

## Bug-Wise

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Office: 1-662-325-2085

**Adapting to Four New Insect Pests:** Bermudagrass stem maggot, spotted wing drosophila, European pepper moth, and kudzu bug are four non-native insect pests that have become established in the state within the last three to four years. Each of these pests causes significant problems in the crop(s) it affects and producers are being forced to adapt management practices because of these pests. Following is a brief summary of the problems caused by each pest and steps producers or homeowners can take to minimize their impact.



**Bermudagrass Stem Maggot, *Antherigona reversura*, (BGS):** Bermudagrass hay producers need to become well familiar with this new pest because it has the potential to cause significant reductions in hay yields throughout the state. Adult flies are about the size of horn flies and have yellow abdomens. The legless white larvae bore inside the tips of bermudagrass shoots, feeding down to the first internode and killing the shoot tip and emerging leaves. At first this may seem like relatively minor damage, but heavy 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%. Fine-stemmed bermudagrass varieties, like most of those we currently grow in Mississippi, are most susceptible to attack, as are highly managed, well-fertilized fields. Populations increase through the growing season, so if the previous cutting sustained significant injury, growers should assume damage will be even higher in the next cutting—unless they treat the field. Pastures are not seriously affected because grazing continually removes susceptible shoots. The same is true for turf-type bermudas. The flies will attack them, but frequent mowing prevents serious damage.

We are still learning about this pest and how to best deal with it. The larvae cannot be controlled once they have bored into the stem. Management depends on controlling adult flies before they lay eggs. Current management recommendations are summarized as follows:

- Harvest the field and remove the bales
- spray 3 to 7 days after harvest (as soon as the field begins to green up again)
- use the low rate of one of the pyrethroid insecticide that is labeled for fall armyworms
- spray again 5 to 7 days later
- may wish to add 2 fl oz Dimilin 2L to 2<sup>nd</sup> spray if fall armyworms are a threat
- cut as soon as maturity and weather allow

### Treatments for Control of Bermudagrass Stem Maggots \*

Insecticide/formulation	Rate of formulated Product per acre	No. of Acres 1 gallon of product will treat	Pre-Grazing Interval	Pre-Harvest Interval (wait to cut hay)
Mustang Max 0.8 EC	2.8 fl oz.	45	0 days	0
Baythroid XL, 1 lb/gal.	1.6 fl oz.	80	0 days	0
Karate Z, 2.08 lb/gal.	1.28 fl oz	100	0 days	7 days

\* This information is for preliminary planning purposes only. Be sure to carefully read the label of any product you plan to use and follow all label restrictions carefully.

See Bug-Wise Newsletter No. 5 of 2013 <http://msucares.com/newsletters/pests/bugwise/2013/bw05.pdf> for additional information on BGS.



**Spotted Wing Drosophila, *Drosophila suzukii*, (SWD):** This little fly is a serious pest of berry crops and other soft-skinned fruits. It is especially damaging to commercially-grown blueberries and blackberries, but the host list is much larger and includes strawberries, figs and many other fruit crops. SWD also breeds in many wild berry-producing host plants. Female SWD have saw-like ovipositors that allow them to lay their eggs in sound fruit that is just beginning to ripen. The small white maggots develop inside fruit that is still on the bush, resulting in yield losses, lower quality, and contaminated fruit. It only takes a few of the ¼ inch long white larvae emerging in retail display containers or at the breakfast table to create a negative consumer impression.

Commercial blueberry and blackberry producers have to control SWD if they want to maintain their markets. Unfortunately, preventive insecticide sprays are the only currently effective control tools, and these sprays must be applied just before and during harvest season to kill adult flies before they are able to lay eggs in the fruit. Fortunately, there are insecticides that are effective against SWD and have short enough pre-harvest intervals (PHIs) to allow their use. However, growers need to be aware that these insecticides are not labeled on all fruit crops and PHIs vary depending on the crop. In most cases, sprays should be applied at weekly intervals, but more frequent treatment is required following rainfall. Avoid overuse of any one insecticide or insecticides from the same IRAC Group; rotate among insecticides from different IRAC groups.

