Soft Scales in Utah Landscapes

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What You Should Know

• There are more than 1,000 different kinds of soft scales found throughout the world. Less than 5% are considered serious pests.

• Soft scales feed on a wide range of woody ornamental plants and often go unnoticed until they stunt growth or cause severe plant stress.

• Scales can be controlled with a combination of cultural control, scouting and reduced risk insecticides.

Soft scales are insects in the family Coccidae and are closely related to armored scales and mealybugs. Scales are fluid feeders with piercing-sucking mouthparts that remove plant phloem or sap. Settled immature and adult scales anchor their mouths to host tissue, rendering them immobile for most of their lives. Soft scales primarily attack woody ornamentals; a large infestation, whether in a landscape, greenhouse, or nursery setting, can cause severe damage. They are difficult to control because of their waxy covering, seasonal abundance, and high fecundity. Soft scales can infest hundreds of species of deciduous trees and shrubs, and several species of conifers. Examples in Utah include beech, elm, linden, maple, oak, pine, and yew. Some soft scales attack a wide host range (European fruit lecanium; Fig. 1) while others are host specific (European elm scale; Fig. 2).

Life Cycle

Life cycles vary among soft scales. In Utah, immature or unmated females overwinter on bark or twigs, and males overwinter in a pupal case. In spring, they resume their growth, feeding, and mating. In some species where males do not exist, female scales reproduce asexually through parthenogenesis. Females produce about 200-1,000 eggs. The female will either swell with eggs or form an egg sac at the hind end of her body that is covered with a thick, fluffy wax. Soon after egg-laying, the female dies, but her body hardens to protect the young. Some soft scale species give birth to live young, similar to aphids (i.e., viviparous birth).

Eggs hatch into mobile “crawlers,” or 1st instars. Crawlers are hardly visible to the naked eye, and may appear as specks of dust. Because of their small size, crawlers can be blown or splashed to nearby hosts, serving as the means of dispersal. Crawlers migrate to succulent growth in the summer. Eventually, crawlers move back to twigs or limbs where they develop a waxy covering, sometimes called a cap, and settle for the remainder of their lives. Females have three instars, and males have five. Most outdoor soft scales have one generation per year, but as the population builds, several life stages can be present at one time.
**Description**

**Female Adults:** Scales are unique insects in that the female adults’ bodies are not visibly segmented and their legs and antennae are absent or highly reduced. Their size and shape depend on the host and their position on the host. The European fruit lecanium, for example, may be large and rounded on one host, and completely flattened on another. In comparison to armored scales, adult soft scales are larger, more rounded, and do not have a hard, removable covering. They are hemispherical in shape, with either a glistening-smooth, waxy body, or white cottony surface (Figs. 1-4, 8-10). Adult females range in size from 2-6 mm, and are variable in color.

**Crawlers:** The crawlers are 1-2 mm in size, mobile, almost flat, and very pale in color (Fig. 3). They are wingless but have well-developed legs and antennae. The settled immature scales are elliptical, flattened, and several shades lighter than the adult.

**Males:** Although rarely seen, male soft scales resemble small wasps or flies (Fig. 4). They have distinct body regions and a pair of antennae. Some males have one pair of wings and are highly mobile during the summer. Males often have reduced or absent mouthparts and do not have a waxy covering. These males are short-lived and are rarely seen; their only purpose is to mate.

**Plant Damage**

Plants with a large scale infestation will show a marked reduction of vigor, yellowing of leaves, premature leaf drop, and death of twigs and limbs (Fig. 5). Most plants are able to tolerate light feeding. Unlike armored scales that feed on cell contents, soft scales feed on phloem by inserting a straw-like stylet into the host tissue. They generally consume more sap than needed, and are adapted to excrete copious amounts of honeydew. The nutrient-poor/sugar-rich honeydew serves as a substrate for the fungus that causes sooty mold, which can grow as a grey or black film on leaves and limbs (Figs. 6, 7). Honeydew is also a nuisance as it drips and covers nearby objects with a sticky sap.
Cultural Control: A heavy infestation of scale is sometimes a sign that the tree or shrub is under some kind of stress. Therefore, keeping plants healthy will minimize the negative effects caused by feeding from scales and other fluid feeding insects. In most cases, natural enemies will help regulate soft scale populations on many woody ornamental trees. Lady beetles and parasitoid wasps target the crawlers and sometimes the capped females. But there are many things homeowners can do to reduce soft scales. The following cultural steps can help minimize infestations:

- Regularly scout for scales in the spring by attaching double-sided sticky tape to limbs where scales occur and examine the tape for crawler activity or capped females.
- Prune infested branches and leaves to protect new growth.
- Rake, bag and discard infested debris.
- Scrub infested limbs with a mesh dish sponge to remove capped adults.
- Spray crawlers off limbs with a high pressure water hose.
- Keep trees in a healthy condition with optimal watering, fertilizing, and mulching. Make sure trees are planted in appropriate sites and soil depth.

