

Cotton Innovate

A Monthly Newsletter from ICAR-Central Institute for Cotton Research, Nagpur



Earias vittella caught by predator (spider)
Photo: Dr. M. Sabesh

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www.cicr.org.in



Invited Research Note

Productivity Enhancement in Extra Long Staple Cotton through Agronomic Manipulation

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Among the cotton types, Extra Long Staple (ELS) cotton commands considerable economic significance in India and International market. There is a felt need to ramp up ELS cotton productivity in our country to attain self-sufficiency and efforts are being made through development of precision farming technologies. Keeping in view the growth habit of *G. barbadense* and hybrids of *Hirsutum* x *Barbadense* (H x B), at present wider spacing is being adopted for cultivation of the ELS cotton varieties and hybrids. However, the availability of growth regulating chemicals like Mepiquat Chloride provides an opportunity to increase the plant population per unit area in these elite ELS varieties and hybrids. Adoption of higher plant population and use of canopy management practices help to reduce the crop duration to certain extent and to produce increased number of bolls per unit area without the problem of rank growth and mutual shading effect. In addition, drip fertigation helps in delivering required amount of water and nutrient directly into the effective root zone of the cotton crop.

A field experiment was conducted at ICAR-CICR, Regional Station, Coimbatore during kharif 2020 to study the effect of increased plant population per unit area and use of growth regulators under drip fertigation system on the productivity of ELS cotton. Two ELS cultivars (Suvini and MRC 7918 BGII) were grown under drip fertigation with six spacings viz., 90 x 60 cm (T₁), 90 x 45cm (T₂), 90 x 30cm (T₃), 120 x 45cm (T₄), 120 x 30cm (T₅), 120 x 25 cm (T₆) along with farmer's practice of 90 x 60 cm spacing (T₇) under ridges and furrow irrigation. The recommended dose of fertilizer viz., 80:40:40 kg N: P₂O₅: K₂O/ha and 90: 45: 45 kg N: P₂O₅: K₂O/ha was applied to Suvini and MRC 7918 BGII, respectively. For drip fertigation, 20% of recommended dose of N and 100% of P was applied as basal and the balance 80% N and 100% K was applied in five equal splits in the form of water-soluble fertilizers through venturi system on 30, 50, 70, 90 and 110 days after sowing (DAS). For farmers practice, in case of Suvini, 50% of N and K and 100% P was applied as basal and the remaining 50% N and K was applied at 45 DAS after earthing up. In case of MRC 7918 BGII under farmers practice, 34% of N, 100% P and 50% K was applied as basal, 33% N and 50%K at 45 DAS (first top dressing) and 33% N at 65 DAS (second top dressing), respectively. Need based Mepiquat Chloride @ 60ppm was applied in 90 x 45, 90 x 30, 120 x 30 and 120 x 25 cm spacing when height node ratio (HNR) reached 1.5 followed by 30 ppm twice at 15 days interval after first spray. The performance of Suvini and MRC 7918 BG II during kharif 2020 is presented in Table 1.

Table 1. Plant height, boll number, boll weight and seed cotton yield of Suvini and MRC7918 BGII during kharif 2020

Treatment	Plant Ht (cm)		#bolls/ sq. m		Boll Wt (g)		SCY (Kg/ha)	
	Suvini	MRC	Suvini	MRC	Suvini	MRC	Suvini	MRC
T ₁ : 90 x 60 cm + Fertigation	108.8	135.6	70	102	3.3	3.6	2093	3960
T ₂ : 90 x 45 cm + Fertigation	108.2	114.7	89	98	2.8	3.6	1918	3932
T ₃ : 90 x 30 cm + Fertigation	100.3	104.8	84	108	2.8	3.6	1991	3932
T ₄ : 120x 45cm + Fertigation	103.5	137.0	71	102	3.3	3.5	1747	3773
T ₅ : 120 x 30 cm + Fertigation	102.9	102.7	84	96	3.3	3.6	2056	3640
T ₆ : 120 x 25 cm + Fertigation	102.3	107.9	98	98	3.2	3.5	2182	3963
T ₇ : Farmer's practice (90 x 60 cm)	144.1	151.0	52	90	3.0	3.5	1413	3074
SEd	7.89	5.93	13.0	7.92	0.47	0.20	292.6	385.2
CD (P=0.05)	17.18	12.91	28.2	17.27	NS	NS	637.5	839.3

Note: Plant Ht - Plant height (cm) at 150 DAS; #bolls/sq.m. - No. of bolls per sq.m. at harvest; SCY- Seed cotton yield (kg/ha)

The results indicated that planting Suvini at 120 x 25 cm spacing with fertigation and canopy management produced highest seed cotton yield of 2182 kg/ha which was significantly higher than that of farmer's practice (1413 kg/ha). In case of MRC 7918 BG II hybrid, application of Mepiquat Chloride significantly reduced the plant height than farmer's practice.

Similarly drip fertigation produced significantly higher seed cotton yield than farmer's practice. Hence, increased plant population combined with drip fertigation and canopy management can enhance the productivity of H x B ELS hybrids and in turn has the potential to give rich dividends to ELS farmers.



Experimental field overview



Suvin crop (120 x 25 cm spacing) at boll formation stage (100 DAS)



MRC 7918 BG II crop (90 x 30 cm spacing) at boll formation stage (100 DAS)



Suvin crop (120 x 25 cm spacing) at boll bursting and maturity stage (150 DAS)



MRC 7918 BG II crop (90 x 30 cm spacing) at maturity stage (150 DAS)



Suvin crop (120 x 25 cm spacing) at maturity stage (180 DAS)

Cleistogamy in *Gossypium barbadense* cotton- A mechanism for self-pollination

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Introduction: Cleistogamy, the phenomenon of self-fertilization in a closed flower has been documented in many wild and cultivated plants, with at least 287 species in 56 families recorded (Lord, 1981). While both environmental and genetic factors may affect the expression of cleistogamy, however, genetic factors are more important. A genetic basis to cleistogamy has been suggested for a number of species viz., rice (Teng and Xu, 1992), barley, cucumber, tomato, durum wheat (Chhabra and Sethi, 1991) with one or two major genes (recessive or dominant) governing cleistogamous expression. *Gossypium* is a moderate-sized genus consisting of about 50 species (Fryxell, 1992). Within the genus, cleistogamy as a normal flowering strategy has been found only in a few Australian wild species, i.e., *G. australe*, *G. bickii*, and *G. nelsonii* (Fryxell, 1992). Cultivated cotton (diploid or tetraploid) is generally chasmogamous; however, cleistogamous variants were found in natural or man-made interspecific hybrid progenies between *G. hirsutum* and *G. barbadense* before 1950 (Neelakantan and Balasubrahmanyam, 1949). Mukhiddinov and Abzalov, 1995 & 1997 proposed two recessive genes viz., *cg1cg2* were responsible for cleistogamy, based on segregation in F₂ generation derived from a hybrid between the two cultivated tetraploid species. Khattab et al. (1982) isolated two cleistogamous plants from the BC₂ of a similar interspecific hybrid, and reported that a recessive gene controlled cleistogamy in the *G. barbadense* background. Zhang et al. (1992) also reported on the isolation of a stable cleistogamous cotton line.

