



# Insect Pest Alert: Soybean Aphid

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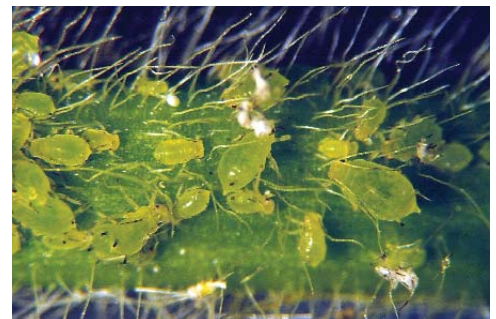
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Soybean

Soybean aphid, *Aphis glycines* Matsumura, was first reported in Arkansas in 2004. Confirmed specimens were found in several Arkansas counties including Clay, Crittenden, Mississippi, Lawrence, Poinsett, Woodruff, White, Jackson, Prairie and Lonoke. Populations were found in late-developing soybean fields in late August through October. Populations were generally observed as small colonies (Figures 1 and 2).

Canada and Nebraska, and south to Kentucky, Virginia and Missouri. In 2002, the soybean aphid was reported in Georgia and detected in Mississippi in 2003.



**Figure 1.** Colony of soybean aphids on a soybean leaf in Clay County, Arkansas.



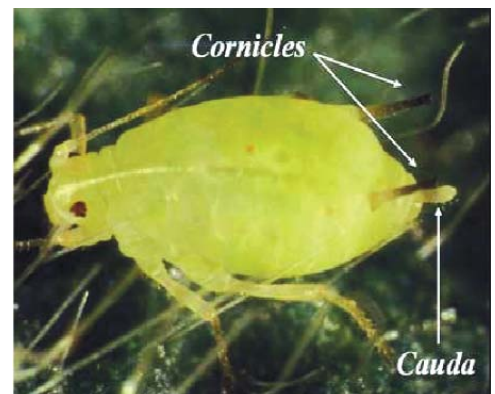
**Figure 2.** Close-up of soybean aphid colony.

## Identification

The soybean aphid is a small aphid, pale yellow, with black tips on the cornicles and a pale cauda (Figure 3). Few other aphids living on soybeans have the same combination

## Origin and Distribution of Soybean Aphid in North America

The soybean aphid, originally native to China, has spread throughout much of the Pacific Rim, including Australia and the Philippines. In 2000, the soybean aphid was reported as a new pest species in North America from findings in Wisconsin. The next year, soybean aphids were reported from New York to the Dakotas as well as in



**Figure 3.** Soybean aphid characterized by pale yellow color, a pale cauda and black tips on the end of cornicles.

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of size and color. Other species of aphids on legumes that might be confused with it are *Aphis gossypii* (the cotton aphid), which has a shorter, dark cauda, and *Aphis craccivora* (the cowpea aphid), which has a black patch on the back of the wingless adults.

While other aphids may be found in soybean, soybean aphid is the only aphid that forms colonies on soybean.

## Life Cycle

The seasonal life cycle of the soybean aphid is complex, with up to 18 generations per year in the Midwest. Soybean aphid requires two different species of host plant to complete its life cycle, common buckthorn and soybean. Buckthorn is a woody shrub or tree and is the overwintering host plant of soybean aphids. The buckthorn species known to serve as a host for soybean aphid are not found in Arkansas.

Soybean aphids lay eggs on buckthorn in the fall. These eggs overwinter and hatch in the spring, giving rise to wingless females. These females reproduce without mating, producing more females. After two or three generations on buckthorn, winged females are produced that migrate to soybean. Multiple generations of wingless female aphids are produced on soybeans until late summer/fall, when winged females and males are produced that migrate back to buckthorn, where they mate. Females then lay eggs on buckthorn, which overwinter, thus completing the seasonal cycle. Soybean aphid has not been observed to overwinter at this time in Arkansas. **The ability of the soybean aphid to overwinter and colonize soybean in Arkansas is unknown.**

Soybean aphid populations can grow to extremely high levels under favorable environmental conditions. Reproduction and development is optimal when temperatures are between 70-80° F. Reproduction declines at higher temperatures, and soybean aphid populations cease increasing and may decline as temperatures reach 95° F. When populations reach high levels during the summer, winged females are produced that migrate to other soybean fields. Like a number of other insect species (e.g., potato leafhoppers), these migrants can be caught in weather patterns, moved great distances and end up in fields far from their origin. In all likelihood, it was these summer migrants that were the major source of infestations in Arkansas in 2004.

