UTAH PESTS News

Utah Plant Pest Diagnostic Laboratory and USU Extension Vol. 1, Spring 2007

What's Inside

News Highlights

NEW *UTAH PESTS* FACT SHEETS
The following can be found on our web site:

Alfalfa Stem Nematode

Boxelder Bug

Codling Moth

Greater Peachtree Borer

Japanese Beetle

Pantry Pests

Western Cherry Fruit Fly

LAB HONORED BY AWARD
The UPPDL was awarded the "Extension Vice President's Award for Excellence/Team" by USU Extension in recognition of the lab's 20 years of service to Utah's citizens.

www.utahpests.usu.edu

Japanese Beetle: Not Just Another Pretty Bug

The Japanese beetle, *Popillia japonica*, was first detected in Utah this summer, and is just the latest example of another invasive introduction to Utah. In July 2006, an Orem resident and USU Master Gardener noticed leaf damage on her wisteria plant in her backyard. She investigated for potential insects and quickly found a shiny, metallic beetle. After initially bringing the insect to the Utah Department of Agriculture and Food (UDAF) for identification, the specimen was confirmed in the Utah Plant Pest Diagnostic Laboratory by Alan Roe. Since July, more than 600 adult Japanese beetles have been collected in a two square-mile area in Orem. Adults were trapped with a special "double lure" system developed by Trece Incorporated (www.trece.com) that includes a floral lure and a pheromone sex attractant.

Adult Japanese beetles are oval, and metallic green with bronze-colored wing covers. Males are usually slightly smaller than females, but in general, adults are about ½-inch long. An obvious distinguishing character of the adults includes six white tufts of hair along each side of the abdomen. Immature Japanese beetle larvae are called grubs, and are about 1-inch long when fully developed. Grubs are C-shaped and are creamy white in color. Japanese beetles are closely related to other scarab beetles, such as May/June beetles and masked chafer beetles;

Continued on page 2

Beyond Bt: Using Microbial Pesticides

Bactur, Bactospeine, Bioworm, Dipel, Javelin, Topside – All names for a commonly used microbial pesticide, *Bacillius thuringiensis* (Bt). Bt has been used commercially since 1961, when it was first registered by the EPA. Today there are over 187 microbial pesticides on the market, and many are used successfully to control a variety of insects and diseases in landscape and agricultural settings. These materials are great alternative to synthetic, broad-based chemical pesticides.

Microbial pesticides are made from bacteria, fungi, protozoa, viruses, and other organisms (or their toxins) that cause death or disease of insects or plant pathogens. They are sold as dusts, wettable powders, sprays, granules, etc. and are applied in the same way as conventional pesticides.

The greatest advantage to using these products is that they are safe for the environment. They target a certain pest or pest group and are thus non-toxic to humans and other life not related to the target pest. For example, the microbial insecticides do not harm predatory and parasitic insects because the toxin that a given organism produces is harmless on its own, and only becomes activated when it encounters a specific "receptor site" on its host.

Other advantages:

- Can be applied almost up to harvest date.
- Useful in locations where synthetic chemicals cannot be used such as near wetlands, schools, and in parks.
- If necessary, can be used in conjunction with synthetic chemical insecticides (follow label directions).

There are a few **caveats** to using microbials. Some require multiple applications, and correct

Continued on page 4

Japanese Beetles, continued from page 1

therefore, the grubs are difficult to identify to species without a high-quality microscope.

The Japanese beetle is a concern because of the potential damage the adults and immature grubs can cause to ornamental plants. Japanese beetle grubs, like most white grubs, feed on turfgrass roots. High numbers of grubs can severely weaken a turfgrass root system. Adult Japanese beetles can feed on more than 300 host plants and often congregate in large numbers to feed and mate. Adults are active during the warmest part of the day and will likely be feeding on suitable host plants during that time. Ripening fruits are especially attractive, but adults also prefer rose, apple, stone fruits (e.g., peach, plum, cherry), basswood/linden, willow, elm, grape, birch, Japanese and Norway maple, pin oak, horse chestnut, and sycamore. All of these plants can be found throughout Utah and are the most likely to have adult feeding damage.

Beetles mating and feeding on corn.

Japanese beetle grub.

