

Pest Management News

Dr. John D. Hopkins, Associate Professor and Extension Entomologist – Coeditor
Dr. Kelly M. Loftin, Professor and Extension Entomologist – Coeditor

Contributors

Dr. James Robbins, Professor and Extension Specialist-Commercial Ornamentals
Dr. Bob Scott, Director, Rice Research & Extension Center
Sherrie Smith, Plant Pathology Instructor, Plant Health Clinic Diagnostician

Letter #2

June 30, 2018

Bed Bugs & Highlights from the 2018 Bugs without Borders Survey

John D. Hopkins

Bed bugs remain a pervasive issue and the public is concerned, however, general awareness and knowledge about these pests is alarmingly low. The Professional Pest Management Alliance (PPMA), the public outreach arm of the National Pest Management Association (NPMA), released the findings of its 2018 Bugs Without Borders Survey just in time for the June 3-9 "Bed Bug Awareness Week" with the goal of helping to increase bed bug awareness in the general public. The top findings from the survey are highlighted below:

1. **Almost all (97 percent) pest management professionals (PMPs) have treated bed bugs in the past year.** A majority say that overall bed bug service work (69 percent) and the prevalence of these pests (66 percent) is increasing.
2. **Bed bugs may be confused with other pests, as 84 percent of PMPs were initially contacted about a different type of pest before identifying them as bed bugs.** The majority of the contacts about these misidentified pests (71 percent) were about fleas, followed by cockroaches (28 percent).
3. **More than half of PMPs noted that they receive the most bed bug complaints in summer,** as increased travel during this time of the year may help spread bed bugs from vacation destinations or colleges to homes as students go on summer break.
4. **The top three places where PMPs encounter bed bugs are single-family homes (91 percent), apartments/condominiums (89 percent) and hotels/motels (68 percent).** However, PMPs also report encountering high numbers of bed bugs in a variety of other places like Nursing Homes (59 percent), Schools & Day Care Centers (47 percent), Office Buildings (46 percent), College Dorms (45 percent), Hospitals (36 percent), and Public Transportation (19 percent).



5. **Bites are the most commonly reported sign of an infestation (92 percent) and more than half of people reach out for treatment after discovering bites and welts on their bodies.** Although some people immediately develop a skin reaction, others may take two to three days before showing obvious symptoms or any at all, meaning that people could be unaware of a bed bug problem until they are forced to deal with a heavy infestation.
6. **Typically found in the cracks and crevices of bed frames and couches, bed bugs can also be found in:** stuffed animals, bedside lamps, alarm clocks, radios, wheelchairs, purses, backpacks, airplanes, school buses, and on and on.

When traveling, pack a small flashlight and thoroughly inspect the entire room before unpacking, including behind the headboard, under lights, and inside dressers, sofas and chairs. Pull back the sheets and inspect mattress seams and box springs, particularly at the corners for signs of bed bugs. Avoid placing luggage on upholstered surfaces or luggage racks with hollow legs where bed bugs may hide unseen. When arriving home from a trip, vacuum luggage thoroughly before storing it. Consider using a garment hand steamer, which can kill any bed bugs or eggs that may have traveled home. Wash and dry all clothes – even those that have not been worn – on hot cycles.

If you are faced with the unfortunate challenge of having to deal with a bed bug infestation, **it is recommended that you contact an experienced licensed pest management professional.** When working with a qualified professional, follow these simple steps to make bed bug work more efficient:

1. Clean, remove clutter, organize and vacuum
2. Follow directions and guidelines given by the professional and prepare correctly
3. If possible, report problems earlier, at the first sign or suspicion

Suggestions available for those that wish to go the do-it-yourself route can be obtained by contacting your local County Cooperative Extension Office. <https://www.uaex.edu/counties/default.aspx>

Bayer Closes Monsanto Acquisition

John D. Hopkins

Bayer successfully completed the acquisition of Monsanto on June 7, 2018 following the receipt of all required approvals from regulatory authorities. Shares in Monsanto, a U.S. company, will no longer be traded on the New York Stock Exchange, with Bayer now the sole owner of Monsanto Company. Monsanto shareholders are being paid 128 U.S.



