

Insects That Kill Trees

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2004 Professional Tree Care Workshops



Topics

- Introduction – websites, IPM strategies
- Ips bark beetles
- Tree borers – flatheaded, shothole, clearwing moths
- Systemic insecticides
- Root borers
- Root weevils

Utah State University Extension Service Internet Sites

Insects and their relatives (fact sheets):

<http://extension.usu.edu/insect>

Plant diseases (fact sheets):

<http://extension.usu.edu/plantpath>

Integrated pest management (fruit tree pest
advisories):

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

Integrated Pest Management IPM



The practice of using multiple techniques to manage pests (e.g., cultural, mechanical, biological and chemical controls) while minimizing negative impacts to the environment.

Use of pest controls are based on a “real need” (thresholds)

Economically viable



Integrated Pest Management Approach

- Proper diagnosis of problem
- Monitor to determine “real need”
- Identify “windows of opportunity”
- Determine “best management practices” for situation



Proper Diagnosis!

- Most plant health problems are not caused by biotic factors (pests: insects, diseases), but by abiotic factors (irrigation, environment, culture & care)



First Step: Proper Diagnosis!



Insect is present



Injury is present



What type of injury?

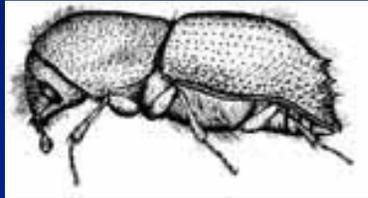
Friend or Foe?

What life stage is present?

Management Strategies for Insects That Kill Trees

- Prevention!!
 - Tree species selection
 - Well adapted to climate and site
 - Few pest problems
 - Prevent and reduce stresses
 - Water, temperature, mechanical, other pests
 - Preventive insecticide treatments
 - Timed with insect activity
 - Systemics, long-term activity
- Treat problem in progress
 - Usually not successful for aggressive tree-killing 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

Ips Bark Beetles

- Typically considered secondary pests
- Prefer fresh downed wood and slash, and weakened trees
- Population build-up in area can result in attack on nearby healthy trees
- Current Utah situation: many stressed spruce in landscapes and nurseries due to lengthy drought and summer heat stress



Ips Bark Beetles

Distinctive gallery pattern

Central chamber with Y or star-shaped side galleries (eggs)

Attack smaller diameter limbs in upper tree first and then move down tree

Conditions to avoid: drought stress, particularly in spring and fall, and high density sapling stands



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, 1-2% ai solution
 - Permethrin (Astro)
 - Treat in spring before beetle flight (late April to early May) 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

Management of *Ips* in Pinyon Pine Stands

- *Ips confusus*, Pinyon Engraver Beetle
- Colorado and single-leaf pinyon pines
- Thinning
 - Below 10% of max stand density index
 - Cut stumps close to ground
 - Delay until late July
 - Burn/dispose of slash
- High value trees may be treated with insecticides

Tree Borers



Major Tree Borers

- Beetles

- Roundheaded/Longhorned borers – Cerambycidae (Poplar or 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
- Preventive trunk insecticide sprays
- Systemics for some species



2002/03 Borer Observations

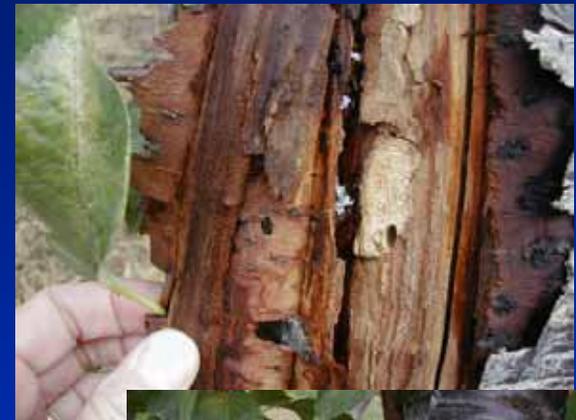
- Greater incidence of borers
- These borers are typically secondary pests, but acting more as primary attackers



Flatheaded Borer (*Chrysobothris*)



Girdling Injury



Older Trees & Shaking Injury



Beetle larva



Adult (1/4-1/2 inch)

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UC Statewide IPM Project
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American Plum Borer

Larvae bore into cambium



Moth adult

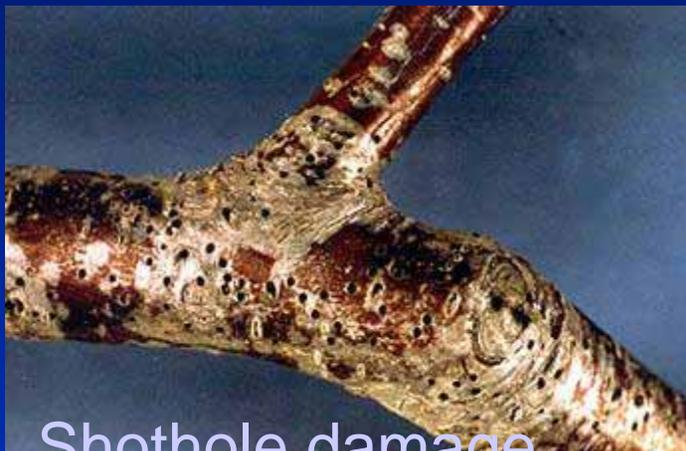


Cocoon under bark



Trunk & limb injury

Shothole Borer



Shothole damage



Galleries



Adult Beetle



Exude sap
from holes

Why are borers on the increase?

