

Cotton Innovate

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



COTTON INNOVATE



Aphids on action
Photo: Dr. M. Sabesh

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CICR's new long staple
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by Dr. S. Manickam

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Invited Research Note

CICR's new long staple upland cotton varieties (non-Bt) for cotton farmers of south and central zone of India

Dr. S. Manickam,

Principal Scientist, ICAR-Central Institute for Cotton Research Regional Station, Coimbatore

Cotton, popularly called as 'the white gold' is cultivated mainly for its textile fibre apart from other uses for extraction of seed oil, seeds as well as oil cakes for animal feed etc. Since Independence, there was a drastic change in cotton production in India in terms of both yield and fibre quality. This has been possible because of continuous breeding efforts to bring new high yielding cotton varieties with good fibre quality matching the textile industry requirements. The fibre quality improvement in upland cotton (*Gossypium hirsutum*) was given due importance in the ICAR-Central Institute for Cotton Research at the Regional Station, Coimbatore during the past few years as evident by the release of MCU 5-VT, Surabhi, Suraj to name a few. These long / extra-long staple cotton varieties occupy sizeable area even in Bt cotton hybrid era because of their superior fibre quality which fetches premium price to the cotton farmers. Recently, the regional station has developed and released following three new high yielding long/extra-long staple cotton varieties with good fibre quality.

Subiksha

The culture CCH 4474 was initially evaluated in AICRP multi-location trial during 2008-09 and was identified as one of the best entries for fibre quality especially tenacity. The variety was found to be semi-compact and was found to yield nominally in normal spacing. Because of moderate yield level, this variety was not promoted to zonal trials in AICRP. Later, under Technology Mission on Cotton (TMC), special emphasis was given to identify such long staple cultures with good tenacity and agronomic manipulations like yield maximization through altering plant geometry and fertilizer requirement were studied. Based on the results from multi-location trials under AICRP on Cotton and TMC, the high strength culture CCH 4474 was released in 2018 as Central Cotton CCH 4474 (Subiksha) for irrigated conditions of South Zone States of Tamil Nadu, Karnataka, Andhra Pradesh and Telangana. This high strength good quality variety recorded a mean seed cotton yield of 1542 kg/ha under conventional spacing and was found to yield better under closer spacing (as high as 3325 kg/ha in Coimbatore and 4201 kg/ha in Guntur). The variety recorded a 2.5% Span length of 32.4 mm, Micronaire of 3.6 in the spinning test in ICC mode and Upper Half Mean Length of 32.7 mm, Micronaire of 3.7 and Tenacity of 33.8 g/tex in the spinning test in HVI mode and was found to spin up to 60s count yarn. It showed field tolerance to jassids and was on par with check varieties for sucking pests.



Sunantha

The variety Central Cotton CCH 14-1 (Sunantha) was developed by pedigree breeding method from the cross Surabhi x Rai – 4A – 3 – 2. The good quality long staple variety recorded a mean seed cotton yield of 1688 kg/ha as against 1853 kg/ha of the Zonal check variety under irrigated condition in South Zone States of Tamil Nadu, Karnataka, Andhra Pradesh and Telangana. However, the yield potential of the variety is 3675 kg/ha. The variety showed yield superiority in closer spacing with 125% RDF at Guntur in agronomic study.

The variety combined an excellent fibre quality character viz., Upper Half Mean length of 32.0 mm, Micronaire of 3.7 and tenacity of 32.7 g/tex in HVI mode and 2.5 % Span length of 32.8 mm, Micronaire of 3.6 and tenacity of 24.1 g/tex in ICC Mode matching the CIRCOT norm for 50s count yarn. The variety is resistant to Bacterial Leaf Blight, Grey Mildew and Tobacco Streak Virus and immune to Root Rot. The variety is tolerant to jassids, white fly, thrips, aphids and stem weevil.



Suraksha:

Suraksha is an extra-long staple hirsutum cotton variety with excellent combination of fibre quality characters suitable for commercial cultivation in both Central and South cotton growing States under irrigated conditions. The variety has been released for cultivation during January, 2021. The ELS cotton variety has a yield potential of 4019 kg/ha in South India and 2335 kg/ha in Central India. The variety is ideally suitable for closer planting with 125% recommended dose of fertilizer for the variety under normal planting. The ELS cotton variety is characterized by excellent combination of fibre quality parameters and has been rated as one of the best entries in multi-location evaluation trials under All India Coordinated Research Project on Cotton in both the zones. The variety has an Upper Half Mean length of 32.4 mm, Micronaire of 3.7 and tenacity of 34.3 g/tex in HVI mode in South Zone and Upper Half Mean length of 31.9 mm, Micronaire of 4.4 and tenacity of 33.5 g/tex in HVI mode in Central Zone indicating its superiority. However, the potential fibre length is 34.5 mm and potential tenacity is 40.9 g/tex. The fibre is suitable for spinning upto 70s count yarn. The variety is resistant to Bacterial Leaf Blight, Grey Mildew, Root rot, Tobacco Streak Virus, Tolerant to Alternaria Leaf Spot, Rust and Tobacco Streak Virus and immune to Root Rot under field evaluation condition. Further, Suraksha has been confirmed and maintained as Alternaria Leaf Blight resistant line with disease grade of 1.0. The variety is tolerant to jassids, white fly, thrips, aphids, and mirid bugs under field conditions and has shown resistance to jassids under laboratory conditions also.



These newly released varieties of ICAR-CICR combine high yield potential under closer spacing with very good fibre quality matching to the industry requirements along with better ginning outturn, basic innate tolerance to pests and diseases and therefore, can greatly benefit the cotton farmers of South and Central Zone of India.



Popular Article

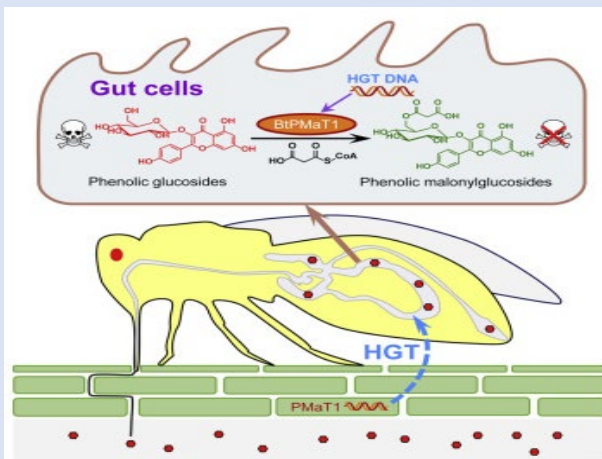
Whitefly (*Bemisia tabaci*) - A tiny tot leader in hijacking the plant defense genes

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'Nothing in biology makes sense except in the light of evolution' said by renowned evolutionary biologist, Theodosius Dobzhansky. This famous quote emphasizes the importance of the evolution which is a continuous process and is necessary for any organism on earth to prosper their generations/populations. Several million years of interaction of plants and herbivore insects has led to evolutionary changes in both the plant and insect species, which is described as 'co-evolution'. In the process of continuous evolution, plants developed different defence mechanisms at morphological, biochemical and molecular levels in order to avoid, tolerate or resist the insect attack. Such defensive attributes of the plant decide the degree of damage by insects. These heritable plant attributes influencing the degree of damage by the insects were described as plant resistance by Painter (1951). Three mechanisms of host plant resistance were described viz., antixenosis or non-preference (that prevent or deter the herbivore from feeding on the plant), antibiosis (that affect the insects' performance and survival by a morphological or biochemical trait), and tolerance (that represents the ability of the plant to compensate for herbivore damage and yield productivity). Among plant biochemical defences (antibiosis mechanism), plant secondary metabolites play an important role in protection of plant from insects. One such most abundant plant secondary metabolite is phenolic glycosides. In plants, the malonylation of phenolic glycosides by the enzyme phenolic glucoside malonyl transferases play an important role in various processes, including xenobiotic detoxification. In many higher plants, the malonylation of glucosides is a system to metabolize xenobiotics i.e., conversion or rendering the toxic compounds to non-toxic. These phenolic glycosides having strong negative effect on the growth and development of insects.