University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

dollars per share. J.P. Morgan assisted Bayer with processing the purchase price payment for the largest acquisition in Bayer's history. Monsanto will operate independently from Bayer while Bayer completes the sale of some of its businesses to BASF. According to the conditional approval from the United States Department of Justice, the integration of Monsanto into Bayer can take place as soon as the above mentioned divestments to BASF have been completed. This integration process is expected to commence in approximately two months. Monsanto seed and other product brands (e.g. DEKALB, Asgrow, etc.) will retain their brand names and become part of the Bayer portfolio. While the company will be referred to as Bayer after the integration begins, the Monsanto legal entity structure will remain in place until a legal entity consolidation process can be completed. That process will take multiple years to complete. Liam Condon, member of the Bayer Board of Management, will lead the combined Crop Science Division when the integration commences. Until that time, Monsanto will operate independently from Bayer.

Forage Insect Pest Update

Kelly M. Loftin

Bermudagrass Stem Maggot (*Atherigona reversura*)

Bermudagrass stem maggot (BSM) populations are beginning to build in south Arkansas; but the population is still minimal in northern Arkansas and will likely increase as the season progresses. County faculty conducting BSM control demonstrations in the southern part of the state are beginning to experience populations that will allow for meaningful control demonstrations. In the northern part of the state, we will likely have to wait another three weeks or so. Multiple control demonstrations are either underway or planned for 2018.

In 2017, Terrell Davis (CEA – Staff Chair, Pike Co.) conducted a BSM control demonstration using our current recommendation for BSM management. His work demonstrated that a pyrethroid applied at the lowest labeled rate seven days after cutting a heavily infested field resulted in an approximate two-fold increase in dry matter. The treated plots were a bit more than double the height compared to the untreated plots. In Terrell's demonstration, the effect on yield and the abundance of damaged leaves of the treated versus non-treated plots was very apparent just prior to harvest.

Decisions on whether to treat or not treat for BSM is dependent upon when the damage occurs. For example, if damage occurs when the bermudagrass is near harvest, yield loss will be minimal (less than 10%). However, if damage occurs early in the regrowth stage, yield losses can be significant. Reports from Georgia, have noted yield losses of 80% in the later part of the season when the BSM population is at its peak.

History and Life Cycle

Range: The BSM, a native of Southeast Asia, was identified in Georgia in 2010 and in Arkansas in 2013. It has spread throughout the southeast and well into Oklahoma and Texas. The BSM has been identified in a few other states such as California, Pennsylvania, New Mexico and Virginia. In 2017, the BSM caused damage in bermudagrass fields in southern Missouri.

Identification: The BSM adult is very distinctive and much easier to find than the larvae. Full-grown BSM larvae are white cylindrical shaped maggots approximately 1/8 inch in length and occur in the

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

pseudostem of the plant. Damage from BSM larvae is readily apparent as it causes the top two or three leaves to yellow and die.



Bermudagrass stem maggot adult. The adult fly is small (~1/8 inch long) and yellow colored with four prominent black spots on the abdomen.



Bermudagrass stem maggot larvae (maggot). The maggot is also yellowish colored and about 1/8 inch in length when fully mature.



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

Life cycle: The adult female BSM lays an egg on a bermudagrass leaf. A first instar larva will hatch from the eggs in about two days or so. The newly hatched larvae will either slip or bore into the central whorl of the pseudostem and begin macerating and feeding on vascular tissue at the first node it encounters. Within a day or two of feeding, the first sign of damage occurs. After feeding begins, the affected leaves continue to deteriorate and die. Mature larvae exit the stem and moves to

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

the ground to pupate. When infested bermudagrass is mowed for hay, viable larvae will exit the stem and pupate in the soil. This results in a sizable flush of adults occurring 7-10 days after cutting.

