Central Institute for Cotton Research, Nagpur

Eighteenth Weekly Advisory for Cotton Cultivation 22nd to 28th September 2014

"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 at weekly intervals will help the plants to recover from the effect of water logging.

Cotton Sown Area (As on 25-09-2014)

Area in lakh ha

S.No.	States	Normal Area (DES)*	Bt	Non Bt	Total
1.	Andhra Pradesh + Telengana	19.83	22.198	1.669	23.867
.	Andhra Pradesh (23.95%)	4.749	7.121	0.239	7.360
	Telangana (76.05%)	15.081	15.077	1.430	16.507
2.	Gujarat	26.490	27.13	2.930	30.060
3.	Haryana	5.640	6.310	0.080	6.390
4.	Karnataka	5.270	6.97	0.630	7.600
5.	Madhya Pradesh	6.390	5.503	0.285	5.788
6.	Maharashtra	39.160	40.097	1.822	41.919
7.	Odisha	0.970	0.000	1.250	1.250
8.	Punjab	5.170	4.300	0.200	4.500
9.	Rajasthan	4.000	3.954	0.208	4.162
10.	Tamil Nadu	1.250	0.560	0.140	0.700
11.	Uttar Pradesh	0.010	0.000	0.260	0.260
12.	Others	0.350		0.050	0.050
	All INDIA	114.530	117.022	9.524	126.547

* Directorate of Economics & Statistics, DAC, Ministry of Agriculture, Krishi Bhavan, New Delhi

Source: Director, DOCD, Mumbai

Weather forecast for 27th Sep to 2nd Oct '2014

Zones/ Weather parameter	Temperature (Min, Max)						Rainfall					
States	27/09	28/09	29/09	30/09	01/10	02/10	27/09	28/09	29/09	30/09	01/10	02/10
Punjab	23,34	23,34	24,34	24,33	23,33	23,33	Mainly clear sky					
Haryana	23,34	24,35	24,35	25,34	23,34	23,34	Mainly clear sky					
Rajasthan	24,36	24,36	25,37	25,37	25,37	25,37	Mainly clear sky					
Gujarat	26,33	25,32	25,32	24,33	25,34	24,33	Partly cloudy sky					
Maharashtra	21,36	20,36	20,36	21,35	21,35	21,35	Mainly clear sky			Partly cloudy sky		Mainly clear sky
M.P.	21,32	21,32	21,32	20,32	20,31	20,31	Partly cloudy sky					
Odisha	25,34	25,34	25,34	25,34	25,34	25,34	Partly cloudy sky with possibility of rain or thunderstorm					
A.P.	24,35	24,35	24,35	23,34	23,34	23,34	Partly cloudy sky					
Karnataka	24,32	24,32	23,31	23,31	23,31	23,31	Light rain					
Tamil Nadu	22,33	22,33	22,33	22,33	22,33	22,33	Partly cloudy sky with possibility of rain or thunderstorm					

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., *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

1. 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.
2. 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.
3. *Alternaria* blight: spray Mancozeb@2.5 g per one litre of water.
4. 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)

1. Grasses: Spray Quizalofop-ethyl or Fenoxaprop ethyl or Fluazifop butyl,
2. Sedges and grasses: Spray Propaquizafop ethyl
3. Broadleaf weeds: Spray Pyrithiobac 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).

DROUGHT MANAGEMENT

Odisha

Mid season drought (long dry spell)

Condition			Suggested Contingency Measures	
Mid season drought (long dry spell	Major Farming Situation	Normal Crop / Cropping System	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Red soil High rainfall Medium elevation	Cotton	Applying of Planofix hormone * spraying the crop with Imidacloprid for controlling of sucking pests	Apply 1250ml micronutrient/ha
	Red and Yellow soil High rainfall Medium elevation	Cotton		
	Black soil High rainfall Medium elevation	Cotton + Arhar		

Terminal drought (Early withdrawal of monsoon)

Condition			Suggested Contingency Measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming Situation	Normal Crop / Cropping System	Crop management	Rabi Crop planning
	Red soil, High rainfall, Medium elevation	Cotton	Provide protective irrigation	Mulch with stovers Dibble rabi crop
		Cotton	Provide protective irrigation	
		Cotton + Arhar	Provide protective irrigation Harvest at physiological maturity stage	

IMPORTANT NOTE: (PEST MANAGEMENT)

Farmers are advised not to spray pyrethroids early in the season singly or in combination against sucking pests such as the whiteflies not only for cotton but also on other H. armigera host plants such as soybean, as it may exacerbate bollworm problems in non Bt cotton, wherever cultivated.

