
Figure 2

Scouting and Planning for the *Bermudagrass Stem Maggot*

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Introduction

Since it was first discovered in South Georgia in the summer of 2010, the bermudagrass stem maggot (BSM; *Atherigona reversura Villeneuve*) has severely damaged bermudagrass (*Cynodon dactylon*) pastures and hayfields throughout the Southeast United States. The damage begins when the BSM larva bores into the pseudostem (stem-like structure made up of leaf sheathes), where it macerates the vascular tissue. This feeding occurs outward from the last node of the plant, which cuts off water and sap flow to and from the top 2-3 leaves. This gives the leaves the characteristic "frosted" or "bronzed" appearance (Figure 1). The damaged leaves can easily be pulled from the sheath, and the end inside will show either evidence of insect damage or obvious decay.

Although the degree of damage depends on the bermudagrass variety, latitude of the farm, and time of year, producers have reported up to an 80% yield loss in late summer. The economic impact of the BSM damage depends on several factors; but if a conservative yield loss of 25% is generally applied to just the bermudagrass acreage in Georgia, the potential economic loss totals $40 million annually!

When in doubt…SCOUT!

Finding the BSM larva (Figure 2) is quite challenging, as it requires dissecting pseudostems as soon as they show the first signs of chlorosis in response to BSM damage. If the pseudostem shows extensive damage, then it is likely that the larva has already left the pseudostem to pupate. Pseudostems may be carefully dissected using a sharp knife or razor blade, then splitting the stem until the center of the shoot is revealed. Because of the small size of the larva, it is best to work over a solid, dark-colored surface so that the larva is not lost during the procedure.

Alternatively, you can easily use sticky traps or sweep nets to collect and identify the adult BSM fly (Figure 3) in the field. The adult flies tend to stay down in the forage canopy and rarely fly higher than 18 inches above the canopy. To date, sticky traps have been useful only in alerting one to the presence of the BSM because fly counts on sticky trap cards have not yet been observed to be correlated with fly populations. If sticky traps are used, secure the traps to stakes at 8 inches above the soil's surface (Figure 4). Sweep net estimates have been found to be relatively accurate predictors of actual fly populations in the field. It is not uncommon to find 50-80 flies in a sample of 10 sweeps during July and August (peak BSM damage season). This translates to ~300-500,000 flies per acre! Be sure to sweep deep into the canopy, as the flies do not fly very high (Figure 5). While the flies


Figure 1


Figure 3


Figure 5


Figure 4

are more active in the morning hours, it is difficult to sweep if dew is present. Plan to scout your fields just after the dew dries off the grass, around 11 a.m. to noon. Transfer your sample (about 10-15 sweeps) to an "insect cube" or a plastic bag and place in a freezer for 5-10 minutes. Remove from the freezer and count the number of flies. If you have observed a significant (30%) level of damage in your field and find at least 40-50 flies in your sample, then it's time to employ the appropriate control strategy.

Control strategies are contingent upon timing of damage

If the BSM damage occurs near the end of a regrowth cycle (2.5-3 weeks after the previous cutting or grazing), the yield loss is estimated to be less than 10%, so you can harvest as normal. However, if the hay crop is damaged at an early stage of regrowth (e.g., 6-8 inches), it is unlikely to further develop. If the crop is damaged at this point, it is crucial to remove (mow and harvest, if possible) the damaged grass to enable new growth to occur.

Strategically-timed insecticide applications can significantly reduce the adult BSM fly population and protect the bermudagrass during the most sensitive regrowth phase. Although several different active ingredients are being evaluated, pyrethroids are the only effective mode of action at this time. In our experience, the flies do not fly very high nor very far (<10 feet) in any single instance of flight, even after being disturbed. Therefore, normal spray boom heights should be effective for chemical applications for BSM control. Furthermore, the BSM flies tend to remain deep in the canopy, so applications that do not penetrate the canopy may have limited success. It would be ideal to apply the insecticide in a volume of water in excess of 12-15 gallons/acre to ensure adequate canopy penetration. Suppressing the BSM can be effective when a recommended rate of an insecticide is applied after the bermudagrass has begun to regrow (7-10 days after cutting) following an affected harvest. A second application can be made 7-10 days later to suppress any flies that have emerged or arrived since the last application.

A word of caution…

Chemical actions should be taken if there is a known history of BSM damage to the bermudagrass and the expense of the application(s) 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) and population buildup may not occur until late into the regrowth cycle for the second cutting for the central latitudes of the Southeast United States or third cutting for more northern areas where bermudagrass is grown. Overuse of a single mode of action to combat a pest may eventually result in a buildup of resistance. Preventing overuse and uneconomical use of insecticides is a crucial educational objective to combat the potential for resistance of the BSM to pyrethroid insecticides.

For more information

The new Extension bulletin "Managing Bermudagrass Stem Maggots" is available online at www.georgiaforages.com or for immediate download by scanning the QR code provided.

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