Metamorphosis into the adult occurs about seven to ten days after pupation. The BSM puparium is barrel shaped and orange colored; and is found just beneath the soil surface. The life cycle from egg to adult requires about three to four weeks.

Management

The BSM is a pest of bermudagrass and stargrass, and their hybrids: other forage species are not impacted. Fine-stemmed bermudagrass varieties are more susceptible to BSM damage than coarse-stemmed varieties. Moderately grazed bermudagrass is less affected by the BSM than bermudagrass grown for hay. The population must build through the season for significant damage to occur. Generally, the BSM is a later season pest and seldom reached the abundance to cause damage at the first cutting. Damage can become apparent at the second or third cutting.

Surveillance methods for bermudagrass stem maggots include yellow stick traps for adults, recovering larva from infested stems or by sweep netting the grass for adults. Of these three methods, the most reliable for predicting the fly population in the field is sweep netting. One should also note that an infested bermudagrass field will appear frosted or bronzed and upon closer observation the top two or three leaves will be dead and brown.



Bermudagrass stem maggot damage. In heavy infestations, the field will look frosted or bronzed.

Management options for BSM management include harvest and appropriately timed insecticide applications. Factors that influence the degree of damage include variety, proximity to other infested fields, plant stress and fertility. Management to minimize plant disease pressure and maintain well-balanced fertility can minimize BSM damage and yield loss.

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

To avoid making an unnecessary insecticide application, the growth stage of the bermudagrass must be considered. In infested fields within one week of harvest (or 17-21 days into new growth cycle), cutting for hay followed by an insecticide application seven to ten days later is the best option. When significant damage occurs early in the growth cycle, cutting, even if harvest would be minimal, followed by an insecticide application seven to ten days after cutting may be required to prevent continued bermudagrass stunting.

Insecticide applications are aimed at the egg-laying flies only. Adult flies are easily controlled with pyrethroids as long as the canopy is not too thick. To control BSM maggots inside the pseudostem, a systemic insecticide would be necessary. None of the systemic insecticides currently labeled for pastures or hay fields are effective against BSM maggots.

Fall Armyworms

Fall Armyworms (FAW), *Spodoptera frugiperda*, have begun their annual appearance. We have had a few sporadic reports of FAW in lawns as well as pastures. Although I have not seen or heard of severe infestations like what we experienced in 2017 and 2016, but we are still early - it can still happen. We may begin experiencing FAWs at treatment levels from now through September. Hay producers are encouraged to begin scouting their field for armyworm presence. Signs of an armyworms infested field include: 1) field appears frosted, 2) presence of birds and 3) the odor of freshly mowed grass.

Someone recently asked “how frequent should we scout for FAW”. The best answer would be at least weekly and here is the why. Although the life cycle from egg to adult requires about one month, not all that time is spent as a caterpillar. During summer conditions, larvae go through the six larval instars in as little as 14 days. Within a week, newly hatched larvae should be at or near the third instar and at least 1/4 inch. For example, if you scouted a field last Friday and didn’t see any worms, by this Friday you could have readily visible worms. Our goal is to identify an infestation before worms get large enough to do considerably more feeding damage that would result in yield loss. Over the last few years, we have experienced overlapping generations making frequent scouting more critical. Remember the treatment threshold for FAW is three or more worms per square foot.

To scout for FAWs, carefully examine grass blades, stems and organic debris at plant base for armyworms. When conditions are hot be sure to dig around into the thatch to count FAWs that have sought shelter from the heat. It is best to take at least ten one-foot-square random samples across the pasture or hay meadow. Include a few areas of lush growth in your sampling because these are often preferred egg laying sites. Make note of the armyworm size and number as this will help make good management decisions. Large worms are more difficult to kill than smaller worms. Extremely large worms, near 1 ½ inch, have likely consumed about all they can eat and are about ready to pupate. Treating a population of 1 ½ inch worms will do very little to prevent additional yield loss and would be considered a “revenge” treatment providing very little benefit.

