

Spitfires – