

North Carolina Pest News

Departments of Entomology and Plant Pathology



Volume 28, Number 16,
July 26, 2013

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.

Dept. of Entomology,
North Carolina State
University, Box 7613,
Raleigh, NC 27695

ANNOUNCEMENTS AND GENERAL INFORMATION	2
• Organic Grain Production Field Day	
FIELD AND FORAGE CROPS	2
• Plant <u>Bug</u> Feeding Frenzy?	
• Stink Bug Predictions, Anyone?	
• Late Cotton Crop Susceptible to Drought	
• Frogeye Leaf Spot	
• Resources for Soybean Rust in 2013	
• Plant Disease and Insect Clinic Update	
FRUIT AND VEGETABLES	4
• End of Harvest Concerns in Blueberries	
• Cucurbit Downy Mildew Moves Towards Western North Carolina	
ORNAMENTALS AND TURF	8
• Debris-carrying Green Lacewing Larvae are Active and Everywhere!	
INSECT TRAP DATA	9
• Light Trap Data from Bertie County	
• Light Trap Data from Craven County	
• Light Trap Data from Edgecombe County	
• Light Trap Data from Lenoir County	
• Light Trap Data from Onslow County	
• Light Trap Data from Scotland County	
• Light Trap Data from Tidewater Research Station	
• Light Trap Data from Wayne County	

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

Distributed in furtherance of the acts of Congress of May 8 and June 30, 1914. North Carolina State University and North Carolina A&T State University commit themselves to positive action to secure equal opportunity regardless of race, color, creed, national origin, religion, sex, age, or disability. In addition, the two Universities welcome all persons without regard to sexual orientation. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.

ANNOUNCEMENTS AND GENERAL INFORMATION

Organic Grain Production Field Day

Organic Grain Production Field Day is on July 30, 2013, and starts at 10:00 a.m. at the Center for Environmental Farming Systems (CEFS) at Cherry Research Farm in Goldsboro, North Carolina. Registration information is at http://www.cals.ncsu.edu/agcomm/writing/Field_Days/organic-grain-e-postcard.pdf.

FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

Plant Bug Feeding Frenzy?

As we mentioned a few weeks ago, eventually this year's abundant wild and cultivated host vegetation supporting plant bugs had to dry down. For some cotton producers, this has happened with a vengeance, particularly in our far eastern counties, but also in scattered fields throughout the state. On Wednesday, July 23, one consultant reported having to make a third treatment on some cotton fields with good control on the previous applications, but these fields were apparently subject to continuous adult reinvasion (the good control was indicated by the lack of plant bug nymph establishment). Plant bug damage in this part of North Carolina is not new; however, our infestations appear to be more widespread and at higher densities in 2013 – at least for some. Even at the Upper Coastal Plain Research Station Thursday, although plant bug levels didn't appear to be high under our mid-afternoon dry conditions, dirty bloom levels were in the 20 to 40% range and missing square positions and blackened squares probably put fields in the 60 to 70% retention range – a sign that prior visits by this pest had been frequent. If control is indicated for plant bugs, be sure to consult this site (<http://ipm.ncsu.edu/cotton/insectcorner/PDF/Insecticide.Performance.Survey.2013.pdf>) for insecticide efficacy comparisons. If cotton is into the second of blooming, remember that internal damage to young bolls by both plant bugs and stink bugs is possible, and insecticide choices should reflect this possible combination.



Dirty bloom (an indication of prior plant bug feeding). Image by Jack Bacheler, North Carolina State University.

Stink Bug Predictions, Anyone?

The correlation between higher stink bug levels and damage potential to cotton bolls in wet years and lower potential damage to bolls in dry years appears to hold up reasonably well. Consider 2013. Stink bug levels so far this year are generally high following our protracted rainy weather, but many areas are now dry and in some cases stink bugs are getting harder to find. For example, my technician and I swept cotton and soybean fields and inspected vegetables, tobacco and field corn in Rocky Mount on Thursday, trying to find green and/or brown stink bugs to put into a field cage for an upcoming class. Approximately one hour of sweeping yielded only a single brown stink bug under these very dry conditions. This same week, several consultants were finding reasonably high levels of stink bugs in soybeans (just waiting for the appearance of pods, I guess) and above threshold levels of stink bug-damaged bolls on cotton. Hopefully, most stink bug treatment decisions will be based on levels of internal damage to bolls. The stink bug decision aid web-based app (<http://ipm.ncsu.edu/cotton/insectcorner/sbapp2/index.html>) can help with these decisions.

