

JUNAGADH AGRICULTURAL UNIVERSITY
RESEARCH RECOMMENDATIONS FOR FARMERS COMMUNITY

II. CROP PRODUCTION

Total 228 research recommendations developed by this group are described herein.

Year: 2004-05

Nutrient Management

1. Integrated nutrient management in bajra- mustard crop sequence

The farmers of North Saurashtra Agro-climatic Zone growing *bajra* (*kharif*)-mustard (*rabi*) crop sequence are advised to apply 100 per cent RDF + 10 t FYM/ha to *bajra* and only 50 per cent RDF to mustard crop to obtain higher yield and net return of the sequence.

(Main Pearl millet Research Station, JAU, Jamnagar)

2. Fertilizer management in sesame based cropping system

The farmers of North Saurashtra Agro-climatic Zone adopting sesame based intercropping system are advised to fertilize sesame + Hy. cotton (3:1) with 100 per cent RDF of main and intercrop as per area for getting higher yield and net return.

(Agricultural Research Station (Ag. Botany), JAU, Amreli)

3. Effect of potassium and zinc levels on garlic-groundnut crop sequence

The farmers of South Saurashtra Agro-climatic Zone adopting garlic-groundnut crop sequence on calcareous black soils having low Zn and medium to high K status are advised to apply 25 kg ZnSO₄ + 75 Kg K₂O per hectare in addition to recommended dose of N and P before sowing of garlic crop and recommended dose of N and P to *kharif* groundnut for getting higher yield and net return from garlic-groundnut crop sequence.

(Department of Agril. Chem. & Soil. Sci., CoA, JAU, Junagadh)

4. Effect of nitrogen application on marvel grass

The farmers of North Saurashtra Agro-climatic Zone are advised to grow marvel grass with application of 60-30 NP kg/ha (30 kg N as a basal and 30 kg N at 30 DAS) for obtaining economically maximum green biomass and dry matter yield in marginal lands under rainfed condition.

5. Nutrient management through their sources in groundnut

The farmers of North Saurashtra Agro-climatic Zone growing groundnut (GG-20) under dry-farming condition in *kharif* season are advised to apply recommended dose of N and P through DAP and urea with gypsum (18.75 kg S/ha) for getting maximum pod yield and higher net return.

6. Integrated nutrient management in sorghum

The farmers of North Saurashtra Agro-climatic Zone growing sorghum as fodder crop in *kharif* are advised to choose sorghum variety GFS-5 and fertilize with 80 kg N/ha (40 kg as basal and 40 kg at 30 DAS) and *Azotobacter* and *Azospirillum* bio-fertilizer treatment (5 packets/ha each of 250 g) for getting maximum fodder yield.

7. Integrated nutrient management in anjan Grass

The farmers of North Saurashtra Agro-climatic Zone growing Anjan grass in *kharif* season are advised to apply 20 kg N/ha (10 kg as basal and 10 kg at 30 DAS) along with *Azotobacter* 5 packets/ha (each of 250 g) for getting economically optimum green and dry matter yield in marginal lands under rainfed condition.

8. Integrated nutrient management in groundnut-wheat crop sequence

The farmers of North Saurashtra Agro-climatic Zone adopting groundnut-wheat crop sequence are advised to apply 50 per cent recommended dose of fertilizer (6.25:12.5 kg NP/ ha) + *Rhizobium* culture (250 g/10 kg seeds) + FYM 10 t/ha to groundnut and recommended dose of fertilizer (120:60:0 kg NPK/ha) to wheat for maximum yield and net return.

(Grassland Research Station, JAU, Dhari)

Cultural practices

9. Cotton based inter cropping system in rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing hybrid cotton (G.Cot.Hy-8) at the distance of 120 cm are advised to adopt intercropping with sesame (G. Til-2) or green gram (K-851) in the row ratio of 1:1 for getting higher yield and net return under dry farming condition.

(DFRS, Nanakandhasar, Jamkhambhakhia; Grassland, Dhari & DFRS, JAU, Targhadia)

10. Study of seed mixture for cultivation of fodder crops under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing grasses are advised to use seed mixture of Anjan grass (2.66 kg/ha) and *Stylosanthes scabra* (1.66 kg/ha) for obtaining economical maximum green biomass and dry matter production on marginal lands under rainfed condition. Alternatively instead of *S. scabra*, *Clitoria* Sp. (5 kg/ha) can also be used.

(Grassland Research Station, JAU, Dhari)

11. Study of plant geometry in cotton

The farmers of North Saurashtra Agro-climatic Zone (AES-15) growing cotton under rainfed condition are advised to sow cotton var. G. Cot. Hy.8 at row spacing of 120 cm for getting higher seed cotton yield and net return.

(Dry Farming Res. Station, JAU, Nanakandhasar & Dry Farming Res. Station, JAU, Targhadia)

12. Study of planting method in *kharif* sesame and groundnut

The farmers of North Saurashtra Agro-climatic Zone growing sesame and groundnut crops in *kharif* season are advised to open the furrow after each three rows for sesame. The ridges and furrow method should be followed for groundnut crop at 20-30 days after sowing for obtaining maximum yield and net return.

13. Effect of tillage practices in groundnut

The farmers of North Saurashtra Agro-climatic Zone growing groundnut in *kharif* are advised to adopt deep ploughing every third year besides tractor harrowing every year to prepare the field for obtaining maximum yield and net return.

(Agricultural Research Station (Ag. Botany), JAU, Amreli)

14. Effect of mulch on onion under poor quality well water

The farmers of coastal area of South Saurashtra Agro-climatic Zone growing *rabi* onion in saline soil with poor quality well water are advised to apply mulch (pearl millet husk) @ 5 t/ha during 15 to 20 days after planting in flat bad for getting higher net return.

(Department. of Agril. Chem. & Soil Science, CoA, JAU, Junagadh)

Irrigation Management

15. Irrigation management in *kharif* sesame

The farmers of North Saurashtra Agro-climatic Zone growing sesame in *kharif* are advised to apply one irrigation at 50 per cent flowering during dry spell for getting maximum sesame yield and net return.

(Agricultural Research Station (Ag. Botany), JAU, Amreli)

Weed Management

16. Integrated weed management in sesame

The farmers of North Saurashtra Agro-climatic Zone growing sesame are advised to adopt two hand weeding at 15 and 30 days after sowing or one hand weeding at 15 days after sowing supplemented with one inter-culturing at 30 days after sowing.

(Agricultural Research Station, JAU, Amreli)

17. Integrated weed management in coriander

Not included as recommendation does not confirm the guideline of CIB.

(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2005-06

Nutrient Management

18. Effect of multi micronutrient with and without sea weed liquid fertilizer on groundnut (summer) under Middle Gujarat Agro-climatic Zone

The farmers of Middle Gujarat Agro-climatic Zone–III (AES-II), growing summer groundnut (GG-2) on soils having marginal status of Zn and Fe are advised to spray 1 % of multi micronutrients mixture (Fe 2 %, Mn 0.5 %, Zn 4.0 %, Cu 0.3 % and B 0.5 % equivalent to Govt. notified general Grade-I) or sea weed liquid fertilizer (SLF) @ 1.5 per cent at 15, 30 and 45 days after sowing to get higher groundnut yield and profit.

19. Effect of multi micronutrient with and without sea weed liquid fertilizer on groundnut (summer) under North Saurashtra Agro-climatic Zone

The farmers of North Saurashtra Agro-climatic Zone(AER-2) growing *kharif* groundnut (GG-2) on Zn and Fe deficient soils are advised to spray the crop with sea weeds liquid fertilizer (SLF) @ 3.5 per cent at 15, 30 and 45 days after sowing to get higher groundnut yield and net realization.

(Fisheries Research Station, JAU, Okha)

20. Soil moisture conservation in hybrid cotton under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing hybrid cotton-8 in *kharif* season under dry farming condition are advised to adopt 30 cm deep tillage every year for highest seed cotton yield, net return and moisture conservation. They are also advised to apply FYM @ 10 t/ha for higher yield, net return and moisture conservation. Recommended dose (80:0:0 NPK kg/ha) of fertilizer should be applied to the crop.

(Grassland Research Station, JAU, Dhari)

21. Phosphorus fertilization in castor

The farmers of South Saurashtra Agro-climatic Zone growing hybrid castor GCH-6 under irrigated condition are advised to fertilize castor crop with 40 kg P₂O₅ ha⁻¹ besides the recommended dose of N for getting maximum castor seed yield and net return.

(Main Oilseeds Research Station, JAU, Junagadh)

22. Response of sesame to chemical fertilizer

The farmers of North Saurashtra Agro-climatic Zone are advised to apply recommended dose of chemical fertilizer (50:25:00 NPK kg/ha) + 20 kg S/ha for getting higher return.

(Agricultural Research Station, JAU, Amreli)

23. Integrated nutrient management in groundnut

The farmers of coastal area of South Saurashtra Agro-climatic Zone growing groundnut crop are advised to apply half recommended dose of NPK (12.5:25:0 kg/ha) in the form of urea and rock phosphate with seed inoculation of bacterium EBJ-3 (*Azotobacter* sp.) @ 25 ml/kg seed of groundnut to obtain higher net return.

24. Integrated nutrient management in pearl millet

The farmers of coastal area of South Saurashtra Agro-climatic Zone growing *bajra* crop are advised to apply half recommended dose of fertilizer in the form of urea and rock phosphate with seed inoculation of bacterium EBKH-1 (*Azotobacter* sp.) @ 25 ml/kg seed to obtain higher net return.

(Dept. of Agril. Chemistry & Soil Science, CoA, JAU, Junagadh)

25. Groundnut based alley cropping system

The farmers of North Saurashtra Agro-climatic Zone are advised to grow groundnut GG 20 with *Glyricidia* at the alley width of 9.6 m along with an application of FYM @ 5 t/ha for getting higher yield of groundnut and net return in the alley cropping system under dry farming condition.

26. Management of soil and nutrient in groundnut under dry farming condition

The farmers of North Saurashtra Agro-climatic Zone are advised to carry out ploughing up to 20 cm depth in alternate furrows in alternate year and apply FYM @ 5 t/ha and recommended dose of NPK (12.5:25:0 kg/ha) for getting higher yield of groundnut and net return under dry farming condition.

(Main Dry Farming Research Station, JAU, Targhadia)

Cultural practices

27. Pasture legumes in combination of grasses under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing grasses are advised to grow *Clitoria* (*Clitoria ternatea*) with Marvel grass/*Zinzvo* (*Dichanthium annulatum*) in 1:2 row ratio for obtaining economically maximum green biomass and dry matter yields under rainfed condition.

(Grassland Research Station, JAU, Dhari)

Irrigation Management

28. Drip irrigation in summer brinjal

The farmers of South Saurashtra Agro-climatic Zone growing brinjal (*Lila gota*) in *summer* season are advised to irrigate the crop with drip system at 1.0 PEF laying lateral at 90 cm distance in each row and drippers of 4.0 LPH at 60 cm distance on each lateral and operate the system at an alternate day with a pressure of 1.2 kg / cm² for one hour and 50 minutes on alternate day for getting more net realization with higher water use efficiency.

Under constraint of irrigation water, they are advised to adopt drip irrigation at 0.8 PEF to save 20 % water and bring about 0.21 ha additional area of this crop under irrigation. Farmers are also advised to apply wheat straw mulch @ 5 t/ha for getting more net realization.

29. Irrigation management in coriander

The farmers of South Saurashtra Agro-climatic Zone growing coriander are advised to irrigate the crop with mini sprinkler at 0.8 PEF with laying lateral at 1.8 m distance in paired row (30-60-30 cm) and sprinkler of 35 LPH at 2.5 m distance on each lateral, and operating the system at an alternate day with a pressure of 1.2 kg/cm² for getting higher net realization.

