

## Central Institute for Cotton Research, Nagpur

### XXV Weekly Advisory for Cotton Cultivation 10<sup>th</sup> to 16<sup>th</sup> Nov '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 at weekly intervals will help the plants to recover from the effect of water logging.

#### Cotton Sown Area

S.No.	States	Normal Area (DES)*	Area in lakh ha		
			Bt	Non Bt	Total
1.	Andhra Pradesh + Telengana	19.83	22.198	1.669	23.867
	Andhra Pradesh (23.95%)	4.749	7.121	0.239	7.360
	Telangana (76.05%)	15.081	15.077	1.430	16.507
2.	Gujarat	26.490	27.13	2.930	30.060
3.	Haryana	5.640	6.310	0.080	6.390
4.	Karnataka	5.270	6.97	0.630	7.600
5.	Madhya Pradesh	6.390	5.503	0.285	5.788
6.	Maharashtra	39.160	40.097	1.822	41.919
7.	Odisha	0.970	0.000	1.250	1.250
8.	Punjab	5.170	4.300	0.200	4.500
9.	Rajasthan	4.000	3.954	0.208	4.162
10.	Tamil Nadu	1.250	0.560	0.140	0.700
11.	Uttar Pradesh	0.010	0.000	0.260	0.260
12.	Others	0.350		0.050	0.050
	<b>All INDIA</b>	<b>114.530</b>	<b>117.022</b>	<b>9.524</b>	<b>126.547</b>

\* Directorate of Economics & Statistics, DAC, Ministry of Agriculture, Krishi Bhavan, New Delhi  
Source: Director, DOCD, Mumbai

Weather forecast for 17<sup>th</sup> to 22<sup>nd</sup> Nov. '2014

Zones/ Weather parameter	Temperature ( Min, Max)						Rainfall					
	States	17/11	18/11	19/11	20/11	21/11	22/11	17/11	18/11	19/11	20/11	21/11
Punjab	7,27	7,26	7,26	7,26	7,26	7,25	Mainly clear sky					
Haryana	9,27	9,27	8,26	8,26	7,26	7,26	Mainly clear sky					
Rajasthan	1,32	1,31	1,31	1,30	1,30	1,29	Mainly Clear sky					
Gujarat	24,34	24,34	23,34	23,34	22,34	22,34	Mainly clear sky					
Maharashtra	16,33	15,32	15,31	17,32	18,33	17,33	Partly cloudy sky			Clear sky		
M.P.	20,29	20,29	19,28	19,28	18,28	16,28	Partly cloudy sky			Clear sky		
Odisha	15,31	15,31	15,31	15,31	15,31	15,31	Mainly clear sky					
A.P.	20,32	20,32	19,31	19,31	19,31	19,31	Mist					
Karnataka	16,31	16,31	16,30	17,30	17,30	17,29	Partly cloudy sky					
Tamil Nadu	22,31	22,31	22,31	22,31	22,31	22,31	Partly cloudy sky					

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

1. **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.
2. **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.
3. ***Alternaria* blight:** spray Mancozeb@2.5 g per one litre of water.
4. **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)**

1. **Grasses:** Spray Quizalofop-ethyl or Fenoxaprop ethyl or Fluazifop butyl,
2. **Sedges and grasses:** Spray Propaquizafop ethyl
3. **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).

### IMPORTANT NOTE: (PEST MANAGEMENT)

Farmers are advised not to spray pyrethroids early in the season singly or in combination against sucking pests such as the whiteflies not only for cotton but also on other *H. armigera* host plants such as soybean, as it may exacerbate bollworm problems in non Bt cotton, wherever cultivated.

**COTTON CROP SITUATION***(Based on inputs received from the State Agricultural Universities of the respective States)***NORTH INDIA**

Cotton crop is in last picking stage. Start the picking of cotton crop when the dew is dried up. Dry the kapas before storage to avoid micro-organism damage.

**CENTRAL INDIA**

**Gujarat:** The crop is at reproductive stage (Crop bearing squares, flowers, bolls). Weather remained fully bright during the reporting period. Hand picking, irrigation and insecticides' spraying carried out as per requirements. The population of jassids and whitefly were recorded above ETL and aphids, thrips & mealy bug were found low throughout the reporting period. Monitoring for pink bollworm by setting up pheromone traps from reliable companies must be initiated. Sampling of green bolls for pink bollworm is important in hot spots.

