

**ICAR-Central Institute for Cotton Research**  
**Weekly Advisory for Cotton Cultivation from 10<sup>th</sup> to 15<sup>th</sup> August 2015**  
**(39<sup>th</sup> Standard Week)**

*"The advisory is based on inputs received from the State Agricultural Universities of the respective states"*

**WEATHER ADVISORY**

Date	Rainfall (mm) August 2015						ADVISORY
	11	12	13	14	15	16	
<b>PUNJAB</b>							Cloudy weather and intermittent rains are predicted until the end of August. The crop is in its early reproductive stage. Though irrigation may not be needed in view of the intermittent moderate rains, regions with no rain for a week may resort to need based irrigation. In case of heavy rains, standing water must be drained from the cotton fields. Fertilizer application has to be done with care to ensure balanced nutrients without excessive load of N. Apply remaining foliar sprays of N: P: K (13:0:45) @ 2.0 kg/acre at 7-10 days interval intervals until mid September. Farmers are advised to monitor their crop for insect pests and diseases regularly. Incidence of leafhopper incidence (0-8/3 leaves), whitefly (18-29/3leaves) and thrips (22-49/ 3 leaves) were observed whereas severe infestation of whitefly has been observed at many locations of North zone and farmers are advised to apply neem oil 1.0 litre or Diafenthiuron 50WP@250 g or Spiromesifen 240SC@200ml or buprofezin @ 320 ml /acre alternately. Spray should be done in the morning or late in the evening and targeted towards lower canopy of plant. Monitor the crop for Bacterial leaf blight. Leaf curl disease has appeared on most of the varieties /hybrids in the fields. Manage the vector whitefly mentioned as above to check its spread and keep the field clean of collateral host. Monitor leafhopper regularly as the cloudy weather is congenial for its build up. Don't apply any intervention for thrips separately which can be managed effectively by the interventions applied against whitefly.
Batinda	3	0	4	0	6	0	
Ferozepur	0	0	4	0	6	0	
Muktsar	4	0	0	0	5	0	
Mansa	6	0	0	0	4	0	
<b>HARYANA</b>							
Sirsa	6	0	0	0	0	0	
Hissar	0	7	3	0	4	0	
Fatehabad	3	4	3	0	4	0	
<b>RAJASTHAN</b>							Light rains are expected in this region. Incidence of leafhopper and whitefly may be noticed. Strictly avoid spraying of pyrethroids or Fipronil as these would aggravate whitefly incidence. Site specific remedial measure for root rot (wilt) and parawilt may be initiated based on symptoms. Recommended insect pest/disease control measures can be initiated only at economic threshold levels on rain free days
Hanumangarh	6	4	0	3	3	0	
Sri Ganganagar	3	0	0	0	0	0	
Banswara	0	10	12	0	0	0	
<b>ORISSA</b>							Heavy rains are expected all through August. The crop is at vegetative and square formation stage. Incidence of aphids, jassids, semilooper and grass hoppers noticed but below ETL. Farmers are advised to go for weeding, second top dressing and earthing up. Drain out excess water from the field. To prevent sucking pest incidence, spray neem oil @ 3ml/litre of water on rain-free days. To retain more number of squares and flowers, spray Planofix @3.5 ml per 15 litres of water.
Koraput	48	38	55	34	14	43	
Kalahandi	36	34	31	31	21	32	
Balagir	24	14	21	28	22	17	
<b>GUJARAT</b>							Cloudy conditions and scanty to light rainfall is expected during the week and also until the end of August. The crop is in flower initiation stage. Farmers are advised to irrigate wherever possible and apply first dose of NPK fertilizers. Thrips and leaf hopper infestations are expected this week. Farmers are advised to install pheromone traps (Five per hectare) to monitor pink bollworm incidence. At economic threshold of 8 moths per trap per night for three consecutive nights, quinalphos may be sprayed at recommended dose. In the absence of pheromone traps, green bolls and flowers may be observed for larvae and quinalphos can be applied if the infestation exceeds 5.0%. Farmers are advised not to spray pyrethroids, spinosad, thiodicarb as it will cause problems of <i>Helicoverpa</i> , mealybugs, leaf reddening, respectively. Farmers are advised to terminate cotton crop in Dec- Jan without extending crop to April-May of 2016. This is necessary to reduce pink bollworm incidence and development of resistance to Bt-cotton.
Amreli	0	0	0	4	6	5	
Bhavnagar	0	0	0	3	4	3	
Jamnagar	0	0	0	0	0	0	
Rajkot	0	0	0	4	6	5	
Baruch	0	0	0	0	0	8	
Sabarkantha	0	0	0	0	0	4	
Surendranagar	0	0	0	0	0	5	
Ahmedabad	0	0	4	6	5	0	
Vadodara	0	0	3	6	10	3	
Patan	0	0	0	0	0	0	
Mehsana	0	0	0	0	0	0	