Late Cotton Crop Susceptible to Drought

With so many cotton fields on the cusp of being unprofitable this year due to the impact of our extended miserable rainy wet weather on cotton development and maturity, decisions about how much application and insecticide costs are warranted are difficult and probably must be made on a field-by-field basis. On one hand, fruiting positions are scarce and squares and bolls may need to be protected over a more extended period of time. And presently, we certainly appear to have the plant bug and stink bug levels in some areas to cause significant yield losses. On the other hand, our earlier excessively wet weather did little to help our cotton seedlings develop good (or even sub-par) root systems, leaving us particularly susceptible to drought. We could certainly use good and timely rainfall from here on out.

From: Steve Koenning, Extension Plant Pathologist, and Jim Dunphy, Extension Soybean Specialist

Frogeye Leaf Spot

Frogeye leaf spot is caused by the fungus *Cercospora sojina*. Most soybean varieties currently grown are resistant to this disease and the use of resistant varieties is the preferred method of control. Although frogeye leaf spot is seed borne, it tends to be worse in fields of continuous soybean. Only newly formed leaves are susceptible to this disease, and fully expanded leaves are resistant until they start to senesce. Immature leaves become infected with periods of rain or high humidity, but infection will be limited by dry weather. So, as the soybean plants put on new layers of leaves, frogeye may be present or absent depending on weather conditions during leaf expansion. This can lead to a situation where frogeye is layered in the canopy at different levels. Frogeye has caused yield losses of 30% in some fields. The general recommendation for susceptible varieties is the application of a strobilurin type fungicide, especially if continued wet and/or humid weather is expected. We do not have a threshold for number of spots or percent leaf area affected to justify fungicide application. If wet and/or humid weather persists as plants start to senesce, older leaves become susceptible again, and the plant may defoliate early. Early defoliation can result in smaller seeds which will translate into yield loss. Also, pod infection can cause a reduction in seed quality or contribute to seed rot. For more information on frogeye leaf spot, see <http://www.ces.ncsu.edu/depts/pp/notes/Soybean/soy003/soy003.htm>.



Frogeye leaf spot caused by *Cercospora sojina*.

Resources for Soybean Rust in 2013

Some sources for more detailed information on Asiatic soybean rust are listed below:

USDA Soybean Rust website: <http://www.sbrusa.net/>

North Carolina Agricultural Chemical Manual: <http://ipm.ncsu.edu/agchem/agchem.html>

Plant Disease and Insect Clinic Update

Corn, cotton, small grain, and soybean disease samples submitted by county agents are still free of charge in 2013.

FRUIT AND VEGETABLES

From: Hannah Burrack, Extension Entomologist

End of Harvest Concerns in Blueberries

As blueberry harvest nears the end in North Carolina, a few important insect related issues require some attention.

Spotted wing drosophila in processing fruit

Rainfall makes spotted wing drosophila (SWD) management more challenging (http://strawberries.ces.ncsu.edu/2013/05/swd_in_rain/), as growers have discovered in the last two months. As we move into the end of blueberry harvest, fruit being picked for processing is at higher risk for SWD infestation for several reasons: It is often softer than fruit picked for the fresh market and SWD

prefer soft fruit (<http://news.ncsu.edu/releases/wms-burrack-suzukii-2013/>). Processing fruit may be harvested less frequently than fresh market fruit, increasing the time ripe berries are exposed to SWD. Finally, because processing fruit is often machine harvested, all the fruit in the field (good and bad) may be picked.

There are some strategies that growers can employ post harvest to decrease the likelihood that SWD infested fruit will be sent off for processing:

1. Hold fruit at cool temperatures. Work in our lab suggests that SWD eggs and larvae cease development at temperatures less than 41°F. They will not necessarily die at cool temperatures, but they likely will not cause further damage to the fruit. The longer fruit are stored and the cooler the temperature of storage, the more likely that *small* SWD larvae will die. Holding fruit at cooler temperatures also give growers the added benefit of determining how significant the infestation, as large larvae will exit fruit as it cools.
2. Sort out soft fruit. Soft fruit is the most likely to be infested with SWD for two reasons – egg laying SWD are more attracted to soft fruit and blueberries become softer as SWD feed. If growers can remove soft fruit before sending fruit for processing, this will further decrease risk of infestation being present. I suspect our aggressive soft sorting standards for fresh market blueberries are one of the reasons that SWD has been a less significant issue in this crop than some other hosts.
3. Sample collection timing. When receiving fruit, processors can either collect samples before or after fruit are sorted/de-stemmed. Samples collected before fruit has been soft sorted are not necessarily representative of the status of the fruit that will be processed. Samples of fruit after chilling and sorting, prior to processing/freezing, are likely more representative.

