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

Thrips on Cotton

Thrips really began "asserting themselves" this week. All of our May 1 and 2 planted seed treatments, with the exception of one seed treatment with a mega-rate of imidacloprid, were pretty banged up at the Rocky Mount research station. However, damage to the untreated check plots were no

worse so far than in an average year. The addition of Admire Pro applied in-furrow to the Avicta seed treatment has noticeably enhanced early growth, while the untreated check plots shows the impact of thrips feeding in a Wilson County at-planting test. If seedlings have not already been sprayed with a foliar insecticide following a seed treatment, this would be a good time to monitor seedlings for bud damage and live thrips. With most of this cotton only approaching 2 true leaves, we likely must hand in there for a week or so before we approach 5 true leaves in this early May planted cotton. We have received no calls of poor thrips control. However, if difficult to control western flower thrips show up as a problem, we would normally expect this "event" to occur about now or within the next week, or so. Some upcoming 90-degree predicted day time highs, if accompanied by dry weather, may increase the odds of "westerns" showing up.

Untreated checks, Wilson County test; May 24, 2012. Image by Dan Mott.

Avicta-treated seed, Wilson County test; May 24, 2012. Image by Dan Mott.

Admire Pro Plus seed treatment, Wilson County test; May 24, 2012. Image by Dan Mott.

On the plus side, we are now in a period of warmer weather with generally adequate moisture levels in many areas of the state. The more rapid seedling growth resulting from these conditions should shorten the present window of vulnerability to thrips damage.

Kudzu Bug Building on Early Soybean?

On the kudzu bug front, the colonizing of early planted soybean by kudzu bug in Georgia, South Carolina and North Carolina was both a surprise and a wakeup call to check soybean early-planted seedlings for the presence of these pests. Although no treatment thresholds have been established yet for kudzu bugs on early soybeans, sweep net samples taken from representative areas (be careful to avoid field edges) of early soybean fields will at least put producers in the ballpark of whether damaging levels may be present. The few soybean fields that I have swept this week averaged approximately 1 to 2 kudzu bugs per 100 sweeps, certainly well below any threshold that may be established for kudzu bug on early beans. On the other hand, Jeff Chandler reported approximately 15 to 20 bugs per seedling at the field margins and 5 bugs per plant in the center plots of a soybean maturity group and planting date test at the Sandhills Research Station near Jackson Springs. This is within the area of North Carolina where kudzu bug was found on soybean last fall. Additionally, the images sent out by Jeremy Greene of Clemson University last week dramatically showed that kudzu bug levels in some early soybean fields have reached alarming levels during the past two weeks, and more could be coming. Dominic's and my seat-of-the-pants guess is that 15 or fewer kudzu bugs per 15 sweeps would probably not result in economic damage. However, we presently have no data to support this suggestion. We do not recommend routine spraying following the finding of a few kudzu bugs, as this may be of limited economic value and the resulting disruption of beneficial insects can greatly enhance subsequent caterpillar establishment. For the later season anticipated large flight of kudzu bugs into soybean, expected here in late July or early August, the treatment threshold of 15 nymphs per 15 sweeps developed in Georgia and South Carolina is recommended.

Kudzu bug infesting early soybean at Sandhills Research station, May 24, 2012. Image by Jeff Chandler.

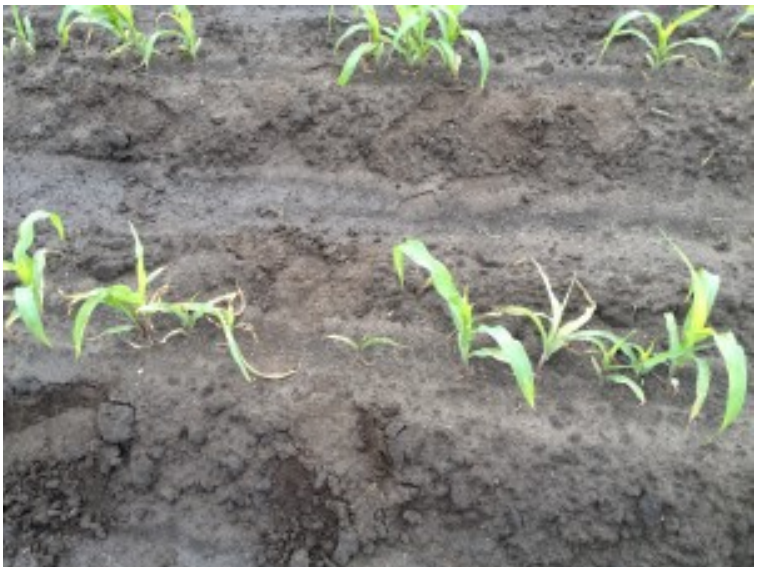
From: Dominic Reisig, Extension Entomologist

