

# PERENNIAL AND PROBLEMATIC INSECT PESTS OF TREES AND SHRUBS



**UtahState**University  
COOPERATIVE EXTENSION



Diane Alston, Entomologist  
Utah State University Cooperative Extension

Utah Pest Control and Lawncare Association Annual Conference  
Gail Miller Center, Sandy, UT  
February 2, 2012

# IPM (INTEGRATED PEST MANAGEMENT)

- ⊙ Sustainable
  - ⊙ Economic and Environmental
- ⊙ Integrated Pest Management Strategies
  - ⊙ Cultural (crop management)
  - ⊙ Mechanical
  - ⊙ Biological
  - ⊙ Chemical
- ⊙ Economic/Action Thresholds
  - ⊙ Treat only when needed



# UTAH PESTS ONLINE RESOURCES

UTAHPESTS.USU.EDU

USU Links >> [USU Home](#) [A-Z Index](#) [calendars](#) [MyUSU](#) [directory](#) [contact](#)

**Utah State University**  
COOPERATIVE EXTENSION

**UTAH PESTS**



[UTAH PESTS Home](#) [Utah Plant Pest Diagnostic Lab](#) [Integrated Pest Management](#) [Bees](#) [CAPS](#) [Plant Diseases](#)

Google™ Search

- Home
- Fact Sheets
- Frequently Asked Questions
- Image Galleries
- Slideshows
- Video Fact Sheets
- Utah Pests News
- Quarterly Newsletter
- Contact Us



**Utah Plant Pest Diagnostic Lab**   
Just \$7 gets your pest problem diagnosed or insect identified.

**Integrated Pest Management**   
Your source for fruit, vegetable, and landscape pest problems.

**Bees**   
Honey bees aren't the only bees that pollinate plants in Utah.

**Cooperative Agriculture Pest Survey**   
CAPS protects Utah agriculture through statewide monitoring of invasive pests.

UTAH PESTS' is a group of Extension entomologists and plant pathologists that helps to solve the thousands of plant pest issues that concern Utah citizens every day. The UPPDL identifies, the IPM Program educates, and the CAPS Program investigates. Open one of the websites to get answers!

# FACT SHEETS

## Lilac-Ash Borer

Ryan S. Davis  
Arthropod Diagnostician

Tawn Beddes  
Coeche Co. Horticultural Agent

Jay B. Karren  
Extension Entomology Specialist

### What You Should Know

- Lilac-ash borer (*Podosesia syringae*), a clear-winged moth common in Utah, can be a destructive pest of many species of ash (*Fraxinus* spp.), privet (*Ligustrum* spp.), lilac (*Syringa* spp.), and related species.

- Adults emerge from host trees and lay eggs in the spring; larvae feed on wood within branches, overwinter in the heartwood, and emerge as adults the following spring.

- Diversifying species used in the landscape, maintaining optimum plant health, monitoring, and preventive sprays (if necessary) are the best methods for preventing infestations.

- Only preventive treatments exist. There are no insecticides registered that can eliminate borers once larvae are inside the plant.

### Description, Biology, and Habits

The lilac-ash borer (*Podosesia syringae*), belongs to a group of insects known as the clear-winged moths. The wings of most asid moths in have at least partially transparent wings ( devoid of the colored scales that coat most moth and butterfly wings). Many of them mimic bees or wasps and, unlike most moths, fly during the day.

Adult lilac-ash borers mimic the common paper wasp in color, size, shape, and flight habits (Fig. 1). Both the dark colored forewings and the transparent hind wings are narrow. The slender body is black in color with yellow banding on the abdomen. The wingpan varies from 1 to 1 1/8 inches. Females are somewhat larger than males.

Lilac-ash borers are generally distributed throughout the United States and Canada. They feed primarily in the trunks and larger limbs of lilac, ash, and privet, but occasionally attack related plants in the family Cleaceae. Significant damage in Utah has been reported from ash, primarily in European, blue, and green ash, and lilacs.



Figure 1. Adult lilac-ash borer (*Podosesia syringae*).

Depending on your location in Utah, adults may emerge from infested hosts as early as late March (usually late April) and continue until mid-July (at Females emit a pheromone (chemical communication signal), which attracts males for mating, with 14 days after emergence. Within an hour of mat females are able to lay the tan, elliptical eggs in crevices, and sounds in the bark. Eggs can be singly or in clusters. A single female can lay about eggs; Eggs hatch within 14 days, and the larvae (larvae) bore into the plant (Fig. 2).

