PROCEEDING OF THE TWELFTH MEETING OF COMBINED JOINT AGRICULTURAL RESEARCH COUNCIL OF SAUs AND KAMDHENU UNIVERSITY– 2015-16

ORGANIZED BY

NAVSARI AGRICULTURAL UNIVERSITY
(APRIL 11-13, 2016)

DIRECTORATE OF RESEARCH
NAVSARI AGRICULTURAL UNIVERSITY
NAVSARI- 396 450

PROCEEDING OF THE TWELFTH COMBINED JOINT AGRESCO MEETING OF STATE AGRICULTURAL UNIVERSITIES AND KAMDHENU UNIVERSITY HELD AT NAVSARI AGRICULTURAL UNIVERSITY, NAVSARI DURING 11-13 APRIL, 2016

The Twelth Combined Joint meeting of the Agricultural Research Council (AGRESCO) of State Agricultural Universities of Gujarat and Kamdhenu University was held at Navsari Agricultural University, Navsari during 11-13 April, 2016 under the Chairmanship of Dr. C.J. Dangaria, Hon. Vice Chancellor, NAU, Navsari. Shri Mansinhbhai K. Patel, Chairman, Gujarat State Federation of Co-operative Sugar Factories ltd. Gandinagar graced the inaugural function as inaugurator and chief guest. Dr. N.C. Patel, Hon. Vice Chancellor, AAU, Anand and Dr. A.R. Pathak, Hon. Vice Chancellor, JAU, Junagadh were the guest of honour and Dr. R. A. Sherashiya, Director of Horticulture, Government of Gujarat was the special guest. Besides, Dr. A. N. Sabalpara, Director of Research and Dean PGS, NAU, Navsari and Dr. G.R. Patel, Director of Extension Education, NAU, Navsari, Directors of Research of all SAUs, Principals and Deans of various faculties of SAUs, officers from Line Department of Gujarat state, the Associate Directors of Research, the conveners of different sub-committees of SAUs, the senior scientists/professors of SAUs attended the meeting.

At the outset, Dr. A.N. Sabalpara, Director of Research, NAU, Navsari welcomed the dignitaries and all the participants. In his welcome address he briefed the summary of recommendation and new technical programmes approved in AGRESCO Sub-committees and Joint AGRESCO meeting of respective Universities, which were to be presented and discussed during the Twelth Combined Joint Agresco Meeting. He also gave a brief account on success of Gujarat in Agricultural sector and opined that the credit goes to visionary planning of Government and sincere efforts made by Line department and State Agricultural Universities and hard work of industrious and responsive farmers of the state.

Dr. C. J. Dangaria, Hon. Vice Chancellor, NAU, Navsari welcomed Shri Mansinhbhai K. Patel and other dignitaries by offering floral bouquets as a symbol of love and affection. All the dignitaries joined their hands for lighting the lamp and inaugurated the XIIth Combined Joint AGRESCO meeting. The august gathering also released informative publications *viz.*, Salient Research Achievements 2004-2014, Research Accomplishments and Recommendations, 2014-15, *Adhunik Khetina Vaigyanik Sawal Jawab,* from NAU, Navsari and three folders from Junagadh Agricultural University, Junagadh.

Dr. R. A. Sherashiya, Director of Horticulture, GOG, Gujarat highlighted horticulture scenario of Gujarat state as well as of India and emphasized on need of undertaking research in priority areas like high density planting and rejuvenation of old mango orchards, protected cultivation, post harvest technology, development of disease resistant varieties of vegetables and fruit crops, introduction and development of package of practices for new crops like *Kantola*, orchids and pomegranate. Further he also expressed the need of production of quality planting material of coconut and mango with salinity resistant root stocks for coastal region as well as diversification in coconut products.

Dr. A. R. Pathak, Hon. Vice Chancellor, JAU, Junagadh expressed his views on agriculture research and need for investment in agriculture research which has more returns than any other enterprise. He added that the challenges and problems faced by farmers should be at the focal point for undertaking research programmes. Considering the difficulty in unbiased biosafety testing in Genetically Modified crops, he recommended the use of Marker Assisted Selection as an option for GM crops, which is otherwise less exploited in SAUs. Further, he emphasized the need for

undertaking research in frontier areas of nanotechnology, value addition in fruit crops, drip irrigation; especially in mango orchards, diversification in mango varieties and supply of organic inputs including seeds and proper demonstrations of organic farming to the farmers for the success of organic farming.

Dr. N. C. Patel, Hon. Vice Chancellor, AAU, Anand acquainted the august gathering to the research achievements of AAU, Anand. He also informed about the research activities related Agricultural engineering and dairy research being implemented at AAU, Anand. He appreciated the *Krishi Mahotsav* and said that the Soil health cards have benefited the farmers and there is reduction in use of chemical fertilizers. He urged the agricultural fraternity to hold research in light of changing climate and emphasized the need of development of stress resistant varieties in vegetable crops. Further he hoped that the resistant varieties of *mung* and *urad* bean to mosaic virus will soon be released.

Shri Mansinhbhai K. Patel, Chairman, Gujarat State Federation of Co-operative sugar Factories limited, Gandhinagar and Chairman, Mahuva Co-operative Sugar Factory, Mahuva, expressed his views on the importance of bridging scientist and farmers through *Krishi Mahotsav* programme and express his gratitude to the Hon. Prime Minister Shri Narendra Modi (the then Chief Minister of Gujarat) for initiating *Krushi Mahotsav* with holistic approach. He appreciated the efforts of scientific community for dissemination of scientific information and demonstration of new crops and varieties, package of practices and technological advancement to the farmers for increased productivity and quality production in different crops. He explained the importance of co-operative sector in agriculture and how it has benefited to the farmers of the Gujarat state. Further he expressed the need of conservation of local breeds of cattle and establishment of animal hostels.

In his chairman address, Dr. C. J. Dangaria, Hon. Vice Chancellor, NAU, Navsari congratulated the scientific fraternity of SAUs and Kamdhenu University for the valuable recommendations for the farming community and entrepreneurs. While explaining the agriculture scenario of Gujarat state, he gave credit to the harmony and whole hearted efforts of scientific community and the farmers along with synergistic impetus by policies laid down by Government lead by Smt. Anandiben Patel, Hon. Chief Minister, Government of Gujarat for increased share of agriculture in the state's GDP. He pointed out the major problems and constraints like depletion & degradation of land, soil nutrient deficiency, over use of fertilizers, climate change, new pest and diseases and water scarcity. He emphasized to plan new research programmes on the priority research areas of climate change, nutrient deficiency, farm mechanization, export standards for fruit crops, protected cultivation in horticulture, biosafety issues, high density planting and marker assisted selection in agriculture.

Dr. G. R. Patel, Director of Extension Education, NAU, Navsari proposed vote of thanks at the end of inaugural session.

12.1 CROP IMROVEMENT:

Chairman:	Dr. A. R. Pathak, Hon. Vice Chancellor, JAU, Junagadh
Co-Chairman:	Dr. K. B. Kathiria, Director of Reseach, AAU, Anand
	Dr. B. D. Jadhav, Professor, NAU, Bharuch
Rapporteurs:	Dr. K. L. Dobariya, Research Scientist, JAU, Junagadh
	Dr. P. B. Patel, Associate Research Scientist, NAU, Navsari

The details of recommendations and new technical programmes presented, discussed and approved during the session are as under:

Universities	Varietal Recommendations				New Technical Programmes	
	Farming Community		Scientific Community			
	Proposed	Approved	Proposed	Approved	Proposed	Approved
AAU	03	03	00	00	03	03
NAU	17	14 +3*	00	00	16	15
JAU	03	03	00	00	07	07
SDAU	03	03	00	00	00	00
TOTAL	**26**	**23 + 3***	**00**	**00**	**26**	**25**

(* Pre-release)

12.1.1 RECOMMENDATIONS/ ENDORSEMENT FOR FARMING COMMUNITY

ANAND AGRICULTURAL UNIVERISTY	
12.1.1.1	**Guinea grass : CO (GG)-3 (Endorsement)**
	This proposal was presented by Dr. R. S. Fougat, Convener, AAU, Anand. The proposed variety of guinea grass was developed through clonal selection and has already been released by TNAU, Coimbatore. It has light green foliage and robust tillering. This variety produced Green forage yield of 2517 q/ha/year which was 84.0, 92.4 and 83.1% higher than national check varieties BG-1, PGG-616 and Riversdale, respectively. The variety produced dry matter yield of 553.7q/ha/year which was 54.4, 84.8 and 58.1% higher than BG-1, PGG-616 and Riversdale, respectively. Looking to the above features, the proposal of CO (GG)-3 was recommended for endorsement for whole Gujarat. The proposal was approved for endorsement with following suggestions. **Suggestions:** 1. Verify dry matter data for the year 2014-15. 2. In final proposal, give data for number of tillers per plant and remove data of days to flowering. 3. Provide cut wise green fodder yield and number of tillers. **(Action : Research Scientist (FC), MFRS, AAU, Anand)**
12.1.1.2	**Forage Sorghum : AFS-44 [GAFS-12 (Gujarat Anand Forage Sorghum-12)]**
	The proposed genotype of sorghum AFS-44 has produced GFY of 300q/ha which was 19.1, 65.2, 31.5 and 37.1 % higher with DMY of 101q/ha which was 14.4, 66.3, 57.4 and 66.0 % higher than check varieties *viz.* GAFS-11, S-1049, GFS-5 and C-10-2, respectively in middle Gujarat. It has thin stem and higher leaf stem ratio than checks. The proposed genotype AFS-44 is recommended for Middle Gujarat. The proposal was approved with following suggestions. **Suggestions:** 1. Include grain yield data. 2. Provide data for station trial. 3. Give reasons for missing data of some years in different centres. 4. Recommend for rainfed ecology. Correct time of sowing in proposal. 5. Reanalyze HCN % data and include corrected data in final proposal to be submitted to SVRC. **(Action: Research Sci. (FC), MFRS, AAU, Anand and Assoc. Res. Sci., Viramgam)**
12.1.1.3	**Kodo millet : GAK-3 (Gujarat Anand Kodra-3)**
	The proposed variety GAK-3 of kodo millet recorded **2457 kg/ha** grain yield which was 27.5% and 37.9 % higher than the local check, GK-2 and national check, GPUK-3. This variety is recommended for Middle Gujarat. The variety was approved with following

	suggestions. **Suggestions:** 1. Correct disease /pest resistance grade. 2. Correct recommended ecology. 3. Give data of milling recovery %. 4. Include data of PET trial. **(Action: Research Scientist, Hill Millet Research Station, AAU, Dahod)**
NAVSARI AGRICULTURAL UNIVERISTY	
12.1.1.4	**Cotton: G. Cot. Hy. 10 BG-II (Endorsement)**
	This proposal was presented by Dr. B. G. Solanki, Convener, NAU, Navsari. Cotton hybrid G.Cot.Hy-10 (BG-II) recorded 2109 kg/ha seed cotton yield which was 92.1 % and 10.7 % higher over its non Bt counterpart and zonal check RCH-2 (BG-II), respetively. The proposed hybrid possesses staple length of 28.8 mm with good uniformity (48), average fineness (4.2 mv), medium fibre strength (22.6 g/tex) and good maturity (0.84). The proposed hybrid G.Cot.Hy-10 (BG-II) recorded below ETL population for major sucking pest. The proposed hybrid was found moderately resistant to bacterial leaf blight and alternaria leaf spot diseases and free from grey mildew. Hybrid G. Cot. Hy-10 (BG-II) is recommended for irrigated and rainfed areas of Gujarat. The proposal was approved for endorsement. **(Action:- Research Scientist (Cotton), MCRS, NAU, Surat)**
12.1.1.5	**Cotton: G. Cot. Hy. 12 BG-II (Endorsement)**
	Cotton hybrid G.Cot.Hy-12 (BG-II) recorded 2115 kg/ha seed cotton yield which was 46.6 % and 11.1% higher over its non Bt counterpart and zonal check RCH-2 (BG-II), respectively. The proposed hybrid had comparatively bigger boll size (4.4 g) with good opening and stay green character. The proposed hybrid had staple length of 28.1 mm with good uniformity (47), average fineness (4.2 mv), medium fibre strength (21.7 g/tex) and good maturity (0.84). G.Cot.Hy-12 (BG-II) recorded below ETL population of major sucking pest and moderately resistant to bacterial leaf blight and alternaria leaf spot diseases and free from grey mildew. Hybrid G. Cot. Hy-12 (BG-II) is recommended for irrigated and rainfed areas of Gujarat. The proposal was approved for endorsement. **(Action:- Research Scientist (Cotton), MCRS, NAU, Surat)**
12.1.1.6	**Cotton: GISV 272 GN Cot. 24 (Irrigated)**
	Cotton variety GISV 272 gave mean seed cotton yield of 1815 kg/ha which was 42.0, 28.8, 37.2 and 30.6% higher over checks G.Cot.10, G.Cot.20, GN.Cot.22 and LRA 5166, respectively. The lint yield produced by the proposed entry was 699 kg/ha which was 47.2, 42.2, 42.7 and 50.6 % higher than checks G.Cot.10, G.Cot.20, GN.Cot.22 and LRA 5166, respectively. The proposed genotype possessed medium long staple with 27.4 mm 2.5 % SL, 5.0 mv Fibre fineness and 20.5 g/tex of Fibre strength. The proposed entry GISV 272 recorded lower population of sucking pest (below ETL). The bollworms damage was found more or less similar to checks. The proposal was approved for **pre release** for irrigated conditions with following suggestions.

	Suggestions: 1. Generate data for pink ball worm infenstation / damage. 2. Compare proposed variety with popular *Bt* hybrid. 3. Include data of HDP, if available. **(Action:- Research Scientist (Cotton), MCRS, NAU, Surat)**
12.1.1.7	**Cotton: GBHV 170 (GN Cot. 26) (Rainfed)**
	Cotton variety GBHV 170 had recorded 1640 kg/ha seed cotton yield which was 22.4 and 40.2 per cent higher than checks G.Cot.16 and NH 615, respectively under rainfed condition. GBHV 170 gave mean lint yield of 538 kg/ha which was 28.4 and 38.4% higher than checks G.Cot.16 and NH 615, respectively. It possessed medium long fibres (25.9 mm) with average fineness (4.5 mv) and average fibre strength (21.4 g/tex). It has recorded lower population of sucking pest and exhibited disease free reaction for wilt and alternaria leaf spot and observed resistant for bacterial leaf blight. The proposal was approved for **pre release** for South and Middle Gujarat with following suggestions. **Suggestions:** 1. Generate data for pink ball worm infestation / damage. 2. Compare proposed variety with popular *Bt* hybrid. 3. Include data of HDP, if available. **(Action:- Research Scientist (Cotton), MCRS, NAU, Surat)**
12.1.1.8	**Rice : NVSR-6137 (GNR-5)**
	The proposed genotype of rice was derivatives of Jaya x GR-6. It has recorded grain yield of 5791 kg/ha which was 13.5 % and 21.4 % higher than checks Dandi and NAUR-1, respectively. The proposed genotype possessed easy threshability compared to checks. NVSR-6137 performed very well in the coastal salt affected soils of Umbharat - Danti in South Gujarat and inland saline areas of middle Gujarat. The proposed genotype was superior over check Dandi with respect to pest and disease reaction. It was also found better in quality traits including HRR % than Dandi. The proposed genotype, NVSR-6137 possess 6.83 mm kernel length (long) with the kernel width of 1.72 mm having the L/B ratio of 3.97 categorizing as long slender grain. Rice genotype NVSR-6137 recommended for salt affected rice growing areas of Gujarat. The proposal was approved by the house. **(Action:- Assoc. Res. Scientist, MRRC, NAU, Navsari)**
12.1.1.9	**Rice: NVSR-2031 (GNR-6)**
	Rice variety NVSR-2031 developed from cross IR-28 x NAUR-1 which recorded 4046 kg/ha grain yield which was 8.5% higher than check IR 28 in overall performance. The genotype has recorded 4152 kg/ha grain yield which was 12.5% higher than check IR 28 in South Gujarat condition. The proposed genotype is moderately resistant to major pest and diseases and better than check IR-28. The proposed genotype GNR-6 has long slender grain with better HRR %. Variety GNR-6 recommended for South Gujarat very specific rainfed transplanted (RFTP) condition. The proposal was approved with following suggestions. **Suggestions:** 1. In ancillary observations, give mean values alongwith range.

	2. Exclude data of Nawagam centre from the proposal. **(Action:- I/c. Assoc. Res. Scientist, RRRS, NAU, Vyara)**
12.1.1.10	**Rice: NVSR-H-1003 (GNRH-1)**
	NVSR-H-1003 is the first rice hybrid of Gujarat. The proposed hybrid has recorded 5077 kg/ha grain yield, which was 10.1% and 17.1 % higher over GR 7 and a popular hybrid Suruchi 5629, respectively. The proposed hybrid is moderately resistant against bacterial leaf blight, grain discolouration and sheath rot whereas tolerant reaction against insect pest. The hybrid NVSR-H-1003 also found superior in quality traits including HRR% over hybrids US 312, suruchi 5629 and NAUR-1. Rice Hybrid NVSR-H-1003 recommended for transplanted rice growing areas of Gujarat. The proposal was approved with following suggestion. **Suggestion:** 1. In ancillary observations, give mean values along with range. **(Action:- Assoc. Res. Scientist, RRRS, NAU, Vyara)**
12.1.1.11	**Sugarcane: CoN 9072 (GNS-9)**
	Proposed clone CoN 09072 (GNS 9) of sugercane is an early maturing gave yield of 129.05 t/ha which is 27.3 %, 11.7 % and 16.6 % higher than CoC 671, GS-5 and GNS-8, respectively. GNS-9 has also recorded higher sugar yield (16.2 t/ha) and it is moderately resistant to red rot and wilt and resistant to whip smut. It is also a good ratooner and having non flowering habit. It is recommended for irrigated areas of South Gujarat. **(Action:- Research Scientist, Main Sugarcane Res. Station, NAU, Navsari)**
12.1.1.12	**Castor: NCH-1 (GNCH-1)**
	The proposed castor hybrid NCH-1 yielded 2444 kg/ha resulting 21.2%, 46.2% and 44.5% higher seed yield than hybrid checks GCH-7, DCH-519 and DCH-177, respectively. The hybrid NCH-1 having medium plant height and long primary as well as secondary spikes. The hybrid is resistant to wilt disease and tolerant to various larval and sucking pest of castor. The hybrid GNCH-1 is recommended for late-*kharif* and *rabi* season in South and Middle Gujarat in irrigated conditions under rice based cropping system. **(Action:- Asst. Res. Sci., Pulse and Castor Project, NAU, Navsari)**
12.1.1.13	**Pigeon pea: BP-06-33 (GNP-2)**
	Pigeon pea vareity BP-06-33 is the first dual purpose (grain and vegetable) in the state. The proposed culture recorded green pod yield of 3394 kg/ha which was 19.5 %, 47.8 % and 16.0 % higher than checks GT-1, AVPP-1 and Vaishali, respectively. Similarly it gave grain yield of 1255 kg/ha which was 17.2%, 49.5% and 20.9% higher than checks GT-1, AVPP-1 and Vaishali, respectively. It is moderately tolerant for pod fly and pod borer and moderately resistant to wilt and SMD. The genotype is with indeterminate growth habit having dark green foliage. The pods are green in colour with 4 to 5 grains with prominent constriction compared to GT-1. BP-06-33 is recommended for *Kharif* pigeon pea cultivating areas of South and North Gujarat. The proposal was approved with following suggestions. **Suggestions:**

	1. Recast proposal as per the prescribed proforma points. 2. Provide quality parameters data of green pods. 3. Specify agency responsible for breeder seed production. 4. Delete grain yield data in table 10. **(Action:- Assoc. Res. Sci., Pulse and Castor Project, NAU, Navsari)**
12.1.1.14	**Sweet Potato: CIP-440127 (Bhukanti) Endorsement**
	Sweet potato culture CIP-440127 gave 33.24 t/ha tuber yield which was 84.0% higher over the national check Gouri. It possesses good amount of Beta carotene content *i.e.,* 2.36 (mg/100g) as against 1.18 (mg/100g) in the national check Gouri. The proposal was approved as **pre-release** for South Gujarat with following suggestions. **Suggestions:** 1. Test for one more year over locations with local check / variety. 2. Recast proposal by using data of Navsari centre for endorsement (Do not consider National level data). 3. Correct average yield in proposal. 4. Remove matter given in point 15, 17 of the proposal for screening under stress condition. 5. Give quality data and compare with locally available variety grown by farmers. **(Action:- Assoc. Professor, ACHF, NAU, Navsari)**
12.1.1.15	**Finger Millet: WWN-25 (GNN-7)**
	The finger millet culture WWN-25 was found superior in grain yield (2477 kg/ha) by 19.48% over local check GN-5 and 18.41% over national check variety VL-149. It has bold grain size, medium duration and synchronous in maturity (120-130 days) and non-lodging type. It is moderately resistant to leaf, neck and finger blast and foot rot disease. It is recommended for Zone- I, II and III *i.e.*, finger millet growing region of Gujarat. The proposal was approved with following suggestions. **Suggestions:** 1. Compile and combine data of AICRP trials / locations. 2. Remove MLT data of the year 2015-16. **(Action:- Assoc. Res. Sci., HMRS, NAU, Waghai)**
12.1.1.16	**Little Millet: WV-125 (GNV-3)**
	The genotype, GNV-3 found superior in grain yield (2864 kg/ha) by 8.77 % and 43.92 % over the existing checks i.e. GV-2 (LC) and CO-2 (NC), respectively. It is early and synchronous in maturity (107-118 days) and multi-tillering and non-lodging type. It showed resistant reaction to diseases like blast (Leaf, neck and panicle) and moderately resistant to grain smut (%) and sheath blight. It is recommended for Zone-I, II and III i.e., littet millet growing region of Gujarat. The proposal was approved with following suggestion. **Suggestion:** **1.** Include data of hulling recovery percentage. **(Action:- Assoc. Res. Sci., HMRS, NAU, Waghai)**
12.1.1.17	**Sorghum: SR-2917 (GNJ-1)**

	The sorghum genotype, SR-2917 recorded 3431 kg/ha which was 33.8%, 16.4% and 21.1% higher than checks GJ- 38, GJ-42 and CSV-20, respectively. SR-2917 found grain mold resistant, less incidence of ergot disease and stem borer. SR-2917 having desirable characteristics like well peduncle exertion resulted in disease resistance. It has long panicle and tall stature suitable for dual purpose. SR-2917 is recommended for rainfed areas of Gujarat. The proposal was approved by the house. **(Action:- I/c. Res. Scientist, MSRS, NAU, Surat)**
12.1.1.18	**Niger: NRS-1304 (GNN-1)**
	Niger variety NRS-1304 has recorded higher seed yield of 406 kg/ha which was 35.8% and 31.4% increase over the national check IGPN-2004-1 (299 kg/ha) and local check GN-2 (309 kg/ha) respectively. It recorded oil yield of 132 kg/ha which was 53.5% and 36.1% higher over the national check IGPN-2004-1 (86 kg/ha.) and local check GN-2 (97 kg/ha). NRS-1304 also found resistant to the Alternaria and Cercospora leaf spot diseases and moderately resistant to semilooper and caterpillar. It is recommended for South Gujarat. The proposal was approved with following suggestions. **Suggestions:** 1. Follow SAU patterns for naming the variety. 2. Specify breeding method with detailed generation advancement. 3. Reanalyze the insect / pest data. Follows standard pattern for recording incidence. 4. Specify seed production technique in proposal. **(Action:- Asst. Res. Scientist, NRS, NAU, Vanarasi)**
12.1.1.19	**Turmeric: NVST-64 (GNT-2)**
	A termeric culture NVST-64 yielded 28.7 t/ha with yield increment of 22.5 % and 26.5 % over checks GNT-1 and Pratibha. It contains more number of mother rhizomes (4-5) per plant, fingers per rhizome (30-34), higher curcumin content (4.10 %), dry weight recovery (20.70%), powder recovery (87.0%) and medium reddish yellow powder colour. Resistant against rhizome rot and moderately resistance against leaf blotch diseases. It is recommended for South Gujarat. The proposal was approved with following suggestions. **Suggestions:** 1. Follow SAU norms for naming the variety. 2. Specify the year/location of source material and generation advancement. **(Action:- I/c. Prof. and Head, NAU, Navsari)**
12.1.1.20	**Brinjal: NSRP-1 (GNB-1)**
	The brinjal culture, NSRP-1 recorded 303.7 q/ha fruit yield which was 17.5 % and 13.8 % higher over standard checks GJB-3 (258.5 q/ha) and GOB-1 (267.0 q/ha), respectively. Under South Gujarat condition, GNB-1 registered 23.0 and 22.7% higher fruit yield over GJB-3 and GOB-1 respectively. The fruits of genotype are round, dark purple in colour and have purple green leaves. GNB-1 had low incidence of little leaf disease reaction (3.90 %) and shoot borer (3.35 %). GNB-1 is recommended for general cultivation in brinjal growing areas of South Gujarat. The proposal was approved with following suggestion.

	Suggestion: 1. Specify year of collection made and procedure followed for generation advancement. **(Action:- Assoc. Professor, ACHF, NAU, Navsari)**

JUNAGADH AGRICULTURAL UNIVERISTY	
12.1.1.21	**Wheat: Gujarat Junagadh Wheat 463 (GJW 463)**
	This proposal was presented by Dr. M. D. Khanpara, Convener, JAU, Junagadh. The proposed wheat variety has recorded 5575 kg/ha grain yield under early sown condition which was 28.1%, 30.0%, 21.7% and 12.9% higher over check varieties GW 496 (3338 kg/ha), LOK 1 (4287 kg/ha), GW 366 (4565 kg/ha) and GW 190 (4938 kg/ha), respectively. Whereas, the proposed variety has recorded 5091 kg/ha grain yield under timely sown condition which was 13.4%, 6.9%, 1.1% and 6.2% higher grain yield over check varieties GW 496 (4479 kg/ha), LOK 1 (4763 kg/ha), GW 322 (5037 kg/ha) and GW 366 (4792 kg/ha), respectively. It possesses amber seed like GW 496. This variety is tolerant against rust disease. The proposal was approved for wheat growing area of the state with following suggestion. **Suggestion:** 1. Include Point No. 17 in the proposal. **(Action : Research Scientist (Wheat), JAU, Junagadh)**
12.1.1.22	**Red Onion: Gujarat Junagadh Red Onion-11 (GJRO-11)**
	This red onion variety was recommended in 11th Combine-Joint AGRESCO held at Anand on 7-9th, April 2015 and was released for Gujarat except South Gujarat. The proposal was presented with South Gujarat data. Overall, this variety recorded bulb yield of 336.29 q/ha, which was 16.0%, 27.3% and 21.3% higher over check varieties, AGFL Red (289.9 q/ha), Pilli Patti (264.2 q/ha) and Talaja Red (277.3 q/ha), respectively. This variety was found less pungent (Pyruvic acid, 1.22 µM/g) as compared to check varieties AGFL-Red and Talaja-Red and the bulbs of this variety were medium in size with flat globe shape and red in colour. The proposed variety was found good as compared to check varieties against diseases and insect-pest reactions. The proposal was approved by the house for South Gujarat too. **[Action : Research Scientist (Onion & Garlic), JAU, Junagadh]**
12.1.1.23	**White Onion: Gujarat Junagadh White Onion-3 (GJWO-3)**
	The proposal was presented by incorporating suggestions of 11th Joint combined AGRESCO. This white onion variety recorded bulb yield of 398.06 q/ha, which was 20.8%, 11.3% and 7.8% higher over check varieties, PWF-131 (329.54 q/ha), GWO-1 (357.75 q/ha) and qualifying variety GAWO-2 (369.26 q/ha), respectively. The proposed variety bulbs contain higher total soluble solid (13.15%) as compared to check varieties *viz*., PWF-131 (12.80%), GWO-1 (12.88%) and GAWO-2 (12.18%). Bolting per cent and jointed bulb per cent were less as compared to check varieties and the bulbs of this variety were medium in size with flat globe shape and white in colour preferred by industry. The proposal was approved by the house for whole Gujarat.

	[Action : Research Scientist (Onion & Garlic), JAU, Junagadh]
SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY	
12.1.1.24	**Cowpea : GUJARAT COWPEA 6 (GC 6)**
	This proposal was presented by Dr. Y. Ravindrababu, Convener, SDAU, S.K. Nagar. Overall, the proposed cowpea variety recorded 1077 kg/ha seed yield which was higher than GC 3 (905 kg/ha), GC 4 (947 kg/ha) and GC 5 (923 kg/ha), respectivity. The proposed variety GC 6 recorded 18.97, 13.66 and 16.64 per cent higher grain yield than checks GC 3, GC 4 and GC 5, respectively over years and locations. The variety also showed superiority in term of yield in summer season (28.32, 12.49 and 28.33 per cent over GC 3, GC 4 and GC 5, respectively). Proposed variety has medium, attractive creamish white colour with higher test weight (10.66 gm). The proposal was approved and recommended for summer season cultivation in North Gujarat. (**Action** : **Pulses Research Station, S. D. Agricultural University, S.K. Nagar)**
12.1.1.25	**Isabgul: GI 4 (GUJARAT ISABGUL 4)**
	The proposed isabgul variety has recorded 928 kg/ha seed yield which was 11.8 % higher over the check GI 3 (830 kg/ha). The variety is non-shettering type with higher husk swelling trait.The proposal was approved by the house for isabgul growing areas of the state. (**Action** : Seed Spices Research Station, S. D. Agricultural University, Jagudan)
12.1.1.26	**FENUGREEK: ENDORSEMENT OF PUSA EARLY BUNCHING (PEB)**
	The proposed fenugreek variety Pusa Early Bunching recorded 20.4 t/ha green leaf foliage yield which was 41.6 % higher than the check variety GM 2 (14.4 t/ha). This variety possesses higher nutrient values *viz.,* Fe, Zn and Mn than the check GM 2. The proposal was approved for endorsement with following suggestions. **Suggestions:** 1. Include seed yield data. 2. Include cut-wise green leaf yield. 3. Give data of number of secondary branches and number of leaves per plant. (**Action** : Seed Spices Research Station, S. D. Agricultural University, Jagudan)

12.1.2 NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERISTY		
Item No.	**Title/Centre**	**Suggestions**
Centre:- Associate Research Scientist, RCRS, Viramgam., AAU, Anand		
12.1.2.1	Validation of male sterility specific SCAR marker in early generation of *Gossypium herbaceum.*	Accepted by the house. **(Action: Associate Research Scientist, RCRS, Viramgam., AAU, Anand)**

12.1.2.2	Characterization of Deshi cotton (*G. herbaceum*) germplasm	Accepted with following suggestion/s 1. Include disease and pest incidence observation **(Action: Associate Research Scientist, RCRS, Viramgam., AAU, Anand)**
Centre:- Professor & Head, Department of Genetics & Plant breeding, AAU, Anand		
12.1.2.3	Evaluation of sesame genotypes in summer season along with molecular characterisation.	Accepted with following suggestion/s 1. Include No. of seeds per capsule observation 2. Include all recommended varieties as checks 3. Take disease and pest observation. (**Action: Professor & Head, Department of Genetics & Plant breeding, AAU, Anand)**

NAVSARI AGRICULTURAL UNIVERISTY		
Item No.	**Title/Centre**	**Suggestions**
Centre:- Research Scientist (Cotton), NAU, Surat (Cotton)		
12.1.2.4	Exploration of cotton germplasms for various characters from Gujarat	Accepted with following suggestion/s 1. Change the title as "Collection, evaluation and development of promising cotton hybrids with big ball size." **(Action:- Research Scientist (Cotton), NAU, Surat)**
Centre:- Associate Research Scientist (PB), MRRC, NAU, Navsari (Rice)		
12.1.2.5	Induction of salt tolerance in rice by mutagenesis	Accepted by the house. **(Action:- Associate Research Scientist (PB), MRRC, NAU, Navsari)**
12.1.2.6	Effect of different priming treatments on seed germination and early growth of rice	Accepted by the house. **(Action:- Associate Research Scientist (PB), MRRC, NAU, Navsari)**
Centre:- Nodal officer & Unit Head, Pulse and Castor Res. Station, NAU, Navsari		
12.1.2.7	Effect of seed coating polymer on seed quality of cotton	**Differed** by the house. **(Action:- Nodal officer & Unit Head, Pulse and Castor Res. Station, NAU, Navsari)**
12.1.2.8	Effect of priming on seed germination and seedling vigour of Pigeon pea (*in vitro* condition)	Accepted with following suggestion/s 1. Take experiment in FCRD design. **(Action:- Nodal officer & Unit Head, Pulse and Castor Res. Station, NAU, Navsari)**
12.1.2.9	To study the effect of different seed priming treatments on chickpea.	Accepted with following suggestion/s. 1. Specify dose in the treatments. **(Action:- Nodal officer & Unit Head, Pulse and Castor Res. Station, NAU, Navsari)**

Centre:- : Professor & Head, Dept. of Genetics and Pl. Breeding, NMCA, Navsari		
12.1.2.10	Improvement in yield and quality parameters in turmeric through mutagenesis	Accepted by the house. **(Action:- Professor & Head, Dept. of Genetics and Pl. Breeding, NMCA, Navsari)**
Centre:- Professor & Head, Dept. of Genetics and Pl. Breeding, Co. of Agri., Bharuch		
12.1.2.11	Exploitation of genomic resources to developed biofortified pigeon pea	Accepted with following suggestion/s. 1. Change title as "Exploitation of genetic resources to develop biofortified pigeonpea". 2. Collect different lines from other research stations and ICRISAT. **(Action:- Professor & Head, Dept. of Genetics and Pl. Breeding, Co. of Agri., Bharuch)**
Centre:- Asso. Research Sci. (PB), Hill Millet Research Station, Waghai		
12.1.2.12	Evaluation of promising genotypes of Finger millet (*Eleusine coracana* L.) developed through gamma rays induced mutation	Accepted with following suggestion/s. 1. Include variety GPU-28 in conventional breeding programme. 2. Add LD_{50} value. 3. Artificial inoculation in M_2 generation should be done. **(Action: - Assoc. Research Sci. (PB), Hill Millet Research Station, Waghai)**
Centre:- Asso. Research Sci. (PB), NRS, NAU, Vanarasi		
12.1.2.13	Collection and evaluation of niger genotypes for seed oil and quality aspects.	Accepted by the house. **(Action: - Asso. Res. Sci. (PB), Vanarasi)**
Centre: - Asso. Research Sci. (PB), Hill Millet Research Station, Waghai		
12.1.2.14	Collection and evaluation of superior cucumber (*Cucumis sativus* L.) genotypes suitable for cultivation in Southern Gujarat region	Accepted with following suggestion/s. 1. Collect more local germplasm from surrounding areas. **(Action: - Asso. Research Sci. (PB), Hill Millet Research Station, Waghai)**
12.1.2.15	Collection, Multiplication and Maintenance of Elephant Foot Yam germplasm for evaluation as well as Selection of Superior Genotypes suitable for cultivation in Southern Gujarat region	Accepted with following suggestion/s 1. Planting material should be used with equal size and weight. 2. Collect more germplasm from various sources. 3. First year trial should be conducted as PET only at one location i.e. Waghai. **(Action: - Asso. Research Sci. (PB), Hill Millet**

		Research Station, Waghai)
Centre:- Assistant Research Scientist, ARS, NAU, Tanchha, Dist: Bharuch		
12.1.2.16	Selection and development of promising chickpea genotype suitable for cultivation under conserved soil moisture condition	Accepted with following suggestion/s. 1. Add protein content in observation. **(Action:- Assistant Research Scientist, ARS, NAU, Tanchha, Dist: Bharuch)**
Centre:- Agricultural Research Station, NAU, Tanchha		
12.1.2.17	Development of molecular markers linked to fragrance in indigenous medium grain aromatic rice genotypes	Accepted by the house. **(Action:- Agricultural Research Station, NAU, Tanchha)**
Centre :- Vegetable Dept., ACHF, NAU, Navsari		
12.1.2.18	Assessment of genetic diversity in sweet potato	Accepted by the house. **(Action:- Vegetable dept., ACHF, NAU, Navsari)**
12.1.2.19	G x E interaction and stability for yield and quality components in greater Yam.	Accepted with following suggestion/s 1. Change title as "Genetic variability, G x E interaction and stability analysis for yield and quality components in greater Yam." 2. Collect more local germplasm and include in trial. **(Action:- Vegetable dept., ACHF, NAU, Navsari)**

JUNAGADH AGRCICULTURAL UNIVERISTY		
Sr. No.	**Title/Center**	**Suggestions**
Center: Wheat Research Station, JAU, Junagadh		
12.1.2.20	Phenotyping wheat genotypes for heat tolerance.	Accepted by the house. **[Action: Research Scientist (Wheat), JAU, Junagadh]**
12.1.2.21	Screening of different wheat genotypes under saline vertisol soil condition.	Accepted with following suggestion/s. 1. Add salt tolerant wheat variety as a check. 2. Include salt injury score in observation. 3. Observe tip sterility in earhead. **[Action: Res. Scientist (Wheat), JAU, Junagadh]**
Center: Research Scientist (Pl. Br.), Agricultural Research Station, JAU, Amreli		
12.1.2.22	Performance of sesame genotypes differing in maturity and plant types and their response to plant geometry.	Accepted by the house. **[Action: Research Scientist (Pl. Breeding), JAU, Amreli]**

12.1.2.23	Screening of sesame varieties/ germplasm lines for yield performance under organic farming.	Accepted by the house. **[Action: Research Scientist (Pl. Breeding), JAU, Amreli]**
Center: Pearl Millet Research Station, Seed Technology Research, JAU, Jamnagar		
12.1.2.24	Standardization of seed production technology in green manure crops (i) Dhaincha (ii) Sun hemp (iii) Pillipesara.	Accepted by the house. **[Action: Research Scientist (Pearl Millet), JAU, Jamnagar]**
12.1.2.25	Effect of High Yielding Technology (HYT) on enhancing seed yield in wheat.	Accepted by the house. **[Action: Research Scientist (Pearl Millet), JAU, Jamnagar]**
Center: Vegetable Research Station, JAU, Junagadh		
12.1.2.26	Research on storability in onion.	Accepted with following suggestion/s 1. Submit technical programme in prescribed format. 2. Include farmer's practice as treatment. **[Action : Res. Sci. (Onion & Garlic), JAU, Junagadh**

During the presentation of varietal release proposals and new technical programmes following points were emerged and discussed at length for implementation by all the centres:

1. The crop varieties should be tested in a specified / systematic evaluation system eg. Station trial/ PET, SSVT, LSVT etc. The release proposal should also contain yield data of the respective systemic evaluation trials.
2. There should be open and free exchange of breeding lines by different centres of SAUs.
3. Cotton varieties should be tested with popular *Bt* hybrids for comparison in yield.
4. Crop scientists should send copy of final research report to concern sub-centre and Director of Research of respective SAUs for reference purpose.
5. No adaptive trials of any variety should be given prior to release.
6. When the material is developed from local, should be specified with pass port data, accession number with breeding procedure followed.
7. Pedigree must be mentioned in release proposal.
8. Release proposal must accomplish with DUST test characters.

At the end of session, Dr. B. G. Solanki, the convener, Combined Joint AGRESCO of Crop Improvement Sub-committee extended the vote of thanks.

12.2 CROP PRODUCTION AND NATURAL RESOURCE MANAGEMENT

Chairman	Dr. K.P. Patel, Principal and Dean, B. A. College of Agri., AAU, Anand
Co-chairman	1. Dr. M. K. Arvadia, Principal and Dean, N.M. College of Agri., NAU, Navsari
	2. Dr. V. R. Patel, Professor and Head, Dept. of Agril. Chem & Soil Science, SDAU, Sardarkrushinagar
Rapporteurs	1. Dr. V.R. Bhatt, Professor and Head, Dept. of Agril. Chem & Soil Science, BACA, AAU, Anand
	2. Dr. V. P. Usadadia, Research Scientist (Soil and Water), NAU, Navsari

SUMMARY

Universities	Recommendations				New Technical Programmes	
	Farming Community		Scientific Community			
	Proposed	Approved	Proposed	Approved	Proposed	Approved
AAU	11	10*	--	--	28	26
JAU	10	10	5	5	28	28
NAU	16	15	2	3	50	49**
SDAU	8	7	--	2	21	20
TOTAL	**45**	**42**	**7**	**10**	**127**	**123**

*** Recommendation no. 4 and 5 are combined in one**

**** One technical programme approved in horticulture and agro forestry sub committee**

12.2.1 RECOMMENDATIONS

A. FARMING COMMUNITY

ANANAD AGRICULTURAL UNIVERSITY

12.2.1.1 Site specific nutrient management in soybean – wheat cropping system in middle Gujarat condition

The farmers of Middle Gujarat Agro climatic Zone growing wheat after soybean are recommended to apply 120-60-120 kg NPK/ha along with 25 kg $ZnSO_4$/ha, 20 kg S/ha (through gypsum 150 kg/ha) and one foliar spray of 0.5 % $FeSO_4$ (5 g $FeSO_4$ + 1 g citric acid /l) at 30 DAS to wheat to get higher yield and net return.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારમાં સોયાબીન પછી ઘઉં ઉગાડતા ખેડૂતોને વધુ ઉત્પાદન તથા નફો મેળવવા માટે ઘઉંના પાકને પ્રતિ હેકટર ૧૨૦-૬૦-૧૨૦ કિ.ગ્રા.ના. ફો. પો. ઉપરાંત ૨૫ કિ.ગ્રા. ઝીંક સલ્ફેટ,૨૦ કિ.ગ્રા. સલ્ફર (૧૫૦ કિ.ગ્રા./હે. જીપ્સમ દ્વારા) આપવાથી તેમજ ફેરસ સલ્ફેટ ૦.૫ % દ્રાવણનો (૫ ગ્રામ ફેરસ સલ્ફેટ + ૧ ગ્રામ લીંબુના ફુલ/લિ.) વાવેતર બાદ ૩૦ દિવસે છંટકાવ કરવાથી ઘંઉનું વધુ ઉત્પાદન તથા નફો મેળવી શકાય છે.

(Action: Professor & Head, Dept. of Agril. Chem. & Soil Sci., BACA, AAU, Anand)

12.2.1.2 Effect of method of sowing and seed rate on wheat in rice-wheat cropping system

The farmers of Middle Gujarat Agro climatic Zone growing wheat after transplanted rice are recommended for line sowing (22.5 cm) of wheat in dry seedbed with seed @ 150 kg/ha followed by irrigation after sowing for higher yield and net return.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારમાં રોપાણ ડાંગર બાદ ઘઉનું વાવેતર કરતા ખેડૂતોને ઘઉનું વધારે ઉત્પાદન અને નફો મેળવવા માટે સુકી જમીનમાં ૨૨.૫ સે.મી.ના અંતરે ચાસ પાડીને હેકટરે ૧૫૦ કિ.ગ્રા. બીજ દર રાખી વાવેતર કર્યા બાદ પિયત આપવાની ભલામણ કરવામાં આવે છે.

(Action: Assoc. Res. Sci., Regional Research Station, AAU, Anand)

12.2.1.4 Response of *rabi* maize (GM 3 and HQPM 1) to tassel removal on maize productivity

The farmers of Middle Gujarat Agro climatic Zone growing *rabi* maize (GM-3 and HQPM 1) are recommended to remove tassel after 15 days of anthesis in alternate rows for getting higher yield and net return.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારમાં રવી મકાઇ (ગુજરાત મકાઇ ૩ અને એચક્યુપીએમ ૧) ઉગાડતા ખેડૂતો માટે ભલામણ છે કે દરેક એકાંતર લાઇનમાંથી છોડ ઉપરથી ફલીનીકરણ થયાના ૧૫ દિવસ પછી ચમરી કાઢી નાખવાથી વધુ ઉત્પાદન અને નફો મેળવી શકાય છે.

(Action: Asstt. Res. Sci. (Agron.), MMRS, AAU, Godhra)

12.2.1.5 Improving use efficiency of inputs (water and nutrients) in *Bt.* cotton (G. Cot Hy-8 BG II)

The farmers of Middle Gujarat Agro climatic Zone growing *Bt* cotton (G Cot. Hy-8, BG II) in paired row (60 x 180 x 60 cm) are recommended to adopt drip irrigation at 0.8 PEF and fertilize the crop with 240 kg N/ha in four equal splits (60 kg N as a basal and remaining 180 kg N in three equal splits at one month interval through fertigation) to get higher yield and net return with 20 % water saving.

System details:

1. Lateral spacing: 2.40 m
2. Dripper spacing: 45 cm
3. Dripper discharge: 4 lph
4. Operating pressure: 1.2 kg/ cm^2
5. Operating frequency: Alternate day
6. Operating time: 84 minutes

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારના બીટી કપાસ (ગુજ. કપાસ સંકર-૮ બીજી -૨) ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે કપાસના પાકને જોડીયા હારમાં (૬૦ x ૧૮૦ x ૬૦ સે.મી.) વાવેતર કરી ૦.૮ પીઇએફ થી ટપક પધ્ધતિ દ્વારા પિયત આપવુ અને હેક્ટરે ૨૪૦ કિ.ગ્રા. નાઇટ્રોજન ચાર સરખા હપ્તામાં (૬૦ કિ.ગ્રા . નાઇટ્રોજન પાયામાં અને બાકીનો ૧૮૦ કિ.ગ્રા. નાઇટ્રોજન ત્રણ સરખા ભાગમાં એક માસના અંતરે ટપક પિયત દ્વારા) આપવાથી વધુ ઉત્પાદન, નફો અને ૨૦ % પાણીનો બચાવ કરી શકાય છે.

આ ટપક પધ્ધતિમા ૪ લિટર પ્રતિ કલાકની ક્ષમતાના ડ્રીપર અને ૪૫ સે.મી .ના અંતરવાળી ડ્રીપલાઇન, બે ડ્રીપલાઇન વચ્ચે ૨.૪૦ મીટરનુ અંતર રાખી ટપક પ્રણાલીને ૧.૨ કિ.ગ્રા/.સે.મી^{2} ના દબાણે આંતરે દિવસે ૮૪ મીનીટ ચલાવવાની ભલામણ છે.

(Action : Res. Sci. (Agron.), TRTC, AAU, Devgadh Baria)

12.2.1.6 Response of different levels of nitrogen, phosphorus and bio-fertilizers on rice (*Oryza sativa* L.) under middle Gujarat condition

The farmers of AES-V (Nawagam area) and AES-II (Thasra area) of middle Gujarat agro climatic zone growing paddy (GAR 13) are recommended to fertilize the crop only with 120 kg N/ha where as 100 kg N/ha for farmers of AES-III (Dabhoi area) to get higher yield and net return. Application of phosphorus is not beneficial to the crop.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારની ખેત પરિસ્થિતી-૫ (નવાગામ વિસ્તાર) અને ખેત પરિસ્થિતી-૨ (ઠાસરા વિસ્તાર) ના ડાંગર (જી.એ.આર. ૧૩) ઉગાડતા ખેડૂતોને ફક્ત ૧૨૦ કિ.ગ્રા. નાઈટ્રોજન પ્રતિ હેક્ટરે જ્યારે ખેત પરિસ્થિતી-૩ (ડભોઇ વિસ્તાર) ના ખેડૂતોને ૧૦૦ કિ.ગ્રા. નાઈટ્રોજન પ્રતિ હેક્ટરે આપવાની ભલામણ કરવામાં

આવે છે જેથી વધુ ઉત્પાદન તથા નફો મેળવી શકાય છે. આ પાકમાં ફોસ્ફરસ આપવો ફાયદાકારક નથી.

(Action : Research Scientist, MRRS, AAU, Nawagam)

12.2.1.7 Production potential and economic feasibility of pigeon pea based intercropping system with different planting pattern.

The farmers of Middle Gujarat Agro climatic Zone growing pigeon pea are recommended to grow one row of black gram as intercrop in pigeon pea grown at 120 cm inter row spacing for getting higher yield and net return.

મધ્ય ગુજરાત ખેત-આબોહવાકીય વિસ્તાર-૩ના તુવેરની ખેતી કરતા ખેડૂતોને વધારે ઉત્પાદન અને નફો મેળવવા માટે ૧૨૦ સે.મી.ના અંતરે વાવેલ તુવેરમાં આંતરપાક તરીકે અડદની એક હાર વાવેતર કરવાની ભલામણ કરવામાં આવે છે.

(Action : Research Scientist, Pulse Research Station, AAU, Vadodara)

12.2.1.8 Weed Management in Drilled Paddy

The farmers of Middle Gujarat Agro climatic Zone growing drilled paddy are recommended to go for two hand weeding at 20 and 40 days after sowing for higher yield and return. In case of paucity of labour, farmer can go for chemical weed control using oxadiargyl @ 90 g/ha as pre-emergence (3 DAS) followed by bispyribac sodium @ 25 g /ha at 20 DAS.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારના ઓરાણ ડાંગરની ખેતી કરતા ખેડૂતોને વધુ ઉત્પાદન અને નફો મેળવવા માટે વાવણી બાદ ૨૦ અને ૪૦ દિવસે હાથથી નિંદામણ કરવાની ભલામણ છે. પરંતુ મજુરોની અછત હોય તો વાવણી બાદ ત્રીજા દિવસે ઓક્ઝાડાયાગ્રીલ ૯૦ ગ્રામ તેમજ વાવણી બાદ ૨૦ દિવસે બીસપાયરીબેક સોડીયમ ૨૫ ગ્રામ પ્રતિ હેક્ટર મુજબ છંટકાવ કરવો જોઇએ.

(Action : Associate Research Scientist, ARS, AAU, Derol)

12.2.1.9 Assessment of Natural Organic Liquid (NOL) and inorganic nutrient supply on yield of *rabi* fennel (GF 1)

The farmers of Middle Gujarat Agro climatic Zone growing *rabi* fennel are recommended to apply recommended dose of fertilizer (90-45-00 NPK kg/ha) along with application of FYM @ 10 t/ha and seed treatment with AAU PGPR (Plant Growth Promoting *Rhizobacteria*) consortium @ 5 ml/kg of seed and apply NOL @ 500 l/ha drenching near plant as well as foliar spray of NOL @ 50 l/ha at 30 and 45 days after sowing for getting higher yield and net return.

NOL preparation

Materials required	**Quantity of materials required**	
	NOL for soil application (A)	**NOL for foliar spray(B)**
Water (l)	500	10
Desi cow dung (kg)	50	1
Desi cow urine (l)	25	0.5
Jaggery / Molasses (kg)	5	0.1
Butter milk (l)	5	0.1
Pulse flour (kg)	5	0.1
Soil under banyan tree (kg)	2.5	0.05

Mix the above materials (A) in barrel or tank and keep it 2 to 7 days for soil drenching.

Mix the above materials (B) in barrel or tank and keep it 48 hrs for foliar spray and use 1 l mixture in 10 l of water.

These both mixtures should be stirred daily two times.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારમાં શિયાળુ વરીયાળીનું વાવેતર કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે, શિયાળુ વરીયાળીના પાકમાં વધુ ઉત્પાદન અને નફો મેળવવા માટે ભલામણ કરેલ ખાતર (૯૦-૪૫-૦૦ નાફોપો કિ.ગ્રા/હેક્ટર) ની સાથે ૧૦ ટન છાણિયું ખાતર/હેક્ટર આપવુ તેમજ ૧ કિ.ગ્રા બિયારણ ને ૫ મિ.લિ. એઍઍયુપીજીપીઆર કોંસોર્ટીયમથી બીજ માવજત આપવી અને વાવણીના ૩૦ અને ૪૫માં દિવસે હેકટરે ૫૦૦ લિટર કુદરતી પ્રવાહી સજીવ ખાતર છોડના થડની નજીક હારમાં રેડવું તથા હેક્ટરે ૫૦ લિટર કુદરતી પ્રવાહી સજીવ ખાતરનો પાક પર છંટકાવ કરવો.

કુદરતી પ્રવાહી સજીવ ખાતર બનાવવાની પધ્ધતિ

સામગ્રી	સામગ્રીના જથ્થાની જરૂરીયાત	
	જમીનમાં હારમાં આપવા (અ)	પાક પર છંટકાવ કરવા (બ)
પાણી (લિ.)	૫૦૦	૧૦
દેશી ગાયનુ છાણ (કિ. ગ્રા.)	૫૦	૧
દેશી ગાયનુ મૂત્ર (લિ.)	૨૫	૦.૫
ગોળ/મોલાસીસ (કિ. ગ્રા.)	૫	૦.૧
છાસ(લિ.)	૫	૦.૧
કઠોળનો લોટ (કિ. ગ્રા.)	૫	૦.૧
વડના ઝાડ નીચેની માટી (કિ. ગ્રા.)	૨.૫	૦.૦૫

સમગ્ર સામગ્રી(અ)ને દર્શાવેલ માત્રામાં પીપ અથવા ટાંકીમાં મિશ્રણ કરી જમીનમાં આપવા માટે ૨ થી ૭ દિવસ રાખી મૂકવુ.

સમગ્ર સામગ્રી(બ)ને દર્શાવેલ માત્રામાં પીપ અથવા ટાંકીમાં મિશ્રણ કરી પાક પર છંટકાવ કરવા માટે ૪૮ કલાક રાખી મૂકવુ. આ મિશ્રણનો ૧ લિટર જથ્થો ૧૦ લિટર પાણીમાં ઉમેરી પાક પર છંટકાવ કરવો.

ઉપરોકત બંને મિશ્રણને દિવસમાં ૨ વાર હલાવવું.

(Action : Professor and Head, Department of Agronomy, BACA, Anand)

12.2.1.10 Long term effect of organic manures on soil, yield and quality of groundnut (*kharif*) – wheat crop sequence

The farmers of Middle Gujarat Agro climatic Zone interested to grow groundnut (*Kharif*)-wheat crop sequence organically are recommended to apply 50 % N (12.5 kg N/ha) through FYM (2.5 t/ha) to groundnut and 50 % N (60 kg N/ha) through FYM (12.5 t/ha) to wheat. The remaining 50 % N to groundnut and wheat should be given through castor cake @ 0.3 and 1.3 t/ha respectively for getting higher yield, net return and maintaining soil health.

મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તારમાં મગફળી (ચોમાસુ) –ઘઉંની સેન્દ્રિય ખેતીમાં રસ ધરાવતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે, મગફળીને ૫૦ % નાઇટ્રોજન (૧૨.૫ કિ.ગ્રા. નાઇટ્રોજન/હે.) છાણિયા ખાતર દ્વારા (૨.૫ ટન/હે.) તથા ઘઉંને ૫૦ % નાઇટ્રોજન (૬૦ કિ.ગ્રા. નાઇટ્રોજન/હે.) છાણિયા ખાતર દ્વારા (૧૨.૫ ટન/હે.) આપવો. બાકીનો ૫૦ % નાઇટ્રોજન દિવેલીના ખોળ દ્વારા મગફળી અને ઘઉં ને અનુક્રમે ૦.૩ અને ૧.૩ ટન/હે. પ્રમાણે આપવાથી વધારે ઉત્પાદન અને નફો મેળવવા ઉપરાંત જમીનનું સ્વાસ્થ્ય જળવાઇ રહે છે.

(Action : Professor and Head, Department of Agronomy, BACA, Anand)

12.2.2.1 Effect of sowing time and spacing on summer clusterbean

The farmers of South Saurashtra Agro-climatic Zone growing summer cluster bean are recommended to sow the crop in second week of February at 45 cm x 15 cm spacing for obtaining higher yield and net realization.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારમાં ઉનાળુ ગુવારનું વાવેતર કરતા ખેડૂતોને ગુવારના દાણાનું મહત્તમ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે ફેબ્રુઆરીના બીજા અઠવાડીયામાં ૪૫ સે.મી. × ૧૫ સે.મી.ના અંતરે પાકની વાવણી કરવાની ભલામણ કરવામાં આવે છે.

*(**Action:** Professor & Head, Department of Agronomy, JAU, Junagadh)*

12.2.2.2 Evaluation of potentiality of organic farming for groundnut (*kharif*)-chickpea (*rabi*) cropping sequence

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut (*kharif*)-chickpea (*rabi*) cropping sequence under organic farming are recommended to apply FYM (1.25 t/ha) + castor cake (139 kg/ha) to groundnut and vermicompost (667 kg/ha) + castor cake (222 kg/ha) to chickpea in furrow before sowing for securing higher net realization and maintaining soil fertility.

દક્ષિણ સૌરાષ્ટ્ર ખેત–આબોહવાકીય વિસ્તારના મગફળી (ખરીફ)–ચણા (રવી) પાક પધ્ધતિમાં સેન્દ્રિય ખેતી અપનાવતા ખેડૂતોને ઓછા ખર્ચે વધુ ચોખ્ખો નફો મેળવવા તેમજ જમીનની ફળદ્રુપતા જાળવવા માટે મગફળીમાં છાણીયુ ખાતર (૧.૨૫૦ ટન/હે.) + દિવેલીનો ખોળ (૧૩૯ કિ.ગ્રા./હે.) અને ચણામાં અળસિયાનું ખાતર (૬૬૭ કિ.ગ્રા./હે.) + દિવેલીનો ખોળ (૨૨૨ કિ.ગ્રા./હે.) વાવણી પહેલાં ચાસમાં આપવાની ભલામણ કરવામાં આવે છે.

*(**Action:** Professor & Head, Dept.of Agronomy, JAU, Junagadh & Professor & Head, Department of Agril. Chemistry & Soil Science, JAU, Junagadh)*

12.2.2.3 Integrated weed management in summer sweet corn

The farmers of South Saurashtra Agro-climatic Zone growing sweet corn in summer season are recommended to apply atrazine 500 g/ha (50% WP 20 g/10 l) as pre-emergence followed by one interculturing and hand weeding at 40 DAS for effective weed management along with higher yield and net realization.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારમાં સ્વીટ કોર્ન (મીઠી મકાઈ)નું ઉનાળુ ઋતુમાં વાવેતર કરતા ખેડૂતોને સ્વીટ કોર્નમાં અસરકારક નીંદણ નિયંત્રણ તેમજ વધુ ઉત્પાદન અનેચોખ્ખો નફો મેળવવા માટે એટ્રાઝીન ૫૦૦ ગ્રામ/હે. (૫૦% વે.પા. ૨૦ ગ્રામ/૧૦ લી.) પ્રમાણે વાવણી બાદ પરંતુ પાક અને નીંદણ ઉગ્યા પહેલાં છંટકાવ તથા વાવણી બાદ ૪૦ દિવસે એક વખત આંતરખેડ અને હાથ નિંદામણ કરવાની ભલામણ કરવામાં આવે છે.

*(**Action:** Professor & Head, Department of Agronomy, JAU, Junagadh)*

12.2.2.4 Development of organic farming packages for system based high value crops (Groundnut-Onion)

The farmers of South Saurashtra Agro-climatic Zone adopting Grountnut (*kharif*)-Onion (*rabi*) cropping sequence are recommended to apply 50% RDF (6.25-25 N-P_2O_5 kg/ha) for groundnut and 37.5-60-50 N-P_2O_5-K_2O kg/ha for onion + 50% RDN as FYM to groundnut (1250 kg/ha) and onion (7500 kg/ha) for securing higher groundnut equivalent yield and net realization along with maintenance of soil fertility.

Farmers interested in adopting Grountnut (*kharif*)-Onion (*rabi*) cropping sequence under organic farming are recommended to follow nutrient management system as 50% RDN as FYM (1250 and 7500 kg FYM/ha for groundnut (*kharif*) and onion (*rabi*), respectively) + biofertilizer (Rhizobium / Azotobacter @ 1250 ml/ha) for N + rock phosphate to meet P requirement of crops (100 kg/ha in groundnut and 600 kg/ha in onion) + PSB (1250 ml/ha) for higher groundnut equivalent yield and net income along with maintenance of soil fertility.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારના ચોમાસુ મગફળી–શિયાળુ ડુંગળી પાક પધ્ધતિ અપનાવતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે વધુ ઉત્પાદન અનેચોખ્ખો નફો મેળવવા તેમજ જમીનની ફળદ્રુપતા જાળવવા માટે મગફળી અને ડુંગળી માં ભલામણ

કરેલ નાઈટ્રોજન ૫૦% રાસાયણીક ખાતરો (મગફળીમાં ૬.૨૫–૨૫ ના–ફો કિ.ગ્રા./હે. તથા ડુંગળીમાં ૩૭.૫–૬૦–૫૦ ના–ફો–પો કિ.ગ્રા./હે.) દ્વારા તથા ૫૦% છાણીયા ખાતર (મગફળીમાં ૧૨૫૦ કિ.ગ્રા./હે. તથા ડુંગળીમાં ૭૫૦૦ કિ.ગ્રા./હે.) દ્વારા આપવું.

સેન્દ્રિય ખેતીમાં રસ ધરાવતા ખેડૂતોને વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા તેમજ જમીનની ફળદ્રુપતા જાળવવા માટે મગફળી અને ડુંગળી માં ભલામણ કરેલ નાઈટ્રોજનના ૫૦% છાણીયા ખાતર (મગફળીમાં ૧૨૫૦ કિ.ગ્રા./હે. તથા ડુંગળીમાં ૭૫૦૦ કિ.ગ્રા./હે.) દ્વારા + નાઈટ્રોજન માટે જૈવિક ખાતરો (રાઈઝોબિયમ / એઝેટોબેકટર ૧૨૫૦ મીલી/હે.) + ફોસ્ફરસ માટે રોક ફોસ્ફેટ (મગફળીમાં ૧૦૦ કિ.ગ્રા./હે. તથા ડુંગળીમાં ૬૦૦ કિ.ગ્રા./હે.) + ફોસ્ફેટ સોલ્યુબિલાઈઝીંગ બેકટેરીયલ કલ્ચર (૧૨૫૦ મીલી/હે.) આપવું જોઈએ.

*(**Action**: Professor & Head, Department of Agronomy, CoA, JAU, Junagadh)*

12.2.2.5 Effect of potassium fertilizer on castor hybrid

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are recommended to apply potash @ 50 kg K_2O/ha (25 kg/ha as basal and 25 kg/ha at 45 days after sowing) along with recommended dose of nitrogen and phosphorus (120-50 N-P_2O_5 kg/ha) for obtaining higher seed yield and net return.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારમાં પિયત દિવેલા ઉગાડતાં ખેડૂતોને ભલામણ કરવામાં આવે છે કે, પોટાશ ખાતર ૫૦ કિ.ગ્રા./હે. (૨૫ કિ.ગ્રા./હે. ના બે સરખા હપ્તામાં પ્રથમ વાવેતર વખતે અને બીજો વાવેતર બાદ ૪૫ દિવસે) ઉપરાંત ભલામણ કરવામાં આવેલ નાઈટ્રોજન અને ફોસ્ફરસ (૧૨૦–૫૦ ના–ફોકિ.ગ્રા./ હે.) આપવાથી વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

*(**Action:** Research Scientist (G'nut), Main Oilseeds Res. Station, JAU, Junagadh)*

12.2.2.6 Identification of suitable row ratio for sesame with pigeonpea and soybean intercropping system

The farmers of North Saurashtra Agro-climatic Zone growing sesame with intercropping system in *Kharif* are recommended to sow pigeon pea as an intercrop with sesame in the row ratio of 2:1 with 60 cm distance between two rows to get higher yield and net return.

ઉત્તર સૌરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તારના ખરીફ ઋતુમાં તલ સાથે આંતરપાકનું વાવેતર કરતા ખેડુતોને ભલામણ કરવામાં આવે છે કે તલની સાથે આંતરપાક તરીકે તુવેર, બે હાર તલ એક હાર તુવેરની અને બે હાર વચ્ચે ૬૦ સેમીના અંતરે વાવેતર કરવાથી વધારે ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

*(**Action:** Research Scientist, Agriculture Research Station, JAU, Amreli)*

12.2.2.7 Nutrient management in Bt cotton under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone(AES-10) growing Bt cotton are recommended to apply 20 kg P_2O_5, 40 kg K_2O and 20 kg sulphur (150 kg gypsum/ha) along with recommended dose of nitrogen (80 kg N/ha) for obtaining higher yield and net return as well as maintaining soil fertility under rainfed condition.

ઉતર સોરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તાર (ખેત હવામાન પરિસ્થિતિ–૧૦) માં વરસાદ આધારિત કપાસ વાવતાં ખેડૂતોને ભલામણ કરવામાં આવે છે કે બીટી કપાસના પાકને ભલામણ કરેલ રાસાયણિક ખાતર ૮૦ કિ.ગ્રા. નાઈટ્રોજનની સાથે ૨૦ કિ.ગ્રા. ફોસ્ફરસ, ૪૦ કિ.ગ્રા. પોટાશ અને ૨૦ કિ.ગ્રા. ગંધક (૧૫૦ કિ.ગ્રા. જીપ્સમ) પ્રતિ હેકટરે આપવાથી વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવાની સાથે જમીનની ફળદ્રુપતા પણ જાળવી શકાય છે.

*(**Action:** Research Scientist (Dry Farming),Main Dry Farming Research Station, JAU, Targhadia & Assistant Res. Sci.,Dry Farming Res. Station, JAU, Jamkhambhalia)*

12.2.2.8 Effect of potassium and sulphur on growth and yield of wheat crop

The farmers of South Saurashtra Agro-climatic Zone growing wheat are recommended to apply 60 kg potash and 40 kg sulphur (through gypsum) per hectare as basal in addition to recommended dose of N and P (120-60 N-P_2O_5 kg/ha) to wheat crop for getting higher yield and net return.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તારમાં ઘઉ ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે, ઘઉના પાકમાં ભલામણ કરેલ રાસાયણિક ખાતર નાઈટ્રોજન અને ફોસ્ફરસ (૧૨૦–૬૦ કિ.ગ્રા./હે.) ઉપરાંત ૬૦ કિ.ગ્રા. પોટાશ તથા ૪૦ કિ.ગ્રા.ગંધક(જીપ્સમના સ્વરૂપમાં) પ્રતિ હેકટર પાયામાં આપવાથી ઘઉનુ વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

*(**Action:** Professor & Head, Department of Agril. Chem. & Soil Sci. & Research Scientist (Wheat), Wheat Res. Station, JAU, Junagadh)*

12.2.2.9 Effect of multi-micronutrient formulations on okra

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* okra in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (150-50-50 N-P_2O_5-K_2O kg/ha) to okra for getting higher yield and net return

Alternatively, foliar spraying of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1% at 45, 60 and 75 DAS in addition to recommended dose of fertilizers (150-50-50 N-P_2O_5-K_2O kg/ha) to okra is recommended for getting higher yield and net return.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તારમાં મધ્યમ કાળી ચુનાયુકત જમીનમાં ચોમાસુ ભીંડાનું વાવેતર કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે, ભીંડાના પાકમાં ભલામણ કરેલ રાસાયણિક ખાતર (૧૫૦–૫૦–૫૦ ના–ફો–પો કિ.ગ્રા./હે.) ઉપરાંત જમીન ચકાસણી મુજબ સૂક્ષ્મતત્વો પાયામાં આપવાથી ભીંડાનું વધુ ઉત્પાદન અને નફો મળે છે.

વિકલ્પમાં ભીંડાના પાકમાં ભલામણ કરેલ રાસાયણિક ખાતર (૧૫૦–૫૦–૫૦ ના–ફો–પો કિ.ગ્રા./હે.) ઉપરાંત મલ્ટીમાઈક્રોન્યુટ્રીઅન્ટ ગ્રેડ–૪ (લોહ–મેન્ગેનીઝ–ઝીંક–કોપર–બોરોન, ૪.૦–૧.૦–૬.૦–૦.૫–૦.૫ ટકા) ના ૧ ટકા દ્રાવણનો ૪૫, ૬૦ અને ૭૫ દિવસે છંટકાવ કરવાથી પણ ભીંડાનું વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

*(**Action:** Professor & Head, Department of Agril. Chem. & Soil Sci., JAU, Junagadh & Research Scientist, Vegetable Research Station, JAU, Junagadh)*

12.2.2.10 Efficacy of multi-micronutrient formulations in improving crop production in Bt cotton

The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (240-50-150 N-P_2O_5-K_2O kg/ha) to Bt cotton for getting higher yield and net return.

