

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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See current and archived issues of the *North Carolina Pest News* on the World Wide Web at:

http://ipm.ncsu.edu/current_ipm/pest_news.html

FIELD AND FORAGE CROPS

From: Jack Bachelier, Extension Entomologist

Thrips versus Weather on Cotton

Unless we have unusual early insect outbreaks on cotton, thrips management will likely dominate our advice for the next six weeks or so. However, cutworms, cotton aphids and spider mites can sometimes cause problems to early cotton.

Weather will again determine if we are in for another rough thrips year. Although we have no control over weather patterns, both hot, dry conditions and cool, wet conditions limit cotton seedling growth and insecticide uptake.

Under hot and dry conditions, we often experience higher thrips populations resulting from their movement from wild and cultivated hosts into cotton fields. Under extended hot, dry conditions, hard to control western flower thrips are also more likely. The 2007 season serves as an example of this situation in many North Carolina cotton fields.

With unseasonably cool temperatures, although the number of thrips migrating into cotton may be only moderate, cotton seedling growth is often slowed to the point that it can stay in the very susceptible cotyledon to first or second true leaf stage for an extended period. On many farms, this was often the case in 2005 and 2006.

So for many producers that has meant three rough thrips years in a row, especially for cotton planted in April – though thrips have also not been particularly kind to cotton planted during the first week or two of May recently. Though not recommended as a “thrips damage avoidance practice,” cotton planted in North Carolina after about May 20, with its typical rapid “grow-off,” is usually well protected with either a seed treatment or Temik 15G at the lower 3.0 pound rate without the need for a foliar insecticide follow up.

The best possible situation for thrips management and cotton in general would be a series of three or four consecutive weeks of the warm moist conditions that favor rapid seedling “grow-off.” Often that’s hard to find in North Carolina.

So much for things that we can’t control.

With either hot, dry conditions with limited soil moisture, or with cool conditions that limit seedling growth, plan on at least one foliar application for thrips. With seed treatments, such as Gaucho Grande, Cruiser, Avicta, or Aeris, a foliar application targeted for the first true leaf stage or at three weeks after planting (whichever comes first) is strongly advised. Under the above conditions, a foliar insecticide following Temik is usually also usually justified, but the timing of this application, if needed, should be scouting-based.

As cotton planting gets underway, hopefully later this week, and the season progresses, I’ll continue to provide updates as the season progresses.

FRUIT AND VEGETABLES

From: Frank Louws and Mahfuzur Rahman, Department of Plant Pathology

Strawberry Disease Management: Colletotrichum Crown Rot and Anthracnose Ripe Fruit Rot

Current situation: *Colletotrichum* crown rot incidence, caused by *Colletotrichum gloeosporioides* (C.glo) occurred on numerous farms in the fall of 2007. Problems included collapsed or stunted plants soon after field setting and a declining loss of plants with the onset of winter. From September 15 to February 20, the North Carolina State University Plant Disease and Insect Clinic (PDIC) managed 64 strawberry samples. We identified 14 growers in North Carolina and 1 out-of-state grower (n=15) with *Colletotrichum* problems. Additional problems were diagnosed in Virginia, South Carolina and Georgia. Thirteen samples in North Carolina were confirmed to have C.glo, 2 farms probably have C.glo but isolations attempts did not verify the presence of the pathogen, and 3 farms were confirmed or suspected to have *C. acutatum* (the anthracnose ripe fruit rot pathogen) in addition to C.glo. Affected growers suffered moderate to severe losses. Although it is dangerous to provide specific numbers of plant mortality since systematic surveys were not done, the numbers are also helpful. Field observations and grower estimations range from less than 5 percent up to 60 percent of the plants died within fields planted to infected plant sources. A rough estimation would put the average plant death at 5 to 15 percent with the majority of plants dying in October through November. In most cases, the problem could be related to specific plant sources. Other strawberry problems were diagnosed. With the dry hot fall weather some fields had low moisture levels in the bed and plants were stunted from drought injury. Three additional North Carolina samples were confirmed to have *Phytophthora* crown rot and three had angular leaf spot. Both of these diseases could cause stunting and *Phytophthora* will cause plant collapse.

Regretfully, this spring, numerous fields that had the *Colletotrichum* crown rot also observed problems with anthracnose ripe fruit rot, caused by *Colletotrichum acutatum*. This is a more serious concern than the crown rot disease.

