NC STATE UNIVERSITY COLLEGE OF AGRICULTURE & LIFE SCIENCES

North Carolina Pest News

Departments of Entomology and Plant Pathology

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CAUTION !

The information and recommendations in this newsletter are applicable to North Carolina and may not apply in other areas.

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In This Week's Issue . . .

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FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

Weather Trumps Cotton Insects

With our **extremely high temperatures** and lack of moisture for many, this been a rough week for cotton producers. The conditions here must be similar to growing cotton in Arizona, but without irrigation.

Where we have spent the past three days in the upper northeast part of our cotton production region and in Wilson County yesterday afternoon, we have had difficulty finding more than a couple percent damaged bolls due to **stink bug feeding**. However, some consultants in this and other areas have been reporting higher damage in scattered fields, some over threshold. Much of our cotton acreage is either already at or approaching the third week of blooming and thus is entering the window of maximum susceptibility to stink bug damage, so this is the time to pay attention for possible stink bug damage. Just as reminder, in the Southeast, we recommend that producers and scouts use a 10% internal damage threshold to quarter-sized bolls during weeks 3 through 5 of the bloom period. Although this threshold appears on the protective side, extensive research in the Southeast has confirmed that it makes sound economic sense. On one hand, yield potential is presently on the low to moderate side in many areas of the state, perhaps justifying raising the threshold somewhat. On the other hand, the relatively high price of cotton probably pushes recommended thresholds in the other direction to a lower, more protective range. All in all, we recommend that producers stay with the recommended dynamic threshold of 10% boll damage for weeks 3 through 5 of the bloom period.

The major **bollworm moth flight** should just now be reaching our middle counties (in the range of Sampson, Cumberland, Jones, Duplin and Onslow counties or somewhat above this area). Still as recently as yesterday, several light and pheromone traps (including Tyrrell County), have shown low moth levels. However, as I was reminded today, some producers and consultants have long observed that corn earworm (aka cotton bollworm, soybean podworm, tomato fruitworm, etc.) pupae can essentially go into a “holding pattern” in the soil and delay emergence until rainfall. Perhaps this helps explain why, despite the unusually hot weather and associated heat units, the flight has not yet overspread our whole state. If not already underway, this would be a good time to begin scouting for bollworm escapes from WideStrike and Bollgard II cotton. Recall that we do not count newly hatched first instar bollworms as many of these have not had a chance to feed upon the *Bt* proteins. Look for the survival of 3 second instar bollworms of 1/8-inch or larger per 100 fruit. Be sure to include “bloom tag bolls” (Fig. 1) in your counts in the same proportion as their occurrence with squares and small bolls. *Bt* toxins are not as well expressed in flower tissue and both white and dry flowers are an ideal target for bollworm egg lay, especially during dry weather. This is where bollworm larvae often get their start. With our very dry weather over most of the state, bloom tags are very abundant in most of our cotton acreage this week. The efficacy of pyrethroids for bollworms generally appears to be higher on *Bt* cotton than for podworms (same species) on soybeans.

At our cotton scouting schools in Halifax County on Tuesday and at the Wilson/Edgecombe/Nash County meeting in Elm City on Thursday afternoon, we found scattered cotton plants with high levels of **cotton aphids** at the edge of cotton fields. On the positive side, several species of ladybird beetle larvae were abundant and feeding on the aphids, but, more importantly, aphid mummies were also present (Fig.

2). This was good opportunity for those in attendance to observe effective biocontrol of this occasionally-damaging pest.

Fig. 1. "Bloom tag boll" with damage and third instar bollworm. Image by Jack Bacheler.

Fig. 2. Cotton aphids, cast skins (white), aphid "mummies" and aphidiid parasitic wasp. Image by Dan Mott.

From: Dominic Reisig, Extension Entomologist

Stink Bug or Drought-induced Injury on Corn?

I visited a corn field last week in Tyrrell County, between Columbia and Gum Neck with the county Extension agent Frank Winslow. It was reportedly so stink bug-damaged that the grower was looking for a silage buyer. This field was surrounded on both sides by wheat and after the wheat was harvested, the stink bugs moved into the corn *en masse*. Unfortunately it was difficult to disentangle what was caused by stink bugs and how the lack of water might have affected the corn (Figs. 3-7). The following link (http://agcrops.osu.edu/specialists/corn/specialist-announcements/AbnormalCornEarsPoster_000.pdf) is to a poster on "abnormal corn." Tell me what you think on my blog at http://www.nccrops.com/?p=219.

