

ANNEXURE-II
TECHNOLOGY DEVELOPED

Sr. No.	Year	Technology
1.	2022	<p>Response to nitrogen application by different varieties of marvel grass (2022) -STATE</p> <p>The farmers of Gujarat state are recommended to plant rooted slips of marvel grass varieties either GMG 1 or GAMG 2 during <i>kharif</i> season after receiving first effective rainfall and apply FYM 10 t/ha with 60 kg N/ha (30 kg N/ha at basal and 30 kg N/ha after one month). Further, after each cut apply 30 kg N/ha as side dressing and 30 kg N/ha at one month after side dressing for obtaining higher green fodder yield and net return.</p>
2.		<p>Performance of dual-purpose barley under different nitrogen levels and cutting management (2022) -STATE</p> <p>The farmers of middle Gujarat Agroclimatic zone growing dual purpose barley are recommended to apply 60 kg N/ha [30 kg N/ha as basal and 30 kg N/ha in two equal splits, 15 kg N/ha after cut (6 weeks after sowing <i>i.e.</i> 42 days) and remaining 15 kg N/ha at 20 days after first cut] for obtaining higher seed yield and net return.</p>
3.	2021	<p>Weed management in forage maize (2021) – AICRP</p> <p>In Madhya Pradesh, Chhattisgarh, Maharashtra and Gujarat, application of Topramezone + Atrazine @35g+ 250g <i>a.i.</i> or Tembotrione + Atrazine @120g+ 250g <i>a.i.</i>/ha at 20 DAS to forage maize is recommended for weed management in forage Maize. The Topramezone + Atrazine controlled 66.7% weed biomass (73.4% with two hand weeding). The technology yielded 607, 147.5 and 11.1 q/ha green fodder, dry matter and CP yields, respectively and resulted in BC ratio of 3.20. (607.4 q GFY, 146.7 q DMY, 9.8 q CPY and 2.91 B:C ratio with two hand wedding).</p>
4.	2019	<p>Effect of cutting management and fertility levels on growth and seed yields of multicut forage sorghum [<i>Sorghum bicolor</i> (L.) Moench] var. CoFS-29 (2019) - STATE</p> <p>The farmers of Middle Gujarat agro-climatic zone growing multi cut forage sorghum variety CoFS 29 for seed production purpose are advised to apply 40 kg N/ha and 40 kg P₂O₅/ha as basal and 120 kg N/ha in three equal splits each at 30 days after sowing, at 50 DAS (<i>i.e.</i>, after first cut) and at 30 days after first cut for obtaining higher seed yield and net return.</p>
5.	2018	<p>Effect of boron and cutting management in seed production of Lucerne (2018) – STATE</p> <p>The farmers of middle Gujarat agro-climatic zone growing lucerne (Anand 2) are advised to have last cut of green forage at 3rd or 4th week of February and leave for seed production, followed by foliar spray of 0.02% boron at flower initiation stage and 2nd spray at 10 days after 1st spray along with all recommended practices to get higher yield and net return.</p>
6.		<p>Influence of nitrogen levels on yield and quality of guinea grass (CP/MFRS/2015/02) (2018) - STATE</p> <p>The farmers of middle Gujarat agro-climatic zone growing guinea grass are advised to grow variety Co (GG) 3 and apply 50 kg N/ha after each cut up to three years to obtain higher green forage, dry matter, crude protein yields and net return. (Basal dose of FYM 10 t/ha, 50 kg N/ha and 40 kg P₂O₅/ha should also be applied).</p>

7.	2017	Influence of weed management practices on growth and seed yield of Oat (<i>Avena sativa</i> L.) (2016-17) – STATE Application of pendimethalin 0.90 kg/ha as pre emergence followed by hand weeding at 40 days after sowing of oat found effective for weed management with higher seed yield and net return.
8.		Study of different models for year-round green fodder production under irrigated condition (2016-17) - AICRP BN Hybrid + Lucerne based perennial cropping system is recommended which fetched higher net monetary return and BC ratio.
9.	2016	Performance of dual-purpose forage crops under different cutting management system (2015-16) - AICRP Amongst the three dual-purpose crops, cutting of wheat at 50 DAS and then leave for seed production showed economically highest value GF, DM, CP, grain and straw yields followed by cutting at oats at 60 DAS and then leave for seed production. Growing of barley not much benefited for dual purpose overall one cutting at 50-60 DAS of oat and wheat leave for seed production recorded significantly higher yields in economics then barley.