Alternatively, foliar spraying of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1% at 45, 60, 75 and 90 DAS in addition to recommended dose of fertilizers (240-50-150 N-P_2O_5-K_2O kg/ha) is recommended to Bt cotton for getting higher yield and net return.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તારમાં મધ્યમ કાળી ચુનાયુકત જમીનમાં બી.ટી. કપાસનું વાવેતર કરતાં ખેડૂતોને ભલામણ કરવામાં આવે છે કે, બીટી કપાસના પાકમાં ભલામણ કરેલ રાસાયણિક ખાતર(૨૪૦–૫૦–૧૫૦, ના–ફો–પો કિ.ગ્રા./ હે.) ઉપરાંત જમીન ચકાસણી મુજબ સૂક્ષ્મતત્વોને પાયામાં આપવાથી બી.ટી. કપાસનું વધુ ઉત્પાદન અને નફો મેળવી શકાય છે.

વિકલ્પમાં બીટી કપાસના પાકમાં ભલામણ કરેલ રાસાયણિક ખાતર (૨૪૦–૫૦–૧૫૦, ના–ફો–પો કિ.ગ્રા./ હે.) ઉપરાંત મલ્ટીમાઈક્રોન્યુટ્રીઅન્ટ ગ્રેડ–૪ (લોહ–મેન્ગેનીઝ–ઝીંક–કોપર–બોરોન, ૪.૦–૧.૦–૬.૦–૦.૫–૦.૫ ટકા) ના ૧ ટકા દ્રાવણનો ૪૫, ૬૦, ૭૫ અને ૯૦ દિવસે છંટકાવ કરવાથી પણ બી.ટી. કપાસનું વધુ ઉત્પાદન અને ચોખખો નફો મેળવી શકાય છે.

*(**Action:** Professor & Head, Department of Agril. Chem. & Soil Sci., &Research Scientist (Cotton), Cotton Research Station, JAU, Junagadh)*

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12.2.3.1 Effect of irrigation and sulphur levels on yields of cluster bean under South Gujarat condition

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES- III) intended to grow cluster bean (GG 2) during summer season are recommended to give six irrigations (60 mm depth) *i.e.,* first irrigation just after sowing, second at 7 to 10 DAS and remaining 4 irrigations at an interval of 13 to 15 days. Farmers are also advised to fertilize their crop at 20-40-00-30 NPKS kg/ha through urea and SSP *or* 20-40-00-40 kg NPKS/ha, through DAP, urea and gypsum (300 kg/ha) for getting higher yield and net return.

દક્ષિણ ગુજરાતનાં વધુ વરસાદવાળા વિસ્તાર (ખેત આબોહવાકીય પરિસ્થિતિ–૩) માં ઉનાળાની ઋતુ દરમ્યાન ગુવાર (ગુજરાત

ગુવાર ૨) ની ખેતી કરવા ઈચ્છતા ખેડૂતોને ગુવારનું વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે કુલ–૬ પિયત (૬૦ મિ.મિ. ઉંડાઈ) આપવાની ભલામણ કરવામાં આવે છે. જેમાં પ્રથમ પિયત વાવણી બાદ તુરત જ, બીજુ પિયત વાવણી બાદ ૭–૧૦ દિવસે અને બાકીનાં ચાર પિયત ૧૩–૧૫ દિવસનાં ગાળે આપવા. વધુમાં ગુવાર પાકને ૨૦–૪૦–૦૦–૩૦ ના.ફો.પો.સ. કિગ્રા/હે. યુરિયા, સિંગલ સુપર ફોસ્ફેટ ખાતરનાં રૂપમાં અથવા ૨૦–૪૦–૦૦–૪૦ ના.ફો.પો. અને સલ્ફર કિગ્રા/હે. યુરિયા, ડી.એ.પી. અને જિપ્સમ (૩૦૦ કિગ્રા/હે.) નાં રૂપમાં આપવા.

(Action:- *Research Scientist, SWMRU, NAU, Navsari)*

12.2.3.2 Effect of irrigation and fertilizer levels on yield and quality of sugar beet grown on clay soils of South Gujarat

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES III and IV) interested to grow sugarbeet (PAC 60008) crop are recommended to irrigate their crop with drip method [raised bed (40 cm X 20cm (three row) x 70cm), 110 cm top bed width and 40 cm furrow width] and fertilize with 120-60-60 kg N, P_2O_5, K_2O/ha. The full dose of P and 12 kg N/ha (10% RDN) and 6 kg K_2O/ha (10% RDK) should be applied as basal and remaining 90% *i.e.*, 108 kg N and 54 kg K_2O/ha should be applied in 10 equal splits at an interval of 8 to10 days starting from 15 DAS for getting higher yield and net return.

12.2.3.4 Study on effect of land configuration and integrated nutrient management on productivity of different varieties of sorghum (*rabi*) in coastal area of South Gujarat

Farmers of coastal areas of South Gujarat Heavy Rainfall Agro climatic Zone (AES-IV) interested to grow sorghum during *rabi* season are recommended to prefer variety GJ 38 to sow on raised bed (bed width- 60 cm and furrow width 30 cm) and apply 100% RDF (80:40:00 NPK kg/ha + 10 t FYM/ha) for getting higher yield and net return.

દક્ષિણ ગુજરાતના દરિયાકાંઠાના વધુ વરસાદવાળા વિસ્તાર (ખેત આબોવાહીક પરિસ્થિતિ–૪) ના રવી ઋતુમા જુવારનો પાક લેવા ઈચ્છતા ખેડૂતોને જુવાર જીજે ૩૮ જાતની પસંદગી કરી ગાદી કયારા (કયારા પહોળાઈ ૬૦ સેમી, નીકની પહોળાઈ : ૩૦ સેમી) ઉપર વાવણી કરી ૧૦૦ ટકા ભલામણ કરેલ ખાતર (૮૦–૪૦– ૦૦ કિ. ગ્રા. નાફોપો/હે + ૧૦ ટન છાણિયુ ખાતર આપવાની ભલામણ કરવામાં આવે છે.

(Action:- *Research Scientist, SWMRU, NAU, Navsari)*

12.2.3.5 Effect of irrigation and date of sowing on seed yield and components of *Salicornia* (*S. brachiata* Roxb.)

The farmers of coastal area of South Gujarat Heavy Rainfall Agro climatic Zone (AES-IV) having waste land adjoining sea coast are recommended to sow salicornia by broad casting on raised bed (120 cm top bed width and 30 cm furrow width) during the 3rd week of June with 12 irrigation of sea water/saline ground water at an interval of 11 to 13 days after cessation of monsoon till February for getting higher seed yield and net return.

દક્ષિણ ગુજરાતનાં દરિયાકાઠાનાં ભારે વરસાદવાળા વિસ્તાર (ખેત આબોહવાકીય પરિસ્થિતિ–૪) નાં ખેડૂતોને દરિયાકિનારાની બંજર જમીનમાં સેલીકોર્નીયાનું વધુ ઉત્પાદન તેમજ ચોખ્ખો નફો મેળવવા માટે ગાદી કયારા (૧૨૦ સે.મી. કયારા તથા ૩૦ સે.મી. નીક) ઉપર જુનનાં ત્રીજા અઠવાડિયામાં પુંખીને વાવેતર કરવા તેમજ પાકને ચોમાસા બાદ ૧૧ થી ૧૩ દિવસને ગાળે ફેબ્રુઆરી સુધી દરિયાનાં પાણીથી/બોરના ખારા પાણીથી કુલ ૧૨ પિયત આપવાની ભલામણ કરવામાં આવે છે.

(Action:- *Research Scientist, SWMRU,NAU, Navsari)*

12.2.3.6 Effect of manuring in organically grown garlic in coastal area of South Gujarat

Farmers of coastal areas of South Gujarat Heavy Rainfall Agro climatic Zone (AES-IV) growing garlic (GG 1) organically during *rabi* season are recommended to apply biofertilizer

(*Azotobacter* + PSB each at 1.25 l /ha) along with 50 kg N/ha through bio-compost (6.5 t/ha) as basal and 50 kg N/ha through castor cake (1.1 t/ha) at 40 DAS. Adoption of organic nutrient management systems also improves soil properties.

દક્ષિણ ગુજરાતનાં દરિયાકાઠાનાં ભારે વરસાદવાળા વિસ્તાર (ખેત આબોહવાકીય પરિસ્થિતિ–૪) નાં રવિઋતુમાં લસણ (ગુજરાત લસણ ૧) ની સેન્દ્રિય ખેતી કરતા ખેડૂતોને જૈવિક ખાતર (એઝેટોબેકટર–૧.૨૫ લી./હે. + પી.એસ.બી.–૧.૨૫ લી./હે.)ની સાથે ભલામણ કરેલ નાઈટ્રોજન ખાતરનાં ૫૦ કિ.ગ્રા. /હે. પાયામાં બાયોકંમ્પોસ્ટ (૬.૫ટન/હે) ધ્વારા તથા બાકી રહેલ ૫૦ કિ.ગ્રા./હે. નાઈટ્રોજન ખાતર દિવેલી ખોળ (૧.૧ ટન/હે) ધ્વારા વાવણીનાં ૪૦ દિવસ પછી આપવાની ભલામણ કરવામાં આવે છે. સેન્દ્રિય ખાતરનાં ઉપયોગથી જમીનની ગુણવતામાં સુધારો થાય છે.

(Action:- *Research Scientist, SWMRU,NAU, Navsari)*

12.2.3.7 Effect of land leveling by laser leveler on yield of wheat crop

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) growing wheat under irrigated condition are recommended to adopt precision land leveling technique with laser leveler device to prepare their land maintaining a slope of 0.15% to obtain higher yield of wheat along with additional water saving through application of six irrigations each of 50 mm depth over those under traditionally leveled fields require six irrigations each of 60 mm depth. Further, once the sloppy land is developed it will be effective for three years.

દક્ષિણ ગુજરાતના વધુ વરસાદવાળા વિસ્તાર (ખેત આબોહવાકીય પરિસ્થિતિ–૩) માં પિયત ઘઉં કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે, પાક વાવતા પહેલા જમીનની તૈયારી કરવા માટે ''લેસર લેવલર સાધન'' દ્વારા પ્રિસીઝન લેન્ડ લેવલીંગ ટેકનીક દ્વારા જમીનમાં ૦.૧૫% નો ઢાળ રાખીને જમીન તૈયાર કરવાથી વધુ પાક ઉત્પાદન સાથે ૫૦ મીમી ઉંડાઈના છ પિયત આપવાથી પાણીની બચત થાય છે અને આ રીતે તૈયાર કરેલ ઢાળ ત્રણ વર્ષ સુધી અસરકારક રહે છે. જયારે ચીલા ચાલુ પધ્ધતિથી જમીન લેવલ કરવાથી ૬૦ મીમી ઉડાઈના ૬ પિયત આપવાની જરૂર પડે છે.

(Action:- *Research Scientist, Soil Science, NAU, Navsari)*

12.2.3.8 Effect of method and levels of FYM and Bio-compost application on the yield of pigeon-pen *cv.* Vaishali and soil aggregates under rainfed condition in South Gujarat

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-II) growing pigeon-pea under rainfed condition are recommended to apply the recommended dose of fertilizer (20-40 kg NP/ha) along with FYM /bio compost @ 7.5 t/ha before monsoon through band placement for higher yield and net return.

દક્ષિણ ગુજરાત ખેત આબોહવાકીય પરિસ્થિતી–૨ ના ખેડુતો કે જેઓ વરસાદ આધારીત તુવેરનો પાક લેતા હોય તેઓને ભલામણ કરવામાં આવે છે કે, તુવેરનું વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે ભલામણ કરેલ (૨૦–૪૦ કિગ્રા ના.ફો./ હે.) ખાતર સાથે હેકટર દીઠ ૭.૫ ટન/હે. છાણીયુ ખાતર કે બાયો કમ્પોષ્ટ ચોમાસુ બેસતા પહેલા હારમા આપવું.

(Action:- *Research Scientist, Soil Science, NAU, Navsari)*

12.2.3.9 Spacing and nutrient management with and without AM for greengram *cv.* Co-4 during *rabi* season

Farmers of South Gujarat Heavy Rainfall Agro climatic Zone(AES-III), growing greengram *(*Co 4) during *rabi* season, are recommended to sow the crop at 45 cm x 10 cm spacing and apply 20-40 kg NP/ha as basal for getting higher yield and net return.

દક્ષિણ ગુજરાતના ભારે વરસાદવાળા વિસ્તારની ખેત આબોહવાકીય પરિસ્થિતી–૩ માં શિયાળુ મગ (સી.ઓ ૪) નું વાવેતર કરતાં ખેડૂતોને વધારે ઉત્પાદન અને ચોખ્ખો નફો મેળવવા બે હાર વચ્ચે ૪૫ સે.મી. અને બે છોડ વચ્ચે ૧૦ સે.મી.નું અંતર રાખી વાવેતર કરવાની તેમજ પાકને વાવણી સમયે ૨૦–૪૦ કિ.ગ્રા. ના.ફો. પ્રતિ હેકટરે ખાતર આપવાની ભલામણ કરવામાં આવે છે.

(Action:- *Research Scientist, Pulse & castor Research Satiation, Navsari*)

12.2.3.10 Effect of integrated nutrient management in rice-green gram cropping sequence under South Gujarat condition

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) are recommended to fertilize *kharif* rice with 100-30-00 kg NPK/ha + 10 t FYM and 20-40-00 kg NPK/ha to succeeding *rabi* green gram for getting higher system profitability of rice-green gram cropping sequence.

દક્ષિણ ગુજરાતના ભારે વરસાદ વાળી ખેત હવામાન પરિસ્થિતિ–૩માં ખેડૂતોને ખરીફ ડાંગરના પાકમાં ૧૦૦–૩૦–૦૦ કિગ્રા ના.ફો.પો./ હેકટર + ૧૦ ટન છાણીયું ખાતર અને ત્યાર પછીના શિયાળુ મગના પાકમાં ૨૦–૪૦–૦૦ કિગ્રા ના.ફો.પો./હેકટર આપવાથી વધુ ઉત્પાદન અને ડાંગર–મગ પાક પધ્ધતિમાં નફાકારકતા મેળવી શકાય છે.

(Action:- *Professor & Head, Dept. of Agronomy, NMCA, Navsari*)

12.2.3.11 Effect of cutting management and nitrogen levels on seed production and nutritional value of Lucerne (*Medicago sativa* L.)

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) growing lucerne for seed purpose are recommended to take three cuts at 60,100 and 130 days after sowing and leave the crop for seed production and fertilized the crop with basal application of 30 kg nitrogen along with 50 kg P_2O_5 and 50 kg K_2O per hectare for getting higher yield and net return.

દક્ષિણ ગુજરાતના વધુ વરસાદ વાળી ખેત આબોહવાકીય પરિસ્થિતિ–૩માં બીજ ઉત્પાદન માટે રજકો ઉગાડતા ખેડૂતોને વધારે ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે રજકાની ત્રણ કાપણી (૬૦, ૧૦૦ અને ૧૩૦ દિવસ) બાદ બીજ ઉત્પાદન કરવાની તેમજ પ્રતિ હેકટર પાયામાં ૩૦ કિલોગ્રામ નાઈટ્રોજન, ૫૦ કિલોગ્રામ ફોસ્ફરસ અને ૫૦ કિલોગ્રામ પોટાશ આપવાની ભલામણ કરવામાં આવે છે

(Action:- *Professor & Head, Dept. of Agronomy, NMCA, Navsari*)

12.2.3.12 Permanent plot experiment on integrated nutrient supply system in a cereal based crop sequence

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) are recommended to integrate 100% RDF (100-30-00 NPK kg/ha) as 50% RDF from inorganic fertilizers and 50% N from FYM (10 t/ha) or Green manure in rice and apply 100% RDF (120-60-00 NPK kg/ha) in wheat under rice-wheat crop sequence for securing similar paddy equivalent yield and maintain soil fertility status. Combined use of 75% RDF from inorganic fertilizers and 25% N from FYM (5 t/ha) or Green manure in rice saves 25% RDF in succeeding wheat.

દક્ષિણ ગુજરાતના વધુ વરસાદ વાળા વિસ્તાર (ખેત આબોહવાકિય પરિસ્થિતિ–૩) ના ડાંગર–ઘઉં પાક પધ્ધતિ અપનાવતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે વર્ષ દરમ્યાન ડાંગર ના પાક માં ભલામણ મુજબ(૧૦૦–૩૦–૦૦ ના.ફો.પો. કિ.ગ્રા./હે) રાસાયણિક ખાતરનો ઉપયોગ કરવાના બદલે ભલામણના ૫૦ ટકા રાસાયણિક ખાતર અને ૫૦ ટકા નાઈટ્રોજન ૧૦ ટન છાણિયા ખાતરથી અથવા લીલા પડવાશ દ્વારા આપવો તેમજ ત્યાર પછીના ઘઉંના પાકમાં ૧૨૦–૬૦–૦૦ (ના.ફો.પો. કિ.ગ્રા./હે) રાસાયણિક ખાતર આપવામાં આવે તો ડાંગર–ઘઉં પાક પધ્ધતિમાં ભલામણના ૧૦૦ ટકા રાસાયણિક ખાતરના જેટલુ ડાંગર સમકક્ષ ઉત્પાદન મળે છે અને જમીન ની ફળદ્રુપતા જળવાય રહે છે. આ ઉપરાંત ડાંગર ના પાક માં ભલામણના ૭૫ ટકા રાસાયણિક ખાતર અને ૨૫ ટકા નાઈટ્રોજન ૫ ટન છાણિયા ખાતરથી અથવા લીલા પડવાશ દ્વારા આપવામાં આવે તો ત્યાર પછી ના ઘઉંના પાક માં ભલામણના ૨૫ ટકા રાસાયણિક ખાતરની બચત થાય છે.

(Action:- *Professor & Head, Dept. of Agronomy, NMCA, Navsari*)

12.2.3.13 Management of cropping systems for resource conservation and climate change

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) are recommended to adopt rice-sorghum-greengram crop sequence without mulch/residue incorporation with 25% higher dose of respective crops' RDF under conventional tillage for

securing higher paddy equivalent yield and net return.

દક્ષિણ ગુજરાતના વધુ વરસાદ વાળા વિસ્તાર (ખેત આબોહવાકિય પરિસ્થિતિ–૩) ના ખેડૂતોને હેકટરે વધુ ડાંગર સમકક્ષ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે પરંપરાગત ખેડ કરી જે તે પાકની ખાતરની ભલામણ કરતા ૨૫ ટકા વધારે રાસાયણિક ખાતર અને પાક અવશેષને જમીન સાથે ભેળવ્યા સિવાય ડાંગર–જુવાર–મગ પાક પધ્ધતિ અપનાવવાની ભલામણ કરવામાં આવે છે.

(Action:- *Professor & Head, Dept. of Agronomy, NMCA, Navsari*)

12.2.3.14 Development of organic farming package for system based high value crops

The farmers of South Gujarat Heavy Rainfall Agro climatic Zone(AES-III) interested to grow organically rice-summer groundnut cropping sequence are recommended to apply recommended dose of fertilizer on N equivalent basis to both the crops in equal proportion from FYM, vermicompost and castor cake, *i.e.*, FYM 6 t + vermicompost 4 t + castor cake 700 kg/ha in rice and FYM 1.5 t + vermicompost 1 t + castor cake 170 kg/ha in summer groundnut for getting similar paddy equivalent yield, higher net profit and improving organic carbon content of soil under organic nutrient management system.

દક્ષિણ ગુજરાતના વધુ વરસાદ વાળા વિસ્તાર (ખેત આબોહવાકિય પરિસ્થિતિ–૩) ના ડાંગર – ઉનાળુ– મગફળી પાક પધ્ધતિમાં સેન્દ્રીય ખેતી અપનાવવા માગતા ખેડૂતોને હેકટર દીઠ વધુ ડાંગર સમકક્ષ ઉત્પાદન, ચોખ્ખો નફો અને જમીનમાં સેન્દ્રીય કાર્બન વધારવા માટે ભલામણ કરવામાં આવે છે કે ડાંગરના પાકમાં ભલામણ મુજબના રાસાયણિક ખાતરના જથ્થા માટે અંદાજીત ૬ ટન છાણિયું ખાતર, ૪ ટન વર્મીકંમ્પોસ્ટ અને ૭૦૦ કિ.ગ્રા. દીવેલીખોળ (નાઈટ્રોજન ની ભલામણ પ્રમાણે ઉપલબ્ધ પોષક તત્વો ને ધ્યાને રાખી) અને ઉનાળુ મગફળીના પાકમાં ૧.૫ ટન છાણિયું ખાતર, ૧ ટન વર્મીકંમ્પોસ્ટ અને ૧૭૦ કિ.ગ્રા. દીવેલી ખોળ આપવાની ભલામણ કરવામાં આવે છે.

(Action:- *Professor & Head, Dept. of Agronomy, NMCA, Navsari*)

12.2.3.15 Priming of cane node for accelerating germination

Sugarcane growers of South Gujarat Heavy Rainfall Agro climatic Zone (AES-III) are recommended to plant sugarcane setts after priming with desi cow dung, cow urine and water in 1:2:5 ratio for 15 minutes to enhance and increase the germination and consequently for higher yield and net return.

દક્ષિણ ગુજરાતના ભારે વરસાદ ધરાવતા વિસ્તાર (ખેત આબોહવાકીય પરિસ્થિતિ–૩) ના શેરડી ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે શેરડીના ટુકડાને દેશી ગાયનુ છાણ, ગૌ મુત્ર અને પાણીને ૧:૨:૫ ના ગુણોત્તરમાં લઈ ૧૫ મિનિટ સુધી બોળી રાખ્યા બાદ રોપણી કરવાથી ઝડપી અને વધુ ઉગાવાને લીધે વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

(Action:- *Research Scientist, MSRS, Navsari*)

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12.2.4.1Permanent plot experiment on integrated nutrient supply system for a cereal based crop sequence

The farmers of North Gujarat Agro-climatic Zone (AES IV) adopting pearl millet-wheat crop sequence in long term are advised to apply 75 % recommended dose of NPK through fertilizer (RDF:80-40-00 NPK) + 25 % N through gliricidia leaves & tender twigs to *kharif* pearl millet and 75 % recommended dose of NPK to wheat (RDF:120-60-00 NPK) for getting higher pearl millet equivalent yield and net return along with system productivity and profitability. The farmers are recommended to apply fertilizers as follow:

	Pearl millet crop	**Wheat crop**
Basal	950 kg Gliricidia + 65 kg DAP	98 kg DAP
Top dressing	104 kg Urea at 18 & 30 DAS in two equal splits	158 kg Urea at 21 & 35 DAS in two equal splits

ઉત્તર ગુજરાત (એઈએસ ૪) ના બાજરા–ઘઉ પાક પધ્ધતિ લાંબા ગાળા માટે અપનાવતા ખેડૂતોને મહત્તમ બાજરા

સમકક્ષ ઉત્પાદન, ચોખ્ખો નફો, પાક પધ્ધતિની ઉત્પાદકતા અને નફાકારકતા મેળવવા માટે બાજરા પાકમાં ૭૫ % ભલામણ કરેલ ના–ફો–પો (૮૦ –૪૦ – ૦૦) નો જથ્થો રાસાયણિક ખાતરના રૂપમાં અને ૨૫ % નાઈટ્રોજનનો જથ્થો ગ્લીરીસિડીયાના પાન અને કુમળી ડાળીઓના રૂપમાં જયારે ઘઉ પાકમાં ૭૫ % ભલામણ કરેલ ના–ફો–પો (૧૨૦ – ૬૦ –૦૦) નો જથ્થો રાસાયણિક ખાતરના રૂપમાં આપવાની ભલામણ કરવામાં આવે છે . ખેડુતોને નીચે મુજબ ખાતર આપવાની ભલામણ કરવામાં આવે છે.

	બાજરા પાક	ઘઉ પાક
પાયાનું ખાતર	૯૫૦ કિલો ગ્લીરીસિડીયા ત્ર ૬૫ કિલો ડી.એ.પી.	૯૮ કિલો ડી.એ.પી.
પૂર્તિ ખાતર	૧૦૪ કિલો યુરીયા વાવણી પછી ૧૮ અને ૩૦ દિવસે બે સરખા ભાગમાં આપવું	૧૫૮ કિલો યુરીયા વાવણી પછી ૨૧ અને ૩૫ દિવસે બે સરખા ભાગમાં આપવું

(Action: Research Scientist, Centre for Integrated Farming System, S.D.Agril. Uni., SKNagar)

12.2.4.2 Development of organic farming package for system based high value crops

The farmers of North Gujarat Agro-climatic Zone (AES IV) adopting sunnhemp (GM)-potato-groundnut crop sequence are recommended to fertilize potato (RDF 220-110-220 NPK kg/ha) and groundnut (RDF 25-50-00 NPK kg/ha) as 50 % RDF + 50 % RDN from FYM + micro nutrients (Zn & Fe as per soil test) for getting higher potato equivalent yield and economic return along with maintenance in soil fertility.

Farmers who are interested to grow organically potato-groundnut crop sequence are recommended to apply RDN to both the crops in equal proportion of FYM, vermicompost and castor cake (33% each) i.e. 15, 9 and 1.6 t/ha, respectively with seed treatment of N containing biofertilizer (*Azotobactor*/*Rhizobium*@ 20 g/kg seed) and P carrying biofertilizer (PSB-16 @ 20 g/ kg seed).

ઉત્તર ગુજરાત (એઈએસ ૪) માં શણ લીલો પડવાશ –બટાટા– મગફળી પાક પધ્ધતિ અપનાવતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે બટાટા (૨૨૦–૧૧૦–૨૨૦ ના–ફો–પો કિલો/હે.) અને મગફળી (૨૫–૫૦–૦૦ ના–ફો–પો કિલો/હે.) માં ૫૦% ભલામણ કરેલ ખાતર રાસાયણિક ખાતરના રૂપમાં અને બાકીનો ૫૦% નાઈટ્રોજન છાણીયા ખાતરના રૂપમાં તથા સૂક્ષ્મ તત્વો (લોહ અને જસત) જમીનના પૃથ્થકરણ મુજબ આપવાથી મહત્તમ બટાકા સમકક્ષ ઉત્પાદન અને આર્થિક વળતર મળે છે તેમજ જમીનની ફળદ્રુપતા જળવાઈ રહે છે.

બટાટા–મગફળીની સેન્દ્રીય ખેતી કરવા માગતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે બન્ને પાકના ભલામણ કરેલ નાઈટ્રોજન સરખા પ્રમાણમાં , છાણીયા ખાતરથીલ વર્મી કમ્પોષ્ટથી અને દિવેલી ખોળથી (૩૩ % દરેકના) એટલે કે અનુક્રમે ૧૫, ૯ અને ૧.૬ ટન/હે. અને જૈવિક ખાતર એઝોટોબેકટર/ રાઈઝોબીયમ (૨૦ ગ્રામ/ કિ.ગ્રા. બીજ) અને પી.એસ.બી. –૧૬(૨૦ ગ્રામ/ કિ.ગ્રા. બીજ) ની બીજ માવજત આપવી.

(Action: Research Scientist, Centre for IFS, ,S.D.A.U., Sardarkrushinagar)

12.2.4.3 Effect of foliar application of plant nutrients on yield of maize

The farmers of North Gujarat Agro-climatic Zone (AES IV) growing maize on medium black Fe and Zn deficient soil under rainfed condition are recommended to apply three sprays each of FeSO4 + ZnSO4 @ 0.5 % (with 0.05 % citric acid and lime solution @ 0.25 %) at 30, 40 and 50 DAS along with recommended dose of fertilizers (80-40 kg N-P_2O_5/ha) for higher yield and net return.

ઉત્તર ગુજરાત (એઈએસ ૪) માં લોહ અને જસતની ઉણપવાળી મધ્યમ કાળી જમીનમાં વરસાદ આધારિત મકાઈની ખેતી કરતા ખેડૂતોને ભલામણ કરવામા˙ આવે છે કે મકાઈના પાકમાં ફેરસ સલ્ફેટ + ઝિંક સલ્ફેટ દરેકના ૦.૫ ટકા પ્રમાણે (સાઈટ્રીક એસીડ, ૦.૦૫ %અને ચુનાના દ્રાવણ, ૦.૨૫ % સાથે) વાવણી બાદ ૩૦, ૪૦ અને ૫૦ દિવસે ત્રણ છંટકાવ કરવા ઉપરાંત ભલામણ કરેલ ખાતર (૮૦૬૪૦ નાઈટ્રોજન–ફોસ્ફરસ કિ.ગ્રા./હે.) આપવાથી વધારે ઉત્પાદન અને ચોખ્ખો નફો મેળવી શકાય છે.

(Action: Research Scientist, CNRM, S. D. Agricultural University, Sardarkrushinagar)

12.2.4.4 Organic farming in Green gram and Sesame (crop rotation) under North Gujarat condition.

The farmers of North Gujarat Agro-climatic Zone (AES IV) adopting organic farming with green gram-sesame in crop rotation on light textured soil under rainfed condition are recommended to apply recommended dose of nitrogen @ 20 kg/ha to green gram and 50 kg N/ha to sesame either through vermicompost (2.5 and 6.25 t/ha respectively) or FYM (4 and 10 t//ha respectively)

for higher yield, net return and maintaining soil fertility.

ઉત્તર ગુજરાત (એઈએસ ૪) ની હલકી પ્રતવાળી જમીનમાં વરસાદ આધારિત સજીવ ખેતીમાં મગ– તલ પાક ફેરબદલી અપનાવતા ખેડૂતોને ભલામણ કરવામા આવે છે કે મગ– તલ પાક ફેરબદલીમાં વધુ ઉત્પાદન, ચોખ્ખો નફો મેળવવા તેમજ જમીનની ફળદ્રુપતા જાળવી રાખવા માટે મગના પાકને ૨૦ કિ.ગ્રા. નાઈટ્રોજન /હે. અને તલના પાકને ૫૦ કિ.ગ્રા. નાઈટ્રોજન/હે. અળસીયાના ખાતર (અનુક્રમે ૨.૫ અને ૬.૨૫ ટન/હે.) અથવા છાણીયા ખાતર (અનુક્રમે ૪.૦ અને ૧૦ . ૦ ટન/હે.) માંથી આપવું.

(Action: Research Scientist, CNRM, SDAU, Sardarkrushinagar)

12.2.4.5 *Ardusa* (*Ailanthus excelsa*) based Silvi-Pastoral System for Livelihood Security in Rainfed Agro-ecosystem of Gujarat

Farmers of North Gujarat Agro-climatic Zone(AES IV) are recommended to adopt *ardusa* based silvipasture system (*Ardusa* 6 m. x 6 m. with Jodhpur Dhaman or Local Dhaman) under rainfed condition for higher green fodder and net returns every year against sole *ardusa* and sole grasses from the unit area besides maintaining soil fertility.

ઉત્તર ગુજરાત (એઈએસ ૪)ના શુષ્ક વિસ્તારના ખેડુતોને એકલા અરડુસા અથવા ઘાસચારા ની સામે એકમ વિસ્તારમા વધુ લીલોચારો અને આર્થિક વળતર મેળવવા તથા જમીનની ફળદ્રુપતા જાળવી રાખવા માટે અરડુસા આધારીત વૃક્ષ–ઘાસચારા પધ્ધતિ(અરડુસા ૬ મી. × ૬ મી. સાથે જોધપુર ધામણ અથવા લોકલ ઘામણ) અપનાવવાની ભલામણ કરવામાં આવે છે.

(Action: Research Scientist, Agro-Forestry Research Station, SDAU, Sardarkrushinagar)

12.2.4.6 Effect of different weed management practices on *rabi* fennel

Farmers of North Gujarat Agro-climatic Zone (AES IV) growing *rabi* fennel are recommended to go for two hand weeding + interculturing at 20 and 40 DAS to control weeds for getting higher yield and net return.

ઉત્તર ગુજરાત વિસ્તારમાં શિયાળું વરીયાળીનું વાવેતર કરતાં ખેડૂતોએ અસરકારક નિંદણ નિયંત્રણ, વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે પાકની વાવણી પછી ૨૦ અને ૪૦ દિવસે આંતરખેડ કરી હાથ વડે નિંદણ કરવાની ભલામણ કરવામાં આવે છે.

(Action: Research Scientist, Seed Spices, SDAU, Jagudan)

12.2.4.7 Development of organic farming modules for pulses in Kachchh

The farmers of North-west Gujarat Agro-climatic Zone (AES II) are recommended to adopt following module for greengram, guar and mothbean crops (*kharif*) for obtaining higher yield, net return and maintaining soil fertility under organic farming system.

- Soil application of 20 kg N/ha through Vermicompost or FYM + *Trichoderma viride* @ 1.5 kg/ha.
- Soil application of phosphorus @ 40 kg/ha through enriched compost (Mix rock phosphate and FYM@1:10 ratio and decomposed for 40-45 days in pit with maintaining 30 to 40% moisture and add 1kg PSB/1 ton compost at the time of application)
- Seed treatment with *Rhizobium* @ 30 g/kg seed.
- Install 50 bird perches/ha.
- Application of bio pesticides as per need.

ગુજરાતના ઉત્તર–પશ્ચિમ (એઈએસ ૨)ના ખેડુતોને સુકી ખેતી વિસ્તારમાં સેન્દ્રીય ખેતી હેઠળ મગ ,ગુવાર અને મઠ ના પાકોનું હેકટર દીઠ વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા અને જમીનની ફળદ્રુપતા જાળવવા માટે નીચે મુજબના સેન્દ્રિય ખેતી મોડયુલ અપનાવવાની ભલામણ કરવામા આવે છે.

- હેકટર દીઠ ૨૦ કિ.ગ્રા નાઈટ્રોજન વર્મીકમ્પોસ્ટ અથવા છાણીયા ખાતર માંથી અને ટ્રાયકોડર્મા વીરીડી હેકટરે ૧.૫ કિ.ગ્રા જમીનમાં વાવણી સમયે આપવું.
- હેકટર દીઠ ૪૦ કિ.ગ્રા ફોસ્ફરસ સમૃધ્ધ કંમ્પોસ્ટ મારફતે આપવુ.(રોક ફોસ્ફેટ અને છાંણીયા ખાતરનું ૧:૧૦ના પ્રમાણમાં મિશ્રણ કરી તેને ખાડામાં ૪૦ થી ૪૫ દિવસ સુધી રાખી તેમાં ૩૦ થી ૪૦% ભેજ જાળવવો. જમીનમાં આપતી વખતે ૧ કિ.ગ્રા. પીએસબી કલ્ચર/૧ ટન કંમ્પોસ્ટમા ભેળવવું.
- રાઈઝોબીયમ જૈવિક ખાતરની બીજ માવજત ૩૦ ગ્રામ પ્રતિ કિલો બીજ દીઠ આપવી.
- હેકટર દીઠ પક્ષીઓને બેસવાના ૫૦ ટેકા મુકવા.
- વનસ્પતિજન્ય દવાનો છંટકાવ જરૂર જણાય ત્યારે કરવો.

(Action: Assistant Research Scientist, RRS, SDAU, Bhachau)

B. RECOMMENDATION FOR SCIENTIFIC COMMUNITY

ANAND AGRICULTURAL UNIVERSITY ------ Nil

JUNAGADH AGRICULTURAL UNIVERSITY

12.2.2.1 Weed management in pre-monsoon groundnut

The effective weed management along with higher yield and net return from pre-monsoon groundnut can be achieved by pre-plant incorporation of pendimethalin 38.7% CS @ 0.75 kg a.i./ha followed by interculturing and hand weeding at 40 DAS under South Saurashtra Agro-climatic Zone.

*(**Action:** Professor & Head, Department of Agronomy, JAU, Junagadh)*

12.2.2.2 Integrated weed management in *kharif* pearlmillet

The application of atrazine @ 0.4 kg/ha as post emergence at two leaf stage of weed followed by one hand weeding at 35 days after sowing for effective weed management in *kharif* pearlmillet was found as effective as pre-emergence application of atrazine @ 0.5 kg/ha followed by one hand weeding at 35 days after sowing under North Saurashtra Agro-climatic Zone.

*(**Action:** Research Scientist (Millet), Millet Research Station, JAU, Jamnagar)*

12.2.2.3 Bio-efficacy of different herbicides for broad spectrum weed management in chickpea

The application of pendimethalin 30% EC 1.0 kg a.i./ha as a pre-emergence followed by hand weeding at 25-30 days after sowing gave higher yield with effective weed management in chickpea. However, pendimethalin 38.7% CS 1.0 kg a.i./ha as a pre-emergence followed by hoeing at 30-35 days after sowing found economical under South Saurashtra Agro-climatic Zone.

*(**Action:** Research Scientist (Chickpea), Pulses Res. Station, JAU, Junagadh)*

12.2.2.4 Soil test based fertilizer recommendation for targeted yield of pigeonpea crop

The nutrient requirements for production of one quintal pigeonpea seed was assessed as 6.09, 1.98 and 1.78 kg; N, P_2O_5 and K_2O, respectively. The fertilizer prescription equation are as: for N (FN : 5.46 T - 0.25 SN - 0.16 FYM), P (FP_2O_5 :4.11 T - 1.34 SP - 0.15 FYM) and K (FK_2O : 11.93 T - 0.51 SK - 0.45 FYM) with FYM. Targeted yield concept could be effectively adopted to bring in site specificity in fertilizer use and achieve high yields of pigeonpea in the medium black calcareous soils of Saurashtra region of Gujarat.

*(**Action:** Professor & Head, Department of Agril. Chem. & Soil Sci., & Research Scientist (Chickpea), Pulses Research Station, JAU, Junagadh)*

12.2.2.5 Establishment of critical limit of sulphur for Bt cotton in medium black calcareous soils

The critical limit for sulphur application to Bt cotton crop grown on calcareous soils of Saurashtra, was found as 15 ppm in soil and 0.475 per cent in cotton plant at 60 DAS.

*(**Action:** Professor & Head, Department of Agril. Chem. & Soil Sci., JAU, Junagadh)*

NAVSARI AGRICULTURAL UNIVERSITY

12.2.3.1Response of sugarcane to different plant nutrients in varied agro ecological situations
Application of inorganic fertilizers based on soil test values before planting of sugarcane has been found effective for getting higher cane yield and net return under south Gujarat heavy rainfall zone (AES III).
Based on field soil analysis data N, P_2O_5, K_2O and micronutrient fertilizes to be applied as below: If the available soil N is 0-140,141-280,281-420,421-560,561-700 and >700kg/ha then 375,

312.50, 250, 250, 187.50 and 125 kg/ha N fertilizer respectively to be applied.

If the available soil P_2O_5 is 0-10, 11-20, 21-30, 31-40, 41-55 and >55 kg/ha then 187.50, 156.25, 125, 125, 93.75 and 62.5 kg/ha P_2O_5 fertilizer respectively to be applied.

If the available soil K_2O is 0-100, 101-150, 151-200, 201-250, 251-300 and >300 kg/ha then 187.50, 131.25, 125, 125, 93.75 and 62.5 kg/ha K_2O fertilizer respectively to be applied.

In case of soil Available micro- nutriants:

Iron: for <5 ppm apply 50 kg/ha ferrous sulphate in every three years.

Manganize: for <5 ppm apply 10 kg/ha manganize sulphate in every three years.

Zinc: for <0.5 ppm apply 50 kg/ha zinc sulphate in every three years.

Copper: for <0.2 ppm apply 5 kg/ha copper sulphate in every three years.

(Action:- ***Research Scientist, MSRS, Navsari*****)**

12.2.3.2 Application of Mixed Statistical Distributions in Fitting Rainfall Data of South Gujarat

Annual rainfall distribution modeling for Navsari district Lognormal distribution and for Bharuch district Weibull distribution should be used for taking decision about future precipitations over a certain period of time.

(Action:-*Professor and Head, Dept. of Agril. Meteorology, NMCA, NAU, Navsari*)

12.2.3.3 Natural resources characterization in relation to banana growing areas of South Gujarat

Banana production constraints

Based on the characterization of soil, water and climatic resources *vis-à-vis* optimum requirement of banana, the crop production constraints related to banana were identified. The resource wise crop production constraints are reported as below:

Production constraints related to banana cultivation

Taluka	Soil	Water	Climate
Nandod	- High BD (1.47g/cc), - Shallow depth (83cm) - High pH (8.46) - Fe (5.32 ppm) deficient	Marginal quality of groundwater (EC 0.95 dSm^{-1})	Low rainfall (91 mm per month)
Jagadia	- High BD (1.50g/cc), - high pH (8.0), - Fe (4.74 ppm) deficient	Marginal quality of groundwater (EC 0.96 dSm^{-1})	Low rainfall (72.8 mm per month)
Bharuch	- Hard consistency, - High BD (1.54g/cc), - High pH (7.95), - Low O.C (0.31%) - Fe (3.0 ppp) deficient	Poor quality of groundwater (EC 1.23 dSm^{-1})	Low rainfall (72.8 mm per month)
Kamrej	- Hard consistency - Texture clay - High BD (1.53g/cc) - Fe (5.48 ppm) deficient	Poor quality of groundwater (EC 1.16 dSm^{-1})	--
Bardoli	- Texture clay - High pH (8.04) - Fe (3.86 ppm) deficient	--	--
Palsana	- Fe (4.50 ppm) deficient	Poor quality of groundwater	--

		(EC 1.04 dSm^{-1})	
Navsari	- Texture clay - High pH (8.89) - Low O.C (0.29%) - Fe (3.34 ppm) deficient - Zn (0.04 ppm) deficient	Poor quality of groundwater (EC 1.03dSm^{-1})	--
Jalalpore	- Hard consistency - High pH (8.47) - Low O.C (0.34%)	Poor quality of groundwater (EC 1.19 dSm^{-1})	--
Valsad	- Texture clay - High BD (1.43g/cc) - Fe (3.34 ppm) deficient	Poor quality of ground water (EC 1.04 dSm^{-1})	--

Constraints based remedial measures for improving banana productivity under south Gujarat condition

SN	**Constraints' for banana**	**Deleterious effect on root growth**	**Remedial measures**
1	High bulk density, low organic carbon, hard consistency	Restricted root growth due to difficulty in penetration of roots	- Deep ploughing once in three years - Addition of organic manures like FYM, biocompost, vermicompost *etc.* - Green manuring with dhaincha or sunn hemp - Insitu incorporation of crop residues - Provide drainage
2	High pH and ESP	Stunted growth of plant due to restricted soil air, moisture and nutrient movement , Apart from this, extremely high pH (>9), Nutrient availability decreased	- Soil analysis based gypsum application in conjunction with organic manures, green manuring *etc.* - Provide drainage facility - Preference to sodicity tolerant variety of banana
3	Low in organic carbon, Fe and in some samples Zn deficient	Poor plant growth and low yield due to inadequate supply of element in question	- Apply recommended doses of fertilizer as per soil test value - Soil test based application of Fe and Zn

4	Marginal or Poor quality of ground water	Stunted plant growth and poor yield of plant Mortality of plant in extreme cases Deterioration in soil health due to prolonged use of such water for irrigation purpose	- Adopt drip irrigation along with mulching for restricted upward movement of soluble salts - Follow fertilization schedule using urea and MOP as source of N and K - Use SSP as a source of P
5	Low rainfall (Unmanageable constraints)	--------	- Change date of planting in such a way that full growth stage of plant comes during monsoon season
			(Action:- *Research Scientist, SWMRU,NAU, Navsari)*

SARDARKRUSHINAGAR DATIWADA AGRICULTURAL UNIVERSITY

12.2.4.1Evaluation of different herbicides for weed control in summer pearl millet (Pennisetum glaucum (L.) R. Br. emend Stuntz)

Application of atrazine 0.50 kg/ha either as pre emergence followed by inter culturing at 25 DAS or atrazine 0.50 kg/ha as post emergence at 20-25 DAS has been found effective to manage weeds in summer pearl millet for getting higher yield and net return.

(Action: Professor & Head, Agronomy, CPCA, S.D. Agricultural University, Sardarkrushinagar)

12.2.4.2 Effect of different weed management practices on *rabi* fennel

Application of pendimethalin @1.0 kg/ha as pre emergence + interculturing followed by hand weeding at 30 DAS has been found effective to manage weeds in *rabi* fennel for getting higher yield and net return.

(Action: Research Scientist, Seed Spices, S. D. Agricultural University, Jagudan)

NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERSITY

Sr. No.	Title	Suggestions	Remarks
Main Maize Research Station, AAU, Godhra			
12.2.1.1	Effect of nitrogen, bio-fertilizer and plant density on yield of baby corn variety VL - 78 in *kharif* season	1.Add observation of barren plants	Approved
12.2.1.2	Effect of nitrogen, bio-fertilizer and plant density on yield of baby corn variety VL - 78 in *rabi* season	1. Add observation of barren plants	Approved
		(Action : Research Scientist, MMRS, AAU, Godhra)	
Bidi Tobacco Research Station, AAU, Anand			

12.2.1.3	Effect of nitrogen levels on quality and yield of rustica tobacco varieties	1.Use word suitable in place of optimum in objective no.1	Approved
			(Action : Research Scientist, BTRS, AAU, Anand)
Tribal Research cum Training Centre, AAU, Devgadh Baria			
12.2.1.4	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	1. Add observation of seed cotton yield/boll (g) instead of boll weight (g) 2. Add observations on fibre quality parameters	Approved
			(Action : Unit Officer, TRTC, AAU, Devgadh Baria)
Agriculture College, AAU, Jabugam			
12.2.1.5	Efficacy testing of native *Rhizobium* isolates in summer groundnut (*Arachis hypogaea*)	1. Add disease and pest observations	Approved
			(Action : Assoc. Prof. & OSD, Agriculture College, AAU, Jabugam
Department of Microbiology, BACA, AAU, Anand			
12.2.1.6	Screening of native *Rhizobium* isolates on green gram (*Vigna radiata* L.)	1. If possible, conduct trial upto maturity	Approved
12.2.1.7	Screening of native *Rhizobium* isolates on pigeon pea (*Cajanus cajan*)	1. If possible, conduct trial upto maturity	Approved
12.2.1.8	Efficacy of methylotrophic bacterial consortium on rice (*Oryzae sativa* L.) cv. Gurjari in field	Approved	Approved
12.2.1.9	Plant growth promoting rhizospheric potash mobilizing bacterial liquid consortium efficacy in maize (*Zea mays* L.)	Approved	Approved
			(Action : Professor and Head, Department of Microbiology, BACA, AAU, Anand)
Micronutrient Research Project, AAU, Anand			
12.2.1.10	Evaluation of heavy metals tolerant native bacterial culture for bioremediation of heavy metals using multi-cut forage jowar	Approved	Approved
12.2.1.11	Evaluation of efficacy of sulphur and zinc containing complex fertilizer for	Approved	Approved

	maximizing yield and quality through balanced nutrition of groundnut crop		
12.2.1.12	Evaluation of efficacy of sulphur and zinc containing complex fertilizer for maximizing yield and quality through balanced nutrition of mustard crop	Approved	Approved
12.2.1.13	Mobilization of Iron and Zinc through Bioconsortium and its effect on growth and yield of maize (*Zea mays* L.)	PG student trial	Not approved
(Action: Associate Research Scientist, Micronutrient Research Project, AAU, Anand)			
Department of Agril. Chemistry and Soil Sci., BACA, Anand			
12.2.1.14	Effect of graded saturation of P- fixing capacity of two different soil types on yield and chemical composition of wheat (*Triticum aestivum* L.)	PG student trial	Not approved
(Action: Professor & Head, Department of Agril. Chemistry and Soil Sci., BACA, Anand)			
Department of Agronomy, BACA, AAU, Anand			
12.2.1.15	Effect of spacing and topping on yield of summer sesame (*Sesamum indicum* L.)	1. Conduct as a feeler trial and will be finalized after getting results	Approved
12.2.1.16	Nutrient management through organic sources in summer green gram (*Vigna radiata* L.)	1. Add observation on pests and diseases	Approved
12.2.1.17	Varietal performance of pearl millet under varying transplanting dates in semi *rabi* season	Approved	Approved
(Action: Professor & Head, Department of Agronomy, BACA, AAU, Anand)			
Pulse Research Station, AAU, Vadodara			
12.2.1.18	Effect of sowing dates and spacing on semi *rabi* green gram (*Vigna radiata* L.)	Approved	Approved
(Action: Research Scientist, Pulse Research Station, AAU, Vadodara)			
Agriculture Research Station, AAU, Arnej			
12.2.1.19	Nutrient management through organic sources in wheat in *Bhal* region	1. Conduct two experiments separately for wheat variety GW 1 and GW 496 and change the methodology	Approved

		accordingly	
12.2.1.20	Effect of different levels of nitrogen, phosphorus and bio-fertilizers on yield of irrigated wheat (*Triticum aestivum* L.) in *Bhal* region	1. Change phosphorus treatment as: P_1: 30 kg/ha and P_2: 60 kg/ha	Approved
(Action: Research Scientist, ARS, AAU, Arnej)			
ARS on Irrigated Crops, AAU, Thasra			
12.2.1.21	Nutrient management through organic sources in grain amaranthus (*Amarathus hypochondriacus* L.) under middle Gujarat conditions	1. Change treatment no. 1 as RDF instead of No manure (Control)	Approved
(Action: Associate Research Scientist, ARS on Irrigated Crops, AAU, Thasra)			
Regional Cotton Research Station, AAU, Viramgam			
12.2.1.22	To study the effect of limited irrigation on production and fibre quality of *desi* cotton	1. Change the title as " Effect of limited irrigation on production and fibre quality of *desi* cotton"	Approved
(Action: Associate Research Scientist, RCRS, AAU, Viramgam)			
AICRP on weed control, AAU, Anand			
12.2.1.23	Management of complex weed flora in Garlic (*Allium sativum* L.)	1. Add observation on Residue analysis	Approved
(Action: Agronomist, AICRP on weed control, AAU, Anand)			
Main Rice Research Station, AAU, Nawagam			
12.2.1.24	Management of nitrogenous fertilizer through need based application by using Leaf Colour Chart (LCC) in rice varieties with different maturity group	1. Change title as " Nitrogen management through need based application by using Leaf Colour Chart (LCC) in rice varieties with different maturity group 2. Initial soil sample should be analysed for N, S, Fe and Zn and if found deficient, should be supplimented before experiment.	Approved
(Action: Research Scientist, Main Rice Research Station, AAU, Nawagam)			
Regional Research Station, AAU, Anand			
12.2.1.25	Effect of irrigation scheduling and fertigation on wheat (*Triticum aestivum* L.) under middle Gujarat conditions	1. Depth of irrigation in conventional treatment should be 50 mm 2. Use lateral line with 8 lph discharge capacity 3. Use word PEF (alternate day) instead of ADPEF 4. Mention fertilizer dose (120-60-0 NPK kg/ha)	Approved
12.2.1.26	Effect of fertigation under different lateral spacing in	Not approved	Not approved

	drip irrigated wheat (*Triticum aestivum* L.)		
(Action: Research Scientist, Regional Research Station, AAU, Anand)			
Polytechnic in Agril. Engineering AAU, Dahod			
12.2.1.27	Effect of tillage methods on soil properties and productivity of soybean (*Glycine max*) - wheat (*Triticum aestivum*) cropping system	1. Change word production instead of productivity in the title 2. Grow wheat with minimum tillage only	Approved
(Action: Associate Professor, PAE, AAU, Dahod)			
Department of Agril. Meteorology, BACA, AAU, Anand			
12.2.1.28	Calibration and validation of SUBSTOR model (DSSAT 4.6) for three cultivars of potato under different sowing time	Approved	Approved
(Action: Professor & Head, Department of Agril. Meteorology, BACA, AAU, Anand)			

JUNAGADH AGRICULTURAL UNIVERSITY

Sr. No.	Title	Suggestions	Remarks
Department of Agronomy, JAU, Junagadh			
12.2.2.1	Evaluation of cow-based bio-enhancers and botanicals for organic cultivation of summer groundnut.	1. Remove 50 % flowering in observation. *(Action: Professor & Head,Department of Agronomy, JAU, Junagadh)*	Approved
Department of Agronomy, JAU, Junagadh			
12.2.2 .2	Integrated weed management in soybean	1. Add residue analysis in observation. *(Action: Professor & Head, Department of Agronomy, JAU, , Junagadh)*	Approved
Department of Agronomy, JAU, Junagadh			
12.2.2.3	Response of Bt cotton to high density planting and nitrogen levels through fertigation	1. Mentioned units of observation. *(Action: Professor& Head, Department of Agronomy, JAU, , Junagadh)*	Approved
Department of Agronomy, JAU, Junagadh			
12.2.2. 4	Promotion of pulses through inter/relay cropping for enhancing climate resilient agriculture	1. Delete length & dry wt. of roots and no. of branches in observation 2. Measure nodules/plant at 45 DAS instead of 60 DAS. 3. Measure soil moisture upto 30 cm depth *(Action: Professor& Head, Department of Agronomy, JAU, Junagadh)*	Approved
Main Oilseeds Research Station, JAU, Junagadh			

12.2.2.5	Evaluation of DAPG-producing fluorescent pseudomonas for enhancing nutrient use efficiency, bio control of soil born disease and yield of groundnut	Approved *(Action: Research Scientist (Groundnut), Main Oilseeds Research Station, JAU, Junagadh)*	Approved
Main Oilseeds Research Station, JAU, Junagadh			
12.2.2.6	Economizing phosphorus use in groundnut production by exploiting phosphorus build up in soil	Approved *(Action: Research Scientist (Groundnut), Main Oilseeds Research Station, JAU, Junagadh)*	Approved
Main Oilseeds Research Station, JAU, Junagadh			
12.2.2.7	Integrated weed management in castor	Approved *(Action: Res. Sc., (G'nut), Main Oilseeds Res. Station, JAU, Junagadh)*	Approved
Main Oilseeds Research Station, JAU, Junagadh			
12.2.2.8	Evaluation of enriched castor meal as a source of K in castor	Approved *(Action: Res. Sc., (G'nut), Main Oilseeds Res. Station, JAU, Junagadh)*	Approved
Main Oilseeds Research Station, JAU, Junagadh			
12.2.2.9	Economizing phosphorus use in *kharif* groundnut production by exploiting phosphorus build up in soil	Approved *(Action: Research Scientist (Groundnut), Main Oilseeds Research Station, JAU, Junagadh)*	Approved
Millet Research Station, JAU, Jamnagar			
12.2.2.10	Performance of pearlmillet released hybrids under organic condition	Approved *(Action: Research Scientist (Millet), Millet Res.h Station, JAU, Jamnagar)*	Approved
Wheat Research Station, JAU, Junagadh			
12.2.2.11	Evaluation of wheat varieties in organic condition	Approved *(Action: Research Scientist (Wheat), Wheat Research Station, JAU, Junagadh)*	Approved
Wheat Research Station, JAU, Junagadh			
12.2.2.12	Performance of new wheat genotypes at different dates of sowing under irrigated condition	Approved *(Action: Research Scientist (Wheat), Wheat Research Station, JAU, Junagadh)*	Approved
Wheat Research Station, JAU, Junagadh			
12.2.2.13	Performance of "marker assisted backcross breeding (MABB)" genotypes of wheat for late sown under irrigated condition	Approved *(Action: Research Scientist (Wheat), Wheat Research Station, JAU, Junagadh)*	Approved
Wheat Research Station, JAU, Junagadh			
12.2.2.14	Management of lodging and yield maximization using nutrient expert in wheat	Approved *(Action: Research Scientist (Wheat), Wheat Research Station, JAU, Junagadh)*	Approved

Wheat Research Station, JAU, Junagadh			
12.2.2.15	Comparative performance of line sowing versus dibbling in wheat	Approved *(Action: Research Scientist (Wheat), Wheat Research Station, JAU, Junagadh)*	Approved
Sugarcane Research Station, JAU, Kodinar			
12.2.2.16	Ratoon management in sugarcane	1. Use word "Emergence" instead of "germination" in observation *(Action: Research Scientist (Sugarcane), Sugarcane Res. Station, JAU, Kodinar)*	Approved
Sugarcane Research Station, JAU, Kodinar			
12.2.2.17	Weed management in sugarcane with special reference to *Cynodon dactylon*	1. Add residue analysis in observation. *(Action: Res. Sci. (Sugarcane), Sugarcane Research Station, JAU, Kodinar)*	Approved
Sugarcane Research Station, JAU, Kodinar			
12.2.2.18	Study on shift of weed flora in sugarcane under changing climate scenario	Approved *(Action: Res. Sci. (Sugarcane), Sugarcane Research Station, JAU, Kodinar)*	Approved
Pulses Research Station, JAU, Junagadh			
12.2.2.19	Management of chickpea under organic farming	Approved *(Action: Research Scientist (Chickpea), Pulses Res. Station, JAU, Junagadh)*	Approved
Main Dry Farming Research Station, JAU, Targhadia			
12.2.2.20	Production potential and economics of Bt cotton based intercropping system under rainfed condition	Approved *(Action: Research Scientist (Dry Farming), Main Dry Farming Research Station, JAU, Targhadia)*	Approved
Main Dry Farming Research Station, JAU, Targhadia			
12.2.2.21	Fertilizer management in groundnut + castor (3:1) intercropping system under rainfed condition	Approved *(Action: Research Scientist (Dry Farming), Main Dry Farming Research Station, JAU, Targhadia)*	Approved
Agril. Res. Station, JAU, Ratia & Main Dry Farming Res. Station, JAU, Targhadia			
12.2.2.22	Effect of NP fertilization on yield of sorghum under conserved soil moisture in Ghed area	Approved (*Action: Asst. Res. Sci., Agril. Res. Station, JAU, Ratia & Res. Sci. (Dry Farming), Main Dry Farming Res. Station, JAU, Targhadia)*	Approved
Department of Agril. Chemistry & Soil Science, JAU, Junagadh			
12.2.2.23	Establishment of critical limits of sulphur for soybean crop in medium black calcareous soils	1. Delete CRD in text. *(Action: Prof. & Head, Dept. of Agril. Chemistry & Soil Sci., JAU, Junagadh)*	Approved
Dept. of Agril. Chem.& Soil Sci., & Main Oilseeds Res. Station, JAU, Junagadh			

12.2.2.24	Soil test based fertilizer recommendation for soybean	Approved *(Action: Prof. & Head, Dept. of Ag.. Chem. & Soil Sci., & Res. Sci. (G'nut), Main Oilseeds Res. Stat., JAU, Junagadh)*	Approved
Dept. of Agril. Chem.& Soil Sci., & Vegetable Res. Station, JAU, Junagadh			
12.2.2.25	Effect of N, P and K fertilizer on growth, yield and nutrients uptake by brinjal	Approved *(Action: Prof. & Head, Dept. of Agril. Chem. & Soil Sci., & Res. Sci. (G&O)., Vegetable Res. Stat., JAU, Junagadh)*	Approved
Department of Agril. Chemistry & Soil Science, JAU, Junagadh			
12.2.2.26	Effect of saline irrigation water on brinjal crop	1. Collect bulk soil sample for the experiment from salt affected area *(Action: Prof. & Head, Dept. of Agril. Chem. & Soil Science, JAU, Junagadh)*	Approved
Department of Agril. Chemistry & Soil Science, JAU, Junagadh			
12.2.2.27	Effect of saline irrigation water on tomato	1. Collect bulk soil sample for the experiment from salt affected area *(Action: Prof. & Head, Dept. of Agril. Chem. & Soil Science, JAU, Junagadh)*	Approved
Department of Agril. Chemistry & Soil Science, JAU, Junagadh			
12.2.2.28	Effect of saline irrigation water on wheat	1. Collect bulk soil sample for the experiment from salt affected area *(Action: Prof. & Head, Dept. of Agril. Chem. & Soil Science, JAU, Junagadh)*	Approved

NAVSARI AGRICULTURAL UNIVERSITY

Sr.No.	Title	Suggestions	Remarks
SWMRU, NAU, Navsari			
12.2.3.1	Study on drip system layout for different row spacing of vegetable Indian bean (Var. GNIB-21)	**Approved** **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
12.2.3.2	Response of drip irrigated rabi sorghum to different levels of irrigation and fertigation	**1.** Correct plot size as L x W **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
12.2.3.3	Effect of different levels of irrigation, nitrogen and foliar application of banana sap on drip irrigated sweetcorn and their residual effect on succeeding summer green gram under South Gujarat conditions	**Approved** **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
12.2.3.4	Survey on impact of 'NAUROJI Novel Organic Liquid Fertilizer' indifferent crops of South Gujarat	**Approved** **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**

12.2.3.5	Soil test based recommendation for targeted yield of rice	**1.** Fix the targeted yield as 40, 50, 60 and 70 q/ha **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
12.2.3.6	Influence of soil conditioner and integrated nutrient management on *kharif* rice and their residual effect on succeeding onion under partially reclaimed coastal salt affected soil	**1.** Change the title as" Effect of gypsum and integrated nutrient management on *kharif* rice and their residual effect on succeeding onion under partially reclaimed coastal salt affected soil " **2.** Write "a. Gypsum " instead of "a. Soil conditioner" in main plot treatment **3.** Write "G_0: No gypsum" instead of "S_0: No soil conditioner" **4.** Write "G_1: Gypsum @ 50%GR" instead of "S_1: Gypsum @ 75%GR" 5. Remove observation 6 i.e. Test weight **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
12.2.3.7	Effect of land configuration and soil conditioner, integrated nutrient management on growth and yield of radish	**1.** Change the title as "Effect of land configuration, gypsum and integrated nutrient management on growth and yield of radish" **2.** Write "G_2: Gypsum @ 50 % GR" instead of "G_2: Gypsum @ 75 % GR" in main plot treatment **(Action:- Res. Sci., SWMRU, Navsari)**	**Approved**
Main Sugarcane Research Station, NAU, Navsari			
12.2.3.8	Scheduling irrigation with mulch under different sugarcane planting methods	**Approved** **(Action:- Res. Sci., MSRS, Navsari)**	**Approved**

12.2.3.9	Carbon sequestration assessment in sugarcane based cropping system	**1.** Add observation soil WSA (Water soluble aggregates) analysis **(Action:- Res. Sci., MSRS, Navsari)**	**Approved**
12.2.3.10	Agronomic performance of elite sugarcane genotypes	**Approved (Action:- Res. Sci., MSRS, Navsari)**	**Approved**
12.2.3.11	Bio efficacy of herbicides against weeds and its residual effect on sugarcane	**Approved (Action:- Res. Sci., MSRS, Navsari)**	**Approved**
Pulses and Castor Research Station, NAU, Navsari			
12.2.3.12	Soil test based fertilizer recommendation for targeted yields of pigeon pea	**Approved (Action:- Res. Sci., Pulses and Castor Research Station, Navsari)**	**Approved**
12.2.3.13	Soil test based fertilizer recommendation for targeted yields of Indian bean	**Approved (Action:- Res. Sci., Pulses and Castor Research Station, Navsari)**	**Approved**
12.2.3.14	Nutrient management in Indian bean cv. GNIB 21 and its ratoon crop sequence	**1.** Change the treatments as follow **1.Main plot (plant crop)** M_0 - Control M_1 - 20- 40 kg N-P_2O_5 /ha M_2 - 5 t FYM/ha M_3 - 3 t Biocompost/ha **2. Sub Plot (*Ratoon* crop)** **S_0 -** Control **S_1 -** 10-10 kg N-P_2O_5 /ha **S_2 -** 10-30 kg N-P_2O_5 /ha **S_3 -** 20-30 kg N-P_2O_5 /ha **S_4 -** 20-40 kg N-P_2O_5 /ha **(Action:- Res. Sci., Pulses and Castor Research Station, Navsari)**	**Approved**
12.2.3.15	Response of rabi castor to row spacings under different sowing window with or without intercrop of Indian bean var. GNIB-21	**1.** Add LER in observation **(Action:- Res. Sci., Pulses and Castor Res.arch Station, Navsari)**	**Approved**
Hill Millet Research Station, NAU, Waghai			

12.2.3.16	Soil test based recommendation for targeted yield of Nagli (Finger millet)	**1.** Fix the targeted yield as 10, 15, 20 and 25 q/ha **(Action:- Res. Sci., Hill Millet Res. Stat., Waghai)**	**Approved**
Regional Rice Research Station, Vyara			
12.2.3.17	Soil test based fertilizer recommendation for targeted yields of Ground nut	**1.** Fix the targeted yield as 15, 20, 25 and 30 q/ha 2. Remove observation of "days to 50% flowering" **(Action:- Res. Sci., Regional Rice Research Station, Vyara)**	**Approved**
Agriculture Research Station, NAU, Paria			
12.2.3.18	Intercropping in newly established mango Orchard	**1.** Adopt drilling methods by row spacing in below crops : Paddy :20 cm Indian bean : 45 cm Green gram : 30 cm cow pea: 30 cm **2.** Take sweet corn variety HSC 1 instead of Madhuri **(Action:- Res. Sci., Agri. Research Station, Paria)**	**Approved**
12.2.3.19	Effect of different sowing methods and nutrient management on Indian bean var. NPS-1 (GNIB-21) sown after rice	**Approved** **(Action:- Agriculture Research Station, Paria)**	**Approved**
12.2.3.20	Scheduling irrigation along with response of mulches in Brinjal	**1.** Change title as " Response of Brinjal to irrigation schedules and mulches under drip irrigation system" **2.** Drip System detail is required **(Action:- Agriculture Research Station, Paria)**	**Approved**
12.2.3.21	Effect of tillage depth on flowering and fruiting behaviour of mango under rainfed agrosystem	**1.** Change treatment T_3 as " Mould board plough every year " **(Action:- Agriculture Research Station, Paria)**	**Approved**

12.2.3.22	Weed control in tomato *(Lycopersicon esculentum* Mill.) through mulching and herbicides under drip irrigation conditions	**Approved (Action:- Agriculture Research Station, Paria)**	**Approved**
Main Cotton Research Station, NAU, Surat			
12.2.3.23	Soil test based recommendation for targeted yield of cotton	**Approved (Action:- Res. Sci., MCRS, Surat)**	**Approved**
Main Sorghum Research Station, NAU, Surat			
12.2.3.24	Soil test based fertilizer recommendation for targeted yields of sorghum	**1.** Fix the targeted yield as 20, 30, 40 and 50 q/ha **(Action:- Res. Sci., MSRS, Surat)**	**Approved**
12.2.3.25	Weed management in kharif sorghum	**Approved (Action:- Res. Sci., MSRS, Surat)**	**Approved**
Agriculture Research Station, NAU, Achhalia			
12.2.3.26	Studies on irrigation scheduling through drip, nitrogen management and mulch in turmeric	**Approved (Action:- Assoc. Res. Sci., Agri. Res. Stat., Achhalia)**	**Approved**
Agriculture Research Station, NAU, Mangrol			
12.2.3.27	Response of *rabi* sorghum to anti transparent and mulching along with no. of irrigations according to critical stage approach under South Gujarat condition	**1.** Recast the title as " Response of *rabi* sorghum to anti transparent and irrigation scheduling under mulching " **2.** Reform the treatments of antitranspirant as below **A_1:**Water spray **A_2:** Kaoline @ 6% **A_3:** PMA @ 300 ppm **(Action: - Asstt. Res. Sci., Agri. Res. Stat., Mangrol)**	**Approved**
12.2.3.28	Integrated nutrient management in chickpea under South Gujarat condition	**1.** Mention the RDF of gram 2. Use 5 t/ha FYM instead of 8 t/ha in treatment M_1 3. Remove treatment R_2 4.Add treatment R_0: Control **(Action: - Asstt. Res. Sci., Agri. Res. Stat., Mangrol)**	**Approved**

12.2.3.29	Study of critical period of crop weed competition in pigeonpea under south Gujarat condition	**Approved** **(Action: - Asstt. Res. Sci., Agri. Res. Stat., Mangrol)**	**Approved**
Dept. of Agronomy, NMCA, NAU, Navsari			
12.2.3.30	Effect of ZnO nanoparticles on growth, yield and quality of rice	**1.** Remove 5 and 25 ppm levels in each set of treatments **2.** Results of pot trial should be presented in next combined joint agresco-2017 **(Action:- Prof. and Head (Agron.), NMCA, Navsari)**	**Approved**
12.2.3.31	Effect of levels and sources of sulphur application on growth, yield and quality of linseed under South Gujarat condition	**1.** Recast the treatments as given below A. Levels of nitrogen (kg/ha) N_1-50 N_2-75 N_3-100 B. Levels of phosphorus (kg/ha) P_1-25 P_2-50 C. Levels of sulpher (kg/ha) S_1-10 S_2-20 S_3-40 **(Action:- Prof. and Head (Agron.), NMCA, Navsari)**	**Approved**
12.2.3.32	Integrated weed management in *rabi* maize	**1.** Reform the treatment no. 4 as "Atrazine 1 kg/ha PE + hand weeding at 40 DAS **2.** Reform the treatment no. 5 as "Atrazine 1 kg/ha PE + Interculturing at 40 DAS" **(Action:- Prof. and Head (Agron.), NMCA, Navsari)**	**Approved**
12.2.3.33	Integrated weed management in fodder oat	**1.**Recast treatment W5 as "Metsulfuron methyl 4 g/ha" instead of " Metsulfuron methyl 0.008 kg/ha"	**Approved**

