

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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Happy Independence Day

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

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FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

Cotton Insect Levels Low, for Now

Generally, cotton insect levels across the state are low, with reports of plant bugs accounting for most of our calls this past week.

Plant bug-related reports continue to come in regularly, though most callers are presently describing square retentions in the 75 to 80-plus percent range and live plant bug levels in the 8 to 15 bugs per 100 sweeps range. These marginal situations can usually be managed with chloronicotinoid insecticides such as Centric, Belay and others without potentially adding to increased cotton or spider mite outbreaks down the road. Regular assessments of upper square retention remains our most efficient means of determining the possible need for sampling live adult and immature plant bugs with a 15-inch diameter sweep net until the bloom period begins. Plant bugs assessments after blooming has begun is most effectively carried out with a ground cloth, if justified, based on a combination of low square retention, blackened small squares, some evidence of live plant bugs, and/or dirty bloom levels above approximately 15%.

To date only limited acreage has been treated for **spider mites**. However, spider mites can build up quickly in cotton, especially in areas that are still dry. Recent rainfall on parts of North Carolina's cotton acreage should help hold down mite levels in those areas. Because economic treatable levels of spider mites are far more the exception than the rule in our area, treatment is only recommended when spider mites can be found throughout much of the field, with some of the yellowish bottom leaves beginning to fall from infested plants. If rainfall is predicted or considered likely, hold off on treatment and reevaluate in 3 to 4 days, looking for the establishment of the parasitic fungus and dead mites on the undersides of impacted leaves. Due to the small size of living and parasitized mites, a hand lens will come in handy.

Due to the past two months of unseasonably hot weather, we presently expect our major **bollworm moth** flight to begin in southeastern North Carolina on approximately July 8 to 15.

Cotton and Soybean Insect Scouting Schools

Northampton County: July 19 at 9:30 a.m. at the Extension Offices located at 9495 NC Highway 305 in Jackson, NC. Contact Craig Ellison at 252-534-2831 or craig_ellison@ncsu.edu for details.

Halifax County: July 19 at 2:00 p.m. at the County Government Center, 359 Farrell Lane in Halifax, NC. Contact Arthur Whitehead at 252-583-1683 or arthur_whitehead@ncsu.edu for details.

Cotton Scouting Schools

Bertie County: July 20 at 9:30 a.m. in Windsor, NC, probably at the Windsor Community Building. Contact Richard Rhodes at 252-794-5317 or richard_rhodes@ncsu.edu for details.

Area cotton scouting school for Edgecombe, Nash and Wilson Counties: July 21. Location and time to be determined and will be posted in the July 8 issue of the *North Carolina Pest News*. Contact Art Bradley at 252-641-7815 or art_bradley@ncsu.edu for details.

Both indoor and outdoor training will be provided at each of the above training sessions. These educational programs are offered to the public without a fee.

From: Dominic Reisig, Extension Entomologist

Kudzu Bug Feeding on Soybeans in Buncombe and Henderson Counties

Kudzu bug adults (Fig. 1) were found feeding in both Buncombe and Henderson counties. The threshold is three bugs per plant (adults + nymphs) or about one bug per sweep. Although there were multiple adults per sweep in these fields, there were no nymphs present. Soybean should only be treated when the threshold has been reached and when **nymphs are present**. This is based on the biology of the insect. The adults migrate over a period of time and lay eggs in the soybeans. If the treatment is too early, other adults may re-invade the field and you'll likely have to treat their offspring later. As a result, it's better to wait until some nymphs hatch (after you've reached threshold) to kill resident bugs in the field and to catch those that may have invaded in the meantime. Avoid neonicotinoids when choosing an insecticide for this pest.

In edible bean fields, the same threshold can be used, since this is a stem and leaf feeder. Organic growers might try something like PyGanic, although there is no efficacy data for this.



Fig. 1. Kudzu bug adults. Images from Susan Collucci.

We are tracking this pest and would appreciate you contacting Dominic Reisig by electronic mail (dominic_reisig@ncsu.edu) or telephone (252-793-4428 x133) if you find this pest in a non-confirmed county (Fig. 2). If you could also provide GPS coordinates, **as well as the plant on which it was found**, it would enhance our ability to respond to this new threat. Please use caution not to spread this pest from field to field if you find this pest.

