

COTTON Innovate



Weekly Newsletter from Central Institute for Cotton Research, Nagpur

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SCIENTIFIC TALK

Dr. D. Monga during his wild idea talk discussed about "A parasitic fungus that turns unwitting ants into zombies" at CICR, Regional Station, Sirsa. *Ophiocordyceps unilateralis* is a parasitoidal fungus that infects ants such as *Camponotus leonardi* and alters their behavior. The ant falls from the tree where it normally lives, climbs on the stem of a plant, clamps its mandibles on a leaf and dies there, while the fungus consumes its tissues and grows outside it, releasing its spores. The infected ants are popularly known as zombie ants. This is a prime example of a parasitoid that alters the behavior of its host in order to ensure its own reproduction. The *Ophiocordyceps* fungus contains various known and untapped bioactive metabolites, and is being investigated as a new source of natural drugs with immuno-modulatory, antitumor, hypoglycemic and hypo cholesterolemic functions. There are also potential applications for the fungus in neuromedicine and pest control.



A Thai carpenter ant, *Camponotus leonardi*, manipulated and killed by fungus *Ophiocordyceps unilateralis*.

MEETINGS ATTENDED



Dr. D. Monga, Head and Dr. Rishi Kumar, Sr. Scientist CICR Regional Station Sirsa attended and participated in a 'Brain Storming Session' on 'Integrated Pest Management in Cotton' organized by Haryana Kisan Ayog on 7th March 2014 under the chairmanship of Dr. R. S. Paroda. The session was attended by Director NCIPM, Head, Plant Protection Division of CCS HAU Hisar and Deputy Directors of Agriculture from cotton growing districts of Haryana along with the farmers group (Men and women) involved in cotton cultivation based on natural control of pests and diseases. A presentation on the CICR initiatives with IPM in cotton was made by Dr Monga. A presentation by women farmers on natural control was also made.

LITERATURE SCAN

Discovery of "Quinabactin" an ABA Mimic - a major breakthrough in drought tolerant crop research

Masanori Okamoto^a, Francis C. Peterson^c, Andrew Defries^a, Sang-Youl Park^a, Akira Endo^{d,1}, Eiji Nambara^d, Brian F. Volkman^c, and Sean R. Cutler^{a,2}

- ^aDepartment of Botany and Plant Sciences and Center for Plant Cell Biology, University of California, Riverside, CA 92521;
- ^bArid Land Research Center, Tottori University, Tottori 680-0001, Japan;
- ^cDepartment of Biochemistry, Medical College of Wisconsin, Milwaukee, WI 53226; and
- ^dDepartment of Cell and Systems Biology, University of Toronto, Toronto, ON, Canada.

Plants are capable of drought response by opening and closing tiny pores on their leaves called stomata. These pores open or close dynamically to control the amount of water lost to the environment by evaporation. Plants produce abscisic acid, or ABA, a stress hormone that helps them tolerate drought conditions better. This hormone serves as the trigger for the plant's receptors. As water levels decrease, cells throughout the plant produce increasing amounts of abscisic acid, which signals the plant to stressful conditions, triggering the stomata to close and reduce plant moisture loss.

Quinabactin, a sulfonamide ABA agonist that preferentially activates dimeric ABA receptors and possesses ABA-like potency *in vivo*. In *Arabidopsis*, the transcriptional responses induced by quinabactin are highly correlated with those induced by ABA treatments. Quinabactin treatments elicit guard cell closure, suppress water loss, and promote drought tolerance in adult *Arabidopsis* and soybean plants. Results demonstrate that ABA receptors can be chemically controlled to enable plant protection against water stress and define the dimeric receptors as key targets for chemical modulation of vegetative ABA responses. The current breakthrough with the development of the synthetic chemical quinabactin, a substance that provides the same triggering mechanism as ABA, provides a powerful tool for crop protection in a harsh, drought-driven environment. Quinabactin is chemically simpler and easier to manufacture. Perhaps it will become a useful tool in staving off crop loss due to likely rising extreme drought caused by climate change.