10.		Performance of dual-purpose pearl millet as influenced by cutting management and nitrogen levels (2015-16) - AICRP The pearl millet variety GFB-1 and BAIF Bajra-1 fertilized with 150 % of RDN (100 kg N/ha), under one cutting at 50 DAS for green fodder and left for grain was most productive and remunerative.
11.		Performance of dual-purpose forage crops under different cutting management system (2015-16) – STATE The farmers of middle Gujarat Agro-climatic zone- III are recommended to grow oat (JHO-822) as dual purpose, first cut at 60 days after sowing for green fodder and leave it for grain production to get quality forage with higher grain yield and net return.
12.		Effect of growing environment and nitrogen levels on productivity and quality of BN hybrid (2015-16) - AICRP Growing of BN hybrid Co-3 in unshaded condition supplemented with 125% of recommended N (50 kg/ha) was found most productive and remunerative with good quality of fodder. The anti-quality parameters were found within permissible limit.
13.	2015	Yield and quality of hybrid napier varieties as affected by nitrogen levels (2014-15) - STATE The farmers of middle Gujarat Agro-climatic Zone III growing hybrid Napier are recommended to grow variety Co-3 and to fertilized with 75 kg N/ha after each cut up to three years along with common dose of 50 kg N/ha + 50 kg P ₂ O ₅ /ha has basal to obtain higher green forage, dry matter, crude protein and net realization.
14.		To study the effect of nitrogen and phosphorous on yield and quality of multi-cut sorghum (2014-15) - STATE The farmers of middle Gujarat Agro-climatic zone- III growing multi cut forage sorghum cv. CoFS-29 are recommended to apply 160 kg N/ha along with phosphorus @ 60 kg/ha for higher green forage, dry matter, crude protein yields and net realization. Nitrogen to be applied in four equal splits at basal, 30 DAS, after first cut (55 DAS) and second cut (100 DAS) and entire dose of phosphorus to be applied as basal.
15.		Effect of planting methods and forage crop combinations on feeder productivity through moisture consociation (2014-15) - AICRP Planting of <i>Cenchrus ciliaris</i> with <i>Desmanthus vergatus</i> in 1:1 ratio on ridges and furrow is recommended for better production with higher profit under rain fed condition of Gujarat.
16.	2013	The farmers of middle Gujarat agro climatic zone - III growing lucerne (Anand-2) on soils having marginal Zn and deficient Fe status are advised to

		apply 25 kg ZnSO ₄ and 50 kg FeSO ₄ per ha every year besides application of 20:40:40 kg NPK/ha to obtain higher seed yield and net returns.
17.		The farmers of middle Gujarat agro climatic zone - III growing oat (Kent) for seed purpose are advised to apply six irrigations (each of 50 mm) i.e. first five irrigations at 15-20 days interval and 6th irrigation at 13-15 days interval after fifth irrigation. Further they are advised to apply N @75 kg/ha (50 %N at the time of sowing and remaining 50 %N in two equal splits at 30 and 60 days after sowing in equal splits) for getting higher seed yield and net realization.
18.		The farmers of Middle Gujarat Agro-climatic Zone III (AES-II) are advised to spray GA3 (Growth regulator) @ 40 mg/L to the lucerne (var. Anand-2) crop at 30 days after sowing for achieving higher forage yield, better quality and more net realization.
19.	2012	On long term basis, FYM 25 % N + 50 % NPK through inorganic fertilizers + Bio-fertilizers in Sorghum + Cowpea-Lucerne system was more beneficial than 100% through inorganic fertilizers in central zone.
20.		Planting of <i>Cenchrus ciliaris</i> with <i>Desmanthus vergatus</i> in 1:1 ratio on ridges and furrow is recommended for better production with higher profit under rain fed condition of Gujarat.
21.		The farmers of middle Gujarat agro-climatic zone- III are advised to sow Fodder sorghum variety GFS-5 up to 30 th June to get higher yield and net profit.
22.	2011	Sorghum accessions PB-215, PB-257, IS-3260, IS-7053, IS-7650, IS-23262 and SS-96-784 were found to be resistant or moderately resistant against shoot fly. These accessions can be used in breeding programme for developing resistant varieties against shoot fly.
