Summer 2012

Bulletin news from the experiment station associates

The *Bulletin* is published by the Experiment Station Associates and mailed to our members. To become a member, complete the form on page 6.

The Experiment Station Associates was formed in 1990 to encourage and support the work of the scientists at The Connecticut Agricultural Experiment Station.

Station Scientists Report on New Threats in the Northeast

by David Yih

This spring's annual meeting in March of the Experiment Station Associates featured presentations on two emerging threats in the Northeast: boxwood blight and the spotted-wing Drosophila fly.

Boxwood blight
by Dr. Sharon Douglas

In early October, samples from ailing boxwood plants arrived at CAES for diagnosis. After careful scrutiny, it appeared that the pathogen was a new fungus species previously seen in Europe and first described and named in New Zealand in 2002 but never before seen in the United States: Cylindrocladium pseudonaviculatum.

USDA mycologists confirmed the identification on October 26th, and as the fall progressed, several more states reported the presence of the disease. So far, Connecticut has been the hardest hit, with the blight affecting nurseries, garden centers and residential areas in at least five counties and losses estimated at over $3 million.

All species in the genus Buxus are susceptible to the blight.

In Europe, where the blight was first reported, formal box hedges in the numerous parterre estate gardens and 600-year-old hedges two stories high are threatened, as are native populations growing in the wild. This past April, Dr. Douglas attended a boxwood summit meeting in England hosted by the Royal Horticultural Society, at which attendees shared information about the blight.

A boxwood plant infested with boxwood blight. photo by Dr. Sharon Douglas

Like many fungal infections, boxwood blight spreads most readily in wet weather or moist, crowded situations. It can only be definitively diagnosed using microscopy, as the symptoms

Continued on page 2

The symptoms of boxwood blight resemble those of other diseases. It is necessary to examine the leaves and stems with a microscope to positively identify the disease. photo by Dr. Sharon Douglas

resemble those of other diseases (a given plant may also suffer from more than one condition simultaneously).

Lesions appear on leaves and stems, and defoliation ensues. Because the blight affects only the above-ground portion of plants, they are able to put out fresh leaves, but repeated defoliations will kill them.

It takes the pathogen only 4-7 days to complete its life-cycle. Because its spores are sticky, they may be dispersed long distances by sticking to animals, clothing and footwear, equipment, vehicles, or shipping containers. The fungus can survive at least 5 years on decomposing boxwood leaves.

As yet, there are no federal regulations governing how the blight must be handled. In Connecticut, infected plants may not be transported, and many nurseries are conducting their own on-site burial or incineration operations under CAES supervision.

CAES scientists are working to find answers to a number of questions. Most other Cylindrocladium species attack the roots - why doesn't this one? What is the biology of the fungus in New England -- how does it survive here? What are the relevant BMPs (best management practices)? How should equipment be sanitized? Do any fungicides work?

Most fungicides do not easily move through cell walls to reach fungi that are active inside a plant. So fungicides can only be preventative, not curative against boxwood blight.

But there is a danger in attempting to use fungicides preventatively. If the treated plants happen to be already infected but pre-symptomatic, a fungicide would act merely as a fungistatic, inhibiting the growth of the fungus without actually killing it. In a scenario called the "Trojan horse" or "typhoid Mary," these plants would continue to appear healthy and could be sold and transported elsewhere, only to become symptomatic later, spreading the disease over a wider range.
In the question and answer period following her talk, Dr. Douglas gave a rare glimpse into what it's like to be responsible for rapidly detecting, investigating, and developing effective responses to the sudden appearances of destructive pathogens like the boxwood blight fungus. "Time has stopped for me since October," she said.

Dr. Douglas has compiled a detailed fact sheet on the boxwood blight, including photographs and management strategies. It is available on the CAES web site at http://www.ct.gov/caes. The boxwood blight link appears near the top of the left sidebar.

