Alabama IPM leaffooted bug update

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1 author:

C. Akotsen-Mensah
University of Ghana
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The Comprehensive Crop production & Crop Protection Newsletter from Alabama!

ABOUT THE NEWSLETTER

Welcome to Alabama Cooperative Extension System (ACES) where we are committed to providing you research-based information. The main purpose of this newsletter is to provide readers information about critical crop production and pest management information for field crops grown in Alabama. **This newsletter promotes sustainable agriculture, i.e., successful farming without depleting natural resources so future generations can have productive land for food production.** Currently, there are about 570 subscribers (as of April 2011) and many commercial websites that cross-post this newsletter online resulting in a wider readership. Readers can also download or view the newsletter at ACES website (www.aces.edu/go/128). There is a multi-institutional editorial board that works swiftly each week to electronically deliver the newsletter every FRIDAY during the summer months (typically from May to September). Research and Extension personnel from all educational institution in Alabama can submit crop production and protection articles of high relevance for immediate release to the audience; authors should pay attention to the guidelines for format and submission deadlines (Wednesdays) on the last page of this newsletter. Readers from States beyond Alabama should check with their university Extension before using any recommendation. To subscribe, please email a short request to bugdoctor@auburn.edu. Once your name is added to the list , you will get a welcome message from the IPM COMM Listserv.

Editorial Board:

Author guidelines are provided on the last page of this newsletter. Articles may be delayed for publication if they are not in the recommended format.

IN THIS ISSUE…

ALABAMA COOPERATIVE Extension SYSTEM
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LOVE YOUR SMART PHONE?
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- Vegetable producers & gardeners: 'ALABAMA VEGETABLE IPM'

For questions, call 251-331-8416.

Dr. A
ACES Extension Entomologist
bugdoctor@auburn.edu

BACTERIAL SPOT SHOWING UP IN CENTRAL ALABAMA

http://www.aces.edu/dept/peaches/peachipm/index.html

Signs of bacterial spot, leaf infections are showing up in orchards in Central Alabama. Mild temperatures and weekly rainfall have increased the incidence of this disease. Bacterial spot of peaches is caused by the bacterium *Xanthomonas arboricola*. Peach varieties vary in their susceptibility to this disease. Those moderately to highly susceptible are showing yellowing leaves and leaf shed. Right now leaf infection and premature shed is what I'm finding. I have not seen any early signs showing up on fruit (yet).

Many growers applied copper containing products earlier in the year to reduce the inoculum levels. Peaches are sensitive to copper applications when leaves are present. Reduced copper applications can be made in cover sprays, but care should be taken. Look at the rates and comments listed int he 2011 IPM Spray Guide. Multiple weekly applications copper during dry weather will build up and heavy dew or light rain will enhance leaf damage. Damage from copper and damage from bacterial leaf spot are often hard to distinguish between. At times I've seen the copper spots having a more purple coloration around them than bacterial spot which is often light yellow/ translucent. Both spots will generally drop out leaving a shot-hole look.

Robert Boozer
Extension/Research Horticulturist
boozert@auburn.edu

PLANT PATHOLOGY

MUMMY BERRY DISEASE IN BLUEBERRY

Dr. Elina Coneva, Extension Horticulturist, edc0001@auburn.edu
Dr. Ed Sikora, Extension Plant Pathologist, sikorej@auburn.edu

Mummy berry, caused by the fungus *Monilinia vacciniicorymbosi*, is an important fungal disease of blueberries that can cause yield losses of up to 50% when conditions are favorable for disease development. The pathogen can infect shoots, flowers (Figure 1) and fruit (Figure 2). The fungus overwinters in the previous year's berries that have fallen to the ground In early spring a mushroom-like spore cup emerges from the infected berries near the soil surface. Fungal spores are released from these structures when bud swell begins and green tissue is present. Spores are spread via wind and rain. Early detection and control is necessary to reduce the impact of this disease on a crop.

Figure 1. Mummy berry affected blueberry flowers

Figure 2. Shriveled blueberry fruit as a result of mummy berry infection

Symptoms and disease development

Early season infection of flower buds and stems is promoted by wet conditions and cooler then normal temperatures. The earliest symptoms of mummy berry include drooping of developing leaves and shoots in the spring followed shortly by browning of the upper side of bent shoots, midribs and lateral veins of leaves (Figure 3). The bend in twig tips can resemble a shepherd's crook (Figure 4).

