

DIRECTORATE OF RESEARCH
JUNAGADH AGRICULTURAL UNIVERSITY
JUNAGADH - 362 001 (GUJARAT)

RESEARCH ACCOMPLISHMENTS AND RECOMMENDATIONS

2011



DIRECTORATE OF RESEARCH
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MESSAGE



It gives me indeed a great pleasure to bring out this publication communicating the year-long untiring hard work of the university scientists/teachers. This booklet entitled "**Research Accomplishments and Recommendations-2011**" encompasses the technologies generated in Agriculture, Agricultural Engineering, Fisheries and Veterinary Sciences catering to the need of the farming community of the constituent seven districts coming in the jurisdiction of Junagadh Agricultural University. I am sure that this booklet will be immensely helpful to the scientists, officers of the line departments, students and representatives of the private parties.

I congratulate the scientists of the University for their commendable work of evolving recommendations from the research carried out, as also the team of the Directorate of Research for neat compilation.

Junagadh

Date : August 14, 2011

(N.C.PATEL)

VICE-CHANCELLOR

Junagadh Agricultural University Junagadh - 362 001 (Gujarat)



PREFACE



It is a matter of great pleasure for me to highlight the research work carried out in the University and approved in the Seventh combined Joint AGRESO Meeting.

The Junagadh Agricultural University represents seven districts and about 32.82 per cent area of the state. There are five colleges, four polytechnic colleges and 26 Research Stations, which include Multidisciplinary Main Research Stations, sub Research Stations for various crops as well as Testing Centers in the University. The eight different sub-committees have been constituted and conveners were nominated to plan and monitor the research work. All the sub-committees have successfully completed their job. I would also like to mention that during this year Junagadh Agricultural University has signed following seven MoUs with different institutes for collaboration in research, education and extension activities of Junagadh Agricultural University.

1. Sardar Patel Renewable Energy research Institute (SPRERI), Vallabh Vidyanagar, Gujarat for P.G. education research and teaching.
2. Mahindra & Mahindra Limited, Mumbai for facilitation of innovative farming technology development & dissemination of technology to the farmers.
3. University of Venda, South Africa for the purpose of collaboration works and exchange technology of research, education and extension education.
4. KSKV Kachchh University, Bhuj for collaboration between faculty, staff and students and also to explore joint research programmes and exchange experiences in education and research.
5. Bhavnagar University, Bhavnagar for collaboration between faculty, staff and students and to explore joint research programmes and exchange experiences in education and research.

6. Gujarat Livelihood Promotion Company Ltd., Gandhinagar for the purpose of exchange of information, innovation, knowledge, technological developments, management programmes and skills development for the livelihood of poor families of the rural areas.

7. Non-Exclusive License Agreement for Commercialization, Production and Marketing of Hy. Bajra GHB-538 was made between Shakti Vardhak Hybrid Seeds Pvt. Ltd., Hissar.

The university has also recently received the sanction of forty six new projects worth of ₹. 2877.435 lakh from ICAR, Govt. of Gujarat and Private Sectors. The main sanctioned projects are:

1. Establishment of Bull Mother Farm for Gir Cattle and Jaffrabadi Buffaloes at JAU Amreli.
2. Establishment of Bt. cotton Research centre in Surendranagar District.
3. Study to analyses socio-economics impact of using NBP Bio-products in Saurashtra region.
4. Soil test based fertilizer application for targeted yield of Bt. Cotton in Saurashtra region of Gujarat.
5. Genetically enhanced micro-nutrient-dense pearl millet grains for improved human nutrition in western Africa and India.
6. National Initiative on Climate Resilient Agriculture Technology Demonstration in Participatory Demonstration and Action Research Mode.
7. Forecasting Agricultural Output Using Space, Agro meteorology and Land based observations (FASAL).
8. National Initiative on Climate Resilient Agriculture-Ground water utilization.

Five RKVY projects worth of ₹. 544.81 lakhs were also sanctioned during the financial year 2010-11.

1. Smart Farming for increasing agricultural production in sodic soils of coastal area of Saurashtra.
2. Establishment of the elite farm for coconut D x T (Mahuva) seed nut production.
3. Development of Module for precision dairy farming for Gir cattle and Jaffrabadi buffaloes.
4. On season crop field nutrient monitoring of groundnut and cotton in Saurashtra region.
5. Demonstration models of seed production technology in the crop of Saurashtra region.

In all new projects worth of ₹ 3422.245 lakh were approved during current financial year. The breeder seeds of different crops to fulfill the demand of private and public sectors as per the national and state indents were successfully produced. The required nucleus seeds of different crops were also produced for the breeder seed production of next year.

Under the HRD component of University, 221 scientist/teachers were sent to attend winter/summer school and short term training, 136 attended different seminar/ symposium/ conference at state and national level and 169 attended the workshops and group meet of their projects. The university has organized five national level programmes like scientists' meets and workshop as well as four state level seminars. The university has also organized one ICAR sponsored winter school on "Water resource management in coastal area for enhancing water productivity" during October 11-31, 2010.

