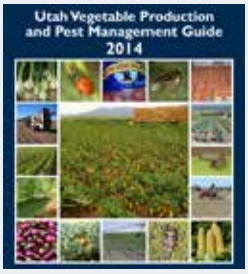
UTAH PESTS News

Utah Plant Pest Diagnostic Laboratory and USU Extension Vol.VIII, Summer 2014

What's Inside

News Highlights



A new vegetable guide for Utah is now available, funded by the USU Extension Grant Program. Click on this link to access a pdf version or to request a bound copy.

FRUIT AND VEGETABLE FIELD DAY

August 13, 1:00-4:30 pm
USU Kaysville Farm
950 South 50 West

Learn about the latest conventinal and organic research on high density orchards, cover crops, pest management, raspberry cultivars, and novel fruit harvest equipment. Free for commercial growers.

utahpests.usu.edu

Insect Population Outbreaks - Why Do They Occur?

Cicadas were a common sight in spring 2014.

Spring and early summer of 2014 have been a season for high populations of some insects. Miller moths (army cutworms) flooded the Wasatch Front of northern Utah in record high numbers, a large emergence of cicadas wreaked havoc in fruit orchards, and large populations of Ips bark beetles continue to infest and kill landscape conifer trees. The Great Basin and desert landscapes of Utah are well known for their extreme environments and cycles of grasshopper and Mormon cricket outbreaks, but why do these insect outbreaks occur?

There isn't a simple answer, but there are common factors, both environmental and biological, that contribute to higher than normal insect populations. Some of the environmental factors include drought, mild winter temperatures, lack of soil snow cover, and higher than normal heat unit accumulation in the late winter and early spring. Common biological factors that influence insect population cycles include regulation of growth by food availability and quality, and suppression by natural enemies, including predators, parasitoids, and pathogens.

Late winter 2014 brought mild temperatures and rainfall, rather than snow, to the valleys of northern Utah. Southern Utah experienced a low-moisture winter and soils had little snow cover. A significant number of heat units (base 50°F) accumulated in the late winter and early

"Miller moths", or army cutworms, were commonly found in our orchard monitoring traps.

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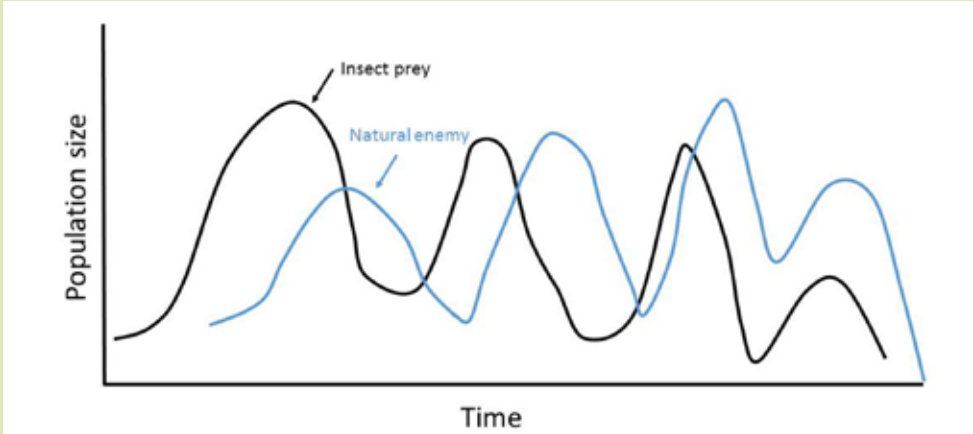
Insect Population Outbreaks, continued from page 1



Most insects have natural population cycles within a growing season in a temperate climate such as Utah. Population density is low early in the season and typically builds in a logistic fashion over the summer as succeeding generations are completed. A high population increase within a year combined with conducive conditions can promote population growth in succeeding years leading to an upwards trajectory in abundance. If optimal environmental and biological conditions are combined with a low abundance of insect natural enemies, the result can be a spike in insect abundance. Abundance of natural enemies tends to lag behind that of their prey. Think of lemming and lynx population cycles. Typically, once natural enemy abundance builds to a high level, it will drive down numbers of its prey, and the insect population may crash.

spring. The mild conditions enhanced survival of overwintering insects such as armyworm and cutworm caterpillars on forage and field crops. Drought conditions can stress plants making them more susceptible to insects. This is the case for Ips bark beetles who can more easily overcome the natural defenses of conifers when tree sap is concentrated and turgor pressure within the cambium is low. Low sap levels are less effective in "pitching out" intruding bark beetles and concentrated nutrient content in sap provides a high quality food source for beetle offspring. Early spring warming and dry soils are optimal for hatch of grasshopper and Mormon cricket eggs in desert soils.