Management plan for the spring: Plants with the crown rot problem will continue to collapse, especially as the plant size and fruit load increases. However, the expectation is that plant collapse will not be that extensive. The main concern now is the anthracnose ripe fruit rot. This disease can build up quickly especially under conditions of hot wet weather (likely to occur during the month of May). We have collected many of the isolates from the affected fields and found that the C. glo strain seems to be tolerant of Topsin-M but that the C. glo and 'acutatum' strains are sensitive to the QoI fungicides (Group 11 fungicides = Abound, Cabrio or Pristine). There is a danger to use the QoI fungicides too much and resistance could develop in the pathogen population. Therefore, work with your growers who have a confirmed problem or have plants from a known infected plant source. Use the following rules to develop a spray program: Where QoI fungicide products are applied solo, do not exceed 33 percent of the total number of sprays or a maximum of 4 during the season. Where mixtures (co-formulations or tank mixes such as a QoI + captan) are used do not exceed 50 percent of the total number of sprays (should be a maximum of about 5 for strawberries). Use a maximum of 1 QoI fungicide spray out of every 3 fungicide applications. Therefore, in our current situation, the best strategy is to include captan when applying a QoI product. Alternate sprays should rely on captan plus other products as needed. Growers with *Botrytis* pressure may elect to use Pristine during cool wet weather,

since it has a QoI component and a good botryticide component. The QoI products also have fairly good activity on powdery mildew.

Detailed recommendations are outlined in the North Carolina Agricultural Chemicals manual or available in our IPM manual at the Small Fruit Center website at:

<http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2008/08StrawberryIntegMgmtGuideDec10.pdf>

From: Rob Welker and Frank Louws, Department of Plant Pathology

Strawberry Regional Fumigation Trials: Take Time to View Them in the Field during May

For field faculty, this report highlights on-farm research currently underway. Contact the agent and schedule a visit to view results.

Three field days were recently held in North and South Carolina to highlight methyl bromide alternatives. Demonstration trials were initiated last fall as part of a USDA AREAWIDE project to help growers transition away from methyl bromide by conducting large scale trials with currently registered alternatives on their farms. During these trials, specific data was collected from each location and pooled together to help us understand the conditions under which fumigants are working well, and to help us document reasons if a fumigant treatment did not work well.

A trial in Gilbert, South Carolina, managed by Powell Smith, was fumigated in September 2007 and the treatments included an unfumigated area, methyl bromide 50/50 (150 pounds per acre in-row) under Pliant High Barrier Film as the grower standard, and MIDAS (75 pounds per acre in-row) and Telone C-35 (196 pounds per acre in-row) both under two different types of plastic (Pliant High Barrier Film and Cadillac Virtually Impenetrable Film (VIF)). This trial was set up as a randomized complete block design with four replications covering over ½ acre of land. Visually there were plant growth differences at this location with the planted variety Camerosa. Untreated areas were visually stunted and the Telone C-35 treatments look smaller than the Methyl Bromide plants, but early yield data from these fumigant treatments has not shown much of a difference. Of course, yield is the critical factor and we will wait and see what the final yield data tells us.

The second trial, located in Pinnacle, North Carolina and coordinated by Terry Garwood, was fumigated in September 2007. Treatments at this location included an unfumigated area, methyl bromide 50/50 (200 pounds per acre in-row) under standard LDPE plastic, Telone C-35 (147 pounds per acre in-row) under Cadillac VIF, Pic-Clor 60 (94 pounds per acre in-row) under Cadillac VIF and Vapam (37.5 gallons per acre in-row) rotovated into the bed then covered with Cadillac VIF. This trial is also a randomized complete block design with three replications covering over ½ acre of land. Berries are not being picked there yet, but plant growth looks similar amongst all the treatments, even the unfumigated area. Last year a replicated trial at this location showed that although the unfumigated treatment had slightly lower yields, the difference was not statistically different than any of the fumigants used. This seems to indicate that fumigation may not be needed at this location, at least not every season. Carolina Geranium (*Geranium carolinianum*) has been a terrible problem at this farm, and methyl bromide was not able to control this weed. To try and minimize the weed problem this year, Goal herbicide was

applied to the pre-formed beds immediately prior to fumigating the Telone C-35 and Pic-Clor 60 treatments in cooperation with Katie Jennings, Department of Horticulture, North Carolina State University. A drawback to using Goal was the 30 day waiting period that, in this case, moved the planting date outside of the normal window. The plants are still much smaller than in the surrounding fields and will likely not recover. We will still be able to compare yields between the treatments, though, since all the plants in the study were planted late. Weed pressure in the Goal treated areas is significantly less than the unfumigated areas and the grower standard methyl bromide treatment, but it might not all be due to the Goal application. Read on.