Continued on page 4

Mummy berry disease continued…

Vegetative shoots, leaves and infected flowers are killed within four days after discoloration begins. After initial infection, the pathogen produces conidial spores that appear as tan-gray tufts on blighted shoots. Conidia are then dispersed by wind, rain and insect pollinators to healthy flowers. Once the fungus has been introduced to the flower, it will germinate with the pollen and infect the developing fruit. Evidence of blossom infection does not appear until the fruit begins to ripen. As normal berries ripen, the infected berries begin to shrivel and turn a pinkish color. Shriveled berries drop to the ground. Infected stems turn brown-to-black and infected foliage wilts and turns brown.

Figure 3. Browning along the major leaf veins

Figure 4. Bended twig tips symptoms resemble shepherd's crook

Control Strategies

An integrated pest management program including both cultural and chemical control strategies is needed for best results. For new orchards, select resistant varieties or late blooming cultivars, if available. Also avoid wet sites and/or improve drainage to reduce conditions that favor mummy berry development. Remove wild blueberries or unwanted plants from the vicinity of the orchard to reduce overwintering inoculum. If mummy berry is detected in an orchard try to remove or destroy infected fruit at the end of the harvest season; this could include covering mummies with at least 2 inches of soil or mulch. Limit or delay overhead irrigation until petal fall during the growing season. Follow a fungicide spray program that is effective for controlling mummy berry from green tip until petal fall.

For additional information see the Southeast Regional Blueberry Integrated Management Guide:
http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2010/2_19_10BlueberrySprayGuide.pdf
Apply all pesticides according to label rates and instructions.

SUSTAINABLE VEGETABLE PRODUCTION RESEARCH: BOTANIGARD ES, MOLT-X AND SUFFOIL-X FOR APHID CONTROL

The goal of this study was to evaluate the effectiveness of BotaniGard, Molt-X and Suffoil-X against aphids and caterpillars. This study was done only once (2010) at Brewton, Alabama, and the prolonged drought affected our planting time. Since plant stands were slightly off the target, I have excluded the yields from this short report (yields in small plots were statistically nonsignificant). Due to delayed planting, caterpillar populations never reached measurable levels but aphids were abundant (two species). All the three products are made or marketed by BioWorks, Inc. (NY) and they have a nice website that farmers can check to find out product details (click www.bioworksinc.com). BotaniGard ES is a living insecticide containing virulent spores of *Beauveria bassiana* fungus and it has activity against soft bodied insects including aphids, whiteflies and thrips. For organic producers, BotaniGard is actually available as Mycotrol-O with the same amount of fungal spore of *B. bassiana*. Molt-X, containing 3% azadirachtin (from neem), is an excellent insect growth regulator effective as foliar and soil insecticide. Molt-X is effective against aphids, thrips, whiteflies, and many caterpillars (it is best is to apply Molt-X against small caterpillars rather than big ones; do not use for controlling just the adult insects). Suffoil-X is basically a highly refined paraffinic oil with very little smell to it. Suffoil-X, being an oil, is very good at suffocating small insects (aphids, whiteflies, scales, etc.) and mites. Homeowners can actually buy BotaniGard wettable powder for home usage from Bioworks. BotaniGard, Molt-X and Suffoil-X were used in various combinations as shown in the table below. Aphid numbers on November 22 were significantly different among the combinations versus the untreated check. It appears that the products offer flexibility for application as tank-mixes. Based on aphid numbers on November 22 (highlighted in yellow in the table), it appears that having Suffoil-X in the insecticide rotation improved aphid control. No phytotoxicity was observed in collards. Visit the company website to learn more about new sustainable pest management choices and try them on small scale to gain more experience about using them correctly. If you use a backpack sprayer with flexible boom, make sure you treat the underside of leaves and at plant bases so that you can extend the persistence of alternative insecticides under hot and humid conditions that prevail in Alabama. Scout crops and correctly identify the target insect pests.