The spotted-wing drosophila fly by Dr. Richard Cowles

Dr. Richard Cowles first noticed these exotic flies in the course of his research on strawberry sap beetles, which were being collected in traps baited with whole-wheat dough. Last August, traps started coming back to the lab with spotted-wing drosophila in them. Within a month, the flies had spread from Fairfield County, Connecticut to Maine, as they emerged from fall raspberry crops and were carried north by last fall's storms.

A close relative of the common fruit fly (D. melanogaster), spotted-wing drosophila is an invasive species whose native range is in east Asia.

It first appeared in the U.S. in 2008, in California. It attacks blueberries, cherries, raspberries, strawberries, grapes, and related species by depositing its eggs in the fruit. As many as 500 eggs may infest a single strawberry.

The male spotted-wing drosophila has two "combs" on its front legs and a single spot near the tip of each wing. The female's ovipositor has serrations that allow it to deposit eggs in fruit that is just starting to ripen, instead of being

limited to damaged or over-ripe fruit, like most other fruit flies.

In the process of depositing eggs, the female also inoculates the fruit with microbes that hasten rotting, creating favorable conditions for the developing larvae. The life cycle takes 2 weeks, during which time there can be a 50- to 100-fold increase in population. During the growing season, adult flies live 20 to 30 days. But the last generation to hatch in the fall lives longer, over-wintering as adults. As yet, no one knows where the flies overwinter.

The spotted-wing drosophila fly. photo by Dr. Richard Cowles

Four possible approaches to combating the problem are: trapping adults, removing and disposing of infested fruit, excluding flies with netting, using insecticides or biological controls.

A good recipe for baiting a monitoring trap is: 60% apple cider vinegar + 40% cheap red wine. If the flies are found to be present, further action can be taken. Sanitation is important because even fallen fruit provides an effective breeding site. As a barrier, a 1mm by .85 mm woven mesh netting is adequate to keep flies away.

Regarding insecticides, Dr. Cowles mentioned spinosyn-based products, which are approved for use in organic agriculture and have a low impact on beneficials and had an interesting tip to offer.

Flies are able to taste through their feet, so anytime they walk across a sweet surface, they will respond by sampling it with their mouths. Thus, adding sugar to insecticides increases their effectiveness against such flies. It also allows users to minimize the quantity of insecticide needed to get results. A "spoonful of sugar" per gallon of insecticide spray will help the medicine go down, as Cowles puts it.

Another organic insecticide/protectant is Surround Wettable Powder, which is made from kaolin (white clay). The desiccant property of kaolin tends to dry the flies out, killing them within three hours. Cowles has also applied for a grant to explore the feasibility of using a biological control agent against the pest.

After Dr. Cowles's talk, attendees clustered around an interesting exhibit he had brought which showed a simple method of setting up an attractant assay to test what types of bait will attract the flies. It consisted of a transparent boxlike enclosure in which there were several drosophila flies along with various small containers containing the attractants being tested. The containers had holes on top that were large enough for the flies to enter, but small enough that they wouldn't normally enter unless actually attracted by the substance in the container.

More information about the spotted-wing drosophila can be found by typing "drosophila" into the search box on the CAES website (http://www.ct.gov/caes) and clicking on the link to the factsheet.

Plant Science Day on August 1

This is always an informative and interesting annual event. There are talks under the tent all day long and exhibits both in the barn and outside.
You can bring your lunch or buy a hot dog or hamburger. The event is held rain or shine. See you there — Lockwood Farm, 890 Evergreen Avenue, Hamden.

Connecticut Invasive Plant Symposium on October 25

Attending this day-long symposium at UConn in Storrs is a great way to learn more about the threat to our ecosystem posed by invasive plants. The keynote speaker will be Elizabeth Farnsworth of the New England Wild Flower Society.
The early registration fee of $45 (postmarked on or before September 21) includes lunch and handouts.
Make your check payable to The University of Connecticut and mail to Donna Ellis, UConn Department of Plant Science & Landscape Architecture, 1390 Storrs Road, Unit 4163, Storrs, CT 06269-4163.
For more info you can call Donna at 860-486-6448 or go to www.hort.uconn.edu/cipwg.

