

Central Institute for Cotton Research, Nagpur

Tenth Weekly Advisory for Cotton Cultivation 4th – 10th 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.

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 1-8-2013	
State	Lakh hectares
Punjab	5.50
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
Orissa	0.94
Tamil Nadu	0.10
TOTAL	103.64

Source: DOCD, Mumbai

Weather forecast for 6th to 10th Aug. 2013

North zone (Punjab, Haryana, Rajasthan)

Weather parameter	6 Aug	7 Aug	8 Aug.	9 Aug.	10 Aug.
Temperature (°C)	29-30	29-31	29-31	29-31	29-32
Rainfall: Haryana	Heavy showers	Heavy showers	Traces	Traces	Traces
Punjab	Heavy showers	Heavy showers	Traces	Traces	Traces
Rajasthan	Traces	Traces	Traces	Traces	Traces

Central Zone (Gujarat, Maharashtra and Madhya Pradesh)

Weather parameter	6 Aug	7 Aug	8 Aug.	9 Aug.	10 Aug.
Temperature (°C)	28-31	28-30	28-30	29-31	30-32
Rainfall Madhya Pradesh	Heavy showers	Heavy showers	Traces	Traces	Traces
Maharashtra	Heavy showers	Traces	Traces	Traces	Traces

South Zone (Andhra Pradesh, Tamil Nadu and Karnataka)

Weather parameter	6 Aug	7 Aug	8 Aug.	9 Aug.	10 Aug.
Temperature (°C)	32-34	31-33	31-34	31-34	31-34
Sunshine		Bright	Bright	Bright	Bright
Rainfall	Isolated showers	Negligible	Traces	Traces	Traces

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

1. **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.
2. **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.
3. **Do not spray Bt-formulations on Bt cotton** to avoid further selection pressure.
4. **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.
5. **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. 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

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

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 at flowering stage. The infestation of sucking pests viz.. white fly and jassids were noticed. The attack of whitefly is severe in some areas resulting in the incidence of cotton leaf curl virus disease. Apply remaining dose of nitrogen fertilizer during flower initiation.

Haryana: The cotton crop is in peak vegetative to square phase. In general, the crop is healthy. Weeding, interculture and fertilizer application must be done during rain free period. If heavy rain occurs, proper drainage is required. 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 the pest. Incidence of cotton leaf curl virus disease was observed at few farmers' field in Hisar, Fatehabad and Sirsa districts. Weeds of *Sida* and *Abutilon* spp. must be removed around the fields, water channel and road side to check the whitefly population on alternate host of the virus/vector. Farmers are advised to monitor their crop for insect pests and diseases regularly.

Rajasthan: At Banswara, farmers are advised to go for weeding and inter-cultural operations.

Uttar Pradesh: The crop is at square to flowering and boll formation stage. Farmers are advised to remove the weeds from cotton fields.

CENTRAL INDIA

Gujarat: At Surat, continuous rainfall has interrupted the inter-culturing and other field operations hampering the overall growth of crop. Farmers are advised to apply light nitrogen dose after weeding as light to moderate rainfall is expected in coming days. Sucking pest may get washed away. Hence spraying of plant protection chemicals against pest and diseases may not be done. Drain excess water regularly from field. At Junagadh germination in all the experiments was quite good but due to continue rain, growth of cotton crop is not satisfactory. However, necessary gap filling was done to maintain proper plant stand.

Madhya Pradesh: At Khandwa, continuous rains hampered inter culture and other field operations. Farmers are advised to avoid water logging conditions in the fields. No pest and disease problem at present. At Indore,

rained cotton crop growth is stunted due to excess rains. Farmers are advised to drain out excess water from fields and follow intercultural operations when fields are in working conditions.

Odisha: The cotton crop is at vegetative stage (35-45 days).

SOUTH INDIA

Andhra Pradesh: In Telangana districts of Andhra Pradesh, the crop is around 30-70 days old. Depending on the stage of the crop, top dressing of fertilizers @ 40-50 kg Urea + 10-15 kg MOP per acre is recommended. Wherever first top dressing is completed, to combat over moisture conditions booster dose of 25-30 kg Urea + 10 kg MOP per acre is also recommended. Foliar application of 2% Urea or 2% DAP or 1-2% KNO₃ along with 1% MgSO₄ is recommended to mitigate the stress conditions.

Karnataka: Sowing of desi cotton varieties (Jayadhar, DDHC-11 and RAHS-14) may be continued till the end of first fortnight of August in northern districts as an intercrop in onion and chilli. Top dressing with 25 kg N/ha (i.e. 50 kg Urea/ha) and 12 kg K (20 kg MOP/ha) to be taken up in 30 and 50 days old crop. Advised application of fertilizer to desi cotton crop sown during first week of July @ 40:25:25 N-P-K kg/ha if not applied at sowing. Post emergent spraying of Quizolopof ethyl (Targasuper) weedicide on weeds @ 1 ml/lit of water in more than 30 days old standing crop is advised if there is a severe problem of monocot weeds in cotton. Shoot weevil incidence has been reported in few districts in 30-45 days old crop. Under unavoidable conditions it is suggested to hand pick the weevil during morning hours and destroy. It is suggested to take up spraying of insecticides if necessary based on ETLs for the control of sucking pests. In southern districts of the State, early sown crop to be monitored for mirid bug incidence and square dropping, Early sown crop which is at boll formation stage to be sprayed with 2% DAP or 2% KNO₃ or 1% of 19:19:19 soluble fertiliser with 1% MgSO₄ and Planofix (5 ml in 15 lit of water). These foliar nutrients may be simultaneously sprayed along with pesticide sprays.

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 stage. Harvesting of kapas is in progress. The weather prevailed during the reporting period was hot and dry with mild wind. Bollworm incidence was noticed in some areas. If ETL crosses 10% damage, insecticides may be used.

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