NC STATE UNIVERSITY

COLLEGE OF AGRICULTURE & LIFE SCIENCES

North Carolina Pest News

Departments of Entomology and Plant Pathology

Volume 28, Number 10, June 14, 2013

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 . . .

See current and archived issues of the *North Carolina Pest News* on the Internet at: http://ipm.ncsu.edu/current_ipm/pest_news.html

FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

Cotton Insect Update: June 14, 2013

Thrips season over? Although thrips are still a struggle for a few growers and although some cotton has been beaten up by our recent rainy weather, most cotton is now beyond the thrips-susceptible stage of four true leaves. In our thrips tests at Rocky Mount, all cotton planted with any seed treatment along that required a foliar application is now safe from further thrips

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damage. This high moisture and warm days and nights really has cotton growing rapidly with squaring less than a week away for a few producers.

As one can see below, the untreated check plot in our Wilson County large scale thrips tests have been badly damaged by thrips, with just barely 1 or 2 crinkled true leaves showing on June 13, at 5½ weeks after planting. This damage will likely result in a significant yield loss and maturity delay. The Avicta-treated seed plots are also showing significant damage from thrips. Oddly, this cotton has just reached the 5 true-leaf stage and is no longer vulnerable to additional damage from thrips feeding. The damage has been done. The Admire Pro plus Avicta treated seed plots averaged 7 true leaves and looks essentially perfect (despite not having received a follow-up spray for thrips). This marks the third consecutive year in Wilson County large-scale tests that Admire Pro plus treated seed plots did not require a follow-up foliar spray for thrips control. The possibility of a "one stop" planting option (i.e., no follow-up spray needed for thrips in most years) would be a huge economic benefit for North Carolina cotton producers. In 2012, just over 90% of our cotton acreage was treated with a follow-up spray for thrips.

Untreated check plot image taken on June 13, 2013, Wilson County. Image by Dan Mott.

Avicta treated seed plot image taken on June 13, 2013, Wilson County. Image by Dan Mott.

Avicta-treated seed plus Admire Pro in-furrow plot taken on June 13, 2013, Wilson County. Image by Dan Mott.

Abundant host growth: Although predicting what and how many insects will show up in the coming weeks and months is close to pure speculation, due to high moisture levels throughout much of the state, we have a large biomass of plant material in CRP land, ditch banks and in the general landscape. Many weed species are excellent hosts for plant bugs and stink bugs. A healthy corn crop with high soil moisture levels is also an excellent host for plant bugs.

Plant bug increases? In recent years, surveyed consultants have reported a significant increase in plant bug treatments, with approximately 6% of our cotton acreage treated from 2004 to 2007 and 16% treated averaged over the past two years. I realize that these numbers would not impress our Midsouth brothers who sometimes are faced with 4 to 8 plant bug sprays annually (boll weevil reminiscing, anyone?), but it will still be interesting to see if our trend toward increasing levels and associated and damage continues.

Stink bug decision aid tool: With stink bugs in cotton, we now have a very straightforward scouting tool in the form of a field decision aid to help scouts select correct boll sizes for examination, recognize the appropriate internal boll wall damage and follow a dynamic boll damage threshold that changes by week of bloom. It's helpful to remind scouts and producers that stink bug damage often varies greatly from year to year and from field to field. Our best bet in economically managing stink bugs is to make threshold-based spray decisions. In a given year it's not unusual for threshold-based sprays to vary between zero and 3 or 4 applications throughout the state depending on stink bug levels and cotton plant susceptibility.

Web-based stink bug app: We hope to have a web-based stink bug decision aid app (an on line version of the field card with significantly more information) posted in the next 4 weeks, accessible from laptops, desk tops, tablets smart phones and other internet enabled devices. This app will provide a stink bug ID guide, list scouting steps, illustrate internal boll damage symptoms, list thresholds by week of bloom and link to other related areas of interest. More information will be coming in the weeks ahead.

Cotton and Soybean Scouting Schools: Beginning with next week's *North Carolina Pest News*, we will begin listing the locations, dates and times of our upcoming July cotton and soybean insect scouting schools.