Contributed by Dr. J.H. Meshram, Scientist, Plant Physiology, CICR, Nagpur

The above literature scan was awarded with cash prize (First) under 'Most Exciting Discoveries in Agricultural sciences after 2010' as a part of National Science day Celebration 2014 on 28th February, 2014 under the category of Scientists.



CICR IN PRESS

8 City LINE Kitarada 3.3.14

CICR awarded for 'innovative inventions'

Staff Reporter

THE city-based Central Institute for Cotton Research (CICR) was honoured with national award for best research institute 'Krishi Sansthan Samman' during Mahindra Samridhi India Agri Awards-2014

ceremony held in New Delhi recently.

Tariq Anwar, Union Minister of State for Agriculture and Food Processing, presented the award to Dr Keshav R Kranthi, Director of CICR. The award comprises a cash prize of Rs 2.11 lakh, a shield, and a

citation.

Dr Kranthi was accompanied by Dr Yadav, Senior Technical Officer, CICR. The institute has been recognised for its 'innovative inventions' like Bt Detection Kits for farmers to identify good quality Bt seeds from spurious seeds. The institute was also recognised for developing concepts of eco-friendly pest management and pioneering implementation of insect resistance management strategies resulting in significant reduction in the usage of insecticides in India, states a press release issued by CICR.

Mahindra Samridhi Awards were given in seven categories to farmers and institutions from a total 40,000 applications. Anand Mahindra, Managing Director, Mahindra and Mahindra; Ashish Bahuguna, Secretary, Union Agriculture Ministry; Dr Pawan Kumar Goenka, President, Automotive and Farm Equipment were present on the dais during the award ceremony.



Union Minister of State for Agriculture Tariq Anwar presenting Mahindra Samridhi Krishi Sansthan Samman to CICR Director Dr K R Kranthi. Also seen are (from left) Union Agriculture Secretary Ashish Bahuguna, Managing Director of Mahindra and Mahindra Anand Mahindra, and Dr M S Yadav.

Indian Express 7.3.14 Fair deal for farmers

At annual expo Krishi Vasant, over 6 lakh farmers from all over India get to know new farm practices, machines and techniques

VIVEK DESHPANDE
NAGPUR

OVER a decade ago, Raghu Gowda, a primary school teacher-cum-farmer in the Dakshin Kannada district of Karnataka, wanted to buy a milking machine for his dairy business. But he had to drop the idea as he could not afford to shell out Rs 96,000 for the product. He then thought of making a machine himself – an easy-to-operate hand-operated one. In 2002, Gowda made his Milkmaster, which has now been patented and commercialised in many parts of the country.

Gowda later made an electric-operated one too, which saved time and labour and made his poultry business much more profitable.

In 2005, he won the National Innovation Foundation (NIF) award for his work.

Gowda's was among the over 90 extraordinary success stories on display at Krishi Vasant, the largest agriculture fair held here from February 9 to 13. The fair attracted over 6 lakh farmers from all over the country.

Over 25,000 farmers interacted with scientists, over 20,000 got training in best agricultural practices ranging from crop to fisheries and from allied poultry and dairy to manure-making. Many shopped for machines with costs running into lakhs. Those who couldn't, however, spent a lot of time in the machines pavilion, wondering if they could ever buy one of them.

But Gowda and others like him provided them with the options they could afford. Milkmaster costs between Rs 14,000 and Rs 35,000.

"The regular machines available in the market use compressor technology. Gowda's model uses a vacuum technique that makes milking an easy experience for the cows," says Rakesh Zaver, the machine's distributor.

Says Kisanrao Zolape from Ateegon village of Amravati district: "I have been using it for nearly two years. It has saved me a lot of labour charges. Moreover, labourers are hard to get. And they come according to their own convenience."

At another corner stood a machine that does everything from making

juices, shampoo and ketchup to gels and jellies. Called multipurpose processing machine, it can be used like a pressure-cooker, a homogeniser and a steriliser alike. And its innovator is Dharamjit Kamboj, a rickshaw-puller-turned-farmer from Dumla village in Yamunanagar, Haryana.

