

Forage Update: Bermudagrass Stem Maggots and Fall Armyworms

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Several producers have completed their second hay cutting with a few getting ready for the third. Although in some regions a few producers are having to treat for fall armyworms (FAW); infestations are spotty and often below treatment threshold. In contrast, bermudagrass stem maggots (BSM) are more widespread and abundant this year. Several producers are treating BSM after this last cutting. Below are pictures (Figures 1 and 2) that Lance Blythe took last week from Green Co.



Fig. 1. BSM adults collected in a sweep net. Photo courtesy of Lance Blythe.



Fig. 2.FAW collected in a sweep net in Green Co. Photo courtesy of Lance Blythe.

Bermudagrass Stem Maggots

As we get into the latter part of the bermudagrass growing season, we continue to observe fields showing readily apparent BSM damage. Generally, noticeable BSM damage does not occur until the second cutting at the earliest; and frequently it is the third and later cuttings that show the most damage. The major problem with a bermudagrass stem maggot infestation is that it often goes unnoticed until the grass is cut and a reduction in yield occurs.

Damage caused by the BSM results from larval stages (maggots) feeding in the shoot causing the top two or three leaves to die (Fig. 3). Lower leaves remain alive and unaffected by the maggot's feeding. Because of the death of the top couple of leaves, the plant (and field, if heavily infested) may exhibit a frosted appearance (Fig. 4). The life cycle from egg to adult requires about three weeks. The adult female fly will lay eggs on the bermudagrass stem near a node. The maggot will hatch from the egg, crawl up to toward the last plant node (where the leaf blade emerges from the stem) and burrow into the shoot and begin feeding. Usually by the time the top leaves have died, the maggots have exited the stem and pupated on the ground. With such a short generation

period, multiple generations occur and populations tend to increase later in the season causing an accumulation of damage.



Fig. 3. Typical damage caused by the bermudagrass stem maggot. Note the dead upper leaves.



Fig. 4. Bermudagrass stem maggot damage.

The adult fly is small (~1/8 inch long) and yellow colored with four prominent black spots on the abdomen (Fig. 5). The maggot (larva) is also yellowish colored and about 1/8 inch in length when fully mature (Fig.6).



Fig. 5. Bermudagrass stem maggot adult. Note the four black spots on its abdomen.



Fig. 6. Bermudagrass stem maggot larvae.

In general (but we have observed exceptions), this pest is less of a problem in coarse stemmed bermudagrass varieties and bermudagrass that is grazed. In grazed pastures, cattle eat the fly eggs and maggots along with the grass, lessening population build up. Bermudagrass stem maggots often become an economic pest in finer stemmed varieties (common, Coastal, Alicia and others) that are baled for hay, especially later in the season after the population builds. In heavy infestations, regrowth after cutting can be slowed substantially. Bermudagrass stem maggot management demonstrations have shown as much as 50% yield loss in fine-stemmed varieties. Figure 7 shows a bermudagrass field with significant damage in untreated verses the pyrethroid treated area.



Fig. 7. Pyrethroid treated verses non-treated areas of a bermudagrass field infested with bermudagrass stem maggots. Photo by Ben Thrash.

Systemic insecticides and insect growth regulators labeled for use in bermudagrass forage are **not** effective in combatting bermudagrass stem maggot damage. Effective insecticide applications are aimed at killing the egg-laying adults. When applied from seven to ten days following harvest, a pyrethroid insecticide application will usually protect the crop until the next cutting. Timing of the pyrethroid application is critical for

two reasons. First, the grass has resprouted and adults are emerging from larvae that pupated at the time of cutting and are ready to lay eggs. Second, pyrethroid applications made after the seven to ten day treatment window are less effective because some eggs have already been laid and the grass canopy may be too thick for the pyrethroid application to penetrate the area where adults rest. In many situations, early cutting is necessary to allow for successful treatment to prevent significant yield loss in the next cutting. Pyrethroid insecticides such as lambda-cyhalothrin and others labeled for use in forage grass are the most cost-effective product choices against BSM. It is always a very good idea to survey the field for BSM just before cutting. If apparent damage is present, treated the field with a pyrethroid 7-10 days after the bermudagrass was cut.

Fall Armyworms

FAW infestations are easily overlooked when the caterpillars are small and eating little. Once they grow larger and consume more grass, damage occurs (Fig. 8). Although we are not having widespread armyworm outbreaks and infestations are limited, we need to keep FAW on our radar. Now through fall, we should continue scouting pastures and hayfields. New growth following rainfall will be particularly vulnerable to fall armyworm attack. Producers that plant winter annuals and hunters planting food plots should remain attentive to pests and damage. As this newly planted grass emerges, it must be frequently scouted for fall armyworms, and treated if necessary, to prevent stand reduction or complete loss.



Figure 8. Fall Armyworms (*Spodoptera frugiperda*).