Unfortunately, Japanese beetles are not a new pest to the United States. Japanese beetles were first discovered in the eastern United States in 1916 and are considered a highly destructive pest along the east coast. Since the 1920's, the beetles have threatened horticulture and agriculture and have slowly moved south and west. Many states, including Utah, have deemed the Japanese beetle a quarantine pest, which restricts movement of plant material. Because of the thriving horticulture and fruit industries in Utah, UDAF has carefully monitored for adults along the Wasatch Front for several years. Japanese beetle populations throughout the midwest have not caused the economic damage as seen on the east coast; however, an eradication program in Colorado is in progress.

Although no one can say how the beetles arrived in Utah, it was likely an accidental introduction with transporting plant material.

Once Japanese beetle becomes established, complete eradication is unlikely based on its other U.S. populations. There are effective biological control agents, such as parasitic flies and wasps, which can help suppress beetles to tolerable levels. In most cases, chemical control for adults and grubs is not necessary. Homeowners can be proactive by discouraging Japanese beetles from causing significant plant damage with the following tips:

- Keep susceptible plants healthy by following a recommended irrigation and fertilization schedule.
- Encourage the diversity and density of biological control agents by incorporating flowering plants that produce nectar and pollen.
- Include a mix of non-attractive plants, such as lilac, dogwood, magnolia, and American holly, to discourage large numbers of adults.
- If you notice adults feeding on ornamental plants, simply remove them by hand or shake the plant above a jar of soapy water to kill them.

The actual extent of plant damage Japanese beetle will cause in Utah is largely unknown because of the many unique climate conditions. The Japanese beetle may never become a persistent problem, but UDAF and USU will be carefully monitoring this new pest. For more detailed information about Japanese beetle, including its life cycle, susceptible plants and control options, see the fact sheet on the Utah Plant Pest Diagnostic Lab web site (http://utahpests.usu.edu).

-Erin Hodgson

UTAH PESTS Staff

Diane Alston,
Entomology Specialist
dianea@ext.usu.edu
435-797-2516

Kent Evans,
Plant Pathology Specialist
ckevans@cc.usu.edu
435-797-2504

Erin Hodgson,
Entomology Specialist
erin@ext.usu.edu
435-797-5689

Julie Jenkins,
Plant Disease Diagnostician
jjenkins@biology.usu.edu
435-797-2435

Position Vacant,
Insect Diagnostician

Marion Murray,
IPM Project Leader
Editor, Utah Pests News
marionm@ext.usu.edu
435-797-0776

Utah Plant Pest Diagnostic Lab
Room 203, BNR
Utah State University
5305 Old Main Hill
Logan, UT 84322
www.utahpests.usu.edu

Utah Pests News
is published quarterly by
the UTAH PESTS staff.

EXTENSION
UtahState UNIVERSITY

Plant Pathology News

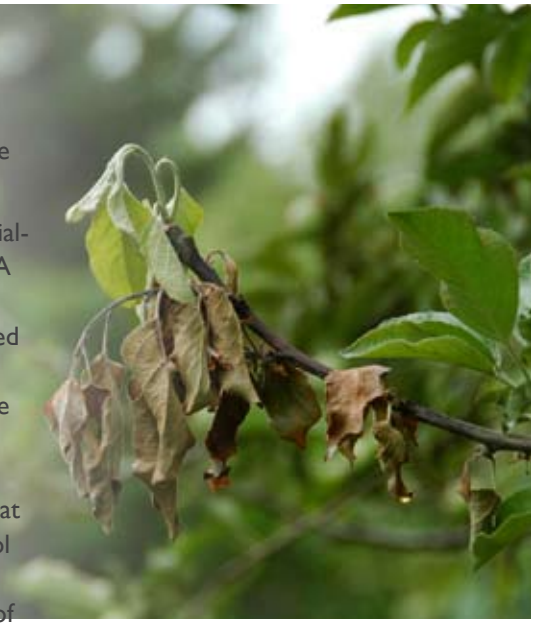
FIRE BLIGHT UPDATE

Fire blight is the most devastating disease of apple and pear production worldwide and this is true of homeowners and commercial growers of those fruits in Utah. The disease is caused by the bacterial pathogen called *Erwinia amylovora* (EA). Pruning is a very effective means to reduce carryover of the disease as cankers serve as a reservoir of the pathogen, although it is labor intensive and expensive on a commercial basis.