Post harvest leafhopper treatments

Treatments to manage sharpnosed leafhopper (http://ipm.ncsu.edu/small_fruit/hopper.html) vectors of blueberry stunt disease typically begin post harvest (http://pemaruccicenter.rutgers.edu/assets/PDF/Blueberry/iSharp-nosed_Leafhopper.pdf). Blueberry stunt disease is caused by a phytoplasma, and symptoms include "bushy" growth due to short, stunted branches and yellowed leaving during the growing season which may prematurely turn red and fall off in late summer. Most importantly, plants infested with stunt-causing phytoplasma do not produce.

Aerial applications of ULV (ultra low volume) malathion has been used in the past for leafhoppers due to effectiveness and ease of application. However, many growers have also used this material for SWD management during the season, and careful attention must be paid to label restrictions on the number of applications that can be made of materials when selecting tools to manage sharpnosed leafhopper. Application limits apply to the entire growing season, not just harvest season, so label limits on the number of applications also apply to leafhopper treatments. Application limits apply to the amount of active ingredient, not the trade names of those active ingredients. Sources for updated labels with current use restrictions include CDMS (<http://www.cdms.net/Home.aspx>) and Agrian (<http://www.agrian.com/home/label-lookup/overview>).

Alternatives to malathion that are effective against sharpnosed leafhopper include Assail (acetamiprid) and Asana (esfenvalurate). Imidacloprid and thiamethoxam are also options for sharpnosed leafhopper.

The *North Carolina Agricultural Chemicals Manual* (<http://ipm.ncsu.edu/agchem/agchem.html>) has recommendations for the use of these materials. It's important to note, however, that all these materials pose some risks to pollinators. While blueberries are not in bloom, some of our most efficient blueberry pollinators (<http://repository.lib.ncsu.edu/ir/handle/1840.16/7822>) are ground nesting bees that may remain near fields after bloom. Therefore, any insecticide treatments should be timed to leafhopper flights, ideally determined through trapping, to provide maximum efficacy against target pests and limit unnecessary applications. See <http://ncsmallfruitsipm.blogspot.com/2011/04/practicing-what-we-preach-implimenting.html> for information on trapping and the following for images, http://ipm.ncsu.edu/small_fruit/hopper.html, to aid in sharpnosed leafhopper identification.

From: Lina Quesada-Ocampo, Extension Plant Pathologist

Cucurbit Downy Mildew Moves Towards Western North Carolina

Cucurbit downy mildew has been reported in Haywood, Polk, Ashe, Henderson and Chatham counties (<http://cdm.ipmpipe.org/scripts/map.php>) during this past week. Now that cucurbit downy mildew is present in several regions of North Carolina and surrounding states, it's important that growers scout for the disease and keep up with preventive sprays to protect their crop and avoid yield losses.

If you are not familiar with cucurbit downy mildew symptoms on different cucurbits please see our previous alert (<http://plantpathology.ces.ncsu.edu/2013/07/do-you-know-how-to-diagnose-cucurbit-downy-mildew-in-different-cucurbit-crops/>) to assist you in diagnosing this foliar disease. If you think you have cucurbit downy mildew in your cucurbits please contact your local Extension agent (<http://www.ces.ncsu.edu/local-county-center/>) and send photos and/or physical samples to the *Plant Disease and Insect Clinic* (<http://www.cals.ncsu.edu/plantpath/extension/clinic/submit-sample.html>).

For more information about the disease and how to control it, see our factsheets in English and Spanish (http://projects.cals.ncsu.edu/veggiepathology/disease_factsheets). Control recommendations are also available in the cucurbit downy mildew IPM pipe website (<http://cdm.ipmpipe.org/index.php>), where you can also register to receive text, e-mail and/or phone alerts when new disease outbreaks are reported. We have also compiled previous cucurbit downy mildew alerts at <http://plantpathology.ces.ncsu.edu/tags/cdm/>.

Follow us on Twitter (<https://twitter.com/QuesadaLabNCSU>) and Facebook for more veggie disease alerts (<https://www.facebook.com/QuesadaLabNCSU>).