In the seventh combined joint AGRESCO meeting, six new varieties/hybrids viz., Groundnut (GJG-17 and GJG-22), Okra (GJOH-3), Indian bean (GJIB-11), Soybean (GJ.Soy-3) and Pearl Millet (GHB-732 endorsed) were recommended for release in the state. Besides, 32 technological/recommendations were made for farmers and eight recommendations were made for Scientific Community. In addition as many as 94 new technical programmes were formulated to initiate the new research programmes for the solutions of the applied and basic problems of Agriculture and allied field. Those new varieties/hybrids were also approved and released in 42nd meeting of State Seed Sub-committee held on 10.08.2011 at Gandhinagar.

Name of the Sub-Committee	No. of recommendations finalized for		New Technical Programme
	Farmer	Scientific Community	
Crop Improvement	06*	-	01
Crop Production	16	05	26
Plant Protection	05	-	21
Horticulture & Agro forestry	04	01	06
Agricultural Engineering	05	01	10
Fisheries Science	02	01	07
Animal Science	-	-	05
Social Science	-	-	08
Basic Science	-	-	10
Total	6* + 32	08	94

* Varieties release



(C. J. Dangaria)

DIRECTOR OF RESEARCH & DEAN
FACULTY OF P.G. STUDIES

Recommendations for the farmers

I. CROP IMPROVEMENT

Six new varieties/hybrids, of different crops viz; Groundnut GJG-17 and GJG-22; Indian Bean GJIB-11; Okra GJOH-3; Soybean GJ Soybean-3 and Pearl Millet GHB-732 were recommended for cultivation to the farmers of the state during 2010-11.

1. Groundnut: Gujarat Junagadh Groundnut-17 (GJG-17)

The variety Gujarat Junagadh Groundnut-17(GJG-17) is recommended for cultivation during *kharif* rainfed condition in the spreading groundnut growing areas of the state. The variety yielded 38.3, 20.4 and 13.7 per cent higher pod yield (1798 kg/ha) over the check varieties M-335 (1332 kg/ha), GG-11 (1493 kg/ha) and GG-13 (1581 kg/ha), respectively. It also has higher shelling out turn, higher kernel yield and oil yield than the checks. It is also tolerant to stem rot.



(Main Oilseeds Research Station, JAU, Junagadh)

2. Groundnut: Gujarat Junagadh Groundnut-22 (GJG-22)

The variety Gujarat Junagadh Groundnut-22 (GJG-22) is recommended for cultivation in *kharif* groundnut growing semi-spreading areas of Saurashtra and South Gujarat. This variety recorded 37.2 and 15.1 per cent higher pod yield (1770 kg/ha) than the checks Kadiri-3 (1290 kg/ha) and GG-20 (1538 kg/ha), respectively. The recommended variety possesses rose coloured uniform kernels with better shelling out turn (72.5%). It also showed resistant reaction to collar rot.



(Main Oilseeds Research Station, JAU, Junagadh)

3. Indian Bean: Gujarat Junagadh Indian Bean-11 (GJIB-11)

The variety Gujarat Junagadh Indian Bean-11(GJIB-11) recorded 31.2 and 32.1 per cent higher green pod yield (95.39 q/ha) over *Virpur* local (72.7 q/ha) and *Dantiwada* local (72.22 q/ha), respectively. This variety being semi-spreading in nature is easier to harvest. The Gujarat Junagadh Indian Bean-11 is recommended for cultivation in late *kharif* growing areas of Saurashtra and Middle Gujarat. The pods of this variety are medium length in size with green colour.



(Vegetable Research Station, JAU, Junagadh)

