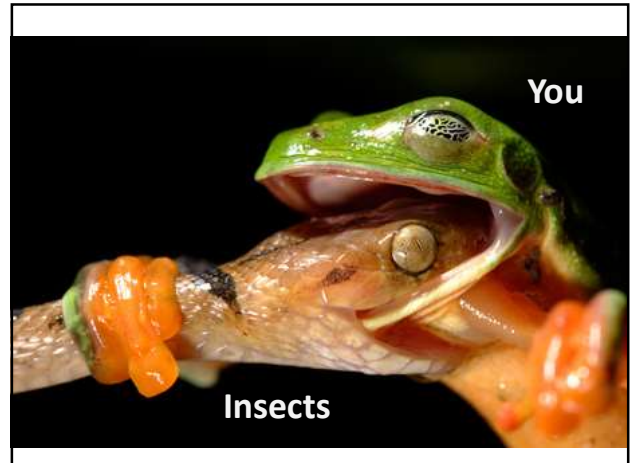


Taming the Top 10 Insect Pests of Woody Landscape Plants

Daniel Potter, Professor Emeritus, Univ. Kentucky

1



2

It's not easy bein' green....

Boxwood leafminer

Bagworms

Spruce spider mite

Emerald Ash Borer

3

Signs of pests with chewing mouthparts (caterpillars, beetles, & borers)

Defoliation

Frass (fecal pellets)

Caterpillar silk

4

Signs of Pests that Suck Plant Juices (aphids, lace bugs, mites)

Hawthorn Lace Bug Stipping on Hawthorn

Stippling, Chlorophyll Loss

Curling, cupping, dieback

Honeydew & sooty mold

5

#10, 9, 8: Web-making Caterpillars

Eastern tent caterpillar (April to early May)

Fall webworm (mainly Aug to Sept)

Mimosa webworm on honeylocust

6

Eastern tent caterpillar

Overwintering ETC Egg Masses

1st instar ETC on Egg Mass

Egg hatch coincides with Forsythia bloom

1st instar ETC with Silk Covering Egg Mass

ETC Nest with Later Instar Caterpillars

Joe Boggs, OSU Extension

7

Dealing with Tent Caterpillars

Grocery bag mittens

Bag 'em

Five-toed Death Stomp

8

~~Kero-lighter Fluid~~

~~Match~~

~~Tent Caterpillar Nest~~

~~Burning Bush~~

9

Tent caterpillars like flowering crabapple, cherry, plum, hawthorn), **but so do bees!**

If you must spray, use a bee-friendly product or wait until after bloom

10

Bee-Friendly Product Update:

Chlorantraniliprole recently went off patent

Acelepryn[®]
Insecticide

DURENTIS
INSECTICIDE

AVAILABLE NOW

Less expensive generics will be available in 2025

THE WAIT IS OVER.
DIAMID T&O
THE ACELEPRYN / DURENTIS ALTERNATIVE IS HERE.

11

Fall Webworms? Do the Two-step

Step 1: Pole pruner

Step 2: Death Stomp

Fall Webworm Management Step 2

Where are we? I've a feeling we're not in Kansas anymore. OH NO! it's a giant shoot! OH NO!!! OH egg!!!

Joe Boggs, OSU Extension

12

Even a late-summer outbreak like this is unlikely to have lasting impact on tree health

Fall webworm outbreak
Black Walnut



Joe Boggs, OSU Extension©

13

Mimosa Webworm: a pest of honeylocust

Systemics (acephate, abamectin, emamectin benzoate) will work if control is necessary



14

#7 Bagworms

Especially on Evergreens



15

Bagworms Behaving Badly



16

People mistake them for "pine cones"
(until it's too late!)



