

## Central Institute for Cotton Research, Nagpur

### Fifth Weekly Advisory for Cotton Cultivation 23<sup>rd</sup> to 29<sup>th</sup> June 2014

"The advisory is based on inputs received from the State Agricultural Universities of the respective states"

**Weed management:** Wherever weeds have emerged, weedicides would provide effective and timely control. Weedicides are effective against younger (less than 10-15 days old) weeds, especially grasses. For grassy weeds, Quizalofop ethyl, Fenoxaprop ethyl, fluazifop butyl, can be used. For sedges and grasses, Propanil is effective and Pyriproxyfen sodium is effective on broad leaf weeds. Farmers may consult the technical experts of the Agricultural Universities for further details.

**Water logging:** Cotton is very sensitive to excess water. In many parts of Central and South India, water logging can be problematic due to excess rains. Cotton grown on deep black soils and ill drained conditions is worst affected due to water logging. Provide adequate drainage channels or water ways (particularly in heavy soils) along the slope of the land for draining excess water under heavy rainfall situations. For better soil moisture conservation, preferably in areas where rainfall is 700-900mm, the land can be reshaped into ridges and furrows with the help of a ridge plough or a bund former. This technique and sowing cotton on ridges would conserve rainwater and the furrows acts drainage channels whenever heavy rains are received particularly in heavy clays.

Drainage channels must be opened up along the field borders so that excess water is removed from the fields. If sowing hasn't yet been completed, it is strongly recommended that to take up sowing immediately on ridges and furrows by planting on top of ridges. Heavy rains will not affect the crop because the furrows will drain away excess water. Apply fertilizers if the crop becomes pale due to water logging. If heavy rains are forecast, fertilizer application may be postponed so as to prevent losses due to surface run-off.

Foliar spray with 0.5 to 1.0% DAP or 19:19:19 (soluble complex of Nitrogen) at weekly intervals will help the plants to recover from the effect of water logging.

## STRATEGIES FOR MANAGEMENT OF PESTS, DISEASES & WEEDS

### INSECT PEST MANAGEMENT

#### *General recommendations*

#### **DOs**

1. Select sucking pest resistant varieties/hybrids. Sucking pest resistant Bt hybrids may require very few insecticide interventions.
2. Inter-crop with cowpea or sorghum or soybean or blackgram to encourage predators of sucking pests.
3. Seed treatment with Imidacloprid @7gms/Kg of seed.
4. Use nitrogenous fertilizers to the minimum especially for sucking pest susceptible varieties.
5. Maintain field sanitation (weed free) and remove and destroy mealy bug infested plants &.
6. **Stem application or soil application** (near the root zone) of Imidacloprid, Dimethoate or Acephate at 30-40 DAS and 50-60 DAS for effective eco-friendly control of thrips, mirid bugs, mealy bugs and other sucking pests.

#### **DON'Ts**

7. **If possible avoid chemical insecticides during the first two months of the crop** to conserve naturally occurring biological control. Ladybird grubs and beetles, *Chrysoperla* grubs and adults, Syrphid flies, *Geocoris* grubs and bugs, *Aenasius* spp., *Aphelinus* grubs and wasps, mirid bugs and Spiders are the most important naturally occurring predators and parasitoids that effectively control aphids, jassids, thrips, mirids, whiteflies and mealybugs.

8. **Do not spray against minor lepidopteran insects** such as the cotton leaf folder, *Sylepta derogata* and cotton semilooper, *Anomis flava*. The larvae cause negligible damage to cotton but serve as hosts for parasitoids such as *Trichogramma* spp., *Apanteles* spp and *Sysiropa formosa*, that attack *H. armigera* and other bollworms.
9. **Do not spray Bt-formulations on Bt cotton** to avoid further selection pressure.
10. **Avoid foliar application of neonicotinoid insecticides** such as Acetamiprid, Imidacloprid, Clothianidin and Thiomethoxam which are likely to aggravate insect resistance, since hybrid cotton seeds are treated with imidacloprid.
11. **Do not use WHO Class-I (Extremely Harzardous category) insecticides** such as Phosphamidon, Methyl parathion, Phorate, Monocrotophos, Dichlorvos, Carbofuran, Methomyl, Triazophos and Metasystox.