		2. Remove treatment W4 and W6 **3.** Add treatment Pendimethalin 1 kg/ha PE 4. In treatment W_3 dose of 2,4 D amine salt is to be changed as 0.5 kg/ha instead of 0.75 kg/ha **(Action:- Prof. and Head (Agron.), NMCA,Navsari)**	
12.2.3.34	Production potential of fodder maize (*Zea maize* L.) with different fodder intercrop	**1.** Change title as "Production potential of fodder maize (*Zea maize* L.) with different fodder intercrops " **(Action:- Prof. and Head (Agron.), NMCA,Navsari)**	**Approved**
12.2.3.35	Integrated farming system model for marginal farmers of Navsari (Gujarat)	**Approved** **(Action:- Prof. and Head (Agron.), NMCA,Navsari)**	**Approved**
Dept. of SSAC, NMCA, NAU, Navsari			
12.2.3.36	Preparation of P enriched Farm Yard Manure and its evaluation in *rabi* sorghum-green gram cropping sequence under South Gujarat condition	**1.** Delete the treatment no.T_4, T_6, T_7, T_9, T_{11} and T_{13} **(Action:- Prof. and Head (Agron.), NMCA,Navsari)**	**Approved**
Dept. of Ag. Met., NMCA, NAU, Navsari			
12.2.3.37	Determination of rank correlation for various weather parameter over South Gujarat	**Approved** **((Action:- Prof. and Head (Agron.), NMCA,Navsari)**	**Approved**
Dept. of NRM, ACHF, NAU, Navsari			
12.2.3.38	Calibration and validation of DSSAT model for sugarcane crop in South Gujarat region.	**Approved** **(Action:- Prof. and Head (NRM), ACHF,Navsari)**	**Approved**
12.2.3.39	Seasonal and Diurnal variation of surface ozone at NAU campus.	**Approved** **(Action:- Prof. and Head (NRM), ACHF,Navsari)**	**Approved**
Dept. of SSAC, ACHF, NAU, Navsari			
12.2.3.40	Effect of different organic sources on yield and quality of sorghum varieties	**1.** In M_1 and M_2 treatments ,use "NADEP compost" word instead of "NADEP"	**Approved**

		(Action:- Prof. and Head (SSAC), ACHF,Navsari)	
12.2.3.41	Effect of liquid manures on growth, yield and quality of green gram under organic farming	**1.** Delete treatment no. 5,6,7 **2.** Add disease/pest observation **3.** Delete Second point in methodology 4. Remove word "fertilizer" from objective and use "natural organic liquid" **(Action:- Prof. and Head (SSAC), ACHF, Navsari)**	**Approved**
Dept. of SSAC, COA, NAU, Waghai			
12.2.3.42	Response of little millet (Vari) to organics	**Approved** **(Action:- Prof. and Head (SSAC), COA,Waghai)**	**Approved**
12.2.3.43	Assessment of quality of irrigation water of Dangs district	**Approved** **(Action:- Prof. and Head (SSAC), COA,Waghai)**	**Approved**
Dept. of Agron., COA, NAU, Bharuch			
12.2.3.44	Response of cotton to green manuring and different fertility levels under rainfed condition.	**Approved** **(Action:- Prof. and Head (Agron.), COA, Bharuch)**	**Approved**
12.2.3.45	Response of sugarcane to tillage and different intercropping system under South Gujarat condition.	**1.** Replace variety of fenugreek GF 1 with GF 2 **(Action:- Prof. and Head (Agron.), COA, Bharuch)**	**Approved**
12.2.3.46	Nutrient management in Dill Seed under south Gujarat condition	**1.** Recast the treatments as follow A. Nitrogen levels (N kg/ha) N1-20, N2-40, N3-60 B. Phosphorus levels (P_2O_5 kg/ha) P- 0, P-20, P-30 **2.** Delete note after treatments **(Action:- Prof. and Head (Agron.), COA, Bharuch)**	**Approved**
12.2.3.47	Evaluation of castor based relay cropping sequences under rainfed condition of South Gujarat.	**Approved** **(Action:- Prof. and Head (Agron.), COA, Bharuch)**	**Approved**
12.2.3.48	N & P management in kharif sorghum with and without bio organics under	**Approved** **(Action:- Prof. and Head**	**Approved**

	South Gujarat conditions	**(Agron.), COA, Bharuch)**	
12.2.3.49	Agroclimatic Approach for Crop Planning	**Approved (Action:- Prof. and Head (Agron.), COA, Bharuch))**	**Approved**
Department of SSAC, PIH, ACHF, Navsari			
12.2.3.50	Effect of tip pruning and foliar application of KNO_3 on early flowering and yield of mango cv. Kesar	**Present in horticulture sub committee (Action: - Asstt. Prof. (SSAC), PIH, ACHF, Navsari)**	-

SARDARKRUSHINAGAR AGRICULTURAL UNIVERSITY

Sr. No.	Title/ Centre	Suggestions	Remarks
12.2. 4.1	**Diversification of cropping system as component for small holder farming systems**	-- (Action: Research Scientist, IFS, SDAU, SKNagar)	Approved
12.2. 4.2	**Evaluation of organic, inorganic and integrated production systems**	1.Add Punchgavya Spray @ 3% and Jivamrut (soil application) @ 500 litre/ha (Action: Res. Sci., IFS, SDAU, SKNagar)	Approved
12.2. 4.3	**Evaluation of response of different varieties of major crops for organic farming**	(Action: Research Scientist, IFS, SDAU, SKNagar)	Approved
12.2. 4.4	**Development of Integrated Organic Farming System model**	1. Add African Tall variety for fodder maize (Action: Research Scientist, IFS, SDAU, SKNagar)	Approved
12.2. 4.5	**Geo-referenced Characterization of Organic Cluster**	(Action: Research Scientist, IFS, SDAU, SKNagar)	Approved
12.2. 4.6	**Response of different sources of urea on growth and productivity of wheat**	1. Change title as "Nitrogen Management in wheat through neem coated urea". 2. Add treatments -T7 & T8 of NPK consortium ,T9- FYM 10t/ha,T10- absolute Control 3. Add test weight observation (Action: Professor & Head, Agron., CPCA, SDAU, SKNagar)	Approved
12.2. 4.7	**Fertigation in cumin** Centre for Natural Resources Management, S. D. A.U. Sardarkrushinagar	1. Title- Response of cumin.to irrigation schedule and fertigation 2. Apply 25 % N as basal and 75 % in three equal splits at 30, 45 and 60 DAS.	Approved

Sr. No.	Title/ Centre	Suggestions	Remarks
		3. Drip is to be operated up to 70 days (Action: Assistant Res. Scientist, PDC, Agronomy, SDAU, SKNagar)	
12.2. 4.8	**Effect of spacing and nitrogen on yield of castor (GCH 7) under rainfed condition** Centre for Natural Resources Management,S. D. A.U. Sardarkrushinagar	1. Change "optimum" word as "suitable" in objective- 1 2.Top dressing of N to be applied in two splits, 3.Change treatments as S3:120 x30 cm and S4:120 x60 cm (Action: Asso. Res. Sci. Agronomy AICRP on DLRP, SDAU, SKNagar)	Approved
12.2. 4.9	**Integrated nitrogen management in castor-cluster bean crop rotation under rainfed condition**	1. Recast objectives 2. Add control as treatment T8 (Action: Asso. Res. Sci., Agronomy AICRP on DLRP, SDAU, SKNagar)	Approved
12.2. 4.10	**Evaluation of drumstick based agri-horticultural system**	1. Add LER in observation (Action: Asso. Res. Sci. Agronomy AICRP on DLRP, SDAU, SKNagar)	Approved
12.2.4.11	**Response of different genotypes of grain amaranths to varying fertility levels**	1.RDF is to be mentioned (Action: Asso. Res. Sci., CCI, SDAU, SKNagar)	Approved
12.2. 4.12	**Integrated weed management in castor**	1.Add residue analysis in observation (Action: Asstt. Res. Sci., Castor Mustard Res. Stat., SDAU,SKnagar)	Approved
12.2. 4.13	**Periodical changes in soil fertility status in fallow land**	Dropped (Action: Asstt. Res. Sci., Castor Mustard Res. Stat., SDAU,SKnagar)	Not approved
12.2. 4.14	**Effect of bio fertilizers inoculation for increasing nutrient use efficiency in field pea**	1.Add 5t/ha FYM as common application 2. RDF is to be mentioned 3.Keep replication four (Action: Asstt. Res. Sci. (Agron.), Pulses Res. Station, SDAU,SKNagar	Approved
12.2. 4.15	**Enhancing resource use efficiency and crop productivity in cowpea**	1.Sources of zinc and boron to be mentioned (Action: Asstt. Res. Sci. (Agron.), Pulses Res. Station, SDAU,SKNagar	Approved
12.2. 4.16	**Integrated weed management in Fenugreek**	1. Add residue analysis in observation (Action: Asstt. Res. Sci., Seed Spices Res. Stat., SDAU, Jagudan	Approved
12.2. 4.17	**Effect of seed priming on wheat under different spacing and nutrient management**	(Action: Asstt. Res. Sci. (Agron.), Wheat Res. Station SDAU, Vijapur)	Approved
12.2. 4.18	**Nutrient requirement of**	1.Mention Design:RBD	Approved

Sr. No.	Title/ Centre	Suggestions	Remarks
	irrigated wheat in North Gujarat	2. Add N level 90 kg/ha instead of 180 kg/ha (Action: Assoc. Res. Sci. (Agron.) and Asstt. Res. Sci. (Agron.), Wheat Res. Station SDAU, Vijapur	
12.2. 4.19	**Effect of bio-fertilizers on yield of wheat under salt affected soils**	1.Treatments T3,T6,T8 to be applied with irrigation at CRI stage 2.50% gypsum to be applied as common on the basis of soil analysis 3. Apply 5t/ha FYM instead of 10 t/ha as common application (Action: Asstt. Res. Sci. (Agron.), Agril. Res. Station, SDAU, Adiya	Approved
12.2. 4.20	**Effect of spacing on yield of Bt. Cotton under salt affected soils**	1. Treatments are as-60x30cm, 60x45cm, 90x30cm, 90x45cm, 120x30 cm and 120x45cm. (Action: Asstt. Res. Sci. (Agron.), Agril. Res. Station, SDAU, Adiya	Approved
12.2. 4.21	**Micronutrient Management in Groundnut**	1.Add treatment T10 as grade-IV multimicro nutrient mixture spray (1%) at 30 & 45 DAS 2. Keep 5t/ha FYM instead of 10 t/ha as common application 3. Keep Plot size:6.0 x 3.6 m (Action: Asstt. Res. Sci. (Agron.), Agril. Res. Station, SDAU, Aseda	Approved

12.3 PLANT PROTECTION/ CROP PROTECTION

Chairman	**:**	Dr. A. N. Sabalpara, Director of Research, NAU, Navsari
Co-Chairman	**:**	Dr. A. M. Parakhia, Director of Extension, Education, JAU, Junagadh Dr. D. M. Korat, Associate Director of Research, AAU, Anand
Rapporteurs:	**:**	Dr. K G. Patel, Principal, College of Agriculture, NAU, Bharuch Dr. R. N. Pandey, Professor and Head, Dept. Pl. Pathology, BACA, AAU, Anand

Summary of recommendations and new technical programmes

Sr. No.	Name of university	Recommendations for farming community		Information for scientific community		New technical programmes	
		Presented	Approved	Presented	Approved	Presented	Approved
1	AAU	09	08	39	39	58	56
2	JAU	03	03	07	07	36	36
3	NAU	03	03	13	13	52	51
4	SDAU	03	03	04	03	11	11
	Total	18	17	63	62	157	154

The details of recommendations and new technical programmes presented/ discussed and approved

RECOMMENDATIONS

12.1 FARMING COMMUNITY

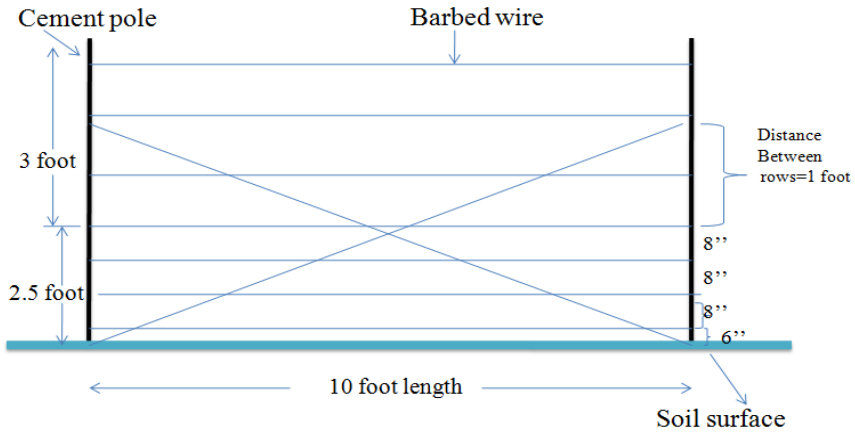
ANAND AGRICULTURAL UNIVERSITY

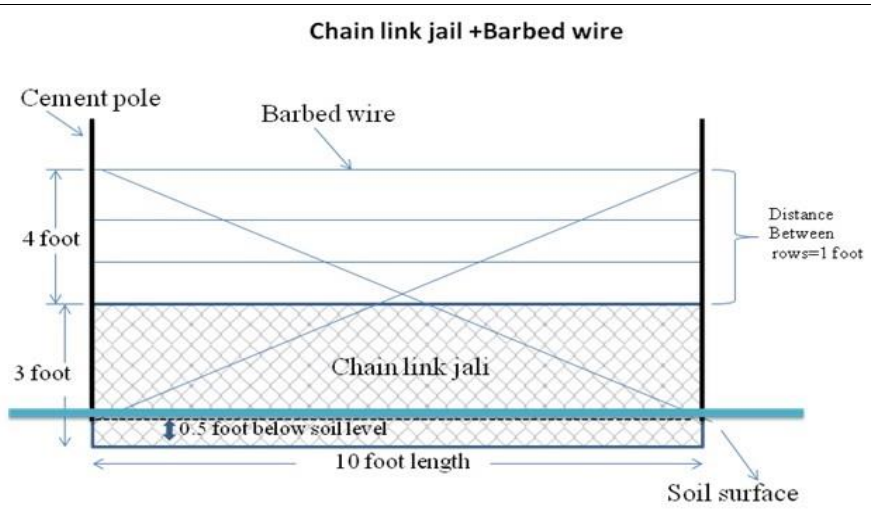
AGRICULTURAL ENTOMOLOGY

12.1.1 Documentation and evaluation of indigenous techniques for wild boar management

Install barbed wire fence on farm periphery with posting cement poles at 10' (3.05 m) interval and tie 7 parallel rows of barbed wire one above other and 2 rows diagonally crossing each other at centre between two adjoining poles to restrict boar (*Sus scrofa*) entering into crop field. Tie parallel rows of barbed wires, starting from 6″ (15.24 cm) above ground, lower 4 rows 8″ (20.32 cm) apart and upper 3 rows 12″ (30.48 cm) apart. By replacing lower 3 rows of barbed wire with chain linked net pushing 6″ (15.24 cm) inside ground can increase the effectiveness.

Only barbed wire fence





ખેતીના પાકમાં ભૂંડ (*સસ સ્ક્રોફા*) ને પ્રવેશતા રોકવા ખેતરની ફરતે ૧૦' (૩.૦૫ મી) ના અંતરે સિમેન્ટના થાંભલા ઉભા કરી તેના પર કાંટાળા તારની ૭ હાર એકબીજાને સમાંતર અને ૨ હાર બે થાંભલા વચ્ચે ચોકડી પડે તેમ બાંધવી. નીચેની સમાંતર હાર જમીનથી ૬" (૧૫.૨૪ સેં. મી.) ઉંચેથી શરૂ કરી ૪ હાર ૮" (૨૦.૩૨ સેં. મી.)ના ગાળાએ અને ઉપરની ૩ હાર ૧૨" (૩૦.૪૮ સેં. મી.) ગાળાએ બાંધવી. નીચેના ૩ તારની હારને બદલે ૩' (૦.૯૧ મી) ઉંચાઇની ચકકર જાળી, ૬"(૧૫.૨૪ સેં. મી.) જમીનમાં દબાવીને લગાવવાથી વાડની અસરકારકતા વધારી શકાય.

(Action: Res. Sci. (Ornitho.), AINPVPM: Agril. Ornithology, AAU, Anand)

12.1.2 **Bio-efficacy of newer insecticides against brinjal shoot and fruit borer, *Leucinodes orbonalis* (Guenee)**

For effective control of shoot and fruit borer (*Leucinodes orbonalis)* and getting higher fruit yield in brinjal, the farmers of middle Gujarat are recommended to spray emamectin benzoate 5 SG 0.0025 per cent (5 g/ 10 litre of water; 12.5 g a.i./ha) or chlorantraniliprole 18.5 SC 0.006 per cent (3 ml/ 10 litre of water; 30 g a.i./ha) when the pest crosses 5 per cent shoot damage and subsequent two sprays at 15 days after first spray application.

Year	Crop	Pest	Pesticides with formulation	Dosage				Appl. schedule	Waiting period /PHI (Days)
				g. a.i./ ha	Quantity of formulation/ ha	Conc. (%)	Dilution in 10 litre water		
2016	Brinjal	Shoot & fruit borer	Emamectin benzoate 5 SG	12.5	250 g	0.0025	5 g	First foliar spray application at 5% damage of shoots and subsequent two at 15 days after first application	1
			Chlorantraniliprole 18.5 SC	30	150 ml	0.006	3 ml		22

મધ્ય ગુજરાત વિસ્તારમાં રીંગણની ડૂંખ અને ફળ કોરી ખાનાર ઇયળના અસરકારક નિયંત્રણ માટે એમામેક્ટીન બેન્ઝોએટ ૫ એસજી ૦.૦૦૨૫ ટકા (૫ ગ્રામ/ ૧૦ લિટર પાણી; ૧૨.૫ ગ્રામ સક્રિય તત્વ/ હેક્ટર) અથવા ક્લોરાન્ટ્રાનિલિપ્રોલ ૧૮.૫ એસસી ૦.૦૦૬ ટકા (૩ મિ.લિ. ૧૦ લિટર પાણી; ૩૦ ગ્રામ

સક્રિય તત્વ/ હેક્ટર) ભેળવી પ્રથમ છંટકાવ ૫ ટકા ડૂંખમાં નુકસાન જોવા મળે ત્યારે અને ત્યારબાદ બીજા બે છંટકાવ પ્રથમ છંટકાવ બાદ ૧૫ દિવસના ગાળે કરવાની ભલામણ છે.

(Action: Asstt. Res. Sci. (Ento.), MVRS, AAU, Anand)

12.1.3 Evaluation of new molecules of insecticides against leaf folder of paddy

Farmers of middle Gujarat growing transplanted rice are recommended to spray flubendiamide 480 SC 0.015 per cent (3 ml/10 litre of water; 72 g a.i./ha) or indoxacarb 15.8 EC 0.015 per cent (10 ml/10 litre of water; 79 g a.i./ha) or acephate 75 SP 0.075 per cent (10 g/10 litre of water; 375 g a.i./ha) for the control of leaf folder at initiation of pest incidence.

Year	Crop	Pest	Insecticides with formulation	Dosage				Appli. schedule	Waiting period /PHI (Days)
				g.a.i. /ha	Quantity of formulation/ha	Conc. (%)	Dilution in 10 litre water		
2015	Rice	Leaf folder and Stem borer	Flubendiamide 480 SC	72	150 ml	0.015	3 ml	Initiation of pest incidence	Safe at harvest as per CIB
			Indoxacarb 15.8 EC	79	500 ml	0.015	10 ml		
			Acephate 75 SP	375	500 g	0.075	10 g		

મધ્ય ગુજરાતના રોપાણ ડાંગર ઉગાડતા ખેડૂતોને પાન વાળનાર ઇયળના નિયંત્રણ માટે જીવાતનો ઉપદ્રવ શરૂ થયે ફ્લ્યુબેન્ડીયામાઈડ ૪૮૦ એસસી ૦.૦૧૫ ટકા (૩ મિલિ/ ૧૦ લિટર પાણી; ૭૨ ગ્રામ સક્રિય તત્વ/ હેક્ટર) અથવા ઈન્ડોક્ઝાકાર્બ ૧૫.૮ ઇસી ૦.૦૧૫ ટકા (૧૦ મિલિ/ ૧૦ લિટર પાણી; ૭૯ ગ્રામ સક્રિય તત્વ/ હેક્ટર) અથવા એસીફેટ ૭૫ એસપી ૦.૦૭૫ ટકા (૧૦ ગ્રામ/ ૧૦ લિટર પાણી; ૩૭૫ ગ્રામ સક્રિય તત્વ/ હેક્ટર) નો છંટકાવ કરવાની ભલામણ કરવામાં આવે છે.

(Action: Asstt. Res. Sci. (Ento.), MRRS, AAU, Nawagam)

PLANT PATHOLOGY

12.1.4 Management of wilt and root rot of chickpea through seed biopriming and soil application of bio-agents

The farmers of middle Gujarat growing chickpea are recommended for application of *Trichoderma viride* or *T. harzianum* ($2x10^8$ cfu/g) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed biopriming at the time of sowing i.e. soaking of seeds for 10 hrs in suspension of talc based formulation 1 % WP ($2x10^8$ cfu/g) of *T. viride* or *T. harzianum*, respectively @ 50 g product / 250 ml of water/ kg of seed and shade dried, for the effective management of wilt - root rot complex.

Year	Crop	Pest	Pesticides with formulation	Dosage				Application schedule	Waiting period/ PHI (days)	Remark
				a.i./ha	Quantity of formulation/ ha	Conc. (%)	Dilution in water			

2016	Chickpea	Wilt and root rot	*T. viride* or *T. harzianum* 1 % WP	--	--	**1.0**	--	Application of *Trichoderma viride* or *T. harzianum* ($2x10^8$ cfu/g) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed biopriming at the time of sowing *i.e.* soaking of seeds for 10 hrs in suspension of talc based formulation ($2x10^8$ cfu/g) of *T. viride* or *T. harzianum*, respectively @ 50 g product / 250 ml of water/ kg of seed.	--	--

મધ્ય ગુજરાતના ચણા ઉગાડતા ખેડૂતોને સુકારા-મૂળખાઇ રોગના અસરકારક નિયંત્રણ માટે *ટ્રાયકોડર્મા વીરીડી* અથવા *ટ્રાયકોડર્મા હરજીયાનમ* (૨x૧૦^{૮} સીએફયુ/ગ્રામ) સંવર્ધિત છાણિયા ખાતરને (૧૦ કિલો જૈવિક નિયંત્રક/ટન છાણિયા ખાતર), ૧ ટન/હેક્ટર પ્રમાણે વાવણી વખતે ચાસમાં આપવું, ત્યાર બાદ તેજ પ્રમાણે ટાલ્ક આધારીત *ટ્રાયકોડર્મા વીરીડી* અથવા *ટ્રાયકોડર્મા હરજીયાનમ* ૧ % વેપા (૨x૧૦^{૮} સીએફયુ/ગ્રામ)ની ૫૦ ગ્રામ બનાવટને ૨૫૦ મિ.લિ. પાણીમાં પ્રતિ કિલો બીજ પ્રમાણે ભેળવી, ૧૦ કલાક બોળી, છાયડામાં સૂકવી, વાવણી માટે ઉપયોગમાં લેવાની ભલામણ કરવામાં આવે છે.

(Action: Prof. & Head, Dept. of Plant Pathology, BACA, AAU, Anand)

12.1.5 Evaluation of bioagents for management of soil-borne diseases in mungbean through seed treatment and soil application

The farmers of middle Gujarat growing mungbean are recommended for application of *Trichoderma harzianum* **or** *T. viride* ($2x10^8$ cfu/g) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed treatment with *T. harzianum* **or** *T. viride* 1 % WP ($2x10^8$ cfu/g) @ 10 g /kg seeds, respectively at the time of sowing for the effective management of root rot disease.

Year	**Crop**	**Pest**	**Pesticides with formulation**	**Dosage**				**Application schedule**	**Waiting period/PHI (days)**	**Remark**
				a.i./ha	**Quantity of formulation/ ha**	**Conc. (%)**	**Dilution in water**			
2016	Mungbean	Root rot	*T. harzianum* or *T. viride* 1 % WP	--	--	1.0	--	Application of *Trichoderma harzianum* or *T. viride* ($2x10^8$ cfu/g) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed treatment with *T. harzianum* or *T. viride* ($2x10^8$ cfu/g) @ 10 g	--	--

મધ્ય ગુજરાતના મગ ઉગાડતા ખેડૂતોને મૂળખાઇ રોગના અસરકારક નિયંત્રણ માટે *ટ્રાયકોડર્મા હરજીયાનમ* અથવા *ટ્રાયકોડર્મા વીરીડી* (૨x૧૦૯ સીએફયુ/ગ્રામ) સંવર્ધિત છાણિયા ખાતરને (૧૦ કિલો જૈવિક નિયંત્રક/ ટન છાણિયા ખાતર) ૧ ટન/હેક્ટર પ્રમાણે ચાસમાં આપવું, ત્યાર બાદ તેજ પ્રમાણે *ટ્રાયકોડર્મા હરજીયાનમ* અથવા *ટ્રાયકોડર્મા વીરીડી* ૧ %વેપા (૨x૧૦૯ સીએફયુ/ગ્રામ)ની ૧૦ ગ્રામ પ્રતિ કિલો બીજ પ્રમાણે માવજત આપી વાવણી માટે ઉપયોગમાં લેવાની ભલામણ કરવામાં આવે છે.

(Action: Prof. & Head, Dept. of Plant Pathology, BACA, AAU, Anand)

12.1.6 Evaluation of bioagents for management of soil-borne diseases in soybean through seed treatment and soil application

The farmers of middle Gujarat growing soybean are recommended for application of *Trichoderma viride* **or** *T. harzianum* ($2x10^8$ cfu/g- 1% WP) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed treatment with *T. viride* **or** *T. harzianum* ($2x10^8$ cfu/g) @ 10 g/kg seeds, respectively at the time of sowing for the effective management of root rot disease.

Year	Crop	Pest	Pesticides with formulation	Dosage				Application schedule	Waiting period/ PHI (days)	Remark
				a.i./ha	Quantity of formulation/ ha	Conc. (%)	Dilution in water			
2016	Soybean	Root rot	*T. viride* or *T. harzianum* 1 % WP	--	--	1.0	--	Application of *Trichoderma viride* or *T. harzianum* ($2x10^8$ cfu/g) enriched FYM (10 kg bioagent/ ton FYM) in furrow @ 1 ton/ha, followed by seed treatment with *T. viride* or *T. harzianum* ($2x10^8$ cfu/g) @ 10 g/kg seeds, respectively.	--	--

મધ્ય ગુજરાતના સોયાબીન ઉગાડતા ખેડૂતોને મૂળખાઇ રોગના અસરકારક નિયંત્રણ માટે *ટ્રાયકોડર્મા વીરીડી* અથવા *ટ્રાયકોડર્મા હરજીયાનમ* (૨x૧૦૯ સીએફયુ/ગ્રામ-૧ %વેપા) સંવર્ધિત છાણિયા ખાતરને (૧૦ કિલો જૈવિક નિયંત્રક/ ટન છાણિયા ખાતર) ૧ ટન/હેક્ટર પ્રમાણે ચાસમાં આપવું, ત્યાર બાદ તેજ પ્રમાણે *ટ્રાયકોડર્મા વીરીડી* અથવા *ટ્રાયકોડર્મા હરજીયાનમ* (૨x૧૦૯ સીએફયુ/ગ્રામ)ની ૧૦ ગ્રામ પ્રતિ કિલો બીજ પ્રમાણે માવજત આપી, વાવણી માટે ઉપયોગમાં લેવાની ભલામણ કરવામાં આવે છે.

(Action: Prof. & Head, Dept. of Plant Pathology, BACA, AAU, Anand)

12.1.7 Effects of different dates of sowing on occurrence of root-knot disease in bidi tobacco nursery

Farmers of middle Gujarat growing bidi tobacco are recommended to raise the nursery by sowing the seeds up to third week of July to minimize root- knot nematode disease and thereby getting more number of healthy seedlings.

મધ્ય ગુજરાતના બીડી તમાકુ ઉગાડતા ખેડૂતોને ધરુવાડીયાના ઉછેર માટે બીજની વાવણી જુલાઇ માસના

	ત્રીજા અઠવાડીયા સુધી કરવાથી ધરુમાં ગંઠવા કૃમિ રોગમાં ઘટાડો થતા તંદુરસ્ત ધરુની સંખ્યા વધારે મળે છે. **(Action: Res. Sci. (Pl. Path.), Bidi Tobacco Research Station, AAU, Anand)**
12.1.8	**Evaluation of bio-fungicides for management of maydis leaf blight, turcicum leaf blight and curvularia leaf spot diseases in maize** Farmers of the middle Gujarat growing *kharif* and *rabi* maize, are recommended to treat the seeds with talc based formulation of *Trichoderma viride* 1% WP ($2x10^8$ cfu/g) @ 7 g/ kg seeds at the time of sowing; followed by four sprays of cow urine 10 per cent (1 litre / 10 litre of water) or neem leaf extract, 10 per cent (1 litre / 10 litre of water) at 30, 40, 50 and 60 days after sowing for the management of maydis and turcicum leaf blight and curvularia leaf spot diseases. મધ્ય ગુજરાતના ચોમાસુ અને શિયાળુ મકાઇ ઉગાડતા ખેડૂતોને મકાઇમાં મેઇડીસ અને ટર્સીકમ પાનનાં સુકારા તથા કર્વુલેરીયા પાનનાં ટપકાંના નિયંત્રણ માટે વાવણીના સમયે ટાલ્ક આધારીત *ટ્રાયકોડર્મા વીરીડી* ૧% વે.પા. (૨x૧૦^{૮} સીએફયુ/ગ્રામ) ૭ ગ્રામ પ્રતિ કિલો બીજ પ્રમાણે માવજત આપવી, ત્યારબાદ ૧૦ ટકા ગૌમૂત્ર (૧ લિટર લિટર/૧૦ લિટર પાણી) અથવા લીમડાના પાનનો ૧૦ ટકા રસ (૧ લિટર લિટર/૧૦ લિટર પાણી) નો વાવણી બાદ ૩૦, ૪૦, ૫૦ અને ૬૦ દિવસે છંટકાવ કરવાની ભલામણ કરવામાં આવે છે. **(Action: Asst. Res. Sci. (Pl.Path.), MMRS, AAU, Godhra)**

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AGRICULTURAL ENTOMOLOGY -- Nil	
PLANT PATHOLOGY	
12.1.9	**Management of alternaria leaf blight of groundnut** The farmers of south Saurashtra growing summer groundnut are advised to apply three sprays of mancozeb 75 WP 0.2% (27 g/10 litre of water) at 35, 50 and 65 days after sowing for effective and economical management of alternaria leaf blight of groundnut. દક્ષિણ સૌરાષ્ટ્ર વિસ્તારના ઉનાળુ મગફળી ઉગાડતા ખેડૂતોને અલ્ટરનેરીયા ફૂગથી થતા પાનના સુકારાના રોગના અસરકારક અને અર્થક્ષમ નિયંત્રણ માટે મેન્કોઝેબ ૭૫ વે.પા. ૦.૨ ટકા (૨૭ ગ્રામ/૧૦ લીટર પાણી) ના વાવણી બાદ ૩૫, ૫૦ અને ૬૫ દિવસે ત્રણ છંટકાવ કરવાની ભલામણ કરવામાં આવે છે. **(Action: Main Oilseeds Research Station, JAU, Junagadh)**
12.1.10	**Refining integrated disease management in groundnut** The farmers of south Saurashtra growing kharif groundnut are advised to apply seed treatment with tebuconazole 25 WG @1.5 g/kg seed or seed treatment with *Trichoderma viride* 1% WP 10 g/kg seed, furrow application of *T. viride* at the time of sowing and broadcasting at 40 DAS @ 4 kg enriched in 50 kg FYM and two sprays of tebuconazole 25.9 SC @10 ml/ 10 l at 15 days interval from initiation of foliar disease for effective and economical management of collor rot, stem rot, tikka and rust disease. દક્ષિણ સૌરાષ્ટ્ર વિસ્તારના ચોમાસું મગફળી ઉગાડતા ખેડૂતોને ઉગસુક, થડનો સડો, પાછોતરા પાનના ટપકા અને ગેરુ રોગના અસરકારક નિયંત્રણ માટે બીજને ટેબુકોનાઝોલ ૨૫ ડબલ્યુજી ૧.૫ ગ્રામ પ્રતિ

	કિલો બીજ અથવા ટ્રાઇકોડર્મા વિરીડી ૧% વે.પા, ૧૦ ગ્રામ પ્રતિ કિલો બીજ પ્રમાણે બીજ માવજત તેમજ હેકટરે ૪ કિલો ટ્રાઇકોડર્મા વિરીડી પાઉડર ૫૦ કિલો છાણીયા ખાતરમાં એક અઠવાડિયા સુધી સંવર્ધિત કરી વાવેતર સમયે તથા વાવેતર બાદ ૪૦ દિવસે ચાસમાં આપવું અને પાનના રોગની શરૂઆત થયે ટેબુકોનાઝોલ ૨૫.૯ એસસી (૧૦ મિલી/ ૧૦લિ પાણીમાં)ના બે છંટકાવ પંદર દિવસના અંતરે કરવાની ભલામણ કરવામાં આવે છે. **(Action: Res. Sci. (Groundnut), Main Oilseeds Research Station, JAU, Junagadh)**
12.1.11	**Efficacy of seed dressing chemicals against wilt and root rot complex of cotton** The farmers of south Saurashtra are advised to treat the cotton seeds with a ready mixture of carboxin 37.5% + thiram 37.5% DS @ 3.5 g/kg seeds before sowing for economical and effective control of wilt and root rot complex and to improve seed cotton yield. દક્ષિણ સૌરાષ્ટ્ર વિસ્તારમાં કપાસ ઉગાડતા ખેડુતોને ભલામણ કરવામાં આવે છે કે, કપાસના સુકારા અને મુળખાઈ કોમ્પલેક્ષ રોગોના અર્થક્ષમ, અસરકારક નિયંત્રણ અને વધુ ઉત્પાદન મેળવવા માટે બીજને વાવતા પહેલા કાર્બોકઝીન ૩૭.૫% + થાયરમ ૩૭.૫% ડી.એસ. નાં તૈયાર મિશ્રણનો ૩.૫ ગ્રામ/ પ્રતિ કિલો મુજબ પટ આપવો. **(Action: Research Scientist (Cotton), Cotton Research Station, JAU, Junagadh)**
NAVSARI AGRICULTURAL UNIVERSITY	
AGRICULTURAL ENTOMOLOGY	
12.1.12	**Waiting period of fenazaquin in/on chilli** To avoid fenazaquin residue in chilli, farmers are recommended to observe 12 days waiting period when fenazaquin 10 EC is applied twice 0.01 per cent (10 ml /10 l water) at 15 days interval starting from 50 per cent flowering stage.

Year	Crop	Pest/ Diseases	Pesticide with formulation	Doses			PHI Waiting Period (days)
				Quantity of formulation	Conc. (%)	Dilution in water	
2016	Chilli	Mites	Fenazaquin 10 EC	1250 ml or 125 g a.i/ha	0.01%	50 0L	12.0

ફિનાઝાક્વીનના અવશેષ મુક્ત મરચાં મેળવવા માટે ફેનાઝાક્વીન ૧૦ ઈ.સી. ૦.૦૧ ટકા (૧૦ મી.લિ./૧૦ લિ. પાણી) ફૂલ અવસ્થા બાદ ૧૫ દિવસના અંતરે બે છંટકાવ કરતા ખેડૂતોને છેલ્લા છંટકાવ અને ઉતાર વચ્ચેનો ગાળો ઓછામાં ઓછો બાર દિવસનો રાખવાની ભલામણ કરવામાં આવે છે.

વર્ષ	પાક	જીવાત	જંતુનાશકની બનાવટ	માત્રા			છેલ્લા છંટકાવ અને ઉતાર વચ્ચેનો ગાળો (દિવસ)
				બનાવટનું પ્રમાણ	સાંદ્રતા (%)	પાણીમાં મિશ્રણ	
૨૦૧૬	લીલા મરચા	પાન કથીરી	ફેનાઝાક્વિન ૧૦.૦ ઈ.સી.	૧૨૫૦ મી.લિ. અથવા ૧૨૫ ગ્રા. સ.ત./હે.	૦.૦૧ %	૫૦૦ લિ.	૧૨

(Action:- Asstt. Prof. (Pesticide Residue, FQTL, Navsari)

PLANT PATHOLOGY

12.1.13 Biological control of Pigeon pea wilt

Pigeon pea growers of South Gujarat are advised to apply *Trichoderma viride* 1 per cent WP @ 10 g/kg (1×10^8 cfu/g) as seed treatment and @ 2.5 kg /500 kg FYM /ha in furrow at the time of sowing for effective management of wilt and to get higher grain yield and net profit.

દક્ષિણ ગુજરાતના તુવેર ઉગાડતા ખેડૂતોને સુકારા રોગનું અસરકારક નિયંત્રણ માટે અને વધુ ઉત્પાદન તેમજ ચોખ્ખી આવક મેળવવા માટે તુવેરને ટ્રાઇકોડર્મા વીરીડી ૧% વે.પા. ૧૦ ગ્રામ/ કિ.ગ્રા ૧ ટકા વે.પા. (૧ × ૧૦^{૮} સીએફયુ પ્રતિ ગ્રામ) ની બીજ માવજત અને ૨.૫ કિ.ગ્રા/૫૦૦ કિ.ગ્રા છાણીયા ખાતર / હેક્ટર ભેળવી વાવણી સમયે ચાસમાં આપવાની ભલામણ કરવામાં આવે છે.

(Action: Assoc Prof.(Pl Path), College of Agri., NAU, Bharuch)

12.1.14 Chemical control of rice grain discoloration

The Paddy growers are advised to apply three sprays of propiconazole 25 EC 0.025 per cent @ 125 g a.i./ ha (10 ml/10 litre) or trifloxystrobin 25 per cent + tebuconazole 50 per cent (75 WG) 0.03 % @ 150 g a.i./ ha (4 g/10 litre) for effective control of grain discoloration and to harvest higher healthy grain and straw yield. The first spray should be given at boot leaf stage and the remaining two sprays thereafter at 10 days interval.

Year	Crop	Diseases	Pesticide with formulation	Doses			Waiting Period (days)
				Quantity of formulation	Conc. (%)	Dilution in water	
2016	Paddy	Grain/glume discoloration	Propiconazole 25EC	125 g a.i./ ha	0.025	500 l	30
			Trifloxystrobin 25 % + tebuconazole 50% (75WG)	150 g a.i./ ha	0.03	500 l	21

ગુજરાતમાં ડાંગર ઉગાડતા ખેડૂતોને ડાંગરનાં કાળા દાણા અથવા ભૂખરા / બદામી દાણાના રોગના અસરકારક નિયંત્રણ અને વધુ તંદુરસ્ત દાણા સાથે વધુ ઉત્પાદન માટે પ્રોપીકોનાઝોલ ૨૫ ઈસી, ૦.૦૨૫ ટકા (૧૦ મી.લી. પ્રતિ ૧૦ લિટર) અથવા ટ્રાયફલોકસીસ્ટ્રોબીન ૨૫ ટકા + ટેબુકોનાઝોલ ૫૦ % (૭૫ વેટેબલ ગ્રેન્યુલ્સ ૦.૦૩ ટકા (૪ ગ્રામ પ્રતિ ૧૦ લિટર) ના ત્રણ છંટકાવ કરવા. પહેલો છંટકાવ ધ્વજ પર્ણદંડ અવસ્થાએ (બુટ લીફ સ્ટેજ) અને ત્યારબાદ બાકીના બે છંટકાવ ૧૦ દિવસના સમય ગાળે કરવાની ભલામણ કરવામાં આવે છે.

વર્ષ	પાક	રોગ	ફુગનાશક	માત્રા			પ્રતીક્ષા સમય (દિવસ)
				સ.ત./ હે	સાંદ્રતા (%)	પાણીમાં મિશ્રણ	
૨૦૧૬	ડાંગર	કાળા દાણા	પ્રોપીકોનાઝોલ ૨૫ ઈસી	૧૨૫ ગ્રામ	૦.૦૨૫	૫૦૦ લિ.	૩૦

			અથવા ભૂખરા / બદામી દાણાના રોગ	ટ્રાયફલોકસીસ્ટ્રોબીન ૨૫ %+ ટેબુકોનાઝોલ ૫૦ % (૭૫ વેટેબલ ગ્રેન્યુલ્સ)	૧૫૦ ગ્રામ્	૦.૦૩	૫૦૦ લિ.	૨૧

(Action: Asstt. Res. Sci. (Pl Path), Main Rice Res. Centre, NAU, Navsari)

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AGRICULTURAL ENTOMOLOGY

12.1.15 Biological control of Date palm scale insect

The date palm growers are advised to spray entomopathogenic fungus Lecanicillium *lecanii (Verticillium lecani)* 1.15 WP (1 x 10^9 cfu/g) @ 40 g/10 l at the appearance of white scale (*Parlatoria blanchardi)* in date palm for its effective control.

ખારેક ઉગાડતા ખેડૂતો માટે ભલામણ કરવામાં આવે છે કે પાકમાં સફેદ ભીંગડાવાળી જીવાતનો ઉપદ્રવ જોવા મળેથી લેકાનીસીલીયમ લેકાની (વર્ટીસીલીયમ લેકાની) ફૂગ આધારીત ૧.૧૫ ડબલ્યુપી (૧ x ૧૦^{૯} સીએફયુ/ગ્રામ) ૪૦ ગ્રામ/ ૧૦ લીટર પાણીમાં મિશ્ર કરી છંટકાવ કરવાથી તેનું અસરકારક નિયંત્રણ કરી શકાય છે.

[Action: Asso. Res. Sci. (Ento), Date palm Res. Station, SDAU, Mundra – Kachchh]

12.1.16 Management of red palm weevil through pheromones

Date palm growing farmers are advised to use sugarcane pieces 250 g or chickoo with vinegar 5 ml/250 g as food bait in pheromone trap of red palm weevil for higher catches of adults.

ખારેક ઉગાડતા ખેડૂતો માટે ભલામણ કરવામાં આવે છે કે લાલ ચાંચવા(સુંઢિયા)ના ફેરોમેન ટ્રેપમાં શેરડીના ટુકડા ૨૫૦ ગ્રામ અથવા ચીકુ સાથે વીનેગર ૫ મી.લી. ઉમેરી ૨૫૦ ગ્રામ ખાદ્ય પદાર્થ તરીકે ઉપયોગ કરવાથી તેના પુખ્ત કિટકો વધારે પ્રમાણમાં આકર્ષિત થાય છે.

[Action: Asso. Res. Sci. (Ento), Date palm Res. Station, SDAU, Mundra – Kachchh]

PLANT PATHOLOGY

12.1.17 Management of bacterial blight of cluster bean

For the management of bacterial blight disease in vegetable cluster bean the farmers of North Gujarat are advised to soak the seeds in streptomycin sulphate 90 per cent + tetracycline hydrochloride 10 per cent SP @ 250 ppm (2.5 g/10 litre water) for 30 minutes before sowing and apply its first spray at the appearance of the disease and second at 15 days interval.

Year	Crop	Disease	Pesticide with formulation	Dose/ha			Formulation in 10 litre water	Application schedule	Weighting period /PHI (days)	Remarks
				a.i. (g)	Formulation (g/ml)	water requirement litre				

	2015	Cluster bean	Bacterial leaf blight	Streptomycin sulphate 90% + tetracycline hydrochloride 10 % SP	300.25g	250mg (seed treat) + 300g (Two foliar spray) Total 300.25 g	One l for seed treatment 600 litre for foliar application	2.5 g	Seed soaking for 30 minutes before sowing Two foliar sprays First at appearance of the disease and second at 15 days interval	-	-

ઉત્તર ગુજરાતના શાકભાજી ગુવારનું વાવેતર કરતા ખેડુતોને જીવાણુથી થતા કાળીયા રોગના અસરકારક નિયંત્રણ માટે બીજને વાવેતર કરતા પહેલાં સ્ટ્રેપ્ટોમાયસીન સલ્ફેટ ૯૦ ટકા + ટેટ્રાસાયકલીન હાઇડ્રોકલોરાઇડ ૧૦ ટકા એસ પી ના ૨૫૦ પીપીએમ (૨.૫ ગ્રામ દવા/ ૧૦ લીટર પાણી) દ્રાવણમાં ૩૦ મિનિટ બોળી રાખી વાવણી કરવાની તથા આ દવાનો પ્રથમ છંટકાવ રોગ દેખાયે અને ત્યારબાદ ૧૫ દિવસે બીજો છંટકાવ કરવાની ભલામણ કરવામાં આવે છે.

(Action: Asso. Res. Sci. (Path), Seed Spices Res. Station, SDAU, Jagudan)

12.2 INFORMATION FOR SCIENTIFIC COMMUNITY

ANAND AGRICULTURAL UNIVERSITY

AGRICULTURAL ENTOMOLOGY

12.2.1 Bio-efficacy of different insecticides against anar butterfly, *Virachola isocrates* (Fabricius) infesting pomegranate

Two sprays of flubendiamide 39.35SC 0.015 per cent (3 ml/10 litre of water) or chlorantraniliprole 18.5SC 0.006 per cent (3 ml/10 litre of water) or emamectin benzoate 5 SG 0.0025 per cent (5 g/10 litre of water) first at initiation of the pest and second at 30 days after first spray proved effective for the control of anar butterfly, *Virachola isocrates* (Fabricius) infesting pomegranate in mrug bahar.

(Action: Prof. & Head, Department of Entomology, BACA, AAU, Anand)

12.2.2 Residue and persistence of ethion 50 EC in/on cabbage

Two foliar sprays of ethion 50 EC in cabbage at 10-day interval @ 500 g a.i./ ha starting from 50 per cent head formation resulted in its residue below the limit of quantitation of 0.05 µg/g in cabbage heads if harvested from 7th day after the last spray. Therefore, PHI of 7 days could be suggested if ethion 50 EC is recommended in cabbage with MRL of 0.05 µg/g.

(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)

12.2.3 Residue and persistence of acephate 75 SP in/on cabbage

Two foliar sprays of acephate 75 SP in cabbage at 10 days interval @ 560 g a.i./ha starting from 50 per cent head formation resulted in cabbage head residue below the MRL 2.0 µg/g (CODEX) immediately after the last application. Therefore, PHI of 1 day could be suggested if acephate 75 SP is recommended in cabbage.

(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)

12.2.4 Residue and persistence of triazophos 40 EC in/on cabbage

Two foliar sprays of triazophos 40 EC in cabbage at 10 days interval @ 500 g a.i./ha starting from 50 per cent head formation resulted in its residue below the limit of

	quantitation of 0.05 µg/g in cabbage heads if harvested from 10th day after the last spray. Therefore, PHI of 10 days could be suggested if triazophos 40 EC is recommended in cabbage with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.5	**Residue and persistence of carbendazim 50 WP in/on cabbage** Two foliar sprays of carbendazim 50 WP in cabbage at 10 days interval @ 250 g a.i./ha starting from 50 per cent head formation resulted 0.70 µg/g residues even on the 15th day of the last application which being higher than limit of quantitation of 0.05 µg/g, label claim of carbendazim 50 WP can be considered for cabbage based on the risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.6	**Residue and persistence of quinalphos 25 EC in/on cabbage** Two foliar sprays of quinalphos 25 EC in cabbage at 10 days interval @ 250 g a.i./ha starting from 50 per cent head formation resulted in its residue below the limit of quantitation of 0.05 µg/g in cabbage head if harvested from 5th day after the last spray. Therefore, PHI of 5 days could be suggested if quinalphos 25 EC is recommended on cabbage with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.7	**Residue and persistence of ethion 50 EC in/on cauliflower** Two foliar sprays of ethion 50 EC in cauliflower at 10 days interval @ 500 g a.i./ha starting from 50 per cent curd formation resulted in its residue below the limit of quantitation of 0.05 µg/g in cauliflower curd if harvested from 15th day after the last spray. Therefore, PHI of 15 days could be suggested if ethion 50 EC is recommended on cauliflower with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.8	**Residue and persistence of acephate 75 SP in/on cauliflower** Two foliar sprays of acephate 75 SP in cauliflower at 10 days interval @ 560 g a.i./ha starting from 50 per cent curd formation resulted in 0.12 µg/g residues even on the 15th day after the last application which being higher than the limit of quantitation of 0.05 µg/g, label claim of acephate 75 SP can be considered for cauliflower based on the risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.9	**Residue and persistence of carbendazim 50 WP in/on cauliflower** Two foliar sprays of carbendazim 50 WP in cauliflower at 10 days interval @ 250 g a.i./ha starting from 50 per cent curd formation resulted in 0.16 µg/g residues even on the 15th day of the last application which being higher than limit of quantitation of 0.05 µg/g, label claim of carbendazim 50 WP can be considered for cauliflower based on the risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.10	**Residue and persistence of triazophos 40 EC in/on cauliflower** Two foliar sprays of triazophos 40 EC in cauliflower at 10 days interval @ 500 g a.i./ha starting from 50 per cent curd formation resulted in its residue below the limit of quantitation of 0.05 µg/g in cauliflower curd if harvested from 10th day after the last spray. Therefore, PHI of 10 days could be suggested if triazophos 40 EC is recommended in cauliflower with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.11	**Residue and persistence of quinalphos 25 EC in/on cauliflower** Two foliar sprays of quinalphos 25 EC in cauliflower at 10 days interval @ 250 g a.i./ha

	starting from 50 per cent curd formation resulted in its residue below its MRL of 0.1 µg/g in cauliflower curd if harvested from 7th day after the last spray. Therefore, PHI of 7 days could be suggested. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.12	**Residue and persistence of quinalphos 25 EC in/on chilli** Two foliar sprays of quinalphos 25 EC in chilli at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue below its MRL of 0.2 µg/g in green chilli fruits if harvested from 5th day after the last spray. Therefore, PHI of 5 days could be suggested. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.13	**Residue and persistence of triazophos 40 EC in/on chilli** Two foliar sprays of triazophos 40 EC in chilli at 10 days interval @ 500 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.05 µg/g in green chilli fruits if harvested from 15th day after the last spray. Therefore, PHI of 15 days could be suggested if triazophos 40 EC is recommended in chilli with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.14	**Residue and persistence of chlorpyriphos 20 EC in/on chilli** Two foliar sprays of chlorpyriphos 20 EC in chilli at 10 days interval @ 300 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.01 µg/g in green chilli fruits if harvested from 10th day after the last spray. Therefore, PHI of 10 days could be suggested if chlorpyriphos 20 EC is recommended on chilli with MRL of 0.01 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.15	**Residue and persistence of carbendazim 50 WP in/on green chilli** Two foliar sprays of carbendazim 50 WP in chilli, at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue below the MRL 2.0 µg/g (CODEX) in green chilli fruits on the 3rd day after the last application. Therefore, PHI of 3 days could be suggested if carbendazim 50 WP is recommended in chilli. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.16	**Residue and persistence of fluopyram 200 + tebuconazole 200 - 400 SC in/on chilli** Three foliar sprays of fluopyram 200 + tebuconazole 200 - 400 SC in chilli at 10 days interval @ 100 + 100 g a.i./ha starting from fruiting stage resulted its residue below its limit of quantitation of 0.05 µg/g in green chilli fruits on the 20th day after the last application. Therefore, PHI of 20 days could be suggested if the fluopyram 200 + tebuconazole 200 - 400 SC combination is recommended in chilli with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.17	**Residue and persistence of carbendazim 50 WP in/on capsicum grown in open field** Two foliar sprays of carbendazim 50 WP in capsicum grown in open field, at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue 0.41 µg/g in the fruits even on the 20th day after the last application, which being higher than the limit of quantitation of 0.05 µg/g , label claim of carbendazim 50 WP can be considered for capsicum based on risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**

12.2.18	**Residue and persistence of chlorpyriphos 20EC in/on capsicum grown in open field** Two foliar sprays of chlorpyriphos 20 EC in capsicum grown in open field at 10 days interval @ 300 g a.i./ha starting from fruiting stage resulted in its residue below its MRL 2.0 µg/g (CODEX) in the fruits immediately after the last application. Therefore, PHI of 1 day could be suggested if chlorpyriphos 20 EC is recommended in capsicum grown in open field. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.19	**Residue and persistence of quinalphos 25 EC in/on capsicum grown in polyhouse** Two foliar sprays of quinalphos 25 EC in capsicum grown in polyhouse at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.05 µg/g in the fruits if harvested from 10th day after the last spray. Therefore, PHI of 10 days could be suggested if quinalphos 25 EC is recommended in capsicum grown in polyhouse with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.20	**Residue and persistence of triazophos 40 EC in/on capsicum grown in polyhouse** Two foliar sprays of triazophos 40 EC in capsicum grown in polyhouse at 10 days interval @ 500 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.05 µg/g in the fruits if harvested from 15th day after the last spray. Therefore, PHI of 15 days could be suggested if triazophos 40 EC is recommended in capsicum grown in polyhouse with MRL of 0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.21	**Residue and persistence of chlorpyriphos 20 EC in/on capsicum grown in polyhouse** Two foliar sprays of chlorpyriphos 20 EC in capsicum grown in polyhouse at 10 days interval @ 300 g a.i./ha starting from fruiting stage resulted in its residue below its MRL of 2.0 µg/g (CODEX) in the fruits immediately after the last application. Therefore, PHI of 1 day could be suggested if chlorpyriphos 20 EC is recommended in capsicum grown in polyhouse. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.22	**Residue and persistence of acephate 75 SP in/on capsicum grown in polyhouse** Two foliar sprays of acephate 75 SP in capsicum grown in polyhouse, at 10 days interval @ 560 g a.i./ha starting from fruiting stage resulted in its residue 0.42 µg/g in the fruits even on the 15th day after the last application which being higher than limit of quantitation of 0.05 µg/g, label claim of acephate 75 SP can be considered for capsicum based on the risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.23	**Residue and persistence of carbendazim 50WP in/on capsicum grown in polyhouse** Two foliar sprays of carbendazim 50 WP in capsicum grown in polyhouse, at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue 0.25 µg/g in the fruits even on the 20th day after the last application which being higher than limit of quantitation of 0.05 µg/g, label claim of carbendazim 50 WP can be considered for capsicum based on the risk assessment. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.24	**Residue and persistence of quinalphos 25 EC in/on tomato** Two foliar sprays of quinalphos 25 EC in tomato at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.05 µg/g in tomato fruits if harvested from 7th day after the last spray. Therefore, PHI of 7 days could be suggested if quinalphos 25 EC is recommended in tomato with MRL of

	0.05 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.25	**Residue and persistence of carbendazim 50 WP in/on tomato** Two foliar sprays of carbendazim 50 WP in tomato at 10 days interval @ 250 g a.i./ha starting from fruiting stage resulted in its residue below the MRL 0.5 µg/g (CODEX) in the tomato fruits on the 15th day after the last application. Therefore, PHI of 15 days could be suggested if carbendazim 50 WP is recommended in tomato. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.26	**Residue and persistence of chlorpyriphos 20 EC in/on tomato** Two foliar sprays of chlorpyriphos 20 EC in tomato at 10 days interval @ 300 g a.i./ha starting from fruiting stage resulted in its residue below its limit of quantitation of 0.01 µg/g in tomato fruits if harvested from 7th day after the last spray. Therefore, PHI of 7 days could be suggested if chlorpyriphos 20 EC is recommended in tomato with MRL of 0.01 µg/g. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.27	**Residue and persistence of imidacloprid 70 WG in/on tomato** Three foliar sprays of imidacloprid 70 WG in tomato at 7 days interval @ 35 g a.i./ha starting from fruiting stage resulted in its residue below its MRL of 1.0 µg/g in tomato fruits one hour after the last application. Therefore, PHI of 1 day could be suggested if imidacloprid 70 WG is recommended in tomato. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.28	**Residue and persistence of fluopyram 400 SC in/on tomato** Soil drench of fluopyram 400 SC @ 250 g a.i./ha in tomato, twice at 15 days interval starting from fruiting stage revealed its residue below determination level in tomato fruits even up to 15 days after the last application. Therefore PHI of 1 day could be suggested if fluopyram 400 SC is recommended in tomato. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.29	**Residue and persistence of imidacloprid 17.8 SL in/on okra** Two foliar sprays of imidacloprid 17.8 SL in okra at 10 days interval @ 20 g a.i./ha starting from fruiting stage resulted in its residue below its MRL of 2.0 µg/g in okra fruits one hour after the last application. Therefore, PHI of 1 day could be suggested. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.30	**Residue and persistence of imidacloprid 17.8 SL in/on brinjal** Two foliar sprays of imidacloprid 17.8 SL in brinjal at 10 days interval @ 20 g a.i./ha starting from fruiting stage resulted in its residue below its MRL 0.01 µg/g 1-day after the last application. Therefore, PHI of 1 day could be suggested if imidacloprid 17.8 SL is recommended in brinjal. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.31	**Residue and persistence of spiromesifen 22.9 SC in/on brinjal** Two foliar sprays of spiromesifen 22.9 SC in brinjal at 10 days interval @ 96 g a.i./ha starting from fruiting stage resulted in its residue below limit of quantitation of 0.05 µg/g in brinjal fruits one day after the last application. Therefore, PHI of 1 day could be suggested. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.32	**Residue and persistence of fluopyram 200 + tebuconazole 200 - 400 SC in/on onion** Three foliar sprays of fluopyram 200 + tebuconazole 200 – 400 SC in onion at 10-day interval @ 75 +75 g a.i./ha starting from bulb formation stage resulted in the residue

	below their limit of quantitation of 0.05 µg/g in onion bulbs on the 50th day (at harvest) after the last application. Therefore, the PHI of 50 days could be suggested for bulb onion if the fluopyram 200 + tebuconazole 200 – 400 SC combination is recommended in onion with 0.05 µg/g MRL. However, in spring onion as the residue levels being higher than the limit of quantitation even on the 20th day, risk assessment can be carried out to fix the MRLs. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.33	**Residue and persistence of flubendiamide 240 + thiacloprid 240 - 480 SC in/on redgram** Three foliar sprays of flubendiamide 240 + thiacloprid 240 - 480 SC in red gram at 10 days interval @ 48 + 48 g a.i./ha starting from pod formation stage resulted in the residues below their limit of quantitation of 0.05 µg/g in matured pods on the 41st day (harvest) after the last application. Therefore, the PHI of 41 days could be suggested for matured pods/seeds if flubendiamide 240 + thiacloprid 240 - 480 SC combination is recommended in red gram with 0.05 µg/g MRL. However, in green pods as the residue levels being higher than the limit of quantitation even on the 20th day, risk assessment can be carried out to fix the MRLs in green pods. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.34	**Residue and persistence of trifloxystrobin 25 + tebuconazole 50 - 75 WG in / on cowpea** Two foliar sprays of trifloxystrobin 25 + tebuconazole 50 – 75 WG in cowpea at 10 days interval @ 87.5+175 g a.i./ha at pod formation stage resulted in the residues below their limit of quantitation of 0.05 µg/g in matured pod /seed on the 42nd day (harvest) after the last application. Therefore, the PHI of 42 days could be suggested for matured pods if the trifloxystrobin 25 + tebuconazole 50 – 75 WG combination is recommended in cowpea with 0.05 µg/g MRL. However, in green cowpea pods as the residue levels reached below determination limit of 0.05 µg/g on the 20th day, PHI of 20-day could be suggested for green pods. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.35	**Residue and persistence of deltamethrin 2.5 EC in/on chickpea** Three foliar sprays of deltamethrin 2.5 EC in chickpea at 7 days interval @ 12.5 g a.i./ha starting from pod setting stage resulted in its residue below its limit of quantitation of 0.05 µg/g in matured pods/seeds on the 37th day (harvest) after the last application. Therefore, PHI of 37 days could be suggested if deltamethrin 2.5 EC is recommended in chickpea with 0.05 µg/g MRL in seed. However, for green pods, PHI of 7 days could be suggested. **(Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand)**
12.2.36	**Bio-efficacy of newer insecticides against tomato leaf miner, *Liriomyza trifolii* (Burgess)** For effective and economical management of leaf miner in tomato, spray spinosad 45 SC, 0.0135 per cent (3 ml/ 10 litre water; 67.5 g a.i./ha) or abamectin 1.9 EC, 0.0006 per cent (3 ml/ 10 litre water; 2.85 g a.i./ha) alongwith 400 g jaggery, first at appearance of the pest and subsequent two sprays at 15 days interval. **(Action: Asstt. Res. Sci. (Ento.), MVRS, AAU, Anand)**
12.2.37	**Evaluation of different miticides against paddy mites** One spray of spiromesifen 240 SC, 0.024 per cent (10 ml/10 litre of water, 120 g. a.i./ha) or propargite 57 EC, 0.057 per cent (10 ml/10 litre of water, 285 g. a.i./ha) or

	fenpyroximate 5 SC, 0.005 per cent (10 ml/10 litre of water, 25 g. a.i./ha) at the time of initiation of yellow leaf mite of paddy was found effective **(Action: Asstt. Res. Sci. (Ento.), MRRS, AAU, Nawagam)**
12.2.38	**Evaluation of synthetic insecticides for the control of *Spodoptera litura* Fabricious infesting bidi tobacco under nursery conditions** Application of emamectin benzoate 5 SG, 0.0025 per cent (5 g / 10 liter water; 7.5 g a.i./ha) in tobacco nursery found effective against leaf eating caterpillar (*Spodoptera litura* Fabricious) infesting bidi tobacco seedlings at the initiation of infestation. **(Action: Asstt. Res. Sci. (Ento.), BTRS, AAU, Anand)**
PLANT PATHOLOGY	
12.2.39	**Bio-efficacy of newer fungicides against maydis leaf blight, turcicum leaf blight and curvularia leaf spot diseases in maize** For the management of leaf blight (maydis and turcicum) and curvularia leaf spot diseases of maize during *kharif* and *rabi* seasons, the seed treatment with captan 75 WS @ 3 g/ kg seeds followed by two sprays of azoxystrobin 18.2% + difenconazole 11.4% (29.6 SC), 0.03% (9.2 ml/ 10 litre of water) at 30 and 45 days after germination was found effective. **(Action: Asst. Res. Sci. (Pl. Path.), MMRS, AAU, Godhra)**

JUNAGADH AGRICULTURAL UNIVERSITY	
AGRICULTURAL ENTOMOLOGY	
12.2.40	**Field efficacy of newer insecticides against sucking pests of cumin** Spray of imidacloprid 17.8 SL 0.004% (2.24 ml/10 l water) or spinosad 45% SC 0.009% (2.0 ml/10 l water) or acetamiprid 20% SP 0.004% (2.0 g/10 l water) at the appearance of pests was found effective and economical for control of aphids and thrips in cumin. Residue was not detected in cumin at harvest of imidacloprid 17.8 SL 0.004% or spinosad 45% SC 0.009% or acetamiprid 20% SP 0.004%. **(Action:- Prof. & Head, Dept. of Entomology, JAU, Junagadh**
12.2.41	**Management of sucking pests through seed treatments in cluster bean** Seed treatment with imidacloprid 600 FS @ 10 ml/kg seed or thiamethoxam 30 FS @ 10 ml/kg seed found effective and economical for control of whitefly of cluster bean var. Pusa Navbahar. **(Action:- Prof. & Head, Dept. of Entomology, JAU, Junagadh**
12.2.42	**Field efficacy of newer insecticides against inflorescence pests of mango** For effective management of inflorescence pests of mango *viz.*, hopper, thrips and flower bug, two sprays of spinosad 45 % SC 0.018% (4 ml/10 l water) or carbosulfan 25 % EC 0.05% (20 ml/10 l water) or acetamiprid 20 % SP 0.01% (5 g/10 l water) at 15 days interval starting from pests infestation were found effective. **(Action:- Prof. & Head, Dept. of Entomology, JAU, Junagadh**
12.2.43	**Survey of various pests in mango orchard** The incidence of leaf gall midge, mango hopper, shoot borer and thrips were found enormously during the month of September to October, January to March, July to September and August to December, respectively. Maximum population of leaf gall midge and mango hopper was noticed in Chalala and Mendarda area, while shoot borer and thrips were found maximum in Talala area of Saurashtra region. **(Action:- Prof. & Head, Dept. of Entomology, JAU, Junagadh**

PLANT PATHOLOGY	
12.2.44	**Management of alternaria leaf blight of groundnut** Three sprays of difenconazole 25EC 0.025% (10 ml/10 l. of water) at 35, 50 and 65 days after sowing was found effective and economical for management of alternaria leaf blight of groundnut grown in summer season. **(Action:- Research Scientist (Groundnut), JAU, Junagadh**
12.2.45	**Integrated management for wilt disease of chickpea** Seed treatment of *Trichoderma harzianum* 1% WP @ 4 g/ kg of seed or carboxin 37.5 + thiram 37.5 DS (Ready mix Vitavex powder) @ 2 g/kg seed alongwith soil application of *T. harzianum* 1% WP @ 4.0 kg/ha at the time of sowing in furrow was found effective against chickpea wilt under irrigated condition. **(Action:- Research Scientist (Pulse), Pulse Research Station, JAU, Junagadh)**
12.2.46	**Management of foliar and fruit spot diseases in bottle gourd** Four sprays of difenconazole 25 EC 0.025 % (10 ml/10 l. of water) or hexaconazole 5 EC 0.005 % (10 ml/10 l. of water) at 10 days interval after appearance of the disease was found effective and economical for management of foliar and fruit spot diseases of bottle gourd grown in *kharif* season. **(Action:- Res. Scientist(Garlic-Onion),Vegetable Research Station, JAU, Junagadh**

NAVSARI AGRICULTURAL UNIVERSITY	
AGRICULTURAL ENTOMOLOGY	
12.2.47	**Chemical control of chiku moth** For effective management of chiku moth in sapota, apply three sprays of either flubendiamide 39.35 SC @ 0.0096% (2.4 ml/10 litre) or emamectin benzoate 5 SG @ 0.0022% (4.4 gm/10 litre) at one month interval during fruiting stage for higher yield and better return. The residues of these insecticides remain below determination level in sapota fruits. **(Action:- Asstt. Prof. Agri Polytech. NAU, Bharuch)**
12.2.48	**Population dynamics of major insect pests of sapota** Chiku moth, bud borer, leaf miner, mid rib folder and fruit fly remain active round the year under Agro climatic zone- II, AES- V indicating their peak in 1st fortnight of September, 2nd fortnight of September, 1st fortnight of December, 1st fortnight of November and 2nd fortnight of July, respectively. **(Action: Asstt. Prof., Agri polytech, NAU, Bharuch)**
12.2.49	**Monitoring of fruit fly in mango orchard** The fruit flies remain active round the year under Agro climatic zone - II, AES- V in mango orchard with peak population during the 2nd week of July (28th SMW). **(Action: Asstt. Prof., Agri polytech, NAU, Bharuch)**
12.2.50	**Screening of promising genotypes for multiple resistance against stem borer, leaf folder and brown plant hopper of rice.** Rice genotypes *viz.*, NVSR-6137, IRBB-2, IR 77498-47-2-6 2-3 and IR 11A334 are found to have multiple resistant reaction against stem borer, leaf folder and brown plant hopper under natural field conditions. **(Action: Assoc.Res.Sci., Main Rice Research Centre, NAU, Navsari)**
12.2.51	**Effect of non-ionizing (UV) radiation on the development of egg parasitoid, *Trichogramma chilonis* Ishii (Hymenoptera: Trichogrammatidae)** Exposure period of 45 minutes (at 42 cm height from the target site with 30 W UV lamp)

is found suitable to irradiate the eggs of factitious host, *Corcyra cephalonica* (Stainton) by enhancing effectiveness of *Trichogramma* without any detrimental effect of UV radiation (non- ionizing) under laboratory condition.