4. Okra: Gujarat Junagadh Okra Hybrid-3 (GJOH-3)

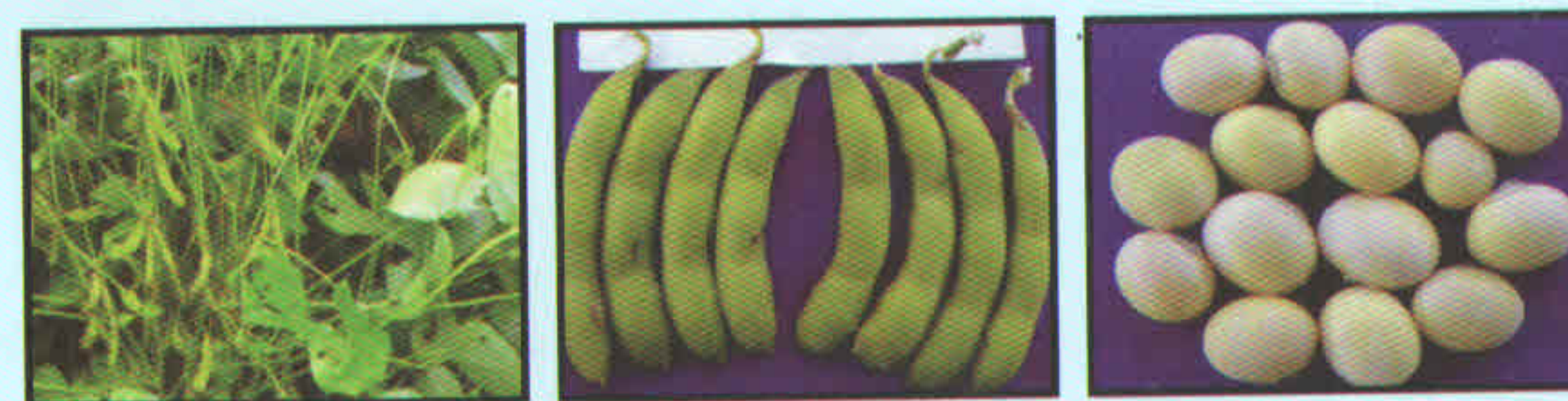
The hybrid Gujarat Junagadh Okra Hybrid-3 (GJOH-3) is recommended for endorsement for cultivation in *kharif* okra growing area of Gujarat state due to its yield superiority (137.44 q/ha) to the tune of 19.9, 26.2, and 29.8 per cent over the checks GOH-1 (114.65 q/ha), Parbhani Kranti (108.87 q/ha) and Pusa Sawani (105.87 q/ha), respectively. The fruit is dark green colour and tender with higher protein (1.15%) and ascorbic acid content (6.3 mg/100g). The hybrid showed lesser incidence of YVMV (24.2%). The hybrid has already been released under AICRIP programme for zone V, VI and VII of India.



(Vegetable Research Station, JAU, Junagadh)

5. Soybean: Gujarat Junagadh Soybean-3 (GJS-3)

The variety Gujarat Junagadh Soybean-3(GJS-3) is recommended for cultivation under *kharif* rainfed condition for Saurashtra region, as it out-yielded (1860 kg/ha) the local checks GS-1(1490 kg/ha) and GS-2 (1277 kg/ha) to the tune of 24.8 and 43.7 per cent, respectively. It has also recorded 18.02 and 28.63 per cent higher yield than zonal checks JS-335 (1576 kg/ha) and PK-472 (1446 kg/ha), respectively. Consequent upon its higher oil content (19.2%), it gave 30.7, 49.6, 20.2 and 32.6 per cent higher oil yield per hectare than GS-1, GS-2, JS-335 and PK-472, respectively. It is determinate type, with dark green foliage and yellowish brown seeds coupled with non-shattering habit.



(Agricultural Research Station, JAU, Amreli)

6. Pearl Millet: Gujarat Hybrid Bajra-732 (GHB-732)

The hybrid Gujarat Hybrid Bajra-732 (GHB-732) is recommended for endorsement for summer pearl millet growing area of Gujarat state as a medium late maturity hybrid. The hybrid revealed 15.0, 13.0 and 22.0 per cent higher grain yield (5037 kg/ha) over GHB-538 (4389 kg/ha), GHB-558 (4449 kg/ha) and GHB-526 (4140 kg/ha), respectively. It has synchronous tillering, appealing ear head with bold seeds. It showed resistance to lodging with good quality fodder (8150kg/ha).



(Main Pearl Millet Research Station, JAU, Jamnagar)

II. CROP PRODUCTION

1. Nutrient Management

Effect of foliar application of nutrients on growth, yield & quality of onion

The farmers of AES-VI of South Saurashtra Agro-climatic Zone growing onion for bulb production (Var. Gujarat White Onion-1) during *rabi* season are recommended to apply NPK (19:19:19) @ 0.5 per cent as foliar spray at 30, 45 and 60 days after planting in addition to recommended dose of fertilizer (75:60:50 NPK kg/ha) for higher yield and net return.

(Vegetable Research Station, JAU, Junagadh)

Response of tomato to foliar application of micronutrients

The farmers of AES-VI of South Saurashtra Agro-climatic Zone growing tomato crop (Var. Gujarat Tomato-1) during *rabi* season are recommended to apply micronutrient mixture of boric acid, zinc sulphate, copper sulphate, ferrous sulphate and manganese sulphate each @ 100 ppm, and ammonium molybdate @ 50 ppm at 40, 50 and 60 days after planting in addition to recommended dose of fertilizer (75:37.5:62.5 kg NPK/ha) for getting higher fruit yield and net return.

(Vegetable Research Station, JAU, Junagadh)

Integrated nutrient management in tomato

The farmers of AES-VI of South Saurashtra Agro-climatic Zone growing tomato crop (Var. Gujarat Tomato-1) during *rabi* season are advised to apply NPK @ 120:60:80 kg/ha + FYM @ 10 t/ha + S @ 25 kg/ha + *Azotobactor* @ 5 kg/ha as soil application at the time of planting and foliar spray of micronutrient mixture of boric acid, zinc sulphate, copper sulphate, ferrous sulphate and manganese sulphate each @ 100 ppm, and ammonium molybdate @ 50 ppm at 50 days after planting for getting higher fruit yield and net return.