Fig. 3. The discolorations are tissue that has been broken as a result of stink bugs puncturing through the leaf sheath that contained the ear. Image from Dominic Reisig.

Fig. 4. Here is the discoloration on the outside of the sheath. Image by Dominic Reisig.

Fig. 5. The cause of these multiple ears is unknown to me. It is possible that the expression of this was caused by stink bugs (notice the staining from punctures inside the sheath). Perhaps stink bugs fed on this ear at a critical point in development to cause this. However, this is not the typical "banana ear" symptom. Image from Dominic Reisig.

Fig. 6. This ear was likely a victim of stink bug injury combined with poor-pollination as a result of drought. Image from Dominic Reisig.

Fig. 7. My guess is that this tiny little ear was a result of drought-stressed corn. Image from Dominic Reisig.

Lesser Cornstalk Borers versus Threecornered Alfalfa Hoppers in Soybeans

We've seen the symptoms of the lesser cornstalk borer (Fig. 8) for nearly a month now (see blog post "http://www.nccrops.com/?p=130" on July 11, 2011). However, the hot and dry conditions, as of late, have favored its development, especially in the Coastal Plain. Jim Dunphy, Extension Soybean Specialist at North Carolina State University, and I have been diagnosing these fields. If you have it, how do you know and what can you do about it?

Some of what both Jim and I have been seeing is a result of threecornered alfalfa hopper. According to Jim, this sort of injury has been more prevalent in the Piedmont while lesser cornstalk borer injury has been more prevalent in the Coastal Plain. This makes sense, as lesser cornstalk borer development is favored by hot and dry conditions and it seems to injure soybeans more on droughty soils. I have seen threecornered alfalfa hopper injury in the Coastal Plain as well, though. So how do you know what you have?

Threecornered alfalfa hopper injury typically occurs as a girdle around the stem above the soil line (Fig. 9). This likely occurred when the plant was small (less than 10 inches). These insects will continue to feed as the plants grow, but will feed on and injure petioles on the main stem. This can block the vascular tissue of the beans, causing indirect yield loss. More often, loss is direct when plants lodge during harvest. The breaking point from the lodge is often a distinct and clean break.

Fig. 8. Lesser cornstalk borer larvae. Image from D. Reisig.

Fig. 9. Threecornered alfalfa hopper injury. Image from David Adams, University of Georgia (http://www.bugwood.org).

Lesser cornstalk borer injury is found near their place of feeding, at or below the soil surface. Sometimes you can see the feeding galleries (Fig. 10), if you pull back the base. This lodging that results from these pests is usually irregular and at the soil surface.

Fig. 10. Peeling back the bark of the soybean stem can sometimes reveal the tunnels and girdles resulting from this pest. Image from Dominic Reisig.

If you have threecornered alfalfa hopper injury, the damage is probably already complete. Plant compensation when soybeans are over 10 inches tall will generally suffice to maintain yield, unless population densities are extremely high. Next year, scout soybeans under 10 inches tall and use a pyrethroid insecticide spray if densities exceed one per sweep.

If you have lesser cornstalk borer injury and even if you have lesser cornstalk borer larvae present, a remedial treatment will be ineffective. Things that can be done next year include avoiding "droughty" soils, planting a resistant variety (see the links in this post at http://www.nccrops.com/?p=130 on July 11), burning weeds down two weeks prior to planting, and incorporating a granular in-furrow application of Lorsban or a directed in-furrow spray of Lorsban at planting.

FRUIT AND VEGETABLES

From: Emma Lookabaugh, Plant Disease and Insect Clinic

My Tomato Plants are Wilting . . . and Then They Die!

Every summer the Plant Disease and Insect Clinic at North Carolina State University receives samples from clients who tell us that their tomato plants "wilt and then die." This can be very discouraging for a home gardener, and devastating for a commercial grower who has a field of plants going down. If you observe these symptoms (Fig. 11), be prepared for some bad news!

Fig. 11. Tomato wilting symptoms. Image by F. J. Louws.