In spite of detrimental effects, certain insects are able to feed on the plant parts containing phenolic glycosides by neutralizing through toxin sequestration and by converting it to salicylaldehyde. One such insect is a highly polyphagous pest whitefly (*Bemisia tabaci Gennadius*) feeding on its wide range of host plants mostly containing phenolic glycosides as defensive compound. This mystery attracted closer attention by a group of researchers to understand and unravel the mechanism behind the wider adaptability of these certain group of insects to cope with such toxic defensive compounds. A landmark study by Xia and co-workers published in journal Cell in 2021 revealed that "B. tabaci genome possess a plant specific gene BtPMT1, encoding a phenolic glucoside malonyltransferase, which horizontally transferred to B. tabaci from plant and this gene enables the insect to detoxify the phenolic glycosides. Thus, B. tabaci evolved to feed on wide host range having phenolic glycoside as defensive compound". The horizontal gene transfer (HGT) or lateral gene transfer (LGT), is the movement of genetic material between unicellular and/or multicellular organisms other than the (vertical) transmission of DNA from parent to offspring (through reproduction). HGT is a common phenomenon observed in prokaryotes and also in eukaryotes. There are many evidences of HGT from bacteria to fungi, bacteria to plant, bacteria to insects, endosymbionts to insects, virus to plant, plant to plant, plant to animal, fungi to insects, human to protozoan etc (Soucy et al., 2015). In order to confirm HGT, Xia and team employed different bioinformatic tools and identified BtPMT1 gene from Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways, responsible for phenolic glycoside detoxification in B. tabaci. They found that the BtPMT1 gene had closest homologues in plants but not in any other arthropods including other whitefly species, except for other B. tabaci cryptic species. The gene BtPMT1 was found to be integrated in B. tabaci genome and is located on scaffold 523 surrounded by two typical arthropod serine protease genes. Further through molecular techniques, they studied the expression of BtPMT1 gene in different life stages from egg to adult and observed significant higher expression of the said gene in adults and in gut portion. Through RNA interference (RNAi), virus-induced gene silencing (VIGS) and the bioassay study with higher dose (10 mM) of phenolic glycosides Xia and team confirmed the detoxification function of BtPMT1 gene. Eventually through the transgenic approach, they also confirmed the resistance to whitefly in transgenic tomato plant expressing dsBtPMT1 and also observed nil effect on the non-target pests viz., peach-potato aphid, Myzus persicae and the spider mite Tetranychus urticae.



Whitefly (*Bemisia tabaci*) acquired plant gene (*BiPMaT1*) via horizontal gene transfer mechanism which conferred ability to neutralize ingested toxic plant phenolic glycosides and expand its host range (Image credit: Xia et al. 2021)



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Mechanical transmission for *Tobacco Streak Virus (TSV)* – local lesion assay on cowpea

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Among the ilarviruses which infect annual and herbaceous crops, Tobacco Streak Virus (TSV) is distributed almost throughout India. Initial disease epidemics of TSV occurred mostly in southern states like Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra especially on cucurbits, cotton, okra, legumes and sunflower. The occurrence of TSV was reported from over 26 countries, worldwide. In India, TSV was first identified as causal virus for sunflower necrosis disease and peanut stem necrosis disease (PSND) during 1999-2000 from Andhra Pradesh. Since, then virus was found to be responsible for causing serious damage in groundnut, sunflower, cotton and several other annual crops in Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu.

TSV was first described by Johnson (1936), is the type species of the genus Iilarvirus, of the family Bromoviridae that includes viruses having tripartite quasi-isometric particles of size 27 to 35 nm. Most common symptoms of TSV include chlorosis and necrosis of leaves, necrotic streaks on petioles, stems, floral parts and stunted growth. TSV infection at seedling stage results in premature death of the plant. Infection during mid-stage of the plant growth may result in necrosis of the leaves and severe reduction in yield. Infection at later stage of the plant growth results in mild chlorotic symptoms, with little effect on plant growth and crop yield. In several weed hosts, such as parthenium, TSV causes asymptomatic infection. Premature death of plant was the main reason for enormous yield losses during the PSND/TSV epidemics. TSV is transmitted through pollen assisted by thrips (Thysanoptera: Thripidae) and experimentally by mechanical sap inoculation, grafting and dodder (*Cuscuta campestris*), but not by contact or soil.

The presence of disease affected plants in the germplasm of *Gossypium barbadense* were observed at 90 days after sowing (DAS). The per cent disease incidence varied from 5.81% (DB 3) to 26.60% (ICB 71). The symptoms were very distinct with necrotic spots dark purple in colour and also drying of squares. The presence of disease affected plants in the varieties and hybrids of *Gossypium hirsutum* were observed at 60 to 70 DAS. The per cent disease incidence varied from 12.4% (Suraj) to 16.6% (Surabhi) and 35.2% in RCH659 BG-II.

Typical symptoms observed in *G. hirsutum* were chlorotic with necrotic spots in young leaves and marginal necrotic streaks with leaf deformation. Whereas, in matured plants veinal necrosis, drying of squares and also in terminal shoots was observed. Yellowing, leaf malformation and necrotic spots were observed in *G. arboreum*.



Fig 1. Sap transmission studies on local lesion host - Cowpea CO 7 (Artificial inoculation)

The transmission of a plant virus from infected to healthy tissues is a procedure fundamental to the study of virus diseases. In the laboratory, this is usually accomplished by grinding the leaf of a diseased plant, and rubbing the infectious sap on to the leaf of a healthy plant. The procedure is referred to as mechanical or sap transmission. It is used in the laboratory to isolate viruses from diseased field plants, to transmit them to test hosts, to sub-culture viruses, to study virus symptoms in a range of host species, and to assay for virus infectivity. A local lesion assay technique confirmed the presence of TSV in *Gossypium barbadense* genotypes through sap transmission studies on cowpea seedlings (CO 7). Crude sap of infected plant (*G. barbadense* genotypes CCB 29, ICB 25 and Suvin) was extracted using sodium phosphate buffer pH 7.2 with 0.01 M mercaptoethanol, 1 per cent sodium sulphite and 1-2 per cent sodium EDTA and rubbed on cowpea. Daily monitoring confirmed transmission to cowpea with expression of symptoms like chlorotic lesions, necrotic lesions, necrotic spots, veinal necrosis, systemic symptoms, necrosis on petioles, stem necrosis and total necrosis (Fig. 1) at 3 to 7 days after inoculation.