MADHYA PRADESH						
Khargaon	0	9	0	3	0	3
Dhar	4	3	0	0	0	0
Khandwa	0	14	0	4	3	6
MAHARASHTRA						
Nagpur	14	30	15	21	23	17
Wardha	5	46	11	13	17	15
Chandrapur	11	30	18	19	12	4
Yavatmal	3	38	8	6	8	9
Amravati	0	61	11	11	30	40
Akola	0	27	3	0	4	7
Buldhana	0	27	4	5	3	4
Parbhani	0	26	6	4	0	0
Nanded	0	21	6	5	0	0
Beed	0	9	7	4	0	0
Washim	0	39	4	0	0	6
Dhule	0	9	6	5	6	4
Jalgaon	0	15	6	5	3	4
Jalna	0	15	5	0	0	0
Aurangabad	0	11	5	4	6	3
TELANGANA						
Adilabad	5	20	18	10	0	3
Warangal	15	60	94	31	4	6
Khammam	11	77	94	35	5	8
Karimnagar	4	60	94	31	3	6
Nalgonda	1	77	29	35	3	7
ANDHRA PRADESH						
Guntur	4	20	4	0	0	4
Prakasam	9	20	7	6	3	6
KARNATAKA						
Dharwad	20	14	18	15	17	14
Haveri	23	14	37	27	25	32
Mysore	46	73	53	49	55	40
TAMILNADU						
Perambalur	0	0	0	0	4	7
Salem	4	6	4	0	3	10
Trichy	0	0	0	0	4	24
Virudhunagar	20	15	11	20	18	24

Weather is expected to be cloudy with very light rainfall all through August. The crop is about 50 to 60 days in different areas as per sowing dates. Top dressing with N+P is recommended during rain free period. Wilt and root rot problems are expected after rains. These should be attended on priority with remedial measures recommended in the appendix of this advisory. Do not spray insecticide against sucking pests. If sucking pests persist on susceptible Bt-cotton hybrid, neem oil based sprays are recommended.

Heavy rains are expected during the second and third weeks of August. The crop is in square formation stage in irrigated fields and in vegetative to square formation stage under rainfed conditions. Intercultural operations should be carried out for weed management. Basal dose of fertilizer N+P at recommended dose should be applied immediately, if not applied previously. Post emergence spray of weedicides as recommended for management can be taken up on a rain-free day. Infestation of jassids and white flies is observed on cotton. The Safflower caterpillar is often confused as *Helicoverpa armigera* in Non Bt cotton. There is no need for any control measure for this insect on cotton. In early sown non-Bt cotton, scouting for bollworms may be initiated and recommended measures may be taken up based on economic threshold levels of damage.

The crop is in seedling to vegetative stage. Sowings are also under progress in few areas. Moderate to heavy rainfall is predicted for the second and third weeks of August. First split application of N & K fertilizers may be initiated in early sown crop. For later sown crop, gap filling & Inter-cultivation should be taken up. Inter-cultivation / Pre-emergence application of Pendimethalin within 24-36 hours of sowing is to be taken up. For Summer Cotton, foliar application of 1 to 2% KNO<sub>3</sub> + 1% MgSO<sub>4</sub> is recommended twice at weekly interval to mitigate yellowing, leaf reddening and stunted growth. If the moisture is sufficient, application of nitrogen and potassic fertilizers is advocated. For kharif crop, wherever sowings were done farmers are advised to take up inter-cultivation as moisture conservation measure. In view of the incessant rains, there is no need for any insecticide applications during this week.