Initial feeding occurs just beneath the bark and it feeds into the sapwood. Larvae continue feeding sapwood as summer progresses. Their tunnels (galleries) eventually turn upward and terminate just below the bark surface by the end of the season. Larvae enlarge their galleries as they grow, frequently in foss (sawdust-like excrement) out of the entrance. Completed galleries may be over 12 inches long 1/3 inch wide. Full grown larvae are about 1 inch and white with a brown head. Mature larvae over winter in the heartwood.

In spring, a larva will cut an emergence hole in the bark, leaving a thin flap of tissue over the hole. P (formation of a cocoon) occurs in the burrow. W

## Yellowjackets, hornets and paper wasps

Erin Hoagson  
Extension Entomology Specialist

Alan Roe  
Insect Diagnostician

### What You Should Know

- Yellowjackets, hornets and wasps are closely-related social wasps commonly found in Utah.

- All social wasps are capable of repeatedly stinging without dying if they feel threatened.

- Bees are often blamed for most stings, but about 90% of all stings are likely caused by yellowjackets.

- Most social wasps are predatory of other insects and considered beneficial.

- Although providing natural insect control, social wasps can be considered nuisance pests when near humans.

Social wasps, including yellowjackets, hornets and paper wasps, are common stinging insects in Utah (Figs. 1, 2). The wasps are related to ants and bees, which are also capable of stinging; however, yellowjackets are the most likely to sting. Less than 1% of people are allergic to wasp or bee stings; however, some people are fatally stung every year. Nearly 80% of all serious venom-related deaths occur within one hour of the sting. Most people will only experience a mild local reaction with redness, pain, swelling and itching at the sting site. If symptoms are more serious, a physician should be consulted. Some people may develop venom sensitivity after repeated stinging episodes over a short or long period of time.



Fig. 1. Yellowjacket.



Fig. 2. Bald-faced hornet.

### Social Wasp General Description

- Have three well-separated body regions, a distinct waist and two pairs of clear wings.

- Care for their young and develop a caste system with different forms living together.

- Regenerate a new nest every year because only the queen overwinters; honey bee colonies overwinter together every year.

- Create their nests out of wood and saliva paste.

- Capture prey with their legs and jaws and use stinging for defensive purposes only; this is different than solitary wasps that subdue prey with stinging (e.g., spider wasp).

- Go through complete metamorphosis (i.e., egg, larva, pupa, adult); adults and larvae have chewing mouthparts, and larvae are legless.

- Capable of multiple stings because they have "smooth" stingers; bees have barbed stingers (Fig. 3)



Fig. 3. Honey bee (left) and wasp (right) stingers.

## White grubs

Erin Hoagson  
Extension Entomology Specialist

### What You Should Know

- White grubs are the larval stage of scarab beetles.
- Several different kinds of white grubs are found in Utah.
- White grubs prefer to feed on turfgrass roots.
- Healthy turfgrass can mask white grub feeding.

### Damage Symptoms

White grubs chew off the turfgrass roots near the soil surface or just below the thatch layer. Early signs of white grub damage include grass wilting or yellowing; however, the initial feeding injury often goes unnoticed until brown patches of turf start to develop. White grub feeding damage can be most apparent in the late summer when grubs are nearly fully developed. Small patches of dying turf can quickly join together if grub density is extremely high.

Grub-damaged turfgrass becomes loosely attached to the soil as the roots are consumed. Heavily damaged turfgrass can feel spongy and easily pull away from the soil surface. Drought conditions can make turfgrass injury appear worse.

### Description

Adult scarab beetles are identified by size and color pattern. Adults range in size from 2/16 - 1" and can be tan, brown or black (Fig. 1). Scarab beetles are stout, oval-shaped, and have clubbed antennae. Adults have a pair of hardened forewings called elytra and a pair of membranous hindwings for flight. The first pair of legs are modified to help burrow in the soil to lay eggs. Some adults are nocturnal and are only active at night.

Many of the white grub species established in Utah look similar to each other but vary in size. Mature grubs range in size from 3/8 - 2". In general, grubs are C-shaped and have three pairs of thoracic legs (Fig. 2). The head capsule is dark, but the body is usually creamy white in color. While grub species identification is often not necessary because the cultural control practices are similar. The arrangement of hairs and spines on the posterior end of the grub, called the raster, is a distinguishing feature between species (Fig. 3).



Fig. 1. White grubs are actually scarab beetles. Common scarab beetle adults are shown here (NOT TO SCALE).



