THE BERMUDAGRASS STEM MAGGOT

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The bermudagrass stem maggot (BSM; *Atherigona reversura*) first hit southern Georgia in July 2010. Since then, it has infested and damaged forage bermudagrass throughout the southeastern United States (Fig. 1A). Little was known about this tiny invasive fly before it showed up here four years ago. In the years since, we've learned much about this native of Central and Southeast Asia.

The adult fly of the BSM lays its eggs on bermudagrass leaves. Upon hatching, the BSM larva (or maggot) slips into the stem and chews on the vascular tissue at the uppermost node. The top 2-3 leaves die 1-3 days later (Fig. 1B). The affected leaves slip easily out of the sheath and show obvious damage at their base (Fig. 1C). Between when the leaves are first discolored and they completely die, the larva exits the stem and moves to the soil for pupation. After pupating for 7-10 days, the adult fly emerges. This complete process occurs in as little as 10-12 days.

In severe infestations, over 80% of the tillers in a given area may be affected. Since its discovery in southern Georgia, the BSM has spread throughout the southeast, damaging bermudagrass turfgrass, hayfields, and pastures as far north as North Carolina and Kentucky and as far west as Texas. Based on our experiences so far, we expect that damage to begin toward the end of the first cutting through the middle stages of the second cutting. We now expect this to be an annual occurrence.

In general, *Atherigona* populations cannot be fully. However, the use of mechanical and/or chemical controls may suppress the population enough to prevent severe economic damage. But, timing is critical.

If signs of BSM damage occur near the end of a regrowth cycle (2.5-3 weeks after cutting or grazing), harvest or graze the field as soon as conditions become favorable. Damage seen earlier in the growth cycle will very likely substantially reduce agronomic performance of the crop. Stands that are only 6-8 in. or taller when damaged should be cut and/or grazed to a height of 3-4 in., since bermudagrass is unlikely to grow out of this damage even if the BSM population is suppressed. Ideally, the infected material should be removed from the field to prevent shading of any regrowth.

The larvae do not appear to remain in cut stems. Within hours of cutting, larvae will exit damaged stems and travel to the soil. Those larvae that are mature enough to progress will pupate and emerge from the soil 7-10 days later. Flies in fields that have been harvested escape to field margins and neighboring bermudagrass fields.

Chemical control of the BSM larva is challenging because it is inside the pseudostem. Consequently, an insecticide with systemic activity would be needed to prevent larval feeding. However, systemic insecticides are not approved for use in pastures or hay crops.

Suppression of the BSM fly is also challenging because the flies are mobile, and it is unclear to what degree the flies travel from one field to another. In our experience, the flies do not fly far (no more than 10 feet) in any single instance of flight, even after being disturbed. In addition, one must consider the limits of a chemical application in canopy penetration. In our experience, the BSM flies tend to remain deep in the canopy except to move from one location to another or in response to a disturbance.

To suppress the fly population, apply a recommended rate of an inexpensive pyrethroid insecticide after the bermudagrass has begun to regrow (7-10 days after cutting) following an affected harvest. A second application may be necessary 7-10 days later to suppress any flies that have emerged or arrived since the last application. Chemical actions should be taken if there is a known history of BSM damage to the bermudagrass and the expense of the two applications (usually less than $15/acre for both applications) is justified by the forage yield saved. Based on our current observations, BSM populations are not high enough to warrant chemical suppression prior to the first bermudagrass hay cutting (or equivalent timing if the crop is to be grazed). Population buildup may not occur until late into the regrowth cycle for the second cutting for most of the bermudagrass-growing region.

Our research has shown that the BSM damages the finer textured varieties more than the coarser varieties. In general, the most susceptible varieties are ‘common’, ‘Alicia’, ‘Coastal’, ‘Russell’, and ‘Tifton 44.’ ‘Tifton 85’ and bermudagrass x stargrass hybrids have much fewer tillers damaged by the BSM and have relatively less yield loss. We have also noticed that plants that received higher than normal N fertilization (75 lbs N/acre) or plants suffering from leaf spot damage seem to be preferred or suffer more damage than those that are not subjected to these factors.

Much remains unanswered about the BSM. Our work to date has only just begun to grapple with these issues, but we have made much progress. With these basic suppression techniques and timely action, producers can do much to manage the bermudagrass stem maggot. For more information on the bermudagrass stem maggot, visit our website, www.georgiaforages.com.

Figure 1. “Bronzing” of bermudagrass hay fields as a result of bermudagrass stem maggot damage (A). The bronzing is the result of damage done at the uppermost node that results in senescence of the top two to three leaves of the plant (B). The damaged leaves can easily be pulled from the sheath and the end inside the sheath shows evidence of insect damage or obvious decay (C). Photo credits: A: Will Hudson, University of Georgia Entomology Dept.; B and C: Lisa Baxter, University of Georgia Crop and Soil Sciences Dept.