

DIRECTOR OF RESEARCH

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Research Recommendations released during 2012 - 2013

(Approved by Joint Agresco –2013)

RESEARCH RECOMMENDATIONS

Production Technologies for Field Crops

1) For minimizing the incidence of leaf reddening in rainfed cotton, application of FYM @ 5 t/ha + RDF(30: 30:30) NPK kg/ha as a basal dose and 30 kg N at 30 DAS followed by spraying of 2% Urea at flowering stage and 1% Urea + 1% MgSO₄ at boll development stage is recommended.

2) Under dry land conditions, for obtaining higher yield, monetary returns and improvement in soil fertility status integrated application of FYM @5t ha⁻¹ + 50% RDF @ 25:12.5:12.5 kg N:P:K ha⁻¹+ azatobactor + PSB and opening of furrow in each row at 30-40 DAS is recommended.

3) For getting the sustainable higher yield and economic returns from *Bt* cotton grown on Entisols under protective irrigation condition, it is recommended that *Bt* cotton should be spaced with 120cm (27778 plants/ ha) along with an application of 150:75:75 NPK kg/ ha.

4) In soybean-linseed double cropping system, to maintain soil fertility through integrated nutrient management, as well as to get yield and economic returns comparable to 100% recommended dose of fertilizer (RDF), application of 75% RDF to both the crops (i.e. 23:56 kg and 45:23 kg N:P / ha to Soybean and Linseed, respectively) along with seed treatment of Rhizobium to Soybean (25 g/kg seed) and Azobactor to Linseed (25 g/kg seed), and PSB to both the crops (20 g/kg seed) is recommended.”

Soil Science and Agril Chemistry

5) In medium deep soil having deficiency of sulphur and zinc, application of sulphur @ 30 kg ha⁻¹ + zinc @ 2.5 kg ha⁻¹ along with recommended dose N (30 kg ha⁻¹) and P (75 kg ha⁻¹) is recommended for higher yield of soybean, monetary returns, nutrient use efficiency and quality of grain as well as improving soil fertility status

- 6) In medium deep black soil having deficiency of zinc, foliar application of zinc through zinc sulphate @ 5 g per litre or Zn –EDTA @ 2.5 g per litre at 30, 45 and 60 DAE is recommended for obtaining higher yield of soybean, monetary returns and grain quality as well as N and P use efficiency
- 7) In zinc and boron deficient medium, deep black soils for obtaining higher yield of maize, improvement in grain quality, nutrient use efficiency and monetary returns as well as improvement in soil fertility status, application of zinc @ 10 kg ha⁻¹ + boron @ 1 kg ha⁻¹ along with recommended dose of fertilizer (100: 50: 50 kg N, P₂O₅ and K₂O ha⁻¹) is recommended
- 8) In order to fulfill the requirement of organics, it is recommended to decompose unused wheat straw with rock phosphate @ 12 per cent (120 kg tone⁻¹) using PDKV decomposer (1 kg / tonne) for 90 days with intermittent turnings at regular interval of 15 days followed by its curing for 30 days for preparation of phosphocompost of good quality within 120 days
- 9) For obtaining higher yield with quality of soybean and also to improve soil fertility in Vertisol, an application of phosphogypsum @100 kg ha⁻¹ once in three years along with recommended dose of fertilizer is recommended.

II. Plant Protection

A) Entomology

- 10) For the eco-friendly management of aphids, jassids, thrips and whiteflies on cotton, spraying of bio-pesticides *Metarhizium anisopliae* @ 50g or *Verticillium lecanii* @ 50 g (2x10⁸ CFU/ml) in 10 liters of water is recommended.
- 11) For integrated pest management in mungbean seed treatment with Imidacloprid 600 FS 5 ml per kg seed and *Trichoderma* 4 g per kg seed followed by spraying of azadirachtin (10000 ppm) 10ml/10 lit water at 30 days and profenphos (50 EC) 25 ml/10 lit water at 45 days after crop emergence is recommended.
- 12) For management of pod borer complex of pigeonpea, ETL based spraying of rynaxypyr (20SC) 2.5 ml or flubendiamide (20WDG) 5.0 g in 10 liter water is recommended.
- 13) For management of pigeonpea pod fly, application of thicloprid (21.7SC) 4.0 ml or acephate (75SP) 20.0 g per 10 lit water at grain filling and 15 days after first application is recommended.

14) For management of gram pod borer, on chickpea, ETL based spraying of rynaxypyr (20SC) 2.5 ml or flubendiamide (20 WDG) 5.0 g/10 lit water is recommended.

15) For management of Gonocephalum beetles on chickpea, seed treatment with clothionidan (50WDG) 2 g/kg seed followed by spraying of chlorpyriphos (20EC) 20 ml/10 liter water at 20 days after crop emergence or application of phorate granules (10G) 10 kg/ha at sowing and spraying of chlorpyriphos (20EC) 20 ml/10 liter water at 20 days after crop emergence is recommended.

