Insecticides Have Boosted Chili Pepper Production and Farmer Incomes in India

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Chili pepper is grown all over India and is essential for imparting pungency and color to Indian dishes. India is the world’s largest producer of chilies—accounting for 50% of production. Farmers produce 1.2 million tons of chili pepper with an annual value of $1.3 billion. India exports about 20% of its production, which earns the country about $350 million in export sales. Chili is an important source of cash income for 946,000 small-scale farmers. Production has tripled in volume since 1981 as a result of a tripling in average yields, while the value of export sales has increased by over $300 million since 1981. Dissatisfied with low yields and low earnings, Indian chili growers increased their use of hybrid seed. Hybrid seeds cost the farmer more but have the potential to quadruple the yields of local varieties [1]. Indian chili farmers have tried to maximize the return on the higher seed costs by improving management practices, including treating a higher proportion of fields with insecticides. This dramatically reduced the yield losses due to insect infestation.

Three-fourths of India’s chili farmers use insecticides. Insecticide use is 50% in local chili and almost 100% in hybrids [1]. Growers of local chili varieties spray insecticides an average of 7 times while growers of hybrid varieties spray 15 times [1]. As a result, hybrid growers incur average losses to insects of 14% while local varieties incur losses of 64% [1]. There is still considerable potential to increase yields by introducing hybrid seeds and insecticide spraying to more farmers [1].

The major insect pests of chili in India are chili thrip and chili fruit borer. Chili thrip adults and nymphs lower yields by piercing and sucking sap from growing shoots, developing flowers and tender leaves, which then exhibit characteristic leaf curl symptoms. Corky tissue develops on infested fruits. Chili borer larvae move from one fruit to the next. The entrance hole develops a dark scar [2]. Damaged fruit may drop, ripen prematurely or become infected with disease.

These insects not only directly reduce yield by damaging the plants but also reduce the value of chili as a result of their presence in peppers. Surveys of Indian consumers show that hotness is the number one valued attribute while insect-free is the number two valued characteristic, ranking ahead of price and color [1]. Research has shown that insect damage lowers the market value of chili by up to 88% [6]. Studies indicate insecticide use can reduce thrip and borer populations on chili plants by over 95%, which leads to a doubling of yield in comparison to untreated plants [3][4][5]. Insecticide sprays for control of borers and thrip have demonstrated a cost benefit ratio as high as 1:9.10 [6].

References