1-23-2006

Five years of soybean aphid in NE Iowa: What have we learned?

Brian J. Lang
Iowa State University, bjlang@iastate.edu

Five years of soybean aphid in NE Iowa: What have we learned?

Abstract
Since the onset of soybean aphid in northeast Iowa in 2001, Iowa State University Extension has conducted research trials near Decorah. We have monitored this pest's activity on a weekly basis and tested foliar insecticides, timing of applications, insecticide seed treatments, and certified organic aphid deterrents. At the Howard County Experimental Farm near Cresco/Saratoga and at the Iowa State University Northeast Research and Demonstration Farm near Nashua, we also measured aphid activity relative to soybean plant populations, row spacing, tillage systems, planting dates, and relative maturity of varieties. In this article, I provide a general summary of most of this soybean aphid research and highlight trends and patterns that we have observed in northeast Iowa.

Disciplines
Agricultural Science | Agriculture | Entomology

Insects and Mites

Five years of soybean aphid in NE Iowa: What have we learned?

by Brian Lang, Iowa State University Extension

Since the onset of soybean aphid in northeast Iowa in 2001, Iowa State University Extension has conducted research trials near Decorah. We have monitored this pest's activity on a weekly basis and tested foliar insecticides, timing of applications, insecticide seed treatments, and certified organic aphid deterrents. At the Howard County Experimental Farm near Cresco/Saratoga and at the ISU Northeast Research and Demonstration Farm near Nashua, we also measured aphid activity relative to soybean plant populations, row spacing, tillage systems, planting dates, and relative maturity of varieties. In this article, I provide a general summary of most of this soybean aphid research and highlight trends and patterns that we have observed in northeast Iowa.

In-season trends and patterns of soybean aphid

Over the last five years, soybean aphid populations have oscillated from very high levels in 2001 in far northeast Iowa, to low levels in 2002, to high levels in 2003 almost statewide, to very low levels in 2004, to spotty low and high levels in 2005. While year-to-year aphid populations have been inconsistent, the migratory pattern of the pest has been the same every year.

Our data show the final movement of soybean aphid from their overwintering host (common buckthorn) to emerging soybeans occurs in late May to early June. Soybeans planted in a timely manner in the spring and developing near buckthorn sites were at greatest risk of an infestation by aphids in early June on seedling soybeans, whereas soybeans planted in the same region at the end of May or later were not initially infested until July. Apparently, the late planted soybeans were not sufficiently emerged by early June to attract the migrating winged aphids from the buckthorn.

However, by mid-July there was a second significant migration of winged aphids, which comes from the first infested soybean fields and movement from neighboring fields as well as fields considerable distances away (i.e., New Hampton, Mason City, etc.). We observed

Winged soybean aphids fly from buckthorn to soybean where they give birth to live aphids. ***(Marlin E. Rice)***

one more significant migration of winged aphids in early August. This migration could also reach fields considerable distances away or spike aphid activity in already infested fields. While we were not able to specifically track aphids migrating to the west, the time of initial infestations follows a westward pattern (i.e., first near Decorah in June, then Nashua in July, then farther west in early August).

Figure 1 represents the general pattern of soybean aphid migrations and corresponding population development in soybean fields. Population levels may be higher or lower in any given location depending upon migrating numbers and environmental factors, but the time frame has been consistent every year.

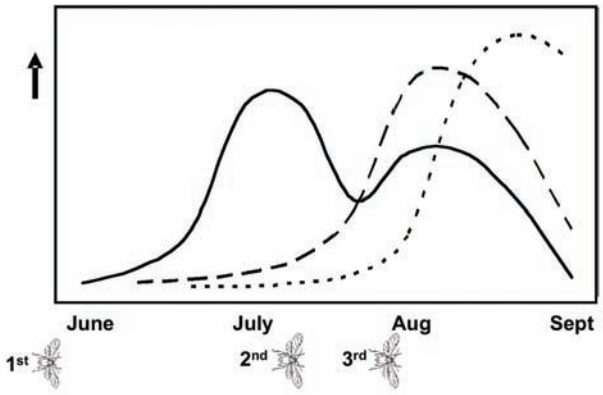

Figure 1. Seasonal soybean aphid population trends.

