Scale Insects and Their Relatives

- What are scales?
  - Biology, Phylogeny
- Diagnosis of Scales
- Biology and Control of Key Species
Scale Insects and Their Relatives

- Aphids
- Adelgids
- Margarodid scales
- Ensign scales
- **Mealybugs**
- Bark scales
- Bark crevice scales
- Kermes or gall-like scales
- **Soft scales**
- False pit scales
- Pit scales
- Armored scales
How to tell scales from just another bump on a log?
Galls are bumps of plant tissue that rip when removed.
Armored Scale Diagnosis

Bumps present, no honeydew, bumps not part of plant
What Are Scales?

Pine Needle Scale Biology

Crawlers

Adults

Parasite
Exit hole

Settlers
Armored Scales Under a Waxy Cover
Armored Scale Diagnosis

Dieback

Waxy Scale Covers
Euonymus scale (armored)
Juniper scale (Armored)
Obscure Scale (Armored)
Oystershell scale (Armored)
Pine needle scale (Armored)
San Jose Scale (Armored)
Scurfy Scale (Armored)
Winged Euonymus Scale (Armored)
Armored Scale Summary

Winters as egg stage:
- Oystershell, Winged euonymus, and pine needle (in part)

One generation/year (Month)
- San Jose Scale (mid Jun-July)
- Obscure Scale (June or July)

Two generations/year (May, July)
- Euonymus, juniper pine needle, oystershell

Three generations/year
- Winged euonymus (May, July, September)
Golden Oak Scale (Pit scale)
Soft scale diagnosis

Honeydew and Sooty Mold  Bloated Scale Bodies
Cottony Maple Scale (Soft Scale)
Fletcher’s Scale (Soft Scale)
Magnolia Scale (soft)
Tuliptree scale (soft)
Spruce Bud Scale
Striped pine scale (soft)
Soft Scale Crawler periods

- April
  - Spruce bud scale
- May-June
  - Cottony maple scale
- June-July
  - Striped pine, Fletcher’s
- September
  - Tuliptree, Magnolia
European Elm Scale (Bark Scale)
Kermes scale
Mealybug Diagnosis

- Plant sticky and or coated with black mold
- Bumps not part of plant
- Bugs covered with waxy powder
Taxus mealybug
Hawthorn mealybug
Miscanthus mealybug

- An emerging problem on ornamental grasses
- Winters and gravid female
- Crawlers in spring
- Move on contaminated nursery stock
- Control with imidaclofrid
Miscanthus mealybug

http://www.ppdl.purdue.edu/ppdl/weeklypics/8-25-03.html