Cleistogamy or automatic self-pollination is a breeding system in which permanently closed, self-pollinated flowers are produced. This trait has received increasing research attention in recent years. Investigations indicated that the evolution of cleistogamy in taxa may be influenced by the presence of heterogeneous environments, inbreeding depression, geitonogamy and differential seed dispersal, as well as by various ecological factors and plant size (Zhang et al. 2017). There are three different categories of cleistogamy identified so far viz., dimorphic, complete, and induced.

Morpho-agronomic Characteristics: In cotton plant, once it begins to bloom, it is said to be “flowering”. *Gossypium barbadense* cotton typically flowers for about 6-7 weeks. Once blooms are onset the stage of cotton development is discussed in terms of weeks of bloom. Cotton square is actually a flower bud; three bracts surround the flower bud in a pyramid-like shape. *G. barbadense* cotton plant produces perfect flowers, meaning the flower contains both male and female organs. The first square is typically visible on node 5 to 6 about 37-39 days after planting. Anthesis or a flower bloom occurs approximately 24 days after the first square appears. Flowering is important to cotton production because pollinated flowers produce cotton bolls. The bloom process takes several days, and bloom age can be estimated by the bloom characteristics. On the day a flower opens it is yellow in color. Pollination of that flower usually occurs within a few hours after the yellow flower opens. Occurrence of cleistogamous flowers in *G. barbadense* is very rare. We identified a mutant that was stable and found in the progeny from an intra *barbadense* cross (Suvin × Giza-45). The cleistogamous trait is controlled by two independent recessive genes and can be transferred in populations by breeding methods, haploidization or back-crosses. It can be utilized for autogamous reproduction (fixation and pure line breeding and seed production).

Associated characters and Cultivated Practices

Cleistogamy may be complete or partial depending on species and environment. Environmental factors such as drought, heat, cold, shade, nutrition, submersion or burying of flowers are reported to influence cleistogamy (Lord, 1981). Thus, a cleisto-chasmogamous type of floral dimorphism may become seasonal. When the original stable cleistogamous line 1057-1 was crossed to normal chasmogamous upland cotton, the cleistogamous condition was destabilized by the new genotypic background and with environmental factors or time of flowering. There are indications that modifying factors influenced the expression of cleistogamy. The mechanism of cleistogamy and effects of ecological factors on cleistogamous expression are under further study. Upland cotton has been classified as often being cross-pollinated. A considerable range of 1 to 81% for natural out-crossing in cotton has been reported, with most reports citing more than 10% (Meredith and Bridge, 1973). This not only leads to rapid genetic deterioration of released cultivars and genetic stocks, but it also influences the efficiency of crop-breeding procedure

since selfing of early generation selections is expensive and difficult. Cotton with cleistogamous flowers would reduce the natural out-crossing to an extent that the problem of genetic contamination could be solved. Because of the ability of the cleistogamous character to maintain the genetic purity of genotypes, the trait appears to be extremely useful.

Cleistogamous flowers help in reproduction with minimal energy and resource expenditure. It also maximizes the chance of reproduction, which is an important factor where the agents of pollination are scarce. On the other hand, chasmogamous flowers provide variability, hybrid vigour and generate better genotypes through recombination. Both of these strategies are useful in different environments. In adverse (less pollinators, energy stress) cleistogamy would be favourable, and in other cases where no energy stress prevails, chasmogamy is advantageous. The main advantage of cleistogamy is that it is a cheap method. Producing and maintaining large, nectar-rich open flowers is biologically expensive. The cost of producing a seed through cleistogamy is only about two-thirds of that for one formed through chasmogamy. A closed flower prevents wasting time responding to incompatible pollen. Open flowers must deal with pollen by actively preventing self pollination with some physical barrier or a chemical barrier to self fertilization. The principle advantage of cleistogamy is that it requires less plant resources to produce seeds than chasmogamy because development of petals, nectar and large amounts of pollen are not required. This efficiency makes cleistogamy particularly useful for seed production at unfavorable sites or adverse conditions. The obvious disadvantage of cleistogamy is that self-fertilization occurs, which may suppress the creation of genetically superior plants.

The mutant identified (Fig. 1) at ICAR-Central Institute for Cotton Research, Regional Station, Coimbatore was stable and found in the progeny from an intra *barbadense* cross SS-2 (Suvin x Giza-45). The F₂ from back crossing the mutant with cleistogamous flowers segregated 142 plants with open flowers; 24 plants with partially open flowers; 8 plants with cleistogamous flowers. It is provisionally suggested that the character is controlled by two independent recessive genes, *cg1* and *cg2*. The petals are so locked into each other as to prevent the opening of the flower, thereby excluding the possibility of cross-pollination. This character in breeding lines would be of great importance. The genetics of this mutant is being worked out.



Fig. 1 Cleistogamous line CCB12 is a mutant from the *Gossypium barbadense* intra cross SS-2 (Suvin x Giza-45).

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CICR Happenings

45th Foundation Day of ICAR-CICR

ICAR-CICR celebrated its 45th Foundation Day today on 1st April 2021 in the august presence of the Chief Guest Dr. C. D. Mayee, Ex-Chairman (ASRB) & Ex-Director (ICAR-CICR), Dr. R. K. Singh, ADG (Commercial Crops), ICAR, New Delhi and Dr. B. S. Dwivedi, Director, ICAR-NBSS&LUP, Nagpur as Guests of Honour. Dr. Y. G. Prasad, Director, ICAR-CICR welcomed the chief guest, guests of honour, invited speakers and all the staff and presented the overview of achievements. Dr. P. K. Chakrabarty, Member (Plant Sciences), ASRB & Ex-ADG (Plant Protection and Biosafety), ICAR, New Delhi and Dr. P. G. Patil, Vice Chancellor, MPKV, Rahuri delivered the Foundation Day Lectures in virtual platform followed by address by Chief Guest. Staff and retired colleagues of ICAR-CICR family participated in the celebration.