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.



Fall armyworm caterpillars.



FAW sampling square (1 square foot).

Insecticide application is usually necessary when three or more fall armyworms per square foot occur in a field. Remember that if the grass is mature enough, cutting for hay is a good option. Per-acre insecticide cost will vary from as low as about \$3.00 up to over \$12.00. When calculating cost, always consider the cost per acre and not the cost per gallon of product. Also, consider residual activity of the product, especially if you are seeing overlapping generations (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) have short-duration residual activity. In contrast, products such as Prevathon® (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. If the grass is mature enough, cutting for hay is a good option to avoid making an insecticide application. For additional information on armyworms see “Managing Armyworms in Pastures and Hayfields” and is available at: <http://www.uaex.edu/publications/PDF/FSA-7083.pdf> and the “2018 Insecticide Recommendations for Arkansas” at: <http://www.uaex.edu/publications/pdf/mp144/c-forages.pdf>.

Pistachio Panicle and Shoot Blight of Pistachio

Sherrie Smith

Pistachio Panicle and shoot blight of Pistachio is a serious threat to the Pistachio industry in some parts of the United States and overseas. It is caused by the fungus *Botryosphaeria dothidea*, a common fungal pathogen of many crops. Symptoms appear in mid-late spring as circular, black spots, 1-2mm in diameter, on leaves, shoots, and rachises. Black lesions develop at the base of shoots originating from infected buds. Leaves on infected shoots wither in 3-5 days. Petiole lesions kill individual leaflets and entire leaves. Dead leaves begin dropping by July. Clusters of elongated spots appear on the midribs of leaflets. Small, round, black, spots appear on leaf blades. As the season progresses, the spots



Pistachio Panicle and Shoot Blight of Pistachio

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

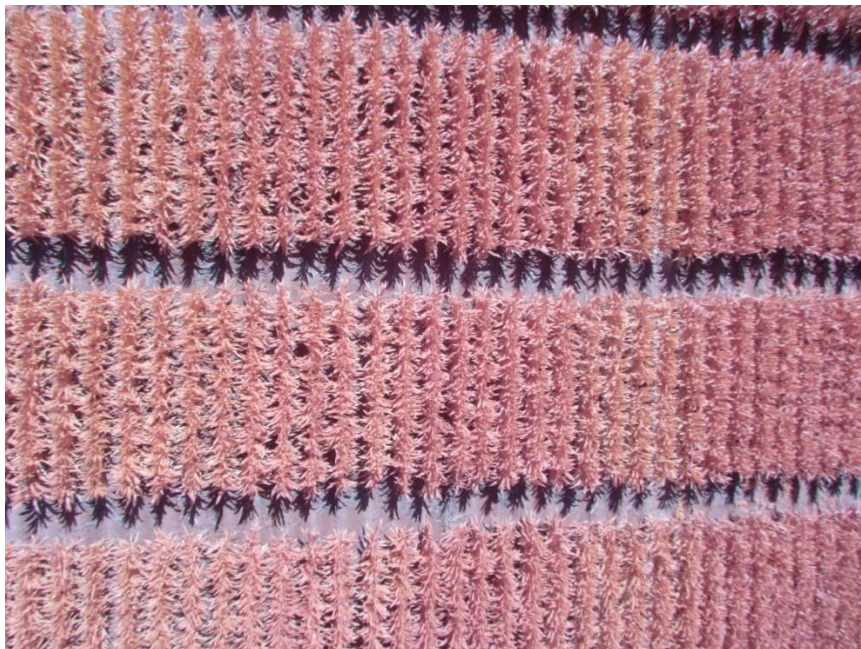
enlarge into irregularly shaped brown lesions, up to 15mm in diameter, surrounded by a diffuse, slightly chlorotic halo. The spots may coalesce into large tan blotches. Defoliation can be severe in late summer. A hundred or more tiny, black pin sized lesions may develop on the fruit. The fruit turns black as the lesions enlarge, Entire clusters may be damaged. Cankers can develop around bud scars and wounds. Control is best achieved fungicides, pruning, and irrigation management. Multiple applications of systemic fungicides are required in summer. One application of systemic at bloom improves the efficacy of the summer treatments. Prune infected parts 5cm below the blighted margins in late summer. Lower the sprinklers so the spray does not reach the canopy. Clean up fallen leaves.