17

Bagworms: The Mamas and the Papas



Female is wingless,
legless; never leaves
her bag






Male is a furry moth
that emerges in late
summer

18

Male moths mate with female in late summer

Female lays eggs in her bag, where they overwinter

19

Eggs hatch and young bagworms begin feeding in May





Newly-hatched bagworms on silk strand

20

Bagworms spread by wind and crawling




Bagworms spreading along a hedge

21

Winter is a good time to scout and hand-pick bagworms




22

Bagworm Control Tips

Handpick bags with egg masses in winter




Target small larvae with reduced-risk insecticide in late May or June




23

#6 Sawfly larvae


Adult sawflies are small wasps



Redheaded Pine Sawfly

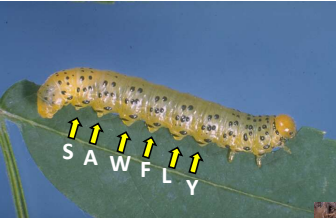


European Pine Sawfly




24

Sawflies versus caterpillars



Sawfly: 6 or more pairs of fleshy abdominal "prolegs" (enough to spell SAWFLY)
No little hooks on prolegs



Caterpillar: 5 or fewer pairs with little hooks

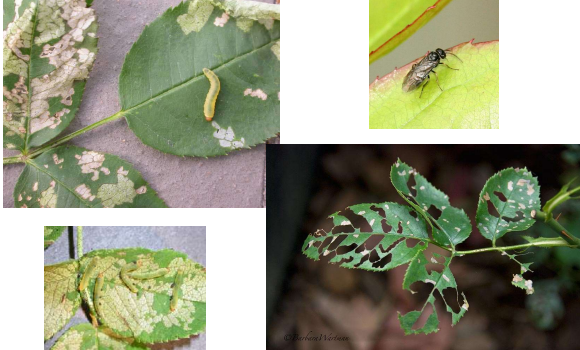
25

Sawflies behaving badly....



26


"Roseslug" is a Sawfly!



27


Stopping sawflies

Prune out and stomp small infestations!



Acelepryn, Provaunt, pyrethroids work well

BUT....Bacillus thuringiensis (Bt) products will not control sawflies!



28

Elm Zigzag Sawfly

A new invasive pest



So far, found in Virginia, Pennsylvania, North Carolina, Maryland, Massachusetts, and New York

29

6: Boxwood Blues



Boxwood leafminer

Boxwood psyllid: cupped leaves

Boxwood spider mite

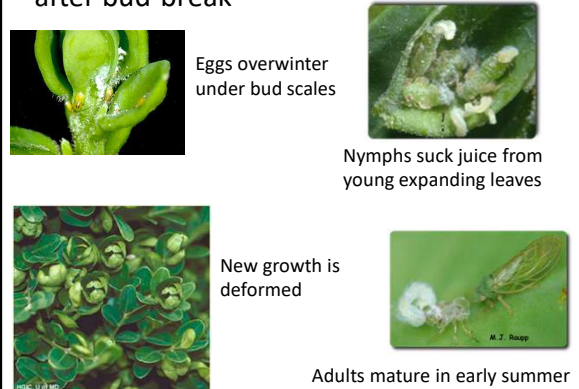
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Boxwood leafminer adults emerge at bud-break and lay eggs in expanding leaves



31

Boxwood psyllid damages new growth just after bud-break



32

Systemics work well for boxwood leafminer and boxwood psyllid!

Apply via the soil in early spring, before budbreak



But can be a bee hazard!



33

Spraying abamectin (Avid®) at first appearance of adults reduced larval mines by > 85%

Adults emerge at leaf flush, which is after bloom



- d'Eustachio and Raupp (2001)



34

Box Tree Moth

An important new invasive pest

Confirmed in New York, Massachusetts, Michigan, Ohio, Delaware, and Pennsylvania.