#### Insecticides for Control of Spotted Wing Drosophila in Commercial Fruit

Insecticide		IRAC Group	Labeled for use on this crop? (PHI)		
Active ingredient	Brand Name		Blueberries	Blackberries	Strawberries
zetamethrin	Mustang Max	3A	Yes (1 day)	Yes (1 day)	No
bifenthrin	Brigade WSB	3A	Yes (1 day)	Yes (3 days)	Yes (0 days)
fenpropathrin	Danitol 2.4 EC	3A	Yes (3 days)	Yes (3 days)	Yes (2 days)
malathion *	Malathion *	1B	Yes (1 day)	Yes (1 day)	Yes (3 days)
phosmet	Imidan 70-W	1B	Yes (3 days)	No	No
spinetoram	Delegate 25 WG	5	Yes (3 days)	Yes (1 day)	No
spinetoram	Radiant 1 SC	5	No	No	Yes (1 day)
<i>(Organic Treatment Options Listed Below)</i>					
spinosad	Entrust 2 SC **	5	Yes (3)	Yes (1)	Yes (1)
Pyrethrins	Pyganic 5 EC ***	3A	Yes (0 days)	Yes (0 days)	Yes (0 days)

\* Malathion has a strong, persistent odor. Some growers report having berries rejected by buyers—because of odor—even though they complied with the pre-harvest interval.

\*\* For organic production, provides relatively long residual control.

\*\*\* For organic production, short-lived residual control, requires frequent spraying.

See Bug-Wise Newsletter No. 1 of 2013 <http://msucares.com/newsletters/pests/bugwise/2013/bw01.pdf> for more detailed information on SWD and how to recognize and control this pest, as well as how to use traps to determine if

SWD is present in your crop (go to msucares.com, click on “newsletters”, click on “Bug-Wise” and search the index). See Bug-Wise Newsletter No. 2 of 2013 <http://msucares.com/newsletters/pests/bugwise/2013/bw02.pdf> for information on managing SWD in homegrown small fruits.



**European Pepper Moth, *Duponchelia fovealis*, (EPM):** Commercial greenhouse and nursery producers need to be aware of an important new caterpillar pest, the European pepper moth. EPM was first detected in the US in California in 2005 and was first found in Mississippi in 2010 when APHIS trapped moths from several Mississippi counties. Last fall we ran pheromone traps in several Mississippi greenhouses, and caught EPM in almost every location we trapped.

Despite the name, EPM is more important as a pest of succulent greenhouse and nursery crops such as: begonias, chrysanthemums, gerberas, kalanchoe, cyclamen, impatiens, cineraria, heuchera, verbena, lantana, geranium, lisianthus, coleus, and more. It will also damage vegetables, herbs, and feeds on many weeds. As of now, it is not considered a threat to plants growing in outdoor gardens and landscapes. One of the most significant problems for nurseries that ship products out of state is that many states have active quarantines against EPM and loads can be, and have been, rejected because of the presence of EPM.

Adults are small, grey to brown moths that are only about 1/3 to 1/2 inch long. Despite their small size, the moths are fairly easy to identify because of the distinctively shaped wavy white line on each forewing (see accompanying photos). The caterpillars are about 1 inch long when fully mature and range in color from creamy white to dark grey. Their bodies are covered with dark-colored spots, which are easier to see on light-colored specimens.

The feeding behavior of the caterpillars is quite different from that of most other caterpillars. They tend to remain in the growing media near the base of the plant, leaving silken webbing along the surface of the growing media, and will even tunnel into the potting media and feed on roots. Although all parts of the plant are subject to attack, damage most commonly associated with EPM includes defoliation of lower leaves, especially leaves touching the growing media; boring in plant stems, which can result in sudden collapse of individual plants; and girdling of the main stem at the base of the plant. This last type of feeding injury is similar to that caused by a beaver chewing the bark off of a pine or sweet gum tree. These caterpillars will even eat dead leaves lying on the growing media and roots growing through the drain holes in the bottom of the pot.

