

# 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 . . .

<b>FIELD AND FORAGE CROPS</b> .....	<b>2</b>
• Cotton Insect Update	
• Expectations for Hurricane Irene's Impact on North Carolina Field Crops	
• Soybean Rust Update: Hurricane Irene Special Report, August 24, 2011	
<b>ORNAMENTALS AND TURF</b> .....	<b>4</b>
• Leaf Miners on Fall Greenhouse Crops	
• Armillaria Root Rot in the Landscape: Attack of the "Humongous Fungus"	
• Pythium Root Rot and Fusarium Wilt in Chrysanthemum Production	
<b>RESIDENCES, STRUCTURES AND COMMUNITIES</b> .....	<b>10</b>
• Mosquitoes and Eastern Equine Encephalitis	
<b>INSECT TRAP DATA</b> .....	<b>11</b>
• Light Trap Data from Anson, Stanly and Union Counties	
• Light Trap Data from Bertie	
• Light Trap Data from Craven County	
• Light Trap Data from Cumberland County	
• Light Trap Data from Edgecombe County	
• Light Trap Data from Halifax County	
• Light Trap Data from Lenoir County	
• Light Trap Data from Martin County	
• Light Trap Data from Northampton County	
• Light Trap Data from Onslow County	
• Light Trap Data from Sampson County	
• Light Trap Data from Tidewater Research Station (Washington Co.)	
• Pheromone Trap Data from Tidewater Research Station, Tyrrell Co. and Upper Coastal Plains Research Station	
• Light Trap Data from Wayne County	
• Light Trap Data from Wilson County	

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## FIELD AND FORAGE CROPS

From: Jack Bacheler, Extension Entomologist

### Cotton Insect Update

Far and away the biggest concern for producers in the Coastal Plain and the Tidewater areas of North Carolina is the degree to which Hurricane Irene will impact cotton and other major crops. All weather models now suggest wind and rainfall amounts that will significantly impact us.

At this point in the growing season, cotton insect concerns are minor, even more so with the predicted weather damage. We have received a few telephone calls about scattered fields treated for cotton aphids this past week, with unusually poor control in one area in the east. As is the case with insect resistance in general, because a number of factors may contribute to poor control and before lack of control can be attributed to resistance development, resistance must be confirmed by following a strict protocol in the laboratory. However, this field (and the insects in it) had considerable exposure to neonicotinoid insecticides this year. Neonicotinoids were used for the seed treatment, in two applications for stink bugs and in two additional applications for cotton aphids. This is significant exposure by cotton aphids to a single class of chemicals; perhaps a record for North Carolina. Hopefully, there is a lesson here. On the positive side, in North Carolina we typically treat less than 10% of our cotton acreage for cotton aphids and/or plant bugs with a single application of neonicotinoids in an average year. Hopefully, if resistance is confirmed in this case, we can manage this potential problem in the coming years.

With the exception of some replanted June cotton, stink bugs and bollworms should no longer be a problem. In Edgecombe County this past week, in our conventional cotton tests that were set up for damage with late planting, irrigation, and disruptive oversprays, essentially all of the bollworms we found were late instars, with no new eggs or hatching bollworms. In cases of cotton re-growth, treatment very rarely pays unless the producer has a good chance of making a new top crop following earlier drought and cutout.

We will update the cotton insect situation for the final time next week.

From: Dominic Reisig, Extension Entomologist

### Expectations for Hurricane Irene's Impact on North Carolina Field Crops

Because I have never experienced a hurricane, I deferred to the expertise of Rogers Leonard, Louisiana State University, and Ron Smith, Auburn University. This is what we can expect **if** we see significant rain and wind.

1. Plants will lodge. If farmers are not able to pick all their corn, there are some header attachments that can be procured to pick up stalks that have lodged. Ron Smith was not sure what this was called, but I found some options listed on an Iowa State Extension website (<http://www.extension.iastate.edu/nwcrops/reducing-harvest-losses.htm>) and on a Mississippi State University Extension website (<http://msucares.com/crops/corn/hurricane.html>). He cautioned that this attachment was in short supply, so first farmers to get this attachment were the only ones able to use it.
-

2. Suppression of all pests **currently in the system** for the season, except, possibly, stink bugs. This is almost a sure bet. However, Rogers Leonard mentioned sweeping soybeans for soybean loopers after 15 inches of rain after Hurricane Katrina. He was still recording about one looper per sweep. He speculated that this was because the impact of the rain on the pest was not as beneficial as the combination of the wind and rain. I am unsure about the impact on stink bugs, since they are highly mobile and are not reproducing in large numbers in our system. Consequently, if the adults that we have in the system now are able to ride out the storm, we may an influx, reproduction and flush of stink bug nymphs in soybean fields later this fall.
3. Migratory pests may be an issue. Hurricane Irene may bring some soybean loopers, velvetbean caterpillars or fall armyworms from the south with her. We should expect this to be the grass (rice) strain of fall armyworms, which favors things like peanuts or hay crops, but will feed on soybeans.