Adult moth



Joe Boggs, OSU Extension©

35

Box Tree Moth: What to Look For



Green to greenish-yellow caterpillars with black stripes and black dots



Webbing and frass



Joe Boggs, OSU Extension©



Joe Boggs, OSU Extension©

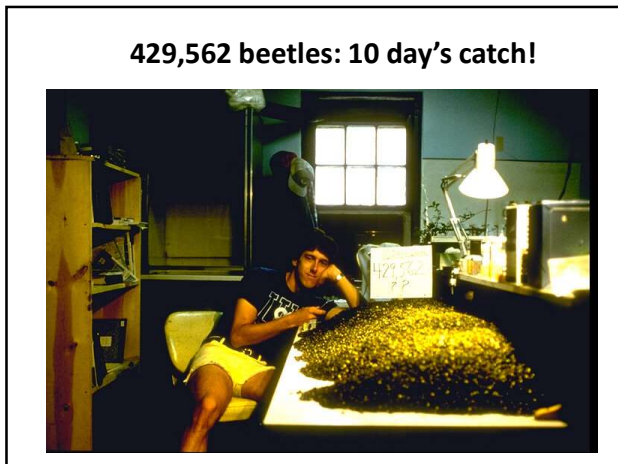
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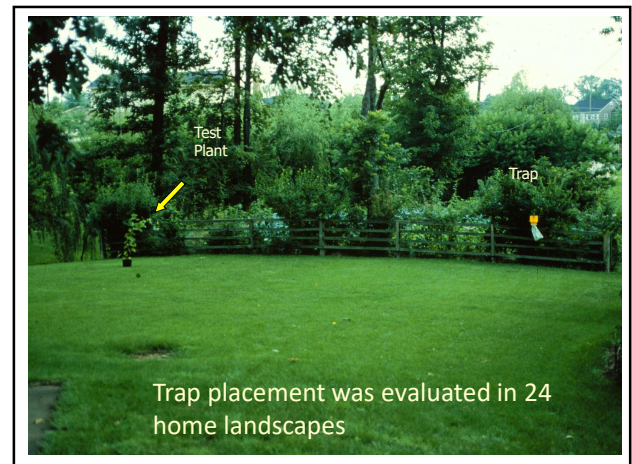
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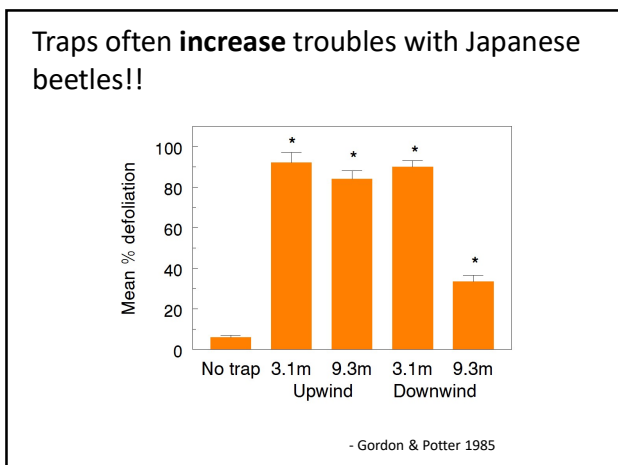
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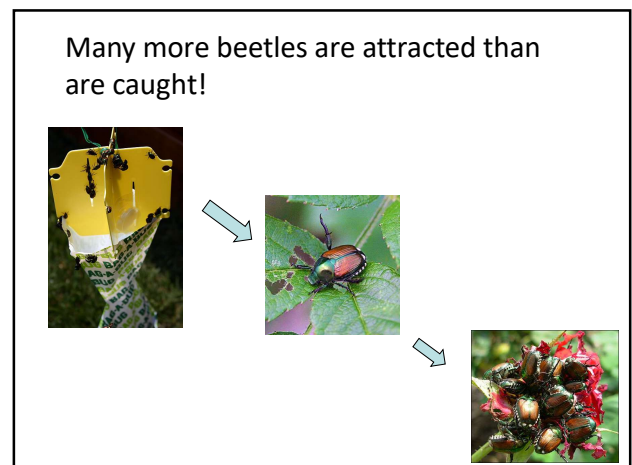
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46