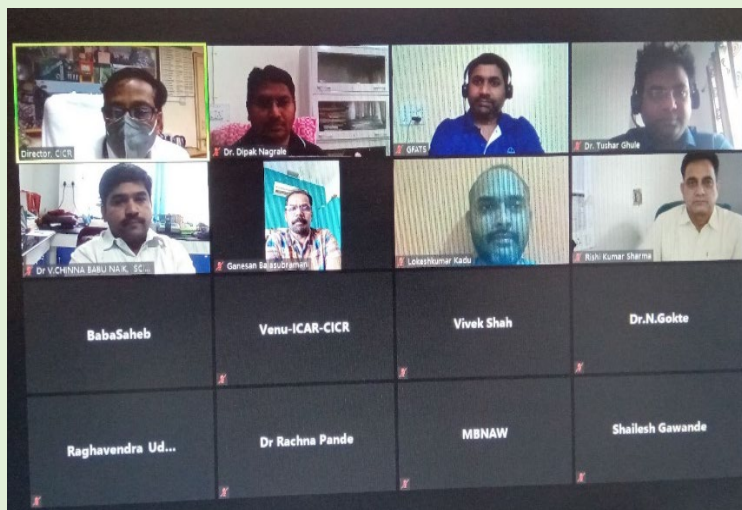


Photo: Dr. M. Sabesh

CICR Happenings

One day interaction meeting of ICAR-CICR-Bayer Crop Sciences Ltd. collaboration

An interaction meeting (virtual mode) between ICAR-CICR, Nagpur and Bayer Crop Sciences Ltd. for possible research collaboration on the theme “Management of economically important insect pests and disease in cotton” was organized by ICAR-CICR, Nagpur on May 13, 2021. At the outset, Dr. Babasaheb Fand, Nodal Officer for prospective collaboration between ICAR-CICR and Bayer Crop Sciences Ltd. welcomed the participants. In the opening remarks, Dr. Y. G. Prasad, Director, ICAR-CICR, Nagpur addressed that research collaboration should be based on economically important and emerging insect pests and diseases in cotton with its evaluation, validation and field application. Mr. Raghavendra Udupa, Customer Marketing Lead-IBSL told that the theme of collaboration is realistic in present cotton pest scenario and he is very hopeful to develop research collaboration with some refinement in technical program.



During the meeting, Dr. V. Chinna Babu Naik, Senior Scientist (Entomology) presented project proposal “Mass trapping of pink bollworm in cotton using ICAR-CICR pheromone lures”. Whereas, Dr. Vivek Shah, Scientist (Entomology) presented project proposal “Monitoring insecticide resistance in American bollworm, *Helicoverpa armigera* (Hübner) populations from cotton growing regions of Maharashtra and Gujarat”. Dr. Rishi Kumar, Principal Scientist (Entomology) discussed the project proposal “Refinement of strategies for sucking pest management in cotton for north zone” while, Dr. Dipak Nagrale, Scientist (Plant Pathology) discussed the project proposal “Studies on boll rot disease complex of cotton and its integrated management”.

Dr. Nandini Gokte-Narkhedkar, Head (I/c), Division of Crop Protection mentioned the importance of these projects on priority basis for the effective management of economically important insect pests and diseases in cotton. In addition, Dr. M. V. Venugopalan, i/c PME cell pointed out the significance of total cost of production and considering the benefit-cost ratio of the projects and their practical field application. Dr. G. Balasubramani, i/c ITMU sensitized the participants about the IPR issues of projects collaboration between ICAR-CICR- Bayer Crop Sciences Ltd.

In the concluding remarks, Dr. Y. G. Prasad, Director urged the participants to take up research project collaboration which have immediate field application as well as deliverable recommendations to cotton farmers. Dr Rachna Pande, Senior Scientist (Entomology) and Dr Shailesh Gawande, Scientist (Plant Pathology) from the institute and Mr. Tara Charan, Agronomic Solution Manager-IBSL, Mr Lokesh Kumar Kadu, FTO Team Lead (Western India) and Dr. Tushar Ghule, FTO Specialist, Nagpur from Bayer Crop Sciences Ltd. attended the meeting.

AICRP Breeders Meet

AICRP Breeders Meet was held in a virtual platform on May 22, 2021 to discuss about the varieties suitable for high density planting system (HDPS) and status of breeder seed production. Dr. Y. G. Prasad, Director, ICAR-CICR, Nagpur in his introductory remark, emphasized on identification of Bt and non-Bt cotton varieties suitable for HDPS, breeder seed demand and cataloguing of notified varieties and hybrids. Dr. A. H. Prakash, Project Coordinator and Head, ICAR-CICR, Regional Station, Coimbatore in his presentation gave the list of varieties and hybrids so far received from various AICRP centres for cataloguing. Dr. S. Manickam, Principal Investigator -, Plant Breeding (AICRP on Cotton) presented a status report on breeder seed production of both Bt and Non-Bt varieties. Breeder seed production and seed lifting by the breeders of various centres was discussed and deliberated. Dr. M. V. Venugopalan, Principal Scientist, ICAR-CICR, Nagpur made a presentation on ‘High Density Planting System in Cotton’.

CICR Happenings

MoUs signed by ICAR-CICR, Nagpur

ICAR-CICR, Nagpur signed an MoU with Agrovision Foundation, Nagpur on May 27, 2021 for leveraging the joint expertise for conceptualization, development, sourcing and implementation of new initiatives and interventions including projects, programs, events, trials, proof-of-concept studies in cotton production technologies in Maharashtra in the spirit of Public Private Partnership encouraged by ICAR.

ICAR-CICR also signed an MoU with M/s. Rasi Seeds Pvt. Ltd., Coimbatore on May 27, 2021 for a contract research project on "Evaluation of nectariless Rasi cotton hybrids against pink bollworm and American bollworms in cotton".



Pre-sowing training to cotton farmers

One day district level pre-season meeting (virtual mode) was organized to impart the training to the farmers by Dr. Hedgewar Seva Samiti's Krishi Vigyan Kendra, Nandurbar at Krishak Mandal Nandurbar along with ICAR-CICR, Nagpur on May 25, 2021. Dr. Y. G. Prasad, Director, ICAR-CICR, Nagpur emphasized that pink bollworm and boll rot disease are to be managed for good cotton production. Shri. R. S. Dahatonde, Senior Scientist and Head, Krishi Vigyan Kendra, Nandurbar urged the farmers for adoption of latest technologies for improving cotton production. Dr. V. Chinna Babu Naik, Senior Scientist (Entomology), ICAR-CICR, Nagpur gave presentation on "Integrated management of pink bollworm in cotton".



