

Connecticut IPM Program – Donna Ellis, IPM Coordinator

The Connecticut IPM Program 2013-2014 Annual Report is available on the UConn IPM website (www.ipm.uconn.edu).

I. **Funding:** The Connecticut IPM Program is funded in part by USDA (NIFA EIPM and APHIS), CT Department of Energy and Environmental Protection (DEEP), CT Department of Agriculture/USDA Specialty Crop Block Grant Program, USDA (APHIS, SARE), and the University of Connecticut.

II. Pest Management Project Updates

Fruit IPM (Mary Concklin): UConn participated in a new project during 2014 to collect site specific weather monitoring data to help with critical decision making about pest management for fruit crops and on school grounds and athletic fields. Thirty-two weather stations were installed on orchard and berry farms, vineyard sites, and school grounds, with additional stations to be installed in 2015. The weather stations are connected to the Network for Environment and Weather Applications (NEWA) system, which is maintained by Cornell University's IPM Program. With the NEWA system, data specific to Connecticut is available 24/7 to all fruit growers, IPM scouts and consultants, green industry clientele, students, and Extension personnel via mobile devices and computers. The data is used to forecast various fruit and turf diseases as well as insect emergence and development. The information was provided in regular Pest Alerts to growers via e-mail list serves and the UConn IPM website. Weather data is used to fine-tune pest management decisions, aid in reducing pesticide applications, facilitate better cultural management practices, and, for turf, assist with development of Best Management Practices for pesticide-free turf. The weather stations are being used in conjunction with educational programs for fruit growers, school grounds managers, and the green industry. Placing weather stations at schools will have the multiplicative advantage of providing an opportunity for educators to teach how weather data can be used to understand pest development. The project participants are excited to be a part of the NEWA project in Connecticut as they learn to use this new tool to aid in their pest management programs.

Greenhouse IPM (Leanne Pundt): More greenhouse growers are interested in using biological controls (beneficial insects, mites, nematodes and fungi) to help manage their pests and diseases. Season long hands-on training helps growers in their transition to using biological controls. By using biological controls, growers report improved plant quality, safety to workers and the environment. In 2014, 6 businesses participated, impacting greenhouse production plus outdoor production, and 5 of the 6 participating businesses are using some biological controls.

March Farms is a 3rd generation family farm that produces fruits, vegetables and greenhouse vegetables (tomatoes, lettuce and cucumbers). Spider mites are a challenging pest to manage in greenhouse tomatoes, as the workers can accidentally move the spider mites through the crop as they prune and train the tomato vines and harvest the fruit. By using a combination of predatory mites and midges, March Farms was able to market much of their crop as pesticide free. Twenty-four pest messages were sent out to 240 CT greenhouse growers, retailers and allied industry members during the growing season and placed on the UConn IPM website.

Invasive Species IPM (Donna Ellis and Ana Legrand): The Connecticut Invasive Plant Working Group (CIPWG; Donna Ellis, Co-Chairperson) is a consortium of members of environmental organizations and affiliates of municipal and state agencies whose mission is to promote awareness of invasive plants and their non-invasive alternatives. The CIPWG website (www.cipwg.uconn.edu) provides information on invasive plant identification and management, the CT list of invasive plants, photos, invasive alternatives, resources, and legislative updates. Invasive plant outreach was provided to over 73,200 Connecticut business owners and citizens via invasive plant educational materials and CIPWG exhibits at 28 local, statewide, and regional events. In collaboration with Connecticut Agricultural Experiment Station scientists, approximately 8,100 beneficial insects (*Rhinoncomimus latipes* weevils) were released onto invasive mile-a-minute vines (*Persicaria perfoliata*) at 10 Connecticut locations in a biological control project.