(Department of Agronomy, CoA, JAU, Junagadh)

Weed Management

30. Integrated weed management in *kharif* groundnut

Not included as recommendation does not confirm the guideline of CIB.

(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2006-07

Nutrient Management

31. Reclamation of salt affected soils for groundnut

The farmers of the coastal area of South Saurashtra Agro-climatic Zone growing *kharif* groundnut on saline-sodic soil are advised to apply gypsum @ 5 t/ha (50 % of GR) besides recommended dose of fertilizer for obtaining higher net return.

(Department of Agril. Chem. & Soil Science, CoA, JAU, Junagadh)

32. Effect of potassium and zinc levels on cotton

The farmers of South Saurashtra Agro-climatic Zone growing cotton in medium black calcareous soils are advised to apply 120 kg K₂O and 50 kg ZnSO₄ per hectare as basal in addition to recommended dose of nitrogen for getting maximum net return.

(Dept. of Agril. Chem. & Soil Sci., JAU, Junagadh and Cotton Res. Station, JAU, Junagadh)

33. Study of organic V/s inorganic fertilizers in legumes

The farmers of North Saurashtra Agro-climatic Zone applying enriched compost @ 6 t/ha or vermicompost @ 2 t/ha need not to apply inorganic fertilizers in legumes.

34. Reclamation of salt affected soils for pearl millet

The farmers of North Saurashtra & West Gujarat Agro-climatic Zones growing *kharif* pearl millet in saline sodic soil with marginal sulphur status are advised to apply 250 kg gypsum/ha in addition to recommended dose of fertilizer (80:40 kg NP/ha) for obtaining higher yield and net realization.

(Main Dry Farming Research Station, JAU, Targhadia)

35. Effect of multi-micronutrient on *kharif* pearl millet

The farmers of North Saurashtra Agro-climatic Zone growing *kharif bajra* (var. GHB-558) on soil deficient in available Fe and Zn are advised to follow soil application of FeSO₄ @ 15 kg/ha and ZnSO₄ @ 8 kg/ha or micronutrient mixture grade having Fe-2 %, Mn-0.5 %, Zn-5 %, Cu-0.2 % and B-0.5 % equivalent of Govt. notified Grade-V as soil application @ 20 kg/ha at the time of sowing to get higher yield and net return. Alternatively, farmers are advised to spray 1 % foliar grade of multi-micronutrients having Fe 4 %, Mn 1 %, Zn 6 %, Cu 0.5 % and B 0.5 % equivalent of Govt. notified Grade-IV (for Fe and Zn deficiency) at 20, 30 and 40 DAS.

(Main Pearl millet Research Station, JAU, Jamnagar)

36. Effect of nitrogen and sulphur sources on rabi onion

The farmers of South Saurashtra Agro-climatic Zone utilizing urea as a source of nitrogen in *rabi* onion are recommended to apply 20 kg sulphur/ha through phospho gypsum at the time of sowing or as elemental sulphur at 20 to 25 days before transplanting for getting higher bulb yield.

(Vegetable Res. Station, JAU, Junagadh & Dept. of Agril. Chem. & Soil Sci., JAU, Junagadh)

37. Nitrogen management in *kharif* onion

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* onion (Agri Found Dark Red) are recommended to apply 75:50:25 kg NPK/ha. Of which 50 per cent nitrogen and full doses of phosphorus and potash should be applied as basal and remaining 50 per cent nitrogen should be top dressed one month after transplanting for getting higher yield.

(Vegetable Research Station, JAU, Junagadh)

Cultural practices

38. Groundnut (*kharif*)-Onion (*rabi*)-Green gram (summer)

The farmers of South Saurashtra Agro-climatic Zone having assured irrigation facility are advised to adopt groundnut (*kharif*)-onion (*rabi*)-green gram (summer) sequence for obtaining higher production and net returns.

(Department of Agronomy, CoA, JAU, Junagadh)

Irrigation Management

39. Irrigation management in summer pearl millet

The farmers of North Saurashtra Agro-climatic Zone (AES-X) growing hybrid pearl millet (GHB-558) in summer are advised to give 13 irrigations each of 40 mm depth at 6-7 days interval for obtaining higher yield and net return. Under limited water availability, they are advised to give 11 irrigations each of 40 mm depth at 7-8 days interval.

(Main Pearl millet Research Station, JAU, Jamnagar)

Weed Management

40. Weed management in groundnut through farm mechanization

The farmers of South Saurashtra Agro-climatic Zone harvesting wheat through combined harvester are advised to incorporate wheat straw in soils using rotavator for better weed control and net return along with maintenance of soil fertility in *kharif* groundnut.

(Dept. of Agronomy, JAU, Junagadh and Dept. of Agril. Chem. & Soil Sci., JAU, Junagadh)

41. Integrated weed management in garlic

Not included as recommendation does not confirm the guideline of CIB.

(Main Dry Farming Research Station, JAU, Targhadia)

Year: 2007-08

Nutrient Management

42. Evaluation of potentiality of organic farming for groundnut (*kharif*)-wheat (*rabi*) crop sequence

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut-wheat crop sequence are advised to apply soil test based recommended dose of fertilizer to both the crops for realizing higher net return. Application of nutrients only through organic sources was not found economical.

43. Evaluation of potentiality of organic farming under groundnut (*kharif*)-onion (*rabi*) crop sequence

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut-onion crop sequence are advised to apply recommended dose of N through FYM on equivalent N basis to both the crops.

Under the situation of inadequate availability of FYM; farmers should follow soil test based fertilizer application to both the crops.

44. Evaluation of potentiality of organic farming under pearl millet (*kharif*)-wheat (*rabi*) crop sequence

The farmers of South Saurashtra Agro-climatic Zone adopting pearl millet-wheat crop sequence are advised to apply chemical fertilizers as per soil test to both the crops for realizing higher net return. Application of nutrients only through organic sources was not found economical.

(Department of Agronomy and Dept. of Agril. Chem. & Soil Sci., CoA, JAU, Junagadh)

45. Effect of sulphur with and without potassium on yield, nutrient uptake and quality of pigeon pea in relay inter cropping system

The farmers of South Saurashtra Agro-climatic Zone adopting pigeon pea + groundnut relay cropping in medium black calcareous soils are advised to apply 40 kg sulphur (one month prior to sowing) and 50 kg K₂O per hectare as basal in addition to recommended doses of N and P to pigeon pea for higher yield and net return.

(Department of Agril. Chem. & Soil Sci., CoA, JAU, Junagadh)

46. Integrated nutrient supply system for rainfed semi-arid tropics

The farmers of North Saurashtra Agro-climatic Zone following pearl millet-groundnut cropping system under rainfed conditions are advised not to follow mono cropping and apply N @ 80 kg/ha to pearl millet only for obtaining higher yield and net return.

(Main Dry Farming Research Station, JAU, Targhadia)

47. Nutrient management in sesame

The farmers of North Saurashtra Agro-climatic Zone are advised to apply FYM @ 5 t/ha + NP fertilizer (25:25 kg NP/ha) to sesame crop for getting higher yield and net realization.

Alternatively, the farmers are advised to apply FYM @ 5 t/ha + NP (12.5:12.5 kg/ha) through chemical fertilizers along with seed inoculation of PSM + *Azotobacter* each @ 625 g/ha to sesame crop.

(Main Dry Farming Res. Stat., JAU, Targhadia and Dry Farming Res. Stat., JAU, Nanakandhasar)

48. Response of pearl millet to zinc application

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet (GHB-558) during *kharif* on Zn deficient soils are advised to apply 20 kg/ha zinc sulphate at the time of sowing followed by 0.2 per cent spray of ZnSO₄ at pre-flowering stage to obtain higher grain yield and net return.

(Main Pearl Millet Research Station, JAU, Jamnagar)

49. Integrated nutrient management in black seeded sesame under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing black seeded sesame (G.Til-10) in *kharif* are advised to apply 25 kg N + 25 kg P₂O₅/ha as basal and 25 kg N/ha as top dressing at 30 DAS or apply FYM 10 t/ha + *Azotobacter* and PSB each @ 5 kg/ha as soil application for getting higher yield and net return.

50. Efficacy of multi-micronutrient formulation in improving crop production in sesame

The farmers of North Saurashtra Agro-climatic Zone growing sesame during *kharif* in soils with marginal to deficient in available Fe and Zn are advised to apply mixture grade of multi-micronutrients @ 20 kg/ha (Fe-2.0 %, Mn-0.5 %, Zn-5.0 %, Cu-0.2 % and B-0.5 %) equivalent to Government notified general grade-V as soil application for obtaining higher yield and net return.

51. Study the response of sesame to micronutrients in combination with organic manure

The farmers of North Saurashtra Agro-climatic Zone growing sesame on soils marginal to deficient in Zn and Fe are advised to apply 2.5 t FYM/ha with ZnSO₄ @ 20 kg/ha and FeSO₄ at 25 kg/ha in addition to the recommended fertilizer dose (50:25:00 NPK kg/ha) for getting higher yield and net return.

(Agricultural Research Station, JAU, Amreli)

Cultural practices

52. Effect of dry seeding on the performance of castor under rainfed condition

The farmers of South Saurashtra Agro-climatic Zone growing rainfed castor are advised to soak the seed in one per cent sodium chloride solution for three hours and sow at onset of monsoon to get higher seed yield and net return.

(Main Oilseeds Research Station, JAU, Junagadh)

53. In-situ moisture conservation technique and seed priming for improving sesame productivity

The farmers of North Saurashtra Agro-climatic Zone growing sesame are advised to adopt seed soaking technique (8 hours soaking of seed in water (1:1) and drying in shade for 12 hours) before sowing followed by one hand weeding at 15 DAS and mulching with dust (soil mulch) for getting higher seed yield and net return.

(Agricultural Research Station, JAU, Amreli)

54. Reclamation of sodic soil under rainfed condition in cotton

The farmers of coastal area of South Saurashtra Agro-climatic Zone growing *kharif* Dhummad cotton are advised to apply gypsum @ 75 % of GR in addition to recommended dose of N (40 kg/ha) under sodic soil condition for getting higher yield and net return.

(Dept. of Agril. Chemistry & Soil Science, CoA, JAU, Junagadh)

55. Amelioration of drought stress in pearl millet

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet (GHB-558) during *kharif* are advised to sow the crop in paired row at 30 cm x 60 cm to get higher yield and net return.

(Main Pearl millet Research Station, JAU, Jamnagar)

56. Optimization of castor production under resource constraints

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are advised to apply 75:40:00 NPK kg/ha along with two inter culturing, two hand weedings and two sprays of insecticide to control sucking pest and semi looper for getting higher yield and net return.

Among the various package of practices, fertilizer application is the most critical practice followed by weeding and plant protection which could reduce seed yield by 45.30, 32.43 and 23 per cent, respectively.

57. Effect of irrigation and sowing methods on yield and economics of groundnut-pigeon pea intercropping

The farmers of South Saurashtra Agro-climatic Zone interested in adopting semi-spreading groundnut + pigeon pea intercropping system are advised to open the furrow at 40 cm distance and

sow two rows of groundnut (GG-20) and one row of pigeon pea (Vaishali). They are also advised to apply 4 irrigations at an interval of 10 days (1.0 IW/CPE) to pigeon pea after harvest of groundnut for realizing higher net return.

