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High Energy Forages and Soil Building Cover Crops

The Sugarcane Aphid in Forage Sorghum, Grain Sorghum, and Sorghum-Sudan

The Sugarcane Aphid (SA), previously only affecting sugarcane in the Deep South, has changed preferred hosts in recent years to affect sorghum crops – grain and forage sorghum and sorghum-sudan, as well as the related johnsongrass. This change in feeding biotype resulted from either a genetic change or a new pest introduction. The aphid will sometimes appear on other grass crops, but does not colonize them.

There are currently 12 affected southeastern states from Texas to Florida, extending as far north as Kansas, Arkansas, and Tennessee. Only certain counties are affected, however, so check with your local extension office to know your risk in advance.

The aphids are hard to see; the first telltale signs are usually sticky and/or discolored leaves that are purplish or yellow (from chlorosis).

The aphids feed on the plant leaves and extract nutrients primarily from the plant phloem; the sap is rich in sugars. In affected areas of the Southeast, the aphid does the most damage late in the season, especially in double-cropped sorghum.

Aphids become a problem in areas where they can overwinter, so mild winters will present the biggest challenges for aphid infestations.

Know what to look for – both in terms of the bugs themselves and the traces they leave behind – and have a plan in place that includes both preventive and retroactive strategies.

Identification and Life Cycle

The white sugarcane aphids are much more of a problem than the yellow sugarcane aphid. It is pale yellow to whitish, with dark cornicles (a "stove pipe" structure at its rear), light-colored legs, and dark feet (tarsi). The yellow aphid can be differentiated by the presence of many little hairs all over its body.

The first sign of the aphids is the presence of sticky honeydew, the sugary excrement they produce after they have extracted most of the nutrients from the plants' sap. A leaf sticky with honeydew indicates aphids on the underside of the leaf directly above it.

Honeydew in itself is a harmless substance, but can make harvest difficult when it clogs up combines or choppers (large populations of aphids can also contribute to clogging). In excessive amounts, it can also hamper transpiration, or evaporation of water from plant leaf pores. Black sooty mold eventually grows on the honey dew, reducing the leaves' ability to perform photosynthesis.

The aphid population escalates exponentially, which makes it capable of doing extreme damage within a matter of weeks of the first few sightings. The population is entirely female and reproduces asexually, giving birth to live young. Each adult gives birth to 8-20 nymphs. This is an extremely rapid and efficient method of reproduction.

Infestation during early stages of growth can cause severe stunting and seedling loss. The aphid population is more likely to explode, however, around the time of heading – this is when you will see the exponential growth curve. For grain sorghum, this causes a yield hit with lower test weight grain. Injury to pre-boot stage sorghum especially interferes with grain formation.

It's common for infestations to begin on field margins, but they can begin anywhere in the field. Infestations are most common where broad spectrum insecticides have been used – especially from the pyrethroid class. This type of insecticide removes natural enemies of the aphid like sorghum midge, which would normally keep SA at more controlled levels. When controlling the sorghum midge, it's important to scout carefully to avoid any unnecessary applications of broad-spectrum insecticides.

Control – It's not just about chemicals

Begin with resistant or tolerant hybrids. Alta seeds hybrids that are genetically tolerant include **AG 1201, AG 1203,** and **AG 1301.**

Use treated seed if in doubt about your risk. Neonicotinoids seed treatments are controversial in their effect on pollinators, but their use would be more warranted if there is a known risk in your area and there has been a mild winter. These insecticide treatments will be effective against SA for the first 30 days of growth. These treatments include Cruiser 5FS and Poncho 600.

Plant early with a high seeding rate, and don't overfertilize. SA infests later in the seasons, and late double-crop plantings are particularly at risk. When you plant, inspect and remnant plants that have overwintered from last year for surviving aphids. The aphids can overwinter in mild temperatures if they have a living host plant – such as volunteer sorghum or Johnsongrass (widely considered a weed). Check for winged aphids, too – these can be carried by wind to the new field even if there are no surviving host plants. Along the same lines, be sure to rotate crops so sorghum crops do not follow each other in the same field.

It's not yet known how far north the SA can overwinter, but it is capable of rapid migration.

Scout. Once aphids are detected, scout twice a week. Small numbers can quickly accelerated beyond accepted thresholds. There are various guidelines out there, but generally the action threshold for SA is once 25% of plants are infested with 50 or more aphids per leaf, from pre-boot through dough stage. The aphids will move from the plant's base and progress to the top, so you must scout by looking from the bottom to the top and mostly at the undersides of the leaves. Look especially in any areas of the field where johnsongrass is growing. Insecticide applications are most effective during the early stages of infestation.

Check the field 2-3 weeks before harvest. Treatment may be needed if large numbers of aphids are in the grain head to prevent damage to combines. Malathion can be useful in this situation, because its PHI is shorter.

Avoid broad-spectrum insecticides that could harm SA predators. These include parasitoids, lace wings, syrphid flies, lady beetles, sweat flies, thrips, and even a fungus (lecanicillium lecanii). These natural enemies can help keep populations in check, but they can't control the aphid alone and should not be relied upon. However, their presence usually means the difference between a high aphid population and an out-of-control one.

Use well-timed, targeted insecticides responsibly. Transform WG (sulfoxaflor) and dimethoate are the two insecticides that can be used on sorghum.

- Transform is approved on an emergency exemption from the EPA and can be applied at 3 oz/acre at a maximum, in 2 applications over the course of a year. Apply at 1-1.5 oz/acre in at least 5 gallons of water per acre by air or 10 gallons of water per acre in a ground application. Pre-harvest interval (PHI) is 14 days for grain and 7 days for sorghum.
- Use Transform first, then if more is needed, switch to either
    - Dimethoate (28-day PHI), 1 pint/acre or
    - Chlorpyrifos (Lorsban, Nufos, etc.) (30-day PHI), 1 pint/acre. Use caution, as this is toxic to many beneficial insects.
- If aphids recolonize three weeks before harvest, you can use a second application of Transform to reduce damage through harvest.
- Transform works better in warm temperatures. In cooler temperatures, aphids may not feed on the leaves as much.
- If possible, do not use pyrethroids indiscriminately for midge and headworm control, as these kill beneficial insects, and aphid populations have been shown to flare up following an application. Use after careful scouting. If pyrethroids must be used, follow up with a dedicated aphicide (but don't mix the two).
- Sivanto (flupyradifurone) is another possible insecticide, but it's newly labeled and isn't backed up by much data. Limit to 28 oz. per acre per year.

Control with insecticides requires good coverage of the entire canopy, including the lower leaves. This may be more difficult with forage sorghums because they are often leafier and have a denser canopy.

Harvest or graze early. With forage sorghum and sorghum sudan, an early grazing or cutting may be appropriate in place of insecticide application. After harvest of sorghum sudan, aphids may persist on lower leaves, so monitor regrowth.

If a field is more than 50 percent infested, it is recommended to use it for grazing. Because of the loss of sap (dense in plant sugars) and leaf damage, ensilage and fermentation will be more difficult. If damage is increasing rapidly, intensive grazing may be needed.