23.	2010	For the effective management of <i>Helicoverpa armigera</i> in Lucerne grown for seed production following IPM module is recommended. <ul style="list-style-type: none"> • Spraying <i>Bacillus thuringiensis</i> @ 1 kg/ha at flowering. • Release of <i>Trichogramma chilonis</i> wasps @ 1,00,000 per hectare synchronizing with the appearance of <i>H. armigera</i>. Installation of 'T' shaped perches stands for predatory birds @ 15/ha.
24.	2007	The farmers of middle Gujarat agro-climatic zone- III (AES-II) are advised to adopt cropping system of Hybrid napier (APBN-1) with cowpea (EC-4216) as inter crop in kharif and lucerne (GAUL-1) in rabi for obtaining the higher net return (CBR-1:2.05). It gives higher forage production round the year for two to three years cycle under irrigated condition.
25.		The farmers of Middle Gujarat, Agro-climatic Zone-III (AES-II) are advised to grow sorghum (S-1049) (single cut) in kharif, sunflower (EC-68414) in semi rabi and lucerne (GAUL-1) in rabi season with application of 100% RDF to each crop along with 30 t FYM/ha to kharif crop to obtain higher forage production, quality as well as higher net realization (CBR- 1:1.65) under irrigated conditions.
26.		For the effective and economic control of sucking pests (Aphid, jassid and thrips) and anthracnose and yellow mosaic virus in lucerne the farmers of middle Gujarat are advised to apply endosulfan 0.07 % + mancozeb 0.02 % twice (each spray after 10 days of cut) during winter season when pest population is high (ICBR 1:18.69).
27.		For the effective and economics control of <i>Spodoptera</i> , <i>Helicoverpa</i> and rust disease in lucerne, following modules are recommended: <ul style="list-style-type: none"> • Raising of marigold (0.5 m apart) on border of the field and on inside bunds. • Raising the castor plants (3.0 m apart) on border of the field and on inside bunds. • Application of NSE 5 % and mancozeb 0.2 % at the time of flowering.

		Application of HNPV and SNPV @ 250 LE/ha at the appearance of 2 larvae/m ² followed by application of mancozeb 0.2 % (ICBR 1:3.87).
28.		The farmers of middle Gujarat are advised to give seed treatment of carbendazim @ 2.0 g/kg seed (ICBR 1:128.66) for the management of root rot in forage cowpea.
29.	2006	The farmers of middle Gujarat agro-climatic zone- III (AES-II) growing forage bajra are advised to grow genotype AFB-1 or AFB-2 (GFB-1) for four cuts at an interval of 40 + 25 + 25 + 25 days and harvest the crop at a cutting (stubble) height of 15.0 cm above the ground for higher forage production with better quality and for getting higher net realization.
30.		The farmers of middle Gujarat agro-climatic zone- III (AES-II) growing lucerne and pandadiu crops are advised to adopt mixed cropping of lucerne and pandadiu with seed ratio proportion of 7.5 + 2.5 kg/ha of lucerne + pandadiu along with 30 kg N/ha basal and 15 kg N/ha after each cutting to obtain higher green forage, dry matter and crude protein yields and for getting higher net realization. (A common basal application of 10 t FYM/ha + 50 kg P ₂ O ₅ /ha should also be done to the crop)
31.	2003	Farmers of North Saurashtra Agro-climatic Zone-VI growing sorghum as a green fodder crop are advised to grow <i>kharif</i> sorghum var. GJ-39 and fertilize it with 40 kg N/ha for getting maximum green fodder yield and better returns. Phosphorus application is not found beneficial.
32.		Farmers of Middle Gujarat Agro-climatic Zone III growing sorghum variety SSG.59-3 in <i>kharif</i> season in soils having medium availability of phosphorus and deficient level of sulphur are advised to apply 40 kg phosphorus (87 kg DAP) and 20 kg sulphur (133 kg gypsum) per hectare every year to obtain maximum forage yield, total returns, net ICBR and better quality (crude protein and digestible dry matter production) of forage. These levels also remarkably reduced the HCN content in leaf and shoot of forage sorghum. (A common basal dose of 25 kg N/ha at the time of sowing, 25 kg N/ha at 30 DAS and 25 kg N/ha after the first cut i.e., 60 DAS should be applied).