The upswing in abundance of some insect populations this year can be attributed to some or all of these factors. Can we predict when insect populations will peak? Yes, to some extent. If we analyze the key factors and track insect populations over time, we can often make reasonable predictions of insect abundance. However, nature always has the upper hand and can deliver surprises that we didn't anticipate. We can be sure that whatever happens with insect populations, they will always provide an interesting show.

Spruce ips beetle tend to kill trees from the top down, and trees affected by drought are the most susceptible.

- Diane Alston, USU Entomologist

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EXTENSION
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High Schoolers Learn About Biocontrol

Clark Israelson is the Agriculture Extension Agent for USU Extension in Cache County. Much of his work deals with forage crops, small grains and oilseed plants. A native of Cache County, Clark was raised on a diversified family farm. He enjoys being involved with commodity organizations and the Utah Farm Bureau Federation.

Weeds have been a menace since the time humans began cultivating fields and grazing livestock. Traditional methods of weed control include cultural, mechanical, and chemical means. Biological weed control is another method that shows much promise. This self-sustaining, environmentally-friendly method consists of introducing and managing selected natural enemies into invasive weed patches. These host-specific, plant-feeding organisms reduce the competitive advantage of weeds, thus allowing more desirable plant species to thrive. Biological control agents (BCAs) are on duty 24 hours a day, 7 days a week. For weeds growing in less accessible areas, biological control is an effective method for weed control. This long-term, self-perpetuating control method results in a lower cost per acre and allows BCAs to build up and disperse to the limits of the infestation.

Some of the disadvantages of BCAs include the limited availability of agents for some plants, and BCAs are often slower than other methods of weed control. Additional challenges to biocontrol methods have to do with the time required to monitor and evaluate beneficial insect numbers, collection of excess populations, and the redistribution of BCAs to new areas.

USU Extension, County Weed Departments, US Forest Service, BLM, and APHIS have worked cooperatively to establish thriving BCA populations. Our problem, however, has been our inability to properly monitor the effectiveness of BCAs, and then to collect and redistribute them to new areas when needed. It seems we never have sufficient time or manpower.

To remedy this dilemma, Cache County Weed Warriors obtained an IPM/WSARE grant for two years and involved local high school science students in collecting and distributing BCAs. Other participants included representatives from Cache County Weed Department, USU Extension, Amber Mendenhall from APHIS, and Carla Hoopes who was filming a documentary on biocontrol.

To introduce the concept of invasive species, Eric Bingham, Cache County Weed Department, presented a slide show to the students, focusing on the dangers of noxious weeds and the concept of biocontrol. Afterward, the students and other participants headed to Ogden Canyon where we collected 5,000 *Mecinus janthinus* weevils, which are the biocontrol agent for Dalmatian toadflax weed.

High school science students were involved in helping to collect and release *Mecinus janthinus* weevils (inset) as biocontrol agents to manage Dalmatian toadflax.

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Keep Firewood Close to Home!

Now that summer is in full swing, it means more BBQs, more boating, and more camping. This is the perfect time to remind people to keep an eye out for pesky hitchhikers that can catch a ride on our personal belongings and things we carry around with us. For example, by transporting firewood or other wood products from one place to another, you could be spreading destructive plant pests without even knowing it. Movement of pest-infested wood to un-infested areas has been implicated in the spread of several destructive pests, including the emerald ash borer (*Utah Pests News*, Winter 2014) and the velvet longhorned beetle (Utah Dept. of Ag. and Food News Bulletin).