- Source of insects (old, weakened, neglected trees, burn & firewood piles)
- Tree stress (drought, heat, winter injury)
- Newly planted trees next to infested source are especially susceptible

Borer Management

- Keep trees healthy & vigorous
- Remove & burn sources
- Do not plant new trees next to sources
- Prevent trunk sunburn by painting trunks
- Keep weeds and debris away from base of trunks
- Insecticide treatment to prevent egg-laying

Tree Borer Management

- Trunk Protection
 - 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 – June and late Sept.
- Insecticides: carbaryl, endosulfan, pyrethroids (permethrin, bifenthrin)

Systemic Insecticide

- **Imidacloprid** (Merit, Bayer Advanced Garden Tree & Shrub Insect Control, BAG Plant Spikes (fert. + insect.)
 - Soil drench, soil injection, foliar
 - Soil: translocation delay of 60 days or longer
 - N containing fertilizer may enhance uptake
 - Target insects: soft-bodied pests on leaves and limbs (aphids, adelgids, leafminers, leaf beetles, mealybugs, psyllids, scale); longhorned borers, flatheaded borers, white grub larvae

Root Borer

Larvae bore into roots
and crown



Large beetle
Prionus californicus

Adults fly at night

Older sweet cherry roots
with extensive damage;
common in cottonwoods



No success with insect-
parasitic nematodes;
systemic may be effective

Root Borer



Ten-lined June Beetle
Polyphylla decemlineata
1 – 1 ½ inch

Larvae browse on roots

Broad host range

Primarily a pest of turf

Soil insecticides

Bacillus popillae

Insect parasitic nematodes

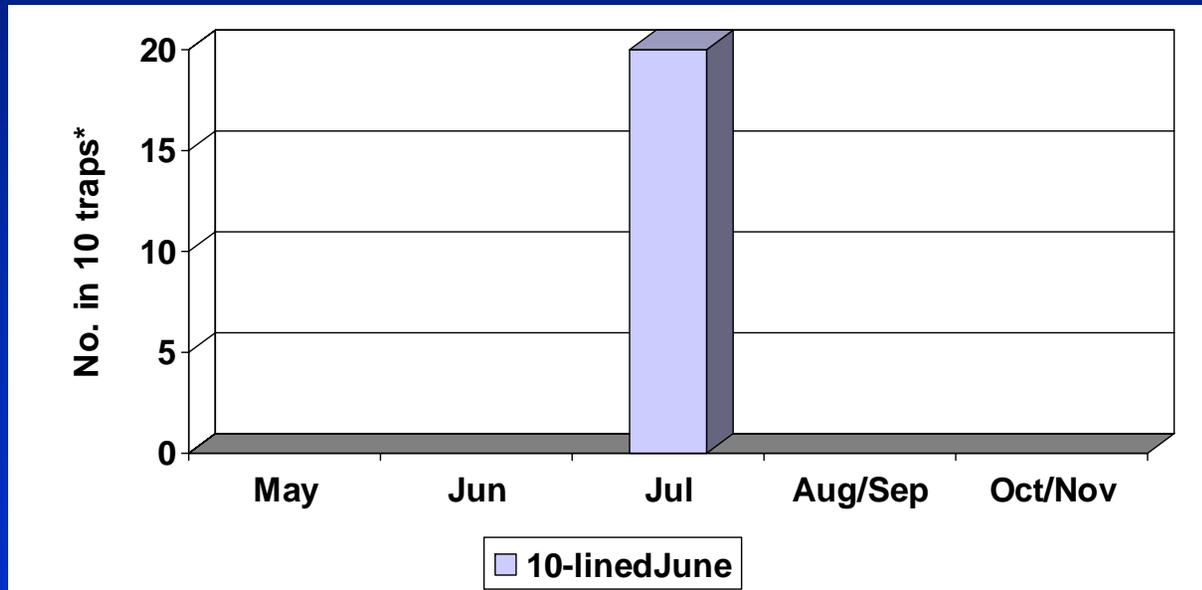


Management of June Beetles

Sanitation, remove infested wood, paint/protect trunks,
prevent stresses
Prevent in new plantings



Ten-lined June
Beetle
Root borer
2-4 yr life cycle
Peak adult flight:
Jul & Aug
Protect new plantings



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