Although Asian longhorned beetle has not yet been found in the state, this destructive pest was first detected in MA in 2008. Emerald ash borer was confirmed in Connecticut in 2012 and is now found in 6 counties. A volunteer network of UConn Master Gardeners assisted with exotic pest educational outreach, and together these efforts reached approximately 13,400 Connecticut citizens. Lily leaf beetle (*Lilioceris lillii*) is a serious pest of many herbaceous ornamental plants, including lilies. Donna Ellis and Gail Reynolds collaborated on a biological control project for lily leaf beetle. Two species of lily leaf beetle biological control agents (parasitic wasps) were introduced onto lilies during 2013 and 2014, for

a total of 21 release sites in Connecticut to date. Project results showed that biological control of lily leaf beetles has just begun in the state and is expected to increase with time as more of the beneficial wasps are introduced in future years.

The brown marmorated stink bug (BMSB) *Halyomorpha halys* is an invasive insect from Asia. It was first detected in Connecticut in 2008 and as of June 2014, BMSB had been detected in 41 states and two Canadian provinces. This insect is a pest of vegetables, fruits and ornamental plants. It is also considered a nuisance pest when it enters homes in the fall in search of overwintering shelter. Research is being conducted by the USDA on exotic parasitoids for the biological control of this stink bug in the US. Ana Legrand is working in identifying BMSB egg parasitoids and other relevant predators in CT. Ana and her graduate student are rearing BMSB in the lab to produce eggs for natural enemy research.

Landscape and Turf IPM (Ana Legrand): The Japanese beetle and Oriental beetle are considered key pests of turfgrass and landscapes. Their larvae or white grubs primarily feed on the roots of all cool-season grasses. Research efforts in landscape and turf IPM have focused on *Tiphia* parasitoids. Our research on *Tiphia* is the first one to show that turfgrass volatiles induced by white grub feeding on roots play a role in attracting *Tiphia* wasps to injured grasses. These signals may help them in their grub search. Of importance has been the finding that Kentucky bluegrass and tall fescue have been shown to release attracting volatiles, while perennial ryegrass does not. In addition to learning about the role of turfgrass herbivore-induced volatiles, we have also obtained new information about how turfgrass species influence the development and survival of Oriental beetle grubs. We will follow up on these results to understand how grass species impact the survival of white grubs.

The parasitoid wasp *Tiphia vernalis* or spring *Tiphia* attacks the larval or grub stage of Japanese and Oriental beetles during spring. Spring *Tiphia* adults have been observed feeding on honeydew deposits from soft scales or aphids on tree foliage. During the time when spring *Tiphia* are active, there are limited plant resources that they can use to obtain nectar. In a 3-year study, we evaluated the use of peonies to conserve and enhance *Tiphia* parasitism of white grubs in turfgrass. Results showed that peonies can provide a valuable aesthetic function in the landscape and have the potential to be a component of conservation biological control involving *Tiphia* wasps.

School IPM (Candace Bartholomew, Donna Ellis, and Victoria Wallace): Since 2010, there has been a ban in CT on the use of pesticides for K-8 schools and daycare facilities. The state of CT requires the use of an IPM plan for all school grounds and athletic fields, even if these school properties are obligated to manage and care for these properties without the use of pesticides. The CT School IPM Coalition was formed as the result of the pesticide ban and has served to provide educational opportunities, via training workshops for school grounds and athletic field managers and their staff, on maintaining grounds and fields without the use of pesticides. Assessment tools to determine impacts of the management and quality of school grounds and athletic fields have been developed to better serve school grounds managers. Two day-long hands-on educational workshops were presented to promote pesticide-free care of school grounds. A new UConn Extension document, "Best Management Practices (BMPs) for Pesticide-Free, Cool Season Athletic Fields" was developed. A part-time student assistant was hired in 2014 to provide educational training for 25 school grounds managers to document changes in athletic field turf quality using the UConn Field Assessment form.