Severe cucurbit downy mildew symptoms on cucumber leaf, note angular shape of yellow lesions. Older lesions turn brown and necrotic and start to coalesce losing their characteristic angular shape and making the diagnosis difficult. Photo: Debbie Roos, North Carolina State University Extension Agent.



Close up of initial cucurbit downy mildew lesions on cucumber leaf, note angular shape of yellow lesions. Photo: Travis Birdsell, North Carolina State University Extension Agent.



Close-up of cucurbit downy mildew “downy”, dark (gray, black, brown) sporulation on backside of cucumber leaf. Photo: Travis Birdsell, North Carolina State University Extension Agent.

ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

Debris-carrying Green Lacewing Larvae are Active and Everywhere!

Green lacewing larvae are common predators of several soft-bodied pest arthropods across the United States. Their prey includes but is not limited to: scale insects, spider mites, aphids, thrips, and eggs of pest insects. They are useful in biological control because of their generalist and voracious feeding habits. Lacewing larvae are often compared to alligators due to their elongate, slender body shape and are typically yellow and brown in color with six legs. These larvae have large pincer mouthparts that they use to penetrate bodies of prey, paralyze them, and literally suck out their insides. They use these mouthparts to devour several hundred prey per week. Lacewings are known to be cannibalistic if they cannot find any other food source. This is one reason that they deposit their eggs individually on long hairs that suspend them above the leaf surface out of reach. These eggs are common and can be easily found on leaf surfaces.

Some, but not all green lacewing larvae, develop a camouflage cover which hides them from predation by other insects. These are called debris-carrying lacewing larvae because they pick up plant tissue debris and other insect debris and attach it to their back. This camouflage makes them difficult to recognize by natural enemies and the inexperienced human eye. Often times they will appear to be a cluster of tree lichen until you notice small legs underneath or it start to move. They can currently be found on most plants just by scanning leaf surfaces. I have seen several recently without looking for them. These insects remain larvae for two to four weeks at which point they develop into winged green lacewing adults. Adult lacewings are not predators and primarily feed on plant nectar. The adults are commonly attracted to lights at night and can often be found around your home.



Debris carrying lacewing larvae covered in tree lichen. Photo: Steve Frank.

INSECT TRAP DATA

From: Richard W. Rhodes, County Extension Director, Bertie County

Light Trap Data from Bertie County

```

*****
                Windsor   Hexlena   Woodard
                *****   *****   *****
Date            BW  GSB   BW  GSB   BW  GSB
*****
July 22         1   1    -   -    -   -
July 24         0   0    0   1    -   -
July 25         0   1    -   -    -   -
*****

```

BW = bollworms; GSB = green stink bugs

From: Mike Carroll, Agricultural Extension Agent, Craven County

Light Trap Data from Craven County

```

*****
                Number of Adult Insects
                *****
Date            BW  GSB   BSB   FAW   THW
*****
July 8          ----- Date Initiated -----
July 11         3   1     0     0     1
July 12         2   0     0     0     0
July 15         8   1     0     0     1
July 16         7   0     0     0     1
July 17         8   0     0     0     1
July 19         8   0     0     1     0
July 22        12   0     0     0     1
July 26        20   1     0     0     0
*****

```

BW = bollworms; GSB = green stink bugs; BSB = brown stink bugs;
FAW = fall armyworms; THW = tobacco hornworms

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

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 5                   -    -    -      2    3    7      -    -    -
July 8                   -    -    -      1    2   20      -    -    -
July 10                  -    -    -      0    0    6      -    -    -
July 12                   0    1    1      2    0    6      -    -    -
July 15                   0    0    0      3    0    0      -    -    -
July 17                   0    0    0      4    1    8      -    -    -
July 19                   1    0    0      0    0    9      -    -    -
July 22                   0    1    0      0    2   10      -    -    -
July 24                   0    0    0      0    0    6      -    -    -
*****
    
```

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

From: Alan A. Harper, Lenoir County

Light Trap Data from Lenoir County

June

```

*****
                        Number of Adult Insects
*****
Date                    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
June 15                  0     0     0     0     0     0     0     0
June 16                  0     0     1     0     0     0     1     0
June 17                  0     0     0     0     0     1     0     0
June 18                  0     0     0     0     0     0     1     0
    