33.		Farmers of Middle Gujarat Agro-climatic Zone III growing forage sorghum in <i>kharif</i> season in soils having marginal available zinc and Fe status are advised to apply 8 Kg ZnSO ₄ + 15 Kg FeSO ₄ per ha every year to obtain higher forage yield, total return, net ICBR and better forage quality (crude protein and digestible dry matter production). Alternatively, the farmers can also supplement the micronutrients by 1.0 % foliar application of micronutrient mixture having concentration of Fe-6.0%, Mn-1.0%, Zn-4.0%, Cu-0.3% and B-0.5% equivalent to Government notified grade-III Zn-4.0 %, Cu-0.3 % and B-0.5 % equivalent to Government notified grade-III (Fe deficiency) at 20, 30 and 40 days after sowing (A common basal dose of 25 Kg N + 25 Kg P ₂ O ₅ /ha and 25 kg N/ha after one month of sowing should also be applied).
34.		Farmers of Middle Gujarat Agro-climatic Zone III growing maize variety Gujarat Maize-2 in <i>kharif</i> season are advised to apply every year multi-micronutrients consisting of Fe-2.0 %, Mn-0.5 %, Zn-5.0 %, Cu- 0.2 % and B-0.5 % equivalent to Government notified grade-V for soil application (20 kg/ha) in soils having marginal status of Zn and Fe to obtain higher forage yield, total return, net ICBR and better forage quality (Crude protein and digestible dry matter production). Alternatively, the micronutrients can be supplemented by 1.0 % foliar application of multi-micronutrients mixture having Fe-2.0 %, Mn 0.5 %, Zn-8.0%, Cu-0.5% and B-0.5% equivalent to government notified grade-I (Zn deficiency) at 20, 30 and 40 days after sowing. (A common basal dose of 40 Kg N + 40 Kg P ₂ O ₅ /ha and 40 Kg N/ha after 30 days of sowing also be applied).
35.		Farmers of middle Gujarat Agro-climatic Zone III growing Lucerne variety GAUL-1 are advised to apply 40 kg S/ha in the form of gypsum (300 kg/ha) and 25 kg ZnSO ₄ in soils having Zn status marginal to deficient to obtain

		higher seed yield of lucerne and net returns. A common basal dose of 10 tones FYM/ha and 25:50:50 kg NPK/ha should also be applied to the crop.
36.		Farmer of South Gujarat Heavy Rain fall Zone adopting mixed farming of agriculture with animal husbandry and following practice of wallowing (if alternate irrigation is given from wallowing pond to Oat) can save 30 kg N/ha.
37.		Khejda (<i>Prosopis cineraria</i>) in Gujarat is recommended for plantation in pastureland because it is a beneficial tree, which enriches pasture land soil and increases fodder yield of <i>Cenchrus</i> grass growing below its canopy.
38.	2001	Farmers of Middle Gujarat Agro-climatic Zone growing fodder sorghum are advised to treat seeds with phosphate culture such as PBA 22, <i>Torulospora globosa</i> (ICBR 1:24) or (PBA 12, <i>Bacillus brevis</i> (ICBR 1:24) or PBA 16, <i>Bacillus coagulans</i> (ICBR 1:22) @ 30 g/kg of seeds (10^8 cfu/g) to get higher fodder yield.
39.		The farmers of middle Gujarat Agro-climatic Zone growing kharif or summer sorghum in zinc deficient soils are advised to add FYM @ 10 t/ha every year and Zinc sulphate @ 25 kg/ha every third year for getting higher green and dry matter yield as well as good quality fodder (NICBR 1:2.10). The marginal farmers may apply only Zinc sulphate once in three years without FYM (ICBR 1: 2.73). In all the cases N and P should be applied @ 80 and 40 kg/ha, respectively.
40.		One spray of endosulfan 0.075 % + mancozeb 0.2 % is recommended to avoid loss (16.49 %) (ICBR 1:12.93) in seed yield due to different insect pests (<i>Helicoverpa armigera</i> and <i>Spodoptera litura</i>) in Lucerne crop under middle Gujarat Agro-climatic Zone.
41.		Farmers of <i>Bhal</i> and Coastal Agro-climatic Zone are advised to grow either <i>Dichanthium</i> or <i>Gatton</i> panic for forage on their marginal lands.
42.	2000	Farmers of Middle Gujarat Agro-climatic Zone –III growing hybrid napier cv. APBN-1 are advised to follow 100 x 50 cm or 50 x 50 cm spacing and fertilize with 75 kg N/ha after each cut up to two years to obtain higher green forage (3001 q/ ha), dry matter, crude protein and C: B ratio (2.50). (A common basal dose of FYM 10 t / ha + 50 kg N + 50 kg P ₂ O ₅ / ha should also be applied to the crop).
