chaudhari Chirag Parbatbhai	Dr. R. S. Joshi
122	Identification of somatic mutations associated with squamous cell carcinoma of horn in Kankrej (<i>Bos indicus</i>) Bullock	M. V. Sc.	Bhatia Dhruvkumar Rameshbhai	Dr. C. G. Joshi
123	Clinicophysiological and haematobiochemical studies on ketamine, propofol and sevoflurane anaesthesia in dexmedetomidine premedicated dogs	M. V. Sc.	Pal Itishaben Anandbhai	Dr. P. V. Parikh
124	Effect of exogenous fibrolytic microbes and enzyme on growth and economics of cross-bred calves	M. V. Sc.	Kapadiya Rajat Ishvarlal	Dr. S. V. Shah
125	Study ondairy animal housing pattern in Annad district of middle Gujarat	M. V. Sc.	Patel Priyankkumar Ashokbhai	Dr. M. M. Trivedi
126	Isolation, Electropherotyping and molecular characterization of Bovine Rotavirus from diarrhoeal samples of bovine calves	M. V. Sc.	Golaviya Akash Vinubhai	Dr. R. A. Mathakiya
127	In vitro effecacy of staphylococcus spp. and Escherichia coli- specific bacteriophage and detection of antimicrobial resistance genes in phage genome	M. V. Sc.	Kulkarni Pratik Manohar	Dr. B. B. Bhanderi
128	Effect of feeding solid state fermentation biomass on performance of lactating buffaloes	M. V. Sc.	Patel Kishan Praveen	Dr. S. B. Katole
129	Methane mitigation in crossbred bullocks by dietary interventions	M. V. Sc.	Gosvami Vishalgi Jasavantgiri	Dr. P. R. Pandya
130	Gross, histological and histochemical studies on the hippocampus of the Goat (<i>Capra hircus</i>)	M. V. Sc.	Pushpendra Rawat	Dr. Subhash. C. Dubal

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
131	Pathological and immunological studies on immune complex vaccine of infectious bursal disease in Broiler chicks	M. V. Sc.	Kapadiya Bhumikababen Kanubhai	Dr. B. P. Joshi
132	Effect of tannin as phytonutrient on growth performance of Surti kids	M. V. Sc.	Chaudhari Hiteshkumar Masungbhai	Dr. S. G. Vahora
133	Study on genital microbiota in cyclic, acyclic, endometritic and pregnant buffalo	M. V. Sc.	Patel Binal Ramchandra	Dr. M. T. Panchal
134	Seroprevalence of IBR in cattle and buffaloes, molecular detection and characterization of BoHV-1	M. V. Sc.	Kulkarni Aishwarya Chaitanya	Dr. M. K. Jhala
135	Genetic diversity among domestic chicken using DNA barcoding and microsatellite markers	M. V. Sc.	Dave Ankit Rajeshkumar	Dr. D. N. Rank
136	Comparative efficacy of uterine lavage, cytobrush and biopsy techniques for the diagnosis of endometritis in mares	M. V. Sc.	Agnus Mathew	Dr. D. M. Patel
137	Evaluation of therapeutic efficacy of plants Bryophyllum calycinum and Achyranthes aspera on adenine induced chronic kidney disease in Rats	M. V. Sc.	Gehani Mukeshkumar Tolaram	Dr. S. K. Raval
138	Effect of dietary supplementation of prebiotic, probiotic and synbiotic as an alternative to antibiotic growth promoter on performance of commercial broilers	M. V. Sc.	Patel Ajaykumar Anilbhai	Dr. F. P. Savaliya
139	Effects of dietary supplementation of different essential oils as an alternative to antibiotic growth promoter on performance of commercial broilers	M. V. Sc.	Rajalekshmi C	Dr. R. K. Mishra
140	Genetic characterization of native chicken population of north Gujarat using microsatellite markers	M. V. Sc.	Chaudhary Dhavalkumar Faljibhai	Dr. R. S. Joshi
141	Phenotypic characterization of hill cattle of Gujarat	M. V. Sc.	Patel Dineshkumar Dhanjibhai	Dr. D. N. Rank
142	Transcriptome profiling to evaluate effect of herbal plant extract on bull spermatozoa	M. V. Sc.	Italiya Jignesh Manubhai	Dr. P. G. Koringa
143	Metagenomic analysis of camel rumen microbial diversity for mining glycoside hydrolases	M. V. Sc.	Priyaranjan Mishra	Dr. P. G. Koringa

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
144	Studies on Etio-diagnosis and therapeutic management of canine demodicosis with special reference to role of PDGF-BB, TGF- β 1 and IL-10 in canine generalized demodicosis	M. V. Sc.	Mayank Parwari	Dr. G. C. Mandali
145	Clinico-etiodiagnosis and therapeutic management of otitis in dogs	M. V. Sc.	Parmar Jignashaben Manilal	Dr. S. K. Raval
146	Studies on prevalence of subclinical coccidiosis and necrotic enteritis in broilers	M. V. Sc.	Prajapati Ramdatt Khemabhai	Dr. D. J. Ghodasara
147	Performance of Adult Surti Goats on Different Types of Floor	Ph. D.	Modi Rakeshkumar Jayantilal	Dr. K. N. Wadhwani
148	Comparison of breeding values of progeny tested sires with pedigree selected sires in holstein friesian crossbred cattle	Ph. D.	Patel Ashishkumar Chandulal	Dr. D. N. Rank
149	Performance of crossbred cows under different feeding regimes	Ph. D.	Md. Manzarul Islam	Dr. S. V. Shah
150	Clinico-diagnosis and surgico-therapeutic management of lower urinary tract affections in dogs	Ph. D.	Parmar Jigneshkumar Jayantilal	Dr. P. V. Parikh
151	Effect of varying dietary crude protein and tryptophan levels on production performance of white leghorn birds	Ph. D.	Rajpura Raisbhai Mahmmadbhai	Dr. F. P. Savaliya
152	Effect of dietary levels of inorganic and organic trace minerals on production and reproduction traits of layer breeders	Ph. D.	Avinash Sahebrao Kadam	Dr. R. S. Joshi
(C) FACULTY OF DAIRY SCIENCE				
153	Efficacy of glucono delta-lactone and selected hydrocolloids in preparation of reduced-fat Paneer	M. Tech.	Chaudhary Mamata Lavjibhai	Dr. Suneeta V. Pinto
154	Development of milk solids and cereal based energy bar	M. Tech.	Jetavat Karmajitsinh Jagadevsinh	Dr. Amitkumar M. Patel
155	Standardization of technology for manufacture of lemon flavoured paneer	M. Tech.	Yashavantha R	Dr. Suneeta V. Pinto
156	Development of DPPH indicator based method for the detection of vegetable oils adulteration in ghee	M. Tech.	Joshi Hardiben Prakashbhai	Dr. Smitha Balakrishnan

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
157	Evaluation of effect of Cardamom on proteolysis and lipolysis in paneer	M. Tech.	Jadav Kishorbhai Dheerubhai	Dr. B. M. Mehta
158	Purification and characterization of antioxidative peptides derived from fermented Goat milk	M. Tech.	Panchal Gauravkumar Satishbhai	Dr. Subrota Hati
159	Development of technology for manufacture of thabdi utilizing ghee residue	M. Tech.	Parth	Dr. J. P. Prajapati
160	Evaluation of selected parts of Moringa oleifera for antioxidant activity in ghee	M. Tech.	Chaudhari Mihirkumar Kantibhai	Dr. Amit kumar Jain
161	Quality of Mozzarella cheese as affected by plasticizing techniques	M. Tech.	Akash Patel	Dr. A. Jana
162	Development of Barley (Hordeum vulgare) enriched probiotic fermented milk and evaluation of its functional properties	M. Tech.	Deepti Suman	Dr. Sreeja V.
163	Process optimization for the Preparation of fermented functional Soy based beverage	M. Tech.	Undhad Truptiben Jayantibhai	Dr. Subrota Hati
164	Evaluation of potential antiobesity effect of probiotic fermented milk products by In vitro and In vivo methods	M. Tech.	Chaudhari Shivaniben Narayanbhai	Dr. Sreeja V.
165	Evaluation of selected parts of Moringa oleifera in preparation of whey based candy	M. Tech.	Panchal Manjiram Devilal	Dr. S. C. Parmar
166	Effect of particle size of sodium chloride on the quality characteristics of reduced-fat and full-fat Pizza cheeses	M. Tech.	Patel Akshaykumar Dineshkumar	Dr. A. H. Jana
167	Performance evaluation of mechanized system for manufacture of Thabdi	M. Tech.	Baldha Kinjalben Govindbhai	Dr. Sunil M. Patel
168	Development of technology for manufacture of brown Peda containing Jaggery	M. Tech.	Nitin Sureshrao Thakare	Dr. J. P. Prajapati
169	Performance evaluation of mechanized system for manufacture of Beetroot Halwa	M. Tech.	Parmar Ankur Philipbhai	Dr. C. S. Baladhiya
170	Evaluation of different approaches for detection of adulteration in khoa	Ph. D.	Parekh Sonaliben Lalitkumar	Dr. K. D. Aparnathi
171	Development of technology for manufacture of a protein enriched moringa fortified spread	Ph. D.	Patel Komal Naginbhai	Dr. S. V. Pinto

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
172	Evaluation of probiotic cultures for production of short-chain fatty acids and its effect on cholesterol reduction	Ph. D.	Makwana Mitalibahen Rameshbhai	Dr. J. B. Prajapati
173	Metagenomic based microbial diversity study of dairy effluent treatment plants	Ph. D.	Momin Jafarali Kasimali	Dr. J. B. Prajapati
(D) FACULTY OF FOOD PROCESSING TECHNOLOGY AND BIO-ENERGY				
174	Utilization of moringa leaves powder into selected food products	M. Tech. (FT)	Raval Harsh Mukundray	Dr. S. H. Akbari
175	Standardization of technology for production of whole dried lime	M. Tech. (FT)	Khatri Maheshkumar Nareshbhai	Dr. S. H. Akbari
176	Performance evaluation of solar hybrid refrigeration system for storage of fruits and vegetables using Artificial Neural Network (ANN)	M. Tech. (FT)	Kripali D. Dave	Dr. S. S. Kapdi
177	Development of the multi fruit smoothie	M. Tech. (FT)	Snigdha Bhardwaj	Dr. Sumit Dutta
178	Effect of Nano-emulsion coating on shelflife of Tomato fruits	M. Tech. (FT)	Vahora Khushbhu Altafbhai	Dr. R. F. Sutar
179	Development of mahua (<i>Madhuca Longifolia</i>) flower enriched nutri - cereals based laddoo for lactating Women	M. Tech. (FT)	Parmar Rohankumar Robinbhai	Dr. Samit Dutta
180	Effect of atmospheric pressure cold plasma (APCP) and UV -C treatment on selected pesticides and microorganisms in cumin seeds	M. Tech. (FT)	Saiyad Akhtarhusain Yakubali	Dr. R. V. Prasad
181	Shelf- life extension of date palm fruit using nano coating	M. Tech. (FT)	Gohil Swetaben Rameshbhai	Dr. R. F. Sutar
182	Production technology of dehydrated bottle gourd shreds	M. Tech. (FT)	Patel Hiralben Amrutbhai	Dr. R. R. Gajera
183	Study of gamma irradiation treatment for degradation of pesticide residues in selected leafy vegetables	M. Tech. (FT)	Pargi Jigishaben Shankarbhai	Dr. H. G. Bhatt
184	Aqueous oil extraction from groundnut using low frequency ohmic heating	M. Tech. (FT)	Maradiya Ashruti Bhagavanjibhai	Dr. A. Nema

