Biology and Management of Key Insect Pests of Ornamentals

Southeast Oklahoma Turfgrass and Landscape Maintenance Program

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Managing Insect Pests
(Keys to Success)

- Knowledge of production system
- Proper identification
- Knowledge of biology and seasonal occurrence
- Proper monitoring and selection of controls

Sucking Pests

Aphids

- Order Hemiptera (true bugs, hoppers, etc.)
- Gradual metamorphosis
- Piercing-sucking mouthparts
- DS: nymph, adult
- Overwinter as eggs, adults
- Host: all kinds of plants, shrubs and trees; they can transmit plant diseases, make galls

Aphids

- Can cause yellowing, stunting, wilting
- Controls:
  - Natural enemies
  - Stream of water
  - Insecticidal soaps (e.g., Safer's) (NS)
  - Horticultural oils (e.g., Sunspray) (NS)
  - Neem oil (e.g., Bioneem) (UN)

Scales

- Order Hemiptera
- Gradual metamorphosis
- Piercing-sucking mouthparts
- DS: nymph, adult
- Overwinter as eggs, nymphs, adult females
- Lay eggs at different times during year
- Host: many plants

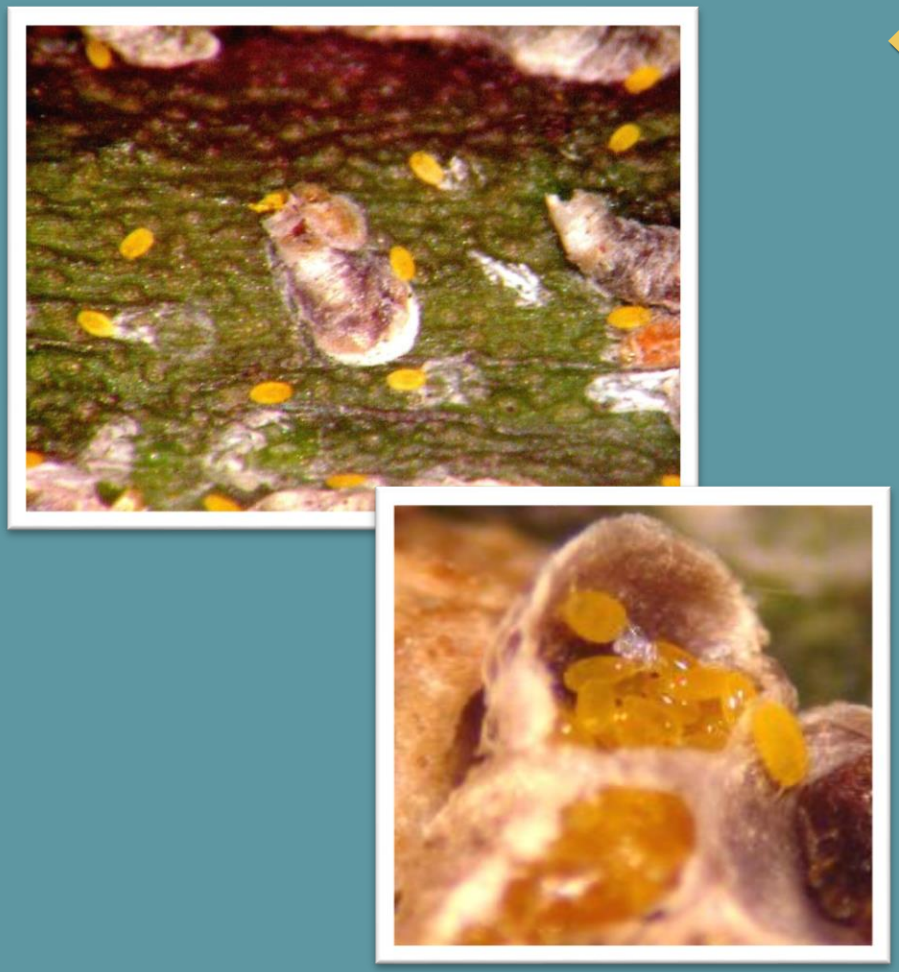
Scales

- Scales
  - Soft (Family Coccidae)
  - Armored (Family Diaspididae)
  - Related to aphids
  - Produce a waxy covering for protection
  - Typically immobile on plant once they settle down to feed

