Managing Utah’s Persistent Insect Pests of Trees & Shrubs

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EXTENSION
Utah State University
Lending a helping hand to Utahns since 1914.
Pest Management Resources on the Web

- Pest fact sheets & photos
- Pest management recommendations
- Pesticide information
- Utah Plant Pest Diagnostic Lab
- Outreach education slideshows
Pest Management Resources on the Web
“Insects and Plant Diseases”

One-stop shopping for Utah pest management information

http://extension.usu.edu/cooperative/ipd
Integrated Pest Management

- Definition
- IPM strategies for landscape pests
- IPM Tools
Integrated Pest Management

IPM

- Plan ahead (use preventive strategies where possible)
- Use multiple pest management tools
  - Cultural
  - Mechanical
  - Biological
  - Chemical
- Treat only if needed (thresholds)
- Environmentally and economically sound
Major IPM Strategies for Landscape Pests

- Plant selection & planting site selection
- Irrigation – design for plant needs
  - Amount & application method
  - Group plants with similar needs
- Plant nutrition – prevent stress !!!
- Preventive controls for chronic pests
  - Sanitation
  - Traps, exclusion barriers
  - Oil sprays
  - Spring application of systemic or residual insecticide

Ips-killed spruce trees in Garland, UT cemetery
Major IPM Strategies for Landscape Pests

◘ For “secondary pests”
  • Aphids, Scale, Leaf feeders
  • Exposed feeders
  • Use “soft” (selective) controls
  • Natural biological control is more prevalent

◘ For “primary pests”
  • Tree borers, Fruit feeders
  • Hidden feeders
  • Target / Timing for susceptible life stage(s) is critical
  • Maintain active residues for critical period

◘ Conserve natural enemies by avoiding toxic, broad-spectrum insecticides

Elm leaf beetle
Traps and Physical Barriers

- **Traps**
  - Yellow jacket wasps, slugs, spiders

- **Sticky bands**
  - Trees and shrubs
Biological Control

- How can I make it work for me?
- Outdoor landscapes - Conservation of natural enemies
  - Avoid toxic chemicals
  - Maintain a diverse plant environment (avoid monocultures)
  - Cultivate plants that provide nectar & pollen
  - Tolerate some herbivorous insects

Parasitic wasp that attacks caterpillars

Big-eyed bug nymph feeding on an insect egg
Aphids

- Suck sap from phloem tubes in leaves and stems
- Curl leaves, produce sticky honeydew that promotes growth of black sooty mold, reduce plant vigor at high densities
- Populations increase rapidly, low numbers can be tolerated
- Only control if honeydew is a nuisance problem or distortion of leaves is severe and aphid numbers are very high
- Many generations per summer

Apple aphid curls leaves

Giant willow aphid feeds on limbs

Sooty mold
Aphid Biology

Alternate hosts

Woody overwintering host

Woody or herbaceous summer host

Only females, bear young live
Continual, overlapping generations

Fruit tree aphids
plum, peach, rosy apple, cherry
Spirea
Dogwood
Woolly elm
Woolly alder
Honeysuckle
Rose
Woolly Maple
Poplar
Ash
Cottonwood

Mostly a spring pest
Aphid Biology

Single host

Produce overwintering eggs in colder climates

Birch aphid

Cinara conifer aphid

Season-long pest

Apple
Birch
Poplar
Cottonwood
Walnut
Conifers
Sycamore
Maple
Pecan
Hackberry
Elm
Aphid Management

- **Delayed Dormant Spray:** Dormant oil + Pyrethroid (at bud break)
- **Spring and Summer control:** hard spray of water, horticultural oil, insecticidal soap, imidacloprid (systemic), Conserve, Aria, azadirachtin, Orthene, pyrethroids, others
- **Biological control:** lady beetles, lacewings, syrphid flies, parasitic wasps
Insecticide Resistance Management

- **Rotate chemical classes / modes of action**
  - Within a generation
  - Between generations within a season

Aphid giving birth to live nymph
Cooley Spruce Gall Adelgid

- Form galls on new growth of spruce; also attack Douglas fir - cause needle swelling, necrosis and shedding
- Adults lay eggs on new “candle” growth in spring; young feeding at base of needles form the galls
- 2-year alternating life cycle