Clues to FAW infestations include: 1) field appears “frosted” 2) presence of birds in the field and/or 3) the odor of freshly grass. Armyworm outbreaks often occur in waves about 30 days apart. However, when mixed worm sizes occur (Fig.9), overlapping generation are present and new infestations will occur more frequently than every 30 days. When scouting, carefully examine grass blades, stems and organic debris at plant base for armyworms. It is best to take at least ten one-foot-square random samples (Fig. 9) across the pasture or hay meadow. Make note of the armyworm sizes as this will help make good management decisions. In addition to counting worms per square

foot, counting the number of worms collected in a sweep net is a very good method to identify a FAW infested field and are most effective at collecting the small worms.

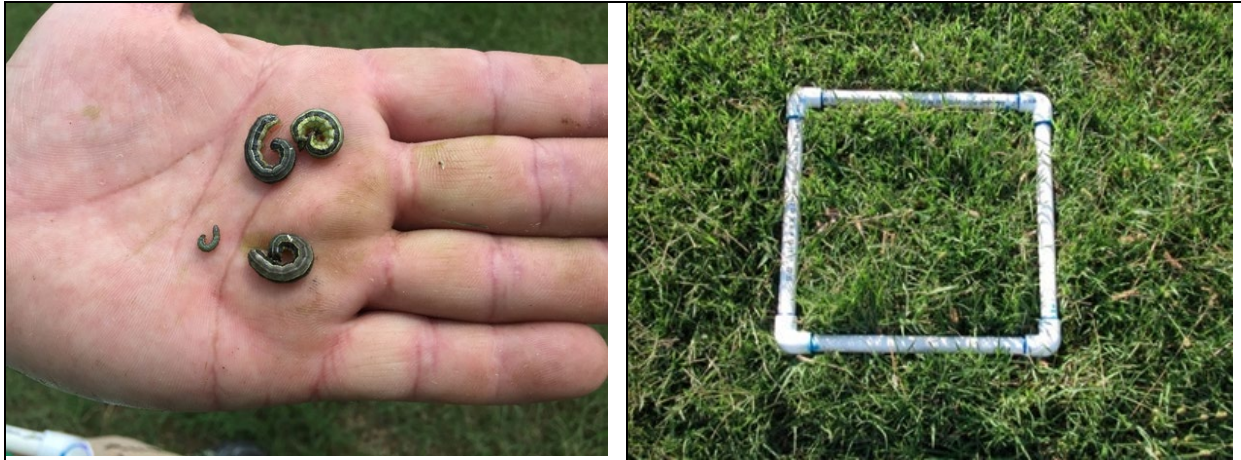


Figure 9. Mixed sizes of fall armyworms (left) and fall armyworm sampling square (right).

Insecticide application is recommended when an average of two or three FAWs per square foot occur within the field. Although we are working to develop a threshold using sweep nets, the data has been inconsistent. Correlations between worms per square foot and worms per 25 sweeps vary between data sets. For example, 3 worms/square foot correlated with 28, 77, 149 and 177 worms/25 sweeps depending upon which data set was used in the analysis. Sweep netting is very efficient in alerting for FAW presence and particularly efficient for detection of small worms

Per-acre insecticide cost will vary from as low as about \$3.00 up to about \$16.00. When calculating cost, always consider the cost per acre and not the cost per gallon of product. Consider residual activity of the product, especially if you have multigenerational populations (all sizes of fall armyworm caterpillars) and heavy armyworm pressure. Pyrethroid insecticides such as Karate® (lambda-cyhalothrin), Mustang Max® (zeta-cypermethrin) and Baythroid XL (beta-cyfluthrin) lack long residual activity. In contrast, products such as Vantacor (chlorantraniliprole), Besiege® (chlorantraniliprole and lambda-cyhalothrin) and Intrepid® (methoxyfenozide)) have longer-duration residual activity and can reduce the number of applications necessary to produce a hay crop. A mixture of lambda-cyhalothrin and Dimilin® (diflubenzuron) will provide longer-duration residual activity than lambda-cyhalothrin alone but not as long as chlorantraniliprole (Vantacor®) or the chlorantraniliprole/lambda-cyhalothrin product (Besiege®). Also remember, for a translaminar or systemic products to work, green growing grass needs to be present. In other words, activity of a long residual product will be reduced if green grass is very sparse or not present.

Bermudagrass hayfields can be dually infested with FAW and BSM. And in some cases, the timing of an application for FAW and BSM coincide. When this occurs, remember that BSM control is aimed at the egg laying adult flies which are treated with

pyrethroids. When both FAW and BSM occur in a field, tank mix lambda cyhalothrin with Vantacor®, or simply use Besiege® (chlorantraniliprole and lambda cyhalothrin) or tank Dimilin® and lambda-cyhalothrin.

For additional information on armyworms see “Managing Armyworms in Pastures and Hayfields” and is available at: <https://www.uaex.uada.edu/publications/PDF/FSA-7083.pdf> and the Insecticide Recommendations for Arkansas” at: <https://www.uaex.uada.edu/publications/mp-144.aspx>.