From: Steve Koenning Extension Plant Pathologist, and Jim Dunphy, Extension Soybean Specialist, Department of Crop Science

### **Soybean Rust Update: Hurricane Irene Special Report, August 24, 2011**

Hurricane Irene seems likely to impact North Carolina this weekend. If Hurricane Irene makes landfall or draws air and moisture across Florida before it arrives in North Carolina, it may pick up soybean rust spores and could deposit them in North Carolina this weekend. Still the likelihood of a late season epidemic of soybean rust seems remote. If spores are deposited on soybean this weekend, it would probably be four weeks before we detected soybean rust, and yield loss at this point would not be measureable. Affected fields would require an additional two to three weeks before disease loss would be perceptible and this puts us at mid-October, when the majority of our soybean crop is mature.

Late planted soybeans would obviously be more likely to benefit from a fungicide, and have greater potential for developing soybean rust at damaging levels. As dry as most of the state is, many fields would be accessible with ground equipment by late next week if the need to spray arises. The general level of soybean diseases may become worse following the hurricane, so soybeans may benefit from a fungicide application to protect quality and quantity of the soybean crop at this time.

Thus far in 2011, soybean rust has been detected on kudzu in New Iberia parish in Louisiana, several locations in Florida, and presumably is active in Mexico. The potential for spread from these regions at this time is unlikely. Very hot weather throughout most of the Southeast remains as a major impediment to development of rust at this time. We are starting to receive samples from sentinel plots, and foliar diseases are less frequently encountered this year than any year in the recent past.

### **Sentinel Plots in North Carolina**

Sentinel plots are in place in about 23 locations in North Carolina, and we will continue to monitor them for soybean rust until frost. This effort is supported through soybean check-off dollars.

We reserve the right to recommend fungicide applications to researchers and some few others, such as seedsmen, that may not be applicable to the majority of soybean growers. Research plots in particular

can be ruined or the information devalued if disease is not uniform throughout an experiment. Thus, the value of research and/or seed increase plots may exceed thousands of dollars per acre.

## ORNAMENTALS AND TURF

From: Steve Frank, Extension Entomologist

### Leaf Miners on Fall Greenhouse Crops

As fall flower season gets underway we have started to get reports from the Plant Disease and Insect Clinic at North Carolina State University about leaf miners on mums. *Liriomyza trifolii* is a serpentine leafmining fly in the family Agromyzidae. It is a pest of many flowers and vegetables in greenhouses. The more specialized chrysanthemum leaf miner, *Chromatomyia syngenesia*, feeds on mums. Adult flies insert eggs into leaf tissue. Larvae develop between the leaf surfaces moving within the leaf to acquire food (Fig. 1). The serpentine galleries created by larvae result in aesthetic damage to leaves that have to be removed before sale or in severe cases the whole plant may be discarded. Adult leaf miners (Fig. 2) can be monitored with sticky cards. If adults are present plants can be protected with a number of insect growth regulators or systemic neonicotinoid insecticides. See *Ornamentals and Turf Insect Information Note No. 9* at <http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/note09/note09.html>.



Fig. 1. Damage by chrysanthemum leaf miner. Image by the Central Science Laboratory, Harpenden Archive, via Insect Images (<http://www.insectimages.org>).



Fig. 2. Chrysanthemum leaf miner adult. Image by the Central Science Laboratory, Harpenden Archive, via Insect Images (<http://www.insectimages.org>).

From: Emma Lookabaugh, Plant Disease and Insect Clinic

### Armillaria Root Rot in the Landscape: Attack of the "Humongous Fungus"

Root rot is one of the most commonly diagnosed disease problems of woody plants in landscapes in North Carolina. Each year we see dozens of shrubs and trees that have one of the "big three" root rotting diseases: *Phytophthora* root rot, *Thielaviopsis* black root rot, or *Armillaria* root rot.

This article will feature *Armillaria* root rot (Fig. 3). *Armillaria* root rot is caused by species of the fungus *Armillaria*. Common names for this group of fungi include the oak fungi, shoestring root rot fungi, or the honey fungi, the latter referring to the honey-colored mushrooms the fungus produces.



Fig. 3. *Armillaria* fruiting bodies. Image from Department of Plant Pathology, NC State University.



Fig. 4. Symptoms of *Armillaria* root rot. Image from Plant Disease and Insect Clinic, NC State University.



Fig. 5. *Armillaria* symptoms on juniper. Image from Plant Disease and Insect Clinic, NC State University.



Fig. 6. Black lines of zonation. Image from Bugwood (<http://www.bugwood.org/>).



Fig. 7. Windthrow hazard. Image from Bugwood (<http://www.bugwood.org/>).

*Armillaria* is a common soil inhabitant and can infect a very wide host range including; oaks, maples, azaleas, beeches, birches, boxwoods, cedars, dogwoods, firs, poplars, rhododendrons, yews, roses, spruces, and sycamores (pretty much any woody tree or shrub). It can be destructive in orchards or on fruit trees in the landscape.

*Armillaria* is typically a problem in older plants or plants that have been stressed due to drought, frost, insect attack, mechanical injuries, poor drainage, low soil fertility excessive shade, or pollution damage. However, it can be an aggressive pathogen under some conditions. Severe infections of young plants in nurseries can result in a quick death. Older or mature plants can withstand infections for several years, resulting in a slow decline, eventually ending with the death of the plant.