Historically, two agricultural antibiotics have been used commercially as controls but in recent times EA has developed resistance to streptomycin, the most effective of the two. An extensive survey conducted in Summer 2006 in Utah County, followed by laboratory tests, found that as much as 26% of the EA isolates in that county were resistant to streptomycin. Those isolates were found to be resistant at 2 to 4 times the concentration of streptomycin that was recommended for control of the disease. However, there is a glimmer of good news.

Recently, the EPA established an import tolerance for residue of kasugamycin (made and marketed by Arysta Life Science), an agricultural antibiotic for control of EA used in other countries on foods being sent to market in the U.S. What does this mean regarding the possible registration of this compound in the U.S.? If history serves as an example, when the EPA makes a move like this, it signals the agency is considering the registration for use of the chemical(s) for which they approve import tolerances.

Dr. Howard Deer, USU Pesticide Specialist, provided us with news that the EPA had approved an import tolerance for kasugamycin residue on foods imported in the U.S., so we conducted research during the 2006 season to evaluate the efficacy of kasugamycin to control fire blight in field and laboratory experiments. Preliminary findings suggest that kasugamycin is effective for the control of streptomycin-resistant isolates of *Erwinia amylovora* and for the control of fire blight shoot strikes comparable to levels of control provided by streptomycin. Further testing is underway for the 2007 growing season with on-farm trials and further USU based research.

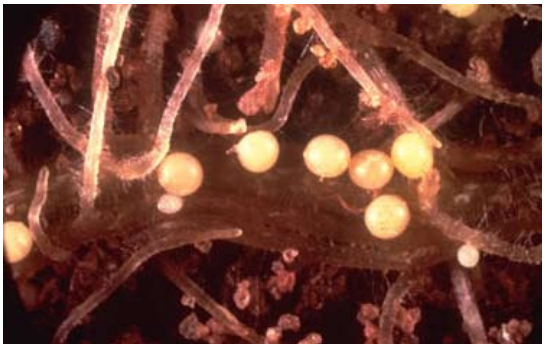


Fire blight strike on apple.

POTATO CYST NEMATODE UPDATE

Potato Cyst Nematodes (*Globodera pallida*, http://nematode.unl.edu/pest5.htm [ignore the statement that it does not occur in the U.S. now]), an international quarantine pathogen, was identified in five potato fields in Idaho in summer 2006. APHIS/PPQ has established quarantine sites of the fields testing positive and an extensive screening program has been established in Idaho. Nationwide Cooperative Agricultural Pests Surveys (CAPS) are being conducted to screen for the nematode. Updates will be passed along if additional news develops.

-Kent Evans



Potato cyst nematode on host.

Six IPM Mini-Grants Awarded

Six integrated pest management (IPM) and sustainable agriculture mini-grants have been awarded for 2007 for a total of $10,200. Project teams and topics are diverse and will be conducted across the state. The mini grant program is designed to provide seed funds to county agents to demonstrate and stimulate adoption of IPM and sustainable agriculture practices for commercial, public, and private producers.

Congratulations to the 2007 award winners:

1) Craig Poulson and David Drake, Use of Oilseeds as Biofumigants to Control Alfalfa Stem Nematode
2) Rick Heflebower and Chad Reid, Curly Top Resistant Tomato Varieties for Southern Utah
3) Sterling Banks, Using Goats to Control Noxious Weeds
4) Clark Israelson, Michael Pace, Mark Nelson, and Craig Poulson; Economic Thresholds for Control of Alfalfa Weevil
5) Larry Sagers, JayDee Gunnell, Adrian Hinton, and Linden Greenhalgh; Reducing Pesticide Use on Turfgrass Through IPM Practices
6) Maggie Shao, IPM Methods for Home Vegetable Gardens

Microbial Pesticides, continued from page 1

timing of application is crucial. They also have a short shelf life, and must be protected from exposure to UV light and excessive heat. Most of the products that control insects must be ingested to be effective. And finally, some materials are costly due to their time-consuming production and difficulty in large-scale production.

Bacillius thuringiensis is the most common organism used in microbial products. Several strains have been discovered, each targeting the larvae of specific pests. One strain targets beetles, specifically Colorado potato beetle, elm leaf beetle, and cottonwood beetle. Another strain targets only mosquito, black fly, and fungus gnat larvae, but not house fly larvae. Research continues to identifying other strains. The table below lists several microbial products available to Utah growers and landscapers.