(Vegetable Research Station, JAU, Junagadh)

Fertilizer management in cotton + sesame (1:1) intercropping system under dry farming condition

The farmers of AES-IV of North Saurashtra Agro-climatic Zone adopting hybrid cotton (G. Cot. Hy.-8) + sesame (1:1) intercropping system are advised to apply 80 kg nitrogen/ha to cotton and 100 per cent RDF on half of the area basis 25 kg nitrogen and 12.5 kg phosphorus/ha to sesame crop for getting higher yield and net return under dry farming condition.

(Main Dry Farming Research Station, JAU, Targhadia)

Balanced use of fertilizer in pearl millet based crop sequence (Pearl millet-Mustard)

The farmers of AES-II of North Saurashtra Agro-climatic Zone following pearl millet (*kharif*)-mustard (*rabi*) crop sequence are advised to apply 5 t FYM/ha and 100% RDF (80:40 kg N:P₂O₅/ha) to pearl millet crop and apply 100% RDF (50:50 kg N:P₂O₅/ha) + K₂O 30 kg + gypsum 100 kg + ZnSO₄ 10 kg + FeSO₄ 10 kg/ha to mustard crop for obtaining higher net return.

(Main Pearl Millet Research Station, JAU, Jamnagar)

Integrated nutrient management in summer pearl millet

The farmers of AES-II of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during summer season in Zn deficient soil are advised to apply recommended dose of fertilizer (120:60:0 NPK kg/ha) along with 20 kg ZnSO₄ per hectare (basal) to obtain higher yield and net return.

(Main Pearl Millet Research Station, JAU, Jamnagar)

Nitrogen management in summer pearl millet

The farmers of AES-II of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during summer are advised to apply nitrogen @ 120 kg/ha in three splits i.e., $\frac{1}{3}$ as basal, $\frac{1}{3}$ at tillering stage (25-30 DAS) and $\frac{1}{3}$ at boot stage (40-45 DAS) to obtain higher yield and net return.

(Main Pearl Millet Research Station, JAU, Jamnagar)

Response of sesame (*Sesamum indicum* Linn.) to potassium fertilization under rainfed condition

The farmers of AES-VIII of North Saurashtra Agro-climatic Zone growing sesame (G.Til-3) in *kharif* are advised to apply 40 kg K₂O/ha in addition to the recommended dose of fertilizer (50:25 NP kg/ha) for getting higher yield and net return.

(Agricultural Research Station, JAU, Amreli)

Effect of foliar spray on seed yield and economics of sesame

The farmers of AES-VIII of North Saurashtra Agro-climatic Zone growing sesame (G.Til-2) in *kharif* are advised to apply recommended dose of fertilizer (50:25:00 NPK kg/ha) with two foliar sprays of urea @ 2% at flowering and capsule formation stages for getting higher yield and net return. Foliar spray of DAP was not found beneficial.

(Agricultural Research Station, JAU, Amreli)

Nutrient management in onion under salt stress condition

The farmers of South Saurashtra Agro-climatic Zone growing white onion under saline irrigation water (EC 6.00 dSm⁻¹) are advised to apply FYM @ 20 t/ha + Gypsum 7 t/ha (50% GR) + 75 kg K₂O/ha in addition to recommended dose of fertilizer (75 kg N + 60 kg P₂O₅/ha) to obtain higher yield and net income.

(Deptt. of Agricultural Chemistry & Soil Science, JAU, Junagadh)

Development of technology for rapid composting of cotton residues under rainfed agriculture

The farmers are advised to recycle cotton stalk (which are either burned or wasted) by chopping into small pieces of 5-6 cm using cotton shredder and composting with addition of compost culture @ 500 g per tonne, urea (N @ 0.5%) and cow dung @ 20% as well as 500 g each of *Azotobacter* and PSM per tonne during first turning of to get enriched compost within 120 days having higher content of all the plant nutrients.

(Main Dry Farming Research Station, JAU, Targhadia)

2. Package of Practices

Effect of date of sowing and weather parameters on growth and yield of wheat under South Saurashtra Agro-climatic Zone

On the basis of the results obtained using heat unit concept, it is recommended to the farmers of AES-VI of South Saurashtra Agro-climatic Zone interested for early sowing of wheat i.e., during first fortnight of November (Minimum temperature 12 to 13° C and Maximum temperature 30 to 31° C) should prefer variety GW-366 for getting higher yield and net profit.

(Agril. Meteorology & Wheat Research Station, JAU, Junagadh)

Identification of innovative Bt. cotton based cropping systems (Irrigated)

The farmers of AES-VI of South Saurashtra Agro-climatic Zone, who are growing irrigated Bt. cotton, are recommended to sow fodder sorghum or maize in *rabi* and sesame or groundnut (bunch) in summer after Bt. cotton to get higher net return.