58. Optimization of plant density of groundnut crop under rainfed condition

The farmers of South Saurashtra Agro-climatic Zone growing rainfed groundnut (cv. GG-20) are advised to sow the crop at 60 cm x 7.5 cm with bullock drawn automatic seed drill using 120 kg seed/ha treated with mancozeb @ 3.0 g/kg seed and soil application of FYM based *Trichoderma viride* (2.5 kg/ha) at the time of sowing for getting higher pod yield and net return.

(Main Oilseeds Research Station, JAU, Junagadh)

Irrigation Management

59. Effect of supplementary irrigation on productivity of groundnut-castor inter cropping system

The farmers of South Saurashtra Agro-climatic Zone adopting bunch groundnut + castor (3:1) intercropping system are advised to irrigate castor crop at 1.0 IW/CPE ratio (four irrigations). First irrigation should be given at 20 days after harvesting of groundnut and remaining at an interval of 10 days for getting higher net return.

(Main Oilseeds Research Station, JAU, Junagadh)

60. Response of wheat varieties to restricted irrigations

The farmers of South Saurashtra Agro-climatic Zone growing irrigated wheat are advised to prefer wheat variety GW-322 and give 7 irrigations *i.e.* at sowing, CRI, tillering, boot, flowering, milky and dough stages for getting higher yield and net return. Under limited water availability, farmers can apply 6 irrigations by skipping irrigation at boot stage without affecting yield.

(Wheat Research Station, JAU, Junagadh)

Weed Management

61. Integrated weed management in summer pearl millet

The farmers of South Saurashtra Agro-climatic Zone growing summer pearl millet are advised to keep their fields weed free through hand weeding and interculturing at 20, 40 and 60 days after sowing.

62. Efficacy of post emergence herbicides in kharif groundnut

Under the circumstances of labourer shortage or not able to spray pre-emergence herbicide; the farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are advised to spray quizalofop-ethyl 40 g/ha (quizalofop-ethyl 5 % EC, 800 ml/ha) by dissolving it in 500 liters of water as post-emergence at 25 days after sowing to control monocot weeds. It should be followed by a hand weeding and interculturing at 45 days after sowing for effective weed management.

(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2008-09

Nutrient Management

63. Integrated nutrient management in kharif pearl millet

The framers of North Saurashtra Agro-climatic Zone (AES-X) growing *kharif* pearl millet are advised to apply 50 per cent RDF (40:20 NP kg ha⁻¹) along with 2.5 t ha⁻¹ compost and 500 kg castor cake ha⁻¹ for obtaining higher yield and net realization.

(Main Dry Farming Res. Stat., JAU, Targhadia and Dry Farming Res. Stat., JAU, Jamkhambhalia)

64. Integration of bio-inoculants with inorganic and organic sources of nutrients for yield maximization of sesame

The farmers of North Saurashtra Agro-climatic Zone growing sesame (G.Til 3) in *kharif* are advised to apply RDF (50:25 NP kg ha⁻¹) as 25 kg N +25 kg P₂O₅ ha⁻¹ as basal and 25 kg N ha⁻¹ as top dressing to sesame for getting higher yield and net return.

65. Effect of FYM and castor cake on the productivity of sesame

The farmers of North Saurashtra Agro-climatic Zone growing sesame (G.Til-2) during *kharif* are advised to apply 1.0 t castor cake ha⁻¹ or 7.5 t FYM + 750 kg castor cake ha⁻¹ for getting higher yield and net return.

66. Response of summer sesame to N-P fertilizers

The farmers of North Saurashtra Agro-climatic Zone growing sesame (G.Til-2) in summer are advised to apply 25 kg N + 25 kg P₂O₅ ha⁻¹ as basal and 25 kg N ha⁻¹ as top dressing at 30 DAS for getting higher yield and net return.

67. Effect of sulphur on yield and oil content of sunflower

The farmers of North Saurashtra Agro-climatic Zone growing sunflower (G. Sunflower 1) in *kharif* are advised to apply 40 kg S ha⁻¹ through gypsum besides application of chemicals fertilizers (90:50 NP kg ha⁻¹).

68. Fertilizer requirement of sunflower

The farmers of North Saurashtra Agro-climatic Zone growing Sunflower (G. Sunflower 1) in *kharif* are advised to apply 45 kg N + 60 kg P₂O₅ ha⁻¹ as basal and 45 kg N ha⁻¹ as top dressing for getting higher yield and net returns.

(Agricultural Research Station, JAU, Amreli)

69. Integrated nutrient management in castor (*rabi*)-groundnut (*kharif*) crop sequence

The farmers of South Saurashtra Agro-climatic Zone adopting castor (*rabi*)-groundnut (*kharif*) crop sequence are advised to treat the castor seed with *Azospirillum* and PSB cultures in addition to 100 per cent RDF (NP 75:50 kg ha⁻¹) for obtaining higher yield and net return.

(Central Experimental Research Station, Sagadiwidi, & Department of Agril. Chem. & Soil Science, CoA, JAU, Junagadh)

70. Effect of potassium with and without Zn on yield and nutrient uptake by castor

The farmers of South Saurashtra Agro-climatic Zone growing castor in medium black calcareous soil deficient to marginal in K and Zn availability are advised to apply 50 kg K₂O + 50 kg ZnSO₄ ha⁻¹ as basal in addition to recommended fertilizer dose (75:50 NP kg ha⁻¹) for getting higher yield and net return.

(Dept. of Agril. Chem. & Soil Science, CoA, and Main Oilseed Res. Station, JAU, Junagadh)

71. The interaction effect of Zn, Fe, and K in wheat-groundnut crop sequence in calcareous black soil

The farmers of South Saurashtra Agro-climatic Zone adopting wheat-groundnut crop sequence in medium black calcareous soils (low to marginal in available K and Zn) are advised to apply 80 kg K₂O + 25 kg ZnSO₄ ha⁻¹ to wheat crop only as basal in addition to RDF (NP 120:60 and 12.5:25 kg ha⁻¹ to wheat and groundnut, respectively) for getting higher yield of crops in wheat-groundnut sequence.

(Dept. of Agril. Chem. & Soil Science, CoA, and Wheat Research Station, JAU, Junagadh)

72. Response of cotton to nitrogen sources

The farmers of South Saurashtra Agro-climatic Zone growing hybrid cotton in medium black calcareous soil are advised to apply recommended dose of nitrogen in form of urea only.

(Dept. of Agril. Chem. & Soil Sci. and Central Experimental Research Station, Sagadiwidi, JAU, Junagadh)

73. Use of *Rhizobium* and varying levels of nitrogen and phosphorus in groundnut-pigeon pea relay cropping system

The farmers of South Saurashtra Agro-climatic Zone growing pigeon pea as a relay crop in groundnut are advised to treat pigeon pea seed with *Rhizobium* culture prior to sowing (@ 25 g/kg) seed and apply 75 per cent RDF (20:37.5 NP kg ha⁻¹). The N should be applied in two equal splits i.e. first at time of sowing and the second at the time of earthing up i.e. before first irrigation for getting higher yield and net return.

(Pulses Research Station, JAU, Junagadh)

Cultural practices

74. Effect of tillage on rainfed groundnut

The farmers of South Saurashtra Agro-climatic Zone are recommended to cultivate their field by cultivator followed by harrowing and sow rainfed groundnut (GG 20) on broad bed and furrow method (90 cm width followed by 30 cm wide and 15 cm deep furrow) for getting higher yield and net return.

(Department of Agronomy, CoA, JAU, Junagadh)

75. Effect of planting and methods of fertilizer application on yield of onion seed

The farmers of South Saurashtra Agro-climatic Zone growing *rabi* onion (Gujarat White Onion 1) for seed production are recommended to plant bulbs on ridges by keeping spacing of 30 cm x 30 cm for getting higher seed yield and net profit.

(Vegetable Research Station, JAU, Junagadh)

76. Relative salinity tolerance of castor genotypes

The farmers of South Saurashtra Agro-climatic Zone having irrigation water salinity up to 2 dSm^{-1} are advised to prefer castor variety GC 3.

(Department of Agril. Chem. & Soil Science, CoA, JAU, Junagadh)

Irrigation Management

77. Feasibility of micro irrigation and organic manures in tomato

The farmers of South Saurashtra Agro-climatic Zone growing tomato (Gujarat Tomato-1) in *rabi* season are advised to irrigate the crop with drip system at 1.0 PEF for getting higher yield and net realization.

Farmers are also advised to apply recommended dose of fertilizer i.e. 75.00:37.50:62.50 NPK kg/ha along with FYM @ 10 t ha^{-1} for getting more net realization.

The system details are:

1. Lateral spacing = 90 cm
2. Dripper spacing = 60 cm
3. Dripper discharge = 4 lph
4. Operating time = 1 hour and 45 minutes at alternate day.
5. Operating pressure = 1.2 kg cm^{-2}

(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2009-10

Nutrient Management

78. 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.

79. 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.

(Main Dry Farming Research Station, JAU, Targhadia)

80. 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 *Azotobacter* for wheat to obtain higher yield and net return.

OR

Alternatively, they should apply 100 % RDF + $20 \text{ K}_2\text{O}$ kg/ha to both the crops for securing higher yield and net return.

(Main Pearl millet Research Station, JAU, Jamnagar)

81. 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.

(Main Oilseeds Research Station, JAU, Junagadh)

82. Impact of foliar application of KNO_3 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 % KNO_3 in addition to RDN (160 N kg/ha) at flowering, boll initiation and 50% boll formation to get higher yield and net income.

(Cotton Research Station, JAU, Junagadh)

Cultural practices

83. 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, Pigeon pea, Cotton.

(Main Dry Farming Research Station, JAU, Targhadia)

84. 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.

(Department of Agronomy, CoA, JAU, Junagadh)

85. Evaluation of bunch groundnut cultivars for late sown condition

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 situation for realizing higher yield and net return.

Order of preference:

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

(Main Oilseeds Research Station, JAU, Junagadh)

86. 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.



(Cotton Research Station, JAU, Junagadh)

Irrigation Management

87. Relative salinity tolerance of groundnut genotype

The 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.

(Department of Agri. Chem. & Soil Science, CoA, JAU, Junagadh)

Weed Management

88. 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 weedings at 20, 40, 60 and 80 and three interculturing at 20, 40 and 60 days after transplanting.

89. Evaluation of post emergence herbicides in groundnut

Not included as recommendation does not confirm the guideline of CIB.

(Main Oilseeds Research Station, JAU, Junagadh)

Year: 2010-11

Nutrient Management

90. 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.

91. 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.

92. 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 + *Azotobacter* @ 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 net return.

(Vegetable Research Station, JAU, Junagadh)

93. 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 returns under dry farming condition.

(Main Dry Farming Research Station, JAU, Targhadia)

94. Balance 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.

95. 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.

96. 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)

97. 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.

98. 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)

99. 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.

(Department of Ag. Chem. & Soil Sci., CoA, JAU, Junagadh)

100. 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 tonnes during first turning to get enriched compost within 120 days having higher content of all the plant nutrients.

101. 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)

Cultural practices

102. 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.

(Agro meteorological cell (Agronomy) & Wheat Research Scientist, JAU, Junagadh)

103. 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)

104. Performance of sesame varieties to pair row sowing under rainfed condition

The farmers of AES-VIII of North Saurashtra Agro-climatic Zone are advised to grow *khari*f 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)

Irrigation Management

105. 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)

Year: 2011-12

Nutrient Management

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

The farmers of North Saurashtra Agro-climatic Zone (AES XV) adopting hybrid cotton + sesame (1:1) intercropping system under rainfed condition are advised to apply 40 kg N/ha to cotton and 25 kg N/ha + 12.5 kg P₂O₅/ha to sesame for getting higher yield and net return.