Distinguishing Among Insect Injury Types in Seedling Corn

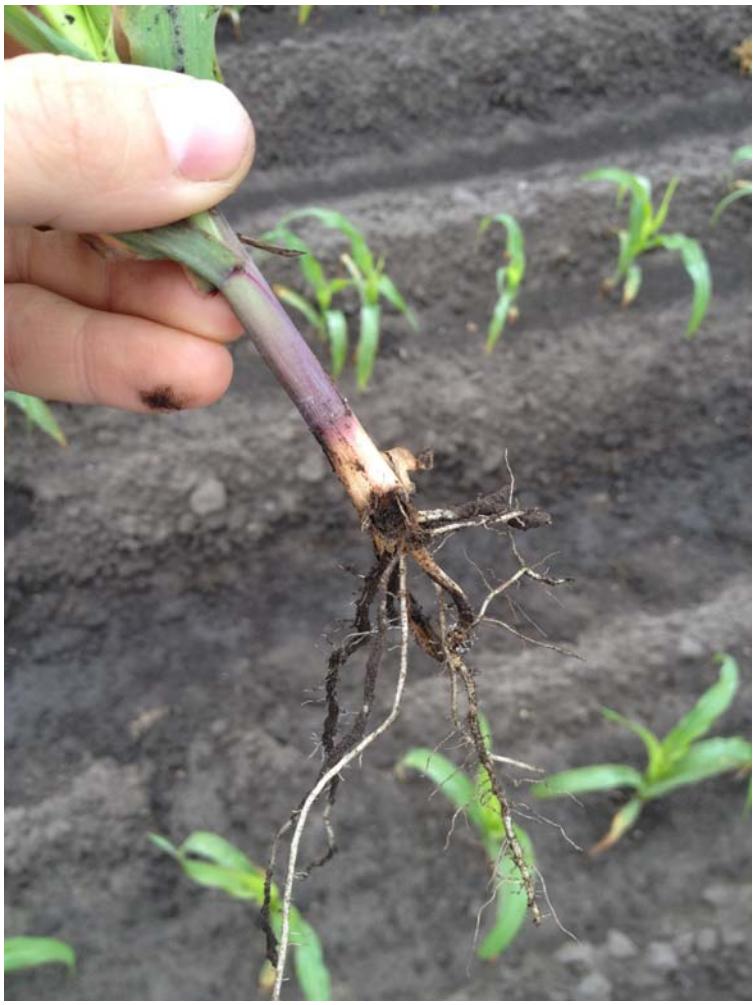
Sometimes it can be hard to tell what insect pest has injured your seedling corn. In addition to looking for the presence of the pest or evidence of the pest, you might be able to gather clues from the injury itself. Below are some pictures of different types of injury and options of common insect pests in North Carolina that can cause this type of injury.