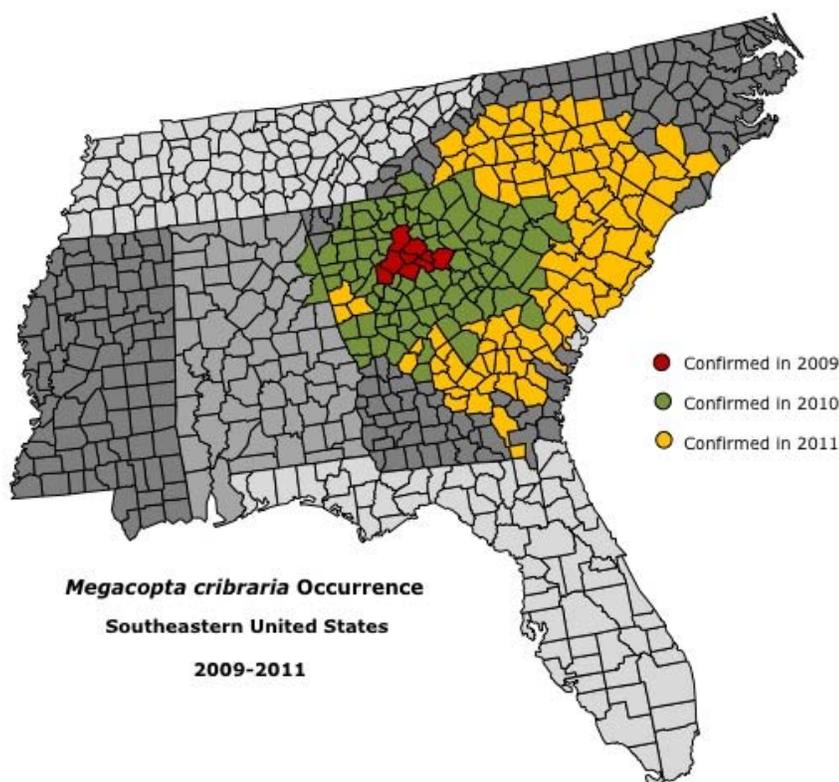


Fig. 2. Confirmed kudzu bug distribution. Image from Wayne Gardner.

New Blog for Field Crop Insects in North Carolina

I have started a blog called *North Carolina Field Crop Entomology* (<http://www.nccrops.com>). Until now, my written Extension outreach regarding current events has been restricted to the *North Carolina Pest News*. I will now post my pest news articles on the blog, in addition to the pest newsletter. The advantage is that the information will be available immediately on the blog. It will also allow me to convey information that may not be "Pest News worthy". For example, Frank Winslow told me about several outbreaks of blister beetles on soybeans and gardens in Tyrrell and Dare counties. I would not submit a newsletter article for this, but might post it on the blog. You should be able to leave comments, as well. This way we can all dialogue and keep in touch about what is going on.

From the blog, you can also access the new Field Crop Entomology web page at <http://www.ces.ncsu.edu/plymouth/ent/Entomology.html>. Please be patient, as the webpage is still a work in progress. This is a busy time of year and updating everything in one go is difficult. Much of the web page is based on information from John Van Duyn, the previous field crops entomologist at North Carolina State University. Some of the information is completely new. Some pages, like the cotton page, have broken links that are still under construction. I will address these issues this winter, after the field season. In the meantime, subscribe to my blog feed and leave some comments!

FRUIT AND VEGETABLES

From: Matt Bickerton and Mark Abney, Department of Entomology

Brown Marmorated Stink Bug: An Emerging Threat to North Carolina Agriculture

The invasive brown marmorated stink bug, *Halyomorpha halys* (Stål), was first reported in North Carolina in 2009, and it is expected to be far more numerous this year as it appears to be expanding its southern range.

This pest is native to Asia and was accidentally introduced to the United States in 1996 in Allentown, Pennsylvania. Since its entry, it has spread throughout the United States and Canada and has become well established throughout the mid-Atlantic region: Pennsylvania, New York, New Jersey, Delaware, Maryland, West Virginia, Virginia, and at least eight other states. It is an economic pest in numerous agricultural systems, including apples, peaches, peppers, corn, soybean, and will thrive on other cultivated and wild plants.

