

## Central Institute for Cotton Research, Nagpur

### XXIII Weekly Advisory for Cotton Cultivation 27<sup>th</sup> Oct to 2<sup>nd</sup> Nov '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, Propanil is effective and Pyriproxyfen 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)

S.No.	States	Normal Area (DES)*	Area in lakh ha		
			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
	<b>All INDIA</b>	<b>114.53</b>	<b>117.02</b>	<b>9.524</b>	<b>126.547</b>

\* Directorate of Economics & Statistics, DAC, Ministry of Agriculture, Krishi Bhavan, New Delhi  
Source: Director, DOCD, Mumbai

Weather forecast for 4<sup>th</sup> to 9<sup>th</sup> Nov. '2014

Zones/ Weather parameter	Temperature ( Min, Max)						Rainfall					
	States	04/11	05/11	06/11	07/11	08/11	09/11	04/11	05/11	06/11	07/11	08/11
Punjab	13,30	13,29	12,29	12,28	11,28	11,28	Mainly clear sky					
Haryana	13,30	13,30	13,30	12,29	12,29	12,29	Mainly clear sky					
Rajasthan	15,32	15,32	14,33	13,33	13,33	13,33	Partly cloudy sky	Mainly Clear sky				
Gujarat	23,36	23,36	22,35	22,35	21,35	21,35	Clear sky					
Maharashtra	15,33	15,33	16,32	16,32	17,32	17,32	Clear sky					
M.P.	18,32	18,32	18,31	20,31	20,31	21,31	Partly cloudy sky					
Odisha	20,31	20,31	21,31	21,29	18,27	18,27	Partly cloudy sky				Partly cloudy sky with thunder development	
A.P.	20,33	19,32	19,32	20,31	20,31	20,31	Mainly or partly cloudy sky with thunder development				Light rain	
Karnataka	17,31	18,31	17,32	17,32	18,32	18,33	Partly cloudy sky					
Tamil Nadu	23,29	23,29	24,30	24,30	25,31	25,32	Light rain	Thunderstorm with rain		Light rain	Partly cloudy sky	

Source: [www.imd.gov.in](http://www.imd.gov.in)

## STRATEGIES FOR MANAGEMENT OF PESTS, DISEASES &amp; 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 *Sysiroa 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

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 Pyriithiobac sodium

#### GENERAL CROP HEALTH MANAGEMENT

1. **Optimize nutrient management** for macro and micronutrients. Foliar spray of MgSO<sub>4</sub>, 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).

#### 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 at maturity phase and picking has been initiated. *Kapas* should be picked dry, free from trash. It is advised to start picking in the morning after the dew dries from the opened bolls to avoid deterioration of seed cotton quality. Picking should be done after every 8-10 days to avoid losses. After picking, lint should be placed in jute/cotton bags on dry piece of land.

**Haryana:** The crop is normal at picking stage. Do not irrigate the field after one third opening of the bolls in the field. Avoid picking of rotten bolls and picking in early morning hours. Dry the *kapas* before storage to avoid micro-organism damage.

**Rajasthan:** The crop is at boll bursting stage. First picking is almost over in June sown crop. Among sucking pests, still jassids remain above ETL for which the recommended pesticide may be sprayed. However, white fly infestation is very low. Bollworm infestation was not recorded.

**CENTRAL INDIA**

**Gujarat:** The crop is at reproductive stage (Crop bearing squares, flowers, bolls). Weather remained fully bright during the reporting period. Hand picking, irrigation and insecticides' spraying carried out as per requirements. The population of jassids and whitefly were recorded above ETL and aphids, thrips & mealy bug were found low throughout the reporting period. Monitoring for pink bollworm by setting up pheromone traps from reliable companies must be initiated. Sampling of green bolls for pink bollworm is important in hot spots.

**Odisha:** The crop is at boll formation and development and maturity stage. Incidence of aphids, jassids and mealy bug were observed. Sporadic incidence of leaf folder, stem borer and Spodoptera were also recorded for which appropriate control measures recommended may be taken up. Conserve the rain water by making cross bonds between two rows at 30 m distance. Picking of the first opening bolls should be done on clear days. Spray 2% DAP with 0.75% KNO<sub>3</sub> for better boll development and 0.5% Zinc sulphate with 0.1% boric acid to improve fibre quality.

**SOUTH INDIA**

**Andhra Pradesh:** The crop is at squaring to boll development stage. Inter-cultivation with harrow and blade has been taken up. Incidence of sucking pests like jassids and whiteflies noticed. If jassid incidence crosses ETL i.e. 2/leaf, spraying of Acephate 75 SP 1.5 g/l or Fipronil 5% SC 2.0 ml/l or Flonicamid 50% WG 0.3 g/l is recommended. For control of whitefly, spray Triazophos @ 2.0 ml or Profenofos 5.0 ml with 5.0 ml neem oil / l of water. Incidence of Spodoptera on BG II is observed for which spraying of Novaluron 10% EC @ 1.0 ml/l or Lufenuron 5% EC @ 1.25 ml/l is recommended. For management of grown up larvae, poison baiting (10kg rice bran + 2kg jaggery + 500-750 ml Chlorpyrifos or 250-300 g Thiodicarb /acre + sufficient water to make small pellets and spread in the field during evening hours). For the control of mealy bug, destruction of affected plant parts and spraying of Profenofos 50 EC 3.0 ml (or) Acephate 2.0 g (or) Sandovit 1.0 ml (or) Teepol 1.0 ml along with 1.0 g surf / l of water is recommended. Spraying of Mancozeb @ 3.0 g/l or Propiconazole @ 1.0 ml/l is recommended to manage the leaf spots as prophylactic or curative measure. Grew mildew and rust diseases were observed in Telangana area. Spraying of wettable sulfur 3.0 g/l or Carbendazim 1.0 g/l against grew mildew is recommended. Spraying of Tridemorph 1.0 ml/l or Propiconazole 1.0 ml/l is recommended to manage rust diseases. In Coastal A.P., the cotton crop is 90 to 110 days old. Foliar application of 2% urea/1-2% KNO<sub>3</sub>/1-2% DAP/ 1-2% 19-19-19 is recommended. For correction of magnesium deficiency, spraying of Magnesium sulphate @ 10.0 g/l of water at 75 and 85 DAS and for boron deficiency, spraying of Borax @ 1.0-1.5 g/l of water

