

Proceeding of the Sixth Combined Joint Meeting of the Agricultural Research Council (AGRESCO) of Junagadh Agricultural University held at JAU, Junagadh on 20-22nd April, 2010.

The Sixth Combined Joint meeting of the Agricultural Research Council (AGRESCO) of SAUs was held in the Auditorium, Junagadh Agricultural University, Junagadh during 20-22 April, 2010 under the Chairmanship of Dr. N. C. Patel, Hon'ble Vice Chancellor, Junagadh Agricultural University, Junagadh. Prof. M. C. Varshneya, Hon'ble Vice Chancellor, Anand Agricultural University, Anand; Dr. A. R. Pathak, Hon'ble Vice Chancellor, Navsari Agricultural University, Navsari and Dr. J. B. Misra, Director of Groundnut Research, ICAR, Junagadh were remain present. Welcome address was given by Dr. H. J. Vyas, Director of Research & Dean, P. G. Studies, Junagadh Agricultural University, Junagadh.

Dr. S. B. S. Tikka, Director of Research & Dean, P. G. Studies, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar; Dr. H . C. Pathak, Director of Research & Dean, P. G. Studies, Navsari Agricultural University, Navsari; Dr. A. M. Shekh, Director of Research & Dean, P. G. Studies, Anand Agricultural University, Anand; Dr. R. L. Savalia, Director of Extension Education, Junagadh Agricultural University, Junagadh; Dr. P. P. Patel, Director of Extension Education, Anand Agricultural University, Anand; Prof. R. B. Maravia, Executive Director (Agril.), Sardar Sarovar Nigam Limited, Gandhinagar were also present in the meeting and greeted the scientists for fruitful research recommendations.

All the University Officers, Principal & Deans of various faculties of SAUs, the officers from line department of Gujarat state, the Associate Directors of Research and Associate Directors of Extension Education of SAUs, the conveners of various subcommittees of SAUs, the senior scientists/professors of SAUs attended the Sixth Combined Joint AGRESCO meeting.

Dr. A. R. Pathak, Hon'ble Vice Chancellor, Navsari Agricultural University, Navsari, in his opening remarks, addressed scientists of SAUs for collaborative research work in areas of breeding programmes. He also suggested research needs on biotechnology, nanotechnology, low cost technology and recycling of agricultural waste.

Dr. J. B. Mishra, Director, Groundnut Research Centre, ICAR, Junagadh expressed his views on research activity of SAUs. He opined that stem rot and aflatoxin in groundnut are the important issues for groundnut cultivation. He also suggested research needs on disease control in groundnut through micronutrients.

Prof. M. C. Varshneya, Hon'ble Vice Chancellor, Anand Agricultural University, Anand expressed his experience and expertise. He gave his views on various areas of research like, research on rainfed farming particularly groundnut and cotton; increase in area of horticulture and spices crop; challenges of agricultural scientists for conversion of fallow or barren land into cultivated land; dry matter partitioning in respect of temperature regime; modified agricultural technologies i.e., cultural practices and mulches in respect to thermal and moisture regime; soil improvement through bioremediation; reduction in cost of cultivation through biotechnology, restoration of soil organic carbon for water conservation; research on bio-fortification of food produce through genetic enhancement of food crops; fodder quality research; development of agronomical practices of different crops for poly houses; multistory cropping for horticultural crops; needs to introduce agricultural educations in primary and secondary school.

Dr. N. C. Patel, Hon'ble Vice Chancellor, Junagadh Agricultural University, Junagadh delivered the chairman's address. In his address he stressed on the new challenges in agriculture. He stated that Gujarat state has large coastal area having saline and sodic soil. Approximately 22 percent soil of the state is having the same problem and needs immediate attention of the scientific community. Sound research programmes to be initiated to bring these soils under cultivation through bioremediation and crop diversification. The 12th Five Year Plan is striking the door. The brain storming exercise should be done for the preparation of new project proposals to be included in next plan. He also proposed for implementing group wise subcommittee meeting of Agricultural Universities from next year for better screening of technology. He advised the agricultural scientists to take advanced training under HRD programme. Further, he suggested that scientists should utilize maximum available resources in their research work.

Vote of Thanks

Dr. R. L. Savalia, Director of Extension Education, Junagadh Agricultural University, Junagadh proposed the vote of thanks.

JUNAGADH AGRICULTURAL UNIVERSITY

Recommendations for farmers were presented by concerned conveners of AGRESKO subcommittees and discussed thoroughly in the various technical sessions. Five new crop varieties, 43 farmers', six scientific information and 134 new technical programmes were presented and approved with suggestions.

6.1 CROP PRODUCTION

Chairman : Prof. M. C. Varshneya, Hon'ble VC, AAU, Anand
Co-chairman: Dr. P. T. Patel, SDAU, Sardarkrushinagar
Presentation: Dr. V. D. Khanpara, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMERS COMMUNITY

6.1.1 Evaluation of tillage practices in castor

The farmers of South Saurashtra Agro-climatic Zone are advised to prepare the land by ploughing followed by cultivator and blade harrowing and sow the *kharif* castor at 90 x 60 cm spacing for getting higher yield and net realization.

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

6.1.2 Integrated weed management in brinjal

The farmers of South Saurashtra Agro-climatic Zone growing *rabi* brinjal are advised to keep their fields weed free by four hand weeding at 20, 40, 60 and 80 and three interculturing at 20, 40 and 60 days after transplanting.

OR

Under shortage of labourers, apply pendimethalin @ 0.9 kg/ha dissolved in 500 liters of water as pre-emergence + one hand weeding and interculturing at 45 days after transplanting followed by application of pendimethalin @ 0.9 kg/ha with irrigation water for getting higher yield and net realization as well as effective weed control.

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

6.1.3 Contingency crop planning for varying onset of monsoon situations

The farmers of North Saurashtra Agro-climatic Zone are advised to select crop from the following crops for securing higher income under delayed onset of monsoon situations.

Order of preference

Short duration crops: Bunch groundnut, Sesame, Pearl millet, Black gram.

Long duration crops: Castor, Spreading groundnut, Pigeonpea, Cotton.

(Action: Research Scientist (Agronomy), DFRS. JAU, Targhadia)

6.1.4 Crop rotation studies in respect of sustaining crop yield and increasing total productivity under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone are recommended to adopt integrated nutrient management practices (25% RDF for the respective crop + compost @ 5 t/ha + castor cake @ 500 kg/ha + Azotobacter and PSM @ 5 g/kg of seed) in groundnut based crop rotation with groundnut or sesame or pearl millet for getting higher yield and net realization.

(Action: Research Scientist (Agronomy), DFRS. JAU, Targhadia)

6.1.5 Nutrient management practices for sustaining groundnut yield and productivity of sandy loam soils

The farmers of North Saurashtra Agro-climatic Zone (AES-10) growing *kharif* groundnut GG-7 are advised to apply 50% RDF (6.25:12.50 NP kg/ha) along with castor cake @ 500 kg /ha for obtaining higher yield and net realization.

(Action: Research Scientist (Soil Science), DFRS, JAU, Targhadia)

6.1.6 Possibilities of organic farming in pearl millet – wheat sequence

The farmers of North Saurashtra Agro-climatic Zone following pearl millet (*Kharif*) – wheat (*Rabi*) crop sequence are advised to apply 50% RDF to both the crops + FYM @ 5 t/ha + seed inoculation with PSB + Azospirillum to pearl millet and Azatobacter for wheat to obtain higher yield and net return.

OR

Alternatively, they should apply 100% RDF + 20 K₂O kg/ha to both the crops for securing higher yield and net return.

(Action: Research Scientist (Agronomy), Pearl Millet Research Station, JAU, Jamnagar)

6.1.7 Evaluation of post emergence herbicides in groundnut

The farmers of South Saurashtra Agro-climatic Zone growing groundnut in *kharif* season are advised to keep crop weed free by three hand weeding and interculturings at 20, 40 and 60 DAS. Under paucity of farm labourers, they are advised to apply pendimethalin @ 1.0 kg/ha as pre emergence and quizalofop ethyle @ 0.050 kg/ha or imazethapyr @ 0.075 kg/ha as post emergence at 20 DAS after sowing for effective weed control and net return.

(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)

6.1.8 Evaluation of bunch groundnut cultivars for late sown conditions

The farmers of South Saurashtra Agro-climatic Zone growing bunch groundnut are advised to select variety from the following varieties on priority basis under delayed onset of monsoon situations for realizing higher yield and net return.