(Action: Prof. & Head, Dept. of Ento., NMCA., Navsari)

12.2.52 Monitoring of mite associated with vegetable crop nurseries

Two spotted spider mite, *Tetranychus urticae* Koch (Tetranychidae: Acari) remain active during nursery stage of brinjal and tomato, while yellow mite, *Polyphagotarsonemus latus* (Banks) (Tarsonemidae: Acari) remain active in chilli nursery.

Activities of mites remain higher in summer followed by *kharif* and *rabi* nurseries of brinjal, tomato and chilli.

(Action: Prof. & Head, Dept. Of Ento., NMCA., Navsari)

12.2.53 Documentation of mite problems in major protected floricultural crops

(1) Two spotted spider mite, *Tetranychus urticae* Koch (Tetranychidae: Acari) remain active round the year under greenhouse conditions on gerbera (cv Stenza) with peak population during April (15thSMW) and Mid September (38thSMW).

(2) Two spotted spider mite, *Tetranychus urticae* Koch (Tetranychidae: Acari) remain active round the year under polyhouse conditions on rose (cv Top Secret) with peak population during April (15thSMW) and Mid-October (42ndSMW).

(3) Tenupulpid mite, *Tenupalpus sp*. remain active round the year on dendrobium orchid cv Sonia-17 under polyhouse conditions with peak population during last week of September (41st SMW).

(Action: Prof. & Head, Dept. of Ento., NMCA., Navsari)

12.2.54 Screening of mango germplasm against pests of mango

Mango accessions, *viz*., Bombai and Himsagar showed tolerant reaction against mango hopper whereas, Mahmud Vikarabad is found resistant against thrips.

(Action: Asstt.Res.Sci. (Ento) AES, NAU, Paria)

12.2.55 Residue and dissipation pattern of fenazaquin in/on chilli under South Gujarat conditions

Fenazaquin 10 EC applied twice @ 0.01% (10 ml /10 l water) at 15 days interval starting from 50% flowering stage in green chilli resulted in built up of residue in dried chilli powder by 5.22 to 5.79 times. Therefore, it is recommended to consider a processing factor of 5.64 (i.e. 6.0) for fenazaquin for dried chilli powder.

DAA	Control (Water spray)	Mean Residues (µgg^{-1}) applied at the rate of 125 g a.i./ha	Residues(µgg^{-1}) in green chillies*	Processing Factor
0 (2 hrs)	-	13.19	2.53	5.22
5 day	-	8.27	1.40	5.92
10 day	-	2.94	0.53	5.61
30 day	-	0.35	0.06	5.79
			Mean	**5.64**
LOD (µg/g)	Fruit	0.01		
	Powder	0.02		
LOQ (µg/g)	Fruit	0.04		
	Powder	0.06		

	$\text{Processing factor} = \frac{\text{Residues in chilli powder}}{\text{Residues in green chilli}}$ **(Action: Asstt. Prof. (Pesticide Residue), FQTL, Navsari)**
12.2.56	**Status of pesticide residues in major seasonal fruits** Residue analysis of fruit samples collected from different market places of south Gujarat revealed that 31.67 % out of 120 samples are positive for pesticide presence wherein 9.17 % are found above MRL. Maximum positive samples are detected from Surat market. Carbendazim was the most frequently detected pesticide followed by chlorpyrifos and tebuconazole. Most positive samples are detected in apple and least in sapota. However, banana had most positive samples above MRL. Total 52 pesticides detected in different fruits out of which 29 (55%) pesticides violated label claim fixed by the CIBRC. **(Action: Asstt. Prof. (Pesticide Residue), FQTL, Navsari)**
12.2.57	**Screening of genotypes against insect pests of brinjal** Among various brinjal genotypes screened, lowest shoot and fruit borer damage (3.35%) and lowest jassid (3.19/ leaf) population are recorded in genotype NSRP-1 whereas lowest whitefly population (2.27 / leaf) was recorded in GBL-1. **(Action: Assoc. Prof. (Ento), ACHF, Navsari)**
12.2.58	**Screening of promising genotypes for multiple resistance against bacterial blight, sheath rot and grain discolouration diseases of Rice.** Rice genotypes *viz*., IR-BB2, IR-BB11, IR-BB50, IR-BB62, IR 11A334 and NVSR-6137 are found to have multiple resistant reaction against bacterial blight and sheath rot diseases under artificial inoculation and high disease pressure conditions in field and grain discoloration under natural field condition. **(Action: Asstt. Res. Sci. (Pl Path), Main Rice Res. Centre, NAU, Navsari)**
12.2.59	**Screening of genotypes against little leaf of brinjal** Among various brinjal genotypes screened, minimum little leaf infection (3.58%) was recorded in GJB-2. **(Action: Assoc. Prof. (Pl Path), ACHF, NAU, Navsari)**

SARDAR KRUSHINAGAR DANTIWADA AGRICULTURE UNIVERSITY	
AGRICULTURAL ENTOMOLOGY- NIL	
PLANT PATHOLOGY	
12.2.60	**Epidemiological study on black point of wheat** • Bold seeded *aestivum* wheat varieties GW 366, Lok 1 and GW 496 are more vulnerable whereas, durum wheat variety GW 1139 was free from black point incidence. • Morning relative humidity (68.9 to 73.7 %) and afternoon relative humidity (27.1 to 46.9%) was significantly positively and negatively correlated with black point incidence. **(Action : Assoc. Res. Scientist (Pl. Path.), Wheat Research Station, SDAU, Vijapur)**
12.2.61	**Management of *Ramularia* blight in fennel** Three foliar sprays of chlorothalonil 75WP @ 0.15% (20 g/ 10 litre water) at an interval of 10 days commencing from disease appearance found effective against Ramularia blight disease in fennel. **[Action: Asstt. Res. Sci. (Path), Seed Spices Res. Station, SDAU, Jagudan]**
12.2.62	**Morpho-pathological and molecular characterization of organisms causing cumin**

	blight Not approved as isolates were not identified **(Action: Asstt. Professor (Micro.), C. P. College of Agri., Sardarkrushinagar**
12.2.63	**Bio-prospecting as well as functional and genetic diversity of promising PGPR strains of fluorescent *Pseudomonas* for the control of pathogen of cumin blight *in-vitro* condition** ➢ The isolate P-10 showed maximum phosphate solubilization followed by the isolate P-15. Phosphate solubilization increased successively with incubation period i.e. after 2, 4, 6, 8, and 10 days of incubation. ➢ Strains P-10 and P-15 proved as an effective bioagent against *A. burnsii* . ➢ Amplified rDNA (Ribosomal DNA) Restriction Analysis (ARDRA) of 16S-rDNA gene of P-10 produced a fragment of 175, 140, and 90 bp whereas P-15 produced a fragment of 175, 150, and 90 bp; and these fragments were not found in the other 18 isolates of fluorescent *Pseudomonas*. ➢ Dendrogram obtained from the 16S-rDNA restriction pattern of the isolates of fluorescent *Pseudomonas* using NTSys-pc software placed the P-10 and P-15 together in a cluster, and hence these isolates are closely related to each other. **(Action: Asstt. Professor (Micro.), C. P. College of Agri., Sardarkrushinagar**

12.3 NEW TECHNICAL PROGRAMME

12.3.1 ANAND AGRICULTURAL UNIVERSITY

AGRICULTURAL ENTOMOLOGY			
Action: Dept. of Agril. Entomology, BACA, AAU, Anand			
Sr. No.	**Title/Centre**	**Approved/Accepted with suggestions**	**Remarks**
12.3.1.1	Standardization of pheromone traps required for mass trapping of pink bollworm in *Bt* cotton	1. Pheromone traps should be installed one week prior to flowering 2. Trap should be installed one feet above the crop canopy	
12.3.1.2	Bio-rational management of cumin pests	1. Write replication instead of repetition. 2. Recommended chemical check should be kept for comparison. 3. Include ginger rhizome and garlic bulb extract in treatment	
Action : AICRP on Biological Control, AAU, Anand			
12.3.1.3	Survey and surveillance of pinworm, *Tuta absoluta* (Meyrick) on tomato	1. In objective it should be for middle Gujarat instead of Gujarat 2. Record the observations on other pests	
12.3.1.4	Biological suppression of American pinworm, *Tuta absoluta* (Meyrick) on tomato	1. Replace name of '*Verticillium'* replace with new name '*Lecanicillium'*. 2. Mention the number of sprays required	

Action: AINPVPM : Agril. Ornithology, AAU, Anand			
12.3.1.5	Evaluation of impact of climate change on water bird community assemblage	1. Pond/ wet land spacification required 2. Site in western India must be fixed for observations	
12.3.1.6	Evaluation of bird predation on honey bees/pollinators	**Approved**	
12.3.1.7	Effect of roosting sites of Rose-ringed parakeet on agricultural crops	**Approved**	
Action: Residue Analyst, AINP on Pesticide Residues, AAU, Anand			
12.3.1.8	Residue and dissipation of flubendiamide 240 + thiacloprid 240 – 480 SC on brinjal	**Approved**	
12.3.1.9	Residue and dissipation of imidacloprid 17.1 SL on tomato	**Approved**	
12.3.1.10	Residues and persistence of tetraniliprole 200 SC on tomato	**Approved**	
12.3.1.11	Residue and dissipation of imidacloprid 17.1 SL on chilli	**Approved**	
12.3.1.12	Residue and dissipation of fluopyram 400 SC on cucumber	**Approved**	
12.3.1.13	Residue and persistence of fluopyram SC 400 on banana	**Approved**	
12.3.1.14	Monitoring of pesticide residues at national level	**Approved**	
12.3.1.15	Studies on pesticide residues from surface and ground water under SSP phase - I area.	1. Sample will be used as provided by sardar sarovar Narmada Nigam Ltd.	
12.3.1.16	Studies on pesticide residues from surface and groundwater under SSP phase - II area Kheda, Ahmedabad and Gandhinagar region.	**Approved**	
Action : Main Vegetable Research Station, AAU, Anand			
12.3.1.17	Survey and status of south American tomato moth, *Tuta absoluta* (Meyrick)	1. Fix the field / village for observations 2. Do work in collaboration with AICRP and there should not be two different experiments on same aspect. **<u>So treat this trial as not approved.</u>**	Not approved as separate trial
Action : College of Horticulture (Wing), BACA, AAU, Anand			
12.3.1.18	Bio-efficacy of different insecticides against leaf webber infesting mango	1. Record the number of fruits per tree and calculate yield accordingly. 2. Record the larvae after 15 days of	

		last spray.	
Action : Pulse Res. Station, AAU, Vadodara and Agril. Res. Station, AAU, Derol			
12.3.1.19	Screening of pigeonpea genotypes against insect pests and diseases	1. Add "under natural conditions" in title 2. Sow susceptible check around the experiment and after two test entries, also.	
12.3.1.20	Screening of mungbean genotypes against insect pests and diseases	1. Add "under natural conditions" in title 2. Sow susceptible check around the experiment and after two test entries, also.	
12.3.1.21	Screening of urdbean genotypes against insect pests and diseases	1. Add "under natural conditions" in title 2. Sow susceptible check around the experiment and after two test entries, also.	
Action : Agricultural Research Station, AAU, Derol			
12.3.1.22	Fixation economic threshold level for gram pod borer in chickpe	1. Title should be " Determination of economic threshold level for gram pod borer in chickpea"	
Action : Agricultural Research Station, AAU, Arnej			
12.3.1.23	Evaluation of insecticides for the control of stem borer and wire worm infesting unirrigated Wheat	1. Count initial and final population of wireworm in the soil adjoining to plants	
12.3.1.24	Evaluation of insecticides for the control of stem borer and wire worm infesting unirrigated fodder sorghum	**Approved**	
	Agricultural Research Station, AAU, Sansoli		
12.3.1.25	Effect of sowing periods on the incidence of castor capsule borer, *Dichrocrosis punctiperalis* Guenee and their relation with weather parameters	1. Remove "and their relation with weather parameters" from title.	
12.3.1.26	Population dynamics of major insect pests of Castor	**Approved**	
12.3.1.27	Evaluation of different insecticidal application strategies against stem borer, *Chilo partellus* Swinhoe infesting maize	1. Record phytotonic effect of the insecticides and fodder yield	
Action : College of Agriculture (Wing), AAU, Jabugam			
12.3.1.28	Bio-efficacy of different	1. Pesticide residue analysis of	

	insecticides against serpentine leaf miner, *Liriomyza trifolii* (Burgess) on watermelon	effective treatments should be carried out. 2. No. of live and dead maggots should be recorded in each treatment.	
PLANT PATHOLOGY AND NEMATOLOGY			
Action : Department of Nematology, BACA, AAU, Anand			
12.3.1.29	Effect of planting periods on root–knot nematodes in tomato	1. Record Plant height/10 plants in each treatment	
12.3.1.30	Screening of mungbean lines/germplasms against root-knot nematodes	1. Mention the name of susceptible check	
12.3.1.31	Screening of urdbean lines/germplasms against root-knot nematodes	1. Mention the name of susceptible check	
12.3.1.32	Screening of cucurbits lines/germplasms against root-knot nematodes	1. Mention the name of susceptible check	
12.3.1.33	Screening of vegetables lines/germplasms against root-knot nematodes	1. Mention the name of susceptible check	
12.3.1.34	Diversity of Entomopathogenic Nematodes (EPNS) gene pool of the country	**Approved**	
12.3.1.35	Screening, confirmation and evaluation of rice genotypes for resistance against rice root-knot nematode (*M. graminicola)*	**Approved**	
12.3.1.36	Determination of host races of *Meloidogyne graminicola*	**Approved**	
12.3.1.37	Management of root-knot nematode, *M. incognita* infesting cowpea using bioagents	1. Confirm the dose of bioagent and carbofuran in soil	
12.3.1.38	Efficacy of bio-agents in the management of *Meloidogyne* species in bitter gourd	1. Mention the bioagent strain	
12.3.1.39	Management of *Meloidogyne* spp. in okra through bioagents	1. Bioagent strain should be mentioned.	
12.3.1.40	Management of plant parasitic nematode on okra by bio-fumigation	**Approved**	
12.3.1.41	Organic management of root-knot nematode, *Meloidogyne spp*. in potato using bioinoculants	1. Dose of bioagnet is too high. Confirm the dose. 2. The AICRP experiment will not be considered for the recommendation from this house.	

12.3.1.42	Integrated management of root-knot nematodes using organic amendments and bio-products on potato in field	1. Confirm the dose of bioagent of *T. viride* and other bioagents	
12.3.1.43	Management of root-knot nematodes through beneficial microbes in tomato nursery	1. Clarify the consortium (A, B, C, D) microorganism.	
12.3.1.44	Management of root-knot nematodes (*Meloidogyne* sp./race) in pulses by crop rotation	**Approved**	
12.3.1.45	Bio-management of root-knot nematode and fungal wilt complex in pomegranate	**Approved**	
12.3.1.46	Management of root-knot nematodes (*Meloidogyne* spp.) in polyhouse by using organic amendments in capsicum	**Approved**	
12.3.1.47	Screening crop genotype against root-knot nematodes for polyhouse conditions	**Approved**.	
12.3.1.48	Management of root-knot nematodes (*Meloidogyne* spp.) on cucumber in polyhouse by using bioagents	**Approved**.	
12.3.1.49	Management of root-knot nematodes (*Meloidogyne* spp.) in polyhouse through crop rotation	**Approved**	
12.3.1.50	Interaction between *Meloidogyne* sp. and *Ralstonia solanacearum* on polyhouse crop - tomato (pot trial - autoclaved soil)	1. Mention the dose of *Ralstonia solanacearum* 2. Mention the plot size	
12.3.1.51	(a) Isolation and identification of potential indigenous bio-control agents (b) Evaluation of available bacteria in the microbial collections against test nematode species	**Approved**	
Action : Bidi Tobacco Research Station, AAU, Anand			
12.3.1.52	Effect of bulky manures in management of nematodes in bidi tobacco nursery	1. Mention the dose per hectare.	
Action : College of Horticulture (Wing), BACA, AAU, Anand			
12.3.1.53	Management of citrus gummosis (*Phytophthora citrophthora*)	1. Mention the dose of *T. viride* in enriched FYM 2. Record the total number of lesions	

		in each tree	
Action : Regional Research Station, AAU, Anand			
12.3.1.54	Screening of castor genotypes against wilt (*Fusarium oxysporum* f.sp. *ricini*) *in vivo* and *in vitro* conditions	1. Mention the susceptible check 2. Mention the screening scale	
Action : Main Maize Research Station, AAU, Godhra & College of Agri.(Wing), Jabugam			
12.3.1.55	Efficacy of *Trichoderma viride* in management of banded leaf and sheath blight under field conditions	1. Modify the title as "Efficacy of *Trichoderma viride* in management of banded leaf and sheath blight of maize under field conditions". 2. PDI is to be calculated 3. Trial should be conducted as multi location at Godhra and Jabugam.	
12.3.1.56	Effect of salicylic acid against all foliar diseases of maize	1. Delete treatment T_2 and add *P. fluorescence.0.025%* 2. PDI is to be calculated	
Action : College of Agriculture (Wing), Jabugam & Main Maize Res. Station, Godhra			
12.3.1.57	Management of banded leaf and sheath blight of maize (*Rhizoctonia solani* f. sp. *Sasakii*) with biocontrol agents	This trial should be conducted as multi location *i.e* in addition to Jabugam it should also be conducted as Main Maize Res. Station, Godhra with same title	Not approved as separate trial
Action : Agricultural Research Station, AAU, Derol			
12.3.1.58	Screening of black gram genotypes against Yellow Mosaic Virus (YMV)	1. Susceptible genotype should be made as scientific information.	

12.3.2 JUNAGADH AGRICULTURAL UNIVERSITY

AGRICULTURAL ENTOMOLOGY			
	Action :Department of Entomology, College of Agriculture, JAU, Junagadh		
12.3.2.1	Effectiveness of different bio-pesticides against mealy bug in custard apple	1. Keep the spray interval of 20 days. 2. Record observation of pest before and after 10 days of each spray. 3. Record healthy and infested fruits 4. Sticker should be added.	
12.3.2.2	Effectiveness of different bio-pesticides and chemicals insecticides and its combination against onion thrips	1. Title should be modify as "Effectiveness of *Beaveria bassiana* in combination of different insecticides" 2. Modify objective according to title. **3.** Generate Residue data of effective treatment	
12.3.2.3	Effect of different schedule	1. Generate Residue data of effective	

	based insecticidal sprays against garlic thrips	treatment	
12.3.2.4	Synergism of different plant oils with different insecticides against pod borer, *Helicoverpa armigera* infesting chickpea	1. Modify the concentration of plant oil as Neem oil 0.5%, Sesamum 1%. 2. Delete treatment – quinalphos, chlorpyriphos and lemon grass oil 1%. 3. Keep RBD with combinations of remaining treatments. 4. Detergent powder should be added as sticker.	
12.3.2.5	Compatibility of *beauveria bassiana* with different insecticides	1. Recast title as "Effect of insecticides on growth of *Beauveria bassiana*'' 2. Take observation on sporulation *3.* Concentration should be in ppm.	
12.3.2.6	Compatibility of *beauveria bassiana* with different fungicides	*1.* Recast title as "Effect of fungicides on growth of *Beauveria bassiana*''	
12.3.2.7	Management of lepidopteran insect pests of groundnut	1. Generate Residue data of effective treatment	
12.3.2.8	Bio-efficacy of different bio-pesticides and its combinations against sucking pests of Bt cotton (Bollgaurd II)	1. Modify title as "Bio-efficacy of *Beauveria bassiana* in combination with different insecticides against sucking pests of Bt cotton. 2. Replace 'spinosad' with Flonicamid' *3.* Generate Residue data of effective treatment	
12.3.2.9	Effect of bio-pesticides and insecticides on aphid population and bee visits and yield of mustard	1. Recast title as "Impact of bio-pesticides and insecticides on foraging bee in mustard" 2. Delete treatment No. T9. *3.* Replace T5 with Imidacloprid.	
12.3.2.10	Study on foraging activities of honey bees on seed spices	1. Record Bee species *2.* Record peak period of foraging and accordingly record the observation of honey bees during that peak period	
12.3.2.11	Bio-efficacy of different bio-pesticides and their combination against pink boll worm in cotton	1. Generate Residue data of effective treatment	
Action :Main Oilseed Research Station, JAU, Junagadh			
12.3.2.12	Bio-efficacy of insecticides against sucking pests of summer groundnut	1. Dose of insecticide must be clarify, if possible use the insecticide as CIBRC concentration.	

		2. Delete treatment Number T_7 and T_9. 3. Record No. of thrips per three terminal leaves **4.** Mention Aphid index	
12.3.2.13	Bio-efficacy of bio-pesticides and biorationals against sucking pests infesting groundnut	1. Remove the word 'biorational' from title. 2. Record No. of thrips per three terminal leaves *3.* Mention Aphid index	
12.3.2.14	Management of lepidopteran pests in groundnut by using botanicals	*1.* Mention details of Poneem	
12.3.2.15	Testing the bio-efficacy of newer insecticides against thrips in castor	1. Remove the word 'Newer' from title. *2.* Mention formulation of *B. bassiana* in T8	
Action :Millet Research Station, JAU, Jamnagar			
12.3.2.16	Testing the efficacy of different insecticides against shoot fly and stem borer in pearl millet	**Approved**	
12.3.2.17	Management of major insect pest infesting pearl millet under organic cultivation	1. Clarify the no. of treatments and design in experiment.	
12.3.2.18	Evaluation of pre-harvest spraying of insecticides for management of pulse beetle, *Callosobruchus spp* (Crop: Green gram)	1. Clarify the no. of treatments and design in experiment.	
Action : Dry Farming Res. Station, JAU, Targhadia (Rajkot)			
12.3.2.19	Integrated management of insect pests and diseases of green gram crop under rain fed condition	1. Modify title as "Integrated Pest and Disease Management of green gram under rainfed condition" 2. Do compatibility of insecticide and fungicide (T6 and T7) study under laboratory condition?	
Action: Oilseed Research Station, JAU, Amreli			
12.3.2.20	Management of white fly and aphid in summer sesame	**1.** Neem leaf extract should be 5% instead of 2%.	
Action : Post Harvest, Processing and Food Engineering, CAET, JAU, Junagadh			
12.3.2.21	Effect of different packing materials against groundnut bruchid (*Caryedon serrtus*, Olivier.) during storage	**Approved**	
Action : Grass Land Res. Station, JAU, - Dhari			
12.3.2.22	Management of shoot fly and stem borer in sorghum crop	**1.** Mention as 'seed treatment followed by spraying' in T8	
12.3.2.23	Management of *Helicoverpa*	**1.** Mention concentration in '%'	

	armigera in chickpea	instead of 'a.i.'	
Action : Pulse Research Station, JAU, Junagadh			
12.3.2.24	Phenology based application of selective insecticides/bio-pesticides combinations against *Helicoverpa armigea* in chickpea	**1.** Keep technical name of insecticide in treatments.	
Action: Horticulture Wing, JAU, Junagadh			
12.3.2.25	Study on efficacy of different insecticide against whitefly in papaya	1. Write PSB instead PSM. 2. Remove need base application.	

PLANT PATHOLOGY			
Action : Dept. of Plant Pathology, College of Agriculture, JAU, Junagadh			
12.3.2.26	Impact of Phosphate solubilizing microorganism on groundnut under field conditions	1. Write PSB instead PSM in methodology.	
12.3.2.27	Biological control of root rot of coriander	1. Delete Treatment No. 7 and add one treatment of *T. viride*.	
12.3.2.28	Biological control of root rot (*Macrophomina phaseolina*) of groundnut	1. Add seed treatment of *P. fluorescence* should be included instead of T7.	
12.3.2.29	Efficacy of fluorescens producing *Pseudomonas* against collar rot (*Aspergillus niger*) of groundnut	1. Give treatment of *P. fluorescence* as seed treatment. 2. Delete blanket treatment of Tebuconazole.	
12.3.2.30	Efficacy of fluorescens producing *Pseudomonas* against foliar diseases (Leaf spots and rust) of groundnut	**Approved**.	
12.3.2.31	Effect of biofertilizers on the yield of oyster mushroom (*Pleurotus sajor caju*)	1. It should be taken as filler trial.	
12.3.2.32	Effect of different substrates on nutritional and biochemical properties of oyster mushroom (*Pleurotus sajor caju*)	1. Mention straw of crops.	
Action : Main Oilseeds Research Station, JAU, Junagadh			
12.3.2.33	Management of groundnut diseases through organic amendments, bio products and biocontrol agents	1. Treatment T4 should be enriched with T. viride. 2. Record germination (%)	
12.3.2.34	Efficacy of *Trichoderma harzianum* on growth and stem rot disease management in groundnut	**Approved**	

Action : Millet Research Station, JAU, Jamnagar			
12.3.2.35	Management of downy mildew disease of pearl millet	*1.* Mentioned technical name instead of trade name of Apron 35 SD	
Action : Vegetable Research Station, JAU, Junagadh, RS (O&G)			
12.3.2.36	IDM package for cucurbit diseases (Bottle gourd)	**Approved**.	

12.3.3 NAVSARI AGRICULTURAL UNIVERSITY

ENTOMOLOGY

Sr. No.	Title/Centre	Suggestions	
Action: Dept. of Ento., NMCA, NAU, Navsari			
12.3.3.1	Management of the two spotted spider mite, *Tetranychus urticae* Koch on gerbera with the use of biopesticides and the predatory mite, *Amblyseius longispinosus* (Evens)	**Approved**	
12.3.3.2	Survey of soil oribatid mites fauna	**Approved**	
12.3.3.3	Seasonal incidence and pest activity of two spotted spider mite, *Tetranychus urticae* Koch. on adenium (*Adenium obesum* (Forssk.) Roem & Schutt)	1. Record the seasonal weather data. 2. Conduct this trial in polyhouse also.	
12.3.3.4	Effect of various leaf defoliation levels on castor yield for rearing of eri silkworm, *Samia cynthia ricini* Hutt	1. Mention Plucking of top leaves	
12.3.3.5	Survey for native Entomopathogenic Nematode (EPN)	**Approved**	
12.3.3.6	Survey of South American leaf miner, *Tuta absoluta* in Tomato.	**Approved**	
12.3.3.7	Standardize the height of pheromone traps in pigeon pea ecosystem for the mass trapping of *Helicoverpa armigera* (Hubner)	**Approved**	
12.3.3.8	Pollinator's fauna in Lucerne flora	**Approved**	
Action: Dept. of Ento., ACHF NAU, Navsari			
12.3.3.9	Effect of organic pesticides on shoot borer in organic mango	**1.** Replace the word 'organic pesticide' with 'biopesticide'.	
Action : FQTL, Navsari			
12.3.3.10	Dissipation and persistence of combi-product of chlorantraniliprole 9.26 % + lambda-cyhalothrin 4.63 % in/on pigeon pea	**Approved**	

12.3.3.11	Disssipation and persistence of Spiromesifin (22.9 % SC) in brinjal under south Gujarat conditions	**Approved**	
12.3.3.12	Effect of ozonized water washing on pesticide residues and shelf-life of green chilli and okra	**Approved**	
Action : MRRC, Navsari			
12.3.3.13	Bio-efficacy of biopesticides against insect-pests of rice crop	**Approved**	
Action: Main Cotton Research Station, NAU, Surat			
12.3.3.14	Study of expression of *Bt* proteins with different categories of parents	**Approved**	
12.3.3.15	Isolation and characterization of endophytic bacteria from wild cotton plants and exploring insecticidal activity against pink bollworm, *Pectinophora gossypiella*	**Approved**	
12.3.3.16	Bio-chemical traits in relation to insect tolerance of wild species and cross derivatives involving wild species of cotton	**Approved**	
Action : Min Sorghum Researsh Station, NAU Surat			
12.3.3.17	Evaluation of different modules for pest management in sorghum	1. Take fourth Module as absolute control.	
Action : KVK, NAU, Navsari			
12.3.3.18	Development of organic nutrient and bio pest management modules for chilli	1. Clarify *B. subtilis* in the experiment. 2. Keep absolute control also	
12.3.3.19	Survey of major insect pests, diseases and their Natural enemies in brinjal, okra and chilli in Tribal belt of Surat district	1. Correct index as PDI.	
Action : SWMU, NAU, Navsari			
12.3.3.20	Incidence of pests in high density mango plantation under drip irrigation	**Approved**	
12.3.3.21	Varietal preference of pests in ultrahigh density mango plantation under drip irrigation	**Approved**	
Action : AES, NAU, Paria			
12.3.3.22	Integrated Pest Management of hopper in mango	1. Modify title as "Integrated Management of mango hopper". 2. In module, fix the quadrate with large plot technique.	

12.3.3.23	Documentation and monitoring population of pollinators on mango	1. Replace design 'RBD' with 'CRD'. 2. Take single tree as one repetition.	
12.3.3.24	Management of mango hoppers and thrips using entomophathogens	1. Record observation at 7 and 12 days.	
12.3.3.25	Efficacy of biopesticides against Tea Mosquito Bug (TMB), *Helopeltis antonii* Signoret in cashew	1. Mention Design as CRD.	
Action : Hort. Polytech, NAU, Paria			
12.3.3.26	Assessment of yield losses due to major insect pest in cashew	1. Mention Design as CRD and't' test.	
Action : College of Agri, NAU, Waghai			
12.3.3.27	Evaluation of insecticides against insect pest of mango	1. Mention Design as CRD.	
Action : Hort. Polytech, NAU, Navsari			
12.3.3.28	Screening of mango varieties against shoot borer, *Chlumetia transversa*	**Approved**	
Action : Dept. of Ento., NMCA., Navsari			
12.3.3.29	Pest survey in cucurbits under protected cultivation	**Approved.**	

PL. PATHOLOGY

Action : Dept. of Pl. Path., NMCA.,NAU, Navsari			
Sr.No.	**Title of experiment**	**Suggestions**	
12.3.3.30	Effect of phosphate solubilizing microbes in wheat (*Triticum aestivum*) under saline conditions.	**Approved**.	
12.3.3.31	Isolation and characterization of plant growth promoting Actinomycetes from rhizosperic soil	**Approved**	
12.3.3.32	Status of diseases of cucurbits under protected and unprotected cultivation	**Approved**	
12.3.3.33	Investigation of phylloplane microflora of tomato and banana diseases	1. Remove word 'Disease' from title.	
12.3.3.34	Evaluation of different substrates for cultivation of Oyster mushroom	**1.** Biochemical analysis should be done	
12.3.3.35	Diagnostic kit for the identification of yellow mosaic virus infecting pulses	1. Title should be " Development of diagnostic kit for the identification of yellow mosaic virus infecting pulses"	

12.3.3.36	Relative susceptibility of medicinal plants to Garmar (*Coleus forskohlii* Briq.) Root knot Nematode (*Meloidogyne* sp.)	1. Recast title as "Susceptibility of medicinal plants against root knot Nematode (*Meloidogyne* sp.) of Garmar (*Coleus forskohlii* Briq.)". 2. In objective, mention the medicinal plants	
Action : Dept. of Pl. Path., ACHF., NAU, Navsari			
12.3.3.37	Management of leaf blight of gerbera under polyhouse condition	1. Check the formulation and concentration of fungicides in Module-I.	
Action : College of Agri., NAU, Bharuch			
12.3.3.38	Study of free living nitrogen fixing bacterial diversity with respect to seasonal variation	**Approved**	
Action : FQTL, NAU, Navsari			
12.3.3.39	Standardization of liquid chromatography based aflatoxin detection method and their status in raw and processed groundnut	**NOT APPROVED** 1. Drop the experiment	
Action : AES, NAU, Paria			
12.3.3.40	Determination of different decline disorders in Mango orchards	**Approved**	
12.3.3.41	Survey and incidence of diseases in cashew	**Approved**	
Action : FRS, Gandevi			
12.3.3.42	Integrated management of papaya diseases	1. Confirm dose of neem oil 2% and record toxicity, if any. 2. Keep Control as one module.	
Action : Pulse and Castor Res. Station, Navsari			
12.3.3.43	Screening of mungbean entries against *Mungbean Yellow Mosaic Virus* (LSET-I & SSET)	1. Delete 'Virus' word from title. 2. Include GM 5 as resistant variety instead of Meha.	
12.3.3.44	Screening of urdbean entries against *Mungbean Yellow Mosaic Virus* (SSET)	1. Delete 'Virus' word from title.	
12.3.3.45	Screening of cowpea entries against *Yellow Mosaic Virus* (SSET & PET)	**1.** Delete 'Virus' word from title	
12.3.3.46	Screening of pigeonpea entries against sterility mosaic disease (SSET)	**Approved**	
12.3.3.47	Screening of Indian bean entries against yellow mosaic and powdery mildew (SSET)	**Approved**	
Action: RRRS, NAU, Vyara			

12.3.3.48	Root knot nematode (*Meloidogyne graminicola*) disease in rice nurseries of South Gujarat	1. Recast title as "Survey of root knot nematode (*Meloidogyne graminicola*) in rice nurseries of South Gujarat"	
Action: Agri. Polytech, Waghai			
12.3.3.49	Screening of Little millet (*Panicum miliare* L.) varieties and germplasm against Blast	**Approved**	
Action: AES, NAU, Paria			
12.3.3.50	Standardisation of hot water treatment technique (HWTT) to manage post-harvest anthracnose as well as fruit flies of mango	1. Replace '@' with 'at'. 2. Keep the temperature 45 ± 2°C, 50 ± 2°C and 55 ± 2°C with five repetitions.	
Action: Dept. of Pl. Path., NMCA., Navsari			
12.3.3.51	Occurrence of diseases in high density mango plantation under drip irrigation	**Approved**	
12.3.3.52	Prevalence of diseases in ultra-high density mango plantation under drip irrigation	**Approved**	

12.3.4 SARDARKRUSHINAGAR AGRICULTURAL UNIVERSITY

Sr. No.	Title /Centre	Suggestions	Remarks
Action: Pulse Research Station, SDAU,SKN			
12.3.4.1	Integrated pest management for cluster bean (AICRP Trial)	**Approved**	
12.3.4.2	Evaluation of sequential application of insecticides against insect pests of pigeonpea	1. Observation should be taken from 50 pods per treatment.	
Action: Seed Spices Res. Station, SDAU, Jagudan			
12.3.4.3	Bio-efficacy of different synthetic and botanical insecticides against isabgol aphid, *Aphis gossypii* Clover	**1.** Recast title as "Bio-efficacy of synthetic insecticides against isabgol aphid, *Aphis gossypii* Clover	
12.3.4.4	Eco-friendly management of sucking pests infesting cumin	**Approved**	
Action: Date Palm Res. Station, SDAU,Mundra			
12.3.4.5	Chemical control of Red mite (*Raoiella indica*) and date palm mite complex	1. Modify title as "Chemical control of date palm mite complex" 2. Record mite observation at 3, 7, and 15 days interval. 3. Design should be RBD	
12.3.4.6	Chemical control of date palm scale, *Parlatoria blanchardii*	**Approved**	
Action:KVK, SDAU,Deesa			

12.3.4.7	Study of damage status of fruit sucking moth, *Othreis materna/ O.fullonia* in pomegranate in Banaskantha district	**Approved**	
Action: Arid Fruit Res. Stn, Horti. College, SDAU, SKN			
12.3.4.8	Eco-friendly management of mustard aphid	1. Remove treatment T3 and T8. **2.** Clarify the ppm of Azadiractin.	
Action: Seed Spices Res. Station, SDAU, Jagudan			
12.3.4.9	Management of coriander powdery mildew using new generation fungicides	1. Recast title as "Management of coriander powdery mildew through fungicides''	
Action: Date Palm Res. Station, SDAU,Mundra			
12.3.4.10	Management of Graphiola leaf spot disease of date palm through fungicides in field and nurseries	1. Replace 'need oil' with 'Azadiractin'. 2. Residue analysis of effective treatment should be made.	
Action: Dept. of Plant Path., CPCA, SDAU, SKNagar			
12.3.4.11	Spatial distribution of Papaya ringspot disease in north Gujarat	1. Recast title as "Survey virus diseases of Papaya in Banaskantha". 2. Observation on viral disease of papaya should be recorded. **3.** Delete observation No.2. (Host range)	

General Suggestions:

1. As per the Insecticide Act 1968, recommendations of pesticides to the farmers is issued by the Central Insecticide Board and Registration Committee (CIBRC) and SAUs can not recommend insecticides/ fungicides/ plant growth regulators/ herbicides/ biopesticides to the farmers. However, there are following short-comings with CIBRC recommendations which are required to be resolved at state/ central level.

a). Crops like Sapota, and Anola have not recommendations at all or important crops like cumin/ castor have only limited recommendations.

b). In CIBRC recommendations, number of spray, stage of application and resistance management points are grossly ignored.

c). Over the years, SAUs have evaluated number of pesticides on different crops for which CIBRC has no recommendations. Such recommendations can be submitted to the CIBRC for approval.

The above matter was thoroughly discussed during the XII Combined Joint AGRESCO and house proposed to take up the issue in the plenary session to represent the matter at approximate level.

2. Year wise data of insect pest, diseases and nematode etc. of the recommendations need to be presented for more clarity of the treatments

3. Common format of the recommendation is to be formed

4. Now the experiments on ecofriendly management of insect pests and diseases should be of more attention

5. As per the technical programme of AICRP are finalized in respective workshops and that too before our AGRESCO, there are no chance of any change in such technical programmes. Therefore, it was also discussed in the meeting that the recommendations emerged out from AICRP trial should not be passed in AGRESCO.

12.4 HORTICULTURE AND AGRO-FORESTRY

Technical Session-I: Recommendations for Farmers and Scientific Community

Chairman	Dr. A. V. Barad, Principal and Dean, College of Agriculture, JAU, Junagadh
Co-Chairman	1. Dr. B. N. Patel, Principal and Dean, ASPEE College of Horticulture and Forestry, NAU, Navsari 2. Dr. R. R. Sankhela, Research Scientist (Agroforestry), SDAU, Dantiwada
Rapporteurs	1. Dr. R. S. Chovatia, Professor and Head, Dept. of Fruit Science, College of Agriculture, JAU, Junagadh
	2. Dr. T. R. Ahlawat, Assoc. Prof., Dept. of Fruit Science, ACHF, NAU, Navsari

Technical Session-II: New Technical Programs

Chairman	Dr. A. V. Barad, Principal and Dean, College of Agriculture, JAU, Junagadh
Co-Chairman	1. Dr. B. N. Patel, Principal and Dean, ASPEE College of Horticulture and Forestry, NAU, Navsari 2. Dr. R. R. Sankhela, Research Scientist (Agroforestry), SDAU, Sardarkrushinagar
Rapporteurs	1. Dr. S. L. Chawla, Associate Professor, Dept. of Floriculture and Landscape Architecture, ACHF, NAU, Navsari
	2. Dr. Minal Tandel, Asstt. Professor, Dept. of Agroforestry, ACHF, NAU, Navsari

University	**RECOMMENDATION**					
	Proposed		**Accepted**		**Not approved**	
	Farmers community	**Scientific community**	**Farmers community**	**Scientific community**	**Farmers community**	**Scientific community**
AAU	**-**	**-**	**-**	**-**	**-**	**-**
JAU	**2**	**-**	**2**	**-**	**-**	**-**
NAU	**25**	**2**	**18**	**2**	**4 +3***	**-**
SDAU	**8**	**1**	**7**	**1**	**1**	**-**
TOTAL	**35**	**03**	**28**	**3**	**5 +3***	**-**

Note: One recommendation made by NAU is for bifurcated as both farming as well as scientific community. **3* Extended for one more year suggested by Agril. Engg. Sub committee.**

NEW TECHNICAL PROGRAMMES

University	**Proposed**	**Accepted**	**Not accepted**	**Remarks**
AAU	**06**	**06**	**-**	**-**
JAU	**04**	**04**	**-**	**-**
NAU	**78**	**48**	**08**	**22 ***
SDAU	**08**	**07**	**01**	**-**
TOTAL	**96**	**65**	**09**	**22***

*** Transfer to respective subcommittee**

12.4. RECOMMENDATIONS FOR FARMING COMMUNITY

JUNAGADH AGRICULTURAL UNIVERSITY

12.4.2.1	**Effects of chemical fertilizers and vermicompost on yield and quality of banana (*Musa paradisiaca* L.) cv. Grand Naine.**
	Farmers of South Saurashtra Agro - climate Zone cultivating banana cv. Grand Naine are advised to apply total 300g nitrogen and 4kg vermicompost per plant in four equal split at 2nd, 3rd, 4th and 5th month after planting; along with recommended dose of phosphorus 90g and 200g

	potash per plant at 3rd month after transplanting, while 5 kg FYM as basal dose at transplanting for getting good quality, higher yield and higher return. દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારના કેળની ગ્રાન્ડ નેઇન જાત ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે પ્રતિ છોડ દીઠ કુલ ૩૦૦ ગ્રામ નાઈટ્રોજન અને ૪ કિગ્રા અળસિયાનુ ખાતર એક સરખા ચાર હપ્તામાં ફેર રોપણીના બીજા, ત્રીજા, ચોથા તથા પાંચમા મહિને આપવુ, તેમજ ભલામણ મુજબ ૯૦ ગ્રામ ફોસ્ફરસ અને ૨૦૦ ગ્રામ પોટાશ ફેર રોપણીના ત્રીજા મહિને જ્યારે પાયામા ૫ કિલો ગ્રામ ગળતિયુ ખાતર ફેર રોપણી વખતે આપવાથી સારી ગુણવતા, વધુ ઉત્પાદન અને ચોખ્ખો નફો મળે છે. (**Action:** Professor and Head, Dept. of Horticulture, JAU, Junagadh)
Centre: Fruit Research Station, JAU, Mangrol	
12.4.2.2	**Feasibility of organic farming in coconut (*Cocos nucifera*) under saline water irrigation condition.**
	The farmers of South Saurashtra Agro-climatic Zone interested organic cultivation of coconut cv. West Coast Tall (WCT) are advised to apply FYM @ 60 kg per tree under saline irrigation (EC 10-14 dSm^{-1}) condition for obtaining higher return and improving soil fertility. દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકિય હવામાનમાં જે ખેડૂતો નાળીયેરીની પસ્ચિમ કિનારાની ઉંચી જાત (દેશી) ની સજીવ ખેતીમાં રસ ધરાવતા હોય અને ખારા પાણીની પિયત (ઇસી ૧૦-૧૪ ડીએસએમ$^{-૧}$) પરીસ્થિતિ હોય તેને સલાહ આપવામાં આવેછે કે ઝાડ દીઠ ૬૦ કિ.ગ્રા. છાણિયું ખાતર આપવાથી વધારે વળતરની સાથે જમીનની ફળદ્રુપતા પણ જાળવી શકાય છે. (**Action:** Asstt. Res. Sci., FRS, JAU, Mangrol**)**

NAVSARI AGRICULTURAL UNIVERSITY

12.4.3.1	**Effect of heading back and training on growth, flowering, yield and quality in old orchard of mango cv. Rajapuri**
	The farmers of South Gujarat Heavy Rainfall Agro-climatic Zone are advised to head back their above 30 years old mango trees cv. Rajapuri at 4 to 5 m height from ground level and maintain 6 newly emerged tertiary limbs to get higher yield with quality production. **Note:** 1. Rejuvenation should be done after completion of monsoon in month of October. 2. For rejuvenation slant cut should be made and cut portion should be treated with copper fungicide paste (100 g lit^{-1}) and frequently visit to rejuvenated orchard for controlling stem borer. દક્ષિણ ગુજરાતના ભારે વરસાદવાળા વિસ્તારમાં ૩૦ વર્ષ કરતા જુના રાજાપુરી આંબાના ઝાડ ધરાવતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે સારી ગુણવત્તાવાળા ફળોનું વધુ ઉત્પાદન મેળવવા માટે જુના આંબાના ઝાડને જમીનથી ૪ થી ૫ મીટર ઉંચાઈથી કાપી નવી નીકળતી ડાળીઓમાંથી ૬ ડાળીઓની કેળવણી કરવી. **નોંધ:-** ૧. નવીનીકરણ ચોમાસુ પૂર્ણ થયા પછી ઓકટોબર માસમાં કરવું ૨. નવીનીકરણ માટે ત્રાંસો કાપ મુકી કપાયેલા ભાગ ઉપર તાંબાયુકત ફુગનાશક દવાની પેસ્ટ લગાવવી ૧૦૦ ગ્રામ / લી.) અને આબાંવાડીમાં આંબાના મેઢનાં નિયંત્રણ માટે નિયમિત મુલાકાત લેતા રહેવું . (**Action**:-Assoc. Res. Sci. RHRS, NAU, Navsari)
12.4.3.2	**Standardization of organic nutrient schedule in banana cv. Grand Naine**

	The farmers of South Gujarat Heavy Rainfall Agro-climatic Zone-I (AES-III) growing banana cv. Grand Naine under organic farming are recommended to apply 10 kg FYM and 1.25 kg Neem cake at planting, Bio fertilizers 50 ml each *Azospirillum* and PSB, 50 g *Trichoderma harzianum* and 25 g AM at one month after planting, 5 kg Vermicompost after three months of planting and 1.75 kg Wood ash after five months of planting per plant. This gives higher yield with higher return. દક્ષિણ ગુજરાતના ભારે વરસાદવાળા વિસ્તાર ઝોન–૧ અને ખેત આબોહવાકીય પરિસ્થિતિ–૩ માં કેળની ગ્રાન્ડ નૈન જાતની સેન્દ્રિય ખેતી કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે રોપણી વખતે છોડ દીઠ ૧૦ કિ. ગ્રા. છાણિયું ખાતર અને ૧.૨૫ કિ. ગ્રા. લિંબોળી ખોળ આપવો. એક માસ બાદ જૈવિક ખાતર છોડ દીઠ ૫૦ મીલી દરેક એઝોસ્પીરીલમ અને પીએસબી, ૫૦ ગ્રામ ટ્રાયકોડર્મા હારઝીનીયમ અને ૨૫ ગ્રામ આપવું. ત્યારબાદ ત્રીજા માસે છોડ દીઠ ૫ કિ. ગ્રા. વર્મીકમ્પોસ્ટ અને પાંચમા માસે છોડ દીઠ ૧.૭૫ કિ. ગ્રા. લાકડાની રાખ આપવી. આ માવજતથી વધુ ઉત્પાદન સહિત વધુ નફો મળે છે. (**Action**:- Associate Res. Sci., FRS, Gandevi)
12.4.3.3	**Macro propagation technique for Banana**
	Banana growing farmers and nurserymen are advised to produce lower cost quality planting material through macro propagation technique. This technique saves cost of planting material. A sucker treated with each AM and *Trichoderma viride* @ 30 g/sucker produces maximum 20 plants per sucker within 5-6 months. **Methodology** ➢ Selection of good quality suckers weighing 500-1000g. ➢ Suckers are detopped just above the juncture of the aerial shoot (Decortications). ➢ Removal of apical meristem to a 4 cm depth and 2 cm width (Decapitation). ➢ 6-8 cross wise cuts given to sucker. ➢ Sucker placed in net house at 1 X 1 feet distance and covered with sawdust. ➢ Application of 30g each AM and *Trichoderma viride* around each sucker. ➢ Removal of juvenile meristem of primary and secondary buds to produce tertiary buds. ➢ Plants produced from tertiary buds having 4-5 leaves separated and planted in plastic bag in media containing Red soil : Sand : FYM in ratio of 1 : 1 : 1. ➢ Plants kept in net house for hardening. ➢ Regular watering by water can during entire procedure. કેળની ખેતી કરતા ખેડુતો અને નર્સરીધારોકોને કેળની રોપણી માટે ઓછા ખર્ચે ગુણવત્તા સભર રોપા તૈયાર કરવા માટે મેક્રોપ્રોપોગેશન પધ્ધતિ અપનાવવાની ભલામણ કરવામાં આવે છે. આ પધ્ધતિથી રોપણી સામગ્રી પાછળ થતો ખર્ચ ઘટાડી શકાય છે. આ પધ્ધતિમાં પ્રતિ ગાંઠ વામ અને ટ્રાયકોડર્મા વિરીડી બંને ૩૦ ગ્રામ મુજબ આપવાથી પાંચથી છ માસમાં એક ગાંઠમાંથી વધુમાં વધુ ૨૦(વીસ) જેટલા રોપવા લાયક છોડ મળી શકે છે. **રોપ તૈયાર કરવાની પધ્ધતિ** ➢ સારી ગુણવત્તાવાળી ૫૦૦ થી ૧૦૦૦ ગ્રામ વજનની ગાંઠો પસંદ કરવી. ➢ ગાંઠનો ઉપરનો ભાગ થડની શરૂઆત થાય ત્યાંથી કાપી નાંખવો. ➢ ગાંઠની વચ્ચેથી ૪ સે. મી. ઉંડાઈ અને ૨ સે. મી. પહોળાઈ જેટલો ભાગ ખોતરીને મુખ્ય આંખ દુર કરવી. ➢ ગાંઠના ઉપરના ભાગે છ કે આઠ ભાગ થાય તે પ્રમાણે આડા કાપા મુકવા. ➢ આ રીતે તૈયાર થયેલ ગાંઠોને નેટ હાઉસમાં ૧×૧ ફુટના અંતરે ગોઠવી લાકડાના વ્હેરથી ઢાંકી દેવી. ➢ ગાંઠ દીઠ વામ અને ટ્રાયકોડર્મા વિરીડી બંને ૩૦ ગ્રામ મુજબ ગાંઠની ફરતે આપવું. ➢ ગાંઠમાંથી નીકળતી પ્રાથમિક અને દ્વિતિય કળીઓને ખોતરીને દુર કરવી. ➢ ત્યારબાદ નીકળતી તૃતીય કળીઓનો વિકાસ થવા દેવો અને જયારે ચાર થી પાંચ પાન ધારણ કરે ત્યારે છોડને છૂટા પાડી માટી, રેતી અને છાણિયા ખાતરના સમ પ્રમાણમાં તૈયાર કરેલ ઉછેર માધ્યમને પ્લાસ્ટીક બેગમાં ભરી તેમાં રોપવા. ➢ તૈયાર થયેલ રોપાને સખ્તાઈ માટે નેટહાઉસમાં રાખવા. ➢ સમગ્ર પધ્ધતિ દરમ્યાન જરૂરિયાત મુજબ ઝારાથી નિયમિત પિયત આપવું. (**Action**:- Associate Res. Sci. FRS, Gandevi)
12.4.3.4	**Standardization of fertigation and methods of training in cucumber under naturally ventilated polyhouse**

Farmers cultivating parthenocarpic cucumber in naturally ventilated polyhouse (1000 m^2 area) are advised to train plants to single stem system and fertigate the crop with 9.0:7.5:7.5 kg NPK (As per the Table given below) along with application of 0.5 kg *Trichoderma viride*, 0.5 litre *Pseudomonas fluorescens*, 2.0 t FYM or 0.4 t vermicompost and 5.0 kg micro-nutrients (Grade-5) at the time of sowing for higher net returns.

Crop Duration	Distribution pattern fertilizers			Remarks
	N (kg)	P (kg)	K (kg)	
First Growth Period (Up to 30 days)	4.50 kg	3.21 kg	1.07 kg	• Fertigation should be started at the appearance of 2nd true leaf stage. • Fertigation should be carried out twice a week.
Second Growth Period (30-60 days)	2.25 kg	2.15 kg	3.22 kg	
Third Growth Period (60-90 days)	2.25 kg	2.14 kg	3.21 kg	

Note:

1. Training of cucumber plants to single stem system can be achieved by removing all the laterals arising from the axils of leaves, commonly known as suckers at the attainment of 10-12 cm length and only main stem should be allowed to grow vertically along the supporting string.

નેચરલી વેન્ટીલેટેડ પોલી હાઉસમાં પાર્થેનોકાર્પિક કાકડીની રક્ષિત ખેતી સાથે સંકળાયેલ ખેડૂતોને ૧૦૦૦ ચો.મી.ના વિસ્તારમાં વધુ આવક મેળવવા માટે કાકડીના વેલાને એક થડ ઉપર કેળવણી કરવાની અને પાકને ફર્ટીગેશન અંતર્ગત ૯.૦:૭.૫:૭.૫ કિ.ગ્રા.નાફોપો (નીચેના કોઠામાં દર્શાવ્યા પ્રમાણે) ની સાથે ૦.૫ કિ.ગ્રા. ટ્રાયકોડર્મા વીરીડી, ૦.૫ લિટર સ્યુડોમોનાસ ફ્લુરોએન્સ, ૨.૦ ટન સંપૂર્ણ સડેલું છાણિયું ખાતર અથવા ૦.૪ ટન વર્મીકંમ્પોસ્ટ અને ૫. ૦ કિ.ગ્રા. ગ્રેડ–૫ સૂક્ષ્મ તત્વ પ્રમાણે બીજની વાવણી સમયે આપવાની ભલામણ કરવામાં આવે છે.

સમયગાળો	રાસાયણિક ખાતરનું વિભાજન			ટિપ્પણી
	નાઈટ્રોજન (કિ.ગ્રા.)	ફોસ્ફરસ (કિ.ગ્રા.)	પોટેશીયમ (કિ.ગ્રા.)	
પ્રથમ વિકાસ તબક્કો (પ્રથમ ૩૦ દિવસ)	૪.૫૦	૩.૨૧	૧.૦૭	• ફર્ટીગેશનની શરૂઆત બીજા મુખ્ય પાનની અવસ્થાએ કરવી. • અઠવાડીયામાં બે વાર ફર્ટીગેશન આપવું.
દ્વિતીય વિકાસ તબક્કો (૩૦ થી ૬૦ દિવસ)	૨.૨૫	૨.૧૫	૩.૨૨	
તૃતીય વિકાસ તબક્કો (૬૦ થી ૯૦ દિવસ)	૨.૨૫	૨.૧૪	૩.૨૧	

નોંધ:– છોડને એક થડ ઉપર કેળવણી માટે પર્ણકક્ષ માંથી નીકળતા પીલા જયારે ૧૦ થી ૧૨ સે.મી. લંબાઈના થાય ત્યારે તેને દૂર કરી ફકત મુખ્ય થડને જ ઉપરની દિશામાં વધવા દઈ દોરીથી ટેકો આપવો.

(**Action:-** Research Sci. (Veg.) ACHF, NAU, Navsari)

12.4.3.5 Site specific nutrient management study of Elephant foot Yam

The peasantry of south Gujarat Heavy Rainfall Agro-climatic Zone-I (AES III), growing elephant foot yam cv. Gajendra in the soil having deficient N and sufficient P and K are advised to apply 100 : 45 : 75 NPK kg/ha in two splits. Apply first dose of 50 : 45 : 37.5 NPK kg/ha at 45 days after planting and second dose of 50 : 00 : 37.5 NPK kg/ha one month after application of first dose for obtaining higher income. At the time of planting application of 25 tonne FYM per hectare is advisable.

દક્ષિણ ગુજરાત ભારે વરસાદીય ખેત આબોહવાકિય વિસ્તાર ઝોન–૧ (એઈએસ–૩) માં નાઈટ્રોજનની ઉણપ અને ફોસ્ફરસ અને પોટાશ પૂરતા પ્રમાણમાં ધરાવતી જમીનમાં સુરણની ગજેન્દ્ર જાત વાવતાં ખેડૂતોને ભલામણ કરવામાં આવે છે કે સુરણના પાકમાં ૧૦૦ : ૪૫ : ૭૫ ના.ફો.પો. કિલો / હે. ના પ્રમાણમાં બે હપ્તામાં આપવું. પ્રથમ હપ્તામાં ૫૦ : ૪૫ : ૩૭.૫

	ના.ફો.પો. કિલો/ હે. વાવણીના ૪૫ દિવસે તથા બાકીનો ૫૦ : ૦૦ : ૩૭.૫ ના.ફો.પો. કિલો / હે. પ્રથમ હપ્તાના એક મહના પછી આપવાથી મહત્તમ આર્થિક ફાયદો મેળવી શકાય છે. વાવતી વખતે ૨૫ ટન છાણિયુ ખાતર આપવું સલાહભર્યુ છે. (**Action:-** Research Sci. (Veg.) ACHF, NAU, Navsari)
12.4.3.6	**Feasibility of Papaya banana sugarcane relay cropping under organic farming**
	The farmers of south Gujarat Heavy Rainfall Agro - climatic Zone- I (AES III) growing papaya (variety Red Lady 786)-banana (variety Grand Naine)-sugarcane (variety CoN 07072) under relay system are advised to apply 25 per cent N through biocompost, 40 per cent N through vermicompost and 15 per cent N_2 through castor cake to supply recommended nitrogen on N equivalent basis and also advice to apply banana pseudostem sap @ 2 l/plant to papaya-banana and 4000 l/ha for sugarcane **or** 50 per cent N through biocompost and 40 per cent N_2 through vermicompost to supply recommended nitrogen on N equivalent basis and also advice to apply banana pseudostem sap @ 1 l/plant for papaya-banana and 4000 l/ha for achieving higher yield as well as net income. **Detail management for papaya** i. Planting: Prepared the pits at 1.5 m x 2.4 m distance. Sow plant by applying 1.7 kg biocompost, 3.1 kg vermicompost and 0.341 kg castor cake per plant along with PSB and Azatobactor @ 5kg/ha. ii. 3 & 6 MAP: Apply 0.8 kg biocompost, 1.6 kg vermicompost and 0.17 kg castor cake per plant. iii. After one months of planting, apply banana pseudostem sap @ 200ml/plant in 5 equal splits at one month interval. iv. In summer green manuring should be followed in wider space. v. Drench 500 ml 0.5% each of Trichoderma and Pseudomonas at the time of planting. vi. Spray 0.5 % neem based solution. **Detail management for banana** i. Planting: Prepared the pits at 1.2 m x 1.5 m x 3.3 m distance (paired row). Sow plant by applying 2.5 kg biocompost, 4.6 kg vermicompost and 0.5 kg castor cake per plant alongwith *PSB* and *Azatobactor* @ 5kg/ha. ii. 3 & 6 MAP: Apply 1.25 kg biocompost, 2.3 kg vermicompost and 0.25 kg castor cake per plant. iii. After one months of planting, apply banana pseudostem sap @ 200ml/plant in 5 equal splits at one month interval. iv. In summer green manuring should be followed in wider space. v. Drench 500 ml 0.5% each of *Trichoderma* and *Pseudomonas* at the time of planting. **Detail management for sugarcane** i. At planting, treat two eye budded setts with biofertilizer *i.e. Acetobacter* and PSB and biopesticide *i.e. Trichoderma* and *Pseudomonas* @ 100ml each/ 50 litre of water for 20 minutes. ii. Planting: Apply 4.15t biocompost and 3.85t vermicompost per hectare as basal. iii. 3 & 6 MAP: Apply 2.1t biocompost and 1.9t vermicompost per hector. iv. After one months of planting, apply banana pseudostem sap @ 800 l/ha in 5 equal splits at one month interval. v. In summer green manuring should be followed in wider space. vi. Drench 0.5% each of *Acetobactor*, *Trichoderma* and *Pseudomonas* at the time of earthing up. પપૈયા (જાત રેડ લેડી ૭૮૬)-કેળા (જાત ગ્રાન્ડ નેન)- શેરડી (જાત સીઓએન ૦૭૦૭૨) રીલે પધ્ધતિ માટે દક્ષિણ ગુજરાતનાં ભારે વરસાદવાળા ખેત આબોહવાકિય વિસ્તાર-૧ (પરિસ્થિતિ-૩) માં સેન્દ્રિય ખેતીથી પપૈયા (જાત રેડ લેડી ૭૮૬)-કેળા (જાત ગ્રાન્ડ નેન)- શેરડી (જાત સીઓએન ૦૭૦૭૨) રીલે પધ્ધતિથી ઉગાડતા ખેડૂતોને વધુ ઉત્પાદન અને આવક મેળવવા ભલામણ કરેલ નાઈટ્રોજન પૂરો પાડવા ૨૫ ટકા નાઈટ્રોજન

	બાયોકંપોષ્ટ દ્વારા, ૪૦ ટકા નાઈટ્રોજન અળસિયાનાં ખાતર દ્વારા અને ૧૫ ટકા નાઈટ્રોજન દિવેલી ખોળ દ્વારા નાઈટ્રોજન તત્વનાં આધારે આપવો તેમજ પપૈયા અને કેળને કેળના થડનો રસ ૨ લી./છોડ અને શેરડીને ૪૦૦૦ લી./હે આપવો અથવા ૫૦ ટકા નાઈટ્રોજન બાયોકંપોષ્ટ દ્વારા અને ૪૦ ટકા નાઈટ્રોજન અળસિયાનાં ખાતરમાંથી નાઈટ્રોજન તત્વનાં આધારે આપવો તેમજ પપૈયા અને કેળને કેળના થડનો રસ ૨ લી./છોડ અને શેરડીને ૪૦૦૦ લી./હે આપવો **પપૈયા માટે વિગતે માવજતો:** • રોપણી સમયે: ૧.૫ મી × ૨.૪ મી ના અંતરે ખાડા કરવા. છોડ દીઠ ૧.૭ કીગ્રા બાયોકંમ્પોષ્ટ, ૩.૧ કીગ્રા અળસિયાનું ખાતર અને ૦.૩૪૧ કિગ્રા દિવેલી ખોળની સાથે પીએસબી અને એઝાટોબેકટર ૫ કિગ્રા/હે પ્રમાણે નાંખી રોપણી કરવી. • રોપણી બાદ ત્રણ અને છ મહિને: છોડ દીઠ ૦.૮ કીગ્રા બાયોકંપોષ્ટ, ૧.૬ કીગ્રા અળસિયાનું ખાતર અને ૦.૧૭ કિગ્રા દિવેલીનો ખોળ આપવો. • રોપણીનાં એક મહિના બાદ કેળના થડનો રસ ૨૦૦ મીલી./છોડ લેખે પાંચ સરખા હપ્તામાં ૧ મહિનાનાં આંતરે આપવો. • ઉનાળામાં પહોળા પટ્ટામાં લીલો પડવાશ કરવો. • રોપણી સમયે ૫૦૦ મિલી ૦.૫% ટ્રાયકોડર્મા અને સ્યુડોમોનાસનું દ્રાવણ રેડવું. • ૦.૫% લીમડા યુક્ત દરવાનો છંટકાવ કરવો. **કેળ માટે વિગતે માવજતો:** • રોપણી સમયે: ૧.૨ મી × ૧.૫ મી × ૩.૩ મીના અંતરે ખાડા કરવાં. છોડ દીઠ ૨.૫ કીગ્રા બાયોકંમ્પોષ્ટ, ૪.૬ કીગ્રા અળસિયાનું ખાતર અને ૦.૫ કિગ્રા દિવેલી ખોળ નાંખી રોપણી કરવી. • રોપણી બાદ ત્રણ અને છ મહિને: છોડ દીઠ ૧.૨૫ કીગ્રા બાયોકંપોષ્ટ, ૨.૩ કીગ્રા અળસિયાનું ખાતર અને ૦.૨૫ કિગ્રા દિવેલી ખોળ સાથે પીએસબી અને એઝાટોબેકટર @ ૫ કિગ્રા/હે નાંખી રોપણી કરવી. • રોપણીનાં એક મહિના બાદ કેળના થડનો રસ ૨૦૦ મીલી./છોડ લેખે પાંચ સરખા હપ્તામાં ૧ મહિનાનાં આંતરે આપવો. • ઉનાળામાં પહોળા પટ્ટામાં લીલો પડવાશ કરવો. • રોપણી સમયે ૫૦૦ મિલી ૦.૫% ટ્રાયકોડર્મા અને સ્યુડોમોનાસનું દ્રાવણ રેડવું. **શેરડી માટે વિગતે માવજતો:** • રોપણી સમયે બે આંખનાં ટુકડાને એસિટોબેક્ટર અને પીએસબી જેવા બાયો ફર્ટીલાઈઝર તેમજ ટ્રાયકોડર્મા અને સ્યુડોમોનાસ જેવી બાયોપેસ્ટીસાઇડ દરેકનાં ૧૦૦ મિલી/૫૦ લીટર પાણીમાં બનાવેલ દ્રાવણમાં ૨૦ મિનિટ સુધી બોળવા. • રોપણી સમયે: પાયામાં ૪.૧૫ ટન બાયોકંપોષ્ટ અને ૩.૮૫ ટન અળસિયાનું ખાતર પ્રતિ હેક્ટર આપવું. • રોપણી બાદ ત્રણ અને છ મહિને: ૪.૧૫ ટન બાયોકંપોષ્ટ અને ૩.૮૫ ટન અળસિયાનું ખાતર પ્રતિ હેક્ટર આપવું. • રોપણીનાં એક મહિના બાદ કેળના થડનો રસ ૮૦૦ લી./હે લેખે પાંચ સરખા હપ્તામાં ૧ મહિનાનાં આંતરે આપવો. • ઉનાળામાં પહોળા પટ્ટામાં લીલો પડવાશ કરવો.

	• ૦.૫% એસિટોબેક્ટર, ટ્રાયકોડર્મા અને સ્યુડોમોનાસનું દ્રાવણ પાળા ચઢાવતી વખતે રેડવું. (**Action**:-Assoc. Professor (NRM), ACHF, NAU, Navsari) **(Give the soil condition after experiment)**
12.4.3.7	**Evaluation of *in situ* farm residue management on quality and productivity of banana cultivated under organic farming**
	The farmers of South Gujarat Heavy Rainfall Agro-climatic Zone- I (AES III) growing banana, variety Grand Naine, organically are advised to apply 10 tonnes farm residue along with 400 litres, 2% banana pseudostem sap per hectare for achieving higher net income. **Detail management** • Prepared the pits at 1.5 m x 1.2 m x 2.4 m distance and apply the 2.0 kg NADEP compost in each pit along with *Azatobactor* and PSB each @ 5.0 kg/ha. • Add the farm residue @10t/ ha. in equal two splits at the time of two and four monts after planting. • Apply 400l/ha 2% banana pseudostem sap on residue and covered the residue by thin layer of soil. • Drench 500 ml (0.5%) per plant each of *Trichoderma* and *Pseudomonas* at the time of planting દક્ષિણ ગુજરાત ભારે વરસાદવાળા ખેત આબોહવાકિય વિસ્તાર-૧ (પરિસ્થિતિ-૩)ના સેન્દ્રિય ખેતિથી કેળની જાત ગ્રાન્ડ નેન ઉગાડતા ખેડૂતોને વધુ આવક મેળવવા પ્રતિ હેકટર ૧૦ ટન ખેત અવશેષ સાથે ૪૦૦ લીટર, ૨ ટકા કેળના થડનો રસ આપવાની સલાહ આપવામા આવે છે. **વિગતે માવજતો:-** • રોપણી સમયે: ૧.૫ મી x× ૧.૨ મી x× ૨.૪ મીના અંતરે ખાડા કરવા અને દરેક ખાડામાં ૨ કિગ્રા નાડેપ કમ્પોસ્ટ અને એઝોટોબેકટર અને પીએસબી ૫ કિગ્રા/હે આપવું. • ૧૦ ટન/હે ખેતરનો કચરો બે સરખા ભાગમાં રોપણીનાં ૨ અને ૪ મહિના પછી ઉમેરવો. • ખેતરના કચરા ઉપર ૨ ટકા કેળનાં થડનો રસ ૪૦૦ લી/હે પ્રમાણે ઉમેરવો અને અવશેષને માટીનાં આછા થરથી ઢાંકવો. • રોપણી સમયે પ્રતિ છોડ ૫૦૦ મિલી (૦.૫%) ટ્રાયકોડર્મા અને સ્યુડોમોનાસનું દ્રાવણ રેડવું. (**Action**:- Assoc. Professor (NRM), ACHF, NAU, Navsari) **(Give the soil condition after experiment)**
12.4.3.8	**Effect of Land configuration and integrated nutrient management on growth, quality and yield of tuberose (*Polinathes tuberosa* var. Prajwal)**
	The farmers of South Gujarat Heavy Rainfall Agro-climatic Zone - I AES-III cultivating tuberose var. Prajwal are advised to grow bulbs on raised bed of 90 cm width and 15 cm height in 3 rows along with 15 ton FYM/ha per year + RDF 300-200-100 kg N, P_2O_5, K_2O / ha. (application of nitrogen in four equal splits 3 months interval per year) for qualitative as well as quantitative spike production up to three years after planting. **દક્ષિણ ગુજરાતના ભારે વરસાદીય ઝોન–૧ ખેત આબોહવાકીય પરિસ્થિતિ–૩ માં ગુલછડીની પ્રજજવલ જાતની ખેતી કરતા ખેડુતોને ભલામણ કરવામાં આવે છે કે ગાંઠની ૯૦ સે.મી પહોળા અને ૧૫ સે.મી ઉંચાઈ વાળા ગાદીકયારા માં ત્રણ હારમાં રોપણી કરી ૧૫ ટન છાણિયું ખાતર અને ભલામણ કરેલ રસાયાણિક ખાતર ૩૦૦ : ૨૦૦ : ૧૦૦ કિ ગ્રા ના.ફો.પો. પ્રતિ હે. પ્રતિ વર્ષ (નાઈટ્રોજન ને પ્રતિ વર્ષ ચાર સરખા ભાગમા ત્રણ મહિનાનાં અંતરે) આપવાથી રોપણી કર્યા બાદ ૩ (ત્રણ) વર્ષ સુધી સારી ગુણવત્તાવાળા વધુ ફુલોનું ઉત્પાદન આપે છે.** (**Action**:-Assoc. Res. Sci. (Flori.), ACHF, NAU, Navsari)
12.4.3.9	**Effect of bio-fertilizers and chemical fertilizers on growth and yield of gladiolus cv. Psittacinus Hybrid.**

The farmers of the South Gujarat Heavy Rainfall Agro-climatic Zone I, AES-III, growing gladiolus cv. Psittacinus Hybrid are advised to dip gladiolus corms in microbial consortium solution (10 ml /l water) for one hour and dry under shade then use for planting. Apply 75% of RDF (150-150-150 kg NPK / ha.), P and K as basal and N in two equal splits, 15 days and 45 days after planting which reduced 25% fertilizers cost and gives higher realization.