47



48



49

Effective Japanese Beetle Sprays

Chlorantraniliprole (Acelepryn®, Durentis®)



(4 weeks residual, and “bee friendly”)

Pyrethroids

- **Onyx®** (4 weeks)
- Other pyrethroids (2-3 wks)
- Sevin (1 week residual)

50

Some Organic Options for Japanese Beetles

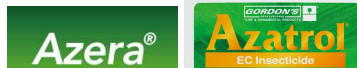
(These can deter JB for 3 to 7 days)



Beetle-active
Bt product



Pyrethrins +
canola oil



Neem
(azadirachtin)

51

Japanese beetles love
lindens (*Tilia* spp.)

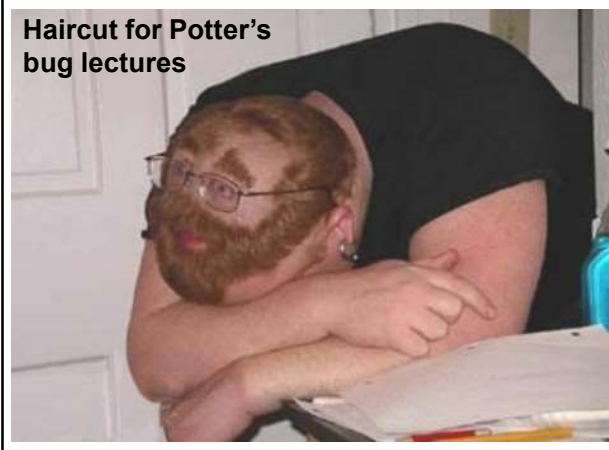
Bees do, too!



If you *must* treat lindens for JB, use a bee-friendly product or wait until after bloom!

52

Haircut for Potter's
bug lectures



53

#4 *There's a Sucker Born Every Minute*



Aphids



Lace bugs



Mites



Spotted lanternfly




54

Aphids

Cornicles ("tailpipes")

Sucking mouthparts

Live birth

55





Oak aphids, honeydew, and sooty mold

Myzocallis Oak Aphids on Burr Oak

Myzocallis Oak Aphids "Mainlining" Sap

Honeydew Myzocallis Aphids Burr Oak

Black Sooty Mold Myzocallis Aphids White Oak









56

Rose aphids with honeydew & sooty mold

Honeydew

Sooty mold

57

Many products work well for aphids

Systemic neonics, pyrethroids, Altus®, insecticidal soap, horticultural oil

Safer **Neem** **Altus**

Some bee-friendly options





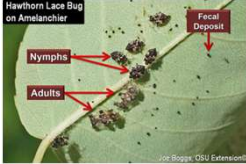


58

Lace bug symptoms

Shiny black fecal specks

Stippling, chlorophyll loss

Nymphs and adults on leaf undersides












59

Several lace bug species damage woody plants:

Azalea **Hawthorn** **Sycamore**

Pyracantha, cotoneaster, serviceberry **Oak**

60

Chlorophyll loss from Hawthorn Lace Bug



61

Soil-applied Systemics (acephate, imidacloprid, dinotefuran) work well for lace bugs