Order of preference:

Groundnut variety: GG 5, GG 2, J 11, GG 7, TG 37A

(Action: Research Scientist, Main Oilseed Research Station, JAU, Junagadh)

6.1.9 Response of castor to levels and sources of S

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are recommended to apply 20 kg S/ha through gypsum (150 kg/ha) along with recommended dose (75:40 NP kg/ha) as urea and DAP.

OR

The crop should be fertilized with RDF (75:40 NP kg/ha) through urea and SSP for obtaining higher yield and net return.

(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)

6.1.10 Relative salinity tolerance of groundnut genotype

Farmers of Saurashtra region growing summer groundnut variety *viz.*, GG 4, GG 5, GG 6 can irrigate with water having salinity around 2 dS/m.

(Action: Professor & Head, Dept. of Agri. Chem. & Soil Science, JAU, Junagadh)

6.1.11 Agronomic evaluation of Bt Cotton hybrid (RCH 2)

The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton (RCH 2) under irrigated condition are advised to follow spacing of 120 x 45 cm and apply 160 kg N/ha to get higher yield and net income.

(Action: Research Scientist, Regional Cotton Research Station, JAU, Junagadh)

6.1.12 Impact of foliar application of KNO₃ on yield and quality of cotton

The farmers of South Saurashtra Agro-climatic Zone growing cotton Bt Hybrid (VICH 5) under irrigated condition are advised to spray 3% KNO₃ in addition to RDN (160 kg/ha) at flowering, boll initiation and 50% boll formation to get higher yield and net income.

(Action: Research Scientist, Regional Cotton Research Station, JAU, Junagadh)

RECOMMENDATION FOR THE SCIENTIFIC COMMUNITY

6.1.13 Establishment of critical limit of phosphorus for black gram grown on medium black calcareous soils

The critical limit of available P₂O₅ (Olsen's method) is 24 kg P₂O₅ ha⁻¹ in medium black calcareous soils and that for P content in leaves (3rd leaf) of black gram at 30 DAS is 0.471 per cent.

(Action: Professor & Head, Dept. of Agril. Chem. & Soil Science, JAU, Junagadh)

6.1.14 Determination of thermal requirement for different *kharif* crops under rainfed condition

Based on the field experiment, it was concluded that with delay in onset of monsoon, the Growing Degree Days and Heat Use Efficiency of different crops were tended to decline. The phenophase wise GDD is given herein.

Sr. No.	Particular	Short duration crops								
		Sesame			Pearl millet			Black gram		
		I*	II**	III***	I*	II**	III***	I*	II**	III***
	Yield (kg/ha)	747	547	158	1980	1709	539	667	384	94
	HUE	0.40	0.34	0.10	1.20	1.18	0.38	0.41	0.24	0.07
	Phenophase	Growing Degree Days (GDD)								
1.	Germination	105	125	118	105	132	124	76	94	87
2.	Branching	752	583	558	644	551	569	455	421	355
3.	Flowering	722	377	361	407	298	293	347	318	247
4.	Capsule/pod/ear head formation	370	312	311	327	300	261	525	544	414
5.	Maturity	212	221	172	158	170	128	306	258	254
	Total	1862	1619	1517	1641	1452	1375	1708	1635	1356

Sr. No.	Particular	Long duration crops								
		Cotton			Castor			Spreading G'nut		
		I*	II**	III***	I*	II**	III***	I*	II**	III***
	Yield (kg/ha)	531	357	96	1597	1350	467	665	443	36
	HUE	0.17	0.13	0.04	0.51	0.49	0.19	0.29	0.22	0.02
	Phenophase	Growing Degree Days (GDD)								
1.	Germination	115	113	123	153	133	123	153	153	123
2.	Branching	808	715	679	876	768	639	700	647	463
3.	Flowering	1093	1009	749	1156	1051	821	443	422	326
4.	Capsule/pod/boll formation	722	620	417	545	486	308	593	495	401
5.	Maturity	384	336	257	365	257	277	436	451	402
	Total	3120	2792	2224	3092	2694	2167	2325	2066	1715

GDD= Growing Degree Days, HUE= Heat Use Efficiency

Where, I* Onset of monsoon, II** 15 days after onset of monsoon, III*** 30 days after onset of monsoon

(Action: Research Scientist (Meteorology), DFRS, JAU, Targhadia and Professor & Head, Department of Agronomy, JAU, Junagadh))

6.1.15 Relative salt tolerance of different groundnut (*Arachis hypogaea* L.) genotypes in simulated saline soils

Based on the biomass yield and Na/K ratio in haulm of spreading type GG 13, semi-spreading type GG 20 and bunch type J 33533 varieties of groundnut were found tolerant to 2 ECe (dS/m) salinity. Whereas, GG 20 (semi-spreading) and J 33533 (bunch) were found more tolerant to higher salinity (4 dS/m ECe) than other varieties.

(Action: Professor & Head, Dept. of Agril. Chem. & Soil Science, JAU, Junagadh)

Technical Session: II

NEW TECHNICAL PROGRAMMES

1. Integrated weed management in summer soybean

- a) First year results to be presented during next meeting.
- b) Record test weight.

(Action: Professor & Head, Dept. of Agronomy, JAU, Junagadh)

2. Impact of tillage practices and sowing pattern on Bt. cotton

- a) Take four replications.
- b) Write factor instead of main and sub plot.
- c) Opening of furrow between two pair in S₄ treatment.

(Action: Professor & Head, Dept. of Agronomy, JAU, Junagadh)

3. Evaluation of pre and post emergence herbicides in irrigated Bt cotton

- a) Determine quality parameters.

(Action: Professor & Head, Dept. of Agronomy, JAU, Junagadh)

4. Evaluation of different organics in summer groundnut

- a) Determine BD.
- b) Follow large plot technique design.

(Action: Professor & Head, Dept. of Agronomy, JAU, Junagadh)

5. Impact of climate change on rainfall pattern in Saurashtra region

(Action: Professor & Head, Dept. of Agronomy, JAU, Junagadh)

6. Evaluation of organics in *kharif* groundnut

- a) Determine BD.
- b) Follow large plot technique design.

(Action: Research Scientist (Agro.), DFRS, JAU, Targhadia)

7. Sulphur fractionation in medium black soils of Rajkot district

(Action: Research Scientist (Soil Science), DFRS, JAU, Targhadia)

8. Population dynamics of aphids and jassid on groundnut in relation to different weather parameters

(Action: Research Scientist (Ag. Met), DFRS, JAU, Targhadia)

9. Effect of potassium and zinc on yield and quality of fodder maize under rainfed conditions

- a) Take four levels of potassium, 0, 20, 40 and 60 kg/ha and three levels of ZnSO₄, 0, 10 and 20 kg/ha.

(Action: Associate Research Scientist, Grassland Research Station, JAU, Dhari)

- 10. Effect of planting geometry and irrigation levels on yield of sugarcane**
 - a) Take three levels of irrigation 0.5, 0.76 and 0.9 PEF.
 - b) Apply N and K @ 80% of RDF only.
(Action: Research Scientist, Sugarcane Research Station, JAU, Kodinar)
- 11. Evaluation of different row ratios in sesame based inter cropping systems**
 - a) Take test weight of all the crops.
 - b) Take four replications.
(Action: Research Scientist, Agricultural Research Station, JAU, Amreli)
- 12. Effect of levels and sources of organics on productivity of pearl millet-gram cropping sequence**
 - a) Add one treatment of RDF outside the experiment.
 - b) Modify plot size i.e. 6.0 x 5.4 m.
 - c) Keep four replication in trial.
(Action: Research Scientist (Agro.), Pearl Millet Research Station, JAU, Jamnagar)
- 13. Integrated weed management in castor under irrigated conditions (AICRP)**
(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)
- 14. Effect of different levels of N, P and K on yield of summer groundnut (bold seeded)**
 - a) Take 4 replications from next season.
(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)
- 15. Management of sulphur and calcium through application of gypsum in rainfed groundnut**
(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)
- 16. Optimization of potassium and calcium requirement in rainfed groundnut**
(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)
- 17. Relay cropping of castor in groundnut and soybean**
(Action: Research Scientist (Agro.), Main Oilseed Research Station, JAU, Junagadh)
- 18. Evaluation of chickpea varieties under different dates of sowing under irrigated condition**
 - a) Determine quality parameters.
(Action: Research Scientist (Chickpea), Pulse Research Station, JAU, Junagadh)
- 19. Management of leaf reddening of cotton**
 - a) Delete treatment T₃, T₆, T₇, T₉ and T₁₀.
 - b) Take two plant protection block i.e. farmers and recommended package.
(Action: Research Scientist, Regional Cotton Research Station, JAU, Junagadh)
- 20. Effect of multi-micronutrient formulations on wheat**
 - a) Follow SPD with three replications if possible.
 - b) Increase plot size.
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)

