

LSU
AgCenter
Research · Extension · Teaching

Figure 2. Sugarcane aphid outbreak in Mississippi (top photo), aphids accumulated on a combine at harvest near Corpus Christi, Texas (second photo), and winged and wingless aphids colonizing grain sorghum near Corpus Christi, Texas (third and fourth photos).

Identification

Wingless sugarcane aphid specimens observed in 2013 and 2014 were light yellow to gray. They have dark cornicles (paired tailpipe-like structures on the rear of the abdomen) and tarsi (insect feet) that contrast with the remainder of the body. Most other commonly occurring aphids in sorghum have clear cornicles and tarsi. These morphological features are more easily viewed with a hand lens or other magnification source. Sugarcane aphids can be distinguished from greenbugs by the absence of a dark line that appears on the back of greenbugs. Yellow sugarcane aphids can be differentiated from these newest pests by the presence of numerous hairs covering the entirety of the body of yellow sugarcane aphids (magnification source often needed). Corn leaf aphids possess a dark head and legs that are easily discernable from sugarcane aphids.

Biology

Sugarcane aphids are known to reproduce only asexually in Louisiana – where 100 percent of the population is female, with enormous population growth potential. Adults can be winged or wingless, whereas nymphs (young aphids) always are wingless. The development of winged adults generally is triggered by adverse environmental conditions. Adults give birth to live pregnant young nymphs (30-60 nymphs per female), which are mature in three days.

Sugarcane aphids extract nutrients primarily from plant phloem. Because plant sap is rich in sugars and water, once nitrogen-containing nutrients are filtered from the sap, the sugary waste, or honeydew, is expelled and accumulates on leaf surfaces. The sugarcane aphid's development, as with most insect species, is highly tem-