Velvet longhorned beetle has already been found in Utah and is thought to have arrived here via imported wooden pallets or crates. It was first discovered in Salt Lake City in 2010, and has been detected in parks, nurseries, and orchards in both Salt Lake and Utah counties. This pest can attack both healthy and declining trees, and may have a preference for fruit trees (apple, mulberry, and cherry).

Emerald ash borer (EAB) has not been encountered in Utah, but does pose a significant risk of introduction and establishment, especially considering that in September 2013, it was found in Boulder, Colorado. EAB specializes on ash trees, and is considered to be the most destructive forest insect to ever invade the U.S. EAB has killed tens of millions of ash trees in the mid-western and eastern states since being detected in the U.S. in 2002.

Many insects and diseases that threaten natural resources can lie dormant in wood products for long periods of time (1-2 years), and once they emerge from their protected retreats, they begin infesting trees and reproducing to ensure the survival of their species. However, we may not even realize that the pest is present until many years later, when their populations are at higher levels and/or damage is more apparent and widespread. In some cases, infested trees cannot be saved and will eventually die. When we transport wood, we may be contributing to the killing of trees – trees that provide us food (e.g., apples, cherries) or are found in some of our favorite places (e.g., national/regional parks). Trees have important social, health, environmental, and economic benefits, so it is crucial that we do what we can to prevent invasive pests from entering or spreading throughout our state.

A study conducted by Oregon State researchers found that 20 live and invasive insects were found in just 6 bundles

of firewood purchased at grocery stores throughout their state. These firewood bundles originated as far away as New Zealand and Russia.

In June of 2014, we spent an afternoon visiting a few Cache County stores that sell firewood to determine whether our local stores sell out-of-state firewood. Of the 7 different firewood bundles that we examined, only one originated from Utah (Salt Lake City). The remaining bundles originated from California, Oregon, New Mexico, and Canada, and one was of unknown origin. Some of these firewood bundles were labeled as kiln-dried and pest free, but kiln-drying firewood is not considered to be as effective at killing pests as heat treating (see article, "Kiln Dried vs Heat Treated Firewood" for more information).

Firewood that has been packaged and heat treated (i.e., exposed to temperatures of at least 160°F for 75 minutes) is generally considered to be free from pests. Firewood that has been heat treated usually contains a USDA APHIS treatment seal on the package.

HOW CAN YOU HELP?

- Avoid transporting firewood across county lines. A good rule of thumb is to purchase firewood within 50 miles of your campsite.

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IN THE SPOTLIGHT..., continued

Youths and Biocontrol, continued from page 3

The following day, the group traveled to the release site just below first dam in Logan Canyon. Before releasing, we had the students try to find weevils that had survived the winter from release one year earlier. The students were excited to see that the weevils were able to survive at this site. The students then released 2,500 weevils at the Cache County site in Logan Canyon and sent 2,500 with Amber (APHIS) for release at other sites in Salt Lake County and surrounding areas. At the time we did our collection, *M. janthinus* weevils were selling for $1.50 each. As such, our one field day of collection netted $7,500.

We held another field day in late June to collect *Aphthona nigriscutis* flea beetles for control of leafy spurge weeds. We estimate that we collected approximately 5,000 bugs which would be valued at $500. We released them at a site near Cove in northern Cache County. Release survey sheets were completed prior to the release. Leaders also helped students assess the impact of reduced leafy spurge plant populations based on our release from the previous year. We saw significant impact, though more time will be needed to completely control the current infestation of weeds.

The students had enlightening educational experiences learning about biocontrol. They were amazed to see the difference between the collection sites and the release sites. The insects are doing an impressive job in controlling specific weeds at the collection sites. The field days were a success from both a financial and educational perspective.

We think we have made a significant improvement in our success by involving local high school science students who have an interest in plants and insects. Not only have they been helpful here and now, but they will carry the biocontrol concept to the next generation. In many cases, their parents or grandparents are the current landowners in areas where biological control of weeds is a sustainable approach.

