

Entomologists and agronomists throughout the North Central region are optimistic about host plant resistance as a viable pest management tool for the soybean aphid.

## What is host plant resistance?

Host plant resistance in soybean, specifically aphid-resistant soybean, works by suppressing aphid growth and reproduction on the plant. This is called **antibiosis**. Other types of host plant resistance include **antixenosis**, the inability of an insect to find and/or feed on a plant and **tolerance**, the ability of a plant to produce yields despite insect feeding. A single plant can express one or more types of resistance.

Scientists have been searching for genetic resistance to the soybean aphid since it was discovered in the United States in 2000. To date, at least four different genes have been isolated. The first gene to be commercialized, named Rag1, was first identified by scientists at the U.S. Department of Agriculture.



## Developing aphid-resistant soybean varieties

Soybean varieties expressing the Rag1 gene have been evaluated throughout the North Central region. In Iowa, there was a significant difference in soybean aphid population growth when comparing resistant and susceptible plots (Figure 1). When not treated with an insecticide, aphid-resistant soybean had higher yields than aphid-susceptible soybean (Figure 2). Similar results were observed in other states (MN, MI, IL, WI).

A comparison of a soybean aphid-resistant variety (left) to a soybean aphid-susceptible variety (right). Note the susceptible plants are stunted and have black sooty mold from heavy soybean aphid feeding. Photo: Iowa State University



**Figure 1.** Average number of soybean aphids per plant ( $\pm$  standard error of the mean) in 2007 and 2008 at Iowa State University Research Farm in Story County (O'Neal and Chiozza, unpublished data).