The third trial, located near Tar Heel, North Carolina and coordinated by Rick Morris, was fumigated in September 2007. Treatments at this location were several untreated areas, methyl bromide 50/50 (120 pounds per acre in-row) under Cadillac VIF, Pic-Clor 60 (94 pounds per acre in-row) under Cadillac VIF and Inline (13 gallons per acre in-row) put through 2 drip tapes in each bed, also under the Cadillac VIF. This trial was set up as a side-by-side comparison of the alternatives, and the test area is 1 acre. Plants at this location all look great, with visual stunting of the untreated areas. Initial harvest data from this location has shown reduced yields in the unfumigated areas, but similar yields in all other treatments. An interesting result from this location seems to reinforce our initial findings about VIF films and fumigation. We are consistently achieving better pathogen and weed control using reduced rates of fumigants under a VIF. Weed counts at this location are consistently showing 50 percent weed infestation in the unfumigated beds (weeds in plant holes), 10 percent weed infestation in the methyl bromide area and 2 to 3 percent in each of the Inline and Pic-Clor 60 fumigated areas. These films seem to have a positive affect on the efficacy of all fumigants, and this is good news for growers.

A field day was held at each of these on-farm tests in April, each led by a local Cooperative Extension Agent or Regional Agronomist (Powell Smith in South Carolina, Terry Garwood in Pinnacle, North Carolina and Rick Morris in Tar Heel, North Carolina). Discussions about the trials and the alternative work were led by Rob Welker from North Carolina State University, and Barclay Poling also presented strawberry production information at the Pinnacle field day. Attendance was good at each location, and over 70 growers, Cooperative Extension Agents, Regional Agronomists and industry representatives attended these field days. Topics included the current outlook for using methyl bromide in 2008 and beyond, application issues using alternatives including personal protective equipment and Virtually Impenetrable Films, and costs associated with alternatives. Very good discussions were held at each location.

These were intended to be local on farm-research projects and demonstrations, so if you did not get to attend one please be on the lookout for a trial in your area this fall and more field days next spring. If you have an interest in participating in a fumigant trial on your farm, please contact Rob Welker by electronic mail (rob_welker@ncsu.edu) or telephone (919-306-0941). Only a few locations will be chosen to participate, and our goal is to move these trials to different locations each year. If you are interested, please let us know as soon as possible, and this invitation is also extended to vegetable growers wanting to try alternatives on their crops.

This is an excellent opportunity to try alternatives on your farm and discover an alternative combination right for you and before you find out that you cannot buy methyl bromide. When is that actually going to happen? Some growers have been told it might happen to them this year, but the key thing is to get experience with alternatives before that day happens.

ORNAMENTALS AND TURF

From: Steve Bambara, Extension Entomologist

Spruce Spider Mites

We received a juniper sample with active spruce spider mites, so if these are a perennial problem, check your plants now for activity. Spruce spider mites are active during the cool season, but the symptoms don't show until many weeks later. This would be the time to treat, if you feel it is needed. Horticultural oils are great and work as well as the expensive stuff, though you may need a follow up application. Commercial landscapers can use their favorite miticide. For more information on spruce spider mites, see *Ornamentals and Turf Insect Note No. 77* at <http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/ort077e/ort077e.htm>.

Euonymus Scales

The euonymus scale (Fig. 1) is a common and sometimes very damaging armored scale pest of euonymus and a few other ornamental plants. It is found throughout North Carolina wherever euonymus, pachysandra and Celastrus grow. Yellow spots first appear on the leaves. Leaves and stems may become encrusted with the scales to such an extent that whole branches or the entire plant may die. This scale usually has two or three generations per year. Males emerge from under their armor and crawl or fly until they find a female scale with which to mate. The females lay eggs under their protective shell, and the tiny crawlers hatch and emerge from the mother's armor in April, May and June. They crawl along the leaves and stems before inserting their microscopic, threadlike mouthparts and settling down to grow and secrete the armor. I recommend replanting with some other plant. If that doesn't suit you, use treatments of a horticultural oil for euonymus scale suppression. Professionals may try Safari for armored scale.

If thinking about planting euonymus, plant something else or pick a variety less susceptible to this scale. *Ornamentals and Turf Insect Note No. 15* provides some information on the control of euonymus scales (see <http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note15/note15.html>).



Fig. 1 Euonymus scale. Image by James R. Baker.



Fig. 2. Adult crane fly. Image by Janco Tanis (<http://www.bugwood.org>).

