

## **Recommendations for farmers and Scientific Community (March 2020 to November 2025)**

### **Recommendation for Farmers: 2020-21**

#### **Recommendation No. 1**

##### **Title: Effect of multi-micronutrient formulations on chickpea**

The farmers of South Saurashtra Agro-climatic Zone growing chickpea in medium black calcareous soil are recommended to apply multi micronutrients formulation Grade-V (40 kg/ha) as basal or micronutrients as per soil test value in addition to recommended dose of chemical fertilizers (20-40-0 N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O kg/ha) to chickpea for getting higher yield and net return.

#### **Recommendation No. 2**

##### **Title: Effect of foliar application of various fertilizers on growth, yield and nutrients uptake by onion**

The farmers of South Saurashtra Agro-climatic Zone growing onion in medium black calcareous soil are recommended to apply 75% RDF (56-45-37.5-15 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O-S) + 1 % (100 g/10 liter water) foliar spray of water soluble fertilizer (19-19-19 N-P-K) and 1 % Banana pseudostem sap both at 45 and 60 day after transplanting for getting higher yield and net return.

#### **Recommendation No. 3**

##### **Title: Effect of foliar application of water soluble fertilizer on growth, yield and nutrients uptake by Bt. cotton**

The farmers of South Saurashtra Agro-climatic Zone growing Bt cotton in medium black calcareous soil are advised to apply 75% RDF (180-37.5-112.5 N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O kg/ha) + two spray of 2.0 % water soluble fertilizer (19-19-19) at 50 and 75 DAS to Bt cotton for getting higher yield and net return.

### **Recommendation for Scientific Community :**

#### **Recommendation No. 1**

##### **Title: Soil test based fertilizer recommendation for targeted yield of wheat**

The scientist of soil testing laboratories are informed that the nutrients requirement for production of one quintal wheat grain was assessed as 3.81, 0.82 and 3.40 kg; N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively and the fertilizer prescription equations are: for N: [FN = 6.82 x T - 1.01 x SN - 0.27 x FYM], P: [FP<sub>2</sub>O<sub>5</sub> = 1.80 x T - 2.25 x SP - 0.09 x FYM] and K: [FK<sub>2</sub>O = 3.14 x T - 0.46 x SK - 0.27 x FYM] with FYM 10 t ha<sup>-1</sup>. While, without FYM nutrients requirement for production of one quintal wheat grain was assessed as 3.52, 0.77 and 3.02 kg; N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively and the fertilizer prescription equations are: for N: [FN = 8.53 x T - 1.19 x SN], P: [FP<sub>2</sub>O<sub>5</sub> = 2.61 T - 3.07 x SP] and K: [FK<sub>2</sub>O = 5.03 x T - 0.68 x SK]. Targeted yield concept could be effectively adopted up to 50 q/ha for site specific fertilizer recommendation to achieve high yields of wheat in the medium black calcareous soils of Saurashtra region of Gujarat.

#### **Recommendation No. 2**

##### **Title: Establishment of critical limit of zinc for summer green gram in medium black calcareous soils**

For recommending Zn application to green gram crop grown in calcareous soils of Saurashtra, STL of Gujarat should consider the critical limit 0.70 ppm in soil and 47.0 ppm in green gram plant at 45 DAS.

#### **Recommendation No. 3**

##### **Title: Establishment of critical limit of zinc for pigeonpea crop in medium black calcareous soils**

For recommending Zn application to pigeonpea crop grown in calcareous soils of Saurashtra, STL of Gujarat should consider the critical limit of 0.63 ppm in soil and 33.9 ppm in pigeonpea plant at 60 DAS.

#### **Recommendation No. 4**

##### **Title : Effect of saline irrigation water on garlic**

It is for the information to scientific community especially for the plant breeder that garlic varieties GJG-5 recorded value of different salt tolerance criteria like higher mean

salinity index (77.00%), comparable mean bulb yield (54.78), minimum yield decline (43.61) at EC 5.0 dS m<sup>-1</sup> and for 50 % yield reduction at EC 9.32 as well as lower Na/K ratio in bulb (GJG-5) and straw (GJG-5). Garlic varieties GJG-5 were found more salt tolerant as compared to GG-4, G-282 and GG-2 on the basis of salinity indices.