```

June 19	0	0	0	0	0	0	0	0
June 20	0	0	0	0	0	0	0	0
June 21	0	0	2	0	1	0	0	0
June 22	0	0	0	0	0	1	0	0
June 23	0	0	0	0	0	0	0	0
June 24	0	0	0	0	0	0	0	0
June 25	0	0	0	0	0	1	0	0
June 26	0	0	0	0	0	0	0	0
June 27	0	0	0	0	1	0	0	0
June 28	0	0	0	1	0	0	0	0
June 29	0	0	0	0	0	0	0	0
June 30	0	0	0	0	0	2	0	0

July

Number of Adult Insects

Date	HW	CEW	ECB	AW	AWC	GSB	BSB	TBW
July 1	1	0	0	0	0	3	0	0
July 2	0	0	0	0	0	0	0	0
July 3	0	0	0	0	0	3	2	0
July 4	0	0	0	0	0	6	0	0
July 5	0	0	1	0	1	4	2	0
July 6	0	0	0	0	0	5	0	0
July 7	0	0	0	0	0	1	0	0
July 8	0	0	0	0	0	0	0	0
July 9	0	0	0	0	0	0	1	0
July 10	0	0	0	0	0	1	0	0
July 11	0	0	0	0	1	1	1	0
July 12	0	0	0	0	0	0	0	0
July 13	0	0	0	0	0	0	0	0
July 14	1	0	0	0	0	0	0	0
July 15	0	0	0	0	0	0	0	0
July 16	0	0	0	0	0	1	0	0
July 17	0	0	0	0	0	2	1	0
July 18	0	0	0	0	0	0	0	0
July 19	0	0	0	0	0	0	0	0
July 19	0	0	0	0	0	0	0	0
July 20	0	0	0	0	0	0	0	0
July 21	0	0	0	0	0	0	0	0
July 22	0	0	0	0	0	0	0	0
July 23	0	0	0	0	0	0	0	0
July 24	0	1	0	0	1	1	0	0
July 25	1	2	1	0	2	2	0	0
July 26	0	0	0	0	1	2	0	1

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: Melissa E. Huffman, Agricultural Extension Agent, Onslow County

Light Trap Data from Onslow County

```

*****
                        Number of Adult Insects
*****
                Green          Fall      Tobacco
Date          Bollworms  Stink Bugs  Armyworm  Hornworm
*****
July 1                0            0            0            0
July 3                0            0            0            0
July 5                0            0            0            0
July 8                0            0            0            0
July 10               0            2            0            0
July 12               0            1            0            0
July 15               0            0            0            0
July 17               6            2            0            0
July 19               6            3            0            1
July 22              11            8            1            0
July 24               8           15            1            0
*****
    
```

Trap Location: Richlands; Cooperator: Richlands Farm, Inc.
 Insect counts are from a single black light trap located
 approximately 1 mile east of Richlands.

From: Scotland County Extension Center

Light Trap Data from Scotland County

```

*****
                        Number of Adult Insects
*****
                Gibson          John's          Laurinburg
*****          *****          *****
Date          BW  GSB  BSB  FAW    BW  GSB  BSB  FAW    BW  GSB  BSB  FAW
*****
July 17         -   -   -   -      11  14  34   0      -   -   -   -
July 19         4   6   5   0      12   7  20   0      0  11  44   0
July 22        16  21   0   0      12   5  14   0      1  11  13   0
July 24        44   7   0   0      25   6  17   0      1   2   6   0
*****
    
```

BW = bollworms; GSB = green stink bugs;
 BSB = brown stink bugs; FAW = fall armyworms

From: Dominic Reisig, Extension Entomologist

Light Trap Data from Tidewater Research Station

```

*****
                        Number of Adult Insects
*****
Date          CEW    TBW    AW    SBL    BSB    GSB
*****
July 5         0     0     0     0     0     0
July 8         0     0     0     0     0     0
July 10        0     0     0     0     1     1
July 12        0     0     0     0     1     3
July 15        0     1     0     0     6     2
July 17        0     0     0     0     2     8
July 19        0     1     0     0     6     3
*****

```

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

From: Tyler Whaley, Agricultural Extension Agent, Wayne County

Light Trap Data from Wayne County

```

*****
                        Number of Adult Insects
*****
                        Goldsboro
*****
Date          GSB    BSB    CEW    HW
*****
July 14         -     2     -     -
July 15         5     6     -     -
July 17         9    19     -     -
July 19         -     6     -     -
July 22         2     5     -     -
July 24         1     5     -     -
July 26         1     1     1     1
*****

```

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

Cooperator: Willie Howell Farm (Goldsboro)

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.
