

Central Institute for Cotton Research, Nagpur

Twenty-first Weekly Advisory for Cotton Cultivation 20th to 26th 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, 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 08-10-2013

State	Lakh hectares
Punjab	5.05
Haryana	5.57
Rajasthan	3.03
Uttar Pradesh	0.23
Gujarat	26.88
Madhya Pradesh	6.21
Maharashtra	38.72
Odisha	1.24
Andhra Pradesh	21.20
Karnataka	5.38
Tamil Nadu	0.90
Others	0.10
TOTAL	114.51

Source: Director, DOCD, Mumbai

Weather forecast for 22nd Oct to 25th Oct. 2013

Zones/ Weather parameter	Temperature (Min, Max)				Rainfall			
	22/10	23/10	24/10		22/10	23/10	24/10	25/10
Punjab	15,32	14,31	14,31		Mainly clear sky			
Haryana	18,32	17,32	17,32	16,32	Mainly clear sky			
Rajasthan	17,36	16,36	16,36	16,37	Clear sky			
U.P.	17,32	17,32	17,32	18,31	Mainly clear sky			
Gujarat	23,35	23,34	23,34	22,37	Mainly clear sky			
Maharashtra	20,33	21,33	20,33	19,33	Partly cloudy sky	Partly cloudy sky with thundery development		Partly cloudy sky
Madhya Pradesh	19,32	19,31	18,30	18,33	Partly cloudy sky		Partly cloudy sky with possibility of rain or thunderstorm	Light rain
Odisha	24,30	23,30	23,30	23,29	Generally cloudy sky with thundery development			
Andhra Pradesh	22,34	22,34	22,34	24,29	Partly cloudy sky with possibility of rain or thunderstorm	Light rain	Partly cloudy sky with possibility of rain or thunderstorm	
Karnataka	20,32	20,31	20,31	20,31	Possibility of rain or thunderstorm	Light rain		
Tamil Nadu	22,29	22,29	22,29	22,29	Partly cloudy sky with possibility of rain			

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. 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 Pyriithiobac sodium

GENERAL CROP HEALTH MANAGEMENT

- **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.
- **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 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. Check for boll rot if any, after rains and manage with Carbendazim @0.1%. 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.

Haryana: Desi cotton crop is in picking stage, whereas, Bt. cotton hybrids are in early boll opening stage. In general, the crop is healthy. Do not irrigate the field after one third opening of the 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

Rajasthan: Crop is in boll opening and picking stage. Incidence of white fly, jassid, Spodoptera, Spotted boll worm and pink boll worm were noticed in the fields of cotton crop. The sucking pest incidence decreased during this period.

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 aphid, white fly, mirid bug, mealy bug and mite were very low throughout the week.

Odisha: The cotton crop is at boll development and boll maturity stage (110-120 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 when the plants are at 1 metre height. Spray 2% DAP for better boll development. 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.

SOUTH INDIA

Andhra Pradesh: In Telangana districts of Andhra Pradesh, the crop is around 110 to 130 days old. In Guntur, Krishna and Prakasam districts, the crop is 60 to 100 days old. Foliar application of 2% Urea or 2% DAPS or 1 to 2% KNO₃ along with 1% MgSO₄ is recommended to mitigate the stress conditions. For the control of sucking pests, need based spraying with appropriate control measures is recommended. Monitoring of bollworms in particular to *Spodoptera litura* through pheromone traps is to be done. Sudden death of the plants in patches or yellowing of leaves and wilting of plants, angular leaf spot and vein blight should be managed by drenching the affected plants and soil with recommended solutions. Fungal leaf spots should be managed by protective or curative spraying with recommended fungicides at 7 to 10 days interval.

Karnataka: Heavy rainfall occurred due to onset of cyclone in some cotton growing regions of the State. Cotton crop with squares, flowers and bolls at this stage is very much sensitive to water logging. Hence, it is advised to drain out excess water from the root zone of the cotton crop to minimize the square and flower drop. Further, it is advised to spray the crop with 2 % Urea or 1 % of 19:19:19 soluble fertiliser with 1 % MgSO₄. In Bt hybrid cotton crop, it is suggested to spray the crop with any systemic insecticide for controlling the sucking pests. In *herbaceum* and *arboreum* cotton crop (Desi varieties), it is suggested to spray the crop with Carbendazim 50 WP @ 1g/lit of water for effective control of cotton grey mildew disease. Nipping of growing shoot tip is advised in 90 days old *arboreum* cotton crop. Light irrigation in alternate furrows is suitable in black soils wherever the crop is at boll development stage.

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 stage. Sowing of cotton is also in progress by utilizing North East Monsoon rainfall. The weather prevailed during the reporting period was moderately cool. The onset of North East Monsoon brought moderate quantity of rainfall in many parts of the State. 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.

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