21. **Effect of integrated nutrient management on yield, quality and nutrient uptake by garlic under salt affected soil**
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
22. **Potassium fertilization to summer groundnut in calcareous soil**
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
23. **Screening of wheat varieties at different salinity levels**
 - a) If possible, increase plot size.
 - b) Adopt FRBD.
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
24. **Potassium fertilization to *kharif* groundnut in calcareous soil**
 - a) Record plant stand.
 - b) Determine quality parameters.
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
25. **Effect of soil amendments on different varieties of castor under salt affected soil**
 - a) Apply K split at flowering.
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
26. **Effect of multi-micronutrient formulations on pigeon pea**
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)
27. **Effect of soil amendments on mung (black) under salt affected soil**
 - a) Dropped programme as crop is sensitive to salinity.
(Action: Professor & Head, Dept. of Agril. Chemistry and Soil Science, JAU, Junagadh)

6.2 CROP IMPROVEMENT

Chairman : Dr. A. R. Pathak, Hon'ble VC, NAU, Navsari
Co-chairman: Dr. G. C. Jadeja, AAU, Anand
Dr. A. S. Acharya, SDAU, Sardarkrushinagar
Presentation: Dr. C. J. Dangaria, JAU, Jamnagar

Technical Session: I

PROPOSALS FOR RELEASE VARIETIES

6.2.1 Groundnut: GJG-9

The proposed bunch groundnut variety Gujarat Junagadh Groundnut-9 (GJG-9) recorded overall 30.0, 20.5 and 15.5 per cent pod yield superiority over the checks GG-2, GG-5 and GG-7 respectively in *kharif* season. It also displayed higher kernel and oil yield than the checks. It showed tolerant reaction to stem rot disease, jassid and thrips. Due to superior pod and kernel yield, bold kernels and comparable shelling out-turn the variety GJG-9 is recommended for release for cultivation in the *kharif* rainfed groundnut growing areas of the state. The average pod yield is 1632 kg/h.

(Action: Research Scientist (Groundnut), Main Oilseed Research Station, JAU, Junagadh)

6.2.2 Groundnut: GJG-31

The summer bunch groundnut variety GJG-31 exhibited 36.9, 24.1, 17.5 and 20.6 per cent higher pod yield respectively over the checks GG-2, GG-4, GG-6 and TG-26 across the years. The variety also showed superiority in pod and kernel features over the check varieties. Due to less damage by jassid and heliothis and free from incidence of bud necrosis (PBNB) the variety is recommended for cultivation in the summer groundnut growing areas of the state. The average pod yield is 3483 kg/h.

(Action: Research Scientist (Groundnut), Main Oilseed Research Station, JAU, Junagadh)

6.2.3 Brinjal: GJB-2

The brinjal variety Gujarat Junagadh Brinjal -2 (GJB-2) recorded overall 20.9 per cent higher yield over check variety GOB-1. The fruits of this variety have attractive pink purple color, medium in size, medium long shape and possessing white fruit pulp with less seeds. The variety showed tolerance against little leaf disease. It also showed superiority in quality parameters. The average fruit yield is 342.94q/h. The variety is recommended for cultivation during late *kharif* and *rabi* seasons across the Gujarat State with following suggestions:

- a) The data of Junagadh and Ladol stations needs to be corrected.
- b) The data of little leaf disease recorded at Anand to be included in the final proposal.

(Action: Research Scientist (Garlic & Onion), Vegetable Research Station, JAU, Junagadh)

6.2.4 Okra: GJ-Okra-3

The variety Gujarat Junagadh Okra-3 (GJ Okra-3) registered 20.6 and 25.7 per cent higher green fruit yield over checks GO-2 and Pusa Sawani, respectively. Further, it also registered 38.4, 49.1 and 71.3 per cent higher yield as compared to Parbhani Kranti, Arka Anamika and Pusa Sawani, respectively. The variety possesses green, tender and attractive fruits. The variety is recommended for *kharif* cultivation in the Saurashtra and South Gujarat region. The average fruit yield is 150.52 q/ha.

(Action: Research Scientist (Garlic & Onion), Vegetable Research Station, JAU, Junagadh)

6.2.5 Sesame: Gujarat Til-4

The variety Gujarat Til-4 (AT-159) registered 18.3 and 10.8 per cent yield increment over check varieties G-Til-2 and G-Til-3, respectively. It also showed per day oil production (kg/ha) superiority to the tune of 26.2 and 16.3 per cent over the check varieties G-Til-2 and G-Til-3, respectively. The variety possesses white seeds suitable for export. The variety showed parity with G-Til-2 and G-Til-3 for reaction to capsule borer, gallfly and mites. It has showed earliness to the tune of five to seven days than the check varieties. The variety has recommended for cultivation in the North Saurashtra Agro-climatic Zone. The average seed yield is 770 kg/h.

(Action: Research Scientist (Pl. Br.), Agril. Research Station, JAU, Amreli)

RECOMMENDATION FOR THE FARMERS / SEED PRODUCERS

6.2.6 Suppression of interspersed staminate flowers (ISF) in non-environmental sensitive (NES) pistillate line for hybrid seed production of castor

Castor hybrid seed production growing farmers/ seed producers are recommended to apply two spray of ethrel @ 0.05 per cent on pistillate parent (JP-65) at 45 and 65 days after sowing to reduce the number of interspersed staminate flowers (ISF) in racemes of female parent, ultimately to reduce the per cent of selfing in hybrid seed of Castor Hybrid GCH-6 and to derive more profit per hectare from hybrid seed production programme.

The recommendation was approved with following suggestions:

- i. The two promising treatments *viz.*, chemical sprays ethrel @ 0.1 per cent and ethrel @ 0.05 per cent should be studied on larger scale to generate additional information on economic viability of these treatments.
- ii. The data of genetic purity should be reported after GOT.

(Action: Research Scientist (Seed Tech.), Pearl Millet Research Station, JAU, Jamnagar)

Technical Session: II

NEW TECHNICAL PROGRAMME

1. Testing of fresh seed dormancy in bunch groundnut varieties

(Action: Research Scientist (Seed Tech.), Pearl Millet Research Station, JAU, Jamnagar)

6.3 AGRICULTURAL ENGINEERING

Chairman : Dr. N. C. Patel, Hon'ble VC, JAU, Junagadh

Co-chairman: Prof. A. H. Memon, JAU, Junagadh

Dr. D. C. Joshi, AAU, Anand

Presentation: Prof. J. B. Savani, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY

6.3.1 Design and development of SPV operated greenhouse ventilation system

The farmers/ greenhouse growers and greenhouse manufacturers are recommended to use JAU SPV operated Greenhouse Ventilation System for natural ventilation of greenhouses built in farms, where frequent power cut may cause greenhouse environment unfavorable for crop cultivation.

(Action: Professor and Head, Dept. of RE&RE, CAET, JAU, Junagadh)

6.3.2 Performance of bio-degradable plastic mulch on onion production in comparison of normal plastic mulch

Farmers of Saurashtra region are advised to use bio-degradable plastic mulch (20 μ , black colour) for the cultivation of onion for the higher yield of the crop (15%) and to reduce weed growth (50-62%) as compared to no mulch. After harvesting of the crop, the field should be ploughed for mixing mulch in to the soil.

(Action: Professor and Head, Dept. of RE&RE, CAET, JAU, Junagadh)

6.3.3 Storage study of wheat obtained by combine harvester and thresher

Farmers growing wheat for seed purpose are advised to use thresher for better germination and vigour as compared with self propelled combine harvester.

(Action: Prof. & Head, Department of Agril. Process Engineering, CAET, JAU, Junagadh)

6.3.4 Studies on drying characteristics of vegetables using crop residue dryer

The agro processor interested in using the crop residue based dryer developed by Junagadh Agricultural University for drying serrated carrot, carrot slices, cabbage leaves, cauliflower pieces, tomato slices and whole green chillies are recommended to use following operating parameters :

1. Air temperature : 51 to 55 $^{\circ}$ C
2. Air velocity : 1.5 m/s
3. Bed thickness : 8.0 cm
4. Average fuel required : 5.5 kg/h

(Action: Prof. & Head Deptt. of Agril. Process Engineering, CAET, JAU, Junagadh)

6.3.5 Evaluation of the size of the bed at a given grade for effective soil and water management

The farmers of North Saurashtra Agro-climatic Zone growing bunch groundnut (GG-5) are advised to sow groundnut at 30 cm distance between rows having three rows on broad bed of 90 cm and furrow of 45 cm for getting higher yield and net return per hectare as well as to check runoff and soil loss under dry farming condition.

