

Management of Lawn and Tree Insect Pests



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Topics

- Insect Diagnostics - recognizing common insects & plant injury
- **New** Pest - Japanese beetle
 - Turf and ornamental pest
- **New** Mealybug pest of shadetrees
- *Ips* and Banded elm bark beetles
- Lilac root weevil
- European earwig
- *Utah Pests* on-line information



Insect Diagnosis



Insect is present



Injury is present



What type of injury?

Friend or foe?

Which life stage is present?



Insect Feeding Types

Chewing



Piercing-Sucking



Borers



Gall Formers



Diagnosis



Scouting for Pests

- Look at the big picture
 - Pattern of plant decline/injury
 - Pest injury tends to be aggregated
 - Can injury be associated with irrigation or other pattern?
- Look at new growth
- Check for root/crown problems
- Hand lens for small insects and mites
- Scout every 1-2 weeks



Raspberry
horntail
injury to cane tips

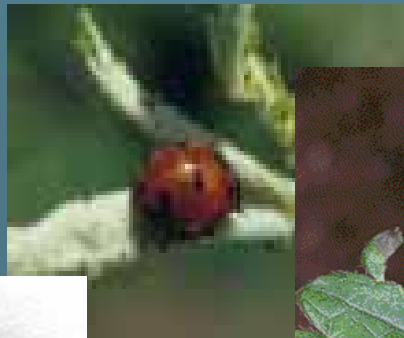


UC Statewide IPM Project
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Recognizing Common Insects

Beetles

Hard wing covering
Most diverse group: > 250,000 spp.
Chewing mouthparts



Larvae - grub-like
Chewing mouthparts



UGA1306041

Beetle Injury



Leaves: holes, skeletonizing, notching



Trunks:
tunnels,
girdling

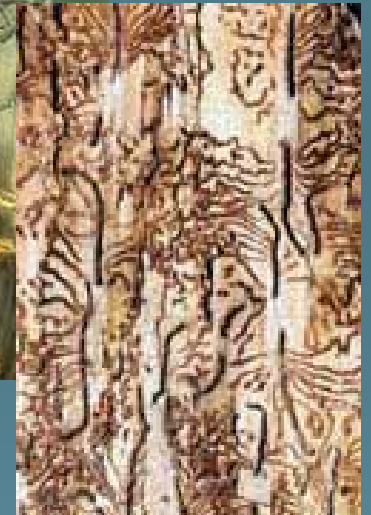


Photo Courtesy: Shawn Steffan,
Utah State University Extension

Roots/Crowns:
tunnels, chew off fine
roots



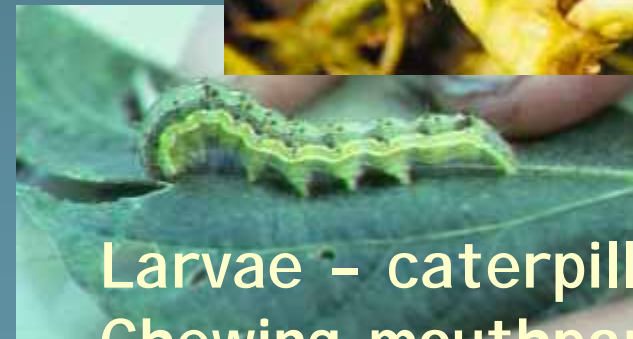
Recognizing Common Insects

Moths

Colored scales on wings
Adults feed on nectar
Good flyers
Most are active at night



...worm, *Helicoverpa zea*, adult moth.



Larvae – caterpillars
Chewing mouthparts

Caterpillar Injury



Tunnels in limbs and trunks



Holes chewed in leaves



Tunnels and holes in fruits



Recognizing Common Insects

Hemiptera - True Bugs

Half wing: front is leathery, back is membranous
Inverted triangle on back
Piercing sucking mouthparts