One day meeting on “Finalization of recommendations and SOPs for boll rot disease complex management in cotton”

One day meeting (virtual mode) on “Finalization of recommendations and SOPs for boll rot disease complex management in cotton” was organized on April 17, 2021 by Directorate of Research, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra in reference to letter from Secretary (Agriculture), Agriculture, Animal Husbandry, Dairy Development and Fisheries Department, Mantralaya, Mumbai, Maharashtra. Dr. V. M. Bhale, Vice-Chancellor, Dr PDKV, Akola presided over the meeting. The meeting was called upon to develop common SOPs by all the SAUs and ICAR-CICR, Nagpur on ‘Boll rot disease complex management in cotton’ for the cotton cultivators in the state. Many experts from Division of Crop Protection, ICAR-CICR, Nagpur, Dr PDKV, Akola, Dr MPKV, Rahuri and VNMKV, Parbhani attended the program and discussed on management of insect pests and diseases in cotton. Dr Dipak T. Nagrale, Scientist (Plant Pathology), ICAR-CICR, Nagpur gave detailed presentation on “Boll rot disease complex in cotton and its integrated management”. He discussed in detail about types of boll rots, causes, etiological factors, disease scoring and management strategies. Dr Shailesh P. Gawande, Scientist (Plant Pathology) and Dr Nandini Gokte-Narkhedkar, Principal Scientist & Head (I/c), Division of Crop Protection participated in the meeting from ICAR-CICR, Nagpur.

CICR Happenings

One day district level meeting on “Pink bollworm and boll rot management in cotton”

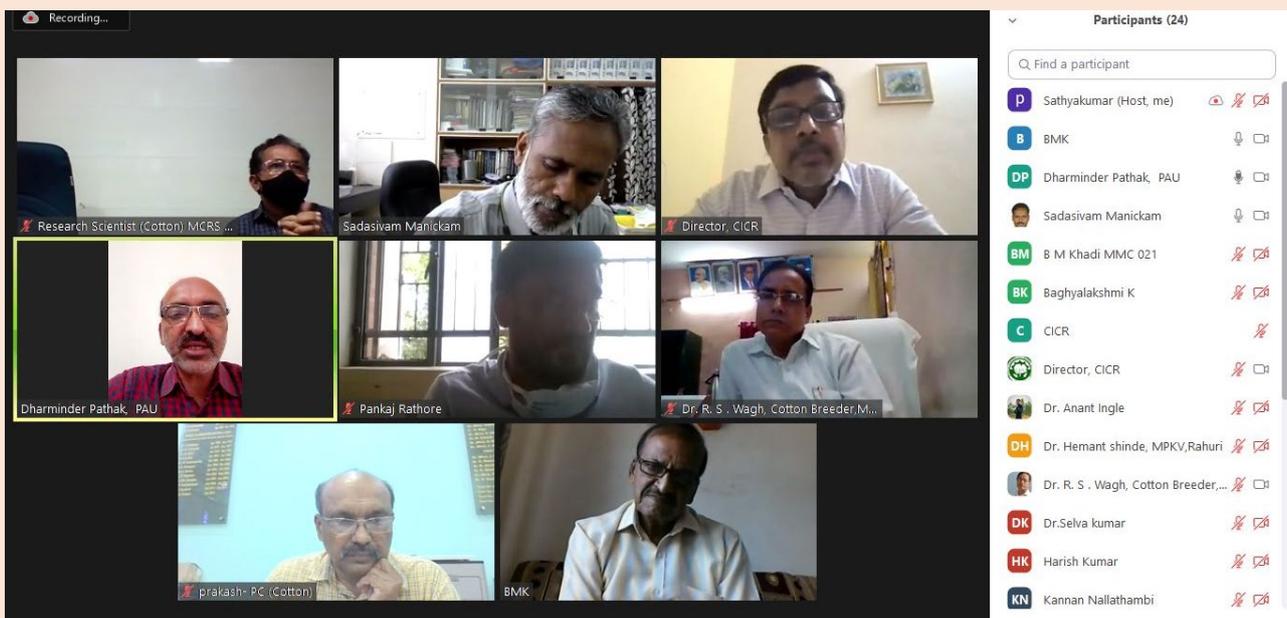
One day district level meeting (virtual mode) on “Pink bollworm and boll rot management in cotton” was organized by District Superintendent Agriculture Officer (DSAO), Yavatmal under the Chairmanship of Sh. Amol Yedge, District Collector, Yavatmal on April 22, 2021. Dr Dipak T. Nagrale, Scientist (Plant Pathology), ICAR-CICR, Nagpur delivered a lecture on “Integrated management of boll rot disease complex in cotton”. He interacted in detail about boll rot types, its causes, disease cycle and integrated management strategies. Dr. V. Chinna Babu Naik, Senior Scientist (Entomology), ICAR-CICR, Nagpur gave presentation on “Integrated management of pink bollworm in cotton”. Dr V.S. Nagrare, Principal Scientist (Entomology), ICAR-CICR, Nagpur highlighted the important key points for effective management of pink bollworm, Dr Shailesh P. Gawande and Dr Babasaheb B. Fand, Scientist (Entomology), ICAR-CICR, Nagpur interacted with the participants. Dr Nandini Gokte-Narkhedkar, Principal scientist & Head (I/c), Division of Crop Protection, ICAR-CICR, Nagpur emphasized the importance of “Integrated pest and disease management strategies in cotton” in cotton farming. Several state agricultural officials, KVK subject experts, representatives from cotton seed producer companies, ginning mills owners, secretaries from APMC, progressive farmers, TAOs, Manager-MahaBeej etc. from the district attended the meeting.

Review meeting on the progress of the activities/Recommendations under ICAR-CSIR MoU

A meeting was chaired by Dr. T Mohapatra, Secretary, DARE & DG, ICAR to review the progress of activities/recommendations of the 2nd ICAR-CSIR Joint Steering Committee Meeting held on September 08, 2020. Dr R. K. Singh, ADG (Commercial Crops) appraised the purpose of the meeting. Dr Y. G. Prasad, Director, ICAR-CICR, Nagpur presented the progress of activities/recommendations by ICAR-CICR with respect to three action points emanating from the 2nd ICAR-CSIR joint steering committee, viz., (1) Status of application for RCGM approval for import of GM seeds (2) Bio-efficacy evaluation of GM event seed against whitefly in cotton (3) Multi-location testing of CSIR-IICT pheromone lure for monitoring of pink bollworm in cotton (4) Development of prototype spindle type cotton picker by CSIR-CMERI, Durgapur.