Wait until after bloom to minimize bee hazard

62

Mite Pests



Fine webbing

Tiny: about the size of a period (.) of 12-pt text
Eight legs
Leaf undersides



Stippling

63

Spruce spider mite on Alberta spruce

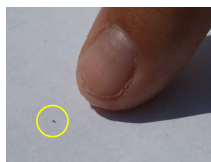


Twospotted spider mite on burning bush



64

Beating foliage over paper to dislodge and detect mites



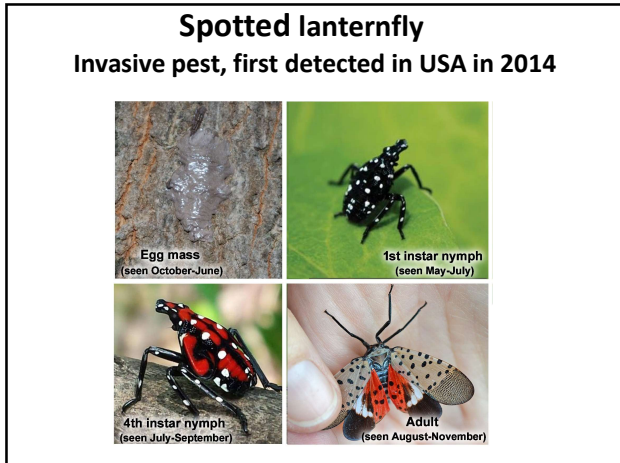
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Use a **Miticide!**

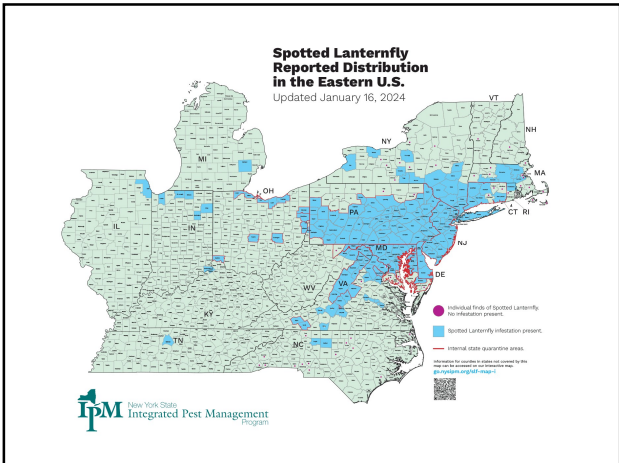
Choose one with **translaminar activity** (systemic through leaf surface) and that **controls all life stages, including eggs**



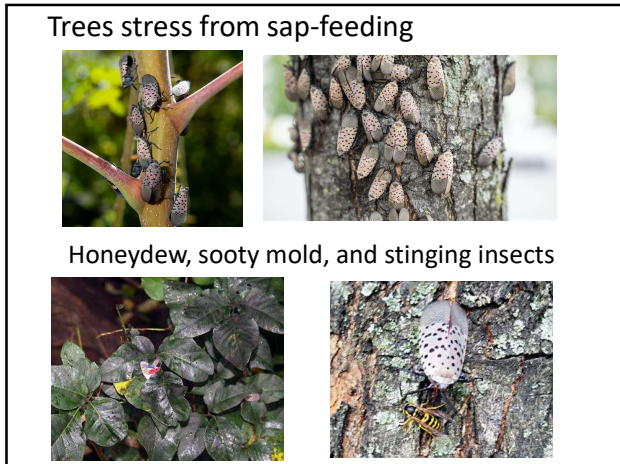
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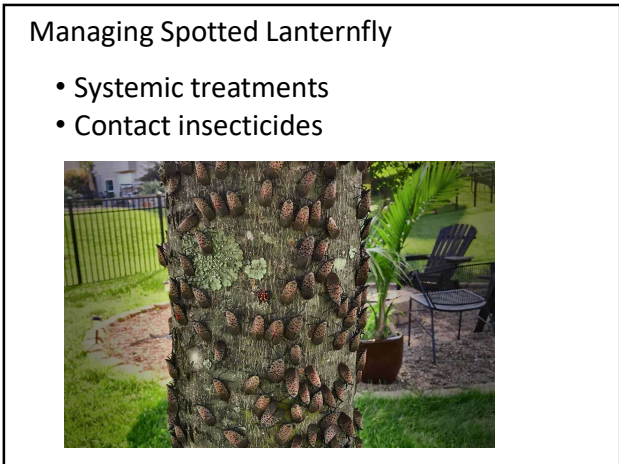
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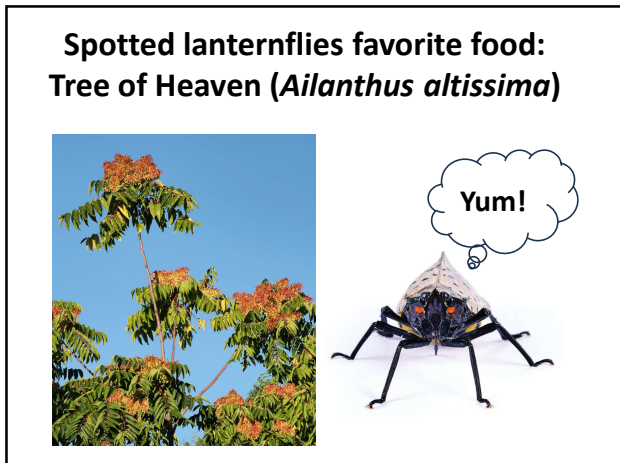
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69