ESA Field Trip to CT Wineries This Fall

ESA Board member Barbara Yaeger and field trip planner *par excellence* is working on a trip to Connecticut wineries in October. Members will receive information and an invitation by mail in early fall.

Managing Bed Bugs

by Robert C. Pollack

In the last 10 years, bed bugs have enjoyed a major resurgence in the United States including Connecticut. In response to bed bug issues in the state and the city of New Haven, The Connecticut Agricultural Experiment Station (CAES) located in New Haven, developed strong research, public education, and professional training, programs. CAES has become one of the national leaders in bed bug management.

Research at the Station, using desiccant dusts and entompathogenic fungi, is proving effective against bed bugs.

Two years ago, former station Director and Emeritus Scientist Dr. John Anderson invited Dr. Cowles to determine how effective various insecticides are against bed bugs.

After many laboratory experiments, Dr. Cowles found four products that effectively killed them: Drione, Tempo Dust, Delta Dust and Tech Dust.

"Dust-based products kill bed bugs because they remove the wax that covers their bodies which protects them from water loss. Thus, moisture within the bugs evaporates into the air, in effect, dehydrating them," Dr. Cowles said.

"And while insects including bed bugs can develop resistance to other pesticides, this cannot happen with dust-based products," he added.

However, these dust-based products can only be used by trained professionals. Bed bug labeled pesticides available to the public are generally ineffective.

Another station scientist who is working on managing the resurgence of bed bugs is Dr. Gale E. Ridge, who is an entomologist, head of the Insect Inquiry Office at the Experiment Station, and

photo by Mike Thomas, CAES

chair of the Connecticut Coalition Against Bed Bugs (CCABB).

Her research is in two parts: Finding a non-chemical agent that can kill bed bugs and their ancestry, tracking lineages back to different parts of the world because while they all belong to the same species, many populations have different histories.

She also studies their reproduction and behavior. "The better we understand them, the more effectively we can be in managing them," Dr. Ridge said, "and studying their behavior and reproductive habits may help us do this."

Dr. Ridge has found a fungus strain which has proven "highly effective in killing bed bugs in the laboratory. The fungus spores after germination infect the insects and kill them," she said.

Dr. Ridge said "bed bugs which are honey brown, flat, oval, and apple seed in size, usually frequent bedding and/or seating where people sleep or sit for extended periods of time." They usually cluster in a "refuge" away from the host, up to 20 feet and commute to feed.

They originated in cave systems in the Hindu Kush mountain system of Afghanistan and crossed over to people during the last ice age. Thus they are crack and crevice dwellers and can be found in cracks, seams, and small openings in a home where they like to hide.

Dr. Ridge continued, "The deep social and cultural stigma of being infested by bed bugs stops many people from communicating and cooperating in efforts to manage the insect effectively. If bed bug populations are caught early, they can be easily managed," she said.

She and Dr. Cowles agree that many people panic and throw out mattresses and box springs, and other furniture, which they say is not necessary.

Bed bug proof covers (encasements) that cover mattresses and box springs are an effective deterrent to bed bugs. Also, ClimbUp® insect interceptors designed after the old fashioned Watch-glasses used under the feet of furniture can be used as a barrier and monitor.

"If people are educated and proactive, not reactive in regard to bed bugs, they can be quickly and cheaply managed in almost any setting, said Ridge. "It is no one's fault if they get bed bugs. It is often an accidental introduction; this is an opportunistic insect and no one is to blame," concluded Dr. Ridge.

Following are some protective steps for bed bug management suggested by Dr. Ridge.

1. If a suspicious insect is found, have it identified by an expert. Fleas, ticks, spider beetles, and carpet beetles etc. can be mistaken for bed bugs. Additionally, the Eastern bat bug and species of bird bugs found in Connecticut look like the human-feeding Common bed bug. Their control is different.