#### **Recommendation No. 5**

##### **Title: Effect of saline irrigation water on sesamum**

It is for the information to scientific community especially for the plant breeder that sesamum variety Guj. Til-3 recorded value of different salt tolerance criteria like higher mean seed yield (19.69 g/pot), comparable with other varieties of mean salinity index (71.82 %), yield decline (38.51 %) at 5.0 dS m<sup>-1</sup> and for 50% yield reduction at EC 9.47 dS m<sup>-1</sup>, as well as lower Na/K ratio in seed (0.253) and straw (0.551).

#### **Recommendation for Farmers: 2021-22**

#### **Recommendation No. 1**

##### **Title: Effect of nano boron on yield and nutrients uptake by summer groundnut**

The farmers of South Saurashtra Agro-climatic Zone growing summer groundnut in medium black calcareous soil are advised to apply three sprays of 0.2% (20 ml/10 lit water) nano boron OR 0.2% (20 g/10 lit water) boric acid at 30, 45 and 60 DAS in addition to recommended dose of fertilizers (25-50-50 N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O kg ha<sup>-1</sup>) to summer groundnut for getting higher yield and net return.

#### **Recommendation No. 2**

##### **Title: Effect of different levels of NPK and time of application on cucumber yield under protected condition**

The farmers of South Saurashtra Agro-climatic Zone growing cucumber during *kharif* under protected conditions are advise to apply 80-50-50 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O in form of water soluble fertilizer and urea through fertigation in four equal splits i.e. basal, 30, 45 and 60 DAS for getting higher yield and net return.

#### **Recommendation No. 3**

##### **Title: Integrated management practices in groundnut under poor drained medium**

## **black calcareous soil**

The farmers of South Saurashtra Agro-climatic Zone growing *kharif* groundnut under poor drained medium black calcareous soil are advised to apply tanch 50 t/ha every three year for getting higher yield and net return.

### **Recommendation for Scientific Community :**

#### **Recommendation No. 1**

##### **Title: Evaluation of cow pea varieties for salinity tolerance**

It is for the information of scientific community especially for plant breeders that cowpea variety GC 1 recorded value of different salt tolerance criteria like higher mean salinity index (81.07), higher mean seed yield (15.81 g/plant), minimum yield decline (29.1 %) at 8.0 dSm<sup>-1</sup> and for 50 % yield reduction at EC 7.68 dSm<sup>-1</sup>, as well as lower Na/K ratio in seed and stalk. Cowpea variety GC 1 was found more salt tolerant compared to other varieties on the basis of salinity indices. The sequential order of salinity tolerance for cowpea varieties was observed GC 1 > AVC 1 > Pusa Falguni > GC 2.

#### **Recommendation No. 2**

##### **Title: Effect of saline irrigation water on pearl millet**

It is for the information to scientific community especially for the plant breeder that pearl millet variety GHB-1129 recorded value of different salt tolerance criteria like higher mean salinity index (79.25%), higher mean grain yield (504.0 g/plot), minimum yield decline (32.49%) at 8.0 dS/m and for 50% yield reduction at 11.21 dS/m, as well as lower Na/K ratio in grain and fodder. Pearl millet variety GHB-1129 was found more salt tolerant compared to other varieties on the basis of salinity indices. The sequential order of salinity tolerance for pearl millet variety was observed GHB-1129 > GHB-538 > GHB-732 > GHB-558.

#### **Recommendation No. 3**

##### **Title: Periodical evaluation of soil fertility status of Saurashtra region**

It is informed to scientific community that, in periodical soil survey of third decayed

started from 1990, the range and mean value of Physico-chemical properties of Saurashtra soil are as below;

<b>pH</b>	<b>EC dS/m</b>	<b>CaCO<sub>3</sub> (g/kg)</b>	<b>CEC cmol(P+) kg<sup>-1</sup></b>	<b>Ex. Ca me/100g</b>	<b>Clay (%)</b>	<b>ESP (%)</b>
6.95-8.90 (7.92)	012-2.82 (0.6)	9.6-181.8 (38.8)	7.17-47.10 (24.56)	1.00-34.00 (15.54)	12.25- 65.36 (37.63)	1.31-19.65 (7.36)
<b>OC (%)</b>	<b>Avail. N (kg ha<sup>-1</sup>)</b>	<b>Avail. P<sub>2</sub>O<sub>5</sub> (kg ha<sup>-1</sup>)</b>	<b>Avail. K<sub>2</sub>O (kg ha<sup>-1</sup>)</b>	<b>Heat Soluble S (ppm)</b>		
0.21-0.86 (0.46)	97-442 (260)	4.6-74.9 (32.5)	142-597 (341)	4.3-46.3 (17.7)		