Scales

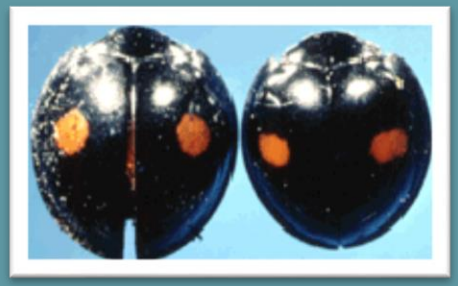
- Soft Scales (Brown Elm)
  - Female is brown with smooth, hemispherical shape 1/8 to 1/4 inch in diameter
  - Found on many trees, including ash, mulberry, plum, pecan, maple, and especially American elm
  - Can kill small branches, stunt tree growth, weaken tree, making it susceptible to disease and attack by borers
  - Produce honeydew, can "damage" cars parked under heavily infested trees

Scales



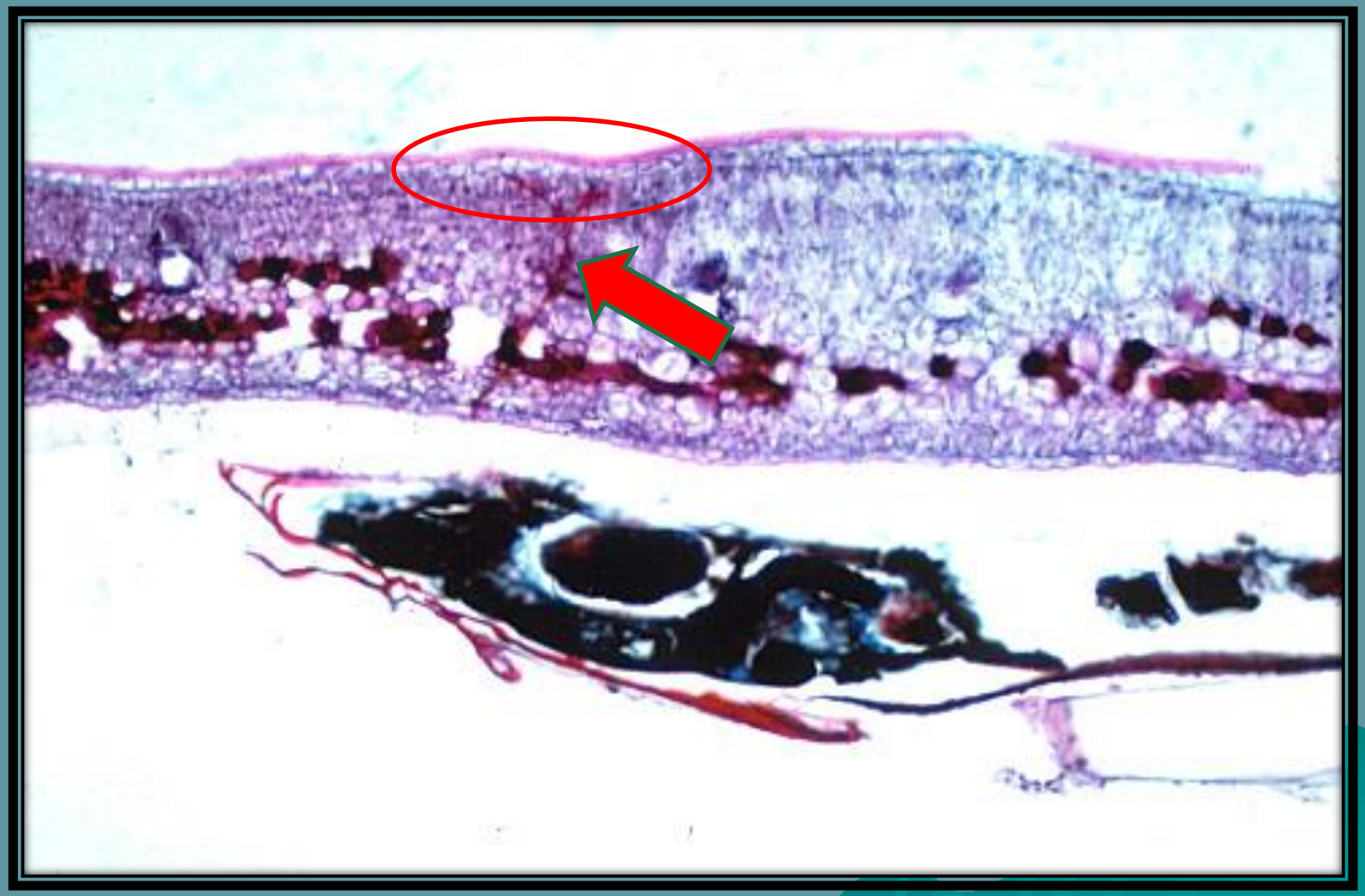
- Armored Scale (Euonymus)
  - Attacks many species of Euonymus, occasional pest of camellia, ivy, hibiscus, holly, and others
  - Yellowish, or whitish spots on leaves; females are usually found along the stem and leaf veins
  - May cause premature leaf drop; can kill plant if not controlled