Reduced Risk Insecticides: If oils or soap are not effective, consider using reduced risk insecticides to target soft scales. Reduced risk chemicals will conserve natural enemies and have a relatively short residual.

- Insect growth regulators, such as pyriproxyfen (Esteem), will help reduce scales on tree nuts, pome fruits, stone fruits, pear, or bushberries.
- Systemic insecticidal soil drenches, like imidacloprid (Merit) and others, are an option for persistent scale problems. Soil drenches are absorbed by the roots of the plant and target only fluid feeding insects like scales and aphids. Products like Merit will affect all feeding stages, including the adults.
- Other examples include a bacterial fermentation product called spinosad (Conserve) and a plant-derived product called pyrethrin (Pyganic).

Other Foliar Insecticides: As a last resort for soft scale control, foliar insecticides may be applied to infested trees. Crawlers are the targeted life stage for foliar applications and must be well-timed for effective control. Examples of foliar products for scale control include: carbaryl (Sevin), permethrin (Pounce). Foliar applied summer insecticides will also kill beneficial insects, so use these products with discretion.

Suffocants and Desiccants: In certain situations where soft scales are becoming established even with cultural control methods, applications of oils and/or soap can reduce feeding scales.

- Dormant oils will suffocate capped scales and emerging crawlers. Apply dormant oils before bud burst in the spring for optimal control.
- Horticultural oils should be used after bud burst and are geared to suffocate crawlers. Use care when applying summer oils because they can burn new growth.
- Insecticidal soaps remove the waxy cuticle and cause dehydration of soft scales, especially at the crawler stage. Soaps are only effective when wet, so multiple applications may be necessary for adequate control.
**Examples of Soft Scales in Utah**

**Brown soft scale, Coccus hesperidum**
Hosts: avocado, citrus, cottonwood, holly, manzanita, palm, poplar, stone fruit, willow.

Found worldwide, this subtropical scale occurs outdoors only in southern Utah, but may also be a common pest of indoor and greenhouse plants throughout the state. The brown soft scale may have up to three generations per year in warmer climates. Adults are yellowish green, often mottled with brown spots (Fig. 4).

**Cottony maple scale, Pulvinaria innumerabilis**
Hosts: linden, maple, basswood, ash, elm, hawthorn, locust, fruit trees, and others.

These scales become most visible when they produce their cottony white egg sac in early summer (Fig. 9). Large outbreaks are generally only seen on stressed or weakened trees. The crawler stage occurs from mid-June to early August in northern Utah.

**European elm scale, Gossyparia spuria**
Hosts: native and introduced elms.

The adult female has a distinctive, white cottony fringe (Fig. 2). The crawler stage occurs from late June to late July in northern Utah.

**European fruit lecanium, Eulecanium corni**
Hosts: maple, elm, beech, birch, ash, linden, fruit trees, and many more.

This species varies in form depending on its host, making identification difficult (Fig. 1). It can build to a large population quickly, to the point where scales will settle on top of nearby scales. The crawler stage occurs from early July to mid-August in northern Utah.

**Fletcher scale, Parthenolecanium fletcherii**
Hosts: yew (preferred), arborvitae, juniper, and pachysandra.

Fletcher scale begins feeding early in spring, so signs of damage should be quite apparent. Crawlers are not very mobile, so there are often localized, dense populations. The crawler stage occurs from late June to late July in northern Utah.

**Spruce bud scale, Physokermes piceae**
Hosts: Norway spruce and dwarf Alberta spruce.

Spruce bud scale is somewhat rare in Utah, but has been reported on dwarf Alberta spruce. It is a small scale and often overlooked because the scales resemble buds on twigs. The appearance of black sooty mold on needles and bark, as well as death of lower limbs aids diagnosis. These scales congregate at shoot tips and lower branches (Fig. 10). The crawler stage occurs from early to mid-June through mid-July.

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1 Images courtesy of Marion Murray, Utah State University Extension.
3 Images courtesy of Whitney Cranshaw, Colorado State University Extension (www.ipmimages.org).
5 Image courtesy of Steve Katovich, USDA Forest Service (www.ipmimages.org).

**Precautionary Statement:** All pesticides have benefits and risks; however following the label will maximize the benefits and reduce risks. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.

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