16) For the effective management of Gujhia weevil on safflower, application of phorate 10G @ 10 kg/ha (at the time of sowing) followed by spraying of chlorpyriphos 20 EC @ 25 ml/10 lit of water at or Lambda Cynalothrin @ 2.5 EC @ 10 ml/10 lit of water at 10 days after emergence and need based second spraying at 10 days after first application is recommended.

17) At the initiation of mite incidence on mandarin, an application of abamectin 1.9 EC @ 3.7 ml or ethion 50 EC @ 10 ml or buprofezin 25 SC @ 10 ml or triazophos 40 EC @ 15 ml in 10 lit water is recommended, for effective management of citrus mite.

18) For management of citrus Psylla on new flesh of Nagpur Mandarin first spraying of imadacloprid 17.8 SL @ 2.5 ml or Thiomethoxam 25 WG @ 1 g or Acetamiprid 20 SP @ 2.5 g per 10 lit of water and after 15 days of interval spraying of neem oil @ 100 ml + 10 g of detergent per 10 lit of water is recommended.

B. Plant Pathology

19) For obtaining maximum yield of pigeonpea, seed treatment of Rhizobium isolate PKVPR -101 @ 25 g/kg seed before sowing is recommended.

20) The occurrence of pokkah boeng disease in seasonal (suru) sugarcane crop can be predicted 14 days in advance by the following equation. The resulting –ve value will indicate absence of disease and +ve value will indicate possibility of occurrence of disease.

$$\sqrt{Y} = 0.6234 + 0.0161X_1^{**} + 0.0227X_2^{**} + (-0.0127X_3^{**}) + (-0.2288X_4^{**}) + (-0.0618X_5^{**}) + 0.1354X_6^{**} + 0.0026X_7^{**} - 1.2403$$

Where,

\sqrt{Y} = Square root of percent disease incidence,

X_1 = Meteorological Week,

X_2 = Morning relative humidity,

X_3 = Evening relative humidity,

X_4 = Bright sunshine hours,

X_5 = wind speed,

X_6 = Evaporation,

X_7 = Cumulative rainfall,

** = Significant at 1% level of significance.

21) The occurrence of alternaria leaf spot disease in sunflower crop can be predicted 14 days in advance by the following equation. The resulting –ve value will indicate absence of disease and +ve value will indicate possibility of occurrence of disease.

$$\text{Log}_e Y = - 11.1309 + 0.2680 X_1^{**} + (- 0.0793 X_2^{**}) + 0.2262 X_3^{**} + 0.0011 X_4^{**} - 1.0702$$

Where,

$\log_e Y$ = Natural logarithm of percent disease incidence,

X_1 = Meteorological Week,

X_2 = Maximum Temperature,

X_3 = Minimum Temperature,

X_4 = Cumulative rainfall,

** = Significant at 1% level of significance

Horticultural crops

22) It is recommended that for better establishment of pomegranate cutting for propagation, hardwood cuttings be treated with IBA 2500 ppm for five minutes and be kept under 70% green shade net house condition.

23) For commercial propagation of guava, softwood grafting during first week of February on 9-10 months old rootstock is recommended.

24) Soaking of jamberi seed in GA₃ (10 ppm) solution for 24 hours before sowing is recommended for better germination

25) Sowing of ajwain crop variety A.A.-01 during second week of November with wider spacing (45 x 45 cm) is recommended for obtaining the higher seed yield and monetary returns.

26) Sowing of fennel crop variety A.F.-101 during the last week of October with ridges and furrow method is recommended for obtaining the higher seed yield and monetary returns.

27) Sowing of cumin variety R.Z-209 during the last week of October with ridges and furrow method is recommended for obtaining the higher seed yield and monetary returns

Soil & Water Conservation

28) The embankment height of 2 to 2.5 m is recommended for dug out type farm ponds to reduce evaporation losses during water storage period till its utilization.

Agriculture Engineering and Technology

29) PKV marking nut cracker is recommended.

30) The PKV Continuous hot air puffing system is recommended for preparation of oil free Ready-to-eat and durable snack foods.

31) PKV Animal feed mill is recommended for making animal feed pellets from byproduct of dal mill.

32) PKV Roselle (Ambadi) Calyces Detacher (RCD) is recommended for detaching calyces from roselle fruit.

33) PKV onion seed extractor is recommended for onion seed extraction.

Social Science

34) University recommended soybean technology created significant economic impact on soybean growers in terms of increased yield, income, area, cropping pattern, annual spending pattern. However, socio impact was found very low as far as social participation, is concerned. It is, therefore, recommended to enhance the participation of soybean growers in formal and informal organizations for getting their active participation in rural development.

35) The non- remunerative prices, weather related uncertainties, fluctuations in market rates, rise in cost of inputs, lack of irrigation facilities, lack of accurate weather information and crop damages by wild animals were severely affecting factors. Therefore, it is recommended that the Government may give remunerative prices to the farm produce and takes due consideration of mentioned factors for reducing the agrarian distress

36) Ajwain crop is a promising profitable cash crop based on three years average per hectare cost and returns to the ajwain growers. Hence, it is productivity and growing farmers It is recommended that, farmers should incorporate Ajwain crop in Rabi cropping pattern.