70



71



72



3: Horned Oak Gall

Mainly on pin oak
 (sometimes on black, blackjack, Shumard, water, willow, and other oaks)




73

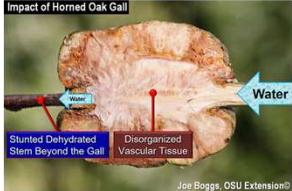

Horned Oak Gall

74

Heavy infestations cause branch death, thinning and tree decline

Galls inhibit vascular conductivity

75

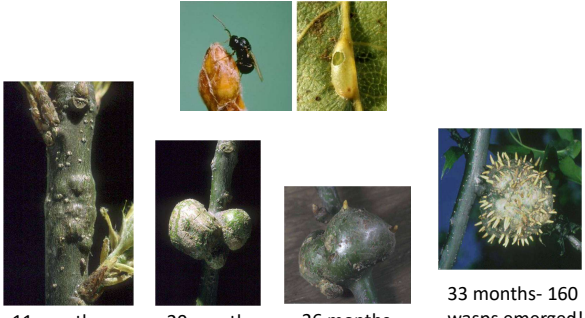
Horned oak gall wasp has complex, 33-month life cycle involving both leaf and stem galls



76

Why treatments usually fail:

The twig galls take nearly 3 years to mature!



77

Control efforts usually fail. Why?

Systemic insecticides don't reach larval chambers in galls



Old dried galls remain for years

78

Individual trees vary in susceptibility

(All photos taken in same row of trees on same day)

79

Removing heavily-galled trees *may* help save others nearby

In some cases, infestation gradually dies out on its own

80

#2 Emerald Ash Borer

81

Emerald Ash Borer

Toledo, Ohio, USA

Before (2006) After (2009)

Photo: D Herms

82

Diagnosing Emerald Ash Borer

Thinning, dieback starting at top of tree

Suckering

Tunnels under bark

D-shaped holes

83

Systemic Treatments CAN Protect Trees from Emerald Ash Borer!

Not Treated Treated Not Treated Treated

84

Rule of thumb: Under 30% canopy dieback, tree can be saved



Tree can still be saved



Too far gone to save

85

Systemic insecticides for Emerald Ash Borer



TREE-age



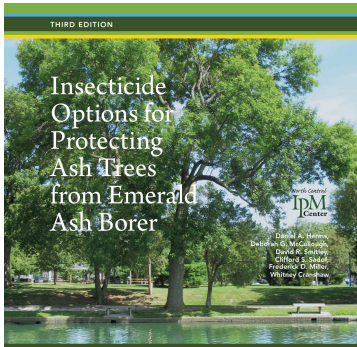
Emamectin benzoate
2-3 year's protection



Neonicotinoids
1 year protection

86

Posted on Conference Website



87

#1 Scale Insects



Armored Scales



Soft Scales

88

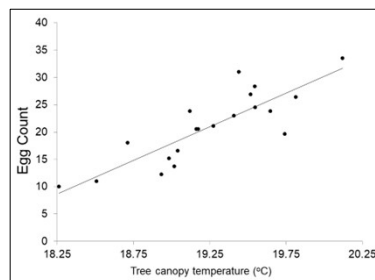
Stressed trees surrounded by hardscape are especially vulnerable to scale outbreaks



89

Scale insects are getting worse. Why?