### SUCKING PEST MANAGEMENT

**Economic Threshold Level (ETL):** If whitefly and/or leafhopper damage reaches economic threshold levels of grade-II damage of curling and crinkling of lower leaves and yellowing of margins in 25% plants or more, any one of the following pest control measures as suggested below can be used.

- a. Neem oil 1.0% + Neem Seed Kernel Extract 5.0% + 0.05-0.1% detergent
- b. *Verticillium lecanii* 10gms/lit of water, wherever good formulations are available from reliable manufacturers
- c. Diafenthiuron (50WP 800g /ha),
- d. Flonicamid 50 WG 200g a.i/ha or
- e. Buprofezin 25% SC 200 g a.i/ha.

Insecticides such as Fipronil or Dimethoate or Acephate or Ethion can also be used but may be considered as alternatives only, in view of factors that relate to ecological and environmental safety, efficacy and resistance.

If mirid bugs are observed to cause economic damage to squares, it is advised to spray Acephate 75 SP @ 1 g/lit or Fipronil 5 SC @ 1.0 ml/lit of water

### BOLLWORM MANAGEMENT

Bt cotton is effective in controlling bollworms.

*The following strategies are being recommended for non-Bt cotton*

At Economic Threshold Levels (ETLs) of 50% infested plants (plants having flared squares with entry hole) for *Helicoverpa armigera*.

1. **Use HaNPV on Bt-cotton** followed by the application of **5% NSKE** a week later. **Or, use Phosalone** at 50% bollworm infested plants (plants having flared squares with entry hole) or for the management of *Spodoptera* or whitefly.
2. ***Trichogramma***, if available, can be used on non-Bt genotypes at 70-80 DAS. Avoid *Trichogramma* egg parasitoid releases on Bt-cotton since maximum neonates get killed on Bt-cotton and with *Trichogramma* application becoming superfluous.
3. **Insecticides effective on Bollworms**, especially *Helicoverpa armigera*.
  - a. Chlorantraniliprole (Coragen),
  - b. Flubendiamide (Fame),
  - c. Spinosad,
  - d. Emamectin benzoate and
  - e. Indoxacarb

These insecticides have a high selective toxicity towards the target pests while being less toxic to many beneficial insects in the cotton ecosystem. These insecticides are ideally suited in eco-sustainable insecticide resistance management programmes.

4. **Pink bollworm and Spotted bollworms:** ETL level of one live larva in 10 green bolls or 8 moths per night for three consecutive nights. Spray Quinalphos 25 EC Profenophos 50 EC @ 2 ml/lit of water / Spray of Thiodicarb 75 WP @ 20 g or any pyrethroid.
5. ***Spodoptera litura*:** Collection of egg masses or application of *SNPV* (*Spodoptera litura* Nuclear Polyhedrosis Virus) @ 500 LE/ha or Spray 200 ml Rimon 10 EC or 250g Larvin 75WP in 250 litres of water per acre
6. To minimize **shoot weevil** damage, spray Profenofos @ 2 ml/lit
7. In case of snail incidence in heavy rainfall areas, baiting with 2% Metaldehyde (Snail kill) @ 12.5 kg/ha has to be taken up and it is to be applied at the hideouts of the snails, on the bunds and to the soil around the crop where the damage is seen

### DISEASE MANAGEMENT

**Parawilt or Sudden drying (New wilt) or Wilt / Root rot:** Symptoms are noticed in some fields after drought followed by rains or irrigation.

Spray cobalt chloride @10mg/litre (10ppm) on affected plants within few hours of onset of symptoms and/or Drench plants with a mixture of Copper-Oxy-Chloride 25g and 200g Urea in 10 ltr of water or Carbendazim 1g/L.

**Boll Rot:** Generally early formed lower bolls rot due to cloudy and drizzling conditions.

Spray Mancozeb 75 WP + Chlorothalonil 70 WP each @ 2 g/lit of water. For better results, mix 10g Selvet 99 or 50 ml Triton in 100 litres of fungicide solution.

***Alternaria* blight:** spray Mancozeb@2.5 g per one litre of water.

**Myrothecium leaf spot disease and/or Bacterial blight:** Spray Streptomycin sulphate (15-20 g/ha) plus Copper oxychloride (1500-2000 g/ha) in 200-250 L of water.

### WEED MANAGEMENT

Herbicides are most effective on younger weeds.