Cotton Breeders Meet

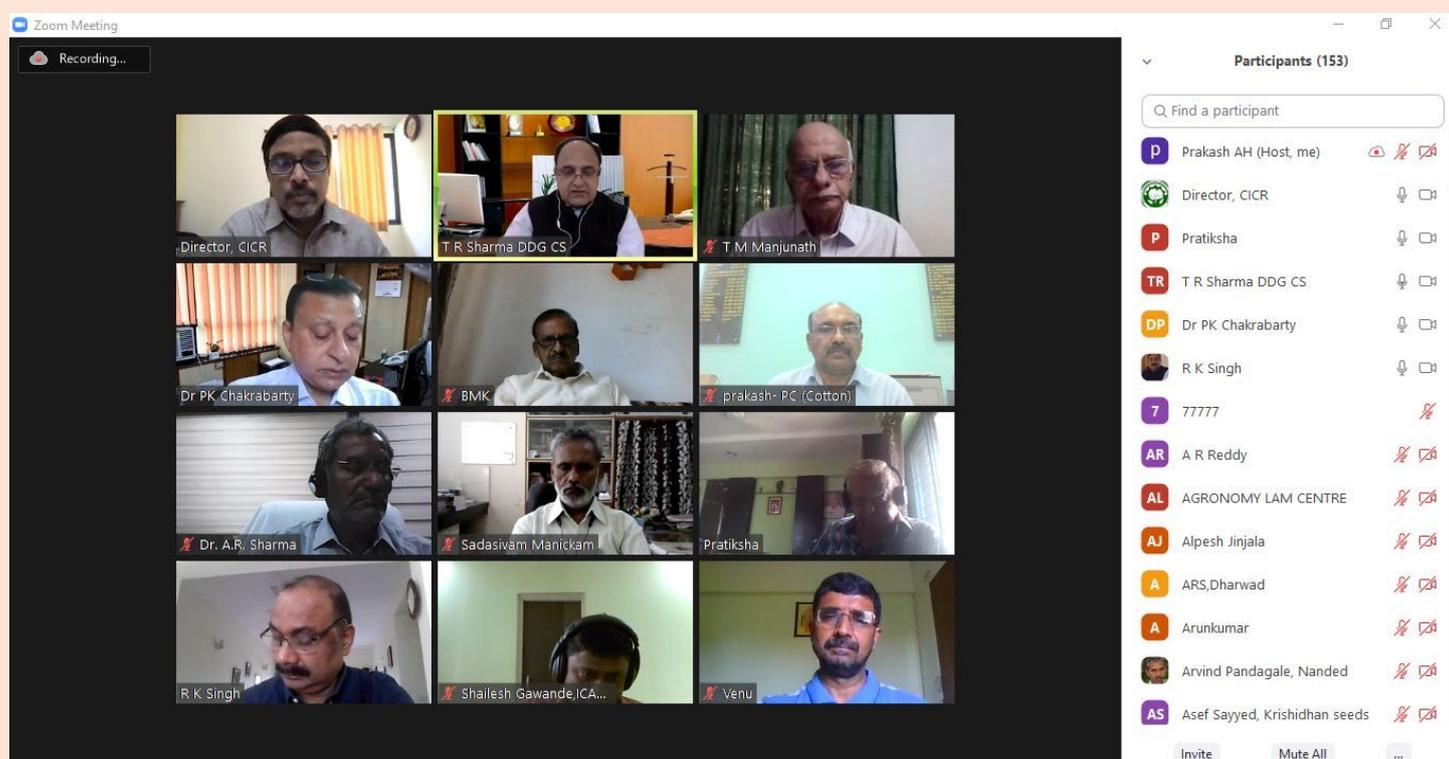
ICAR-AICRP Cotton Breeders Meet was held in virtual mode on April 3, 2021 which was chaired by Dr. B. M. Khadi, Member, Programme Advisory & Monitoring Committee of ICAR-AICRP on Cotton. Dr. Y. G. Prasad, Director, ICAR-CICR, Nagpur, Dr. A. H. Prakash Project Coordinator & Head, Dr. V. N. Waghmare, Head, Division of Crop Improvement, ICAR-CICR, Nagpur and all the cotton breeders from ICAR-CICR and different AICRP centres participated in the meet. Dr. Prakash made a detailed presentation on achievements of different AICRP on Cotton Centres from 2010- 2020. Dr. B. M. Khadi made a detailed presentation on ‘Revisiting of Cotton Breeding Strategies in Bt Era’. The main purpose of the virtual meeting was to reorient the breeding trials as per the farmers’ demand and Industries requirement. Issues like rationalizing number of Non-Bt trials, benchmark for different traits, data for sponsoring entry in AICRP, etc were discussed during the meeting.



CICR Happenings

Annual Group Meeting of ICAR-AICRP on cotton

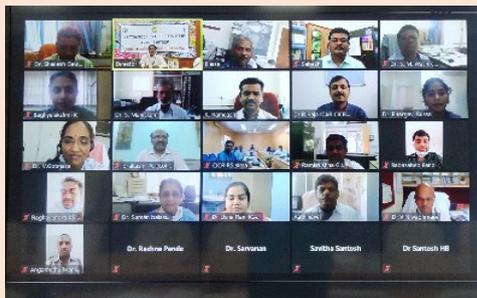
The annual group meeting of ICAR-All India Coordinated Research Project (AICRP) on Cotton was conducted through video conference during April 9-10, 2021 hosted by ICAR-CICR Regional Station, Coimbatore. Dr. T.R. Sharma, DDG (Crop Science), Dr. R. K. Singh, ADG (Commercial Crops), Dr. C. D. Mayee, Chairman, Programme Advisory & Monitoring Committee of AICRP on Cotton, Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur, Dr. V.K. Kharche, Director of Research, Dr. PDKV, Akola and Dr. A.H. Prakash, Project Coordinator, AICRP on Cotton along with the members of Programme Advisory and Monitoring Committee of AICRP on Cotton, scientists from various public and private sector R & D institutes participated in the meeting. The meeting had seven technical sessions followed by valedictory session. The results of various trials under Plant Breeding, Agronomy, Entomology, Pathology and Fibre quality were reviewed in detail. Further the technical programme for the forth coming year was also discussed and finalized. During the group meeting, the Variety Identification Committee meeting of both Bt and non-Bt Cotton Hybrids/Varieties was held under the chairmanship of Dr. T.R. Sharma, DDG (Crop Science).



