

Central Institute for Cotton Research, Nagpur

Twenty-Sixth Weekly Advisory for Cotton Cultivation 24th November to 30th 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 26-11-2013

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	5.89
Tamil Nadu	1.26
Others	0.10
TOTAL	115.73

Source: Director, DOCD, Mumbai

Weather forecast for 26th Nov to 29th Nov 2013

Zones/ Weather parameter	Temperature (Min, Max)				Rainfall			
	26/11	27/11	28/11	29/11	26/11	27/11	28/11	29/11
Punjab	10,28	11,28	13,27	15,27	Mainly clear sky	Partly cloudy sky		Mainly clear sky
Haryana	11,28	13,28	14,28	14,28	Clear sky	Mainly clear sky		Partly cloudy sky
Rajasthan	14,31	13,31	13,31	12,30	Partly cloudy sky	Mainly Clear sky		
U.P.	10,29	11,30	14,31	14,31	Fog			
Gujarat	22,34	22,34	22,34	22,34	Mainly clear sky			
Maharashtra	19,32	18,32	17,31	17,31	Mainly clear sky	Clear sky		
Madhya Pradesh	16,31	15,30	15,30	14,29	Clear sky			
Odisha	17,32	17,31	16,30	16,30	Generally cloudy sky with possibility of rain or thunderstorm			Partly cloudy sky
Andhra Pradesh	22,32	21,32	21,33	21,33	Mainly cloudy sky with possibility of rain or thunderstorm			Partly cloudy sky
Karnataka	21,32	21,32	21,32	21,32	Haze			
Tamil Nadu	23,31	23,31	23,31	23,32	Light rain	Generally cloudy sky with possibility of rain or thunderstorm		Light 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 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 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

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: At Junagadh, the crop is in squaring, flowering, boll development and boll bursting stages. At present, crop growth is good. The incidence of jassids was above ETL and thrips, aphids, white fly, mirid bug, mealybug and mites were very low throughout the week.

Maharashtra: Cotton crop in Marathwada region is in boll bursting stage. Picking of cotton should be done in morning hours to avoid trash material sticking to seed cotton. Picked cotton should be dried and stored at dry place. For better development of bolls during second flush, irrigation may be given as per availability.

Odisha: The cotton crop is at boll development to maturity stage (146-156 days). Picking must be avoided on rainy and cloudy days. Use cotton bags instead of polythene or gunny bags for picking. Dry the seed cotton on cement concrete floors or tarpaulin sheets to reduce moisture below 10%. Keep the first picked cotton separately. After harvesting, spray 2% DAP for development of the upper bolls. Regular monitoring should be done for incidence of Spodoptera and leaf folders. To know the incidence of boll worms, fix pheromone traps as recommended. Spraying of insecticides must be avoided on rainy days.

SOUTH INDIA

Andhra Pradesh: The cotton crop is 100 to 140 days old and is in flowering, boll development to boll bursting and first to second picking stage. Foliar application of 2% Urea or 2% DAP or 1-2% KNO₃ along with 1% MgSO₄ at 2 to 3 times at weekly interval is recommended. Prophylactic sprays of fungicides at weekly intervals should be taken up. As curative sprays, proper control measures for leaf spots is recommended. Wherever the crop height exceeded more than 5 ft, detopping is to be done for regulating the vegetative growth in healthy crop. For the control of leaf hoppers and whitefly, appropriate management strategies should be adopted.

Karnataka: Midge fly and mirid bug incidence is increasing in late sown Bt cotton, Non Bt hybrids and other cotton varieties also. Night temperature is decreasing in major cotton growing areas with cold weather conditions. Hence, for late sown cotton crop, it is advised for the foliar application of 19:19:19 (1%) or DAP (2 %) with 1% MgSO₄ to reduce leaf reddening. In majority areas, the crop is at first picking stage with more than 50% boll opening. It is advised to avoid picking of kapas in early hours of morning as the kapas will be wet due to morning dew. The kapas has to be sun dried for a day before storing. First picked cotton is of good quality, hence, it is to be marketed separately to get higher price in the market. The crop has to be irrigated lightly after each kapas picking wherever irrigation facilities are available. It is suggested to use the cotton stalks for compost making instead of burning or using as fuel wherever the picking is completed. Alternatively the cotton stalks can be roto-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 flowering and square formation stage in many parts and boll development stage in some areas. The weather prevailed during the reporting period was moderately cool and drizzling was observed in scanty areas. Infestation of *Spodoptera litura* and *S. exigua* were recorded. Spraying of Chlorpyrifos 20 EC @ 2.0 lit per ha during early morning or in the evening hours is recommended. Early infestation of spotted bollworm and American bollworm were also noticed. Monitoring of bollworm shall be done using pheromone traps.

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