Photo: Dr. M. Sabesh

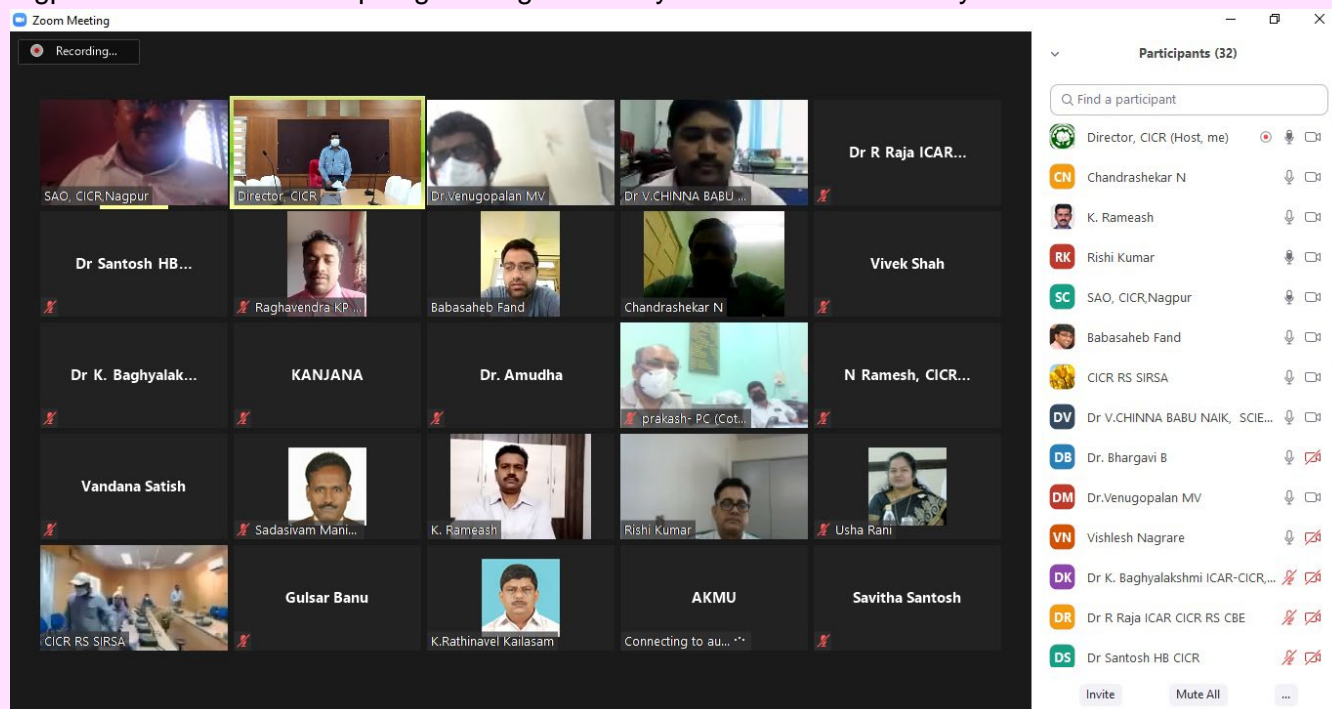
Publications, Awards, Recognitions and special assignments

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- Verma SK, Goyal S, Tuteja OP (2021). Line x tester mating design analysis with GMS based system for seed cotton yield, its component traits and fibre quality parameters in Asiatic cotton (*Gossypium arboreum* L.). *Electronic Journal of Plant Breeding*, 12(1), 97-103.

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

- Director and Scientists of CICR participated in collaborative project "Evaluation and refinement of spindle type header prototype and development of a cotton picker" between ICAR-CICR and CSIR-CMERI held on May 3, 2021 through videoconferencing.
- Dr. S. K. Verma, Principal Scientist (Plant Breeding) and Head (i/c), ICAR-CICR, Regional Station, Sirsa and Dr. Rishi Kumar, Principal Scientist (Entomology) attended a meeting to finalize the protocol for evaluation of Tma12 events against whitefly on May 5, 2021 (virtual mode). The meeting was chaired by Dr Y. G. Prasad, Director, ICAR-CICR, Nagpur. Dr. Pankaj Rathore, Director Regional Station, PAU Faridkot, and Dr. Satnam Singh, Entomologist, PAU, Faridkot participated in the meeting.
- Dr. Blaise Desouza, I/c Head, Division of Crop Production, ICAR-CICR presented the 'Best Management Practices for Cotton' in the smart-cotton conference (virtual mode) organized by MahaCot on May 15, 2021. Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur and Dr. M. V. Venugopalan participated.
- Dr. V. S. Nagrare, Principal Scientist (Entomology) delivered lecture on Integrated Pest Management and Dr D.T. Nagrale, Scientist (Plant Pathology) delivered lecture on Integrated Disease Management through online mode at RAMETI, Nagpur on May 18, 2021.
- Krishi Vigyan Kendra, ICAR-CICR, Nagpur celebrated World Honey Bee Day and organized a technical session on "Honey Bee Keeping" for the farmers through virtual platform on May 20, 2021. Dr Y G Prasad, Director, ICAR-CICR delivered the presidential address while Dr. Lakhan Singh, Director, ICAR-ATARI VII, Pune was the Chief Guest in the event.
- Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur conducted a review meeting of IRM Project for planning activities for 2021-22 season on May 21, 2021. Dr A H Prakash, Dr Nandini Gokte, Dr S Wasnik, Dr V S Nagrare, Dr Rishi Kumar, Dr Chinna Babu Naik, Dr B Fand, Dr S Gawande, Dr D Nagarale, Dr Rameash & Dr S S Patil participated in meeting.
- Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur along with Dr S.M. Palve & Dr Ramkrushna attended Interactive meeting with Hon'ble Shri. Sunil Chatrapal Kedar, Minister for Animal Husbandry, Dairy Development, Sports and Youth Welfare and Guardian Minister District - Wardha, Government of Maharashtra on May 22, 2021.
- Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur attended the Annual Group Meeting of Sunflower, Castor, Sesame, and Niger – 2021 organized by Director, ICAR-IIOR, Hyderabad through virtual mode on May 25, 2021. Director, ICAR-CICR Nagpur chaired a Session on Castor (Plant Protection).

- Dr. Y. G. Prasad, Director ICAR-CICR participated as Expert Advisor in the State level Annual Group Webex meeting organized by PJTSAU, Hyderabad regarding Plant Protection (Entomology & Plant Pathology) on May 26-28, 2021.
- Anti- Terrorism Day was observed on 21 May 2021 at ICAR CICR Nagpur. All the employees of ICAR-CICR, Nagpur attended the virtual pledge taking ceremony on Anti- Terrorism Day.



- Dr. M. V. Venugopalan, Principal Scientist (Agronomy), ICAR-CICR Nagpur participated as Expert Advisor in the state level Annual Group Meeting (virtual mode) organized by PJTSAU, Hyderabad for reviewing ongoing projects and new project proposals related to NRM (Agronomy, Soil Science, Ag. Engineering and Ag. Economics) during May 26-29, 2021.
- “World No Tobacco Day” with the theme “Commit to Quit” was observed on May 31, 2021 at Institute. Employees of ICAR-CICR, Nagpur attended the virtual pledge.
- Dr. Y. G. Prasad, Director ICAR-CICR, Dr Dipak Nagrale, Scientist (Plant Pathology) participated a virtual training on cotton boll rot management on May 31, 2021 organized by Commissionerate of Agriculture, Maharashtra State, Shivaji Nagar, Pune.



Photo: Dr. M. Sabesh

Farmers' Corner

Increase in net profit by adopting IRM strategies in cotton: Shri. Ramaraj from Kinathukadavu shares his success story

The ICAR-CICR, Regional Station, Coimbatore has been implementing National Food Security Mission (NFSM) funded project on "Insect Resistance Management (IRM): Dissemination of Pink bollworm management strategies" at Kinathukadavu Block of Coimbatore District, Tamil Nadu since 2018. During 2018-2020, a total of 50 farmers from five villages viz., Kallapuram, Sikkalampalayam, Vadaputhur, Singaiyanputhur and Solavanpalayam and during the current season, 50 farmers from Palanigoundanur, Muthugoundanur, Sokkanur, Veerappagoundanur, Sattakkalputhur villages were adopted for the implementation of project activities.

The adopted farmers were sensitised on plant protection technologies through lectures, training programmes, field demonstrations, group meetings and exhibitions. Awareness on pest monitoring with pheromone traps, use of bio-control agents and release of egg parasitoid in cotton, safe handling of pesticides and timely crop termination to prevent of pest carryover of pink bollworm in cotton were imparted to the cotton growers. Live specimens of pests with their photographs and natural enemies were displayed to enhance the farmer's knowledge by better understanding about the pest and nature of damage. The population of sucking pests, natural enemies, bollworms and fruiting body damage like green boll damage, open boll damage and locule damage were monitored at weekly intervals and accordingly the farmers were advised to follow the plant protection measures. Adopted farmers were also supplied with critical inputs like pheromone traps, pesticides and biocontrol agents for the timely management of pink bollworm and sucking pests.