CAPS NEWS AND UPDATES..., continued

Keep Firewood Close to Home, continued from previous page

- Call ahead to your camping destination for assistance in tracking down a local firewood dealer and leave unburned firewood behind. Wood that looks healthy may still be harboring tiny insect eggs or fungal spores.
- Keep an eye out for invasive bark- and wood-boring pests (see "Don't Move Firewood's" Gallery of Pests for a list of non-native pests that can spread via firewood or other wood products like pallets and wood chips).
- Tell your family and friends about the dangers associated with moving firewood and other wood products.

Many agencies have initiated campaigns to help raise awareness about the dangers of moving firewood. For example, the "Don't Move Firewood" campaign, which was first launched by the Nature Conservancy in July 2008, has played a major role in slowing the spread of invasive bark- and wood-boring insects. The Nature Conservancy has partnered with dozens of state and federal agencies, including the U.S. Department of Agriculture and the U.S. Forest Service, since their initial inception. For more information about the campaigns against transporting firewood and other wood products, please follow the links below.

- Nature Conservancy: www.dontmovefirewood.org
- USDA APHIS: www.hungrypests.com
- USDA APHIS: stopthebeetle.info

-Lori Spears, USU
CAPS Co-Coordinator

References:

Knight, P. 2011. OSU uses campground firewood as invasive species education tool. Media article available by clicking here.

Oliver, M. 2014. Science Findings 158. Exploring connections between trees and human health. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Available by clicking here.

The Cooperative Agricultural Pest Survey is a federal program, administered jointly by USDA-APHIS-PPQ and each state, whose purpose is early detection of invasive species that could threaten U.S. agriculture. In Utah, the program is co-coordinated by Lori Spears (Utah State University) and Clint Burfitt (Utah Department of Agriculture and Food).

Emerald ash borer (EAB) is an invasive pest that specializes on ash trees, and is considered to be the most destructive forest insect to ever invade the U.S.

Who's in Your Compost?

The Utah Plant Pest Diagnostic Lab received numerous calls this spring concerning white grubs in compost. In general, there can be many beneficial organisms present in compost, including centipedes, flies (maggots), predatory and other mites, rove beetles, ants, springtails, sowbugs, pseudoscorpions, earwigs, nematodes, earthworms and more. One of the largest organisms found in compost, however, is the larval stage of the green fruit beetle (*Cotinis mutabilis*).

The green fruit beetle is a scarab beetle and is related to the May/June beetles. Unlike some of its economically significant relatives, the green fruit beetle is not a major plant pest. However, the adult beetle can cause damage (usually minor) when they eat maturing and ripe thin-skinned soft fruit such as tomato, peach, plum, fig, grape, pear, blackberry, raspberry, apple, nectarine, and apricot. In the compost pile, the green fruit beetle larvae feed on plant detritus and organic material, aiding in the decomposition and composting processes. In this respect, they are beneficial organisms.

Cotinis larvae can be large, up to 1.5-2 inches in length! Larvae are white grubs that have 6 legs and roll into a "C" shape when disturbed. The larvae of green fruit beetle actually crawl on their backs instead of their legs. This behavior can help with field identification. The green fruit beetle overwinters in the larval stage. The adult beetle is a Japanese beetle look-alike, but it is much larger, about 1.25 inches long and metallic green in color. Adults are noisy fliers and are active in July and August.

If green fruit beetle larvae are found in small numbers, their presence can be considered beneficial, and they will not cause damage to garden plants. In large numbers, larvae can be hand-picked or screened out of compost before applying to the garden. The larvae can be added back into the remaining compost pile to aid in decomposition, left to desiccate, or fed to chickens, etc. If compost is heating properly, high temperatures will kill the larvae. Since the larvae are particularly fond of manure, non-composted manure could be removed to prevent populations from building up. Areas with manure present can be flooded for a minimum of 2 days to kill larvae. Frequent turning of compost can also increase larval mortality.

-Ryan Davis, Arthropod Diagnostician

References:

Trautmann, N. 1996. Cornell Composting Science and Engineering: Invertebrates of the compost pile. Cornell Center for the Environment.

Solana Center for Environmental Innovation: Fresh Perspectives. 2013. Rotline: Are the white grubs in my bin safe to put in my garden?

Flint, M.L. 1998. Pests of the Garden and Small Farm, 2nd Edition. Statewide Integrated Pest Management Project, University of California, Division of Agriculture and Natural Resources Publication 3332.

