Landscape IPM and Insects

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Pesticide Applicator Training
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Internet Resources
USU Extension

Insects and their Relatives:
http://extension.usu.edu/insect

Plant Pathogens:
http://extension.usu.edu/plantpath

Integrated Pest Management (Tree Fruit):
http://extension.usu.edu/ipm

Cooperative Extension Publications:
http://extension.usu.edu/cooperative/publications

Basics of IPM
Integrated Pest Management

- Use multiple management tools to solve plant health problems (cultural, physical, biological, chemical, genetic)
- Minimize negative impacts to the environment
- Has to be cost effective

IPM Approach

- Identify pest(s)/problem(s)
- Monitor density/incidence/severity
- Assess pest biology/life history in relation to plant development/production
- Target “windows of opportunity”
- Consider pest management options/timings
- Follow-up assessment

Insect Life Cycles

Complete

Target

Incomplete

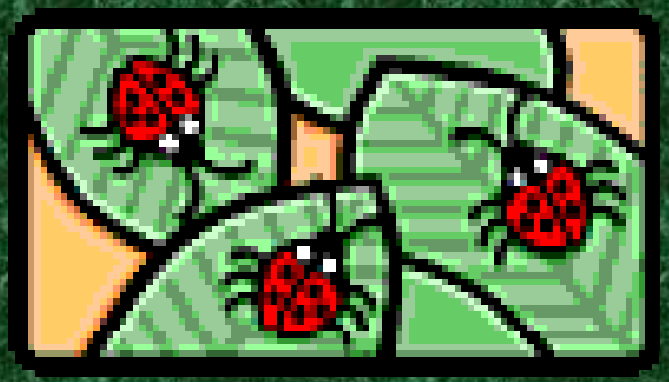
Target

Target

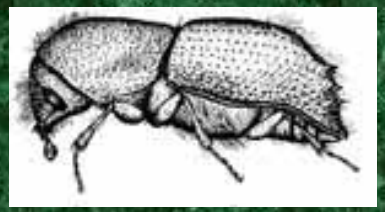
Windows of opportunity

Important Landscape Insect Pests

- *Ips* bark beetles
- Tree borers
- Root weevil
- Aphids
- Mites
- Turf insects



Ips Bark Beetles



Ips species

- *Ips pilifrons* – spruce
- *Ips pini* – pine
- *Ips confusus* – pinyon pine

Ips Facts

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

Spruce Ips (*Ips pilifrons*)

Attacks spruce
Secondary pest
Prefer fresh downed wood and slash, and weakened trees
Tree attack begins at top and moves down
Population build-up in area can result in attack on nearby healthy trees
Current Utah situation: many stressed spruce in landscapes and nurseries

Spruce *Ips* Management

- Maintain tree vigor, avoid stress (proper watering, planting site, avoid injuries)
- Remove & dispose of infested material; tarp & heat infested firewood
- Apply chemical insecticide to bole:
  - Carbaryl (Sevin): flowable
  - Permethrin (Astro)
  - Treat in spring before beetle flight (late April to early May) or treat in fall (late Sep to mid Oct)
  - 12-18 months protection (carbaryl)

Utah *Ips* Bark Beetle Publications

Utah Division of Forestry, Fire and State Lands

http://www.ffsl.utah.gov/id.php

Ips Bark Beetles
Pinyon Engraver Beetle (Pinyon Ips Beetle)

Landscape Ornamental Pests

Tree Borers

Major Tree Borers

- Beetles
  - Roundheaded/Longhorned borers – Cerambycidae (Aspen borer, Locust borer)
  - Flatheaded/Metallic wood borers –Buprestidae (Bronze birch borer, Flatheaded apple borer
  - Weevils – Curculionidae (Poplar-and-Willow borer)
  - Bark beetles – Scolytidae (Shothole borer, Ips)
- Moths
  - Clearwinged Moths - Sessidae (Peachtree borer, Lilac/Ash borer)
  - Other moths (American plum borer – Pyralidae)

Tree Borers

- Avoid planting trees with borer problems (birch, poplars, aspen, ash)
- Maintain good tree health – stressed trees are more prone to attack (drought, heat, winter injury)
- Increasing sources of borers (established populations will spread; old, weakened, neglected trees; burn & firewood piles)
- Young trees next to a source are especially susceptible
- Preventive trunk insecticide sprays
- Systemics??