Field demonstration on release of egg parasitoids at Kindathukadavu



Shri. Ramaraj sharing his experience to the Field Executive, All India Radio, Coimbatore

Shri N. Ramaraj (Mobile number 9787588571), a progressive farmer cultivating cotton, tomato, cowpea and brinjal at his farm at Singaiyanpudur actively participated in the events organised under the project. He volunteered for learning the pest monitoring using pheromone traps, identification of pests and damage symptoms and the concept of economic threshold level (ETL) in deciding the timing of insecticide spray. By following the IRM strategies, he could reduce the number of insecticides spray by 4 in his cotton crop as against 8-9 sprays by the neighbouring farmers. He spent Rs. 8,130/ha for the pesticide sprays as against Rs.15,500/ha by the non-IRM farmer which resulted in the reduction of cost of cultivation and increased net profit with a benefit cost ratio of 1.62. He shared his experience of adopting better pest management strategy and obtaining increased net profit in cotton at the CICR-Farmers' interaction programme broadcast by the All India Radio, Coimbatore on 16 March 2021 in the "Erum Oorum" (Tamil) ("The Plough and The Village") programme. The knowledge gained in the IRM project is helping the farmers in the monitoring and management of insect pests in other crops also. In addition to cotton, Mr. Ramaraj installed pheromone traps in his brinjal and tomato crops as well for the pest monitoring and undertakes timely management of insect pests in other crops as well.

Information provided by,
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Cotton Statistics and Trade

Revised estimates of area, production and productivity of cotton in India

Dr Isabella Agarwal and Dr A R Reddy

The committee on Cotton Production and Consumption (COCP) in its meeting held on April 30, 2021 revised the figures of state-wise area, production and productivity of cotton in India. As per the revised estimates, cotton area during 2019-20 was 134.77 lakh ha while, the production was 365.0 lakh bales. Similarly, cotton area during 2020-21 was estimated at 133.41 lakh ha while, the production was 360.0 lakh bales.

Table 1: Revised estimates of area, production and productivity of cotton in India

Name of the state	Area in lakh hectares; Production in lakh bales of 170 kgs each; and Yield in Kilogram / Hectare					
	2019-20 (P)*			2020-21 (P)*		
	Area	Production	Yield	Area	Production	Yield
Punjab	2.48	9.50	651.21	5.01	11.00	373.25
Haryana	7.23	26.50	623.10	7.22	22.50	529.78
Rajasthan	7.60	29.00	648.68	8.08	32.00	673.27
NORTHERN ZONE	17.31	65.00	638.36	20.31	65.50	548.25
Gujarat	26.55	89.00	569.87	22.79	90.00	671.35
Maharashtra	44.91	87.00	329.33	42.86	84.00	333.18
Madhya Pradesh	6.50	20.00	523.08	5.89	18.00	519.52
CENTRAL ZONE	77.96	196.00	427.40	71.54	192.00	456.25
Telangana	21.27	54.00	431.59	24.51	51.00	353.73
Andhra Pradesh	6.57	18.00	465.75	6.06	17.00	476.90
Karnataka	8.17	20.00	416.16	7.65	22.00	488.89
Tamilnadu	1.70	6.00	600.00	1.55	6.00	658.06
SOUTHERN ZONE	37.71	98.00	441.79	39.77	96.00	410.36
Odisha	1.70	4.00	400.00	1.71	4.50	447.37
Others	0.09	2.00	--	0.08	2.00	--
TOTAL	134.77	365.00	460.41	133.41	360.00	458.74
P - Provisional						

Source: Office of the Textiles Commissioner, Gol (<http://www.txcindia.gov.in/>)

Cotton balance sheet

As per the revised estimates, total supply of cotton during 2019-20 was 437.02 lakh bales which include crop receipts of 365.0 lakh bales, imports of 15.50 lakh bales and opening stock of 56.52 lakh bales. Similarly, total demand for the year 2019-20 was 316.23 lakh bales which include mill consumption of 233.70 lakh bales and exports of 47.04 lakh bales. Closing stock for the year 2019-20 was estimated at 120.79 lakh bales.

Table 2. Cotton balance sheet during 2019-20 and 2020-21 (in lakh bales of 170 kg. each)

Particulars	2019-2020	2020-2021
SUPPLY		
Opening Stock	56.52	120.79
Crop	365.00	360.00
Import	15.50	11.00
TOTAL SUPPLY	437.02	491.79
DEMAND		
Mill Consumption	233.70	266.00
S.S.I Consumption	20.49	22.00
Non Textile Consumption	15.00	15.00
Export	47.04	70.00
TOTAL DEMAND	316.23	373.00
Closing Stock	120.79	118.79

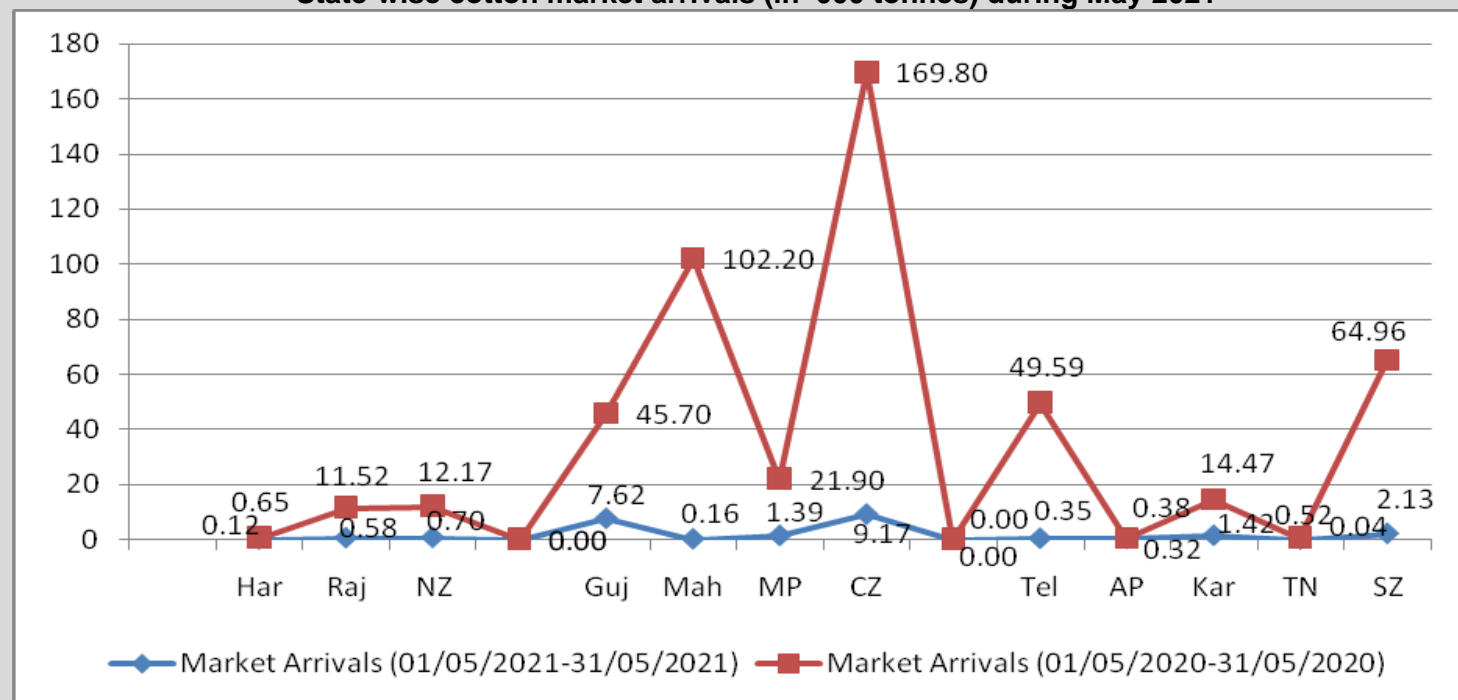
Source: Office of the Textiles Commissioner, Gol (<http://www.txcindia.gov.in/>)

