



RESEARCH REPORT



Research Chapter -4 2019-20

COLLEGE OF HORTICULTURE
ANAND AGRICULTURAL
UNIVERSITY

College of Horticulture
Anand Agricultural University, Anand
16TH ANNUAL REPORT OF THE YEAR 2019-20
Performa: A (Part I)

1. Importance of Research Centre / Department along with work carried out during 2019- 20 (in brief):

The prime mandate of College of Horticulture is to impart education in the field of horticulture science coupled conducting research on various disciplines like fruit, vegetable, flower as well as on postharvest technology. During the year 2019-20 following experiments were conducted under different departments of College of Horticulture:

Vegetable Science Dept.:

- i. Evaluation of vegetables during different season under different shade net condition

Fruit Science Dept.:

- i. Effect of different organic manures and PGPR consortium on growth, yield and quality of sapota (*Manilkara hexandra L.*) cv. Kallipatti
- ii. High density plantation and canopy management in mango cv. Kesar

Floriculture and Landscape Architecture Dept.:

- i. Effect of spacing and nitrogen on growth, flowering, yield and shelf life of desi rose under middle Gujarat conditions
- ii. Evaluation of different chrysanthemum genotypes (loose flower) for yield and growth parameters
- iii. Feasibility of use of Reverse Osmosis (RO) waste water in gaillardia

Natural Resource Management Dept.:

- i. Nutrient management through organics in broccoli (*Brassica oleracea var. italica L.*)

Plant Protection Dept.:

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

Crop Improvement Dept.:

- i. Induction of mutation in rose and lilly

Post Harvest Technology Dept.:

- i. Technology for production of Indian gooseberry (aonla) murabba
- ii. Development of production technology for vegetable based juice from carrot and tomato

- iii. Standardization of moringa pulping technique using brush type pulper

Basic Science Dept.:

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

2. Research recommendations with photographs (2019-20):

I. Floriculture and Landscape Architecture Dept.:

Effect of rooting media on propagation of African marigold (*Tagetes erecta* L.) cv. Calcutta Selection through herbaceous shoot tip cutting under net house:

Recommendation for farming community

Farmers/nurserymen cultivating marigold in middle Gujarat agroclimatic zone are recommended to propagate 4-5 cm long herbaceous shoot tip cuttings of African marigold cv. Calcutta Selection in plug tray media of Sandy loam soil + FYM (1:1) OR FYM alone OR Sandy loam soil + Vermicompost (1:1) OR Vermicompost alone for getting higher survival of plants/cuttings and net profit.

Note: Cuttings of marigold are to be planted into the plug tray after dipping them in 150 mg/L IBA solution for 10 min. under 50% green shade net condition.



Overview of experiment

II. Vegetable Science Dept.:

Effect of different plant spacing on growth and yield of capsicum under open ventilated poly house:

Recommendation for farming community

The farmers of middle Gujarat agro climatic zone growing capsicum under open ventilated polyhouse are advised to transplant capsicum in paired row system with spacing of 45 – 85 – 45 cm × 30 cm in raised bed for getting higher yield and net return. The bed should be prepared 40 cm apart with 90 cm base width, 75 cm top width and 45 cm height. The farmers of middle Gujarat agro climatic zone growing capsicum under open

ventilated polyhouse are advised to transplant capsicum in paired row system with spacing of 45 – 85 – 45 cm × 30 cm in raised bed for getting higher yield and net return. The bed should be prepared 40 cm apart with 90 cm base width, 75 cm top width and 45 cm height.