Vegetable IPM (Jude Boucher): With Jude unable to get to the field last summer, he transformed his usual crop-by-crop Vegetable IPM Pest Message into a "farmers' report from the farms" (modeled after one Vern Grubinger started in VT several years back). The evaluations were all very positive, with most growers asking for a hybrid between the two models in 2015. Jude worked for several years with Oxen Hill Farm, which produces USDA certified organic vegetables and cut flowers. In 2014, the farm entered its third year of USDA Organic Certification, and they rented additional land to expand into a growing wholesale business. They also worked with Extension to learn how to grow and manage pests on sweet corn, despite the multitude of challenges from weeds, insects, diseases and wildlife that this crop presents for organic farmers. Several family members also expanded the cut flower business - catering to weddings, floral arrangements, and retail sales. At the end of 2014, they purchased an additional 90 acres to further expand production in the future. It appears that there is nothing that this team can't handle, and we expect a bright future for Oxen Hill Farm and the many customers that they supply with locally produced food and flowers. The family credits much of the success at Oxen Hill to the strong partnership with UConn Extension and the frequent support of their willing and capable staff.

Plant Diagnostic Lab (Joan Allen): The UConn Plant Diagnostic Laboratory and UConn Home & Garden Education Center processed over 600 samples from both private and commercial clients from July 2013 through June 2014. These included plant and insect identification and plant problem diagnosis. One hundred of the samples were fruits and vegetables, nursery crops, greenhouse crops (both ornamental and vegetable), and Christmas trees. An evaluation survey

was done to assess service satisfaction and the impact on chemical use by clients submitting diagnostic plant samples. Eighty-six percent of respondents indicated that their diagnostic report included information needed to manage their problem, chemical pesticide applications were either eliminated or reduced in 43% of the operations, and all reported that the overall service was good to excellent. The UConn Plant Diagnostic Laboratory is a member of the National Plant Diagnostic Network (NPDN). Two workshops for new farmers and gardeners were held in February 2015 on pests and diseases of four vegetable families: the cucurbits, brassicas, Solanaceae, and legumes. One workshop featured a talk on the use of cover crops for disease control. Sustainable practices and IPM were emphasized. Workshops were organized by Joan Allen with other speakers including Vegetable IPM specialist Jude Boucher and Eero Ruuttila from the UConn Scaling Up for New Farmers program.

Other updates:

- **Greenhouse Pest Guide App (Leanne Pundt):** A mobile optimized website app that contains options for biological control and pesticides for management of insect and mite pests common in commercial greenhouse production was developed that can be used on a computer, smart phone or other electronic device. This was a cooperative project with Tina Smith, Project Leader, Extension Floriculture Specialist for the University of Massachusetts Greenhouse Crops and Floriculture Program and Leanne Pundt, Extension Educator, UConn Extension.
<http://tiny.cc/greenhousepestguide>
- **Plant Sample Submission App Launched (Joan Allen):** The UConn Plant Diagnostic Lab joined forces with seven other university diagnostic labs to develop a plant sample submission app for the iPhone and iPad. The effort was led by Purdue University, and the app became available as a free download in July 2013. Users select the lab they'd like to use, fill in information fields on their plant problem, and submit up to six images of the plant. The app can also be used for plant and insect identification. Submissions go to the selected diagnostic lab via email.
- The UConn IPM Program delivered outreach that impacted many stakeholders. Two major plant conferences, the **Perennial Plant Conference** for landscape and horticultural professionals and the **Garden Conference** for garden enthusiasts were developed and presented by the UConn Ornamental Plant Extension Team in March 2014 to address the needs of Connecticut's Environmental Horticulture Industry and to provide outreach education to stakeholders and the general public. The annual **Connecticut Vegetable & Small Fruit Growers' Conference** outgrew its previous venue and moved in 2014 to a larger conference center. The old attendance record of 197, set in 2013, was shattered with 260 farmers and industry people attending the 2014 conference, and the Trade Show expanded from 12 to 31 exhibits. A one-day **Biological Control Conference** for greenhouse growers co-sponsored by UConn Extension and University of Massachusetts Extension was held in November 2013 in Sturbridge, MA. A conference on **Pest and Disease Management in the Landscape** was held in October 2013 in Southbury, CT and was attended by 111 people. Two ½-day educational programs on **Bedding Plants** were held in two CT locations in February 2014 in order to reach more greenhouse growers and retailers across the state.