		APHID NUMBERS			
Treatment	**Mean Yield (lb/plant)**	**Obs. 1 (Nov. 10)**	**Obs. 2 (Nov 22)**	**Obs. 3 (Nov 29)**	**Obs. 4 (Dec 6)**
Untreated Check	0.15 ± 0.01	0	31.5 ± 18.8 a	108.00 ± 194.81	40.00 ± 73.48
Mustang Max (Chemical std.)	0.13 ± 0.01	2.5 ± 5.0	0.25 ± 0.50 b	0.75 ± 1.50	0
BotaniGard & Molt-X rotation every 5-7 days	0.15 ± 0.02	0	4.75 ± 9.50 b	3.75 ± 7.50	0
BotaniGard mixed with Molt-X, rotated with Molt-X every 5-7 days	0.13± 0.01	0.5 ± 1.0	5.75 ± 10.21 b	0	0
BotaniGard rotated with a tankmix of Molt-X+Suffoil-X every 5-7 days	0.14 ± 0.01	1.0 ± 2.0	0 b	0	0
BotaniGard mixed with Molt-X, rotated with Suffoil-X every 5-7 days	0.13 ± 0.01	0	0 b	0	0
ANOVA	F = 1.9, df = 5, P = 0.131	F = 0.7, df = 5, P=0.581	F = 6.6, df = 5, P = 0.001	F = 1.2, df = 5, P = 0.345	F = 1.1, df = 5, P = 0.355
RESULT	NS	NS	***	NS	

Dr. A
ACES Extension Entomologist
bugdoctor@auburn.edu

ENTOMOLOGY

VEGETABLE INSECT PEST UPDATE

Last week I mentioned about the stink bug and vegetable weevil activity in AL. Here are some more details.

Scouting for vegetable weevil (pictured on right): This is a cool season pest and should go away as the heat levels rise in Alabama. The grubs live in soil, feed on leaves buds, roots, etc., and drop to the ground to pupate. Dig around the base of plants (random sampling at several locations within a large field) and look for all the caterpillars that emerge. Pest invasion could occur from one side of your field. Grubs of vegetable weevils are legless with numerous folds in their skin that are used for crawling on leaf surfaces. Head of the grub is brown and body is creamish (translucent grubs could be hard to see sometimes). You can seek help from a Regional Extension Agent for insect identification if you bring host plant and insect samples in good condition. There is only one generation of the vegetable weevil and all weevils you see on crops are females.

Scouting for stink bugs: There are numerous species of stink bugs, but remember not all are bad (there are some predatory stink bug species). To look at some common stink bugs and their immature stages, click here for the ACES Timely Information. Use a sweep net to catch adults or examine the whole plants; scout in the mid-morning hours. Scouting on a hot day should be avoided since pests usually seek shelter from the hot sun and they may be difficult to find. Scout more intensively when it gets closer to flowering stage of tomatoes (central and north AL) and during the green fruit formation stage (south AL). Black specks or discolored areas on developing tomato fruits could indicate stink bug feeding. Conventional tomato producers should turn to 176 of the Southeaster U.S. Vegetable Crop Handbook 2011 to look for chemical control that work to a limited extent. Having an intense chemical schedule on a trap crop to concentrated the stink bugs may work under low to moderate pest pressures. Research is underway in Alabama this year to understand complexities of the trap cropping system in vegetable production. Keep reading this newsletter for more info.

Since I am traveling to another destination today and running out of time, I am going to put a series of images I captured during crop scouting this week at various vegetable fields and hope that you will be able to identify the pest on your crop. For control measures in home vegetable garden, consult the ACES publication **IPM-1305**. For commercial producers, consult the 2011 edition of the **SE Vegetable Crop Handbook**.

Cross stripped cabbageworm: A persistent attacker of Brassica crops. Loves collards and chews irregular holes in the leaves. Early instars may feed in small groups and many larvae could be seen underside of leaves. If you have collards now with abundance of caterpillars, harvest early or timely to avoid extensive loss of foliage.

Imported cabbageworm (cabbage butterfly): Loves a variety of leafy vegetables. Larvae have smooth body and feed slowly along major leaf veins and midrib. Could not get a better shot of the insect with my small Nikon camera, but go online and see better pictures.

Diamondback moth: Seen in the picture on left is a diamondback moth larva (top) with three cross stripped cabbageworm larvae at the bottom of the photo. Diamondback moth larvae have sort of a tapering green body and often seem to lay stretched on leaves. Can completely defoliate plants if not controlled. The adult moth is a quick flier and may be seen flitting around host plants even during the evening hours.

Squash bugs are very active and can be found mating and egg laying in young squash plantings. Eggs are elliptical and laid on the undersurface of leaves in small batched. More on this in the next issue.