Dead Seedling

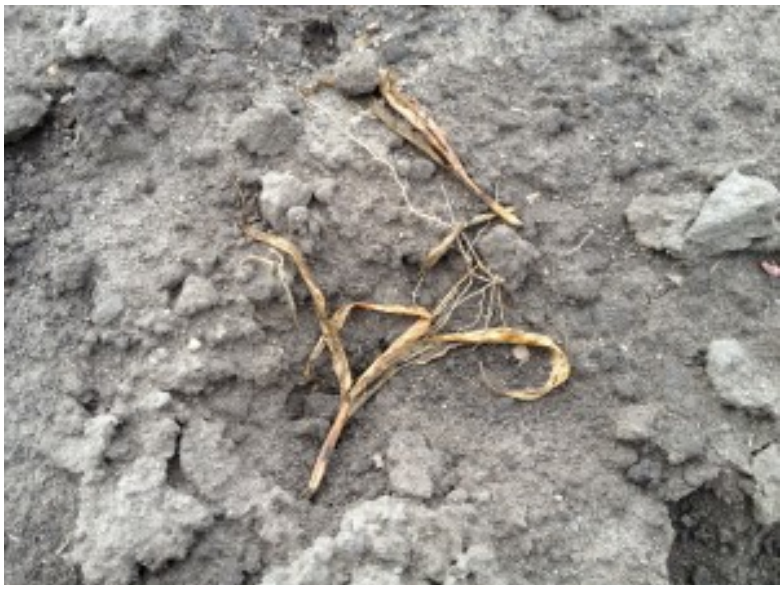
Many seedling pests of corn can cause plant death, including billbugs, cutworm, grasshopper, Japanese beetle larvae, stink bugs, sugarcane beetle, white grubs, and wireworms. If you can, try to see how the plant was killed. Stink bugs or billbugs can kill the plant “heart”. This can directly kill the plant or cause it to stunt or tiller out, essentially rendering it a weed. A clean cut near or above the soil line could indicate that a cutworm or grasshopper is the culprit. These can be problems in fields with lots of surface residue (i.e., no-till). Below the surface, wireworms feed on the roots, but can tunnel up into the large lateral roots or into the plant stalk. Both white grubs and Japanese beetle prune roots and are more of a problem in no-till fields. Finally, sugarcane beetles will often leave a distinctive cavity from their feeding. They can also entirely clip plants.



Seedlings killed by billbugs. Image from D. Reisig.



A sugarcane beetle adult chewed this cavity below the soil on a corn seedling. The larva of this insect does not damage corn. Image from D. Reisig.



A sugarcane beetle adult chewed this cavity below the soil on a corn seedling. The larva of this insect does not damage corn. Image from D. Reisig.

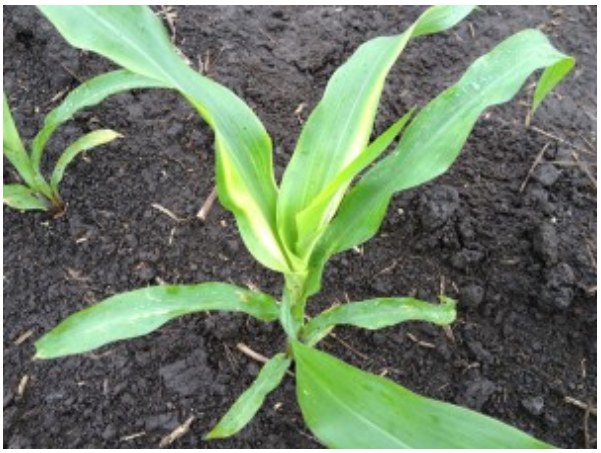
Whipped or Stunted Plant

Whipped (buggy whipped) or stunted plants can be caused by many of the pests listed above and others not mentioned. If injury if not apparent above the surface, you should dig up the plant to see if you see some of the injury described for the dead plants. Often, whipped plants are caused by wireworm feeding, but I sometimes see this associated with billbug or sugarcane beetle feeding. When these pests feed just below the soil surface at the growing point of the plant, they can cause problems when the plant attempts to elongate and to unfurl its leaves.

Plant whipping due to billbug feeding. Image from D. Reisig.

Streaked Leaves

Some pests of seedling corn can disrupt the vascular tissue that carries water and nutrients from the plant roots to the leaf. In serious cases, this can cause the plant to wilt and die, but often it results in distinct streaks on the leaves. Pests that commonly cause this streaking symptom are billbugs and sugarcane beetle.