So why do synthetic pesticides still significantly outnumber bio-pesticides? One reason is the "caveats" listed above. More likely, the pest control industry has not heard a large enough demand from consumers. The need for a wider variety of organic and alternative pest control treatments will certainly drive the product development in the future.

-Marion Murray

Table of microbial pesticides available for Utah growers and homeowners.
Those with an italics (*) are available for home use.

Active Ingredient	Product Names	Target Pest and Notes
Bacteria		
Bacillus sphaericus	Vectolex CG, Vectomax	mosquito larvae Remains effective in stagnant or turbid water
Bacillus subtilis	Pro-Mix, Rhapsody, Serenade*	many diseases including leaf spots, anthracnose, blights, powdery mildew, and root rots
Bacillus thuringiensis subsp. *kurstaki*	Biobit, Caterpillar Killer*, Dipel*, Foray, Green Light*, Safer Garden Dust, Thuricide*, Xentari	foliage-feeding caterpillars Deactivates rapidly in sunlight; apply in the evening or on overcast days and direct some spray to lower surfaces or leaves
Pseudomonas fluorescens A506	Blightban	protection against fire blight, bunch rot, and botrytis rot on a variety of fruits and nuts
Streptomyces griseoviridis	Mycostop	protection against fusarium root rot, alternaria, botrytis, phytophthora root rot and more
Streptomyces lydicus	Actino-Iron, Actinovate	protection against a variety of root and foliar diseases including damping-off, alternaria leaf spot, pythium and phytophthora root rot, take-all, verticillium, and more
Fungi		
Beauveria bassiana	Botanigard, Naturalis	aphids, fungus gnats, mealy bugs, mites, thrips, whiteflies
Myrothecium verrucaria		nematodes, including cyst, dagger, root-knot, and stunt Made from dried fermentation solids and solubles of the fungus
Trichoderma harzianum	PlantShield, Root Shield, T-22 HC	protection against botrytis, root rots, powdery mildew
Protozoa		
Nosema locustae	NOLO Bait	grasshoppers and Mormon crickets Useful for rangeland grasshopper control.
Viruses		
Codling moth granulosis virus (GV)	Cyd-X, Carpovirusine, Virosoft	codling moth caterpillars Active only if ingested; subject to rapid breakdown in ultraviolet light

Plant Disease Diagnoses, 2006

There were 149 samples diagnosed for plant diseases or abiotic stress in the 2006 season. Many were diagnosed with abiotic stress and chemical injury. Turf was at the top of the frequently submitted category at 31 entries total. Of the turf samples, fading out (*Curvularia* spp.) and *Fusarium* spp. were the most frequently isolated. Other common turf pathogens were snow mold (*Michrodochium nivale*) and take-all (*Gaumanomyces* spp.). Dothistroma needle blight is present in Utah and has shown up on a couple of Austrian pines (see below). The UPPDL had one greenhouse sample test positive for impatiens necrotic spot virus. Viral diseases can be difficult to recognize, so be on the lookout to spot them in commercial greenhouses.

THE UNUSUAL SUSPECTS

The 2006 season brought about some interesting pathogens and symptoms on host samples submitted to the UPPDL. A peppermint grower submitted a sample that was infected with a pathogen and was thought to be Verticillium wilt but was not. The UPPDL diagnoses found that it was a *Phoma* sp. Verticillium in peppermint can ruin a grower's ability to produce the crop.

Honeylocust tree branches were submitted having large swellings around the nodes. There is much controversy nationwide and internationally whether this is due to a bacterial infection or other causal agent. The issue remains unresolved.

A *Photinia fraseri* plant was submitted from a nursery to the UPPDL to screen for sudden oak death (*Phytophthora ramorum*). The sample was tested using ELISA and found negative. For verification it was sent to Oregon State University for PCR (polymerase chain reaction) testing. The PCR test was also negative. The UPPDL's diagnosis was confirmed as Entomosporium leaf spot. It is not known if this disease has been reported in Utah.

PANDORA'S BOX

The UPPDL has initiated long-term storage of pathogens that were positively identified in submitted samples. Among these are an *Alternaria* sp., *Bipolaris* spp., *Curvularia* spp., *Fusarium* spp., and a *Verticillium* sp. (all are fungi). This is a plus for research in that the location information is recorded in the database and can be traced directly to the isolate. The cultures will serve as a reference collection and for future research.