Scale Insect Management



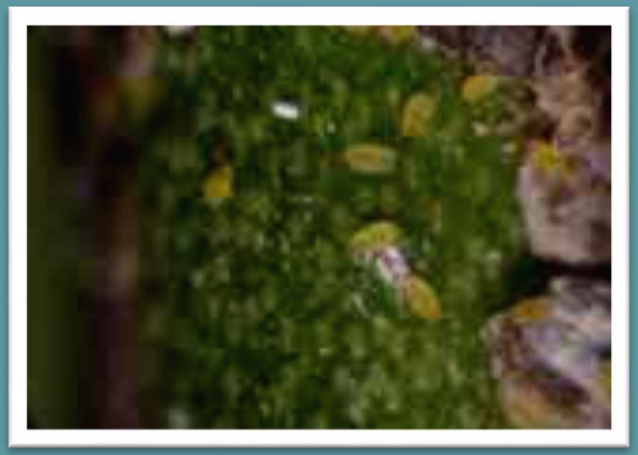
- Numerous natural enemies
- Insecticides:
  - Pyriproxyfen (Distance) (7C)
  - Imidacloprid (Merit) (4A)
    - Soft scales only!
  - Thiamethoxam (Meridian) (4A)
  - Dinotefuran (Safari) (4A)
  - Acetamiprid (Tristar) (4A)
  - **Most non-systemic products must be applied when crawlers are active**

How Armored Scales Feed



Scale Insect Management

- Horticultural oils (HO)
  - Sunspray, Suffoil-X, etc.
- Insecticidal soap (UN)
  - M-Pede, Safer's, etc.
- Bifenthrin (3A)
  - OnyxPro
- Cyfluthrin (3A)
  - Decathlon, Tempo
- Carbaryl (1A)
  - Sevin
- Contact insecticides should be applied to target crawler stage
- Use double-sided sticky tape to monitor crawler emergence and correctly time sprays



Lace Bugs

- Order Hemiptera
- Gradual metamorphosis
- Piercing-sucking mouthparts
- DS: nymph, adult
- Overwinter as eggs, adults
- Host: many trees, sycamore, hawthorn, honeylocust, azalea, elm, oak, others

