

Black (*Saissetia oleae*), Citricola (*Coccus pseudomagnoliarum*),
Cottony cushion (*Icerya purchasi*), Soft brown (*Coccus hesperidum*)

Alison Fattore, NSW DPI, 2024

Risk period

Table 1. The risk and monitoring periods for soft scale activity.

Flowering		Fruit drop			Golf ball			Colour break		Maturation	
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul

Soft scales differ from hard scales. Soft scales do not have a separate cover disconnected from their body. Soft scales excrete more honeydew than hard scales and promote increased sooty mould growth.

Description

Eggs: up to 2,000 pink eggs can be produced by black scale (*Saissetia oleae*), 1,500 by citricola (*Coccus pseudomagnoliarum*) scale and 1,000 bright orange eggs from cottony cushion (*Icerya purchasi*) scale, which have distinctive white, 10 mm long fluted, cottony egg sacs (Figure 1). Most species lay eggs underneath their body. Soft brown scale (*Coccus hesperidum*) differs, giving birth to about 200 live crawlers.

Nymphs: are mobile and approximately 1 mm long. Black, citricola and soft brown scale nymphs are very similar and easily confused. They are oval, flat, yellow-green to yellow-brown. Cottony cushion nymphs are bright red (Figure 2).

Adults: males are mobile with one pair of wings, are short-lived and rarely seen. Females are soft-bodied and have a protective covering of thick waxy or mealy secretion. They produce large amounts of honeydew, promoting sooty mould growth. The adult scales seen on infested trees are usually immobile females. Black scale are dome-shaped, 3–5 mm long, black or dark-brown with an H-pattern ridge on their back (less obvious in reproducing females) (Figure 3). Citricola scale are convex, 3–4 mm long, and grey-brown with a ridge running the length of the body (Figure 4). Cottony cushion scale are 5 mm long, red-brown and covered with a white mealy secretion (Figure 5). Soft brown scale are oval, flat, 3–4 mm long, yellow-green or yellow-brown with brown mottling that darkens with age (Figure 6), and a ridge that stops before the end of the body.

Life cycle

Eggs are laid under the female's body over 4–6 weeks, hatching after 2–3 days (Figure 7). Egg hatchlings and live born are called crawlers, which usually develop through 2 nymphal stages and settle on leaves and twigs (rarely on fruit), becoming immobile, where they reproduce once mature. Most soft scale produce 1–2 generations per year except for soft brown scale, which produce 3–4. Various life cycle stages of soft brown scale can be found at any given time, while other soft scales are usually at a similar life cycle stage.



Figure 1. Fluted egg sacs of cottony cushion scale (*Icerya purchasi*).



Figure 2. Bright red cottony cushion scale nymphs (*Icerya purchasi*) on a fluted egg sac.

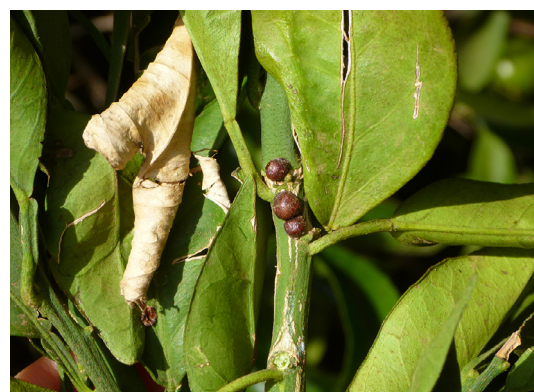


Figure 3. Immobile black scale adults (*Saissetia oleae*) on a green twig.

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Figure 4. Adult citricola scale (*Coccus pseudomagnoliarum*) with ridge along the body. Photo: Smith et al. (1997).



Figure 5. Cottony cushion scale (*Icerya purchasi*) covered in a white mealy secretion.



Figure 6. Immobile soft brown scale adults (*Coccus hesperidum*) with brown mottling.

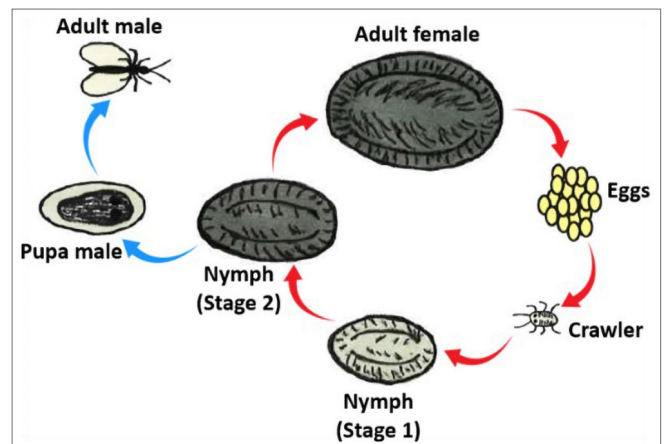


Figure 7. Generalised life cycle of a typical soft scale.