In the Piedmont and Coastal Plain regions of our state the most common cause of wilting and death in tomatoes is bacterial wilt. The destructive pathogen *Ralstonia solanacearum* is able to wipe out home gardens and whole fields of tomatoes. It also attacks many members of the nightshade family: tomatoes, peppers, potatoes, and eggplant, along with zinnias, geraniums, sunflowers, and marigolds. Ralstonia causes Granville wilt in tobacco (also a relative of tomatoes), the subject of some of the earliest work on plant diseases at North Carolina State University. A bulletin published in 1903 warned growers that curing Granville wilt was "hopeless."

The most obvious symptom of bacterial wilt is wilting, followed by sudden collapse of the entire plant (Figs. 12 and 13). Basically, bacteria plug up the water conducting tissue in the stem. The plant is unable to transport water from the soil to the leaves and the plant wilts and dies.

Ralstonia can survive in most soils for years without a host present. When susceptible plants are planted in infested soil, it is only a matter of time before the plant becomes infected. A heavy rain or watering can help bacteria move through soil to the roots of susceptible plants. A few large black roots are often found where the infection got started (Fig. 14). This is especially evident in infected tobacco plants.

If you suspect bacterial wilt, there are quick and easy diagnostic checks you can do yourself. The first thing you need to do is check for vascular browning inside the stem (Fig. 15). Tomato stem tissue should

be very light green. The easiest way to check for vascular discoloration is to cut the stem, as shown in the image above (Fig. 16).

Fig. 12. Tomato collapse. Image by F. J. Louws.

Fig. 13. Burley tobacco wilting. Image by H. D. Shew.

Fig. 14. Black roots where the infection took place. Image by H. D. Shew.

Fig. 15. Tomato stem. Note the brown discoloration. Image by M. J. Munster.

Fig. 16. Vascular browning. Image by E. C. Lookabaugh.

Next, check for bacterial ooze. The easiest method is to cut the stem off at the base. Take the stem cutting and hang it over a glass of water (Fig. 17). After a few minutes, you should be able to observe a cloudy stream of bacteria oozing from the cut tissue (Fig. 18). It is very important not to disturb the glass of water during the test.

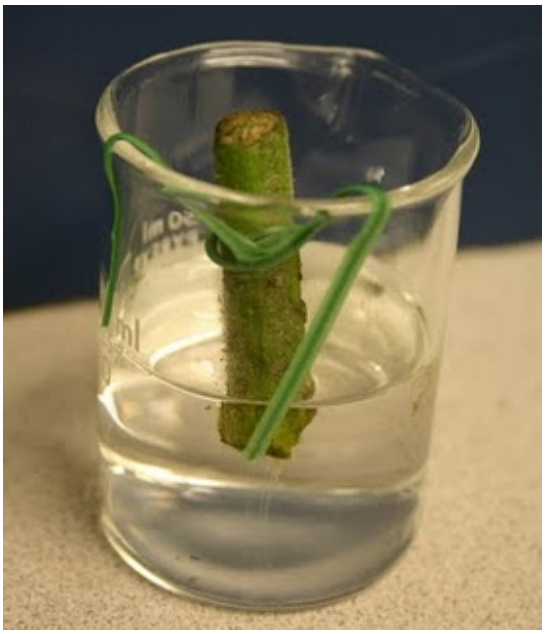

Fig. 17. Bacterial stream test. Image by M. J. Munster.