COTTON CROP SITUATION

(Based on inputs received from the State Agricultural Universities of the respective States)

NORTH INDIA

Punjab:.At Faridkot, the crop is nearly 135 days at reproductive stage (Crop bearing squares, flowers, bolls), Weather remained mildly hot and humid during the reporting period. The farmers who have witnessed leaf reddening in their cotton fields are advised to spray $MgSO_4$ @1%(1 kg/100 lts of water) twice during flowering and boll development stage as a prophylactic remedial measure. Give the last irrigation to cotton during end of September. Due to high rainfall in the last weeks, there may be resurgence of itsit (*Trianthema* spp.) which is a host of Tobacco caterpillar. Hence farmers need to be vigilant. If hot and humid conditions persist, whitefly incidence will increase. If necessary, spray Triazophos 40 EC @ 600ml/acre or Ethion 50 EC @ 800 ml/acre if whitefly population is higher than ETL level of 6/leaf after rainfall. Cotton leaf curl disease intensity has increased to highest levels in the past week. If plants show Parawilt symptoms after rainfall/irrigation, spray Cobalt Chloride @ 10 mg/litre on affected plants within few hours to check it

Haryana: The crop is normal at reproductive stage, Irrigate the field as and when required. Irrigate the field as and when required. Mean population of whitefly adults was above ETL in fields. Population of leafhopper was below ETL. Low to moderate incidence of leaf-curl virus disease was observed. Myrothecium leaf spot disease was observed in traces. For the control of bollworms in non Bt cotton varieties, spray the recommended insecticides in 200 litres of water per acre. For checking whitefly, spray Nimbecidine 500 ml. + Triazophos 500 ml. in 200 litres of water per acre, Some farmers were observed spraying cotton crop by mixing 2 to 3 insecticides for the control of whitefly which should be discouraged. If boll rot disease appears, spray Streptomycine sulphate (8g) plus Copper oxychloride (800g) or 400 gm. Bavistin in 200 L of water per acre.

Rajasthan: The crop is 110 to 120 days old at initial boll bursting stage, The weather was partially cloudy with high humidity, Weeding and spray for sucking pests has been taken up, At present, the crop is weed free. Among sucking pests, only jassids crossed ETL. However, white fly infestation is very low. Bollworm infestation was not recorded.

CENTRAL INDIA

Gujarat: The crop is nearly 150 days old at reproductive stage (Crop bearing squares, flowers, bolls). Weather remained fully bright and no rainfall was received during the reporting period. Split applications of fertilizers and insecticides spraying carried out as per requirements. The population of jassids was recorded medium. Thrips and mealy bug infestation were found medium throughout the reporting period. No incidence of bacterial blight and other cotton diseases.

Maharashtra: At Rahuri, the crop is 135 days old at boll development stage, Fertilizer application, weeding, Insecticide sprays were taken up. The control measures recommended may be followed to control the pest and disease attack. Incidence of semilooper and its leaf damage were recorded in non BT cotton that should be ignored.

Odisha: The crop is 73 to 93 days old at flowering, boll formation and development stage. The weather was hot and humid. Spraying of insecticides for pest management was taken up. Incidence of aphids, jassids and mealy bug were observed. Sporadic incidence of leaf folder, stem borer and Spodoptera were recorded. Farmers are advised to conserve rain water by making cross bunds between two rows of cotton at 30 m distance. For control of weeds, Glyphosate should be applied as post emergence directed spray @ 1.0 kg/ha. Spray 2% DAP with 0.75% KNO_3 for better boll development. When sucking pest population exceeds ETL (> 20% infested plants) spray buprofezin @1 ml/litre of water or Flonicamid @ 4.5 g per 15 litre water.

SOUTH INDIA

Andhra Pradesh: The crop is at squaring to boll development stage. Inter-cultivation by working with Gorru & Guntaka was taken up. Application of fertilizers was done in the form of N & K as top dressing depending upon the age of the crop. Post emergence application of weedicides is recommended at 4 to 6 leaf stage of weeds, wherever inter-cultivation is not possible due to high moisture stress. For the control of grassy weeds, Quizalfopethyl @ 400 ml/acre and for the control of broad leaf weeds, Pyrithiobac sodium @ 250 ml/acre is recommended. Stem application (1:4) Monocrotophos & water @ 30 & 45 DAS and (1:20) Imidacloprid & water @ 60 DAS if jassid incidence crosses ETL i.e. 2/leaf spraying of Acephate 75 SP 1.5 g/l or Fipronil 5% SC 2ml/l is recommended. Spraying of Mancozeb @ 3 g/l or Propiconazole @ 1 ml/l is recommended to manage the leaf spots. In Coastal A.P the cotton crop is in 30 to 90 days stage.Foliar application of 2% urea/1-2% KNO_3/1-2% DAP/ 1-2% 19-19-19 is recommended. In Telangana, the cotton crop is 40 days (vegetative) to 95 days ols at squaring, flowering and boll development stage.

Tamil Nadu: The crop is at seedling stage. The winter irrigated cotton cultivation has started in isolated meager areas. Rainfed cotton sowing is also in progress by utilizing the pre monsoon rainfall in some areas (Sowing to 10 DAS). The weather prevailed during the reporting period was moderately cool with drizzles in many areas. As the sowing of cotton is under way, acid delinting and seed treatment with insecticides / fungicides followed by biofertilizer may be recommended as a prophylactic measure

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