(Action: Res. Sci.(Agri.Engg.), Main Dry Farming Research Station, JAU,Targhadia)

RECOMMENDATION FOR SCIENTIFIC COMMUNITY

6.3.6 Determination of aquifer properties of the wells of Junagadh region

The aquifer properties viz., transmissibility and storage coefficient for different talukas of the Junagadh district are recommended for the scientific community, Government/Non Government Organizations for crop planning and simulating groundwater behaviour for adopted cropping pattern as below.

Aquifer properties of different talukas of Junagadh District

Sr. No.	Taluka	Tested site	Aquifer properties	
			Transmissibility (m ² /h)	Storage coefficient
1	Vanthali	Vanthali	0.55	0.1919
2	Manavadar	Manavadar	1.187	0.0000358
3	Visavadar	Vishavadar	0.7065	0.0002272
4	Mangrol	Mekhadi	6.439	0.1655
6	Junagadh	Junagadh,	4.36057	0.0047
7		Bamangam		
8	Una	Keshariya	3.3697	0.00011264S
9	Kodinar	Vadanagar	1.141	0.0001614
10	Sutrapada	Amrapur	9.65	0.108223
11	Mendarada	Amargadh	9.072	0.0013881
12	Talala	Chitrod	33.8846	0.061592
13	Veraval	Supasi	44.553	0.1267303
14	Keshod	Pipari	13.30	0.0000982164
15	Bhesan	Sukhpur	14.2165	0.0252
16		Khambhaliya		
17		Bamangadh		
18		Samatpara		
18	Malia	Vadia	19.3192	0.033766
19		Panakava		
20		Itali		
21		Babara		
22		Dudhala		

(Action: Prof. & Head, Department of Soil and Water Engineering, CAET, JAU, Junagadh)

6.3.7 Determination of water front advance under different dripper (emitter) discharge rate in medium black soil.

- (i) At any given duration of water application, the wetted diameter at soil surface increased with increase in dripper discharge rate.
- (ii) Time to reach a particular wetted soil depth is more with low discharge rate of the dripper as compared to higher discharge rate of the dripper.
- (iii) The following relationships between time of application and depth of soil can be used in medium black soils for emitter discharge rate of 2, 4, 8 and 16 lph, respectively.

$$t = 16.889 Z^{1.1951}$$

$$t = 12.474 Z^{1.3325}$$

$$t = 11.574 Z^{1.2625}$$

$$t = 6.0753 Z^{1.5547}$$

where, t = Time of application (time to reach water at funnel outlet), min

Z = Depth of soil (depth of funnel placement), cm

- (iv) The following relationships between diameter of wetted soil at surface and depth of soil can be used in medium black soils for emitter discharge rate of 2, 4, 8 and 16 lph, respectively.

$$W = 7.175 Z^{0.4534}$$

$$W = 7.242 Z^{0.5545}$$

$$W = 7.807 Z^{0.6138}$$

$$W = 8.208 Z^{0.6858}$$

where, W = Diameter of wetted soil surface, cm ; Z = Depth of soil, cm.

(Action: Research Scientist (Agril. Engg.), Main Dry Farming Research Station, JAU, Targhadia)

Technical Session: II

NEW TECHNICAL PROGRAMME

1. Constraints analysis of watershed techniques in rainfed area of Junagadh district.

(Action: Professor & Head, Dept. of Agril. Ext. Edu. Engg., CAET, JAU, Junagadh)

2. Performance evaluation and modification of bullock drawn “Brahmpuri” seed cum fertilizer drill

(Action: Professor & Head, Department of Farm Engg., JAU, Junagadh)

3. Study of energy consumption for various tillage operations

(Action: Professor & Head, Department of FMP, CAET, JAU, Junagadh)

4. Development of tractor drawn plant thinning device for row crops

(Action: Professor & Head, Department of FMP, CAET, JAU, Junagadh)

5. Evaluation of rainfall erosivity index and soil erodibility factor in medium black soil under different cropping systems

(Action: Research Scientist (Agril. Engg.), Main Dry Farming Research Station, JAU, Targhadia)

6. **Rainfall analysis for crop planning**
House approved the programme with suggestion that along with rainfall analysis minimum and maximum temperature should also be analyzed.
(Action: Research Scientist, Main Dry Farming Research Station, JAU, Targhadia)
7. **Design and development of tractor operated farm yard manure applicator**
(Action: Research Scientist (Agril. Engg.), RTTC, JAU, Junagadh)
8. **Drought investigation using SPI index for Junagadh**
(Action: Research Scientist (Agril. Engg.), RTTC, JAU, Junagadh)
9. **Summer sesame response to irrigation under drip and mulching technology**
(Action: Prof.& Head, Department of Soil & Water Engineering, CAET, JAU, Junagadh)
10. **Study of watershed development activities conducted in dark zone area of Junagadh district**
(Action: Prof.& Head, Department of Soil & Water Engineering, CAET, JAU, Junagadh)
11. **Water balance and assessment of ground water recharge in Meghal river basin of Saurashtra region**
(Action: Prof.& Head, Department of Soil & Water Engineering, CAET, JAU, Junagadh)
12. **Conjunctive use of surface water with ground water for irrigating wheat crop**
(Action: Prof.& Head, Department of Soil & Water Engineering, CAET, JAU, Junagadh)
13. **Determination of ground water potential of the south west Saurashtra region**
(Action: Prof.& Head, Department of Soil & Water Engineering, CAET, JAU, Junagadh)
14. **Development and performance evaluation of PLC based low cost green house fustigation system**
(Action: Prof.& Head, Department of RE&RE, CAET, JAU, Junagadh)
15. **Performance of green house for cultivation of capsicum**
(Action: Prof.& Head, Department of RE&RE, CAET, JAU, Junagadh)
16. **Performance of mulching in Bt cotton production**
House approved the programme with suggestion to record the soil parameters and time taken for disintegration of degraded plastic mulch.
(Action: Prof.& Head, Department of RE&RE, CAET, JAU, Junagadh)
17. **Study of transportation losses for sapota**
(Action: Prof.& Head, Department of RE&RE, CAET, JAU, Junagadh)

6.4 PLANT PROTECTION

Chairman : Dr. S. B. S. Tikka, DR, SDAU, Sardarkrushinagar
Co-chairman: Dr. P. G. Butani, JAU, Junagadh
 Dr. G. M. Patel, SDAU, Sardarkrushinagar
Presentation: Dr. M. N. Kapadia, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY

Agricultural Entomology

6.4.1 Field efficacy of bio-pesticides against thrips in onion (bulb purpose)

Farmers of South Saurashtra Agro-climatic Zone are advised to apply two sprays of *Beauveria bassiana* @ 2.0 kg/ha or *Metarhizium anisopliae* @1.5 kg/ha at 10 days intervals starting from pest infestation for effective and economical bio-pesticide based management of thrips in *rabi* onion (bulb purpose).

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

6.4.2 Management of pest complex in brinjal through bio-pesticides

Farmers of South Saurashtra Agro-climatic Zone are advised to apply two sprays of *Metarhizium anisopliae* @1.0 kg/ha combined with endosulfan 35 EC 0.035 % (10 ml/ 10 l) or *Beauveria bassiana* @1.0 kg/ha combined with endosulfan 35 EC 0.035 % (10 ml/ 10 l) or *Metarhizium anisopliae* @ 2.0 kg/ha at 10 days intervals starting from pest infestation for effective and economical bio-pesticide based management of brinjal sucking pests i.e. jassid and whitefly in *rabi* season.

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

6.4.3 Management of shoot fly and stem borer in bajra crop

Farmers of North Saurashtra Agro-climatic Zone growing bajra crop are advised to apply two sprays of endosulfan 35 EC 0.07% (20 ml/10 l) or profenophos 50 EC 0.05% (10 ml/10 l) or fenobucarb 50 EC 0.1% (20 ml/10 l) at 20 and 40 days after germination for the control of shoot fly and stem borer.

(Action: Research Scientist (Ento.), Pearl Millet Res. Station, JAU, Jamnagar)

6.4.4 Development of low cost protection technology for sorghum shoot fly, *Atherigona soccata*

Farmers of North Saurashtra Agro-climatic Zone growing sorghum for fodder purpose in *kharif* season are advised to give seed treatment with imidacloprid 70 WS @ 5 g/kg seeds and two sprays of Neem Seed Kernel Extract 5% at 7 and 14 days after germination for the management of shoot fly.

