



North Carolina Pest News

Departments of Entomology and Plant Pathology

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In This Week's Issue . . .

CAUTION !

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

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FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

Thrips Update on Cotton

Depending on location, planting date and moisture level, thrips populations and their threat to cotton is probably all over the map this week. Approximately a week ago, George Kennedy's tobacco thrips weather model suggested that our major thrips generation could be large. However, our recent extended rainfall and cooler weather may have dampened these unwanted expectations, at least until a return to warm sunny weather. At Rocky Mount, May 17, our seedlings averaged approximately four adult and 0.5 immature thrips per plant behind seed treatments at 16 days after planting. Even with the low level of immatures (indicating that the seed treatment is still active), the 4 adult thrips per plant can be damaging, so this finding would call for a foliar spray. Remember that only two thrips per plant with some indication of immatures calls for a spray. Table 1 provides the results of thrips foliar insecticide efficacy tests that were conducted in collaboration with Ames Herbert of Virginia Tech. Note the evidence of why the pyrethroids (not just Karate), though inexpensive, are not advised for thrips control.

Table 1. Effectiveness of selected foliar sprays for thrips control, Rocky Mount, North Carolina, and Suffolk, Virginia, 2011.

Insecticide	Rate (ounce/acre)	% Control
Karate Z 2.08 CS	1.3	22.5
Lannate 2.4 LV	2.4	74.3
Vydate 3.77 C-LV	17.0	77.5
Dimethoate 4 E	8.0	90.4
Radiant 1 SC	6.0*	92.1
Orthene 97 ST	4.0	92.7
Benevia 10 OD	20.6**	98.1

* 2x the highest labeled rate

** Not yet labeled for cotton

In-furrow Spray Boost to Cotton Seed Treatment?

Seed treatments are known to lose their residual activity against thrips within two to three weeks of planting. As a possible replacement for the typical follow-up foliar spray often put out at the first true leaf stage, a seed treatment along with a chloronicotinoid in-furrow spray (Admire Pro) is being evaluated in Wilson County for the second year. The below photos show seedlings with untreated seed, Avicta-treated seed, and Avicta-treated seed plus an at-planting application of Admire Pro at 16 days after planting on May 17. Although week three after planting often is the acid test of thrips insecticide effectiveness, growth trends are already evident. This approach is also being evaluated at the Rocky Mount and Plymouth stations, as well as very high seed treatment rates, a 2x2 at-planting fertilizer approach to faster early growth, and a planting date study.



Untreated check seed with severe damage to bud area @ 16 DAP. Image by Dan Mott.



Avicta-treated seed with some damage to first true leaf @ 16 DAP. Image by Dan Mott.



Avicta plus Admire Pro in-furrow with good first true leaf expansion @ 16 DAP. Image by Dan Mott.

Western Flower Thrips Dilemma

In general, our hard-to-control western flower thrips often become a problem on cotton somewhat later than tobacco thrips. In most cases, the levels of western flower thrips on cotton are lower when we have good rainfall patterns and are higher when we experience extended hot dry weather. Because correct thrips species identification requires an expensive high powered microscope, and considerable time and expertise, the first time most producers are aware that they may have western flower thrips is when extremely poor thrips control follows a foliar spray for thrips. For now, a high expensive rate of Radiant insecticide is essentially the only labeled insecticide that appears to provide good control of western flower thrips. A number of tests are underway in the Southeast to determine if lower, more affordable rates of Radiant are also effective against western flower thrips. In most cases with western flower thrips, we keep our fingers crossed that the “thrips safe” five true leaf stage comes along as quickly as possible.

Late Cotton Planting Benefit?

On a brighter note, as we approach May 20 and later, cotton seed treatments planted after this time often do not require a follow-up foliar spray due to the temperature-related shorter “window” of high vulnerability to thrips damage and declining adult migrating thrips levels that often occur toward the end of May to early June. Additionally, remember that as cotton approaches the five true leaf stage a foliar spray is seldom needed - even if immature thrips are present in the bud area.

Kudzu Bugs on Cotton?

On another subject, my technician found a kudzu bug on the second cotton seedling sampled in a Wilson County thrips test May 17. This might be a good time to let producers and others know that kudzu bugs are not known to damage row crops other than soybean. Dominic Reisig will have regular status reports and advice about managing kudzu bugs in soybean this year at this site and on his *NC Field Crops Blog* (<http://www.nccrops.com/wp-login.php>).