Institute Research Committee (IRC) meeting – 2021

The Annual Institute Research Committee (IRC) - 2021 meeting of ICAR-CICR was conducted as a combined IRC for ICAR-CICR, Nagpur, ICAR-CICR, Regional Stations, Coimbatore and Sirsa during 22-27 March, 29 April, and 5 May 2021 in a virtual mode. Dr. Y. G. Prasad, Director and Chairman, IRC chaired the meetings. All the Heads of Divisions/Regional Stations, Head, PME Cell, Secretary, IRC, and the Scientists of ICAR-CICR participated in the deliberations. Dr. K. Velmourougane, Secretary, IRC presented the Action Taken Report (ATR) of the previous IRC (2020). In the IRC 2021, a total of 19 concluding projects were approved for closure, and 18 new projects were approved. After the project matrix finalization on the last day of IRC, a total of 82 (71 institute & 11 externally funded) projects werelisted as on-going projects. As a part of 'World Water Day' celebration, a special lecture on "Water foot print of cotton" was delivered by Dr B. Bhargavi, Scientist, ICAR-CICR on 22nd March 2021. The IRC felicitated Dr. O. P. Tuteja, Principal Scientist (Plant Breeding) and Head, ICAR-CICR Regional Station, Sirsa who presented his lifetime achievements in cotton research in the IRC-2021 due for superannuation in March. Dr. K. Velmourougane, Secretary IRC and Dr. Dipak Nagrale, Joint Secretary IRC coordinated the meetings.

CICR Happenings



Scientists' Corner

Publications, Awards, Recognitions and special assignments

- ✓ Thapa S, Prasanna R, Ramakrishnan B, Mahawar H, Bharti A, Kumar A, Velmourougane K, Shivay YS and Kumar A. (2021). Microbial inoculation elicited changes in phyllosphere microbial communities and host immunity suppress *Magnaporthe oryzae* in a susceptible rice cultivar. *Physiological and Molecular Plant Pathology*. doi.org/10.1016/j.pmpp.2021.101625 (NAAS score 7.65)
- ✓ Daunde, A. T., Sain, S. K., Baig, K. S. and Tatikundalwar, V. R. (2021). Correlation of weather parameters with the development of grey mildew disease of cotton caused by *Ramularia areola*. *Indian Journal of Pure & Applied Biosciences*. 9(1), 489-494

Participation of scientists in Training/seminar/conference/symposia/etc.

- ✓ **Dr. Y.G Prasad, Director, ICAR-CICR, Nagpur participated in the following meetings/events**
 - Virtual meeting regarding HDPS discussion with Rasi Seeds (P) Ltd on April 03, 2021.
 - Virtual discussion on Pollination with WWF- India April 05, 2021.
 - Six Monthly Review Meeting (virtual) of Regional Committee for Region II organized by ICAR-NRRI, Odisha on April 12, 2021.
 - Virtual meeting regarding licensing of varieties to public and private sector seed producing agencies and other seed related issues held under the chairmanship of Dr T Mohapatra, Secretary, DARE and DG, ICAR on April 19, 2021.
 - Virtual meeting with Solidaridad, India on April 21, 2021 on varietal demonstrations
- ✓ Director and Heads of Division participated in the online AICRP Review Meetings during April 8- 9, 2021 organized by Dr AH Prakash, PC, AICRP on Cotton & Head, CICR Regional Station, Coimbatore. Dr VN Waghmare, Dr Blaise Desouza and Dr Nandini Narkhedkar, HoDs co-chaired Breeding, Agronomy and Plant Protection sessions, respectively.
- ✓ Dr. S. K. Verma, Principal Scientist (Plant Breeding) and Head (I/C), Dr. Rishi Kumar, Principal Scientist (Entomology), Dr. S. K. Sain, Principal Scientist (Plant Pathology), Dr. Amarpreet Singh, Scientist (Sr. Scale) Agronomy and Debashis Paul, Scientist (Seed Science and Technology), ICAR-CICR, Regional Station, Sirsa attended a meeting with representatives of "Kheti Virasat Mission" NGO based in Jaitu, Faridkot, Punjab and farmers regarding the 'Organic farming of cotton' on April 16, 2021.

Scientists' Corner



- ✓ Director, HoDs and team of scientists participated in the review meeting on the progress of the activities / recommendations under ICAR-CSIR MoU under the chairmanship of Dr T Mohapatra, Secretary, DARE & DG, ICAR on April 26, 2021.
- ✓ Dr. Prakash AH., I/c PC, RS, Coimbatore coordinated a virtual Breeders Meet on Pre-breeding on April 27, 2021.
- ✓ Dr. S. K. Verma, Principal Scientist (Plant Breeding) and Head (I/C), ICAR-CICR, Regional Station, Sirsa performed the coding of AICRP Breeding and Bt Trials during April 27-29, 2021.
- ✓ Dr. S. K. Sain, Principal Scientist (Plant Pathology), ICAR-CICR Regional Station, Sirsa distributed the seeds of CICR Bt-6, CICR-1, CICR-3, CSH-3129 and CSH-3075 seeds to the farmers for conducting the FLDs under the NFSM scheme at farmers' fields in the area of Rewari, and Bhiwani Districts of Haryana on April 27, 2021 in collaboration with KVK-CCSHAU, Bawal, Rewari.



- ✓ Dr. Y. G. Prasad, Director, ICAR-CICR and Dr. V. S. Nagrare, Principal Scientist (Entomology) participated in the 1st Steering Committee Meeting (virtual) of the project "Crop Pest Surveillance and Advisory Project in Maharashtra" for the year 2021-22, chaired by Commissioner Agriculture Maharashtra on April 28, 2021.
- ✓ Dr. Y.G Prasad, Director, ICAR-CICR, Nagpur along with Dr D Blaise, Dr MV Venugopalan and Dr S. Manickam participated in the meeting of Stakeholders under the aegis of Committee on Cotton Production and Consumption on April 30 2021 organized by Cotton Section. Office of Textile Commissioner, Mumbai.
- ✓ Dr. Blaise Desouza, I/c Head, Division of Crop Production attended ISWS-4 Webinar on April 30, 2021, organized by the Indian Society of Weed Science, Jabalpur.