(Action: Asstt. Research Scientist (Ento.), Grassland Res. Station, JAU, Dhari)

6.4.5 Management of sesame leaf webber /capsule borer through insecticides

Farmers of North Saurashtra Agro-climatic Zone growing sesamum in *kharif* season are advised to apply three sprays of endosulfan 35 EC 0.07% (20 ml/10 l) at vegetative i.e. 30 days, flowering i.e. 45 days and capsule i.e. 60 days of crop for effective and economical management of leaf webber.

(Action: Assoc. Research Scientist (Ento.), Agril. Research Station, JAU, Amreli)

6.4.6 Testing of newer molecules of pesticides against sucking insect pests of groundnut

Farmers of North Saurashtra Agro-climatic Zone cultivating groundnut under rainfed condition are advised to apply imidacloprid 17.8 SL 0.007 % (4 ml/10 l) or thiamethoxam 25 WG 0.01 % (4 g/10 l) or acetamiprid 20 SP 0.004 % (2 g/10 l) at ETL of aphid (1.5 aphid index/plant) and jassid (3 nymphs/3 top leaves) for effective and economical control of these pests.

(Action: Research Scientist (Ento.), Dry Farming Res. Station, JAU, Targhadia)

6.4.7 Integrated management of insect pests and diseases of groundnut under rainfed condition

Farmers of North Saurashtra Agro-climatic Zone cultivating groundnut under rainfed condition are advised to spray the tank mixture of insecticides and fungicides in schedule i.e. schedule 1: dimethoate 30 EC @ 10ml + mancozeb 75 WP @ 26 g/10 l at 35 days after sowing (DAS), methyl-o-demeton 25 EC @10ml + carbendazim 50 WP @ 5 g/10 l at 50 DAS, and endosulfan 35 EC @ 20 ml + mancozeb 75 WP @ 26 g/10 l at 65 DAS or schedule 2: thiamethoxam 25 WG @ 4 g + hexaconazole 5 EC @10ml/10 l at 35 DAS, acetamiprid 20 SP@ 2 g + chlorothalonil 75 WP @ 25 g/10 l at 50 DAS and imidacloprid 17.8 SL@ 4ml + carbendazim 50 WP @ 5 g + mancozeb 75 WP@ 26 g/10 l at 65 DAS for effective and integrated management of the sucking insect pests i.e. aphid, jassid and thrips and diseases i.e. tikka and rust.

(Action: Research Scientist (Ento.), Dry Farming Res. Station, JAU, Targhadia)

6.4.8 Testing of new insecticides against sucking pests in groundnut

Farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are advised to give seed treatment with imidacloprid 600 FS @ 3 g/kg seed or thiamethoxam 70 WS @ 1 g/kg seed or dimethoate 30 EC 0.06% (20 ml/10 l) as foliar spray at 15 and 30 days after sowing for effective and economical management of thrips and jassid.

(Action: Research Scientist (Ento.), Main Oilseeds Res. Station, JAU, Junagadh)

6.4.9 Bio-efficacy of insecticides against thrips in groundnut

Farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are advised to spray profenophos 40 % + cypermethrin 4 % 0.044 % (10 ml/10 l) or thiamethoxam 25 WG 0.006 % (2.4 g/10 l) or imidacloprid 17.8 SL 0.005 % (2.8 ml/10 l) or methyl-o-demeton 25 EC 0.025 % (10 ml/10 l) or endosulfan 35 EC 0.07 % (20 ml/10 l) at the initiation of the pest for effective and economical management of thrips.

(Action: Research Scientist (Ento.), Main Oilseed Research Station, JAU, Junagadh)

Plant Pathology

6.4.10 Chemical control of powdery mildew of mango

Farmers of South Saurashtra Agro-climatic Zone cultivating mango are advised to apply three sprays of hexaconazole 5 EC 0.005% (10 ml/10 l) or propiconazole 25 EC 0.025% (10 ml/10 l) at 20 days intervals from initiation of flowering for effective and economical management of powdery mildew.

(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)

6.4.11 Chemical control of Colletotrichum and Cercospora leaf spots of urdbean

Farmers of South Saurashtra Agro-climatic Zone growing urdbean are advised to apply three sprays of propiconazole 25 EC 0.025% (10 ml/10 l) or hexaconazole 5 EC 0.005% (10 ml/10 l) at 15 days intervals from the disease initiation for effective and economical management of Colletotrichum and Cercospora leaf spot.

(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)

6.4.12 Evaluation of fungicides for the control of downy mildew disease of bitter gourd

Farmers of South Saurashtra Agro-climatic Zone growing bitter gourd are advised to apply three sprays of metalaxyl MZ 72 WP, 0.1% (14 g/10 l) or chlorothalonil 75 WP, 0.1 % (13.3 g/10 l) or fosetyl-Al 80 WP, 0.1% (12.5 g/10 l) at 15 days intervals from the disease initiation for effective and economical management of downy mildew.

(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)

6.4.13 Management of stem rot of groundnut (*Sclerotium rolfsii*) by different methods of application of *Trichoderma* sp.

The farmers of South Saurashtra Agro-climatic Zone cultivating groundnut are advised to treat the seed with talc based *Trichoderma viride* @ 10 g/kg seeds **or** apply *T. viride* @ 2.5 kg/ha as soil drenching at 30 days after sowing **or** *T. viride* @ 2.5 kg along with either castor cake **or** FYM @100 kg /ha in furrow at the time of sowing to reduce stem rot incidence.

(Action: Res. Scientist (Pl. Path.), Main Oilseed Research Station, JAU, Junagadh)

6.4.14 Management of *Meloidogyne arenaria* and *Sclerotium rolfsii* complex in groundnut

The farmers of South Saurashtra Agro-climatic Zone cultivating groundnut are advised to treat the seed with talc based *Pseudomonas fluorescens* @ 20 g/kg seeds followed by the application of *Pseudomonas fluorescens* in furrow @ 2.5 kg/ha for effective management of root knot nematode and stem rot diseases.

(Action: Res. Scientist (Pl. Path.), Main Oilseed Research Station, JAU, Junagadh)

6.4.15 Biological control of angular leaf spot disease of cotton

Farmers of South Saurashtra Agro-climatic Zone growing cotton are advised to treat the seeds with talc based *Pseudomonas fluorescens* (Pf-1) @ 10 g/kg seed along with foliar sprays of *P. fluorescens* (Pf-1) @ 0.2 % (20 g/10 l) at 30, 50, 70 and 90 days after sowing for effective and economical management of angular leaf spot disease.

(Action: Asst. Res. Scientist (Pl. Path.), Regional Cotton Research Station, JAU, Junagadh)

6.4.16 Chemical control of *Alternaria* leaf spot of sesame

Farmers of North Saurashtra Agro-climatic Zone cultivating sesamum are advised to apply three sprays of propiconazole 25 EC 0.025% (10 ml/10 l) **or** cymoxanil 8 WP + mancozeb 64 WP 0.1% (20 g / 10 l) **or** mancozeb 75 WP 0.2% (25 g/10 l) i.e. first at 40 days after sowing and subsequent sprays at 12 days intervals for effective and economical management of *Alternaria* leaf spot disease.