**Post emergence herbicides (application rate 50 to 75 g ai /ha)**

**Grasses:** Spray Quizalofop-ethyl or Fenoxaprop ethyl or Fluazifop butyl,

**Sedges and grasses:** Spray Propaquizafop ethyl

**Broadleaf weeds:** Spray Pyriithiobac sodium

### GENERAL CROP HEALTH MANAGEMENT

1. **Optimize nutrient management** for macro and micronutrients. Foliar spray of MgSO<sub>4</sub>, 2% Urea followed by 2% DAP, to ensure proper Cry1Ac expression and also to reduce problems of leaf reddening. Sprays of 1% cobalt chloride and soil drenching with Bavistin 1 % in the initial stage of wilt was found to help in the recovery of plants.
2. **Prevention of Leaf Reddening:** Spray 2 % urea, 0.5% Zinc Sulphate and 0.2 % Boron, twice at 15 days interval on 90 days old crop.
3. **Retention of squares and flowers:** Spray Planofix 4.5 SL (NAA) hormone @ 21 ppm (7 ml per 15 litres of water).

### COTTON CROP SITUATION

*Based on inputs received from the State Agricultural Universities of the respective States*

#### NORTH INDIA

**Haryana:** Normal weather. Crop is in pre square formation stage. Possibility of dry and hot weather and rise in day temperature. Sporadic appearance of thrips. It is advised for removal of weeds in and around fields, balanced use of fertilizers and regular monitoring of crop

## CENTRAL INDIA

**Maharashtra:** Premonsoon Bt cotton was sown in last week of May and first fortnight of June. The growth of cotton is satisfactory but wherever temp is higher than 40°C the growth is stunted. Advised to give irrigation and second dose of Nitrogen. For rainfed Bt, 90x45 cm with 60: 30:30 NPK kg/ha is recommended. HDPS cotton should be grown 60x10 cm. In case of irrigated cotton, sowing is about to be completed. Irrigation should be given as required. Cotton sown on drip irrigation should be given fertilizer through drip system. Fertilizer dose for Fertigation : 80:40:40 NPK kg/ha (Splits of NPK should be done up to 100 DAS). In case of rainfed cotton, cross harrowing should be done before showers of rain for field preparation. Sowing should be done after receipt of 50 to 75 mm rainfall. Seed should be treated with Thiram @ 3 g / kg seed against fungal diseases, Azotobacter and PSB @ 25 g / kg seed for nitrogen fixation and phosphorus availability. Seed, basal fertilizers, pesticides for seed treatment should be made available for timely sowing. Use of recommended doses of pre emergence weedicides should be sprayed for weed management. Farmers in the rainfed zones of Maharashtra are still awaiting monsoon. Expensive seed may therefore be used in areas having irrigation.

**Odisha:** Out of the target 1.35 lakh ha under cotton in the State, 27% area has been sown till date. The crop is in seedling stage. Weather is hot and humid. Field preparation, ploughing and sowing is going on. Farmers are advised to go for sowing when there is sufficient rainfall to avoid failure of germination and seedling mortality. They should procure seeds from reliable sources and keep all the inputs like fertilizers, and herbicides ready well in advance. Fertile and well drained soils having depth not less than 3 feet should be selected for hybrid cotton. Soils with low fertility and depth should be taken for high density planting (HDP) with suitable varieties. Well decomposed FYM/compost should be applied @ 2.5-5.0 ton/ha before the final ploughing. Fertilisers should be applied as per soil test reports. For hybrids, 120:60:60 and for varieties, 90:45:45 kg N:P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha is recommended. 100% P<sub>2</sub>O<sub>5</sub>, 50% K<sub>2</sub>O and 25% N should be applied as basal dose at the time of sowing. Seeds should be treated with Azotobacter and PSB @ 25 g/kg seeds on the date of sowing. For normal planting, a spacing of 90 cm x 60 cm and for HDPS 60 cm x 10 cm (deep soils) and 45X10cm (in shallow soils) should be followed. For control of weeds, Pendimethalin should be applied as pre emergence spray @ 1.0 kg/ha at one day after sowing when sufficient moisture is there in the soil.