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
185	Extraction and encapsulation of polyphenols from mango seed kernel	M. Tech. (FT)	Ghadiyali Hritvika Ashokkumar	Dr. R. V. Prasad
(E) FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY				
186	Development and performance evaluation of scraped surface heat exchanger for cooking and cooling of Kajukatli	M. Tech. (Agril. Engg.)	Rathod Jaydipsinh Pravinsinh	Dr. Navneet Kumar
187	Development of pull type battery operated multi-crop planter for woman farmers in tribal region of Gujarat	M. Tech. (Agril. Engg.)	Chavda Shaktisinh Kanjibhai	Dr. R. Swarnkar
188	Processing of sweet corn kernels for enhancement of shelf life	M. Tech. (Agril. Engg.)	Popalia Chandani Jitendrabhai	Dr. Navneet Kumar
189	Sediment yield estimation using spectral mixture modelling technique	M. Tech. (Agril. Engg.)	Ghetiya Jemin Maheshbhai	Dr. G. R. Patel
190	Assessment of Agro-Land suitability for rice (<i>Oryza sativa</i> L.) and wheat (<i>Triticum</i> L.) using GIS and Remote sensing	M. Tech. (Agril. Engg.)	Ranjan Kumar	Dr. G. R. Patel
191	Drying of ber and storage study of ber powder	M. Tech. (Agril. Engg.)	Sharma Amarkumar Vasantbhai	Dr. Neeraj Seth
192	Hydrological modelling under climate change scenarios in a selected watershed of middle Gujarat	M. Tech. (Agril. Engg.)	Herbha Nilkanth Bhagabhai	Dr. M. K. Tiwari
193	Effect of Di-tert butyl peroxide on diesel engine performance fuelled by biodiesel blends	M. Tech. (Agril. Engg.)	Kachot Pareshkumar Kalabhai	Dr. D. K. Vyas
194	Evaluation of a sensor based mechanism for soil infiltration tests	M. Tech. (Agril. Engg.)	Bhanderi Harsh Maganbhai	Dr. M. L. Gaur
195	Development of tractor drawn electronic multi-crop planter cum fertilizer applicator for precision farming	M. Tech. (Agril. Engg.)	Sidhartha Shankar Baral	Dr. R. Swarnkar
196	Development of mathematical model for estimation of wetting front under drip irrigation	M. Tech. (Agril. Engg.)	Khadsaliya Ashishkumar Jagjivanbhai	Dr. M. M. Trivedi

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
197	Development of bullock drawn battery powered sowing machine	M. Tech. (Agril. Engg.)	Monpara Alpeshkumar Mansukhbhai	Dr. R. Swarnkar
198	Validation and irrigation scheduling of maize crop by AquaCrop model under semi-arid environment of middle Gujarat	M. Tech. (Agril. Engg.)	Kasundra Trushalkumar Harsukhbhai	Dr. M. K. Tiwari
199	Development of bullock drawn plastic mulch sheet cum drip laying machine	M. Tech. (Agril. Engg.)	Kothiya Amitkumar Vinodbhai	Dr. B. K. Yaduvanshi
200	Development of battery powered inter and intra-row weeder	M. Tech. (Agril. Engg.)	Shamkuwar Snehal Vidyasagar	Dr. Pankaj Gupta
201	Development and performance evaluation of mini tractor mounted two row automatic potato planter	Ph. D.	Dabhi Kanuji Lakhaji	Dr. R. Swarnkar
(F) FACULTY OF AGRIBUSINESS MANAGEMENT				
202	Mapping of Rasi Seeds field crop business opportunity in Rewa, Satna and Sidhi districts of Madhya Pradesh	MBA	Devendra Raghuvanshi	Dr. Y. C. Zala
203	Market Survey of milking machine in selected districts of Gujarat and Rajasthan	MBA	Patel Jileshkumar Mukeshbhai	Dr. D. R. Vahoniya
204	A Study on market potential and retailers' perception towards AMUL milk in Nadiad city of Gujarat	MBA	Solanki Hemitkumar Karsanbhai	Dr. D. R. Vahoniya
205	Market opportunities for the products of Adare Food Ingredients Pvt. Ltd in Chennai city	MBA	D. Gayathri	Dr. R. S. Pundir
206	Contribution of dairying on rural livelihood in central and south regions of Gujarat	MBA	Prerna Singh	Dr. Ritambhara Singh
207	Mapping of Rasi Seeds' field crop business opportunity in Banaskantha district of Gujarat and Jalore district of Rajasthan	MBA	Vadukiya Shrey Pravinbhai	Dr. S. R. Panigrahy
208	Market potential BIG-B BG-II cotton hybrid of senthil seeds and farmers' purchasing behavior towards cotton seed in Rajkot district	MBA	Desai Siddharth Dineshbhai	Dr. Ritambhara Singh

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
209	Estimation of water and energy productivity of Ozarala Feeder in central Gujarat	MBA	Hasniya Khanum	Dr. Snehal Mishra
210	Estimation of water and energy productivity of Ashapuri Feeder in central Gujarat	MBA	Nikita Poddar	Dr. R. S. Pundir
211	Study of standard operating procedures and customer satisfaction survey for Paneer manufacturing plant for ABC Process Solutions Pvt. Ltd.	MBA	Padaliya Savankumar Pravinbhai	Dr. S. R. Panigrahy
212	Study of standard operating procedure and customer satisfaction survey for Ice cream manufacturing plant for ABC Process Solutions Pvt. Ltd	MBA	Unjia Yashkumar Bipinbhai	Dr. R. S. Pundir
213	Market potential for Sejal-50 pearl millet hybrid of Senthil seeds and farmers' purchasing behavior towards Bajara seed in Jodhpur district of Rajasthan	MBA	Mukeshkumar Madhavlal Chaudhari	Dr. Mahesh Prajapati
214	Study on retailers perception and consumer buying behaviour towards AMUL bakery products in Vadodara city	MBA	Trivedi Jay Rajendrakumar	Dr. Mahesh Prajapati
215	Market Potential and farmers' buying behaviour towards Bajara seed of Mangalam Seeds Limited in selected talukas of Anand district	MBA	Charel Pragneshkumar Sureshbhai	Dr. Mahesh Prajapati
216	Study on farmers' buying behavior and satisfaction level towards neem coated urea in Bharuch district	MBA	Halpati Jerul Ramanbhai	Dr. S. R. Panigrahy
217	Estimation of water and energy productivity of Isnava Feeder in central Gujarat	MBA	Patel Janakiben Harshadbhai	Dr. Y. A. Lad
218	Farmers' preference towards traditional mandi over Reliance Fresh collection centre in Mahemdabad	MBA	Rabari Devjibhai Labhubhai	Dr. S. R. Panigrahy
219	Market opportunities for the products of Adare Food Ingredients Pvt. Ltd in Hyderabad	MBA	Posanpally Alekhya	Dr. R. S. Pundir
220	Export potential and market competitiveness of IQF and frozen vegetables from India	MBA	Shah Shraddha Sanjaykumar	Dr. Y. A. Lad

Sr. No.	Thesis Title	Degree	Name of Student	Major Guide
221	Marketing activity tracking and develop a farmer influencer network for GSP Crop Science Pvt. Ltd	MBA	Hirani Kishan Jagdishbhai	Dr. Y. A. Lad
222	Study of trade facilitation services offered by different NBFCs	MBA	Patel Rahibahen Maheshkumar	Dr. Mahesh Prajapati
223	Profitability analysis of poultry farming in Anand District	MBA	Rathwa Rajubhai Maniyabhai	Dr. Snehal Mishra
224	Study on customer's buying behavior and satisfaction level towards fruits and Vegetables of Sangath Reliance Fresh in Ahmedabad city	MBA	Balas Namrataben Devayatbhai	Dr. D. R. Vahoniya
225	Study of fungicide usage in cumin crop of Morbi and Surendranagar district in Gujarat	MBA	Katariya Nikul Kishorbhai	Dr. D. R. Vahoniya
226	Contribution of dairying on rural livelihood in Saurashtra and North Gujarat	MBA	Zala Jaydipsinh Dilipsinh	Dr. Y. A. Lad
(G) FACULTY OF DISTANCE EDUCATION				
227	Agricultural Journalism Skill of Postgraduate Students of Anand Agricultural University	M. Sc. (Agril. Journalism)	Patel Hardi Jayantibhai	Dr. N. B. Chauhan
228	Attitude of subscriber farmers towards Krushigoviddya farm magazine	M. Sc. (Agril. Journalism)	Patel Januben Dipakkumar	Dr. C. P. Desai
229	Attitude of Extension Functionaries towards i-Khedut Portal	M. Sc. (Agril. Journalism)	Thakor Chandansinh Divansinh	Dr. H. B. Patel
230	Utility Perception of Farm Telecast by Farm-Televiwers of Bharuch District	M. Sc. (Agril. Journalism)	Prajapati Harshadkumar Mohanbhai	Dr. A. R. Makwan
231	Spatial and Temporal Behaviour Analysis of Arrivals and Prices of Green Gram (Vigna radiata) in Saurashtra Region of Gujarat	M. Sc. (Agril. Marketing)	Kaliya Vijaykumar Vinubhai	Dr. K. S. Jadav
232	Economics of Production and Marketing of Chickpea in Saurashtra Region of Gujarat	M. Sc. (Agril. Marketing)	Nakum Nimisha Vijaykumar	Dr. Ritambharasingh
233	Spatial and Temporal Behaviour Analysis of Arrivals and Prices of Groundnut in Saurashtra Region of Gujarat	M. Sc. (Agril. Marketing)	Chauhan Jaydip Ukabhai	Dr. K. S. Jadav

Appendix - 6

LIST OF SEMINAR, SYMPOSIA, CONFERENCES AND WORKSHOP ETC. ORGANIZED

(1) Faculty of Agriculture

Sr. No.	Title	Duration	Sponsored Authority
1	28 th Annual Group Meeting/ Workshop of AICRP on Biological Control of Crop Pests	06-06-2019 to 08-06-2019	Project Co-ordinating Cell, ICAR-NBAIR Bangalore.
2	2 nd State level Convention on “Doubling farmers’ income through resource management and rural prosperity”	12-10-2019 to 13-10-2019	Anand Agricultural University, Anand and Agrivision, Gandhinagar
3	Hands on training program on ‘Phytonematodes attacking different crops and their cost effective management’ for three staffs of VNR seeds, Raipur, Chhattisgarh & one faculty of NAU, Navsari at Dept of Nematology, BACA, AAU, Anand	30-10-2019 to 03 -01- 2020	VNR Seeds, Pvt., Ltd., Raipur, Chhattisgarh
4	State level seminar on “ <i>Krushhi ane Bagayati Pakoma PravartmanPak Sanrakshan na Prashno ane Nirakaran</i> ” held at AAU, Anand.	8 -11-2019	Plant Protection Association of Gujarat (PPAG), Gujarat; Horticulture Mission, Department of Horticulture, GoG, Gandhinagar and Anand Agricultural University, Anand
5	One day farmers’ training programme on “ <i>Chana, soybean ane makai ma avata bijjanya rogo ane tenu niyantran</i> ”	19-12-2019 to 20-12- 2019	AICRP on NSP (Crops)- Tribal Sub Plan (TSP), Dept. of Plant Pathology, BACA, AAU, Anand and TRTC, Devgadbaria
6	Farmers Training on Organic Farming	06-01-2020 to 10-01-2020	Govt. of Gujarat
7	“Nematodes Awareness and Integrated Management” at Tribal Farm Women Training Centre, Devgadbaria, Dahod	17-01 -2020	AICRP on Nematodes in Agriculture
8	Training Programme on “Organic Farming”	10-02- 2020 to 10-03-2020	Regional Centre of Organic farming (RCOF), Govt. of India, Gandhinagar; Gujarat Organic Agricultural University (GOAU), Gandhinagar and Anand Agricultural University

Sr. No.	Title	Duration	Sponsored Authority
9	Seminar on Quality Seed production in Castor at Goriyad, Ta. Padara, Dist. Vadodara	18-2-2020	ICAR-Indian Institute of Seed Science, Mau, State: Uttar Pradesh
10	Seminar on Quality Seed production in Castor at Mandala, Ta. Dabhoi, Dist. Vadodara	19-2-2020	ICAR-Indian Institute of Seed Science, Mau, State: Uttar Pradesh
11	Scientific Cultivation of Medicinal and Aromatic Crops	19/02/2020	Centrally Sponsored Scheme - Mission for Integrated Development of Horticulture (CCS-MIDH)
12	Cotton cultivation practices and live stock management	24/02/2020 to 26/02/2020	Department of Animal Husbandry, Gujarat Government
13	Annual review workshop of AICRPAM-NICRA	02-03-2020 to 03-03-2020	ICAR-CRIDA, Hyderabad
14	Capacity Enchantment program of AICRPAM	04-03-2020 to 07-03-2020	ICAR-CRIDA, Hyderabad

