THE OHIO STATE UNIVERSITY EXTENSION

FACT SHEET

Agriculture and Natural Resources

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Soybean Aphid

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Crop: Soybean
Crop Development: Midsummer to late Summer (reproductive stages)
Scientific Name: *Aphis glycines*

The soybean aphid (fig. 1) was introduced into the United States sometime in the late 1990s. It was first observed in 2001 in southern Wisconsin and soon afterwards became noticed in most other northern soybean-growing states and Ontario. Since that time, it has become well established throughout the northern Midwest and the provinces of Ontario and Quebec, Canada.

Soybean aphids are small (1/16 inch) insects with the typical cornicles, or tail pipes, at the rear of the insect (fig. 2). Aphids are interesting creatures in that all of them during the spring and summer are females, and they give live birth to new female aphids until soybean maturity. Aphids can have up to 12 generations per year, with most generations being wingless. When populations become large, a winged generation of female aphids occurs, which will spread from field to field, county to county, and even state to state on wind currents. These winged migrations are often quite large, and have been known to become major news items.

Figure 1. Soybean aphid adult and nymphs

Figure 2. Close-up of wingless soybean aphid

During late summer or early fall, the population will finally produce winged males along with special winged females called gynoparae. These aphids move to their overwintering host, buckthorn, *Rhamnus carthartica*, where mating occurs and at least one generation occurs (fig. 3). The results of that mating are eggs oviposited near buckthorn buds.

Symptoms

The determining criterion of an economic problem is the presence of an increasing population above the threshold level. Later symptoms of a large aphid population are soybean leaves covered with honey dew produced by the aphids, and subsequently the sooty mold that develops (fig. 4). However, both these symptoms occur well after aphids have passed economic thresholds when they should have been treated. Whether yield can be saved by spraying at this time is questionable, and depends on environmental conditions, value of the soybean, and cost of insecticide application.

Scouting

Scouting for soybean aphid is done by walking into the field at least 100 feet from the field's edge. Individual soybean plants are pulled from the soil and soybean aphids counted or estimated. It is recommended that 5 individual plants from at least 20 locations in the field be pulled from the ground and the aphids counted (fig. 5). The average number of aphids on plants should then be calculated. Having done this over a few weeks, if the average number of soybean aphids is over the established economic or action threshold of 250 aphids per plant, an insecticide treatment is warranted. Growers should be aware that at the early buildup of soybean aphids in a field, aphids will normally be found on the upper 2–3 leaves of the plant (fig. 6), making counting of aphids easier.

Management

Researchers in numerous Midwest states developed a threshold that is useful in Ohio. The action threshold, when an insecticide treatment is warranted, is an average of 250 soybean aphids per plant with a rising population. This threshold is useful from flowering through the R5 growth stage of soybean (pods beginning to fill with seed). This threshold has a 3–7 day use window, that is, a grower has 3–7 days to spray their soybean in case getting a custom or an aerial applicator into the field takes a few days. Thus, we recommend sampling numerous times to determine whether the aphid population is rising, decreasing, or remaining the same.

Numerous insecticides are labeled for soybean aphid control. Studies show that efficacy in controlling this aphid is increased by using a sufficient volume of spray and small to medium-sized nozzles to enhance spray penetration into the plant canopy. The highest and quickest aphid mortality is usually achieved with the older organophosphates, while longer residual activity often comes from the pyrethroids. We do not see the need to combine different insecticides

Figure 3. Soybean aphids on buckthorn

Figure 4. Honey dew and sooty mold on leaves

Figure 5. Soybean aphids

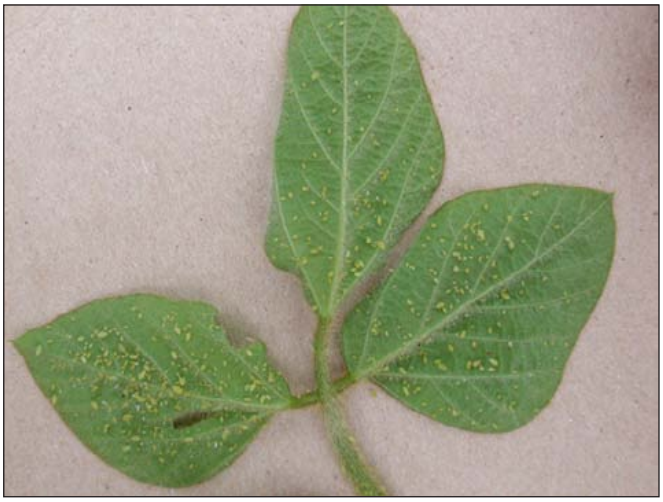

Figure 6. Soybean aphids on terminal leaf

to achieve these goals, and thus, do not recommend mixing different insecticides to achieve both these ends because using either alone usually achieves good economic control in Ohio. However, we are aware that there are some new materials on the market that contain both an organophosphate and a pyrethroid for this very purpose.

At this time, there are no specific biocontrol agents available that will prevent economic losses if aphid populations get off to a good start in soybean fields. However, researchers are exploring the ability of introduced parasitoids to provide economic control. Additionally, there has been much interest in breeding soybeans resistant to the soybean aphid, and a few varieties are nearing release. However, early indications suggest that aphid biotypes already exist in Ohio that are capable of overcoming the resistance in those lines. Thus, when and if these varieties are released, growers should contact their local OSU Extension educators or specialists to determine the usefulness of those lines.

See Ohio State University Extension Bulletin 545, *Control of Insect Pests of Field Crops*, for those insecticides labeled for soybean aphid, or for all insecticides labeled on soybean. Bulletin 545 can be accessed at http://entomology.osu.edu/ag/.

Additional information is available from your local OSU Extension office or The Ohio State University Entomology Agronomic Crops Insects web site (http://entomology.osu.edu/ag/).