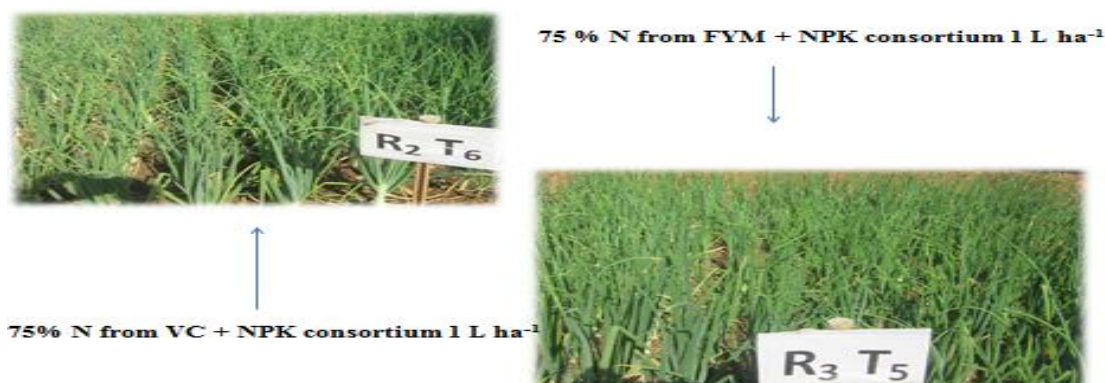
Overview of experiment

III. Natural Resource Management Dept.:

Nutrient management through organics in onion *Allium*:

Recommendation for farming community

The farmers of middle Gujarat agro climatic zone growing onion organically in sapota orchard during initial years are recommended to apply either 75 kg N/ha through FYM + bio NPK consortium 1 L/ha in soil or 75 kg N/ha through vermicompost + bio NPK consortium 1 L/ha in soil for getting higher yield and net return, and maintaining soil health.



Overview of experiment

IV. Plant Protection Dept.:

Bio-efficacy of agrochemical against bacterial canker (*Xanthomonas axonopodis* pv. *citri*) in citrus:

Recommendation for farming community

Farmers of Middle Gujarat (Agro-climatic zone III) are advised to spray tank mixed solution of streptomycin sulphate 90% + tetracycline hydrochloride 10% SP, 100 ppm (1gm/10litre) (streptocycline) and copper oxychloride 50WP, 0.1% (20gm/10litre), first at initiation of disease and subsequent three sprays at 20 days interval for effective and economical management of bacterial canker in citrus.



3. Output during 2019-20 [No. of trials allotted (new / ongoing) and conducted successfully]

No. of ongoing trails : 14
 No. of new trails : 04

4. Salient achievements during the year with photographs and information (Other than approved recommendation): NIL

5. Variety/ Breed/ Machinery etc. Released / developed with brief information and photographs.: NIL

6. For breeding: Generation wise detail and new crosses made during the year: NIL

7. Seed production information: NIL

8. Project title and financial outlay under projects of:

Budget Head: 12987-16

Year	Recurring			Non-recurring		
	Sanction grant	Expenditure	Balance	Sanction grant	Expenditure	Balance
2019-20	37,00,000	35,49,637	1,50,363	7,86,000	7,66,527	19,473

Budget Head: 12712-02

Year	Recurring			Non-recurring		
	Sanction grant	Expenditure	Balance	Sanction grant	Expenditure	Balance
2019-20	11,50,300/-	11,50,300/-	NIL	----	----	----

9. Awards / Honors etc. information with photographs: NIL

10. Important events

10 A. Seminar / Symposia / Conference / Training organized: NIL

10 B. University teachers who have participated in Seminar/Symposia/Conference /Training: Appendix - 1

10 C. Names and Details of dignitaries visited: NIL

Performa: A (Part II)

11. List of Research paper published during the year 2019-20:

No. of research papers published in scientific journal 2019-20	International Journal	09
	National Journal	04