Fig. 2. Common white grub body characters!

# PEST ADVISORY (INTEGRATED PEST MANAGEMENT)

[utahpests.usu.edu/ipm](http://utahpests.usu.edu/ipm)

Free subscription  
Timely info on pest  
activity

- insects
- mites
- diseases
- nutrient deficiencies
- environmental stress

Lots of images!  
IPM recommendations  
Effective pesticides

The screenshot shows the Utah State University Cooperative Extension website. The header includes navigation links like 'USU Links >> USU Home A-Z Index calendars MyUSU directory contact' and the 'UTAH PESTS Integrated Pest Management' logo. A main navigation bar lists 'UTAH PESTS Home', 'Integrated Pest Management', 'Plant Diseases', 'Bees', 'Utah Plant Pest Diagnostic Lab', and 'CAPS'. The main content area is titled 'Pest Advisories' and includes a search bar and a list of advisory categories: Fruit IPM, Vegetable IPM, Landscape IPM, Pest Advisories (with sub-links for Tree Fruit, Landscape, Small Fruit, and Turf), Fact Sheets, Image Galleries, Slideshows, Utah IPM & SA Mini-Grant Program, Pesticide Information, Weather Info, Resources and Links, and Contact Us. A central article titled 'Ornamental Horticulture IPM' lists 'Landscape IPM Advisory', 'Tree Fruit IPM' (with sub-links for Tree Fruit, Plum Curculio Quarantine, and Insect Pest Biofixes), 'Small Fruit and Vegetable IPM' (with sub-link for Small Fruit and Vegetable IPM Advisory), and 'Turf IPM' (with sub-link for Turf IPM Advisory). A sidebar on the right features a 'Subscribe to IPM Pest advisories HERE' button with a ladybug image and a tweet from 'what am I doing...' about Greater peachtree borers.

# PEST DIAGNOSTICS

USU Links >> USU Home A-Z Index calendars MyUSU directory contact

**UtahStateUniversity**  
COOPERATIVE EXTENSION

**UTAH PESTS**  
Utah Plant Pest Diagnostic Lab



UTAH PESTS Home Integrated Pest Management Plant Diseases Bees Utah Plant Pest Diagnostic Lab CAPS

Google™ Search

Home  
Fact Sheets  
Frequently Asked Questions  
Image Galleries  
\$7.00 Diagnosis  
Recent Pests  
Alfalfa Hay Testing  
Contact Us

Current Pest Issues  
Top 20 Insects  
Top 20 Arachnids  
Bed Bug Travel Tips

**Utah's Top 20 Arachnids**



1 2

**Submit a Sample**



**Fact Sheets**



1

**Events**

Jul 13, 2011  
**VIVA Vegetables:  
Green Beans**

Jul 16, 2011  
**Schooling Horse  
Show sponsored by  
Morgan Horse Club**

More Events...

Utah State University is an affirmative action/equal opportunity institution. © 2011 Utah State University Utah Plant Pest Diagnostic Lab

[ext home](#) • [site map](#) • [ext directory](#)

Utah Plant Pest Diagnostic Lab  
[utahpests.usu.edu/uppd/](http://utahpests.usu.edu/uppd/)

# ARTHROPOD PLANT FEEDING GROUPS

Defoliators, Fruit Tunnels  
(chew)



Stippling, Distortion  
(suck sap)

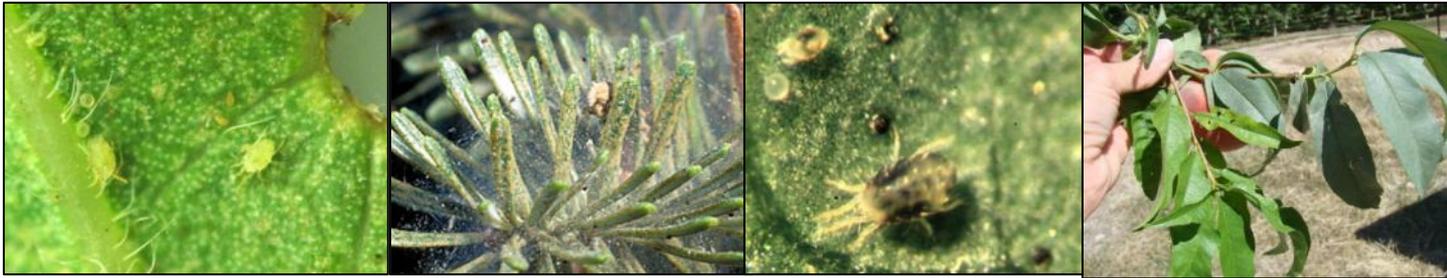


Borers (chew into trunks & stems)