(Cotton Research Station, JAU, Junagadh)

Performance of sesame varieties to paired row sowing under rainfed condition

The farmers of AES-VIII of North Saurashtra Agro-climatic Zone are advised to grow *kharif* sesame var. G Til-10 or G. Til-3 and adopt

paired row sowing at 30:60 cm for getting higher yield and net return.

(Agricultural Research Station, JAU, Amreli)

3. Water Management

Drip irrigation studies in onion crop (seed production)

The farmers of AES-VI of South Saurashtra Agro-climatic Zone growing onion for seed production (Var. Pilipatti) during *rabi* season are recommended to grow bulbs under drip irrigation with 4.0 LPH dripper at 0.5 m spacing on lateral with 1.45 m lateral spacing for getting higher seed yield. The system should be operated daily at 75 % PEF for 47 minutes.

(Vegetable Research Station, JAU, Junagadh)

4. Soil Health

Evaluation of crop sequence and nutrient management in respect to sustain agriculture and soil health under rainfed condition

The farmers of AES-X of North Saurashtra Agro-climatic Zone are recommended to adopt cotton-cotton rotation with integrated nutrient management practices (25% RDF + compost @ 5 t/ha + castor cake @ 500 kg/ha + *Azotobacter* and PSM @ 5 g/kg of seed) or cotton-groundnut rotation with RDF for each crop (12.5:25 N:P for groundnut and 40 kg N for cotton/ha) for getting higher yield and net realization along with maintaining soil fertility under rainfed condition.

(Main Dry Farming Research Station, JAU, Targhadia)

III. PLANT PROTECTION

Agricultural Entomology

Efficacy of newer insecticides against sucking pests of coriander



For effective and economical management of aphids in coriander, one spray of acetamiprid 20% SP 0.004 % (2 g/10 l water) or imidacloprid 17.8 % SL 0.005% (2.80 ml/10 l water) or dimethoate 30 % EC 0.03 % (10 ml/10 l water) at the

appearance of the appearance of aphid infestation is recommended under South Saurashtra Agro-climatic Zone.

(Department of Agricultural Entomology, JAU, Junagadh)

Management of eriophyid mites in coconut cv. T x D



For effective and economical management of eriophyid mite in coconut, root feeding application of azadiracatin 2.5% @ 15 ml with equal water quantity per palm at two months interval throughout the year is recommended under South Saurashtra Agro-climatic Zone.

(Agricultural Research Station (Fruits Crop), JAU, Mahuva)

Testing efficacy of bio-pesticides for the control of sesame leaf webber/capsule borer (*Antigastra catalaunalis*)

For effective and economical bio-pesticide based management of leaf webber/capsule borer in *kharif* sesame, three sprays of *Beauveria bassiana* (2×10^8 cfu/mg), 5 g/l or neem seed kernel extract 5 % (500 g/ 10 l water) at 15 days interval starting from the pest infestation are recommended for the farmers of North Saurashtra Agro-climatic Zone.

(Agricultural Research Station, JAU, Amreli)

Plant Pathology

Integrated management of downy mildew of cucurbit (Ridge gourd)



For economical and effective management of downy mildew disease and to get higher ridge gourd fruit yield, the farmers of South Saurashtra Agro-climatic Zone are advised to adopt bower system with seed treatment of combi product of metalaxyl 8 % + mancozeb 64 % WP

@ 4 g/kg seeds followed by three times removing of old leaves in the morning and three sprays of mancozeb 75 % WP 0.2 % (27 g/10 l of water) in the afternoon at 50, 60 and 70 days after sowing or bower system with seed treatment of metalaxyl 8 % + mancozeb

64 % WP @ 4 g/kg seeds followed by two sprays of fosetyl-AI 80 % WP 0.1 % (12.5 g/10 l of water) at 50 and 65 days after sowing.

(Vegetable Research Station, JAU, Junagadh)

Chemical control of leaf/stem/capsule spots (*Alternaria alternata*) of sesame

Farmers of North Saurashtra Agro-climatic Zone growing *kharif* sesame are advised to apply three sprays of propiconazole 0.025 % (10 ml/10 l water) or hexaconazole 0.005 % (10 ml/10 l water) or carbendazim 12 % WP + mancozeb 63 % WP 0.15 % (20 g/10 l water) at 12 days interval starting from 40 days after sowing for effective and economical management of leaf/stem/ capsule spots.

(Agricultural Research Station, JAU, Amreli)

IV. HORTICULTURE & AGRO-FORESTRY

Comparison of open and low cost net house nursery for seed germination and dynamic growth of coconut seedling cv. D x T (Mahuva)



The nursery growers of South Saurashtra Agro-climatic Zone producing coconut seedlings are advised to grow coconut seed nut in the month of June under low cost net house (50 % shed net) to get higher quality seedling and net return as compared to open field.