Insect updates: To listen to our Wednesday cotton insect updates, just go to the *Cotton Insect Hotline* (http://ipm.ncsu.edu/cotton/insectcorner/radio/index.html) or call the *Extension Teletip* number 1-800-662-7301 and press "2" at the prompt (pressing "1" will take you to a soybean rust update last recorded by Jim Dunphy in 2011). Cotton-related information is also available at Keith Edmisten's *North Carolina Cotton Facebook* page. Finally, check out Dominic Reisig's and Hannah Burrack's *North Carolina Field Crops Blog* (http://www.nccrops.com/) for regular field crops and tobacco insect IPM updates. For soybean producers, this blog is a good way to keep up with kudzu bug-related information, including scouting, threshold and treatment recommendations

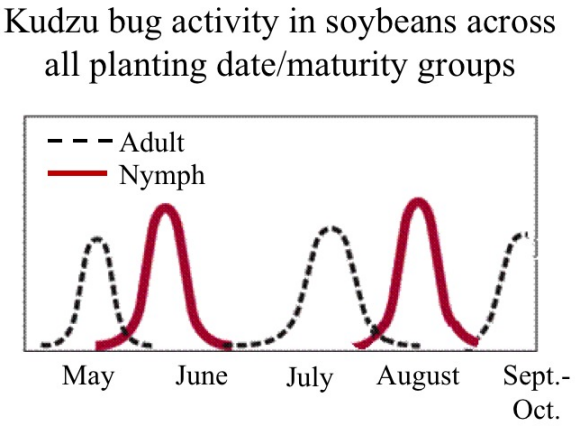
From: Dominic Reisig, Extension Entomologist

Kudzu Bug Soybean Scouting and Treatment Update

There are a number of things I would like to address with this article. 1) Where we are in the life cycle and how this might impact your management efforts; 2) best known scouting procedures; and 3) why I

do not think that treating soybeans with insecticides now will lower kudzu bug densities later in the field.

1) We have now reached the end of the first migration of adult kudzu bugs into soybeans. Keep in mind that these adults resulted from eggs laid last August (2012). Adults can feed on the plants and cause stunting and/or yield loss. However, these insects are spent and will likely die out in the next few weeks. However, they might still lay some eggs in the meantime. Soybean fields now need to be managed for nymphs hatching from eggs, rather than the adults migrating into the field (http://www.nccrops.com/2013/05/15/kudzu-bug-seedling-soybean-spray-threshold-recommendations/ lists recommended thresholds). Focus on fields that had sub-threshold levels of adults that you might not have sprayed and fields where you might have sprayed the adults and had some re-invasion. Keep in mind that there are two generations of kudzu bugs a year and that insecticides won't kill the eggs.



Stylized life cycle of kudzu bug in North Carolina soybeans. Image from D. Reisig.

2) If you are visually sampling seedling soybeans, peel back the plants to reveal the stems. Some plants will be very heavily colonized, with other plants relatively clean (we think the insect has an aggregation pheromone, making it attractive to other kudzu bugs). Base treatments decisions on a per-plant average. My best guess is that neighboring plants will compensate for any stunting that might occur on heavily infested plants.

   Some full-season beans are now "sweepable". I recommend using the sweep net whenever you can and following the one nymph per sweep threshold anytime your beans are near reproductive stages. Small nymphs are very difficult to see, as they blend in with a soybean stem. By the time nymphs are large enough to see stacked up and down the stem you have probably already lost some yield. Kudzu bugs take a long time to develop relative to other insects, so this will not happen overnight. Entomologists are aware that the sweep net "undersamples" nymphs compared to adults. Our sweep net thresholds are calibrated for this “undersampling”.

   For both visual samples and sweeping, you can check field edges to see if the bugs are present. However, this, insect congregates much more heavily on these edges. You must base all treatment decisions on field interiors. Start sampling at least 50 field into the field to make any treatment decisions, being sure to visit several parts of the field.

3) This is speculation, but I do not think that it is a good idea to treat soybeans now, hoping that we can reduce their abundance later in the season. This insect has been sprayed like crazy in Georgia and South Carolina, but is still showing up in great numbers. Also, we know for certain that many individuals can be produced on kudzu and suspect that it can reproduce on wisteria. My opinion is that there are enough wild reproductive hosts to create a source of insects for soybeans anywhere in the state.

From: Hannah Burrack, Extension Entomologist

Questions About Tank Mixing Pesticides in Tobacco

This week, I have received several questions about possible phytotoxicity associated with insecticide applications directed against tobacco budworm (http://tobacco.ces.ncsu.edu/tobacco-pest-management-insects-tobacco-budworms/). The three separate phone calls and e-mails each involved a different insecticide (all caterpillar materials), and different application methods.