(2) Faculty of Veterinary Science

Sr. No.	Title	Date	Funding Agency
1	Block course of Veterinary Emergency Response Operations on “Management of animals in Disaster”	9/12-10-2019	World Animal Protection, India
2	ASCAD Training on “Surgery including Surgical techniques and X-ray and Imaging techniques etc.”	05/10-12-2016	Government of Gujarat
3	Workshop on “Management of injured birds during Utarayan”	31-12-2016	Forest Department, Govt. of Gujarat

(3) Faculty of Dairy Science

Sr. No	Title	Duration	Sponsoring Authority
1	Probiotic Awareness Day	29-06-2019	Swedish South Asian Studies Network –Fermented Foods (SASNET-FF)
2	National Seminar on New Developments in Dairy Sector: Issues and Strategies for Increasing Income of Rural Milk Producers of India	16-11-2019	Indian Council of Social Science Research (ICSSR), New Delhi
3	Ninth International Conference on Fermented Foods, Health Status and Social well-being during	13/14-12-2019	Swedish South Asian Studies Network –Fermented Foods (SASNET-FF), Anand

(4) Faculty of Agricultural Information Technology

Sr. No.	Title	Duration	Sponsoring Authority
1	IIRS Outreach Programme on “Hyperspectral Remote Sensing and its applications”	21-01-2019 – 01-02-2019	IIRS & CAIT
2	IIRS Outreach Programme on “Principles of Polarimetric SAR Remote Sensing and its Processing”	18-02-2019 – 01-03-2019	IIRS & CAIT
3	IIRS Outreach Programme on “Advances in Forest Remote Sensing”	05-03-2019 – 13-03-2019	IIRS & CAIT
4	IIRS Outreach Programme on “Advances in Remote Sensing and geospatial technologies for Disaster early warning, monitoring and mitigation”	08-07-2019 – 12-07-2019	IIRS & CAIT
5	IIRS Outreach Programme on “Digital Photogrammetry based 3D modelling”	29-07-2019 – 02-08-2019	IIRS & CAIT
6	Workshop on “Geospatial Information System Using IGIS 2.0”.	03-08-2019	CAIT, AAU, Anand

(5) Faculty of Food Processing Technology and Bio-energy

Sr. No.	Title	Duration	Sponsoring Authority
1	Certificate Course on Food Processing Technology	01-02-2019 to 30-04-2019	College of FPT&BE, AAU, Anand
2	Technical talk by expert Dr. K. K. Pramanik, AGM-QA AMUL Dairy, Anand.	01-06-2019	FPTBE Alumni Association
3	Industry Interface Meet for polarization of developed technologies	10-06-2019	SMC College of Dairy Science and College of FPT&BE, AAU, Anand
4	Certificate Course on Food Processing Technology	01-9-2019 to 30-11-2019	College of FPT&BE, AAU, Anand
5	National Tech Fest (Food Processing) ADROIT' 19	16-10-2019 to 17-10-2019	College of FPT&BE, AAU, Anand

(6) Faculty of Agril. Engineering and Technology

Sr. No.	Title	Duration	Sponsoring Authority
1	Food awareness training program on 'Food Nutrition, Quality and Safety'	07-09-2019	CAET, AAU, Godhra
2	One day workshop on "Energy Conservation Awareness"	19-09-2019	Gujarat Energy Development Agency, Gandhinagar
3	Orientation cum awareness programme on "Gandhian Ideologies and Plastic Waste Free Environment"	05-10-2019	CAET, AAU, Godhra
4	10 days ICAR Short Course Training Program on "Renewable Energy for Environmental Protection and Energy Conservation"	14/23-10-2019	Indian Council of Agricultural Research, Pusa, New Delhi
5	Motivational Training Program on "Skill development in higher education"	23-10-2019	CAET, AAU, Godhra
6	Two days workshop on Machine Learning and Deep Learning with MATLAB	05/06-11-2019	CAET, AAU, Godhra
7	One day workshop on IPR awareness	14-11-2019	CAET, AAU, Godhra
8	Seminar on "Education and Employment Opportunities (For Agriculture Sector)"	05-12-2019	Agricultural Engineering Alumni Association, CAET, AAU, Godhra and Directorate of Employment and Training, Gandhinagar
9	Seminar on "Cyber Crime"	22-01-2020	CAET, AAU, Godhra and Cyber Cell, Office of the DSP, Godhra Division, Godhra

(6) Faculty of IABMI

Sr. No.	Title	Duration	Sponsoring Authority
1	Workshop on "Price Forecasting: Methodology and Approaches"	19/21-12-2019	ICAR NAHEP-CAAST Project, AAU, Anand
2	Workshop cum Training on "Remote sensing, Data Science and Agro-Block chain for Market Intelligence"	31-01-2020 to 02-02-2020	ICAR NAHEP-CAAST Project, AAU, Anand
3	Workshop on "Role of FPOs in Enhancing Farmers' Income"	12/13-02-2020	ICAR NAHEP-CAAST Project, AAU, Anand
4	Workshop cum Training on "Market Analytics with R-Phase I"	24/26-02-2020	ICAR NAHEP-CAAST Project, AAU, Anand
5	Workshop cum Training on "Methodology for Price Forecasting, Market Competitiveness and Export Opportunities Assessment for Dairy and Food Products"	28/29-02-2020	ICAR NAHEP-CAAST Project, AAU, Anand
	Workshop cum Training on "Market Analytics with R-Phase II"	2/4-03-2020	ICAR NAHEP-CAAST Project, AAU, Anand

Appendix - 7

LIST OF UNIVERSITY TEACHERS/SCIENTISTS WHO PRATICIPATE IN SEMINAR, SYMPOSIA, CONFERENCES, WORKSHOPS AND TRAINING PROGRAMMES ORGANIZED BY THE OTHER INSTITUTE

(1) FACULTY OF AGRICULTURE / HORTICULTURE

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
1	Dr. M. B. Patel Shri K. H. Patel Dr. P. K. Parmar Dr. S. K. Singh Dr. H. S. Varma	62 nd Maize workshop organized by IIMR (ICAR), Ludhiana AAU, Assam	05-04-2019	07-04-2019
2	Dr. M. P. Patel	Annual Group Meeting on Castor, IIOR, Hyderabad	02-05-2019	04-05-2019
3	Dr. H. N. Prajapati	Training programme on “Quarantine pathogens: Seed health testing and molecular diagnostic technique” organised by National Institute of Plant Health Management, Hyderabad, Telangana	06-05-2019	10-05-2019
4	Dr. Dileep Kumar	Summer school on ‘Geospatial Technologies’ an initiative of the Natural Resources Data Management System (NRDMS), Department of Science and Technology, Government of India at University of Allahabad	10-05-2019	30-05-2019
5	Dr. M. M. Pandya	Workshop on ‘Farm business management for extension functionary’ at EEI, AAU, Anand	13-05-2019	18-05-2019
6	Shri Arjunsinh Rathva	Training programme on “Climate change and its impact on agriculture” at Extension Education Institute, AAU, Anand	20-05-2019	25-05-2019
7	Dr. Nitin Patel	National Seminar on “Application of Mathematics in Engineering” at Adani Institute of Infrastructure Engineering, Ahmedabad and Gujarat Council on Science and Technology, Gujarat	25-05-2019	-

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
8	Dr. Akarsh Parihar	Workshop on Genome editing in Plants entitled “CRISPR/Cas mediated genome editing in plants: Applications, tools and experimental design” sponsored by DBT, GOI held at Delhi University, South Campus, Dhaula Kuan, New Delhi	27-05-2019	31-05-2019
9	D. J. Kacha Dr. S.G.Patel	Summer school training on Research & Development in organic farming current status and way forward, MPAUT, Udaipur.	01-06-2019	21-06-2019
10	Dr. K. D. Mevada Dr. P. M. Patel	National level Conference on “स्वर्णिम भारत का आधार: शाश्वत यौगिक खेती” organized by Brahmakumaris Ishwariya Vishwavidhyalaya, Mount Abu.	03-06-2019	07-06-2019
11	Dr. D. B. Prajapati, Dr. M. B. Parmar, Dr. R. K. Gangwar Shri S. S. Thorat Dr. R. G. Machhar	54 th Annual Group Meeting of All India Coordinated Rice Improvement Project (AICRIP) and Rice Workshop, CRRI, Cuttack.	04-06-2019	07-06-2019
12	Dr. Sunil R. Patel Dr. H. C. Parmar Dr. A. R. Makwan Dr. Manish R. Dabhi Dr. R. G. Machhar, Shri C. B. Damor Shri G. D. Hadiya Dr. K. D. Parmar, Dr. N. S. Litoriya, Dr. R. L. Kalsariya Shri N. R. Chauhan Dr. M. B. Zala Dr. A.S. Patel Dr. R.P. Kacha Dr. Nitin Patel Dr. Nikhil Joshi Dr. J. B. Patel Dr. D. D. Patel Dr. Hemlata Saini Dr. Vinaya Kumar H M Dr. Vinod B. Mor Dr. P. J. Joshi Shri K. H. Patel Dr. B. N. Thakker Shri D. M. Rathod Dr. G. J. Patel Dr. G. N. Thorat	SEEG national Symposium-2019 on “Pragmatic Perspectives of Agricultural Development Programmes in Present Scenario” organized by Society of Extension Education, Gujarat and Navsari Agricultural University at Navsari Agricultural University, Navsari	08-06-2019	09-06-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
13	Dr. H. L. Dhaduk Dr. Amarjeet Singh	13 th Annual Review Meeting of CSS-MIDH of the year 2018-19 & Annual Action Plan for 2019-20 held at OUAT, Bhubaneswar, Odisha	11-06-2019	12-06-2019
14	Dr. R. R. Acharya Dr. V. I. Joshi Dr. N. A. Patel Dr. M. M. Pandya	All India Coordinated Research Project on Vegetable crop XXXVII group meeting of vegetable research workers held at TNAU Coimbatore	22-06-2019	25-06-2019
15	Dr. Sunil J. Macwan	Govt. of India, Ministry of youth Affairs & Sports, Empanelled training institute, NSS, Gujarat	09-07-2019	15-07-2019
16	Dr. N. M. Gohel	Training programme on “ <i>Plant Quarantine National Regulations & Procedures</i> ” at National Institute for Plant Health Management, Hyderabad	15-07-2019	19-07-2019
17	Dr. Nitin Patel	State level seminar on “Mathematical Modelling and Applications of Mathematics in Engineering-2019” organized by Mathematics and Humanities Department, GIT and Gujarat Council on Science and Technology, Gujarat at GIT, Gandhinagar.	19-07-2019	20-07-2019
18	Dr. Manish R. Dabhi	Production Protocol programme for predator and parasitoids at National Institute of Plant Health Management, Hyderabad	22-07-2019	26-07-2019
19	Dr. M. M. Pandya	Workshop on ‘ICT applications, use of M-kisan portals and digital learning agriculture and allied fields’ at EEI, AAU, Anand	22-07-2019	27-07-2019
20	Dr. A. V. Kotecha	Seminar on “Latest production technology in banana” organized by Shri Vansol Satavis Patidar Samaj, V. V. Nagar at Sanskurti Kendra, Bhalej chokadi, Ta. Umreth, Anand	28-07-2019	28-07-2019
21	Shri G. D. Hadiya Shri S. S. Thorat Dr. P. H. Godhani Dr. G. N. Thorat Dr. Chirag J. Patel	The training/workshop on “Management of fall Army worm and integrated pest management practices through extension skills” at Extension Education Institute (EEI), AAU, Anand	29-07-2019	02-08-2019
22	Dr. P. G. Shah, Dr. N. S. Litoriya. Shri N. R. Chauhan	7 th Annual workshop on “Monitoring of pesticide residues” at KAU, Vellayani	02-08-2019	--
23	Dr. P. G. Shah, Dr. N. S. Litoriya. Shri N. R. Chauhan	27 th Annual workshop of “AINP on Pesticide Residues” organized by KAU, Vellayani	03-08-2019	--