# ARTHROPOD GROUPS

## Mites (stippling, bronzing, webbing)



## Nuisance & Stinging Insects



# INSECTICIDE CLASSES

IRAC - [WWW.IRAC-ONLINE.ORG](http://WWW.IRAC-ONLINE.ORG)

- ◎ Mode-of-Action
  - Site of action within the insect
  - Similar chemistry within a class
  - Understand efficacy of chemicals; which insects will be susceptible; characteristics, such as residual, application method
- ◎ Goals: To select most effective chemistries for a pest & prevent development of resistance

# GARDEN & LANDSCAPE INSECTICIDES

Class	Examples	MOA	Pest spectrum	Residual	Signal word
Carbamate (1A)	carbaryl	Nerve (AChE)	C,B, G, RM	Week (s)	Caution to Danger
Organophosphate (1B)	acephate malathion diazinon	Nerve (AChE)	C,S,B	Week (s)	Caution to Danger
Pyrethroid & Pyrethrin (3A)	bifenthrin cyfluthrin esfenvalerate permethrin	Nerve (Na channel)	C,S,B,N/St	Day (s) - Week	Caution to Warning Toxic to beneficials
Neonicotinoid (4A)	acetamiprid dinotefuran imidacloprid	Nerve (Nic ACh)	C,S,B	Weeks – Months Systemic	Warning Toxic to bees in pollen/nectar
Spinosyn (5)	spinosad spinetoram	Nerve (Nic ACh)	C,T,P,E	Days – Week (s)	Caution

Pest spectrum:

**C**hewing, **S**ucking, **B**orers, **N**uisance/**S**tinging, **G**rasshoppers, **R**ust **M**ites, **T**hrips, **P**sylla, **E**arwigs

# Garden & Landscape Insecticides

Class	Examples	MOA	Pest spectrum	Residual	Signal word
IGR (JH – 7, Chitin - 16)	pyriproxyfen buprofezin	Insect growth	S,A	Weeks	Caution
Mite growth inhibitor (10)	clofentezine hexythiazox etoxazole	Mite growth	SM	Weeks	Caution
Bacillus thuringiensis (11)	Bt kurstaki Bt israelensis Bt tenebrionis	Microbial - insect midgut	caterpillars mosquitos beetles	Days	Caution
Diamide (28)	chlorantraniliprole	Nerve & muscle (Ryano)	C,B	Weeks – Months Systemic	None Commercial only

Pest spectrum:

**Chewing, Sucking, Borers, Nuisance/Stinging, Grasshoppers, Rust Mites, Thrips, Psylla, Earwigs, Ants, Spider Mites**

# HOMEOWNER & COMMERCIAL APPLICATIONS

- ⊙ Make sure that plant site is on the product label
  - ⊙ e.g., bifenthrin is registered on pear, caneberry & citrus, but not other fruits
- ⊙ Check the restricted entry interval & pre-harvest interval (REI & PHI)
- ⊙ Check the rate range & maximum allowed for the season

# IDENTIFICATION & CONTROL OF COMMON LANDSCAPE PESTS: WOODY ORNAMENTALS

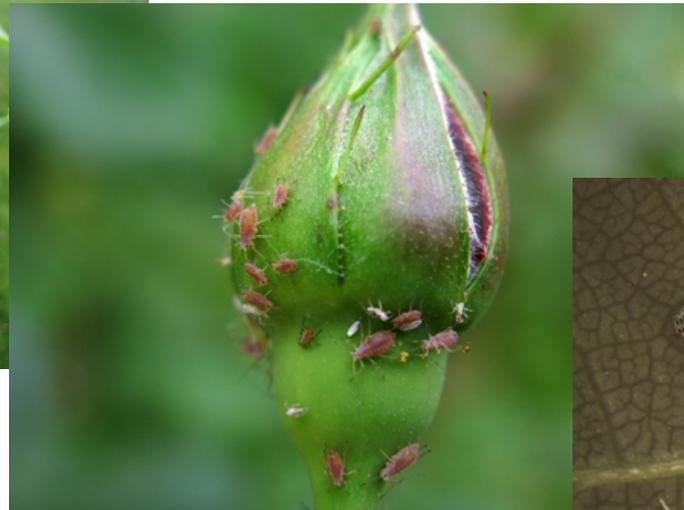


# APHIDS



Woolly ash aphid

Symptoms:  
Curled leaves & shoots  
Sticky honeydew  
Black sooty mold



Rose aphid



Linden aphid

Small, soft-bodied  
Live in groups (colonies)  
Winged & non-winged  
“Tail pipes” (cornicles)