Yellowed tobacco following an insecticide application for tobacco budworm. Hertford County, North Carolina. Photo via Matthew Vann.

In one case, the grower had used insecticide alone and seen yellowing. In two other cases, growers had tank mixed insecticides with fungicides. I am on the record (http://ncsmallfruitsipm.blogspot.com/2011/07/mid-season-tobacco-pests-burning.html) as not recommending tank mixing insecticides with other pesticides, including fungicides or sucker control materials for two very important reasons:

1. We do not want to apply insecticides to the same part of the plant as we do fungicides or sucker control.

   Insecticides to manage tobacco budworms should be applied as a directed spray into the bud, ideally in between 15 to 30 gpa water. In the early season, fungicides, if necessary, should be applied to achieve good coverage on leaves to target foliar pathogens. Sucker controls, on the other hand, should be applied to achieve good stalk run down. Although it might be tempting to mix insecticides

in early contact treatment to target tobacco budworm, treating budworms close (within 1-2 weeks) to topping does not make economic sense as the plant parts that budworms are feeding on will be removed when plants are topped. Post topping, insecticides for tobacco flea beetle (http://tobacco.ces.ncsu.edu/tobacco-pest-management-insects-tobacco-flea-beetle/) and tobacco/ tomato hornworms (http://tobacco.ces.ncsu.edu/tobacco-pest-management-insects-tobacco-and-tomato-hornworm/) should be applied to leaves, not stalks. Therefore, tank mixing insecticides for these pests with sucker control materials will not result in good control. Growers often say that tank mixing "saves them a trip across the field", but if the materials are not applied in a way to achieve good control, they haven't saved a trip, they might have simply added the cost of an insecticide! Growers may also feel that some insecticides are "cheap", so adding them to another material doesn't cost much even if control is not optimum. Some insecticides may be less expensive, but they are not free! There is still an added cost that may not be justified by insect control or by yield benefits.

2. Tank mixing may impact efficacy and plant impacts.

   Because I do not recommend tank mixing insecticides with other pesticides in tobacco, I do not compare the effects of insecticides when tank mixed in my research plots. Therefore, I cannot say if insect control will be same when materials are tank-mixed, nor can I say if there will be compatibility issues.

   So, what caused the yellowing on the plants pictured above and at the other two sites? We have not seen phytotoxicity (yellowing, burning, flecking) associated with any of the insecticides labeled for tobacco budworm in the last five years. However, with the wet, hot conditions of the last two weeks, tobacco leaves are very succulent, and any sprayed on materials may result in some visible leaf effects if it doesn't evaporate quickly. This should be transient and is not a concern for yield. Other issues (contamination, for example) can also cause injury like that above and should also be ruled out.

FRUIT AND VEGETABLES

From: Lina Quesada-Ocampo, Extension Plant Pathologist

Cucurbit Downy Mildew Now in Johnston County

Cucurbit downy mildew was found June 8, 2013, in Johnston County. This is the third cucurbit downy mildew report for North Carolina. Recent wet weather will favor disease, and cucurbit growers should protect their crops. Forecasts indicate a high to moderate risk of cucurbit downy mildew infection for cucurbits in parts of eastern North Carolina during the next few days (http://cdm.ipmpipe.org/index.php?option=com_content&view=category&layout=blog&id=38&Itemid=61).

For control recommendations, please refer to initial report in Wayne County (http://plantpathology.ces.ncsu.edu/2013/06/pest-news-5313/).

From: Dave Ritchie, Extension Plant Pathologist

Bacterial Spot of Peaches

Bacterial spot of peaches has become very common as a result of the frequent rains. There is very little if anything that will provide disease control at this time where the disease is present. Information about bacterial spot is available: http://www.ces.ncsu.edu/wp-content/uploads/2013/06/Learning-from-Peach-Bacterial-Spot-Epidemics.pdf

ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

Fungus Gnat Larvae

This week we had reports of fungus gnats forming long lines on sidewalks and driveways. This happens after a lot of rain or heavy irrigation. In the landscape larvae feed on plant roots and live in areas with a lot of thatch or organic matter. You can read more and see a picture of the larvae-snake in an insect note at http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/note29/note29.html.