Lace Bugs

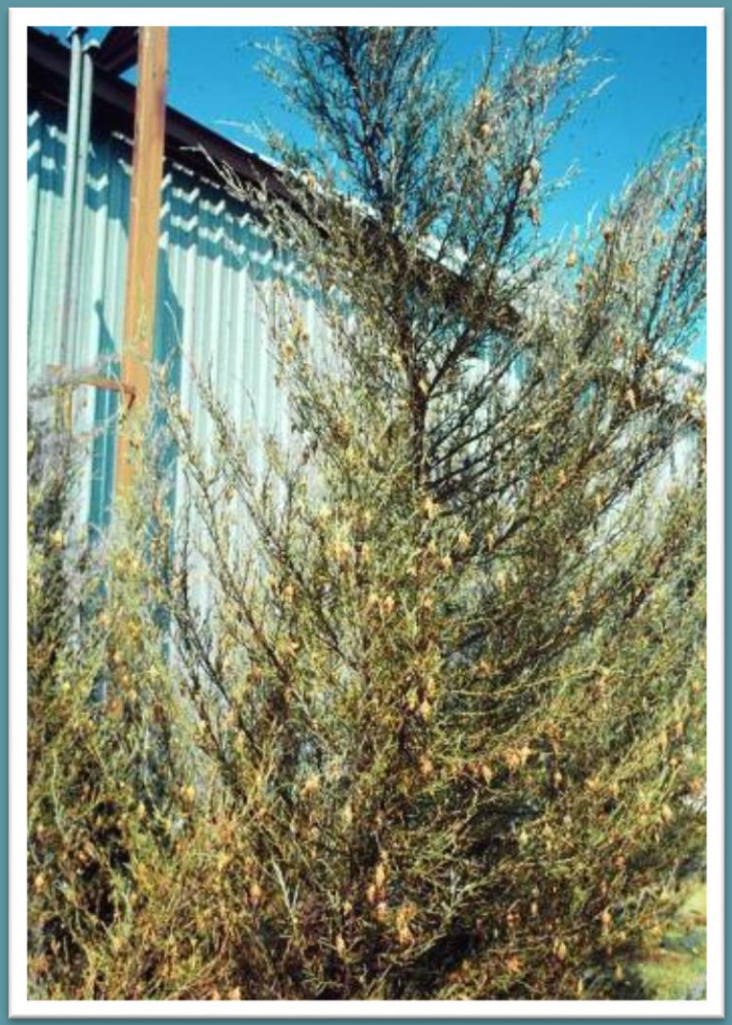
- Nymphs feed on new leaves, causing yellowing, browning of leaves; plant just looks "sick"
- Insecticides
  - neem oil (UN)
  - horticultural oil (NS)
  - insecticidal soap (NS)

Chewing Pests

Bagworms

- Order Lepidoptera (moths and butterflies)
- Complete metamorphosis
- Chewing mouthparts (larvae)
- DS: larva
- Overwinter as eggs in female bags
- Females wingless, males with clear wings
- Hosts: eastern red-cedar, juniper, arborvitae (+ 125 others)