Nutrient index values for available N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O and S were 1.50, 1.68, 2.68 and 2.19, respectively. Based on nutrient index values, the soils of Saurashtra region categorized in low in available N, medium in available P<sub>2</sub>O<sub>5</sub> and S whereas, high in available K<sub>2</sub>O. While, nutrient index values for DTPA extractable micronutrients were 1.47, 2.70, 2.07 and 3.00 for Fe, Mn, Zn and Cu, respectively. Based on nutrient index values, the soils of Saurashtra region categorized in low in available Fe, medium in Zn and high in Mn and Cu.

#### **Recommendation No. 4**

##### **Title: Establishment of critical limit of zinc for soybean crop in medium black calcareous soils**

For recommending Zn application to soybean crop grown in calcareous soils of Saurashtra, STL of Gujarat should consider the critical limit of 0.55 ppm in soil and 42.44 ppm in soybean plant at 45 DAS.

#### **Recommendation for Farmers: 2022-23**

##### **Recommendation No. 1**

##### **Title: Effect of N, P and K levels on growth, yield and nutrients uptake by bottle**

## **gourd**

The farmers of South Saurashtra Agro-climatic Zone growing bottle gourd in summer season are recommended to apply nitrogen 125 kg/ha in three equal splits (Basal, 30 and 45 days after sowing), 75 kg P<sub>2</sub>O<sub>5</sub>/ha and 75 kg K<sub>2</sub>O/ha as basal for achieving higher yield and net return.

### **Recommendation No. 2**

#### **Title: Effect of fresh cow dung on yield, quality and uptake of nutrients in groundnut**

The farmers of South Saurashtra Agro-climatic Zone growing kharif groundnut are advised to apply 1500 kg/ha fresh cow dung slurry (cow dung : water - 1:3) at the time of sowing or RDN (12.5 kg/ha) through FYM + 25:50 P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O kg/ha for getting higher yield and net return.

### **Recommendation for Scientific Community :**

#### **Recommendation No. 1**

##### **Title: Optimization of nutrient package in Bt cotton under irrigated condition**

It is inform to scientific community that in South Saurashtra Agro-climatic Zone, if soil status of available nitrogen and phosphorus is low and potassium is high, than apply 180:50:113 kg/ha N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O to Bt cotton. N fertilizer apply in five splits viz; 20 % as basal, 20 % at 30, 20 % at 60, 20 % at 90 and 20 % at 120 DAS and K<sub>2</sub>O in two splits viz; 50 % as basal and 50 % at 30 DAS and P<sub>2</sub>O<sub>5</sub> as basal. Beside this, Azatobactor, PSB and KSB each 3 L/ha also apply through drenching for getting higher yield and net return.

### **Recommendation for Farmers: 2023-24**

#### **Recommendation No. 1**

##### **Title: Effect of fresh cow dung on yield and yield attributes of garlic**

The farmers of South Saurashtra Agro-climatic Zone growing garlic are recommended to apply slurry of 1500 kg/ha fresh (up to five days) cow dung (cow dung : water - 1:3)

with irrigation at the time of sowing for getting higher yield and net return.

**Recommendation for Scientific Community :**

**Recommendation No. 1**

**Title: Evaluation of soil texture of Junagadh district**

It is inform to scientific community that, soil texture of Junagadh district is clayey, consisting of soil separate viz; sand 29.05 %, silt 24.67 % and clay 46.23 % i.e. 64 % area of soils of Junagadh district. Among the different talukas, Malia, Mangrol and Visavadar talukas soils are falls under clay loam texture, while, in Vanthali, Bhesan, Keshod, Manavadar, Mendarda and Junagadh talukas soils are falls under clayey texture.