Land preparation was done in the areas where good amount of rainfall was received. Only about 10% of the area was sown in the region. No sowing of Hybrid.cotton either Bt or or Non Bt should be taken up beyond July. Top dressing with 25 kg N/ha (i.e. 50 kg Urea/ha) & 12 kg K (20 kg MOP/ha) to be taken up in 30 and 50 days old crop. If there is a severe problem of monocot weeds in cotton crop, it is advised for post emergent spraying of Quizalopof ethyl (Taraga Super) weedicide on weeds @ 1 ml/lit of water in more than 30 days cotton crop. Early sown crop which is at peak square formation and early boll formation stage to be sprayed with 1% of 19:19:19 soluble fertiliser with 1% MgSO<sub>4</sub> and Planofix (5 ml in 15 lit of water). In northern districts where the rainfall is scanty, suggested to irrigate the crop at critical stages i.e., square formation and flowering by adopting alternatively alternate furrow irrigation to irrigate more area with the available water.

Cloudy sky with possibility of rainfall is predicted for this week. Sowing is in progress wherever rains were received. Pre – emergence application of herbicide – Pendimethalin @ 3.3 liters / ha. and seed treatment with *Pseudomonas fluorescens* @ 10 / kg of seed or *Trichoderma viride* @ 4 g /kg of seed is to be done.

Legend					
Rainfall in mm	< 5	5-20	20-50	50-80	> 80

## MANAGEMENT STRATEGIES RECOMMENDED BY CICR

(Authored by K. R. Kranthi; No part of this advisory may be used in any form in any publication electronic or print or any other means without the permission of the author)

The strategies recommended in this brief note are based on results of experiments conducted by CICR and developed in consonance with various ecologically compatible guidelines issued by various National and Global agencies.

### GENERAL CROP HEALTH MANAGEMENT PRACTICES

1. **Early maturing varieties or Bt-cotton hybrids** may be preferred in rain-fed regions.
2. **Early sowing** is preferred in rain-fed regions immediately after receiving the first showers of 80 mm rainfall.
3. **Sowing on ridges in rain-fed regions** especially in high density planting systems is most preferred.
4. **Bt-cotton hybrids** may be sown at 90 x 30 cm in rain-fed regions and at wider spacing under irrigation
5. **Non-Bt varieties** Suraj such as (CICR) NH 615 (VN-MAU, Parbhani), AKH 081 (Dr PDKV Akola), Phule Dhanwantari (MPKV Rahuri) and Anjali (LRK 516) are early maturing. If these varieties are sown before 15<sup>th</sup> June in high density planting at 60x10 cm (40x10cm for Phule Dhanwantari), the crop will escape drought stress and bollworms.
6. **Intercropping in high density non-Bt cotton varieties** can be taken up with soybean (seed treated with *Bradyrhizobium japonicum*), cowpea or blackgram in alternate rows at 45 cm row to row and 10 cm plant to plant.
7. **Intercropping in Bt hybrids** can be taken up with soybean (seed treated with *Bradyrhizobium japonicum*), cowpea or blackgram as one row between two Bt-hybrid rows
8. **Border rows (2-3 rows) of pigeonpea** around cotton fields will prevent infestation of mealy bugs and serve as refugia.
9. **Farm Yard Manure** @ 5 to 10 t/ha or compost should be applied just after the first rain.
10. **Azotobacter and PSB** @ 25 g each / kg seed should be used for nutrients fixation.
11. **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.
12. **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.
13. **Retention of squares and flowers:** Spray Planofix 4.5 SL (NAA) hormone @ 21 ppm (7 ml per 15 litres of water).

### 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. **Imidacloprid (8 g), Vitavax or Thiram (3 g)** per kg seed will protect varieties against sucking pests and diseases.

4. **Use nitrogenous fertilizers to the minimum** especially for sucking pest susceptible varieties.
5. **Maintain field sanitation** (weed free)
6. **Remove and destroy mealy bug infested plants.**
7. **Use Neem preparations and biological control options** for least disruptive pest management.
8. **Pheromone traps** are efficient for pest monitoring of Pink bollworm.
9. **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**

10. **Avoid late sowing beyond 15<sup>th</sup> May in North India** to prevent aggravation of cotton leaf curl virus.
11. **As far as 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.
12. **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.
13. **Do not spray Bt-formulations on Bt cotton** to avoid further selection pressure.
14. **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.
15. **Do not use WHO Class-I (Extremely Harzardous category) insecticides** such as Phosphamidon, Methyl parathion, Phorate, Monocrotophos, Dichlorvos, Carbofuran, Methomyl, Triazophos and Metasystox.
16. **Avoid Fipronil and Pyrethroids** to prevent whitefly outbreaks.
17. **Avoid insecticide mixtures.** Mixtures severely disrupt eco-systems thereby leading to pest outbreaks.

