

Central Institute for Cotton Research, Nagpur

Twelfth Weekly Advisory for Cotton Cultivation 18th – 24th August 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 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.

Net Cotton Area sown as on 1-8-2013	
State	Lakh hectares
Punjab	5.5
Haryana	5.19
Rajasthan	3.27
Uttar Pradesh	0.28
Gujarat	23.49
Madhya Pradesh	6.37
Maharashtra	39.07
Andhra Pradesh	16.34
Karnataka	3.09
Odisha	0.94
Tamil Nadu	0.1
TOTAL	103.64

Source: DOCD, Mumbai

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.

Weather forecast for 19th to 23rd Aug. 2013

Zones/ Weather parameter	19/08	20/08	21/08	22/08	23/08
Temperature (Max./ Min.)					
North Zone (Punjab, Haryana, Rajasthan, U.P.)	24-27 30-35	23-28 28-35	22-27 28-35	22-27 27-34	22-27 31-36
Central Zone (Gujarat, M.P., Maharashtra, Odisha)	22-25 25-30	21-24 24-28	20-22 24-27	19-24 22-27	19-25 22-26
South Zone (A.P., Karnataka, Tamil Nadu)	22-24 26-30	21-23 26-29	21-23 26-30	21-23 26-31	21-23 27-33
Rainfall (mm)					
North Zone (Punjab, Haryana)	6-16	7	-	-	-
U.P.	25	15	17	18	5
Central Zone (Odisha)	38	34	40	12	-
South Zone (A.P., Tamil Nadu)	11	3	21	14	6
Karnataka	33	26	23	21	12

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

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 Pyrethiobac 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

Whitefly and leaf hopper high infestation must be managed with insecticides as the population has crossed ETL. The appearance of any fungal foliar disease may be monitored because of cloudy weather. The incidence of cotton leaf curl virus disease has been noticed in the zone. Farmers are advised to control its vector, white fly to check the further spread of the disease. As it has rained in the current week up to 100mm, farmers must ensure proper drainage of water from the fields. Monitor for flared up squares for bollworm damage in non Bt and Bt.

Punjab: The crop is in reproductive phase. The continuous cloudy weather and rains over the week may increase the attack of sucking pests. So, farmers are advised to monitor their crop for insect pests. The attack of sucking pests i. e. Whitefly and jassids are above economic threshold level in some pockets and recommended plant protection measures should be followed for control of these. The attack of whitefly has resulted in the incidences of cotton leaf curl virus disease in many cotton areas of Punjab. Monitor for flared up squares for bollworm damage in non Bt and Bt .

Haryana: Cotton crop is at peak vegetative to reproductive phase. In general, the crop is healthy. Weeding, interculture and fertilizer application must be done during rain free period. If heavy rains occur, proper drainage is required. One third nitrogen fertilizer is to be applied. Since *Aenasius* parasitoid is quite active, the mealybug is likely to remain in low profile and there is no need of spraying any insecticide against this pest. Detopping is recommended in *desi* cotton. Farmers are advised to monitor their crop for insect pests and diseases regularly. Monitor for flared up squares for bollworm damage in non Bt and Bt .

Rajasthan: At Banswara, the weather during next 4 days would be stable with clouds. Drizzling to normal rains up to 6-9 mm rains is expected during all the four days. Farmers are advised to go for weeding and intercultural operation in crops. At Junagadh, germination in all the experiments was quite good but due to continuous rain, growth of cotton crop is not satisfactory. However, necessary gap filling was done to maintain proper plant stand. Initial crop condition was very good but now adversely affected by submergence condition due to continuous rainfall. Monitor for flared up squares for bollworm damage in non Bt and Bt .

Uttar Pradesh: Crop is in flowering to boll formation stage. Farmers are advised to take control measures for bollworm during clean weather.

CENTRAL INDIA

Gujarat: At Surat, continuous rainfall interrupted the interculturing and other field operations hampering the growth of crop. Farmers are advised to carryout hand weeding and intercultural operations in the field. Split dose of nitrogen to be applied after weeding. Drain excess water regularly from field.

Maharashtra: At Akola, second dose of nitrogen should be applied immediately after weeding. Hoeing should taken after urea application. For sucking pests and bollworms, proper care has to be taken up. Yellowing of leaves is observed in some fields. Monitor for flared up squares for bollworm damage in non Bt and Bt.

Odisha: The cotton crop is at square formation and early flowering stage(49-59 days). The crop condition is almost good and there is no incidence of any severe pest/diseases. 25% Nitrogen to be applied as second top dressing. Plant hormones to be sprayed to check drop of fruiting bodies. 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 40-80 days old. In Guntur, Krishna & Prakasam districts the crop is 10-60 days old. Monitor for egg masses of Spodoptera on cotton and on weeds. The continuous heavy rains received during past 10 to 15 days resulted in water logging or over moisture conditions in the low lying areas in some of the districts like Adilabad, Karimnagar and Khammam. Farmers are advised to drain the water from the fields immediately. Depending on the stage of the crop top dressing of fertilizers is recommended. Wherever top dressing is completed, to combat over moisture conditions booster dose of 25-30 kg Urea + 10 kg MOP per acre is also recommended. Second split application of fertilizers is recommended for the early sown crop (wherever the crop is > 50 DAS). Foliar application of nutrients is recommended to mitigate the stress conditions. Due to the continuous rains wherever inter-cultivation operations could not be taken up for the control of monocot and dicot weeds, post emergence application of weedicides is recommended.

Karnataka: Top dressing is to be taken up in 50-60 days old crop. In the early sown crop in southern districts where the crop is 90-100 days old, the incidence of mirid bug and midge in the developing squares is reported. Rotting of early formed lower bolls is expected due to cloudy and drizzling conditions. Depending upon the severity of the disease, it is advised to spray the crop and developing bolls with suitable fungicides. Crop sown during the month of May is at boll formation stage and to be sprayed with appropriate fertilizers alternatively at an interval of 15 days along with foliar nutrients to manage leaf reddening and square dropping effectively. These foliar nutrients may be simultaneously sprayed along with pesticide sprays. Excess water in the standing crop under continuous rainfall conditions has to be drained out and suggested to top dress the crop with 50 kg urea/ha with intercultivation. Light irrigation is advisable in black soils during the dry spell wherever the crop is under protective irrigation. Alternate furrow irrigation is suggested in black soils for cotton crop of more than 80 days old under water scarcity conditions.

Tamil Nadu: In the summer irrigated cotton growing zones of Tamil Nadu (Parts of Tirunelveli, Virudhunagar, Ramanathapuram and Madurai District), the cotton crop is in boll maturity and almost in ending stage . About 4 to 5 of kapas picking was completed.

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