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
24	Dr. Tulika Singh	7 th International Cereal Nematodes Symposium at NSC complex, New Delhi	03-08-2019	07-08-2019
25	Dr. Nitin Patel	Second International Conference on “Mathematical Modelling, Applied Analysis and Computation-2019 (ICMMAAC-19)” at Department of Mathematics, Faculty of Science, JECRC University, Jaipur, Rajasthan-303905	08-08-2019	10-08-2019
26	Dr. A.N. Khokhar	One day Workshop & Regional Orientation Session on IIC 2.0 and ARIIA 2020 organized by Government of India, Ministry of Human Resources Development’s Innovation Cell held at Entrepreneurship Development Institute of India (EDII), Ahmedabad, Gujarat.	09-08-2019	-
27	Dr. M. B. Parmar, Dr. D. B. Prajapati Shri S. S. Thorat, Dr. R. K. Gangwar Shri D. J. Kacha R. L. Chotaliya	Quinquennial Review Team Meeting (Western Zone-VI) 2012-13 to 2016-17, AICRIP, Nawagam presentation held at ICAR-CCARI, Goa.	17-08-2019	18-08-2019
28	Dr. Dileep Kumar	Workshop on ‘GIS using IGIIS – GIS & Image Processing’ at College of Agricultural Information Technology, AAU, Anand	19-08-2019	-
29	Dr. Vinod B. Mor	Workshop on Promotion of Organic Farming for Sustainable Agriculture EEI, AAU, Anand	19-08-2019	23-08-2019
30	Shri R. K. Patel	Organic Farming Training, EEI, Anand	23-08-2019	-
31	Dr. Akarsh Parihar	The conference CRISPR: Understanding genome editing organized by Edgene, Bangalore	24-08-2019	-
32	Shri R. N. Choudhary Shri K. J. Suthar	58 th All India Wheat and Barley Research workers’ meet held at, IARI-ICAR, Indore (MP)	24-08-2019	26-08-2019
33	Dr. Nitin Patel Dr. Nikhil Joshi Dr. V. B. Bhalodiya	Training Program on “Participatory Programme Planning, Monitoring and Evaluation” at Extension Education Institute, AAU, Anand	26-08-2019	31-08-2019
34	Ms Rucha Dave	Online Training on “ Remote Sensing and Digital Image Processing of Satelite Data” by NPTEL	26-8-2019	13-10-2019
35	Dr. Vinaya Kumar H M	Summer school on Agricultural Education, Entrepreneurship and Skill Development in India” at CAU, Imphal, Manipur.	26-08-2019	16-09-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
36	Dr. A. S. Thounaojam	Summer School on “Agricultural Education, Entrepreneurship and Skill Development in India” organized by Directorate of Instruction, Central Agricultural University, Imphal	27-08-2019	16-09-2019
37	Dr. D. P. Gohil Dr. H. K. Patel Dr. P. H. Rathod	National Group Meet <i>Rabi</i> -2019 held at Central Agricultural University, Imphal (Manipur).	30-08-2019	31-08-2019
38	Dr. S. N. Shah Dr. R.A. Patel Dr. V. R. Gohel Dr. P. M. Patel Dr. P. H. Rathod Dr. H. K. Patel Dr. D. D. Patel Shri R. L. Chotaliya	State level workshop on “ <i>Prakrutik Krushi</i> ” organized by Government of Gujarat at Mahatma Mandir, Gandhinagar	04-09-2019	-
39	Dr. K. C. Patel Dr. Dileep Kumar	Global Micronutrient Summit -2019 at New Delhi	05-09-2019	06-09-2019
40	Dr. Aakash Mishra	21 Days ICAR-CAFT Training On “Productivity, Economics and Environmental Performance in Organic Agriculture” at MPUA&T, Udaipur	05-09-2019	25-09-2019
41	Dr. Nikhil Joshi	21 days “Orientation Programme” at UGC-HRDC, GU, Ahmedabad (Gujarat)	16-09-2019	06-10-2019
42	Dr. D. R. Patidar	Training on “Molecular Approaches to Cotton Improvement” at ICAR - Central Institute for Cotton Research (CICR), Nagpur	19-09-2019	28-09-2019
43	Dr. C. B. Dhobi	Seminar ‘Steps Towards Implications and Conservation of Medicinal Plants in View of Pharma Interest’ organized by Indukaka Ipcowala College of Pharmacy at Vallabh Vidhyanagar	20-09-2019	-
44	Dr. X. U. Shukla Dr. P. H. Rathod	Centre for Advanced Faculty Training (CAFT) on “Advances in Data Science using R” held at ICAR-Indian Agricultural Statistics Research Institute, New Delhi.	21-09-2019	10-10-2019
45	Dr. S.K. Singh	2nd International Conference On Recent Advances in Agricultural, Environmental & Applied Sciences for Global Development (RAAEASGD-2019), Dr. Y.S. Parmar University of Horticulture and Technology, Solan, HP.	27-09-2019	29-09-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
46	Shri Bhavin Ram	21 days summer school on “Up-scaling of water productivity in arid and Semi-arid areas for sustainable agriculture” at Department of Soil and Water Engineering, College of Technology and Engineering, MPUAT, Udaipur	03-10-2019	23-10-2019
47	Shri N. R. Chauhan	Attended ICAR sponsored summer school on “Innovative tools and techniques for Bio-fortification” organized by Chimanbhai Patel College of Agriculture, S.D.A.U., Sardarkrushinagar, Gujarat	03-10-2019	23-10-2019
48	Dr. C. B. Dhobi	Advance training course on ‘Advances in Biology, Conservation, Rearing and Management of Apis & Non-Apis Bees’ organized by Department of Entomology, CCS Haryana Agricultural University, Hisar	04-10-2019	24-10-2019
49	Dr. Nikhil Joshi	National Workshop on “Academic Integrity, Research Ethics and Prevention of Plagiarism” organized by Gujarat University, Ahmedabad	12-10-2019	-
50	Dr. Sneha Macwana Dr. R. G. Parmar Dr. P. R. Vaishnav Dr. A D Kalola Dr D J Parmar Dr. Murari Lal Gaur Dr H. K. Patel Dr. Ajay Kumar Maru Dr. D. B. Sisodiya Dr. J. B. Patel Dr.K. D. Mevada Dr. S. N. Shah Dr. P. M. Patel Dr. J. C. Shroff Dr. G. N. Motka Dr. H. N. Prajapati	2 nd State Level Convention on “Doubling Farmers’ Income through Resource Management and Rural Prosperity” held at Anand Agricultural University, Anand.	12-10-2019	13-10-2019
51	Dr. A.S. Patel	The short course on “Renewable Energy for Environmental Protection & Energy Conservation” at College of Agricultural Engineering And Technology, AAU, Godhra	14-10-2019	23-10-2019
52	Dr. B. D. Patel Shri D. D. Chaudhari	AICRP-WM Annual Review Meeting-2019 held at Jorhat, Assam	15-10-2019	16-10-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
53	Dr. H. L. Dhaduk Shri B. V. Hirppara	XXVII Group Meeting of AICRP on Medicinal and Aromatic Plants and Betel vine at Dr. Y. S. R. Horticulture University, Venkataramannagudem (AP)	18-10-2019	20-10-2019
54	Dr. Ajay Kumar Maru Dr. S.K. Singh	Participated and presented research paper on 'Effect of different chemicals for management of root-knot nematode (<i>Meloidogyneincognita</i>) in cucumber under protected cultivation' in an International conference on 'Global Research Initiatives for Sustainable Agriculture & Allied Sciences (GRISAAS-2019) at ICAR-National Academy of Agricultural Research Management, Rajendranagar, Hyderabad, Telangana	20-10-2019	22-10-2019
55	Dr. B. N. Thakker	Training on "Writing skills for print and electronic media" at EEI, AAU, Anand	21-10-2019	25-10-2019
56	Dr. M. B. Parmar	Work shop on ENV and PPV&FR, ICAR-IIRR, Hyderabad	24-10-2019	25-10-2019
57	Dr. Nitin Patel Dr. B. N. Thakker	21 days "43 rd Orientation Programme" at UGC-HRDC, SPU, VV Nagar (Gujarat)	04-11-2019	24-11-2019
58	Dr. Murari Lal Gaur	3-in-1 global conference 2019 (20th International Soil Conservation Organization – ISCO USA's Conference; 4th World Association of Soil & Water Association- WASWAC, China's Conference; 4th Soil Conservation Society of India – SCSI's Conference) organized at NAAS, New Delhi.	05-11-2019	09-11-2019
59	Dr. P. M. Patel	Dairy, Livestock & Poultry Expo 2019 on " Doubling Farmers' Income through Technology" at Mahatama Mandir, Gandhinagar	6-11- 2019	-
60	Dr. A. B. Brahmhatt Dr. R. G. Parmar Dr. N. M. Gohel Dr. V. R. Gohel Dr. Puja Pandey Shri Arjunsinh Rathva Dr. Sneha Mistry Dr. J. B. Patel Dr. S. N. Shah Dr. P. M. Patel Shri Raghunandan, B.L.	The State Level Seminar on " <i>Krushni Ane Bagayati Pakoma Pravartman Pak Sanrakshan Na Prashno Ane Nirakaran</i> " jointly organized by Plant Protection Association of Gujarat (PPAG), Anand Agricultural University, Anand & Gujarat Horticultural Mission, Gandhinagar	08-11-2019	-