Farmers' Corner

Extra-long staple (ELS) Bt Cotton Hybrid DCH 32 benefits farmers in southern dry zone of Karnataka

Cotton is one of the most important commercial crops, which plays a vital role in livelihood security of the farmers in southern dry zone of Karnataka. Mysore and Chamarajnanagar are the leading cotton growing districts of the zone. Traditionally this zone is known for cultivation of Extra Long Staple (ELS) cotton, due to its favourable climatic conditions. Prior to the introduction of Bt cotton hybrids, the predominant cultivar cultivated in the zone was DCH-32. But, in the current era of Bt cotton, the area under non-Bt version of DCH 32 declined. During the year 2019-20, with the introduction of DCH-32 Bt cotton (BGII) by Karnataka State Seed Corporation (KSSC), the ICAR-AICRP on Cotton, Chamarajanagar centre attempted to introduce DCH-32 Bt cotton in farmers' field through Front Line Demonstrations (FLDs) under the National Food Security Mission on Cotton – Commercial Crops.



Sri Siddappa S/o Basappa, is a young progressive farmer from Tagalur village, in Begur Hobli of Gundlupet taluk, Chamarajanagar District. He owns six acres of land and adopts Integrated Farming System (IFS) concept for sustainable agriculture. He opted for demonstration of new DCH-32 Bt cotton in his field under the supervision of ICAR-AICRP scientists. He took up the sowing in the month of April 2020 at a spacing of 90 × 90 cm following recommended package of practices. Gap filling was taken with seedlings that were raised in polythene bags after the occurrence of rains. Seeing the good establishment of crop, higher number of bolls per plant and good boll size achieved attracted the neighbouring farmers to visit his field regularly and they started showing interest in DCH 32 Bt cotton. Consequently, the officials from the Karnataka State Department of Agriculture and Karnataka State Seed Corporation also visited the demo field. A field day was organized for farmers in the presence of Dr. A.H. Prakash, Project Coordinator (Cotton Improvement), Dr. Y.G. Sadakshari, Director of Research, UAS, Bangalore, Dr. S.N. Vasudevan, ADR, ZARS, VC Farm, Mandya, JDA of KSDA, Director of KSSC, Scientists of ICAR-AICRP on Cotton and KVK. Under rainfed conditions, a good yield of 2000 kg/ha was harvested eliciting interest of other farmers in the adoption of the ELS hybrid. As a result, during the year 2020-21, ICAR-AICRP on Cotton, Chamarajanagar implemented 50 acres of frontline demonstration in farmers' fields on ELS cotton realizing an average seed cotton yield of 1481 kg/ha (11.9% higher yield) as against farmers' practice of 1324 kg/ha. Cost of cultivation, gross return, net return and B:C ratio per hectare were Rs. 42184, Rs.81455, Rs.39271 and 1.93, respectively in FLD fields and Rs.39930, Rs.72820, Rs.32890 and 1.82 respectively under farmers' practices.

The efforts of the farmer and the centre paved way for re-entry of DCH 32 Bt cotton in the southern dry zone of Karnataka which will benefit many rainfed ELS cotton growers.

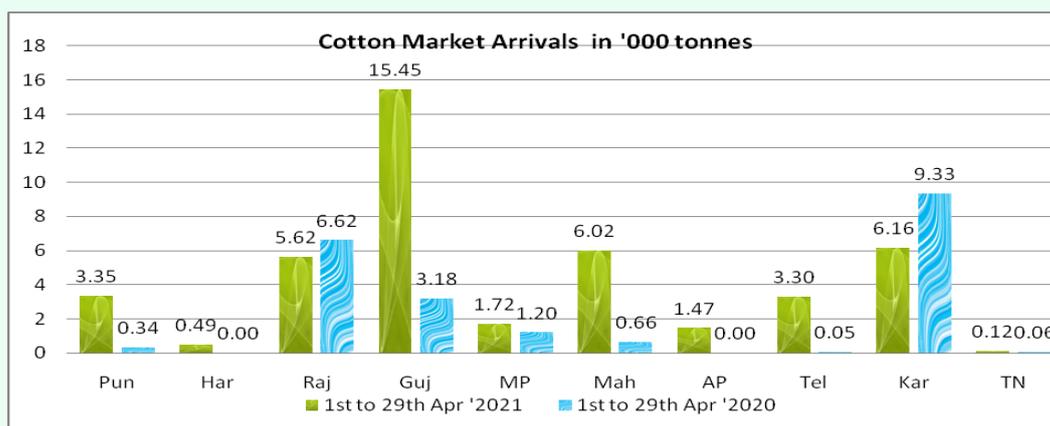
Information provided by,
Dr. C. SHASHI KUMAR, Assistant Agronomist & Scheme Head,
ICAR-AICRP on Cotton, KVK Campus, Haradanahalli farm, Chamarajanagar-571127 email: shashiagron76@gmail.com

Cotton Statistics and Trade

Cotton market arrivals and prices during the month of April, 2021

Dr A R Reddy and Dr Isabella Agarwal

The cotton market arrivals during April, 2021 were 43.70 '000 tonnes as against 21.43 '000 tonnes during April 2020. The arrivals were higher in Punjab, Gujarat, Maharashtra, and to some extent from Rajasthan to the tune of 3.35, 15.45, 6.02 and 5.62 thousand tonnes, respectively. The likely reason might be the lock down effect due to pandemic during April, 2020 wherein, non-availability of labour and closure of markets would have slowed down the domestic trade. During the year 2020-21, there has been an increase in yield in the Central zone from 431 to 473 kg /ha which would have added to the increased arrivals in the market. In case of Karnataka, the cotton arrivals were lesser by 34 per cent when compared to April, 2020.



Cotton market arrivals (Source: <https://agmarknet.gov.in>)

State wise Wholesale Prices (Rs.) Monthly Analysis for Cotton April, 2021

State	Prices April, 2021	Prices March, 2021	Prices April, 2020	% Change (Over Previous Month)	% Change (Over Previous Year)
Gujarat	6133	5963	4668	2.84	31.38
Haryana	6100	5926	-	2.94	-
Karnataka	5518	5757	3826	-4.16	44.21
Madhya Pradesh	5745	5896	4236	-2.56	35.63
Maharashtra	5820	5858	4757	-0.65	22.34
Odisha	5317	5615	5296	-5.31	0.39
Punjab	6351	5973	5405	6.33	17.51
Rajasthan	6486	6167	5091	5.16	27.39
Tamil Nadu	4666	6458	4481	-27.74	4.13
Telangana		5881	-	-	-
Average	5793	5949	4720	-2.63	22.73

Source: <https://agmarknet.gov.in>

The cotton prices showed a decelerated trend in the South zone during the month of April, 2021 when compared to previous month. In the North zone, slight increase in prices was observed, which was almost stable in the Central zone except Gujarat cotton markets. In total, there has been an increase of 22.73 per cent in cotton prices during April, 2021 when compared to April, 2020.