Damage

Soft scales excrete copious amounts of sticky honeydew that drips on tree surfaces, promoting superficial sooty mould growth on fruit, leaves and twigs, downgrading fruit (Figure 8). Leaf drop may occur in severe infestations. Soft scales are a problem in young trees as heavy infestations promote thick, sooty mould growth, slowing photosynthesis and tree growth. Ants actively protect soft scale from natural enemies (Figure 9) for their honeydew secretions (Figure 10).



Figure 8. Soft scale promote superficial sooty mould growth on fruit, leaves and twigs.



Figure 9. Ants protecting cottony cushion scale (*Icerya purchasi*) for their honeydew.

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Risk period: October to March (Table 1).

Monitoring

All citrus varieties are susceptible. Monitor trees during the risk period. Use a 10x hand lens to check leaves and green twigs for signs of scale and sooty mould growth. The number of trees to be inspected depends on orchard size. Inspect young branches from representative healthy trees.

Management and control

Scale become a serious problem in citrus when the predator and parasite balance is disrupted. Broad-spectrum insecticide use kills beneficial insects, reducing their number and diversity. Ant activity can exacerbate the scale problem, so ant hotspots should be controlled.

Biological: natural predators include the lady beetles *Cryptolaemus montrouzieri* (Figure 11 and Figure 12), *Rodolia cardinalis* (Verdalia lady beetle), *Rodolia koebeli*, *Rhyzobius lophanthae*, *Diomus notescens* and *Orcus australasiae*. Both larvae and/or adult lady beetles prey on soft scale. Green lacewing (*Mallada* spp.) (Figure 13) and brown lacewing (*Micromus* spp.) larvae feed on soft scale. Parasitic wasps, including *Coccophagus* spp., *Metaphycus* spp., *Anicetus* spp. and *Microterys* spp., lay eggs inside scale, while the *Scutellista caerulea* wasp feeds on scale eggs. *Cryptochaetum iceryae* is an important natural parasitic fly of cottony cushion scale, as they lay their eggs, feed and develop inside the scale, killing it. A caterpillar (*Catoblemma dubia*) also feeds on soft scale.

Cultural: inter-row vegetation can encourage natural enemies by promoting food abundance and protection. Maintain food and shelter for beneficial insects by alternate mowing of inter-rows. Scale are very lightweight and easily dispersed by wind. Minimise dust by avoiding bare soil in inter-rows and using windbreaks.

Chemical: decisions to spray should be based on monitoring; avoid calendar spraying. Using broad-spectrum chemicals to manage other pests also kills natural enemies of soft scale, promoting scale outbreaks. Horticultural oil sprays give good control of most scale and are less harmful to beneficial insects. Good control is achieved when sprays are applied during the most susceptible growth stages (active crawlers and newly settled scale). Applying oil sprays during hot weather or when trees are water-stressed can damage trees.

More information

Kabashima JN and Dreistadt SH (2014). *Scales: integrated pest management for home gardeners and landscape professionals*. Pest Notes, Publication 7408, University of California. <https://ucanr.edu/sites/sjcoeh/files/309011.pdf>

Smith D, Beattie GA and Broadley R. 1997. *Citrus pests and their natural enemies: integrated pest management in Australia*. Queensland Department of Primary Industries, <http://hdl.handle.net/10462/pdf/9446>



Figure 10. Cottony cushion scale (*Icerya purchasi*) secreting a droplet of honeydew.



Figure 11. Adult *Cryptolaemus montrouzieri* lady beetle, a natural predator of soft scale. Photo: Sonya Broughton, Department of Agriculture and Food Western Australia, Bugwood.org.



Figure 12. Larval *Cryptolaemus montrouzieri* lady beetle, a natural predator of soft scale. Photo: Sonya Broughton, Department of Agriculture and Food Western Australia, Bugwood.org.



Figure 13. Green lacewing larva (*Mallada signatus*), a natural predator of soft scale.

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