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
	Dr. H. K. Patel Dr. A D Kalola Dr. B. D. Patel Dr. D. Chaudhari Dr. R. K. Thumar Dr. C. B. Dhobi Shri M. D. Suthar Shri P. S. Panchal Shri R. I. Chaudhary Dr. J. B. Patel Dr. P. G. Shah, Dr. K. D. Parmar, Dr. R. L. Kalsariya Shri N. R. Chauhan Dr. J. G. Dulera Dr. C. K. Borad Ms Hitiksha K. Parmar Dr. M. B. Zala Dr. Ajay Kumar Maru Dr. Tulika Singh Ms Anjana B. Prajapati Dr. Vinod B. Mor Shri C. B. Damor, Shri G. D. Hadiya Dr. K. C. Patel			-
61	Dr. M. B. Parmar	National conference on Biochemistry and Biotechnology, ICAR-IIRR, Hyderabad	08-11-2019	09-11-2019
62	Shri S. V. Rathod Shri V. D. Chaudhary	21 Days ICAR-Winter School on “Advances in Organic Manure Production and Biogas Technology for Entrepreneurial Development and Empowerment of Farmers” at SKNAU, Jaipur	08-11-2019	28-11-2019
63	Dr. Vinaya Kumar H M	ISEE National Seminar on Holistic approaches for enhancing agricultural growth in changing rural scenario, organized by ISEE and KRAU, Bikaner.	14-11-2019	16-11-2019
64	Dr. T. T. Patel,	XXX Workshop of AICRP on Spices at Coimbatore, Tamil Nadu	14-11-2019	16-11-2019
65	Dr. Vimal Natubhai Patel Dr. K. C. Patel	National Seminar on Development in Soil science- 2019 in Varanasi Chapter of the Indian Society of Soil Science, Institute of Agricultural Sciences, BHU, Varanasi	15-11-2019	18-11-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
66	Dr. C. S. Baladhiya Dr. V.K. Gondalia Dr. K. S. Jadav Dr. A.S. Shaikh Dr. Ganga Devi Ms Rachana K. Bansal	National seminar on “new development in dairy sector: Issues and strategies for increasing income of rural milk producer of India, at AAU, Anand	16-11-2019	16-11-2019
67	Ms. M. D. Suthar Dr. H. S. Varma Dr. J. G. Dulera	ICAR funded winter school on ecological perspectives in arthropod pest management for sustainable crop production organized at department of entomology, PAU, Ludhiana	19-11-2019	09-12-2019
68	Dr. Punit Mehta Shri P. S. Panchal	21 Days ICAR- CAFT Training on “Agronomic Interventions for Augmenting Food, Nutrition and Farmers’ Income” at GBPUA&T, Pantnagar	20-11-2019	10-12-2019
69	Dr. J. H. Chaudhari	Winter school on Enhancing Water Productivity in Agriculture for Scarcity Zones at SDAU, S.K. Nagar	20-11-2019	10-12-2019
70	Dr. D. B Prajapati	A poster presented on Gujarat Methi-2 and Pusa Early Bunching: Pharmacologic and Medicinal Properties of Fenugreek Varieties in International Conference	23-11-2019	25-11-2019
71	Shri A.G.Pampaniya	International Conference on Pharmacologic and Medicinal properties of Garlic variety: Gujarat Anand Garlic-7, held at Smt. N. M. Padaliya Pharmacy Collage, Ahmedabad	23-11-2019	25-11-2019
72	Dr. P. G. Shah, Dr. K. D. Parmar, Dr. R. L. Kalsariya, Dr. N.S. Litoriya Ms. N. N. Chaudhary, Mr. N. R. Chauhan	A National Level Seminar on “ <i>Secondary Agriculture: Significance and Scope in the Era of Globalization</i> ” sponsored by NAHEP and ICAR, New Delhi held on NAU, Navsari	27-11-2019	29-11-2019
73	Dr. S.K. Singh	Programme on “Recent advances in sample survey and data analysis using statistical software” at ICAR-IASRI, New Delhi	28-11-2019	18-12-2019
74	Shri Raghunandan, B.L.	International Conference on ‘Advances in Sustainable Agriculture: Bioresources, Biotechnology and Bioeconomy’ held at Mansarovar Global University, Bhopal (MP)	29-11-2019	30-11-2019
75	Dr. S.K. Singh	International Conference on “Global Perspective in Agricultural and Applied Sciences for Food and Environmental Security (GAAFES-2019)” at UGC-HRDC, Kumaun University, Nainital	01-12-2019	02-12-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
76	Dr. D. P. Gohil Dr. V. I. Joshi Dr. N. A. Patel	The Short Course training Programme (six days) training/workshop on “Value Addition & Post Harvest Management of Agricultural & Horticultural Crops” at held EEI, AAU, Anand.	02-12-2019	07-12-2019
77	Dr. H. C. Parmar Dr. Vinod B. Mor	The Short Course training programme on Advances in micro-irrigation and fertigation for improving water use efficiency and crop productivity” held at CSKHPKV, Palampur (H.P)	02-12-2019	11-12-2019
78	Ms. N. N. Chaudhary	44 th Orientation Programme at UGC College, Vallabh Vidhyanagar, Anand	02-12-2019	22-12-2019
79	Dr. R.P. Kacha	The short course on “Post-Harvest Management for Economic Security of Farmers in Arid Zone” from at ICAR-Central Arid Zone Research Institute, Jodhpur, Rajasthan	03-12-2019	12-12-2019
80	Dr. M. M. Lunagaria Shri N. J. Chaudhari	The Annual working group meeting of AICRPAM at ZARS, Solapur (MH).	04-12-2019	06-12-2019
81	Dr. Murari Lal Gaur	3 days Trainers Training under Skill India Mission via Agriculture Skill Council of India and ICAR-ATARI, Pune ; organized at KVK Jalna in Maharastra (India) for Job role of ‘ Micro Irrigation Technicians’.	05-12-2019	07-12-2019
82	Mr. N.R. Bumbadiya Dr. C. B. Dhobi Shri C. B. Damor Dr. G. N. Thorat	Participate in SPNF Training at Vadatal	05-12-2019	11-12-2019
83	Dr. M. S. Kulshrestha Dr. Nitin Patel Dr. D. A. Patel Dr. Sneha Macwana Dr. Arna Das Shri R. M. Chavadhari Dr. R. G. Parmar Dr. N. M. Gohel Dr. Puja Pandey Shri Arjunsinh Rathva Dr. P. R. Vaishnav Dr. A D Kalola Dr D J Parmar Dr. A.N. Khokhar Dr. X. U. Shukla Dr. G N Motka Dr. R. A. Patel Dr H. K. Patel	One day seminar on “Biodynamic Farming” at Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand.	09-12-2019	09-12-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
	Dr. Y. K. Jhala Dr. M. M. Trivedi Dr. R. M. Rajpura Dr. Sunil J. Macwan Dr. Kalyanrao Patil Dr. B. D. Patel Shri D. D. Chaudhari Dr. Ajay Kumar Maru Dr. R. K. Thumar Dr. Tulika Singh Ms. Anjana B. Prajapati Ms Rachana K. bansal Dr. C. B. Dhobi Dr. V. J. Patel Dr. M. V. Dabhi Shri R. I. Chaudhary Dr. N. B. Chauhan Dr. J. B. Patel Dr. Vinaya Kumar H M Dr.K. D. Mevada Dr. S. N. Shah Dr. P. M. Patel Dr. J. C. Shroff Dr. G. N. Motka Shri V. D. Chaudhary Shri Raghunandan, B.L. Dr. Akarsh Parihar Dr. M. B. Vaja Shri Jigar G. Mistri Dr. R. R. Gajera, Dr. A. V. Kotecha, Dr. D. D. Parekh, Dr. A. H. Barad, Dr. H. N. Prajapati, Dr. C. H. Raval Dr. Prity Kumari Dr. R. G. Machhar Shri C. B. Damor Shri G. D. Hadiya Dr. K. C. Patel Dr. Dileep Kumar Shri K. H. Patel Shri D. B. Prajapati Dr M. B. Parmar Shri D. J. Kacha Dr. R. R. Acharya	One day seminar on “Biodynamic Farming” at Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand.	09-12-2019	09-12-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
	Dr. V. I. Joshi Dr. N. A. Patel Dr. M. M. Pandya Dr. K. D. Parmar Dr. R. L. Kalsariya Shri R. L. Chotaliya Dr. M. P. Patel Shri V. K. Chaudhary, Ms Hitiksha K. Parmar Dr. M. B. Zala Dr. G. J. Patel Dr. P. H. Godhani Dr. G. N. Thorat	One day seminar on “Biodynamic Farming” at Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand.	09-12-2019	09-12-2019
84	Dr. Hemlata Saini	Training programme on gender mainstreaming and leadership skills in agriculture, organized by EEI, Anand	09-12-2019	14-12-2019
85	Dr. H. K. Patel	ICAR sponsored 10 days national training on “Meta-Omics based methods and techniques for understanding microbial community functions” at ICAR-National Bureau of Agriculturally Important Microorganisms, Mau, Uttar Pradesh.	10-12-2019	19-12-2019
86	Dr. H. K. Patel (Agro)	Short training Programme on “Recent advance in Soil Carbon sequestration and stabilization for soil health improvement and climate change mitigation” held at Indian Institute of Soil Science, Bhopal.	10-12-2019	19-12-2019
87	Dr. M. S. Kulshrestha	National symposium ,Tropmet 2019 on “Land, Ocean and Atmosphere interactive process in the context of weather and climate organized by Indian Meteorological Society at Visakhapatnam, A. P.	11-12-2019	14-12-2019
88	Dr. J. J. Dhruv Dr. Vimal Natubhai Patel	National seminar on “Biochemical and Molecular Biology Intervention for Nutritional Security and Food Safety” at Navsari Agril. University, Navsari	12-12- 2019	13-12- 2019
89	Dr. C. S. Baladhiya	International conference on “Fermented foods, Health status and Social well-being” at AAU, Anand	13-12-2019	14-12-2019

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
90	Dr. Shrikant B. Katole	International Conference on Animal Nutrition on “Nutritional Strategies for Improving Farm Profitability and Clean Animal Production” Biswa Bangal Convention Centre (BBCC), Kolkata	17-12-2019	19-12-2019
91	Dr. S. B. Yadav	Annual Review Meeting of GKMS held on RVSKVV, Gwalior (M.P)	18-12-2019	20-12-2019
92	Shri N. J. Chaudhari Dr D J Parmar Dr. X. U. Shukla Dr. V.K. Gondalia Dr. K. S. Jadav Dr. A.S. Shaikh Dr. Ganga Devi Ms Rachana K. Bansal Dr. J. B. Patel Dr. Hemlata Saini Dr. Prity Kumari Shri C. B. Damor Shri N. R. Chauhan	The workshop on “Price forecasting: methodology and approaches” organized by NAHEP, AAU, Anand.	19-12-2019	21-12-2019
93	Dr. S. B. Yadav	One day training programme on “Agromet-DSS software” for atomization of block level Agromet-Advisory, Organized by IMD, New Delhi at Gwalior (M.P)	21-12-2019	-
94	Dr. Vinaya Kumar H M	Workshop cum training on Remote sensing, data science and agro-block chain for market intelligence at NAHEP-CAAST, AAU, Anand	01-01-2020	02-01-2020
95	Shri D.J.Kacha	21 days winter school on Entrepreneurial Skill Development or Rural youth through innovative approach, MPAUT, Udaipur.	04-01-2020	24-01-2020
96	Shri G. D. Hadiya Shri S.S.Thorat	The winter school training on Insecticide resistance: Biochemical and molecular perspectives; and strategies for combating resistance to insecticides at ICAR-National Bureau of Agricultural Insect Resources (NBARI), Bengaluru	08-01-2020	28-01-2020
97	Dr. S.K. Singh	7 th International Conference on Phytopathology in Achieving UN Sustainable Development Goals, at IARI, Pusa Campus, New Delhi	16-01-2020	20-01-2020
98	Dr. M. M. Lunagaria Dr.S.B. Yadav	National Seminar on Agrometeorological Interventions for Enhancing Farmers’ Income (AGMET-2020) at Kerala Agricultural University, Thrissur, Kerala Organized by Association of Agrometeorologists, Anand and Kerala Agricultural University, Thrissur.	20-01-2020	22-01-2020

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
99	Shri Azadchandra S. Damor Shri Hemrajsinh D. Rahevar	Training on Use of Social Media for Transfer of Technology at EEI, AAU, Anand	20-01-2020	24-01-2020
100	Dr. M. M. Pandya	Recent advances on mutation breeding for crop improvement at BCKV, West Bengal, Mohanpur	20-01-2020	30-01-2020
101	Shri S. S. Thorat Dr. S. G. Patel Dr. R. K. Gangwar Dr. M. B. Parmar Shri D. J. Kacha Dr. D.B.Prajapati	National Symposium on Sustainable Management of Pests and Diseases in Augmenting Food and Nutritional Security, NAU, Navsari.	22-01-2020	24-01-2020
102	Dr.Ranganath Swamy	National Symposium on Climate change, Pollution and Harmony with Nature at M.S. University, Vadodara	25-01-2020	-
103	Shri N. J. Chaudhari Dr. Ganga Devi Dr.K. D. Mevada Dr. Prity Kumari	Participated in the workshop cum training on “Remote sensing, data science and agro-block chain for market intelligence” organized by NAHEP, AAU, Anand during 31st Jan. to 2nd Feb. 2020.	31-01-2020	02-02-2020
104	Dr. Ganga Devi Dr. J. B. Patel Dr. Hemlata Saini Dr. Prity Kumari	Role of Farmer Producer Organizations (FPOs) in Enhancing Farmers’ Income, NAHEP – CAAST, AAU, Anand	12-02-2020	13-02-2020
105	Dr. B.N. Satodiya	Indian Horticulture Summit-2020, organised by Mahatma Gandhi Chitrakoot Gramodya Vishwavidyalaya, Chitrakoot, MP	14-02-2020	16-02-2020
106	Dr. A D Kalola Dr D J Parmar Dr. A.N. Khokhar Dr. X. U. Shukla Dr. V.K. Gondalia Dr. K.S.Jadav Dr. A.S. Shaikh Dr. Ganga Devi Ms Rachana K. Bansal Dr. V. J. Patel Dr. M.V.Dabhi Shri P. S. Panchal	8 th Convention of BACA, Alumni Association and Open Forum discussion on “Prospects of Artificial Intelligence in Agriculture” held at BACA, AAU, Anand.	16-2-2019	-
107	Dr. M. M. Lunagaria	Output oriented in-service capacity enhancement program at BAU, Ranchi, Jharkhand	16-02-2020	25-02-2020