Bagworms

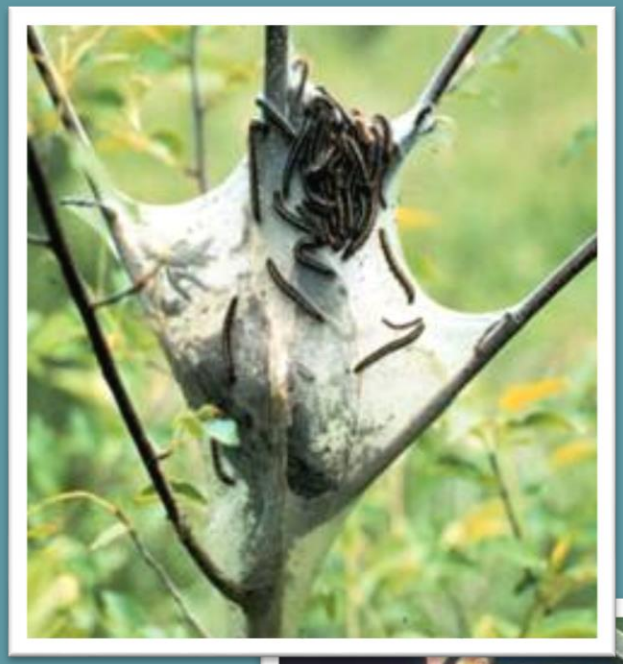


- Can cause long-lasting damage to evergreens
- Controls
  - Hand pick bags
  - Natural enemies
  - Insecticides
    - *Bt* ssp. *kurstaki* (Dipel, Javelin) (11A)
    - Spinosad (Conserve) (5)
    - Tebufenozide (Confirm) (18)
    - **Time with larval emergence**

Bagworms

- Controls (large larvae)
  - Acephate (Orthene) (1B)
  - Carbaryl (Sevin) (1A)
  - Chlorantraniliprole (Acelepryn) (28)
  - Bifenthrin (Onyx) (3A)
  - Cyfluthrin (Tempo) (3A)
  - Deltamethrin (Deltagard) (3A)
  - Permethrin (Astro) (3A)
  - Lambda cyhalothrin (Scimitar) (3A)

Eastern Tent Caterpillar



- Order Lepidoptera
- Complete metamorphosis
- Chewing mouthparts
- DS: larva
- Overwinter as eggs, hatch as leaves emerge (March)
- Host: Crabapple, hawthorn, plum
- Insecticides
  - *Bt* ssp. *kurstaki* (11A)
  - Spinosad (5)
  - Insecticidal soap (NS)
  - **Time with larval emergence**

Forest Tent Caterpillar

- Can defoliate, keep leaves from emerging
- Do not form tents
- Controls
  - Prune/destroy egg masses
  - Monitor egg hatch at bud break, look for silken tents, or caterpillars
  - *Bt* ssp. *kurstaki* (11A)
  - Spinosad (5)
  - Insecticidal soap (NS)
  - **Time with larval emergence**

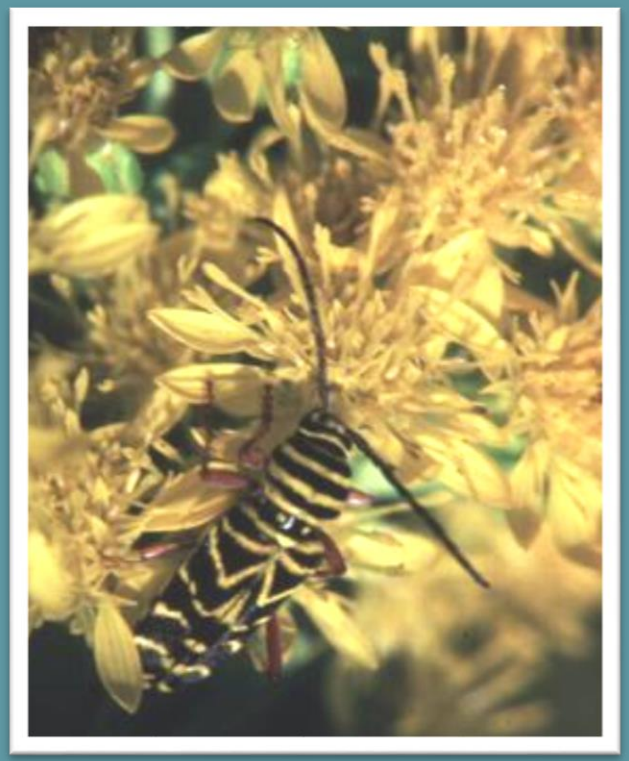
Fall Webworm

- Order Lepidoptera
- Complete metamorphosis
- Chewing mouthparts
- DS: larva
- 2 generations, 2 races
- Host: Pecan, persimmon, walnut, crabapple, and others (84 other species)