- Article by Dr. A, bugdoctor@auburn.edu

LEAF-FOOTED BUG UPDATE FROM CENTRAL ALABAMA

By Clement Akotsen-Mensah, Research Associate (AU Entomology), akotscl@tigermail.auburn.edu
Joseph Anikwe, Visiting Scholar (AU Entomology)
Henry Fadamiro, Associate Professor (AU Entomology)

Leaf-footed bugs (Hemiptera: Coreidae: *Leptoglossus* spp.) are emerging pests of a wide range of crops in the southern United States, including cotton, tomato, peach, citrus, watermelon, corn, pecan and eggplant because they are polyphagous (Xiao and Fadamiro 2008). Fadamiro et al. (2008) reported two species of leaf-footed bugs in southern Alabama, *Leptoglossus phyllopus* and *L. zonatus* (Fadamiro et al. 2008) and peaches in central Alabama (Akotsen-Mensah et al. unpublished). *L. zonatus* can be distinguished from *L. phyllopus* by the presence of two large whitish-yellow spots on the anterior portion of the pronotum (Fig. 1). Furthermore, there is a zigzag white band across the wings of *L. zonatus*, whereas *L. phyllopus* lacks the spots and has a straight white band (Fig. 1). Fadamiro et al. (2008) reported that *L. zonatus* is the predominant leaf-footed bug species on Satsuma mandarin in southern Alabama. However, the species composition of leaf-footed bugs in other parts of Alabama has not been studied. The results of a recent study conducted at the E.V. Smith Research Center in Tallassee, central Alabama to evaluate potential trap crops for managing plant bugs in peaches (Fig. 2) showed that *L. phyllopus* is the most important species. Of all the total leaf-footed bugs collected in the winter trap crops (hairy vetch, winter peas, oats, wheat, and rye) from March to end of April by using sweep net and visual observations, more than 96% were *L. phyllopus*. This suggests that *L. phyllopus* is probably the dominant leaf-footed bug species in central Alabama where peaches, cotton and tomatoes are mostly grown.

Our field observations also suggest that there are some predators that could contribute significantly to the natural mortality of leaf-footed bugs in central Alabama. We hope that our ongoing research will help identify effective trap crops and other strategies for management of leaf-footed bugs and stink bugs in fruit and vegetable crops in Alabama.

Figure 1. *Leptoglossus phyllopus* (left) (note the absence of two large whitish-yellow spots on the anterior portion of the pronotum) and *L. zonatus* (right) (note the zigzag white band across the wings). *L. phyllopus* were collected in trap crop plots at the E.V. Smith Research Center. *L. zonatus* were collected in Satsuma orchard at the Gulf Coast Research and Extension Center, Fairhope

Figure 2. Layout of trap crop plots at a 4-yr old peach orchard at E.V. Smith Station Research Center.

For references cited in this article, please contact the first author at the email provided.

THE 13-YEAR CICADA EXPECTED TO MAKE AN APPEARANCE

It has been 13 years since Alabama experienced the swarm of the cicadas in Alabama. The last time the 13-year periodical cicada made a spectacular appearance was in early May 1998.
Alabama recorded having 2 cicada broods: XIX and XXIII. Broods are various populations designated by Roman numerals so scientists can refer.
Based on the records of the past results at Alabama Agricultural Experiment Station, the periodical cicada that will emerge this year is known as Brood XIX.
Brood XIX is the primary and biggest brood that we have in Alabama, which is a southeastern brood that ranges west into Louisiana and north into Illinois and southern Iowa. Brood XXIII primarily lives west of Alabama.
Cicada brook XIX is often referred to as 13-year "locus", because the adult cicadas mass emerge from ground, precisely on schedule, every 13 years by millions.
The cicadas emerge at nights in later April or early May, and only live about 5-6 weeks. You may see numerous nymph skins on tree trunk, twig, and leaf. They prefer to lay eggs in branches about the size of a pencil. Females cut into the underside of the branch and lay their eggs in it. The egg-loaded branches often wilt and fall on the ground.
The eggs hatch out nymphs, which are wingless and drop to the ground.
Nymphs dig into ground, begin a journey of 13 years in the soil quietly and unseen. Nymphs have sucking-mouth and feed on sap of roots of trees and plants. Fried nymphs made a great tasty, high protein value dish on table.
After the 13-year growth, winged adult cicadas emerge out, climb onto trees, and sing extremely loud and incessant from morning to dusk, declaring their appearing after 13-years hiding under ground and calling for mates. Only males sing, females are mute and voiceless.
Cicadas are basically harmless, except the egg-laying damages to twigs and stems of trees and shrubs. Whether you like the cicada "song" or dislike the "noise" is up to your judgment.
The next occurrence will be in 2024.