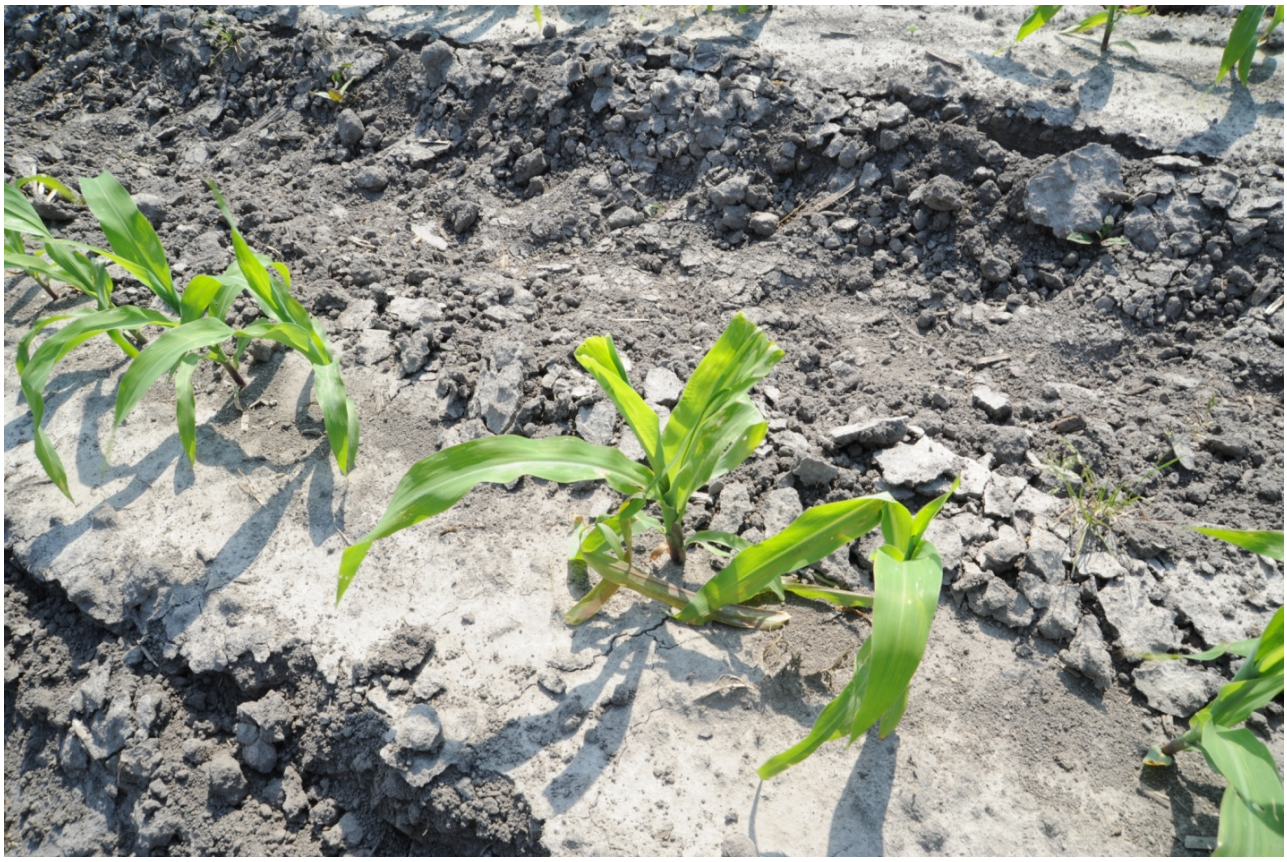
Leaf streaking from billbug feeding. Image from D. Reisig.

Leaf streaking from sugarcane beetle feeding. Image from D. Reisig.

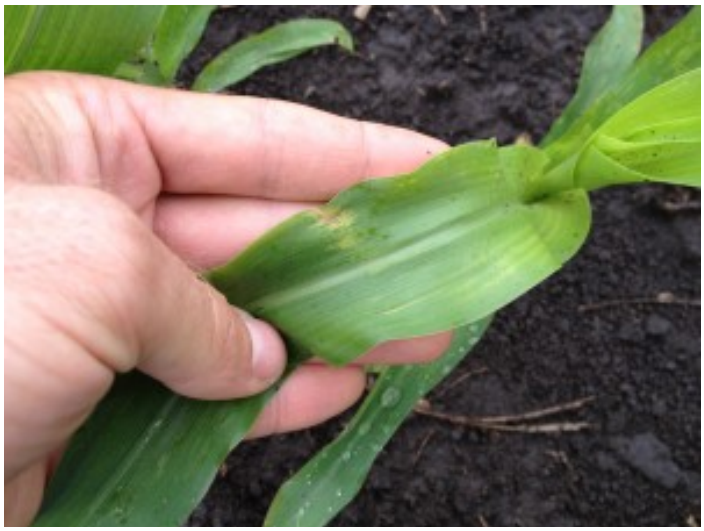
Leaf Holes

Billbugs feed using chewing mouthparts near the base of the plant. As a seedling a corn plant growth and development takes place about an inch below the soil line. The outer leaves in the whorl are the oldest and most developed. As a billbug begins to feed on these outer leaves, it can chew through to inner developing leaves. Some of these inner leaves may be tightly furled. When these leaves unfurl, the previous single billbug feeding spot appears as several transverse holes through the leaf.