**Recommendation No. 2**

**Title: Effect of FYM with and without phosphorus on groundnut (GG 20) yield**

It is inform to scientific community that in kharif groundnut application of FYM 10 t/ha along with 20 kg/ha P<sub>2</sub>O<sub>5</sub> every year gave higher yield and net return and also increase phosphorus content and uptake by pod and haulm. Application of FYM 10 t/ha along with 20 kg/ha P<sub>2</sub>O<sub>5</sub> every year also increasing the phosphorus level in soil as compared to control.

**Recommendation for Farmers: 2024-25**

**Recommendation No. 1**

**Title :Effect of cow dung on yield and nutrients uptake by wheat**

The farmers of South Saurashtra Agro-climatic Zone growing wheat are recommended to apply 60% RDF (72-36-36 kg N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O) to wheat along with slurry (cow dung: water - 1:3) of 1500 kg/ha fresh cow dung (up to five days) (1/2 at basal and 1/2 at 30 DAS) with irrigation for getting higher yield and net return.

**Recommendation for Scientific Community :**

**Recommendation No. 1**

**Title: Effect of silicon on chickpea under saline irrigation water**

It is inform to scientific community that, chickpea crop irrigated with saline irrigation water yield was decreased with increase in salinity levels from 2.0 to 8.0 dS/m. With increase in soil application of silicon in form of SiO<sub>2</sub> at the time of sowing from 0 to 300 ppm there was increased in yield and Si content in soil and decreased in Na/K ratio in plant and soil, EC<sub>2.5</sub>, SAR and ESP of soil under saline irrigation water.

### **Recommendation No. 2**

#### **Title: Effect of silicon on wheat under saline irrigation water**

It is inform to scientific community that, wheat crop irrigated with saline irrigation water, yield was decreased with increase in salinity levels from 2.0 to 8.0 dS/m. With increase in soil application of silicon in form of SiO<sub>2</sub> at the time of sowing from 0 to 300 ppm there was increased in yield and Si content in soil and decreased in Na/K ratio in plant and soil under saline irrigation water.

### **Recommendation No. 3**

#### **Title : Study on relative salinity tolerance of leafy vegetables**

It is inform to scientific community that, among the different leafy vegetable crops like coriander, fenugreek and spinach, higher mean salinity index (69.12) and mean seed yield (619.64 g/plot), minimum yield decline (52.87 %) at EC 8.0 dS/m and 50 % yield reduction at EC 8.02 dS/m for spinach, 6.09 dS/m for fenugreek and 4.78 dS/m for coriander. Spinach crop found more salt tolerance as compared to coriander and fenugreek on the basis of salinity indices.

### **Recommendation No. 4**

#### **Title: Soil test based fertilizer recommendation for targeted yields of coriander**

Soil testing laboratories are informed that the nutrients requirement for production of one quintal coriander grain was assessed as 3.92, 0.51 and 2.61 kg; N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively and the fertilizer prescription equations are: for N: [FN : 8.13 x T - 0.46 x SN - 0.23 x FYM], P: [FP<sub>2</sub>O<sub>5</sub> : 4.75 x T - 3.60 x SP - 0.24 x FYM] and K: [FK<sub>2</sub>O : 8.05 x T - 0.56 x SK - 0.26 x FYM] with FYM 5 t/ha. While, without FYM the fertilizer prescription equations are: for N: [FN : 11.16 x T - 0.63 x SN], P: [FP<sub>2</sub>O<sub>5</sub> : 9.41 T - 7.13 x SP] and K:[ FK<sub>2</sub>O : 9.23 x T - 0.63 x SK]. Targeted yield concept could be effectively adopted from 12.5 to 17.5 q/ha for site specific fertilizer recommendation to achieve high yields of coriander in the medium black calcareous soils of Saurashtra

region of Gujarat.

**Recommendation No. 5**

**Title: Evaluation of soil textural classes in the soils of different talukas of Rajkot district**

It is inform to scientific community that in Rajkot district overall soil texture class is clay (25.48, 30.19 and 44.33 % sand, silt and clay, respectively), i.e. 51 % area of soils of Rajkot district. Among the different talukas, Gondal and Jetpur talukas soils are comes under Silty clay loam soil texture. While remaining talukas like Rajkot taluka, Padadhari, Jam-Kandorna, Kotda- Sangani, Vinchhiya, Dhoraji, Upleta, Jasdan and Lodhika comes under clay soil textural.