

COTTON Innovate



Weekly Newsletter from Central Institute for Cotton Research, Nagpur

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SCIENTIFIC TALKS

Under the aegis of Innovation Cell, a video on "Science of Spirituality" was screened by Dr. K. R. Kranthi, Director, CICR, on 2.08.2014 at CICR, Nagpur. All the Scientists, RAs/SRFs/PAs were present.

FAREWELL MEETINGS

Mrs. Mukta Chakrabarty, Scientist, Crop Production Division was given warm farewell on behalf of the Crop Production Division on 30.07.2014 and on behalf of IRC on 2.08.2014 in the event of her transfer to IARI, New Delhi.



LITERATURE SCAN

Researchers find nematode incites defense response in plants that benefits itself

A team of researchers at the University of Bonn has discovered that a certain species of nematode actually does better when exposed to defensive chemicals made by plants. In their paper published in the journal *Science Signaling*, the team describes how they found that disabling the production of a defensive chemical in a flowering plant caused nematodes that invade it to fare less well.

Earlier research has shown that plants produce chemicals known as reactive oxygen species (ROS) to ward off fungal and bacterial infections. But now it appears that the same defensive mechanism in some plants allows a certain type of nematode to thrive.

Heterodera schachtii, sugar beet cyst nematode is a serious pest of sugarbeet. To study role of ROS in plant defense, the researchers genetically modified an *Arabidopsis* plant so that it would not produce ROS when attacked. To their surprise they found that when they introduced the nematode to the root, the worm actually did worse in the absence of the defensive chemicals.

Normally ROS does its job by killing plant cells in the vicinity of an attack and without live cells to attack, bacteria die as well. But with the nematode, the researchers found, ROS cell killing is controlled, or managed by the parasite, which allows the worm to fuse the cells it's after and grow large and healthy. Without the ROS, they found it more difficult to effectively modify plant cells and as a result didn't grow as large or as healthy as they did in non-modified plants. The research suggests that it might be possible to reduce nematode infestations in vegetable crops by modifying them to produce less ROS, though that would likely mean having to add more antibacterial agents at the same time.

Reference : "Parasitic Worms Stimulate Host NADPH Oxidases to Produce Reactive Oxygen Species that Limit Plant Cell Death and Promote Infection," by S. Siddique *et al.*, *Science Signaling*, 2014.

CICR adopts high-density cotton plantation system

SUSHIL MANAV
TRIBUNE NEWS SERVICE

SIRSA, JULY 30

After last year's successful trials, the Sirsa-based Regional Station of the Central Institute for Cotton Research (CICR) has sown cotton over 250 acres using the high-density plantation system (HDPS). Scientists of the CICR increased productivity by 15 to 20 per cent through this method on demonstration plots last year.

This year, out of the 1,804 acres brought under the HDPS in 75 villages of 11 cotton producing states in the country, 250 acres have been taken up in four villages of Sirsa, said Dr Dalip Monga, principal scientist and head of the regional station of the CICR at Sirsa.

The HDPS involves closer

spacing of cotton plants to have more number of plants and hence more cotton bolls on a given piece of land.

From the present 67.5 cm (row to row) X 60 cm (plant to plant), the plantation is increased to 67.5 cm (row to row) X 10 cm (plant to plant). While in the current system, the number of plants is 24,691 in one hectare, by close spacing it, the number of plants increases to 1,48,148 in one hectare of land.

The national average of cotton productivity in India is 15 quintal per hectare, while in North India, it is 18 quintal per hectare against the world average of 22.5 quintal (750 kg lint) per hectare, said Monga.

Of the 80-odd cotton producing countries, India has the largest area under cotton, but in productivity (yield per



CICR head Dr Dalip Monga shows cotton produced using the high-density plantation system in Sirsa. A TRIBUNE PHOTO

acre), the country at the 33rd place in the world.

"India is second in the world in the total production of cotton, second in exports and yet the country is placed at 33rd

position in productivity due to outmoded techniques.

The HDPS, if adopted in normal practice by farmers, can improve productivity," said Monga.

Productivity enhancer

- The high-density plantation system (HDPS) involves closer spacing of cotton plants and hence more cotton bolls on a given piece of land
- Using the HDPS, productivity has improved by 15 to 20 per cent
- In the present system being used in cotton production, the number of plants is 24,691 in one hectare. By close spacing it, the number of plants increases to 1,48,148 one hectare

Besides the HDPS, the CICR was also doing trials of the insect resistance management (IRM) techniques on 13,400 acres in the country, he added.

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