Egg production increases with temperature



Eggs under a soft scale

Source: A. Dale, Univ. Florida

90

Scale insects are getting worse. *Why?*

New Invasive Scale Species



Japanese maple scale



Crapemyrtle bark scale

91

Armored Scales have detachable, shell-like cover made from shed skins and waxy secretions



Obscure scale on oak – an armored scale



Covers flipped to expose insects

92

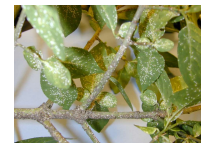
Armored scales encrust branches or leaves; cause dieback and death of plant



93

Dieback from Euonymus Scale

Variegated cultivars are especially vulnerable



94



Pine Needle Scale



95

Soft Scales

No detachable cover
Body shaped like an inverted teacup



Cottony maple scale



Magnolia scale




Oak Lecanium scale




Calico scale

96

Soft Scale Honeydew Issues....





Dripping honeydew



Sooty mold fungus



*%&\$!!



Attracts bees, wasps & ants

97

Option 1: Monitor for and target the crawlers





Detect crawler hatch with sticky tape

98

Phenology calendars help time crawler hatch using flowering plants as indicators



The Ohio State Phenology Calendar


Using this calendar

Timing Control Actions for Landscape Insect Pests Using Flowering Plants as Indicators

99

Example of Phenological Sequence



Species	Event
Red Maple	first bloom
Eastern Tent Caterpillar	egg hatch
Eastern Redbud	first bloom
Gypsy Moth	egg hatch
Snowdrift Crabapple	first bloom
Birch Leafminer	adult emergence
Common Lilac	first bloom
Pine Needle Scale	egg hatch
Vanhoutte Spirea	first bloom
Lilac Borer	adult emergence
Black Cherry	first bloom
Euonymus Scale	egg hatch
Black Locust	first bloom
Bronze Birch Borer	adult emergence
Mountain-laurel	first bloom
Juniper Scale	egg hatch
Littleleaf Linden	first bloom
Japanese Beetle	adult emergence




Pine needle scale crawlers

100

Distance® or Talus® sprays are effective against active or settled crawlers!


Crawlers





Both are Insect Growth Regulators (IGRs)

101

These work well as sprays for scale crawlers, and also are bee-friendly



102

Other “green” options for controlling scale insects:

Horticultural oil (2%) for armored scale crawlers



Insecticidal soap for soft scale crawlers






103

Option 2: Systemic insecticides

Lepitect® (acephate) soil injection

Dinotefuran (e.g., Safari®) or imidacloprid (Merit®) can work, but inconsistent






Soil injection with Lepitect®

Bark spray with Safari® or Transect®

104


Scrubbing bark with soapy water can remove many scale insects




105

Campus Scale Scrub!

Before



After

106

“Cadillac” 4-step Program for Scale Insects




1. Dormant oil



2. Soapy water scrub



3. Systemic insecticide



4. Crawler spray

107

Scale insects can be hard to control!

PURDUE UNIVERSITY | Extension ENTOMOLOGY | E-29-W

Landscape & Ornamental

Department of Entomology

SCALE INSECTS ON SHADE TREES AND SHRUBS

Clifford S. Sabel, Extension Entomologist

Scale insects are common pests of shade trees and shrubs. More than 60 different kinds occur in Indiana, yet they are often overlooked or ignored until tree or shrub branches mysteriously start to die. Upon closer examination, these branches are likely to be covered with small bumps that are actually scale insects. They damage plants by sucking out plant juices.