Transverse holes and leaf streaking from billbug feeding. Image from D. Reisig.



Sometimes billbug feeding will completely cleave the leaves, rather than leaving holes. Image from D. Reisig.



Sometimes injury is not severe (for example, if a high rate of neonicotinoid seed treatment kills the billbug after a short feeding bout). The resulting injury can appear as a small "blotch" across the leaf, sometimes accompanied by a hole. Image from D. Reisig.

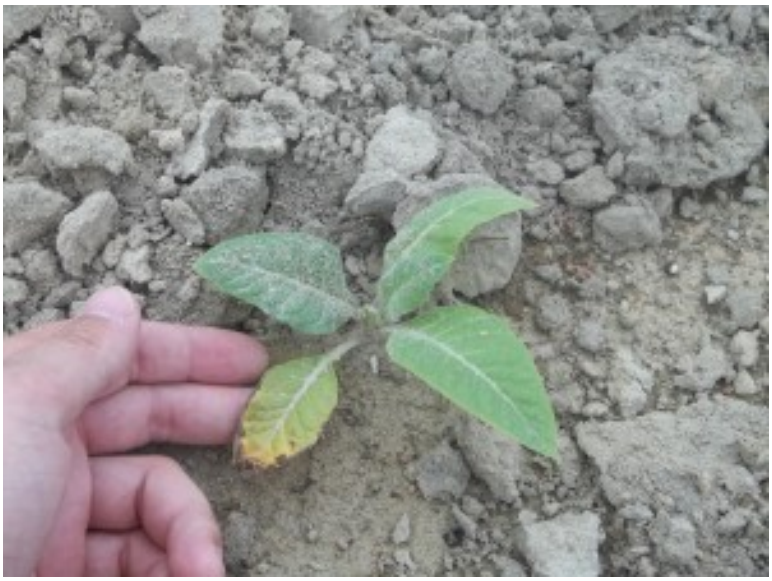
Stink bugs can also cause transverse holes through the leaves. Generally stink bugs are not present in corn until V5 and are associated with movement from wheat after harvest. Although there may be stink bugs present in corn when you find this sort of injury, remember that the injury happened some time

previously (perhaps one to several weeks). Stink bugs do not commonly injure corn seedlings in North Carolina, although they have the potential to injure corn seedlings. Stink bugs feed using piercing sucking mouthparts. These mouthparts can pierce directly through leaves, including developing unfurled leaves, resulting in transverse holes once the leaf has unfurled.

From: Hannah Burrack, Extension Entomologist

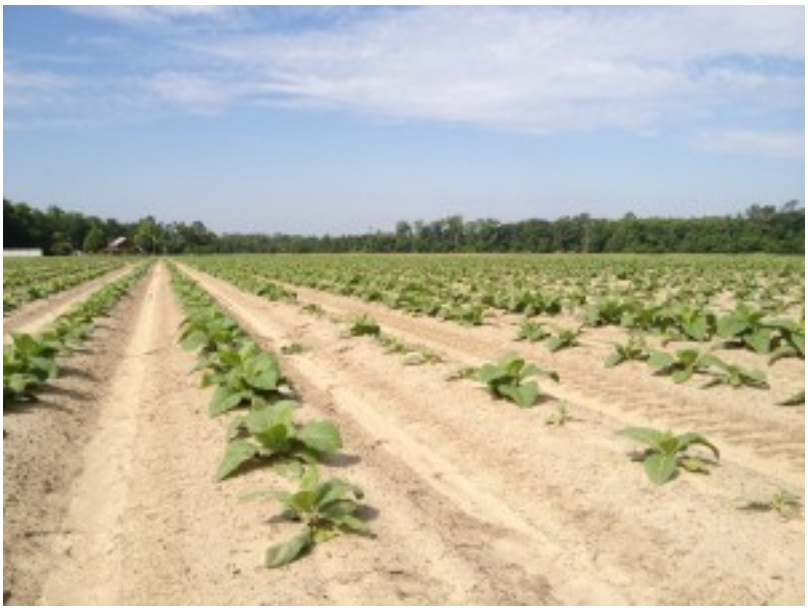
Early Season Plant Stunting Issues in Tobacco