International journal

1. Masu, M. M., Patel, J. S., Shah, N. I. and Patel, H. C. (2019). Effect of integrated nutrient management on growth and flower yield of chrysanthemum (*Chrysanthemum coronarium* L.) cv. Local. *Int. J. Chem. Studies*, 7 (5): 2563-2565.
2. Patel, J. S., Masu, M. M., Shah N. I. and Patel H. C. (2019). Effect of plant growth regulators on growth, flowering and flower yield of desi red rose (*Rose damascene* L.) *Int. J. Chem. Studies*, 7 (5):1944-46.
3. Parmar, A.B., Patel, H.C., Patel, D. D. and Parmar, J. R. (2019). Effect of pruning and plant growth regulators on fruit quality of guava (*Psidium guajava* L.) cv. Allahabad Safeda, *Int. J. Chem. Studies*, 7(4):858-862.
4. Thakur, Komal, Satodiya B.N. and Parmar S.K. (2019). Effect of integrated nutrient management on growth, yield and economics of brinjal (*Solanum menongena*) cv. GABH 3. *Int. J. Chem. Studies*, 7(4): 1440-1442
5. Raut H.R. & Kotecha A.V. (2019). Effect of GA₃, NAA and biofertilizers on seedling growth of custard apple (*Annona squamosa* L.) cv. Local, *Int. J. Chem. Studies*, 8(1):195-99.
6. Nadoda S.R, Kotecha A.V., Vaghela K.S. and Aal J.M. (2020). Effect of different organic manures and PGPR consortium on quality of bottle gourd (*Lagenaria siceraria* MOL. STANDL.) CV. Anand bottle gourd-1, *Int. J. Chem. Studies*, 8(2): 1842-1845
7. Nadoda S.R, Kotecha A.V., Vaghela K.S. and Aal J.M. (2020). Effect of different organic manures and PGPR consortium on growth and yield of bottle Gourd (*Lagenaria siceraria* Mol. Standl.) CV. Anand Bottle Gourd-1, *Int. J. Cur. Microbio & App. Scs.* 9(3): 1467-1474
8. Barad A.J., Singh S.K., Bhagora G.J. and Barad, A.H. (2019). Efficacy of Different Fungicides against *Exserohilum turcicum* Causing Turcicum Leaf Blight Disease in Maize. *Int. J. Curr. Microbiol. App. Sci* 8(8): 108-114.
9. Patel, S. J., Parekh, D. D. and Aal, J. A. (2019). Effect of foliar application of humic acid, salicylic acid and novel liquid on fruit drop and yield of mango (*Mangifera indica* L.) cv. Amrapali. *Int. J. Chem. Studies*, 7(5): 4558-4560.

ii. National journal

1. Parmar, S.K., Satodiya B.N., Raval C.H. and Thakur, Komal (2019). Influence of plant geometry and integrated nutrient management on growth and yield of cluster bean (*Cyamopsis tetragonaloba* L. Taub) cv. Pusa Navbahar. *J. pharmacology and phytochemistry*, 8(5):2138-2140.
2. Patel, Hiral and Gajera R.R. (2019). Effect of dehydration on quality of bottle gourd shreds. *Chem. Scs. Review and Letters*, 8(32): 216-219
3. Raol, J.B., Gajera, R.R., and Kumpavat, M.T. (2019). Quality Characteristics of Paneer from Solar Assisted Heat Exchanger. *Chem. Scs. Review and Letters*, 8(31): 132-136
4. Patel Hiral A. and Gajera R.R. (2019). Effect of steam blanching on bottle gourd shreds, *J. Medicinal Plants Studies*, 7(5): 01-03

12. Number of abstract/research paper presented at Seminar/ symposia etc. for 2019-20:

No. of papers/abstracts published in seminar/symposia/conference 2019-20	International	00
	National	06

i. International level: NIL

ii. National level:

1. Satodiya B.N., Bhatt A.H., Maheriya P.A. and Shah N I (2020). Effect of plant geometry on growth and yield of capsicum under open ventilated polyhouse. Paper presented in Indian Horticulture Summit -2020 “Mitigating Climate changes for Doubling Farmers’ Income through Diversification.Organized at Mahatma Gandhi Chitrakoot Gramodya Vishwavidyalaya,Chitrakoot, M P. during 14-16, February, 2020.
2. Gajera R. R., Sharma H and Nema A (2019). The Atkins Diet: Newer Food Concept. Agrivision. An abstracts presented in 2nd State Level Convention on Doubling Farmers’ Income through Resource Management and Rural Prosperity, Anand Agricultural University, Anand, Gujarat during 12-13 October, 2019.
3. Gajera R. R, Doshi J S and Ravani A (2019). Crispr Technology: Promising For Desired Food Formulations. Agrivision. An abstracts presented in 2nd State Level Convention on Doubling Farmers’ Income through Resource Management and Rural Prosperity, Anand Agricultural University, Anand, Gujarat during 12-13 October, 2019.
4. Gajera R. R., Sharma H and Nema A (2020). Production Technology of Juices from the Horticultural Crops. An abstracts presented in 54th Annual convention of ISAE and International Symposium on Artificial Intelligence based Future Technologies in Agriculture was held at MPKV, Rahuri during January 07-09, 2020.
5. Gajera R. R., Nema A and Sharma H (2020). Decontamination in Food Industry by [Pulsed UV-C](#) Robot. An abstract published in souvenir; 54th Annual convention of ISAE and International Symposium on Artificial Intelligence based Future Technologies in Agriculture was held at MPKV, Rahuri during January 07-09, 2020.
6. Gajera R. R, Parmar M R and Sardar N R (2020). Harvesting Clean Energy from Rainfall. An abstract published in souvenir; 54th Annual convention of ISAE and International Symposium on Artificial Intelligence based Future Technologies in Agriculture was held at MPKV, Rahuri during January 07-09, 2020.

