Managing Soybean Insect Pests

Who cares and why?

Soybeans are a major crop in the U.S., where they are grown in 31 states and account for 35% of the world’s production. Specialty soybean production is also a growing, profitable market. Specialty soybeans are sought for traits such as high protein or improved flavor and texture in the case of tofu and edamame. Furthermore, soybeans are the most-produced legume in the U.S. organic industry, which has grown 20% or more annually since 2002. Given the large acreage and wide distribution of soybeans, insect pests are an increasing problem. Insect pests hinder soybean growth, quality, and yield and elevate risks to human health and the environment. This damage is costly. In just Mississippi alone, insect pests caused estimated losses of $20.33 million per year from 2004 to 2010. Pest infestations also raise the cost of soybean production by dramatically increasing chemical insecticide use. The distributions and impacts of many soybean pests (such as soybean aphids, bean leaf beetle, and stink bugs) are increasing as a result of expanding soybean production, changes in cropping practices, and/or global climate change. Farmers are also encountering new insect pest problems that they have never seen or managed before. As pest problems evolve, richer, more up-to-date knowledge of these pests is needed in addition to new or modified thresholds, scouting practices, and control methods. Although insecticides are often the go-to tools for dealing with insect pest problems, sustainable long-term solutions must include pest-resistant soybean plants and biological control. Furthermore, these solutions must be effective for soybeans in many different growth stages and planting systems.

What has the project done so far?

Over the past five years, S-1039 members (who represent many disciplines and almost all soybean production acres in the U.S.) have shared expertise. S-1039 researchers have characterized many soybean pests and their impacts on the growth, quality, and yield of different soybean varieties. Project members have also researched when to plant soybeans, when to apply seed treatments and/or insecticides, and which agricultural practices are the most effective and cost-efficient. Building on these findings, the group has developed tactics for managing key soybean pests, including new or refined thresholds that are appropriate for specific regions, cropping systems, and growth stages; cost-effective insecticides and spray technologies; organic-compliant insecticides; modified agricultural practices; biological control; and pest-resistant soybean varieties. S-1039 members have also set up a multistate trapping network that has provided critical information for predicting pest outbreaks, keeping track of insecticide resistance, and making pest advisories and alerts.
What research is needed?

Continuous cooperation among states and across disciplines will improve soybean insect pest management and insecticide resistance monitoring. Additional emphasis will be placed on pest-resistant soybeans (especially finding molecular markers of pest resistance) and natural control. Scientists will continue to adjust thresholds as needed and will develop precision technologies to help farmers properly apply insecticides. Seed treatments for SBA control are becoming more popular, and seemingly more affordable, but additional research is required to make sure that this tactic is not overused to the point that it becomes ineffective. Management recommendations must also be adapted for electronic delivery.

Want to know more?

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