

## Central Institute for Cotton Research, Nagpur

### Third Weekly Advisory for Cotton Cultivation 9<sup>th</sup> to 15<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, Propaquizafop ethyl is effective and Pyriithiobac 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.

#### Weather forecast for 11<sup>th</sup> to 16<sup>th</sup> May 2014

Zones/ Weather parameter	Temperature ( Min, Max)						Rainfall					
	11/06	12/06	13/06	14/06	15/06	16/06	11/06	12/06	13/06	14/06	15/06	16/06
Punjab	27,47	28,45	29,44	29,43	28,44	28,44	Clear sky	Cloudy sky		Clear sky		
Haryana	25,47	26,45	27,43	26,44	26,44	27,45	Clear sky	Cloudy sky		Clear sky		
Rajasthan	32,47	32,47	31,46	30,45	30,45	30,45	Clear sky	Partly cloudy sky		Clear sky		
Gujarat	30,35	30,35	29,35	29,35	29,34	29,34	Mainly cloudy sky					
Maharashtra	30,45	30,45	29,44	29,44	28,43	27,41	Clear sky	Cloudy sky				
M.P.	21,42	21,42	21,41	21,41	20,40	20,40	Partly cloudy sky					
Odisha	27,39	27,39	27,39	24,35	24,37	24,37	Partly cloudy sky					
A.P.	26,40	25,40	25,39	25,38	26,38	25,37	Partly cloudy sky					
Karnataka	23,38	23,38	23,38	23,38	22,38	22,38	Thunderstorm with rain				Cloudy sky	

Source: [www.imd.gov.in](http://www.imd.gov.in)

## 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 Hazardous 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. Diafenthuron (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:** Crop from sowing to seedling stage is normal. Most of the sowing of cotton crop has been completed in the State. Removal of weeds in and around fields, balanced use of fertilizers, regular monitoring of crop is recommended.

**Rajasthan:** Sowing will be started after the onset of monsoon. Field preparation and ploughing is going on. Farmers are advised to procure seeds from reliable sources and keep all the inputs like fertilizers, and herbicides ready well in advance.

#### CENTRAL INDIA

**Maharashtra:** Pre monsoon Bt Cotton should be sown under drip system / ridges and furrow where irrigation is available. Sowing should be taken during last week of May or first week of June looking into the duration of variety which could not be caught in rains during October. Best variety of ~~our~~ the area from last three years should be selected. 5 t FYM before sowing is to be applied. Fertilizer requirement for irrigated Bt cotton is 120kg N in three split doses and 60kg P and 60kg Potash. Pre monsoon showers started in some pockets of Vidarbha. Farmers should take up harrowing and cleaning the field. Purchase of seed and fertilizers should be done well in advance. Looking into the weather forecast, dry seeding of varieties can be taken up during 16<sup>th</sup> to 20<sup>th</sup> June 2014 for non Bt cotton. For Bt cotton, sowing should be done only after receipt of about 75-100 mm rainfall. The sowing of cotton initiated at Rahuri centre but awaited at farmers field. Soil health testing of farmers' fields need to be done before sowing. Farmers with shallow marginal soils in rainfed regions of Vidarbha can adopt the high density planting system using non Bt varieties. Such farmers are advised to contact the JDA of their division.

#### SOUTH INDIA

**Karnataka:** Sowing of Bt cotton may be continued during this week in all cotton growing areas of the State. It is advised to purchase the Bt hybrid suitable for the particular locality from the authorised dealer with authentic cash bill. Dibble Bt cotton (H x H) at a spacing of 90 cm x 60 cm and H x B varieties at 120 cm x 60 cm. It is advised to maintain required plant population by filling the gaps with Bt cotton seeds only. Short duration crops like green gram (1:1), peas (1:1), beans (1:1) and groundnut (1:2) may be taken up as intercrops with Bt cotton. Sow the refugia crop (seeds of Red gram or Non Bt cotton) given with Bt cotton seeds around the Bt cotton crop without fail. One or two rows of Bhendi crop has to be sown around the Bt cotton plot and also with Bt cotton in 10:1 row proportion as "Trap Crop" to minimise the shoot weevil attack. One or two rows of Maize crop may also be grown around the Bt cotton plot as "Feast Crop" to increase the population of predators that control sucking pest on Bt cotton. Apply fertiliser dose of 100:50:50 NPK kg/ha of which 25% N & K and entire P fertilizers has to be applied basally at the time of sowing. Apply the remaining N and K as top dressing in 3 equal splits *i.e.* 25% N & K each at 30, 45 and 60 DAS. Spray Pendimethalin 30 EC weedicide @ 3-4 ml/lit of water on the soil to control the weeds up to 30 days.

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