Crahsnaw, W. 2004. Garden Insects of North America. Princeton University Press.

Larvae of the green fruit beetle are large grubs, and crawl on their backs instead of their legs. They help to decompose organic matter, and will not feed on live plants.

The adult green fruit beetle will sometimes feed on the skin of soft fruits such as tomatoes, peach, and plum, but is usually not a pest of concern.

The Curious Case of Parasitoids

Although they differ from predators and parasites, parasitoids are important in pest suppression. Unlike predators, parasitoids do not kill their host immediately and unlike parasites, they eventually kill their host. Parasitoid wasps and flies have been keystone agents in biological control, in part, because of their specialization on certain pest families and species. Their life histories inspire science fiction. They are cryptic insects, but upon close observation, they can be found everywhere. Mass production of parasitoids has expanded their use against several pests.

Many sci-fi movies have utilized (either on purpose or by accident) the intriguing development of parasitoids as a proxy for alien development. Parasitoids lay eggs in or on their host and the parasitoid larva hatches and survives on or within the host. Eventually the host dies when the parasitoid has completed development. The temporary relationship between the parasitoid and its host can be quite dynamic and is geared toward the survival of the parasitoid. In an extreme case, *Glyptapanteles* parasitoid wasp pupae are protected from other predators by the actual host caterpillar from which they fed upon, and can be seen in this YouTube video.

You don't have to look far to find parasitoids. Having a keen eye for a healthy versus parasitized insect is key. Identifying features include parasitoid exit holes or exposed parasitoid larvae and pupae. Aphid populations on many plants can be teeming with aphid parasitoids. Parasitized aphids (also called 'mummies') will have a bulbous appearance, straw-like or sometimes black color, and adult parasitoid exit hole. Of the several parasitoids released against alfalfa weevil in Utah, only one, *Bathyplectes curculionis*, has become well established. The pupal case of the weevil parasitoid is quite distinct with a white stripe (shown at right). One of the more noticeable parasitized hosts is the tomato hornworm that when parasitized by a Braconid wasp, has multiple white pupal cases on its outer body. Wheat growers that have to deal with cereal leaf beetle may be familiar with the resident larval parasitoid, *Tetrastichus julis* or Tj for short, which aids in extensive beetle suppression. It is important to conserve these beneficial parasitoids by avoiding broad-spectrum insecticides whenever possible, and planting nectar-producing plants for the adults.

In smaller settings or enclosed areas such as backyard gardens, greenhouses, or high tunnels, parasitoids may be purchased and released to aid in pest management. Note that each parasitoid is specific to a particular family of insects or to a single species. In addition to their host specificity, the parasitoid also deposits eggs in or on specific life stages (egg, larva, pupa, or adult) of the insect host. So matching up the parasitoid with the proper pest type and life stage is important for their success. *Trichogramma* wasps, for example, primarily attack the egg stage of various insects. Parasitoids are conveniently sold in ready-to-use dispensers such as a shaker bottle or a card that hangs on a plant stem. They are shipped with cool packs and can be immediately applied or briefly stored according to directions.

The ichneumon wasp (***top***) is harmless, although the long ovipositor of the female is intimidating. Their larvae live as parasites inside caterpillars and other larval insects.

Parasitized aphids ("mummies") are easy to identify (***bottom***) in that their bodies are bulbous, they have stopped eating or moving, and if the adult wasp has exited, there will be a hole in the abdomen.

-Ricardo Ramirez, Entomologist

Brown Needles Not Necessarily Due to Insects or Diseases

Frequently, spruce and pine samples are submitted to the Utah Plant Pest Diagnostic lab with a request to determine insect or disease problems. Some of the common symptoms are brown needles, needles with bands, or needle loss. However, these symptoms do not mean that the tree has been affected by an insect or disease. Fungal pathogens, for example, are identified by raised, blister-like fruiting structures on the undersides of the needles. In Utah, ornamental conifers are rarely affected by needle casts, or other foliar diseases. Trees with dying needles usually indicates an abiotic cause such as salt damage, winter injury, root issues, under- or over-watering, or atmospheric injury.