Cotton Scouting Schools

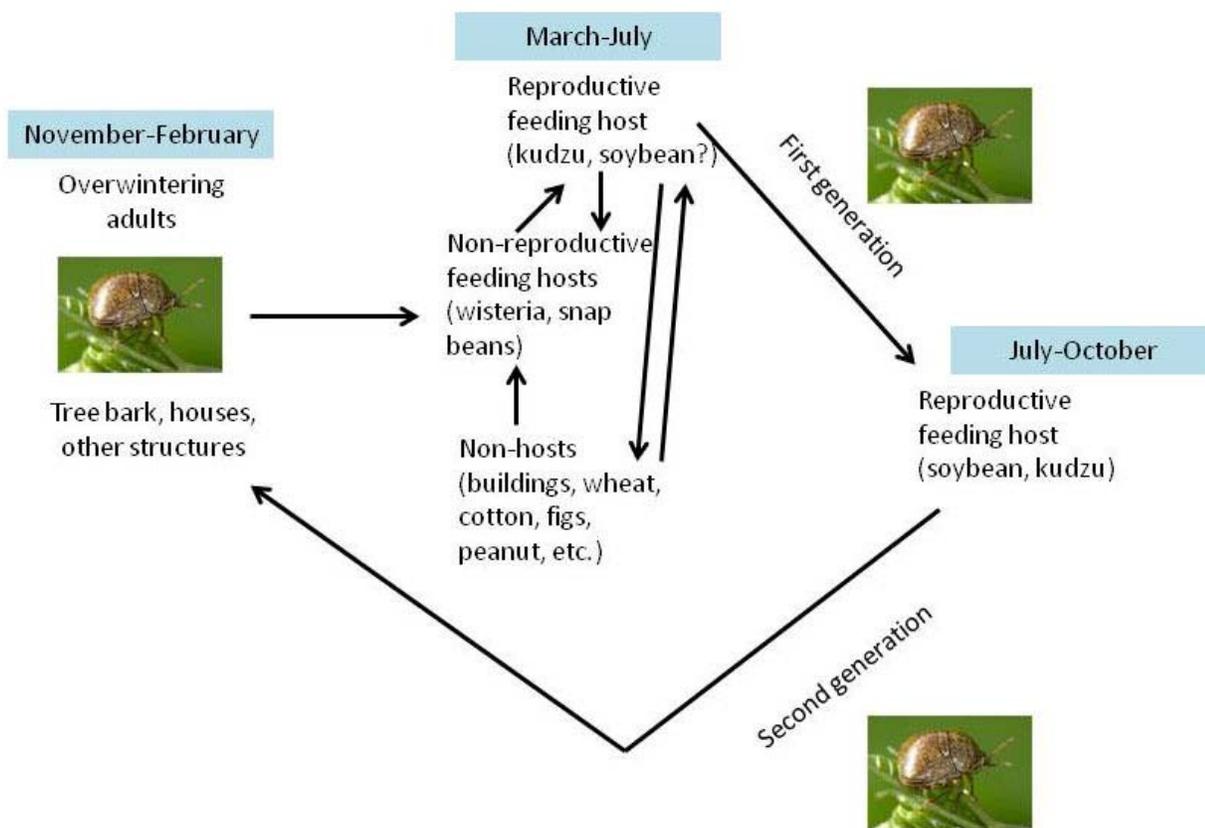
We will begin posting the dates for upcoming cotton and soybean schools beginning with next week's *North Carolina Pest News*.

From: Dominic Reisig, Extension Entomologist

How to Deal with Early-Season Kudzu Bug in Soybean

Since kudzu bugs showed up on soybeans in Georgia, South Carolina and parts of our state in 2010 and 2011, there has not been a reported infestation on a commercially planted soybean field until the first generation kudzu bug adults have developed. From observations in the previous years, kudzu bugs emerge from overwintering and migrate to hosts (see hypothetical life cycle diagram below). In the spring of this year, we have had reports of kudzu bugs on all sorts of non-hosts (humans, houses, fig

trees, grapes, wheat, cotton, and a magnolia tree, to name a few), hosts on which they feed and may or may not reproduce (e.g., legumes such as wisteria), and the major host of this pest, kudzu plants. In 2010 and 2011 adults moved from overwintering sites through the landscape until they found kudzu and laid eggs, which developed as nymphs to the adult stage (first generation). These first generation adults then moved onto soybean, stayed on kudzu, or moved to other legume plants. They then laid eggs, which resulted in the development of a second generation of kudzu bugs for the year.



Hypothetical life cycle of kudzu bug in North Carolina.