Total cotton supply for the year 2020-21 was estimated at 491.79 lakh bales while, the demand was 373.0 lakh bales. The estimated crop size for the year 2020-21 was 360.0 lakh bales while, the mill consumption was 266.0 lakh bales. Similarly, imports and exports for the year 2020-21 were to be 11.0 lakh bales and 70.0 lakh bales respectively.

Domestic Cotton market scenario

Though, government has allowed mills to operate, mills are facing a cash crunch as markets are closed. Textiles mills dealing in exports are still going strong as Indian yarn prices are attractive. Cotton arrivals were very low during May, 2021 when compared to May, 2020 due to lockdown restriction all around the country.

State-wise cotton market arrivals (in '000 tonnes) during May 2021



Source: www.agmarket.nic.in

State-wise wholesale prices (Rs./qtl.) of cotton for the month May 2021

State	May 2021	May 2020	% Change (Over Previous Year)
Punjab	-	-	-
Haryana	-	-	-
Rajasthan	-	5244.78	-
Gujarat	6373.49	4548.62	40.12
Maharashtra	5984.07	4710.15	27.05
Madhya Pradesh	5295.85	4923.82	7.56
Odisha	-	5335.28	-
Telangana	-	5342.04	-
Karnataka	5134.55	3986.62	28.79
Tamil Nadu	5598.71	3980.94	40.64
Average	5677.33	4759.03	-

Source: www.agmarket.nic.in

During May 2021, Gujarat farmers fetched higher price of Rs.6373/- for their produce when compared to the same month of previous year which was just around Rs.4550/- accounting for 40 per cent increase in cotton price. Similar trend was registered in Tamil Nadu to the tune of 41 per cent. Farmers of Maharashtra and Karnataka received around 28 per cent increase but in Madhya Pradesh, the price was Rs.5300/- as against its previous year price of Rs.4900/- with just 8 per cent increase.

नंद दर्शन 28 मे 2021

कृषी विज्ञान केंद्रात ऑनलाइन कापूस पीक परिषद

खरिपासाठी तयारी ; राज्याच्या विविध भागातील तज्ज्ञांचे मार्गदर्शन

लोकमत न्यूज नेटवर्क

नंदुरबार : तासुक्यातील कोवळे येथील कृषी विज्ञान केंद्राच्यावतीने ऑनलाईन कापूस पीक परिषदाचे आयोजन आले. कापूस पीक लागवडीचा अगोप्य कापसातील तंत्रज्ञान शेतकऱ्यांपर्यंत पोहोचविण्यासाठी या परिषदेचे आयोजन करण्यात आले होते.

यावेळी नागपूर येथील केंद्रीय कापूस संशोधन संस्थेचे महाव्यवस्थापक डॉ. वाय.जी.प्रसाद यांनी मार्गदर्शन केले. डॉ. प्रसाद यांनी कापूस उत्पादनासाठी गुलाबी बोंडअळी आणि बोंडअळी रोगाचे व्यवस्थापन कसे करावे असा प्रश्न विचारला. त्यावेळी कापूस पीक परिषदाचे अध्यक्ष डॉ. प्रसाद यांनी मार्गदर्शन केले. या परिषदेतील तज्ज्ञांच्या मार्गदर्शनाचा उपयोग करून घेण्याचे आवाहन केले.

राष्ट्रीय कृषी विद्यापीठाच्या विभागीय विस्तार केंद्राचे प्रमुख डॉ.मुरलीधर महाजन यांनी संतुलित संसाधनांचा वापर व एकरी झाडांची संख्या महात्वाची असल्याचे सांगितले. कृषी विद्यापीठाचे विकसित केलेले वाय.जा.प्रसाद यांचे अंतर्, फर्टीगेशन तंत्रज्ञान,सुसम अन्नद्रव्यांची कमतरतीची कापूस पिकात दिसणारी लक्षणे व त्यावरील उपाय याबाबतही डॉ. महाजन यांनी मार्गदर्शन केले.

परिसंवादात भारतीय किसान संघाचे राज्य संघटन मंत्री दादा लाड यांनी कापूस पिकात दोन प्रकारच्या फांबा असून त्याचे नियमन करण्याचे आवाहन केले. गड फांबा ज्या अनावश्यक असतात व फळ, फांबा ज्यादारे चांगले उत्पादन मिळते त्या ओळखून झाडावर कशा ठेवाय्या याबाबत मार्गदर्शन केले. परिसंवादात केंद्रीय कापूस संशोधन संस्थेचे कीटक शास्त्रज्ञ डॉ. विद्या बाबू नायक यांनी गुलाबी बोंडअळी व्यवस्थापनाबाबत, कमी दिवसाच्या वाणाची लागवड, नियमित सर्वेक्षण, ट्रायकोकार्डचा वापर व कीटकनाशकांच्या शिकारशीलता वापर करण्याचे आवाहन केले. कृषी विज्ञान केंद्राचे पीक संरक्षण तज्ज्ञ पद्माकर कुंदे यांनी कृपसातील प्रमुख रोग जीवमनुष्य कृपा देण्या तसेच आक्रमिक मर व लावण्या या विकृतीचे व्यवस्थापन याबाबत उपस्थितांना मार्गदर्शन केले. या ऑनलाईन कार्यक्रमाचे संवादन कृषी अभियंता जयंत उततवार, उमेश पाटील यांनी केले. परिसंवादात शेतकरी सहभागी झाले होते. जूनिअर फाउंडेशनच्या कार्यकर्त्यांनी या परिषदेत सहभाग नोंदवत निरीक्षणे नोंदवली.

कापूस उत्पादनासाठी रोगाचे व्यवस्थापन गरजेचे- डॉ.प्रसाद

नंदुरबार (प्रतिनिधी)- चांगल्या कापूस उत्पादनासाठी गुलाबी बोंडअळी व बोंडअळी रोगाचे व्यवस्थापन करणे गरजेचे आहे. योग्य व्यवस्थापन न झाल्यास कापूस लागवडीवर रोगाचा प्रादुर्भाव येतो. यामुळे उत्पादन येण्यास फटकाही बसतो, असे प्रतिवादन नागपूर येथील केंद्रीय कापूस संशोधन संस्थेचे महाव्यवस्थापक डॉ.वाय.जी.प्रसाद यांनी केले.