AI to aid cotton ryots in 2,800 villages

MoU signed by Agriculture department and Wadhvani AI to help check pests

SPECIAL CORRESPONDENT HYDERABAD



Farmers in 2,800 villages across six districts in Telangana who raise cotton crop during the next kharif (wanakalam) season would have the help of information technology to predict the bollworm and other devastating pest infestations and take immediate measures to prevent crop damage to a large extent and improve income along with the quality of the produce.

All this, deployment of traps and lures along with a mobile application developed by Wadhvani AI, would be provided free of cost to farmers as part of an agreement between the Agriculture Department and Wadhvani Institute for Artificial Intelligence (Wadhvani AI). While the Wadhvani AI would provide their solution (mobile app) free of cost to the State, the Indian Institute of Chemical Technology would procure and deploy the traps and lures free of cost.

According to Principal Secretary (Agriculture) B. J. Nardhan Reddy, the Wadhvani AI already has MoU existing with the Department of IT, Electronics & Communication (ITEC) to facilitate AI-based solutions and with Professor Jayashankar Telangana State Agricultural University (TSTU) to help with agri science research, monitoring and deployment.

"Third largest crop" "Cotton is the third largest crop cultivated in India after paddy and wheat with 75% of it grown by small landholding farmers who struggle with uncertainty in yield and income. One of the critical challenges they face is the inability to manage pests despite heavy use of pesticides", Mr. Reddy said.

Wadhvani AI has developed an AI solution that would equip smaller cotton farmers with the scientific knowledge of an agriculture expert with the help of a simple smartphone. The solution, delivered via the mobile app, would provide real-time localized advisory and surveillance.

It would enable farmers to detect pest infestations early and take correct and immediate action to avoid crop damage and would improve their income with improved quality of produce.

"The solution is based on the scientific concept of action thresholds and is able to predict pink and American bollworm infestation with an accuracy of over 90%", the Principal Secretary, who is also officiating as the Agriculture Commissioner, said.

In 2020 kharif, the solution was deployed by 700 lead farmers and 17,000 cascade farmers in Telangana, Maharashtra, Karnataka and Gujarat through agricultural programmes managed by the Wadhvani AI worked in 150 villages in Adilabad and Rangareddy districts collectively with 7,000 cascade farmers.

vada NAGPUR ■ Friday ■ April 16 ■ 2021
April 16, 2021

Cotton exports to jump 20 pc in 2020-21 season

Business Bureau

THE Cotton Association of India (CAI) on Thursday estimated cotton exports to increase by 20 per cent to 60 lakh bales in the 2020-21 season that begins in October, mainly due to higher international prices.

In 2019-20 season, cotton exports stood at 50 lakh bales, it said in a statement.

"We are expecting the exports to go up by 10 lakh bales this season to 60 lakh bales due to higher international prices of cotton compared to the Indian commodity. The average price difference between the Indian and the international cotton was ruling between 10 to 15 cents a month before, which is now near about 4 to 5 cent," CAI President Atul Ganatra said.

In the international market, cotton prices are generally in US dollars. The export shipments up to March 31, 2021 are pegged at 43 lakh bales. Besides, CAI has slightly increased its cotton crop estimate for the 2020-21 season to 360 lakh bales due to higher production in the north zone. The quantum is higher than the association's projection in February. Cotton production for 2020-21 is estimated to be 360 lakh bales due to increase in output by 1,50,000 bales in north zone -- that is 50,000 bales each in Haryana, Upper Rajasthan and Lower Rajasthan, as per the statement. The total cotton production for the 2019-20 season stood at 360 lakh bales.

The total cotton supply for October 2020 to March 2021 period is estimated at 459.26 lakh bales. This consists of arrivals of 328.76 lakh bales, imports of 7.50 lakh bales and the opening stock estimated at the beginning of the season.

Further, CAI has projected, cotton consumption at 165 lakh bales for 2020-21 season.

कपास के बीज की किल्लत की आशंका

घिजनेस संवाददाता | नई दिल्ली

कपास की कीमतें इस साल एमएसपी से ऊपर रहने और अनुकूल मौसम की वजह से अगले सीजन में कपास की खेती बढ़ सकती है, लेकिन किसानों को बीज की किल्लत का सामना करना पड़ सकता है। बीज का उत्पादन इस साल घटा है और कैरी फॉरवर्ड स्टॉक कम है। कपास की एमएसपी 5,515 रुपए प्रति क्विंटल है, जबकि चालू सीजन में अब तक कपास के औसत भाव 6,000 रुपए प्रति क्विंटल रहे हैं। इसके चलते किसान इसकी खेती बढ़ाने वाले हैं। कौटन इंस्टीट्यूट के विशेषज्ञों के मुताबिक इस साल 1.2 करोड़ हेक्टेयर में कपास की खेती हुई है, लेकिन अगले सीजन में इस फसल का रकबा 15-20% बढ़ सकता है। नेशनल सीड एसोसिएशन ऑफ इंडिया (एनएसएसआई) के मुताबिक देश में कपास के बीज का सबसे बड़ा उत्पादक राज्य तेलंगाना में 20-25 प्रतिशत उत्पादन घटा है। आम तौर पर 5-5.5 करोड़ पैकेट (हर पैकेट में 450 ग्राम) कपास के बीजों की मांग रहती है, जो इस साल बढ़कर 6 करोड़ पैकेट तक पहुंच सकता है। इस साल कैरी फॉरवर्ड स्टॉक भी घटकर 1.3 करोड़ पैकेट रह जाने की आशंका है, जबकि आम तौर पर 1.5 करोड़ पैकेट का स्टॉक रहता है। इस बीच पंजाब, हरियाणा और राजस्थान जैसे राज्यों को बीजों की सप्लाई होने लगी है, जहां अप्रैल के मध्य से कपास की बुआई शुरू हो जाती है।

बॉड अळीबाबत जनजागृतीचे जिल्हाधिकार्यांना निर्देश

आगामी हंगामात नुकसान टाळण्यासाठी प्रशासनाचा पुढाकार

अंत्रोवन वृत्तसेवा

अकोला : आगामी हंगाम सुरु होण्यापूर्वीच कापूस उत्पादक शेतकऱ्यांमध्ये बॉडअळीच्या दृष्टीने मोठ्या स्तरावर जनजागृती करण्याची सूचना कृषी आयुक्तांनी जिल्हाधिकार्यांना केली आहे. कृषी आयुक्त घोरजकुमार यानी सोमवारी (ता. १२) अकोला जिल्हाधिकारी जितेंद्र पापळकर यांना याबाबत पत्र पाठवत काय उपाययोजना करणे आवश्यक आहे, याची सविस्तर माहिती कळविले आहे.