(Agricultural Research Station, (Fruit Crop), JAU, Mahuva)

Effect of soil amendments with organic materials on yield and quality of onion cv. Talaja Red under sodic soil and brackish water condition

Onion growers of South Saurashtra Agro-climatic Zone having sodic soil and brackish irrigation water condition are advised to apply Gypsum 5 t/ha with 50 per cent recommended dose of chemical fertilizer (N:P:K 37.5:30:25 kg/ha) and Neem Cake 900 kg/ha to get maximum yield and net return of onion cv. Talaja Red.



(Agricultural Research Station, (Fruit Crop), JAU, Mahuva)

Effect of plant growth regulators on gladiolus cv. American Beauty in protected condition for spikes

Farmers of South Saurashtra Agro-climatic Zone who are interested to grow gladiolus cv. American Beauty under poly house are advised to treat the corms of gladiolus with Thiourea 1g/liter for 10 hrs before planting for getting maximum number of spikes with good quality and vase life and to get highest net return.



(Department of Horticulture, JAU, Junagadh)

Effect of plant growth regulators on gladiolus cv. American Beauty in protected condition for corms

Farmers of South Saurashtra Agro-climatic Zone who are interested to grow gladiolus cv. American Beauty under poly house are advised to treat the corms of gladiolus with GA₃ 0.05g/liter for 10 hrs before planting for getting maximum number of corms and highest net return.



(Department of Horticulture, JAU, Junagadh)

V. AGRICULTURAL ENGINEERING

Modified atmosphere packaging technique for sapota

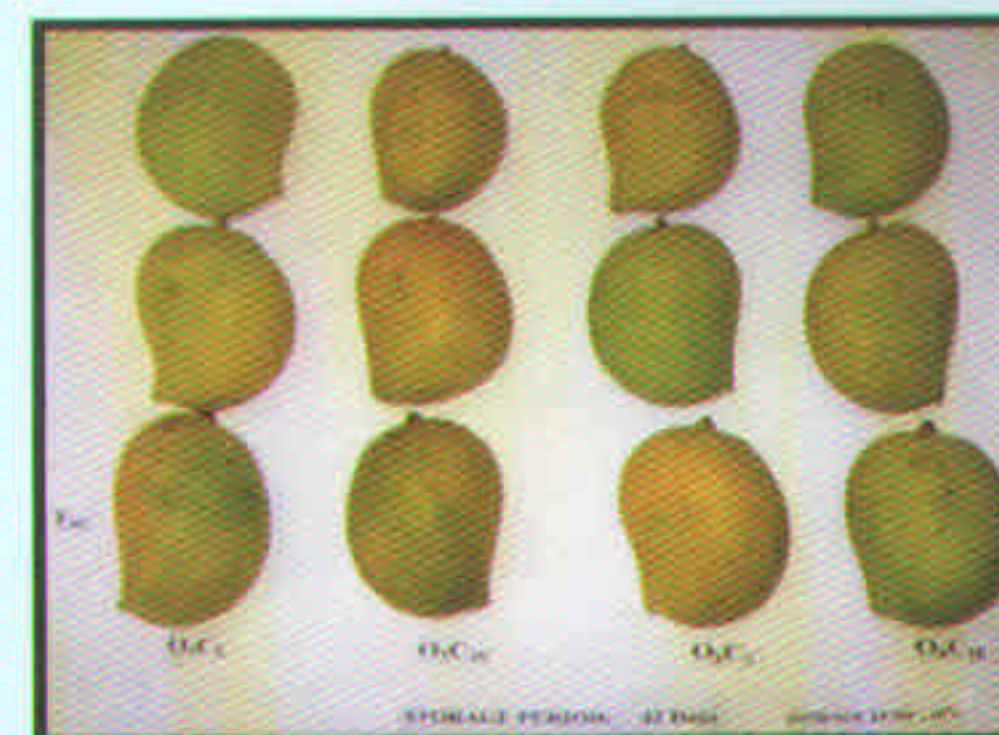


The farmers, processors and exporters are recommended to adopt modified atmosphere packaging technique developed by JAU for increasing the shelf life of sapota fruit by packing in 25 μ LDPE bag with a combination of 5 % O₂ + 10 % CO₂ gas concentration and stored

at 6°C temperature. The shelf life of sapota fruits can be increased up to 49 days by using this technique.

(Deptt. of Renewable Energy and Rural Engineering, CAET, JAU, JND.)

Modified atmosphere packaging technique for mango



The farmers, processors and exporters are recommended to adopt modified atmosphere packaging technique developed by JAU for increasing the shelf life of mango fruit by packing in 25 μ LDPE bag with a combination of 6 % O₂ + 5 % CO₂ gas concentration and stored

at 10°C temperature. The shelf life of mango fruits can be increased up to 35 days by using this technique.

(Deptt. of Renewable Energy and Rural Engineering, CAET, JAU, JND.)

Lime harvester

The farmers having Kagzi lime orchards are advised to use the JAU-Lime harvester to reduce losses like impact damage and immature lemon fall-up.