नंदुरबार येथील कृषी विज्ञान केंद्राच्यावतीने कृषक मंडळात ऑनलाईन कापूस पीक परिषदाचे आयोजन करण्यात आले. कापूस पीक लागवडी अगोप्य कापसातील तंत्रज्ञान शेतकऱ्यांपर्यंत पोहोचविण्यासाठी परिसंवादाचे आयोजन करण्यात आले. यावेळी केंद्रीय कापूस संशोधन संस्थेचे महाव्यवस्थापक डॉ.वाय.जी. प्रसाद यांनी कापूस उत्पादनासाठी व्यवस्थापनाचे महत्त्व पटवून दिले. तसेच कृषी विज्ञान केंद्राचे प्रमुख शास्त्रज्ञ आर.एस.दहातोडे यांनी जिल्हातील या सुमूळ पिकात अद्यावत तंत्रज्ञानाचा उपयोग करण्याचे आवाहन केले. राष्ट्रीय विद्यापीठातील डॉ.मुरलीधर महाजन यांनी संतुलित संसाधनांचा वापर व एकरी झाडांची संख्या महात्वाची असल्याचे सांगितले. परिसंवादात भारतीय किसान संघाचे महागड संघटन मंत्री दादा लाड यांनी कापूस पिकात दोन प्रकारच्या फांबा असून त्याचे नियमन करण्याचे आवाहन केले. केंद्रीय कापूस संशोधन संस्थेचे शास्त्रज्ञ डॉ.विद्या बाबूनायक यांनी कितकनाशक फवारणीविषयी मार्गदर्शन केले. कृषी विज्ञान केंद्रातील पीक संरक्षण तज्ज्ञ पद्माकर कुंदे यांनी कापसावरील तासुक्या विविध रोगांसंदर्भात व्यवस्थापनाची माहिती दिली. ऑनलाईन कार्यक्रमाचे आयोजन अभियंता जयंत उततवार, कृषी विद्यापीठाचे उमेश पाटील अर्दींनी परिश्रम घेतले. या कार्यक्रमातून शेतकऱ्यांसह जुनिअर फाउंडेशनच्या सदस्यांनी सहभाग नोंदविला.

State Agriculture Deptt launches 'One Village, One Variety' initiative

25 villages in five taluhs of Nagpur district selected for the initiative aimed at increasing cotton yield while reducing pest attacks

Staff Reporter

OTTN, farmers take two or more varieties of cotton crop thinking that at least one variety will produce good yield. However, due to different cycles and bio-maturity periods, likelihood of pest attacks increases. Considering this and other problems faced at the level of ginning and pressing units in dealing with multiple varieties of cotton harvest, State Agriculture Department has now come up with 'One Village, One Variety' initiative.

Variety Initiative for cotton crop. A detailed date-wise schedule has been prescribed to make farmers aware of the initiative and phase-wise action to be taken. Accordingly, in Nagpur district,

Nagpur district villages chosen under the initiative

- Hingna Taluhs - Adogan, Kirli, Mhasoli, Kharat (Mhasoli), and Sawali (Bibi)
- Sumer - Jalpur, Telangbhed, Jatanbhira, Redegon, and Vadi
- Nashed - Nashipur, Shikhipana, Mogra, Pipa Khurd, and Jambon (D)
- Koli - Ajina, Chikhalodi, Dawalpur, Sategan, and Chikra
- Samtek - Khumari, Mangni, Gholi, Patgawari, and Bondri

25 villages in five taluhs namely Hingna, Sumer, Nashed, Koli, and Samtek have been chosen for implementation of the initiative. Similarly, 25 villages in Wardha district have been chosen.

(Contd. on page 2)

कापूस उत्पादन वाढविण्यासाठी सर्वतोपरी नियोजन करा

जिल्हाधिकारी शैलेश नवाल यांच्या सूचना

अंत्रवली वृत्तसेवा

अंत्रवली : कापूस महाराष्ट्रातील सर्वात महत्वाचे नगदी पीक आहे. महाराष्ट्रातील ४२ लाख हेक्टर क्षेत्र कापूस पिकासाठी असून, ते देशाच्या क्षेत्राचा ३३ टक्के एवढे आहे. भारतातील एकूण उत्पादनापैकी २२ टक्के उत्पादन महाराष्ट्रात आहे. तसेच महाराष्ट्राची उत्पादकता देशाच्या तुलनेत ३३ टक्के कमी आहे.

खरीप हंगाम सन २०२०-२१मध्ये विस्तारित कापूस पिकाची २ लाख ४४ हजार हेक्टर क्षेत्रावर पेरणी झाली होती. तर कापसाची उत्पादकता ४२१ कि.ग्रॅ. रूई प्रति हेक्टर इतकी आहे. कापूस पिकाचे उत्पादन वाढविण्याच्या दृष्टीने शेतकऱ्यांनी पृथील प्रभावर धार घेणे आवश्यक आहे, असे जिल्हाधिकारी शैलेश नवाल यांनी सांगितले.

कापूस विद्यापीठाची छोट्टी करताना गुणवत्ता व दर्जाची हमी देण्याचा अधिकृत विक्रेत्यांकडून विषयाचे छोट्टी करावे. बाजारपेठ तसेच पोषकदुग्ध विषयांसाठी छोट्टी टायपसाठी अधिकृत विक्रेत्यांकडून पावतीसह विषयाचे छोट्टी करावे. पेशवाईची रूई करून कापसासाठी विषयाचे पाकिटे सिस्टमद किंवा मोहोरबंद असल्याची खात्री करावी. या बाबत कृषी विभागाने व्यापक प्रमाणात शेतकऱ्यांपर्यंत जबाबदारी करावी.

अधिकृत वॉट्टी विषयांसाठी विक्री होईल व परराष्ट्रातून अधिकृत वाणाची विक्री होणार नाही, या बाबत कृषी विभागाने सूचना घ्यावी.

रासायनिक छतांचा वापर कमी करा

शेतजमिनीतील मातीच्या नमुन्याची तपासणी करून जमीन आरोग्यविका आहारापुरत अन्नद्रव्यांचे व्यवस्थापन करण्याबाबत शेतकऱ्यांना प्रशिक्षण देण्यात येईल. शेतकऱ्यांनी सुद्धा अशा प्रशिक्षणात उपस्थित राहून आवश्यक पीक नोंदी ठेवाव्यात. नव्याच्या स्थितीकानुसार रासायनिक नत्र छताची बचत करण्यासाठी अॅडोटेक्नर किंवा अॅडोस्प्रिटरला या साधनाचा वापर संवर्धकांनी बोंडअळिया करावी. यासाठी शेतकऱ्यांना प्रोत्साहित करावे. कापसाच्या मूग व उडीद अशा आंतरपिकांचा समावेश करावा. फवारणीचे संमिश्रण सफेद, सुरिया, डीपी ३, छताचा वापर केल्यास रासायनिक छताची बचत होईल. रासायनिक नत्र वापर कमी करणेसाठी छतांचा फॅरीशियनदारे वापर करण्यास प्रोत्साहन देण्यात येईल. रासायनिक छतांचा कार्यप्रमाण वापर करणेसाठी साईटिंग घ्यावे. हिचल्लोचे छते, वैदिक छताचा एकात्मिकरीत्या अय्यव्ये करावा.

State Agriculture Deptt launches 'One Village, One Variety' initiative

(Contd. from page 1)

Chosen. These villages are in five taluhs namely Wartha, Setao, Samadapur, Ashi and Dewh. The 25 villages chosen in Chandrapur district are in Chandrapur, Solapur, Jalura, Korpana, and Jwari taluhs.

The initiative is being implemented from ensuing Kharif season and preparations are on to involve farmers in selected villages to opt for any one variety of cotton in village.