(Main Dry Farming Res. Station, JAU, Targhadia & Agril. Res. Station, JAU, Nana Kandhasar)

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

The farmers of North Saurashtra Agro-climatic Zone (AES X) adopting cotton + sesame (1:1) intercropping system under rainfed condition are advised to apply 80 kg N/ha to cotton and 25 kg N/ha + 12.5 kg P₂O₅/ha to sesame crop for getting higher yield and net return.

(Main Dry Farming Res. Station, JAU, Targhadia & Agril. Res. Station, JAU, Jam Khambhalia)

108. Effect of nitrogen and bio fertilizer on yield of shaniar grass (*Sehima nervosum*)

The farmers of North Saurashtra Agro-climatic Zone growing *shaniar* grass (*khari*f) are advised to apply 60 kg N/ha in two equal splits first at 10 days after first rain and second at 30 days after first application for getting higher fodder yield.

109. Effect of phosphorus with and without K₂O on yield of anjan grass

The farmers of North Saurashtra Agro-climatic Zone growing *anjan* grass (*khari*f) are advised to apply 60 kg P₂O₅/ha as a basal dose along with recommended dose of 20 kg N/ha (10 kg as basal + 10 kg/ha at 30 DAS) for getting higher fodder yield.

110. Effect of potassium and zinc on yield and quality of fodder jowar under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone (AES-XIV) growing fodder sorghum (*khariif*) are advised to apply 40 kg K₂O + 20 kg ZnSO₄/ha along with recommended dose of fertilizers (80:40 kg NP/ha) for getting higher fodder yield.

(*Grassland Research Station, JAU, Dhari*)

111. Effect of application of potassium and zinc on growth, yield and nutrients uptake by onion and its residual effect on *khariif* groundnut in medium black calcareous soil

The farmers of South Saurashtra Agro-climatic Zone adopting onion-groundnut sequence in medium black calcareous soil are advised to apply 75 kg K₂O/ha in two splits i.e. ½ K₂O as basal + ½ at 30 DAS besides 25 kg ZnSO₄/ha and recommended fertilizer dose (75:60 kg NP/ha) to onion crop for getting higher yield and net return.

112. Bt. cotton response to potash with and without zinc

The farmers of South Saurashtra Agro-climatic Zone growing irrigated Bt. cotton on medium black calcareous soil are advised to apply potassium @ 150 kg/ha as basal or in two splits (i.e. 1/2 as basal + 1/2 at 30 DAS) along with 50 kg zinc sulphate per hectare in addition to recommended fertilizer dose (N 160 kg/ha⁻¹) for getting higher yield and net return.



113. Balance fertilization in Bt. cotton

The farmers of South Saurashtra Agro-climatic Zone growing Bt. cotton on medium black calcareous soil are advised to apply 10 t FYM/ha + 240 kg N/ha (four splits, 25 % at sowing and remaining three equal splits at 30, 60 and 90 DAS) and @ 50 kg P₂O₅/ha as basal for getting higher yield and net return.



114. Effect of soil amendments on different genotypes of gram under salt affected soil

The farmers of South Saurashtra Agro-climatic Zone having sodic soil are recommended to grow gram variety GG-4 or GG-1 and apply 10 t FYM/ha + gypsum @ 50 % G.R. for getting higher yield and net return.



(*Department of Agril. Chem. & Soil Science, CoA, JAU, Junagadh*)

115. Integrated nutrient management in garlic on sandy loam soil of Saurashtra

The farmers of North Saurashtra Agro-climatic Zone (AES-X) growing garlic are advised to apply 75 % RDF (37.5:37.5:37.5 NPK kg/ha) along with either 2.5 t FYM/ha or castor cake 300 kg/ha for obtaining higher yield and net realization.

(*Main Dry Farming Res. Stat., JAU, Targhadia & Dry Farming Res. Stat., JAU, Jam Khambhalia*)

116. Integrated nutrient management for *bajra*-cotton rotation under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone (AES-XV) adopting *bajra*-cotton rotation are recommended to apply 50 per cent of recommended dose of fertilizers (*bajra* 40:20 NP kg/ha and cotton 40 kg N/ha) along with castor cake @ 900 kg/ha for getting higher yield and net realization.

(*Main Dry Farming Res. Stat., JAU, Targhadia & Dry Farming Res. Stat., JAU, Nana Kandhasar*)

117. Evaluation for the potentiality of bio-fertilizer and organic resources for sustaining sesame yield under rainfed condition

The farmers of Western *Bhal* and Coastal Zone (AES-1(a), 1(b) and 3) growing sesame under rainfed condition are advised to apply 50 % of recommended dose of fertilizers i.e. 12.5:12.5 kg NP/ha along with 500 kg castor cake/ha and besides seed treatment of *Azotobacter* and PSB (CFU

10⁸/g) each of 30 g/kg seed for getting higher yield and net realization along with 50 % saving of fertilizers.

(Main Dry Farming Res. Station, JAU, Targhadia and Dry Farming Res. Station, JAU, Vallabhipur)

Cultural practices

118. Evaluation of different seed pellets on production of pasture grasses

The farmers of North Saurashtra Agro-climatic Zone growing *anjan* grass (*kharif*) are advised to prepare small balls containing seeds (40,000 balls/ha) using 200 kg soil + 200 kg FYM + 4 kg seeds mixture to get higher germination and fodder yield.

(Grassland Research Station, JAU, Dhari)

Weed Management

119. Weed management in *kharif* pearl millet

Not included as recommendation does not confirm the guideline of CIB.

(Main Pearl Millet Research Station, JAU, Jamnagar)

Year: 2012-13

Nutrient Management

120. Evaluation of potentiality of organic farming for groundnut (*kharif*) -garlic (*rabi*) cropping sequence

The farmers of South Saurashtra Agro-climatic Zone-VII adopting groundnut (*kharif*)-garlic (*rabi*) cropping sequence under organic farming are advised to apply FYM @ 2.5 t/ha to groundnut and 10 t/ha to garlic on sequence basis for securing higher net realization and maintaining soil fertility.

(Dept. of Agronomy and Dept. of Agril. Chem. & Soil Sci., CoA, JAU, Junagadh)

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

The farmers of South Saurashtra Agro-climatic Zone-VII adopting pearl millet (*kharif*)- wheat (*rabi*) cropping sequence are advised to apply FYM @ 8 t/ha and 50 % RDF (40:20:25 N:P₂O₅:K₂O kg/ha) to pearl millet and 120:60:25 N:P₂O₅:K₂O kg/ha to wheat to get higher yield and net realization as well as to maintain soil fertility.



(Department of Agronomy, CoA, JAU, Junagadh)

122. Integrated nutrient management in okra

The farmers of South Saurashtra Agro-climatic Zone - VII growing okra during summer season are advised to apply FYM @ 10 t/ha + half RDF (75:25:25 N:P₂O₅:K₂O kg/ha) to get higher yield and net profit.

123. Integrated nutrient management in ridge gourd

The farmers of South Saurashtra Agro-climatic Zone - VII growing ridge gourd during summer season are advised to apply FYM @ 5 t/ha and 25:12.5:12.5 N:P₂O₅:K₂O kg/ha to get higher yield and net return.

(Vegetable Research Station, JAU, Junagadh)

124. Feasibility of the organic farming in respect to sustain soil productivity under rainfed agriculture

The farmers of North Saurashtra Agro-climatic Zone-VI (AES-IV) interested to follow groundnut-sesame crop rotation under organic farming during *kharif* are advised to apply compost @ 1.25 t/ha + vermicompost @ 165 kg/ha + castor cake @ 75 kg/ha to groundnut and compost @ 5 t/ha + vermicompost @ 650 kg/ha + castor cake @ 300 kg/ha to sesame along with groundnut shell mulching @ 1 t/ha, biofertilizer (*Rhizobium* & *Azotobacter*) to both the crops @ 1.5 kg/ha and *Trichoderma* @ 2.5 kg/ha for obtaining higher net returns and sustaining soil fertility under rainfed condition.



(Main Dry Farming Research Station, JAU, Targhadia)

125. Irrigation and nutrient management in *rabi* bajra

The farmers of South Saurashtra Agro-climatic Zone - VII growing bajra in *rabi* season are advised to apply nine irrigations i.e. two common irrigations for germination and the remaining seven irrigations at 10 days interval to get higher yield and net realization. Farmers are also advised to apply fertilizer @ 120:60 N: P₂O₅ kg/ha and potassium on soil test basis.

(Dept. of Seed Science & Tech., JAU, Junagadh and Main Millet Res. Station, JAU, Jamnagar)

126. Effect of multi-micronutrient formulations on wheat

The farmers of South Saurashtra Agro-climatic Zone-VII growing wheat are advised to apply multi-micronutrients mixture Grade-V @ 40 kg/ha or apply micronutrients on soil test basis beside the recommended dose of fertilizer (120:60 N:P₂O₅ kg/ha) to get higher yield and net returns.

(Dept. of Agril. Chemistry & Soil Sci., JAU, Junagadh and Wheat Res. Station, JAU, Junagadh)

127. Efficacy of multi-micronutrient formulations for improving crop production in castor

The farmers of South Saurashtra Agro-climatic Zone-VII growing castor are recommended to apply micronutrients on soil test basis or four sprays of multi-micronutrients mixture Grade-IV @ 1 % at 45, 60, 75 and 90 DAS besides recommended dose of fertilizer (75:50:50 N:P₂O₅:K₂O kg/ha) to get higher yield and net returns.



(Dept. of Agril. Chem. & Soil Sci. and Main Oilseeds Res. Station, JAU, Junagadh)

128. Effect of multi-micronutrient formulations on pigeon pea

The farmers of South Saurashtra Agro-climatic Zone -VII growing pigeon pea are advised to apply micronutrients on soil test basis or multi-micronutrient mixture Grade-V @ 40 kg/ha besides recommended dose of fertilizer (25:50:0 N:P₂O₅:K₂O kg/ha) to get higher yield and net returns.



(Dept. of Agril. Chemistry & Soil Sci., JAU, Junagadh and Pulses Res. Station, JAU, Junagadh)

129. Balance nutrient management in groundnut (monsoon) – wheat (winter) cropping sequence on LTFE basis

The farmers of South Saurashtra Agro-climatic Zone -VII adopting groundnut (*khariif*)-wheat (*rabi*) cropping sequence are advised to apply FYM @ 10 t/ha + 6.25:12.5 N:P₂O₅ kg/ha through fertilizer to groundnut and 120:60:60 N:P₂O₅:K₂O kg/ha through fertilizer only to wheat for securing higher net return and maintaining soil fertility.



(Dept. of Agril. Chemistry & Soil Sci. and Dept. of Agronomy, CoA, JAU, Junagadh)

Cultural practices

130. Effect of sowing time and spacing on summer sesame

The farmers of South Saurashtra Agro-climatic Zone-VII growing summer sesame are advised to sow the crop in second week of February by keeping 30 cm row spacing for obtaining higher yield and net realization.

131. Evaluation of tillage practices in pigeon pea

The farmers of South Saurashtra Agro-climatic Zone-VII growing pigeon pea are advised to till the field by cross cultivation followed by blade harrowing and subsoiling between two rows to get higher yield and net realization.



(Department of Agronomy, CoA, JAU, Junagadh)

132. Response of summer sesame to date of sowing and row spacing

The farmers of North Saurashtra Agro-climatic Zone - VI growing sesame in summer season are advised to sow the crop in third week of February at a spacing of 30 cm x 10 cm to get higher yield and net return.