દક્ષિણ ગુજરાતનાં ભારે વરસાદવાળા વિસ્તાર ૧ એઈએસ- ૩ માં ગ્લેડીઓલસની સીટેસીનસ હાઈબ્રીડ જાત ઉગાડનાર ખેડૂતોને ભલામણ કરવામાં આવે છે કે વાવણી પહેલા ગ્લેડીઓલસ કંદને ૧૦ મીલી જૈવિક ખાતર/લીટર પાણીમાં ૧ કલાક બોળી, છાયડામાં સુકવી રોપણી કરવી. રોપણી બાદ ભલામણ કરેલા ૭૫% જથ્થા(૧૫૦-૧૫૦-૧૫૦ ના. ફો. પો. કીલો / હે.) પૈકી ફોસ્ફરસ અને પોટાશનો પુરો જથ્થો પાયામા આપવો અને નાઇટ્રોજન રોપણી બાદ ૧૫ દીવસે અને ૪૫ દીવસે બે સરખા હપ્તામાં આપવાથી ૨૫ % રાસાયણિક ખાતરના ખર્ચમાં ઘટાડો કરી વધુ આવક મેળવી શકાય છે.

(**Action**:- Principal, Horti. Polytechnic., Navsari)

12.4.3.10 **Development of technology for utilization of banana peel for preparation of sev**

Home-makers, processors and entrepreneurs are recommended to utilize ripe banana peel for preparation of *sev*. Ripe banana peel must be pre-treated immediately to prevent enzymatic browning by dipping in 2% salt (NaCl) solution along with 100 ppm ascorbic acid for 30 min.. After pre-treatment, banana peel must be blanched, grind to make paste and mixed(30% ripe banana peel paste) with gram flour (70%) for preparation of fibre rich *sev*. The recipe for the preparation of ripe banana peel based *sev* comprised of 30 g ripe banana peel paste, 70 g gram flour, 2.5 g common salt, 1.5 g chilli powder, 0.75 g white pepper powder, 1.0 g turmeric powder, 2.5 g coriander powder and 5 ml edible oil.

આથી ગૃહિણીઓ, પ્રોસેસરો અને ઉદ્યોગ સાહસિકોને ભલામણ કરવામાં આવે છે કે પાકા કેળાની છાલનો સેવ બનાવવા માટે ઉપયોગ કરી શકાય છે. પાકા કેળાની છાલનું એન્ઝાયમેટીક બ્રાઉનીંગ અટકાવવા માટે તરત જ ૨% મીઠું અને ૧૦૦પીપીએમ એસ્કોર્બીક એસીડ ના દ્રાવણમાં ૩૦ મિનિટ સુધી પૂર્વ માવજત આપવી જ જોઈએ. પૂર્વ સારવાર બાદ બ્લાન્ચિંગ કરી, પેસ્ટ બનાવીને (૩૦% પાકા કેળાની છાલની પેસ્ટ) અને બેસન (૭૦%) મિશ્ર કરી રેસાયુકત સેવ બનાવી શકાય છે.પાકા કેળાની છાલ આધારિત સેવ બનાવવા માટેની રેસીપી નીચે મુજબ છે:

૩૦ ગ્રામ પાકા કેળાની છાલની પેસ્ટ, ૭૦ ગ્રામ બેસન, ૨.૫ગ્રામ મીઠું, ૧.૫ગ્રામ મરચુ પાવડર, ૦.૭૫ગ્રામ સફેદ મરી પાવડર, ૧.૦ ગ્રામ હળદર પાવડર, ૨.૫ગ્રામ ધાણા પાવડર અને ૫મિલીખાદ્ય તેલ.

Process	**પધ્ધતિ**
Selection of banana	**કેળાની પસંદગી**
↓	
Peeling	**છાલ ઉતારવી**
↓	
Pre-treatment of peel	**છાલને પૂર્વ માવજત આપવી**
↓	
Blanching (3 min at 85-90^{o} C)	**બ્લાન્ચિંગ (૮૫-૯૦^{o}સે ૩ મિનીટમાટે)**
↓	
Preparation of peel paste	**છાલની પેસ્ટબનાવવી**
↓	
Preparation of dough by mixing gram flour,	**છાલની પેસ્ટમાં બેસન,મસાલા અને તેલ**

spices and edi le oil	ઉમેરી કણક તૈયાર કરવો
↓	
Deep frying of the cold extruded *sev*	સેવ પાડીને તેલમાં તળવી
↓	
Draining of the oil	તેલ દુર કરવું
↓	
Packaging	પેક કરવું
↓	
Storage	સંગ્રહ

(**Action**:-Assoc. Professor (PHT) ACHF, NAU, Navsari)

12.4.3.11 **Standardization of method for extraction of Noni (*Morinda citrifolia*) fruit juice**

Processors and entrepreneurs are recommended to extract noni juice by treating crushed fruits with 0.1 % pectinase for 3 hours to get higher juice recovery. The juice after extraction must be filtered, pasteurized (96^{o}C), packed in glass bottles followed by processing (96$\pm$1^{o}C) for 30 min. The packed juice has storage stability for 12 months at ambient temperature.

પ્રોસેસર્સ અનેઉદ્યોગ સાહસિકોને નોનીના રસની વધારે પ્રાપ્તિ માટે કશ કરેલા નોનીના ફળોને ૩ કલાક માટે ૦.૧ % પેક્ટીનેઝ એન્ઝાઈમની સારવાર આપવાની ભલામણ કરવામાં આવે છે. રસ કાઢ્યા બાદ ગાળીને, જીવાણુંમુકત (૯૬° સે) કરીને, કાચની બોટલમાં પેક કર્યા બાદ ૩૦ મિનીટ માટે પ્રોસેસિંગ (૯૬+ ૧° સે) કરવું જોઈએ. આ રીતે પેક કરેલ રસની સંગ્રહ ક્ષમતા સામાન્ય તાપમાને ૧૨માસની છે.

Process	**પધ્ધતિ**
Selection of mature fruits, washing and ripening	પરિપકૂવ ફળોની પસંદગી,ધોવા અને પકવવા
↓	
Crush the well ripen fruits	પાકેલા ફળોને છુંદવા
↓	
Enzyme treatment	એન્ઝાઈમની સારવાર આપવી
↓	
Extraction of juice by pressing	દબાવીને રસ કાઢવો
↓	
Clarification	રસને કલીયર કરવો
↓	
Pasteurization (96^{o}C)	જીવાણુંમુકત કરવો
↓	
Bottling	બોટલમાં ભરવો
↓	
Processing (96$\pm$1^{o}C for 30 min)	પ્રોસેસિંગ કરવું(૯૬+ ૧° સે૩૦ મિનીટ માટે)
↓	
Storage	સંગ્રહ

(**Action**:-Asso. Professor (PHT) ACHF, NAU, Navsari)

12.4.3.12 **Standardization of formulations for preparation of noni mango nectar from Noni juice**

Processors and entrepreneurs are recommended to utilize noni juice for preparation of blended noni mango nectar to increase the acceptability of noni juice. For preparation of blended noni mango nectar, blend 5% noni juice with 15% mango pulp by maintaining 16^0 Brix TSS and 0.3% acidity. The nectar after blending, filtered, pasteurized (96^oC), packed in glass bottles followed by processing (96 ± 1^oC) for 30 min. The packed nectar has storage stability for 6 months at ambient temperature.

પ્રોસેસર્સ અને ઉદ્યોગ સાહસિકોને નોની રસની સ્વીકાર્યતા વધારવા માટે નોનીના રસનો ઉપયોગ કરી નોની કેરી મિશ્ર નેકટર બનાવવા માટે ભલામણ કરવામાં આવે છે.નોની કેરી મિશ્ર નેકટર બનાવવા માટે ૫% નોની સાથે ૧૫% કેરીના રસને મિશ્ર કરી ૧૬°બ્રિક્ષ ટીએસએસ અને ૦.૩% અમ્લતા જાળવવી. રસ મિશ્ર કરી, ગાળીને, જીવાણુંમુકત (૯૬°સે) કરીને નેકટર બનાવી, કાચની બોટલમાં પેક કર્યા બાદ ૩૦ મિનીટ માટે પ્રોસેસિંગ (૯૬+ ૧° સે) કરવું. આ રીતે પેક કરેલ નેકટરની સંગ્રહ ક્ષમતા સામાન્ય તાપમાને ૬ માસનીછેP

Process	**પધ્ધતિ**
Selection of mature fruits, washing and ripening	**પરિપકૂવ ફળોની પસંદગી,ધોવા અને પકવવા**
↓	
Pulping and juice extraction of fruits	**ફળોમાંથી રસ કાઢવો**
↓	
Mixing of pulp and juice	**ફળોના રસને મિશ્ર કરવો**
↓	
Addition of sugar and citric acid	**ખાંડઅને લીંબુના ફૂલ ઉમેરવા**
↓	
Pasteurization (96^oC)	**જીવાણુંમુકત કરવો**
↓	
Bottling	**બોટલમા ભરવો**
↓	
Processing (96 ± 1^oC for 30 min)	**પ્રોસેસિંગ કરવું(૯૬+ ૧° સે૩૦ મિનીટ માટે)**
↓	
Storage	**સંગ્રહ**

(**Action**:-Assoc. Professor (PHT) ACHF, NAU, Navsari)

12.4.3.13 **Evaluation and modification of banana comb cutter**

The farmers growing banana are recommended to use banana comb cutter developed by ICAR – CIPHET with the NAU developed safety cover (340 mm x 220 mm) to separate comb from banana bunch.

કેળની ખેતી કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે કેળાની લુમમાંથી કેળાનું ઝુમખુ અલગ કરવા આઇસીએઆર-સીફેટ દ્વારા વિકસાવેલ ઓજાર અને ન.કૃ.યુ. દ્વારા વિકસાવેલ રક્ષણાવરણ (૩૪૦ એમ.એમ. ૨૨૦ એમ.એમ.) સાથે ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે.

Suggestions:

1. This would be presented in the Agricultural Engineering Subcommittee group meeting.

(**Action**:-Assoc. Professor (PHT) ACHF, NAU, Navsari)

12.4.3.14 **Investigation on tree ring analysis (Dendrochronology) to monitor radial growth responses of teak to climate in South Gujarat**

To enhance the radial growth in teak (*Tectona grandis* L.), the farmers of South Gujarat Heavy Rainfall Agro-climatic Zone-1 (AES-I & III) growing teak in their plantations may give light irrigation during March and normal irrigation during peak growth period from June to July, especially, when there is a moisture stress due to deficient rainfall.

દક્ષિણ ગુજરાત ભારે વરસાદીય ઝોન –૧, ખેત આબોહવાકીય પરિસ્થિતિ–૧ અને ૩ માં સાગ (ટેકટોના ગ્રાન્ડીસ એલ.) ની ખેતી કરનારા ખેડૂતોને ભલામણ કરવામાં આવે છે કે સાગનો સારો ઘેરાવો અને સારો વિકાસ મેળવવો હોય તો માર્ચ માસ દરમ્યાન હલકુ પિયત આપી શકાય. જયારે જુન–જુલાઈ માસમાં તેનો વિકાસ સારો થવાનો હોઈ, જો અપુરતો વરસાદ થાય તો, સામાન્ય પિયત આપવાથી ભેજ ના અભાવથી થતા તણાવની અસર ઘટાડી શકાય.

(**Action**:- Principal, College of Forestry, NAU, Navsari)

12.4.3.15 **Performance of turmeric (*Curcuma longa*) grown as an intercrop under different tree species in South Gujarat conditions**

The farmers of South Gujarat heavy rainfall zone – I (AES- III) growing *Mitragyna parvifolia* (Kalam), *Adina cordifolia* (Haldu) and *Gmelina arborea* (Sevan) at 10 X 2.5 m spacing are advised to grow Turmeric Variety – Sugandham planted at 30 x 15 cm spacing having 19 rows as an intercrop in plantation of *Gmelina arborea* (Sevan) for additional income.

દક્ષિણ ગુજરાતના ભારે વરસાદીય ઝોન – ૧, ખેત આબોહવાકીય પરિસ્થિતી – ૩ માં કલમ, હલ્દુ તેમજ સેવન જેવા વૃક્ષોને ૧૦ × ૨.૫ મીટરે ઉછેરતા ખેડુતોને ભલામણ કરવામાં આવે છે કે હળદરની જાત સુગંધમને ૩૦ × ૧૫ સેમી. ના અંતરે ૧૯ જેટલી હાર રોપીને સેવનના વૃક્ષની સાથે આંતર પાક તરીકે લેવાથી વધારાની આવક મેળવી શકાય છે.

(**Action**:- Principal, College of Forestry, NAU, Navsari)

12.4.3.16 **Standardization of the recipe for the preparation of candy from the fruits of Palmyra palm**

Home Makers, processors and entrepreneurs are recommended that, candy from the fruits of Palmyra palm can be prepared by steeping the slices (5cm x 5mm) in sugar syrup having 65% TSS for 8 hours followed by drying of slices for 7 hours at 65^{o}C and packed in PE pouches can be stored successfully up to six month at ambient storage.

આથી ગૃહિણીઓ, પ્રોસેસરો અન`ઉદ્યોગ સાહસિકોને ભલામણ કરવામાં આવે છે કે, કે તાડફળી (ગલેલી)માંથી કેન્ડી ૬૫% ટીએસએસ વાળી ખાંડની ચાસણીમાં ગલેલીના ટુકડાઓ (૫ સેમી.X૫ મિમિ) ૮ કલાક માટે બોળીને ૭ કલાક માટે ૬૫^{o}સે પર સૂકવણી કરી તૈયાર કરી શકાય છે અને પીઈ પાઉચમાં પેક કરી છ મહિના સુધી સફળતાપૂર્વક સંગ્રહ કરી શકાય છે .

Process	**5wWlT**
Selection of Fruits	O/MGL 5;\NUL
↓	↓↓
Peeling	KF, pTFZJL
↓	↓↓
Slicing (5cm x 5mm)	:,F.; AGFJJL s5 ;[lDx 5 lDlDf
↓	
Preparation of sugar syrup (75^{o} Brix)	BF\0GL RF;6L AGFJJL s&5–lA\Ùf
↓	↓↓
Steeping of slices (24 hrs)	:,F.;G[RF;6LDF\ 0}AF0JL s(S, Sf
↓	↓↓
Draining of syrup	RF;6L N]Z SZJL
↓	↓↓
Drying (65^{o} C for 7hrs)	;]SJ6L s&5– ;[* S,FS DF8[f

↓	↓↓
Packing	5[ÃSU
↓	↓↓
Storage	;\U|C

(**Action**:- Principal, College of Forestry, Navsari)

12.4.3.17 **Standardization of the recipe for the preparation of jam from the fruits of Palmyra palm**

Home Makers, processors and entrepreneurs are recommended that jam from the tender fruits of palmyra palm can be prepared by using pulp:sugar ratio (1:1.2) and addition of pectin 16g/kg of pulp and it also can be stored for six months at ambient temperature in glass bottle.

આથી ગૃહિણીઓ, પ્રોસેસરો અને ઉદ્યોગસાહસિકોને ભલામણ કરવામાં આવે છે કે, તાડફળી (ગલેલી)માંથી માવો:ખાંડનું પ્રમાણ (૧:૧.૨) અને ૧૬ ગ્રામ પેકટીન પ્રતિ કિલો માવા દિઠ ઉમેરીને મિશ્રણને ૬૫°બ્રિક્ષ ટીએસએસ સુધી ઉકાળીને જામ બનાવી શકાય છે તેમજ તેને કાચની બરણીમાં પેક કરીને સામાન્ય તાપમાને છ (૬) માસ સુધી સંગ્રહી શકાય છે.

Process	**5wWlT**
Selection of Fruits	0]\U/LGL 5;\NUL
↓	↓↓
Peeling	KF, pTFZJL
↓	↓↓
Slicing (5cm x 5mm)	:,F.; AGFJJL s5 ;[lDx 5 lDlDf
↓	
Preparation of sugar syrup (75^{o} Brix)	BF\0GL RF;6L AGFJJL s&5⁻lA|Ùf
↓	↓↓
Steeping of slices (24 hrs)	:,F.;G[RF;6LDF\ 0}AF0JL s(S,FSf
↓	↓↓
Draining of syrup	RF;6L N]Z SZJL
↓	↓↓
Drying (65^{o} C for 7hrs)	;]SJ6L s&5⁻ ;[* S,FS DF8[f
↓	↓↓
Packing	[ÃSU
↓	↓↓
Storage	;\U|C

(Action:- Principal, College of Forestry, NAU, Navsari)

12.4.3.18 **Standardization of the recipe for the preparation of jelly from the Neera of Palmyra palm**

Home Makers, processors and entrepreneurs are recommended that jelly from the *Neera* can be prepared by using pectin 13 g/kg of *Neera* and can be safely stored for six months. Recipe should be *Neera*:sugar (1:1.1), 0.5% acidity (50 g citric acid per kg of jelly) and pectin. Boil the mixture till 68^{o}Brix followed by hot filling in to glass bottle.

આથી ગૃહિણીઓ, પ્રોસેસરો અને ઉદ્યોગસાહસિકોને ભલામણ કરવામાં આવે છે કે, પેક્ટીન ૧૩ ગ્રામ પ્રતિ કિલો વાપરીને નીરામાંથી જેલી બનાવી શકાય છે તેમજ ૬(છ) માસ સુધી સુરક્ષિત રીતે સંગ્રહી શકાય છે. રેસિપિ – નિરા:ખાંડ (૧:૧.૧) પ્રમાણે, ૦.૫ એસિડીટી, ૮૫૦ ગ્રામ લીંબુના ફુલ ૧ કિલો જેલી દીઠ અને પેક્ટીનના મિશ્રણને ૬૮°બ્રિક્ષ સુધી ઉકાળીને ગરમ ગરમ કાચની બરણીમાં ભરવી.

Process	**5wWlT**

Neera	GLZF
↓	↓↓
Heating for a while	YM0L JFZ DF8[UZD SZJ]\
↓	↓↓
Addition of sugar and boil till sugar dissolve	BF\0pD[ZJL V [BF\0VF[U/L ÔI tIF\ ;]WL pSF/J]\
↓	↓
Addition of citric acid	,ÄA]GF O}, pD[ZJF
↓	↓↓
Addition of Pectin	5[S8LG pD[ZJ]\
↓	↓↓
End point (68^{o} Brix)	K[ÐM 5M.g8s&(¯lA|Ùf
↓	↓↓
Filling in to bottle	AM8,DF\ EZJ]\
↓	↓↓
Storage	;\U|C

(**Action**:- Principal, College of Forestry, NAU, Navsari)

SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

12.4.4.1	**Effect of different levels of Nitrogen and methods of application on growth, yield and quality of Garlic (*Allium sativum L.)***
	Farmers of North Gujarat growing garlic under sprinkler irrigation system are advised to fertilize their crop with 125: 50: 50 kg NPK per hectare. Out of that 25 kg Nitrogen, 50 kg Phosphorus and 50 kg Potash should be applied as basal dose while remaining 100 kg Nitrogen in four equal splits of 25 kg each should be given at 30, 50, 70 and 90 DAS in order to obtain maximum yield and net income. ઉત્તર ગુજરાત વિસ્તારના ફુવારા પધ્ધતિથી લસણ ઉગાડતા ખેડૂતોને પાકમાં ૧૨૫–૫૦–૫૦ કિલો ના.ફો.પો. આપવાની ભલામણ કરવામાં આવે છે. જે પૈકી ૨૫ કિલો નાઈટ્રોજન ૫૦ કિલો ફોસ્ફરસ અને ૫૦ કિલો પોટાશ પાયાના ખાતર તરીકે અને નાઈટ્રોજનનો બાકીનો જથ્થો ૧૦૦ કીલોગ્રામના ચાર સરખા હપ્તામાં વાવેતરના ૩૦, ૫૦, ૭૦ અને ૯૦ દિવસ પછી આપવો. (**Action:** Professor, Dept. of Horticulture, CPCA, SDAU, Sardarkrushinagar)
12.4.4.2	**Multilocation trial to study the performance of different varieties and hybrids of mango**
	Farmers of North Gujarat are recommended to grow Amrapali or Langra or Kesar variety of mango to get higher net return ઉત્તર ગુજરાત ના ખેડૂતોને વધુ ચોખ્ખો નફો મેળવવા માટે આંબાની આમ્રપાલી અથવા લંગડા અથવા કેસર જાત વાવવાની ભલામણ કરવામાં આવે છે. (**Action:** Professor, Dept. of Horticulture, CPCA, SDAU, Sardarkrushinagar)
12.4.4.3	**Performance of different varieties and time of planting in Marigold (*Tagetes erecta* Linn.) for growth, yield and quality parameters.**
	Marigold growing farmers of North Gujarat are recommended to grow the Pusa Narangi Gainda or Pusa Basanti Gainda varieties in September to obtain the maximum yield and higher net return. ઉતર ગુજરાતમા ગલગોટા ની ખેતી કરતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે વધુ ઉત્પાદન અને ચોખ્ખો નફો મેળવવા માટે સપ્ટેમ્બર માસમાં પુસા નારંગી ગેંદા અથવા પુસા બસંતી ગેંદા જાતનુ વાવેતર કરવું. (**Action:** Professor, Dept. of Horticulture, CPCA, SDAU, Sardarkrushinagar)
12.4.4.4	**Effect of foliar application of plant growth substances on multiplication of pomegranate through cutting in plug tray under control condition.**

	The growers and nurserymen growing pomegranate cv. Bhagwa are advised to use sub-apical cutting after three days of spray of ethrel 1000 ppm (1 ml/l water) on mother plant, cutting should be treated with 2000 ppm IBA as quick dip method and planted in plug tray to get higher survival per cent under control condition. દાડમની ભગવા જાત ઉગાડતા ખેડૂતો અને નર્સરી ધારકોને ભલામણ કરવામાં આવે છે કે માતૃછોડ ઉપર ૧૦૦૦ પીપીએમ (૧ એમ. એલ./લી. પાણી) ઈથરલનો છંટકાવ કરી ત્યારબાદ ત્રણ દિવસ પછી ડાળીના કટકા લઈ તેને ૨૦૦૦ પીપીએમ આઈબીએમના દ્રાવણમા બોળી ગ્રીનહાઉસમાં પ્લગ ટ્રેની અંદર લગાવવાથી વધુ સફળતા મળે છે. (**Action:** Principal, College of Horticulture, SDAU, Sardarkrushinagar)
12.4.4.5	**Effect of different shoot portion and media on multiplication of pomegranate in plug tray under control condition.**
	The growers and nurserymen growing pomegranate cv. Bhagwa are advised to use Vermiculite:Poultry Manure (1:1) + *Pseudomonas fluorescens* @ 50ml/10 kg media in plug tray for cuttings taken from the 30 cm below part of top to obtain maximum survival under control condition. Cutting should be treated with 2000 ppm IBA as quick dip method. દાડમની ભગવા જાત ઉગાડતા ખેડૂતો અને નર્સરીધારકોને ભલામણ કરવામાં આવે છે કે પ્લગટ્રેમા વર્મીકયુલાઈટ : મરઘીનું ખાતર (૧:૧) સાથે સુડોમોનાસ ફલુરોસન્સ (૫૦ એમએલ/૧૦ કિલો માધ્યમ)નો માધ્યમ તરીકે ઉપયોગ કરી તેમાં ડાળીઓની ટોચથી ૩૦ સેમી નીચેના ભાગમાંથી લીધેલ કટકાને ૨૦૦૦ પીપીએમ આઈબીએમના દ્રાવણની માવજત આપી ગ્રીનહાઉસમાં લગાવવાથી વધુ સફળતા મળે છે. (**Action:** Principal, College of Horticulture, SDAU, Sardarkrushinagar)
12.4.4.6	**Effect of levels of IBA and different media on multiplication of ixora (*Ixora spp.*) through apical cutting in plug tray under control condition.**
	The nurserymen are advised to use vermiculite:poultry manure (1:1) as a media + *Trichoderma viride* @ 50 g/10 kg media in plug tray and dip the apical cutting with IBA of 5000 ppm (5 g/l water) to get maximum survival of ixora (*Ixora spp.*) under controlled conditions. નર્સરી ધારકોને સલાહ આપવામા આવે છે કે ગ્રીનહાઉસમાં ઈકઝોરા ના કટકા કલમથી છોડ ઉછેર માટે વર્મીકયુલાઈટ : મરઘીનું ખાતર (૧:૧) માધ્યમ તરીકે ઉપયોગ કરી તેમાં ટ્રાયકોડર્મા વીરીડી (૫૦ ગ્રામ/૧૦ કિલો માધ્યમ) ભેળવી પ્લગટ્રેમા ભરીને ડાળીના ટોચના ૧૦ સેમીના ટુકડાને ૫૦૦૦ પીપીએમ (૫ ગ્રામ/લી. પાણી) આઈબીએ ના દ્રાવણમાં ડૂબાડીને લગાવવાથી વધારે સફળતા મળે છે. (**Action:** Principal, College of Horticulture, SDAU, Sardarkrushinagar)
12.4.4.7	**Effect of GA_3 and time of seed soaking on germination of sandalwood (*Santalum album* L.) in plug tray under control condition.**
	Sandalwood growers and nurserymen are advised to soak the seeds with 500 ppm (0.5 g/l water) gibberellic acid (GA_3) for 24 hours to get better germination under control condition. ચંદન ઉગાડતા ખેડૂતો અને નર્સરીધારકોને ભલામણ કરવામાં આવે છે કે ચંદનના બીજને ૫૦૦ પીપીએમ (૦.૫ ગ્રામ/લી. પાણી) જીબ્રેલીક એસીડ (જીએ૩) ના દ્રાવણમાં ૨૪ કલાક સુધી ડુબાડી રાખીને ગ્રીનહાઉસમાં પ્લગ ટ્રેની અંદર વાવવાથી બીજનો ઉગાવો સારો થાય છે. (**Action:** Principal, College of Horticulture, SDAU, Sardarkrushinagar)

B. RECOMMENDATION FOR SCIENTIFIC COMMUNITY

NAVSARI AGRICULTURAL UNIVERSITY

12.4.3.1	**Investigation on tree ring analysis (Dendrochronology) to monitor radial growth responses of teak to climate in South Gujarat**
	It is informed to the scientific community and state forest department that the mean ring-width-index chronologies of teak developed for Navsari from AD 1991-2015, Valsad from AD 1867-2012 and Dang from 1912-2012 of South Gujarat are useful in reconstruction of past climate mainly the rainfall patterns during drought years. Furthermore, it also indicates the major El Niño and drought years of India. These ring-width-index chronologies developed for the particular time periods at the three sites are also helpful in determining the unknown year in

	which the teak tree was felled. (**Action**:- Principal, College of Forestry, NAU, Navsari)
12.4.3.2	**Effect of different tree species leaf leachate on germination and seedling growth of some vegetable crops**
	The leaf leachates of various tree species reduced germination and growth parameters of different vegetable crops in laboratory as well as in nursery condition. The percentage of inhibition was maximum in Eucalyptus as compared to other tree species leaf leachates in laboratory as well as in nursery condition. Moreover the percentage of inhibition was minimum in Teak. The different vegetable crops have different mode of inhibition during the study. In both the growing conditions Brinjal (*Solanum melongena*), Okra (*Abelmoschus esculentus*) and Tomato (*Lycopersicon esculentum*) performed better for all parameters under study for the respective years of investigation while, V_5: Chilli (*Capsicum anum*) performed poor for all the parameters under study. In case of leachates concentration, all the parameters under study were decreased as the concentration of leaf leachates increased in both the growing conditions. This response showed concentration dependent phenomenon as highest inhibitory effects were observed with 20 % leaf leachate concentration of all the tree species. (**Action**:- Principal, College of Forestry, NAU, Navsari)

SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

12.4.4.1	**Effect of various levels of IBA on rooting in semi-hard wood cutting of Olive (*Olea europaea*) under net house conditions.**
	It has been observed that semi hard wood cutting of olive treated with 2500 to 3000 ppm solution of IBA and planting in cocopeat gives maximum survival percentage under net house condition. (**Action:** Research Scientist, Agroforestry Res. Station, SDAU, Sardarkrushinagar)

NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERSITY

Sr. No	Title/ centre	Suggestions	Remarks
	Centre : - Department of Horticulture, BACA, AAU		
1	Effect of different organics manures on growth, yield and quality of sapota (*Manilkara achras* L.)	Accepted with following suggestion/s 1. Mention Canopy volume in observations to be recorded 2. Recast the title "Effect of different organic manures and PGPR consortium on growth, yield and quality of sapota (*Manilkara achras* L.) cv. Kalipatti" 3. Recast objectives (Action : - Professor & Head (Horticulture), BACA, AAU, Anand	
2	High density plantation and canopy management in mango cv. Kesar	Accepted with following suggestion/s 1. Experiment should be laid out in *In situ* planting (Action : - Professor & Head (Horticulture), BACA, AAU, Anand	
3	High density plantation and prunning in guava cv. Allahabad Safeda	Accepted with following suggestion/s 1. Remove T_3 treatment from treatments (May, February)	

		(Action : - Professor & Head (Horticulture), BACA, AAU, Anand	
4	Effect of different plant spacing on growth & yield of capsicum under open ventilated poly house cv. Arka Gaurav/IIHR variety	Accepted with following suggestion/s 1. Remove cvs. from title and name of variety in Experimental details (IIHR variety/ Indra) (Action : - Professor & Head (Horticulture), BACA, AAU, Anand	
Centre : College of Horticulture (Wing), BACA, AAU, Anand			
5	Nutrient management through organics in onion as intercrop in sapota orchard	Accepted with following suggestion/s 1. Total sugar in observations to be recorded instead of Total soluble sugar (%) (Action : - Professor and OSD Horticulture college, AAU, Anand)	
Centre : TRTC, AAU, Devgadh Baria			
6	Nutrient management through fertigation on green fruit yield of chilli (*Capsicum annuum* L.) under middle Gujarat conditions	Accepted as such (Action : - Research scientist, TRTC, AAU, Devgadh Baria	

JUNAGADH AGRICULTURAL UNIVERSITY

Sr. No.	Title/Centre	Suggestions	Remarks
	Centre: Department of Horticulture, JAU, Junagadh		
1	Effect of various concentrations of multi micronutrients (Grade-IV) on growth, yield and quality in pomegranate (*Punica granatum* L.) cv. Bhagavo.	Accept with following suggestions 1. Remove number of aril per fruit and Fresh and dry weight from observations 2. Add physiological disorder (Fruit Cracking) in observations 3. Correct name of cultivar write Bhagava **(Action:** Professor and Head, Dept. of Horticulture, JAU, Junagadh)	
2	Evaluation of different varieties of guava and its genotypes under meadow plantation.	Accept with following suggestions 1.Recast title (HDP instead of Meadow) 2. Remove locules / pulp weight observation from observations **(Action:** Professor and Head Dept. of Horticulture, JAU, Junagadh)	
3	Effect of polyamines on storage life of mango (*Mangifera indica* L.) cv. Kesar	Accept with following suggestions 1. Recast the title – Effect of polyamines on quality and shelf life of mango (*Mangifera indica* L.) cv. Kesar 2. Shelf life instead of storage life in observations. **(Action:** Professor and Head, Dept. of Horticulture, JAU, Junagadh)	
	Centre: Agricultural Research Station, JAU, Mahuva		
4	Feasibility of organic farming in pomegranate (*Punica granatum* L.) under	Accept with following suggestions 1. Remove inorganic word from	

	saline water irrigation condition.	objectives 2. Correct name of cultivar Bhagava **(Action:** Res. Sci., ARS, JAU, Mahuva)	

NAVSARI AGRICULTURAL UNIVERSITY

Sr. No.	Title/Centre	Suggestions	Remarks
	Centre:- ASPEE College of Horticulture and Forestry, Navsari		
1	Pheno-physiological studies on regular and biennial bearing of mango	Accepted with following suggestion/s 1. Add Alphanso in biennial bearer 2. Remove No. of panicles / tree and flowering intensity from observations. (Action:-Professor & Head (Fruit Science), ACHF, NAU, Navsari)	
2	Effect of growth regulators on flowering and yield of sapota cv. Kalipatti	Accepted with following suggestion/s 1. Add GA_3 @ 100 mg/l as per previous recommendation (Control) 2. Remove S_4 and S_8 treatments from treatments (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
3	Response of media, fertilizer and chemicals application on growth of mango rootstock	Accepted with following suggestion/s 1. Remove C : N Ratio (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
4	Effect of foliar application of fertilizers on yield and quality of sapota cv. Kalipatti.	Accepted with following suggestion/s 1. Add high density rejuvenate word in title 2. Take treatment T_4, T_5 and T_6 and its combinations. (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
5	Feasibility of planting and pruning intensity of meadow orchard in guava cv. Lalit	Accepted with following suggestion/s 1. Add incidence of pest and diseases in observations. (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
6	Impact of pre-soaking treatments on germination and growth of mango (*Mangifera indica* L.) stones	Accepted with following suggestion/s 1. Take S_8 treatment as a common treatment 2. Design CRD 3. take stone of Kesar cultivar (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	

7	Evaluation of different biofertilizers with graded chemical fertilizers for nutrient management in papaya var. Red Lady Taiwan.	Approved as Such (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
8	Intercropping studies under coconut orchard	Accepted with following suggestion/s 1. Remove Ber from treatments 2. Add Phalsa in treatments at a spacing of (1.25 x 1.25 m) (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
9	Effect of foliar application of plant growth regulators and novel organic liquid on growth, yield & quality of garlic (*Allium sativum* L.) var. GG-3	**Not Approved** (Action:-Professor & Head(Fruit Science), ACHF, NAU, Navsari)	
10	Effect of tip pruning and foliar application of KNO_3 on early flowering and yield of mango cv. Kesar	Accepted with following suggestion/s 1. Total treatment numbers (12+1 =13) (Action:-Principal Horticulture Polytechnic, ACHF, NAU, Navsari)	
11	Standardization of stage wise requirement of nutrients in sapota cv. Kalipatti	Approved as such (Action:- Associate Research Scientist, FRS, NAU, Gandevi)	
12	Evaluation of different rootstocks of mango for problematic soils	Accepted with following suggestion/s 1. Increase number of stones (3) per pit as *in situ.* (Action:- Research Scientist, AES, NAU, Paria)	
13	Varietal evaluation of different pineapple varieties under South Gujarat conditions	Accepted with following suggestion/s 1. Remove 4^{th} objective 2. Add Incidence of pest and diseases in observations (Action:- Research Scientist, AES, NAU, Paria)	
14	Effect of different organic sources on yield and quality of banana under certified organic farm.	Accepted with following suggestion/s 1. Two successive green manuring (Action:-Associate professor (Agril. Chemistry), Organic farming Unit, ACHF, NAU, Navsari	
15	Effect of organics and mineral sources on yield and quality of sapota [*Manilkara achras* (Mill.) Fosberg] cv. Kalipatti.	Accepted with following suggestion/s 1. Recast the title "Effect of organic and rock phosphate on yield and quality of sapota [*Manilkara achras* (Mill.) Fosberg] cv. Kalipatti." 2. In factor A - FYM @ 150 kg/tree instead of 200 kg/tree (Action:- Associate Professor (Horticulture), College of	

		Agriculture, NAU, Bharuch)	
16	Assessment of Genetic diversity in sweet potato [*Ipomoea batatas* (L.) Lam.]	House suggested to present in Crop Improvement Sub-committee (Action:-Prof. and Head (Vegetable Science) ACHF, NAU, Navsari)	
17	Genotypic × environment interaction and stability analysis for yield and quality components in Greater Yam (*Dioscorea alata* L.)		
18	Okra (YVMV) IET		
19	Tomato (Determinate) AVT-I		
20	Tomato (Determinate) AVT-II		
21	Tomato (Indeterminate) IET		
22	Chilli AVT – II		
23	Pumpkin AVT-I		
24	Bitter Gourd Hybrid- IET		
25	Bitter Gourd Hybrid- AVT-I		
26	Feasibility of tomato cultivation through grafting during rainy season Part 1: Evaluation of grafting techniques in tomato under NVPH Part 2: Comparative performance of grafts and non-grafts of tomato for growth, yield and related traits during rainy season	Accepted with following suggestion/s 1. Remove weight of grafted transplant from observations (Part 1) (Action:-Professor and Head (Vegetable Science), ACHF, NAU, Navsari)	
27	Response of musk melon (*Cucumis melo* L.) to different levels of N and K fertigation for yield and other horticultural traits under NVPH	Accepted with following suggestion/s 1. Year of commencement is 2016-17 2. Take popular variety among the farmers (Action:-Prof .and Head (Vegetable Science), ACHF, NAU, Navsari	
28	Preliminary Evaluation Trial (PET) on Tomato	House suggested to present in Crop Improvement Sub-committee (Action:-Professor and Head (Vegetable Science) ACHF, NAU, Navsari)	
29	Preliminary Hybrid Trial (PHT) on Tomato-I		
30	Preliminary Hybrid Trial (PHT) on Tomato-II		
31	Multi-location Trial (MLT) on Tomato		
32	Preliminary Evaluation Trial (PET) on Brinjal		
33	Preliminary Hybrid Trial (PHT) on Brinjal		
34	Preliminary Hybrid Trial (PHT) on Okra		
35	Collection and evaluation of cucumber (*Cucumis sativus* L.) genotypes suitable for cultivation in Southern Gujarat region		

36	Collection and Maintenance of Elephant Foot Yam (*Amorphophallus paeoniifolius*) germplasms for Evaluation as well as Selection of Superior Genotypes suitable for cultivation in Southern Gujarat region		
37	Assessment of bush type Frenchbean (*Phaseolus vulgaris*) varieties suitable for the Dangs district.		
38	Organic farming in Capsicum (*Capsicum annum* L.) under protected condition.	Accepted with following suggestion/s 1. Correct the commencement year 2016-17 (Action:- Assoc. Prof. (Ag. Chem.), Organic Farm, NAU, Navsari	
39	Organic Farming in Pointed Gourd (*Trichosanthes dioica* Roxb.).	Accepted with following suggestion/s 1. Add observation of wilt incidence 2. Days to first picking instead of days to 50 % flowering (Action:- Assoc. Prof. (Ag. Chem.), Organic Farm, NAU, Navsari	
40	Standardization of soil less media for brinjal plug tray nursery	Accepted with following suggestion/s 1. Add Survival % in observations (Action:- Principal Horticulture Polytechnic, AES, Paria)	
41	Induction of variability in spider lily (*Hymenocallis littorallis*) through chemical mutagens	Accepted with following suggestion/s 1. Mention cytological study in detail (Action:- Assoc. Prof. (Floriculture), ACHF, NAU, Navsari)	
42	Induction of variability in spider lily (*Hymenocallis littorallis*) through colchicine treatment	Accepted with following suggestion/s 1. Mention cytological study in detail (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
43	Integrated nutrient management in rose (*Rosa chinensis* L.)	**Approved as such** (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
44	Collection and evaluation of local turfgrass germplasm of Gujarat	Accepted with following suggestion/s 1. Include seasonal effect in observation 2. Take Quality attributes of trfgrass in relation to season (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
45	Testing of new genotypes of China aster.	Approved as such (Action:- Associate Professor	

		(Flori.), ACHF, NAU, Navsari)	
46	Standardization of packing techniques for flower strings of marigold.	Accepted with following suggestion/s 1. Correct Commencement of year 2016-17 (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
47	Standardization of postharvest treatment using boric acid and sodium benzoate for improving postharvest life of loose flowers of tuberose.	Approved as such (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
48	Studies on use of food dyes for tinting in tuberose stems.	Accepted with following suggestion/s 1. Remove Control No-Dipping from factor -2 2. Correct Commencement of year 2016-17 (Action:- Assoc. Prof. (Floriculture), ACHF, NAU, Navsari)	
49	Standardization of soilless based growing media for different varieties of potted *Euphorbia milli*	Approved as such (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
50	Influence of different seasons on plant growth, flower production and flower quality in rose variety "Top Secret" in soilless culture under protected condition.	Accepted with following suggestion/s 1.Mention "First week of every month" in case of treatments (Action:- Associate Professor (Flori.), ACHF, NAU, Navsari)	
51	Standardization of Grafting Technique in Adenium	Accepted with following suggestion/s 1. Add Incremental height of scion in observations (Action:- Associate Professor (Flo.), ACHF, NAU, Navsari)	
52	Response of PGRs and cutting methods on vegetative growth of different varieties of bougainvillea (*Bougainvillea* spp.).	**Not Approved** (Action:- Professor (Horticulture), NMCA, NAU, Navsari)	
53	Response of different varieties and growing media on growth and yield of gladiolus (*Gladiolus grandiflorus* L.) in pot culture.	**Not Approved** (Action:- Associate Professor (Horticulture), College of Agriculture, Bharuch)	
54	Management of leaf blight of gerbera under poly house condition	Approved as such and present in Plant Protection Sub Committee (Action:- Associate Professor (Plant Pathology), ACHF, NAU, Navsari)	

55	Effect of chemicals on vase life of Gerbera cut flower Var. Tera Juba.	Accepted with following suggestion/s 1. Number of bend flowers instead of stem curvature in observations 2. Flower appearance as per RHS colour chart (Action:- Principal, Horticulture Polytechnic, AES, Paria)	
56	Standardization of technology for preparation of Aloe vera based vermicelli	Accepted with following suggestion/s 1. Increase size of sample 250 g instead of 100 g (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
57	Standardization of technology for minimal processing of fresh cut cauliflower (*Brassica oleracea* var. botrytis L.). Experiment – 1: To study the effect of blanching and Calcium chloride ($CaCl_2$) on texture of minimally processed cauliflower Experiment – 2 : To study the effect of citric acid and KMS on quality of minimally processed cauliflower.	Approved as Such (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
58	Standardization of technology for minimal processing of fresh cut potatoes (*Solanum tuberosum* L.)	Approved as Such (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
59	Standardization of technology for preparation of candy from ripe papaya (*Carica papaya* Linn.) fruits.	Approved as Such (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
60	Standardization of technology for preparation of Tomato (*Solanum lycopersicum* L.) powder for home scale adoption	**Not approved** (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
61	Development of technology for preservation of tender coconut water	**Not approved** (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
62	Development of technology for health based digestive tablets from noni pomace powder.	Accepted with following suggestion/s 1. Remove health based word from the title (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
63	Characterization of the Sapota seed oil for extraction and value addition	**Not Approved** (Suggested to take filler trial) (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
64	Home scale ripening of Banana cv. Grand Naine	Approved as Such (Action:- Research Scientist,	

		SWMRU, NAU, Navsari)	
65	Effect of pre-cooling on quality and shelf-life of Banana Cv. Grand Naine	**Not approved** (Action:- Associate Professor & Head, PHT, NAU, Navsari)	
66	Isolation, Characterization and filed efficacy of PGPRs from different banana cultivars	Approved in Basic Science Committee (Action:-Associate Professor, Department of Plant Molecular Biology and Biotechnology, ACHF, NAU, Navsari)	
67	Determination of Nutritional Composition of Minor Fruits	Accepted with following suggestion/s 1. Remove Chironji from crop and variety (Action:- I/C Professor & Head (FQTL), NAU, Navsari)	
68	Determination of critical limit of water salinity for *Ailanthus excelsa* Roxb. Seedlings	Accepted with following suggestion/s 1. Add local name of *Ailanthus excelsa* also in title 2. Add ESP in observation (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
69	Development of volumetric equation for Teak (*Tectona grandis* L.) in South Gujarat	Accepted with following suggestion/s 1. Write derivation instead of development in title. (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
70	Seed source variation for seed traits, germination and seedling vigour in *Cinnamomum verum* J. Presl	Accepted with following suggestion/s 1. Also collect possible accessions from FRS, Gandevi (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
71	Metagenomic analysis of flooded rice ecosystem under climate change resilience	Not approved* 1. Present in Basic Science sub committee (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
72	Evaluation of various *Poplar* clones for early Growth and Establishment under South Gujarat condition	Approved as such (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
73	Evaluation of different *Salix* clones for early Growth and Establishment under South Gujarat condition	Approved as such (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	

74	Emission of N_2O and CH_4 from forests soils.	Accepted with following suggestion/s 1. Add Co_2 in observation (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
75	Effect of different seed treatment and media on growth of Indian Cheese Maker - *Withania coagulans* (Stocks) Dunal	Approved as such (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
76	Documentation of basic density and calorific value of different tree species of South Gujarat.	Approved as such (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
77	Growth assessment of various kinds of fishes in fresh water.	Not Approved* Present this programme in Animal Science and Fisheries sub committee (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	
78	Establishment of plantations of minor fruit species for PG research	**Not Approved** (Action:-Principal, College of Forestry, ACHF, NAU, Navsari)	

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S.N.	Title/ Centre	Suggestions	Remarks
1	Evaluation of different propagules of pomegranate for its biotic stress.	1 **Not Approved** (**Action:** Principal, College of Horticulture, SDAU, Sardarkrushinagar)	
2	Evaluation of different filling medias for offshoot of Date palm	Accepted with following suggestion/s 1.Take Variety Barhee instead of Elite – 63 II 2. Remove treatment No. 3 and 9 (**Action**: Assoc. Res. Sci. DPRS, Mundra)	
3	Evaluation of different pollen mixtures (with inert materials) on fruit set and yield of date palm cv. Barhee/ Halawy	Approved as such (**Action**: Assoc. Res. Sci. DPRS, Mundra)	
4	Growth and biomass productivity of *Melia azadirach* in different densities in agroforestry system	Accepted with following suggestion/s 1. Write spacing as per treatment 2. Correct plot size (**Action:** Research Scientist, Agroforestry Res. Station, SDAU, Sardarkrushinagar)	
5	Eveluation of Melia varieties under agroforestry system for biomass production under North Gujarat conditions	Accepted with following suggestion/s 1.Write species word in title instead of varieties (**Action:** Research Scientist, Agroforestry Res. Station, SDAU, Sardarkrushinagar)	
6	Fertilizer management in five year old olive (*Oleae europaea* L.)	Accepted with following suggestion/s 1. Remove five year old word from title 2. Mentioned age of plant in treatment details (**Action:** Research Scientist, Agroforestry Res. Station, SDAU, Sardarkrushinagar)	
7	High density planting in	Accepted with following suggestion/s	

	organic guava	1.Mention about pruning methodology 2.Mention about bahar in methodology (**Action:** Asstt. Res. Sci., FRS, SDAU, Dehgam)	
8	High density planting in organic Mango	Accepted with following suggestion/s 1. Mention about pruning in methodology 2. Design FRBD (**Action:** Asstt. Res. Sci., FRS, SDAU, Dehgam)	

12.5 AGRICULTURAL ENGINEERING, AIT, DAIRY AND FOOD TECHNOLOGY DAIRY SCIENCE AND FPT & BE/AGRIL. ENGINEERING

Chairman	Dr. N C Patel, Hon. VC, AAU, Anand
Rapporteurs	Dr. P K Shrivastava, NAU, Navsari and Dr. R V Prasad, AAU, Anand

The details of recommendations and new technical programmes presented, discussed and approved during the session are as under

Departments/ Discipline	No. of Recommendations				No. of New Technical Programmes	
	Farmer / Industry		Scientific Community			
Universities	**Proposed**	**Approved**	**Proposed**	**Approved**	**Proposed**	**Approved**
AAU	24	24	14	14	41	39
JAU	5	4	3*	4*	8	8
NAU	9	4	1	1	27	23
SDAU	0	0	0	0	10	10
Kamdhenu	0	0	0	0	1	1
Grand Total	**43**	**37**	**18***	**19***	**87**	**81**

*One recommendation proposed for farmer community is approved for scientific community

12.5.1 RECOMMADATIONS

A - FARMING / INDUSTRY COMMUNITY

ANAND AGRICULTURAL UNIVERSITY

12.5.1.1 Development and evaluation of a multipurpose tool bar for mini tractor suitable for the cropping pattern of middle Gujarat region

A mini tractor (15-20 HP) drawn multipurpose tillage tool developed by Anand Agricultural University is suitable for seed bed preparation at wapsa conditions under sandy loam soil of Middle Gujarat Agro-climatic zone in a single operation. The implement consisting of iron ploughs for tillage and clod crusher for breaking clods is useful for preparation of seed bed in a single pass with a saving of upto 50% in the cost of operation as compared to the cultivator. Therefore it is recommended for farmers of the region to prepare the seedbed by using the developed implement.

આણંદ કૃષિ યુનિવર્સિટી દ્વારા મીની ટ્રેક્ટરથી (૧૫-૨૦ હો.પા.) ચાલતું ખેડ કરવા માટેનું બહુલક્ષીય સાધન વિકસાવવામાં આવ્યુ છે જેના વડે મધ્ય ગુજરાત એગ્રો ક્લાઇમેટીક ઝોનમાં આવેલ ગોરડું જમીનમાં વરાપની અવસ્થાએ એકીસાથે વાવણી લાયક જમીન તૈયાર કરી શકાય છે અને કલ્ટીવેટર કરતાં ખર્ચમાં આશરે ૫૦ ટકા જેટલી બચત થાય છે. આ સાધનમાં ખેડ માટે લોખંડના હળ તેમજ ઢેફા ભાંગવા માટે ક્લોડ ક્રશર લગાડવામાં આવ્યા છે જેથી એકજ ઓપરેશનમાં વાવણી લાયક જમીન તૈયાર થતી હોવાથી ખેડૂતોને આ સાધનનો ઉપયોગ કરવા ભલામણ કરવામાં આવે છે.

(Action: PI/HOD/Principal, CAET, Godhra)

12.5.1.2 Modification of three point linkage system of medium tractor drawn sowing machine to operate by mini tractor

By modifing the three point hitching system of the sowing machines designed for medium size tractor (35-40 HP) it can be easily operated by the mini tractor (15-20 HP) and saving upto 20 % in sowing operation can be achieved as compared to the medium sized tractor. A 100 kg front ballasting in the mini tractor will be required. The manufacturers of the seed drill are advised to

follow the hitching specifications given below for fabrication of the new seed drill so that the machine can be operated by the mini tractor also : (1) Maximum distance between lower hitching points have to be set in the range of 60-70 cm and (2) Vertical distance between top hitching point and lower hitching point have to be set in the range of 50-60 cm.

મધ્યમ સાઈઝના ટ્રેક્ટરથી (૩૫-૪૦ હો.પા.) ચાલતા વાવણી યંત્રોંના થ્રી પોઈન્ટ હિચિંગ સિસ્ટમમાં ફેરફાર કરવાથી આ જ વાવણી યંત્રોને મીની ટ્રેક્ટરમાં (૧૫-૨૦ હો.પા.) આગળ ના ભાગે ૧૦૦ કિલો વજન મૂકી (ફ્રન્ટ બાલાસ્ટિંગ કરી) સહેલાઇથી ચલાવી શકાય છે. આમ વાવણી ના ખર્ચમાં પણ મધ્યમ ટ્રેક્ટર થી ચાલતા વાવણી ના યંત્રો કરતાં આશરે ૨૦ ટકા જેટલી બચત કરી શકાય. ટ્રેક્ટરથી ચાલતા વાવણી માટે ના યંત્રોં ના ઉત્પાદકોને સલાહ આપવવામાં આવે છે કે વાવણી ના યંત્રોનું હિચિંગ નીચે આપેલ માપ મુજબ રાખવામાં આવે તો મધ્યમ ટ્રેક્ટર દ્વારા સંચાલિત વાવણી યંત્રોંને મીની ટ્રેક્ટરથી પણ ચલાવી શકાય: (૧) લોઅર હિચિંગ પોઈન્ટ વચ્ચે મહત્તમ ૬૦ - ૭૦ સેમી. નું અંતર અને (૨) ટોપ હિચિંગ પોઈન્ટ અને લોઅર હિચિંગ પોઈન્ટ વચ્ચે વર્ટિકલ અંતર ૫૦ - ૬૦ સેમી. રાખવાની ભલામણ કરવામાં આવે છે.

(Action: PI/HOD/Principal, CAET, Godhra)

12.5.1.3 Development and evaluation of mini tractor drawn semi automatic potato planter

A mini tractor (15-20 hp) drawn two row semi-automatic potato planter developed by AAU is recommended for the farmers for planting the potato crop. The planter places the potato tubers and fertilizer at appropriate depths in a single operation. In the planter the distance between two rows (45-70 cm) can be adjusted as per requirement. The use of this planter with mini tractor will save about 40% cost of the potato planting as compared to the medium size tractor (35-40 hp) operated planter. The cost of the planter is estimated as Rs. 26000/-

આણંદ કૃષિ યુનિવર્સિટી દ્વારા મીની ટ્રેક્ટરથી (૧૫-૨૦ હો.પા.) ચાલતું બે ચાસવાળું સેમી ઓટોમેટિક બટાટા ની વાવણી કરવાનું મશીન વિકસાવવામાં આવેલ છે. જેનો બટાટાના પાક ઉગાડતા ખેડૂતોને ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ પ્લાન્ટરથી બટાટાની વાવણી અને ખાતરની ઓરણી યોગ્ય ઉંડાઈએ એકી સાથી થાય છે. આ પ્લાંટર થી બે ચાસ વચ્ચેનું અંતર જરૂરિયાત મુજબ (૪૦-૭૦ સેમી) ગોઠવી શકાય છે. આ પ્લાંટરનો ઉપયોગ કરવાથી મધ્યમ સાઇઝના ટ્રેક્ટર (૩૫-૪૦ હો.પા.) થી ચાલતા પ્લાંટર કરતાં વાવણીના ખર્ચમાં આશરે ૪૦ ટકા જેટલી બચત થાય છે. આ પ્લાંટરની અંદાજીત કિંમત રૂ. ૨૬૦૦૦ જેટલી થાય છે.

(Action: PI/HOD/Principal, CAET, Godhra)

12.5.1.4 Design and Development of a Throat Type Up Draft Biomass Gasifier For Thermal Application

The throat type updraft biomass gasifier developed by AAU is recommended for thermal applications at community kitchen, restaurants, dhabas and similar establishments owners who are interested in shifting to biomass gasifier system. The developed gasifier can be successfully operated using maize cobs, sized wood and saw dust briquettes. Maize cob is found more suitable for throat type updraft gasifier as compared to other two fuels. The newly developed gasifier remains about 50% cheaper in operation as compared to that by LPG system.

સામુહિક રસોડા, હોટલ તથા ઢાબા જેવી સંસ્થાઓના સંચાલકોને આણંદ કૃષિ યુનિવર્સીટી દ્વારા વિકસાવાયેલ મકાઈના લાટિયા, લાકડાના ટુકડા અને લાકડાના વેરની બ્રિકેટસ ઉપર ચાલતા થ્રોટ ટાઇપ અપડ્રાફ્ટ બાયોમાસ ગેસીફાયરનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ ગેસીફાયરના ઉપયોગથી એલ.પી.જી. ગેસની સરખામણીએ ૫૦ ટકા સુધીનો બળતણ ખર્ચ બચાવી શકાય છે તથા મકાઈના લાટિયા બીજા બળતણ કરતા વધારે

અનુકુળ છે.

(Action : HOD, Dept. of REE, CAET, AAU, Godhra)

12.5.1.5 Development of Mobile based application for farmers

Anand Agricultural University has started "i-khedut" mobile application. This application provides packages of practices and animal husbandry related information in Gujarati language and hence recommended to use by Farmers of Gujarat.

આણંદ કૃષિ યુનિવર્સીટી દ્વારા i-Khedut મોબાઈલ અપ્લિકેશન શરૂ કરવામાં આવેલ છે. આ એપ્લિકેશન દ્વારા વૈજ્ઞાનિક પાક પદ્ધતિ (વૈજ્ઞાનિક ખેતી પદ્ધતિ) તથા પશુપાલનને લગતી માહિતી ગુજરાતી ભાષામાં ઉપલબ્ધ કરાવતી હોઈ ગુજરાત રાજ્યના ખેડૂતોને તેના ઉપયોગ કરવા ભલામણ કરવામાં આવે છે.

(Action: PI / Director IT, Anand)

12.5.1.6 Edible coating material for extending the shelf life of tomato fruit

Farmers, Entrepreneurs and Agro-processing units involved in post-harvest handling of tomato fruits are advised to use the technology of edible coating developed by AAU, for extension of shelf life. For storage of pre-breaker stage tomatoes at ambient conditions ($27\pm3^{o}C$) the coating formulation of Bee wax 20%, oleic acid 2%, sodium hydroxide 4%, glycerol monostearate 1%, remaining 73% hot distilled water is recommended which will extend shelf life by 24 days. For low temperature storage ($15\pm2^{o}C$), the coating formulation comprising of Bee wax 20%, mineral oil 15%, oleic acid 2%, sodium hydroxide 4%, glycerol monostearate 1 %, remaining 58% hot distilled water is recommended which will extend the shelf life of tomatoes by 15 days compared to non-coated tomatoes stored at same temperature.

ટામેટાની ખેતી અને તેના વ્યવસાય સાથે સંકળાયેલા ખેડૂતો તેમજ ઉદ્યોગકારોને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવવામાં આવેલ ટામેટાને કોટિંગ કરી લાંબા સમય સુધી જાળવી રાખવા માટેની તકનીકના ઉપાયોગની ભલામણ કરવામાં આવે છે. સામાન્ય તાપમાને (૨૭±૩ ^{0}C) અર્ધ પરિપકવ ટામેટા સંગ્રહ કરવા, ૨૦% બી-વેક્સ ,૨ %ઓલિક એસિડ ,૪% સોડીયમ હાઈડ્રોકસાઈડ અને ૧ %ગ્લીસરોલ મોનોસ્ટીયરેટનું સંયોજન બનાવી તેમાં બાકીનું ૭૩ % ગરમ પાણી ઉમેરીને ટામેટા ઉપર કોટિંગ કરવાથી ૨૪ દિવસ વધારે સાચવી શકાય છે. ઓછા તાપમાને (૧૫±૨^{0}C) ટામેટ સંગ્રહ કરવા ૨૦ %બી-વેક્સ ,૧૫% મિનરલ ઓઈલ ,૨% ઓલિક એસિડ ,૪% સોડીયમ હાઈડ્રોકસાઈડ અને ૧ %ગ્લીસરોલ મોનોસ્ટીયરેટનું સંયોજન બનાવી તેમાં બાકીનું ૫૮% ગરમ પાણી ઉમેરીને કોટિંગ કરવાથી ૧૫ દિવસ વધારે સાચવી શકાય છે.

(Action:- HOD, Department of PHE, FPT & BE, AAU, Anand)

12.5.1.7 Biodiesel conversion technology

Entrepreneurs interested in producing biodiesel from sunflower oil and cottonseed oil are advised to use the biodiesel conversion technology developed by AAU, Anand. The process involves transesterification with methanol in presence of specific catalyst (Sodium hydroxide) under controlled reaction followed by separation of glycerol and other downstream processes.

સૂર્યમુખીના તેલ અને કપાસીયાના તેલમાંથી બાયોડીઝલ બનાવવામાં રસ ધરાવતા ઉદ્યોગ સાહસિકોને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ તકનીકનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ તકનીકમાં ખાસ ઉદ્વીપકની (સોડીયમ હાઇડ્રોકસાઈડ) હાજરીમાં, મીથેનોલ સાથે ટ્રાન્સએસ્ટરીફીકેશન કરી ગ્લીસરોલ છૂટા પાડવાની અને તેના પછીની પ્રક્રિયાઓનો સમાવેશ થાય છે.

(Action:- HOD, Department of PHE, FPT & BE, AAU, Anand)

12.5.1.8 **Design and development of a multi-chamber equipment for online measurement of**

rate of respiration of fruits and vegetables

Entrepreneurs and instrument manufactures interested in online measurement of rate of respiration of fruits and vegetables or equipment for above purpose are advised to use the design of multi-chamber equipment for online continuous measurement of respiration rate developed by AAU, Anand. The system is quick, accurate, versatile and user friendly for continous determination of the rate of respiration under varying storage environments for different fruits and vegetables.

ફળ અને શાકભાજીનાં શ્વસન દરને ઓનલાઇન માપવામાં રસ ધરાવતા ઉદ્યોગકારો અને/અથવા તેને માપવા માટેના યંત્રો બનાવનાર ને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિક્સાવેલ મલ્ટી ચેમ્બર યંત્રની ડીઝાઇનનો ઉપયોગ કરવા ભલામણ કરવામાં આવે છે. આ યંત્ર દ્વારા ફળ અને શાકભાજીને જુદા- જુદા વાતાવરણમાં તેના શ્વસન દરને સરળ રીતે, ઝડપથી અને ચોક્કસાઇ પૂર્વક ઓનલાઈન માપી શકાય છે.

(Action:- HOD, Department of PHE, FPT & BE, AAU, Anand)

12.5.1.9 Development of osmotically dehydrated whole aonla fruits

The entrepreneurs and fruit processors interested in production of osmotically dehydrated whole

Aonla are advised to use processing technology developed for the purpose by AAU, Anand. The technology involves ultrasonication, osmotic dehydration in sugar syrup (58^0 Brix) followed by hot air drying and results in good quality whole sweetened dehydrated Aonla. Final product packed in HDPE (200 gauge) bags can be stored at ambient storage condition (27±2°C, 65% RH) for six months.

આખા આમળાની કેંડીનું ઉત્પાદન કરવામાં રસ ધરાવતા સાહસિકો અને ઉદ્યોગકારોને આણંદ કૃષિ યુનિવર્સિટી ધ્વારા વિકસાવવામાં આવેલ ટેકનોલોજીનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ પધ્ધતિમાં સારી ગુણવતાના આખા આમળાની કેંડી બનાવવા અલ્ટ્રાસોનીકેશન, ખાંડની ચાસણી (૫૮^0 બ્રિકસ) ધ્વારા ઓસ્મોટીક ડીહાઇડ્રેશન અને મીકેનીકલ ડ્રાયર ધ્વારા સુકવણી કરવામાં આવે છે. આ પધ્ધતીથી બનાવેલ આખા આમળાની કેંડીને એચડીપીઈ (૨૦૦ ગેજ) પેકેજીંગમાં ૬ મહિના માટે સંગ્રહ (૨૭±૨°C, ૬૫% આરએચ) કરી શકાય છે.

(Action:- HOD, Department of FPT, FPT & BE, AAU, Anand)

12.5.1.10 Production technology for superior quality malt flour from moth bean

The entrepreneurs and food processors interested in manufacture of malt based products are advised to adopt the production technology of mothbean malt developed at AAU, Anand. The technology involves soaking and germination of mothbean for 12 and 36 h, respectively, followed by drying at 60˚C and milling. This process reduces the anti-nutrients thereby improving the assimilable nutrients (proteins, carbohydrates and minerals) in malted mothbean.

માલ્ટ આધારિત ઉત્પાદનો બનાવવામાં રસ ધરાવતા ઉદ્યોગ સાહસિકો અને ઉત્પાદકો ને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ મઠ માંથી માલ્ટ બનાવવાની પધ્ધતિ અપનાવવાની ભલામણ કરવામાં આવે છે. આ પદ્ધતિમાં મઠ ને ૧૨ કલાક પલાળી અને ૩૬ કલાક ફણગાવ્યા બાદ તેને ૬૦˚સેં સુકવીને દળવામાં આવે છે. આ રીતે બનાવેલ મઠનો માલ્ટ પૌષ્ટિક તત્વો (પ્રોટીન, કાર્બોહાઈડ્રેટ અને મીનરલ્સ) નું પ્રમાણ સુધારે છે તથા પ્રતિ-પોષક તત્વો નું પ્રમાણ ઘટાડે છે.

(Action:- HOD, Department of FPT, FPT & BE, AAU, Anand)

12.5.1.11 Supercritical fluid extraction of carotenoid from vacuum dried pumpkin powder

The entrepreneurs and food processors interested in production of carotenoids from pumpkin powder are advised to use supercritical extraction technology developed by AAU, Anand. This technology involves extraction of carotenoid from vacuum dried pumpkin powder using

blanching, sulphitation, drying, sieving and super critical fluid extraction using CO_2 at controlled pressure and temperature. The process enables to achieve the maximum yield of solvent-free carotenoid (0.6 g/100 g) having higher β-carotene content (151.47 mg/100 g). This extract is stable up to 45 days at -18°C temperature.

કોળા પાવડરમાંથી કેરોટીનોઈડનુ ઉત્પાદન કરવામાં રસ ધરાવતા, ફૂડપ્રોસેસિંગ સાથે સંકળાયેલા ઉદ્યોગ સાહસિકોને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ સુપરક્રિટિકલ એક્સ્ટ્રેક્સન દ્વારા નિષ્કર્ષણની ટેકનોલોજીનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ ટેકનોલોજીમાં કોળાને બ્લાન્ચિંગ, સલ્ફાઈટેશન અને શૂન્યાવકાશમાં સુકવીને ચાળ્યા બાદ મળેલ પાવડરને નિયંત્રિત દબાણે અને તાપમાને સુપરક્રિટિકલ એક્સ્ટ્રેક્સન કાર્બન ડાયોક્સાઈડ દ્વારા નિષ્કર્ષણ કરી કેરોટીનોઈડનુ ઉત્પાદન કરવામાં આવે છે, જે પરંપરાગત નિષ્કર્ષણ પદ્ધતિ કરતા શ્રેષ્ઠ છે. આ પદ્ધતિથી કેરોટીનોઇડ (૦.૬ ગ્રામ/ ૧૦૦ ગ્રામ) અને β-કેરોટિન (૧૫૧.૪૭ એમજી/ ૧૦૦ ગ્રામ) નુ મહત્તમ ઉત્પાદન પ્રાપ્ત કરી શકાય છે. આ રીતે મેળવેલ અર્કને -૧૮° સે. તાપમાને ૪૫ દિવસ સુધી સાચવી શકાયછે.

(Action:- HOD, Department of FPT, FPT & BE, AAU, Anand)

12.5.1.12 Development of High Protein Pumpkin Bar

The food processors interested in development of nutritious protein fortified pumpkin bar are advised to follow the protocol developed for this purpose by AAU, Anand. The technology involves addition of whey protein concentrate (5%), maltodextrin (0.1%) , pectin (0.2%) and citric acid (0.86%) to pumpkin pulp, cooking, drying and packaging of final product in metallized cast polypropylene (MPP).

જે ફૂડ પ્રોસેસરોને પૌષ્ટિક પ્રોટીન ફોર્ટિફાઇડ કોળાની બાર બનાવવામાં રસ હોય તેઓને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ પદ્ધતિનો ઉપયોગ કરવાની ભલામણ છે. આ ટેક્નોલોજીમાં વ્હે-પ્રોટીન કોન્સંટ્રેટ(૫%), માલ્ટોડેક્ષટ્રીન (૦.૧ %), પેક્ટિન (૦.૨%) અને સાઈટ્રિક ઍસિડ(૦.૮૬%) કોળાના પલ્પમાં નાખી, તેને પકવી, મેટલાઈજડ કાસ્ટ પોલિપ્રોપીલીનમાં(એમપીપી) પેકિંગ કરવામાં આવે છે.