This year I have seen a glitch in this pattern, as kudzu bugs have been found in low densities on soybean seedlings in scattered areas of North and South Carolina (<http://www.nccrops.com/2012/05/15/kudzu-bug-eggs-turn-up-on-volunteer-soybean/>). These areas are all in areas where kudzu bug was confirmed as present in 2011. The recommendation has been to focus treatment on the kudzu bugs that arrived in soybeans and the resulting second generation of nymphs. A preliminary threshold of **one nymph-stage bug per sweep** (i.e., 15 nymphs per 15-sweep sample) is recommended and may help reduce the need for multiple sprays in reproductive stage soybean. This is based on multiple trials in Georgia and South Carolina in 2010 and 2011. But how do we deal with kudzu bugs this early in the season?

Remember that adults present in the field during this time of the year are adults that have overwintered last year. They are laying and have laid eggs that will develop into the first generation of kudzu bugs for the year. This impacts how we manage adults in May:

1) Managing populations of kudzu bugs that are found in the homeowner landscape will not impact population densities in soybeans (see <http://www.ces.ncsu.edu/depts/ent/notes/Urban/kudzubug.htm>). Homeowners (especially ones who grow soybeans) may think that by killing kudzu bug adults they find in and around their home (e.g., bugs on a fig tree) will reduce later populations in soybeans. This is simply untrue for this prolific and mobile pest. First generation kudzu bugs are developing in the surrounding natural landscape and will infest soybeans despite our best efforts.

2) I do not know if treating adults on volunteer soybeans or those that are currently present in soybean fields will impact population densities in soybeans later in the season. If soybeans are treated now, there is a chance for re-invasion. Remember that the adults are moving around and are mobile. Furthermore, in areas of the state surrounded by kudzu, kudzu patches will provide a source for these insects to develop and move into soybean fields. Finally, we do not know whether the first generation of this insect can complete development (from egg to adult) on soybean alone. The second generation can easily complete development on soybean alone.

3) I do not know if kudzu bugs can cause a yield loss when feeding on soybeans this early in the season. If you decide to spray, not only do you risk re-infestation, but you may be throwing away money. Soybean plants have the ability to compensate for injury, especially when this occurs early in the season. In conclusion, I am unsure of the “correct” management action to take against kudzu bugs in soybean at this point in the season simply because this behavior is new and there are no data. My advice is to carefully consider each individual case. Ask yourself about the characteristics of the surrounding landscape, if kudzu bug was an issue on soybeans in your area last year and where the kudzu bug population is in terms of its life cycle before making a decision. Hopefully, I can give you a better answer than this in the near future.

FRUIT AND VEGETABLES

From: Mark Abney, Extension Entomologist

Soil Insect Management in Sweetpotato

It is sweetpotato planting time again. That means it is also time for wireworm management. North Carolina State University’s current wireworm management recommendations can be found at <http://www4.ncsu.edu/~mrabney2/index-4.html>.

Brown Marmorated Stink Bugs

Though we did not see damaging populations of brown marmorated stink bug in North Carolina in 2011, this invasive pest still poses a significant threat to fruit and vegetable crops in the state. Researchers need your help to determine the distribution of the bug in North Carolina. You can find a description of brown marmorated stink bug, information about its biology, and a link to report sightings of the pest at <http://www.ces.ncsu.edu/fletcher/programs/apple/entomology/BMSB/index.html>.

Thrips in Cucurbits

Cucurbit growers are probably seeing thrips in their crops this week. Heavy thrips infestations can distort leaves and stunt small plants. The decision to treat thrips is based on the condition of the plants and the number and developmental stage of thrips present. Rapidly growing plants usually do not need treatment for thrips. If plants begin to show signs of damage (i.e., slow growth, discolored or distorted leaves) and both adult and immature thrips are present, treatment may be warranted. Adult thrips are mobile, and can re-infest fields after insecticide applications are made.

Squash Bugs

In the last few years we have seen more and more squash bugs in commercial cucurbit plantings. This long time bane of the home gardener is making a serious pest of itself in commercial plantings across the state. A report from Rockingham County this week indicated that squash bugs are already present in damaging numbers. Controlling squash bugs can be difficult in conventional production systems and a nightmare in organic production. The insects spend most of their time on the undersides of leaves or hiding under mulch or debris; this makes killing them with insecticides difficult. Scouting for squash bugs is important. As few as two adult squash bugs can kill a young squash plant, and mature plants are not immune to damage. Consult the *North Carolina Agricultural Chemicals Manual* for control recommendations (<http://ipm.ncsu.edu/agchem/5-toc.pdf>).

ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

Thrips are Early and Abundant in Greenhouses

Western flower thrips have several life history traits that make them notoriously difficult to manage. In particular of the four primary life stages (egg, larvae, pupae, adult) only larvae and adults are susceptible to insecticide applications. Eggs are inserted into leaves and pupae are in the soil. Thus, right after you make an application eggs start hatching and adults start emerging from pupae and you feel as though you are right back where you started. This is why we recommend that growers make 3 applications 5 to 7 days apart to help break the lifecycle of the population present in their greenhouses. This initial round of applications could be done with a single chemical but rotate to a new chemical with new mode of action for subsequent applications. Since many plants are starting to bloom we have several chemicals that are generally not phytotoxic to foliage or flowers though mixing chemicals (insecticides, fungicides, etc.) or addition of adjuvants can have unexpected phototoxic results. Consider a rotation that includes Conserve (spinosad; label indicates potential spotting on African violets), Avid (abamectin; label indicates potential phytotoxicity on Adiantum ferns and Shasta daisy), Flagship (thiamethoxam), and/or bifenthrin. Complete list of chemicals can be found at:

<http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/ort072e/ort072e.htm> or

http://dpm.ifas.ufl.edu/plant_pest_risk_assessment/ALS6921%20Presentations/ThripsManagementProgram_09_12_09.pdf.

Lilac/Ash Borer Adult Flight

The lilac/ash borer, *Podosesia syringae*, has been captured in pheromone traps this week in the Piedmont and foothills. This particular clearwing borer is not a major pest. Others such as the banded ash clearwing typically cause more damage. However, this critter will cause lilac canes to wilt suddenly as larvae bore within. So, it is good to be aware of this even though we do not recommend preventative insecticide treatments. The lilac/ash borer overwinters as larvae in twigs then adults emerge over several weeks to mate and lay eggs. Later in the summer dogwood borers, lilac borers and other will be emerging.

Second Generation Euonymus Scale Crawlers

Euonymus scale 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. 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. There are many predators that feed on scale insects such as the lacewing larva in this video (<http://youtu.be/cnzlMrxv0tA>). However, euonymus scale still tends to reach damaging levels once established. 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 plant growth regulators Distance and Talus. Note that imidacloprid is not labeled for or effective against armored scale. Please check our blog <http://ecoipm.com/> and the updated insect note for recommendations and up-to-date information <http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note15/note15.html>.



Euonymus scale crawlers covering a euonymus leaf. Photo: S. D. Frank.

From: Mike Munster, Plant Disease and Insect Clinic, and Kelly Ivors, Extension Plant Pathologist

Controlling Botrytis in the Greenhouse

Due to weather conditions, *Botrytis* epidemics are currently occurring in greenhouses across the state. A wide range of floriculture crops can be affected. Symptoms of *Botrytis* infection range from flecking of blossoms, blossom blight, and even leaf and stem rot. On rose canes it can cause a tan-colored canker. The characteristic gray mold may be visible under high humidity conditions. The two keys to *Botrytis* management are keeping the relative humidity below 85% and maintaining the greenhouse free of dead or injured plant material (spent flowers, fallen leaves, pruned branches, culls, etc.) on which the fungus can produce new spores. Irrigate at times of day when foliage will dry quickly, and if possible ventilate greenhouses in the evening to bring down the humidity. Avoid wounding plants, which allows *Botrytis* to invade healthy tissue. Keep fertilization at optimal levels to avoid premature leaf senescence. Plants with bloom infection or crown rot should be discarded along with the potting mix. NEVER REUSE POTTING MIX WITH THIS PATHOGEN. Clean up all plant debris from the block and discard it. Do not compost any of this material, as the sclerotia of the fungus are capable of surviving adverse conditions. Spores of this fungus can be windborne, so be sure there are no cull piles nearby on which the fungus could produce them.

If re-using pots, first clean thoroughly and then sanitize with either steam (150 to 160° F for at least an hour at the center of the pile) or one of many chemical disinfectants available.

Fungicides may help prevent new infections, but won't cure plants that already have symptoms like those submitted. Effective products for *Botrytis* control include Chipco 26019/26 GT (Iprodione), Decree, Medallion and Pageant. Chlorothalonil (e.g., Daconil) can also be used; however chlorothalonil can cause phytotoxicity on blooms so this product should not be used on flowering plants. Decree is probably the most effective product for *Botrytis* control; however, it is only labeled for controlling *Botrytis* and should be used in a rotational program. In addition, there is a new Syngenta product named Palladium that just got registered for use in greenhouses and it is very effective against *Botrytis*. Be sure to rotate fungicides of different modes of action (FRAC groups) so as not to pressure the fungus into becoming insensitive (resistant) to any particular chemical. Note that one of the active ingredients in Palladium (fludioxonil) is the same as that found in Medallion. Get good coverage of the stems/crowns. Test any new treatments on a small number of plants first, to ensure that there are no adverse effects.



Botrytis stem rot on lavender.
Photo: M. J. Munster.



Petal spotting by *Botrytis*. Photo:
M. J. Munster.



Botrytis sporulating on petunia
stem. Photo: M. J. Munster.

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.
