

Managing pests after 15 years of Bt cotton: Farmers' practices, performance and opinions in northern China

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Non-target pest pressure change

GM & insecticide use
Insecticide spray frequency
Pest control cost
Insecticide amounts

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Bt cotton

Estimation of pesticide use
Estimation of insecticide use

Change in fauna complex
Fauna complex shift

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Abstract

In China, a substantial amount of literature addresses pest control in Bt cotton, which is genetically engineered to resist some target pests but which had no direct effects on many other pests. The impact of this technology was positive a few years after the commercial release, but this impact was subsequently found to have reversed. The reversal was made known to the international community about ten years after the commercial release of Bt cotton in China, as a consequence of a pest complex shift phenomenon. Nevertheless, all the existing literature seldom took farmers' practices in spraying chemicals into account; farmers' opinions about using Bt cotton were not reported, nor were their opinions of their performance in growing cotton.

Our study compensates for this lack through a specific and holistic approach in appraising farmers' practices, performance and opinions 15 years after the commercial release of Bt cotton in northern China. It focused on the topic of pest control by combining a survey of farmers' characteristics and opinions about Bt cotton effectiveness and profitability, as well as on their cotton cropping characteristics, with participatory detailed record-keeping of insecticide spraying by farmers. It is a holistic approach as it took into account the farming context when analyzing the results.

Our results indicated that farmers used chemicals somewhat intensively, carrying out 11 insecticide sprayings on average, involving an average of 2 pest target-oriented insecticide controls. The pest complex shift phenomenon was confirmed as farmers aimed 60% of target-oriented insecticide controls at sucking pests, principally aphids even more than Lygus bugs. Three quarters of farmers were not content with Bt cotton profitability while providing a shorter protection time and most of them displayed a lack of proficiency in implementing chemical pest control. The remaining quarter of contented farmers carried out more pest target-oriented insecticide controls. Four spraying strategy factors were found and were associated notably with farmers' attitudes in controlling bollworms, aphids and Lygus bugs. The observed strategies were connected with distinct farming efficiency in a country where farming has lost its attractiveness. Sustainable use of Bt cotton calls for locally adapted actions to improve farmers' proficiency in pest control.

English abstract

In China, a substantial amount of literature addresses pest control in Bt cotton, which is genetically engineered to resist some target pests but which had no direct effects on many other pests. The impact of this technology was positive a few years after the commercial release, but this impact was subsequently found to have reversed. The reversal was made known to the international community about ten years after the commercial release of Bt cotton in China, as a consequence of a pest complex shift phenomenon. Nevertheless, all the existing literature seldom took farmers' practices in spraying chemicals into account; farmers' opinions about using Bt cotton were not reported, nor were their opinions of their performance in growing cotton.

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