(Action:- HOD, Department of FQA, FPT & BE, AAU, Anand)

12.5.1.13 Super critical fluid extraction of oleoresins from red chilli.

The entrepreneurs and food processors interested in production of oleoresins, capsaicin and pigment compounds from red chillies are advised to use supercritical extraction technology developed for this purpose by AAU, Anand. This technology involves better recovery of oleoresins (6.5%), capsaicin (2.2%) and pigment compounds having 16024 Nesslerimeter Colour Value (NCV) using drying, sieving and CO_2 supercritical fluid extraction at controlled pressure and temperature. The process results in superior quality oleoresins, capsaicin and pigment compounds as compared to conventional extraction methods.

લાલ મરચામાંથી ઓલિયોરેસિન, કેપ્સીસીન અને પીગમેંટ પદાર્થો બનાવવામાં રસ ધરાવતા ઉધોગ-સાહસિકો અને ફૂડ પ્રોસેસરોને આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ સુપરક્રિટિકલ ફ્લૂઈડ એક્સ્ટ્રેક્સન ટેક્નોલોજીનો ઉપયોગ કરવાની ભલામણ છે. આ ટેક્નોલોજી પ્રમાણે મરચાંની સુકવણી કરી તેનો પાઉડર બનાવી તેને ચાળી, નિર્ધારિત તાપમાને અને દબાણે સુપરક્રિટિકલ ફ્લૂઈડ એક્સ્ટ્રેક્સન કાર્બન ડાયોક્સાઈડ વડે કરવાથી ઓલિયોરેસિન (૬.૫%), કેપ્સીસીન(૨.૨%) અને પીગમેંટ પદાર્થો (નેસલેરીમિટર કલર વેલ્યુ - ૧૬૦૨૪) મેળવી શકાય છે. આ પદ્ધતિના ઉપયોગથી મળતા ઓલિયોરેસિન, કેપ્સેસીન અને પીગમેંટ પદાર્થો હાલ વપરાતી અન્ય પદ્ધતિઓ કરતાં

વધુ સારી ગુણવત્તાના હોય છે.

(Action:- HOD, Department of FQA, FPT & BE, AAU, Anand)

12.5.1.14 Use of Basil (Tulsi-leaves) as flavouring ingredient in the manufacture of ice cream

A technology for making acceptable basil flavoured ice cream is developed by Anand Agricultural University, Anand using basil juice (6% TSS) @ 6.0% or freeze dried basil powder (5% moisture) @ 1.0% in ice cream mix. Basil powder is preferred over basil juice.

આણંદ કૃષિ યુનિવર્સિટી દ્વારા સારી ગુણવત્તા યુક્ત તુલસી ફ્લેવર્ડ આઇસક્રીમ બનાવવાની પધ્ધતિ વિકસાવેલ છે. જેમા ૬% તુલસીનો રસ અથવા ૧% ફ્રીજ ડ્રાઈડ તુલસી પાવડરનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. વ્યાવસાયિક ઉપયોગ માટે ફ્રીજ ડ્રાઈડ તુલસી પાઉડર તુલસીનાં રસ કરતા સારૂ પરિણામ આપે છે.

(Action:- HOD, Department of DT, DSC, AAU, Anand)

12.5.1.15 Evaluating the effect of partial homogenization of milk on the quality of Mozzarella cheese

The technology developed by Anand Agricultural University for Mozzarella cheese making from partially homogenized milk enables obtaining product with higher yield, superior appearance and baking qualities, and greater cost returns compared to the one prepared from unhomogenized milk.

આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસિત આંશિક હોમોજીનાઈઝડ મોઝ્ઝરેલ્લા ચીઝ, હોમોજીનાઈઝ કર્યા વગરના મોઝ્ઝરેલ્લા ચીઝની સરખામણીમાં વધુ ઉત્પાદન , સારો દેખાવ, સારી બેકિંગ ગુણવત્તા અને વળતરની દ્રષ્ટિએ ચઢિયાતી છે.

(Action:- HOD, Department of DT, DSC, AAU, Anand)

12.5.1.16 Formulation of ready mix *carrot halwa* from dried carrot shreds

A technology to prepare Carrot *Halwa* ready-mix is developed by Anand Agricultural University using carrot shreds mixed with *Khoa* and Ghee, followed by drying under vacuum. The prepared Ready-mix for *Carrot Halwa* had a shelf-life of 45 and 30 days at 7±2°C and 30±2°C respectively when packed in Met-Polyester/Polyfilm pouches (85 µm) and packed under CO_2 environment. The ready-mix and water (85°C) in the proportion of 1:2 (w/v), along with sugar (28 - 36% by weight) can be mixed to get good quality carrot *Halwa*.

ગાજરના છીણ, માવો અને ઘી નો ઉપયોગ કરી બનાવેલ મીશ્રણને શૂન્યાવકાશમાં પુર્ણ સૂકવણી કરી "રેડી મીક્ષ" ગાજર હલવો બનાવવાની રીત આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવવામાં આવેલ છે. "રેડી મીક્ષ" ગાજર હલવા ને કાર્બન ડાયોક્સાઈડ ગેસ હેઠળ પ્લાસ્ટીકની થેલી (૮૫ µm) માં પેક કરી ફ્રીજના તાપમાને (૭±૨ °C) ૪૫ દિવસ અને સાધારણ તાપમાને (૩૦ ± ૨°C) ૩૦ દિવસ સુધી સાચવણી કરી શકાય છે. રેડી મીક્ષ અને પાણી (૮૫°C) 1:2 ના પ્રમાણમાં તથા ખાંડ ૩૦ થી ૩૬ % સુધી (જરુરીયાત મુજબ) ઉમેરી સારી ગુણવત્તા વાળો ગાજર હલવો બનાવી શકાય છે.

(Action:- HOD, Department of DPO, DSC, AAU, Anand)

12.5.1.17 Screening of qualitative tests for detection of adulterants in milk

Large numbers of qualitative tests for detection of adulterants in milk are reported in literature with wide procedural variations. Among all the test compared and evaluated at AAU, Anand following tests were found to give the best results and hence are suggested for practical application.

PART I Qualitative tests suggested for detection of adulterants in milk

Sr.	Adulterant	Test	Reported by

No.			
1	Detergent	Methylene blue	Paradkar *et al.* (2000), FSSAI (2015)
2	Urea	DMAB	Bector *et al.* (1998), Dixit (2012), Sharma *et al.* (2012), FSSAI (2015)
3	Ammonium salts	Phenol	Mittal & Roy (1976), Srivastava (2010), FSSAI (2015)
4	Glucose	Barfoed	Roy & Mittal (1977), Sharma *et al.* (2012), Dixit (2012), FSSAI (2015)
5	Sucrose	Seliwanoff (solid)	Sharma *et al.* (2012)
6	Maltodextrin	Iodine	Dairy Development Department of Maharashtra (2013)
7	Starch	Iodine	BIS (1960), Anon. (2006), Dixit (2012), Sharma *et al.* (2012)
8	Nitrate	Diphenylamine	FAO (1986)
9	Sulphate	Barium chloride	Sharma *et al.* (2012), FSSAI (2015)
10	Gelatine	Picric acid	Jacobs & Jaffe (1932), DGHS (2005), FSSAI (2015)
11	Formaldehyde	Leach	Williams & Sherman (1905), BIS (1961)
12	Hydrogen peroxide	*p*-Phenylenediamine	Draaiyer *et al.* (2009)
13	Neutralizers	Rosolic acid	DGHS (2005)
14	Borax & Boric acid	Turmeric paper	Anon. (2006), Dairyforall (2006), Singh *et al.* (2012), Dixit (2012)
15	Salicylic acid	Ferric chloride	Dixit (2012)
16	Benzoic acid	Ferric chloride	Singh *et al.* (2012), Dixit (2012)

Note: For sodium chloride, potassium chromate test needs modification to increase the test accuracy for detection (Anon. 2006, Dairyforall 2006, Anon. 2009, Srivastava 2010, Singh *et al.* 2012, Dixit 2012, Sharma *et al.* 2012, Kamthania *et al.* 2014, FSSAI 2015).

PART II If qualitative test for detection of adulterant is performed in milk itself; it is suggested to perform at optimum temperature as given below.

Sr. No.	Adulterant	Test	Optimum temperature
1	Detergent	Methylene blue (FSSAI 2015)	20 to 30°C
2	Urea	Urease (Paradkar *et al.* 2000)	40°C
		Phenol (Paradkar *et al.* 2000)	20°C
3	Starch	Iodine(BIS 1960, Anon. 2006, Dixit 2012, Sharma *et al.* 2012)	20°C
4	Maltodextrin	Iodine (Sharma *et al.* 2012)	30°C
5	Hydrogen peroxide	*p*-phenylenediamine (Draaiyer *et al.* 2009)	20°C
		Iodometry (Sharma *et al.* 2012, FSSAI 2015)	10°C
6	Borax & Boric acid	Turmeric paper (Dairyforall 2006, Dixit 2012, Singh *et al.* 2012)	20 to 30°C

Note: No influence of temperature of milk (10-40^{o}C) was found on performance of DMAB test for urea (Anon. 2009, Dixit 2012, Sharma *et al.* 2012, FSSAI 2015), Rosolic acid test for neutralizer (DGHS 2005), Ferric chloride test for benzoic acid (Dixit 2012, Singh *et al.* 2012) and Ferric chloride test for salicylic acid (Dixit 2012) detection.

PART III If heating is involved in procedure of conducting qualitative test for detection of

adulterant in milk, it is suggested to use optimum heating period as given below.

Sr. No.	Adulterant	Test	Optimum heating period
1	Ammonium salts	Phenol (Mittal & Roy 1976, DGHS 2005, Srivastava 2010, FSSAI 2015)	20 sec
2	Glucose	Barfoed (in milk) (Roy & Mittal 1977, Vishweshwar & Krishnaiah 2005, Anon. 2006, Singh *et al.* 2012, Sharma *et al.* 2012, Dixit 2012, Kamthania *et al.* 2014, FSSAI 2015)	3 min
3	Sucrose	Seliwanoff (resorcinol solid) (Sharma *et al.* 2012)	4 min
		Seliwanoff (resorcinol solution) (Srivastava 2010)	5 min
4	Formaldehyde	Leach (heating by direct flame) (Williams & Sherman 1905, BIS 1961, Vishweshwar & Krishnaiah 2005)	1 min
		Leach (heating in boiling water bath) (Sharma *et al.* 2012)	4 min

વિભાગ ૧

દૂધમાં ભેળસેળ કરવામાં આવતા પદાર્થોની ચકાસણી કરવા માટે સંખ્યાબંધ ગુણાત્મક કસોટીઓ સાહિત્યમાં પ્રકાશિત કરવામાં આવેલ છે, જેમાં ભિન્નતા જોવા મળે છે. આથી ચકાસેલ, સરખામણી કરેલ અને મૂલ્યાંકિત કરેલ કસોટીઓ પૈકી નીચે દર્શાવેલ કસોટીઓ કે જે સૌથી સારું પરિણામ આપે છે તે પદ્ધતિઓ વાપરવાની સલાહ આપવામાં આવે છે.

દૂધમાં ભેળસેળની ચકાસણી માટે કસોટીની સલાહ			
ક્રમ	ભેળસેળ કરેલ પદાર્થ	કસોટી	સંદર્ભ
1	ડીટરજન્ટ	મીથીલીન બ્લ્યુ કસોટી	Paradkar *et al.* (2000), FSSAI (2015)
2	યુરિયા	ડી. એમ. એ. બી. કસોટી	Bector *et al.* (1998), Dixit (2012), Sharma *et al.* (2012), FSSAI (2015)
3	અમોનિયમ ક્ષારો	ફીનોલ કસોટી	Mittal & Roy (1976), Srivastava (2010), FSSAI (2015)
4	ગ્લુકોઝ	બારફોડ કસોટી	Roy & Mittal (1977), Sharma *et al.* (2012), Dixit (2012), FSSAI (2015)
5	ખાંડ	સેલીવાનોફ કસોટી (ઘન)	Sharma *et al.* (2012)
6	માલ્ટોડેક્ષ્ટ્રિન	આયોડીન કસોટી	Dairy Development Department of Maharashtra (2013)
7	સ્ટાર્ચ (કાંજી)	આયોડીન કસોટી	BIS (1960), Anon. (2006), Dixit (2012), Sharma *et al.* (2012)
8	નાઈટ્રેટ	ડાઈફીનાઈલ એમાઈન કસોટી	FAO (1986)
9	સલ્ફેટ	બેરીયમ ક્લોરાઈડ	Sharma *et al.* (2012), FSSAI (2015)
10	જીલેટીન	પીક્રીક એસીડ કસોટી	Jacobs & Jaffe (1932), DGHS (2005), FSSAI (2015)
11	ફોર્માલડીહાઈડ	લીચ કસોટી	Williams & Sherman (1905), BIS (1961)
12	હાઈડ્રોજન પેરોક્ષાઈડ	ρ-ફીનીલીન ડાઈએમાંઈન	Draaiyer *et al.* (2009)

		કસોટી	
13	ન્યુટ્રલાઈઝર	રોઝોલીક એસીડ કસોટી	DGHS (2005)
14	બોરેક્સ અને બોરિક એસીડ	ટરમરીક પેપર કસોટી	Anon. (2006), Dairyforall (2006), Singh *et al.* (2012), Dixit (2012)
15	સેલીસીલીક એસીડ	ફેરિક ક્લોરાઈડ કસોટી	Dixit (2012)
16	બેન્ઝોઈક એસીડ	ફેરિક ક્લોરાઈડ કસોટી	Singh *et al.* (2012), Dixit (2012)
નોંધ: સોડીયમ ક્લોરાઈડ (મીઠું) ની ભેળસેળ પારખવા માટેની કસોટીઓ પૈકી Anon. 2006, Dairyforall 2006, Singh *et al*. 2012, Dixit 2012, Sharma *et al.* 2012, FSSAI 2015, Anon. 2009, Srivastava 2010, Kamthania *et al.* 2014 કોઈ પણ કસોટી 0.05% સુધીની સોડીયમ ક્લોરાઈડ (મીઠું)ની ભેળસેળ પારખી શકતી નથી. આથી આ કસોટીની પદ્ધતિમાં સુધારો કરવાની જરૂર છે.			

વિભાગ ૨

દૂધમાં ભેળસેળ કરવામાં આવતા તત્વોની ચકાસણી માટેની ગુણાત્મક કસોટીમાં જો દૂધનો જ માધ્યમ તરીકે ઉપયોગ થતો હોય તો, તેવી કસોટીમાં નીચે દર્શાવ્યા પ્રમાણેના સૌથી સાનુકુળ તાપમાનનો અમલ કરવાની સલાહ આપવામાં આવે છે.

ભેળસેળ માટેની ગુણાત્મક કસોટીની પદ્ધતિમાં દૂધના તાપમાનની અસર			
ક્રમ	ભેળસેળ કરેલ પદાર્થ	કસોટી	સાનુકુળ તાપમાન
1	ડીટરજન્ટ	મીથીલીન બ્લ્યુ કસોટી (FSSAI 2015)	20 થી 30 °C
2	યુરિયા	યુરીએજ કસોટી (Paradkar *et al.* 2000)	40 °C
		ફીનોલ કસોટી (Paradkar *et al.* 2000)	20 °C
3	સ્ટાર્ચ (કાંજી)	આયોડીન કસોટી (BIS 1960, Anon. 2006, Dixit 2012, Sharma *et al.* 2012)	20 °C
4	માલ્ટોડેક્ષ્ટ્રિન	આયોડીન કસોટી (Sharma *et al.* 2012)	30 °C
5	હાઈડ્રોજન પેરોક્ષાઈડ	ρ-ફીનીલીન ડાઈએમાઈન કસોટી (Draaiyer *et al.* 2009)	20 °C
		આયોડોમેટ્રી (Sharma *et al.* 2012, FSSAI, 2015)	10 °C
6	બોરેક્સ અને બોરિક એસીડ	ટરમરીક પેપર કસોટી (Dairyforall 2006, Dixit 2012, Singh *et al.* 2012)	20 થી 30 °C
નોંધ: યુરિયા માટેની ડી. એમ. એ. બી. કસોટી (Anon. 2009, Dixit 2012, Sharma *et al.* 2012, FSSAI 2015), ન્યુટ્રલાઈઝર માટેની રોઝોલીક એસીડ કસોટી (DGHS, 2005), બેન્ઝોઈક એસીડ માટેની ફેરિક ક્લોરાઈડ કસોટી (Dixit 2012, Singh *et al.* 2012) અને સેલીસીલીક એસીડ માટેની ફેરિક ક્લોરાઈડ કસોટી (Dixit 2012) માં તાપમાનની અસર જણાઈ નથી.			

વિભાગ ૩

દૂધમાં ભેળસેળ કરવામાં આવતા તત્વોની ચકાસણી માટેની ગુણાત્મક કસોટીની પદ્ધતિમાં જો કસોટી માટેના મિશ્રણને ગરમ કરવામાં આવતું હોય તો નીચે દર્શાવેલા સૌથી સાનુકુળ સમયગાળાના ઉપયોગની સલાહ આપવામાં આવે છે.

ભેળસેળ માટેની ગુણાત્મક કસોટીની પદ્ધતિમાં મિશ્રણ ગરમ કરવાના સમયગાળા ની અસર			
ક્રમ	ભેળસેળ કરેલ પદાર્થ	કસોટી	સૌથી સાનુકુળ સમયગાળો
1	અમોનિયમ ક્ષારો	ફીનોલ (Mittal & Roy 1976, DGHS 2005, Srivastava 2010, FSSAI 2015)	20 sec
2	ગ્લુકોઝ	બારફોડ (દૂધમાં કરેલ કસોટી) (Roy & Mittal 1977, Vishweshwar & Krishnaiah 2005, Anon. 2006, Singh *et al*. 2012, Sharma *et al.* 2012, Dixit 2012, Kamthania *et al*., 2014, FSSAI 2015)	3 min
3	ખાંડ	સેલીવાનોફ કસોટી (ઘન રીસોર્સીનોલ) (Sharma *et al*. 2012)	4 min
		સેલીવાનોફ કસોટી (રીસોર્સીનોલ દ્રાવણ) (Srivastava 2010)	5 min
4	ફોર્માલ્ડીહાઈડ	લીચ કસોટી (ડાયરેક્ટ ફ્લેમ) (Williams & Sherman 1905, BIS 1961, Vishweshwar & Krishnaiah 2005)	1 min
		લીચ કસોટી (બોઈલીંગ વોટર બાથ) (Sharma *et al*. 2012)	4 min

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.18 Studies on physico-chemical and sensory characteristics of iron rich biscuits

Anand Agricultural University has developed a technology for preparation of Iron-rich biscuits with improved protein content which can be prepared using a mixture comprising of rajkeera (*rajgaro*) flour, bengal gram flour, refined wheat flour and wheat flour along with whey powder, coconut powder, amaranth leaves powder, cocoa powder, sesame seeds, spices and condiments.

આણંદ કૃષિ યુનિવર્સિટી, આણંદ દ્વારા રાજગરા, ચણા ના લોટ, ઘઉં ના લોટ અને મેંદા ના લોટના મિશ્રણ તથા વ્હે પાઉડર, નાળીયેરનું છીણ, તાંદળજાની ભાજીનો પાઉડર, કોકો પાઉડર, તલ તથા મરી મસાલાનો ઉપયોગ કરી લોહતત્વ અને પ્રોટીનસભર બિસ્કિટ બનાવવાની ટેક્નોલોજી વિકસાવેલ છે.

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.19 Optimization of biomass production for probiotic *Lactobacillus helveticus* MTCC 5463

Cheddar cheese whey supplemented with 0.95% each of yeast extract and proteose peptone at pH 6.25 and inoculated with 6% (v/v) active culture of *Lactobacillus helveticus* MTCC 5463 and fermented at 40ºC for 24 h can yield 3.25 g/l dry cell biomass and 14.82 log cfu/g total viable count.

ચેડાર ચીઝ વ્હે માં 0.૯૫ % યીસ્ટ એકસ્ટ્રેકટ અને પ્રોટીઓઝ પેપ્ટોન ઉમેરી, પી.એચ. ૬.૨૫ રાખી તેમાં એક્ટીવ લેક્ટોબેસીલસ હેલ્વેટીકસ MTCC 5463 નું કલ્ચર ૬% (વી/વી) પ્રમાણ માં ઉમેરી તેને ૪૦°સે તાપમાન પર ૨૪ કલાક સુધી આથવણ (ફરમેન્ટ) કરવાથી ૩.૨૫ ગ્રામ/લિટર ડ્રાય સેલબાયોમાસ (જૈવિક જથ્થો) મળે છે. જેમાં કુલ જીવંત બેક્ટેરીયા નું પ્રમાણ ૧૪.૮૨ લોગ સી.એફ.યુ પ્રતિ ગ્રામ જોવા મળે છે.

(Action:- HOD, Department of DM, DSC, AAU, Anand)

12.5.1.20 ACE Inhibitory activity of *Lactobacillus helveticus* MTCC 5463 in fermented milk added with honey

A technology developed by Anand Agricultural University is recommended for the preparation

of fermented milk rich in ACE inhibitory activity (antihypertensive property), which can be prepared using toned milk and fermented by *L. helveticus* MTCC5463 at the rate of 2% for 24 h at 42^0C.

આથવણ કરેલ ટોન્ડ દૂધ કે જેમાં વધારે માત્રામાં એન્ટીઓટેન્સીન કન્વર્ટીંગ એન્ઝાઈમને અવરોધતી સક્રીયતા રહેલી છે. તેનું ઉત્પાદન કરવા આણંદ કૃષિ યુનીવર્સિટી ખાતે વિકસાવેલ તકનીકી ભલામણ કરવામાં આવે છે. આ પ્રક્રિયા માં ટોન્ડ દૂધમાં ૨% ના દરથી *Lactobacillus helveticus* MTCC 5463 નામના પ્રોબાયોટીક કલ્ચરને ઉમેરી આ મિશ્રણને ૨૪ કલાક અને ૪૨° સે. તાપમાને રાખવાથી મળે છે.

(Action:- HOD, Department of DM, DSC, AAU, Anand)

12.5.1.21 Utilization of Whey Protein Concentrate (WPC) in the selected cultured dairy product i.e. fermented milk drink

A technology for making acceptable 'Mango based fermented milk drink' is recommended by Anand Agricultural University using Double Toned Milk, 1.23% Whey Protein Concentrate (WPC-70), 0.1% Pectin and 18.24% Mango pulp.

આણંદ કૃષિ યુનીવર્સિટી દ્વારા સારી ગુણવત્તા યુક્ત મેંગો બેઝ્ડ ફર્મેન્ટેડ મિલ્ક ડ્રીંક બનાવવાની પધ્ધતિ વિકસાવેલ છે. જેમા ડબલ ટોન્ડ મિલ્ક (ડી.ટી.એમ.) સાથે ૧.૨૩% ડબ્લ્યુ. પી. સી. – ૭૦ (વ્હે પ્રોટીન કોન્સન્ટ્રેટ – ૭૦), ૦.૧% પેક્ટીન, ૧૮.૨૪% કેરીનો રસ તથા ૧૫% ખાંડના ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. ઉપરોક્ત પધ્ધતિથી વિકસાવેલ મેંગો બેઝ્ડ ફર્મેન્ટેડ મિલ્ક ડ્રીંક ની સંગ્રહ ક્ષમતા ૭ ± ૨ ° સે. તાપમાને ૯ દિવસની છે.

(Action:- HOD, Department of DM, DSC, AAU, Anand)

12.5.1.22 Development of commercial process for manufacture of 'carrot *halwa'*

Commercial process for the manufacture of carrot *halwa* using scraped surface heat exchanger developed by Anand Agricultural University is recommended. The process saves about 66% of processing time with 67% saving in the thermal energy and in-canned sterilized carrot *halwa* has better sensory and nutritive attributes with extended shelf-life up to 6 months as compared to carrot *halwa* prepared by traditional method.

આણંદ કૃષિ યુનિવર્સિટી દ્વારા વિકસાવેલ સ્ક્રેપ સરફેસ હિટ એક્સચેંજરનો ઉપયોગ કરીને ગાજર હલવા ના ઉત્પાદન માટેની કોમર્શિયલ પ્રક્રિયા ભલામણ કરવામાં આવે છે. આ પ્રક્રિયા લગભગ ૬૭% ઉષ્મા ઊર્જાની સાથે ૬૬ % સમય બચાવે છે અને કેન માં ભરીને સ્ટરીલાઈજ્ડ કરેલ ગાજર હલવો પરંપરાગત પદ્ધતિ દ્વારા તૈયાર કરેલા ગાજર હલવાની સરખામણીમાં વધુ સારો સ્વાદ અને પોષણ ગુણો ધરાવે છે અને 6 મહિનાથી વધુ સમય માટે જાળવી શકાય છે.

(Action:- HOD, Department of DE, DSC, AAU, Anand)

12.5.1.23 Development of commercial process for manufacture of 'bottle gourd *halwa*'

Commercial process for the manufacture of bottle gourd *halwa* using scraped surface heat exchanger developed by Anand Agricultural University is recommended. The process saves about 63% of processing time with 66% saving in the thermal energy and in-canned sterilized bottlegourd *halwa* has better sensory and nutritive attributes with extended shelf-life up to 6 months as compared to bottlegourd *halwa* prepared by traditional method.

આણંદ કૃષિ યુનિવર્સિટી દ્વારા સ્ક્રેપ સરફેસ હિટ એક્સચેંજરનો ઉપયોગ કરીને દૂધી હલવા ના ઉત્પાદન માટે વિકસાવેલ કોમર્શિયલ પ્રક્રિયાની ભલામણ કરવામાં છે. આ પ્રક્રિયા લગભગ ૬૬% ઉષ્મા ઊર્જાની સાથે ૬૩ %

સમય બચાવે છે અને કેન માં ભરીને સ્ટરીલાઈજ્ડ કરેલ દૂધી હલવો પરંપરાગત પદ્ધતિ દ્વારા તૈયાર કરેલા દૂધી હલવાની સરખામણીમાં વધુ સારો સ્વાદ અને પોષણ ગુણો ધરાવે છે અને 6 મહિનાથી વધુ સમય માટે જાળવી શકાય છે.

(Action:- HOD, Department of DE, DSC, AAU, Anand)

12.5.1.24 Evaluation of energy conservation potential of soft starter in dairy industry

Application of soft staters in operating machinery up to 5 kW is recommended which results in saving of average instantaneous energy and average overall energy in the range of 4.00 to 17.16% and.10 to 4.57%, respectively, depending on the loading conditions.

પાંચ કિલોવોટ સુધીના મશીનોને ચલાવવા માટે સોફ્ટ સ્ટાર્ટરને વાપરવાની ભલામણ કરવામાં આવે છે. આમ કરવાથી પ્રારંભિક ઉર્જામાં અને એકંદર ઉર્જામાં અનુક્રમે ૪.૦૦ થી ૧૭.૧૬ અને ૦.૧૦ થી ૪.૫૭ ટકાની લોડની વધ-ઘટ પ્રમાણે બચત થઇ શકે છે.

(Action:- HOD, Department of DE, DSC, AAU, Anand)

JUNAGADH AGRICULTURAL UNIVERSITY

12.5.2.1 Evaluation of different mulches for Sapota crop under drip irrigation

Farmers of South SaurashtraAgroclimatic Zone growing Sapota (Kalippati) are advised to adopt drip irrigation (2 drippers per plant upto 2 years and after that 4 dripper per plant, dripper discharge of 4 lph) covered with black plastic mulch of 100 micron and irrigate every alternate day at 0.6IW/ET_c (or apply water 14, 34, 48, 34, 8, 11 and 9 liters per day per plant during January-February, March-April, May, June, July-August, September-October and November-December respectively) for acquiring higher yield and net return of Sapota over no mulch.

દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવા વિસ્તારના ખેડૂતોને ભલામણ કરવામાં આવે છે કે, ચીકુ (કાલીપત્તી) માં ટપક પિયત પધ્ધતિ (બે વર્ષ સુધી છોડ દીઠ ૨ ડ્રીપર ત્યાર બાદ છોડ દીઠ ૪ ડ્રીપર, ડ્રીપર ડીસ્ચાર્જ: ૪લીટર/કલાક) ઉપર ૧૦૦ માઈક્રોનનું કાળું પ્લાસ્ટિક પાથરી તેને એકાંતરે દિવસે ૦.૬ ઈટીસી લેવલે (અથવા છોડ દીઠ ૧૪, ૩૪, ૪૮, ૩૪, ૮, ૧૧ અને ૯ લીટર પ્રતિ દિવસ પ્રતિ છોડ પાણી અનુક્રમે જાન્યુઆરી-ફેબ્રુઆરી, માર્ચ-અપ્રિલ, મે, જુન, જુલાઈ-ઓગષ્ટ, સપ્ટેમ્બર-ઓક્ટોબર અને નવેમ્બર-ડીસેમ્બર) આપવાથી મલ્ચીંગ વગરના ચીકુની સરખામણીમાં વધુ ઉત્પાદન તેમજ વધારે આવક મેળવી શકાય છે.

(Action:- Research Scientist (Agril.Engg.) , RTTC, JAU, Junagadh)

12.5.2.2 Preparation of extruded products from flour of amaranth grain, sago and defatted groundnut

Food processors are advised to prepare quality cold extruded pasta by blending defatted groundnut flour, amaranth flour and sago flour (as a binder) in the ratio of 20, 70 and 10 % respectively followed by sun drying for 14 hours in summer months or in solar cabinet dryer for 1hour at 55 ^{0}C. The product can be stored in transparent polyethylene (LDPE) bags of 75 micron to retain the good quality at least up to two months of storage period.

ફૂડ પ્રોસેસર્સને સલાહ આપવામાં આવે છે કે તેલ કાઢેલ મગફળીના લોટ, રાજગરાના લોટ તેમજ સાબુદાણાનો લોટ (બાઈંડર તરીકે) ના અનુક્રમે ૨૦, ૭૦ અને ૧૦% ના ગુણોત્તરવાળા મીશ્રણનો ઉપયોગ કરી ગુણવતાયુકત બનાવેલા ઠંડા પાસ્તાને ઉનાળાના મહિનાઓમાં ૧૪ કલાક સૂર્યપ્રકાશમાં અથવા તો ૫૫ ડિગ્રીસેલ્સિયસ તાપમાને એક કલાક માટે સોલાર કેબિનેટ ડ્રાયરમાં સુકવીને તૈયાર કરેલ પાસ્તા (સેવ) ને ૭૫ માઇક્રોન ટ્રાન્સપરંટ

પોલિઇથિલિન (LDPE) પેકેજિંગ બેગમા ઓછામાં ઓછા બે મહિના માટે યોગ્ય ગુણવતા સાથે સારી રીતે સંગ્રહ કરી શકાયછે.

(Action:-HoD, Dept. of PFE, CAET, JAU, Junagadh)

12.5.2.3 Development of power operated sapota cleaner.

The farmers are recommended to use power operated sapota cleaner developed by Junagadh Agricultural University for cleaning and shining sapota surface after harvesting. This machines saves 90 per cent cost of cleaning as compared to manual cleaning. Machine capacity is 575 kg/h.

ખેડૂતોને ચીકુને ઝાડ પરથી ઉતાર્યા બાદ ચીકુની સપાટીને સાફ અને ચળકતી કરવા માટે જુનાગઢ કૃષિ યુનીવર્સીટી દ્વારા વિકસાવાયેલ પાવરથી ચાલતા ક્લીનરનો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. આ મશીન દ્વારા સફાઈ કરવામાં આવે તો માણસો દ્વારા કરવામાં આવતી સફાઈના ખર્ચ કરતા ૯૦ ટકા બચત થાય છે. આ મશીનની ક્ષમતા ૫૭૫ કિગ્રા/કલાક છે.

(Action:-HoD, Dept. of PFE, CAET, JAU, Junagadh)

12.5.2.4 Effect of different structures on protection of cumin crop against adverse climate

The farmers of South Saurashtra agroclimatic zone are recommended to adopt plastic (LDPE-50 micron) low tunnel (sing tunel size: 4x2x1m) covered with 30% shade net at both the ends for cultivation of cumin. This type of structure protects the crop from adverse climate, insects/pests, diseases and results in better quality and higher yield of cumin. It can be used for seed production also.

આથી દક્ષિણ સૌરાષ્ટ્ર કૃષિ આબોહવાકીય વિસ્તારનાં જીરૂ ઉગાડતા ખેડુતોને ૩૦ ટકા શેડ નેટથી બન્ને છેડે ઢાંકેલ પ્લાસ્ટીક (એલડીપીઈ – ૫૦ માઈક્રોન) લો ટનલ (એક ટનલ સાઈઝ ૪×૨×૧ મી.) વાપરવાની ભલામણ કરવામાં આવે છે. આ પ્રકારનાં ટનલ વાપરવાથી પાકનું પ્રતિકૂળ વાતાવરણ તેમજ રોગ–જીવાતથી રક્ષણ કરી શકાય છે તેમજ સારી ગુણવત્તા અને વધુ ઉત્પાદકતા મેળવી શકાય છે. આ પ્રકારનું ટનલ બીજ ઉત્પાદન માટે પણ ઉપયોગમાં લઈ શકાય છે.

(Action:-Department of RE & RE, CAET, JAU, Junagadh)

NAVSARI AGRICULTURAL UNIVEERSITY

12.5.3.1 Preparation of Ready to Serve (RTS) beverage from banana pseudostem sap.

Farmers and processors are recommended to utilize blend of banana psuedostem sap and aonla fruit juice having 3.5% and 8% TSS respectively with the ratio of 90:10 for the prepration of ready to serve drink. The drink packed in glass bottle after pasteurization at 87^0 C for 15 min followed by sterilization in bottles at 96 ± 1^0 C for 25 min has storage stability for six month at ambient condition.

ખેડુતો અને પ્રોસેસરોને કેળાના થડના રસ અને આમળાના રસ કે જેના ટી. એસ. એસ. અનુક્રમે ૩.૪ % અને ૮ % હોય તેને ૯૦:૧૦ પ્રમાણમાં મીશ્રણ બનાવી પીરસવા માટે તૈયાર પીણું બનાવવાની ભલામણ કરવામાં આવે છે. આ પીણાને ૮૭° સે. તાપમાને ૧૫ મીનીટ પાસ્ચરાઈઝ કરી ગ્લાસની બોટલમાં ભરી ૯૬ ૂય ૧° સે તાપમાને ૨૫ મીનીટ સ્ટરીલાઈઝ કરવાથી સામાન્ય તાપમાને ૬ મહિના સુધી સંગ્રહ કરી શકાય છે.

(**Action:** I/c, CE on PHT, Navsari)

12.5.3.2 Study of effect of drainage on banana production in South Gujarat

Farmers of South Gujarat Heavy Rainfall Zone (AES-III), growing banana are advised to follow 45cm deep open drainage system (bottom width 15cm and top width105cm) spaced 12 m apart with 1:1 side slope and a bed slope of 0.05%, to achieve higher yield and maximum net return.

દક્ષિણ ગુજરાતના વધુ વરસાદ વાળા ખેત આબોહવાકીય વિસ્તાર–૩ મા કેળની ખેતી કરતા ખેડૂતોને વધુ ઉત્પાદન અને આર્થિક વળતર મેળવવા ૧૨ મીટર અંતરે ૪૫ સેમી ઉડી તથા બાજુએ ૧:૧ નો તથા ૦.૦૫ % સમાંતર ઢાળવાળી ખુલ્લી નીતાર નીક(પાયાની

પહોળાઈ ૧૫ સે.મી. અને ઉપરની પહોળાઈ ૧૦૫ સે.મી.) બનાવવા ભલામણ કરવામાં આવે છે.

(Action: I/c Prof. and Head, Dept. of Agril. Engg., NMCA, Navsari)

12.5.3.3 Effect of laser leveling on crop water requirement and growth of castor crop

Farmers of South Gujarat Heavy Rainfall Zone (AES-III), growing irrigated castor (GCH-7) during rabi season are advised to adopt laser land leveling technique to provide 0.45 per cent longitudinal slope to castor field for getting higher castor yield, net return and water saving.

દક્ષિણ ગુજરાતના ભારે વરસાદ વાળા વિભાગ (કૃષિ આબોહવાકીય પરિસ્થિતી –૩) માં રવિ ઋતું દરમ્યાન પિયત દિવેલા (જી.સી.એચ.–૭) ઉગાડતા ખેડૂતોને દિવેલાનું વધું ઉત્પાદન અને આર્થિક વળતર મેળવવા તેમજ પાણીની બચત માટે લેસર લેવલરનો ઉપયોગ કરી ૦.૪૫ ટકા સમાંતર ઢાળ આપી દિવેલાનો પાક લેવા ભલામણ કરવામાં આવે છે.

(Action: I/c Prof. and Head, Dept. of Agril. Engg., NMCA, Navsari)

12.5.3.4 Development and evaluation of low cost of solar still

A low cost roof top cement brick type solar still covered with 4mm thick toughened glass developed by NAU is recommended to get 2 l/m^2 - day distilled water for Dediapada area.

નવસારી કૃષિ યુનિવર્સિટી દ્વારા વિકસાવવામાં આવેલ સિમેન્ટ– ઈંટ બાંધકામ અને ૪ એમ. એમ. ટફન કાચ કવર પ્રકારના ઓછી કિંમતના સોલર સ્ટીલ ૨ લી/ મી^{2} પ્રતિ દિવસ શુધ્ધ પાણી (દેડીયાપાડા ક્ષેત્ર માટે) મેળવવા ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે.

(Action: Dean, CAET, Dediapada)

12.5.3.5 Development of technology for dehydration of onions rings for adoption at commercial scale

The house deferred the recommendation with following suggestions;

- Data without pre treatment are to be given
- Industry norms should be followed in process methodology be given
- Microbial analysis be included
- Usage of silica gel to be reviewed

(**Action:** Assoc. Pro. & Head, Dept. PHT, ACHF, Navsari)

12.5.3.6 Development of technology for dehydration of okra slices for adoption at commercial scale

The house deferred the recommendation with following suggestions;

- Data without pre treatment are to be given
- Industry norms should be followed in process methodology be given
- Microbial analysis be included
- Usage of silica gel to be reviewed

(**Action:** Assoc. Pro. & Head, Dept. PHT, ACHF, Navsari)

12.5.3.7 Development of technology for dehydration of cauliflower for adoption at commercial scale

The house deferred the recommendation with following suggestions;

- Data without pre treatment are to be given
- Industry norms should be followed in process methodology be given
- Microbial analysis be included
- Usage of silica gel to be reviewed

(**Action:** Assoc. Pro. & Head, Dept. PHT, ACHF, Navsari)

12.5.3.8 Standardization of Method for Preparing of Candy from Bitter Gourd

The house deferred the recommendation due to following reason:

Practical utility of the product is not meeting the desired objectives (product found very bitter in spite of adding sugar)

(**Action:** Assoc. Pro. & Head, Dept. PHT, ACHF, Navsari)

12.5.3.9 Effect of different types of processing on the nutritional quality of green gram, french

bean and chick pea

House deferred the recommendation

B. SCIENTIFIC COMMUNITY

ANAND AGRICULTURAL UNIVERSITY

12.5.1.1 Screening of novel thermotolerant yeast with improved process economics for bioethanol production

Ethanogenic and thermotolerant AAU cultures ETGS1 and ETDLT1 are identified as strains of *Saccharomyces cerevisiae* and *Kluyveromyces marxianus* respectively. These strains have shown potential for bioconversion of starch and lactose containing substrates into ethanol. Scientists interested in the process development for bioconversion of starch or lactose into ethanol can use these strains.

(**Action:- HOD, Department of FQA, FPT & BE, AAU, Anand)**

12.5.1.2 Screening, Identification and Characterization of Lactic Acid Bacteria with probiotic potential and phytic activity

Lactic acid bacterial strains *Pediococcus acidilactici* ID-01 and*Pediococcus lolii* ID-02 were isolated and identified having probiotic potential and phytate degrading ability. Scientists interested in phytate processing are advised to use these AAU strains

(Action:- HOD, Department of FQA, FPT & BE, AAU, Anand)

12.5.1.3 Comparative appraisal of physical, chemical, instrumental and sensory evaluation methods for monitoring oxidative deterioration of ghee

1. Among BIS, AOAC, AOCS, FOX and IDF methods for determination of peroxide value of ghee, the use of FOX method is recommended since it is best correlated with the flavour score of ghee.
2. Among Weight gain, Conjugated dienes content, Iodine value, FFA content, Kreis number and Peroxide value (by FOX) method for monitoring primary stage of oxidation in ghee, determination of peroxide value of ghee by FOX method is recommended since it is best correlated with the flavour score of ghee.
3. Among Thiobarbituric acid, ρ-Anisidine value, Totox value and Carbonyl value for monitoring secondary stage of oxidation in ghee, the method of Carbonyl value is recommended since it is best correlated with the flavour score of ghee.

(**Action:- HOD, Department of DC, DSC, AAU, Anand)**

12.5.1.4 Preparation of ghee from camel milk and evaluation of its shelf life

The ghee prepared from camel milk has Reichert Meissl (RM) value of 9.91 and Butyrorefractometer Reading (BR) at 40^{o}C of 44.52. These parameters do not fulfill the present requirements specified by FSSAI and AGMARK for ghee. Therefore, while formulating FSSAI and/or AGMARK specifications for ghee prepared from camel milk, the RM value and BR reading at 40^{o}C reported in the present study will be useful.

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.5 Evaluation of selected spices/herbs for their suitability to enhance the shelf life of paneer

Among the common culinary spices/herbs (ajwain, asafoetida, black pepper, cardamom, cinnamon, clove, coriander, cumin, fenugreek, garlic, ginger, mint, onion and turmeric), cardamom was found to be most effective to improve the shelf life of *paneer*. The addition of crushed cardamom seeds in milk @ 0.6% of the expected yield of *paneer* improves the shelf life of *paneer* up to 21 days at 7 ± 1^{o}C.

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.6 Characterization of *Khoa* prepared from camel milk and evaluation of its suitability for preparation of selected sweets

The flavor of gulabjamun prepared from camel milk *khoa* blended with refined wheat flour (10%), *suji* (12%), baking powder (0.25%) and water can be improved using cardamom, when added both in dough (20 ml extract of 7.5% crushed cardamom seed in water) and in sugar syrup (63^{o}Brix) (3 g crushed cardamom seeds in 1 lit of sugar syrup).

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.7 Study on distribution pattern of nitrogenous components in milk

In pooled cow milk samples collected from Anand district, the average values of total nitrogen (TN), casein nitrogen (CN), whey protein nitrogen (WPN) and non-protein nitrogen (NPN) were 0.5102, 0.3903, 0.0793 and 0.0411%; in buffalo milk 0.6230, 0.4922, 0.0879 and 0.0429% while in mixed milk 0.5588, 0.4360, 0.0810 and 0.0418% respectively. Distribution of total nitrogen amongst CN, WPN and NPN was 76.50%, 15.53% and 8.06% in cow milk; 79.00%, 14.11% and 6.89% in buffalo milk; while it was 78.02%, 14.50% and 7.48% in mixed milk respectively.

(Action:- HOD, Department of DC, DSC, AAU, Anand)

12.5.1.8 Metagenomic and Clinical investigation of synbiotic fermented dairy product containing probiotic *Lactobacillus helveticus* MTCC 5463 in geriatric volunteers

A honey supplemented probiotic fermented milk containing *Lactobacillus helveticus* MTCC 5463 is recommended for consumption by geriatrics as it is found to have immune boosting functional property in geriatrics and positively modulates the gut microflora.

The metagenomic study revealed that the faecal samples were dominated by Firmicutes (50%), Actinobacteria (20%) and Proteobacteria (10%) and feeding honey supplemented probiotic fermented milk resulted in 7% increase in Firmicutes, 1.5 % rise in Actinobacteria and 1.9% increase in Proteobacteria.

(Action:- HOD, Department of DM, DSC, AAU, Anand)

12.5.1.9 e-Student Corner with Attendance and Result module for UG courses

e-student corner web system developed by Anand Agricultural University is recommended for attendance, results and fees collection. The system is useful to Course Teachers, Academic in-charges, Principals, Registrar and Administrative Officers to carry out various academic activities of AAU and recommended for use in Anand Agricultural University.

(Action: PI / Director IT, Anand)

12.5.1.10 Web User Interface Assisted Document Management System

Web user interface assisted document management system developed by Anand Agricultural University automates the workflow process. It is applied for digitization of documents and recommended for use by Anand Agricultural University.

(Action: PI / Director IT, Anand)

12.5.1.11 Development of web based Procurement Management System

Web based procurement management system developed by Anand Agricultural University is useful to purchase goods. System generates comparative statement, kharid patrak etc. and recommended to use for Anand Agricultural University.

(Action: PI / Director IT, Anand)

12.5.1.12 Development of web based Online Tour Program

Web based online tour program developed by Anand Agricultural University is useful to place online tour proposals for university staff members with provision for approval from authorities. It also generates print out of tour diary, TA-DA reports, and previous tour reports and

recommended for use at Anand Agricultural University.

(Action: PI / Director IT, Anand)

12.5.1.13 Development of web based Online Bill Processing System

Web based online bill processing system developed by Anand Agricultural University automates many financial functions like budget entry, grant allocation, checking bill, passing bill and necessary reports for management. It is recommended to use by Anand Agricultural University.

(Action: PI / Director IT, Anand)

12.5.1.14 Development Web Based PG Module of Student Corner for Anand Agricultural University

Web based PG Module of Student Corner developed by Anand Agricultural University is useful to store and manipulate PG students' information like basic details, course, degree, major and minor subject, major guide, seminar and synopsis approval date, thesis title, thesis date and notification. It is also used for managing student progress in his/her studies and recommended to use by Anand Agricultural University.

(Action: PI / Director IT, Anand)

JUNAGADH AGRICULTURAL UNIVERSITY

12.5.2.1 Response of Groundnut to supplemental irrigation.

The farmers of North Saurashtra Agro-climatic Zone growing groundnut GG-20 are advised to apply supplemental irrigation at soil moisture deficit of about 40 % (about 20% soil moisture content) for obtaining higher productivity, maximum net returns and improving crop and field water use efficiency under dry farming conditions.

(Action:- Reseach Scientist Main Dry Farming Research Station, JAU, Targhadia)

12.5.2.2 Performance of MIS in Canal Command Area.

Irrigation planners are advised to use either the regressional formula or ANN approach for determining seasonal runoff from the seasonal rainfall for Uben command area:

$Y = 0.010X^{1.118}$, $R^2 = 0.754$…… and

ANN model architecture 1 - 6 – 1 with $R^2 = 0.82$, $\eta_{model} = 80\%$

- Irrigation planners are advised to adopt the following optimal cropping pattern under surface irrigation system for Uben command area:

  Under surface irrigation system, 250 ha groundnut and 2250 ha green gram during the Kharif season and 50 ha wheat and 1529 ha onion during the Rabi season can be irrigated to get maximum return with cropping intensity of 163.15.

- Irrigation planners are advised to adopt the following optimal cropping pattern under drip irrigation system for Uben command area:

  Under drip irrigation system, 2475 ha groundnut and 25 ha green gram during the Kharif season and 50 ha wheat and 1992 ha onion during the Rabi season i.e. an additional 463 ha area can be brought under irrigation in Rabi season by constructing 315 intermediate storage structures having 260 m3 capacity each to serve one chuck (8 ha area).

Type of Irrigation system in Command Area	Season	Crop	Crop Area (ha)	Cropping Intensity (%)	Remark
Surface	Kharif	Ground nut	250	163.15	
		Green gram	2250		
	Rabi	wheat	50		
		Onion	1529		

Pressurized	Kharif	Ground nut	2475	181.68	315 intermediate storage structures having 260 m^3 capacity (9m X 9m X 3.2m) each to serve a chuck of 8 ha area will bring additional area of 462 ha in Rabi season under irrigation
		Green gram	25		
	Rabi	wheat	50		
		Onion	1992		

(Action:-Principal, Post Graduate Institute in Agri Business Managament, JAU, Junagadh)

12.5.2.3 Online HRD Programme

It is recommended to Staff members of JAU to use the online HRD programme developed by Junagadh Agricultural University to obtain the permission from concerned authority for participating or attending the programmes as per statute 121 Item No. 28.

(Action:-HOD,Department of Processing & Food Engg., CAET, JAU, Junagadh)

12.5.2.4 Assessment of microbial floral strength during post-harvest handling of mango, custard apple and lemon

The presence of harmful fungus and bacteria during transportation stage was observed maximum amongst all stages of post-harvest handling in mango, custard apple and lime fruits and found increasing in subsequent stages. Therefore, farmers and traders are recommended to take control measures to check microbial growth prior to transportation.

કેરી, સીતાફળ અને લીંબુ જેવા ફળોની કાપણી બાદના વિવિધ તબક્કાઓ પૈકી પરિવહનના તબક્કા દરમ્યાન હાનિકારક ફૂગ અને જીવાણુનું વધુ પ્રમાણ જોવા મળે છે અને ત્યારબાદ તેમાં ઉત્તરોત્તર વધારો થતો જાય છે. જેથી ખેડૂતો અને વેપારીઓને ભલામણ કરવામાં આવે છે કે આવા ફળોના પરિવહન પહેલાં સુક્ષ્મ જીવાણુંઓના નિયંત્રણ માટેના ઉપાયો કરવા જરૂરી છે.

(Action:-HoD, Dept. of PFE, CAET, JAU, Junagadh)

NAVSARI AGRICULTURAL UNIVERSITY

12.5.3.1 Study relating to "Formulating long-term mechanization strategy for Dediapada taluka"

The mechanization tool level (MTL), which indicates percentage of mechanization used for particular farming operation in Dediapada taluka was found to be tillage 40%, sowing 11%, transplanting 0%, interculture 18%, spraying 35%, weeding 22%, harvesting 14% and threshing 33%. Therefore design, development and popularization of small hand tools and impliments suitable for sowing, transplanting and harvesting operations need to be done on priority basis in order to enhance mechanization index in selected operations and also to increase the income of farmers of Dediapada taluka.

(Action: Dean, CAET, Dediapada)

NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERSITY

Sr. No	Title	Suggestions	Action
12.5.1.1	Studies on quality changes of rice during ageing: Effect of different storage conditions	Approved with suggestion 1. Add metallic bean as one of the treatment 2. cooking parameters should be included	Action:- HOD, Dept. of PHE
12.5.1.2	Design & development of low cost portable mango ripening system	Approved with suggestion 1. Air movement may be removed from observations.	HOD, Dept. of PHE
12.5.1.3	Production of high quality powder	Approved with suggestion	HOD, Dept. of

	with maximum retention of essential oil using cryogenic grinding of some selected spices	1.Add one more treatment of -40 degrees celcius.	PHE
12.5.1.4	Standardization of process parameters for the development of partially defatted peanut	Approved	HOD, Dept. of PHE
12.5.1.5	Extension of shelf life of bread using suitable ingredient	Approved	HOD, Dept. of FPT
12.5.1.6	Utilization of pumpkin carotenoid in food products	Approved	HOD, Dept. of FPT
12.5.1.7	Energy assessment in selected food processing plant/s	Approved	
12.5.1.8	Effect of gamma irradiation on cooking & milling characteristics of pigeon pea grains	Approved	HOD, Dept. of FE
12.5.1.9	Popping of sorghum grain using microwave energy	Approved	HOD, Dept. of FE
12.5.1.10	Development of Sesame spread production technology	Approved	HOD, Dept. of FQA
12.5.1.11	Super critical fluid extraction of essential oil from curry leaves	Approved	HOD, Dept. of FQA
12.5.1.12	Bioethanol production from potato processing starch waste by thermotolerant strain of *Saccharomyces cerevisiae* ETGS1	Approved	HOD, Dept. of FQA
12.5.1.13	Development of method for Vitamin C estimation	Approved	HOD, Dept. of FQA
12.5.1.14	Performance evaluation of a briquetting machine for effective use of loose biomass	House did not approve the study	HOD, Dept. of BE
12.5.1.15	**Title:** Development of technology for value-addition in Indigenous and Western dairy products **Sub-title:** Development of technology for carbonated lemon whey beverage	Approved with following suggestions 1. Amount of salt and ginger to be indicated	HOD, Dept. of DT
12.5.1.16	**Title:** Preparation of dairy/non-dairy analogue cheese of processed cheese and Mozzarella type. **Sub-title:** Value addition to mozzarella cheese analogue through incorporation of whey protein and vitamin A	Approved	HOD, Dept. of DT
12.5.1.17	Development of *Petha* (Ash gourd sweetmeat) ice cream	Approved	HOD, Dept. of DT

12.5.1.18	Development of cereal based *burfi*	Approved	HOD, Dept. of DT
12.5.1.19	Development of a nutri-rich *chakka* based dip fortified with Moringa	Approved	HOD, Dept. of DT
12.5.1.20	Technology for manufacture of extended shelf life of *basundi*	Approved	HOD, Dept. of DPO
12.5.1.21	**Title:** Development of methods for detection of adulteration in Milk and Milk Products **Sub-title:** Application of Infrared spectroscopy in detection of foreign fats and oils in ghee	Approved	HOD, Dept. of DC
12.5.1.22	**Title:** Evaluation of selected natural food additives for their suitability to enhance the quality of dairy products **Sub-title:** Evaluation of common culinary spices as natural antioxidant for ghee	Approved	HOD, Dept. of DC
12.5.1.23	**Title:** Utilization of whey in dairy and food products **Sub-title:** Development of whey based medium for biomass production of lactic acid bacteria	Approved	HOD, Dept. of DM
12.5.1.24	**Title:** Development of dairy starter cultures and value added dairy products **Sub-title:** Development of Greek Yoghurt Type Probiotic Fermented Milk using indigenous culture	Approved	HOD, Dept. of DM
12.5.1.25	**Title:** Development of dairy starter cultures and value added dairy products **Sub-title:** Development of Oat based probiotic smoothie	Approved	HOD, Dept. of DM
12.5.1.26	**Title:** Plasmid profiles of lactic acid bacteria and their use as bio-medical agents **Sub-title:** Development of probiotic cream for vaginal health of women	Not Approved House felt the product is related to medicinal / cosmetic nature and the group doesn't have expertise to recommend such products	HOD, Dept. of DM
12.5.1.27	Daily and monthly rainfall forecasting using extreme learning machines (ELMs), ANN with genetic algorithm (GANN) in the	Approved	CAET, AAU, Godhara

	middle region of Gujarat		
12.5.1.28	Development of a low cost power operated maize Sheller for small and marginal farmers	Approved with suggestion Add name of Assistant Professor instead of mechanic	Prof. & HOD, FMPE, CAET, AAU, Godhara
12.5.1.29	Design and development of tractor – drawn potato harvester with elevator	Approved	Prof. & HOD, FMPE, CAET, AAU, Godhara
12.5.1.30	Determination and analysis of vibration levels on Mini farm tractors	Approved with suggestion to measure Vibrations during operations like cultivation, tillage, transportation. Vibrations needs to be measured at operator's seat and Steering.	Prof. & HOD, FMPE, CAET, AAU, Godhara
12.5.1.31	Development of rapid system for measurement of angle of repose for grains	Approved with suggestion Revise title as 'Development of rapid measurement system for angle of repose of grains'.	AIT / RE, CAET, AAU, Godhara
12.5.1.32	Development of Matlab based programming of seed properties	Approved	AIT / RE, CAET, AAU, Godhara
12.5.1.33	Development of multipurpose solar dryer cum cooker	Approved with suggestion 'incorporate flow regulator and suitable commodity'	AIT / RE, CAET, AAU, Godhara
12.5.1.34	Design and development of custard apple pulp extracting machine with automatic feeding	Approved	AE AIT / PAE, Dahod
12.5.1.35	Quantification of seed quality up gradation through seed processing in wheat, green and paddy	Approved with suggestion to remove the name of company	AE AIT / RRS, Anand
12.5.1.36	Web based application for analysis of completely randomized design latin square design and strip plot design	Approved	AIT, Anand
12.5.1.37	Development of web base integrated attendance and result module for Polytechnic in student corner application	Approved	AE AIT, Anand
12.5.1.38	Transformation of information through multimedia based interactive media for desi cotton crop	Approved	AE AIT, Anand
12.5.1.39	Development of web based annual budget management system	Approved with suggestion to remove word "close" from objective Add one more objective in consultation with Dr Radadia	AE AIT / DITAnand
12.5.1.40	Web based application for dead	Approved	AE AIT /

	stock and IT assets information management		DITAnand
12.5.1.41	Online information management for extension centers of AAU	Approved	AE AIT / DITAnand

JUNAGADH AGRICULTURAL UNIVERSITY

Expt. No.	Experiment Title	Suggestions	Action
12.5.2.1	Design and development of seed drill for small seeds.	Approved	HoD, Dept of FMP, CAET, JAU, Junagadh
12.5.2.2	Coriander crop response to deficit soil moisture on various growth stages under drip irrigation	Approved	HoD, Dept of SWE, CAET, JAU, Junagadh
12.5.2.3	Assessment of potential water resources of Aji river basin using SWAT Model system.	Approved with fallowing suggestions Ground truth data be mentioned in the programme	HoD, Dept of SWE, CAET, JAU, Junagadh
12.5.2.4	In-situ moisture conservation in rain fed stressed region for increasing Productivity of cotton crop	Approved with following suggestion Mention main plot and sub plot in treatments	Research Scientist, Main Dry Farming Res. Station, JAU, Targhadi
12.5.2.5	Design and development of on farm solar assisted dryer for drying of groundnut pods.	Approved with following suggestion Number of investigators should be reduced	HoD, Dept of PFE, CAET, JAU, Junagadh
12.5.2.6	To study the effect of different packaging materials against Groundnut Bruchid (Caryedonserratus Olivier) during storage.	Approved	HoD, Dept of PFE, CAET, JAU, Junagadh
12.5.2.7	Lime grading simulation based on image processing techniques.	Approved with suggestion Tool to be developed to support Matlab for data analysis and included in methodology Add co PI's in the study	HoD, Dept of PFE, CAET, JAU, Junagadh
12.5.2.8	Constraints perceived in adoption of Agro-Processing Centres established by Junagadh	Approved with suggestion	HoD, Dept. of Agril. Engg. Ext.

	Agricultural University, Junagadh	Ranking has to be defined Design should be mentioned	Education, CAET, JAU, Junagadh

NAVSARI AGRICULTURAL UNIVERSITY

No.	Experiment Title	Suggestions	Action
12.5.3.1	Standardization of technology for preparation of Tomato (Solanum lycopersicum L.) Powder for home scale adoption	Approved with following suggestions Recast the title as "Development of technology for ready to use freeze dried tomato (*Solanum lycopersicum* L.) slice" with the objectives; 1.To standardize process parameters for freeze dried tomato slice. 2. To evaluate the quality characteristics of freeze dried tomato slice during storage. 3.To evaluate rehydration characteristics of freeze dried tomato slices And treatment as **Factor1:**Slice thickness 1. 5 mm 2. 10 mm 3.15 mm **Factor 2:** Blanching at 80^0C for 2min 2. Without hot water **Factor 3**:Freezing to -30^0C with three rates (6h, 8h , 12 h) **Factor4**:Vacuum freeze drying stage I: 35^0C Stage II: 50 ^{0}C	Center of Excellence of PHT, Navsari
12.5.3.2	Technology for utilization of Orange Peel and Seed	Approved with following suggestions Characterization of processing waste Standardize drying Essential oil from seed, peel	Center of Excellence of PHT, Navsari

12.5.3.3	Evaluation of Land Leveling and Sowing Methods on Yield and Water use efficiency of Sorghum (Sorghum bicolor L.) Crop in Vertisol of South Gujarat	Approved with following suggestions Replace first treatment with ridge and furrow system. Furrow irrigation system is to be designed Modify the title as Influence of land configuration on productivity of sorghum	Dept. of Agril. Engg., NMCA, Navsari
12.5.3.4	Effect of different colour shade nets on biomass and quality of leafy vegetables (Fenugreek, coriander and garlic)	Approved	Res. Sci., Soil and Water Mgmt. Research Unit, N.A.U., Navsari
12.5.3.5	Modification of NAU designed hold – on type power operated Paddy thresher	Approved with suggestion to work out the economics	Res. Sci., Soil and Water Mgmt. Research Unit, N.A.U., Navsari
12.5.3.6	Evaluation of irrigation scheduling in rice crop by using field water tube (alternative wetting and drying method)	Approved with following suggestions Modify objectives as suggested To simulate soil moisture in root zone To work out the economics of paddy production	Research Scientist, Soil and Water Management Research Unit, N.A.U., Navsari
12.5.3.7	Performance evaluation of Scheffler Solar Concentrating Cooker for direct and indirect community cooking application	Not approved	Action: Dean, CAET, Dediapada
12.5.3.8	Design, development and performance evaluation of mixed mode cabinet solar dryer	Approved	Dean, CAET, Dediapada
12.5.3.9	Trends of Rainfall and temperature variation in Narmada District of Gujarat	Approved with suggestions Data independence / correlation needs to be established before using MK test. Probability distribution selected need to be tested using Andarson-Darling test. The evaporation probability analysis to be	Dean, CAET, Dediapada

		carried out. ER procedure to be highlighted Irrigation requirements to be estimated with local Kc correction procedures.	
12.5.3.10	Development of studies of Sapota (Chikoo) Powder based value added product (pasta) using semolina (Suji) and maida	Approved Change it to control instead of "0" in treatment Remove two different in statistical design	Dean, CAET, Dediapada
12.5.3.11	comparative Studies on the different drying methods on ber (*Ziziphus mauritiana)*	Approved Change in treatment instead of 40^0c take 70^0c	Dean, CAET, Dediapada
12.5.3.12	Effect of laser levelling on water use efficiency and growth of gram crop	Approved Design border irrigation Compare the slope with recommended areas Plot leveling index Vs yield	Dean, CAET, Dediapada
12.5.3.13	Design and development of raised bed former-cum-seeder for clay loam soil condition for Narmada	Approved	Dean, CAET, Dediapada
12.5.3.14	Design and development of suitable furrow opener for heavy clay soil condition for South Gujarat	Approved Modify objectives as suggested	Dean, CAET, Dediapada
12.5.3.15	A Study on technical feasibility and development of online Financial Approval system for NAU	Approved	Dept. of Info. & Comm. Tech., AABMI, Navsari
12.5.3.16	Development program for online tour approval for NAU	Approved Modify 1st objective as suggested To evaluate technical feasibility of online software as per statue 121	Dept. of ICT, AABMI, NAU, Navsari
12.5.3.17	Developing mobile App for the APMC operations.	Approved modify as suggested Modify 1st objective as suggested To study the APMC Management operations and Farmers requirement. Modify 3rd objective as suggested To develop the Mobile App for the APMC	Dept. of ICT, AABMI, NAU, Navsari

		operation Drop 2nd objective	
12.5.3.18	Developing web portal for the farmers of South Gujarat Region	Approved with modified 1st objective To study the requirement of web portal to disseminate the agricultural Information to South Gujarat farmers	Dept. of ICT, AABMI, NAU, Navsari
12.5.3.19	Standardization of technology for preparation of Aloe vera based vermicelli	Approved Also presented in Horticulture sub committee	I/c, CE on PHT, Navsari
12.5.3.20	Standardization of technology for minimal processing of fresh cut cauliflower (*Brassica oleracea* var. botrytis L.).	Approved	I/c, CE on PHT, Navsari
12.5.3.21	Standardization of technology for minimal processing of fresh cut potatoes (*Solanum tuberosum* L.).	Approved	I/c, CE on PHT, Navsari
12.5.3.22	Standardization of technology for preparation of candy from ripe papaya (*Carica papaya* L.) fruits.	Approved	I/c, CE on PHT, Navsari
12.5.3.23	Development of technology for preservation of tender coconut water	Not Approved	I/c, CE on PHT, Navsari
12.5.3.24	Development of technology for health based digestive tablets from noni pomace powder.	Approved with change of title "Development of technology for value added tablets from noni pomace powder".	I/c, CE on PHT, Navsari
12.5.3.25	Characterization of the Sapota seed oil for extraction and value addition	Not Approved	I/c, CE on PHT, Navsari
12.5.3.26	Home scale ripening of Banana Cv. Grand Naine	Approved	I/c, CE on PHT, Navsari
12.5.3.27	Effect of pre-cooling on quality and shelf-life of Banana Cv. Grand Naine	Not Approved as the technology has already been developed by AAU & recommended by Combined Joint Agresco	I/c, CE on PHT, Navsari

SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

No.	Experiment Title	Suggestions	Action
12.5.4.1	Effective utilization of kinetic energy available in output water of Submersible Pump.	Approved with suggestion Calculate net energy generated	Dean, College of RE & EE, SDAU

12.5.4.2	Effect of land configuration and mulching on productivity and resource use efficiency of castor.	Approved with suggestion Plastic mulch should be removed from treatment	Res. Sci., Centre for Natural Resource Mgmt., SDAU
12.5.4.3	Feasibility of rabi crops using harvested rain water through MIS.	Approved with suggestion Specify MIS, give amount of water available, catchment area, number of irrigations, Pond size	Res. Sci., Centre for Natural Resource Mgmt., SDAU
12.5.4.4	Technological Intervention for Fortification of Omega-3 Fatty Acids in Milk.	Approved with suggestion Target group should be identified	Dean, College of Dairy Science & Food Technology, SDAU,
12.5.4.5	Development of Carrot based blended ready-to-serve (RTS) beverages and its qualitative evaluation.	Approved with suggestion • Micrological observation should be added during storage • Addition of KMS as per FSSI • Weekly interval analysis • Refrigerated storage to be included in shelf life study	Dean, College of Home Science, SDAU,
12.5.4.6	Development and evaluation of functional cookies produced from whole wheat flour comprised with soya flour and rice bran.	Approved with suggestion • Functionality of the product to be defined • Title to be refined	Dean, College of Home Science, SDAU,
12.5.4.7	Development and evaluation of multigrain functional flour for traditional recipes**.**	Approved with suggestion • Rheological properties of the dough be included	Dean, College of Home Science, SDAU,
12.5.4.8	Design, Development & evaluation of lemon harvesting device.	Approved with suggestion Collaborators from JAU should be included	Dean, College of Horticulture, Jagudan, SDAU
12.5.4.9	Design and development / assembling of low cost overflow protection and temperature control system for overhead water tank	Approved with suggestion Economics be computed	Dean, College of RE & EE, SDAU

12.5.4.10	Design and development of single axis solar tracker to enhance efficiency of PV array for better operation of water pumping	Approved with suggestion Try to design for 5 Hp pump and compare it with locally available trackers	Dean, College of RE & EE, SDAU

KAMDHENU UNIVERSITY

Expt. No.	Experiment Title	Suggestions	Action
12.5.5.1	Development of milk - beetroot based fibre enriched low calorie burfi	Change title as suggested by the house Observation related to water activity should be added	College of Dairy Science, Kamdhenu Univ. Amreli

12.6 BASIC SCIENCE & HUMANITIES/ BASIC SCIENCE/ PLANT PHYSIOLOGY, BIO- CHEMISTRY AND BIOTECHNOLOGY

Chairman	:	Dr. C. J. Dangaria, Hon'ble V.C., NAU
Co-Chairmen	:	Dr. S. Acharya, ADR, SDAU Dr. B.A. Golakiya, Head, Department of Biotechnology, JAU
Rapporteurs	:	Dr. A.D. Patel, Research Scientist, RRS, AAU Dr. Diwakar Singh, Asst. Prof., NAU

The details of recommendations and new technical programmes presented, discussed and approved during the session are as under:

Universities	Recommendations				New Technical Programmes	
	Farming Community		Scientific Community			
	Proposed	Approved	Proposed	Approved	Proposed	Approved
AAU	2	2	-	-	9	8
JAU	3	3	7	7	12	12
NAU	-	-	-	-	12	12
SDAU	2*	2*	1	1	3	3
Total	**7**	**7**	**8**	**8**	**36**	**35**