I have received several calls from county agents in the last three weeks about stunted tobacco plants with a range of symptoms, each wondering about the possible role of systemic insecticides in the symptoms being observed. While there are more reports of stunted plants this year than in the last 3 years, it's important to remember that systemic insecticides are used on over 90% of the tobacco acres planted in North Carolina each year with the vast majority of these applied in the greenhouse as tray drenches. Fields with enough stunting to result in a telephone call to the county agent or extension specialist are still relatively rare.

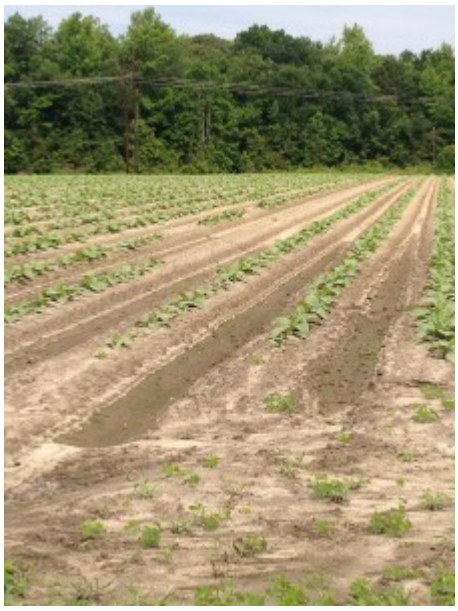


Stunted plant in Lenoir County, NC. Photo: Roy Thagard, Lenoir County Cooperative Extension.

It's impossible to say definitively what caused the injury in these fields, but significant stunting, and in very rare cases plant death, is likely a result of many factors including but not limited to: weather, carryover of pesticides from previous crops, insecticide application method, disease pressure (in and out the greenhouse), transplant quality, fertilizer use and application, and insecticide rate. Because many factors that may influence stunting in early season tobacco fields and these interacting factors are so difficult to tease apart, we cannot predict when and how stunting will occur. There are, however, practices that growers can employ to reduce potential insecticide effects.



Partially replanted tobacco field in Robeson County, NC. Small plants are mostly replants. Photo: Hannah J. Burrack.



Field that had not been replanted in Robeson County, NC. Photo: Hannah J. Burrack.

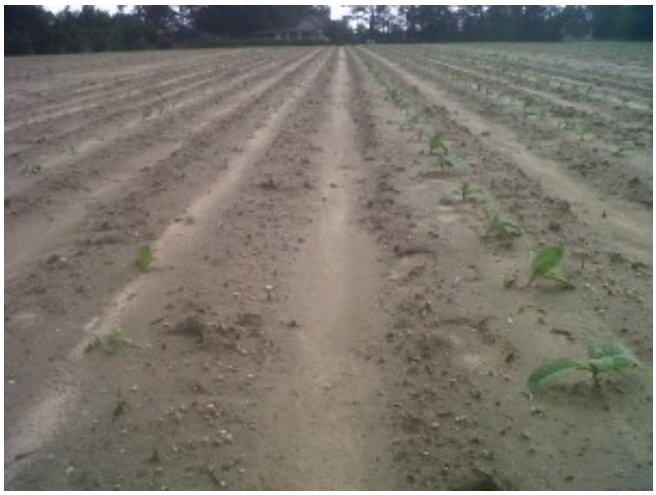
Insecticide rate

This year, all the calls I have received regarding stunted plants have been cases where the insecticide rate was 0.8 fl. oz. Admire Pro 4.6F/1000 plants, 0.9 fl. oz. generic imidacloprid 4F/1000 plants, or greater. These high rates of imidacloprid are only necessary in areas with high tomato spotted wilt virus (TSWV) risk (historic infection rates greater than 10% in imidacloprid treated plants on a regular basis) or in fields with a history of wireworm (http://www.ncsu.edu/project/tobaccoportal/pest-management/insects/soil-pests/wireworms/) pressure. If this is not the case, a lower rate is sufficient for aphid (http://www.ncsu.edu/project/tobaccoportal/pest-management/insects/green-peach-aphid/) and tobacco flea beetle (http://www.ncsu.edu/project/tobaccoportal/pest-management/insects/tobacco-flea-beetle/) control. We have seen an increase in plant stunting with an increase in insecticide rate in research trials, but it's important to note that early season stunting is usually transient, and by mid season, it is difficult to pick previously stunted plants out in the field.

