

Central Institute for Cotton Research, Nagpur

Fifteenth Weekly Advisory for Cotton Cultivation 8th – 14th September 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 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 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 04-09-2013

State	Lakh hectares
Punjab	5.05
Haryana	5.57
Rajasthan	2.93
Uttar Pradesh	0.23
Gujarat	26.88
Madhya Pradesh	6.21
Maharashtra	38.68
Andhra Pradesh	20.94
Karnataka	5.17
Odisha	1.24
Tamil Nadu	0.12
Others	0.10
TOTAL	113.12

Source: Director, DOCD, Mumbai

Weather forecast for 9th to 12th Sep. 2013

Zones/ Weather parameter	Temperature (Min, Max)				Rainfall			
	09/09	10/09	11/09	12/09	09/09	10/09	11/09	12/09
Punjab	24,35	23,36	24,36	25,33	Partly cloudy sky with thundery development	Partly cloudy sky		Thunderstorm with rain
Haryana	24,35	25,36	25,36	26,35	Partly cloudy sky		Clear sky	Partly cloudy sky with thundery development
Rajasthan	25,38	25,38	25,38	25,38	Clear sky			
U.P.	25,35	26,36	26,36	26,36	Mainly clear sky			
Gujarat	26,31	26,31	25,32	25,32	Partly cloudy with possibility of rain or thunderstorm		Partly cloudy sky	
Maharashtra	24,34	23,34	23,33	24,34	Partly cloudy with possibility of rain or thunderstorm		Partly cloudy sky	
Madhya Pradesh	21,31	20,32	21,33	21,34	Partly cloudy sky	Clear sky		
Odisha	24,32	24,32	24,32	24,32	Generally cloudy sky with thundery development			
Andhra Pradesh	23,30	24,32	24,33	24,34	Partly cloudy sky with thundery development			
Karnataka	21,28	21,28	22,30	22,31	Moderate rain		Light rain	
Tamil Nadu	22,29	22,30	23,31	25,33	Partly cloudy with possibility of rain or thunderstorm		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, 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

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 crop is in flowering to boll formation stage. The infestation of whitefly is very high in cotton growing areas of Punjab which needs immediate spray of recommended insecticides. The incidences of cotton leaf curl virus disease have also been noticed in districts of Bathinda, Mansa and Muktsar in addition to traditional infected areas of Abohar and Fazilka. The infestation of *Spodoptera*, American boll worm and Spotted boll worm was

recorded on *desi* cotton and non-*Bt* varieties of American cotton which needs immediate recommended management strategies. Spray Potassium nitrate 2% per acre 3-4 times at weekly intervals as the crop is at peak flowering stage.

Haryana

Cotton crop is in peak vegetative to reproductive phase. In general, the crop is healthy. Excessive nitrogen application may be avoided. Foliar application of 2½% urea at flowering and boll formation stage is recommended. The population of whitefly was observed above economic threshold in farmers' field. Leaf hopper and whitefly should be checked. The incidence of bollworms in non Bt cotton should be controlled with appropriate sprays. Avoid repeated use of the same insecticide or insecticides of the same group. Use pest specific recommended insecticides. Avoid indiscriminate and mixing of two or more insecticides. Clean the sprayer thoroughly before use. Moderate to high incidence of CLCuD was observed throughout the cotton growing areas in the State. To control foliar disease, spray recommended doses 3-4 times at 15 days interval. Spray of cobalt chloride @ 1g in 100 litres of water at initial stage can check the parawilt. Farmers are advised to monitor their crop for insect pests and diseases regularly.

Rajasthan

The weather during next 4 days would be stable with scanty clouds. No signal for rain in next few days. The farmers are advised to conserve the moisture as mostly it is dry days ahead. Farmers are advised to control jassids and spotted bollworm attack through recommended measures.

Uttar Pradesh

Crop is in boll formation to boll development and maturity stage. Farmers are advised to apply light irrigation to avoid water stress in the crop. The bursting bolls are to be picked and dried in the sun light and kept in jute bags.

CENTRAL INDIA

Gujarat

Due to cloudy weather, there are chances of incidences of sucking pest in cotton. The condition is suitable for growth of crop and farmers are advised to take up weeding, inter culturing and fertilizer application to the field crops at the earliest possible.

Maharashtra

At Vidharba, farmers are advised to control sucking pests using recommended control measures. Under non Bt cotton, bollworm attack is to be monitored. Urea 2% @ 200g/10 litre of water should be sprayed at flowering stage. Furrow opening should be done for moisture conservation.

Odisha

The cotton crop is at flowering and boll formation stage (70-80 days). The crop condition is almost good and there is no incidence of any severe pest/diseases. Rains are expected this week and so farmers are advised to conserve the rain water by making bunds between rows. Weeding should be done manually or with the application of the recommended herbicide as protected spray. To check the incidence of sucking pests like aphids, jassids, thrips and whitefly, spray neem based pesticides @ 3ml/litres of water. Regular monitoring should be done for other pests like Spodoptera and Semiloopers etc. To know the incidence of Spodoptera and bollworms, recommended pheromone traps may be fixed and monitored.