(Agricultural Research Station, JAU, Amreli)

133. Response of sugarcane varieties to wider row spacing

The farmers of South Saurashtra Agro-climatic Zone - VII interested to grow sugarcane at wider row spacing are advised to plant sugarcane variety CoN 05071 at 90 cm distance or in paired rows (30:150 cm) to get higher cane yield and net returns.



(Main Sugarcane Research Station, JAU, Kodinar)

134. Study of intercropping system with bunch groundnut under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone-VI (AES-XV) growing bunch groundnut under rainfed condition may also take either green gram or sesame as intercrop by keeping row ratio of 1:1 or 3: 1 to get higher yield and net return. The mothbean cultivation either as sole crop or intercrop with groundnut was not found remunerative.

(Main Dry Farming Research Station, JAU, Targhadia)

Irrigation Management

135. Response of chickpea to drip irrigation and integrated nutrient management

The farmers of South Saurashtra Agro-climatic Zone-VII growing chickpea are advised to irrigate the crop through drip system at 0.8 PEF and apply recommended dose of fertilizer i.e. 20:40 N:P₂O₅ kg/ha along with FYM @ 1 t/ha to get higher yield and net realization.

The system details are as under:

1.	Type of drip system	:	In line	
2.	Lateral diameter	:	16 mm	
3.	Lateral spacing	:	90 cm	
4.	Dripper spacing	:	60 cm	
5.	Dripper discharge	:	4 lph	
6.	Operating pressure	:	1.2 kg/cm ²	
7.	Operating frequency	:	Alternate day	
8.	Operating time	:	65 minutes	

136. Response of summer sesame to drip irrigation and nitrogen levels

The farmers of South Saurashtra Agro-climatic Zone-VII growing sesame in summer season are advised to irrigate the crop through drip system at 1.0 PEF with laying in paired row (30-60-30 cm) and apply 40 kg N/ha along with 25 kg P₂O₅/ha to get higher yield and net return.

The system details are as under:

1.	Type of drip system	:	In line
2.	Lateral diameter	:	16 mm
3.	Lateral spacing	:	90 cm
4.	Dripper spacing	:	60 cm
5.	Dripper discharge	:	4 lph
6.	Operating pressure	:	1.2 kg/cm ²
7.	Operating frequency	:	Alternate day
8.	Operating time	:	2 hrs and 35 minutes



(Department of Agronomy, CoA, JAU, Junagadh)

Weed Management

137. Integrated weed management in summer sesame

Not included as recommendation does not confirm the guideline of CIB.

(Department of Agronomy, CoA, JAU, Junagadh)

138. Integrated weed management in castor under irrigated condition

Not included as recommendation does not confirm the guideline of CIB.

(Main Oilseeds Research Station, JAU, Junagadh)

Year: 2013-14

Nutrient Management

139. Evaluation of potentiality of organic farming for groundnut (*kharif*)-wheat (*rabi*) cropping sequence

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut (*kharif*)-wheat (*rabi*) cropping sequence under organic farming are advised to apply FYM @ 2.5 t/ha to groundnut and 24 t/ha to wheat for obtaining higher yield and net return along with maintaining soil fertility.



(Department of Agronomy, CoA, JAU, Junagadh)

140. Nutrients requirement for bold seeded summer groundnut

The farmers of South Saurashtra Agro-climatic Zone growing bold seeded summer groundnut are advised to fertilize the crop with 50 kg N, 25 kg K₂O and 20 kg S (120 kg gypsum/) per hectore with recommended dose of P₂O₅ (50 kg/ha) for securing higher yield and net realization.



141. Yield maximization in groundnut through nutrient management practices during *kharif* season

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are advised to apply FYM 7.5 t/ha + recommended dose of fertilizer (12.5:25 kg N:P₂O₅/ha) + 25 kg ZnSO₄/ha as basal for obtaining higher yield and net return.



(Main Oilseeds Research Station, JAU, Junagadh)

142. Effect of biofertilizer along with molybdenum application on yield of chickpea

The farmers of South Saurashtra Agro-climatic Zone growing irrigated chickpea are advised to treat seeds with *Rhizobium* culture @ 25 g/kg seed + phosphate solubilizing bacterial culture (*Bacillus subtilis*) 30 g/kg seed along with recommended dose of fertilizers (20:40 N:P₂O₅ kg/ha) for securing higher yield and net return. Application of molybdenum in chickpea was not found advantageous.



143. Effect of different organic, inorganic and bio-fertilizers on groundnut-pigeon pea relay cropping system

The farmers of South Saurashtra Agro-climatic Zone following groundnut pigeon pea (2:1) relay cropping system are advised to apply recommended dose of fertilizers to both the crops to obtain higher yield and net returns or 50 % RDF + FYM 5 t /ha along with seed treatment of *Rhizobium* and phosphate solubilizing bacteria (each 25-30 g/kg seed) to groundnut only to reduce the dose of chemical fertilizers.



(Pulses Research Station, JAU, Junagadh)

144. Integrated nutrient management in rainfed cotton

The farmers of North Saurashtra Agro climatic zone (AES-VI) growing rainfed Bt. cotton are advised to apply 80 kg N +10 t compost + 500 kg castor cake/ha along with bio-fertilizer (*Azotobacter* + PSB) for obtaining higher yield and net return beside improving soil fertility.



(Main Dry Farming Research Station, JAU, Targhadia)

145. Effect of K application on yield of summer groundnut in calcareous soil

The farmers of South Saurashtra Agro-climatic Zone growing summer groundnut in medium black calcareous soil are advised to apply potassium @ 50 kg/ha as basal in addition to recommended dose of fertilizer (25:50 N:P₂O₅ kg/ha) for securing higher yield and net return.



146. Potassium fertilization to kharif groundnut in calcareous soil

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut in medium black calcareous soil are advised to apply potassium @ 50 kg/ha as basal in addition to recommended dose of fertilizer (12.5:25 N:P₂O₅ kg/ha) for securing higher yield and net return.

(Department of Agril. Chemistry & Soil Science, CoA, JAU, Junagadh)

Cultural practices

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

The farmers of South Saurashtra Agro-Climatic Zone growing Bt cotton are advised to prepare the field by ploughing followed by blade harrowing & planking and sow the crop on ridges (120 cm apart) for achieving higher seed cotton yield and net realization.



(Department of Agronomy, CoA, JAU, Junagadh)

148. Relay cropping of castor in soybean

The farmers of South Saurashtra Agro-climatic Zone growing soybean are advised to adopt relay intercropping system with castor by sowing castor 30 days after sowing of soybean with row ratio of 1 : 2 (castor : soybean) for securing higher yield and net return.



149. Optimization of *kharif* groundnut production under resource constraints

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are advised to follow recommended practices of weed control, plant protection and fertilizer management for obtaining higher yield and net return. However, under the situation of resource constraints, farmers are advised to prioritize their resources in order of weed control > plant protection > fertilizer management.



(Main Oilseeds Research Station, JAU, Junagadh)

150. Effect of time of sowing and hybrids on productivity of summer pearl millet

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during summer are recommended to sow the crop during second fortnight of February (30 °C average maximum temperature) to obtain higher yield and net return.

(Main Pearl millet Research Station, JAU, Jamnagar)

151. Time of planting and harvesting for early and midlate varieties of sugarcane

The farmers of South Saurashtra Agro-Climatic Zone growing sugarcane (CoC 671 and CoN 91132) are advised to plant the crop during last week of October to last week of November. The early maturing variety CoC 671 should be harvested between 11 to 12 months of planting and midlate maturing variety CoN 91132 should be harvested between 12 to 14 months of planting for securing higher cane yield and net return.



(Main Sugarcane Research Station, JAU, Kodinar)

152. Evaluation of chickpea varieties under different dates of sowing under irrigated condition

The farmers of South Saurashtra Agro-climatic Zone growing irrigated chickpea are advised to sow the crop during first fortnight of November (mean minimum temperature 19.9 °C and mean maximum temperature 34.7 °C) for securing higher yield and net return.



(Pulses Research Station, JAU, Junagadh)

153. Response of fennel to plant geometry under North Saurashtra Agro-climatic Zone

The farmers of North Saurashtra Agro-climatic Zone (AES-XV) growing *rabi* fennel are advised to sow the crop at 60 cm x 20-30 cm spacing for securing higher yield and net return.



(Main Dry Farming Research Station, JAU, Targhadia)

Year: 2014-15

Nutrient Management

154. Studies on the effect of water soluble foliar grade fertilizers on the growth and yield of summer groundnut

The farmers of South Saurashtra Agro-climatic Zone growing summer groundnut are recommended to fertilize the crop with FYM 7.5 t/ha + 60 % RDF (i.e. 15-30 kg N-P₂O₅/ha) for obtaining higher yield and net realization.



155. Effect of bio-phos on the performance of castor

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are recommended to apply 40 kg P₂O₅/ha and treat the seeds with phosphate solubilizing microorganism (*Chaetomium globosum*) @ 30 g/50 g seed along with recommended dose of nitrogen (120 kg/ha) for obtaining higher seed yield and net return.



156. Nutrient management in groundnut-Bt. cotton intercropping system

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut- Bt. cotton inter-cropping system (in 3:1 ratio) are recommended to apply 50 per cent RDF (i.e. 6.25-12.5-0 kg N-P₂O₅-K₂O/ha) to the groundnut crop and 100 per cent recommended dose of fertilizer (i.e. 160 kg N/ha) to the cotton crop for obtaining higher yield and net realization.



(Main Oilseeds Research Station, JAU, Junagadh)

157. Effect of integrated nutrient management on yield, quality and nutrient uptake by garlic under salt affected soil

The farmers of South Saurashtra Agro-climatic Zone growing garlic in salt affected soil are recommended to apply 50 % RDF (i.e. 25-25-25 kg N-P₂O₅-K₂O/ha) along with FYM @ 10 t/ha for obtaining higher bulb yield and net return.

(Dept. of Agril. Chem. & Soil Sci., CoA, JAU, Junagadh)

158. Studies of possibilities of organic farming in pearl millet–gram crop sequence

The farmers of North Saurashtra Agro-climatic Zone adopting pearl millet-gram crop sequence and interested in organic farming are recommended to apply FYM 7.5 t/ha every year to pearl millet only for securing higher net realization and to maintain soil fertility.

159. Optimization of nutrients for pearl millet production in kharif season

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during *kharif* season are recommended to apply 100 kg N and 30 kg P₂O₅/ha for obtaining higher yield and net return.

160. Nutrient management through organic and inorganic sources for major and trace elements in rainfed pearl millet

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during *kharif* season are recommended to apply ZnSO₄ and FeSO₄ @ 20 kg/ha each, along with recommended dose of fertilizers (80-40-0 kg N-P₂O₅-K₂O/ha) and FYM 5 t/ha for obtaining higher yield and net return as well as for improving grain quality.

(Main Pearl millet Research Station, JAU, Jamnagar)

Cultural practices

161. Effect of soil amendments on different genotypes of castor under salt affected soil

The farmers of South Saurashtra Agro-climatic Zone growing castor with saline irrigation water are recommended to select variety GC 3 and apply FYM @ 10 t/ha and gypsum 50 % GR (3 t/ha) along with recommended dose of fertilizers.

(Dept. of Agril. Chem. & Soil Sci., CoA, JAU, Junagadh)

162. Evaluation of preparatory and secondary tillage practices in rainfed groundnut

The farmers of South Saurashtra Agro-climatic Zone growing rainfed groundnut are recommended to adopt in-row subsoiling (20 cm depth) before sowing, interculturing at 15, 30, 45 and 60 days after sowing (DAS) and apply pendimethalin @ 900 g/ha (30 EC 60 ml/10 lit) as pre-emergence

with hand weeding at 30 and 45 DAS for achieving higher yield and net realization as well as effective moisture conservation and weed management.