Above-ground symptoms include leaf drop, dieback, and an overall decline in plant vigor (Figs. 4 and 5). On conifers, the crowns of infected plants start to thin and change colors, often turning red, brown, or yellowish. Conifer infections sometimes result in heavy resin flow at the tree base.

*Armillaria* infections start in young roots, but soon the fungus begins to decay larger woody roots. In the early stages of infection, wood becomes slightly grey and can have a water-soaked appearance. Later, the wood becomes light yellow to white and has a soft, spongy rot. Often, rotted areas are offset by black lines of zonation (Fig. 6).

Severely diseased trees can pose significant safety hazards during storms since branches and bases are weakened and can easily break under windy conditions (Fig. 7) or if under added pressure from snow or ice.

Unlike most plant pathogenic fungi, *Armillaria* produces mushrooms and other structures that are visible to the naked eye. Three diagnostic signs of *Armillaria* root rot include:

1. Mycelial Fans: The most common diagnostic sign of this disease can be found beneath the bark (between the bark and the wood) at the base of the tree or shrub. White or creamy paper-like mycelial fans can be observed when the outer bark is carefully peeled away (Fig. 8). These white mycelial fans can also be found beneath the bark of infected roots and root collar area (Fig. 9).
2. Black Rhizomorphs: Sometimes rhizomorphs (dense strings of mycelium) that look like black shoestrings can be found under the bark or throughout the soil around infected tissue (Fig. 10). Rhizomorphs serve as one of the primary means of dissemination. Rhizomorphs grow through the soil from infected trees, roots, or old stumps. They are able to directly penetrate healthy roots and cause disease.
4. Honey Mushrooms: In the fall, honey-colored mushrooms (Fig. 11) can be seen growing near the base of diseased trees and shrubs. Typically, these mushrooms grow in clusters. These mushroom produce microscopic basidiospores, but the spores are not thought to play an important role in the spread of the disease. Most species of *Armillaria* are edible and are quite tasty. **Caution:** It is always best to have any mushrooms identified by an expert before you eat them. Eating misidentified mushrooms can be fatal!



Fig. 8. White mycelial fans. Image from Bugwood (<http://www.bugwood.org/>).



Fig. 9. White mycelium under bark. Image from Emma Lookabaugh.



Fig. 10. Shoestring-like rhizomorphs. Image from Bug-Wood (<http://www.bugwood.org/>).



Fig. 11. Honey mushrooms. Image from Department of Plant Pathology, NC State University.

## Control

Usually homeowners do not notice *Armillaria* root rot until the plant is dead or dying. No control is possible at this point and the plant should be removed.

Replanting can be problematic because *Armillaria* can survive for many years as rhizomorphs in soil or in old wood and stumps. Remove the affected plant and thoroughly dig up and remove all large roots, stumps and any other wood or prunings from the affected area. When planting in areas where a plant has died, or where trees have been removed, as in new construction, remove all old roots, stumps, and wood before replanting. Consider planting ornamental herbaceous or perennial plants or grasses in the area for a few years before attempting to replant woody species.

Healthy trees and shrubs are better able to resist *Armillaria* root rot than stressed plants. Choose species that are well-adapted to your region and growing site. Maintain their health by fertilizing as recommended, watering during dry spells, and improving drainage in wet areas. When possible, prevent defoliation from insects and foliar diseases. Be careful to avoid damage to roots when digging or tilling. Do not push up soil around tree trunks and do not move soil from affected areas into sites where woody species are growing.

See the NC State University Plant Disease and Insect Clinic Blog at <http://ncsupdicblog.blogspot.com>.

*Note: Special thanks to Dr. Larry Grand for helping with this article!*

From: Mike Munster and Kelly Ivors, Extension Plant Pathologists

### **Pythium Root Rot and Fusarium Wilt in Chrysanthemum Production**

At North Carolina State University's Plant Disease and Insect Clinic (PDIC), we've received a number of chrysanthemum samples with *Pythium* root rot and *Fusarium* wilt. In two cases, both pathogens were present in the same sample. The most obvious symptom of both diseases is a wilting of the foliage on some or all branches of the plant. With *Pythium* root rot, the wilting occurs because the decayed roots are unable to absorb water (Fig. 12). With *Fusarium* wilt, the upward flow of water within the roots and stems is blocked (Fig. 13). An important difference between these pathogens is that *Pythium* will affect a wide range of herbaceous plants, while these strains of *Fusarium oxysporum* will not infect ornamentals other than chrysanthemum.



**Fig. 12.** *Pythium* decayed the original root system of this mum. Although fungicide applications may have allowed adventitious roots to develop, this plant never thrived. Image from Mike Munster.



**Fig. 13.** Cut-away view of mum stem showing healthy (white) and diseased (reddish brown) areas of vascular tissue. This is typical of *Fusarium* wilt in chrysanthemum. Image from Mike Munster.