# APHID NATURAL CONTROL



Convergent  
Lady Beetle



Hover Fly



Green Lacewing



UF/Castner



# APHID MECHANICAL CONTROL

Stiff spray of water every 2-3 days  
until aphid numbers decline

Best if initiated before leaves are  
tightly curled



# APHID INSECTICIDES

- ⊙ Horticultural Oil (1%) (many brands)
- ⊙ Insecticidal Soap (many brands)
- ⊙ Imidacloprid (Merit, Bayer Advanced, generics)
  - ⊙ Systemic
- ⊙ Flonicamid (Aria)
  - ⊙ Antifeedant, Systemic
- ⊙ Pymetrozine (Endeavor)
  - ⊙ Antifeedant
- ⊙ Malathion

# SCALE INSECTS



European  
Elm  
Scale

Soft Scales



Lecanium  
Scale



Oystershell  
Scale

Armored Scales



Black  
Pineleaf  
Scale

# SCALE INFESTATION SYMPTOMS



Twigs & limbs encrusted in scale insect bodies

Chlorotic leaves

Necrotic spots on leaves & fruit



Limb dieback when scales are abundant

Soft Scales: honeydew (because feeding in tree phloem)

# SCALE MECHANICAL CONTROL

- ◎ Prune out infested limbs
- ◎ Place sticky bands to trap the young “crawler” stage
- ◎ Primarily a monitoring tool



Tangletrap & duct tape  
sticky band



Black pineleaf scale crawlers



San Jose scale crawlers

# SCALE INSECTICIDES

- ◎ Dormant Oil Spray (2-4%)
  - ◎ Spring – at bud break – smothers overwintering scales
- ◎ Systemic soil drench or injection
  - ◎ Spring (May)
    - Soft Scales – imidacloprid (Merit, Bayer Advanced, others)
    - Armored Scales – dinotefuran (Safari)
- ◎ Target Crawlers
  - ◎ June to July (varies with species; sticky bands to monitor)
    - Horticultural oil, insecticidal soap, Safari, pyriproxyfen (Distance), buprofezin (Talus), azadirachtin (Azatin, Neem oil), synthetic pyrethroids (Tempo, Talstar, others), malathion

# PLANT BUGS



Sycamore Plant Bug

Symptoms:  
White & chlorotic stippling on leaves  
Leaf distortion  
Leaf holes  
Leaf drop



Honeylocust Plant Bug

# PLANT BUG MONITORING

Beating tray:

Shake limbs over a white or light-colored tray

Look for young plant bugs crawling on the tray

- green and brown
- narrow bodies
- long antennae
- can crawl quickly



# PLANT BUG INSECTICIDES

- ⊙ Target young (nymphs) – begin monitoring soon after new leaf growth begins
- ⊙ Insecticidal Soap
- ⊙ Horticultural Oil (1%)
- ⊙ Imidacloprid (Admire, Merit, Bayer Advanced, others)
- ⊙ Bifenthrin (Talstar, Tundra, others)
- ⊙ Permethrin (Aloft, Brigade, Pounce, others)
- ⊙ Carbaryl (Sevin)
- ⊙ Malathion

# DEFOLIATING INSECTS

Cankerworms



Tent  
Caterpillars  
and  
Fall  
Webworm



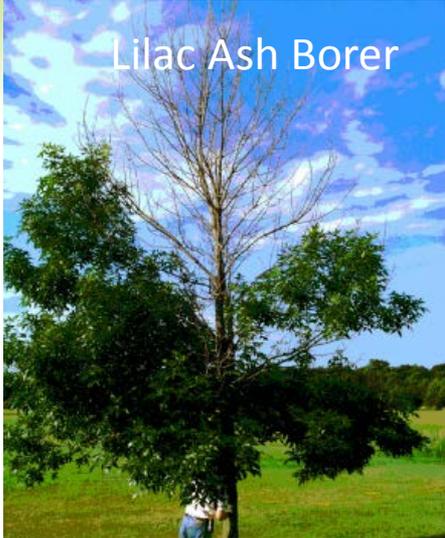
Elm Leaf Beetle

# DEFOLIATOR INSECTICIDES

- ◎ Bt (Dipel, Thuricide, others)
  - ◎ For caterpillars (moths) only
- ◎ Spinosad (Conserve, Success, Natural Guard, others)
- ◎ Imidacloprid (Merit, Admire, Bayer Advanced, others)
- ◎ Dinotefuran (Safari)
- ◎ Acetamiprid (Assail, Ortho Max)
- ◎ Diamide (Acelypryn)

