Scale Insects

Hemiptera: Many families
‘Soft’ Scales

Armored Scales
Some Important Armored (Hard) Scales in Colorado

- Oystershell scale
- Pine needle scale
- Scurfy scale
- Walnut scale
- San Jose scale
- Poplar scale
Armored Scales Family Diaspididae
Oystershell Scale
Oystershell scale can develop thick colonies on the bark of susceptible hosts.
Bark cracking is a common symptom of current or previous oystershell scale infestation of aspen.
Oystershell scale infested trees. Note bark cracking.
Oystershell scale flipped over to exposure lower surface. Some eggs are visible at right where the ‘test’ has torn.
Oystershell scale eggs (left) and recently hatched eggs, producing the Instar I “crawler” stage.

Eggs, under the cover of the mother, are the overwintering stage.
The crawler stage usually occurs in late May and early June. It lasts for about a week.

It is the only mobile stage of the oystershell scale – and all other armored scales.
Within about a week the crawlers have either ‘settled’ or died. They remain in place where they settled for the rest of their life.
Pine Needle Scale
Mother scale and recently laid eggs. Eggs are the primary overwintering stage.
Crawlers usually occur in early to mid May (ca. lilac full bloom)
Natural Enemies of Pine Needle Scale

Lady beetles that specialize in armored scales (*Coccidophilus* spp., *Chilochorus* spp.)
Natural Enemies of Pine Needle Scale

Parasitic Wasps
Poplar Scale on Aspen
Bark cracking (right) and bubbling (below) associated with poplar scale
Overwintering stage of poplar scale in Salida, March 7, 2007
Lady beetle predators of poplar scale
Some Important Soft Scales in Colorado

- European elm scale
- Cottony maple scale
- Striped pine scale
- Pine tortoise scale
- European fruit lecanium
- Soft brown scale
Soft Scales  Families Coccidae, Eriococcidae and others
Soft Scale Example – Cottony Maple Scale
Overwintering stage – Adult females that have not matured eggs.
Females swell with eggs in late spring
Crawlers move to the leaves in summer
Like aphids, soft scales suck sap from the phloem and excrete honeydew.
Overwintering stage – Adult females that have returned to the twigs in late summer.
European Elm Scale
Honeydew is excreted. Where it lands and persists, sooty molds grow.
Branch ‘flagging’ in late summer can be due to stress associated with high scale populations.
Crawlers return to twigs in late summer for overwintering.
Brown Soft Scale

*Coccus hesperidum*
Hemispherical Scale, Saisettia coffae
Crawler Treatments
Soft Scales vs. Armored Scales

Soft scales produce honeydew

Armored scales do not
Soft Scales vs. Armored Scales

Soft scales typically produce several hundred eggs.

Armored scales typically produce a couple of dozen eggs.
Soft Scales vs. Armored Scales

Soft scales retain mobility through their lifetime, moving from foliage to twigs.

Armored scales are only active during the crawler period.
Soft Scales vs. Armored Scales

Soft scales typically produce crawlers for several weeks in late spring and early summer.

Armored scales typically produce crawlers for a week or two in spring.
Principles of Scale Control

• Insecticides timed to coincide with crawlers
• Oils
  – Dormant season treatment
  – Post-crawler treatment
• Systemic insecticides (limited)
• Hand removal
CRAWLER TREATMENT
(Timed to coincide with egg hatch)
Crawler Treatments
Horticultural Oils

- Primarily act by smothering insects
- Derived from various sources
  - Petroleum/Mineral oils
  - Vegetable oils (cottonseed, soybean)
  - Neem seed extracts
  - Fish oils
Petroleum Derived Horticultural Oils (Mineral oils, paraffinic oils)
Dormant season (*dormant oil*) applications of oils tend to work more consistently on soft scales.

'**Soft’ Scales**

Armored Scales
Many current horticultural oils can be used on trees with foliage. Crawlers and young settled scales are targets.
Systemic insecticides applied to the soil for root uptake are primarily effective against phloem-feeding soft scales.
Scraping oystershell scale
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