Tea Scale Crawlers are Active

Tea scale, *Fiorinia theae*, is common on camellias. It is an armored scale that lives on the underside of leaves. You can find it on almost any camellia by looking for inner leaves that have yellow spots on top. When you turn it over you will see tan canoe-shaped scale covers and some white fluff from the males. These are tough to treat because the heaviest infestations are often deep within the foliage of large bushes. To find an insect note with more information and recommendations:
http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note50/note50.html

Tea scale on camellia leaf. Photo: S. D. Frank.

Cottony Cushion Scale Activity

Cottony cushion scale, *Icerya purchasi*, is active much of the year. This week I found young crawlers that were being aggressively tended by fire ants on cherry laurel. The scale is most easily recognized by its oblong cottony ovisac that can reach 1 cm or longer. The rest of its lifecycle is less conspicuous though it is still one of the larger scales. Like other cottony scales, such as cottony maple scale and cottony camellia scale, cottony cushion scale is a soft scale. In the coming weeks the scale will be most easily managed as crawlers are active and exposed. Horticultural oil can be used to smother crawlers on small plants. A systemic drench can be used to treat larger plants and provide longer protection. The host list for this species is long and varied including: maple, boxwood, pecan, cedar, citrus, apple, *Prunus* spp., rose, and others. This week I found ovisacs on *Euonymus*, *Nandina*, and *Fatsia*. More information and chemical recommendations can be found in the cottony cushion scale insect note at http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note51/note51.html.

Cottony cushion scale crawler. Photo: S. D. Frank.

Cottony cushion scale adults with ovisacs on euonymus. Photo: S. D. Frank.

Spider Mite Damage

Although the cool season is over, damage from cool season mites is beginning to appear. I found this cherry laurel with extensive mite stippling. On the leaves there were no active mites, just lots of eggs. This is the last stand of southern red mite for the summer. They spend the hot months as eggs then come out again in fall. They feed in spring but often the damage does not become apparent until the plants face some stress in hot weather. So be sure to monitor these plants in fall. Horticultural oil may help smother the eggs, but be careful in hot weather.

In North Carolina, the most important cool season mites are the spruce spider mite (*Oligonychus ununguis*) and southern red mite (*Oligonychus ilicis*). These are among the earliest and most damaging pests in nurseries and landscapes. As their name implies, cool season mites are active in spring and fall when they suck fluid from cells on plant leaves and needles. In hot summer months these mites are dormant. However, it is summer when their damage becomes apparent as chlorophyll bearing cells die. Thus, by the time plants exhibit aesthetic damage the mites are gone and treatment is wasted.

I found all stages of southern red mites on cherry laurel, but they feed on many broadleaf evergreens such as azalea, camellia, holly, and rhododendron. With eggs juveniles and adults all present these mite populations are well underway and deserve attention from nursery and landscape personnel.

Scout plants that had mites or mite damage the previous year are likely to have them again because the mites have overwintered as eggs. You can identify plants that had mite last year by looking for fine stippling damage on the old leaves. Turn them over and look with a hand lens for silk webbing, shed skins, and mites. On broadleaf evergreens, look on the underside of leaves for the southern red mite. The most efficient method of scouting for cool season mites (and other mites) is to hold a piece of white paper or a paper plate below a branch and strike it with a pencil or stick to dislodge arthropods. Spider mites will appear as tiny moving specks about the size of the period at the end of this sentence.

For more information and control options consult the North Carolina State University insect note at http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/ort077e/ort077e.htm.

Southern red mites on cherry laurel. Photo: S. D. Frank.

Mite damage on cherry laurel. Photo: S. D. Frank.

INSECT TRAP DATA

From: Alan A. Harper, Lenoir County

Light Trap Data from Lenoir County

June

Date	Number of Adult Insects							
	HW	CEW	ECB	AW	AWC	GSB	BSB	TBW
June 1	Put up light trap							
June 2	0	0	0	0	0	7	0	0
June 3	0	1	1	0	0	10	0	0
June 4	0	0	0	0	0	5	0	0
June 5	0	0	1	0	0	2	0	0
June 6	0	0	0	0	0	0	0	0
June 7	0	0	0	0	0	3	1	0
June 8	0	0	0	0	0	3	0	0
June 9	0	0	1	0	0	12	1	0
June 10	0	0	0	0	0	4	0	0
June 11	0	0	0	0	0	0	0	0
June 12	0	0	0	0	0	2	0	0
June 13	0	0	0	1	0	4	1	0
June 14	0	0	0	0	0	0	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