SOUTH INDIA

Andhra Pradesh

In Telangana districts of Andhra Pradesh, the crop is around 60 to 100 days old. In Guntur, Krishna and Prakasam districts the crop is 25 to 80 days old. Second and third split application of fertilizers at 50 kg Urea + 15 kg MOP along with inter-cultivation is recommended for the late sown crop (wherever the crop is \geq 45-60 DAS) and early sown crop (wherever the crop is \geq 80 DAS). Foliar application of recommended nutrients is

advised to mitigate the stress conditions. In the early sown crop (60 to 90 days) for the control of sucking pests, need based spraying with 5% NSKE or appropriate insecticides is recommended. Monitoring of bollworms in particular, *Spodoptera litura* should be done through pheromone traps. Excess moisture and high soil temperature may predispose the plants to fungal root rots and wilts. Sudden death of the plants in patches or yellowing of leaves and wilting of plants should be managed. High relative humidity, windy rains may spread bacterial blight disease. Angular leaf spot and vein blight should be managed by following the recommended doses. Fungal leaf spots should be managed by protective or curative spraying with appropriate measures as recommended at 7 to 10 days interval.

Karnataka

Sowing of desi cotton varieties (*Herbaceum*) like Jayadhar, DDHC-11 and RAHS-14 as an intercrop in onion or chilli crop has to be completed by 15th September. Hybrid cotton crop of 70-80 days has to be top dressed with 20 kg urea/acre. In continuous rainfall areas where it is not possible for mechanical and manual weeding in cotton crop, it is suggested for spraying of selective post emergent weedicides for effective control of both monocot and dicot weeds. Nipping of growing shoot tip is advised in 90 days old crop and after nipping the crop has to be sprayed with nutrients to manage leaf reddening and square dropping effectively. Heavy square shedding is reported in some parts of southern districts due to mirid bug incidence. In 100 to 110 days old cotton crop, at economic threshold level of 8 moths per trap per night, it is suggested to spray the crop once with Cypermethrin 10 EC @ 0.5 ml/lit of water to control pink boll worm incidence. Light irrigation in alternate furrows is suitable in black soils where the crop is at peak square and boll formation stage.

Tamil Nadu

The summer irrigated cotton cultivation comes to an end in southern parts of Tamil Nadu (Parts of Tirunelveli, Virudhunagar, Ramanathapuram and Madurai District) and winter irrigated cotton has started in isolated meager areas. Rainfed cotton sowing is in progress by utilizing the pre monsoon rainfall in some areas. The weather prevailed during the reporting period was cool with moderate rainfall in many areas. As the sowing of rainfed cotton is under way, seed treatment with insecticides / fungicides followed by biofertilizers may be recommended.

COTTON WEEKLY ADVISORY TEAM: 2013

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. P K Chakrabarty		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. Isabell Agrawal		Sr. Scientist CICR, Coimbatore	
Sh. M.Sabesh		Scientist (SG), 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	09416325420	cotton@hau.ernet.in
Dr.S.L.Ahuja	CCS-Haryana Agricultural University, Sirsa, Haryana	09255947380	slahuja2002@yahoo.com
Dr.K.N.Bhatia	Swami Keshwanand Rajasthan Agricultural University, Sriganganagar, Rajasthan	09352700411	bsmeena1969@rediffmail.com
Dr.Harphool Meena	Maharana Pratap University of Agri. & Technology, Udaipur – 313 001, Rajasthan	09460246043	hpagron@rediffmail.com
Dr. Narendra Kumar	CSA University of Agri. & Technology, Kanpur – 208 002, Uttar Pradesh	09335699132	jagdishk64@yahoo.com

Dr. Gofaldu	Navsari Agricultural University, Navsari – 396 450, Gujarat	09662532645	girishfaldu@rediffmail.com
Dr.M.D.Khanpara	Junagadh Agricultural University, Junagadh – 362 001, Gujarat	09426990070	cotton@jau.in
Dr.R.W.Bharud	Mahatma Phule Krishi Vidyapeeth, Rahuri – 413 722, Maharashtra	09850244087	cotton_mpkv@rediffmail.com
Dr. B . R. Patil	Panjabrao Deshmukh Krishi Vidyapeeth, Akola – 444 104, Maharashtra	09657725801	srsottonpdkv1@yahoo.co.in
Dr.P.R.Zanwar	Marathwada Agricultural University, Parbhani – 431 402, Maharashtra	07588151244	crsned@indiatimes.com
Dr. Satish Parsai	RVS Krishi Vishwa Vidyalaya, Gwalior – 474 002, Madhya Pradesh	09406677601	aiccpkhandwa@gmail.com
Dr. B.S.Nayak	Orissa University of Agriculture & Technology, Bhubaneshwar – 751 003, Orissa	9437321675	bsnayak2007@rediffmail.com
Dr.S.Bharathi	Acharya N. G. Ranga Agricultural University, LAM, Guntur, AP	0949072341	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	09448861040	yaladakatti@rediffmail.com
Dr. Bheemana	University of Agricultural Sciences Raichur – 584 102, Karnataka	09448633232	bheemuent@rediffmail.com
Dr. Amala Balu	Tamil Nadu Agricultural University, Srivilliputhur, Tamil Nadu		
Dr. M Gunasekaran	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	09443631359	gunasekaran.pbg@gmail.com

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