THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

Soybean Insect Pest Alert
Soybean Aphid Now Established in Georgia

R.M. McPherson, Professor, Department of Entomology, Tifton Campus
D.C. Jones, Extension Entomologist – Pest Management
J.C. Garner, Superintendent, Georgia Mountain Research and Education Center
G.K. Douce, Extension Entomologist & Professor, Department of Entomology, Tifton Campus

The soybean aphid, *Aphis glycines* Matsumura, was first reported as a new invasive pest species in North America on Wisconsin soybeans during the summer of 2000. By the end of the 2001 growing season, soybean aphid populations were observed from New York westward to Ontario, Canada, the Dakotas, Nebraska and Kansas and southward to Missouri, Kentucky and Virginia. No soybean aphids were observed in Tennessee or Georgia in 2001.

During monthly field sampling of soybeans at the Georgia Mountain Research and Education Center at Blairsville, Georgia, in 2002, several small colonies of soybean aphids (8-10 aphids per leaf) were collected on September 10 and October 1. Aphid identification was verified by Susan Halbert, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL 32614-7100. No soybean aphids were observed in central or southern Georgia in 2002, but surveys will continue in coming years to determine if they are present.

The presence of soybean aphids in Blairsville (Union County), Georgia, represents a new state record for this invasive soybean pest that is being regulated through USDA/APHIS personnel. The source of the initial aphid infestation in North America is not known. This pest is native to China but has spread along the western Pacific and has been reported from Korea to the Philippines. In early 2000, the soybean aphid also was introduced into Australia in New South Wales and Queensland.

Biology

The soybean aphid has a complex life cycle that uses both buckthorn, *Rhamnus* spp. (syn. *Frangula* spp.), and soybean, *Glycine max* (L.) Merrill. These aphids survive from fall to spring as overwintering eggs exclusively on buckthorn. Buckthorn is a woody shrub or small tree found in forests; it is also grown as an ornamental.

The eggs hatch in the spring, producing winged female aphids that migrate to soybean fields and produce live young through parthenogenesis (reproduction by direct growth of egg cells without male fertilization).

Figure 1. Colony of soybean aphids on a soybean leaf. (David Ragsdale, U. Minn.)

Several generations of aphids are produced on soybeans during the summer, with both winged and wingless females being produced.

As soybeans begin to mature, both male and female winged aphids are produced, and they migrate back to buckthorn where they mate and the females lay the overwintering eggs. This begins the cycle over again.

Damage Potential

The soybean aphid feeds primarily on soybean, although some other legumes are possible hosts, including kudzu and green beans. These aphids feed by sucking plant sap from the leaves (Figure 1), stems (Figure 2, page 2) and pods. They are most commonly seen on the undersides of soybean leaves in the middle part of the plant canopy or along the soybean stem.

Heavy infestations have been reported to cause leaf yellowing and curling, plant stunting, poor pod fill, and yield reductions. Honeydew, a sticky substance secreted by aphids, and sooty mold growing on the honeydew, are commonly observed on the soybean foliage heavily infested with soybean aphids. China has reported yield losses exceeding 28 percent when early-season infestations are heavy. These aphids are also known to vector a number of plant virus diseases, including soybean mosaic. Soybean mosaic can cause economic losses to soybean throughout the United States due to reduced yields and seed quality.

Figure 2. Colony of soybean aphids on a leaf petiole. (D. Tuckey, VPI)

Identification

The soybean aphid is a small, yellow aphid with dark tips on the cornicles (two tube-like structures on the abdomen); the cauda or tail end of the abdomen is pale and narrow with four or five pairs of setae, or hair-like structures (Figure 3). The antennae have six segments.

The other aphid species on legumes that might be confused with the soybean aphid in Georgia is the cotton aphid, *Aphis gossypii* Glover (Figure 3). The cotton aphid, also called the melon aphid, is also a small aphid, with females measuring 1 to 2 mm long. The cotton aphid has a broad cauda with usually two pairs of strongly curved setae and five-segmented antennae. Cotton aphids are usually yellow or yellow-green when on cotton and soybeans; but they can be light green mottled with dark green, pale green and even dark green, especially when on melons. Cornicles are all pale (cotton) or all dark (melons).

Biological Control

Producers with soybean aphid invested fields in the Midwest have reported large numbers of beneficial biological control organisms. Lady beetles (Figure 4), lacewings and syrphid fly larvae are the most abundant predatory insects observed in the aphid-infested field.

All these species are very common in Georgia row crops. Parasitic wasps and fungal pathogens also have been observed controlling the soybean aphid, causing dramatic reductions in aphid numbers. Parasites and fungi are also abundant throughout Georgia. This complex of biological control agents may be very beneficial in maintaining soybean aphid densities below economically damaging levels in Georgia soybeans.

Future Implications

As with all invasive pests, the full impact of this new soybean pest will not be known for several years. There are many entomologists throughout the mid-western and eastern United States who are conducting research on this immigrant pest's biology, overwintering, dispersal, damage potential and management tactics. We hope results from these current and future studies will provide soybean producers with information needed to limit the economic impact of this new pest on the production and quality of the soybean crop produced in North America.

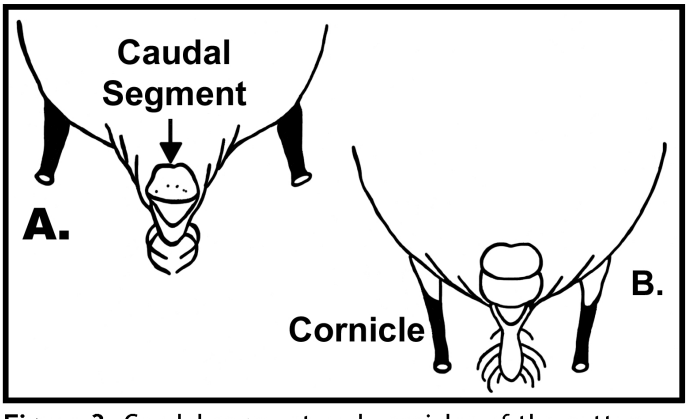

Figure 3. Caudal segment and cornicles of the cotton aphid (A) and soybean aphid (B). (Angelika P. Schmid-Riley)

Figure 4. Convergent lady beetle feeding on aphids. (M.L. Wells, UGA)