Insecticide application method

Insecticide application method can influence the rate applied to areas within a greenhouse, which may result in "tray effects" in the field, meaning that strips apparently stunted plants can appear throughout fields. We recommend using a boom wide enough to cover the enter bed for greenhouse applications. All nozzles should be checked before making an insecticide application to ensure they are the same size, and are not worn (and therefore emitting too much material). Spray patterns should not overlap. Growers are discouraged from applying insecticides in the greenhouse with single nozzles or with backpack sprayers. Insecticides should be also applied 5 days or fewer before transplant. Keeping plants longer in the greenhouse may prevent them from actively growing and increase any potential impact.

Stunted tobacco plant in Johnston County, NC. Photo: Bryant Spivey, Johnston County Cooperative Extension.



Plants from two different sources in Johnston County, NC. Photo: Bryant Spivey, Johnston County Cooperative Extension.

Herbicide effects

Some fields, like those observed in Johnston County (above), also had herbicide injury symptoms, including bleached, twisted, and constricted leaves. Not all locations with reported stunted used herbicide, however.

FRUIT AND VEGETABLES

From: Hannah Burrack, Extension Entomologist

Do It Yourself: An Update on Distinguishing SWD Larvae from Other Insects in Strawberries

Early this spring, I wrote a post discussing how to distinguish spotted wing drosophila (SWD) larvae from other internally feed insects. That post (http://ncsmallfruitsipm.blogspot.com/2012/02/larvae-in-fruit-distinguishing-between.html) was focused primarily on blueberries. This spring and early summer, however, I received several calls about SWD in strawberries, and they appeared in our research plots for the first time.

Fortunately, the majority of grower calls I received about larvae in strawberries ended up being sap beetle larvae rather than SWD larvae. Sap beetles or picnic beetles are actually a complex of beetle pests (http://ohioline.osu.edu/hyg-fact/2000/2047.html) which include at least three species in North Carolina (*Carpophilus lugubris*, *Stelidota geminata*, *Glischrochilus quadrisignatus*, and others) and are attracted to rotting, not sound fruit. If rotting fruit are present near sound fruit, as can commonly happen when you-pickers aren't thorough or rain prevents picking, sap beetle adults and larvae can also attack sound, otherwise marketable fruit.

While sap beetle larvae are also not desirable in strawberries, they are more easily controlled than SWD. Good sanitation, meaning removal of overripe or rotting fruit, is usually enough to keep sap beetle populations in check.

How, then, can you distinguish between sap beetle larvae and SWD?

Host fruit

Sap beetles will first attack overripe, rotting, or otherwise damaged fruit. SWD will be found in fruit that appears otherwise marketable until cut open. As SWD grow older, fruit condition may deteriorate, but fly larvae found in sound fruit are more likely to be SWD than those found in rotting fruit.

Size

Young sap beetle larvae may be similar in size to large SWD larvae, but in general they will be larger than SWD larvae. Size on its own is not a good determinant, but it can be a good initial indicator.

Sap beetle larva on knife blade. Photo from a commerical strawberry farm in eastern NC, 2012.

Appearance

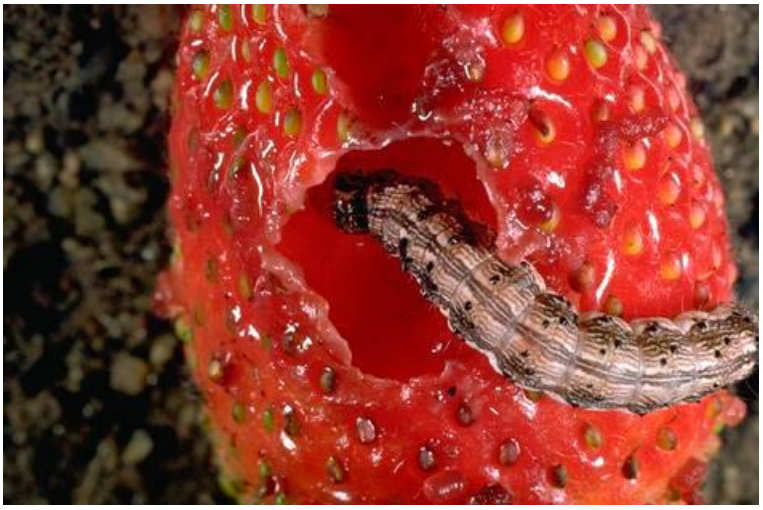
SWD larvae lack legs, have no distinct head, lack hairs or bristles, and are tapered on both ends. Sap beetle larvae have distinctive head capsules, three pairs of legs, and bristles along their bodies. Adult sap beetles may also be present along with larvae.

