Soybean Aphids a No-Show for 2012—Is the Every-Other-Year Prediction a Bust?

For many areas of the North Central region this past growing season, soybean aphids were unable to develop economic infestations in most producers’ fields. David Voegtlin, a well-known entomologist (retired from the Illinois Natural History Survey) and an expert on soybean aphid population dynamics, believes that in 2012 this insect had the lowest impact since it came to prominence a little more than a decade ago. This past year, Dave indicated, infestations began early, then “disappeared in most areas.”

Why have soybean aphid infestations been so anemic the past several years? Dave attributes the answer to both environmental and biotic factors. In both 2009 and 2010, a fungus effectively eliminated many of the fall migrants once they reached their overwintering host (buckthorn). Densities of soybean aphids as monitored by suction traps during the fall flights of 2011 and 2012 have been exceedingly low. Dave believes low trap numbers are a better predictor of future population trends than large trap captures. This would suggest that overwintering densities (eggs on buckthorn) will be low and that next spring we will witness a very small spring flight of aphids to soybean fields in many areas of the Midwest.

In late October, Dave will conduct surveys of buckthorn to determine what the egg count looks like. He may have a difficult time finding colonies this fall. In addition to biotic factors, the extreme heat the past two summers has significantly and negatively impacted aphid survival. One other factor that may be contributing to the overall reduced abundance of soybean aphids is the widespread use of insecticidal seed treatments.

It will be interesting to see what the next several years bring with regard to soybean aphid abundance. At this point, the every-other-year soybean aphid infestation cycle does not appear to be a reliable predictor for producers. I offer my thanks to David Voegtlin for his continuing leadership in coordinating the collection of data from the network of suction traps across the North Central region.—Mike Gray
End-of-Season Disease Issues

As we are getting closer to the end of the growing season, there are still some disease issues and questions that should be addressed.

Corn

*Aspergillus ear rot and aflatoxin.* As I noted in the August 10 issue of *the Bulletin,* Aspergillus ear rot is present in some Illinois drought-stressed corn fields. The biggest concern with the disease is that the fungus that causes the ear mold may also produce a toxin known as aflatoxin. Corn with aflatoxin levels over 20 parts per billion (ppb) may be docked or rejected at the elevator. As discussed in the August article, it is extremely important that producers be aware that their corn could be contaminated with aflatoxin. An Aflatoxin section is now available on the University of Illinois Extension Illinois Drought Resources website (web.extension.illinois.edu/drought), including a new “Frequently Asked Questions about Aflatoxin in Corn” document.

*Black mold and dust clouds during harvest.* After some significant rain in late August and early September, saprophytic fungi, which have a black appearance, have colonized dead corn tissue in some areas of the state. In corn that was drought-stressed and died prematurely, these molds rapidly colonized dead tissue after rains fell. Black clouds of dust, the result of the saprophytic fungi, have been observed as combines go through affected fields. Generally, there is no concern with these saprophytic fungi other than more dust than normal to deal with, which may mean having to clean filters on the combine more often.

Soybean

*Soybean rust.* To date, no soybean rust has been observed in Illinois in 2012. However, it is likely that Hurricane Isaac did bring some spores of the soybean rust fungus as it moved through Illinois a few weeks ago. Given the current stage of the soybean crop, risk of yield loss to soybean rust would be extremely low, so even though soybean rust may be observed in Illinois this year, no management this year is required.

*Soybean vein necrosis virus.* Symptoms of soybean vein necrosis virus have been prevalent throughout the state. As Suzanne Bissonnette wrote in the August 24 issue of *the Bulletin,* the virus is a recently described virus of soybean. It is likely that it is transmitted by thrips, since other viruses in the same group
The egg count should be checked once SCN is detected in a soybean field. The number of eggs per 100 cc of soil can be counted, and the results will be reported in this manner. The frequency of sampling will depend on the management protocol, the SCN egg count, and the specific field population. If consistent rotations with a nonhost such as corn have been implemented and the SCN egg count has significantly decreased, sampling may be spaced to every third year that soybeans are grown. However, if the SCN egg count has increased, sampling may be spaced to every year that soybeans are grown.

When SCN egg counts are consistent, the SCN-infested field, even if resistant soybean varieties are grown, monitoring the SCN egg count can ensure that the variety being grown has effective resistance against the field population. Often, a grower may use a soybean variety with resistance to SCN only to discover that the type of resistance was not effective against the specific field population, thus allowing the population to increase in that field. In addition, this type of population increase leads to a greater proportion of SCN capable of reproducing on resistant varieties.

