Central Institute for Cotton Research, Nagpur

Twentieth Weekly Advisory for Cotton Cultivation 13th to 19th 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 Pyrithiobac 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 14th Oct to 17th Oct. 2013

Zones/ Weather parameter	Temperature (Min, Max)				Rainfall			
	14/10	15/10	16/10	17/10	14/10	15/10	16/10	17/10
Punjab	21,31	20,32	20,32	19,32	Partly cloudy sky	Mainly clear sky		
Haryana	20,34	21,34	21,35	20,35	Partly cloudy sky	Mainly clear sky		
Rajasthan	21,33	21,34	21,35	21,35	Partly cloudy sky			Clear sky
U.P.	22,32	22,33	23,33	23,33	Partly cloudy sky			
Gujarat	26,33	25,33	25,34	24,35	Partly cloudy sky with possibility of rain or thunderstorm		Partly cloudy sky	
Maharashtra	23,31	22,30	23,31	22,31	Generally cloudy sky with thundery development		Partly cloudy with possibility of rain or thunderstorm	
Madhya Pradesh	21,30	22,31	23,32	23,32	Light rain	Partly cloudy with possibility of rain or thunderstorm		
Odisha	23,28	23,28	24,29	24,30	Generally cloudy sky with thundery development			
Andhra Pradesh	24,33	23,33	23,33	23,32	Partly cloudy sky with possibility of rain or thunderstorm			
Karnataka	22,31	22,32	22,32	23,32	Moderate rain		Partly cloudy sky	
Tamil Nadu	23,32	22,32	23,32	22,32	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, mealybugs 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., *Aphilinus* 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 *SL*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% Metaldehide (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 Pyrithiobac 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

After the last irrigation to the crop in the end of September, good boll opening should be awaited. 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 late sown and late duration non-Bt genotype for pink bollworm infestation. Check for boll rot, if any, after rains and manage with carbendazim@0.1%.

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: Due to late rains at maturity, the value of produce is declining considerably. Farmers are advised to bring their produce under shade. Due to conducive weather for the incidence of black arm disease in Bt cotton, suitable control measures should be taken up.

CENTRAL INDIA

Gujarat: 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 incidence were very low.

Maharashtra: Cotton crop in Marathwada region is in to boll formation to boll development stage. Severe infestation of jassids as well as white flies was noticed throughout the region. Due to continuous rains, occurence of wilting and root rot is found in some pockets for which the recommended control measures is suggested. Spray of 2% KNO_3 is beneficial for boll development and 1% MgSO4 to lower number of red leaves as recommended during boll development stage. At Vidharba, if whitefly is observed, farmers are advised to spray appropriate insecticide. The same is the case with bollworm incidence under non Bt cotton. Due to excess rains, if para wilt observed, drenching of 30g COC +100g urea 10 L water can be sprayed on affected plants.

Odisha: The cotton crop is at boll formation and boll development stage (104-114 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. In case of severe

infestation, recommended measure is advised. Regular monitoring should be done for other pests like Spodoptera and Semiloopers etc.

SOUTH INDIA

Karnataka: Leaf reddening is expected in majority of Bt hybrids during October. Sucking pests are to be effectively controlled by spraying the crop with suitable insecticides. Further, along with this chemical spray, it is advised to tank mix 2 % KNO_3 or 1 % of 19:19:19 soluble fertiliser with 1 % $MgSO_4$ to the crop which is at peak boll development stage. In Non Bt hybrid cotton crop, it is suggested to spray the crop with appropriate control measures for controlling the boll worm incidence and leaf spot diseases, respectively. In *herbaceum* and *arboreum* cotton crop, it is suggested to spray the crop with Carbendizim 50 WP @ 1g/lit of water for effective control of cotton grey mildew disease. In water scarcity areas, alternate furrow irrigation method is suggested to cover more area with available water. Heavy irrigation in black soils is to be avoided. Light irrigation has to be given after each picking of *kapas* wherever irrigation facilities are available.

Tamil Nadu: Dry weather prevails in winter irrigated belts. The crop is in flowering stage. Sowings are completed in winter rainfed tracks viz. Perambalur district etc. 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. Sucking pests like aphids, thrips whiteflies and leaf hoppers incidence were noticed in some parts for which need based plant protection measures may be followed depending on the economic threshold level.

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