

Scientists ready for field trials of pest-resistant cotton variety

By Jyoti Singh

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New Delhi, March 18 (India Science Wire): Whiteflies are one of the top ten devastating pests in the world that damage more than 2000 plant species and also function as vectors for some 200-plant viruses. Cotton is one of the worst hit crops by these, in 2015 two third of the cotton crop was destroyed by the pest in Punjab. In a move to fight against whiteflies National Botanical Research Institute (NBRI) Lucknow has developed a pest-resistant variety of cotton and is going to start field trials this year from April to October in Faridkot Center of Punjab Agriculture University, Ludhiana.

As Bt cotton is also a genetically modified cotton and present in the market for farmers usage then why this variety was needed. Answering to this senior scientist, Dr PK Singh from NBRI told, "Bt cotton is resistant to two pests only it is not resistant against white flies. In 2007 we decided to work on one more insect pest- whiteflies. It not only damages cotton but many other crops too with this it transmits disease viruses too."

To develop the pest-resistant variety researchers explored 250 plants from lower plant biodiversity to identify novel protein molecules that are toxic to whitefly. "Leaf extract of all the plants were prepared separately, and whiteflies were allowed to fed on them. Out of the 250 plants, the leaf extract of an edible fern *Tectaria macrodonta* causes toxicity to the whitefly" said Dr Singh.

This fern is known to be used as salad in Nepal and as a concoction for the gastric disorders in many regions of Asia also goes in favour for the possibility of the insecticidal protein that is found in the fern. It works against whiteflies but being safe for application on the crop plants and provides protection from them.

When whiteflies fed on sub-lethal doses of insecticidal protein, it interferes with the life cycle of insect that in turn resulted with very poor egg laying, abnormal egg, nymph and larval development and extraordinary poor emergence of the fly. However, this protein was found to be un-effective on non-target insects. "This clearly shows that the protein is specifically toxic to whitefly and does not cause any harmful effect on other beneficial insects like butterfly and honeybee. To answer that whether this protein is safe to mammals or not, the toxicity of the protein was also tested on the rat mammalian model" said Dr Singh.

By when this variety may be expected to be there for farmers use? "It depends on many factors. Whiteflies tolerance trait that has been introduced in the plant if that performs the same way in the field then only it can be given to the farmers for cultivation. We have to see if this trait can be agronomic trait too" said Dr Singh. (India Science Wire)

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