2. If bed bugs are confirmed, don't

continued on page 6

What Happens to All the Food …

grown by Station scientists for research purposes?

Between July 1, 2010 and June 30, 2011 …. a total of 34,704 pounds of food was grown at Lockwood Farm and the Valley Laboratory and distributed to local foodbanks.

From Lockwood Farm: 24,211 pounds of spinach, radishes, pak choi, summer squash, assorted squash, eggplants, peppers, tomatoes, cucumbers and other assorted vegetables were donated to the Connecticut Foodbank – East Haven. The produce came from plots grown by Drs. Martin P. N. Gent, Frank Ferrandino, Abigail Maynard, Kim Stoner and the Lockwood Farm staff.

From the Valley Laboratory: 10,493 pounds of tomatoes, plums, cabbage, corn, squash and watermelon were donated to Foodshare of Hartford. An additional 1,750 pounds of pumpkins were donated to Northwest Park of Windsor for the Fall country fair event.
Drs. Abigail Maynard, David Hill, Todd Mervosh, and James LaMondia generated the fresh produce, and Jim Preste and Dr. LaMondia organized the distribution effort.

Source: *The Connecticut Agricultural Experiment Station – Record of the Year 2010-2011*

photo by Dr. Abigail Maynard

In early June, ESA members and guests visited White Flower Farm in Litchfield, followed by Freund's Farm and Laurelbrook Farm in East Canaan. Thanks to ESA Board member Barbara Yaeger for organizing it!


photo by Barbara Yaeger


photo by Barbara Yaeger


photo by Barbara Yaeger

Photos from top left going clockwise: Theresa Freund explains the greenhouse, Farm Market and CowPot operation at Freund's Farm. We also toured their dairy and enjoyed a sumptious lunch catered by Theresa. Barbara Pierson told us about the history of White Flower Farm and gave us a tour of their greenhouse operations. Boby Jacquier led us on a tour of his state-of-the-art compost facility at Laurelbrook Farm. Tom Bodnar identified the plants in the Lloyd border at White Flower Farm. Dr. Sharon Douglas talked about boxwood blight. Susanne Hyder demonstrated the seed machine at White Flower Farm. Thank you all for a wonderful day!

photo by Maria Yih

photo by Ellie Tessmer

photo by Barbara Yaeger

MANAGING BED BUGS

panic, but don't linger. Notify your local health department and if a tenant, the landlord (currently landlords are responsible for correcting the problem in Connecticut). Do not self-treat! Current over the counter pesticides and/or bombs rarely work and they can irritate the insects, temporarily driving them away and scattering them to other locations.

3. Contact a Pest Management Professional (PMP). A list of PMP's willing to treat for bed bugs as well as full multi-language information on bed bugs is available on the Experiment Station webpage under the icon "bed bugs". www.ct.gov/caes

4. Communicate, cooperate and under supervision of the PMP or health department, clean and prepare home/apartment/business for treatment. Post treatment, have follow up inspections as a precaution.

Thanks to Dr. Gale Ridge for editing this article.

Experiment Station Associates Membership Application

ESA is a 501c3 nonprofit organization

_____
Name of person, business or organization

_____
Address

_____
Town, State, Zip

_____
Phone

_____
Email (for updates on Station research & activities). We will not share your email with other organizations.

_____	Individual Membership	$20
_____	Family Membership	$30
_____	Supporting Membership	$50
_____	Patron Membership	$100
_____	Business/Organization Membership	$50
_____	Student/Senior (65+) Membership	$15
_____	Student/Senior Family Membership	$25

Please make checks payable to and mail to:
Experiment Station Associates, P.O. Box 975
Naugatuck, CT 06770-0975

EXPERIMENT STATION ASSOCIATES
P.O. Box 975
Naugatuck, CT 06770-0975
www.ct.gov/caes

Experiment Station Associates
P.O. Box 975
Naugatuck, CT 06770-0975