

## Central Institute for Cotton Research, Nagpur

### Twenty-Third Weekly Advisory for Cotton Cultivation 3<sup>rd</sup> November to 9<sup>th</sup> November 2013

"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.

Net Cotton Area sown as on 28-10-2013

State	Lakh hectares
Punjab	5.05
Haryana	5.57
Rajasthan	3.03
Uttar Pradesh	0.23
Gujarat	26.91
Madhya Pradesh	6.21
Maharashtra	38.72
Odisha	1.34
Andhra Pradesh	21.42
Karnataka	5.38
Tamil Nadu	1.16
Others	0.10
<b>TOTAL</b>	<b>115.12</b>

Source: Director, DOCD, Mumbai

Weather forecast for 5<sup>th</sup> Nov to 8<sup>th</sup> Nov 2013

Zones/ Weather parameter	Temperature ( Min, Max)				Rainfall			
	05/11	06/11	07/11	08/11	05/11	06/11	07/11	08/11
Punjab	10,28	11,28	13,27	15,27	Mainly clear sky	Partly cloudy sky	Thunderstorm with rain	
Haryana	11,28	13,28	14,28	14,28	Mainly clear sky		Partly cloudy sky	
Rajasthan	14,31	13,31	13,31	12,30	Clear sky			
U.P.	10,29	11,30	14,31	14,31	Fog	Mainly clear sky		
Gujarat	22,34	22,34	22,34	22,34	Mainly clear sky			
Maharashtra	19,32	18,32	17,31	17,31	Mainly clear sky			
Madhya Pradesh	16,31	15,30	15,30	14,29	Clear sky			
Odisha	17,32	17,31	16,30	16,30	Partly cloudy sky			
Andhra Pradesh	22,32	21,32	21,33	21,33	Partly cloudy sky with possibility of rain or thunderstorm		Partly cloudy sky	
Karnataka	21,32	21,32	21,32	21,32	Partly cloudy sky with possibility of rain or thunderstorm	Partly cloudy sky		
Tamil Nadu	24,32	24,32	24,32	24,32	Light rain			

Source: www.imd.gov.in

## STRATEGIES FOR MANAGEMENT OF PESTS, DISEASES &amp; 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 S/NPV (*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 Quisalofofop-ethyl or Fenoxaprop ethyl or Fluazifop butyl,

**Sedges and grasses**: Spray Propaquizafop ethyl

**Broadleaf weeds**: Spray Pyriithiobac sodium

## GENERAL CROP HEALTH MANAGEMENT

- **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.

- **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.
- **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

The crop is in maturity phase and picking has been initiated. *Kapas* should be picked dry free from trash. It is advised to start picking in the morning after the dew dries from the opened bolls to avoid deterioration of seed cotton quality. Picking should be done after every 8 to 10 days to avoid losses. No agronomic or entomological interventions are needed henceforth. Suitable measures are to be taken for clean picking and storage to fetch better price of the harvested cotton in the market. Farmers are advised to harvest the crop when it has opened more than 50 per cent and there is no dew/ moisture. They are advised to cover their head with cloth. Picked cotton should be placed on cotton sheets or tarpaulins. Care should be taken to pick bolls without leaves, pedicel/ branches to have clean picked cotton.

**Haryana:** In Haryana during preceding week dry weather was observed. Cotton crop is in picking stage. In general, the crop is healthy. Do not irrigate the field after one third opening of bolls in the field. Avoid picking of rotten bolls. Dry the *kapas* before storage to avoid micro-organism damage. Farmers are advised to monitor their crop regularly.

**Uttar Pradesh:** Crop is in boll development and maturity stage. Farmers are advised to pick the bursting bolls and dry in the sun light and keep in jute bags.

### CENTRAL INDIA

**Maharashtra:** Cotton in Marathwada region is in boll development to boll bursting stage. Leaf reddening and Grey Mildew is recorded for which the recommended control measures are to be taken up. Square fall is noticed in some pockets. Spraying of NAA @ 1.2 ml per 10 lit water is advised.