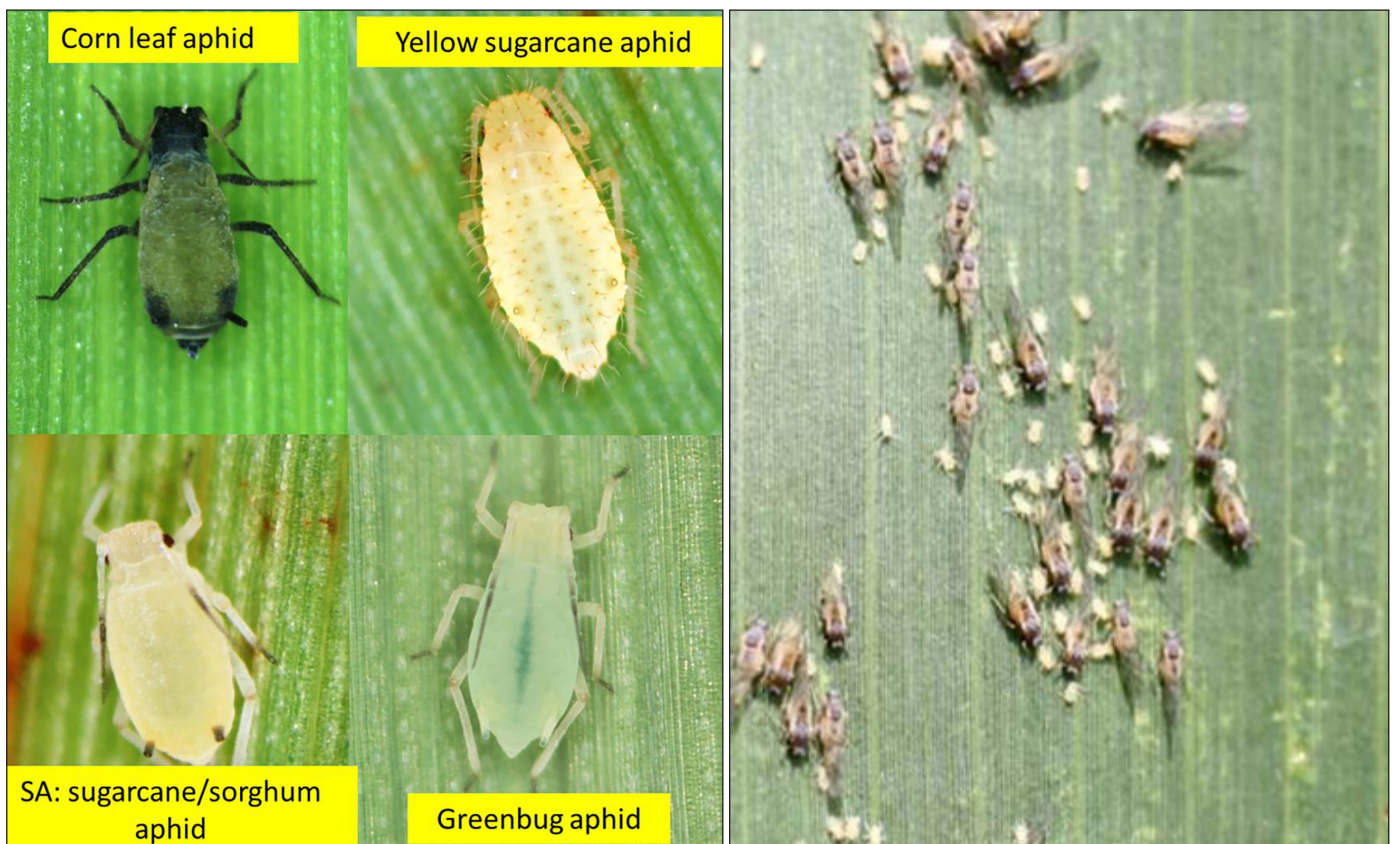


Figure 3. Aphids were reared by Scott Armstrong, USDA-ARS. Photographs courtesy Richard Grantham, Oklahoma State University (left), Winged adults on the underside of a sorghum leaf (right) Photograph courtesy Gary Odvody Texas A&M Agrilife Research.

perature dependent, and exponential population growth may occur as temperatures increase during the growing season.

Injury

Aphid feeding occurs on the underside of the leaves and stems. Infestations often will begin at the bottom of the plant and work toward the top. No known toxin is involved in feeding by this insect. Symptoms of feeding are manifested as reddening or purpling of leaf tissue and result in subsequent necrosis. These symptoms often are exacerbated by dry environmental conditions.

Injury to seedlings can kill plants and reduce stand early in the growing season. That results in inconsistent heading, which, in turn, exacerbates problems with sorghum midge as the crop begins to flower. Injury to pre-boot sorghum reduces seed numbers and, under extreme aphid pressure, will sterilize seed heads (Figure 4). Injury in boot to milk stage sorghum results in inconsistent head emergence and further exacerbates midge issues. Injury to soft to hard dough sorghum may result in yield losses, but the most significant damage occurs as a reduction in test weight.



Figure 4. Sterilized seed head as result of sugarcane aphid feeding. D. Kerns, LSU AgCenter

Management Considerations

Managing sugarcane aphid populations requires the use of an integrated approach that includes hybrid selection, insecticide seed treatments, foliar insecticide selection, targeted application techniques, foliar insecticide timing, other pest considerations, crop desiccation and harvest conditions.

Hybrid selection is fundamental in reducing aphid populations while maximizing yield throughout the growing season. Hybrids with taller stalks – more space between panicle and leaf canopy – may facilitate easier harvest by reducing the amount of honeydew coated chaff moving through the combine.

Commercial hybrids that have shown some resistance or tolerance to sugarcane aphid feeding are available. Early or timely planting will help avoid early sugarcane aphid infestation and reduce the likelihood of sorghum midge and headworm problems. Neonicot-

inoid insecticide seed treatments also have demonstrated excellent activity against sugarcane aphids, offering protection for up to 40 days after planting.

Although recommended hybrids, planting dates and seed treatments will mitigate sugarcane aphid infestations, foliar insecticide treatments still may be justified during the growing season. Foliar insecticides should only be applied when needed. Research conducted by the LSU AgCenter and Texas A&M Agrilife has set a preliminary threshold on boot/milk stage grain sorghum of 50 aphids per leaf colonizing 20 percent of plants in the field. Volume of application will have a significant effect on the level of control achieved by insecticides. A recommended minimum of 10 gallons per acre by ground and 5 gallons per acre by air will help distribute insecticides throughout the canopy and increase the likelihood of controlling populations far below the canopy surface.