(Department of Agronomy, CoA, JAU, Junagadh)

Irrigation Management

163. Effect of crop geometry and irrigation levels on sugarcane

The farmers of South Saurashtra Agro-climatic Zone growing sugarcane are recommended to adopt drip method of irrigation and plant the crop in paired rows (60-90-60 cm) and irrigate the crop at 0.9 PEF with laying laterals in each paired rows for securing higher cane yield and net return. Nitrogen and potassium should be applied at 80 per cent of recommended dose (i.e. 200-100 N-K₂O kg/ha) under drip irrigation in 10 equal splits starting from 45 DAP at an interval of 20 days.

Drip system details:

Details	Operating time-Alternate days	
	Month	Minutes
Dripper spacing: 60 cm	March-May	2 Hrs. 20 min
Dripper discharge: 4 lph	June	2 Hrs. 10 min
Operating pressure: 1.2 kg/cm ²	July-September	1 Hr. 30 min
Operating frequency: Alternate days	October-November December-January	1 Hr. 40 min 1 Hr. 25 min



(Main Sugarcane Research Station, JAU, Kodinar)

Weed Management

164. Weed management in cumin

The farmers of South Saurashtra Agro-climatic Zone growing cumin are recommended to apply oxadiargyl 75 g/ha (6 EC 25 ml/10 lit) as early post-emergence application at 7 DAS followed by hand weeding at 45 DAS for achieving higher yield and net realization as well as effective weed management.



165. Evaluation of pre and post emergence herbicides for irrigated Bt. cotton

The farmers of South Saurashtra Agro-climatic Zone growing Bt. cotton are recommended to apply pendimethalin 900 g/ha (30 EC 60 ml/10 lit) as pre-emergence followed by hand weeding and interculturing at 30 and 60 days after sowing (DAS) or pendimethalin 900 g/ha (30 EC 60 ml/10 lit) as pre-emergence followed by quizalofop 40 g/ha (5 EC 16 ml/10 lit) at 45 DAS for achieving higher yield and net realization as well as effective weed management.



(Department of Agronomy, CoA, JAU, Junagadh)

166. Weed management in *kharif* Urdbean

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* urdbean are recommended to apply quizalofop-ethyl 40 g/ha (5 EC 16 ml/10 lit water) at 20 days after sowing (DAS) and hand weeding at 40 DAS for obtaining higher yield and net realization as well as effective weed management.

(Pulses Research Station, JAU, Junagadh)

Year: 2015-16

Nutrient Management

167. Effect of potassium fertilizer on castor hybrid

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are recommended to apply potash @ 50 kg K₂O/ha (25 kg/ha as basal and 25 kg/ha at 45 days after sowing) along with recommended dose of nitrogen and phosphorus (120:50 N:P₂O₅ kg/ha) for obtaining higher seed yield and net return.



(Main Oilseeds Research Station, JAU, Junagadh)

168. Nutrient management in Bt cotton under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone (AES-10) growing Bt cotton are recommended to apply 20 kg P₂O₅, 40 kg K₂O and 20 kg sulphur (150 kg gypsum/ha) along with recommended dose of nitrogen (80 kg N/ha) for obtaining higher yield and net return as well as maintaining soil fertility under rainfed condition.

(Main Dry Farming Res. Stat., JAU, Targhadia and Dry Farming Res. Stat., JAU, Jamkhambhalia)

169. Effect of potassium and sulphur on growth and yield of wheat crop

The farmers of South Saurashtra Agro-climatic Zone growing wheat are recommended to apply 60 kg potash and 40 kg sulphur (through gypsum) per hectare as basal in addition to recommended dose of N and P (120:60 N:P₂O₅ kg/ha) to wheat crop for getting higher yield and net return.

(Department of Agril. Chem. & Soil Sci. & Wheat Research Station, JAU, Junagadh)

170. Effect of multi-micronutrient formulations on okra

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* okra in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (150:50:50 N:P₂O₅:K₂O kg/ha) to okra for getting higher yield and net return.

Alternatively, foliar spraying of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1 % at 45, 60, 75 and 90 DAS in addition to recommended dose of fertilizers (150:50:50 N:P₂O₅:K₂O kg/ha) to okra is recommended for getting higher yield and net return.



(Dept. of Agril. Chem. & Soil Sci. & Vegetable Research Station, JAU, Junagadh)

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

The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (240-50-150 N-P₂O₅-K₂O kg/ha) to Bt cotton for getting higher yield and net return.

Alternatively, foliar spraying of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1 % at 45, 60, 75 and 90 DAS in addition to recommended dose of fertilizers (240-50-150 N-P₂O₅-K₂O kg/ha) is recommended to Bt cotton for getting higher yield and net return.



(Department of Agril. Chem. & Soil Sci. & Cotton Research Station, JAU, Junagadh)

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

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut (*kharif*)-onion (*rabi*) cropping sequence are recommended to apply 50 % RDF (6.25-25 N-P₂O₅ kg/ha) for groundnut and 37.5-60-50 N-P₂O₅-K₂O kg/ha for onion + 50 % RDN as FYM to groundnut (1250 kg/ha) and onion (7500 kg/ha) for securing higher groundnut equivalent yield and net realization along with maintenance of soil fertility.

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



(Department of Agronomy, CoA, JAU, Junagadh)

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

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

(Dept. of Agronomy & Dept. of Agril. Chemistry & Soil Science, CoA, JAU, Junagadh)

Cultural practices

174. Effect of sowing time and spacing on summer cluster bean

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



(Department of Agronomy, CoA, JAU, Junagadh)

175. Identification of suitable row ratio for sesame with pigeon pea and soybean intercropping system

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

(Agricultural Research Station, JAU, Amreli)

Weed Management

176. Integrated weed management in summer sweet corn

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



(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2016-17

Nutrient Management

177. Response of castor to potash at varying crop geometry

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor in soil having medium status of potash are advised to sow castor at spacing of 150 cm x 60 cm with an application of potash @ 40 kg/ha along with recommended dose of nitrogen and phosphorus (120:50 kg NP/ha) for obtaining higher seed yield and net return.



(Main Oilseed Research Station, JAU, Junagadh)

178. Phosphorus management in sesame under rain fed condition

The farmers of North Saurashtra Agro-climatic Zone growing rainfed sesame are advised to fertilize the crop with 25 kg P₂O₅/ha as basal through SSP along with recommended dose of nitrogen (50 kg N/ha) for getting higher yield and net return.

(Main Dry Farming Research Station, JAU, Targhadia)

179. Effect of foliar fertilizer in Bt. cotton. G. Cot. Hy. 8 (BG-II)

The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton under irrigated condition are advised to apply recommended dose of fertilizer 240:50:150 NPK kg/ha) and spray water soluble fertilizer 1 % (19:19:19 NPK) at flowering, boll formation and boll development stage of the cotton to obtain higher seed cotton yield and net return.

(Cotton Research Station, JAU, Junagadh)

180. Effect of multi-micronutrient formulations on tomato

The farmers of South Saurashtra Agro-climatic Zone growing tomato in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (75:37.5:62.5 N:P₂O₅:K₂O kg/ha) to tomato for getting higher yield and net return. OR Foliar spraying of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) is recommended @ 1 % at 45, 60 and 75 DAS in addition to recommended dose of fertilizers (75:37.5:62.5 N:P₂O₅:K₂O kg/ha) to tomato for getting higher yield and net return.

181. Effect of multi-micronutrient formulations on garlic

The farmers of South Saurashtra Agro-climatic Zone growing garlic in medium black calcareous soil are advised to apply micronutrients as per soil test value as basal in addition to recommended dose of fertilizers (50:50:50 N:P₂O₅:K₂O kg/ha) for getting higher yield and net return. OR Soil application of multi-micronutrient formulation Grade V (Fe-Mn-Zn-Cu-B, 2.0-0.5-5.0-0.2-0.5 %) is recommended @ 40 kg/ha in addition to recommended of fertilizers (50:50:50 N:P₂O₅:K₂O kg/ha) to garlic for getting higher yield and net return. OR Apply foliar spray of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1 % at 60, 75 and 90 DAS in addition to recommended dose of fertilizers (50:50:50 N:P₂O₅:K₂O kg/ha) to garlic for getting higher yield and net return.

(Department of Agril. Chem. & Soil Sci. and Vegetable Research Station, JAU, Junagadh)

Cultural practices

182. Optimizing spacing for medium duration pigeon pea varieties under pigeon pea + Uradbean inter cropping system

The farmers of South Saurashtra Agro-climatic Zone adopting pigeon pea + uradbean (without fertilizer) inter cropping system are advised to sow pigeon pea at 120 cm x 30 cm spacing and two rows of uradbean in between two rows of for getting higher yield and net return.

(Pulses Research Station, JAU, Junagadh)

183. Suitability of pearl millet hybrids under varying time of sowing during semi rabi season

The farmers of North Saurashtra Agro-climatic Zone growing hybrid pearl millet during semi rabi season are recommended to sow the pearl millet early maturing variety GHB 538 during first week of October to obtain higher yield and net return.

(Main Pearl millet Research Station, JAU, Jamnagar)

Irrigation Management

184. Response of cumin to drip irrigation and integrated nutrient management

The farmers of South Saurashtra Agro-climatic Zone growing cumin are advised to irrigate the crop with drip system at 0.6 PEF for getting higher yield and net realization which saves 12.4 % water. Farmers are also advised to apply 75% recommended dose of fertilizer (22.5:11.2:0 kg NPK/ha) along with FYM @ 5 t/ha for getting maximum yield and net return.

The system details as under:

Details	Operating time	
	Month	Minutes
Lateral spacing: 60 cm	Dec.-Jan.	20
Dripper spacing: 45 cm	Feb.-March	30
Dripper discharge rate: 4 lph		
Operating pressure: 1.2 kg/cm ²		
Operating frequency: Alternate day		



185. Drip irrigation and fertilizer in drilled *rabi* fennel

The farmers of South Saurashtra Agro-climatic Zone growing *rabi* drilled fennel are advised to irrigate the crop with drip system at 0.8 PEF and apply 120:45:0 NPK kg/ha out of which full dose of phosphorus and 25 % nitrogen as basal and remaining 75 % nitrogen in three equal splits at 20 DAS interval after sowing through drip for getting higher yield and net return.

The system details as under:

Details	Operating time	
	Month	Minutes
Lateral spacing: 120 cm (45-75-45 cm paired row)	December	58
Dripper spacing: 45 cm	January	62
Dripper discharge rate: 4 lph	February	75
Operating pressure: 1.2 kg/cm ²	March	95
Operating frequency: Alternate day	April	120



(Department of Agronomy, CoA, JAU, Junagadh)

186. Evaluation of drip fertigation on castor productivity

The farmers of South Saurashtra Agro-climatic Zone growing castor are advised to irrigate the crop at 0.8 PEF through drip irrigation and apply nitrogen @ 90 kg/ha (20 kg N/ha as a basal and remaining 70 kg N/ha through drip in form of urea in five equal splits at an interval of 12 days starting after cessation of monsoon) along with recommended dose of phosphorus (50 kg/ha) as basal for obtaining higher yield and net return.