If insufficient water and excess fertilizer salts have been ruled out, *Pythium* and *Fusarium* should be prime suspects when mums wilt. With *Pythium* root rot, large numbers of roots will be darkened, and their outer portion (cortex and epidermis) will pull away easily from the inner strand of vascular tissue. With *Fusarium* wilt, there is a reddish brown streaking in the vascular tissue of the main stem or lower

branches. This is best observed by shaving off the outer green tissues with a sharp knife until you reach the “wood” of the stem, and then examining it under a hand lens. In some cases, the aboveground symptoms of *Fusarium* are yellowing of the foliage and stunted growth. Note that in the advanced stages of these and other diseases there may be stem lesions present. In all cases, diagnostic confirmation at the PDIC is recommended.

The key to managing both of these diseases is sanitation. Preventatively, be sure that only healthy liners are purchased, preferably disease-indexed stock. If you propagate your own material, do so only from healthy stock plants. This is particularly critical for preventing *Fusarium*, which can be present in stems without causing symptoms for many weeks. Do not allow contact of pots or potting mix with natural soil. If you recycle irrigation water, consider a water sanitation system and maintain it properly. This will reduce problems with *Pythium* (and *Phytophthora*). Do not re-use potting mix. When re-using pots or flats, first clean and then sanitize them.

For disinfesting **cleaned** pots, tools, and work surfaces, there are several options. Steaming is very effective if you have the proper set-up. Make sure to maintain the center of the batch of pots/flats at 150 to 160 degrees F for an hour. A number of chemical disinfectants are also available, including:

Active ingredient	Example Brand Names
Alcohol (ethyl or isopropyl)	various, including Lysol Spray (also contains quaternary ammonium)
Phenolics	Pheno-Cen Spray Disinfectant
Peroxyacetic acid + hydrogen peroxide	ZeroTol
Quaternary ammonium compounds	Consan Triple Action 20; Physan 20; GreenShield 20
Sodium hypochlorite	Clorox; commercial bleach

If there are having problems with fungus gnats or shore flies, these should be controlled. Studies have shown that they play a role in the transmission of certain fungal diseases including *Pythium*, *Verticillium*, *Thielaviopsis*, and *Botrytis*. Adult fungus gnats may help spread the disease by carrying fungal spores on their bodies as they move from plant to plant.

Prevention also includes optimizing irrigation and fertilization. Take into account plant needs and the kind of substrate when watering. It is reported that lime and the use of nitrate-only sources of nitrogen help to reduce problems with *Fusarium* wilt in chrysanthemum.

Once either of these diseases has been diagnosed, immediately discard affected plants, including the potting mix. If pots are to be reused, clean and disinfest them as described above. Plants that appear healthy may have latent infections, so monitor them closely. There are several fungicides that can be used – in most cases as drenches – to protect remaining healthy plants, but which will not cure already diseased plants. Since these two are very different (in fact, *Pythium* is not even a true fungus), different fungicides will be required. Also, the efficacy of fungicides against *Pythium* is variable, depending on the species of *Pythium* and the host plant involved.

Products with the active ingredient etridiazole (e.g., Terrazole, Truban) have consistently done well against *Pythium*. Adorn and Subdue MAXX may also give adequate results and can be used in rotation with etridiazole, to reduce the chance of selecting for resistant strains of *Pythium*, as has occurred with

Subdue MAXX. In the *Pythium* trials conducted as part of the IR4 program, Aliette and Segway also did well in general. Conversely, the registered biological products Companion, PlantShield/RootShield and SoilGard were generally ineffective.

Some of the best products against *Fusarium* are chlorothalonil (e.g., Daconil ULTREX) and Medallion. Note that chlorothalonil may damage tender open blooms on some varieties of plants. Very good results have been obtained with Fosphite and with products containing iprodione (e.g., Sextant, Chipco). Banner Maxx, Heritage, and Insignia have also given good results.

Consult the North Carolina Agricultural Chemicals Manual (<http://ipm.ncsu.edu/agchem/agchem.html>) for details on rates and application intervals. Be sure to do a test on a small number of plants when working with a fungicide you have not tried on a particular plant before.

## RESIDENCES, STRUCTURES AND COMMUNITIES

From: Mike Waldvogel, Extension Entomologist

### Mosquitoes and Eastern Equine Encephalitis

A four year old horse in Halifax County, North Carolina was euthanized after being diagnosed with Eastern Equine Encephalitis (EEE). This was the first reported case of EEE this year in the state. The disease is found most commonly in eastern North Carolina (as in this case). Back at the end of July, we had this year's first case of LaCrosse Encephalitis (LCE) diagnosed in a child in Macon County. In North Carolina, LCE occurs most commonly in the western part of the state. Demographically, children under 16 years of age and the elderly are the most susceptible to the disease. There are no human vaccines for either LCE or EEE. There is an EEE vaccine available for horses but booster shots are needed every 6+ months in areas where the disease is most prevalent. Despite the name "equine encephalitis," the major reservoirs for the disease are wild birds. Mosquitoes bite infected birds, acquire the virus, and then transmit it to humans and animals.