(Action: Res. Sci. (Pl. Path.), Main Dry Farming Research Station, JAU, Targhadia)

Technical Session: II

NEW TECHNICAL PROGRAMME

Agri. Entomology

- 1. Field efficacy of newer acaricides for the management of mites in garlic**
(Action: Professor and Head, Department of Entomology, JAU, Junagadh)
- 2. Survey, collection and identification of natural enemies of major pests of horticultural crops**
(Action: Professor and Head, Department of Entomology, JAU, Junagadh)
- 3. Mass multiplication of microbial agents**
(Action: Professor and Head, Department of Entomology, JAU, Junagadh)
- 4. Mass multiplication of macrobioagents under laboratory condition**
(Action: Professor and Head, Department of Entomology, JAU, Junagadh)

5. **Storage of potential bioagent under refrigerator condition**
 - a) Mention the stage of the parasites/predators to be stored.
 - b) Add *Trichogramma* as egg parasitoid (Trichocards).
(Action: Professor and Head, Department of Entomology, JAU, Junagadh)
6. **Testing bio-efficacy of insecticides through seed treatment against sucking pests of summer groundnut**
(Action: Research Scientist (Ento.), Main Oilseed Research Station, JAU, Junagadh)
7. **Testing bio-efficacy of insecticides against sucking pests of summer groundnut**
(Action: Research Scientist (Ento.), Main Oilseed Research Station, JAU, Junagadh)
8. **Effect of newer insecticides against sucking pests of groundnut**
 - a) Mention the concentration of insecticides instead of quantity of insecticides per hectare.
(Action: Research Scientist (Ento.), Main Oilseed Research Station, JAU, Junagadh)
9. **Testing the bio-efficacy of newer insecticides against castor defoliators**
(Action: Research Scientist (Ento.), Main Oilseed Research Station, JAU, Junagadh)
10. **Testing the bio-efficacy of certain insecticides against pod borer complex on pigeonpea**
 - a) Record the pod fly damage at harvest from 50 pods.
 - b) 1st spray at 50% flowering and 2nd spray at pod setting.
 - c) Need base third spray to be followed.
(Action : Research Scientist (Ento.), Pulse Research Station, JAU, Junagadh)
11. **Evaluation of entomopathogenic nematodes for management of *Helicoverpa armigera***
(Action : Research Scientist (Ento.), Pulse Research Station, JAU, Junagadh)
12. **Efficacy of newly molecules against *Helicoverpa armigera*.**
(Action : Research Scientist (Ento.), Pulse Research Station, JAU, Junagadh)
13. **Management of ear head worm, *Helicoverpa armigera* (Hub.) infesting bajra crop with biopesticides**
 - a) Add one more treatment of endosulfan (20 ml/10 lit)+DDVP (5 ml /101 lit).
 - b) Spray fluid applied on ear head.
 - c) Record the observations at 3, 7 and 10 days after spray.
(Action: Research Scientist (Ento.), Pearl Millet Research Station, JAU, Jamnagar)
14. **Determination of Economic Threshold Level (ETL) of jassid, (*Empoasca kerri* Pruthi) infesting groundnut under rainfed condition. (Feeler Trial)**
 - a) Use the round figures (1, 2, 3) for jassid nymphs instead of 0.5, 1.5, 2.5.
(Action: Research Sci. (Ento.), Main Dry farming Research Station, JAU, Targhadia)

Plant Pathology

15. **Efficacy of substrate rates on sporophore production of oyster mushroom (*Pleurotus sajor-caju*)**
 - a) Delete the name of wheat varieties.
(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)

- 16. Effect of spawn rates on sporophore production of oyster mushroom (*Pleurotus sajor-caju*)**
a) It was suggested that the experiment No.1 and 2 should also be carried at Department of Nematology, CPCA, SDAU, S. K. Nagar.
(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)
- 17. Detection of seed borne fungi from seeds of urdbean, mungbean, gram and pigeon pea**
a) It was suggested to change the title as “studies on seed mycoflora and seed pathogens of urdbean, mungbean, gram and pigeon pea seeds.”
(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)
- 18. Chemical control of *Helminthosporium* leaf blight of wheat**
(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)
- 19. Isolation of microorganisms from cumin rhizosphere and testing of their antagonism to *Fusarium oxysporum* f. sp. *cumini***
(Action: Professor & Head, Department of Plant Pathology, JAU, Junagadh)
- 20. The assessment of compatibility of *Trichoderma* spp. with various fungicides, insecticides and herbicides (Laboratory expt.)**
(Action: Research Scientist (Pl. Path.), Main Oilseed Research Station, JAU, Junagadh)
- 21. Integrated management of root knot and stem rot diseases in groundnut**
a) Arrange the demonstration of recent recommendation on farmer's field.
(Action: Research scientist (Pl. Path.), Main Oilseeds Research Station, JAU, Junagadh)
- 22. Management of foliar diseases of cotton**
(Action: Asstt. Research Sci. (Pl. Path.), Regional Cotton Res. Station, JAU, Junagadh)
- 23. Effect of fungicides on phytophthora blight of sesame**
a) Add one treatment of copper oxychloride.
(Action: Res. Sci. (Pl. Path), Main Dry Farming Research Station, JAU, Targhadia)
- 24. Management of root rot of black gram**
a) Use GU-1 variety instead of T-9.
b) Use carbendazim 0.05% instead of 0.1% as soil drenching/spot application wherever diseases noticed.
(Action: Res. Sci. (Pl. Path), Main Dry Farming Research Station, JAU, Targhadia)
- 25. Management of early blight in tomato**
(Action: Research Scientist (G&O), Vegetable Research Station, JAU, Junagadh)
- 26. Management of foliar diseases of cow pea**
(Action: Research Scientist (G&O), Vegetable Research Station, JAU, Junagadh)
- 27. Management of foliar diseases of *Kharif* onion (AICRP Trial)**
(Action: Research Scientist (G&O), Vegetable Research Station, JAU, Junagadh)

6.5 HORTICULTURE & AGRO-FORESTRY

Chairman : Dr. H. C. Pathak, DR, NAU, Navsari
Co-chairman: Dr. N. L. Patel, NAU, Navsari
Dr. L. R. Verma, SDAU, Sardarkrushinagar
Presentation: Dr. A. V. Barad, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY

6.5.1 Pruning trial on gunda (*Cordia dichotoma*)

The farmers of South Saurashtra Agro-climatic Zone are advised to prune 75% length of one year old branches of gunda from all sides of the tree in 1st week of June to get higher yield and economic return.

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

6.5.2 Integrated nutrient management in custard apple cv. Sindhan

Farmers of South Saurashtra Agro-climatic Zone are advised to apply 100g N + 50g P₂O₅ + 25g K₂O + 2.5 kg castor cake per adult custard apple tree cv. Sindhan at first rainfall in monsoon to get higher fruit yield and net profit.

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

6.5.3 Post harvest treatment for enhancement of ripening of Kesar mango

It is recommended that the freshly harvested mature mango fruits of cv. Kesar should be treated with ethrel @ 750 mg /l of water for 5 minutes and kept at room temperature to enhance the ripening and get maximum ripened and marketable fruits at 9th day.

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

6.5.4 Nutrient management in coconut garden through organic manures

The coconut growing farmers of South Saurashtra Agro-climatic Zone are advised to apply half dose of recommended chemical fertilizers i.e. NPK 200:160:750 g per palm per year along with 5 kg castor cake in two equal splits (June & October) to coconut cv. West Coast Tall to obtain higher nut yield with improvement in nut quality and soil fertility.

(Action: Research Scientist (Fruit Crop), Agril. Research Station, JAU, Mahuva)

6.5.5 Proposal for release of brinjal variety Gujarat Junagadh Brinjal -2

The brinjal variety Gujarat Junagadh Brinjal -2 (GJB-2) recorded overall 20.9 per cent higher yield over check variety GOB-1. The fruits of this variety have attractive pink purple color, medium in size, medium long shape and possessing white fruit pulp with less seeds. The variety showed tolerance against little leaf disease. It also showed superiority in quality parameters. The average fruit yield is 342.94q/h. The variety is recommended for cultivation during late *kharif* and *rabi* seasons across the Gujarat State.

(Action: Research Scientist (G&O), Vegetable Research Station, JAU, Junagadh)

6.5.6 Proposal for release of okra variety Gujarat Junagadh Okra -3

The variety Gujarat Junagadh Okra-3 (GJ Okra-3) registered 20.6 and 25.7 per cent higher green fruit yield over checks GO-2 and Pusa Sawani, respectively. Further, it also registered 38.4, 49.1 and 71.3 per cent higher yield as compared to Parbhani Kranti, Arka Anamika and Pusa Sawani, respectively. The variety possesses green, tender and attractive fruits. The variety is recommended for *kharif* cultivation in the Saurashtra and South Gujarat region. The average fruit yield is 150.52q/h.

(Action: Research Scientist (G&O), Vegetable Research Station, JAU, Junagadh)

6.5.7 Evaluation of chrysanthemum (*C. morifolium* R.) varieties

The farmers of South Saurashtra Agro-climatic Zone interested to grow flower crop of chrysanthemum are advised to grow variety IIHR-6 for getting higher yield and maximum monetary return.

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

6.5.8 Use of saline water in tomato crop through drip irrigation

The farmers of South Saurashtra Agro-climatic Zone with well drained soils having saline irrigation water are advised to use irrigation water up to 8 EC through drip irrigation without adverse effect on tomato yield.

- i) Yield is drastically decreased in subsequent years.
- ii) Soil analysis data are not available.

Hence, the recommendation was not accepted and suggested to be concluded.

(Action: Assistant Research Scientist, Fruit Research Station, JAU, Mangrol)

Technical Session: II

NEW TECHNICAL PROGRAMME

1. Effect of different varieties and date of pruning on growth, yield and quality of fig (*Ficus carica*)

a) Pruning time should be verified and corrected.