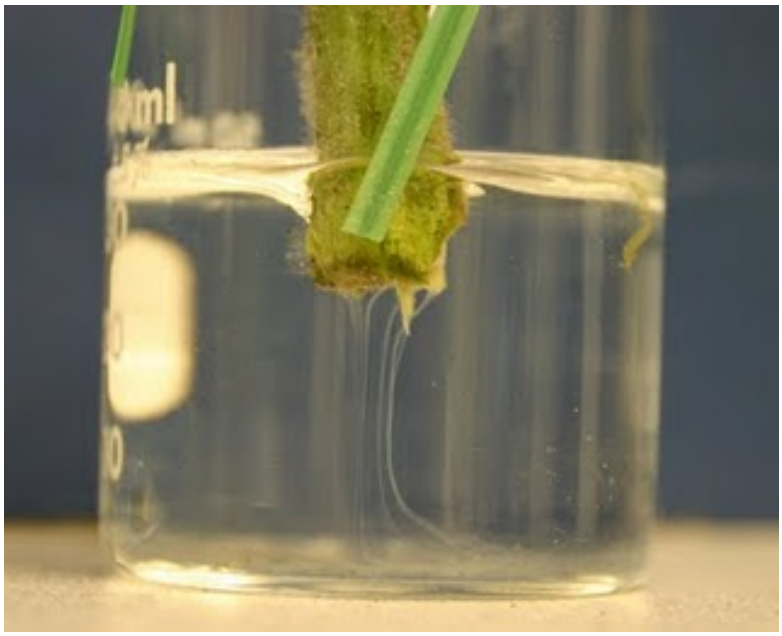

Fig. 18. Note white bacterial streaming. Image by M. J. Munster.

Sometimes, it can be hard to see the bacteria. If you have access to a microscope, take a thin slice of brown vascular tissue and place it in a drop of water on a glass microscope slide (Fig. 19). Make two straight cuts across the tissue (cutting the tissue into three pieces). Put a cover slip on top and look through the microscope using the 10x objective. Within seconds, you should be able to see dark brown plumes of bacteria oozing from the slices (Fig. 20).

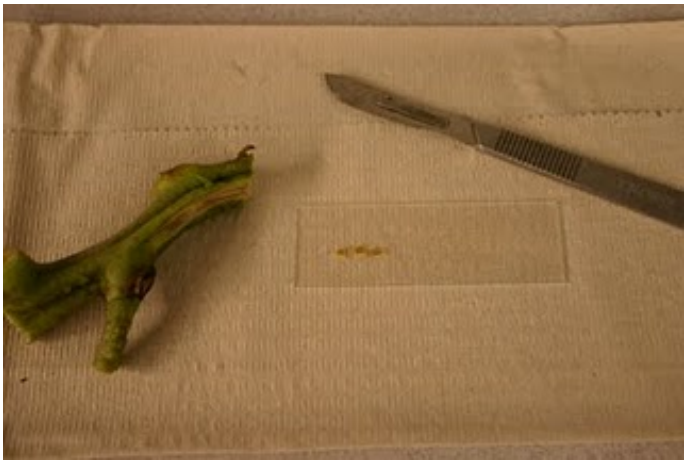

Fig. 19. Slice vascular tissue on glass slide. Image by E. C. Lookabaugh.

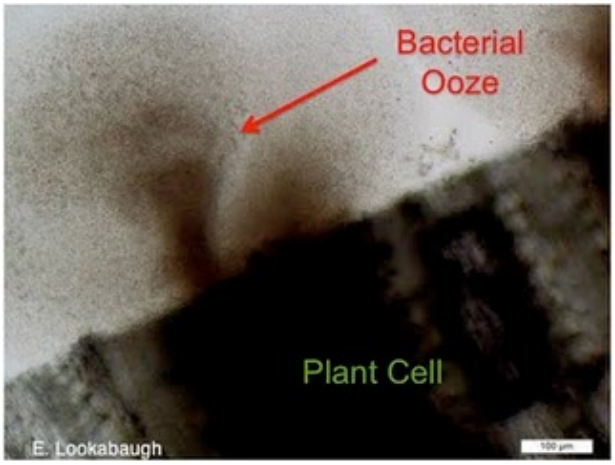

Fig. 20. Micrograph of bacterial ooze. Image by E. C. Lookabaugh.

If you don't see any bacteria (Figs. 21 and 22), then you probably don't have bacterial wilt. Fusarium wilt can cause vascular browning and is common in the Piedmont. Most modern varieties of tomatoes are resistant to Fusarium wilt, but we see it often in heirloom varieties. Southern blight or high soil salts are other potential causes of browning. Another wilt disease, Verticillium wilt, is present in many mountain areas, and has other distinctive symptoms.

