

Bermudagrass Stem Maggot found in the Palo Verde Valley

Michael D. Rethwisch, UCCE Riverisde -Palo Verde Valley
Crop Production and Entomology Farm Advisor
290 N. Broadway, Blythe, CA 92225-1649 (760) 921-5064 mdrethwisch@ucanr.edu

On September 19, 2018, a call from a local professional crop advisor (PCA) indicated that bermudagrass hay in the Palo Verde Valley had whitened growing tips. The PCA and myself were both concerned that the field was infested with the bermudagrass stem maggot.

A visit to the field found damaged bermudagrass as well as adults of the Bermudagrass stem maggot, *Atherigona revursera*. This fly is also known in some parts of the world as the ‘shoot fly’. While this species has previously been collected in California in Los Angeles and Orange Counties, this is the first documentation of its occurrence in Riverside County. It has not yet been reported from Arizona but is prevalent in the southeastern United States, where it was first reported as major pest of bermudagrass hay production.

A quick sweep sampling of 15 bermudagrass fields in the Palo Verde Valley on September 19 found the Bermudagrass seed maggot fly in about half the fields. Interstate 10 seems to be the current dividing line, as 6 of 7 fields adjacent to and north of Interstate 10 had adult Bermudagrass stem maggot flies, but the fly was not collected in fields south of Interstate 10.



Fig. 1. Adult bermudagrass stem maggot fly, *Atherigona revursera*, with grey colored upper thorax and yellowish abdomen

The adult bermudagrass stem maggot fly has very distinctive coloration and markings, making it very easy to identify when examining sweep net contents. It is fairly unusual in that it is a “2-tone” fly, meaning that the thorax and the abdomen are different colors (Fig. 1). In the net the primary color noted is grey (from the thorax), while the abdomen, although obscured by the wings, is yellowish or orange-yellowish. The two colors helps to quickly identify this species, in addition to its size (3-4 mm) being larger than leafminer flies.

There are two other distinctive aspects for species identification. The adult flies have darkened front leg segments furthest from the body (Fig. 2-3)



Figs. 2-3. Adult bermudagrass stem maggot flies showing the darkened front legs on the segments furthest from the body.

The bermudagrass stem maggot fly also has four (two (2) sets of 2) dark markings on the last segments the upper abdomen (Fig. 4). These dark markings are difficult to see on flies in a sweep net however, especially when covered by the wings, but are easily noted under a microscope.



Fig. 4. Bermudagrass stem maggot adult fly with distinctive two sets of dark markings on the upper abdomen.

Life Cycle and Damage

There are multiple generations of this insect/year, with the damage often increasing as the season progresses and bermudagrass stem maggot populations increase. Work done by entomologists at the University of Georgia has shown the adult flies can live for approximately 18-20 days under southeast US conditions, but survival length of adults is of yet unknown for low desert bermudagrass production conditions.

The female fly lays an egg on a leaf, with the larva hatching approximately 2-3 days later. The legless white larvae then bores into the upper portion of the bermudagrass stem where it feeds on sap in the stem. The tissue from the feeding point to end of stem (often 2-3 leaves) is killed and appears “whitened” or “bronzed” (Fig. 5), and can result in economic loss when populations and associated damage is high. The mature larva will exit the stems after feeding for 1-3 days, and pupates in the soil for 7-10 days before adult emergence.



Fig. 5. Bermudagrass stem tip “bronzing/whitening” associated with tissue death due to Bermudagrass stem maggot feeding on top and bottom stems

High levels of bermudagrass stem maggot infestations can essentially stop a field from growing. Such infestations have occurred across the Southeast and yield reductions have been estimated to range from 20 to 50%. Yield reduction locally has not yet been documented, nor have potential effects on bermudagrass hay quality been evaluated under local conditions.

The amount of damage in the southeastern United States seems to be dependent on growing conditions as well as the point in the growing cycle when flies lay their eggs. Earlier infestations after cutting have the potential to cause more damage. If favorable growing conditions with good soil fertility and moisture exist, the loss seems to have minimal impact on dry matter yield. More damage can result if forage production is limited by poor soil fertility and dry soil conditions.

University Cooperative Extension forage specialists in other states have suggested that some varieties are less susceptible to stem maggot damage than others. Fine-stemmed bermudagrass varieties are reported to be most susceptible to attack, as are highly managed, well-fertilized fields.

One unique aspect for bermudagrass in the low desert is the commercial production of seed. The effect of this insect on bermudagrass seed production is yet to be determined, but the potential for economic loss exists. PCAs and growers should be alert for this pest and its presence, especially in those areas that produce bermudagrass seed.

September 20, 2018. All photographs in this report are by the author.