iii. Popular articles published for the year 2018-19:

1. Patel H. C. and Parmar, A. B. (2019). *Falo na chat-pata masaleder athana*, **Krushhi Govidhya**, pp: 19-22.
2. Patel H. C. and Parmar, A. B. (2019). Savanthi ni kheti padhdhati, **Gujarat Bagayat vikas parishad**, (76) pp: 4-6.
3. Patel H. C. and Parmar, A. B. (2019). *Seasonal sevanthi ni vaigyanik kheti*, **Gujarat Bagayat vikas parishad**, (76) pp: 10-12.
4. Patel H. C. (2019). *Different uses of coconut*, **Gujarat Bagayat vikas parishad**, pp: 10-12.
5. Patel H. C. and Parmar, A. B. (2019). *Nadiaeri na vividh upayogo*, **Gujarat Bagayat vikas parishad**, (78), pp:48-51
6. Satodiya, B. N. and Paradva, D. R. (2019). *Naliyelna Pakni Ropani Purve Taiyari, ane Ropani*. **Gujarat Bagayat Vikash Parishad**, pp. 10-12
7. Satodiya, B. N. and Paradva, D. R. (2020). *Naliyelna Pakne Anukul Jamin Tatha Havaman*. **Gujarat Bagayat Vikash Parishad**. pp: 7-9.
8. Choudhari U. C and Paradva D. R (2019). *Phuloma seed production*. **Gujarat Bagayat vikas parishad**, pp: 68-71
9. U. C Choudhari and Paradva D. R (2019): *Deshi gulamni kheti paddhati* **Gujarat Bagayat Vikas Parishad**, Pp:44-46
10. Parekh, D. D., Patel S. J., and Parmar, A. B. (2019). *Gladiolus ni vaigyanik kheti*, **Krushhi go Vidya** Pp: 19-22
11. Parmar, A. B. and Parekh, D. D. (2019). *Spider Lily*, **Fuloni Vyaparic Kheti, Gujarat Bagayat vikas parishad**, Pp:7 – 12.
12. Patel, A. P., Parekh, D. D. and Masu, M. M. (2019). *Fuloni Vyaparic Kheti, Rajnigandhani kheti paddhati*, **Gujarat Bagayat vikas parishad** Pp:21-23.
13. Parekh, D. D., Masu, M. M. and Patel, A. P. (2019). *Fuloni Vyaparic Kheti, Fulakoma vrudhiniyantrakono upyog*, **Gujarat Bagayat vikas parishad**, Pp:72-76.
14. Barad, A. H., and Prajapati H.N. (2019). *Ful Pakkoni jivato ane tenu niyantran*, **Fuloni vyaparic kheti visheshan**, **Gujarat bagayat vikash Parishad**,(76), pp: 49-54.
15. Prajapati H.N. and Barad, A. H. and (2019). *Ful Pakkoni rogo ane tenu niyantran*, **Fuloni vyaparic kheti visheshan**, **Gujarat bagayat vikash Parishad**,(76), pp: 55-58.
16. Barad, A. H., and Prajapati H.N. (2019). *Kheti pakkoma udhaithi thatu nukshan ane tenu vyavasthapan, one day seminar on krushi ane bagayati pakoma pravartnan pak sarnkshanna prashno ane nirakaran,organized by PPAG, 8 Nov. PP. 20-21.*
17. Gajera R. R. (2019). *Processed food products visheni samaj*, **Krushhi Govidhya**, 72 (08), pp: 37.
18. Gajera R. R. (2019). *Naliyerina pakma mulyavardhan*, In: *Naliyerina pakni adhunik sankalit kheti padhdhati*, **Gujarat bagayat vikash Parishad**,(78), pp: 37-42.
19. Gajera R. R. (2019). *Naliyerina Pakma Mulyavardhan*, **Krushhi Govidhya**, 72 (07), pp: 38-41.
20. Gajera R. R. (2019). *Bakery Udyog, a box matter*, **Krushhi Govidhya**, 72 (06), pp:50.
21. Gajera R. R. (2019). *Anajno Sangrah, a box matter*, **Krushhi Govidhya**, 72 (06), pp: 50.
22. Gajera R. R. (2019). *Soyabeanma processing ane mulyavardhan*, **Krushhi Govidhya**, 72(05), pp:22-25.
23. Gajera R. R. (2019). *Shakbhaji ane tena processing ma enzymenu mahatav*, **Krushhi Jivan**, 52 (02), pp: 30-32.

