

## Central Institute for Cotton Research, Nagpur

### Sixth Weekly Advisory for Cotton Cultivation 30<sup>th</sup> June to 6th July 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 and Pyridinofop ethyl 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 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. 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 Pyrithiobac 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 vegetative / square formation stage. Leaf hopper and whitefly are below E.T. The leaf hopper population may increase if rains occur and mean relative humidity will be above 50%. Removal of weeds are to be done in and around fields. Balanced use of fertilizers and regular monitoring of crop is recommended.

### CENTRAL INDIA

#### Maharashtra

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 but for Bt cotton, sowing should be done only after receipt of 75 to 100 mm rainfall. Irrigation should be given to early sown crop. At Rahuri, the crop is in seedling to square formation stage (Irrigated) with a duration of 20 to 40 days. Land preparation for sowing (Rainfed) is to be taken up. Insecticide sprays in irrigated cotton is 20-30 per cent, especially for sucking pest (15-20 per cent). About 30-50 per cent of para wilt incidence was noticed in farmer's field where sowing was undertaken before 15<sup>th</sup> to 20<sup>th</sup> May. It is recommended to go for irrigations at alternate row method, if possible using sprinklers or drip, 2% potassium nitrate (KNO<sub>3</sub>) spray, 8% Kaolin spray, Application of 25 kg urea + 25 kg potash per acre and drenching of 200 ml solution of Urea + MOP per plant (1.5 % each) for para wilt affected plant. In Marathwada region, the irrigated cotton is in vegetative growth stage. The crop is facing shortage of moisture due to high temperature. Irrigation should be given considering duration of the crop. Crop leaves are showing yellowing and lower leaves are turning red due to high temperature, moisture stress leading to reduced nutrient availability. Fertigation of nitrogen should be given. Cotton grown on surface irrigation should be irrigated and foliar application of nitrogen (urea @ 2%) be done. Sowing of rainfed cotton is withheld due to lack of monsoon rains. It should be done after receipt of 50 to 75 mm rainfall. Basal dose of fertilizers should be applied with sowing and seed treatment of Azetobactor and PSB @ 25 gm / kg of seed each should be done at the time of sowing for nitrogen fixation and phosphorus availability. Seed treatment of Thirum @ 3 g / kg seed should be done for fungal diseases

#### Madhya Pradesh

Weather is hot, clear with bright sun shine. Monsoon is still awaited in. Crop growth is satisfactory in irrigated cotton. Frequent irrigation is required. No weed infestation

#### Odisha

Out of the target 1.35 lakh ha under cotton in the State of Odisha, 35 % area has been sown till date. The crop is in seedling stage. Field preparation and 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 for Odisha state. Full 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 Azotobactor and PSB @ 25 g/kg seeds on the date of sowing. For normal planting, a spacing of 90 cm x 60 cm and for HDP 60 cm x 10 cm should be followed. For control of weeds, Pendimethalin should be applied as pre emergence spray @ 1.0 kg/ha at 1 day after sowing when sufficient moisture is there in the soil.

**SOUTH INDIA****Andhra Pradesh**

Dry weather prevailed during the period under report with a mean RH (Morning) 74% & RH (Evening) 46% with high wind velocity. Summer preparatory cultivation is completed. Sowings will be taken up soon after the receipt of rains. Spodoptera litura trap catches were observed @ 2-3 moths/trap/week. Summer cotton sown in 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) were recommended along with timely irrigation.

**Tamil Nadu**

Crop is in boll bursting stage in summer irrigated cotton with 135-145 days after sowing. The weather prevailed during the reporting period was hot and dry. Very meager incidence of sucking pests. Picking of kapas is going on.

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