*** Recommended for domestic and industrial use**

Total number of recommendations:15

12.6. RECOMMENDATIONS

A. FARMING COMMUNITY

ANAND AGRICULTURAL UNIVERSITY	
12.6.1.1.1	**Influence of chemicals and PGR's on growth and dry biomass yield of Dodi (*Leptadenia reticulata* (Retz.) W. & A.)**
	The farmers of Middle Gujarat Agro-climatic Zone-III growing Dodi crop in *kharif* season are recommended to spray urea 2% with potassium chloride (KCl) 2% at 45 and 75 days after planting for getting higher dry biomass yield as well as net return.
	મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તાર-૩ ના ચોમાસુ ઋતુમાં ડોડી (જીવંતિ) પાકનું વાવેતર કરતા ખેડૂતોને વધુ ઉત્પાદન અને આર્થિક વળતર મેળવવા માટે ૨% યુરીયા અને ૨% પોટેશીયમ ક્લોરાઇડના દ્રાવણનું મિશ્રણ રોપણી બાદ ૪૫ અને ૭૫ દિવસે છંટકાવ કરવાની ભલામણ કરવામાં આવે છે. **Approved by house** **(Action: Res. Sci., Medicinal and Aromatic Plant Research Station, AAU, Anand)**
12.6.1.1.2	**Influence of source manipulation through decapitation and PGR's on growth, yield and quality of cluster bean (*Cyamopsis tetragonaloba* L. Taub.) seed cv. 'Pusa Navbahar'**
	Farmers of Middle Gujarat Agro-climatic Zone-III growing cluster bean cv. Pusa Navbahar in *kharif* season for seed production are recommended to spray GA_3 20 mg/l at 45 DAS with decapitation of the plant at 70 DAS for getting higher seed yield as well as net profit.
	મધ્ય ગુજરાત ખેત આબોહવાકીય વિસ્તાર-૩ ના ખેડૂતોને ખરીફ ઋતુમાં ગુવાર (પૂસા નવબહાર)માં વધુ બીજ ઉત્પાદન અને આર્થિક વળતર મેળવવા માટે પાકની વાવણી બાદ ૪૫ દિવસે જીબ્રેલીક એસીડ ૨૦ મિગ્રા / લિટરનો છંટકાવ સાથે ૭૦ દિવસે છોડની ટોચ (અગ્રકલિકા) કાપવાની ભલામણ કરવામાં આવે છે. **Approved by house after recasting the language of recommendation.**

	(Action: Research Scientist, MVRS, AAU, Anand)
JUNAGADH AGRICULTURAL UNIVERSITY	
12.6.1.2.1	**Effect of foliar spray of micro-nutrients on growth and yield parameters of summer groundnut**
	The farmers of South Saurashtra Agro-climatic Zone growing summer groundnut are advised to apply the foliar spray of zinc sulfate 0.5% (2.5 Kg ha^{-1} in 500 liter water) at 35 and 70 DAS for higher vegetative growth, pod yield and net return.
	દક્ષિણ સૌરાષ્ટ્ર ખેત–આબોહવાકિય વિસ્તારના ઉનાળુ મગફળી ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે વધુ વાનસ્પતિક વૃધ્ધિ તથા ઉત્પાદન અને ચોખ્ખી આવક મેળવવા માટે વાવણી બાદ ૩૫ અને ૭૦ દિવસે ઝીંક સલ્ફેટ ૦.૫% (૨.૫ કિ.ગ્રા./ હે., ૫૦૦ લીટર પાણીમાં) છંટકાવ કરવો. Approved by house after recasting the language of recommendation. **(Action: Res. Sci., Main Oilseeds Research Station, J.A.U., Junagadh)**
12.6.1.2.2	**Effect of plant growth regulators and detopping on yield of Bt cotton (*Gossypium hirsutum L.*) under rainfed condition**
	The farmers of North Saurashtra Agro-climatic Zone growing Bt cotton in kharif season are advised for detopping at 75 DAS + spray of Ethrel (Ethylene-39 %) 50 ppm (1.3 ml/10 liter water) at 90 DAS for obtaining higher yield and net return. This is due to higher values of taproot length, number of monopodia and number of sympodia per plant and improved quality of seed i.e. ginning percentage, increase uniformity ratio, elongicity percentage and tenacity.
	ઉત્તર સૌરાષ્ટ્ર ખેત આબોહવાકીય વિસ્તારમાં ખરીફ ઋતુમાં વરસાદ આધારીત બી.ટી.કપાસ નું વાવેતર કરતા ખેડૂતોને વધુ ઉત્પાદન અને ચોખ્ખી આવક માટે બી.ટી.કપાસના પાકનાં વાવણી બાદ ૭૫ દિવસે છોડની ઉપરની ડૂંખ તોડવા તેમજ વાવણી બાદ ૯૦ દિવસે ઇથરેલ (ઇથીલીન–૩૯ %) ૫૦ પી.પી.એમ. (૧.૩ મિ.લિ.પ્રતિ ૧૦ લિટર પાણીમાં) નાં દ્રાવણનો છંટકાવ કરવાની ભલામણ કરવામાં આવે છે. આમ કરવાથી મૂળની લંબાઈ, મોનોપોડીયા અને સિમ્પોડીયાની સંખ્યા તથા બીજની ગુણવત્તામાં વધારાના કારણે ઉત્પાદનમાં વધારો થાય છે. **Approved by house after recasting the language of recommendation.** **(Action: Research Scientist, Dry Farming Research Station, JAU, Targhadia)**
12.6.1.2.3	**Effect of plant growth regulators and detopping on morpho-physiological components of yield in cotton (*G. hirsutum*L.)**
	The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton under irrigated condition are recommended for detopping the cotton plant at 75 DAS for balance growth to obtain higher seed cotton yield and net return. This is due to high chlorophyll content, increased in thickness of leaves, increased in length and number of sympodia, increased plant spread and number of bolls.
	દક્ષિણ સૌરાષ્ટ્ર ખેત આબોહવાકિય વિસ્તારમાં પિયત બી.ટી. કપાસનું વાવેતર કરતા ખેડૂતોને વધારે ઉત્પાદન, વધુ આર્થિક વળતર અને ખર્ચના પ્રમાણમાં વધુ નફો મેળવવા માટે બી.ટી. કપાસની સપ્રમાણ વૃધ્ધિ કરવા ૭૫ દિવસે કપાસના છોડની ટોચ કાપવાની ભલામણ કરવામાં આવે છે. આમ કરવાથી પાનનાં હરિતદ્રવ્ય, પાનની જાડાઈ, સિમ્પોડીયાની સંખ્યા તથા લંબાઈ, છોડનો ઘેરાવો તેમજ જીંડવાની સંખ્યામાં વધારાના કારણે ઉત્પાદનમાં વધારો થાય છે. **Approved by house after recasting the language of recommendation.** **(Action: Research Scientist, Cotton Research Station, J.A.U., Junagadh)**
NAVSARI AGRICULTURAL UNIVERSITY ----- NIL	
SARDARKRUSHINAGAR DANTIVADA AGRICULTURAL UNIVERSITY	
12.6.1.4.1	**Preparation and evaluation of nutritious *Laddu* by incorporation of Ragi, Grain Amaranth, Sesame and Wheat**
	For the preparation of nutritious *Laddu* following two protocols are recommended: 1) Protocol-I Blend coarse flour of wheat, roasted grain amaranth and crushed sesame seeds to the

	proportion of 40:30:30 per cent, respectively. In this blended quantity add its 60 per cent shredded jaggery and 35 per cent pure ghee. 2) Protocol-II Blend coarse flour of ragi, roasted grain amaranth and crushed sesame seeds to equal proportions (i.e. 33.3 per cent of each). In this blended quantity add its 60 per cent shredded jaggery and 30 per cent pure ghee. These *Laddu* contain more amount of quality protein, fiber, minerals particularly calcium, iron and zinc besides essential amino acids mainly lysine, methionine and tryptophan. Additionally the product is organoleptically acceptable by the end user with good keeping quality upto 20 days than control.
	પૌષ્ટિક લાડુ બનાવવા માટે નીચે મુજબની બે રીતોની ભલામણ કરવામાં આવે છે : (૧) ઘઉંનો કરકરો લોટ, શેકેલા રાજગરાનો લોટ અને કચરેલા તલને ૪૦:૩૦:૩૦ ટકા પ્રમાણે ક્રમાનુસાર લઈ મિશ્રણ કરવું. આ મિશ્રણના ૬૦ ટકા છીણેલો ગોળ અને ૩૫ ટકા શુધ્ધ ઘી તેમા ઉમેરવું. (૨) રાગીનો કરકરો લોટ, શેકેલ રાજગરાનો લોટ અને કચરેલા તલને સરખા પ્રમાણમાં (એટલે કે ત્રણેય ૩૩.૩૩ ટકા મુજબ) લઈ મિશ્રણ કરવું. આ મિશ્રણના ૬૦ ટકા છીણેલો ગોળ અને ૩૦ ટકા શુધ્ધ ઘી તેમાં ઉમેરવું. આ લાડુમાં ગુણવત્તાયુકત પ્રોટીન, રેષા, ખનીજ તત્વો ખાસ કરીને કેલ્શિયમ, લોહ અને ઝીંક તેમજ આવશ્યક એમિનો એસિડસ મુખ્યત્વે લાયસીન, મથીયોનીન અને ટ્રીપ્ટોફાનની માત્રામાં વધારો થાય છે. વધુમાં આ લાડુને લોકો ખાવામાં પસંદ કરે છે અને સામાન્ય લાડુ કરતાં તેની સંગ્રહશકિત ૨૦ દીવસ સુધી રાખી શકાય છે. **Approved by house after recasting the language of recommendation.** **(Action: Professor, Department of Food and Nutrition, ASPEE College of Home Science and Nutrition, SDAU, Sardarkrishinagar)**
12.6.1.4.2	**Preparation and evaluation of nutritious Biscuits by incorporation of Ragi, Grain Amaranth, Sesame and Wheat**
	For the preparation of nutritious biscuits following protocol is recommended: Blend whole wheat flour, ragi flour, roasted grain amaranth flour and crushed sesame seeds to the proportion of 55:10:10:25 **or** 50:10:20:20 per cent, respectively. In this blended quantity add its 50 per cent powdered sugar and 40 per cent vegetable ghee. These biscuits contain more amount of quality protein, fiber, minerals particularly calcium, iron and zinc besides essential amino acids mainly lysine, methionine and tryptophan. Additionally the product is organoleptically acceptable by the end user and it has good keeping quality upto 90 days under room condition.
	પૌષ્ટિક બિસ્કીટ બનાવવા માટે નીચે મુજબ ભલામણ કરવામાં આવે છે : ઘઉં, રાગી અને શેકેલ રાજગરાના લોટમાં કચરેલા તલને ૫૫:૧૦:૧૦:૨૫ અથવા ૫૦:૧૦:૨૦:૨૦ ટકા પ્રમાણે ક્રમાનુસાર લઈ મિશ્રણ કરવું. આ મિશ્રણના ૫૦ ટકા દળેલી ખાંડ અને ૪૦ ટકા વેજીટેબલ ઘી ઉમેરવું. આ બિસ્કીટમાં ગુણવત્તાયુકત પ્રોટીન, રેષા, ખનીજ તત્વો ખાસ કરીને કેલ્શિયમ, લોહ અને ઝીંક તેમજ આવશ્યક એમિનો એસિડસ મુખ્યત્વે લાયસીન, મીથીયોનીન અને ટ્રીપ્ટોફાનની માત્રામાં નોધપાત્ર વધારો થાય છે. વધુમાં આ બિસ્કીટને લોકો ખાવામાં પસંદગી કરે છે અને સામાન્ય વાતાવરણમાં તેને ૯૦ દિવસ સુધી સંગ્રહ કરી શકાય છેઙ **Approved by house after recasting the language of recommendation.** **(Action: Professor, Department of Food and Nutrition, ASPEE College of Home Science and Nutrition, SDAU, Sardarkrishinagar)**

B. SCIENTIFIC COMMUNITY

ANAND AGRICULTURAL UNIVERSITY - NIL	
JUNAGADH AGRICULTURAL UNIVERSITY	
12.6.1.2.1	**Effect of date of sowing and pre-treatment of seeds with GA_3 on seed germination and seedling vigour of cumin (*Cuminum cyminum* L.)**

	It is informed to the scientific community that sowing of cumin seed in the third week of November along with pre-soaking treatment of 50 mg/l Gibberellic acid (GA_3) for12 hrs to cumin seed at ambient temperature increases germination with enhanced seedling vigour in cumin. **Approved by house after recasting the language.** **(Action: Prof. & Head, Dept. of Genetics & Plant Breeding, JAU, Junagadh)**
11.6.1.2.2	**The study of fresh seed dormancy in Sesame**
	It is informed to scientific community that the fresh seed dormancy of sesame variety G Til-10 is broken after storage for a month (30 days) after harvest followed by drying, this increases the seed germination percentage and seedling vigour. **Approved by house after recasting the language.** **(Action: Prof. & Head, Dept. of Genetics & Plant Breeding, JAU, Junagadh)**
12.6.1.2.3	**Effect of plant growth regulators and detopping on morpho-physiological components of yield in cotton (*G. hirsutum* L.)**
	The scientific community is informed for detopping the cotton plant at 75 DAS with foliar spray of growth inhibitor Maleic Hydrazide (MH)* 30 ppm (0.3g /10 lit. water) at 90 DAS for balance growth to obtain higher seed cotton yield and net return. This is due to high chlorophyll content, increased in thickness of leaves, increased in length & no. of sympodia, increased plant spread and no. of bolls. *Use of MH is banned by Government of India. **Approved by house after recasting the language.** **(Action: Res. Sci., Cotton Research Station, JAU, Junagadh)**
12.6.1.2.4	**The effect of storage conditions, packing materials and seed treatments on viability and seedling vigour of onion (*Allium cepa* L.) seeds**
	It is informed to scientific community that onion seed may be stored in cold storage ($7^0C \pm 2^0C$) condition packed with cloth bag or polythelene bag (500 gauge) with seed treatment (Carbendazim 2g/kg seed or Mancozeb 2g/kg seed or Thirum 3g/kg seed or Neem leaf powder 10g/kg seed) or without seed treatment for a period of 2 years without deterioration in germination and seedling vigour. **Approved by house after recasting the language.** **(Action: Res. Sci., Department of Seed Science and Technology, JAU, Junagadh)**
12.6.1.2.5	**Seed viability in soybean (*Glycine max* (L.) Merr.) under different storage conditions and seed treatments**
	It is informed to scientific community that soybean seed may be stored under cold storage ($7^0C \pm 2^0C$) condition in cloth bag with seed treatment of Mancozeb 2g/kg seed or Carbendazim 2g/kg seed or Neem leaf powder 10 g/kg seed for a period of 2 years without deterioration in germination and seedling vigour. **Approved by house after recasting the language.** **(Action: Res. Sci., Department of Seed Science and Technology, JAU, Junagadh)**
12.6.1.2.6	**Qualitative and quantitative evaluation of seed vigour and viability by Tetrazolium test in pearl millet [*Pennisetum glaucum* (L.) R. Br.]**
	It is informed to scientific community that pearl millet seed may be stored in air tight plastic containers for a period of 16 months without deterioration in germination seedling vigour **Approved by house after recasting the language.** **(Action: Res. Sci., Department of Seed Science and Technology, JAU, Junagadh)**
12.6.1.2.7	**Performance of *neem* products on the storability of mungbean [*Vigna radiata* (L.) Wilczek]**

	It is informed to scientific community that mungbean seed may be stored in normal condition packed in HDPE bags (500 gauge) with seed treatment of cloth bag or polythelene bag (500 gauge) with seed treatment (*Neem* seed kernel powder 5 to 10 g/kg seed or *Neem* Cake 5–10 g/kg seed) for a period of 2 years without deterioration in germination and seedling vigour. **Approved by house after recasting the language.** **(Action: Res. Sci., Department of Seed Science and Technology, JAU, Junagadh)**
NAVSARI AGRICULTURAL UNIVERSITY --- NIL	
SARDARKRUSHINAGAR DANTIVADA AGRICULTURAL UNIVERSITY	
12.6.1.4.1	**Diversity screening for high iron and zinc content in hexaploid and tetraploid Wheat genotypes using molecular markers**
	The differential staining techniques for iron (PPB 3.5%) and zinc (DTZ 0.5%) can be cost effectively, efficiently and ideally utilized for detecting variations in iron and zinc content (high, medium and low) in wheat flour and identifying iron and zinc rich varieties to be included for human consumption, particularly in mid day meal programmes to alleviate iron and zinc deficiencies among children. **Accepted** **(Action: Biotechnology Section, CIL, S.D.A.U., Sardarkrishinagar)**

12.6.2 NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERSITY

Sr. No.	Title / Centre	Suggestions	Remarks
12.6.2.1.1	**Centre: Department of Seed Science Technology, AAU, Anand**		
	Effect of zinc and iron oxide nanoparticles on seed viability and vigour in soybean seeds under artificial ageing	Approved with following suggestion/s 1. Also present in the crop improvement sub committee at combine joined AGRESCO meeting. It was presented and there it was suggested to include storage period. 2. Include details regarding nanoparticle used in study. **(Action: Prof. & Head, Seed Sci. & Tech., BACA, AAU, Anand)**	Approved with suggestions
12.6.2.1.2	**Centre: Department of Plant Physiology, BACA, AAU, Anand**		
	Influence of seed hardening on germination and related gene expression study in green gram (*Vigna radiata* L)	Approved with following suggestion/s 1. Test the best treatment in the pot trial giving water stress treatment v/s control. 2. Also determine the gene expression in pot trial. **(Action: Prof. and Head, Plant Physiology, BACA, AAU, Anand)**	Approved with suggestions
12.6.2.1.3	**Centre: Plant Physiology, BTRS, AAU, Anand**		
	Physiological investigation on productivity in rustica	Approved with following suggestion/s	Approved with suggestions

	tobacco (*Nicotiana rustica* L.)	1. Measure the leaf thickness. 2. Analyze soil nutrient status before conducting experiment. **(Action: Res. Sci., Pl. Physio., BTRS, AAU, Anand)**	
12.6.2.1.4	**Centre: Department of Biochemistry, BACA, AAU, Anand**		
	Effect of benzyladenine (BA) on water deficit stress in rice seedling	Approved with following suggestion/s 1. Mention the duration of seed soaking in treatment. **(Action: Res. Sci. & Head, Biochem., BACA, AAU, Anand)**	Approved with suggestions
12.6.2.1.5	**Centre: Department of Agril. Biotechnology, AAU, Anand**		
	Development of genomic SSR markers in cluster bean	Approved **(Action: Res. Scientist, Agril. Biotechnology, AAU, Anand)**	Approved
12.6.2.1.6	**Centre: Department of Agril. Biotechnology, AAU, Anand**		
	Transcriptome profiling of resistant and susceptible solanum genotypes in response to infection by Tomato Leaf Curl Virus (ToLCV)	Approved **(Action: Research Scientist, Agril. Biotechnology, AAU, Anand)**	Approved
12.6.2.1.7	**Centre: Plant Tissue Culture Lab, AAU, Anand**		
	Genotype identification in date palm cultivars using molecular markers	Dropped 1. Similar experiment is to be presented and approved for SDAU due to its mandate crop. So, need not to repeat same experiment. **(Action: Res. Sci., Plant Tissue Culture Lab, AAU, Anand)**	Not Approved
12.6.2.1.8	**Centre: Plant Tissue Culture Lab, AAU, Anand**		
	Development of regeneration protocol for large scale production of Coconut (*Cocos nucifera* L.)	Approved **(Action: Res. Sci., Plant Tissue Culture Lab, AAU, Anand)**	Approved
12.6.2.1.9	**Centre: Plant Tissue Culture Lab, AAU, Anand**		
	Synthesis and characterization of hydroxyapatite nanoparticles and its potential applications as phosphorous fertilizers in soybean.	Approved with following suggestion/s 1. Determine the phospohorus use efficiency in pot experiment instead of seed treatment. **(Action: Res. Sci., Plant Tissue Culture Lab, AAU, Anand)**	Approved

JUNAGADH AGRICULTURAL UNIVERSITY

12.6.2.2.1	**Centre: Department of Biochemistry and Biotechnology, JAU, Junagadh**		
	Studies on phytochemicals and metabolomics profiling of	Approved with following suggestion/s	Approved with

	seaweeds	1. Include total protein content. **(Action: Professor and Head, Department of Biochemistry and Biotechnology, JAU, Junagadh**)	suggestions
12.6.2.2.2	**Centre: Department of Biochemistry and Biotechnology, JAU, Junagadh**		
	Elemental, nutritional and microbiological analysis of panchagavya (ancient organic liquid).	Approved with following suggestion/s 1. Foliar spray and soil treatment may not be compared. So design should be decided with statistician. **(Action: Professor and Head, Department of Biochemistry and Biotechnology, JAU, Junagadh**)	Approved with suggestions
12.6.2.2.3	**Centre: Department of Biochemistry and Biotechnology, JAU, Junagadh**		
	Genome sequencing of cumin (*Cuminum cyminum*) to reveal insight of its genomic architecture.	Approved **(Action: Professor and Head, Department of Biochemistry and Biotechnology, JAU, Junagadh**)	Approved
12.6.2.2.4	**Centre: Department of Biochemistry and Biotechnology, JAU, Junagadh**		
	Transcriptome analysis in coriander for identification of candidate genes against stem gall disease.	Approved **(Action: Professor and Head, Department of Biochemistry and Biotechnology, JAU, Junagadh**)	Approved
12.6.2.2.5	**Centre: Department of Biochemistry and Biotechnology, JAU, Junagadh**		
	Transcriptome and Proteomic characterization for identification of candidate genes responsible for pistillate inflorescence and its reversion in castor.	Approved **(Action: Professor and Head, Department of Biochemistry and Biotechnology, JAU, Junagadh**)	Approved
12.6.2.2.6	**Centre: Main Dry Farming Research Station, JAU, Targhadia**		
	Effect of integrated nutrient management on growth and yield of chickpea under North Saurashtra region.	Approved **(Action: Research Scientist, Main Dry Farming Research Station, JAU, Targhadia**)	Approved
12.6.2.2.7	**Centre: Pearl Millet Research Station, JAU, Jamnagar**		
	Evaluation of pearl millet germplasm lines for salinity	Approved with following suggestion/s 1. Salinity level should be indicated in range (e.g. 4-5 EC) **(Action: Res. Sci., Pearl Millet Research Station, JAU, Jamnagar**)	Approved
12.6.2.2.8	**Centre: Department of Seed Science and Technology, JAU, Junagadh**		

	The effect of packing materials and pod treatments on viability and seedling vigour of groundnut (*Arachis hypogaea*) seeds.	Approved **(Action: Prof. and Head, Department of Seed Science and Technology, JAU Junagadh)**	Approved
12.6.2.2.9	**Centre: Department of Seed Science and Technology, JAU, Junagadh**		
	Effect of micronutrient application on seed yield and quality of coriander (*Coriandrum sativum*).	Approved with following suggestion/s 1. Statistical design should be FRBD and treatment combinations should be decided in the consultation with statistician. **(Action: Prof. and Head, Department of Seed Science and Technology, JAU Junagadh)**	Approved with suggestions
12.6.2.2.10	**Centre: Department of Seed Science and Technology, JAU, Junagadh**		
	The effect of seed treatments on viability and seedling vigour of groundnut (*Arachis hypogeae*) seeds stored under air tight container.	Approved **(Action: Prof. and Head, Department of Seed Science and Technology, JAU Junagadh)**	Approved
12.6.2.2.11	**Centre: Department of Seed Science and Technology, JAU, Junagadh**		
	Study the fresh seed dormancy in sesame.	Approved **(Action: Prof. and Head, Department of Seed Science and Technology, JAU Junagadh)**	Approved
12.6.2.2.12	**Centre: Department of Seed Science and Technology, JAU, Junagadh**		
	Application of brassinolide to mitigate saline stress during germination and growth period in chickpea.	Approved **(Action: Prof. and Head, Department of Seed Science and Technology, JAU Junagadh)**	Approved

NAVSARI AGRICULTURAL UNIVERSITY

Sr. No.	Title / Centre	Suggestions	Remarks
12.6.2.3.1	**Centre: Main Cotton Research Station, NAU, Surat**		
	Screening of cotton genotypes for salinity tolerance	Approved with following suggestion/s 1. Analysis of normal and saline soil for EC, pH and NPK status should be done before experiment. Analyse Na/K ratio 2. Trial should be taken in large size pot. 3. Watering should be uniform. 4. If possible do the transcriptome at stress level. 5. Salinity of soil should be more than 4 dSM^{-1}. **(Action: Main Cotton**	Approved with suggestions

		Research Station, NAU, Surat)	
12.6.2.3.2	**Centre: Main Cotton Research Station, NAU, Surat**		
	Biochemical traits in relation to insect tolerance of wild species and cross derivatives involving wild species of cotton	Approved with following suggestion/s 1. Add tricom image in morphological parameter. 2. Analyze total sugar and reducing sugar. Remove non-reducing sugar. **(Action: Main Cotton Research Station, NAU, Surat**)	Approved with suggestions
12.6.2.3.3	**Centre: Main Cotton Research Station, NAU, Surat**		
	Study of Bt proteins expression in cotton hybrids with different categories of parents	Approved with following suggestion/s 1. Cry proteins quantification should be incorporated. **(Action: Main Cotton Research Station, NAU, Surat**)	Approved with suggestions
12.6.2.3.4	**Centre: Main Cotton Research Station, NAU, Surat**		
	Isolation and characterization of endophytic bacteria from wild cotton plants and exploring insecticidal activity against pink bollworm, *Pectinophora gossypiella*	Approved with following suggestion/s 1. Take also wild relative genus and species from Surendranagar, Dhanduka, Viramgam regions for isolation and characterization of endophytic bacteria. **(Action: Main Cotton Research Station, NAU, Surat**)	Approved with suggestions
12.6.2.3.5	**Centre: ASPEE SHAKILAM Agricultural Biotechnology Institute, NAU, Surat**		
	Influence of various nanoparticles on contamination in micropropagation of banana	Approved **(Action: Principal & Dean, ASPEE SHAKILAM Agril. Biotech. Institute, NAU, Surat**)	Approved
12.6.2.3.6	**Centre: ASPEE SHAKILAM Agricultural Biotechnology Institute, NAU, Surat**		
	Optimization of *de novo* regeneration protocol and selection of glyphosate tolerant line for *Cynodon dactylon* variety Selection 1	Approved **(Action: Principal & Dean, ASPEE SHAKILAM Agril. Biotech. Institute, NAU, Surat**)	Approved
12.6.2.3.7	**Centre: ASPEE SHAKILAM Agricultural Biotechnology Institute, NAU, Surat**		
	Optimization of amylase production by soil isolate under solid state fermentation (SSF)	Approved with following suggestion/s 1. Sample should be collected from dump site. **(Action: Principal & Dean, ASPEE SHAKILAM Agril. Biotech. Institute, NAU, Surat**)	Approved with suggestions
12.6.2.3.8	**Centre: Head, Dept. of Plant Molecular Biology & Biotech., ACHF, NAU, Navsari**		

	Characterization and field efficacy of PGPRs from different banana cultivars	Approved **(Action: Head, Dept. of Plant Molecular Biology and Biotech., ACHF, NAU, Navsari)**	Approved
12.6.2.3.9	**Centre: Prof. and Head, Department of Plant Pathology, NMCA, NAU, Navsari**		
	Effect of phosphate solubilizing microbes in wheat (*Triticum aestivum*) under saline conditions	Approved **(Action: Prof. and Head, Department of Plant Pathology, NMCA, NAU, Navsari)**	Approved
12.6.2.3.10	**Centre: Prof. and Head, Department of Plant Pathology, NMCA, NAU, Navsari**		
	Isolation and characterization of plant growth promoting Actinomycetes from rhizospheric soil	Approved with following suggestion/s 1. Add Indian bean rhizospheric soil for isolation of actinomycetes. **(Action: Prof. and Head, Department of Plant Pathology, NMCA, NAU, Navsari)**	Approved with suggestions
12.6.2.3.11	**Centre: Food Quality Testing Laboratory, NMCA, NAU, Navsari**		
	Surveillance of aflatoxin in pasteurized and raw milk	Approved **(Action: Res. Sci., Food Quality Testing Laboratory, NMCA, NAU, Navsari)**	Approved
12.6.2.3.12	**Centre: Food Quality Testing Laboratory, NMCA, NAU, Navsari**		
	Characterization of bacteriocin produced by isolated lactic acid bacteria.	Approved with following suggestions: 1. Add the detail of microbes **(Action: Res. Sci., Food Quality Testing Laboratory, NMCA, NAU, Navsari)**	Approved with suggestions

SARDAR KRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

Sr. No.	Title / Centre	Suggestions	Remarks
12.6.2.4.1	**Centre: Biotechnology Section, CIL, SDAU, Sardarkrishinagar**		
	DNA fingerprinting of Date palm genotypes using SSR markers	Approved with following suggestion/s 1. SCAR markers should be developed for varietal identification of at least 4-5 popular varieties. **(Action: Head, Biotechnology Section, CIL, SDAU, SKNagar)**	Approved with suggestions
12.6.2.4.2	**Centre: Biotechnology Section, CIL, SDAU, Sardarkrishinagar**		
	Evaluation of inflorescence from Grain Amaranth (*Amaranth* spp.) genotypes for betalain pigment & Antioxidant activity	Approved **(Action: Head, Biotechnology Section, CIL, SDAU, SKNagar)**	Approved
11.6.2.4.3	**Centre: Department of Microbiology, College of Basic Science and Humanities, SDAU, Sardarkrishinagar**		
	Isolation and identification of bacterial cultures against	Approved with following suggestion/s	Approved with

	castor wilt pathogen *Fusarium oxysporum*	1. Add the observations to be recorded. 2. Isolate the bacteria from all the crops which is affected by *Fusarium* wilt. Collect diverse samples from different locations. **(Action : Prof. and Head, Dept. of Microbiology, College of Basic Sci. and Humanities, SDAU, SKNagar)**	suggestions

12.6.3 General Suggestions

1. If there is difference in the ppt and report then the presenting scientist should inform at the time of presentation and should say that they will correct the difference.
2. Multidisciplinary program should be formulated with concerned discipline.
3. Scientific recommendation should go through publication.
4. Action taken reports of recommendations as well as new technical programmes should be submitted by the indicated Scientist / Unit Head through the Convener of the sub-Committee to the Director of Research of respective University.

12.7 SOCIAL SCIENCE

Chairman : Dr. P.P. Patel, DEE, AAU (Dt. 11th April 2016)
Prof. (Dr.) Ashok Patel, Hon'ble VC, SDAU (Dt. 12th April 2016)
Co-Chairman: Dr. K.A. Thakkar, DEE, SDAU
: Dr.G.R. Patel, DEE, NAU
Rapporteurs : Dr. R. D. Pandya, NAU
: Dr. P.R. Kanani, JAU

The details of recommendations and new technical programmes presented, discussed and approved during the session are as under:

Name of University	Recommendations				New Technical Programmes	
	Farming Community		Scientific Community			
	Proposed	Approved	Proposed	Approved	Proposed	Approved
AAU	-	-	6	6	41	41
JAU	-	-	1+1*	1+1*	13	13
NAU	-	-	5	0	31	31
SDAU	-	-	-	-	19	19
Total	-	-	13	8	104	104

12.7. RECOMMENDATIONS FOR
A. FARMING COMMUNITY: NIL

B. SCIENTIFIC COMMUNITY: 07
C. POLICY MAKERS: 01*

Out of thirteen recommendations, eight recommendations were approved which are given below.

ANAND AGRICULTURAL UNIVERSITY	
12.7.1.1	**Yard stick of CV% for accepting the results of Safedmusali (*Chlorophytum borivilianum*) crop experiments**
	The yard stick of CV% for accepting the results of Safedmusali (*Chlorophytum borivilianum)* crop experiments is 21 per cent for yield character. Accepted by house for scientific community Action: Professor & HOD, Department of Statistics, BACA, AAU, Anand
12.7.1.2	**Yard stick of CV% for accepting the results of Ashwagandha (*Withania somnifera*) crop experiments**
	The yard stick of CV% for accepting the results of Ashwagandha (*Withania somnifera)* crop experiments is 22 per cent for yield character. Accepted by house for scientific community Action: Professor & HOD, Department of Statistics, BACA, AAU, Anand
12.7.1.3	**Yard stick of CV% for accepting the results of Isabgul (Psyllium) crop experiments**
	The yard stick of CV% for accepting the results of Isabgul (Psyllium) crop experiments is 23 per cent for yield character. Approved by house for scientific community (Action:Professor & HOD, Department of Statistics, BACA, AAU, Anand
12.7.1.4	**National level scale to measure attitude of extension functionaries towards Agricultural Technology Management Agency (ATMA)**

The following national level scale to measure attitude of extension functionaries towards ATMA is recommended.

No	Statements	Responses & Scoring				
		SA	A	UN	DA	SDA
1	I think that ATMA is the perfect platform to coordinate agricultural research and extension activities at district level. (+) મને લાગે છે કે જિલ્લા કક્ષાએ કૃષિસંશોધન અને વિસ્તરણ પ્રવૃત્તિઓના સમન્વય માટેઆદર્શ 'આત્મા' મંચ છે.	5	4	3	2	1
2	I think that ATMA is impractical way to develop rural India.(-) હું માનું છું કે ગ્રામીણ 'આત્મા' ભારતનાં વિકાસ માટે કામ કરવાની અવ્યવહારુ પદ્ધતિ છે.	1	2	3	4	5
3	I believe ATMA is in real sense bottom-up approach to develop rural India. (+) હું માનું છું કે આત્મા' વાસ્તવિક' અર્થમાં ગ્રામીણ ભારતનાં વિકાસના કાર્યોમાં હિસ્સેદારીની દ્રષ્ટિએ પાયાનાં સ્તરથી શરુ થઇ ઉપરનાં સ્તરે પહોંચતો અભિગમ છે.	5	4	3	2	1
4	I believe that ATMA means too many cooks spoil the broth. (-) મને લાગેછે કે એટલે 'આત્મા' ઝાઝા રસોઈયાઓ રસોઈ બગાડે તેવી વ્યવસ્થા છે.	1	2	3	4	5
5	I feel that ATMA is an ideal instrument for the development of district. (+) મને લાગે છે કે 'આત્મા' જિલ્લાના વિકાસ માટે એક આદર્શ માધ્યમ છે.	5	4	3	2	1
6	I feel that ATMA creates conflicts among neighboring farmers. (-) હું માંનુ છું ખેડૂતોમાં 'આત્મા' અંદરોઅંદર મતભેદો ઉભા થાય તેવો અભિગમ છે.	1	2	3	4	5
7	ATMA in real sense is a decentralized model of development. (+) સાચા અર્થમાં વિકાસ 'આત્મા' માટેની એક વિકેન્દ્રિત વ્યવસ્થા પદ્ધતિ છે.	5	4	3	2	1
8	I feel that ATMA is more theoretical and less practical. (-) મને લાગે છે કે વધુ 'આત્મા' પડતો તર્ક આધારીત અને ઓછો વ્યવહારુ અભિગમ છે.	1	2	3	4	5
9	I believe that ATMA is the best agency to encourage Farmer's Interest Groups. (+) હું માંનુ છું કે આત્મા ખેડૂત હિતજૂથોને પ્રોત્સાહિત કરવા માટેનું શ્રેષ્ઠ માધ્યમ છે.	5	4	3	2	1
10	I feel that ATMA is an effective attempt joining all	5	4	3	2	1

		the stakeholders to develop district. (+) મને લાગેછે કે તમામ 'આત્મા' હિસ્સેદારોના સહિયારા પ્રયાસ દ્વારા જિલ્લાના વિકાસ માટેનો અસરકારક પ્રયાસ છે.				

SA: Strongly Agree, **A**: Agree, **UN**: Undecided, **DA**: Disagree, **SDA**: Strongly Disagree

Approved by house for scientific community

(**Action: Professor & HOD**, **Dept. of Ext. Edu., BACA, AAU, Anand)**

12.7.1.5 **Scale to measure attitude of farmers toward use of mineral mixture in cattle**

The following scale to measure attitude of farmers towards use of mineral mixture for cattle is recommended.

No	Statements	Responses and Scoring				
		SA	A	UD	DA	SDA
1	I trust adopting mineral mixture for milch animals. (+) હું દૂધાળાં પ્રાણીઓ માટે મિનરલ મિક્ષચર (ખનિજક્ષાર) અપનાવવામાં વિશ્વાસ રાખું છું.	5	4	3	2	1
2	I believe that there is more propaganda about the use of mineral mixture as animal feed than truth. (-) હું માનું છું કે મિનરલ મિક્ષચરનો પશુઓના ખોરાક તરીકે ઉપયોગ કરવોએ વાસ્તવિકતા ઓછી અને પ્રચાર વધુ છે .	1	2	3	4	5
3	I think that mineral mixture helps to feed crucial minerals to milch animals. (+) હું માનું છું કે મિનરલ મિક્ષચર પશુઓને અતિ આવશ્યક ખનીજો આપવામાં મદદકરે છે.	5	4	3	2	1
4	I believe that use of mineral mixture helps boosting milk yield in animals. (+) હું માનું છું કે મિનરલ મિક્ષચરનો ઉપયોગ કરવાથી દૂધ ઉત્પાદન વધારવાનો જુસ્સોવધે છે.	5	4	3	2	1
5	I think use of mineral mixture helps in making animal bones stronger. (+) હું માનું છું કે મિનરલ મિક્ષચર પશુઓના હાડકાં મજબૂત કરવામાં મદદકરે છે.	5	4	3	2	1
6	I would like to advise my children to use mineral mixture for milch animals. (+) મારા સંતાનોને દૂધાળાં પ્રાણીઓ માટે મિનરલ મિક્ષચર ઉપયોગ કરવાની સલાહ આપું છું.	5	4	3	2	1
7	Use of mineral mixture ensures higher fertility rate in milch animals. (+) મિનરલ મિક્ષચર વાપરવાથી પશુઓની પ્રજનન કાર્યક્ષમતા વધારી શકાય છે	5	4	3	2	1
8	Use of mineral mixture reduces animal stress. (+)	5	4	3	2	1

	મિનરલ મિક્ષચરના ઉપયોગથી પશુઓમાં તણાવ ઘટે છે .					
9	I think that progressive livestock owner is one who uses mineral mixture for animal feed. (+) મને લાગેછેકે પ્રગતીશીલ પશુપાલક એને કહેવાય કે જે પશુઓ માટે મિનરલ મિક્ષચરનો ઉપયોગ કરતો હોય.	5	4	3	2	1
10	I believe that health of milch animals can be improved faster using mineral mixture. (+) હું માનું છું કે મિનરલમિક્ષચરના ઉપયોગથી દૂધાળા પશુઓનું આરોગ્ય સુધારી શકાય છે.	5	4	3	2	1
11	I believe that vigour of milch animal can be increased using mineral mixture. (+) મને લાગે છે કે મિનરલ મિક્ષચરનો ઉપયોગ કરવાથી દૂધાળા પશુઓનો જોમ વધારી શકાય છે.	5	4	3	2	1
12	I think using mineral mixture for milch animals is feasible only to rich farmers. (+) હું માનું છું કે મિનરલ મિક્ષચરનો ઉપયોગ માત્ર સમૃધ્ધ પશુપાલક માટે અનુકૂળ છે.	5	4	3	2	1
SA= Strongly Agree , A=Agree, UD=Undecided, DA=Disagree, SDA=Strongly Disagree						

Approved by house for scientific community

(**Action: Professor & HOD**, **Dept. of Ext. Edu., BACA, AAU, Anand)**

12.7.1.6 Scale to measure attitude of farmers towards dehorning in cattle

The following Scale to measure attitude of farmers towards dehorning in cattle is Recommended.

No	Statements	Responses and Scoring				
		SA	A	UD	DA	SDA
1	The dehorning in cattle is advantages method. (+) પશુમાં શીંગડા ડામવા એ લાભકારક પધ્ધતિ છે .	5	4	3	2	1
2	I dislike purchasing dehorned milch animals for my farm. (-) મારા ફાર્મ માટે મને શીંગડા ડામેલાં દૂધાળાં પશુઓની ખરીદી કરવી પસંદ નથી.	1	2	3	4	5
3	The dehorning is the healthier approach to improve animal health. (+) શીંગડા ડામવાએ પશુઓની આરોગ્ય માટે તંદુરસ્ત અભિગમ છે.	5	4	3	2	1
4	I think that dehorning in animals is unreliable practice. (-) હું માનું છું કે પશુઓના શીંગડા ડામવા એ અવિશ્વનીય પધ્ધતિ છે.	1	2	3	4	5
5	I feel that adoption of recommended dehorning practices in animals involves risk but worth taking. (+) મને લાગે છે કે પશુઓના શીંગડા ડામવાની પધ્ધતિ	5	4	3	2	1

	જોખમી હોવા છતાં તેનો ઉપયોગ ફાયદાકારક છે.					
6	I think that dehorning reduces productivity of milch animals. (-) હું માનું છું કે દૂધાળ પશુઓના શીંગડા ડામવાથી તેની ઉત્પાદકતા ઘટે છે .	1	2	3	4	5
7	Dehorning helps in reducing risk of injury to other animals. (+) શીંગડા ડામવાની પધ્ધતિ અન્ય પશુઓને થતી ઈજાઓ ઘટાડવામાં મદદરૂપ થાય છે .	5	4	3	2	1
8	I think adoption of dehorning in animals is adoptable only by rich farmers. (-) હું માનું છું કે દૂધાળ પશુઓના શીંગડા ડામવાની પધ્ધતિએ માત્ર સમૃધ્ધ ખેડૂતો માટે જ અપનાવવા લાયક છે.	1	2	3	4	5
9	Dehorning helps in decreasing danger of injury to cattle keepers. (+) શીંગડા ડામવાની પધ્ધતિથી પશુધ્વારા પશુપાલકોને થતી ઈજાઓની શક્યતા ઘટે છે	5	4	3	2	1
10	I believe dehorning helps animals in behaving advantageously. (+) હું માનું છું કે શીંગડા ડામવાથી પશુઓને ફાયદો થાય તેવી વર્તણૂક કરવામાં મદદરૂપ થાય છે.	5	4	3	2	1
11	I think that progressive animal keeper is one who believes in dehorning practices in their milch animals. (+) મને લાગે છે પ્રગતિશીલ પશુપાલક એને કહેવાય જે પોતાના દુધાળ પશુઓનાં શીંગડા ડામવામાં માનતો હોય.	5	4	3	2	1
12	I would dislike advising my children to adopt dehorning in milch animals. (-) મારા સંતાનોને તેમના દૂધાળા પશુઓમાં શીંગડા ડામવાની પધ્ધતિ અપનાવવાની સલાહ આપવાનું નહી ગમે .	1	2	3	4	5
	SA= Strongly Agree , A=Agree, UD=Undecided, DA=Disagree, SDA=Strongly Disagree					

Approved by house for scientific community

(**Action: Professor & HOD**, **Dept. of Ext, Edu., BACA, AAU, Anand)**

JUNAGADH AGRICULTURAL UNIVERSITY

	Recommendation for policy
12.7.1.7	**An Economic Analysis of Groundnut Productivity Differentials in Saurashtra Region of Gujarat**
	Increase in the frequency of contact of extension functionaries with farmers throughout the crop season for crop specific information would reduce the productivity differences in groundnut crop. Increase in provision of incentives is needed for mechanization, micro irrigation system and to develop the assured irrigation sources to

	boost up the productivity. The availability of institutional credit should increase adequately to adjust the prevailing inflation level to enhance the productivity level. Approved by house for scientific community **(Action: Professor & Head, Deptt. of Agril. Economics, JAU, Junagadh)**
12.7.1.8	**Effective Number of Replications for Field Experiment on Wheat Crop in Sourasthra (*Triticum aestivum L.*)**
	For effective control of soil variation, an experiment plot having 12 basic units each of 0.90 m^2 with size 4.0 m x 2.7 m (4x3 units) were found optimum with minimum 2 replications are recommended for scientific community to conduct field experiment on wheat crop at Junagarh. **Accepted by the house** **(Action: Professor and Head, Deptt. of Agril. Statistics, JAU, Junagadh)**

NAVSARI AGRICULTURAL UNIVERSITY

Sr. No.	Centre/Station/Department: PC, KVK, Surat
1	Title: Sustenance cropping system in tribal area of Surat district
	Recommendation was not accepted due to inappropriate methodology. (Action:- Programme Coordinator, KVK, Surat)
2	Title : Sustenance cropping system in tribal area of Surat district
	Recommendation was not accepted due to inappropriate methodology. (Action:- Programme Coordinator, KVK, Surat)
3	Title: Sustenance cropping system in tribal area of Surat district
	Recommendation was not accepted due to inappropriate methodology. (Action:- Programme Coordinator, KVK, Surat)
4	Title: Sustenance cropping system in tribal area of Surat district
	Recommendation was not accepted due to inappropriate methodology. (Action:- Programme Coordinator, KVK, Surat)
5	Title: Sustenance cropping system in tribal area of Surat district
	Recommendation was not accepted due to inappropriate methodology. (Action:- Programme Coordinator, KVK, Surat)

12.7.2 NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURAL UNIVERSITY

Sr.	Title/Centre	Suggestions	Remarks
	Centre: Department of Agricultural Economics, BACA, AAU, Anand		
12.7.2.1	Futures and Spot Price Relations: A Case Study of Cotton NCDEX Market in India	Approved by house (**Action**: Prof. & Head, Dept. of Agricultural Economics, BACA, AAU, Anand)	
	Centre: Collage of Horticulture (Wing), BACA, AAU, Anand		
12.7.2.2	An Analytical Study of Self Help Groups (SHGs) functioning in Anand	Approved by house **(Action:** Dr. B. L. Dudhat, Asst. Prof. and Dr. PrityKumari, Asst. Prof., Collage	

	District of Gujarat	of Horticulture (Wing), BACA, AAU, Anand)	
	Centre: IABMI, AAU, Anand		
12.7.2.3	A study on Consumer Behaviour for Inland Fish Consumption in Anand City	Approved by house **(Action:** Principal IABMI, AAU, Anand)	
12.7.2.4	A Study of Drumstick Commodity System in Selected Talukas of Vadodara District of Gujarat	Approved by house **(Action:** Principal IABMI, AAU, Anand)	
12.7.2.5	Economics of Milk Production and its Disposal Pattern in Central Gujarat	Approved by house **(Action:** Principal IABMI, AAU, Anand)	
	Centre: Department of DBM, SMC College of Dairy Science, AAU, Anand		
12.7.2.6	AICT Awareness among the participants of training programme of Dairy Vigyan Kendra	Approved by house **(Action**: Professor & HOD**,** Department of DBM, SMC College of Dairy Science, AAU, Anand)	
12.7.2.7	Impact of Brand Equity on consumer Purchase decision of Dairy product with special reference to AMUL	Approved by house **(Action:** Professor & HOD**,** Department of DBM, SMC College of Dairy Science, AAU, Anand)	
	Centre: College of FPT & BE, AAU, Anand		
12.7.2.8	Study of consumer awareness on food labelling and use of pack information for purchase of pre-packaged food products	Approved by house **(Action**: Dr. Samit Dutta ,Associate Professor, Department of Food Business Management, College of FPT & BE, AAU, Anand)	
12.7.2.9	Problems and challenges faced by working women in food processing companies in Gujarat	Accepted with the following Suggestions 1. Use word unit instead of companies in title 2. Respondent size should be increased up to 100 **(Action:** Mr.Deval B Patel and Dr.S. Dutta, Dept. of Food Business Management, College of FPT & BE, AAU, Anand)	
	Centre: Department of Agricultural Statistics, BACA, AAU, Anand		
12.7.2.10	Statistical assessment to study trend of crop productivity in long term	Accepted with the following Suggestions **Title should be** "Assessment of trend	

	experiments	of crop productivity in long term experiment" **(Action:** Prof. & Head, Dept. of Ag. Statistics, BACA, AAU, Anand)	
	Centre: Extension Education Institute (EEI), AAU, Anand		
12.7.2.11	Attitude of extension personnel towards training programmes organized by EEI, Anand	Approved by the house **(Action:** The Director, EEI, AAU, Anand**)**	
12.7.2.12	Development of the test to measure the knowledge about liquid bio-fertilizer of Farmers	Approved by the house **(Action:** The Director, EEI, AAU, Anand**)**	
12.7.2.13	Assessment of Training Needs of the State officials of Agriculture and allied Departments of Western India	Approved by the house **(Action:** The Director, EEI, AAU, Anand**)**	
12.7.2.14	Follow-up study of Workshop on "Knowledge Management System & Web Designing for Agriculture & Allied Fields	Approved by the house **(Action:** The Director, EEI, AAU, Anand**)**	
	Centre: Director of Extension Education, AAU, Anand		
12.7.2.15	Package of Practices Adopted by the Tomato Growers in Anand district	Approved by the house **(Action:** Dr. H. B. Patel, Ext. Educationist, DEE, A.A.U., Anand,)	
12.7.2.16	Study on time lag in adoption of tissue culture raised banana cultivation technology	Approved by the house **(Action:** Dr. M. R. Patel, Assistant Extension Educationist (Information), SSK, DOEE, AAU, Anand)	
12.7.2.17	Development and standardization of attitude scale of farmers toward Agricultural Produce Marketing Committee (APMC)	Approved by the house **(Action:** Dr. Vinay Kumar H M, Assistant Extension Educationist, DOEE, AAU, Anand	
	Centre: Department of Animal Science, BACA, AAU, Anand		
12.7.2.18	Health and Bio-security measures adopted by commercial poultry farmers of Anandtaluka	Approved by the house **(Action:**Dr R M Rajpura, Assistant Professor, Department of Animal Science, BACA,AAU, Anand)	
	Centre: RBR unit, Veterinary College, AAU, Anand		
12.7.2.19	Effectiveness of	Approved by the house	

	training programmeorganised under Surti buffalo breeders association scheme in terms of gain in knowledge and adoption of scientific AH Practices for Surti Buffalo conservation	**(Action:** Dr. AnkitaKilledar, Research Scientist, RBR unit, Veterinary College, AAU, Anand)	
	Centre: **College of Agriculture, AAU, Jabugam**		
12.7.2.20	Attitude of Tribal Youth towards Agriculture as an Occupation	Approved by the house **(Action:** Dr. S. R. Patel, Assoc. Prof., College of Agriculture, AAU, Jabugam**)**	
12.7.2.21	Training needs of farm women in animal husbandry practices in chhotaudepur district	Approved by the house **(Action:** Dr. Kiran U Chandravadia, Asstt Prof., College of Agriculture, AAU, Jabugam	
	Centre: Department of Extension Education, BACA, AAU, Anand		
12.7.2.22	Attitude of farmers towards Farmers Interest Group (FIG) in Anand District of Gujarat state	Approved by the house **(Action:** Prof. & Head, Dept. of Extension Education, BACA, AAU, Anand)	
12.7.2.23	Development and standardization of scale to measure attitude of women towards kitchen gardening	Approved by the house **(Action:** Prof. & Head, Dept. of Extension Education, BACA, AAU, Anand)	
	Centre: Dept. of Ext. Education, Veterinary Science College, AAU, Anand		
12.7.2.24	Opinion of the clients regarding the services and facilities provided by TVCC (Teaching Veterinary Clinical Complex) of Veterinary Science College, AAU, Anand	Approved by the house **(Action:**Dr. A. C. Vaidya, Assoc. Professor, Dept. of Ext. Education, Veterinary Science College, AAU, Anand)	
	Centre: Agriculture College (Wing), Polytechnic in Agri., BACA, AAU, Vaso		
12.7.2.25	Study on occupational aspiration of students pursuing B. Sc. (Hons.) Agriculture degree programme at Vaso	Approved by the house (**Action:**Dr. A. R. Makwan, Ext. Educationist, Polytechnic in Agriculture, AAU, Vaso)	
12.7.2.26	Study on level of knowledge and adoption of recommended bio-fertilizers (Anubhav Liquid Bio-fertilizers) by paddy growers of	Approved by the house **(Action:** Dr. B. M. Christian, Asstt. Educationists, Poli. Agri., AAU, Vaso)	

	Vasotaluka of Kheda district of Gujarat State		
	Centre: Poly-technique in food science & Home Economics, AAU, Anand		
12.7.2.27	Severity of underweight, stunting and wasting in children presenting to health benefits and utilization pattern by mother under ICDS	**Accepted with Suggestion/s** Title should be "Utilization pattern of health benefits by the mother under ICDS" **(Action:** Smt. HinaH.Chawda, Assoc. Prof.Poly-technique in food science & Home Economics, AAU, Anand)	
	Centre: KVK, AAU, Arnej		
12.7.2.28	Assessment of nutritional knowledge among school teachers regarding diet in diseases - An intervention study	Approved by the house **(Action:** Dr. Gayatree Rajendrasinh Jadeja, SMS (Home Science), KVK, AAU, Arnej)	
12.7.2.29	Basic Agricultural Awareness among Rural Adolescent Boys in Adopted Villages of KVK Arnej: An Intervention Study	Approved by the house **(Action:** Dr. Gayatree Rajendrasinh Jadeja, SMS (Home Science), KVK, AAU, Arnej)	
	Centre: KVK, AAU, Devataj		
12.7.2.30	Awareness and knowledge regarding soil testing and use of soil health cards	Approved by the house **(Action:**Programme Coordinator, KVK, AAU, Devataj)	
	Centre: KVK, AAU, MangalBharti, Vadodra		
12.7.2.31	Impact of BARODA Dugdh Utpadak Sahakari Sangh Ltd. on the Adoption of Improved Animal Husbandry Practices in Chhotaudepur district of Gujarat	**Accepted with Suggestion/s** 1. Change in objective 1 as impact in terms of knowledge 2. Change in objective 2 as impact in terms of adoption **(Action**: Dr. B. L. Dhayal (SMS-Ext.), Dr. B. M. Mehta, Prog. Co-ordinator, KVK, MangalBharati, Golagamdi, Dist-Vadodara)	
	Centre:KVK, ICAR,, Gujarat Vidyapeetha, Dethali Dist.- Kheda		
12.7.2.32	Impact of front line demonstrations on Biopesticide (*Beauveriabassiana*) to manage DBM (Diamond Back Moth) in Cabbage	Approved by the house **(Action: Action:** Dr. P.K. Sharma,Senior Scientist &Headand M.K. Choudhary , SMS- Horticulture, KVK, ICAR, Gujarat Vidyapeeth, Dethali, Dist-Kheda)	
	Centre: KVK, ICAR, Vejalpur, Dist- Panchmahal		
12.7.2.33	Impact of training program on cultivation of	**Accepted with Suggestion/s** 1. Remove the trained and untrained word	

	summer *til* (sesamum) in Panchmahal district of Gujarat	from second objective **(Action:** Dr. KanakLata, PC., KVK, Vejalpur, Dist- Panchmahal)	
	Centre: KVK, AAU, Dahod		
12.7.2.34	Technological gaps in adoption of improved irrigated wheat production technology by wheat growers in Dahod district	**Accepted with following Suggestion/s** 1. In title, eliminate 's' from the word gaps and also from second objective **(Action:** Programme Coordinator, KVK, AAU, Dahod)	
12.7.2.35	A study on calf mortality pattern in the tribal district of Dahod	**Accepted with following Suggestion/s** 1. Title should be "A study on calf mortality pattern in the Dahod district 2. Add objective as "To study the profile of cow owners" **(Action:** Programme Coordinator, KVK, AAU, Dahod)	
	Centre: PashuVigyan Kendra, AAU, Limkheda		
12.7.2.36	Adoption of scientific goat management practices by the livestock keepers in operational area of PashuVigyan Kendra	Approved by the house **(Action:** Dr. S. G. Vahora, Assoc. Professor (Animal Nutrition) and Dr. G. N. Thorat, Assist. Professor (Ext. Edu.), Pashu Vigyan Kendra, AAU,Limkheda)	
12.7.2.37	Adoption of scientific feeding practices by the livestock keepers in Operational area of PashuVigyan Kendra	Approved by the house **(Action:** Dr. S. G. Vahora, Assoc. Professor (Animal Nutrition) and Dr. G. N. Thorat, Assist. Professor (Ext. Edu.), Pashu Vigyan Kendra, AAU, Limkheda)	
	Centre: FTTC, AAU, Sansoli-Nenpur		
12.7.2.38	A study on knowledge and adoption of recommended practices of Summer Sesamum crop in Anand&Kheda districts	Approved by the house **(Action:**Shri N. M. Vegad, Assistant Extension Educationist,Farm Technology Training Centre, AAU, Sansoli-Nenpur**)**	
	Centre: TRTC and TFTWC, AAU, Devgadh, -Baria		
12.7.2.39	Knowledge of Nutritional practices among the Aganwadi workers of Dahod district	Approved by the house **(Action:** Unit Head, TRTC, AAU, Devgadh-Baria)	
12.7.2.40	Attitude of tribal farm women towards agriculture training programme	**Accepted with following Suggestion/s** 1. TFWTC word should be come in chronology/ order in objectives **(Action:**Unit Head, TRTC, AAU, Devgadh-Baria)	
	Centre: Dairy Vigyan Kendra, ,AAU, Vejapur		
12.7.2.41	Economic Performance	Approved by the house	

	of Dairy Farmers (Buffalo owners) in Operational Area of DVK	**(Action:** Dr. J.K. Patel, Assoc. Prof. & Dr. S. J. Jadav ,SMC college of Dairy Science, AAU, Anand)	

JUNAGADH AGRICULTURAL UNIVERSITY

Sr. No.	Title	Suggestions	Remarks
	Centre: Department of Agricultural Economics, JAU, Junagadh		
12.7.2.42	Total Factor Productivity of major crops and contribution of Research Investment to agricultural growth in Gujarat.	Approved by the house Action: Professor & Head, Department of Agricultural Economics, JAU, Junagadh	
12.7.2.43	Development of Optimal Crop Plans towards sustainable groundwater management practices in Saurashtra.	Accepted by with suggestion/s In last objective-adaptation word should be replaced by word suitable **Action:** Professor & Head, Department of Agril. Economics, JAU, Junagadh	
	Centre: Department of Agricultural Statistics, JAU, Junagadh		
12.7.2.44	Path coefficient analysis tools for selection of genotype in wheat.	Approved by the house **Action:** Professor & Head, Department of Agricultural Statistics, JAU, Junagadh	
	Centre: Department of Extension Education, JAU, Junagadh		
12.7.2.45	Consequences of ATMA project in selected districts of Saurashtra.	Approved with following suggestion/s Eliminate the word gain and use know in second objective Action: Professor & Head, Department of Extension Education, JAU, Junagadh	
	Centre: Post Graduate Institute of Agri-Business Management, JAU, Junagadh		
12.7.2.46	Scope and opportunities of Agro-tourism in Saurashtra region.	Approved by the house with following suggestion/s Opportunity word should use in second objective **Action:** Dean , PGIABM, JAU, Junagadh	
12.7.2.47	Weather based forecasting of irrigated wheat productivity for Junagadh district.	Approved by the house **Action:** Dean , PGIABM, JAU, Junagadh	
12.7.2.48	Status study of women vegetable vendors in Saurashtra region.	Approved by the house with following suggestion/s Study word from title should be removed **Action:** Dean , PGIABM, JAU, Junagadh	
	Centre: Dept.of Agril. Engin. Ext., CAET, JAU,Junagadh		
12.7.2.49	Constraints perceived in the adoption of Agro-Processing Centers	**Approved by the house with following suggestion/s** 1. Beneficiary word should be added in	

	established by Junagadh Agricultural University, Junagadh.	title and title should be :Constraints perceived beneficiaries in the adoption of Agro-Processing Centers established by JAU, Junagadh" 2. Specific objectives should be recast accordingly **Action: Prof. & Head, Dept.of Agril. Engg. Extension, CAET, JAU, Junagadh**	
	Name of the Centre: Krishi Vigyan Kendra, JAU, Amreli		
12.7.2.50	Knowledge level of Cotton Growers about Management of Pink Bollworm	Approved by the house **Action:** PC, KVK, JAU, Amreli	
	Name of the centre: Krishi Vigyan Kendra, JAU, Pipalia		
12.7.2.51	Assessment of farmers' attitude towards the use of chemical fertilizer in Bt. Cotton	Approved with following suggestion/s 1. Attitude word should be replaced by opinion **Action: PC,** KVK, JAU, Pipalia	
12.7.2.52	Determinants of knowledge of cotton growers about IPM practices	Approved by the house **Action:** PC, Krishi Vigyan Kendra, JAU, Pipalia	
	Centre: KVK., JAU, Nana Kandhasar **(**Surendranagar)		
12.7.2.53	Extent of Knowledge and adoption about organic farming among farmers of Surendranagar district	Approved by the house with suggestion/s Title should be as Documentation of agronomical practices followed by organic farming units **Action:** PC, KVK, JAU, Nana Kandhasar	
	Centre: Krishi Vigyan Kendra, JAU, Khapat-Porbandar		
12.7.2.54	Study on awareness of farmers about use of bio fertilizers & bio pesticides in adopted and non adopted villages of KVK in Porbandar district	Approved by the house with suggestion/s Word knowledge should be replaced by awareness in specific objective Action: PC, KVK, JAU, Khapat-Porbandar	

NAVSARI AGRICULTURAL UNIVERSITY

Sr. No	Title/Centre	Suggestions	Remarks
	Centre:- KVK, Vyara		
12.7.2.55	Constraints in adoption of *kharif* groundnut production technology in Tapi district	Accepted with following suggestion/s 1. Farmers categories should be made/ considered in methodology 2. Respondent size should be 300 3. Objective on association should be	

		incorporated **(Action:-** PC, KVK, Vyara**)**	
	Centre:- KVK, Waghai		
12.7.2.56	Training needs of farmers in vegetables cultivation in tribal areas" and "Impact of KVK activities in adopted villages of KVK-Dangs	Accepted with following suggestion/s 1. Words in tribal areas should be deleted 2. Fourth & fifth objective should be deleted 3. Selected vegetables should included in 2^{nd} objective and core methodology should be developed with the assistance of DEE, NAU **(Action:-** PC, KVK,Waghai**)**	
12.7.2.57	Impact of KVK activities in adopted villages of Dang district.	Accepted with following suggestion/s 1. Only FLD, OFT and training aspects are to be included in study 2. Methodology should be rectified with the assistance of DEE, NAU **(Action:-** PC, KVK, Waghai**)**	
	Centre:- KVK, Navsari		
12.7.2.58	Impact of FLD on fish culturist in Navsari district.	Accepted with following suggestion/s 1. Effect of FLD on adoption of fish farming in Navsari district 2. Methodology should be made accordingly **(Action:-** PC, KVK, Navsari**)**	
	Centre:- KVK, Dediyapada		
12.7.2.59	Maternal Nutritional Knowledge and its Association with Nutritional Status of School Going Children.	Accepted with suggestion/s 1. Objective 1: Socio economic profile of parents should be studed 2. Objective fourth should be deleted 3. Proportionate sampling method should be adopted in methodology with 120 respondents and half of them should be boys and remove the age criteria of boys & girls **(Action:-** PC, KVK, Dediyapada**)**	
	Centre:- TWTC, Dediyapada		
12.7.2.60	Impact of low drip kitchen garden demonstration organized by Tribal Women Training Centre,	Accepted with following suggestion/s All the farmers under demonstration should be covered **(Action:** PC,KVK, Dediyapada)	

	Dediyapada.		
	Centre:- Deptt. of Ext. Edu., NMCA		
12.7.2.61	Knowledge of farmers about training programme organized by Mega Seed Project of NAU, Navsari on seed production technology of Paddy in Navsari district	Accepted by the house **(Action:-** Prof. & Head, Deptt. of Ext. Edu., NMCA **)**	
	Centre: Dept. of Vet. & AH Ext. VCVSAH, NAU, Navsari		
12.7.2.62	Perception and attitude of young farm women towards animal husbandry as occupation.	Accepted by the house **(Action:-** Assoc**.** Prof., Dept. of Vet. & AH Ext. VCVSAH, NAU, Navsari**)**	
	Centre:- ATIC & Educatorium, DEE, NAU		
12.7.2.63	Constraints faced by farmers regarding protected cultivation in South Gujarat	Accepted with following suggestion/s Crop based constraints should be taken in the study **(Action:-** DEE, NAU **)**	
	Centre:- College of Agriculture, Bharuch		
12.7.2.64	Knowledge and adoption of cotton growers about recommended production technologies in Bharuch district	Accepted by the house **(Action:-** Asstt. Prof. (Ext.) CoA, Bharuch)	
	Centre:- College of Agriculture, Waghai		
12.7.2.65	Aspiration level of farmers lived in tribe situation of Dangs	Accepted with following Aspiration levels of tribal farmers about all-round development of Dangs **(Action:-** Assoc. Prof. (Ext.) CoA, Waghai**)**	
12.7.2.66	**Centre:- Poly-technique Vyara**		
	Constraints faced by tribal farmers in adoption of export oriented okra production technology in Tapi district of South Gujarat	Accepted with following suggestion/s Adoption of export oriented cultivation technology should be added in objective **(Action:-** Principal, Poly-technique, Vyara **)**	

12.7.2.67	A Study on adoption of recommended production technology of brinjal by brinjal growers in Tapi district of Gujarat State	Accepted with following suggestion/s Eliminate words 'of brinjal' from title **(Action:-** Principal, Poly-technique, Vyara**)**	
	Centre:- DEE, NAU, Navsari		
12.7.2.68	Group Dynamics of FIGs / CIGs working under ATMA in South Gujarat	Accepted by the house **(Action:** DEE,NAU, Navsari)	
	Centre:- Department of Agricultural Economics, NMCA, NAU, Navsari		
12.7.2.69	Economic viability of layer poultry farms in Navsari district of Gujarat	Accepted with following suggestion/s Instead of mentioned methodology (cost A, B, C), use appropriate cost concepts like fixed and variable costs **(Action:-** Professor and Head, Agril. Economics, NMCA, NAU, Navsari**)**	
12.7.2.70	**Centre:- Department of Agricultural Economics, ACHF, NAU, Navsari**		
	Economic analysis of palmyra palm(*Borassus flabellifer* L.) in South Gujarat	Accepted with following suggestion/s Economic viability should be worked out by using the appropriate methodology as expected in long term crop **(Action:-** Associate Professor, Agril. Economics, ACHF, NAU, Navsari **)**	
12.7.2.71	Economic analysis of sugarcane cultivation under straw burning practices	Accepted by the house **(Action:** Asso. Professor, Agril. Economics, ACHF, NAU, Navsari **)**	
	Centre:- Department of Agril. Economics, College of Agriculture, Bharuch		
12.7.2.72	Economics of production and marketing of papaya (*Carica papaya* L.) in Bharuch district of South Gujarat	Accepted with following suggestion/s Variables should be quantified in study **(Action:-** Assoc. Professor and Head, (Agril Eco.),CoA, NAU, Bharuch **)**	
	Centre:- Planning cell, Director of Research and Dean, PG Studies		
12.7.2.73	Study of outlay of different sources of funds before and after formation of Navsari Agricultural University	Accepted with suggestion/s Appropriate method for measuring the value of rupee should be adopted **(Action:-** PO and Assoc. Professor (Agril. Eco.) , DR, NAU, Navsari**)**	
12.7.2.74	**Centre:- Department of Agril. Economics, College of Agriculture, Waghai**		

	An assessment of indebtness of agricultural households in different regions of Gujarat	Accepted by the house **(Action:-** Asst. Professor, Agril.Econ.),CoA,Waghai**)**	
12.7.2.75	Assessment of vulnerability to expected poverty among scheduled tribe farmers in South Gujarat	Accepted with following suggestion/s Expected word should be deleted from the title **(Action:-** Assit.Professor, Agril.Econ., CoA,Waghai**)**	
	Centre: Department of Agril. Economics, Polytechnic in Agriculture, Vyara		
12.7.2.76	A study on processing and marketing of vegetables in Tapi district of South Gujarat	Accepted by the house **(Action:-** Asst. Professor, Agril.Econ., Polytechnic, Vyara **)**	
	Centre:- ASPEE Agribusiness Management Institute, NAU, Navsari		
12.7.2.77	A study of consumer behavior and factors affecting edible oil usage in Navsari	Accepted with following suggestion/s The factors affecting the consumption should be mentioned in methodology in its effect should be measured by regression analysis **(Action:**Dean AABMI NAU)	
12.7.2.78	Identification of marketing channels and constraints in fish marketing	Accepted with following suggestion/s Title should be changed as study of marketing channels and constraints in fish marketing **(Action:**Dean AABMI NAU)	
12.7.2.79	Study of Entrepreneurial intentions among the PG students of NAU, Navsari	Accepted with following suggestion/s **1.** Method to measure the entrepreneurial intension should be mentioned in methodology **2.** first objective should be changed accordingly **(Action:**Dean,AABMI,NAU)	
12.7.2.80	Career Management concerns of UG & PG Students of NAU Campus Navsari	Accepted with following suggestion/s Wording in specific objectives should be change in accordance to the title **(Action:**Dean,AABMI,NAU)	
12.7.2.81	Assessment of private plant nursery enterprise in Navsari and Surat districts	Accepted by house **(Action:**Dean,AABMI,NAU)	