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

2. Effect of climate change on flowering and yield of mango cv. Kesar

a) Keep five replications.

b) Count male & hermaphrodite flowers per inflorescence.

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

3. Multi locational trial for custard apple (*Annona squamosa* L.) variety GJCA-1

a) Add two genotypes Anand selection-1 & Anand selection-2.

b) Take six replications as per technical programme of Anand.

c) Write GJCA-1 instead of JCA-1.

d) Add shelf life of fruit in qualitative parameters.

e) Add organoleptic observations.

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

4. Dehydration of sapota (*Manilkara achras* Mill.) slices

a) Economics should be worked out.

b) Add spoilage (%) during storage period.

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

5. Introduction of sweet and red tamarind varieties in Saurashtra region.

a) Change title as : "Evaluation of tamarind genotypes in Saurashtra region".

b) Add more number of available genotypes.

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

6. Standardization of drying and packaging methods for dry ber (*Ziziphus mauritiana*)

a) Economics should be worked out.

b) Add spoilage (%) during storage period.

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

7. **Effect of pre harvest sprays and storage temperature on shelf life and quality of Kesar mango fruits**
(Action: Professor & Head, Department of Horticulture, JAU, Junagadh)
8. **Preservation of lasora (*Cordia dichotana* Roxb.) in different brine preservatives.**
a) Add spoilage (%) during storage period.
(Action: Professor & Head, Department of Horticulture, JAU, Junagadh)
9. **Effect of green manuring in coconut orchard on yield of coconut cv. T x D and soil properties**
a) Mention RDF as common application in all treatments.
(Action: Research Scientist (Fruit Crop), Agril. Research Station, JAU, Mahuva)
10. **Effect of different levels of soil moisture regimes on yield of coconut cv. TxD**
a) Soil analysis should be done before and after experiment.
(Action: Research Scientist (Fruit Crop), Agril. Research Station, JAU, Mahuva)
11. **Effect of different concentrations of ethephone application on gum production from *Accacia senegal* Wild**
a) Record: Total yield of gum/plant (g).
(Action: Associate Research Scientist, Agril. Research Station, JAU, Dhari)
12. **Effect of time of ethephone application and trunk diameter on gum production from *Accacia senegal* Wild**
a) Record : Total yield of gum/plant (g).
b) The injected hole should sealed with blitox treated moist soil to avoid infection & evaporation losses of ethephone.
(Action: Associate Research Scientist, Grassland Research Station, JAU, Dhari)
13. **Use of saline water in okra crops through drip irrigation**
a) This experiment should be conducted on raised bed with and without FYM @ 10 t/ha.
(Action: Assistant Research Scientist, Fruit Research Station, JAU, Mangrol)

6.6 BASIC SCIENCE

Chairman : Dr. A. M. Shekh, DR, AAU, Anand
Co-chairman: Dr. V. Kumar, NAU, Navsari
 Dr. (Miss) C. K. Mandavia, JAU, Junagadh
Presentation: Dr. B. A. Golakia, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY: Nil

Technical Session: II

NEW TECHNICAL PROGRAMME

1. **Allelopathic effects of different weed extracts on seed germination and vigour in groundnut, cowpea and greengram**
a) There was a suggestion that two other weeds should be included in treatments after consulting the weed control scheme and the same was accepted.
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)

2. **Seed vigour as influenced by different seed priming in Okra [*Abelmoschus esculentus* (L.) Moenchi]**
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)
3. **In vitro screening for salinity tolerance in onion (*Alliurn cepa* L.)**
 1. Atleast ten genotypes should be used for germination study.
 2. Cation and anion ratio should be mention.
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)
4. **Low cost Micropropagation in Banana**
 - a) The house has suggested that three inert jelly sugar agent should be included in place of crystal sugar.
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)
5. **Effect of auxin on the rooting and sprouting behavior of stem cuttings of *Bougainvillea spectabilis* cultivar Thima**
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)
6. **Amelioration of simulated water stress by brassinolide application during germination and early seedling growth of groundnut**
 - a) The member of the house suggested that IST standard for germination should be followed. They also suggested that the concentration of PEG may be given in terms of bar instead of per cent.
(Action: Professor & Head, Department of Ag. Botany, JAU, Junagadh)
7. **Estimation of pesticides residues from soil and water resources of Saurashtra region**
 - a) The water sample should be taken as per standard procedure.
(Action: Professor & Head, Dept. of Biochem. & Biotech., JAU, Junagadh)
8. **Estimation of pesticides residues in vegetables of Junagadh region**
(Action: Professor & Head, Dept. of Biochem. & Biotech., JAU, Junagadh)
9. **Surface micro-flora and pathogenic bacteria analysis of fresh vegetables**
(Action: Professor & Head, Dept. of Biochem. & Biotech., JAU, Junagadh)
10. **Biochemical and physiological markers for wheat varieties against high temperature stress**
 - a) The house has suggested that large number of varieties should be included along with including check varieties.
(Action: Professor & Head, Dept. of Biochem. & Biotech., JAU, Junagadh)
11. **Effect of plant growth retardant on growth and yield of groundnut**
 - a) Chlorophyll a and b estimation should be included in observations.
 - b) Leaf specific weight should be measured.
(Action: Research Scientist (G'nut), Oilseed Research Station, JAU. Junagadh)
12. **Effect of NAA on seed cotton (*Gossypium hirsutum* L.) yield**
 - a) Sunshine hours may be recorded.
(Action: Research Scientist, Regional Cotton Research Station, JAU, Junagadh)
13. **Effect of plant growth regulators on buds and bolls shedding in cotton (*Gossypium hirsutum* L.)**
 - a) Use 40 and 80 ppm CCC instead of 150 and 300 ppm CCC.
 - b) The 30 ppm MC may be deleted and one more replication should be taken up.
 - c) Average length of sympodial branch may be added in the observations.
(Action: Research Scientist, Regional Cotton Research Station, JAU, Junagadh)

6.7 SOCIAL SCIENCE

Chairman : Dr. P. P. Patel, DEE, AAU, Anand
Co-chairman: Dr. R. K. Parikh, NAU, Navsari
Dr. K. Sreedharan, SDAU, Sardarkrushinagar
Presentation: Dr. M. N. Popat, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY: Nil

Technical Session: II

NEW TECHNICAL PROGRAMME

1. **Economics of rose flower cultivation in Saurashtra region of Gujarat state**
(Action: Professor & Head, Department of Agri. Economics, JAU, Junagadh)
2. **Analysis of the diagnostic survey for resources / constraints and potentials of all farming situations No. 1 to 15 of North Saurashtra Agro-climatic Zone**
(Action: Professor & Head, Department of Agri. Economics, JAU, Junagadh)
3. **Climatic variability and its impact on production and productivity of cotton crop in Junagadh district**
(Action: Professor & Head, Department of Agri. Statistics, JAU, Junagadh)
4. **Crisis management practices adopted by the cotton growers of Saurashtra region**
(Action: Professor & Head, Department of Extension Education, JAU, Junagadh)
5. **Constraints analysis of watershed techniques in rain-fed area of Junagadh district**
(Action: Research Scientist, Main Dry Farming Research Station, JAU, Targhadia)
6. **Adoption of recommended dry farming practices by the farmers of North Saurashtra Agro-climatic Zone**
(Action: Professor & Head, Department of Extension Education, JAU, Junagadh)
7. **Future trading of cumin in Indian markets: An analysis**
(Principal, P.G.I.A.B.M., JAU, Junagadh)
8. **Economic analysis of production, processing and export marketing of Sesamum**
(Action: Principal, P.G.I.A.B.M., JAU, Junagadh)
9. **Evaluation and performance of *Kisan* Credit Cards (KCC) Scheme**
(Action: Principal, P.G.I.A.B.M., JAU, Junagadh)
10. **Role of farm women in agriculture: A socio-economic study in Junagadh district**
(Action: Principal, P.G.I.A.B.M., JAU, Junagadh)

6.8 ANIMAL HEALTH & ANIMAL PRODUCTION

Chairman : Dr. V. P. Vadodaria, Dean, SDAU, Sardarkrushinagar
Co-chairman: Dr. J. V. Solanki, AAU, Anand
Dr. N. K. Kelawala, NAU, Navsari
Presentation: Dr. P. H. Vataliya, JAU, Junagadh

Technical Session: I

RECOMMENDATION FOR THE FARMER COMMUNITY

6.8.1 Replacement of groundnut gotar with urea treated straw in composite feed blocks for Gir heifers

Farmers and Livestock owners of Saurashtra are recommended that in the ration of Gir heifers, inclusion of 4 per cent urea treated wheat bhusa in place of groundnut gotar results in 19 per cent higher live weight gain at 23 per cent lower cost of feeding.