Tree Borer Management

- Preventive Trunk Treatments
  - Timing is critical (northern Utah)
    - Ash/Lilac borer – May 1- late June
    - Bronze birch borer – late May – June
    - Aspen borer – May-July
    - Peachtree (Crown) borer – late June – August
    - Poplar-and-Willow borer – July – Sept.
    - Locust borer – August – Sept.
    - Shothole borer – May and Sept.
- Insecticides: Sevin, Thiodan, pyrethroids (permethrin, Talstar), Merit (systemic), Orthene (systemic)

Systemic Insecticide

- Imidacloprid (Merit, Bayer Advanced Garden Tree & Shrub Insect Control, BAG Plant Spikes (fert. + insect.)
- Translocated upward from root uptake
- Foliar applications result in locally systemic activity
  - Soil drench, soil injection, foliar
  - Soil: translocation delay up to 60 days or longer
  - Adding N fertilizer may increase soil uptake
  - Target insects:
    - Soft-bodied pests on leaves and limbs (aphids, adelgids, whiteflies, mealybugs, scale, thrips, psylla, leafminers)
    - Some beetles (leaf, root weevils, grubs, flatheaded, roundheaded) – results with tree borers variable
    - Not clear-winged borers, bark beetles

Strawberry Root Weevil

- Common hosts: lilac, peony, dogwood, yew, privet, cotoneaster, arbovitae, others
- Adults chew irregular notches in leaf edges – target with foliar insecticide (Orthene, Merit, Sevin, Diazinon) – in late spring
- Larvae feed on roots – target with soil insecticide (Diazinon, Merit) or insect-feeding nematodes

Aphids

- Suck fluids from leaves and stems; curl leaves; produce sticky honeydew; black sooty mold
- Only control if honeydew is a nuisance problem or distortion of leaves is severe and aphid numbers are very high
- Delayed Dormant Spray: Dormant oil + Diazinon or Thiodan (at bud break)
- Spring and Summer control: Merit (systemic), insecticidal soap, horticultural oil, others
  - Prone to insecticide resistance, so rotate insecticides
- Biological control: lady beetles, lacewings, syrphid flies, parasitic wasps

Spider Mites

- Very small; infested plants appear “dirty”; produce webbing, suck sap (remove chlorophyll); fine speckling of leaves
- When severe, cause bronzing or silvering of leaves; populations build quickly in hot weather
- Controls: pressurized stream of water, horticultural mineral oil, insecticidal soap, weed control
- Don’t recommend miticides (Kelthane, Vendex) unless a rescue treatment
- Pyrethroids, malathion can flare mites
- Biological control: Predaceous mites
  - (natural, supplement)

Turf
First Step:
Proper Diagnosis!

Look for type of injury:

- Chewed leaves
- Short stems
- Stems break easily
- Sawdustlike frass
- Spongy turf
- “Turf roll-back”
- Predator digging

Look for presence of insect:

- Fat caterpillars
- Brown moths
- Small, legless grubs
- Large C-shaped grubs

Turf Cultural Care

- Good lawn care (fertilize, mow, aerate, irrigation)
- Select more tolerant turf species & varieties
- De-thatch

Major Turf Pests

- Surface / Thatch Feeders (leaf, stem):
  - Armyworm
  - Cutworm
  - Sod webworm
  - Mites
- Surface / Crown Feeders (burrow into stem, crown):
  - Billbug
  - Subterranean webworm
- Subsurface (root):
  - May & June beetles

White Grubs
May and June Beetles
(*Phyllophaga* spp.)

- Scarab beetle family
- C-shaped white larvae
  - Brown head, legs
  - Eat roots
  - Turf roll-back
- 1-3 year life cycle

White Grubs

- Damage:
  - Root feeding, plants wilt, yellow, thin
  - Irregular dead patches
  - Turf roll-back
  - Invasion by broadleaf weeds
  - Secondary damage from small mammals & birds
  - Spring to early summer and late summer to fall

May & June Beetle- White Grubs
1-3 year life cycle

Spring

Summer

Fall/Winter

Lays eggs late spring to summer

Pupate

Can spend 1-2 years as 2nd to 3rd instar larva

2nd-3rd instars move deeper for winter

White Grub Control

- Target small larvae (late spring-fall)
- Threshold: 3-4 grubs/sq ft
- Irrigate to move materials to grubs in the upper root zone
  - Imidacloprid (Merit, Marathon)
  - Carbaryl (Chipco Sevin)
  - Chlorpyrifos (Dursban Pro)
  - Diazinon
  - Trichlorfon (Dylox)
  - Beneficial Nematodes -*Heterorhabditis bacteriophora (Cruiser)*

Billbugs (*Sphenophorus* spp.)