13. Books / Book chapters published:**i. Books/ Booklets:**

Sr. No.	Name of Book	Name of Authors	Name of Publisher
1.	Hydroponics and Aeroponics	Satodiya B.N., Maheriya P.A., Patel P.C. and Sipae A.S.	Director of Extension Education, Anand Agricultural University, Anand,

ii. Book chapter: NIL**APPENDIX-1****University teachers who have participated in Seminar/Symposia/Conference Training during the year 2019-20:**

Sr. No.	Name of Teacher/ Scientist	Participated	Duration
1.	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 to 10.05.2019
2.	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
3.	Dr. A. H. Barad, Dr. H. N. Prajapati and Dr. Amita Parmar	Seminar on “krushi ane bagayati pakoma pravartnan pak sarnkshanna prashno ane nirakaran” held at AAU, Anand	08.09.2019
4.	Dr. H. N. Prajapati	Seminar on “Doubling farmers income through resource management and rural prosperity” held at AAU, Anand	12.10.2019 to 13.10.2019
5.	Dr. R. R. Gajera, Dr. A. V. Kotecha, Dr. D. D. Parekh, Dr. A. H. Barad, Dr. H. N. Prajapati, Dr. C. H. Raval & Prity Kumari	Seminar on “Biodynamic Farming”, organized by Zonal Chapter GAAS, BACA Alumni Association and Anand Agricultural University, Anand held at FPTBE College, AAU, Anand	09.12.2019
6.	Dr. Prity Kumari	Workshop cum training Programme on “Price forecasting: Methodology & Approaches” under project named "Establishing centre for Agricultural market Intelligence at A.A.U., Anand" sponsored by ICAR, New Delhi and NHAEP-CASST, at AAU	19.12.2019 to 21.12.2019
7.	Dr. Prity Kumari	Workshop cum training Programme on “Remote Sensing, Data science and Agro Block Chain for market Intelligence” under project named "Establishing centre for Agricultural market Intelligence at A.A.U., Anand" sponsored by ICAR, New Delhi and NHAEP-CASST, at AAU	31.01.2020 to 02.02.2020
8.	Dr. Prity Kumari	Workshop cum training Programme on “Role of farmer Producer organization in Enhancing Farmer’s Income” under project named "Establishing centre for Agricultural market Intelligence at A.A.U., Anand" sponsored by ICAR, New Delhi and NHAEP-CASST, at AAU	12.02.2020 to 13.02.2020
9.	B.N. Satodiya	Indian Horticulture Summit-2020, organised by Mahatma Gandhi Chitrakoot Gramodya Vishwavidyalaya, Chitrakoot, MP	14.02.2020 to 16.02.2020