बॉडअळीच्या दृष्टीने आवश्यक बाबींकोडे दुर्लक्ष न करता आगामी कापूस हंगाम सुरु होण्यापूर्वीपासून शेतकऱ्यांमध्ये प्रभावीपणे जनजागृती करणे आवश्यक आहे. त्यानुसार येथील खरीप हंगामाच्या पूर्वतयारीच्या बैठकीमध्ये गुलाबी बॉडअळी व्यवस्थापनाच्या दृष्टीने विविध मुद्द्यांबाबत प्रचार व प्रसिद्धी करून शेतकऱ्यांमध्ये जनजागृती घडवून आणावी, असे सुचविले आहे. राण्यात सुमारे ४२ लाख हेक्टर क्षेत्र कापूस पिकाखाली असून त्यात बहुतांश बॉटी वाणांचा वापर होतो. मार्गाल काही वर्षात बॉटी कपाशीवर गुलाबी बॉडअळीचा प्रादुर्भाव होत असल्याने शेतकऱ्यांना आर्थिक नुकसान सोसावे लागत आहे. शेतकऱ्यांचे या किडीमुळे होणारे नुकसान टाळण्याचे दृष्टीने सन २०१८-१९ पासून गुलाबी बॉडअळी व्यवस्थापनाची व्यापक मोहिम राबविण्यात येत आहे. या मोहिमेअंतर्गत कृषी विभागासह कृषी विद्यापीठ, केंद्रीय कापूस संशोधन संस्था, कृषी विज्ञान केंद्र, महापट्टा राज्य कृषी उद्योग विकास महामंडळ, निविद्या उत्पादक, वितरक व विक्रेते, विनिंग व प्रेसिंग मिल्स, सीड इंटरनॅशनल असोसिएशन इत्यादी शासकीय व खासगी संस्थांचा सहकार्याने गुलाबी बॉडअळीचा प्रादुर्भाव नियंत्रणात ठेवण्याचे दृष्टीने प्रयत्न केले जात आहेत. जिल्हाधिकार्यांच्या अध्यक्षतेखाली स्थापन केलेल्या जिल्हास्तरीय संयंत्रांना समितीचाही सहभाग राहिलेला आहे. मार्गाल वर्षात गुलाबी बॉडअळीचा प्रादुर्भाव नियंत्रणात ठेवण्यात यश आले असले तरीही तातकाची लॉबलेल्या पावसामुळे अधिक उत्पादनासाठी शेतकऱ्यांनी कापूस यांक शेतात ठेवलेले होते. त्यामुळे किडीचा प्रादुर्भाव होऊ शकतो.

Sakal Agroone, 14 April 2021

कापूस बियाणे दरवाढीस शेतकरी संघटनेचा विरोध

अंत्रोवन वृत्तसेवा

जळगाव : खानदेशात कापूस पीक प्रमुख आहे. पण या पिकाचे बियाणे गुणवत्तापूर्ण असते का, त्यावर गुलाबी बॉड अळी, बॉड सडची समस्या एवढी कशी वाढत आहे, असे प्रश्न उपस्थित करून कापूस बियाण्याची दरवाढ शासन किंवा संबंधितांनी तातडीने मागे घ्यावी, अशी मागणी शरद जोशीप्रणीत शेतकरी संघटना व महाराष्ट्र राज्य शेतकरी संघटनेतर्फे करण्यात आली आहे.

कापूस पिकात गेली दोन वर्षे नुकसान सहन करावे लागत आहे. पाऊस चांगला झाला. पण वेचणीपूर्वीच पिकात गुलाबी बॉड अळी, बॉड सडची समस्या तयार होत आहे. कोरडवाहू कापूस पिकात एकरी दीड क्विंटल आणि पूर्वहंगामी कापूस पिकात एकरी चार क्विंटल उत्पादन येत आहे. शिवाय उत्पादन खर्च खते, मजुरीमुळे वाढत आहे. दरांचा प्रश्न असतोच. कारण हमीभाव कागदावरच दिसतो.

कापसाची दरवाढ नेहमी कापसाचा तुटवडा किंवा शेतकऱ्यांकडील ९८ टक्के कापसाची विक्री झाल्यानंतरच होत असते. अशा स्थितीत शासन किंवा संबंधित यंत्रणांनी कापूस बियाण्याची दरवाढ केली आहे. ही बाब योग्य नाही. शासन मदतीचा हात कापूस उत्पादकांना देत नाही. दुसरीकडे बियाणे दरवाढीस चालना देते, हा प्रकार योग्य नाही, असेही संघटनेचे किरण गुर्जर, कडूअप्पा पाटील आदींनी म्हटले आहे.

कापूस लागवड खानदेशात मे अखेरिस सुरु होईल. पण त्यापूर्वी बियाणे दरवाढ मागे घेतली पाहिजे. दरवाढ पाकिटामागे किरकोळ सांगितली जात असली तरी यामागे मोठे अर्थकारण असते. शेतकऱ्यांच्या खिशातूनच पैसे काढण्याचे काम सुरु आहे, असेही म्हटले आहे.

Sakal Agroone, 14 April 2021

Cotton Innovate

A Monthly Newsletter from ICAR-Central Institute for Cotton Research, Nagpur



COTTON INNOVATE



Earias vittella caught by predator (spider)
Photo: Dr. M. Sabesh

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Cotton Innovate | Volume 4(1), 2021
www.cicr.org.in



Produced and published by
Dr. Y. G. Prasad, Director, ICAR-CICR, Nagpur

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Publication Note: Cotton Innovate is an Open Access monthly newsletter of ICAR-CICR, Nagpur available online at http://www.cicr.org.in/cotton_innovate.html

Published by

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Citation: Cotton Innovate 2021, ICAR-Central Institute for Cotton Research, Nagpur, India, Volume: 04 (01), pp-13, available at http://www.cicr.org.in/cotton_innovate.htm

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