With hurricane Irene heading towards our state, the heavy rains will likely create standing water in areas within the storm's path. Those water sources become the breeding grounds for mosquitoes. As people clean up after the hurricane and spend more times outdoors, they are more likely to get bitten by mosquitoes. This doesn't mean that you're likely to get EEE or West Nile Virus or other mosquito-borne diseases, but the heavy rains will inevitably lead to increased mosquito activity and it can make working outdoors unpleasant. Anyone working outdoors should take precautions, particularly early morning and evening when some of the more important mosquitoes species are most prevalent. Use a repellent on **exposed** skin and reapply it as needed (e.g., if you're perspiring heavily during cleanup efforts). There are also products containing permethrin (e.g., *Permanone*) that can be applied to clothing (not to skin). Eliminating pockets of standing water as quickly as possible will help reduce the threat of mosquitoes and mosquito-borne diseases.

Also, with the elimination of the Public Health Pest Management Section of the North Carolina Department of Environment and Natural Resources in June, organized mosquito abatement efforts following the hurricane will fall to local health departments and mosquito control programs. You may want to contact your local Health Department to verify how they will be handling any inquiries or

requests for mosquito control assistance within your county because you are likely to get some calls as well.

Information about mosquitoes and other pests that may become problems following storms can be found on our website at <http://insects.ncsu.edu/Urban/storm/>.

## INSECT TRAP DATA

From: Richard Melton, County Extension Director, Union County

### Light Trap Data from Anson, Stanly and Union Counties

*****												
Number of Adult Insects												
*****												
	Anson			Union S			Union N			Stanly		
	*****			*****			*****			*****		
Date	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR
*****												
July 16	-	-	-	15	-	-	-	-	-	-	-	-
July 20	-	-	-	43	-	-	-	-	-	-	-	-
July 22	-	-	-	126	-	-	-	-	-	1	2	2
July 25	-	-	-	75	9	-	-	-	-	2	1	2
July 27	43	14	-	68	12	-	-	-	-	1	-	-
*****												

CEW = corn earworm moths; GR = green stink bugs; BR = brown stink bugs  
 Union County South - Marshville; Union County North - Unionville

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

### Light Trap Data from Bertie County

*****									
	Windsor		Woodard		Hexlena		Colerain		
	*****		*****		*****		*****		
Date	Moths	GSB	Moths	GSB	Moths	GSB	Moths	GSB	
*****									
July 20	4	4	15	3	0	1	-	-	
July 21	4	0	25	1	-	-	-	-	
July 22	10	1	12	2	9	5	-	-	
July 23	37	0	-	-	-	-	-	-	
July 24	-	-	-	-	-	-	-	-	
July 25	70	1	19	2	19	4	-	-	
July 26	15	0	7	0	12	0	25	0	
July 27	20	2	19	1	17	0	-	-	
July 28	39	0	34	4	15	1	-	-	
July 29	36	6	27	4	10	2	-	-	
July 30	41	0	-	-	-	-	-	-	
July 31	-	-	-	-	-	-	-	-	
August 1	65	0	42	2	-	-	33	-	

August 2	18	2	32	7	6	2	18	-
August 3	19	4	32	5	3	10	13	0
August 4	12	0	23	7	1	5	25	0
August 5	10	3	24	1	5	0	-	-
August 6	-	-	-	-	-	-	-	-
August 7	-	-	-	-	-	-	-	-
August 8	42	8	37	19	20	0	-	-
August 9	12	3	32	6	3	1	-	-
August 10	6	2	14	10	5	1	12	0
August 11	-	-	4	1	-	-	5	1
August 12	4	0	-	-	-	-	-	-
August 13	-	-	-	-	-	-	5	-
August 14	2	0	-	-	-	-	13	-
August 15	0	0	-	-	-	-	20	-
August 16	-	-	-	-	-	-	11	0
August 17	-	-	13	3	-	-	22	0
August 18	3	0	-	-	-	-	5	0
August 19	-	-	-	-	-	-	5	0
August 20	-	-	-	-	-	-	7	0
August 21	8	1	-	-	-	-	5	0
August 22	5	0	-	-	-	-	10	0
August 23	11	1	-	-	-	-	129	0

\*\*\*\*\*

Moths = Bollworm moths; GSB = Green stink bugs

From: Mike Carroll, Agricultural Extension Agent, Craven County

### Light Trap Data from Craven County

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Number of Adult Insects

\*\*\*\*\*

Date	THW	TBW	CEW	GSB	BSB	ECB	FAW	BAW	LOOP
July 5	1	1	-	2	-	-	-	-	-
July 11	-	-	3	3	1	-	-	-	-
July 18	-	-	23	-	-	4	-	-	-
July 22	-	-	38	1	1	-	-	-	-
July 25	-	-	75	-	-	-	-	-	-
July 29	2	-	91	1	1	-	-	-	-
August 2	-	-	85	-	1	-	-	-	-
August 5	1	-	62	-	1	-	-	-	-
August 8	1	2	47	3	1	-	-	-	-
August 10	-	-	34	6	-	3	-	-	-
August 12	-	-	14	1	-	18	-	-	-
August 15	-	-	10	-	-	-	-	-	-
August 17	-	-	0	-	-	-	-	-	-