**Odisha:** The cotton crop is at boll development to maturity stage (118-128 days). Postpone the picking of seed cotton during rainy days. Spray 2% DAP for better boll development. To check the incidence of sucking pests like aphids, jassids, thrips and whitefly spray recommended insecticides. Regular monitoring should be done for incidence of Spodoptera and leaf folders. In case of severe infestation of American boll worms ( at ETLs of 90-100% plants showing flared up squares) spray recommended control measures during 80 to 100 days after sowing.

### SOUTH INDIA

**Andhra Pradesh:** Wide spread cyclonic heavy rains received during past one week resulted in damage to the cotton crop in several districts. The cotton crop is 80 to 120 days old which is in flowering, boll development to just boll bursting stage. Cotton grown in areas especially in low lying and the fields adjoining to canals and drains were totally submerged in water for 2 to 4 days in over flown drains due to flooding of water from upper terrains. In such situations, the crop was completely damaged due to

inundation of water and the cotton plants were completely dried due to rotting of leaves, stems and bolls. In the same situation in some of the fields, cotton plants were submerged in water for 2 to 4 days up to three fourth height of the plants due to which leaves of the affected fields were rotten and dried. Boll rot occurred to an extent of 15 to 30 bolls per plant totally damaged and leaving top portion of the plant appearing green but with drooping of the leaves. In the above mentioned conditions, the crop survival is not at all possible and it is better to opt for alternate crops like green gram or black gram or bengal gram or maize under ID conditions. In some parts, the cotton crop was inundated with water up to one fourth of the plant height and lower portion of the plants were affected with boll rot at the bottom portion of the plants. The middle and upper portion of the plants were, also affected showing symptoms of nitrogen deficiency due to poor or no uptake of the nutrients which resulted in heavy shedding of the floral parts like squares, flowers and newly formed bolls. In such situations, the crop can be managed by the soil application of the fertilizers preferably N and K as booster dose besides the foliar application of the nutrients to trigger the mechanism for immediate survival of the crop thereby enhancing the capacity to reproduce squares, flowers and boll formation in the forthcoming months. Partially inundated and excess moisture situations prevailed in majority of cotton growing areas where heavy shedding of the floral parts, newly formed bolls and light yellowing of leaves was observed. This situation can be managed by basal application of 30 to 35kg Urea + 10 to 15kg MOP per acre as booster dose.

### **Suggestions for the management of the Cotton crop**

Immediate soil application of fertilizers @ 30 to 35kg Urea and 10 to 15 kg MOP per acre as booster dose. Foliar application of 2% Urea or 2% DAP or 1 to 2% KNO<sub>3</sub> along with 1% MgSO<sub>4</sub> 2 to 3 times at weekly intervals to mitigate the stress conditions. Prophylactic spray of fungicides 0.3% (3 g/lit) COC or 0.25 to 0.3% (2.5 to 3 g/lit) along with 0.01% (100 mg/lit) Streptocyclin at weekly intervals. As curative sprays, Propiconazole @ 0.1% (1 ml/lit) or Hexaconazole @ 0.2% (2 ml/ lit) for the control of leaf spots is recommended. Wherever crop height exceeded more than 5 ft, detopping is recommended for regulating the vegetative growth in healthy crop. After revival of the crop, leaf hoppers and whitefly may flare up and appropriate management strategies should be adopted for controlling the sucking pests.

**Karnataka:** Seed cotton is to be picked on rain free days wherever the first formed bolls are opened and stored properly. Light irrigation is to be given after each kapas picking wherever irrigation facilities are available. Picking of seed cotton is nearing completion where the crop was sown during the month of May. It is suggested to use the cotton stalks for compost making instead of burning or using as fuel. Alternatively the cotton stalks can be rot slashed in the field itself by tractor operated rotovator.

**Tamil Nadu:** The rainfed and winter irrigated cotton crop in southern parts of Tamil Nadu (Parts of Tirunelveli, Virudhunagar, Ramanathapuram and Madurai District) is in vegetative and square formation stage. The weather prevailed during the reporting period was moderately hot. The North East Monsoon begins and lesser quantity of rainfall was also received in some parts. Sucking pests like aphids, thrips, whiteflies and leaf hoppers incidence were noticed in some areas for which need based plant protection measures may be followed depending on the economic threshold level (ETL). Infestation of Spodoptera litura was recorded for which appropriate spraying of insecticides during early morning or in the evening is recommended.

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