Sr. No.	Name of Teacher/ Scientists	Participated in	Duration	
			From	To
108	Dr. A.D. Kalola Dr. A.N. Khokhar Dr. V.K. Gondalia	State level Seminar on “GAU ADHAARIT SAJIV KHETI” organized by the Gujarat Association for Agricultural sciences held at Anand Agricultural University, Anand	18-02-2020	-
109	Dr. G. G. Patel	International Convention on “Perspectives to Face Contemporary Challenges of Agricultural Development”, NASC, New Delhi	18-02-2020	19-02-2020
110	Dr. H. C. Parmar	International Conference on banana – 2020 on Innovations in sustainable production and value chain management in banana” held at Trichy, TN, India	22-02-2020	25-02-2020
111	Dr. Vinaya Kumar H M Dr. Ganga Devi Dr. Mahammad Husen	Workshop cum training on Market analytics with R-phase-I, Organized by NAHEP-CAAST, AAU, Anand	24-02-2020	
112	Dr. J. B. Patel	Workshop cum training on Methodologies for price forecasting, market competitiveness and export opportunities for dairy and food products, Organized by NAHEP-CAAST, AAU, Anand	28-02-2020	29-02-2020
113	Dr. G. G. Patel	XIth National Conference on KVK-2020 at New Auditorium, Convention Centre, NASC Complex, New Delhi.	28-2-2020	01-03-2020
114	Dr. Nikhil Joshi	National seminar organized by Bharteeya Vichar Manch at Gujarat University, Ahmedabad	29-02-2020	01-03-2020
115	Dr. Mahammad Husen	Workshop on Structural Equation Modelling Using AMOS” at AAU Anand	29-02-2020	01-03-2020
116	Dr. M. M. Lunagaria Shri N. J. Chaudhari	Report in annual review workshop of AICRPAM-NICRA at AAU, Anand,	02-03-2020	03-03-2020
117	Dr. Vinaya Kumar H M Dr. Ganga Devi Dr. Mahammad Husen	Workshop cum training on Market analytics with R-phase-II, Organized by NAHEP-CAAST, AAU, Anand	02-03- 2020	04-03-2020
118	Dr. M. M. Lunagaria Shri N. J. Chaudhari	Output oriented in-service capacity enhancement program at AAU, Anand	04-03-2020	07-03-2020
119	Shri Bhavin Ram	21 days winter school on “Recent Advances in Econometric Modeling and Forecasting in Agriculture” at Division of Forecasting and Agricultural Systems Modeling, ICAR-Indian Agricultural Statistics Research Institute (IASRI), Pusa, New Delhi	04-03-2020	24.03.2020

2) FACULTY OF VETERINARY SCIENCE:

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
1	Dr. S.K. Bhavsar Dr. K.A. Sadariya Dr. B.R. Patel	World Veterinary Day-2019 celebration at College of Veterinary Science and Animal Husbandry, Anand Agricultural University, Anand.	27-04-2019	-
2	Dr. K. K. Sorathiya Dr. R. J. Modi Dr. J. H. Chaudhary Dr. D. B. Sadhu	State level seminar on Diagnostic and Managerial Step-Up to improve the fertility for sustainable dairy farming, SDAU, S.K.Nagar	27-04-2019	-
3	Dr. N. R. Patel	Symposium on Pragmatic Perspective of Agricultural Development programmes in Present Scenario at, Navsari Agricultural University, Navsari	08-06-2019	09-06-2019
4	Dr. S.K. Raval Dr. G. C. Mandali Dr. D. B. Sadhu	State level seminar on “Veterinary Laws and Ethics”, Gandhinagar	27-08-2019	-
5	Dr. M. A. Shekh Dr. J. H. Chaudhary	Training programme on “Disaster Risk Management for Livestock”, Gujarat Institute of Disaster Management, Gandhinagar	16-09-2019	18-09-2019
6	Dr. B. B. Bhanderi	Training on Tuberculin skin test and IGRA at LUVAS, Hisar	16-09-2019	18-09-2019
7	Dr. S.K. Bhavsar	Education Management and Academic Leadership (Under NAHEP Component 2A)” at ICAR-National Academy of Agricultural Research Management, Hyderabad	20-09-2019	25-09-2019
8	Dr. C.P. Parmar	21 days training on Current Knowledge and Future Challenges in Domestic Animal Theriogenology, GADVASU, Ludhiana, Punjab	03-10-2019	23-10-2019
9	Dr.U.M.Patel	Workshop on VERU block course on “Management of animals in disaster” at Veterinary College, AAU, Anand	09-10-2019	-
10	Dr. S.K. Bhavsar Dr. K.A. Sadariya Dr. R. J. Modi Dr. K.K. Hadiya Dr. N.D. Hirani Dr. J. H. Chaudhary	Agrivision-2019 second state level seminar entitled “Doubling farmers income through resource management and rural prosperity” at Anand Agricultural University, Anand.	12-10-2019	13-10-2019
11	Dr.U.M.Patel	Short course (10 days) on “Renewable energy for environmental protection and energy conservation” at CAET, AAU, Godhra	14-10-2019	23-10-2019

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
12	Dr. V. P. Belsare	State level Seminar on Livelihood Improvement through Sustainable Livestock Production at CIRC, Meerut	03-11-2019	04-11-2019
13	Dr. D.J. Ghodasara	National Symposium on “Advances in Veterinary Pathology for fostering one health, food security and Environment protection” at 36 th Annual Conference of Indian Association of Veterinary Pathologists, 10 th Annual Meeting of Indian College of Veterinary Pathologists at Aizawl, Mizoram.	06-11-2019	08-11-2019
14	Dr. S.K. Raval Dr. D.B. Sadhu	National symposium on “Sustainable Improvement In Animal Health and Production Bridging Science and Policy For Economic Upliftment Of Farmers”, Veterinary college, DUVASU, Mathura (UP)	08-11-2019	09-11-2019
15	Dr. J. J. Parmar Dr. P. V. Parikh Dr. D. N. Kelawala	36 th Annual Convention of Indian Society for Veterinary Surgery and National Symposium on “Recent Advances in Amelioration of Anesthetic and Surgical Strass in Farm and Companion Animals” to be held at College of Veterinary sciences.	14-11-2019	16-11-2019
16	Dr. K.A. Sadariya Dr. R. J. Modi Dr. N. R. Patel Dr. K. K. Hadiya Shri Y.G. Patel	ICSSR Sponsored National Level Seminar entitled “New development in dairy sector: Issues and strategies for increasing income of rural milk producer of India” at SMC College of Dairy Science, AAU, Anand	16-11-2019	-
17	Dr. A.J. Dhami	5 th Annual Review meeting of AICRP on Nutritional & Physiological Interventions for Enhancing Reproductive Performance in Animals, at OUAT, Bhubaneswar	16-11-2019	-
18	Dr. D. N. Rank Dr. A.C. Patel Dr. A.J. Dhami Dr. J.A. Patel Dr. K.K. Hadiya Dr. J.J. Parmar Dr. P.G. Koringa Dr. S.J. Jakhesara	7 th SVSBT annual Convention and National Seminar on Biotechnological Advances for Improving Animal Health And Productivity, at NAU, Navsari	05-12-2019	06-12-2019

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
19	Dr. N.P. Sarvaiya Dr. K. K. Sorathiya Dr. K.K. Hadiya Dr. A.J. Dhami Dr. V. R. Nimavat Dr. B. B. Bhanderi Dr. R. A. Mathakiya Dr. J.J. Hasnani Dr. P.V. Patel Dr. N.D. Hirani Dr. V. D. Chauhan Dr. P.M. Lunagariya Dr. A. B. Patel Dr. P. R. Pandya Dr. M. A. Shekh Dr. B. R. Devalia	Biodynamic farming organized by GAAS, at AAU, Anand	09-12-2019	-
20	Dr. J. H. Chaudhary	ICAR Short training course on “Advances in Molecular Epidemiology in Veterinary Research” GADVASU at Ludhiana, Punjab	10-12-2019	19-12-2019
21	Dr. S. G. Vahora Dr. K. K. Sorathiya	International Conference on Nutritional Strategies for Improving Farm Profitability and lean Animal Production, WBUAFS, Kolkata	17-12-2019	19-12-2019
22	Dr. A.J. Dhami	35 th ISSAR Annual Conventional and International Symposium on Global Perspectives to Enhance Livestock Fertility through Modern Reproductive Techniques for Doubling Farmers Income, at TANUVAS, Namakkal	18-12-2019	20-12-2019
23	Dr. S.K. Bhavsar	Annual conference of ISVPT and national symposium on “Pharmacogenomics in the development and validation of indigenous drugs” at College of Vet. & Animal sciences, Mannuthy, Thrissur, Kerala.	18-12-2019	20-12-2019
24	Dr.U.M.Patel	Workshop on “Price forecasting methodology and approaches” under NAHEP-CAAST Project at FPT & BE college, AAU, Anand	19-12-2019	21-12- 2019
25	Dr. Neha Rao	Updating Knowledge and Skill of Practicing Veterinarians, Vadodara	05-01-2020	-

Sr. No.	Name of Teacher/Scientist	Participated in	Duration	
			From	To
26	Dr. R. A. Mathakiya	Training on Recent Trends in Animal Cell Culture Techniques at TANUVAS, Chennai	22-01-2020	24-01-2020
27	Dr. M. M. Pathan	CAFT short course training on ' <i>Neuroendocrine regulation of livestock production: Prospect and Retrospect</i> ' at ICAR – Indian Veterinary Research Institute, Izatnagar.	28-01-2020	17-02-2020
28	Dr. A. C. Patel	The Legal System and Veterinarians Role at AAU, Anand	31-01-2020	-
29	Dr. S.K. Bhavsar Dr. K.A. Sadariya Dr. B.R. Patel Dr. R. J. Modi Dr. M. M. Islam Dr. N. R. Patel Dr. M. A. Shekh Dr. B. R. Devalia Dr. K. K. Sorathiya Dr. C.P. Parmar Dr. K.K. Hadiya Dr. D.V. Chaudhari Dr. V. R. Nimavat Dr. B. B. Bhanderi Dr. R. A. Mathakiya Dr Neha Rao Dr.J.J.Parmar Dr. M. N. Brahmhatt Dr. B. C. Parmar Dr. J. H. Chaudhary Dr. P.M. Lunagariya Dr. K. N. Wadhvani Dr. Y.G. Patel Dr. F. P. Savaliya Dr. A. B. Patel Dr. N. J. Bhagora Dr. R. K. Mishra Dr.J.K. Mahla Dr.P.B. Dabhi Dr. S.K. Raval Dr. G. C. Mandali Dr. D. B. Sadhu Dr. R.J. Bhojani Dr.U.M.Patel	ASCAD seminar on "The Legal System and Veterinarians Roles" at Veterinary College, AAU, Anand	01-02-2020	-

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
30	Dr. R.S.Joshi Dr. A. C. Patel Dr. V. P. Belsare Dr. R. J. Modi Dr. M. M. Islam Dr. P. R. Pandya Dr. B. R. Devalia Dr. Y.G. Patel	National Conference on Paradigm Shift in Livestock Management to Obtain High Quality Animal Products for Enhancing Farm Economy and Entrepreneurship, PGIVER, Jaipur	04-02-2019	06-02-2019
31	Dr. D.S. Nauriyal	38 th Annual Convention of Indian Society for Veterinary Medicine (ISVM) & National Symposium on “ Advancement in Veterinary Medicine in Mitigating Challenges to Animal Health ” at Hebbal, Bengaluru	05-02-2020	07-02-2020
32	Dr. N.D.Hirani	National Conference of Veterinary Parasitology & National Symposium on Challenged & Innovastion in controlling parasitic diseases of livestock & poultry with changing climate at College of Veterinary & Animal Sciences, NDVSU, Jabalpur	05-02-2020	07-02-2020
33	Dr. P.G.Koringa Dr. S.J.Jakhesara . Dr. R. A. Mathakiya	Ist Annual Meet cum Conference of One Health Poultry Hub Project	09-02-2020	15-02-2020
34	Dr. M. M. Islam Dr. J. H. Chaudhary Dr. M. A. Gamit	Workshop on Methodology for price forecasting, market competitiveness and export opportunities assessment for dairy and food products, Anand Agricultural University, Anand.	28-02-2020	29-02-2020
35	Dr. M.N. Brahmhatt	National Workshop on Sustainable Scientific Strategies for Improving Health and Productivity of Livestock – AASCON 2020 at Mhow, Madhya Pradesh	06-03-2020	08-03-2020
36	Dr. C.P. Parmar Dr. A.J. Dhami Dr. D.V. Chaudhari	State Level ASCAD-ISSAR Seminar on Innovative perceptions and tactics for improvement of farm animal fertility, at NAU, Navsari	07-03-2020	-

