

Experiment Station Section 2009 Excellence in Multistate Research Award

Presented to

S-1039

Biology, Impact and Management of Soybean Insect Pests in Soybean Production Systems

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Participating Institutions:

University of Arkansas • University of Georgia • University of Illinois • Iowa State
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Missouri • Mississippi State University • North Dakota State University • University of
Nebraska • Ohio State University • South Dakota State University • Texas A & M
University • Virginia Tech • University of Wisconsin • Arkansas Cooperative Extension

The core objective that runs through S-1039 and its previous versions is the development and implementation of management programs for soybean insect pests that are economically and ecologically sustainable. These programs have formed the foundation for extension efforts on national and regional soybean insect problems for more than 30 years. The project has always included a broad spectrum of participation from across the United States and Canada. It has produced an impressive list of outputs and outcomes including the 1994 book, *Handbook of Soybean Insect Pests*, which arguably remains the most comprehensive guide for soybean insect management for North America. It has further generated thousands of peer-reviewed, published research reports, hundreds of pest management programs, and hundreds of graduate students trained in association with regional research efforts.

A recent focus of the project has been on a new, invasive pest of soybeans, the soybean aphid (*Aphis glycines*). Before the arrival of the soybean aphid, soybean production in the North Central region of the US used little insecticide. In 1999, the year prior to discovery of the soybean aphid, the National Agricultural Statistics Service estimated less than 1 percent of the soybean acres in the North Central region were treated with an insecticide. Outbreaks of the soybean aphid have occurred throughout this region, with populations often reaching several thousand per plant, capable of reducing yields by 40 percent. In years when outbreaks are common, insecticide use can cover as much as 50 percent (8 to 10 million acres) of some of the leading soybean producing states. With more than 50 million acres at risk, preventing yield loss from aphids on even a tenth of these acres would represent a saving of more than \$480 million per year. As a result of a coordinated research and outreach program, soybean growers in North America now have new pest management tools and recommendations for their use against the soybean aphid. Survey

results of growers within the North Central region reveal that the widespread adoption of the project's recommendations. When considering only the recommendations made by S-1039 for using insecticides against the soybean aphid, the initial estimates of the value from just this project indicate an impressive return on investment, with projected savings to growers of \$1.3 billion in the next 15 years using the current rate of adoption of S-1039's recommendations. As the research conducted by S-1039 expands the pest management tools available to soybean growers to prevent soybean aphid outbreaks (i.e. aphid resistant soybeans, new biological control agents), we anticipate future reduction in insecticide usage, resulting in additional economic and environmental savings.

Members of S-1039 have successfully leveraged federal funding to attract funding for research and outreach from multiple partners representing many agricultural stakeholders. The most important may be state and regional (NCSRP) soybean check-off programs. These grower-run organizations have identified members of S-1039 as 'go-to' experts for solving their insect pest problems. With the arrival of the soybean aphid, check-off programs provided \$500,000 to \$1.5 million per year to members of the project. Additional funding has come from federal programs (USDA-RAMP) through competitive grants, as well as collaboration with USDA scientists involved in agricultural research. With the identification of insect resistance within the soybean germplasm and the capacity for S-1039 to evaluate its value for soybean aphid management, members are cooperating with multiple agribusiness partners, resulting in additional funding in the amount of \$20,000 to \$100,000 per year. The S-1039 project thus serves as an excellent model of multistate collaboration between institutions, working with stakeholders and providing leadership in partnering with private organizations.