# TREE BORERS

Lilac Ash Borer



Bronze Birch Borer



Peachtree Borer



Aspen Borer



Locust Borer



UGA2107046

© 2013

# BORER INSECTICIDES

- ◎ Systemic trunk injections or soil drenches/injections
  - ◎ Merit, Admire, Safari, Acelypryn
    - Spring (May) – major flush of foliar growth
- ◎ Protective trunk sprays
  - ◎ Sevin, Permethrin, Bifenthrin, others
    - Timed with when adults are active; varies with borer species

# SPIDER MITES



Honeylocust  
Spider Mite



Spruce  
Spider Mite



Two Spotted Spider Mite



Symptoms:  
White & chlorotic stippling  
Webbing

# MITE MECHANICAL CONTROL

Stiff spray of water every 2-3 days  
until mite numbers decline

Initiate as soon as you notice stippling

Monitor:

White beating tray

- look for tiny mites crawling on the tray
- leaves tend to look “dirty”



# MITICIDES

- ③ Horticultural Oil (1%)
- ③ Insecticidal Soap
- ③ Etoxazole (Tetrasan) – mite growth inhibitor
- ③ Pyridazinone (Akari, Nexter, others) – reduces mite respiration
- ③ Acequinocyl (Kanemite, Shuttle, others) – reduces mite respiration
- ③ Bifenazate (Floramite, Acramite) – unknown MOA

# PEST PAPER WASPS

- ⊙ Scavengers (eat live & dead insects) & sugar (fruit) eaters
- ⊙ Social wasps - sting humans – nuisance pest
- ⊙ European Paper Wasp (Invasive)
  - ⊙ Upside down umbrella-shaped “paper” nests
  - ⊙ More black than yellow color; narrow waist
- ⊙ German Yellow Jacket (Invasive)
  - ⊙ Nest in ground
  - ⊙ Dominance of yellow color on black background = “yellow jacket”



# PAPER WASP NESTS



European paper wasp:  
Thin waist, more black than yellow,  
Upside down umbrella-shaped nests



German yellow jacket:  
“Chunky” body, more yellow  
than black  
Paper nests in ground &  
under dense vegetation  
More likely to sting/defend nest  
than other paper wasps

# WASP TRAPS

- ◎ Place around perimeter of fields, gardens, and yards and in spots slightly away from high human activity
- ◎ Yellow jacket – predator/scavenger
  - ◎ Commercial traps with heptyl butyrate bait
  - ◎ Homemade trap with raw meat
  - ◎ Locate ground nests in area - treat with insecticides & remove
- ◎ European paper wasp – fruit-eater
  - ◎ Homemade trap - liter plastic bottle with diluted fruit juice (1 part juice: 10 parts water) – ferment juice (1/4 tsp yeast) + 1/4 tsp liquid dish detergent
  - ◎ Treat & remove nests



# LOOK FOR THIS SLIDESHOW AND OTHERS AT UTAHPESTS.USU.EDU

USU Links >> USU Home A-Z Index calendars MyUSU directory contact

**UtahStateUniversity**  
COOPERATIVE EXTENSION

**UTAH PESTS**

UTAH PESTS Home Utah Plant Pest Diagnostic Lab Integrated Pest Management Bees CAPS Plant Diseases

Google™ Search

- Home
- Fact Sheets
- Frequently Asked Questions
- Image Galleries
- Slideshows
- Video Fact Sheets
- Utah Pests News
- Quarterly Newsletter
- Contact Us



UTAH PESTS' is a group of Extension entomologists and plant pathologists that helps to solve the thousands of plant pest issues that concern Utah citizens every day. The UPPDL identifies, the IPM Program educates, and the CAPS Program investigates. Open of the websites to get answers!

**Utah Plant Pest Diagnostic Lab**  
Just \$7 gets your pest problem diagnosed or insect identified.

**Integrated Pest Management**  
Your source for fruit, vegetable, and landscape pest problems.

**Bees**  
Honeybees aren't the only bees that pollinate plants in Utah.

**Cooperative Agriculture Pest Survey**  
CAPS protects Utah agriculture through statewide monitoring of invasive pests.

Over 100  
slideshows posted