Nymphs and adults will feed on leaves and stems of host plants, but are particularly attracted to the reproductive structures, and thus often damage the marketable portion of the plant. Stink bugs feed by inserting needle-like mouthparts into the plant tissue and sucking out the juices. Damage that occurs soon after fruit set in peaches can result in misshapen "catfaced" fruit. When damage occurs later in the season as with fruiting vegetables (e.g., peppers, tomatoes) feeding corresponds with ripening and will result in discolored stippling on the surface. If feeding damage is intense, the fruit is unmarketable. In corn and soybeans, brown marmorated stink bugs will penetrate the husk or pod and feed on the developing seeds. Switching between different hosts occurs continuously throughout the season as new plants become more attractive.

In addition to the threatening prospects for agriculture, brown marmorated stink bugs have also become a nuisance to homeowners due to its tendency to aggregate (often in very large numbers) in homes and other structures in the fall to overwinter. In North Carolina aggregation can occur in late September through early October and may be especially high in homes bordered by woods or agricultural land. Windows and air conditioning units are typical points of entry, and preventative measures include sealing these areas with caulk or weather stripping.

Brown marmorated stink bugs have been reported in several North Carolina counties. Although it appears to be in the "lag" stage of population growth, the potential for brown marmorated stink bugs to cause economic losses in North Carolina this year are uncertain. Little is known about its potential to damage Southern region crops like cotton, tobacco, and peanuts. Host plant surveys and trapping of brown marmorated stink bugs are currently being performed by Extension personnel to determine the distribution and host range and sequence of host utilization of brown marmorated stink bugs in North Carolina.

Brown marmorated stink bug eggs may be present throughout the summer and are deposited in clusters of 20 to 30 on the undersurfaces of leaves (Fig 3). There are five nymphal or immature stages and each lasts for approximately one week (Fig. 4).



Fig 3. Brown marmorated stink bug egg mass.



Fig 4. Brown marmorated stink bug nymph.



Fig. 5. Brown marmorated stink bug adult male.



Fig. 6. Brown stink bug (*Euschistus servus*) adult.

Nymphs (Fig. 4) and adults (Fig. 5) can be distinguished from our native stink bugs by the presence of white bands on the second to last antennal segment. Adult brown marmorated stink bugs are most commonly confused with the native brown stink bug, *Euschistus servus*, and the rough stink bug, *Bronchymena quadripustulata*. The marbled or marmorated appearance of brown marmorated stink bugs is very similar to that of the native brown stink bug (Fig. 6). Female brown marmorated stink bugs are generally larger than native brown stink bugs, but males are very similar in size. Brown marmorated stink bugs may be reddish on the undersurface, while *E. servus* is often green or yellow on the undersurface.

Brown marmorated stink bugs and rough stink bugs are similar in coloration, but rough stink bugs have several "teeth" or ridges on the outer edge of its shoulder, while brown marmorated stink bugs have a smooth shoulder. For a full description of the differences between brown marmorated stink bugs and rough stink bugs (including pictures), see the Oregon State Department of Agriculture Pest Alert at http://www.oregon.gov/ODA/PLANT/docs/pdf/ippm_bmsb_alert2010.pdf?ga=t.

For images and description of damage in tree fruit by brown marmorated stink bugs, visit the Virginia Cooperative Extension newsletter at <http://pubs.ext.vt.edu/2902/2902-1100/2902-1100.html>.

An online system for reporting brown marmorated stink bug sightings is currently being developed in North Carolina and will be available soon. Accurate records of the distribution of the pest in the state will provide useful information to researchers working to develop management strategies. Your help in reporting the presence of the insect in your county is needed and appreciated.

For more information contact the North Carolina State University Vegetable Entomologist Mark Abney at mark_abney@ncsu.edu.

ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

Fall Webworms Hatching

I found small nests of very young fall webworms, *Hyphantria cunea*, when I was hiking last weekend. Fall webworms feed on over 600 species of trees and shrubs. In North Carolina they are most often found on sourwood, persimmon and pecan. Fall webworms primarily cause cosmetic damage to shade trees because of the unsightly webs they form around the foliage on which they feed. Young caterpillars eat leaf surfaces so that only the tiny veins remain. This residue turns brown and collects in the web. Older caterpillars devour the entire leaf. Because they are most abundant in mid-late summer after the tree has had some time to store food, the weather is hot and rainfall less, a tree's life is rarely in danger. Fall webworms can be easily destroyed or disrupted by pulling down the webs and destroying the caterpillars if the webs are within reach of a stick or pole. This also exposes caterpillars to bird and wasp predation. Insecticides applications will not penetrate the tent so caterpillars can only be exposed by feeding on treated leaves near the nest. For additional information, see *Ornamentals and Turf Insect Information Note No. 46* at <http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note46/note46.html>.