Cut-open gall showing chambers with adelgids

Old gall that adelgids have vacated
Cooley Spruce Gall Adelgid Management

- Insecticide treatment at egg hatch: Merit, Thiodan
- Check the base of new needles for woolly nymphs
- Avoid planting spruce and Doug fir together
- Prune off green/purple galls
Scale Insects

- Soft scales feed in phloem, produce sticky honeydew
- Armored scales feed on mesophyll of plant cells, do not produce honeydew
- Multiple years of scale feeding can kill limbs; cause dieback
Scale Biology

- 1-2 generations per summer
- Overwinter as eggs or young nymphs
- Females are sessile
- Males have wings
- “Crawler” stage is the best target for control

Oystershell scale female surrounded by crawlers
Scale Management

- Delayed Dormant Control is effective for soft scales & some armored scales: Dormant oil + Pyrethroid (at first bud break)

- Use sticky tape in late spring to early summer to time a spray for “crawlers”

- Soft scales: Merit (systemic), Precision, Flagship, horticultural oil, insecticidal soap

- Armored scales: pyrethroids or others timed with crawlers
Lace Bugs

- Adults and nymphs suck sap - spots/speckling, black tar spots of excrement

Feeding injury  Tar spots of excrement

Oak lace bug adult

Azalea lace bug. A, Adult; B, Egg; C to E, Nymphs.

Life stages
Lace Bug Management

- **Planting site selection**
  - Select shady sites

- **Hard spray of water from hose**
  - Washes nymphs off of plants

- **Biological control**
  - Natural enemies

- **Soft insecticides**
  - Insecticidal soap, horticultural oil (repeat applications; cover undersides of leaves)

- **Conventional insecticides**
  - Talstar, Tempo, Merit, Flagship, Orthene, Sevin
Spider Mites

- Very small size; infested plants appear “dirty”; produce webbing, suck sap (remove chlorophyll); leaf speckling
- When severe, cause bronzing or silvering of leaves; populations build quickly in hot weather
- Feed on many species of plants
Spider Mite Management

- Biological control: Predaceous mites
- Soft Controls: pressurized stream of water, horticultural oils, insecticidal soap
- New miticides:
  - Acequinocyl (Kanemite, Shuttle)
  - Bifenazate (Floramite)
  - Pyridazinone (Akari, Nexter, Sanmite)
  - Chlorfenapyr (Pylon)
  - Etoxazole (Tetrazan)
  - Hexythiazox (Ovation, Hexagon)

Spruce spider mite

Predaceous mite feeding on spider mite
Strawberry Root Weevil

- **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-parasitic nematodes, *Beauveria* fungus - late spring or early fall
Leaf Beetles

- Elm & Cottonwood
- Adults chew holes in leaf
- Larvae skeletonize lower leaf
- Overwinter as adults in protected sites
- Spring - bright yellow egg masses
- Larvae feed ~ 3 wk
- Pupate at base of tree or on leaves
- 2 generations per summer
Leaf Beetle Management

- Resistant cultivars of Amer. Elm, Zelkova
- Good tree care, prune dying limbs
- Insecticides:
  - Bt var. *san diego* or *tenebrionus*
  - Azadirachtin
  - Orthene
  - Imidacloprid (Merit)
  - Pyrethroids
  - Trunk band to kill descending larvae of Elm LB: Sevin

Elm LB pupae piled up at base of trunk
Zelkova
Cankerworms

- Native oak, boxelder, maple, elm, beech, linden, cherry
- Fall and spring species
- Females are flightless
- Large numbers of larvae can be a nuisance
- Larvae spin down on webbing
Cankerworm Management

- **Soft insecticides:**
  - Bt var. *kurstaki* (Dipel)
  - Spinosad (Conserve)
  - Azadirachtin
  - Pyrethroids
  - Sevin

- **Small trees:**
  - Hard spray of water

- **Sticky trunk band**
  - Fall or Spring
USU Extension Pest Management Slideshows

Where can you view this slideshow?

http://extension.usu.edu/cooperative/ipd

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http://extension.usu.edu/cooperative/ipm
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