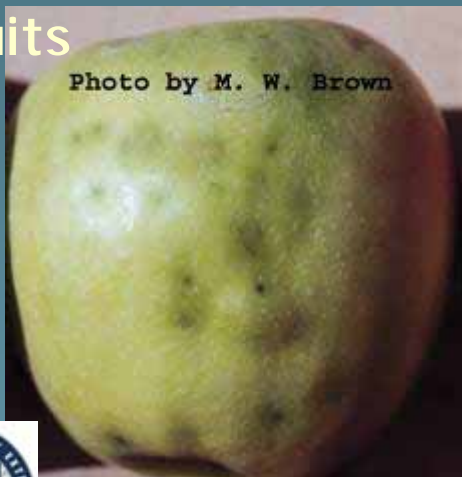
Nymphs - mini adults
without wings



True Bug Injury



Pitting and bumps:
Cells killed in older
fruits



Cat facing:
Cells killed in young
fruit



Squash bug injury

Toxin injected:
Plant stunting and
death



Recognizing Common Insects

Homoptera: Aphid, Scale, Whitefly, Mealybug, Leafhopper

Small

Soft bodied

Wax or covering

Many produce honeydew

Piercing sucking mouthparts



Many feed in phloem
Nymphs



Aphid, Scale, Whitefly, and Mealybug, Leafhopper Injury

Leaf curling



324-23

Limb dieback



Photo 4

Leafhopper burn:
Speckling



Honeydew



Leaf spots
from dead
cells



New Pest to Utah: Japanese Beetle

Popillia japonica
Scarab Beetle



Mating pair of adults

First found in
U.S. in 1916

Orem, Utah:
July 2006
>600 adults



Trap:
Sex pheromone/
Floral lure

Adult feeding injury
to Virginia Creeper



Japanese Beetle

Primarily a turf pest –
Larvae or grubs feed
on grass roots



Adults have a broad
host range –
Skeletonize leaves –
rose, fruit trees,
shade trees, grape, etc.



Injury to rose



Injury to crabapple



Japanese Beetle Management

- Eradication is extremely difficult
- Don't panic - it's unlikely to have a large impact
- Keep plants healthy
- Plant non-attractive plants (lilac, forsythia, dogwood, magnolia, American holly)
- If detected in turf, control larvae with insecticides (imidacloprid, carbaryl, permethrin)
- Traps can provide some adult suppression (75% catch; but can attract them into an area)
- Contact local office of Utah Dept. of Agriculture and Food





Japanese Beetle Fact Sheet

on USU Extension Web Site

UtahState UNIVERSITY **Utah Pest Factsheet**
Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-100-06PR August 2006

Japanese Beetle

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What You Should Know

- Japanese beetle was initially detected in Orem, Utah, in July 2004.
- Adults have a broad host range (over 300 plant species) and can cause significant damage.
- Grubs prefer to feed on turfgrass roots and spend about 10 months of the year under the soil surface.
- Homeowners can successfully manage Japanese beetle with proactive cultural practices, biological control and reduced risk insecticides.

The Japanese beetle, *Papilio japonica* Newman, can be a highly destructive pest to ornamentals, trees, shrubs, turfgrass, and vegetables. First discovered in the eastern United States in 1916, the Japanese beetle has threatened agriculture and horticulture by slowly moving south and west. In 2004, a small population of adult Japanese beetles was detected in Orem, Utah. The invasive pest is especially harmful because the adults and immatures (i.e., grubs) feed on plants and can cause significant damage when in high numbers. Together, the adults and grubs feed on more than several hundred plant species; some of the most susceptible plants are grown in Utah. Adult beetles feed on the upper leaf surface, removing leaf tissue and releasing a strong aggregation pheromone that attracts additional beetles to a potential food source (Fig. 1).

Damage Symptoms

Feeding damage by Japanese beetle adults is commonly seen as holes or skeletonized leaves (Fig. 1). Adults are highly attracted to rose, apple, stonefruits (peach, plum, cherry), basswood/linde, willow, elm, grape, birch, Japanese and Norway maples, pin oak, horse chestnut, and sycamore.

Without actively looking for grubs under the soil surface, grubs often go unnoticed until September, when large patches of turf are destroyed. Evidence of grub damage begins as localized discolored patches, but patches can enlarge and coalesce in just a few weeks. Heavily damaged turfgrass can feel spongy and be easily pulled away from the soil surface. Drought conditions can make turfgrass injury worse.

Description

Adults are oval, metallic green with bronze-colored wings, and are about 1/2" long (Fig. 2). Males are slightly smaller than females. Adults have six white tufts of hair along each side of the body (Fig. 2). Grubs are creamy white, C-shaped, and 1" long when fully grown (Fig. 2). Adults are found clustered together on plants and grubs can be dumped under the soil of turfgrass.