Follow @OrnaPests on twitter for timely updates on ornamental pest activity.

Twospotted Spider Mites Abound!

The twospotted spider mite, *Tetranychus urticae*, thrives in hot, dry weather like we have had lately. I have found many spider mites in the landscape . . . even on my poor Solomon's Seal! It is important to scout for twospotted spider mites now because they reproduce most rapidly in hot dry weather. Under these conditions they can mature from egg to reproducing adult in 5 days! Nursery crops are especially susceptible because they may be exposed to more sun than landscape plants and receive more pesticides. Twospotted spider mites (Fig. 7) feed on over 100 plant species, sucking the fluid out of leaf cells. This 'stippling' damage can rapidly cause entire plants to take on a bronzed appearance. Look on the underside of leaves on susceptible hosts or beat foliage on a white piece of paper to scout for spider mites. If you notice mites or their damage, a range of control options are available, the best of which are several new miticides that provide long residuals and efficacy against all mite life stages. Broad spectrum insecticides will make mite populations worse by killing natural enemies. For more information and product suggestions visit the newly revised *Ornamental and Turf Insect Information Note No. 25* at: <http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/note25/note25.html>.



Fig. 7. Twospotted spider mites. Image by David Cappaert, Michigan State University (<http://bugwood.org>).

From: Emily Meineke and Steve Frank, Department of Entomology

Scale Picnic Beetles, *Cybocephalus nipponicus* (Endrody-Younga)

Scale picnic beetle adults (Fig. 8) are active now in North Carolina! The scale picnic beetle provides prolonged control of armored scale, such as Euonymus and San Jose scale.

C. nipponicus is native to China and Korea and was introduced into the U.S. in the 1990s to control euonymus scale. The New Jersey Department of Agriculture started a rearing program in the mid-1990s, and since its release, *C. nipponicus* programs have expanded. Researchers are currently using populations to control elongate hemlock scale, a serious secondary pest of hemlock stands stressed by the hemlock woolly adelgid.

C. nipponicus eat scale as larvae and as adults. Adults live for months and can reproduce several times. Staggered generations provide year-round control, and, unlike other similar beetles, *C. nipponicus* can survive when prey populations are low. Larvae develop and feed under waxy covers that protect them from direct exposure to pesticides. These tiny beetles are comparatively expensive to purchase, and populations establish over multiple years. However, natural *C. nipponicus* populations are present throughout North Carolina and provide background control of many landscape scale species.



Fig. 8. Scale picnic beetle adults. Image courtesy of <http://www.bugwood.org>.



Fig. 9. Assassin bug. Image by Emily Meineke.

Assassin Bugs (Family: *Reduviidae*)

Assassin bugs (Fig. 9) are members of the diverse, predatory family *Reduviidae*. They use their long stylet to pierce and liquefy caterpillars, aphids, and other pests. Several of these beneficial species live in North Carolina, including but not limited to the lurid assassin bug (*Zelus luridus*), the colorful assassin (*Rhiginia cruciata*), the masked hunter (*Reduvius personatus*), and the wheelbug (*Arilus cristatus*). Some species of assassin bug nymphs look similar to herbivorous true bugs, such as the leaf-footed bugs, that use their stylets to suck plant juices. There is a rudimentary way to tell the difference between these groups as immature insects. Pestiferous bugs that eat plants tend to congregate, while assassin bugs hunt alone.

Assassin bugs like varied plant structure to hunt within, and also high humidity. To encourage their populations on the lawn or beside the garden, you can plant tall native grasses and flowers.

RESIDENCES, STRUCTURES AND COMMUNITIES

From: Patty Alder, Training Coordinator, Department of Entomology

Earwigs

Earwigs get their name from a European superstition that these insects enter the ears of a sleeping person and bore into the brain. While earwigs may cause alarm because of their “pincers,” rest assured they do not enter people’s ears!