Figure 2 illustrates the soybean aphid migration pattern with data from 2003. The soybean field at the Decorah location was planted on May 14; soybean fields closer to Ossian and Calmar were planted on May 29. While these patterns in aphid migration are quite evident, they unfortunately do not help us predict infestation levels.

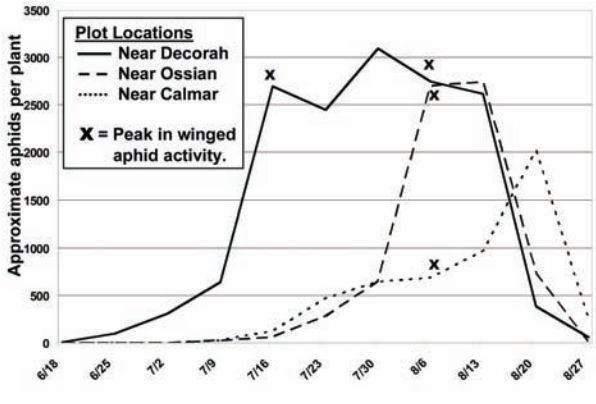

Figure 2. Soybean aphid population trends in NE Iowa, 2003.

Foliar insecticides and insecticide seed treatments

Foliar insecticide trials were conducted from 2001 to 2005. In 2002 and 2004, aphid populations did not exceed threshold, but back then we did not have a threshold set. The current threshold of 250 aphids per plant and increasing may still be adjusted over time as we collect more data. This threshold was exceeded by July 12 in 2001, 2003, and 2005. With the exception of dimethoate, all insecticides provided similar economic returns whether they were organophosphates or pyrethroids. In 2001, the aphid populations resurged after the July 12 treatment to justify another treatment in late July. Since then we have paid greater attention to sprayer setup and application technique to improve insecticide coverage of the canopy.

Insecticide seed treatment trials were conducted from 2002 to 2005. These treatments were very effective on minimizing aphid activity on soybean plants for about two months from the date of planting. After that time period, the insecticidal effect seemed to wear off sufficiently for aphids to begin colonizing on soybeans. The seed treatments were marginally economically viable in 2003 under the higher aphid pressures that year but were not economically viable in the other years with lower aphid pressures. Since the product's main benefit is an approximate 60-day "aphid-free" window from planting date, we feel the best use of this product would be with a "late-plant/replant" strategy in June that would then provide good protection from soybean aphids into August.

Other factors: Plant population, row spacing, tillage systems, planting dates, variety maturity

At the Howard County Experimental Farm, we examined aphid activity on different soybean plant populations and row spacings. To summarize, row spacing did not matter while plant populations had a small influence. The lower plant populations (100,000 plants per acre) had a slightly higher level of aphid pressure and yield reduction than the higher plant populations (150,000 and 200,000 plants per acre), but the highest plant population had a higher seed cost so that 150,000 plants per acre maximized economic returns.

At the ISU Northeast Research and Demonstration Farm, the farm superintendent, Ken Pecinovsky, conducted soybean aphid trials on tillage systems, planting dates, and comparisons of relative maturities of varieties. In brief, tillage systems had no effect on aphids. With planting dates, the earlier planted soybeans had somewhat less aphid pressure than the later planted soybeans. With maturities, the earlier relative maturity soybeans had somewhat lower aphid pressures than the later relative maturity soybeans. However, the earlier maturity soybeans tended to have lower yield potential. The results from the planting date and relative maturity soybean trials support the general view that soybeans at a younger stage of development later in the growing season are at a higher risk of damage from soybean aphid activity and should be scouted accordingly.

So what have we learned?

Soybean aphid populations will be highly variable from year to year, but there is a definite seasonal migratory pattern. There is no economically sound reason to change normal planting practices to potentially reduce soybean aphid infestations. However, consider an insecticide seed treatment if a June replant problem develops. Scout judiciously through August. To minimize scouting time, consider the new "speed scouting" method. Treat if soybean aphids exceed the threshold using application techniques that maximize coverage.

Brian Lang is an extension field crop specialist in northeast Iowa.