## Symptoms of Soybean Aphid Infestation

- **Stunting** – When heavy infestations occur during vegetative growth, plants may become stunted. In severe cases, height and the number of nodes on the stem may be significantly reduced.
- **Lack of canopy closure** – As with stunting, leaf development and expansion can be retarded or drastically altered by heavy infestations.
- **Distorted leaves** – Leaf expansion may be affected, especially during drought, to produce cupped leaves, curled edges or shortened veins (Figure 4A) that may be mistaken for herbicide injury.
- **Potassium deficiency-like chlorosis** – Upper leaves may exhibit a yellowing along leaf edges and in between veins (Figure 4B), resembling symptoms of potassium deficiency on lower leaves. This situation occurs where soils are already low in potassium and, apparently, aphid feeding robs new growth of potassium. This is not a very reliable symptom because it can be confused with other causes.



Figure 4A and 4B. Foliar symptoms of infestation by soybean aphid.

## Biological Control

There are several biological control organisms that help in suppressing populations of soybean aphid. Lady beetles, lacewings, syrphid fly larvae and minute pirate bugs have all been shown to be predators of soybean aphid. An important parasitic wasp and aphid fungus are already present in Arkansas that should provide some level of natural control. When scouting, look for these beneficial organisms, and allow them to maintain populations under the economic threshold as long as possible before taking action with an insecticide.

## Soybean Aphid Management Recommendations for 2005

1. Scout once or twice a week beginning at V2 stage. Check 20 to 30 plants per field. Examine the entire plant, particularly new growth. Scout late-planted fields closely.
2. **Use an action threshold of 250 aphids per plant if populations are actively increasing.** This threshold should work well in late vegetative R4 soybeans. This threshold incorporates an

approximately seven-day lead-time between scouting and treatment to make spray arrangements or handle weather delays. ***Spraying after R6 has not been documented to increase yield.***

- To determine if an aphid population is actively increasing, check several times. Conditions that favor aphid population growth are cool temperatures, plant stress (particularly drought stress) and a lack of aphid predators.
  - Check for aphid mummies (parasitized aphids) and winged females. Do not spray if mummies are numerous or a majority of aphids are winged or developing wings, indicating that the aphids will soon leave the field.
  - Plants are likely to be considerably above threshold if stems or pods are covered with aphids and honeydew, with associated sooty mold covering the bottom leaves, and if plants are stunted. Insecticide treatment may still be of value, but the optimal time for treatment (greatest economic return) has passed.
3. Consider the product choices for your situation. Aphid kill, residual and yield gains are not consistent among individual insecticides.
- Pyrethroids (Asana, Mustang Max, Karate, Baythroid, Prolex) and an organophosphate (Lorsban) are currently labeled and effectively control soybean aphid.
  - Tank mixes of fungicides, herbicides or foliar fertilizers, with an insecticide targeted for the soybean aphid, are generally compatible, but a jar test is always recommended. Consider the optimal timing and method (GPA, pressure, nozzle type) for all the components in the tank mix. However, an insecticide should be added for soybean aphid only when warranted.

- Good coverage is important, particularly with aerial application. Higher spray volumes and higher pressure may help to move the insecticide down into the canopy.
- **Adding insecticide to early-season glyphosate (Roundup) applications as “insurance” is *not* recommended, unless aphids are at threshold levels and actively increasing.**

4. Leave an unsprayed check strip to compare against sprayed areas to determine the performance of the insecticide and the value of the treatment.
5. Communicate treatment plans to beekeepers, and take precautions to minimize bee kills. In areas with concern about honey bees, pyrethroids are a better choice for application than other formulations.

## Acknowledgments

Soybean aphid information used in this report was provided by a number of sources:

University of Minnesota Soybean Aphid website: [www.soybeans.umn.edu/crop/insects/aphid/aphid.htm](http://www.soybeans.umn.edu/crop/insects/aphid/aphid.htm)

CSREES website: [http://www.csrees.usda.gov/nea/pest/pdfs/soybean\\_aphid\\_pest\\_alert.pdf](http://www.csrees.usda.gov/nea/pest/pdfs/soybean_aphid_pest_alert.pdf)

Soybean aphid in Nebraska – Tom Hunt  
[http://entomology.unl.edu/fldcrops/soybean\\_aphid04.htm](http://entomology.unl.edu/fldcrops/soybean_aphid04.htm)

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