\*\*\*\*\*

THW = tobacco hornworms; TBW = tobacco budworms; CEW = corn earworms;  
 GSB = green stink bugs; BSB = brown stink bugs; ECB = European corn  
 borers; FAW = fall armyworms; BAW = beet armyworms; LOOP = Looper

Location of trap: Cove City

Cooperators: R & W McCoy Farms and Cove City Fertilizer

From: Colby S. Lambert, Agricultural Extension Agent, Cumberland County

### Light Trap Data from Cumberland County

```

*****
                        Number of Adult Insects
*****
Date      THW      CEW      GSB      BSB
*****
July 7      ----- trap set up -----
July 9        0        1        3        0
July 11       0        6        8        1
July 13       0        4       26        3
July 15       0        4        1        0
July 18       0        5        6        0
July 20       0       16       16        0
July 22       0       24       12        1
July 25       0       37        7        0
July 29       0      127       22        0
August 1      0       91       11        0
August 3      0       35        3        0
August 8      0       21        1        0
*****

```

THW = tobacco hornworms; CEW = corn earworms;  
GSB = green stinks bugs; BSB = brown stink bugs

Trap located in Godwin at Cumberland/Harnett County Line  
at Lewis Farms off of Highway 301

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 8        -  -  -        0  0  0        -  -  -
July 11        0  0  0        0  1  3        -  -  -
July 13        0  0  0        0  1  1        4  0  6
July 15        0  0  0        0  0  0        0  0  4
July 18        0  0  0        3  0  0        0  0  0
July 20        0  0  0        3  0  2        2  0  4
July 22        0  0  2        4  0  0        1  0  2
July 25        1  0  7       14  0  0        0  0  4
July 27        5  0  5       22  0  0        0  0  1
July 29        4  0  1       26  0  1        0  0  1

```

August 1	10	0	3	41	0	2	1	0	1
August 3	6	0	3	19	0	2	0	0	0
August 5	10	0	2	28	0	0	1	0	2
August 8	4	1	0	19	0	1	0	1	5
August 10	1	0	0	9	0	0	0	0	1
August 12	0	0	0	5	0	0	0	0	1
August 15	0	0	0	4	0	1	1	0	4

\*\*\*\*\*

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

From: Arthur Whitehead, Jr., County Extension Director, Halifax County

### Light Trap Data from Halifax County

\*\*\*\*\*

	Hobgood			East Enfield			Weldon		
	*****			*****			*****		
Date	CEW	BSB	GSB	CEW	BSB	GSB	CEW	BSB	GSB
*****									
July 11	0	0	0	-	-	-	-	-	-
July 13	4	0	6	-	-	-	-	-	-
July 15	0	0	0	-	-	-	-	-	-
July 18	0	0	0	12	0	0	3	0	0
July 20	2	0	4	0	0	0	6	0	0
July 22	2	0	1	15	0	2	4	0	0
July 25	0	0	4	9	0	0	7	0	1
July 27	1	0	1	14	0	0	10	0	1
July 29	-	-	-	-	-	-	-	-	-
August 1	1	0	1	0	0	10	10	0	1
August 3	0	0	0	12	2	0	2	0	0
August 5	1	0	2	8	0	0	1	0	3

\*\*\*\*\*

Abbreviations: CEW = corn earworms;  
GSB = green stink bugs; BSB = brown stink bugs

From: Alan A. Harper, Lenoir County

### Light Trap Data from Lenoir County

\*\*\*\*\*

	Number of Adult Insects							
	*****							
Date	HW	CEW	ECB	AW	AWC	GSB	BSB	TBW
*****								
July 18	0	9	0	0	1	0	0	0
July 19	0	1	2	0	0	1	0	0
July 20	0	5	0	0	0	2	0	0
July 21	0	20	1	0	2	2	0	1
July 22	0	15	0	0	0	4	0	0
July 23	0	8	0	0	3	1	0	0

July 24	0	4	0	0	0	0	0	0
July 25	0	8	0	0	1	0	0	0
July 26	0	11	0	0	2	0	0	0
July 27	0	16	0	0	0	0	0	1
July 28	0	24	0	0	1	2	0	2
July 29	0	13	0	0	3	1	0	0
July 30	0	34	0	1	2	2	0	0
July 31	0	29	0	1	2	2	0	0
August 1	1	36	1	0	3	1	0	0
August 2	0	17	0	1	2	4	0	0
August 3	0	23	1	0	2	0	0	0
August 4	0	20	0	1	3	0	0	0
August 5	0	25	0	3	3	3	0	0
August 6	0	39	0	0	1	1	0	0
August 7	0	25	0	1	3	0	0	0