"My father used to drive a cycle-rickshaw in Delhi many years ago. He returned to his village to do agriculture on a 1-acre land. He sowed aloe vera and wanted to extract its juice. But the machines in the market were very costly. So, he thought of making one himself. About six years ago, he sought subsidy from the government to manufacture one. He got it and soon came out with this machine," says his son Prince.

According to Prince, his father's innate knowledge of machines helped him make the machine.

"Many machines have been sold in and outside the country too, like Africa and Nepal. The NIF has also supported us in the project," he adds.



Pressure cooker, homogeniser, steriliser rolled into one

sil has made many farm implements that can be attached to both bullocks and tractors. Along with Narayan Deshmukh of the adjoining Nanded district, he runs Nirmali Krishi Aajata Upadan Gati that has manufactured hundreds of machines so far.

Roshanlal Vishwakarma from Madhya Pradesh's Narsingpur district developed a small sugarcane bud-chopper machine that, he claims, can help sow more sugarcane per acre at lesser price and augment production from 24 to 40 quintals. He won the ICAR award for his innovation and NABARD gave him Rs 10 lakh to manufacture the machine. "I have sold about 7,000 machines so far," he said.

Dudaji Khobragade is another NIF award-winning farmer from

Nanded village of Chandrapur district. A poor Dalit farmer with just over an acre of land gifted by his son-in-law, he has developed through the process of natural selection one of central India's largest produced rice varieties called HMT. He then went on to develop six more varieties.

"They are real scientists," said Keshav Kranthi, Director of Central Institute for Cotton Research (CICR) here that hosted the expo.

Apart from innovates, there were farmers with progressive and innovative farming practices. Among them were Kavita Gungul from Narayangan in Pune district. She grows exotic vegetables and earns up to Rs 2 lakh per acre.

Apart from individual scientists and agriculturalists, the state and Cen-

6 Times of India 1.3.14

Some say good morning to GM trials, others have nightmares

Scientists, Industry Hail Approval, Activists Question Move

Snehlata Shrivastav | TNN

PROS & CONS OF GM TRIALS

- ▶ GM technology can be answer to food security by increasing productivity
- ▶ GM can minimize use of insecticides and pesticides, which harm environment severely, and save a lot of investment
- ▶ GM or Bt can act as crop protection tool against drought, salinity and issues associated with climate change
- ▶ Open field trials could contaminate other crops
- ▶ Biosafety trials are not being conducted on more than one generation, which does not prove that there is no chronic toxicity
- ▶ Genetic intervention could have unintended harmful effects on the physiology of the variety

Nagpur: The clearance to genetically modified crops (rice, wheat, maize and cotton) by the union environment and forest minister M Veerappa Moily has been expectedly received with diverse reactions by the scientific community, biotech industry and activists. Scientists see it as a positive step while activists are strongly condemning it.

Scientists and industry were desperately waiting for this decision after the Genetic Engineering Approval Committee (GEAC) cleared it two years ago. But the then minister Jayanti Natrajan had kept it on hold, saying the matter was sub judice, as the Supreme Court of India is yet to decide on a PIL filed by Aruna Rodrigues.

"It's good that the government has woken up from its slumber of over two years. It should not take two years for a government to announce clearance after the GEAC has given the green signal. Unfortunately such things happen only in India. The research community, including universities, should have reacted more sharply to the delay," said deputy director general of crop sciences in Indian Council of Agricultural Research (ICAR) Swapan Datta. But he expects extreme transparency in the evaluation system and wants all information in the public domain.

The Association of Biotech Led Enterprises-Agriculture Group (ABLE-AG) too reacted on expected lines. Ram Kaundinya, chairman of the association of both domestic as well as MNC industry, said that the industry had

GROWING CONTROVERSY

been waiting for this for two years. "Trials are a part of research. Trials lead to new information and technology, and hence should not be stopped. But conducting trials in no way means approval of the technology," he said.

Former chief of Agricultural Scientists Recruitment Board CD Mayee too expressed pleasure on the go ahead to trials of GM crops by the centre. "The GEAC is a scientific body and the highest authority on such issues. Unless we conduct trials and get

some results, how can we preempt the results. The trials are anyway conducted as per global protocols," he said.