DISEASE PROFILE: DOTHISTROMA NEEDLE BLIGHT

Common name: Dothistroma needle blight or red band disease.

Scientific name: *Mycospharella pini* is the perfect state. *Dothistroma pini* is the imperfect or conidial state.

Host Range: Susceptible hosts include Austrian, Lodgepole, Mugo and Ponderosa Pines. Less susceptible hosts are Douglas-fir, European Larch, and Sitka Spruce.

Symptoms: Symptoms on needles appear as yellow bands that progress to red. The color change is due to the fungal production of a toxin called dothistromin. Once the fungus has girdled the needle, the upper portion turns brown while the base remains green. Rarely will you will see black fruiting bodies called stromata that develop in the dead needles. Trees can lose their needles. Disease progression will be from the lower branches upward. Pathogen development is where humidity is highest. Dothistroma attacks first, second, and third year growth. Stress predisposes the trees to the disease.

Images, Mike Pace, USU Extension

Dothistroma blight on pine.

Management: Clean up debris when feasible since spores are harbored in the needles. Remove weeds from the base of the tree to help reduce humidity. Sprinkler irrigation will contribute to the spread of Dothistroma. Regular wetting of the foliage provides moisture for sporulation as well as spread of

Continued on page 6

Insect Diagnoses

Striped mealybug - a new insect to Utah.

2006 was a busy time for insect and arthropod-related submissions, with more than 100 submissions. Our Insect Diagnostician, the late Alan Roe, communicated with USU Extension personnel and individual homeowners about identification and management options. Alan was an excellent taxonomist and readily answered hundreds of email and phone inquiries every year.

Most of the specimens were submitted by individuals via USU Extension Agents. Nearly every county submitted at least one specimen in 2006 (22/29 counties). Counties most likely to submit a sample to the UPPDL include: Cache (26),

Continued on page 6

Spreading the Word About Collecting Insects

As a new member of the Utah Plant Pest Diagnostic Lab, I would like to briefly introduce myself. Since first arriving in March 2006, I have been very busy trying to meet with USU Extension personnel, various commodity groups and individuals throughout the state. My Extension duties are vast, and include field/forage crops, landscape/ornamental plants, nuisance/household pests, health-related issues like West Nile Virus, and youth programs. My research programs will focus on IPM in alfalfa and turfgrass. I am also the State Survey Coordinator for the CAPS (Cooperative Agriculture Pest Survey) Program and coordinate exotic pest surveys throughout Utah. I have always been interested in outreach education, especially getting children excited about science; entomology can be a great hands-on tool to teach basic scientific concepts.

I think youth programs, like 4-H, can help children start to learn about science in a fun, social setting. To help promote Utah 4-H programs, I would like to donate two insect collecting kits to every county as a way of encouraging youth to participate in a project. Each kit includes a sweep net and various pinning supplies needed to preserve insects. Kits will be distributed to Extension Agents at the Annual Conference in March 2007. I am relying on Agents to distribute the kits to children in their respective counties.

Two kits per county is certainly not enough for every child that might want to start an insect collection. But my hope is that this small token can help a child that might not otherwise be able to afford a 4-H project. The overall goal is not only to have more insect collections submitted as 4-H projects, but to increase the overall quality and diversity of specimens prepared. I would be happy to help out with any questions you may have about collecting or preserving insects. I can't wait to see the insect collections get bigger and better at upcoming 4-H events.

-Erin Hodgson

Insect Diagnoses 2006, continued from page 5

Davis (18) and Washington (17). We had several new state and county records in 2006, including the Japanese beetle (*Popillia japonica*) on wisteria in Utah County; a mealybug, (*Ferrisia gilli*) on honeylocust; an armored scale, yet to be identified, on Austrian pine in Salt Lake County; a flatheaded cedar borer (*Chrysobothris nixa*) from creeping juniper in Cache County; and an exotic wood borer (*Bostrychoplites cornutus*), from a wooden drum in Washington County.

There were also several exotic beetles identified from a CAPS survey: an elm borer (*Saperda tridentate*) in Morgan County; a bark beetle (*Gnathotrichus pilosus*) in Iron, Davis, and Weber Counties; a bark beetle (*Hylastes rubber*) in Box Elder County; and a buprestid beetle, yet to be determined, in Iron County.