## SOUTH INDIA

**Andhra Pradesh:** Summer preparatory cultivation is under progress. Spodoptera litura trap catches were observed @ 2-3 moths/trap/week. Dry weather prevailed during the period under report with a mean RH (Morning) 55% & RH (Evening) 33% with bright sunshine hours, and high wind velocity. Summer cotton sown approximately in an acreage of 25 thousand hectares which is in squaring to flowering stage to boll development stages. Suitable Plant Protection against sucking pests (Jassids & Thrips) is recommended. Timely irrigation is also recommended.

### Weekly Advisory Report Coordinating Team

Scientists	Address		
Dr K R Kranthi	Director, CICR, Nagpur		
Dr A H Prakash	PC and Head, CICR, Regional station, Coimbatore		
Dr. D Monga	Head, CICR, Regional station, Sirsa		
Dr. S. B. Singh	Head, Div of Crop Improvement, CICR, Nagpur		
Dr Sandhya Kranthi	Head, Div of Crop Protection, CICR, Nagpur		
Dr Blasé De souza	Head, Div of Crop Production, CICR, Nagpur		
Dr. Isabell Agrawal	Sr. Scientist CICR, Coimbatore		
Sh. M.Sabesh	Scientist, CICR, Coimbatore		
Scientists In-charge for Weather Report (AICCIP Centres)			
Scientists	Address	Mobile No	E Mail ID
Dr. Paramajit Singh	Punjab Agricultural University, Bathinda, Punjab	9463628801	rsmeenars@gmail.com

Dr. Pankaj Rathore	Punjab Agricultural University, Faridkot, Punjab	9464051995	pankaj@pau.edu
Dr. Jagdish Beniwal	CCS-Haryana Agricultural University, Hisar 125 004, Haryana	9416325420	cotton@hau.ernet.in
Dr.S.L.Ahuja	CCS-Haryana Agricultural University, Sirsa, Haryana	9255947380	slahuja2002@yahoo.com
Dr.K.N.Bhatia	Swami Keshwanand Rajasthan Agricultural University, Sriganganagar, Rajasthan	9352700411	bsmeena1969@rediffmail.com
Dr.Harphool Meena	Maharana Pratap University of Agri. & Technology, Udaipur – 313 001, Rajasthan	9460246043	hpagron@rediffmail.com
Dr. Narendra Kumar	CSA University of Agri. & Technology, Kanpur – 208 002, Uttar Pradesh	9335699132	jagdishk64@yahoo.com
Dr. Gofaldu	Navsari Agricultural University, Navsari – 396 450, Gujarat	9662532645	girishfaldu@rediffmail.com
Dr.M.D.Khanpara	Junagadh Agricultural University, Junagadh – 362 001, Gujarat	9426990070	cotton@jau.in
Dr.R.W.Bharud	Mahatma Phule Krishi Vidyapeeth, Rahuri – 413 722, Maharashtra	9850244087	cotton_mpkv@rediffmail.com
Dr. B . R. Patil	Panjabrao Deshmukh Krishi Vidyapeeth, Akola – 444 104, Maharashtra	9657725801	srscottonpdkv1@yahoo.co.in
Dr.P.R.Zanwar	Marathwada Agricultural University, Parbhani – 431 402, Maharashtra	7588151244	crsned@indiatimes.com
Dr. Satish Parsai	RVS Krishi Vishwa Vidhyalaya, Gwalior – 474 002, Madhya Pradesh	9406677601	aiccpkhandwa@gmail.com
Dr. B.S.Nayak	Orissa University of Agriculture & Technology, Bhubaneshwar – 751 003, Orissa	9437321675	bsnayak2007@rediffmail.com
Dr.S.Bharathi	Acharya N. G. Ranga Agricultural University, LAM, Guntur, AP	949072341	bharathi_says@yahoo.com
Dr. Sharma	Acharya N. G. Ranga Agricultural University, Nandyal, AP	08514-242296	sharmarars@gmail.com
Dr.Aladakatti	University of Agricultural Sciences, Dharwad – 580 005, Karnataka	9448861040	yaladakatti@rediffmail.com
Dr. Bheemana	University of Agricultural Sciences Raichur – 584 102, Karnataka	9448633232	bheemuent@rediffmail.com
Dr. Amala Balu	Tamil Nadu Agricultural University, Srivilliputhur, Tamil Nadu		
Dr. M Gunasekaran	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	9443631359	gunasekaran.pbg@gmail.com

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