Vikas Padi, Director of Agriculture Extension and Training, Agriculture Commission, mooted the idea last month and wrote to District Superintending Agriculture Officers and wrote to District Superintending Agriculture Officers (DSAOs) of various cotton-producing districts in Maharashtra including Nagpur, Chandrapur and Gadchiroli in Vidarbha region. The other districts include Nashik, Dhule, Dandurbar, Jalgaon, Ahmednagar, Amangbad, Jalna, Beed, Latur, Osmanabad, Nanded, Parbhani, and Hingoli.

In the letter, Padi told the DSAOs that short-duration varieties taken on light soil or straight varieties taken by adopting very intensive plantation increased productivity. On medium quality soil, medium-duration variety, and medium to long duration variety taken on heavy soil also increased productivity of cotton crop. Hence, cotton varieties should be taken after studying soil layer in various cotton producing villages. While choosing a particular variety for a village, under 'One Village, One Variety' initiative, the officers have been asked to ensure that a specific product variety of any particular company was advertised.

The Hitvada 14.5.2021

गुलाबी बोंड अळीबाबत उपाययोजना करा

कापसासाठी निर्माण झालेला कच्चा गरू नगदी परिसर सन्वक्ष ठेवणे आवश्यक आहे. अन्वक्षामध्ये जमिनीची खोल नगदी करून कापसाची पूर्वेरणी (मेमरील) लागवड टायपानुसार शेतकऱ्यांमध्ये बनवायची करण्यात यावी. शिगारस केल्याची कमी बाजारपेठेत पसंभ देण्याचा बोंड कापूस असावू घ्यावा अशा सूचना बेंदरीत म्हणजे पु न्हियाना जमिनीत घेणे ओळखाले आल्यानंतर पेरणी करावे गरजेचे आहे.

कितीयाना अधिकृत अन्नद्रव्य निर्माण करण्यासाठी विषयी परराष्ट्र व्यवस्थापन शेतकऱ्यांमध्ये जागृती करावी. गुलाबी बोंड अळीचा प्रादुर्भाव टाळण्यासाठी मृदा पिकवणू करून नत्र छताचा वापर करावा. विद्युत्वाहित विविंग विंगण, पाणी एकत्रीकरण केंद्र व गीतमन फॅरीमन साफे लवंगू मास टुंगण करावे. बोंडअळीचे व्यवस्थापनासाठी जमिनीचा निचरा करावा, असे आवाहन जिल्हाधिकारी नवाल यांनी केले.

संद्रिय कापूस : भारतासाठी नवी संधी

Sakad Agroone, 9 May 2021

गामाविक पावतीवर संद्रिय कापसासाठी (जेविक कापूस) उत्पादनात भारतात अग्रेसर देश आहे. मात्र दोसऱ्या प्रथम केल्यास हा सोदा मोकळा प्रमाणात गामाविक पावतीवर संद्रिय कापसासाठी विक्रेत्यांकडून विक्रेते स्वतःच पावतीवर भारतातील कापूस उत्पादकांना ही संद्रिय कापसाची सरकारी पावतीवर आरोग्यदायक पावतीची गरज आहे.

संद्रिय कापूस उत्पादनातील आव्हाने

● खोबरेल आरोग्यक विकासाचे रचवणे (बीओटीएस) ही आरोग्यक पावतीवर संद्रिय कापसाची वैज्ञानिक संस्था आहे. मागील अर्थवर्षामध्ये, भारतातील २०,००० टनच्या संद्रिय कापसाचे चुकीच्या पध्तीने नगदीने झाले आहे, असे बीओटीएसच्या प्रामाणिक आढावे. त्यामुळे अद्याप या सरकारी संस्थासह सरकारी संस्थांनी संद्रिय कापूस रचण्यात आहे. बीओटीएसने ११ संस्थांवर कर्जाचे बंधन, असे केंद्र सरकारला सुचवले आहे. त्याचबरोबर, बीओटीएसने सरकारी याचने करीत संद्रिय कापसातील भारतात अर्थव्यवस्था केली.

यामुळे देशातील संद्रिय कापसाच्या पुरवठा साखळ्या जटी बनविलेला झाला असल्या, तो वाचू प्रस्तावित आला आहे. बी ओटीएसच्या संद्रिय कापसाच्या आणि मुळाव्या किंवा २० टक्क्यांनी मुळाव्या होत्या. त्यामुळे येणा काळात मधील काळात प्रक्रियेत महत्त्व येणार असून, परवावळीवर पसंभ टाळता येईल.

संद्रिय कापूस उत्पादनाची गरज

- अल्प साखळी वेळामध्ये
- कोरलवू रोगी
- संवेदनशील उपकरणा
- टुंगण पावतीसह टुंगणे (आवृत्त) हे प्रामाणिक छते अधिक कितकनाशकांवरून टुंगणे करतात.

संद्रिय कापूस उत्पादनातील वाटा (आवृत्त टक्क्यांनी)

भारत	५०
चीन	१७
तुर्की	१०
किर्गिस्तान	१०

१,४०,००० टन संद्रिय कापसाचे आणखिल वाढवणे

कापूस लागवडीत वाढ शक्य

Sakad Agroone, 3 May 2021

केंद्रीय कापूस संशोधन संस्थेच्या तज्ज्ञांचा अंदाज

किरीट जेठेले - अंत्रवली वृत्तसेवा

कापूस : येणा हंगामात चांगल्या उत्पादनासाठी शेतकऱ्यांनी कापूस पिकात कापसासाठी योग्य पध्ती घ्यावी, अशी सूचना बेंदरीत म्हणजे पु न्हियाना जमिनीत घेणे ओळखाले आल्यानंतर पेरणी करावे गरजेचे आहे. कितीयाना अधिकृत अन्नद्रव्य निर्माण करण्यासाठी विषयी परराष्ट्र व्यवस्थापन शेतकऱ्यांमध्ये जागृती करावी. गुलाबी बोंड अळीचा प्रादुर्भाव टाळण्यासाठी मृदा पिकवणू करून नत्र छताचा वापर करावा. विद्युत्वाहित विविंग विंगण, पाणी एकत्रीकरण केंद्र व गीतमन फॅरीमन साफे लवंगू मास टुंगण करावे. बोंडअळीचे व्यवस्थापनासाठी जमिनीचा निचरा करावा, असे आवाहन जिल्हाधिकारी नवाल यांनी केले.

संद्रिय कापूस उत्पादनाची गरज

- अल्प साखळी वेळामध्ये
- कोरलवू रोगी
- संवेदनशील उपकरणा
- टुंगण पावतीसह टुंगणे (आवृत्त) हे प्रामाणिक छते अधिक कितकनाशकांवरून टुंगणे करतात.

संद्रिय कापूस उत्पादनातील वाटा (आवृत्त टक्क्यांनी)

भारत	५०
चीन	१७
तुर्की	१०
किर्गिस्तान	१०

१,४०,००० टन संद्रिय कापसाचे आणखिल वाढवणे

संद्रिय कापूस उत्पादनाची गरज आहे. मागील अर्थवर्षामध्ये, भारतातील २०,००० टनच्या संद्रिय कापसाचे चुकीच्या पध्तीने नगदीने झाले आहे, असे बीओटीएसच्या प्रामाणिक आढावे. त्यामुळे अद्याप या सरकारी संस्थासह सरकारी संस्थांनी संद्रिय कापूस रचण्यात आहे. बीओटीएसने ११ संस्थांवर कर्जाचे बंधन, असे केंद्र सरकारला सुचवले आहे. त्याचबरोबर, बीओटीएसने सरकारी याचने करीत संद्रिय कापसातील भारतात अर्थव्यवस्था केली.

Cotton Innovate

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COTTON INNOVATE



Aphids on action
Photo: Dr. M. Sabesh

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