Recommended insecticides for control of sugarcane aphids include Transform 50 WG, Sivanto and chlorpyrifos (Lorsban, Nufos). Louisiana was granted a Section 18 emergency exemption for Transform for the 2014 growing season and a Section 18 exemption for 2015 is pending.

Applications of Transform at 1 to 1.5 ounces per acre usually were highly effective in controlling sugarcane aphid populations. Transform is limited to two applications totaling 3 ounces per acre and has a 14-day pre-harvest interval. The insecticide is systemic and has limited adverse effects on beneficial insects. Transform has limited contact activity, highlighting the importance of correct application timing. Cooler temperatures may preclude sugarcane aphids from feeding on Transform treated leaf surfaces, which may interfere with control and result in substandard results if low temperatures are experienced immediately after an application. Transform also has very little activity on sorghum midge.

Sivanto is a newly labeled insecticide for use in sorghum and has proved effective against sugarcane aphids, although data is limited. Like Transform, Sivanto is systemic and “fairly soft” on beneficial insects. Sivanto has a 21 day pre-harvest interval.

Chlorpyrifos (Lorsban, Nufos) applied at 2 pints per acre has demonstrated moderate to good control of sugarcane aphids in grain sorghum, while 1 pint per acre offers suppression. Unlike Transform, chlorpyrifos is toxic to many beneficial insects and demonstrates a fuming action that may enhance control under hot conditions. Chlorpyrifos at 1 pint per acre has a 30 day pre-harvest interval and 2 pints per acre has a 60 day pre-harvest interval, which may restrict higher rates to early season use. In addition, some sorghum may suffer phytotoxicity from chlorpyrifos.

Data from the LSU AgCenter demonstrated that although some adjuvants may be beneficial, others have reduced Transform activity targeting sugarcane aphids.

Sorghum midge considerations often complicate control of sugarcane aphids. The indiscriminate use of pyrethroids, often in the absence of scouting, typically will flare existing aphid populations. Therefore, applications for sorghum midge should be made only after a field reaches 20 percent bloom and has been scouted for midges. Midges are best scouted for in the morning with peak activity occurring between 10 a.m. and noon. Sorghum midges trapped in spider webs also can be good indicators of activity.

If aphids are present in low numbers and sorghum midges are low to moderate, chlorpyrifos at 1 pint per acre should be considered. Chlorpyrifos at 1 pint per acre may offer aphid suppression while also controlling midge populations. A follow-up application three to four days later should be anticipated, however.

If grain sorghum is heavily infested with midges, a pyrethroid can be considered, but be prepared to make a follow-up application with a dedicated aphicide to prevent aphid populations from increasing unchecked. Mixing insecticides such as Transform or Sivanto with a pyrethroid will result in loss of beneficial insects and faster potential aphid resurgence.

Desiccant considerations also should be made based on the presence and amount of honeydew and sooty mold on leaf surfaces. Glyphosate may not work well on leaves covered with honeydew and sooty mold. Sodium chlorate has proven to be a better option on leaves covered with honeydew and sooty mold.

It is not unusual to see sugarcane aphids move from the leaves to the grain sorghum heads after crop desiccation. If aphids are present when the desiccant is applied, consider including Transform, but be aware of the 14 day pre-harvest interval.



Authors

Sebe Brown

Assistant Area Agent (Pest Management)
Northeast Region

David Kerns, Ph.D.

Associate Professor (Entomology)
Macon Ridge Research Station

Julien Beuzelin, Ph.D.

Assistant Professor (Entomology)
Department of Entomology

Visit our website:

www.LSUAgCenter.com

William B. Richardson, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
LSU College of Agriculture

Pub. 3369 (online only) 3/15

The LSU AgCenter and LSU provide equal opportunities
in programs and employment.