3) FACULTY OF DAIRY SCIENCE

Sr. No.	Name of Teacher/Scientist	Participated in	Duration	
			From	To
1	Dr. A.K. Makwana Mr. M.D.Gurjar Dr. K.C.Kamani Dr. M.C.Prajapati	Workshop on “Course Curriculum Design and Pedagogy for Five Year Integrated Post Graduate Diploma in Dairy Management (PGDDM) Programme” jointly organized by AAU, Anand, IRMA, NDRI – Karnal held at SMC College of Dairy Science.	17-05-2019	18-05-2019
2	Dr. K.C.Kamani	SEEG National Level Symposium – 2019 on Pragmatic Perspectives of Agricultural Development Programmes in Present Scenario organized at NAU, Navsari	08-06-2019	09-06-2019
3	Dr. A. Jana, Dr. S.V.Pinto, Dr. J.P.Prajapati, Dr. Ajay Gokhale, Dr. Amit Patel, Dr. Chetan Dharaiya, Dr. Jarita Mallik, Dr. Komal Patel, Shri Dhinal Patel, Ms. Rachana Rathwa Dr. A.K. Makwana Mr. M.D.Gurjar Dr. K.C.Kamani Dr. M.C.Prajapati	Probiotic Awareness Day Programme Organized by SMC College of Dairy Science	29-06-2019	-
4	Dr. S.V.Pinto, Dr. Jarita Mallik, Dr. Amit Patel	Workshop on Natural preservation and shelf life extension of dairy products along with cultures and rapid antibiotic testing kit organized by DSM Food Specialties, Netherlands at Madhuban Resort, Anand.	10-07-2019	-
5	Dr. Atanu Jana	4 th International Conference on Agriculture and Animal Husbandry at Hyderabad	28-08-2019	30-08-2019
6	Er. Arpita Rathva	One day Workshop on “ Theory cum practical programme on Energy Conservation Awareness workshop” organized by College of Agricultural Engineering & Technology, AAU, Godhra	19-09-2019	-

Sr. No.	Name of Teacher/Scientist	Participated in	Duration	
			From	To
7	Dr. A. Jana Dr. J.P.Prajapati Dr. Amit Patel Dr. Chetan Dharaiya Dr. Jarita Mallik Dr. Komal Patel Mr. Dhinal Patel Ms. Rachana Rathwa Dr. A.K. Makwana Mr. M.D.Gurjar Dr. K.C.Kamani Dr. M.C.Prajapati	One day seminar on “Dairy products or imitations-consumer’s dilemma” organized by SMC college of Dairy Science at AAU Anand	19-10-2019	-
8	Ms Rachana Rathwa	National Training on <i>Recent advances in membrane processing</i> organized by Dairy Technology Dept., ICAR, NDRI, Karnal	04-11-2019	24-11-2019
9	Ms Mital R Kathiriya Er Yogesh Vekariya	21 days Training “Orientation programme” (UGC- HRDC, V. V. Nagar)	04-11-2019	24-11-2019
10	Dr Atanu Jana	National Livestock and Poultry Show 2019, Assam	09-11-2019	-
11	Dr. B.M. Mehta Dr. A.I. Shaikh Dr. A.K. Jain Dr. S.C. Parmar Dr. Smitha B. Mr. S.I. Patel Ms. Sreeja V. Ms. Mital R Kathiriya Shri Kunal Gawai Dr. Subrota Hati Dr. A. Jana Dr. S. V. Pinto Dr. J. P. Prajapati Dr. Ajay Gokhale Dr. Amit Patel Dr. Chetan Dharaiya Dr. Jarita Mallik Dr. Komal Patel Mr. Dhinal Patel Ms. Rachana Rathwa Dr. Sunil Patel Dr. I. A. Chauhan Dr. A.K. Makwana Mr. M.D.Gurjar Dr. K.C.Kamani Dr. M.C.Prajapati	National Seminar on “New Developments in Dairy Sector: Issues and Strategies for Increasing Income of Rural Milk Producers of India” at AAU, Anand on 16 th November, 2019 organized by SMC College of Dairy Science, Anand Agricultural University, Anand	16-11-2019	-

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
12	Dr. B.M. Mehta Dr. A.I. Shaikh Dr. A.K. Jain Dr. S.C. Parmar Dr. Smitha B. Dr. Ajay Gokhale Dr. Amit Patel Dr. Chetan Dharaiya Dr. Jarita Mallik Dr. Komal Patel Mr. Dhinal Patel Ms. Rachana Rathwa Dr. Sunil Patel	Seminar on 'Biodynamic Farming' jointly organized by Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand held at FPT & BE, AAU, Anand.	09-12-2019	-
13	Dr. B.M. Mehta Dr. A.I. Shaikh Dr. A.K. Jain Dr. S.C. Parmar Dr. Smitha B. Mr. S.I. Patel Dr. J.B. Prajapati, Dr. Sreeja V, Shri Kunal Gawai, Dr. Subrota Hati, Ms. Mital R Kathiriya Dr. A. Jana, Dr. S.V.Pinto, Dr. J.P.Prajapati, Dr. Ajay Gokhale, Dr. Amit Patel, Dr. Chetan Dharaiya, Dr. Jarita Mallik, Dr. Komal Patel, Mr. Dhinal Patel, Ms. Rachana Rathwa Dr. Sunil Patel Dr I. A. Chauhan Er Yogesh Vekariya Er Arpita Rathva Er Ashish Patel	International Conference on "Fermented Foods, Health Status & Social wellbeing" at AAU, Anand	13-12-2019	14-12-2019
14	Dr. Chetan N. Dharaiya	National Training on <i>Emerging Trends in Bio-process Technology in Dairy and Food Processing</i> organized by Dairy Technology Dept., ICAR, NDRI, Karnal	15-01-2020	04-02-2020
15	Dr. S.V. Pinto	Workshop on "Curriculum: Farm income- market- food systems" NAHEP-CAAST project, IABMI, AAU, Anand	28-01-2020	-

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
16	Dr Atanu Jana, Dr. Komal Patel	National Conference on “Emerging Trends for Development of Functional Foods”, Maharashtra	06-02-2020	07-02-2020
17	Dr. JB Prajapati, Dr. Subrota Hati Dr. Smitha B. Dr Atanu Jana, Dr. Jarita Mallik, Dr. Amit Patel	Participated in 48 th Dairy Industry conference on “Dairying for Health & Wealth” organized by IDA north zone at B.M. Birla Auditorium, Jaipur.	20-02-2020	22-02-2020
18	Dr. B.M. Mehta Dr. A.I. Shaikh Dr. A.K. Jain Dr. S.C. Parmar Dr. Smitha B. Shri Kunal Gawai, Dr. Subrota Hati, Ms. Mital R Kathiriya Dr. A. Jana, Dr. S.V.Pinto, Dr. J.P.Prajapati, Dr. Ajay Gokhale, Dr. Amit Patel, Dr. Chetan Dharaiya, Dr. Jarita Mallik, Dr. Komal Patel, Mr. Dhinal Patel, Ms. Rachana Rathwa Dr. J. B. Upadhyay Dr. Sunil Patel Dr. I. A. Chauhan	Workshop on “Methodology for price forecasting, market competitiveness and export opportunities assessment for dairy & food products” at AAU, Anand during February, 28-29, 2020 organized by Centre for Agricultural Market Intelligence under NAHEP – CAAST and IABMI, AAU, Anand	28-02-2020	29-02-2020
19	Dr. J.B. Prajapati Dr. Sreeja V. Dr. Subrota Hati	Participated as an invited delegate in the 10th India Probiotic Symposium “Cutting edge science applications: Intestinal Microbiota and Probiotics” organized by the Gut microbiota and Probiotic Science Foundation (India), at the Suryaa, NewDelhi.	29-02-2020	01-03-2020

4) FACULTY OF AGRICULTURAL INFORMATION TECHNOLOGY

Sr. No.	Name of Teacher / Scientist	Participated in	Duration	
			From	To
1	Dr. J. V. Suthar	21 day training on Research and Development in Organic Farming: Current Status and Way Forward at MPAUT, Udaipur (Raj.)	01-06-2019	21-06-2019
2	Dr. N. M. Vegad	One day seminar on “Dairy products or imitations-consumer’s dilemma” organized by SMC college of Dairy Science at AAU Anand	19-10-2019	-
3	Dr. D.R. Kathiriya Dr. N. M. Vegad Dr. D.K. Parmar	Training on “Writing skills for print and electronic media” at EEI, AAU, Anand	21-10-2019	25-10-2019
4	Dr. J. V. Suthar Dr. N. M. Vegad	One day seminar on “Biodynamic Farming” at Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand.	09-12-2019	-

5) FACULTY OF FOOD PROCESSING TECHNOLOGY AND BIO-ENERGY

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
1	Dr. A.K. Sharma, Dr. H. Pandey	A GIAN Short Term course on ‘Microwave Heating and Processing of Foods’, IIT Bombay, Mumbai	13-05-2019	17-05-2019
2	Dr. K.V. Vala	ETI training of Programme Officer NS-SETI at Gujarat Vidyapith, Ahmedabad	22-07-2019	27-07-2019
3	Dr. A.K. Sharma	Industry - R&D Interaction on Large Scale Deployment of Radiation Processing of Food Commodities (TMRP-FC-2019) at Food Technology Division, Bhabha Atomic Research Centre, Mumbai BARC, Anushaktinagar, Mumbai	17-08-2019	-
4	Dr. G.P. Tagalpallearwar Mr. K.S. Damle	The training programme on Bioprocessing / Food Processing / Packaging / Product / Marketing / Export in reference to Food Processing organised by ICAR at BHU, Varanasi	05-09-2019	25-09-2019
5	Dr. G.P. Tagalpallearwar	Training programme on Food Safety Management Systems (ISO 22000:2018) with reference to HACCP (IS 15000:2013) CAFT training at BHU, Varanasi.	06-09-2019	08-09-2019

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
6	Dr. G.P. Tagalpallearwar	Second state level convention on Doubling Framers' Income through Recourse Management and Rural Prosperity held at Anand Agricultural University, Anand	12-10-2019	13-10-2019
7	Dr. H. P. Sharma	ICAR winter school ON Emerging and Innovative Technologies in Agriculture & Food Engineering. GBPUAT, Pantnagar, UK	01-11-2019	21-11-2019
8	Dr. A.K. Sharma Dr. H. Pandey	Capacity Building Workshop, KRISHIK-Agri Business Incubator, University of Agricultural Sciences, Dharwad	05-11-2019	07-11-2019
9	Dr. S.H. Akbari	National Agricultural Higher Education Project (NAHEP) Meet, JAU, Junagadh	27-11-2019	-
10	Er. T. H. Bhatt Dr. K.V. Vala Dr. G.P. Tagalpallearwar Dr. K.V. Vala	Seminar on 'Biodynamic Farming' jointly organized by Zonal Chapter Gujarat Association for Agricultural Sciences (GAAS)& BACA Alumni Association at FPT& BE , AAU Anand	09-12-2019	-
11	Dr. A.K. Sharma Dr. H. Pandey	Startup & Technology Summit, Vibrant Gujarat Summit 2019 at Gandhinagar, Government of Gujarat	12-12-2019	-
12	Dr. A. Ravani Dr. G.P. Tagalpallearwar Dr R.B. Modi Dr. H. Pandey Dr. S.H. Akbari Dr. H. P. Sharma	International Conference on "Fermented Foods, Health Status & Social wellbeing" at AAU, Anand	13-12-2019	14-12-2019
13	Dr. A.K. Sharma, Dr. H. Pandey	10 th Asia Pacific Drying Conference (ADC-2019) in Vadodara, India	14-12-2019	17-12-2019
14	Dr. H. P. Sharma	International symposium on Artificial Intelligence based future technologist in Agriculture. MPKV, Rahuri, (MH).	07-01-2020	09-01-2020
15	Dr. S.H. Akbari Dr. S.S. Kapdi Dr. A.K. Sharma Dr. K.V. Vala Dr. A. Nema Dr. H.P. Sharma	54 th Annual Convention of Indian Society of Agricultural Engineers (ISAE) 'Agricultural Engineering Technologies for Start-ups' and International Symposium 'Artificial intelligence based future technologies in agriculture' at Dr. Annasaheb Shinde College of Agricultural Engineering and Technology, Mahatma PhuleKrushividyalaya, Rahuri	07-01-2020	09-01-2020