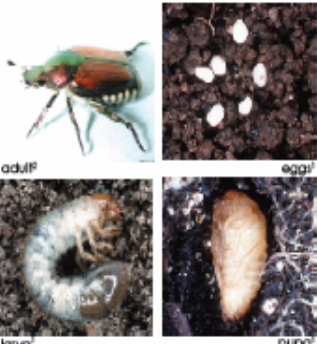



Fig. 1. Adult Japanese beetles feeding²

Fig. 2. Japanese beetle life stages

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"New" Mealybug to Utah



Honeylocust
Redbud



Davis and Utah Counties



Photos by JayDee Gunnell, USU Extension

Management of “New” Shadetree Mealybug

- Delayed dormant oil + insecticide
 - Delay until bud break
 - Suffocate over wintering stages
- Horticultural mineral oil
- Imidacloprid (Merit)
- Synthetic Pyrethroids (permethrin, bifenthrin, cyfluthrin, lambda-cyhalothrin)



Bark Beetles (Scolytidae)



Drought related

Spruce
Pine
Fir
Prunus
Elm

Attack old or stressed trees
& seemingly healthy trees



Ips Bark Beetles

- *Ips pilifrons* - spruce
- *Ips pini* - pine
- *Ips confusus* - pinyon pine
- *Ips paraconfusus* - pine, spruce



1/8-3/8" long
Spines on rear



Ips Facts



- Adults colonize & reproduce in conductive (cambial) tissues
- Construct tunnels (galleries) to lay eggs & feed
- 6-8 wk life cycle; up to 5 generations per year
- Attack trees under stress
- Attack smaller diameter limbs at tops of trees first



Trees at Risk for *Ips* Attack

- Stressed trees:
 - Drought-stressed, trees in dry sites
 - Newly transplanted
 - Root injuries from construction or other
 - Crowded trees
- Trees surrounded by breeding populations of *Ips*
 - Slash (piles of prunings)
 - Stacks of green or infested wood
 - Freshly cut wood is a preferred breeding site



Management of *Ips* in the Landscape

- Maintain tree vigor, avoid stress (proper watering, planting site, avoid injuries)
 - 2-4" water every 2-6 weeks
 - Avoid planting in very dry sites
- Remove & dispose of infested material
 - Dispose 2-3 miles away from hosts
- Remove and treat infested material
 - Chip and spread to dry
 - Burn
 - Remove all bark
 - Cover logs with ≥ 10 ml clear plastic & heat to lethal temperatures



Management of *Ips* in the Landscape

- Apply preventive insecticide or apply to “lightly” infested trees:
 - Carbaryl (Sevin): flowable, 2% ai solution
 - Permethrin (Astro, Dragnet)
 - Treat in spring before beetle flight (April) or treat in fall (late Sep to Oct)
 - 12-18 months protection (carbaryl)
 - High-pressure sprayer (≥ 250 psi) for large trees
 - Apply to entire bole & larger limbs



Banded Elm Bark Beetle



Scolytus schevyrewi



Elm
Prunus
Willow
Russian Olive

Attacking American elm trees
May vector the Dutch Elm Disease fungus



Lilac Root Weevil



UGA1455077

Drought related
Observed heavy injury
to shrubs & small trees



UGA1455074



Lilac Root Weevil

Otiorhynchus meridionalis

- Common hosts: lilac, peony, dogwood, yew, privet, cotoneaster, arbovitae, spruce, others
- Adults chew irregular notches in leaf edges – target with foliar insecticide (Orthene, Merit, Sevin, Azadirachtin, Pyrethroids) – in late spring with first leaf notching
- Larvae feed on roots – target with soil insecticide (Merit), insect-attacking nematodes, *Beauveria* fungus – late spring or early fall