(Action : Research Scientist, Cattle Breeding Farm, JAU, Junagadh)

6.8.2 Milk production in Gir cows on no green rations

Feeding of 4 % Urea treated wheat straw as sole roughage source to lactating Gir cows could sustain milk production upto 3.4 lts/day economically with 139 per cent higher returns compared to feeding ad. Lib. wheat straw and five kg green jowar fodder/cow/ day.

(Action : Research Scientist, Cattle Breeding Farm, JAU, Junagadh)

Technical Session: II

NEW TECHNICAL PROGRAMME

1. **Effect of processing groundnuts haulms and wheat straw based rations for maintenance in Gir and Jafrabadi animals**
(Action: Research Scientist (AG), Cattle Breeding Farm, JAU, Junagadh)
2. **Effect of weaning on growth rate of calves born to primiparous Gir cows and its yield**
(Action: Research Scientist (AG), Cattle Breeding Farm, JAU, Junagadh)
3. **Study on incidence of clinical case of Mastitis on farm and isolation and identification of causative agents**
(Action: Research Scientist (AG), Cattle Breeding Farm, JAU, Junagadh)
4. **Study of the hematological and blood biochemical profile of Dumba breed of sheep**
(Action: Principal, College of Veterinary, JAU, Junagadh)
5. **Evaluation of internal parasitic load from fecal sample at different 'Gaushalla'**
(Action: Principal, College of Veterinary, JAU, Junagadh)
6. **Assessment of microbiological quality of drinking water at different 'Gaushalla'**
(Action: Principal, College of Veterinary, JAU, Junagadh)

6.9 FISHERIES SCIENCE

Chairman : Dr. S. K. Roy, Dean, SDAU, Sardarkrushinagar
Co-chairman: Dr. A. Y. Desai, JAU, Veraval
Dr. K. Sreedharan, SDAU, Sardarkrushinagar
Presentation: Dr. K. L. Jetani, JAU, Okha

Technical Session: I

RECOMMENDATION FOR THE FISH FARMER COMMUNITY

6.9.1 Standardization of transportation method for the fresh water mussel (*Lamellidens corrianus*)

It is recommended to fish farmers that freshwater mussel (*Lamellidens corrianus*) in the Saurashtra-Kutch region can be transported by road using wet gunny bags upto eight hours.

(Action: Principal, College of Fisheries, JAU, Veraval)

6.9.2 *Artemia* (*Artemia fransiscana*) cyst production in varying salinity

It is recommended to salt paners and aquaculturist of coastal Saurashtra to use 160 ppt salinity of sea water as a rearing medium for *Artemia* (*Artemia fransiscana*) to obtain higher cyst production.

(Action: Research Officer, Fisheries Research Station, JAU, Okha)

RECOMMENDATION FOR SCIENTIFIC COMMUNITY

6.9.3 Qualitative analysis of phytoplanktons in freshwater culture pond

It is recommended to the scientific community that seven genera of phytoplankton viz., *Chlorella*, *Scenedesmus*, *Microcystis*, *Navicula*, *Volvox*, *Oedogonium* and *Spirogyra* are commonly observed in freshwater fish culture pond of the Saurashtra region.

(Action: Principal, College of Fisheries, JAU, Veraval)

Technical Session: II

NEW TECHNICAL PROGRAMME

- 1. Determination of suitable protein level for growth enhancement in *Labeo rohita***
(Action: Principal, College of Fisheries, JAU, Veraval)
- 2. Induced spawning of edible oyster *Saccostrea cucullata* by use of chemical treatment**
(Action: Principal, College of Fisheries, JAU, Veraval)
- 3. The effect of air and water transport on stress and survival of rock oyster (*Saccostrea cucullata*)**
(Action: Principal, College of Fisheries, JAU, Veraval)
- 4. Qualitative studies of zooplankton in Meghal river at Chorwad**
(Action: Principal, College of Fisheries, JAU, Veraval)
- 5. Record of marine finfishes of fish landing centre, Veraval**
(Action: Principal, College of Fisheries, JAU, Veraval)

6. **Study of catch composition of trawl net operated along the Veraval coast, Gujarat**
(Action: Principal, College of Fisheries, JAU, Veraval)
7. **Evaluation of cycle duration of fish landings at Veraval fish-landing center**
(Action: Principal, College of Fisheries, JAU, Veraval)
8. **Preparation and evaluation of edible fish powder prepared from small sized croaker *Otolithes ruber* (Block & Scheneider, 1801) landed at Veraval harbor**
(Action: Principal, College of Fisheries, JAU, Veraval)
9. **Effect of different level of protein diets on the growth and survival of *Mugil cephalus* (Linnaeus) fry**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
10. **Survey for cultivable brackish water fish seed along the coast of Okhamandal to Harshad creek**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
11. **Effects of different types of feed on growth and survival of spiny lobster *Panulirus polyphagus* (Herbst, 1793) in cement cisterns**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
12. **Effects of salinity on survival and growth of spiny lobster *Panulirus polyphagus* (Herbst,1793) in aquarium**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
13. **Study on seasonal variation in iodine content of promising iodine yielding red seaweeds of Gulf of kutch**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
14. **Study on algal biodiversity at highly polluted coast of Alang and Sosiya ship breaking yard**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
15. **Effects of different types of feed on maturation of tiger shrimp *Penaeus monodon* in captivity**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
16. **Identification, isolation and culture of micro algae *Chaetoceros sp.* in Okhamandal region (Filler trial)**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
17. **Effect of clove oil treatment on the frozen storage mackerel (*Rastrelliger kanagartha*) steaks**
(Action: Research Officer, Fisheries Research Station, JAU, Okha)
18. **Qualitative and quantitative analysis of phytoplankton of Sikka coast**
(Action: Research Officer, Fisheries Research Station, JAU, Sikka)

19. **Marine mabe pearl production at Fisheries Research Station, JAU, Sikka**
(Action: Research Officer, Fisheries Research Station, JAU, Sikka)
20. **Effect of monospecies diet and mixed species diet on growth and survival of pearl oyster (*Pinctada fucata*) spat**
(Action: Research Officer, Fisheries Research Station, JAU, Sikka)
21. **Effect of different salinity on the growth of *Chaetoceros calcitrans***
(Action: Research Officer, Fisheries Research Station, Sikka)

6.10 PLENARY SESSION

- Chairman** : Dr. N. C. Patel, Hon'ble Vice Chancellor, JAU, Junagadh
Guest of Honour : Dr. A. R. Pathak, Hon'ble Vice Chancellor, NAU, Navsari
Dignitaries : Dr. H. J. Vyas, Director of Research, JAU, Junagadh
 Dr. S. B. S. Tikka, Director of Research, SDAU, SKNagar
 Dr. H. C. Pathak, Director of Research, NAU, Navsari
 Dr. A. M. Shekh, Director of Research, AAU, Anand
 Dr. P. P. Patel, Director of Ext. Education, AAU, Anand
Rapporteurs : Dr. R. H. Patel, ADR, AAU, Anand
 Dr. S. Acharya, SDAU, Sardarkrushinagar

Presentation of proceedings of different Joint Sub-committees

Sr. No.	Sub-committees	Presentation	Recommendations		
			Farmers	Scientific	New Technical
1	Crop Production	Dr. R. G. Patil, NAU, Navsari	12	03	26
2	Crop Improvement	Dr. C. J. Dangaria, JAU, Jamnagar	5*+1	-	01
3	Agril. Engineering	Prof. J. B. Savani, JAU, Junagadh	05	02	17
4	Plant Protection	Dr. R. N. Pandey, AAU, Anand	16	-	27
5	Horticulture & Agro-forestry	Dr. N. L. Patel, NAU, Navsari	(02) 05	-	13
6	Basic Science	Dr. B. A. Golakia, JAU, Junagadh	-	-	13
7	Social Science	Dr. M. N. Popat, JAU, Junagadh	-	-	10
8	Animal Health & Animal Production	Dr. P. H. Vatalia, JAU, Junagadh	02	-	06
9	Fisheries Science	Dr. K. L. Jetani, JAU, Okha	02	01	21
Total			5* +43	06	134

* Released varieties

Vote of Thanks

Dr. A. Y. Desai, Dean & Principal, Fisheries College, JAU, Veraval proposed the vote of thanks.