	Centre:- Dept. of Agril. Statistics, NMCA, NAU, Navsari		
12.7.2.82	**Title:** Comparison of different intrinsically nonlinear models for the prediction of milk yield of Surati Buffalo	Accepted with following suggestion/s Objective should be reconstruct in accordance to the title **(Action:-** Professor & Head, Ag. Stat., NMCA, Navsari**)**	
	Centre:- Dept. of Agril. Statistics, ACHF, NAU, Navsari		
12.7.2.83	Uniformity trial in brinjal (seed purpose)	Accepted with suggestion/s Title of the study should be as Estimation of optimum plot size and shape in brinjal crop **(Action:** Asso. Professor (Ag. Stat.), ACHF, Navsari**)**	
	Centre:- Dept. of Agril. Statistics, CoA, NAU, Bharuch		
12.7.2.84	Uniformity trial in cotton	Accepted with suggestion/s Title of the study should be as Estimation of optimum plot size and shape in cotton crop **(Action:-** Asso. Professor (Ag. Stat.), CoA, Bharuch**)**	
	Centre:- Dept. of Agril. Statistics, CoA, NAU, Waghai		
12.7.2.85	Forecasting of rice (*Oriza sativa*) yield using ordinal logistic regression	Accepted by the house **(Action:** Asst. Professor (Ag. Stat.), CoA, Waghai**)**	

SARDAR KRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

Sr. No.	Title & Centre	Suggestions	Remarks
12.7.2.86	Adoption of contract farming in potato in Sabarkantha district	Accepted by the house with following suggestions **1.** Title should be "Perception of potato growers following contract farming in Sabarkantha district. 2. Specific objective should be recast accordingly **(Action:** Senior Scientist and Head, KVK, SDAU, Khedbrahma**)**	
12.7.2.87	Constraints faced by the tribal women of Sabarkantha district in Agriculture and Animal husbandry activities	Accepted by the house **(Action:** Senior Scientist and Head, KVK, SDAU, Khedbrahma**)**	
12.7.2.88	Impact of ICT on	Accepted with suggestions	

	awareness of certification marks	Imapct should be measure by comparing the beneficiaries and non beneficiaries and this should be included in methodology **(Action:** PC, KVK, SDAU, Khedbrahma **)**	
12.7.2.89	Assessment of Nutritional Status of Adolescent Tribal Girls of Sabarkantha District	Accepted by the house **(Action:** Prof, Food Science & Nutrition, ACHN,SDAU**)**	
12.7.2.90	Assessment of Knowledge and Adoption Level of Farm Women about Vegetable (other than potato)Cultivation Practices	Accepted by the house with following suggestions In title, word in bracket should be deleted and after word about 'selected' word should be incorporated **(Action:** Prof & Head, Dept of HECM, ACHN,SDAU**)**	
12.7.2.91	Impact of Social Networking Sites and Mobile Applications on Students	Accepted by the house with following suggestions Title should be changed as Utilization pattern of social networking sites and mobile application by the students **(Action:** Prof & Head, Dept of HECM, ACHN, SDAU**)**	
12.7.2.92	Occupational Health of Farm Workers in Deesa Taluka	Accepted by the house **(Action:** Prof & Head, Dept of FRM, ACHN,SDAU**)**	
12.7.2.93	Assessment of Consumer Awareness amongst women of Deesa	Accepted by the house **(Action:** Prof & Head, Dept of FRM, ACHN, SDAU**)**	
12.7.2.94	Changing Trends in Traditional Costumes of Females' in Palanpur City	Accepted by the house **(Action: :** Prof & Head,Dept of TAD, A.C.H.N.,S.D.A.U **)**	
12.7.2.95	Adoption pattern of method of FYM preparation	Accepted by the house with following suggestions Adoption word should be added in specific objectives **(Action:** DEE, SDAU)	
12.7.2.96	Attitude and perception of farming as an occupation by sons of farmers	Accepted by the house with following suggestions Second objective should be as "To know the perception of farmers regarding farming as a sustainable occupation" **(Action:** Prof and Head, Dept of Exn Edn, CPCA, S.D.A.U.**)**	
12.7.2.97	Prevailing practices of	Accepted with following suggestions	

	Kankrej cow breeding and factors associated with in Patan District	Title should be as Prevailing practices of Kankrej cow breeding in Patan district Second objective deleted **(Action:** Principal**,** Polytechnic for Diploma in Animal Husbandry, SDAU)	
12.7.2.98	Impact Evaluation of Front Line Demonstration on Groundnut	Accepted with following suggestions Study should be conducted with 50 FLD and 50 non FLD farmers to measure the adoption impact **(Action:** PC, KVK, Deesa)	
12.7.2.99	Status of Crop Insurance in Gujarat	Accepted by the house **(Action:** Prof and Head,Dept of Agril Econ,CPCA,SDAU**)**	
12.7.2.100	An Economic Analysis of Marketing of Tomato in Banaskantha District	Accepted by the house **(Action:** Prof and Head, College of ABM SDAU**)**	
12.7.2.101	Selection index study in castor [Ricinus communis (L)]	Accepted by the house **(Action:** Prof & Head,Dept of Agril Stat CPCA,SDAU**)**	
12.7.2.102	Pre-harvest forecasting of summer bajra crop yield in Banaskantha district of North Gujarat	Accepted by the house **(Action:** Prof and Head,Dept of Agril Stat, CPCA,SDAU**)**	
12.7.2.103	Selection index study in Maize crop	Accepted by the house **(Action:** Principal, Polytechnic in Agriculture, S.D.A.U.,Khedbrahma **)**	
12.7.2.104	Acreage response of Groundnut in Banaskantha district of North Gujarat	Accepted by the house **(Action:** Prof & Head,Dept of Stat, A.C.H.N.,S.D.A.U **)**	

ANIMAL PRODUCTION, ANIMAL HEALTH AND FISHERIES SCIENCE

Technical Session I and II

Chairman: Dr. D. B. Patil, Director of Research, KU, Gandhinagar
Co-Chairman: Dr. A. Y. Desai, Director of Research, JAU
Dr. D. V. Joshi, Dean and Principal, Veterinary College, SDAU
Rapporteurs: Dr. R. G. Shah, Associate Director of Research, KU, Gandhinagar
Dr. B. P. Brahmkshtri, Professor and Head, ILFC, Veterinary College, NAU

SUMMARY

SN	Uni.	Committee	Recommendation				New Technical Program	
			Scientists		Farmers			
			Presented	Approved	Presented	Approved	Presented	Approved
1	NAU	Animal Production	3	3	5	5	9	8
		Animal Health	1	1	2	1	7	7
2	AAU	Animal Production	6	5	3	3	24	22
		Animal Health	3	3	1	1	20	19
3	SDAU	Animal Production	3	3	2	2	4	4
		Animal Health	4	4	--	--	8	8
4	JAU	Animal Production	4	2	2	2	9	9
		Animal Health	9	9	--	--	12	12
5	KU	FISHERIES	--	--	--	--	1	1
5	Total	Animal Production	16	13	12	12	47	44
		Animal Health	17	17	3	2	47	46
6	**Grand Total**		**33**	**30**	**15**	**14**	**94**	**90**

RECOMMENDATION FOR FARMERS

ANAND AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

1	**Study on Nutritional Status of dairy animals of BOTAD district**	
	The farmers of Botad district are advised to feed daily additional 1.0 and 1.5 kg compound concentrate mixture to cows and buffaloes yielding 5.0 to 9.0 and 9.0 to 13.0 kg milk daily respectively throughout the year in order to fulfill their nutrient requirement.	**Approved with modification**

	બોટાદ જીલ્લાના પશુપાલકોને દૈનિક ૫.૦ થી ૯.૦ અને ૯.૦ થી ૧૩.૦ કિ.ગ્રા. દૂધ આપતી દૂધાળ ગાયો અને ભેંસોની પોષક તત્વોની જરૂરિયાત પૂર્ણ કરવા સમગ્ર વર્ષ દરમ્યાન હાલ આપવામાં આવતા દાણ ઉપરાંત અનુક્રમે દૈનિક ૧.૦ કિ.ગ્રા અને ૧.૫ કિ.ગ્રા. વધારાનું સંયુક્ત સમતોલ દાણ આપવાની ભલામણ કરવામાં આવે છે. **(Action: Research Scientist, Animal Nutrition Research Station, Veterinary College, AAU, Anand)**	
2	**Recommendation for farming community/ Poultry Feed Manufacturers**	
	To study the effects of feeding different quality maize on production performance and egg quality parameters of White Leghorn birds	
	Significantly higher content of β-Carotene (8.559 ppm), protein (13.22%) and deep yellow colour of egg yolk are observed in the eggs of White Leghorn birds fed on layer ration prepared by using yellow maize (Gujarat Anand Yellow Maize Hybrid-1) as compared to white maize (Gujarat Maize-3), High Quality Protein Maize-1 (HQPM-1) and purple maize; thus resulting in value addition and satisfying consumer's preference for deep yellow yolk. Hence, it is recommended to use yellow maize (Gujarat Anand Yellow Maize Hybrid-1) in preparation of layer ration. વ્હાઇટ લેગહોર્ન લેયર પક્ષીઓ માટેનો મરઘાં આહાર (લેયર મેશ) બનાવવા માટે પીળી મકાઇ (ગુજરાત આણંદ યલો મેઈઝ હાઇબ્રીડ-૧) નો ઉપયોગ કરવાથી સફેદ મકાઇ (ગુજરાત મેઈઝ-3), હાઇ કવોલિટી પ્રોટીન મેઇઝ-૧ (HQPM-1) અને પર્પલ મકાઇના ઉપયોગની સરખામણીએ ઇંડાંમાં બીટા કેરોટીન (૮.૫૫૯ પીપીએમ) અને પ્રોટીનનું (૧૩.૨૨ ટકા) મહત્તમ પ્રમાણ તથા પીળી જરદીમાં ઘાટો પીળો રંગ જોવા મળેલ હતો જે થકી ઇંડાંમાં મૂલ્યવર્ધન કરી શકાય તથા ઘાટી પીળી જરદી વાળા ઇંડાં માટે ની ગ્રાહકોની પસંદગી સંતોષી શકાય છે. આથી મરઘાં આહાર (લેયર મેશ) બનાવવા માટે પીળી મકાઇ (ગુજરાત આણંદ યલો મેઈઝ હાઇબ્રીડ-૧) નો ઉપયોગ કરવાની ભલામણ કરવામાં આવે છે. **(Action: Res. Sci., Poultry Complex, Vet. College, AAU, Anand)**	**Approved**
3	Performance of Indigenous Sheep under Water Restriction and Rehydration in Middle Gujarat Agro climatic zone.	
	Marwari and Patanwadi hoggets can be maintained on 2.0 litres of water, daily. આથી ભલામણ કરવામાં આવે છે કે મારવાડી અને પાટણવાડી ઘેટાંઓનાં ઉછરતાં બચ્ચાઓને દૈનિક 2.0 લીટર પાણી પર નિભાવી શકાય છે. **(Action : Professor and Head, Department of Livestock Production Management, Veterinary College, AAU, Anand)**	**Approved with modification**

ANIMAL HEALTH

1	**Recommendation for pet keepers**	
	Studies on Clinico-biochemical aspects of Ancylostomosis in dogs	
	The prevalence of Ancylostomosis (14-37%) has been observed round the year in pet dogs of Anand district. Hence, the pet owners are advised to follow the deworming schedule prescribed by veterinarians. આણંદ જિલ્લામાં કૂતરા પાળતા માલિકોને સલાહ આપવામાં આવે છે કે તેઓએ વર્ષપર્યંત (૧૪-	**Approved**

	૩૭%) જોવા મળેલ અંકુશકૃમિ (એંકાયલોસ્ટોમોસિસ)ના રોગના અટકાવ માટે નિયત કૃમિનાશક દવા, નિર્ધારિત સમયાંતરે ,પશુ ચિકિત્સકની સલાહ મુજબ આપવી. **(Action: Prof. and Head, Dept. of Vet. Parasitology, Vet. College, AAU, Anand)**	

JUNAGADH AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

Sr. No.	Centre/Station/Department	
1.	**Study of density dependent growth and survival of *Macrobrachium rosenbergii (scampi)***	
	Fish farmers are recommended to stock freshwater prawn *Macrobrachium rosenbergii (*Scampi) seeds @ 20,000 per hectare in grow-out ponds for obtaining better growth, survival rate and economic returns. મત્સ્યખેડુતોને ભલામણ કરવામાં આવે છે કે મીઠાપાણીના મેક્રોબ્રેકીયમ રોજનબર્ગી (સ્કામ્પી) પ્રજાતીના ઝીંગાનો ઉત્તમ વૃધ્ધિદર, જીવંતદર તથા વધુ આર્થિક દર મેળવવા માટે ઉછેર તળાવોમાં ઝીંગાબીજનો સંગ્રહ દર ૨૦,૦૦૦ નંગ હેકટર દીઠ રાખવો. **(Action: Assoc. Prof., Inland Fisheries Res. Station, JAU, Veraval)**	**Approved with modification**
2	**Aspects of biology and fishery of *Scylla serrata* and *Portunuspelagicus* in and around Sikka**	
	Recommendation paragraph: Fishermen community engaged in Crab fishing are advised to avoid capture of berried female Crabs having orange, greenish, brownish or blackish eggs for sustainable Crab resource. આથી માછીમાર સમુદાયને સલાહ આપવામાં આવે છે કે કરચલાના સાતત્યપુર્ણ પકડાશ માટે કેસરી, લીલા, ભુખરા કે કાળા રંગના ઇંડા ધરાવતી માદાં પકડવી નહી **(Action: Asstt. Res. Sci., Fisheries Research Station, JAU, Sikka)**	**Approved with modification**

NAVSARI AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

Sr. No.	Centre/Station/Department	Status
1	**Effect of bypass fat supplementation on production performance and economics on lactating buffalo**	
	The farmers of South Gujarat are recommended to supplement bypass fat @ 100 g/d for nearly 15 days pre-partum and 90 days post-partum to lactating Surti buffaloes to increase milk fat percentage and net profit. દક્ષિણ ગુજરાતના પશુપાલકોને ભલામણ કરવામાં આવે છે કે સૂરતી ભેંસને વિયાણના આશરે ૧૫ દિવસ પહેલાથી અને વિયાણ બાદના ૯૦ દિવસ સુધી પૂરક આહાર તરીકે બાયપાસ ફેટ ૧૦૦ ગ્રામ/દિવસ આપવાથી દૂધમાં ફેટની ટકાવારી અને નફાનું પ્રમાણ વધે છે. **(Action:- Research Scientist, Livestock Research Station)**	**Approved with modification**
2	**Optimization of stocking density of *Labeo rohita* (Rohu) for the**	

	production of stunted yearlings in cage culture condition	
	The fish farmers of Gujarat engaged with freshwater fish farming are recommended to rear 166 fingerlings/m^3 in cage farming system to obtain profitable stunted yearlings. ગુજરાત રાજ્યના મીઠાપાણીમાં મત્સ્યપાલન કરતા ખેડૂતોને પિંજરા ઉછેર પદ્ધતિમાં નફાકારક સ્ટંટેડ યરલીંગ ઉત્પાદન કરવા ૧૬૬ ફિંગરલીંગ્સ પ્રતિ ઘન મીટરના દરે ઉછેર કરવાની ભલામણ કરવામાં આવે છે. **(Action:- Res. Scientist, Soil and Water Management Research Unit)**	**Approved with modification**
3	**Effects of rubber mat bedding on the lying behavior, cleanliness and hock injuries of crossbred cows**	
	The progressive farmers are recommended to use the rubber mat (6 feet x 4 feet x 17 mm) on concrete floor to improve the comfort level and minimize the limb affections of crossbred cows. પ્રગતિશીલ પશુપાલકોને ભલામણ કરવામાં આવે છે કે, પાકા ભોંયતળિયા ધરાવતા પશુઓના રહેઠાણમાં ભોંયતળિયા પર રબર મેટ **(૬ ફૂટ × ૪ ફૂટ × ૧૭ મી.મી.)** નો ઉપયોગ કરવાથી સંકર ગાયોને આરામ મળવા સાથે પગની ઈજાઓ ઘટાડી શકાય છે. **(Action:- Prof. and Head, Dept. of Livestock Production Management)**	**Approved with modification**
4	**Economics of growth performance due to dietary inclusion of tanniferous leaves (*Ficus benghalensis*) in kids infested with gastrointestinal helminths**	
	The farmers of South Gujarat are recommended to include daily the fresh leaves of Banyan tree (120g/d) in the diet of Surti kids to control gastrointestinal worm load for better growth rate and income. દક્ષિણ ગુજરાતના બકરાપાલકોને ભલામણ કરવામાં આવે છે કે surtI લવારાઓને દરરોજ વડના તાજા પાન (૧૨૦ ગ્રામ/દિવસ) ખવડાવવાથી પાચનતંત્રમાં કૃમિનું ભારણ નિયંત્રિત થાય છે અને વૃધ્ધિ દર તેમજ આવકમાં વધારો થાય છે. **(Action:- Professor and Head, Dept. of Animal Nutrition)**	**Approved with modification**
5	**Effect of supplementation of yeast on average daily growth, feed conversion ratio and cost economics in Surti goat kids.**	
	The Surti goat keepers are recommended to supplement daily 6-7 g of yeast (*Saccharomyces cerevesiae*) along with concentrate to 4-6 month kids for better growth rate at lower feed cost. સુરતી બકરા રાખતા બકરાપાલકોને ભલામણ કરવામાં આવે છે કે ૪ થી ૬ મહિનાની ઉમરના લવારાઓને દરરોજ પૂરક આહાર તરીકે ૬ થી ૭ ગ્રામ યીસ્ટ/દિવસ દાણ સાથે આપવાથી તેના વૃધ્ધિ દરમાં વધારો થાય છે અને આહારનો ખર્ચ ઘટે છે. **(Action:- Professor and Head, Dept. of Animal Science, NMCA)**	**Approved with modification**

ANIMAL HEALTH

1	**Veterinary Medicine Department**	
	Liver and kidney function tests should be carried out regularly twice in a year under the supervision of Veterinarian to know the possibilities of ascites in dogs. k&triai[mi> jli[dr Yvin) s>Bivni ni aikln miT[vP<mi> b[vKt (nym)tpN[ykZt an[m&#i(p>D n[[lgti pr)miNi[n>& pr)xN (nONi>t pS& (c(kRsk pis[krivv&> ji[ea[. **(Action:- Professor and Head, Veterinary Medicine)**	**Deferred**
2	**Medical and surgical management of corneal affections in canines.**	
	Brachycephlalic breeds of dogs (Pug & Boxer) should be subjected to routine ophthalmic check up by veterinarians at every four months. બ્રેકિસીફેલીક (પગ અને બોકસર) પ્રજાતિના કુતરાઓની આંખો નિયમિતપણે દર ચાર મહિને તપાસ કરાવવી જોઇએ. **(Action: Professor and Head, Veterinary Surgery and Radiology)**	**Approved with modification**

SARDAR KRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

Sr. No.	**Centre/Station/Department : Livestock Research Station**	
1.	**Effect of feeding of cotton seed cake on body weight gain in Kankrej female calves (3-6 m).**	
	Feeding of cotton seed cake and compound concentrate mixture @ 850 and 500 g/day, respectively or compound concentrate mixture alone @ 1500 g/day is recommended to achieve the higher growth rate in 3 to 6 months old Kankrej calves. ૩ થી ૬ માસ ઉંમરની કાંકરેજ વાછરડીઓમાં વધારે વૃધ્ધિ દર મેળવવા માટે ૮૫૦ ગ્રામ કપાસીયા ખોળ અને ૫૦૦ ગ્રામ સંયુક્ત સમતોલ દાણ અથવા ૧.૫ કીલોગ્રામ સંયુક્ત સમતોલ પશુ દાણ ખવડાવવાની પશુપાલકોને ભલામણ કરવામાં આવે છે. **(Action :Research Scientist, LRS, SDAU, Sardarkrushinagar)**	**Approved with modification**
2.	**Effect of feeding of cotton seed cake on body weight gain in Mehsana buffalo female calves (3-6 m).**	
	Feeding of compound concentrate mixture @ 1.5 kg/day in 3 to 6 month old Mehsana buffalo calves results in higher growth rate. ૩ થી ૬ માસ ઉંમરની મહેસાણી ઓલાદની પાડીઓમાં વધારે વૃધ્ધિ દર મેળવવા માટે દૈનિક ૧.૫ કીલોગ્રામ સંયુક્ત સમતોલ દાણ ખવડાવવાની પશુપાલકોને ભલામણ કરવામાં આવે છે. **(Action : Research Scientist, LRS, SDAU, Sardarkrushinagar)**	**Approved with modification**

RECOMMENDATION FOR SCIENTIST

ANAND AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

1	**Effect of climatic factors on daily milk production of dairy cows**	

	Minimum Temperature, Morning Relative Humidity and Wind Speed are responsible for 66 % of total climatic variations in milk yield. Minimum Temperature and Morning Relative Humidity are negatively correlated, while Wind Speed has positive impact on milk yield. **(Action: Res. Sci., Livestock Res. Stat., Vet. College, AAU, Anand)**	**Approved with modification**
2	***In vitro* evaluation of Fenugreek (*Trigonella foenum graecum*) for its influence on substrate degradation and methanogenesis.**	
	Supplementation of Fenugreek seeds at 2% level in the total mixed ration for adult goats significantly (P<0.01) improved *in vitro* digestibility of dry matter and organic matter with reduction in methane emission. **(Action: Res. Sci., Animal Nutrition Res. Stat. Vet.College, AAU, Anand)**	**Approved**
3	**Effect of incorporation of dried date palm (*Phoenix dactylifera* L. [Arecaceae]) leaves in total mixed ration for adult sheep and goats**	
	Total mixed ration without or with air dried or green date palm leaves replacing *jowar* hay at 40% DM equivalent basis, has no adverse effect on voluntary feed intake, body weights and cost of feeding in adult Surti goats and Marwari sheep. **(Action: Res. Sci., Animal Nutrition Res. Stat. Vet.College, AAU, Anand)**	**Approved**
4	**Effect of incorporation of dried date palm (*Phoenix dactylifera* L. [Arecaceae]) leaves in total mixed ration for adult sheep and goats**	
	Total mixed ration without or with air dried or green date palm leaves replacing *jowar* hay at 40% DM equivalent basis on feeding adult Surti goats or Marwari sheep do not influence rumen fermentation patterns and digestibility coefficient for dry matter, organic matter, proximate constituents, neutral detergent fibre and acid detergent fibre. **(Action: Res. Sci., Animal Nutrition Res. Stat. Vet.College, AAU, Anand)**	**Approved**
5	**To study the effects of feeding different quality maize on production performance and egg quality parameters of White Leghorn birds**	
	Significantly higher content of lysine (0.427%), tryptophan (0.216 %), anthocyanin (0.874 mcg %) and total anti-oxidant activity (13.876 mg/100 g.) are observed in eggs of White Leghorn layer birds fed layer mash containing purple colour maize in comparison with white maize (Gujarat Maize-3), yellow maize (Gujarat Anand Yellow Maize Hybrid-1) and High Quality Protein Maize-1 (HQPM-1) . **(Action: Res. Sci., Poultry Complex, Veterinary College, AAU, Anand)**	**Approved**
6	**Performance of Indigenous Sheep under Water Restriction and Rehydration in Middle Gujarat Agroclimatic condition**	
	It is recommended that Marwari and Patanwadi hoggets kept on 40 % water restriction of their normal requirement of 2.5 liters showed significantly (P<0.05) increased level of physiological responses, PCV, glucose, urea, creatinine, cortisol and aldosterone with significant (P<0.05) decrease in body weight, feed and nutrients intake. **(Action: Professor& Head, Dept. of Livestock Production Mgmt., Anand)**	**Deferred**

ANIMAL HEALTH

1	**Study on effect of biherbal drug of *Bryophyllum calycinum* and *Tribulus terrestris* on urolithiasis.**	

	The biherbal methanolic extract of *Bryophyllum calycinum* (Panfuti) and *Tribulus terrestris* (Gokharu) (1:1) at the dose rate of 400 mg/kg body weight, orally, once in a day, for four weeks has antiurolithiatic effect on ethylene glycol induced urolithiasis in Wistar rat. **(Action: Prof. and Head, Dept. of Vet. Pharmacology & Toxicology, Veterinary College, AAU, Anand)**	**Approved**
2	**Effect of Inclusion of Antioxidants - Cysteine and Taurine - in TFYG Extender on Refrigeration (5°C) and Cryopreservation (-196°C) of Buffalo Semen"**	
	Taurine @ 4 mg/ml or cysteine @ 1 mg/ml in standard Tris Fructose Yolk Glycerol (TFYG) extender is recommended to the semen banks as a routine antioxidant additive for improved cryopreservation and/or refrigeration preservation of buffalo semen as it significantly ($p<0.01$) enhanced sperm progressive motility, viability, and membrane integrity with reduced sperm/acrosome abnormalities. **(Action: Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)**	**Approved with modification**
3	**Seasonal Influence on Efficacy of Estrus Induction and Synchronization Protocols in Anoestrus Cows andBuffaloes**	
	Three estrus/ovulation synchronization protocols, viz., Ovysynch, Heatsynch and Triu-B used in true anoestrus crossbred cows during winter and summer seasons resulted in per cent estrus induction (corresponding values during winter and summer seasons - 100.00, 100.00, 100.00; 88.88, 92.30, 90.90, respectively) and conception rates (58.33, 41.66, 50.00; 44.44, 46.15, 45.45, respectively). In anoestrus buffaloes, during winter and summer seasons the corresponding per cent estrus induction and conception rates were 83.33, 91.66, 83.33; 73.33, 84.21, 83.33; and 58.33, 50.55, 50.00; 26.66, 21.05, 33.33, respectively. Hence, the three protocols can be used round the year in cows, whereas in buffaloes Ovysynch protocol to be used only during winter season. **(Action: Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)**	**Approved with modification**

JUNAGADH AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

1.	**Efficacy comparision among different medicaments on Anoestrus Gir heifers.**	
	It is recommended that true anestrous Gir heifesr having average body condition, when treated with GnRH (Buserelin acetate) for estrus induction, the estrus induction response was higher and majority of heifers (88.88%) conceived with two inseminations indicating effectiveness of GnRH treatment. **(Action: Research Scientist, Cattle Breeding Farm, JAU, Junagadh)**	**Deferred**
2.	**Effect of stage, season and parity of lactation on fat, SNF, protein and sugar content in milk of Gir cattle.**	
	It is informed to animal scientists that Season of lactation, Stage of lactation and order of lactation significantly influenced the Fat content of the milk in	**Deferred**

	Gir cow. All the four constituents Fat, SNF, Protein and Lactose in milk of Gir cow were found to vary due to Season of lactation. Maximum Fat content was observed in milk of animals that produced milk in July-Sept months and lowest in Summer (April-June). Stage of lactation was found to influence only Fat content of milk. **(Action: Research Scientist, Cattle Breeding Farm, JAU, Junagadh)**	
3.	**Impact of insectivorous Birds on Fish Drying Grounds at Veraval**	
	Fishes dried on open grounds during the fishing season are infested with maggots and adults of technids fly attracting of several insectivorous birds especially cattle Egret, which play an important role in the natural control of the infested pests. **(Action: Professor, Fisheries Resource Management, JAU, Veraval)**	**Approved with modification**
4.	**Study of seaweed diversity at selected intertidal areas of Saurashtra and Diu (UT)**	
	In the coastal belt of Saurashtra and Diu, 117 seaweed species are available (Intertidal and drifted), of which 38 Chlorophyceae, 34 Phaeophycea and 45 species of Rhodophyceae are found during September to April. The economically important species from Chlorophyceae group are 14, Phaeophyceae group 07 and Rhodophyceae group 15. **(Action: Assoc. Professor and Head, Fisheries Research Station, Okha)**	**Approved with modification**

ANIMAL HEALTH

1.	**Preliminary evaluation of antibacterial activity of extracts of *Cassia auriculata*, *Prosopisjuliflora* and *Annona squamosa***	
	Alkaloid rich fractions of *Prosopis juliflora* leaves can be a good drug entity against resistant bacteria due to its antibacterial property against various bacteria including Methicillin-Resistant *Staphylococcus aureus*. **(Action: Professor and Head, Department of Veterinary Pharmacology & Toxicology, Veterinary College, JAU, Junagadh)**	**Approved with modification**
2.	**Survey on indigenous plants use for medicinal purpose in animals in Junagadh region**	
	Farmers of Junagadh, Mendarda and Vanthali taluka are commonly using *Adansonia digitata* (Gorakh ambli) for gastric problems, *Elephantopus scaber* (Ghaa Jadvu) and *Clerodendrum phlomidis* (Arni) for wound healing, *Psoralea corylifalia* (Baauchi) for skin infection, *Enicostemma littorale* (Mamejvo) for internal parasites and *Tecomella undulata* (Ragat rohido) for fracture healing in animals. **(Action: Professor and Head, Department of Veterinary Pharmacology & Toxicology, Veterinary College, JAU, Junagadh)**	**Approved**
3.	**Assessment of Blood cells' Immunocompetence around Parturition in Gir cows and Jaffarabadi buffaloes**	
	During peripartum period phagocytic activity and lymphocyte proliferation responses are lower in Gir cows as compared to Jaffarabadi buffaloes. **(Action: Professor and Head, Department of Veterinary Physiology & Biochemistry, Veterinary College, JAU, Junagadh)**	**Approved with modification**
4.	**Haemato-biochemical profiles of horses in and around Junagadh**	

<table>
<tr><td></td><td>In Kathiawari horses, total granulocyte per cent and MCHC (g/dl) are higher in females and lymphocyte per cent higher in males.
(Action : Professor and Head, Department of Veterinary Physiology & Biochemistry, Veterinary College, JAU, Junagadh)</td><td>Approved with modification</td></tr>
<tr><td>5.</td><td>Diagnosis of Babesia bigemina and Trypanosoma evansi in bovines in and around junagadh: traditional vs molecular detection and assessment of risk factors</td><td></td></tr>
<tr><td></td><td>In cattle and buffaloes PCR is the most effective technique in diagnosis of subclinical and latent infections of Babesia spp. (Sensitivity, 100%; Specificity, 82.90%) and Trypanosme spp. (Sensitivity, 100%; Specificity, 95.92%).
(Action: Professor and Head, Department of Veterinary Parasitology, Veterinary College, JAU, Junagadh)</td><td>Approved with modification</td></tr>
<tr><td>6.</td><td>Study of parasitic infections/infestations in animals presented at TVCC, Junagadh</td><td></td></tr>
<tr><td></td><td>The major parasites recorded in domesticated animals in and around Junagadh are as below:
<table>
<tr><th>Name of Parasite</th><th>Animal species</th></tr>
<tr><td>Buxtonella sulcata, Eimeria spp., Fasciola gigantica, Aamphistomes, Babesia spp.</td><td>Cattle , Buffaloes</td></tr>
<tr><td>Eimeria spp.</td><td>Goat, Bird</td></tr>
<tr><td>Strongyle , Babesia spp.</td><td>Horse</td></tr>
<tr><td>Hook Worm, Babesia spp., Demodex</td><td>Dog</td></tr>
<tr><td>Trypanosoma evansi</td><td>Camel</td></tr>
</table>
(Action: Professor and Head, Department of Veterinary Parasitology, Veterinary College, JAU, Junagadh)</td><td>Approved with modification</td></tr>
<tr><td>7.</td><td>Effect of replacement of graded levels of maize with raw and detoxified Mango seed kernel (<u>Mangifera indica</u>) in conventional concentrate mixture on in vitro rumen fermentation pattern</td><td></td></tr>
<tr><td></td><td>Total phenol content in raw mango seed kernels is reduced by 60.00 per cent and 70.40 per cent by boiling in water and treatment with 1.00 per cent calcium hydroxide, respectively. Based on in vitro studies, treated mango seed kernel can replace 100 per cent maize in ISI grade-II concentrate mixture for cattle.
(Action: Professor and Head, Department of Animal Nutrition, Veterinary College, JAU, Junagadh)</td><td>Approved with modification</td></tr>
<tr><td>8</td><td>Aetio-Pathological studies on broiler mortality in and around Junagadh</td><td></td></tr>
<tr><td></td><td>E. coli infection is the major cause (31.21 per cent) of mortality in broilers of 16-30 days (22.55 per cent) during winter (22.40 per cent) in and around Junagadh.
(Action: Professor and Head, Department of Veterinary Pathology, Veterinary College, JAU, Junagadh)</td><td>Approved with modification</td></tr>
<tr><td>9.</td><td>Study on Postnatal Development of Adrenal Gland in Gohilwadi Goat</td><td></td></tr>
</table>

	(*Capra hircus*)	
	Adrenal gland of day old Gohilwadi kid has definite cortex and medulla, while adult adrenal exhibits the structures of typical zones of cortex and medulla. Width of definite cortex increases, while that of foetal zone decreases with increasing age. **(Action: Professor and Head, Department of Veterinary Anatomy, Veterinary College, JAU, Junagadh)**	**Approved with modification**

NAVSARI AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

Sr. No.	Centre/Station/Department	
1	**Effect of bypass fat supplementation on production performance and economics on lactating buffalo**	
	Dietary supplementation of bypass fat (calcium salt of palm fatty acid) @ 0.75 % of dry matter intake from 15 days pre-partum to 90 days post-partum to lactating Surti buffaloes (2-4 lactations) improves milk fat percentage (13%), feed efficiency in terms of FCM (29.24%) and serum triglyceride and cholesterol levels without affecting body condition score. **(Action:- Research Scientist, Livestock Research Station)**	**Approved with modification**
2	**Study of suckling behavior and mothering ability vis-à-vis production performance of Surti goat**	
	For early selection of breeding male Surti kids at 60 days of age more than 2.5 suckling and 1.0 maternal care scores are recommended. **Suggestions:** **1. Approved with modification** **(Action:- Professor and Head, Dept. of LPM)**	**Approved with modification**
3	**Economics of growth performance due to dietary inclusion of tanniferous leaves (*Ficus benghalensis*) in kids infested with gastrointestinal helminthes**	
	Dietary inclusion of fresh leaves of *Ficus bengalensis* (Banyan tree) to supply 1.5% condensed tannin to the diet of non dewormed Surti kids (5-6 month) helps to alleviate the gastrointestinal helmiths load and improves growth rate. **Suggestions:** 1. Approved with Modification **(Action:- Professor and Head, Dept. of Animal Nutrition)**	**Approved with modification**

ANIMAL HEALTH

SN	Centre/Station/Department:	
1	**Diagnosis and management of Ascites in Canines**	
	The combination of loop diuretics and silymarin @ 30mg/kg/day along with vitamin B complex orally for 15 days can be used to manage ascites of	**Approved**

	hepatic origin in dogs. **(Action:- Professor and Head, Veterinary Medicine)**	

SARDAR KRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTION

1.	**Study of Seasonal effect on sexual behavior of Kankrej bull.**	
	In Kankrej bulls, the mean scores of sexual behavioral components, viz., temperament (0-5), libido (0-9), erection (0-4), protrusion (0-4), Flehman's reaction (0-1) and ejaculatory thrust (0-4) are 1.98±0.02, 6.23±0.08, 3.39±0.03, 2.90±0.02, 0.51±0.03 and 3.43±0.04, respectively; and the reaction time (sec) and total time (sec) is 110.05±3.45 and 168.47±7.23, respectively. The mean values for seminal attributes, viz., volume (ml), concentration (million/ml), colour (score 1-4), pH, mass activity (grade 0-5), per cent initial motility and live sperm are 5.03±0.07, 1414.83±24.69, 3.71±0.02, 6.72±0.01, 4.11±0.04, 83.27±0.27 and 90.29±0.22, respectively. Hence these values can be used as reference for the selection/evaluation of Kankrej bulls by the frozen semen banks. **(Action :Research Scientist, LRS, SDAU, Sardarkrushinagar)**	**Approved with modification**
2.	**Study of Seasonal effect on sexual behavior of Kankrej bull.**	
	The Kankrej bulls evinced good sexual behavior with the better semen quality throughout the year and during the summer months a significantly higher sex drive (6.69, score 0-9) and semen quality (volume 5.28 ml, initial motility 85.19 %, live sperm 90.63%). Hence it is recommended that the semen can be harvested throughout the year from Kankrej bulls. **(Action :Research Scientist, LRS, SDAU, Sardarkrushinagar)**	**Approved with modification**
3.	**Study of Seasonal effect on sexual behavior of Kankrej bull.**	
	During semen collection, the Kankrej bulls preferred buffalo bulls (78.26%) as dummy instead of Kankrej bull, with no risk and significant reduction in training period (5 months). Hence, at semen stations for effective semen collection from the Kankrej bulls it is recommended to use the buffalo bull as dummy. **(Action :Research Scientist, LRS, SDAU, Sardarkrushinagar)**	**Approved with modification**

ANIMAL HEALTH

1.	**To study the prevalence of cardiac diseases in local canine population using electrocardiography and cardiac biomarkers.**	
	The prevalence of cardiac dysfunction in canines of Banaskantha District is 10.86 percent (154/1417) with highest percentage of cardiac arrhythmias (83.13 %), followed by dilated cardiomyopathy (9.09%) and acute heart failure (1.29%). **(Action: Professor and Head, Department of Veterinary Medicine)**	**Approved with modification**
2.	**Study on status of acaricide resistance and development of alternate strategy to control ticks in northern Gujarat**	
	In Banaskantha district under *in vitro* studies, Flumethrin (1%) is more effective in control of both adults and larval stages of *Rhipicephalus (Boophilus) microplus* ticks in comparison to deltamethrin (1.25%) and	**Approved with modification**

	fipronil (1.0%). **(Action: Professor and Head, Department of Veterinary Parasitology)**	
3.	**Study on status of acaricide resistance and development of alternate strategy to control ticks in northern Gujarat.**	
	In Banaskantha district under *in vitro* studies, crude methanolic extracts of Papaya (Carica papaya) seeds at 100 mg/ml concentration is effective in control of both adult and larval stages of Rhipicephalus (*Boophilus*) microplus ticks. **(Action : Professor and Head, Department of Veterinary Parasitology)**	**Approved with modification**
4.	**Evaluation of surgical treatment of obstructive urolithiasis in bovines in clinical cases.**	
	Surgico-therapeutic management of urolithiasis in Kankrej male calves with tube cystotomy followed by ammonium chloride feeding @ 5 gm total dose for 10 days is effective. **(Action: Professor and Head, Dept. of Veterinary Surgery & Radiology)**	**Approved with modification**

NEW TECHNICAL PROGRAMMES

ANAND AGRICULTURE UNIVERSITY

ANIMAL PRODUCTION

Sr. No.	Title	Suggestions	Status
1	Identification of coccidial species and evaluation of anticoccidial drugs in calves.	Accepted **(Action :** Research Scientist, Livestock Research Station)	**Dropped**
2	Association of Body Condition Score (BCS) and milk production to Ketosis.	Accepted with following suggestion/s: 1.Title should be "To study the metabolic profile of cows with BCS 2.Measurement of NEFA at regular intervals **(Action :** Research Scientist, Livestock Research Station)	**Approved with modification**
3	Prevalence of clinical and subclinical mastitis and sensitivity pattern of antibiotics	Accepted with following suggestion/s: 1. Add dry cow therapy at the end of the title. 2. Year of completion will be 2018 3. Economic loss should be estimated. **(Action :** Research Scientist, Livestock Research Station)	**Approved with modification**
4	Effect of supplementing Fenugreek (*Trigonella foenum graecum*) seeds in total mixed ration (TMR) of Surti goats on nutrient utilization and milk production.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**

5	Effect of supplementing Fenugreek (*Trigonella foenum graecum*) seeds in the ration of crossbred cows on nutrient utilization and milk production. **(In Collaboration with Livestock Research Station)**	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
6	To evolve area specific mineral mixture for dairy animals in Mahisagar district.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
7	Formulation and evaluation of total mixed ration comprising of pigeon pea (*Cajanus cajan*) straw in adult sheep.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
8	Formulation and evaluation of total mixed ration comprising of Gram (*Cicer arietinum* L) straw in adult goats.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
9	Studies on aflatoxin M_1 level in milk of dairy animals in Anand District.	Accepted **(Action :** Research Scientist: Animal Nutrition Research Station)	**Approved**
10	Study of nutritional status of dairy animals of Chhotaudepur district.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
11	Methane mitigation in buffaloes on legume straw based total mixed ration.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
12	Studies on the effect of different levels of SSF Biomass based on Wheat straw, Jowar straw and Paddy straw in Total Mixed Rations (TMR) on *In vitro* digestibility and methane emission.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
13	Studies on effect of different SSF Biomass in TMR on digestibility of nutrients and rumen fermentation in small ruminants.	Accepted **(Action :**Research Scientist: Animal Nutrition Research Station)	**Approved**
14	Screening of indigenous and crossbred cattle and buffalo breeds of Gujarat state for β casein milk protein variants (A1/A2 variants) using PCR-RFLP.	Accepted **(Action :** Professor and Head, Department of Animal Genetics and Breeding)	**Approved**
15	Genetic Characterization of Gujarat Malvi cattle population using microsatellite markers.	Accepted **(Action:** Prof. & Head, Dept. of Animal Genetics and Breeding)	**Approved**
16	Genetic Characterization of Kahmi Goat using microsatellite	Accepted **(Action:** Prof. & Head, Dept. of	**Approved**

	markers.	Animal Genetics and Breeding)	
17	Genetic Characterization of Halari donkey using microsatellite markers.	Accepted **(Action:** Prof. & Head, Dept. of Animal Genetics and Breeding)	**Approved**
18	Genetic Characterization of *Desi* fowl populations from North and South Gujarat using microsatellite markers.	Accepted **(Action:** Prof. & Head, Dept. of Animal Genetics and Breeding)	**Approved**
19	Udder and teat characteristics in relation to milk yield and incidences of sub clinical mastitis in Zebu cows.	Accepted with following suggestion/s: 1. Replace word Zebu with Gir 2. Sample size should be 150 animals **(Action:** Prof. and Head, Dept. of Livestock Prod. Managementt.)	**Approved with modification**
20	Udder and teat characteristics in relation to milk yield and incidences of subclinical mastitis in water buffaloes.	Accepted with following suggestion/s: 1. Sample size should be 150 animals **(Action:** Prof. & Head, Dept. of Animal Science, BACA)	**Approved with modification**
21	Study of Physiological, Haematological, Biochemical and Hormonal Changes in Preweaned Lambs and Kids.	Accepted with following suggestion/s: 1.IGF-1 should be estimated with Ovine kit **(Action :** Prof. and Head, Dept of Physiology and Biochemistry)	**Approved with modification**
22	Study of Physiological, Hematological, Biochemical and Hormonal Changes in Preweaned Calves.	Accepted with following suggestion/s: 1. IGF-1 should be estimated with Bovine kit **(Action :** Prof. and Head, Dept of Physiology and Biochemistry)	**Approved with modification**
23	Validation of seed germination inhibition test for pregnancy diagnosis in goat and cattle.	Accepted with following suggestion/s: 1. This experiment should be treated as pilot study **(Action :** Res. Scientist, PSC, Ramna Muvada and Minawada)	**Dropped**
24	To study the testicular biometry, sexual behaviour, semen quality and sex steroid and biochemical profile in growing Surti male kids up to the age of adolescence.	Accepted with following suggestion/s: 1. Replace the word adolescence with sexual maturity. 2.Start the experiment from 6 months of age rather than 3 month **Action :** Research Scientist, Ramna Muvada and Minawada)	**Approved with modification**

ANIMAL HEALTH

Sr. No.	Centre / Title	Suggestions	Remarks
1	To determine *in-vitro* antibacterial activity of aqueous and alcoholic extracts of *Solanumxanthocarpum* (Kantkari) and *Achyranthesaspera* (chaff-flower).	Accepted with following suggestions: Nil (**Action**: Prof. and Head, Dept. of Vet. Pharmacology & Toxicology, Veterinary College, AAU, Anand)	**Approved**
2	Studies on prevalence, haemato-biochemical alterations and diagnostic aspects of *Trypanosomaevansi* using blood smear examination and polymerase chain reaction (PCR) in cattle and buffaloes.	Accepted with following suggestions: 1. Enumeration of microorganisms in subclinical and clinical cases of disease should be added in observations. (**Action**: Prof. and Head, Dept. of Vet. Parasitology, Veterinary College, AAU, Anand)	**Approved with modification**
3	Studies on clinico-pathological changes and therapeutic management of canine babesiosis.	Accepted with following suggestions: 1. Modify title as "Clinico-pathological studies in canine babesiosis cases presented at TVCC, Anand". 2. Objective 1: Incorporate "To study the prevalence and clinical signs" instead of "epidemiology". 3. Minimum of 400 animal be screened over a period of two years. 4. The treatment protocols should be adopted based on the recent published references. (**Action:** Prof. and Head, Dept. of Vet. Medicine, Vet. College, AAU, Anand)	**Approved with modification**
4	Pathological and molecular studies on Low Pathogenic Avian Influenza virus and *E. coli* infection in broilers	Accepted with following suggestions: (**Action**: Prof. and Head, Dept. of Vet. Pathology, Vet. College, AAU, Anand)	**Approved**
5	Isolation and identification of bacteria from various ocular afflictions of dogs.	Accepted with following suggestions: 1. Modify title as "Isolation and identification of bacteria from various ocular affections in dogs." (**Action**: Prof. and Head, Dept. of Vet. Microbiology, Veterinary College, AAU, Anand)	**Approved with modification**
6	'N' gene sequencing of rabies virus obtained from animals.	Accepted with following suggestions: 1. Modify title as "Nucleoprotein gene sequencing of rabies virus	**Approved with modification**

		obtained from animals". (**Action**: Prof. and Head, Dept. of Vet. Microbiology, Veterinary College, AAU, Anand)	
7	Isolation and characterization of *Brucella* isolates from the reproductive disorders in large domestic ruminants.	Accepted with following suggestions: 1. Third objective shall be: To detect the Brucella organism load. 2. Sequence of 3rd& 4th objectives' sequence should be interchanged. 3. Use of PCR/digital PCR technique should be added. (**Action**: Prof. and Head, Dept. of Vet. Microbiology, Veterinary College, AAU, Anand)	**Approved with modification**
8	Standardization of Polymerase Chain Reaction technique for diagnosis of *Theileria equi (Babesia equi)* directly from blood.	Accepted with following suggestions: 1. Modify title as " Standardization of Polymerase Chain Reaction technique for diagnosis of *Theileria equi* directly from blood. 2. Objective: To be modified as : Use of PCR technique for specific detection & quantification (**Action**: Prof. and Head, Dept. of Vet. Microbiology, Veterinary College, AAU, Anand)	**Approved with modification**
9	Study on the prevalence, causes and therapeutics of genital infections in repeat breeders and postpartum dairy cows.	Accepted with following suggestions: 1. Metagenomics work may be initiated. (**Action**: Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)	**Approved with modification**
10	Study on relative merits of homemade TFYG extender and commercial extenders Andromed and Optixcell for cryopreservation of buffalo semen.	Accepted (**Action**: Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)	**Dropped**
11	Effect of nutritional management of transition period on blood profile, puerperal events and postpartum fertility in buffaloes: a demonstration to tribal farmers.	Accepted (**Action**: Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)	**Approved**
12	Prevalence of bovine infertility in different regions of Gujarat.	Accepted (**Action:** Prof. and Head, Dept. of Gynaecology and Obstetrics, Veterinary College, AAU, Anand)	**Approved**
13	Effect of peripartum nutritional (multi-minerals and bypass fat)	Accepted (**Action**: Prof. and Head, Dept. of	**Approved**

	supplementation on uterine involution, postpartum fertility and reproductive peridata in Jafarabadi buffaloes	Gynaecology and Obstetrics, Veterinary College, AAU, Anand)	
14	To study the sero-prevalence of Brucellosis by using *Brucellamelitensis*antigen in small ruminants and human"	Accepted with following suggestions: 1. Statistically viable number of samples should be increased. 2. PCR based diagnostic method should be adopted. 3. Specify the human population to be include in the study (Vets/Paravet/Occupationals etc.) (**Action**: Prof. and Head, Dept. of Vet. Public Health, Veterinary College, AAU, Anand)	**Approved with modification**
15	Studies on Xylazine- Ketamine, Midazolam-Ketamine and Isoflurane Anaesthesia in Butorphanol premedicated birds.	Accepted with follwing suggestions: 1. First group of treatment proposed should be dropped. 2. Title to be changed as Studies on Midazolam-Ketamine and Isoflurane Anaesthesia in Butorphanol premedicated birds. (**Action**: Prof. and Head, Dept. of Vet. Surgery & Radiology, Veterinary College, AAU, Anand)	**Approved with modification**
16	Ultrasonographic Evaluation of Udder and Teat in Dairy Animals.	Accepted (**Action**: Prof. and Head, Dept. of Vet. Surgery & Radiology Veterinary College, AAU, Anand)	**Approved**
17	Studies on Management of Canine Mammary Tumours with Dendritic Cell Therapy.	Accepted (**Action**: Prof. and Head, Dept. of Vet. Surgery & Radiology Veterinary College, AAU, Anand))	**Approved**
18	Studies on Incidence, Diagnosis and Management of Surgical Affections of Urinary System in Dogs.	Accepted (**Action**: Prof. and Head, Dept. of Vet. Surgery & Radiology Veterinary College, AAU, Anand)	**Approved**
19	Clinical Studies on Tube-Cystotomy in Bovines Calves.	Accepted (**Action**: Prof. and Head, Dept. of Vet. Surgery &RdiologyVeterinary College, AAU, Anand)	**Approved**
20	Studies on Clinical Use of Orthosis in Dogs and Goats with Locomotary Disorders.	Accepted (**Action**: Prof. and Head, Dept. of Vet. Surgery & Radiology Veterinary College, AAU, Anand)	**Approved**

JUNAGADH AGRICULTURAL UNIVERSITY

ANIMAL PRODUCTIN AND HEALTH

Sr. No.	Title/Centre	Suggestions	
1.	Preliminary evaluation of antibacterial activity of various extracts of selected medicinal plants	Accepted (Action: PI: Dr. U. D. Patel, Asso. Professor, Vety. Pharm. CVS & AH, JAU, Junagadh)	**Approved**
2.	*In-vitro* anti-inflammatory activity of different extracts of selected medicinal plants	Accepted with following suggestion/s: 1. *In vitro* evaluation of cytokine profiles for evaluation of anti-inflammatory cytokines, may be included if feasible. (Action: PI: Dr. U. D. Patel, Asso. Professor, Vety. Pharm., CVS & AH, JAU, Junagadh)	**Approved with modification**
3	*In-vitro* antioxidant activity of various extracts of selected medicinal plants	Accepted with following suggestion/s: 1. Oxidative stress model should be described properly. 2. Parameters for estimation of oxidative stress like SOD, H_2O_2 and Lipid Peroxidase may be included, if possible. (Action: PI: Dr. U. D. Patel, Asso. Professor, Vety. Pharm., CVS & AH, JAU, Junagadh)	**Approved with modification**
4.	*In-vitro* anti-diabetic activity of different extracts of selected medicinal plants	Accepted with following suggestion/s: 1. The study may be supported with *in vivo* in experimental laboratory animal model. (Action:PI: Dr. U. D. Patel, Asso. Professor, Vety. Pharm., CVS & AH, JAU, Junagadh)	**Approved with modification**
5.	Molecular characterization of A1 and A2 ß-Casein genes in Gir cattle	Accepted (Action: PI: Dr. A. R. Ahlawat, Asso. Prof., AGB, CVS & AH, JAU, Junagadh)	**Approved**
6.	Molecular characterization of BoLA-DRB3 gene in Gir cattle	Accepted with following suggestion/s: 1. Restriction enzyme analysis may be excluded. 2. Sequencing of the amplified product has to be included. (Action: PI: Dr. A. R. Ahlawat, Asso. Professor, CVS & AH, JAU, Junagadh)	**Approved with modification**
7.	Hematological and Biochemical aspects associated with hemoprotozoan infection in cows,	Accepted with following suggestion/s: 1. Biochemical estimation namely	**Approved with modification**

	buffaloes and horses in and around Junagadh	TSH, Glutathione, SOD, LPO, TAS may be included, if feasible. (Action: PI: Dr. Arjun Odedara, Prof., Vety. Phy. CVS & AH, JAU, Junagadh)	
8.	Seroprevalence of Infectious Bovine Rhinotracheitis (IBR) in Dairy Animals with Reproductive Disorders	Accepted (Action : PI: Dr. J.B. Kathiriya, Asst. Professor, VPH, CVS & AH, JAU, Junagadh)	**Approved**
9.	Etiological and Therapeutic studies on Canine Dermatoses in and around Junagadh	Accepted with following suggestion/s: 1. Exclude the hormone profiling from the Study. (Action :PI: Dr. Joice P. Joseph, Asstt. Prof.,TVCC, CVS & AH, JAU, Junagadh)	**Approved with modification**
10.	Clinical epidemiology of Gir cattle and Jaffrabadi buffalo at CBF	Accepted (Action: PI: Dr. Shivaji H. Talekar, Asso. Res. Sci., CBF, JAU, Junagadh)	**Approved**
11.	Management of mastitis in Gir Cattle and Jaffrabadi Buffalo	Accepted with following suggestion/s: 1. Reframe the title as "Incidence and management of mastitis in Gir Cattle and Jaffrabadi Buffalo". (Action: PI: Dr. Shivaji H. Talekar, Asso. Res. Sci., CBF, JAU, Junagadh)	**Approved with modification**
12.	Comparative efficacy of hormonal regimens for oestrous induction in post-partum Jaffrabadi buffaloes	Accepted with following suggestion/s: 1. Replace the word 'oestrous' with 'estrus' in the title. (Action :PI: Dr. H. P. Vijyeta, Asst. Res. Scientist, CBF, JAU, Junagadh)	**Approved with modification**
13	Effect of Methyl ergometrine and $PGF_2\alpha$ during puerperium period in Gir cows"	Accepted with following suggestion/s: 1. Club 2nd and 3rd objectives. (Action: PI: Dr. G. B. Solanki, Asst. Res. Scientist, CBF, JAU, Junagadh)	**Approved with modification**
14	Sexual behaviour and its relationship with semen quality parameters in Jaffarabadi breeding bulls	Accepted with following suggestion/s: 1. Omit 'morphological abnormalities' in Seminal attributes. (Action :PI: Dr. J. K. Chaudhary Asstt. Res. Sci.t, CBF, JAU, Junagadh)	**Approved with modification**
15	Effects of vitamin E and minerals supplementation during peri-partum period on BCS, milk yield, body weight and performance of calves in Gir heifer	Accepted with following suggestion/s: 1. Workout the dose of Vit. E before conducting the actual experiment. (Action :PI: Dr. P. M. Gamit, Asstt. Res. Scientist, CBF, JAU, Junagadh)	**Approved with modification**
16	Effect of a high-pressure fogger cooling on body comfort, milk yield and composition in Jaffrabadi	Accepted with following suggestion/s: 1. Microclimate recording of shed	**Approved with modification**

	buffaloes during summer season	may be undertaken using Data logger. (Action :PI: Dr. B. D. Savaliya, Asstt. Res. Sci., CBF, JAU, Junagadh)	
17	Utilization of duckweed (*Lemnaminor*) meal as partial supplementation in the diet of *Catlacatla*fish.	Accepted with following suggestion/s: (Action : PI: Prof. A.A. Vyas, Assoc. Prof., Inland Fisheries, JAU, Junagadh)	**Approved**
18	Study of copepod diversity in coastal region of Okhamandal and its culture potential as live feed.	Accepted (Action :PI: Prof. M. P. Patel, Assist. Professor, FRS, Okha)	**Approved**
19.	Seed production of mud spiny lobster *Panuliruspolyphagus* (Herbst, 1793) in hatchery.	Accepted (Action :PI: Prof. M. P. Patel, Assist. Professor, FRS, Okha)	**Approved**
20.	Diversity and Distribution of Opisthobranch fauna at Sikka Coast	Accepted (Action :PI: Dr. Hitesh K Kardani, Research Officer, FRS, Sikka)	**Approved**
21.	Breeding and Larval rearing of Opisthobranch fauna (*Elysiatomentosa, Hypselodorisinfucata, Erronea onyx* (cowry))	Accepted (Action :PI: Dr. Hitesh K Kardani, Research Officer, FRS, Sikka)	**Approved**

NAVSARI AGRICULTURAL UNIVERSITY
ANIMAL PRODUCTION AND FISHERIES SCIENCE

Sr. No.	Title/Centre	Suggestions	Remarks
1	Effect of dietary protein levels on growth performance of Surti buffalo calves.	**Accepted (Action:- RS, Livestock Research Station**	**Deferred**
2	Effect of different floor types on the growth performance and behavioral traits of surti buffalo calves during winter.	**Accepted (Action:- RS, Livestock Research Station**	**Approved**
3	Study of marine Finfish and Shell fish landings and their taxonomical identification at Dholai fish landing centre.	**Accepted with following suggestion/s** **1.** Add DNA bar-coding of fish **2.** Remove the statement on photography of different fish species **(Action:-** Principal Investigator, COF, NAU , Navsari	**Approved with modification**
4	Study of Indian white shrimp (*Fenneropenaeus indicus*) growth under varying salinities, of SWMRU.	**Accepted (Action:- PI & RS,** SWMRU, NAU)	**Approved**

5	Strategies to mitigate the impact of climate change.	**Accepted with following suggestion/s** **1.** Modify the title as follows: Strategies to mitigate the impact of climate change: Effect of 75 % agro-green net **on** production, reproduction and stress parameters in Surti buffaloes. **2.** Add micro RNA of blood circulation **(Action:- PI & Head, Vety Phy., COVS, NAU)**	**Approved with modification**
6	Effect of feeding processed maize on fattening of male Surti kids.	**Accepted with following suggestion/s** **1.** The days of fattening should be restricted to 1-2 months. **(Action:- PI & Head, ANN, COVS, NAU)**	**Approved with modification**
7	Effect of bedding materials on broiler performance	**Accepted (Action:- PI & Head, ILFC, COVS, NAU)**	**Approved**
8	Study on managemental practices adopted by the commercial layer farmers in Navsari district	**Accepted (Action:- PI & I/c Dean, Polytechnic In Animal Husbandary , COVS, NAU)**	**Approved**
9	Study on managemental practices adopted by the commercial broiler farmers in Navsari district	**Accepted (Action:- PI & I/c Dean, Polytechnic In Animal Husbandary , COVS, NAU)**	**Approved**

ANIMALHEALTH

Sr. No.	Title/Centre	Suggestions	Remarks
1	Evaluation of *in vitro* pharmacological activities of *Morus alba.*	**Accepted with following suggestion/s** **1.** Write local name of plant under title **2.** Cytokines studies may be included for anti -inflammatory effects. **(Action:- Professor, Pharmacology, COVS, NAU)**	**Approved with modification**
2	Sero-diagnosis of caprine paratuberculosis in selected organized farms and panjrapoles of South Gujarat.	**Accepted (Action:- Professor, Pathology, COVS, NAU)**	**Approved**

3	Development of plastination technique for long term preservation of macro parasites.	**Accepted (Action:-Asso. Professor, Parasitology, COVS, NAU)**	**Approved**
4	Evaluation of various therapeutic techniques for posterior paresis in dogs.	**Accepted (Action:- Professor, Surgery & Radiology, COVS, NAU)**	**Approved**
5	Management of corneal ulcers in dogs.	**Accepted with following suggestion/s** **1.** Indolent word to be replaced with "**non- healing"** ulcers under treatment **(Action:- Professor, Surgery & Radiology, COVS, NAU)**	**Approved**
6	Management of traumatic reticulo-pericarditis (TRP) in bovines.	**Accepted with following suggestion/s** **1.** Pericardio-centensis under USG Guidance to be carried out. **Action:- Professor, Surgery & Radiology, COVS, NAU)**	**Approved with modification**
7	Studies on goniometry of limbs in Labrador Retriever, German Shepherd, Spitz and Pug breeds of dogs.	**Accepted with following suggestion/s** **1.** To include Anatomist as CO-PI **2.** Adult dogs of 2-4 years be used. **(Action:- Professor, TVCC, COVS, NAU)**	**Approved with modification**

SARDAR KRUSHINAGAR AGRICULTURAL UNIVERSITY
ANIMAL PRODUCTION

Sr. No.	Title & Centre	Suggestions	Remarks
1.	Effect of different ratios of DM intake from green and dry fodder on growth performance of Kankrej heifer calves	**Accepted with following suggestions** 1. Blood biochemical and hormonal parameters to be removed **(Action :Research Scientist, LRS, SDAU, SKNagar)**	**Approved with modification**
2.	Effect of different ratios of DM intake from green and dry fodder on production performance of Mehsana buffaloes	**Accepted with following suggestions** **1.** Blood biochemical and hormonal parameters to be removed **(Action :Research Scientist, LRS, SDAU, SKnagar)**	**Approved with modification**
3.	Estimation of genetic, phenotypic and environmental trends for traits of economic importance in Kankrej cattle	**Accepted** **(Action: Professor & Head, Dept. of AGB, COVS, SDAU, SKNagar)**	**Approved**

4.	Study on milk composition with reference to biochemical, enzymatic mineral and insulin profile of Kutchi camels (*Camelusdromedarius*) at different lactating stages	**Accepted with following suggestions** 1. Colostrum may also be tested for insulin hormone levels **2.** technique for estimation of insulin hormone may be mentioned in material and methods **(Action: Professor & Head, Dept. of Physiology & Bio., COVS, SDAU, SKnagar)**	**Approved with modification**

ANIMAL HEALTH

Sr. No.	Title & Centre	Suggestions	Remarks
1.	Comparative evaluation and efficacy of the commonly used acaricides against *Hyalomma anatolicum* Ticks by in-vitro tests.	**Accepted with following suggestions** 1. Remove the word 'if any' from objective no. 2 **(Action:** RADIC Scheme and Dept of VPH, College of Veterinary Science & A.H, SDAU**)**	**Approved with modification**
2.	Hemato-biochemical and electrocardiographic changes in caprine diarrhea.	**Accepted with following suggestions** 1. Parameters BUN, Serum Creatinine and Chloride to be included **(Action:** Dept. of Vet. Medicine, College of Vet. Sci. & A.H., SDAU.	**Approved with modification**
3.	Evaluation of homeopathic formulation in anemia in goat and dog	**Accepted with following suggestions** **1. Detailed blood profile under complete blood count to be included** **2. Treatments to be specified** **(Action:** Dept. of Vet. Medicine, College of Vet. Sci. & A.H., SDAU.	**Approved with modification**
4.	Development of multiplex PCR for the simultaneous detection of haemoprotozoan infections in livestock	**Accepted with following suggestions** 1. Provision for positive as well as negative control to be made **(Action:** Dept. of Animal Biotech. and Veterinary Microbiology, College of veterinary Science & A.H., SDAU **)**	**Approved with modification**
5.	Anti cancer effect of *curcumin* against cancer cell line	**Accepted with following suggestions** 1. Extract of *curcumin* should be validated by HPLC 2. Transcriptom analysis needs to be attempted	**Approved with modification**

		(Action: Dept. of Animal Biotech. and Veterinary Microbiology, College of veterinary Science & A.H., SDAU **)**	
6.	Optimization of diagnostic techniques for detection and confirmation of rabies virus from suspected field cases	**Accepted** **(Action:** Department of Veterinary Microbiology, College of veterinary Science & A.H., SDAU	**Approved**
7.	Histopathological and Molecular Characterization of Canine Mammary Tumors	**Accepted with following suggestions** 1. Canine Mammary Tumors should be replaced with the word 'non-inflammatory Canine Mammary Tumors ' in the title. 2. Sample should be collected from non spayed (intact) female. **(Action:** Department of Veterinary Pathology, College of veterinary Science & A.H., SDAU.	**Approved with modification**
8.	Comparative evaluation of modified and standard surgical technique for amputation of horn in Mehsana buffaloes.	**Accepted with following suggestions** 1. Circumference of the horn base should be measured 2. Estimation of blood loss to be measured **(Action: PI & Head,** Dept. of Vet. Surgery & Radiology, College of veterinary Science & A.H., SDAU.	**Approved with modification**

FISHERIES SCIENCE, KAMDHENU UNIVERSITY GANDHINAGAR

1.	Comparative study of in integrated farming of Indian major carps with mussels (*Lamellidens marginalis*) and Indian major carps.	**Accepted** **(Action:- PI, Fisheries Science, Kamdhenu University Gandhinagar)**	**Approved**

PLENARY SESSION:

Plenary session of 12th Combined Joint AGRESCO meeting of SAUs was Chaired by Dr. C. J. Dangaria, Hon'ble Vice Chancellor of NAU, Navsari and Co-Chaired byDr. A. R. Pathak, Hon'ble Vice Chancellor, JAU, Junagadh; Dr. N. C. Patel, Hon'ble Vice Chancellor of AAU, Anand, Dr. Ashok Patel, Hon'ble Vice Chancellor of SDAU, Sardarkrushinagar were guest of hounor. Besides, Dr. A. N. Sabalpara, Director of Research, NAU, Navsari and Dr. G. R. Patel, Director of Extension Education, NAU, Nasari, Director of Research of SAUs, Director of Extension Education of SAUs, Principals and Deans of SAUs and Associate Director of Research of SAUs remained present. After the formal welcome by Dr. A. N. Sabalpara, Director of Research, NAU, Navsari, the session began with the presentation of proceedings of all the sub-committees by the respective conveners, where in recommendations and new technical programmes of different sub-committees were approved by house. Dr. D. M. Korat, ADR, AAU, Anand; Dr. Sankhela, SDAU, S. K. Nagar; Dr. I. U. Dhruj, ADR, JAU, Junagadh and Dr. K. A. Patel, ADR, NAU, Navsari, Dr. H. M. Virdia, Associate Professor, NAU, Navsari and Dr. P. B. Patel, Associate Professor, NAU, Navsari were the rapporteurs for this session.

During discussion on crop improvement Sub-committee presentation, Dr. A. R. Pathak, Hon'ble Vice Chancellor, JAU, Junagadh suggested that local check should be included in trials. As per the norms of SAUs, nomenclature of variety should be given.

During discussion on Crop production and NRM Sub-committee presentation, Dr. Ashok Patel, Hon'ble Vice Chancellor of SDAU, Sardarkrushinagar suggested to include methodology of PROM with full name.

During discussion on Crop protection Sub-committee presentation, Dr. Ashok Patel, Hon'ble Vice Chancellor of SDAU, Sardarkrushinagar suggested solar system may be effective for wire fencing. He also suggested for reducing the height of chain link to reduce the cost of fencing.

During discussion on Horticulture and Forestry Sub-committee presentation, Dr. N. C. Patel, Hon'ble Vice Chancellor of AAU, Anand suggested to give details of soil properties in recommendations on organically grown crops. For multidisciplinary experiments, the recommendations need to be passed in various research sub committees.

During discussion on Agricultural Engineering, AIT, Diary and Food technology Sub-committee presentation, Dr. N. C. Patel, Hon'ble Vice Chancellor of AAU, Anand suggested that comb cutter recommendation should be mentioned in Horticulture sub-committee with a language as per engineering discipline.

Dr. A. R. Pathak, Hon'ble Vice Chancellor, JAU, Junagadh suggested to take demonstration of new technology on large scale by KVKs, Research stations and line departments. He also suggested, for healthy discussion of recommendation and new technical programmes, the AGRESCO report should be circulated to all the Director of Research of all SAUs by E-mail and Director of Research should forwarded the report to concerned members of respective Agresco Sub-committees well in advance, so as to save the precious time during Combined Joint Agresco meeting.

Dr. Ashok Patel, Hon'ble Vice Chancellor of SDAU, Sardarkrushinagar suggested that many recommendations are not adopted by the farmers; hence more focus should be given on farm trials and extension programmes of SAUs. Last five years recommendations should be demonstrated on research stations and KVKs. He further suggested to preapare colourful leaflets of important new technologies for wide publications among the farmers.

CONCLUDING REMARKS:

Dr. C. J. Dangaria, Hon'ble Vice Chancellor, NAU, Navsari and Chairman of the session, congratulated the scientists for bringing out large number of useful recommendations and also for planning new technical programmes. He emphasized that the research work should be target oriented and each University should target one major crop each by focusing all the related aspects for that crop. He was also of the opinion that while presenting new technical programmes, review of literature should also be included by the concerned scientist.

Dr. S. R. Chaudhary, Associate Director of Research, NAU, Navsari proposed the vote of thanks at the end of plenary session.