

Beneficial bugs can co-exist with Bt crops, new studies show

Genetically modified, insect-resistant Bt crops do not have harmful effects on beneficial bugs in farmers' fields, two new scientific papers published this week have shown.

These add to the environmental case for GM technology, because by controlling crop pests in a very targeted way using [insecticidal proteins \(Bt\)](#) expressed in plant tissues, farmers can reduce broad-spectrum insecticide sprays and thus protect wider farm-scale biodiversity.

In the first paper, an international team led by Chinese scientists reported that after conducting field experiments lasting several years, they found no significant differences in the spider communities populating Bt rice fields as compared to a non-Bt control rice crop.

On the other hand, as expected, when both types of fields were treated with chemical insecticide sprays, populations of spiders were significantly reduced. Spiders play an important role in controlling agricultural pests.

The scientists [write in Plant Biotechnology Journal](#): “These results suggest that Bt rice has no long term impacts on the structure of the spider community, whilst chemical insecticides exhibit negative impacts.”

The second paper looked at the potential impact of Bt maize in Brazil on a tiny parasitic wasp called *Trichogramma pretiosum*. This insect occurs naturally in the country, and because it feeds on the eggs of fall armyworm moths and other agricultural pests it is highly valued as a biocontrol agent by farmers.

If the insecticidal proteins expressed inside Bt maize crops — which have proven extremely effective in targeting lepidopteran pests — were also harming beneficial insects like *T. pretiosum*, that would be a serious concern for farmers and ecologists alike.

Fortunately, that appears not to be the case. As reported by Brazilian scientists [in the journal Biocontrol Science and Technology](#): “All Bt hybrids [of maize] evaluated were harmless to *T. pretiosum*.”

The authors add: “All the Bt proteins evaluated in this study target lepidopterans specifically, and do not have deleterious effects on *T. pretiosum*, even when extreme exposures produced under laboratory conditions have been tested.”

The findings of both papers are important because they strengthen the case for the use of Bt crops in integrated pest management (IPM) farming approaches. One of the techniques of IPM is to nurture populations of natural enemies of insect pests — such as lacewings, wasps, ladybugs and spiders — to reduce the necessity for chemical sprays.

These studies, which add to a [widespread consensus](#) that Bt crops do not harm non-target organisms, mean that Bt crops can be used as part of a broad array of IPM techniques. This is important also to try to forestall the evolution of resistance to Bt proteins among the pest species.

One [recent review paper](#) concluded: “In summary, the available body of literature provides evidence that insecticidal proteins used in commercialized Bt crops cause no direct, adverse effects on non-target species outside the order (i.e., Lepidoptera for Cry1 and Cry2 proteins) or the family (i.e. Coleoptera, Chrysomelidae for Cry3 proteins) of the target pest(s).”

Good news for spiders and wasps is also good news for farmers and the environment, it seems.

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