Alan's experience and knowledge will be sorely missed, but we are attempting to refill his position by the June 2007. If you know of someone who might be interested in the Insect Diagnostician position, please go to http://utahpests.usu.edu/insects for a full job description. In the meantime, please be patient with the UPPDL, as Diane Alston and I attempt to diagnose incoming specimens and make management recommendations.

-Erin Hodgson

Plant Disease Diagnoses 2006, continued from page 5

the disease. Promote plant health with adequate water and fertilization. Bordeaux can be applied as a protectant, although it can be toxic to newly formed needles. Follow the recommended guideline on the label for application and rates. Two applications per season are the most effective. Apply once before bud break and then 3 to 4 weeks later (to avoid harming newly formed needles). This is a preventative fungicide and will not cure those needles that have already been infected. It is also important to make sure that you get good coverage. Any healthy needles that are not protected will become infected.

-Julie Jenkins

In Memory of Alan Hickman Roe, UPPDL Insect Diagnostician

Alan Roe was a highly valued member of the Utah Plant Pest Diagnostic Lab for over 20 years. Alan unexpectedly passed away on December 14, 2006 at the age of 52. Alan's expertise and knowledge of arthropod identification and insects and spiders of Utah is greatly missed. Following the arrival of the hobo spider in Utah, Alan became highly proficient at spider identification and has trained many extension agents and specialists in spider identification. Alan grew up in Salt Lake City and graduated from East High School. He received both his bachelor's and master's degrees from Utah State University. He studied entomology and became interested in taxonomy of insects. In addition to working as the state insect diagnostician, he was an important cooperator in the Utah Cooperative Agriculture Pest Survey Program, Utah Pesticide Programs, and Western Plant Diagnostic Network. Alan enjoyed developing and improving databases for pest and pesticide survey information. We would like to dedicate this first issue of *Utah Pests News* to Alan and his many years of service to USU Cooperative Extension and the people of Utah.

-Diane Alston

Feature Picture of the Quarter

Black tar spot on maple is easy to diagnose, and is rarely damaging. Notice that the pathogen is causing the leaf tissue around it to retain chlorophyll longer than healthy tissue.

-Photo by Kent Evans

In the National News

WATER QUALITY TESTS

Water quality was measured by USGS in streams across the country and results showed that over 90% of streams and about 50% of shallow wells near agricultural and urban areas contained pesticide residue. From Gilliom, et. al. 2006, "The quality of our nation's streams and ground water", 1992-2001.

PESTICIDES UPDATE

EPA continues phase-out of harmful pesticides. Lindane, "recognized internationally as one of the most toxic, persistent, bio-accumulative pesticides ever registered," according to Jim Gulliford, assistant administrator for the EPA's Office of Prevention, Pesticides and Toxic Substances, has finally been banned after over 10 years of review. It is still approved, however, by the FDA as a medicinal treatment for lice and scabies.

EPA is also phasing out the carbamate, carbofuran, over a 4-year period.

ORGANIC FARMING DEGREE

The organic food industry is expected to generate sales of $32 billion by the year 2009. WSU now offers a B.S. in organic farming.