(Research Testing and Training Centre, JAU, Junagadh)

Application of murrum in groundnut

The farmers of North Saurashtra Agro-climatic Zone growing bunch groundnut (GG-5) are advised to apply *murrum* @ 40 t/ha or FYM @ 10 t/ha along with recommended dose of fertilizer for obtaining higher yield of groundnut and net returns under dry farming conditions.

(Main Dry Farming Research Station, JAU, Targhadia)

Mulching in dripped guava orchard



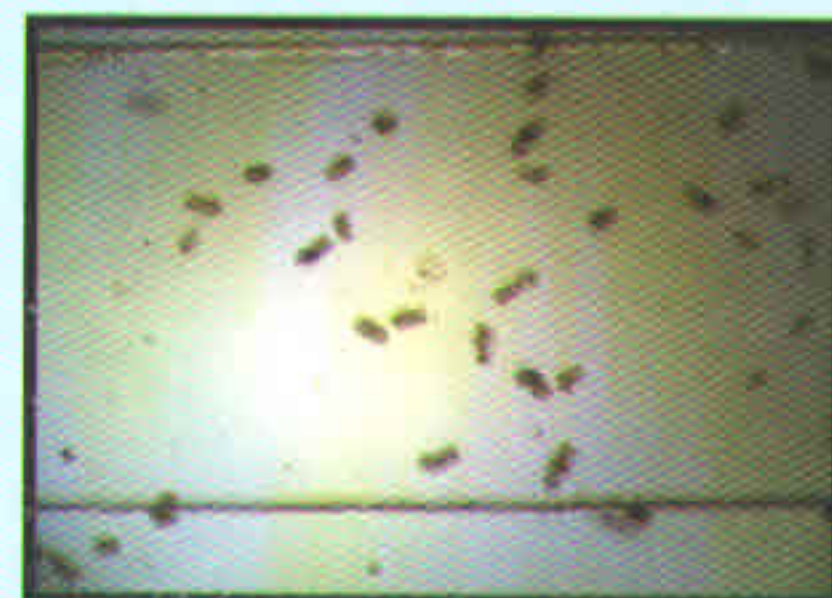
The farmers of North Saurashtra Agro-climatic Zone growing Guava under drip irrigation system are advised to apply black plastic (50 micron) or groundnut shell or wheat straw mulch @ 7.5 kg/plant (0.5 m around the plant) for obtaining maximum plant growth, fruit yield and net return.

(Main Dry Farming Research Station, JAU, Targhadia)

VI. FISHERIES SCIENCE

Population growth of rotifer *Brachionus rotundiformis* Tschugunoff in varying salinity

Finfish/crustacean hatchery entrepreneurs are recommended to use 15 to 20 ppt salinity water at 25°C to achieve higher production of rotifer, *Brachionus rotundiformis* in 10 days.



(Fisheries Research Station, JAU, Okha)

Study of location specific growth rate in marine macro algae *Kappaphycus alvarezzi*



It is recommended that carrageenan yielding marine algae *Kappaphycus alvarezzi* can be grown profitably in Okha mandal region and five fold growths can be achieved in 45 days from January onwards.

(Fisheries Research Station, JAU, Okha)

Recommendations for the scientific community

I. CROP PRODUCTION

Soil test based fertilizer recommendation for targeted yields of onion crop

The fertilizer prescription equations of N ($FN=0.84 \times T - 0.45 SN$), P ($FP_2O_5 = 0.72 \times T - 2.21 SP$) and K ($FK_2O = 0.43 \times T - 0.17 SK$) is fit up to yield target of 225 q/ha in onion. The yield targeting approach is also found effective in economic return and soil fertility build up for cultivation of onion in Saurashtra region.



(Department of Agricultural Chemistry & Soil Science, JAU, Junagadh)

Soil test based fertilizer recommendation for targeted yields of garlic crop



The fertilizer prescription equations of N ($FN= 3.73 \times T - 0.52 SN$), P ($FP_2O_5 = 2.10 \times T - 2.36 SP$) and K ($FK_2O = 2.90 \times T - 0.45 SK$) is fit up to yield target of 70 q/ha in garlic. The yield targeting approach is also found effective in economic return and soil fertility build up for cultivation of garlic in Saurashtra region.

(Deptt. of Agricultural Chemistry & Soil Science, JAU, Junagadh)

Establishment of critical limit of potassium for cotton variety G. Cot. Hybrid-10 in medium black calcareous soils



The critical limit for cotton variety G. Cot. Hybrid-10, available K_2O (ammonium acetate-K) was obtained 152.0 kg K_2O /ha in medium black calcareous soil, while the critical value of K content in plant was observed 1.72 per cent at 30 DAS.

(Deptt. of Agricultural Chemistry & Soil Science, JAU, Junagadh)

Relative salt tolerance of different wheat genotypes in simulated saline soil condition

The wheat varieties GW-322 and KRL-119 were found salinity tolerant up to EC_e 4 dS/m.