43.	1998	In the coastal areas (AES-IV) of South Gujarat Heavy Rainfall Zone, the farmers are advised to grow Lucerne (Local or Anand-2 or T-9) with 20 kg/ha (recommended dose). In the soils of medium P availability, the crop need not be fertilized with P.
44.	1997	In the <i>Cuscuta</i> infested Lucerne fields, farmers of middle Gujarat Zone should spray pendimethalin @ 0.5 kg/ha at 10 days after sowing (dissolving in 500 liter of water /ha) for effective control of <i>Cuscuta</i> and higher profit (BCR 1:2.18). This treatment also effectively controls other annual weeds. Pendimethalin residues were not detected in lucerne plants; hence, use of this herbicide is safe.
45.	1996	Farmers of North Saurashtra Agro-climatic Zone (AES-1) growing rainfed fodder sorghum are advised to apply 50 kg N/ha in two splits, half as basal and the remaining half as top dressing 30 DAS (CBR 1:3) with the recommended dose of phosphorus (30 kg/ha) to get more fodder yield and net returns.
46.		Farmers of North Saurashtra Agro-climatic Zone-VI growing maize (Gujarat Maize-2) for green fodder under dry farming conditions are advised to apply FYM @10 t/ha and 60 kg N/ha (50 % as basal and 50 % N at 30 DAS) for securing optimum green fodder yield. Phosphorus application is not necessary. They are also advised to apply 140 kg N/ha [50 % as basal and 50 % as top- dressing (30 DAS) to get 19 % more income].
47.		Farmers of Middle Gujarat Agro-climatic Zone growing maize variety Gujarat Maize-1 in rabi season are advised to use seed rate of 80 kg/ha. They are also advised to apply 140 kg N/ha [50 % as basal and 50% as top dressing

		(30 DAS) to get 19% more income]. When status of the available phosphorus is medium, application of phosphorus was not beneficial.
48.		The farmers of North Gujarat Agro-climatic Zone (AES-I) are advised to irrigate the lucerne crop through sprinkler, giving 25 irrigations each of 40 mm depth (First 10 irrigations at an interval of 10-12 days and the remaining at 5-6 days intervals), for getting 8 per cent more green fodder yield and 28 per cent water saving as compared to that of surface method of irrigation. The sprinkler system needs to be operated at 275 KPa pressure with a lateral and keeping the sprinkler spacing 12 m x 12 m.
49.		The farmers of South Gujarat Heavy Rainfall Zone are advised to grow forage Lucerne variety Anand-2 and to irrigate the crop 18 times at an interval of 10 days in winter (9 irrigations) and 8 days in summer (9 irrigations) and fertilize the crop with 40 kg N/ha (CBR 3.52) and 120 kg P ₂ O ₅ /ha (CBR 1.60).
50.		Farmer of <i>Bhal</i> and coastal Zone having insufficient fodder for their animals particularly during draught period, can grow <i>Gatton</i> panic or <i>Dichanthium</i> grass through saline water irrigation (up to 8 ds/m). After every three years they are advised to change the site.
51.	1995	In North Gujarat Zone, the farmers are advised that lucerne crop should be left for seed production after taking four cuts of green fodder (135 days after sowing <i>i.e.</i> 3 rd week of March).
52.		Farmer of Middle Gujarat Argo-climatic Zone growing Oat (JHO-822) for green forage are advised to fertilize the crop with 60 kg N/ ha (50% as basal and 50 % as top dressing 30 DAS) for getting maximum green forage yield and 24 % increased income.
53.		The farmers of North Saurashtra Agro-climatic Zone growing forage legumes are advised to grow cowpea (GFC-1) for getting maximum green forage, dry fodder and income.
54.		The farmers of Middle Gujarat Agro climatic Zone growing <i>Rajka bajra</i> for fodder purpose are advised to use seed rate of 12 kg/ ha keeping the sowing distance 45 cm between the rows and fertilize the crop with 100 kg N/ha (50 kg N/ha as basal and 50 kg N/ha just after first cut). An additional 50 kg N/ha should be given after each cut. The application of P ₂ O ₅ is not beneficial, when native P is medium to high.