Sap beetle larva. Note the three pairs of legs, the distinctive brown to black head capsule and the bristles along the body. Sap beetle larvae will be mostly white or cream colored and lack patterns on their body. Photo from a commerical strawberry farm in eastern NC, 2012.

Two spotted wing drosophils larvae (center) inside a day neutral strawberry, Upper Mountain Research Station, October 2011. Photo: Hannah J. Burrack.

What other insects might be present inside strawberries?

Corn earworms (*Helicoverpa zea*) are occasional pests of strawberries, and the larvae can tunnel into berries. Corn earworms are caterpillars, which means they have a distinctive head capsule and three pairs of front legs like sap beetle larvae, but they also have short, grippy prolegs (http://en.wikipedia.org/wiki/Proleg) along their abdomen and have a pattern of stripes along their body (although their appearance can be highly variable (http://www.ipm.ucdavis.edu/PMG/H/I-LP-HZEA-LV.023.html) as larvae age).



Corn earworm larvae feeding on strawberries. Photo via UC IPM.

ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

New App for Landscape and Nursery Pests

The Southern Nursery IPM Working Group (SNIPM), of which several faculty at North Carolina State University are members, has just released and exciting new App available for iPhones and Android phones. The App predicts the emergence of arthropod, disease, and weed pests based on degree day estimates, provides diagnosis help, and even pesticide recommendations. This is a very comprehensive tool that should prove valuable to industry and extension personnel. A complete description can be found on the website http://www.ipmproapp.com/.

Crape Myrtle Aphids

Crape myrtle aphids are one of the most common pests of crape myrtle but rarely require treatment. Small populations are present in Raleigh and have been building over the past couple weeks. Feeding by these aphids results in leaf yellowing and distortion, leaf drop, and honeydew deposits which of course lead to sooty mold. Crape myrtle aphids are generally kept in check by natural enemies. When scouting for them I often find almost as many lacewing eggs, lady bug larvae, and other predators as aphids.

Interestingly, there are no known parasitoids of this exotic aphid. A variety of chemicals are available should these aphids reach unacceptable levels in nurseries or landscapes. Some of the same chemicals recommended for aphids such as imidacloprid can be applied as a drench to protect against Japanese beetles later in the year. For more information on this pest including control options, visit http://ecoipm.com/ and *Ornamentals and Turf Insect Note ENT/ort-31* at http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note31/note31.html.

Crape myrtle aphids.

Crape myrtle aphids.

Indian Wax Scale Eggs Hatching

Indian wax scale cover partially removed to reveal crawlers underneath. Photo: Steve Frank.

Indian wax scale, *Ceroplastes ceriferus*, is a common scale on landscape plants. In particular we find it on hollies, cherry laurel, spirea, boxwood, and barberry. Indian wax scale is a soft scale that, as the name suggests, looks like white, gray, or pinkish wax on the branches of infested plants. Indian wax scale secretes a lot of honey dew as do most soft scales. This can create sooty mold and reduce the aesthetic appeal of landscape plants. Heavy infestations will reduce plant vitality. Indian wax scale has one generation per year. They overwinter as mostly as adults but we have found younger stages in the fall and spring that apparently overwintered. In spring crawlers emerge and crawl around to find a new feeding site. Crawlers are the best stage to target for control of any scale and for wax scale the time is now. Crawlers are emerging from eggs under the heavy wax covers on campus right now. At this stage crawlers can be killed very easily as they are small and unprotected. Thus horticultural oil is a very viable option. Systemic products such as neonicotinoids make the plant toxic so crawlers and later stages will be killed as they feed. More information can be found at http://ecoipm.com/ or http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note156/note156.html.

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.