Adult & leaf notching



Needle notching on spruce



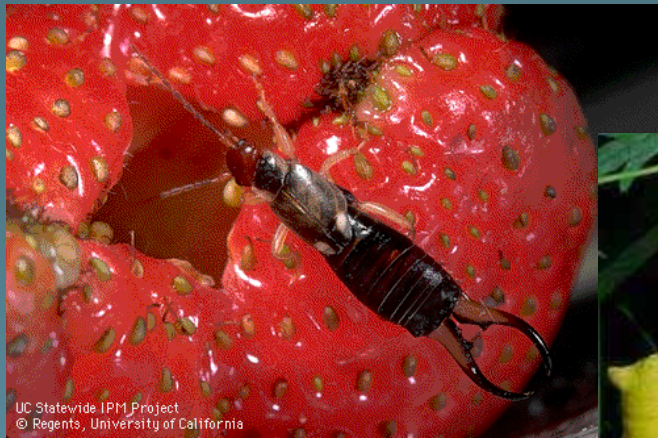
Larvae feeding on crown & roots



European Earwig

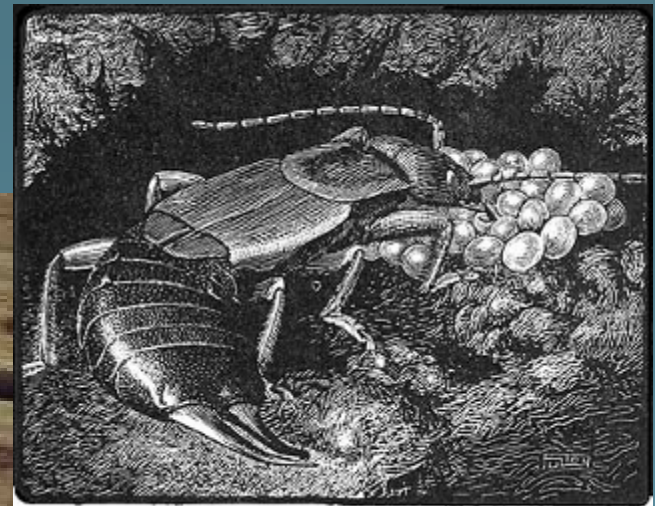
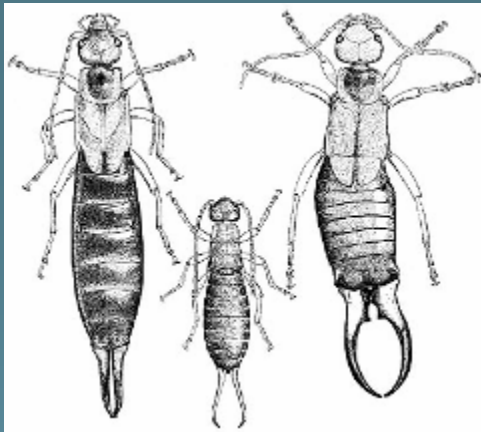


- Primarily feed on decaying organic matter (saprophytic)
- Feed on young, tender plants; chew holes in flower petals, fruits; nuisance pest
- Adults are also predators; nocturnal



European Earwig

- Cultural & mechanical controls: avoid overuse of mulch and damp debris where they hide during the day; place and remove rolled newspaper; attractant traps: tuna can with bacon grease
- Chemicals: permethrin; target young in nests
- Tanglefoot on base of trunks, stems



Female earwig in winter quarters with eggs.

Tuna can trap with
bacon grease



Utah Pests Web Page

<http://utahpests.usu.edu>

The screenshot shows the Utah Pests website in a Mozilla Firefox browser window. The browser's address bar displays <http://utahpests.usu.edu/>. The website features a navigation menu with links for [ext home](#), [site map](#), and [ext directory](#). A search bar is located in the top right corner. The main content area includes a large image of a bee on a white flower, with the text "EXTENSION Utah State UNIVERSITY" overlaid. Below this, a "UTAH PESTS" section provides an overview of the site's purpose. A sidebar on the left contains a "WEBSITES" section with links to various resources. The browser's taskbar at the bottom shows several open applications, including an email client and a file explorer.

Utah Pests - utahpests.usu.edu - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://utahpests.usu.edu/

Customize Links Free Hotmail Windows Marketplace Windows Media Windows

Bookmarks

Search:

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USU Biology

Biology Art

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From Internet Explorer

Utah State University

USU Ext Insects and Plant Dis...

Utah State University Extension

USU Biology

Google

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ESA

PBESA

Utah Agricultural Experiment St...

Utah Department of Agricultur...

Utah State Horticultural Assoc.

Agrichemical and Environmenka...

Agricultural Research magazine

BeeLab

CSREES of USDA

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USU LINKS: [USU home](#) [A-Z index](#) [directories](#) [calendar](#) [libraries](#) [access](#) [webmail](#)

ext home site map ext directory

search GO Extension Sites A-Z

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UTAH PESTS

Utah Pests

Utah's diverse landscape supports thousands of insects and plant pathogens. **UTAH PESTS** is your portal for learning more about pests and their beneficial counterparts around the state, and how Utah Extension personnel are working to provide a greater understanding of these organisms in our world. Click on one of the links below to get started!