Performa: B

Name of Unit: College of Horticulture

Details of Seminar/ Symposia/ Conference/ Training attended by the faculties

1	Total number of national seminar attended by total faculty in the year	05
2	Total number of international seminar attended by total faculty in the year	00
3	Total number of workshop & conferences attended by total faculty in the year	03
4	Total number of research papers presented by faculty at conferences in India & abroad during the year	01
5	Number of research contribution to Scopus till date by permanent faculty	00
6	Number of research contribution to Scopus by permanent faculty	00
7	Total number of research publications of existing permanent faculty in national journals	04

Details of Research Publications (National):

Name of Faculty Member	Name of the Research Paper	Year of Publication	Name of the Journal
B.N. Satodiya	Influence of plant geometry and integrated nutrient management on growth and yield of cluster bean (<i>Cyamopsis tetragonoloba</i> L. Taub) cv. Pusa Navbahar	2019	J. pharmacology & phytochemistry.
R.R. Gajera	Effect of dehydration on quality of bottle gourd shreds	2019	Chem. Scs. Review and Letters
	Quality Characteristics of Paneer from Solar Assisted Heat Exchanger	2019	Chem. Scs. Review and Letters
	Effect of steam blanching on bottle gourd shreds	2019	J. Medicinal Plants Studies

8 Total number of research publications of existing permanent faculty in international journals: **09**

Details of Research Publications (International):

Name of Faculty Member	Name of the Research Paper	Year of Publication	Name of the Journal
H. C. Patel	Effect of integrated nutrient management on growth and flower yield of chrysanthemum (<i>Chrysanthemum coronarium</i> L.) cv. Local	2019	Int. J. Chem. Studies
H. C. Patel	Effect of plant growth regulators on growth, flowering and flower yield of desi red rose (<i>Rose damascene</i> L.)	2019	Int. J. Chem. Studies
A.B. Parmar & H. C. Patel	Effect of pruning and plant growth regulators on fruit quality of guava (<i>Psidium guajava</i> L.) cv. Allahabad Safeda	2019	Int. J. Chem. Studies

B.N. Satodiya	Effect of integrated nutrient management on growth, yield and economics of brinjal (solanum menongena) cv.GABH 3	2019	Int. J. Chem. Studies
A.V. Kotecha	Effect of GA ₃ , NAA and biofertilizers on seedling growth of custard apple (Annona squamosa L.) cv. Local	2019	Int. J. Chem. Studies
	Effect of different organic manures and PGPR consortium on quality of bottle gourd (Lagenaria siceraria MOL. STANDL.) CV. Anand bottle gourd-1	2020	Int. J. Chem. Studies
	Effect of different organic manures and PGPR consortium on growth and yield of bottle Gourd (Lagenaria siceraria Mol. Standl.) CV. Anand Bottle Gourd-1	2020	Int. J. Cur. Microbio & App. Scs.
A. H. Barad	Efficacy of Different Fungicides against Exserohilum turcicum Causing Turcicum Leaf Blight Disease in Maize	2019	Int. J. Cur. Microbio & App. Scs.
D. D. Parekh	Effect of foliar application of humic acid, salicylic acid and novel liquid on fruit drop and yield of mango (Mangifera indica L.) cv. Amrapali	2019	Int. J. Chem. Studies

9 Total number of books published by existing permanent faculty in the year: 01

Number and value of research projects undertaken by the University with various organization in the year		
Sr. No.	Research Projects	Number / Value
1	Number of research projects	NIL
2	Total value of research projects (Rs. Lakhs)	
Sr. No.	Consultancy Projects	Number / Value
1	Number of consultancy projects	NIL
2	Total value of consultancy projects (Rs. Lakhs)	
Details about Patent and Intellectual Property Rights (IPRs) filed by the University		
Sr. No.	Patents	Number
1	No. of Patents Filed	NIL
2	No. of Patents Published	
3	No. of Patents Granted	
4	No. of Patents Licensed	
5	Intellectual Property Rights (IPRs)	
6	Total earning from Patents (in Rupees)	
Awards / Fellowship		
1	Number of prestigious national & international awards received by the permanent faculty	NIL
2	Total number of permanent faculties received Research awards	
3	Total number of permanent faculties awarded Emeritus Fellowship	