### **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 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 Dimethoate.

### **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 (*Helicoverpa armigera* Nuclear Polyhedrosis Virus)** on Bt-cotton followed by the application of **5% Neem Seed Kernel Extract (NSKE)** a week later. **OR, use Phosalone** at ETL for the management of bollworms, *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,
  - b. Flubendiamide,
  - 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.

### **OTHER PESTS**

1. ***Spodoptera litura*:** Collection of egg masses or application of *SINPV* (*Spodoptera litura* Nuclear Polyhedrosis Virus) @ 500 LE/ha or Spray 200 ml Novaluron 10 EC or 250g Thiodicarb 75WP in 250 litres of water per acre
2. To minimize **shoot weevil** damage, spray Profenofos @ 2 ml/lit
3. **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

**Application of Pre-emergence weedicide** Stomp 30EC or Basalin @45EC 2.5 lt/ha and harrow immediately to prevent degradation.

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

Post-emergence weedicides would provide effective and timely control especially when interculture operations or manual weeding becomes difficult in wet soils. 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. Pyriithiobac sodium is effective on broad leaf weeds. Farmers may consult the technical experts of the Agricultural Universities for further details.

## WATER LOGGING MANAGEMENT

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 sprays 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.

### Weekly weather 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, Division of Crop Improvement, CICR, Nagpur
Dr Sandhya Kranthi	Head, Division of Crop Protection, CICR, Nagpur
Dr Blasé De souza	Head, Division of Crop Production, CICR, Nagpur
Dr. Isabell Agrawal	Sr. Scientist CICR, Coimbatore
Dr. M.Sabesh	Scientist, CICR, Coimbatore
Dr. N Anuradha	Scientist, CICR, Nagpur

### Scientists in-charge for weather report (AICRP centres)

Scientists	Address	Phone Nos.	E-mail id
Dr. Pankaj Rathore	Punjab Agricultural University, Faridkot, Punjab	09464051995	pankaj@pau.edu
Dr (Ms) Suneet Pandher	Punjab Agricultural University, Faridkot, Punjab	09814513681	suneet@pau.edu
Dr.Sanjeev Kumar Kataria	Punjab Agricultural University, RRS, Bhatinda		k.sanjeev@pau.edu
Dr. Jagdish Beniwal	CCS-Haryana Agricultural University, Hisar Haryana	09416325420	jbeniwal2016@gmail.com
Dr. Rishikumar.	CICR Regional Station, Sirsa, Haryana	09729106299	rishipareek70@yahoo.co.in
Dr. Roop Singh Meena	Swami Keshwanand Rajasthan Agricultural University, Sriganganagar, Rajasthan	09413024080	rsmeenars@gmail.com
Dr.B.S.Nayak	Orissa University of Agriculture & Technology, Bhubaneswar, Orissa	09437321675	bsnayak2007@rediffmail.com
Dr. Gofaldu	Navsari Agricultural University, Navsari, Gujarat	09662532645	girishfald@rediffmail.com
Dr. A. N Paslawar	Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra	09822220272	adinathpaslawar@rediffmail.com
Dr. Arvond D. Pandagale	Marathwada Agricultural University, Nanded, Maharashtra	07588581713	arvindpandagale@yahoo.co.in
Dr. Satish Parsai	RVS Krishi Vishwa Vidhyalaya, Gwalior, Madhya Pradesh	09406677601	aiccpkhandwa@gmail.com
Dr. S. Bharathi	Acharya N. G. Ranga Agricultural University, LAM, Guntur, AP	0949072341	bharathi_says@yahoo.com
Dr. Aladakatti	University of Agricultural Sciences, Dharwad, Karnataka	09448861040	yaladakatti@rediffmail.com
Dr. M. Y. Ajaykumar	University of Agricultural Sciences Raichur, Karnataka	09880398690	dr.my.ajay@gmail.com
Dr. S. Somasundaram	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	09965948419	rainfed@yahoo.com
Dr. M. Gunasekaran	Tamil Nadu Agricultural University, Cotton Research Station, Srivilliputhur, Tamil Nadu	09443631359	gunasekaran.pbg@gmail.com