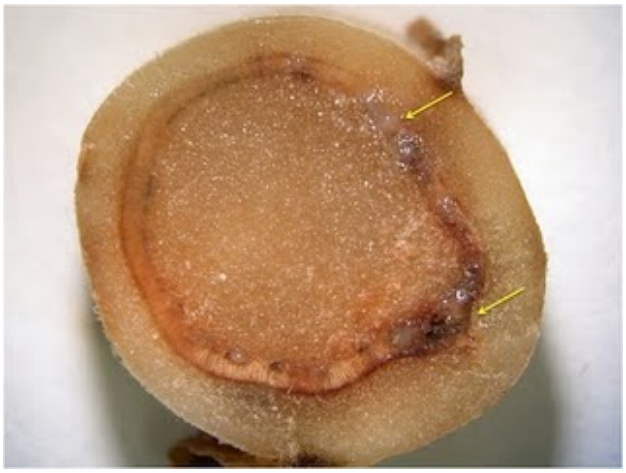

Fig. 21. Arrow pointing to bacterial ooze on tobacco stem. Image by H.D. Shew.

Fig. 22. Arrow pointing to bacterial ooze on tomato stem. Image by E.C. Lookabaugh.

Much as in 1903, if your plants have bacterial wilt, there is nothing you can do to save them. Infected plants will not recover and should be removed and destroyed. Replanting with new plants will not solve the problem because they will likely become infected and die too. The bacteria can persist in the soil for years, so it is best not to plant susceptible plants back into that area. Rotation with non-host plants, for example, sweet corn, for at least three years is recommended.

Growing tomatoes in containers with potting soil is one option if your garden is infested. Be sure that the containers are not in contact with the native soil and be careful not to spread infested soil to new locations.

For commercial growers, some soil treatments and the use of resistant rootstocks and grafting can be an option for the following year. More information on root grafting can be found at the following web site: http://www4.ncsu.edu/~clrivard/TubeGraftingTechnique.pdf.

For a look at the history of the Department of Plant Pathology and Granville wilt in North Carolina agriculture, see http://www.cals.ncsu.edu/plantpath/FromLabtoField.pdf.

See the NC State University Plant Disease and Insect Clinic Blog at http://ncsupdicblog.blogspot.com.

From: Jim Walgenbach, Extension Entomologist

New Website to Report Brown Marmorated Stink Bug Sightings in North Carolina

Most people are probably aware of the brown marmorated stink bugs (Fig. 23) and its recent invasion of North Carolina. This is an invasive pest of Asian origin that was first detected in the U.S. in Allentown, Pennsylvania in 1998. In 2010, brown marmorated stink bug populations developed to extremely high densities in the mid-Atlantic region of northern Virginia, eastern West Virginia, Maryland, Delaware, and south central Pennsylvania, causing unprecedented damage to a diversity of crops, including apples, peaches, caneberries, tomato, pepper, corn and soybeans. Indications are that this pest is again present in high densities this season in the mid-Atlantic region, with significant crop damage already occurring.

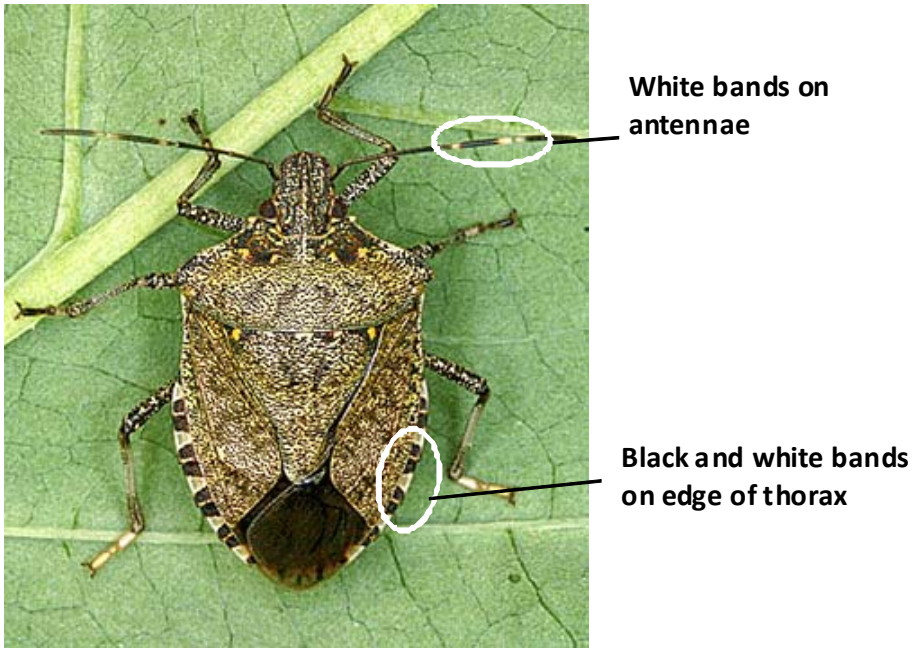

Fig. 23. Brown marmorated stink bug. Image from Jim Walgenbach.

