Profile from the Field

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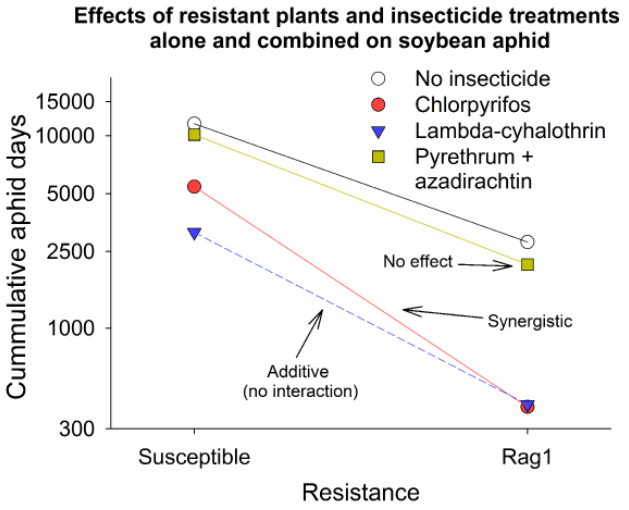
Integrating Host Plant Resistance and Insecticides for Soybean Aphid Management

Project Title: Integrating Host Plant Resistance and Insecticides for Soybean Aphid Management
Coordinator: Anthony Hanson

Location: University of Minnesota
SARE Grant: $9,938
Duration: 2013-2015

To read the full project report, go to www.sare.org/projects and search for project number GNC13-170.



With support from a SARE grant, University of Minnesota graduate student, Anthony Hanson learned that the combined use of resistant plants and chlorpyrifos produced a synergistic effect in the battle against soybean aphids. In those plots, the decrease in aphids compared to susceptible untreated plants was lower than expected combined effects of plots with resistant untreated plants or susceptible treated plants alone.

Soybean aphids (Aphis glycines Matsumura), are a major pest of soybean in the Midwest. Insecticides, such as pyrethroids and organophosphates, are used to suppress soybean aphid outbreaks to prevent yield loss. Another management tactic is host-plant resistance.

In 2013, University of Minnesota graduate student Anthony Hanson, received a $9,938 Graduate Student grant to determine if there are combined effects of insecticide application and using resistant plants for soybean aphid control, with the hope that the efficacy of insecticides would be improved on resistant plants. Hanson's team tested three different insecticides. Two were conventional insecticides with active ingredients lambda-cyhalothrin and chlorpyrifos, which are a pyrethroid and an organophosphate, respectively. They also tested an insecticide available for organic growers containing pyrethrum and azadirachtin.

This research in ongoing, but so far Hanson has learned that the combined use of resistant plants (containing the Rag1 gene) and chlorpyrifos produced a synergistic effect. In those plots, the decrease in aphids compared to susceptible untreated plants was lower than combined effects of plots with resistant untreated plants or susceptible treated plants alone. Lab assays are ongoing, but are expected to conclude in spring 2015.