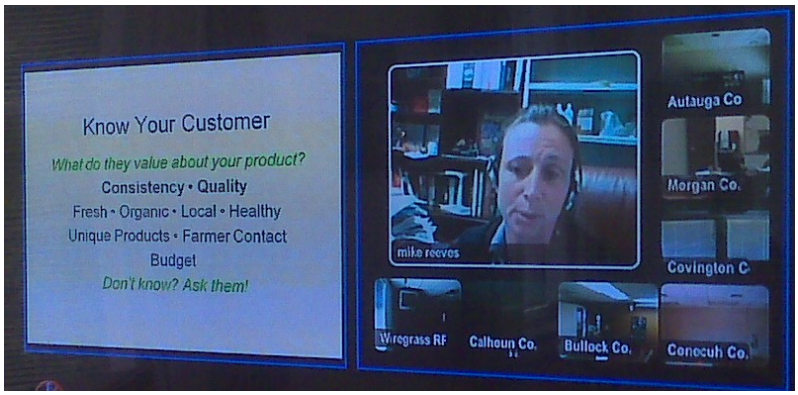
Related articles:
Hyche, L.L. 1998. Periodical cicada's ("the 13-year locusts") in Alabama. http://www.ag.auburn.edu/enpl/bulletins/cicadas/cicadas.htm

Hyche, L.L. 1998. The "Locust" (13-year periodical cicadas) Are A-coming. http://www.aaes.auburn.edu/comm/pubs/highlightsonline/spring98/cicada.html

-Article By Dr. Xing Ping Hu, Extension Entomologist,
huxingp@auburn.edu

To hear a story on NPR about cicada emergence in Washington, D.C., click here and listen to the 7 minute audio program. You may find it very interesting.

NEWS AROUND THE STATE



FRUIT & VEGETABLE EXTENSION WEB CONFERENCE- SLIDESHOWS & VIDEO NOW AVAILABLE ON ACES

If you missed the 3rd Annual Fruit & Vegetable Web Conference (May 4th—shown in picture above), you can download and review eight presentations from various authors on the Web conference archive. Click on www.aces.edu/go/25. You can also see a full recording of the meeting using a link on the bottom of the webpage. For direct links to presentations click on the presentation titles listed below. You will need QuickTime software for watching video.
Here are the presentations (click to see content):
Vegetable insect pest outbreaks and management recommendations
Diagnosing cucurbit yellow vine decline
Do's and don'ts of hoop house crop production
Peach pest issues and updates
Basics of organic gardening
Emerging pests in blueberries and grapes
Strategies for marketing local and organic produce
Pecan market and outlook

In a few days, I will send you a link to an electronic event quality and impact survey. I will appreciate if you respond to it after viewing the presentations or video. Our coursecast (Panopto live stream) was unavailable during the event on May 4th that left out some audience from participating. This was a technical error and I apologize for the inconvenience. For questions, please feel free to call 251-331-8416.

- Article by Dr. A, bugdoctor@auburn.edu

TIMELY INFORMATION FROM ALABAMA COOPERATIVE EXTENSION

Did you know that you can read many useful articles on immediate crop and health concerns on the ACES 'Timely Information' Website? Go ahead and read about recently posted long articles based on your interest. Click on the links below and download the PDF documents. Call or email the authors for more information, if needed. Good luck!

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Plant pathology articles: http://www.aces.edu/timelyinfo/PlantPathology/PlantPathology.php
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For various other series, go the general website and click on the topic of your choice to see a full archive of important stories. Click http://www.aces.edu/timelyinfo/archive.php

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CALL FOR EXTENSION ARTICLES

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Articles should be written in easily understandable format; short articles will facilitate rapid reading by audience who typically scan publications for information. Long technical articles will not be published in newsletter unless it is a key story. The editor reserves the right to modify articles to fit newsletter format without affecting the technical details. Announcements for upcoming events is also published in the newsletter.

Suggestions for improvement: Editorial board is always open to suggestions. Please email or call 251-331-8416 to provide your input to the Editorial board.

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