From a damage standpoint, there are two types of scales, those that excrete a sugary liquid (honeydew), and those which do not. Honeydew is both a nuisance and a threat to plant health. Parked cars, walks, and benches beneath infested trees often become a sticky mess. The sugary liquid attracts ants, flies and wasps. Plants become unsteady when this liquid becomes a food for a black fungus called sooty mold. This mold can shade leaves and reduce plant growth.

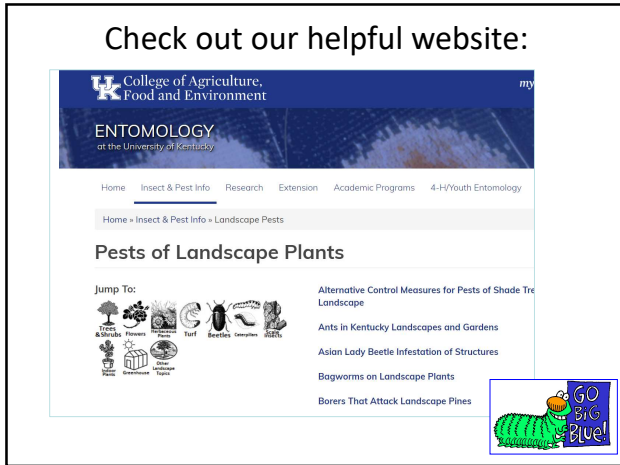
where they spend the winter as settled second stage scales. They continue to grow on twigs in the spring until winged males mate with wingless females, who swell with up to 1,000 eggs.

CONTROL MEASURES

Inspection Check plants for live scale infestations. Flip over suspicious looking bumps on twigs and branches with a thumbnail. Bark is usually intact beneath a scale. When a soft body is beneath it cover the plant is likely to have live armored scales. When the bump itself can be squashed it is likely to be some other type of scale. When honeydew falls from a tree, leaves should be inspected for live soft scales or mealybugs.

Cultural Control Scale will not live on trees that are under stress. Disturb roots

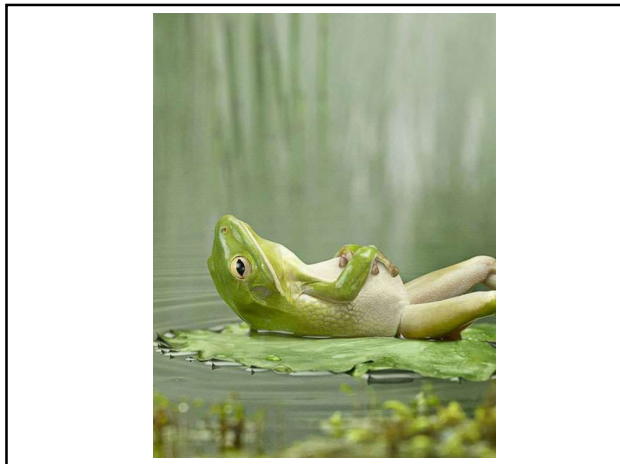
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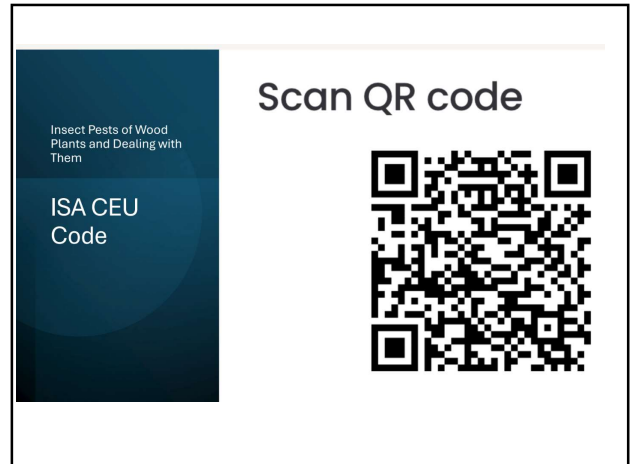
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