'Drones' and Crop Monitoring

Jim Robbins

You've heard the buzz about 'drones' or small unmanned aircraft systems (sUAS) but then you ask the obvious question, "can I use them to monitor for plant problems (e.g. insects, diseases, nutrient deficiencies)"? The quick answer is 'YES' we can use sUAS for general crop monitoring just as you might have used imagery taken by a satellite, a low flying aircraft, or ground-based sensor system. The reason people are so excited about the potential of sUAS for crop monitoring is the affordable cost and the incredible resolution. As an example, a few years ago I contracted with a company to capture aerial images on a single day of a small farm for \$3,000.

Today, for the same amount, I can generate my own images in-house and repeat as often as necessary.



Near infrared (NIR) image of corn plots, July 16, 2013, Marianna, AR

While a great deal of research has been conducted using sUAS to monitor for a specific disease or insect, or to locate hot spots for weeds, the most frequently researched topic is a vegetative index of which NDVI (Normalized Difference Vegetation Index) is the most common. Within the next five years it is likely medium- to large-sized agricultural producers will operate their own sUAS to generate images for crop monitoring. Like any other business decision, it is critical for the agricultural producer to decide if it is better to own and operate their own equipment or rather to hire, on an as-needed basis, a third party provider to fly the aircraft and process the images. Users need to understand that they will need to invest in more than simply the aircraft and sensor. They will need an upgraded computer and appropriate software. As the research community delves into this deeper, it is likely that for specific row crops (e.g. corn, soybean) we will be able to monitor crops for a specific insect or

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.

disease issue. For today, simply knowing that an area within the production area is sending us a signal via remote sensing that something needs our immediate attention is still of tremendous value. There is no doubt that sUAS is an emerging technology that will play a critical role (i.e. inventory/yield/crop insurance; crop monitoring; asset tracking; sales/marketing) in the future of agricultural production.

Name That Weed

Bob Scott

This month's weed is an annual weed that develops as a basal rosette initially, eventually producing flowering stems that have a bottle-brush appearance. It is a weed of agronomic importance in vegetable, orchard, and nursery crops, and is distributed throughout the United States. In Arkansas, it is a weed of wheat and disturbed areas although it is easily controlled with herbicides and mowing. Unlike its name might suggest, it cannot be used for seasoning food to my knowledge and it is not in the family that is suggested by its common name. It is however a member of the mustard family. Be the first to email me at bscott@uaex.edu (use this link) with the correct common name and win a prize.



June 2018 PMN Weed of the Month #1



June 2018 PMN Weed of the Month #2

To The Readers

Please offer any suggestions for Urban or Livestock Integrated Pest Management topics (insect pests, plant diseases, weed problems, wildlife control problems) that you would like to see – **OR** – feel free to submit an article that you have prepared. Kelly and I will be glad to include it (subject to editing). Send feedback to jhopkins@uaex.edu or kloftin@uaex.edu

University of Arkansas, United States Department of Agriculture and County Governments Cooperating.

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer

The mention of any commercial product in this publication does not imply its endorsement by the University of Arkansas Cooperative Extension Service over other products not named, nor does the omission imply that they are not satisfactory.