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
16	Er. T.H. Bhatt	Workshop cum training on 'Remote Sensing, Data Science and Agro Block chain for Market Intelligence' IABMI, AAU, Anand	31-01-2020	02-02-2020
17	Dr. S.H. Akbari	Indian Horticulture Summit-2020 at Chitrakoot, M.P.	14-02-2020	16-02-2020
18	Er. T.H. Bhatt, Dr. A.Ravani, Dr. G.P. Tagalpallewar	Workshop on 'Methodology for Price forecasting , market competitiveness and export opportunity assessment for dairy and food' IABMI, AAU, Anand	28-02-2020	29-02-2020

6) FACULTY OF AGRICULTURAL BUSINESS MANAGEMENT

Sr. No.	Name of the Scientist/Teacher	Participated in	Duration	
			From	To
1	Dr. C. R. Dudhagara	One Week Workshop / Training on "ICT Applications, Use of M-Kishan Portals and Digital Learning in Agriculture & Allied Fields" at Extension Education Institute, Anand Agricultural University, Anand	22-07-2019	27-07-2019
2	Dr. Ritambhara Singh	Training on Application of Remote Sensing and Geographic Information System (GIS) in Agricultural Development, EEI, Anand	05-08-2019	08-08-2019
3	Dr. C. R. Dudhagara	Attended a Workshop on "GIS using IGiS – GIS & Image Processing" at College of Agricultural Information Technology, AAU – Anand	19-08-2019	19-08-2019
4	Dr. A. B. Mahera Dr. Ritambhara Singh	Six days Workshop on "Entrepreneurship Development for Rural Transformation" organized by EEI, Anand	16-09-2019	21-09-2019
5	Ms. Snehal Mishra	21 days training on "Analytical Approaches on Doubling Farmers Income" at division of Agricultural Economics, ICAR-IARI, New Delhi	01-10-2019	21-10-2019
6	Dr. Y.C. Zala	State Convention on "Doubling Framers' Income through Resource Management and Rural Prosperity" organised by Agrivision, Gujarat in coloration with Nidhi Trust, Ahmedabad and AAU, Anand	12-10-2019	13-10-2019

Sr. No.	Name of the Scientist/Teacher	Participated in	Duration	
			From	To
7	Ms. Vishita Khanna	Workshop on “Data Analysis using R for Beginners” organized by Ganpat University- Centre for Management studies and Research	21-10-2019	23-10-2019
8	Dr. A. B. Mahera Ms. Snehal Mishra Dr. M. R Prajapati	One day national seminar on, “Leveraging new developments in dairy sector for increasing income of milk producers”, organized by S.M.C. college of Dairy Science, Anand Agricultural University, Anand, Gujarat	16-11-2019	-
9	Dr. S. R. Panigrahy,	Training / Workshop on “Recent Advances in Sample Survey and Data Analysis using Statistical Software” at ICAR- Indian Agricultural Statistics Research Institute, New Delhi	28-11-2019	18-12-2019
10	Dr. Y. A. Lad Dr. Ritambhara Singh	Seminar on “Biodynamic Farming” Jointly organized by Zonal Chapter GAAS, BACA Alumini Association and Anand Agricultural University At Anand	09-12-2019	-
11	Ms. Vishita Khanna Dr. Y. A. Lad Dr. A. B. Mahera Dr. Ritambhara Singh	Workshop on “ Price Forecasting: Methodology and Approaches” organized by NAHEP- CAAST at IABMI, AAU	19-12-2019	21-12-2019
12	Dr. C. R. Dudhagara	CAFT Programme on “Statistical and Machine Learning Techniques for Modeling and Forecasting Agricultural Data” at ICAR – Indian Agricultural Statistics Research Institute (ICAR-IASRI), New Delhi	20-12-2019	09-01-2020
13	Dr. A. B. Mahera	21 days winter school on “Entrepreneurial Skill Development of Rural Youth through Innovative Approach” at Department of Extension Education, CCAS, MPUAT, Udaipur, Rajasthan	04-01-2020	24-01-2020
14	Dr. M. R. Prajapati	5 th Faculty Development Programme: Statistical Tools & Techniques through SPSS organized by UGC- HRDC S. P. University, V. V. Nagar	06-01-2020	12-01-2020
15	Dr. C. R. Dudhagara Ms. Vishita Khanna Dr. Y. A. Lad Dr. A. B. Mahera Dr. M. R. Prajapati Dr. Ritambhara Singh	Workshop cum Training on “Remote sensing, Data Science and Agro-Block chain for Market Intelligence” organized by NAHEP-CAAST, AAU, Anand	31-01-2020	02-02-2020

Sr. No.	Name of the Scientist/Teacher	Participated in	Duration	
			From	To
16	Dr. C. R. Dudhagara Ms. Vishita Khanna Dr. Y. A. Lad Dr. A. B. Mahera Dr. M. R. Prajapati Dr. Ritambhara Singh	Workshop on “Role of farmer producer organization (FPOS) in enhancing farmers’ income” organized by NAHEP-CAAST, AAU, Anand	12-02-2020	13-02-2020
17	Dr. Y. A. Lad Ms. Snehal Mishra Dr. Ritambhara Singh	Workshop cum Training on “Market Analytics with R-Phase I” organized by NAHEP- CAAST at IABMI, AAU	24-02-2020	26-02-2020
18	Ms. Vishita Khanna Dr. Y. A. Lad Dr. M. R. Prajapati Dr. Ritambhara Singh	Workshop cum Training on “Methodology for Price Forecasting, Market Competitiveness and Export Opportunities Assessment for Dairy and Food Products” organized by NAHEP-CAAST at IABMI, AAU	28-02-2020	29-02-2020
19	Ms. Vishita Khanna Dr. Y. A. Lad Ms. Snehal Mishra Dr. Ritambhara Singh	Workshop cum Training on “Market Analytics with R-Phase II” organized by NAHEP- CAAST at IABMI, AAU	02-04-2020	04-03-2020

7) FACULTY OF AGRIL ENGINEERING AND TECHNOLOGY

Sr. No.	Name of Teacher/ Scientist	Participated in	Duration	
			From	To
1	Dr. Mukesh Tiwari	ICARsponsoredCAFTNationalTraining Programme on “Recent Advances in Crop Micrometeorology” at Centre for Advanced Faculty Training (CAFT) in Agril. Meteorology, Department of Agricultural Meteorology, College of Agriculture, MPKV, Pune	17-09-2019	07-10-2019
2	Dr. Brijesh Amin	Training on Renewable Energy for Environmental Protection & Energy Conservation at REE Dept. CAET, Godhra	14-10-2019	23-10-2019
3	Dr. Gautam Kamani	Training Program on Innovations in Educational Technology at NAARM, Hyderabad.	13-11-2019	22-11-2019
4	Dr. K. L. Dabhi	ICAR sponsored Winter School training programme on “Application of Sensors, Instrumentation, artificial intelligence and machine learning in Precision Agriculture at CIAE, Bhopal	14-02-2020	05-03-2020
5	Dr. D. K. Vyas Er. J. J. Chavda	One day training program on “Renewable Energy Sources & Environment Protection” at Mahatma Gandhi Institute for Integrated Rural Energy and Development (MGIRED)	26-02-2020	-

Appendix - 8

NAME & DETAILS OF THE DIGNITARIES VISITED

Sr. No.	Name	Date of visit
1	Dr. A. L. Pharande, Dean, Faculty of Agriculture & Director of Instruction MPKV, Rahuri (MH)	14-05-2019
2	Dr. Madhuri Joshi, DEE, SKN Ag. Univ., Jobner	16-05-2019
3	Dr. S. N. Puri former Vice Chancellor MPKV, Rahuri and CAU, Imphal along with Dr. Patil B. V. former Vice Chancellor, UAS, Raipur and Biocontrol Expert	07-06-2019
4	Mrs. Francoise Moreau Lalanne, Counsellor for Agricultural Affairs, French Embassy in India, New Delhi	12-06-2019
5	Dr. Sakthi Kumaran Subburayalu, Scientist, School of Environment and National Sciences, Central State University, USA Dr. Eric Ariel L. Salas, Post-Doc Fellow, School of Environment and National Sciences, Central State University, USA Dr. Brian Slater, Associate Professor and Associate Director, The Ohio State University, USA	15-06-2019
6	Dr. B. R. Shah, Hon. Vice Chancellor, Organic University, Mandvi, Halol	11-07-2019
7	SAARC comprising of 35 members led by Dr. Rudra B., Policy Advocacy, along with two officials (Shri Hrishikesh Kumar and Shri Denzil Dias) from NDDB, Anand	24-07-2019
8	Jaydrathsinh Parmar, Hon. Agriculture Minister (State Level) , Govt. of Gujarat	23-08-2019
9	A team from GNFC comprising of Mr. Manish Billore, Additional General manager, Mr. M. I. Patel, and Mr. D. J. Adhvaryu Sr. Marketing manager, GNFC, Bharuch	25-09-2019
10	Dr. B. R. Shah, Vice Chancellor, Gujarat Organic Agricultural University	04-10-2019
11	Dr. G. Padmavathi, Dr. V. Jhansi Laxmi, Principal Scientist, (IIRR,Hyderbad) and Dr. Guru P.Pandia, Scientist, NRRI, Cuttack	20-10-2019
12	Ms. Balde Fatoumata, Honorable Ambassador, Republic of Guinea, Africa	08-11-2019

Sr. No.	Name	Date of visit
13	Dr. K.S. Khokhar, Ex-Vice Chancellor, CCSHAU, Hisar; Dr. Sudhir Raizada, Ex-ADG (Fisheries); Dr. A.K. Mehta, Ex-ADG (Agril Extension); Dr. RPS Ratan, Ex-Director of Extension, BAU, Ranchi; Dr. Indrajeet Mathur, Ex-Director of Extension, MPUAT, Udaipur & Dr. Lakhan Singh, Director, ICAR-ATARI, Pune visited KVK, Devataj	25-11-2019
14	Dr. N. Rana, Controller of Examination (Agri. Edu.), ICAR, New Delhi	13-12-2019
15	Dr. Digvir Jayas, Vice President, University of Manitoba, Canada	17-12-2019
16	Dr. Rameshwar Singh, Hon. Vice Chancellor, BASU, Patna	17-12-2019
17	A team of scientists / faculty of Agriculture University, Kota	26/27-12-2019
18	Dr. Ramlakhan Singh, Professor, Biochem. & Coordinator, Biotech Programme, Dr. Rammanohar Lohia Avadh university, Ayodhya	15-01-2020
19	Dr. R. L. Singh, Vice Chancellor, Nilambar-Pitambar University, Jharkhand	15-01-2020
20	Dr. R. C. Agarwal, DDG(EDU), ICAR, New Delhi	24-01-2020
21	Terry Tucker, Cornell University, New York	27-01-2020
22	Prof. VO Netshandama, Director community Engagement, University of Venda	15-02-2020
23	Dr. P. Vijayakumar, Programme Co-ordinator, AICRAPAM, CRIDA and other scientists from 25 AICRPAM center of different state from India	02-03-2020 to 07-03-2020
24	Dr. R.P Dubey, Principal Scientist, DWR, Jabalpur	17-03-2020 to 19-03- 2020



INDIAN COUNCIL OF AGRICULTURAL RESEARCH NEW DELHI

NATIONAL AGRICULTURAL EDUCATION ACCREDITATION BOARD

CERTIFICATE OF ACCREDITATION

On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi hereby grants accreditation to the **Anand Agricultural University, Anand (Gujarat)** and its following constituent colleges upto March 31, 2021.

- B.A. College of Agriculture, Anand
- Sheth M.C. College of Dairy Science, Anand
- College of Agricultural Engineering & Technology, Godhra
- College of Food Processing Technology & Bio-Energy
- College of International Agri-Business Management Institute
- College of Veterinary Sciences and Animal Husbandry, Anand

The accredited academic programmes are listed overleaf.

November, 2017
New Delhi

(Narendra Singh Rathore)
Deputy Director General (Agril. Edn.), ICAR
and Vice-Chairman, NAEAB

(Trilochan Mohapatra)
Secretary, DARE & Director General, ICAR
and Chairman, NAEAB