Supporting Mayee's views, director of Central Institute of Cotton Research (CICR) Keshav Kranthi said there was no ban or stay on GM trials by apex court to prevent the trials. "However, there is no denying that the finer aspects of the trials, like biosafety research levels should not be compromised. No government should stop science," he said.

Similarly, vice chancellor of Panjabrao Deshmukh Krishi Vidyapeeth Ravi Prakash Dani too stood by the scientific community. "Trials are a universal phenomenon and should not be objected to. But the process of evaluation of results should be rigorous and stringent," he said.

However, activist Aruna Rodrigues, who has filed a PIL in the apex court against

GM crops, vehemently opposed the move by Moily. She said that it was morally indefensible for this government to announce such a decision at this time.

"What is the legitimacy of this announcement when the Parliament is not in session, and the elections are round the corner. Doesn't this raise questions on the integrity of this government, which didn't wait for the Supreme Court's decision, which could go against GM trials. The Technical Expert Committee report too was against it," she told TOI.

She alleged that the minister has just gone along with the PM and agriculture minister Sharad Pawar, who do not realize the gravity of the set back this could bring to agriculture due to irreversible damage.

Vandana Shiva, who opposes the trials as a scientist, says that the trials were not at all scientific research. Research can be done in green houses and tested on rats, and need not be open trials. "Open field trials means playing with environment. If one wants to test the pollination distance, it can be done on local varieties. Trials by Bayer in USA contaminated the entire rice there and the country lost all exports. This decision proves that companies have hired government agencies. The scientists supporting GM must be out of their minds to call field trials 'science'," she said.



कपास संस्थान को राष्ट्रीय पुरस्कार

व्यापार प्रतिनिधि

नागपुर, महिंद्रा समूह इंडिया एग्री अवाइस-2014 द्वारा केंद्रीय कपास अनुसंधान संस्थान को श्रेष्ठ अनुसंधान संस्थान के रूप में कृषि संस्थान सम्मान राष्ट्रीय पुरस्कार से सम्मानित किया गया. संस्थान के निदेशक डा. केशव राज क्रांति को

दिल्ली में एक समारोह के दौरान कृषि एवं खाद्य प्रसंस्करण राज्य मंत्री तारिक अन्वर द्वारा पुरस्कार प्रदान किया गया. संस्थान के मुख्य तकनीकी अधिकारी डा. महेंद्र सिंह संस्थान सम्मान राष्ट्रीय पुरस्कार से सम्मानित थे. पुरस्कार स्वरूप 2.11 लाख नगद, शील्ड एवं प्रशस्तिपत्र दिया गया.

किसानों को सशक्त बनाती है किट

“बीटी पहचान किट” के आविष्कार एवं पेटेंट तथा कीट प्रतिरोध प्रबंधन रणनीति के विकास एवं देश में इसके कार्यान्वयन के लिए दिया गया है. बीटी पहचान किट कपास की अच्छी गुणवत्ता के बीटी बीजों से नकली बीजों की पहचान करने के लिए किसानों को सशक्त बनाती है. देश में कपास की फसल में कीट प्रतिरोध प्रबंधन रणनीति के अपनाने से कीटनाशकों के उपयोग में महत्वपूर्ण कमी आई है. महिंद्रा समूह पुरस्कार देश भर से प्राप्त 40,000 आवेदनों में से किसानों को सात श्रेणियों में और श्रेष्ठ अनुसंधान संस्थान एवं कृषि विश्वविद्यालय को प्रदान किटे गये. इस अवसर पर महिंद्रा एंड महिंद्रा के प्रबंध निदेशक आनंद महिंद्रा, आशीष बहुगुणा और महेंद्र सिंह वादव उपस्थित थे.

Produced and Published by : Dr. K. R. Kranthi, Director, CICR, Nagpur
Chief Editor : Dr. Nandini Gokte-Narkhedkar

Editors : Dr. J. Annie Sheeba, Dr. Vishlesh Nagrare, Dr. J. Amutha, Dr. M. Saravanan
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Post Bag No. 2, Shankar Nagar PO, Nagpur 440010
Phone : 07103-275536 Fax : 07103-275529; email: cicrnagpur@gmail.com