Fall Webworm

- Unsightly, but not permanently damaging because damage occurs primarily in fall
- Prune out webbing
- Insecticides
  - *Bt* ssp. *kurstaki* (11A)
  - Spinosad (5)
  - Chlorantraniliprole (28)
  - **Time with larval emergence**

Borers



- Order Coleoptera, Lepidoptera
- Complete metamorphosis
- Chewing mouthparts
- DS: larva
- Overwinter as larvae
- Host: many trees

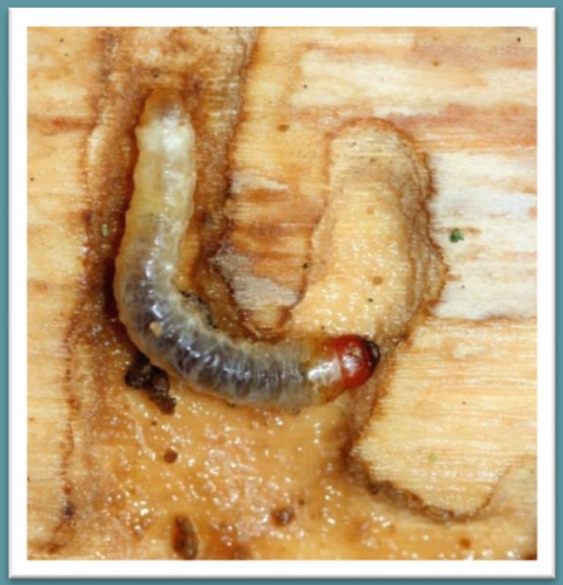
Borers

- Roundheaded borers
  - Cerambycidae; 1+ year life cycle; pine sawyers have 2-2 ½ generations per year
  - Adults emerge in spring or fall, lay eggs in bark crevices or feeding notches created by adult
  - Some produce sawdust; holes are irregularly spaced
  - Some species are attracted to cut wood, others to living trees, but most are attracted to weakened, stressed trees

Borers

- Flatheaded borers
  - Buprestidae; adults shiny, often metallic or brightly colored, wedge-shaped beetle
  - Antennae not as long as body; can measure from 1/3 to nearly 1 inch long
  - Larvae creamy white to yellow, with a prominent swollen, flattened area just behind the mouthparts
  - Most are attracted to weakened, stressed trees

Borers



- Clearwing borers
  - Adult moths are wasp-like with clear wings, may have orange markings on body; active during the daytime
  - Larvae 1 inch, creamy white with shiny brown head
  - Many attracted to weakened, stressed trees

Borer Management

Keep trees healthy

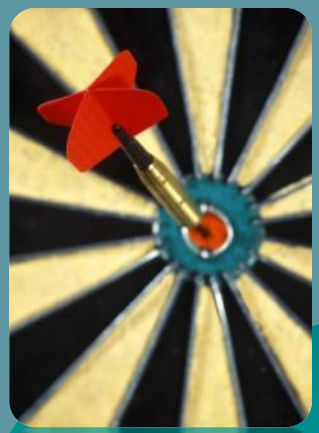
Systemic insecticides

The Best Insecticide for the Job

- Doesn’t quit until the job is done
- Doesn’t cost an arm and a leg
- Safe around kids and pets
- Doesn’t get in the way of your activities
- Isn’t a nuisance to your neighbors
- Compatible with other control strategies

The Best Insecticide for the Job

- For your consideration
  - Efficacy (killing power)
  - Residual activity (persistence)
  - Selectivity (target vs. non-target)
  - Safety to applicator and environment
  - Resistance management issues



Why Do I Need to Know the Insecticide's Mode of Action?

- Helps understand spectrum of activity (selectivity)
- Helps understand safety
- Helps for managing resistance
  - Avoid exclusive repeated use of insecticides from the same chemical group
  - Integrate other control methods (cultural, biological) into insect control programs (IPM)

Development of Insecticide Resistance