Crane Flies

Adult crane flies (Fig. 2), *Tipula* sp., resemble giant, mutant mosquitoes. However, crane flies are harmless to humans. The maggots of crane flies are sometimes called leatherjackets because of their tough skin. Leatherjackets sometimes infest tobacco plant beds where they apparently feed on the roots of the tobacco seedlings and are of some economic concern.

I have seen them quite numerous in grain and forage fields this week. Some species of crane flies have predaceous maggots and some feed on decaying organic matter. As adults, they may not feed at all. There may be more maggots which will develop into crane flies shortly or additional flies may arrive from surrounding woods so that there may be a small "plague" of these flies until the weather warms up and the soil dries out a little more. Usually no control measures are recommended for these short-lived flies. See *Ornamentals and Turf Insect Note No. 129* at <http://www.ces.ncsu.edu/depts/ent/notes/O&T/lawn/note129/note129.html> for more information.

Crape Myrtle Aphids

Crape myrtle aphids are something I normally think of later in the season, but they are active now on the North Carolina State University campus. A heavy infestation might cause a little leaf distortion later and excessive honey dew often produces black sooty mold fungus on crape myrtle. Watch for ants crawling up trunks which may indicate aphids above. Crape myrtle is the only host plant of the crape myrtle aphid. Once the population has been eliminated, the plants may remain free of aphids for years. Horticultural oil and insecticidal soaps are good for control. Most yard and garden products have "aphids" on the label. Systemic insecticides will work and Orthene is also labeled as a bark paint.

Wool Sower Gall Time

The wool sower gall (Fig. 3) is a distinct and unusual plant growth induced by the secretions of the grubs of a tiny gall wasp, *Callirhytis seminator*. If a fresh wool sower gall is held in a plastic bag out of the sun (so it will not get too hot), within one to three weeks the tiny, harmless gall wasps will emerge. The wool sower gall is specific to white oak and only occurs in the spring. Pulling the gall apart exposes small seed-like structures. The gall wasp grubs develop inside these structures. (This gall is also called the oak seed gall.) Fortunately, wool sower galls are hardly ever abundant enough to cause harm to white oaks. Gall wasps invariably have alternation of generations in which one generation develops in one type of gall (leaf gall) and their offspring develop into another type of gall (stem gall). Wasps of each alternate generation are slightly different in size and the galls of each generation are enormously different from the parents. The wool sower gall may be the leaf gall of this species because of its transient nature. For more information on galls of oaks, see *Ornamentals and Turf Insect Note No. 05* on the web at <http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note05/note05.html>.



Fig. 3. Wool sower gall. Image by Herbert A. Pase III
(<http://www.bugwood.org>).

Vein Pocket Gall

Last week we received a vein pocket gall (Fig. 4) on a white oak leaf (*Quercus alba*). We have not yet identified the midge fly larva that causes this one. There are other common vein pocket galls that are brown, but this one is a bright crimson. Oaks have a huge number of galls. The gall causing insects may not help the oaks, but they seem to have coexisted peacefully for many thousands of years (or more). There is little that can be done to deal with galls on oaks and little reason to try. We'll cover other galls on oak and other trees in the coming weeks.



Fig. 4. Vein pocket gall on oak. Image by Steve Bambara.

Invasive Plants of the United States DVD and Website

A new exotic weed DVD is available at <http://www.invasive.org/weedcd/>. The project includes 219 invasive plant species in the United States. The focus of this DVD-ROM is to provide identification, ecology, and control information for invasive plants in the United States occurring in aquatic, wetland, forest, rangeland, desert, or prairie habitats. This product compiles information in recent publications from leaders in invasive species management in the United States, such as the USDA Forest Service, USDA APHIS PPQ, The Nature Conservancy, The Plant Conservation Alliance, The Southeast Exotic Pest Plant Council, and Invasive Plant Atlas of New England.

While this is not an official list of "invasive" plants throughout the United States, it includes Federal Noxious Weeds and those listed by state regulatory agencies, pest plant councils, and other organizations. Some of the plants on this list are often found in ornamental plantings and landscapes. In fact, many non-native plants introduced for horticultural and agricultural use now pose a serious ecological threat in the absence of their natural predators and control agents. This publication will aid landowners, foresters, resource managers, and the general public in becoming familiar with invasive plants in their area to help protect our environment from the economic and ecological impacts of these biological pollutants.

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.

Employment and program opportunities are offered to all people regardless of race, color, national origin, sex, age or disability. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.