Earwigs are elongate, flattened insects that may be light red-brown to black in color (Fig. 10). They are easily recognized by their forcep-like appendages (cerci) on the end of the abdomen. The size and shape of the cerci vary between species and between males and females. If wings are present, the first pair is hard and very short. Immature earwigs (nymphs) are similar to adults and will have a white to olive-green appearance and do not have wings.



Fig. 10. Earwigs. Image from the University of Nebraska Department of Entomology.



Fig. 11. Gravel around foundation of building. Image by Mike Waldvogel.

Earwigs can move about readily and often hitchhike in laundry baskets, cut flowers, luggage, newspapers, cardboard boxes, lumber, baskets of fruits and vegetables, etc. They require moist, cool places and are usually found in damp crawl spaces or basements, flower gardens near the home, in mulches, compost piles and trash, under boards, and in woodpiles.

During dry, hot weather, earwigs sometimes migrate indoors. They are active primarily at night and are often found around lights. They feed on mosses, lichens, algae, fungi, insects, spiders and mites, both dead and alive. Some earwigs are predators, feeding on aphids, while others feed on living plants and may become pests in greenhouses and on certain crops such as vegetables, fruits, ornamentals, forages and field plants.

Management

Earwigs are attracted to light. Reduce lighting around doors, windows, and other potential entry sites. For exterior lighting, use sodium vapor yellow lights, which attract fewer insects compared to white, neon, halide, or mercury vapor lights.

Earwigs need and are attracted to moisture around buildings, particularly when the weather turns hot and dry. High populations may be present around foundations, in landscaped areas, in mulch, under boards, etc. Eliminate damp, moist conditions in crawl spaces, around exterior water spigots, air-conditioning units, and along building foundations. Rain gutters and downspouts should carry water away from the foundation. If possible, use a 12 to 18 inch gravel border around the foundation wall. Use caulk to seal up possible entry points, especially at ground level.

Earwigs can be trapped indoors with ordinary sticky traps placed under sinks or other such areas where earwigs have been seen.

Earwigs are easily killed by residual insecticide treatments. Indoors, focus on cracks and crevices where earwigs might hide. Any indoor treatments should supplement pesticide applications outdoors since earwigs do not typically become established indoors, except in areas of high moisture.

Outdoors, you can treat 18 to 24 inches of the foundation wall and possibly a 3 to 6 foot band around the building adjacent to the foundation to stop or limit earwig invasions (Fig. 11). There are also some granular baits that can be used outdoors for earwigs, crickets, and cockroaches. If you plan to use baits, do not treat these areas with insecticides, so that the bait is not contaminated.

Bee Flies

Large bee flies (*Bombylius* spp.) are 1/4 to 1/2 inches in length. They are quite hairy and resemble bumble bees at first glance (Fig. 12). Their mouthparts are slender and beaklike, almost as long as the body. Adult bee flies are often found around homes and other structures with ornamental flowers and gardens. Large bee flies feed on nectar and are often seen hovering next to the plant they are feeding on. They usually rest two legs (front or hind) on the flower while feeding.

Bee fly larvae are parasites of solitary wasps and bees. Bee flies are often seen hovering in mid-air motionless as they wait for a female solitary bee. The female bee fly follows a solitary bee species from a flower to her nest. The bee fly waits for the solitary bee to depart, and then lays her eggs in the nest entrance. The larvae of the bee fly feed on the larvae of the solitary bee, pupate in the nest, and emerge as adults in early summer.

No control measures are needed for large bee flies as they do not invade homes nor do they sting. Upon closer inspection, the long, slender beak usually clues people in that they are not dealing with a bumble bee.



Fig. 12. Bee fly. Image by Patricia Alder.

INSECT TRAP DATA

From: Dominic Reisig, Extension Entomologist

Light Trap Data from Tidewater Research Station (Washington County)

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*****
                        Number of Adult Insects
*****
Date      CEW    TBW    ECB    AW    SBL    BSB    GSB
*****
June 22      9      0      0      0      0      0      1
June 24      5      0      0      0      0      2      2
*****
    
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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

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*****
                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
*****

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Abbreviations: CEW = corn earworms; TBW = tobacco budworms

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.