55.		Farmer of South Gujarat Heavy Rainfall Agro-climatic Zone (AES-IV) growing <i>Gatton</i> Panic grass (<i>Panicum maximum</i> Jacq) in coastal salt affected waste land are advised to adopt broad bed furrow system with a bed width of 2.4 m x 6.0 m with a furrow depth of 60 cm. With this combination an additional increase in income to the tune of 250% could be obtained. The biological reclamatory effect was also better with this land configuration.
56.	1994	For obtaining higher sorghum grain and fodder yield, seed inoculation either with <i>Azospirillum</i> (ICBR 1:10.0) or <i>Azotobacter</i> ABA-1 (ICBR 1:9.46) having 10 ⁸ viable cells/g (200 g culture/10 kg seeds) along with the recommended dose of 40 kg N/ha is recommended to the marginal farmers of South Gujarat.
57.		The farmers of middle Gujarat Agro-climatic Zone (AES-IV) growing lucerne (Anand-2) on deep black soils are advised to apply 11 irrigations (for five cuttings), each of 80 mm depth, at IW/CPE ratio 0.9 (NICBR 1: 39.26) as under i. First irrigation-At sowing ii. Second irrigation-7 DAS iii. Five irrigations- At an interval of 16-18 days during December- February iv. Rest of irrigations- At an interval of 10-12 days. Farmers are also advised to apply P ₂ O ₅ @ 80 kg/ha to lucerne crop to obtain an NICBR of 1: 4.73.
58.		It is recommended to the farmers of middle Gujarat Agro-climatic Zone (AES-IX) growing lucerne (Anand-2) on deep black soils to adopt a basin size of 4 m x 8 m with a flow rate of 6 L/sec.

59.	1993	The farmers of Dhari area of South Saurashtra Zone growing forage sorghum variety GFS-4 are advised to sow the crop using seed rate 80 kg/ha and applying nitrogen @ 40 kg/ha to get an economic return of green fodder yield. Of the total nitrogen, 50% should be applied as basal dressing and the remaining as top-dressing 25 DAS.
60.		Farmers of middle Gujarat Zone growing Lucerne for green forage in medium fertile soils are advised to apply 50 kg P ₂ O ₅ /ha and 50 kg K ₂ O/ha in addition to 20 kg N/ha as basal dose for getting the maximum net realization from variety Anand-2.
61.		Farmer of AEC-II of Middle Gujarat Zone growing oats variety Kent for dual purpose are advised to apply 80 kg N/ha (50% at sowing and 50 % after first cut 50-55 DAS) to obtain higher forage and seed yield as well as maximum net realization.
62.		The farmers of AES II of South Gujarat Heavy Rainfall Zone are advised to take two cuts (one at 45 days stage and second at maturity) of Fulva grass with the application of 40 kg N/ha under natural grassland conditions. The marginal farmers who cannot afford to give 40 kg N/ha may apply 20 kg N/ha.
63.	1992	The farmers of south Gujarat Agro-climatic Zones (I and II) growing forage sorghum variety GFS-4 are advised to keep the seed rate 80 kg/ha and fertilize the crop with 80 kg/ha and 40 kg P ₂ O ₅ /ha. Of the total fertilizers 50 %N and the whole quantity of P ₂ O ₅ should be applied as basal dose and the remaining N as top-dressing 30 DAS. Marginal farmers may adopt the seed rate 60 kg/ha and fertilize the crop with 40 kg N/ha and 40 kg P ₂ O ₅ /ha following the method of application same as above.
64.		The farmers of South Gujarat growing sorghum fodder variety GFS-4 are advised to fertilizer the crop @ 80 kg N/ha for getting higher economic return. Of the total 80 kg N, 40 kg N/ha should be applied as basal dose and 20 kg each immediately after first cut and 15 th day of the first cut, respectively.
65.		The farmers of North Gujarat growing forage sorghum variety GFS-4 are advised to keep the seed rate 80 kg/ha and 40 kg P ₂ O ₅ /ha so as to get an economic return through green fodder yield. Of the total fertilizers, 50 % N and the whole quantity of P ₂ O ₅ should be applied as basal dressing and the remaining N as top-dressing 30 DAS.
66.		The coastal saline-sodic soils of South Gujarat can be reclaimed by biological means through cultivation of <i>Gatton</i> Panic grass. Planting the grass at 30 cm x 15 cm spacing and fertilizing with 60 kg N/ha tends to increase the yield and hastens the process of reclamation.