The brown marmorated stink bug is known to be present in many areas of North Carolina, but damaging populations have not been reported in agricultural crops. Most sightings have been in residential areas (in homes and on trees and shrubs). To gain a better understanding of the distribution of brown marmorated stink bugs in North Carolina and the potential threat to agricultural crops, a new website is now operating to report sightings of brown marmorated stink bugs in North Carolina. The web site includes several questions as to the location, site (tree, agricultural crop, building, etc.) and time of day the bug was observed, as well as an option to download a picture to verify its identity, and information on where to send specimens for identification. There is also a map of the location of positive identifications in the state, and this will be updated weekly. Only positive ID's based on submitted photos or specimens sent in will be posted on the map. While the brown marmorated stink bug has distinctive features that distinguish it from most of the native stink bugs encountered in North Carolina, to the untrained eye these differences may not be apparent.

To learn more about the brown marmorated stink bug and to report a sighting in North Carolina, go to http://www.ces.ncsu.edu/fletcher/programs/apple/entomology/BMSB/index.html.

ORNAMENTALS AND TURF

From: Emily K. Meineke, Graduate Student, Department of Entomology, and Steve Frank, Extension Entomologist

Drought and Fertilizer: How Two Mainstays of Summer Bring in the Bugs

In the middle of the hot summer, insect populations build to increasingly damaging levels. Pest control becomes harder this time of the season, and two key little-known issues arise for herbivorous insect control.

Drought: Plant stress due to heat and drought can lead to higher herbivore numbers, especially if that stress is intermittent. For example, let's say you have a shrub, and aphids really like that shrub. You do not water it regularly, and the plant lives outside in the heat of the summer. The weather has stayed dry for a while, and your shrub is starting to stress. Sap feeders like aphids do not usually respond well to drought, because plant sap is powered by turgor pressure, and the sap must move for them to eat. No rain, no food. However, leafy plants produce more nitrogen in times of stress. Your dry, stressed plant produces tons of nitrogen and then (viola!) it rains. The aphids suddenly have everything they need to produce tons of baby aphids.

Fertilizers: Nitrogen fertilizers are generally applied to improve plant growth and help them cope with biotic and abiotic stresses. However, although maintaining plant health is the first line of defense against herbivore attack, trees that are over fertilized are often more vulnerable. This occurs by improving plant nutrition for herbivores. Just as nitrogen is essential for plant growth, it also increases herbivore growth. Therefore, plant tissue that is high in nitrogen due to fertilization makes herbivorous pests grow faster and reproduce more. Fertilizer also benefits herbivores by reducing plant defenses. This happens because nitrogen stimulates rapid plant growth which requires all the carbon fixed through photo-synthesis to be used for plant tissue instead of defensive chemicals. Therefore, plants do not build chemicals toxic to herbivores or chemicals that attract natural enemies such as parasitoids to help defend themselves. Therefore, be sure to calibrate fertilizer application equipment, and do not apply more fertilizer than is recommended or necessary to maintain plant quality.

From: Steve Frank, Extension Entomologist

Rose Aphids

Rose aphids, *Macrosiphum rosae*, are active on Knock Out rose bushes on campus. So far populations are small but as with other aphids they reproduce rather rapidly. Fortunately, I find live aphids and parasitized aphid mummies in almost equal numbers. This and other natural enemies such as lady beetles, minute pirate bugs, and syrphid flies generally prevent rose aphids (Fig. 24) from becoming a problem in most situations. Scout by looking for shiny accumulations of honey due on leaves and white flecks which are shed skins. Aphids will be on the underside of leaves above where you find honeydew and skins.

