

Central Institute for Cotton Research, Nagpur

Eighteenth Weekly Advisory for Cotton Cultivation 29th September - 5th October 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, Propanil 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.

Net Cotton Area sown as on 13-09-2013

State	Lakh hectares
Punjab	5.05
Haryana	5.57
Rajasthan	2.93
Uttar Pradesh	0.23
Gujarat	26.88
Madhya Pradesh	6.21
Maharashtra	38.68
Odisha	1.24
Andhra Pradesh	21.13
Karnataka	5.29
Tamil Nadu	0.19
Others	0.10
TOTAL	113.50

Source: Director, DOCD, Mumbai

Weather forecast for 28th Sep to 1st Oct. 2013

Zones/ Weather parameter	Temperature (Min, Max)				Rainfall			
	28/09	29/09	30/09	01/10	28/09	29/09	30/09	01/10
Punjab	25,33	23,33	23,34	24,34	Partly cloudy with possibility of rain or thunderstorm	Thunderstorm with rain		Partly cloudy sky
Haryana	25,33	25,32	24,34	23,35	Partly cloudy with possibility of rain or thunderstorm	Thunderstorm with rain	Partly cloudy sky	Clear sky
Rajasthan	24,37	24,37	24,37	24,37	Partly cloudy sky			Clear sky
U.P.	22,32	22,32	23,33	23,33	Partly cloudy with possibility of rain or thunderstorm			
Gujarat	25,32	25,32	25,32	25,32	Moderate rain			
Maharashtra	23,34	24,33	24,33	23,32	Partly cloudy with possibility of rain or thunderstorm			
Madhya Pradesh	22,33	22,33	22,33	23,33	Light rain			
Odisha	24,30	24,30	24,30	24,30	Generally cloudy sky with thundery development			
Andhra Pradesh	23,34	24,34	24,34	23,33	Partly cloudy sky with thundery development		Partly cloudy sky	
Karnataka	22,33	22,33	22,33	23,33	Light rain			
Tamil Nadu	22,33	22,33	21,33	21,33	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 Harzardous 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 Propanil or Propaquizafop ethyl

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).

COTTON CROP SITUATION

Based on inputs received from the State Agricultural Universities of the respective States

NORTH INDIA

Punjab: The cotton crop is in boll development stage. The boll opening has started in early maturing varieties/hybrids of American cotton and all varieties of desi cotton. The irrigation should be applied to late sown and late maturing varieties where crop is at peak boll development stage. The infestation of whitefly is quite high in cotton growing areas of the state. Cotton leaf curl virus disease has also been observed in larger areas of cotton cultivation in Punjab. Parawilt symptoms are noticed in some fields which can be cured by spraying cobalt chloride @10mg/litre (10ppm) on affected plant within few hours of onset of symptoms. Spread of fungal foliar diseases should be checked with appropriate fungicides. Farmers are advised to monitor their crop for insect pests and diseases regularly.

Haryana: Cotton crop is now in reproductive stage. In general, the crop is healthy. Foliar application of 2½% urea or 1% KNO₃ at flowering and boll formation stage is recommended. Leaf hopper, whitefly and bollworm incidence should be controlled with the recommended control measures. Moderate to high incidence of CLCuD was observed throughout the cotton growing areas in the State. Farmers are advised to monitor their crop for insect pests and diseases regularly.

Rajasthan: At Banswara, the farmers are advised to conserve the moisture as mostly dry days ahead are expected. At Sriganganagar, the crop is in boll opening stage. Incidence of white fly, jassid, thrips, mite, Spodoptera, spotted boll worm and pink boll worm were noticed in the fields of cotton crop. The sucking pest incidence decreased during this period.

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 store in jute bags.

CENTRAL INDIA

Gujarat: At Junagadh, the crop is in square and flowering stage. The incidence of jassids was above ETL and thrips was below ETL whereas aphids, white fly, mealybug and mite were at low population throughout the week.

Maharashtra: Heavy rainfall in Vidarbha region resulted in water logged condition. Around 5 to 25% plants dried due to parawilt. Farmers are advised to drench the affected plants with recommended

measures for recovery. Sucking pests should be controlled appropriately. Urea 2% in 200g/10 litres of water should be sprayed at flowering stage.

Madhya Pradesh: At Indore, the crop condition is very good . There are chances of borer attack. Farmers are advised to take care of pests with appropriate control measures.

Odisha: The cotton crop is at boll formation and boll development stage (90-100 days). The crop condition is almost good and there is no incidence of any severe pest/diseases. Conserve the rain water by making cross bunds between two rows. Remove the tips of the plants at 90 DAS or when the plants are at 1 metre height. To check the incidence of sucking pests like aphids, jassids, thrips and whitefly, spray neem based pesticides @ 3ml/litre of water. Regular monitoring should be done for other pests like Spodoptera and Semiloopers etc. In case of severe infestation of American boll worms (at ETLs of 90 to100% plants showing flared up squares) spray recommended insecticide during 80 to100 days after sowing.

SOUTH INDIA

Andhra Pradesh: In Telangana districts of Andhra Pradesh, the crop is around 70 to110 days old. In Guntur, Krishna and Prakasam districts, the crop is 35 to 90 days old. Second and third split application of fertilizers at 50 kg Urea + 15 kg MOP along with inter-cultivation is recommended for the late sown crop (wherever the crop is \geq 45-60 DAS) and early sown crop (wherever the crop is \geq 80 DAS). Due to continuous rains wherever inter-cultivation is not possible, spray recommended weedicides for control of grasses and broad leaved weeds. Foliar application of 2% Urea or 2% DAP or 1-2% KNO₃ along with 1% MgSO₄ is recommended to mitigate the stress conditions. Monitoring of bollworms in particular to *Spodoptera litura* should be done through pheromone traps. Excess moisture and high temperature may predispose the plants to fungal root rots and wilts. Sudden death of the plants in patches or yellowing of leaves and wilting of plants should be managed by drenching the affected plants and soil with appropriate foliar nutrients. High relative humidity, windy rains may spread bacterial blight disease. Angular leaf spot and vein blight should be managed by spraying recommended fungicides at 7 to10 days interval.

Karnataka: At Raichur, there has been sucking pest incidence in some areas but under control. The rainfall received during first and second weeks of September was more than the normal rainfall. At Dharwad, leaf reddening is expected in majority of Bt hybrids during October. Sucking pests are to be effectively controlled by spraying the crop with suitable recommended insecticides. Further, along with chemical spray, it is advised to tank mix 2% urea or 2% KNO₃ or 1% of 19:19:19 soluble fertiliser with 1% MgSO₄ and Planofix (5 ml in 15 lit of water) to minimize leaf reddening and square dropping. Square dropping due to mirid bug damage to be managed with the spray of Acephate @ 1 g/lit of water. In 100 to110 days old crop, it is suggested for ovicidal recommended insecticide spray for controlling pink bollworm along with Copperoxychloride @ 3 g /lit and Streptocycline @ 0.5 gm/lit of water to control boll rot. Boll opening has commenced in the crop sown during the month of May. Kapas is to be picked on rain free days and to be stored picking wise separately. Light irrigation is advised after each picking of kapas.

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 early vegetative stage. The weather prevailed during the reporting period was moderately dry and cool with slight rainfall in some areas. Sucking pests like aphids, thrips and leaf hoppers incidence was noticed in some parts for which need based plant protection measures may be followed depending on ETL. Dry weather prevails in

winter irrigated belts. The crop is in flowering stage. Sowings are completed in winter rainfed tracks viz. Perambalur district etc. Dry sowing is in progress in southern districts expecting rains during first week of October.

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