When SCN egg counts are moderate to high and soybeans are to be grown, or if your resistant variety rotation does not seem to be managing the pest, then it’s a good idea to perform a greenhouse test called the “SCN Type test” (formerly known as an SCN race test). This test evaluates the field population’s development on three sources of resistance found in varieties currently available to Illinois producers and so provides information about the most effective type of resistance for a specific field. Variety selection can be narrowed to the resistant soybean varieties that will provide effective resistance and prevent increases in the SCN population. If you are interested, the actual soybean variety you’d like to plant (or have been planting) can be included in the test to directly assess its effectiveness.

The University of Illinois Plant Clinic nematology testing program can perform this test for you; the fee is $50, it requires a greenhouse grow-out, and it takes 1 to 2 months. Call the Plant Clinic (217-333-0519) or contact Dr. Colgrove (acolgrov@illinois.edu, 217-333-9057) for specific sampling information for Hg typing.

The Varietal Information Program for Soybeans website (VIPS; www.vipsoybeans.org/v4/vpHome/vipshome.cfm) is an excellent source of information for soybean variety selection based on yield and disease, including SCN. — Alison Colgrove and Suzanne Bissonnette

**Crop Development**

**Green Soybean Plants**

While many soybean fields are drying normally and harvest is getting underway, there are reports and observations of soybean plants that have dry pods and seeds but green leaves and green stems. Many of these fields have too much green tissue to combine but are in danger of shattering as pods and seeds continue to dry.

In some ways this appears to be the “green stem syndrome” that has cropped up in some fields in some years. We think that this occurs when seeds stop
taking up sugars and nitrogen before senescence is complete. Stems and petioles continue to photosynthesize but sugars have no place to go, so they accumulate and keep leaf and stem tissues healthy and green. Lower temperatures and more soil moisture recently have likely contributed some to this problem by keeping leaves well supplied with water and slowing sugar movement and leaf drying.

While we think this explains what happens, it’s much less certain in many cases why it happens. One near-certain cause is lack of pods—when disease or drought or insect damage (rare in North America) result in low pod numbers, the senescence signal normally sent by seeds and pods isn’t sent or isn’t received normally, and leaves don’t lose their protein. This means that they stay green and stay attached, while continuing to produce more sugars.

We think that lack of pods in drought-stressed fields is one of the factors leading to this problem in 2012. But there are two unusual features this year. One is that pods seem to be maturing and drying normally; in many cases we have seen before, pods tend to stay green or to dry slowly when pod numbers are low.

We are also seeing this year that some fields have only the lower leaves staying green and attached to the stem, while upper leaves senesce normally. We think that the soybean senescence signal is usually all-or-none; that is, when enough seeds are reaching maturity, all leaves on the plant senesce and fall. It’s possible that so many lower pods failed to develop that sugars from the lower leaves had no place to go, and that without a “sink” for sugar and nitrogen, these leaves could not senesce normally, while the upper leaves could and did senesce.

Regardless of the cause, green leaves on plants with dry pods will probably stay green, quite possibly until frost. Even frost may not damage leaves effectively when they have a lot of sugar, since sugar acts as an antifreeze. Gramoxone is labeled for use as a soybean defoliant, but there is a 15-day wait until harvest, and it’s not clear how cost-effective it would be, especially if it has to be applied by air.

Some fields have a “mottled” appearance, with green and yellow and leafless plants all present. It may be possible as more green plants start to lose color to combine these, taking care not to have green tissue interfere with threshing or cleaning. But in many cases we’ll simply have to wait until plants dry and hope that seeds don’t shatter before they can be combined.

Green leaves trap some moisture from dew, and pods on plants with green leaves aren’t as exposed to drying conditions as are those on plants without leaves, so pods may stay intact better than they otherwise would. On the other hand, reports of shattering this year suggest that pods may have been weakened due to drought conditions. So our hope may not be realized.

There are some indications that the problem of dry pods on green plants may be related to variety, but this is not very clear. Later-maturing varieties are more likely to experience this problem, in part because severe stress can (and in some cases did) desiccate early-maturing varieties before the normal senescence sequence kicked in. Varieties with little foliar disease, either because of genetic resistance or as a result of fungicide application, may be more prone to stay green.

Though the green-stem issue has been studied to some extent, there has been little progress in finding preventive measures or a cure. Unfortunately, conditions like we have had in 2012 will usually result in more of this, adding one more problem to what will be low yields in some of the affected fields.—Emerson Nafziger

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