- Bluegrass & Denver Billbugs
- Weevil beetle family (snout)
  - Burrow in stems, crown
  - Small, legless larvae
  - Blades break at crown
  - Sawdustlike frass
- 1 year life cycle

Billbugs

- Life Cycle
  - Adults & larvae overwinter in turf
  - Begin feeding in spring
  - Eggs laid in stems (spring to summer)
  - New adults in summer
- Damage
  - Larvae feed within stems, crowns
  - Abundant frass
  - Stems break easily at crown
  - Dollar spots grow into larger patches

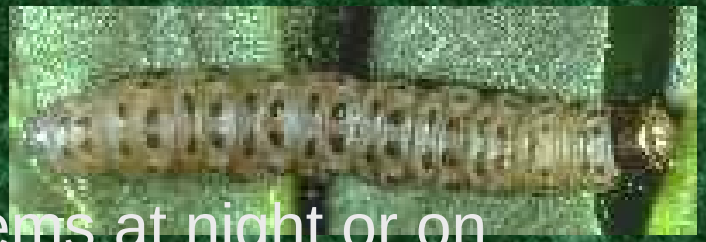
Billbug Control

- Target small larvae (spring and summer)
- Threshold: 1-5 grubs/sq ft
- Light irrigation to move materials into crown zone
- Resistant turfgrass varieties
  - Imidacloprid (Merit, Marathon)
  - Chlorpyrifos (Dursban Pro)
  - Diazinon
  - Beneficial Nematodes -*Heterorhabditis bacteriophora* (Cruiser) & *Steinernema carpocapsae* (Scanmask)

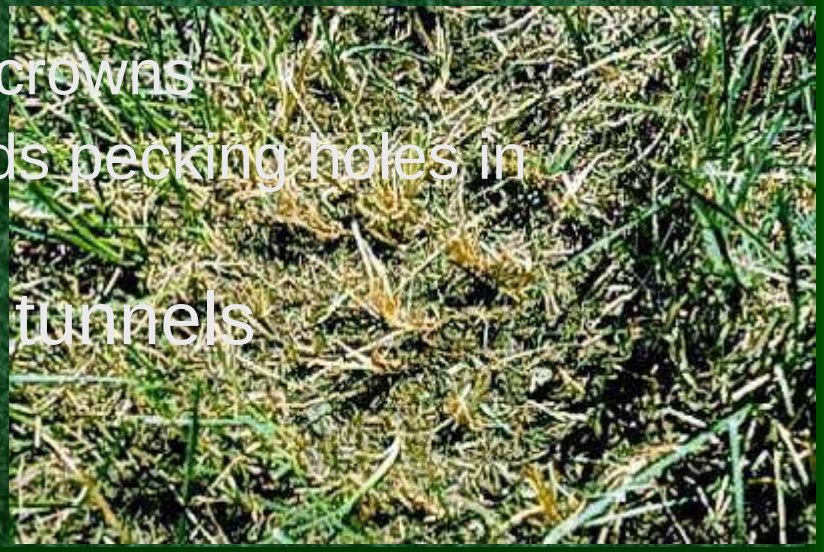
Sod Webworms

- Lepidoptera (moth, caterpillar)
- Snout moths
  - Gray to brown caterpillars
  - Larvae feed on grass blades
  - Larvae form silken tunnels in thatch
  - Injury not as severe as grubs & billbugs
  - Gray to brown moths fly just above turf in zig-zag pattern
- 1-3 generations per year

Sod Webworms



- Damage
  - Larvae chew on leaves & stems at night or on cloudy days
  - Cut off grass blades, drag into tunnels
  - Small, irregular brown patches of closely cropped grass
  - Green frass accumulates at crowns
  - Secondary damage from birds pecking holes in turf
- Larvae overwinter in silken tunnels



Sod Webworm Control

- Target young larvae (late spring to summer)
- Threshold: 15 larvae/sq yd
  - *Bacillus thuringiensis* (Bt) – small larvae
  - Acephate (Orthene)
  - Carbaryl (Chipco Sevin)
  - Spinosad (Conserve)
  - Azadirachtin (Ornazin)
  - Cyfluthrin (Tempo)
  - Diazinon
  - Chlorpyrifos (Dursban)
  - Beneficial Nematodes (*Steinernema carpocapsae)*

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