(Deptt. of Agricultural Chemistry & Soil Science, JAU, Junagadh)

Potassium supplying power of soils of Rajkot district

- The soils of Rajkot district were neutral to moderately alkaline reaction, non calcareous to highly calcareous, low to medium in organic carbon content. The 33.6, 1.8, 32.1, 20.7, 36.4 and 3.9 per cent soils were found low in availability of P, K, S, Fe, Zn and Mn, respectively.
- The maximum and minimum values of various potassium fractions were recorded in soils of Malia-Miyana and Paddhari Taluka, respectively.
- The higher and lower values of various potassium fractions were recorded with cotton-cotton and cotton-rabi crops sequences, respectively.
- Availability of K and values of different K fractions were increased with increase in soil depth.
- The different K fractions and availability of K were lower in irrigated conditions as compared to un-irrigated conditions.

(Main Dry Farming Research Station, JAU, Targhadia)

II. AGRICULTURAL ENGINEERING

Drying air variables of tomato slices

The influence of drying air variables i.e. drying air temperature and velocity on drying rate constant "k" of tomato slices is recommended in the form of Arrhenius-type model, given below, for describing the thin layer drying behavior of 5.0 ± 0.5 mm thick tomato slices. The value of constant "c" did not show any regular dependence on drying air variables and recommended to be equal to mean value of 1.005.

$$k = 587.83 v^{0.36} \exp(3487.79/T_{ab})$$

(COD, $r^2 = 0.998$, $x^2 = 9.541 \times 10^{-8}$ for $0.25 \text{ m/s} \leq v \leq 1 \text{ m/s}$ and $50^\circ\text{C} \leq T \leq 80^\circ\text{C}$).



(Department of Renewable Energy and Rural Engineering, CAET, JAU, Junagadh)

III. FISHERIES SCIENCE

Study on seasonal variation in iodine content of promising iodine yielding red saw-weeds of Gulf of Kutch

Among the available red sea-weed (*Rhodophyceae*) species of Gulf of Kutch, maximum iodine content is found in *Asperogopsis entestinalis* (555 mg/100g DW) followed by *Rhodomenia australis* (151 mg/100 DW).

(Fisheries Research Station, JAU, Okha)

IV. HORTICULTURE & AGRO-FORESTRY

Characterization of different accessions of Jamun (*Syzygium cumini* Skeels) from Saurashtra region

The different accessions like VR-1, VM-1, JAU-6, VMA-1 and VB-1 of black jamun identified from Junagadh region were observed better in different characteristics.



(Department of Horticulture, JAU, Junagadh)

Production of Nucleus / Breeder seeds during year 2010-11

Sr. No.	Crop	Variety	Nucleus Seed (Qtl.)	Breeder Seed (Qtl.)		Total (Qtl.)
				National	State	
1.	Groundnut	GG-2	18.30	2.00	134.00	154.30
		GG-5	13.16	-	51.00	64.16
		GG-6	10.00	50.00	-	60.00
		GG-7	5.01	20.60	1.10	26.71
		GG-8	3.00	8.00	-	11.00
		GG-20	103.53	10.00	198.80	312.33
		GAUG-10	16.02	-	43.20	59.22
		GG-11	20.55	-	17.70	38.25
		GG-14	12.51	5.40	-	17.91
		GG-21	1.50	4.20	-	05.70
		GG-16	3.00	22.50	-	25.50
		GJGHPS-1	4.50	-	-	04.50
		GJG-9	4.00	-	-	04.00
		GJG-31	5.25	-	-	05.25
	Sub-Total	220.33	122.70	445.80	788.83	
2.	Chickpea	GG-1	-	-	44.77	44.77
		GG-2	0.07	2.50	40.50	43.07
		GG-3	-	-	9.75	09.75
		GG-4	1.79	24.25	-	26.04
		Sub-Total	1.86	26.75	95.02	123.63
3.	Sesame	G.Til-1	-	0.85	2.24	03.09
		G.Til-2	-	0.35	10.04	10.39
		G.Til-3	-	0.17	5.04	05.21
		G.Til-10	-	0.76	0.34	01.10
		Sub-Total	-	02.13	17.66	19.79
4.	Wheat	GW-496	-	133.20	188.00	321.20
		GW-366	05.30	188.40	442.00	635.70
		Sub-Total	05.30	321.60	630.00	956.90
5.	Pearl Millet	Parent Seed	-	-	19.99	19.99
Grand Total....			227.49	473.18	1208.47	1909.14



Hon'ble Vice Chancellor Dr. N. C. Patel Inaugurated the winter school on "Water resource management in coastal area for enhancing water productivity" held at JAU, Junagadh during 11-31 October, 2010



Participants of Capacity Building Programme on "Agricultural Research Management" sponsored by NAARM, Hyderabad. held at JAU, Junagadh during 1-5 February, 2011