European pepper moth caterpillars are not easy to control. Their preferred feeding locations: near the base of the plant, in the growing media, under lower leaves touching the growing media, and under fallen leaves make it physically challenging to achieve proper spray coverage, especially on larger plants with heavy foliage. Applying treatments as a drench or directing sprays to the growing media and base of the plant may be necessary to obtain adequate coverage. The best treatments for controlling EPM are still being worked out. So far, acephate (Orthene TT&O) is the most effective treatment and provides a high level of control when properly applied (but keep in mind that acephate does injure some plants and check the label carefully before treating). Conserve (spinosad) is also effective against small caterpillars. Some trials from other states indicate that bifenthrin (Talstar) is not effective (presumably this would also apply to other pyrethroids, or at least that control with pyrethroids is erratic), nor do treatments like dinotefuran (Safari) or imidacloprid (Marathon II) work against this caterpillar.

Pheromone traps to monitor for the presence of EPB can be ordered from Koppert (<http://www.koppert.com/products/monitoring/products-monitoring/detail/pherodis-2/>). To get started, one might only need to order two to four of the Delta Traps and one 4 pack of the PHERODIS pheromone dispensers for *Duponchelia fovealis*. This pheromone seems to be pretty species specific, so if you catch moths it is likely they are EPB, but be sure to check for that deeply notched wavy line on the forewing to be sure. Feel free to send samples in for confirmation if you wish. If you use sticky traps, it is usually best to just mail in the whole trap.



**Kudzu Bug, *Megacopta cribraria*:** Kudzu bugs were first detected in Georgia in 2009 and first appeared in Mississippi in 2012. By fall of last year they were present in 37 Mississippi counties and they are expected to occur essentially statewide by the end of this season. Because kudzu bugs belong to a family of insects that has not previously existed in North America, plataspidae, they have no natural enemies here and their populations are growing unchecked. Adult kudzu bugs are easy to identify because they have a distinctive body shape. When viewed from above they are roughly square, a little less than  $\frac{1}{4}$  inches long and similar in width.

Unfortunately, kudzu bugs don't limit their feeding to kudzu. These unique, stink bug-like little insects are a threat to both farmers and homeowners. Uncontrolled infestations can cause more than 50% yield losses in soybeans and some fields in the state required treatment for this pest last year. In the fall, kudzu bugs invade homes and vehicles, including recreational vehicles, in large numbers, much like Asian lady beetles, causing distress and inconvenience to the owners. This problem is exacerbated by the strong, unpleasant odor these insect exude and the fact that direct contact can cause skin blisters and serious eye irritation.

So far infestations in soybeans have been limited to fields located near large plantings of kudzu, but high populations of adults can accumulate in fields of relatively young soybeans. According to Dr. Angus Catchot, current recommendations for controlling this pest in soybeans are to treat vegetative soybeans if populations reach 5 adults per plant or to treat reproductive soybeans at a threshold of 1 nymph per sweep. Kudzu bugs can be controlled with pyrethroid insecticides recommended for stink bug control. See page 32 of the 2014 Insect Control Guide for Agronomic Crops <http://msucares.com/pubs/publications/p2471.pdf> for specific products and rates.

The best way for homeowners to deal with kudzu bugs is to make their home as insect-proof as possible during the spring and summer months before the fall invasion begins. This is far preferable to having to deal with these pests after they have gotten inside and good exclusion practices will help keep out other home-invading insects and spiders as well. See Bug-Wise Newsletter No. 9 of 2011, [http://msucares.com/newsletters/pests/bugwise/2011/bw09\\_2011.pdf](http://msucares.com/newsletters/pests/bugwise/2011/bw09_2011.pdf), for tips on insect exclusion. Kudzu bugs accumulating on the outsides of buildings can be killed by spraying with a labeled pyrethroid insecticide (bifenthrin, cyfluthrin, and permethrin are examples) according to label directions, but such treatments will not prevent invasion of buildings with poor insect exclusion. Insecticides are not recommended for indoor control; a vacuum is the best treatment option at this point. Avoid crushing these insects or direct contact with skin. In cases where it is practical to do so, eliminating nearby plantings of kudzu may be the best long-term method of managing this pest, but this approach will require an aggressive herbicide program, or good fencing and a lot of goats, and may require cooperation with neighbors and/or government agencies.

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Blake Layton, Extension Entomologist

This information is for educational and preliminary planning purposes only. Always read and follow the insecticide label.



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