NEW EPA PROGRAM

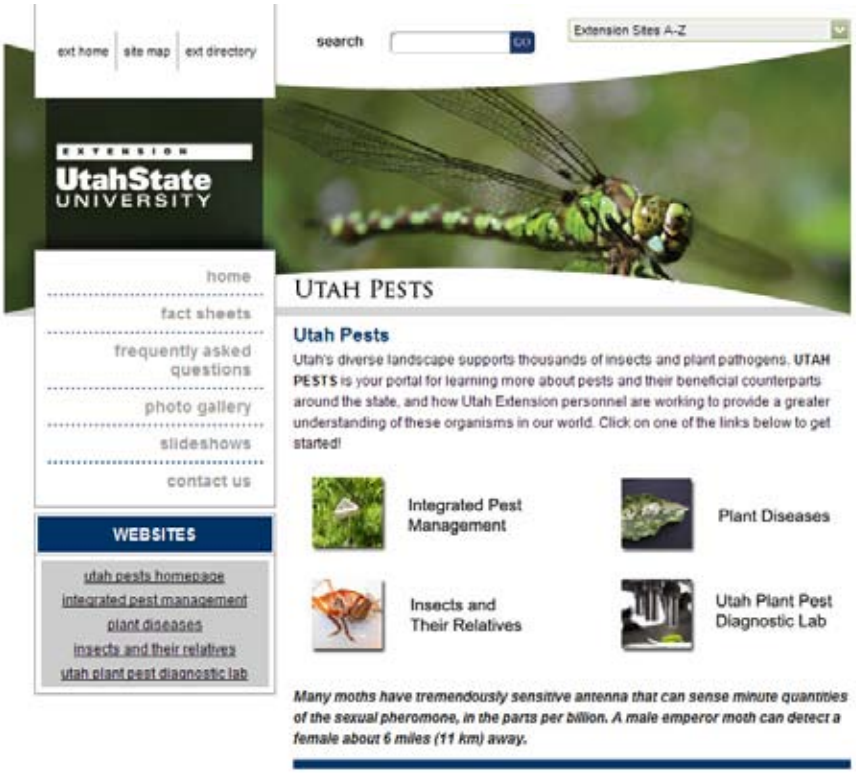
EPA's "Greenscapes" is a new program designed to promote healthy landscapes through water conservation, pesticide reduction, recycling, and "green landscaping." www.epa.gov/greenscapes

LIVING MULCHES—ANOTHER IPM STRATEGY

A newly reported study* confirms the long-suspected hypothesis that living mulch increases populations of predatory insects by improving habitat. The researchers found that the predatory insects in the legume mulch trial killed over 50% more of the European corn borer pupae as compared to the non-mulched plots. Other research has shown that living mulches can reduce the need for fertilizer, suppress weeds, and limit erosion.

*J.R. Prasifka,et al "Effects of Living Mulches on Predator Abundance and Sentinel Prey in a Corn-Soybean-Forage Rotation,", Environmental Entomology. 35:5.

New Name, New Web Site, New Logo



Many positive changes have occurred over the last several months that were designed to allow us to better serve you and the community. The Utah Plant Pest Diagnostic Lab and the IPM group are now collectively called the "Utah Pests" group.

Our web site, utahpests.usu.edu, is packed with information about insects, plant pathogens, and IPM. A searchable photo gallery includes Utah's common insect and diseases, primarily on tree fruits. We are constantly adding to our fact sheet offerings (see list on page 1) and on-line publications. Slide shows in a variety of topics are available to view, as well as IPM tree fruit research reports.

Thank you to Andrea Bell at the USU Fact Center for designing our new logo, shown on the front of this newsletter. The logo includes a fire blight "shepherds' crook" and a beetle on a Utah map background.

Useful Web Sites and Publications

WEB SITES

- http://pnwpest.org/pnw/insects: PNW Insect Management Handbook
- http://plant-disease.ippc.orst.edu/: PNW Disease Management Handbook
- http://www.ipm.ucdavis.edu/: a treasure-trove of IPM information
- http://pep.wsu.edu/hortsense/: home gardener fact sheets for managing plant problems using IPM

PUBLICATIONS AVAILABLE

- "Canada Sprayer Guide" (www.canadasprayerguide.com) includes material on sprayer technology, application techniques, and related research.
- The online book on "Building Soils for Better Crops", by SARE (Sustainable Agriculture Research and Education) can be found at: http://www.sare.org/publications/bsbc/index.htm
- An educational DVD, "Growing your Business the Natural Way" is available for lawn-care professionals for $5 from The Grassroots Healthy Lawn Program, at 516-883-0887, or http://ghlp.org/prof_ed.html. They also offer DVDs for homeowners and school districts.
- Cornell has recently published two spiral-bound IPM sources: "Guide for Integrated Field Crop Management", and "Integrated Crop and Pest Management Guidelines for Vegetables." Contact Cornell at 607-255-2080, or www.cce.cornell.edu/store.

Calendar of Events

International Master Gardener Conference, May 2-5, Little Rock, AR

Urban Extension conference, May 7-10, Kansas City, MO

Western Pesticide meeting, May 15-17, Portland, OR

Utah Master Gardener Conference, June 8-9, Provo, UT

ASHS Annual Conference, July 16-19, Scottsdale, AZ

ISA Conference, July 28-Aug. 1, Honolulu, HI