WEBSITES

[utah pests homepage](#)

[integrated pest management](#)

[plant diseases](#)

[insects and their relatives](#)

[utah plant pest diagnostic lab](#)

Integrated Pest Management

Plant Diseases

Insects and Their Relatives

Utah Plant Pest Diagnostic Lab

100 YEARS 1907 - 2007

Inbox - Microsoft Ou... Abston UCFC ISA PAT... Abston Utah Pest Con... Abston Adv IMG Cash... Utah Pests - Utahpes... Earwig

2:30 PM

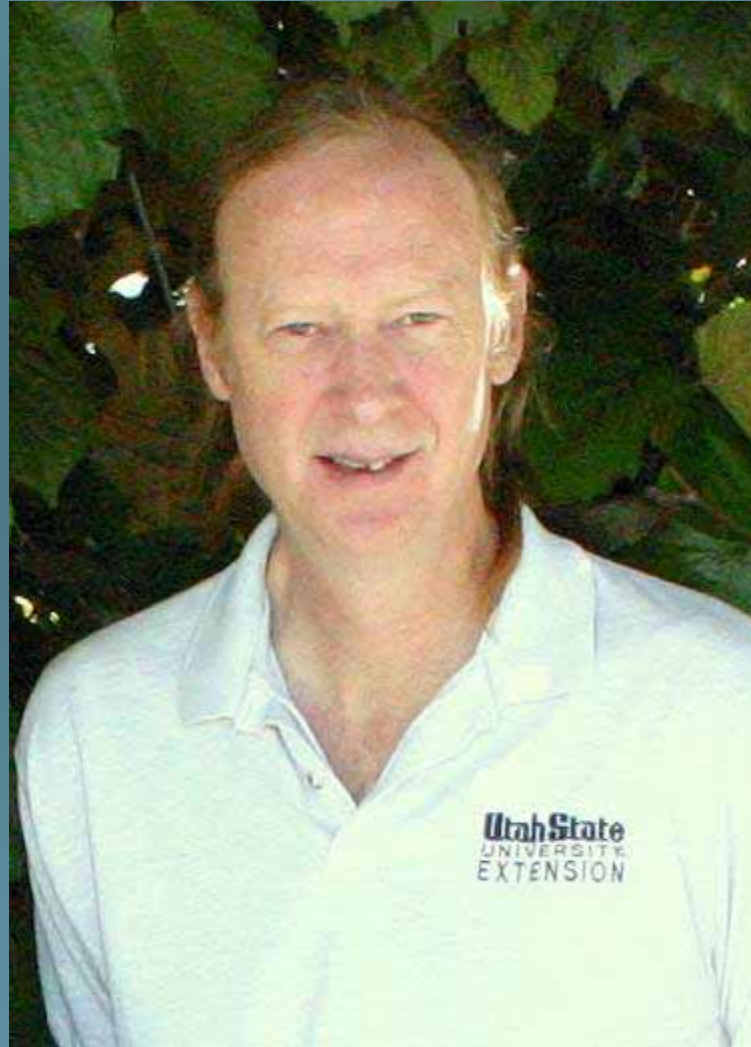
Utah IPM Web Page

<http://utahpests.usu.edu/ipm>

The screenshot shows a Mozilla Firefox browser window displaying the Utah IPM web page. The browser's address bar shows the URL <http://utahpests.usu.edu/ipm/>. The page content includes a navigation menu with links for 'ext home', 'site map', and 'ext directory'. A search bar is located at the top right. The main content area features a large image of a white grub in soil, with the text 'EXTENSION Utah State UNIVERSITY' overlaid. Below the image, the heading 'INTEGRATED PEST MANAGEMENT' is followed by a sub-heading 'Integrated Pest Management' and a paragraph: 'This is the Place... for information to help solve your Utah pest management problems.' To the right, a 'COUNTY OFFICES' section lists links for 'boxelder county', 'juab county', 'salt lake county', 'tooele county', 'washington county', 'weber county', and 'county directory'. A vertical sidebar on the left contains a list of links including 'home', 'fact sheets', 'frequently asked questions', 'photo gallery', 'pest advisories', 'publications & slideshows', 'ipm mini-grant program', 'resources and links', and 'contact us'. At the bottom of the sidebar is a 'WEBSITES' section. The browser's taskbar at the bottom shows several open applications, including 'Inbox - Microsoft Ou...', 'Alston UCFC ISA PAT...', 'Alston Utah Pest Con...', 'Alston Adv IMG Cash...', and 'Integrated Pest Man...'. The system clock in the bottom right corner indicates the time is 2:31 PM.

In Memory

Alan Hickman Roe



1954 - 2006

USU Extension
Insect Diagnostician