**Odisha:** The crop is 123 to 143 days old at boll formation, development and maturity stage. The weather is cold and dry. Harvesting and spraying of insecticides for pest management is going on. All three types of weeds i.e grasses, sedges and broad leaved weeds have infested the crop but their population has reduced. Incidence of aphids, jassids and mealy bug observed. Sporadic incidence of leaf folder, stem borer, Spodoptera and American boll worm recorded. Bacterial blight has been reported from some parts of the State. Picking of the first opening bolls should be done on clear days after drying of the morning dew. Seed cotton should be dried under sun for 2 to 3 days and stored. Spray 2% DAP with 0.75% KNO<sub>3</sub> for better development of the remaining bolls. To improve fibre quality, spray 0.5% Zinc sulphate and 0.1% boric acid. To control bacterial leaf blight, spray Copper oxychloride @ 2.5 g with 1 g Plantomycin in 1 litre of water. To control American boll worms spray Flubendiamide @ 3.75 ml per 15 litre of water

**SOUTH INDIA**

**Andhra Pradesh:** The crop is at peak flowering to boll development stage. Inter-cultivation with harrow and blade has been taken up. Foliar application of 2% urea/ 1-2% KNO<sub>3</sub>/ 1-2% DAP/ 1-2% 19-19-19 along with 1.0% MgSO<sub>4</sub> is recommended. For the control of whiteflies, erecting of yellow sticky traps @ 20 per acre for monitoring incidence of the whitefly. Spray Profenophos 50% EC @ 2 ml or Triazophos 40% EC @ 2 ml / l of water along with 5 ml of neem oil / l. Spray Diafenthuron 50%WP @ 1.25 g per lt. of water. It can manage both whitefly and jassid. For the control of mealy bug, clean cultivation, removal and burning of weeds in and around the cotton fields, removal and burning of the severely mealy bug affected cotton plants, spraying of Acephate 75% SP @ 2 g or Profenophos 50% EC @ 3ml or Triazophos 40% EC @ 3 ml / l of water is recommended. Care should be taken to add sticking agents like Teepal 1 ml or Sandovit 1 ml or surf powder 1 g/l water for effective control. Spraying should be directed towards the affected plants and surrounding plants. Entire affected plant must be thoroughly sprayed covering all the plant parts including twigs and stem. Spraying of Mancozeb @ 3.0 g/l or Propiconazole @ 1.0 ml/l is recommended to manage the leaf spots as prophylactic or curative measure. For control of Grew mildew, spraying of wettable Sulfur 3.0 g/l or Carbendazim 1.0 g/l is recommended. Spraying of Tridemorph 1.0 ml/l or Propiconazole 1.0 ml/l is recommended to manage rust diseases. In Coastal A.P., the cotton crop is in 100 to 120 days stage. In Telangana, the cotton crop is in 105 days (vegetative) to 145 days (boll formation, boll development and in picking stage). Picking should be done from fully opened bolls during dry hours. Care should be taken not to mix infested/ bad opened/ rotten bolls with good kapas. Picked bolls should be shade dried and stored in dry places with good ventilation.

**Karnataka:** As cold conditions are prevailing in majority of cotton growing areas, it is advised to continue the foliar application of 19:19:19 (1%) or DAP (2 %) with 1% MgSO<sub>4</sub> to reduce leaf reddening in Bt and Non Bt

hybrids. Cotton is to be picked on rain free days wherever the first formed bolls are opened and stored properly. Kapas should be sun dried for a day and to be stored picking wise separately if it has to be stored for future sale. Cyclonic rains in some places damaged kapas quality hence, it is suggested to pick such kapas after bright sunshine for a day or two and sell the kapas separately. In early sown crop, wherever kapas picking is completed it is advised not to irrigate the crop to get new flush of growth and few flowers and bolls. It will lead to build up of pest and diseases which will affect the forthcoming regular cotton crop in that region during next season. It is suggested to use the cotton stalks for compost making instead of burning or using as fuel. Alternatively the cotton stalks can be roto-slashed in the field itself by tractor operated rotovator.

**Tamil Nadu;** The crop is 30 days old in southern districts and 100 days old in other districts. The weed infestation is very high for which the recommended weedicides may be sprayed. Spraying fungicides against alternaria leaf spot and foliar application of 2% DAP have been taken up.

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