The system details are as under:

Details	Operating time	
	Month	Minutes
Lateral spacing : 120 cm	October	110-125
Dripper spacing : 60 cm	November	100-110
Dripper discharge rate : 4 lph	Dec.-Jan.	95-105
Operating pressure : 1.2 kg/cm ²	-	-
Operating frequency: Every 3 rd day irrigation	-	-



187. Response of summer groundnut to fertilizer dose and plant population under drip and check basin method

The farmers of South Saurashtra Agro-climatic Zone growing summer groundnut are advised to apply initially two normal irrigations and remaining through drip at 0.8 PEF (20 DAS) and apply water soluble fertilizer (N:P:K: 17:44:0) @ 75 % of RDF (18.75:37.5 kg NP/ha) in five equal splits through fertigation at an interval of 8 days starting from 20 DAS and maintain spacing 20 cm x 10 cm (plant population @ 5.00 lakh/ha) for higher yield and net return which gives 23 per cent water and 25 per cent fertilizer saving.

The system details are as under:

Details
Lateral spacing : 60 cm
Dripper spacing : 45 cm
Dripper discharge rate : 4 lph
Operating pressure : 1.2 kg/cm ²
Operating frequency : Alternate day

Operating time	
Month	Minutes
February	75-80
March	100-110
April	120-125
May	130-135
-	-



(Main Oilseeds Research Station, JAU, Junagadh)

Weed Management

188. Integrated weed management in organically grown groundnut

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut under organic farming are advised to adopt stale seedbed technique (pre-sowing irrigation + killing of weed flush by harrowing) and keep weed free condition throughout the crop growth period or carry out hand weeding and interculturing at 15, 30 and 45 days after sowing for effective control of weeds and securing higher net realization.



(Department of Agronomy, CoA, JAU, Junagadh)

189. Weed management practices in spring planted sugarcane-based intercropping system

The farmers of South Saurashtra Agro-climatic Zone interested to grow spring-planted sugarcane with intercropping system are advised to grow one row of sesame or green gram or black gram as intercrop without fertilizer application in sugarcane planted at 90 cm row spacing for securing higher yield and net return. Weed control should be done with two hand weeding at 20 and 40 days after sowing of intercrop.

(Main Sugarcane Research Station, JAU, Kodinar)

Year: 2017-18

Nutrient Management

190. Comparative efficacy of PSB and bio-phos on the performance of castor

The farmers of South Saurashtra Agro-climatic Zone growing irrigated castor are recommended to apply PSB in soil @ 2.0 L/ha and 40 kg P₂O₅ along with recommended dose of N and K (120-50 kg/ha) for obtaining higher seed yield and net return.



(Main Oilseeds Research Station, JAU, Junagadh)

191. Effect of multi-micronutrient formulations on brinjal

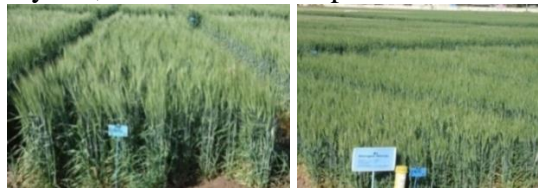
The farmers of South Saurashtra Agro-climatic Zone growing late *khari* brinjal in medium black calcareous soil are recommended to apply micronutrients as per soil test value as basal **OR** apply foliar spray of multi-micronutrient formulation Grade IV (Fe-Mn-Zn-Cu-B, 4.0-1.0-6.0-0.5-0.5 %) @ 1% at 45, 60 and 75 DATP in addition to recommended dose of fertilizers (100 - 37.5 - 37.5 N-P₂O₅-K₂O kg/ha) to brinjal for getting higher yield and net return.



(Department of Agril. Chem. & Soil Sci. and Vegetable Research Station, JAU, Junagadh)

192. Nitrogen management in wheat crop

The farmers of South Saurashtra Agro-climatic Zone growing wheat in medium black calcareous soil are recommended to apply nitrogen @ 120 kg/ha in three splits (¼ as basal + ½ at 20 to 25 DAS + ¼ at 35 to 40 DAS) instead of two splits in addition to recommended dose of P₂O₅- K₂O (60 - 60 kg ha⁻¹) for getting higher yield, net return and improve nutrient use efficiency.



(Department of Agril. Chem. & Soil Sci. and Wheat Research Station, JAU, Junagadh)

193. Effect of soil amendments on different varieties of soybean (*Glycine max* L.) under sodic soil

The farmers of South Saurashtra Agro-climate Zone growing soybean in sodic soil during *khari* season are recommended to grow soybean variety NRC-37 and apply FYM @ 10 t ha⁻¹ + Gypsum @ 50 % GR along with recommended dose of 30:60:00 kg N:P₂O₅:K₂O ha⁻¹ for obtaining higher yield and net realization.

(Department of Agril. Chem. & Soil Sci. and Agril. Research Station (FC), JAU, Mahuva)

194. Effect of nutrients management modules for minimizing drought impact and groundnut yield maximization in rainfed region

The farmers of North Saurashtra Agro-climatic Zone growing semi spreading groundnut crop are recommended to spray urea @ 2% at 30 to 35 DAS along with recommended dose of 12.5-25 N-P kg/ha for obtaining higher yield and maximum net return.

195. Effect of zinc fertilization on wheat yield in sandy loam

The farmers of North Saurashtra Agro-climatic Zone (AES-10) growing wheat are recommended to apply ZnSO₄ @ 20 kg ha⁻¹ as basal along with two foliar sprays of ZnSO₄ @ 0.5 % (50 g/10 lit. water) at heading and milking stages with recommended dose of fertilizer (120-60-60 NPK kg/ha) for obtaining higher yield and net realization.

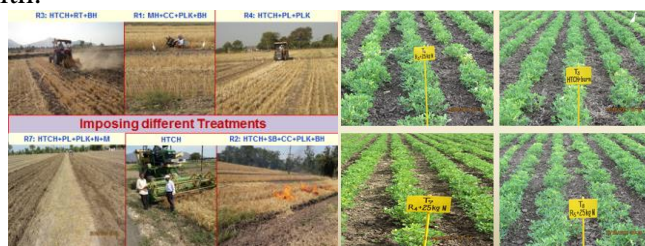
(Main Dry Farming Research Station, JAU, Targhadia)

Cultural practices

196. Tillage practices for residue management in groundnut-wheat cropping sequence

The farmers of South Saurashtra Agro-climatic Zone who are adopting wheat (*rabi*)-fallow-groundnut (*khari*) crop sequence are advised to harvest the wheat crop by combined harvester and incorporate the wheat straw in the soil with rotavator and blade harrowing + application of 12 kg N/ha (26 kg urea/ha) + Madhyam culture @ 5 kg/ha and give a light irrigation to the soil through

sprinkler irrigation system to secure higher production and profitability of *kharif* groundnut as well as to sustain the soil health.



197. Cropping system diversification and/or intensification

The farmers of South Saurashtra Agro-climatic Zone adopting groundnut (*kharif*) - wheat (*rabi*) cropping system are recommended to replace the system with any one of the following intensified cropping systems to secure higher yield and net profit.

<i>Kharif</i>	<i>Rabi</i>	Summer
Two rows of groundnut (semi spreading) at 60 cm + one row of sweet corn.	Two rows of coriander (seed) at 45 cm + one row of vegetable pea.	Two rows of sesame at 45 cm + one row of vegetable cowpea.
OR		
Clusterbean (seed) at 45 cm.	Paired row of fennel at 60 cm + eight rows of garlic at 15 cm.	Two rows of sesame at 45 cm + two rows of fodder sorghum at 22.5 cm.



(Department of Agronomy, CoA, JAU, Junagadh)

198. Groundnut based cropping system under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone adopting bunch groundnut based intercrop system under rainfed condition are recommended to grow groundnut with cotton in 2:1 row ratio for getting higher yield and net return.

(Main Dry Farming Research Station, JAU, Targhadia)

199. Moisture stress management in sugarcane

The farmers of South Saurashtra Agro-climatic Zone interested to grow spring-planted sugarcane under water deficit condition during formative stage are recommended to apply trash mulch @ 5 t/ha at 4-6 days after planting and foliar spray of urea + muriate of potash both @ 2.5 % (2.5 kg urea + 2.5 kg KCl in 100 litres of water) at 60, 80 and 100 days after planting for securing higher cane yield and net return.



(Main Sugarcane Research Station, JAU, Kodinar)

Irrigation Management

200. Evaluation of precision land levelling in wheat

The farmers of South Saurashtra Agro-climatic Zone growing wheat in *rabi* season are recommended to apply 10 irrigations, first immediately after sowing and remaining 9 irrigations at 8-10 days interval (at 0.9 IW/CPE ratio) for securing higher yield and 10 per cent water saving.



(Department of Agronomy, CoA, JAU, Junagadh)

201. Effect of different irrigation scheduling and irrigation interval through drip on chickpea

The farmers of South Saurashtra Agro-climatic Zone growing chickpea under drip irrigation system are recommended to irrigate the crop with drip system at 0.8 ETC at 5 days interval through drip after two flood irrigations for getting higher yield, net return and 27 % saving of irrigation water. The system details are as under:

Lateral spacing: 90 cm Dripper spacing: 45 cm Dripper discharge rate: 4 LPH Operating pressure: 1.2 kg/cm ² Operating frequency: every 5 th day irrigation	Operating time	
	Month	Minutes
	December	57
	January	104
	February	65



202. Irrigation management through critical stages of chickpea

The farmers of South Saurashtra Agro-climatic Zone interested to grow chickpea under water crisis condition are recommended to irrigate the chickpea crop at four critical stages like branching, flowering, pod initiation and grain filling apart from two common irrigations, first immediately after sowing and second at 6-7 days after sowing for getting higher yield and saving 17 per cent of irrigation water.



(Pulses Research Station, JAU, Junagadh)

Weed Management

203. Integrated weed management in okra

The farmers of South Saurashtra Agro-climatic Zone growing okra in *kharif* season are recommended to carry out hand weeding at 15, 30 and 45 DAS for effective weed management and achieving higher fruit yield and net realization.



204. Integrated weed management in *rabi* fennel

The farmers of South Saurashtra Agro-climatic Zone growing fennel in *rabi* season are recommended to carry out two hand weeding and inter culturing at 20 and 40 DAS for effective weed management and achieving higher seed yield and net realization.

(Department of Agronomy, CoA, JAU, Junagadh)

Year: 2018-19

Nutrient Management

205. Herbicidal control of purple nutsedge

The farmers of South Saurashtra Agro-climatic Zone are recommended to spray either tank-mix glyphosate 1230 g/ha (41 % SL 60 ml/10 L water) + halosulfuron-methyl 33.75 g/ha (75 % WG 0.9 g/10 L water) or halosulfuron-methyl 67.5 g/ha (75 % WG 1.8 g/10 L water) at 30 days after emergence for effective control of purple nutsedge under non-cropped condition during summer season. These herbicides have no residual effect on the succeeding *kharif* crops (groundnut, pearl millet, cotton and sesame) grown 90 days after spray.



(Department of Agronomy, JAU, Junagadh)

206. Fertilizer management in groundnut + castor (3:1) intercropping system under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing groundnut+castor (3:1) intercropping system are recommended to apply 75 % of recommended fertilizer dose to groundnut and 100 % recommended fertilizer dose to castor on area basis of both the crops for obtaining higher yield and net return.

(Main Dry Farming Res. Station, JAU, Targhadia)

207. Performance of pearl millet hybrid and popular cultivars under organic condition

The farmers of North Saurashtra Agro-climatic Zone adopting organic farming of pearl millet are recommended to apply FYM 10 t/ha and sow pearl millet hybrid GHB 732 or GHB 744 or GHB 538 for achieving higher yield and net realization, maintaining soil fertility and improving quality of produce.