at 60 and 90 DAS is recommended. In Telangana, the cotton crop is 95 days old (vegetative stage) to 135 days old (squaring, flowering, boll formation, boll development and in first picking stage).

**Tamil Nadu;** The crop is at seedling to vegetative stage. The weather prevailed during the reporting period was moderately cool. Heavy rainfall in many areas and moderate rainfall in some places were received. Gap filling and first hand weeding was taken up. Sucking pests like leaf hoppers, whitefly and aphids were noticed in some areas. Root rot was observed in few spots. Drenching of Chlorpyrifos @ 2.5 ml / lit of water along with Carbandazim @ 1 g / lit of water may be sprayed for the prevention of stem weevil and root rot respectively. .

#### Weekly Advisory Report Coordinating Team

Scientists	Address		
Dr K R Kranthi	Director, CICR, Nagpur		
Dr A H Prakash	PC and Head, CICR, Regional station, Coimbatore		
Dr. D Monga	Head, CICR, Regional station, Sirsa		
Dr. S. B. Singh	Head, Div of Crop Improvement, CICR, Nagpur		
Dr Sandhya Kranthi	Head, Div of Crop Protection, CICR, Nagpur		
Dr Blasé De souza	Head, Div of Crop Production, CICR, Nagpur		
Dr. Isabella Agarwal	Sr. Scientist CICR, Coimbatore		
Sh. M.Sabesh	Scientist, CICR, Coimbatore		
Scientists In-charge for Weather Report (AICCIP Centres)			
Scientists	Address	Mobile No	E Mail ID
Dr. Paramajit Singh	Punjab Agricultural University, Bathinda, Punjab	9463628801	rsmeenars@gmail.com
Dr. Pankaj Rathore	Punjab Agricultural University, Faridkot, Punjab	9464051995	pankaj@pau.edu
Dr. Jagdish Beniwal	CCS-Haryana Agricultural University, Hisar 125 004, Haryana	9416325420	cotton@hau.ernet.in
Dr.S.L.Ahuja	CCS-Haryana Agricultural University, Sirsa, Haryana	9255947380	slahuja2002@yahoo.com
Dr.K.N.Bhatia	Swami Keshwanand Rajasthan Agricultural University, Sriganaganagar, Rajasthan	9352700411	bsmeena1969@rediffmail.com
Dr.Harphool Meena	Maharana Pratap University of Agri. & Technology, Udaipur – 313 001, Rajasthan	9460246043	hpaqron@rediffmail.com
Dr. Narendra Kumar	CSA University of Agri. & Technology, Kanpur – 208 002, Uttar Pradesh	9335699132	jagdishk64@yahoo.com
Dr. Gofaldu	Navsari Agricultural University, Navsari – 396 450, Gujarat	9662532645	gjrishfaldu@rediffmail.com
Dr.M.D.Khanpara	Junagadh Agricultural University, Junagadh – 362 001, Gujarat	9426990070	cotton@jau.in
Dr.R.W.Bharud	Mahatma Phule Krishi Vidyapeeth, Rahuri – 413 722, Maharashtra	9850244087	cotton_mpkv@rediffmail.com
Dr. B . R. Patil	Panjabrao Deshmukh Krishi Vidyapeeth, Akola – 444 104, Maharashtra	9657725801	srscottonpdkv1@yahoo.co.in
Dr.P.R.Zanwar	Marathwada Agricultural University, Parbhani – 431 402, Maharashtra	7588151244	crsned@indiatimes.com
Dr. Satish Parsai	RVS Krishi Vishwa Vidhyalaya, Gwalior – 474 002, Madhya Pradesh	9406677601	aiccipkhandwa@gmail.com
Dr. B.S.Nayak	Orissa University of Agriculture & Technology, Bhubaneswar – 751 003, Orissa	9437321675	bsnayak2007@rediffmail.com
Dr.S.Bharathi	Acharya N. G. Ranga Agricultural University, LAM, Guntur, AP	949072341	bharathi_says@yahoo.com
Dr. Sharma	Acharya N. G. Ranga Agricultural University, Nandyal, AP	08514-242296	sharmarars@gmail.com

Dr.Aladakatti	University of Agricultural Sciences, Dharwad – 580 005, Karnataka	9448861040	yaladakatti@rediffmail.com
Dr. Bheemana	University of Agricultural Sciences Raichur – 584 102, Karnataka	9448633232	bheemuent@rediffmail.com
Dr. Amala Balu	Tamil Nadu Agricultural University, Srivilliputhur, Tamil Nadu		
Dr. M Gunasekaran	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	9443631359	gunasekaran.pbg@gmail.com

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