August 8	0	5	0	1	2	0	0	0
August 9	0	5	0	2	1	2	0	0
August 10	0	20	0	3	2	0	0	0
August 11	0	15	1	3	5	0	0	0
August 12	0	10	1	1	1	1	0	0
August 13	0	15	1	1	0	2	0	0
August 14	1	7	0	0	0	1	0	0
August 15	2	7	0	0	3	0	0	1
August 16	0	7	0	1	1	2	0	0
August 17	0	5	0	1	1	0	0	0
August 18	-----light trap unplugged-----							
August 19	0	9	1	0	0	2	0	0
August 20	0	5	0	2	0	1	0	0
August 21	0	19	0	0	0	1	0	0
August 22	2	2	0	0	4	0	0	0
August 23	0	38	0	0	1	2	0	0
August 24	2	41	0	2	7	1	0	0
August 25	0	49	0	0	2	1	0	0
August 26	2	46	0	1	2	3	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: Al Cochran, County Extension Director, Martin County

### Light Trap Data from Martin County

\*\*\*\*\*

	Robersonville		Farm Life	
	*****			
Date	BW	GSB	BW	GSB
*****				
July 8	8	3	2	6,1*
July 13	3	1	3	0
July 15	3	0	0	3
July 18	5	0	2	0
July 20	5	1	3	1
July 22	9	1	12	0

\*\*\*\*\*

July 25	12	1	7	1
July 27	17	0	8	4
July 29	17	0	24	0,6*
August 1	21	2	29	7
August 3	18	1	25	5,5*
August 5	13	1	11	3,1*
August 8	14	1	24	1
August 10	12	0	20	0
August 12	7	0	-	-
August 15	6	0	-	-
August 17	6	0	6	1
August 19	16	0	6	0
*****				

BW = Bollworm moths; GSB = Green stink bugs  
 \* brown stink bugs

From: Craig Ellison, Agricultural Extension Agent, Northampton County

### Light Trap Data from Northampton County

*****																					
Number of Adult Insects																					
*****																					
	Woodland			Conway			Galatia			Seaboard			Gaston			W. Gaston			Jackson		
	*****			*****			*****			*****			*****			*****			*****		
Date	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR	CEW	GR	BR
*****																					
July 11	-	-	-	21	0	0	-	-	-	-	-	-	-	-	-	-	-	-	6	15	0
July 13	-	-	-	13	2	0	-	-	-	0	0	0	-	-	-	-	-	-	21	11	0
July 15	-	-	-	0	0	0	-	-	-	0	0	0	-	-	-	-	-	-	7	0	0
July 18	-	-	-	1	0	0	2	0	0	2	0	0	2	0	0	-	-	-	0	0	0
July 20	0	1	1	2	12	0	2	0	0	4	0	0	8	0	0	-	-	-	19	6	0
July 22	0	1	0	0	0	2	7	0	0	1	3	0	13	0	0	-	-	-	17	5	0
July 25	0	1	0	0	16	0	7	7	0	8	25	0	6	0	0	-	-	-	35	29	0
July 27	3	0	0	7	26	0	23	11	0	1	7	0	8	1	0	-	-	-	17	17	1
July 29	0	4	2	14	5	1	22	2	1	0	0	0	12	4	0	-	-	-	28	15	1
August 1	0	1	0	15	5	0	49	5	0	4	3	0	-	-	-	-	-	-	63	25	5
August 3	0	2	0	8	5	0	25	2	0	6	18	0	-	-	-	-	-	-	26	12	2
August 5	4	0	1	8	3	2	25	0	1	4	8	0	-	-	-	-	-	-	35	5	1
August 8	1	0	0	12	2	0	18	0	0	8	2	0	-	-	-	-	-	-	58	6	1
August 10	0	0	0	8	2	0	6	0	0	6	2	0	-	-	-	-	-	-	61	2	0
August 12	2	0	0	2	0	0	-	-	-	2	0	0	-	-	-	-	-	-	36	0	0
August 15	0	1	0	4	0	0	6	1	0	4	1	0	-	-	-	-	-	-	36	3	0
August 17	2	0	0	1	0	0	-	-	-	2	0	0	-	-	-	-	-	-	18	2	0
August 19	2	0	0	-	-	-	4	0	0	-	-	-	-	-	-	-	-	-	17	0	0
*****																					

CEW = corn earworms; GR = green stink bugs; BR = brown stink bugs

Locations: Woodland, Conway, Galatia, Seaboard, Gaston, West Gaston and Jackson  
 Monitored by: L. Culpepper, K. Edwards, Ben Harris, T. Flythe, D. Grant,  
 Tim Phelps and B. Bryant

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

### Light Trap Data from Onslow County

*****				
Number of Adult Insects				
*****				
Date	Bollworms	GSB	BSB	Hornworms
*****				
July 22	30	1	-	-
July 25	30	1	-	-
July 27	80	2	-	-
July 29	115	7	-	-
August 1	155	3	-	-
August 3	105	5	-	-
August 5	58	0	-	-
August 8	-	-	-	-
*****				

GSB = green stinks bugs; BSB = brown stink bugs

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

From: Keith Kettner, Agricultural Extension Agent, Sampson County

### Light Trap Data from Sampson County

*****			
Number of Adult Insects			
*****			
Date	GSB	BSB	BW
*****			
July 26	8	-	85
July 29	6	2	92