(Main Pearl millet Research Station, JAU, Jamnagar)

208. Effect of N, P and K fertilizers on growth, yield and nutrients uptake by brinjal

The farmers of South Saurashtra Agro-climatic Zone growing brinjal under medium black calcareous soil in late *kharif* season are recommended to apply nitrogen @ 125 kg/ha in four equal splits (Basal, 25, 50 and 75 days after transplanting), P₂O₅ @ 50 kg/ha and K₂O @ 50 kg/ha as basal for achieving higher yield and net return.



(Dept. of Agril. Chem. & Soil Sci. and Vegetable Research Station, JAU, Junagadh)

Cultural practices

209. Evaluation of groundnut + sweet corn mix/inter cropping systems

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut are recommended to adopt paired row (45-75-45 cm) groundnut + sweet corn (2:1) or groundnut + sweet corn (3:1) additive intercropping system for achieving higher net returns as compared to sole groundnut.



(Department of Agronomy, CoA, JAU, Junagadh)

210. Optimization of seed rate and spacing in semi-spreading groundnut cultivars having differential seed sizes

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* semi-spreading groundnut varieties having seed index of 42-45 and 50-52 g/100-seed are recommended to sow at spacing of 45 cm x 10 cm with seed rate of 110 and 125 kg/ha, respectively for obtaining higher yield and net returns.



(Main Oilseeds Research Station, JAU, Junagadh)

211. Production potential and economics of Bt cotton based intercropping system under rainfed condition

The farmers of North Saurashtra Agro-climatic Zone adopting *Bt* cotton-based intercropping system under rainfed condition are recommended to intercrop one row of cowpea or sesame or groundnut or green gram in between two rows of cotton (Spacing: 120 cm x 30 cm) for obtaining higher yield and net return.



(Main Dry Farming Res. Station, JAU, Targhadia)

212. Effect of spacing on castor under conserved moisture condition at Ratia

The farmers of North Saurashtra Agro-climatic Zone growing castor in *Ghed* area under conserved soil moisture are recommended to sow the castor at 120 cm x 60 cm for obtaining higher yield and net return.

(Dry Farming Res. Station, JAU, Ratia & Main Dry Farming Res. Station, JAU, Targhadia)

Irrigation Management

213. Response of Bt cotton to high density planting and nitrogen levels through fertigation

The farmers of South Saurashtra Agro-climatic Zone growing *Bt* cotton (Cv. G.Cot.Hy.-8 BG-II) under high density planting are recommended to sow the crop at 30-60-30 cm x 30 cm or 30-90-30 cm x 30 cm in paired row and fertilized with 125 % RDN (300 kg N/ha) in eight equal splits at 15 days interval through drip fertigation along with 50 kg P₂O₅ and 150 kg K₂O/ha for obtaining higher yield and net return.

Details of drip system

Details of drip system particular	Detail	Duration of irrigation
Lateral spacing	90 cm	Oct.: 1 hour 30 minutes
Dripper distance	40 cm	Nov.: 1 hour 20 minutes
Dripper discharge rate	4 lph	Dec.: 1 hour 15 minutes
Operation pressure	1.2 kg/cm ²	
Irrigation interval	Alternate day	



(Department of Agronomy, CoA, JAU, Junagadh)

Weed Management

214. Integrated weed management in Indian bean

The farmers of South Saurashtra Agro-climatic Zone growing Indian bean in *rabi* season are recommended to carryout hand weeding at 15, 30 and 45 DAS for effective weed management and achieving higher seed yield and net realization.



215. Post-emergence weed management in wheat

The farmers of South Saurashtra Agro-climatic Zone growing wheat are recommended to carry out hand weeding at 15 DAS *fb* either ready-mix sulfosulfuron + metsulfuron 32 g/ha (75 + 5 % WDG 0.8 g/10 l water) or ready-mix clodinafop + metsulfuron 64 g/ha (15 + 1 % WP 8 g/10 l water) at 30 DAS or hand weeding at 15 and 30 DAS as per availability of labourers for effective weed management along with higher yield and net returns.



(Department of Agronomy, CoA, JAU, Junagadh)

216. Weed control in kharif groundnut

The farmers of North Saurashtra Agro-climatic Zone growing groundnut during *kharif* season are recommended to keep their crop weed free through hand weeding and interculturing at 15, 30, 45 and 60 DAS or apply Quizalofop-ethyl 40 g/ha at 20 DAS *fb* IC & HW at 40 DAS for effective weed management as well as to obtain higher yield and net return.

(Main Dry Farming Res. Station, JAU, Targhadia)

217. Weed management in autumn planted sugarcane-chickpea intercropping system

The farmers of South Saurashtra Agro-climatic Zone growing autumn-planted sugarcane are recommended to grow one row of chickpea as an intercrop in sugarcane planted at 90 cm row spacing for securing higher yield and net return. Weed control should be done with two hand weeding at 30 and 60 days after sowing of the intercrop.



(Main Sugarcane Research Station, JAU, Kodinar)

Year: 2019-20

Nutrient Management

218. Evaluation of different *kharif* groundnut varieties under organic farming

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* bunch groundnut under organic farming are recommended to apply 50 % RDN through FYM (1250 kg/ha) + 50 % RDN through vermicompost (312.50 kg/ha) for higher pod yield and net return.



219. Application of bio-formulations in *kharif* groundnut production

The farmers of South Saurashtra Agro-climatic Zone growing groundnut during *kharif* season are recommended to apply 75 % recommended dose of chemical fertilizers (9.37-18.75-37.5 kg NPK/ha) with seed treatment of NPK liquid bio-fertilizer (250 ml for seed of 1 ha) + Zn solubilizing bacteria (125 ml for seed of 1 ha) for obtaining higher pod yield and net return.



(Main Oilseeds Research Station, JAU, Junagadh)

220. Nutrient and pest management in pigeon pea

The farmers of South Saurashtra Agro-climatic Zone, growing *kharif* pigeon pea are recommended to apply recommended dose of fertilizer (25-50-50 N-P₂O₅-K₂O kg/ha) and spray of indoxacarb 14.5 SC 0.010 % (7 ml/10 L of water) at 50 % flowering and spray of chlorantraniliprole 18.5 SC 0.006 % (3 ml/10 L of water) 15 days after 1st spray.

Alternatively, apply recommended dose of fertilizer (25-50-50 N-P₂O₅-K₂O kg/ha) and spray of multi micronutrient formulation Grade IV 20 ml/10 liter and spray of indoxacarb 14.5 SC 0.010 % (7 ml/10 L of water) at 50 % flowering and spray of chlorantraniliprole 18.5 SC 0.006 % (3 ml/10 L of water) 15 days after 1st spray for obtaining higher seed yield and net realization.



Recommendation for PHI as per CIB guidelines									
Year	Crop	Pest	Pesticides with formulation	Dosage			Dilution in water	Application schedule	Waiting period/ PHI (days)
				g a.i./ ha	Quantity of formulation (g or ml/ha)	Conc. (%)			
2020	Kharif pigeon pea	Pod borer complex	Indoxacarb 14.5 SC	50.75	350	0.010	500 liters	First spray at 50 % flowering	15
			Chlorantraniliprole 18.5 SC	27.75	150	0.006		Spray at 15 days interval after 1 st spray	29

(Pulses Research Station, JAU, Junagadh)

221. Effect of mulching and hydrogel on the productivity of pearl millet in rainfed condition

The farmers of North Saurashtra Agro-climatic Zone growing pearl millet in *kharif* season are recommended to apply hydrogel (350 µm mesh) 2.5 kg/ha as soil application at the time of sowing + pearl millet straw mulch 5.0 t/ha at 30 days after sowing for getting higher yield and net returns and improving moisture availability in soil.



(Main Pearl millet Research Station, JAU, Jamnagar)

222. Effect of multi-micronutrient formulations on papaya

The farmers of South Saurashtra Agro-climatic Zone growing papaya in medium black calcareous soil are recommended to apply multi micronutrients formulation Grade-V (40 g/plant) as basal or micronutrient as per soil test value in addition to recommended dose of chemical fertilizers (200-200-250 N-P₂O₅-K₂O g/plant) as well as 5 kg FYM/plant to papaya for getting higher yield and net return.



(Dept. of Agril. Chem. & Soil Sci. and Dept. of Horticulture, CoA, JAU, Junagadh)

223. Effect of nano boron on yield and nutrients uptake by kharif groundnut

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut in medium black calcareous soil are recommended to apply three sprays of 0.2 % boric acid **OR** 0.2 % nano boron (20 ml/10 lit water) at 30, 45 and 60 DAS in addition to recommended dose of fertilizers (12.5-25-50 N-P₂O₅-K₂O kg/ha) to *kharif* groundnut for getting higher yield and net return.



(Dept. of Agril. Chem. & Soil Sci., & Main Oilseed Research Station, JAU, Junagadh)

224. Effect of N, P and K levels on growth, yield and nutrients uptake by coriander

The farmers of South Saurashtra Agro-climatic Zone growing coriander are recommended to apply 40 kg N/ha in two equal splits (½ as basal and ½ at 30 DAS), 30 kg P₂O₅/ha and 20 kg K₂O/ha as basal for getting higher seed yield and net return.

(Dept. of Agril. Chem. & Soil Sci., & Vegetable Research Station, JAU, Junagadh)

Cultural Practices

225. Influence of plant geometry and fertilizer levels on the productivity of semi-spreading groundnut

The farmers of South Saurashtra Agro-climatic Zone growing semi-spreading groundnut during *kharif* are recommended to sow at a spacing of 45 cm x 10 cm (seed rate 135 kg/ha) and apply either 50 % RDF (6.25-12.5-25 N-P₂O₅-K₂O kg/ha) + 50 % RDN through FYM (1250 kg/ha) + Bio-fertilizer (*Rhizobium* 10 ml/kg seed, PSB & KMB soil application 3.0 liter/ha) or 100 % RDF (12.5-25-50 N-P₂O₅-K₂O kg/ha) + Bio-fertilizer (*Rhizobium* 10 ml/kg seed, PSB & KMB soil application 3.0 liter/ha) for obtaining higher pod yield and net return.



(Main Oilseeds Research Station, JAU, Junagadh)

226. Screening of sesame varieties/germplasm lines for yield performance under organic condition in summer season

The farmers of South Saurashtra Agro-climatic Zone of Gujarat state interested to grow summer sesame in organic condition are recommended to grow sesame variety G. Til 4 or GJT 5 or G. Til 6 for achieving higher seed yield.



(Agricultural Research Station, JAU, Amreli)

Irrigation Management

227. Response of rabi onion (*Allium cepa* L.) to levels and application schedule of soluble fertilizers under drip irrigation

The farmers of South Saurashtra Agro-climatic Zone growing *rabi* onion (Cv. Pilipatti) are recommended to apply 5 t FYM/ha along with 75 % RDF (i.e. 56.25-45.00-37.50 kg N-P₂O₅-K₂O/ha) in water soluble form through drip fertigation in six equal splits at 10 days interval after two common flood irrigations for getting higher yield and net return.

Details of drip system Particular	Detail	Particular	Detail
Later spacing	90 cm	Dripper distance	40 cm
Operation pressure	1.2 kg/cm ²	Irrigation interval	Alternate day
Dripper discharge rate	4 l/hr		



Weed Management

228. Integrated weed management in soybean

The farmers of south Saurashtra Agro-climatic zone growing soybean are recommended to apply pre-mix pendimethalin + imazethapyr 800 g/ha (30 + 2 % EC 50 ml/10 l water) as pre-emergence *fb* IC & HW at 40 DAS or IC & HW at 20 & 40 DAS for effective weed management and achieving higher seed yield and net realization.



(Department of Agronomy, CoA, JAU, Junagadh)