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## A soybean is a soybean is a soybean: Do aphids reproduce the same on all varieties?

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# A soybean is a soybean is a soybean: Do aphids reproduce the same on all varieties?

## **Abstract**

Since the soybean aphids' arrival in Iowa, many growers have observed that soybean aphid outbreaks vary across different varieties of soybeans. As mentioned in earlier articles within this special edition, several factors can influence soybean aphid population growth (plant health, predators, overwintering success). Adding to the factors that influence aphid population growth is variation in soybean aphid response to different varieties of soybeans, but the source of this variation is unclear. Typically, external features like leaf hairs or internal factors that contribute to aphid feeding (antibiosis) can influence how well an aphid population grows on a given plant.

## **Keywords**

Entomology

## **Disciplines**

Agricultural Science | Agriculture | Entomology



## Insects and Mites

# A soybean is a soybean is a soybean: Do aphids reproduce the same on all varieties?

by Matt O'Neal, Department of Entomology

Since the soybean aphids' arrival in Iowa, many growers have observed that soybean aphid outbreaks vary across different varieties of soybeans. As mentioned in earlier articles within this special edition, several factors can influence soybean aphid population growth (plant health, predators, overwintering success). Adding to the factors that influence aphid population growth is variation in soybean aphid response to different varieties of soybeans, but the source of this variation is unclear. Typically, external features like leaf hairs or internal factors that contribute to aphid feeding (antibiosis) can influence how well an aphid population grows on a given plant. And recently, plant breeders at the University of Illinois have identified resistance within the soybean germplasm. This resistance has been shown to have a dramatic impact on aphid growth, nearly preventing aphids from surviving on plants with this trait. It may be several years before this resistance is made available to growers.

In the meantime, some seed companies have begun characterizing the variation in aphid response to their soybean varieties. Currently, full resistance—complete prevention of soybean aphid feeding and survival—is not available in commercial soybean varieties. However, varying degrees of antibiosis may be present. Antibiosis is defined as a form of host plant resistance that impairs the ability of the insect to feed and reproduce. Although the goal of a plant breeder may be to completely prevent an insect's growth on a resistant variety, intermediate levels of antibiosis may help slow and prevent an insect from developing into a population that can reduce yields.

If you select a variety that is advertised as having antibiosis against soybean aphids, be aware of a couple of issues. First, soybean aphids may still be found on these plants. Compared to other varieties, the growth of soybean aphid populations may not be as great, but do not be surprised to find aphids on these plants. Finding aphids on these varieties does not mean that they don't work. Antibiosis can lower aphid populations without keeping them completely off the plant.



**Soybean aphids excrete large amounts of sticky honeydew that falls on leaves below them. Sooty mold grows on the honeydew and turns the leaves black. (Marlin E. Rice)**

Second, little data exist on how well these varieties hold up under field conditions. Researchers at Kansas State University have identified several levels of antibiosis in commercial varieties; however, their screening is done in a greenhouse at early vegetative stages of soybean growth. I am not aware of field-level data comparing susceptible with full or even partially resistant varieties.

So, should one invest in varieties of soybeans advertised as resistant to soybean aphids? One should evaluate the data and costs before making such a decision. Assuming the maturity group and other agronomic factors are appropriate for your field (SCN resistance, chlorosis response, etc.) and if the costs are equivalent, I would encourage the consideration of even partially resistant varieties. Managing soybean aphids will require multiple tactics—there will be no single silver bullet. Incorporating varieties that can slow soybean aphid population growth may improve upon other factors like the existing impact of insect predators. Going into the 2006 growing season, it is unlikely that any variety can be selected that will not have to be scouted as well. But it would be nice to have a pleasant surprise come late July and August instead of honeydew encrusted plants from thousands of aphids.

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