Plants that are under stress or over fertilized are likely more susceptible to eruptive populations. In addition, application of insecticides to target other pest such as Japanese beetles could kill natural enemies and cause an outbreak. This is true for any aphid. Plants in greenhouses where conditions are good for aphid growth (good temperature, plenty of water, constant fertilizer, no natural enemies) may also have higher populations of rose aphids. Should control be necessary consult the aphid insect note at http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/note38/note38.html.

Fig. 24. Rose aphid adult and nymphs on a Knock Out rose leaf. Image by Steve Frank.

Euonymus Scale Update

The euonymus scale (Fig. 25) has three generations per year in North Carolina, the first of which we reported on in the spring. It is best to treat euonymus (or any) scale in the crawler stage (Fig. 26). So if you forgot in the spring or didn't get sufficient control, now is your second chance. Crawlers are active at research sites on campus and in Raleigh neighborhoods. In the first generation crawlers come out all at once but become less synchronized in second and third generations. Thus you may find all developmental stages present at this time.

Fig. 25. Euonymus scale adults on the underside of a Euonymus leaf. Image from Steve Frank.

Fig. 26. Euonymus scale crawlers on a heavily infested bush. Image from Steve Frank.

There are a number of products that can be used to treat armored scale. We have found neonicotinoids Safari, Flagship, and TriStar to be very effective; also the plant growth regulators Distance and Talus. Note that imidacloprid is not labeled for or effective against armored scales. For recommendations, please check the updated *Ornamental and Turf Insect Information Note No. 15* on the Internet at http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note15/note15.html.

INSECT TRAP DATA

From: Mike Carroll, Agricultural Extension Agent, Craven County

Light Trap Data from Craven County

	Number of Adult Insects								
Date	THW	TBW	CEW	GSB	BSB	ECB	FAW	BAW	LOOP
July 5	1	1	-	2	-	-	-	-	-
July 11	-	-	3	3	1	-	-	-	-
July 18	-	-	23	-	-	4	-	-	-

THW = tobacco hornworms; TBW = tobacco budworms; CEW = corn earworms; GSB = green stink bugs; BSB = brown stink bugs; ECB = European corn borers; FAW = fall armyworms; BAW = beet armyworms; LOOP = Looper

Location of trap: Cove City
Cooperators: R & W McCoy Farms and Cove City Fertilizer

From: Colby S. Lambert, Agricultural Extension Agent, Cumberland County

Light Trap Data from Cumberland County

	Number of Adult Insects			
Date	THW	CEW	GSB	BSB
July 7	-------- trap set up ---------			
July 9	0	1	3	0
July 11	0	6	8	1
July 13	0	4	26	3
July 15	0	4	1	0
July 18	0	5	6	0
July 20	0	16	16	0
July 22	0	24	12	1

THW = tobacco hornworms; CEW = corn earworms; GSB = green stinks bugs; BSB = brown stink bugs

Trap located in Godwin at Cumberland/Harnett County Line
at Lewis Farms off of Highway 301

From: Arthur R. Bradley, Jr., County Extension Director, Edgecombe County

Light Trap Data from Edgecombe County

	Number of Adult Insects								
	West Edgecombe			Coakley			Lawrence		
Date	CEW	BS	GS	CEW	BS	GS	CEW	BS	GS
July 8	-	-	-	0	0	0	-	-	-
July 11	0	0	0	0	1	3	-	-	-
July 13	0	0	0	0	1	1	4	0	6
July 15	0	0	0	0	0	0	0	0	4
July 18	0	0	0	3	0	0	0	0	0

Abbreviations: CEW = corn earworms;
BS = brown stink bugs; GS = green stinks bugs

From: Alan A. Harper, Lenoir County

Light Trap Data from Lenoir County

July

	Number of Adult Insects							
Date	HW	CEW	ECB	AW	AWC	GSB	BSB	TBW
July 18	0	9	0	0	1	0	0	0
July 19	0	1	2	0	0	1	0	0
July 20	0	5	0	0	0	2	0	0
July 21	0	20	1	0	2	2	0	1
July 22	0	15	0	0	0	4	0	0

Abbreviations: HW = hornworms; CEW = corn earworms; ECB = European corn borers; AW = true armyworms; AWC = armyworm complex; GSB = green stink bugs; BSB = brown stink bugs; TBW = tobacco budworms