August 1	10	4	105
August 5	25	5	76
August 8	9	4	180
August 12	18	6	292
August 15	11	3	219
August 19	14	2	326
*****			

GSB = green stink bugs; BSB = brown stink bugs;  
BW = cotton bollworms

Black trap located 6 miles south of Clinton on  
US-701S on the farm of Mike and James Hope.

From: Dominic Reisig, Extension Entomologist

### Light Trap Data from Tidewater Research Station (Washington County)

*****									
Number of Adult Insects									
*****									
Date	CEW	TBW	ECB	AW	SBL	BSB	GSB	BaSB	DSB
*****									
June 22	9	0	0	0	0	0	1	0	0
June 24	5	0	0	0	0	2	2	0	0
June 27	4	0	0	0	0	17	0	0	0
June 29	3	0	0	0	0	13	0	0	0
July 1	3	0	0	0	0	6	0	0	0
July 4	3	0	0	0	0	2	0	0	0
July 6	0	0	0	0	0	2	1	0	0
July 8	2	0	0	0	0	1	3	5	0
July 11	1	0	0	0	0	0	0	0	0
July 13	1	0	0	0	0	5	2	0	1
July 15	0	0	0	0	0	2	1	0	0
July 18	0	0	0	0	0	0	0	0	0
July 20	0	0	0	0	0	0	0	0	0
July 22	0	0	0	0	0	0	0	0	0
July 25	6	0	0	0	0	0	0	1	0
July 27	14	0	0	0	0	1	1	2	0
July 29	11	0	0	0	0	2	4	0	0
August 1	6	0	0	0	0	2	6	3	0
August 3	2	0	0	0	0	0	0	0	0
August 5	5	0	0	0	0	3	2	0	0
August 8	7	0	0	0	0	6	0	0	0
August 10	13	0	0	0	0	1	0	0	0
August 12	8	0	0	0	0	0	0	0	0
August 14	3	0	0	1	0	0	0	0	0
August 17	3	0	0	0	0	0	0	0	0
August 19	0	0	0	0	0	0	0	0	0
*****									

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

### Pheromone Trap Data from Tidewater Research Station, Tyrrell County and Upper Coastal Plains Research Station

*****						
	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
June 30	-	-	9	16	11	15

July 8	-	5	16	4	3	16
July 11	-	-	36	0	-	-
July 12	2	4	-	-	-	-
July 13	-	-	-	-	17	0
July 18	-	-	6	0	-	-
July 19	13	0	-	-	-	-
July 20	-	-	-	-	15	0
July 25	-	-	47	1	-	-
July 26	18	-	-	-	-	-
July 27	-	-	-	-	24	0
August 1	40	4	324	4	62	-
August 10	16	0	295	5	34	0
August 17	438	0	72	1	13	3
August 21	-	-	27	2	25	1
*****						

Abbreviations: CEW = corn earworms; TBW = tobacco budworms

From: Kevin Johnson, County Extension Director, Wayne County

### Light Trap Data from Wayne County

*****				
Number of Adult Insects				
*****				
Goldsboro				
*****				
Date	GSB	BSB	CEW	HW
*****				
July 6	0	2	0	0
July 8	2	1	-	-
July 11	-	3	3	3
July 13	1	8	4	1
July 15	-	1	1	-
July 18	-	-	2	-
July 20	2	-	4	-
July 22	1	3	29	-
July 25	9	3	50	-
July 27	3	3	85	2
July 29	10	3	45	1
August 1	10	-	61	-
August 3	6	2	68	-
August 5	6	3	30	-
August 8	2	1	26	1
August 10	3	-	12	-
August 12	-	-	4	-
August 15	-	-	4	1
August 17	-	-	5	-
August 19	-	-	34	1
August 22	-	1	62	-
August 24	-	-	72	-
August 26	1	2	76	4
*****				

GSB = green stink bugs; BSB = brown stink

bugs; CEW = corn earworms; HW = hornworms

Cooperator: Willie Howell (Goldsboro)

From: Norman E. Harrell, Agricultural Extension Agent, Wilson County

### Light Trap Data from Wilson County

*****						
Number of Adult Insects						
*****						
	Kenly		Fountain		Pender's	
	*****		*****		*****	
Date	CEW	GSB	CEW	GSB	CEW	GSB
*****						
July 13	-	-	1	9	-	-
July 15	2	0	1	2	-	-
July 18	3	0	2	1	-	-
July 20	0	3	2	2	-	-
July 22	3	1	0	7	-	-
July 25	2	2	7	5	-	-
July 27	7	1	9	5	-	-
July 29	19	2	8	9	-	-
August 1	30	5	9	4	-	-
August 3	15	2	7	3	-	-
August 5	50	1	13	5	-	-
August 8	25	2	17	8	3	2
August 10	8	0	13	6	5	0
August 12	10	0	3	0	2	0
August 15	5	1	9	0	3	0
August 17	9	0	8	0	4	0
August 19	3	1	5	2	1	0
August 22	7	1	6	1	0	2
August 24	12	0	8	0	1	0
*****						

CEW = corn earworms; GSB = green stink bugs

Locations: Kenly, Fountain and Pender's Cross Roads

Monitored by: Norman Harrell, Barbara Smith and Adam Gardner

*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.*