De-icing salt used in the winter causes damage to trees in a few ways. Water containing de-icing salt sprayed onto trees from passing cars results in brown discoloration of the needles. The side of the tree facing the road is usually affected more than the other side. In the spring after snow melts, salt water enters the ground and the sodium ions reduce availability of essential tree nutrients and disrupt water uptake. Chloride ions taken into the roots can cause direct damage to the tree over time when they concentrate in leaves and interfere with energy production. Salt damage can be aggravated by drought. To prevent salt damage, wrap trees next to roads with burlap or create a barrier. Other de-icing agents such as sand, calcium chloride, calcium magnesium acetate, or a salt-free melting agent made from limestone and acetic acid are safer for trees.

Root problems, including girdling roots, root rots, and other issues created by improper planting can prevent the tree from taking up enough water even if adequate irrigation is provided. Typical symptoms of root problems are needle browning and needle drop that is uniform throughout the tree. Container-grown or balled and burlaped trees that are planted without cutting or scoring circling roots will prevent roots from spreading far enough into the surrounding soil to take up water. Over time, the circling roots will girdle the main trunk of the tree and the remaining roots are not able to support the tree with nutrients and water. If trees are planted in high clay-content soils and heavily watered, water can pool in the root zone of newly planted trees and create ideal conditions for infection by collar or root rot pathogens.

Drought stress or overwatering can cause similar symptoms in trees. Make sure to deep-water trees during the summer to a depth of 18-24 inches every other week, or more frequently during very hot and dry periods. Water-related symptoms in pines and firs includes needle tip dieback (similar to winter dessication) and banding (necrotic areas in the middle of the needle). In spruces, foliage will take on a purplish tinge.

Ozone injury to conifers causes small chlorotic spots on needles (***top***). Spruce and pines affected by winter dessication will have needles that are uniformly necrotic (brown) from the top down (***bottom***).

Ozone/sulfur dioxide in large amounts can cause damage to needles. In areas in Utah where air quality can be poor in winter, injury to pine, spruce and fir trees is possible.

-Claudia Nischwitz, Plant Pathologist, and
Ryan Davis, Arthropod Diagnostician

References:

Beckerman and Lerner, 2009. Salt Damage of Landscape Plants. Purdue Extension. ID-412-W

In the National News

BIRD PREDATION DEPENDS ON CATERPILLAR APPEARANCE

Biologists at UC Irvine and Wesleyan University have found that caterpillars that feed only on one or two plant species are less visible to predatory birds than caterpillars that eat from a wide variety of plants. This is due to the fact that some caterpillars have evolved to adopt the coloration of the primary host plant that they consume, while generalist caterpillars may be more brightly colored. This evolutionary trait not only affects the caterpillars but also the plants: species consumed by the generalist caterpillars benefit because many caterpillars are removed by birds. Plants eaten by "specialist" caterpillars don't benefit as much because birds do not target them.

BEE DIVERSITY IMPROVES PROFITS

Researchers from North Carolina State University have found that blueberry fruit size and production increase when flowers are pollinated by more diverse bee species. They identified 5 groups of pollinators within the test fields: honey bees, bumble bees, carpenter bees, and 2 groups of native bees. The economic benefits of pollination by more than one group are huge: for each additional group, the increase in yield was approximately $300 per acre. They believe the benefit comes from the differe nces in behavior between bee groups, especially in relation to the weather. With diverse species being active at different times, it is possible for continuous pollination to occur.

HABITAT FRAGMENTATION LEADS TO DISEASE SUSCEPTIBILITY

A new Finland fungal epidemiology study in *Science* has found that proximity to other meadows increases disease resistance in wild meadow plants. More than 4,000 meadows were surveyed over the last 13 years, looking at the infection rate of powdery mildew in comparison to the surrounding area. The study shows that disease resistance has increased in areas where there is more gene flow between plant populations. This is a strong demonstration that landscape structure determines how seed and pollen travel, shaping the genetic diversity of populations.