67.	1991	The farmers of Middle Gujarat Agro-climatic Zone growing fodder sorghum variety SSG 59-3 are advised to treat the seed with <i>Azotobacter</i> for getting higher dry matter yield and crude protein production. Nitrogen should also be applied @50 kg/ha in two equal splits, first as basal and the second 30 DAS for one cutting management and for two cuttings management top dressing should be done immediately after first cutting.
68.		In Middle Gujarat, seed treatment of fodder sorghum with <i>Azotobacter</i> (ABA-1) or <i>Azospirillum</i> (ASA-1) culture having 10 ⁸ viable cells/g @ 200 g/10 kg seeds was proved effective (ICBR 1:17.80 and 1:15.157, respectively) in saving half the recommended dose (40 kg/ha) of nitrogen requirement of the crop.
69.		The farmers of Middle Gujarat Argo-climatic Zone are advised to grow oat (Kent, JHO- 822) with the application of 80 kg N/ha for getting higher green and dry matter yield as well as crude protein. Nitrogen should be applied in three splits, i.e. 50 % as basal and 25 % each after 30 days of sowing and after first cut. There should be two cuttings first 50 days after sowing and the second at 50 % flowering stage (NICBR 1:7.69). For marginal and sub-marginal farmers nitrogen recommendation is 40 kg/ ha applied in three splits (NICBR 1: 8.95).

70.	1990	For obtaining higher green (274 q/ha) and dry fodder (132 q/ha) yield of forage sorghum variety IS-5026 is recommended for South Gujarat heavy rainfall region, the crop needs to be fertilized with 40 kg N/ha.
71.		The farmers of <i>Bhal</i> and Coastal agro-climatic region are advised to apply 15 kg N and 15 kg P ₂ O ₅ /ha to obtain 243 q/ha and 215 q/ha green fodder yield, respectively to sorghum variety Trapaj.
72.	1989	Farmers of North Saurashtra Zone are advised to fertilize forage sorghum crop (<i>Gundari</i> or SSG-59-3) with 60 kg N/ha and 20 kg P ₂ O ₅ /ha. The marginal farmers may go in for 20 kg N /ha and 10 kg P ₂ O ₅ /ha.
73.		Adoption of mixed cropping system of fodder <i>jowar</i> + karingda where in karingda is taken after four lines of <i>jowar</i> at 45 cm spacing under rainfed conditions was found to be more beneficial than the sole crop of <i>jowar</i> grown in the sandy loam soils of Kutch districts of North West Zone.
74.		For the control of weeds in lucerne (Anand-2) in middle Gujarat, the farmers are advised to do two-hand weeding (20 and 60 DAS). Alternatively, they may go in for oxadiazon @ 0.5 kg/ha as pre-emergence application.
75.	1987	For obtaining higher sorghum grain and fodder yield, seed inoculation should be done either with <i>Azospirillum</i> ASA-1 (ICBR 1:10.00) or <i>Azotobacter</i> ABA-1 (ICBR 1:9.46) having 10 ⁸ viable cells/g (200 g culture/10 kg seeds) along with the recommended dose of 40 kg N/ha is recommended to the marginal farmers of South Gujarat.
76.		It is recommended that sorghum seed be inoculated with endogenous <i>Azotobacter</i> culture @ 5g or 5 ml culture/ kg of seeds having 10 ⁸ viable cells/g or ml using jaggery as a sticker as per the method prescribed on the inoculum packet (1987) (The ICBR for dry fodder is 1:95).
77.	1986	The farmers of North Saurashtra are advised to apply 40 kg N/ha to sow pasture grass, <i>Sahima nervosum</i> , during the <i>kharif</i> season.
78.	1985	Lucerne varieties SS-627 and Anand-2 should be sown early by line sowing during second week of November for obtaining higher forage yield and net realization.
79.		Lucerne variety Anand-2 and SS-627 should be sown by line sowing at the seed rate of 10 kg/ha for obtaining higher forage yield and net realization.
80.		For obtaining higher realization and seed yield of Lucerne, variety Anand-2 should be sown by line sowing during second week of November (15 th) by keeping seed rate 5 kg/ha. No phosphorus is required under Anand soil conditions where availability of P ₂ O ₅ is high.
81.		Under North Gujarat Zone soil conditions, where availability of P is medium, the farmers are advised to sow Lucerne (Var. Anand-2) during last week of October at a spacing of 25 cm with a seed rate of 10 kg/ha and application of P @ 80 kg/ha.