

Central Institute for Cotton Research, Nagpur

Twentieth Weekly Advisory for Cotton Cultivation 6th Oct to 12th Oct '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 (As on 25-09-2014)

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
	All INDIA	114.530	117.022	9.524	126.547

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

Weather forecast for 13th to 18th Oct '2014

Zones/ Weather parameter	Temperature (Min, Max)						Rainfall					
	States	13/10	14/10	15/10	16/10	17/10	18/10	13/10	14/10	15/10	16/10	17/10
Punjab	24,33	24,33	23,33	23,33	23,33	23,33	Partly cloudy sky	Mainly clear sky				
Haryana	20,35	19,34	18,34	18,34	18,34	18,34	Mainly clear sky					
Rajasthan	24,37	24,36	23,36	23,35	23,35	23,35	Mainly clear sky					
Gujarat	22,38	22,38	22,38	21,38	21,38	21,38	Mainly clear sky					
Maharashtra	24,33	24,33	24,34	23,34	23,34	23,34	Light rain	Partly cloudy sky	Mainly clear sky			
M.P.	18,33	19,33	19,33	19,33	19,33	19,33	Mainly or Generally cloudy sky with Thundery development					
Odisha	24,33	24,33	23,32	22,28	22,28	22,28	Partly cloudy sky					
A.P.	25,35	25,35	24,35	24,34	23,34	23,34	Mainly or Generally cloudy sky with Thundery development					
Karnataka	20,32	21,33	21,32	22,32	22,32	22,32	Partly cloudy sky	Light to moderate rain				
Tamil Nadu	22,32	22,32	23,33	23,33	23,33	23,33	Light rain	Partly cloudy sky				

Source: 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. 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 MgSO₄, 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**

Punjab: At Faridkot, the crop is at reproductive stage (Crop bearing squares, flowers, bolls), Weather remained mildly hot and humid during the reporting period. After the last irrigation to the crop in the end of September, good boll opening should be awaited. The crop is nearing maturity and bolls have started opening. Picking should be done after the dew dries up to maintain quality of lint. Monitor the fields (particularly growing non bt cotton) for bollworm infestation in bolls regularly. Sucking pest incidence has declined below economic threshold levels. After picking, lint should be placed in jute/cotton bags on dry piece of land

Haryana: The crop is normal at reproductive stage, Irrigate the field as and when required. Mean population of whitefly adults was above ETL in fields. Population of leafhopper was below ETL. Low to moderate incidence of leaf-curl virus disease was observed. Do not irrigate the field after 1/3rd opening of bolls in early maturing hybrids. Do not spray pyrethroids or mixtures containing pyrethroids on cotton for whitefly management.

CENTRAL INDIA

Gujarat: The crop is nearly 160 to 165 days old at reproductive stage (Crop bearing squares, flowers, bolls). Weather remained fully bright and no rainfall was received during the reporting period. Split applications of fertilizers and insecticides spraying carried out as per requirements. No incidence of bacterial blight and other cotton diseases. 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.

Maharashtra: At Vidharba, there was no rainfall for more than a month. Hence protective irrigation is needed where ever it is possible. Sucking pests like jassid and white fly is on the increase which should be controlled by the use of recommended pesticides along with IPM. Mulching may be done with possible material under two rows of cotton. Early signs of leaf reddening were observed on Bt cotton in and around Akola. Monitoring for pink bollworm by setting up pheromone traps from reliable companies must be initiated.

Odisha: The crop is at flowering, boll formation and development stage. The weather was hot and humid. Spraying of insecticides for pest management was taken up. Incidence of aphids, jassids and mealy bug were observed. Sporadic incidence of leaf folder, stem borer and Spodoptera were recorded. Farmers are advised to conserve rain water by making cross bunds between two rows of cotton at 30 m distance

SOUTH INDIA

Andhra Pradesh: The crop is at squaring to boll development stage. Inter-cultivation was done with harrow and blade. Application of fertilizers in the form of N and K as top dressing was given depending upon the age of the crop. Post emergence application of weedicides is recommended at 4 to 6 leaf stage of weeds wherever inter-cultivation is not possible due to high moisture stress. Sucking pests like jassids & whiteflies was noticed. If jassid incidence crosses ETL i.e. 2/leaf, spraying of Acephate 75 SP 1.5 g/l or Fipronil 5% SC 2ml/l or Flonicamid 50% WG 0.3 g/l is recommended. Incidence of Spodoptera on BG II was observed for which spraying of Novaluron 10% EC @ ml/l or Lufenuron 5% EC @ 1 ml/l is recommended. For management of grown up larvae, poison baiting (10kg rice bran + 2kg jaggery + 750 ml Chloripyrifos or 300 g Thiodicarb /acre with sufficient water to make small pellets and spread in the field during evening hours). Spraying of Mancozeb @ 3 g/l or Propiconazole @ 1 ml/l is recommended to manage the leaf spots. Grew mildew and rust diseases were observed in Telangana area. Spraying of wettable Sulfur 3g/l or Carbendazim 1 g/l against grew mildew is recommended. Spraying of Tridemorph 1 ml/l or Propiconazole 1 ml/l is recommended to manage rust diseases. In Coastal A.P., the cotton crop is 35 to 95 days old. Inter-cultivation and split application of fertilizers is to be taken up. Foliar application of 2% urea/1-2% KNO₃/1-2% DAP/ 1-2% 19-19-19 is recommended. At Telangana, the crop is at 45 days (vegetative) to 100 days (squaring, flowering & boll development) old.

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