MALES WIN IN HOTTER CLIMATES

Scientists out of the University of Montreal have discovered that weather plays a role in the gender of insect offspring. The study looked at a parasitoid wasp, *Trichogramma euproctidis*, whose fertilized eggs produce females and unfertilized eggs produce males. Their research found that when the wasps parasitized prey in hot weather and in sunny areas, more males were produced. When they parasitized prey in cool weather or shady areas, more females were produced. The scientists theorize that with the advance of climate change, there could be an "asynchrony" between parasitoids and their hosts, and therefore an impact on the availability of host eggs and on pest control by their natural enemies.

SPIDER VENOM SAFE FOR BEES

A new insecticide made from the Australian funnel web spider venom and a snowdrop's plant protein has been found to be safe for honey bees yet highly toxic to a number of insect pests. Feeding large doses to honey bees, much higher levels than they would experience in the field, had a very slight effect on the bee survival rate and no effect on learning or memory. Previous studies have also shown that the chemical is safe for mammals, and therefore has potential to be a new biopesticide.

SOCIAL SPIDERS ADOPT ROLES

Researchers investigated the social roles of the comb-footed spider and found that there are two kinds of females in this species: aggressive and docile. Aggressive females tend to attack prey and invaders while docile females don't. Docile females care for offspring three times as much as aggressive spiders. The study found that colonies with a mixture of aggressive and docile females perform better than those with just one or the other. These new findings shed light on how differences in personality can help divide up labor in species.

Useful Publications and Websites

- The Pollinator-Friendly Seed Directory is a comprehensive list of companies that sell organic seeds to the general public.
- Farming with Native Beneficial Insects out of Storey Publishing is a new book that includes insect biology and identification, and shows how to create a farm or garden habitat that will attract beneficial insects.
- The National Pesticide Information Center has released 2 new apps: Pesticide Education and Search Tool (PEST) and Mobile Access to Pesticides and Labels (MAPL).
- Biological Control of Plant-Parasitic Nematodes is newly published book that focuses on integrated soil biology management and ways to increase the activity of natural enemies and use soil biological processes to reduce losses from nematodes.

Featured Picture of the Quarter

The eggs on this raspberry resemble squash bug eggs, but they–and newly hatched nymphs–are leaf footed plant bugs. The name represents the leaf-like appearance of the femoral portion of the adult's legs. The nymphs and adults feed on a wide variety of plants, from foliage to flowers to fruit, by piercing the plant tissue with their proboscis and sucking the juices. Their saliva contains a toxic secretion, and feeding on fruit causes pitting, distortion and discoloration. Like stink bugs, leaf-footed bugs can exude foul-smelling fluids from pores on the sides of their bodies, helping to protect them from predators.

-Image by Marion Murray, IPM Project Leader

Tordon Herbicide: Not For Backyards

Over the past few months, the Utah Plant Pest Diagnostic Lab received a few inquiries of distorted perennials, vegetables, and dying trees, all linked to the use of an herbicide called Tordon. Tordon (picloram; Dow AgroSciences) is used for controlling unwanted weeds and woody plants, and for treating cut stumps in forests and non-cropland areas. It is a "restricted use" product, meaning that it can only be applied by a licenced pesticide applicator. The use of Tordon in backyard settings to kill tree stumps or weeds, even by a licensed applicator, is prohibited by law and could result in civil fines by the Utah Department of Agriculture and Food.

The Tordon label states that trees growing near treated areas can occasionally be affected when their roots come into contact with and absorb herbicide residues from the soil or from roots of nearby treated trees. Therefore, Tordon should never be used near the root zone of desirable trees.
Dr. Ralph Whitesides, Professor and Extension Weed Specialist at Utah State University, says that this statement applies to the treatment of cut stumps as well. Tordon is persistent in the soil for a long time and broadleaf crops can be severely damaged even if the product was applied a year or two prior. Glyphosate, the active ingredient in Roundup and many generic herbicide formulations, should be used instead to kill stumps and to prevent sprouting from roots.

-Claudia Nischwitz, Plant Pathologist

Tomato plant with distorted foliage caused by picloram.

UTAH PESTS people and programs are supported by:

EXTENSION UtahStateUniversity · WPDN Western Plant Diagnostic Network · NPDN National Plant Diagnostic Network · APHIS · NIFA · UDAF Utah Department of Agriculture and Food