From: Al Cochran, County Extension Director, Martin County

Light Trap Data from Martin County

	Robersonville		Farm Life	
Date	BW	GSB	BW	GSB
July 8	8	3	2	6,1*
July 13	3	1	3	0
July 15	3	0	0	3
July 18	5	0	2	0
July 20	5	1	3	1
July 22	9	1	12	0

BW = Bollworm moths; GSB = Green stink bugs
* brown stink bugs

From: Craig Ellison, Agricultural Extension Agent, Northampton County

Light Trap Data from Northampton County

	Number of Adult Insects																	
	Woodland			Conway			Galatia			Seaboard			Gaston			W. Gaston			Jackson		
Date	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR
July 11	-	-	-	21	0	0	-	-	-	-	-	-	-	-	-	-	-	-	6	15	0
July 13	-	-	-	13	2	0	-	-	-	0	0	0	-	-	-	-	-	-	21	11	0
July 15	-	-	-	0	0	0	-	-	-	0	0	0	-	-	-	-	-	-	7	0	0
July 18	-	-	-	1	0	0	2	0	0	2	0	0	2	0	0	-	-	-	0	0	0
July 20	0	1	1	-	-	-	2	0	0	4	0	0	-	-	-	-	-	-	19	6	0

CEW = corn earworms; GR = green stink bugs; BR = brown stink bugs

Locations: Woodland, Conway, Galatia, Seaboard, Gaston, West Gaston and Jackson
Monitored by: L. Culpepper, K. Edwards, Ben Harris, T. Flythe, D. Grant,
Tim Phelps and B. Bryant

From: Dominic Reisig, Extension Entomologist

Light Trap Data from Tidewater Research Station (Washington County)

	Number of Adult Insects								
Date	CEW	TBW	ECB	AW	SBL	BSB	GSB	BaSB	DSB
June 22	9	0	0	0	0	0	1	0	0
June 24	5	0	0	0	0	2	2	0	0
June 27	4	0	0	0	0	17	0	0	0
June 29	3	0	0	0	0	13	0	0	0
July 1	3	0	0	0	0	6	0	0	0
July 4	3	0	0	0	0	2	0	0	0
July 6	0	0	0	0	0	2	1	0	0
July 8	2	0	0	0	0	1	3	5	0
July 11	1	0	0	0	0	0	0	0	0
July 13	1	0	0	0	0	5	2	0	1

Abbreviations: CEW = corn earworms; TBW = tobacco budworms; ECB = European corn borers; AW = armyworms; SBL = soybean loopers; BSB = brown stink bugs; GSB = green stink bugs

Pheromone Trap Data from Tidewater Research Station, Tyrrell County and Upper Coastal Plains Research Station

	Tidewater		Tyrrell Co.		UCPRS	
Date	CEW	TBW	CEW	TBW	CEW	TBW
June 9	-	-	11	2	6	7
June 15	0	4	1	5	0	0
June 22	-	9	7	6	7	2
June 30	-	-	9	16	11	15
July 8	-	5	16	4	3	16
July 12	2	4	-	-	-	-

Abbreviations: CEW = corn earworms; TBW = tobacco budworms

From: Kevin Johnson, County Extension Director, Wayne County

Light Trap Data from Wayne County

	Number of Adult Insects			
	Goldsboro			
Date	GSB	BSB	CEW	HW
July 6	0	2	0	0
July 8	2	1	-	-
July 11	-	3	3	3
July 13	1	8	4	1
July 15	-	1	1	-
July 18	-	-	2	-
July 20	2	-	4	-
July 22	1	3	29	-

GSB = green stink bugs; BSB = brown stink bugs; CEW = corn earworms; HW = hornworms

Cooperator: Willie Howell (Goldsboro)

From: Norman E. Harrell, Agricultural Extension Agent, Wilson County

Light Trap Data from Wilson County

	Number of Adult Insects			
	Kenly		Fountain	
Date	CEW	GSB	CEW	GSB
July 13	-	-	1	9
July 15	2	0	1	2
July 18	3	0	2	1
July 20	0	3	2	2
July 22	3	1	0	7

CEW = corn earworms; GSB = green stink bugs

Locations: Kenly and Fountain
Monitored by: Norman Harrell and Barbara Smith

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University, North Carolina A&T State University or North Carolina Cooperative Extension nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical. For assistance, contact an agent of North Carolina Cooperative Extension.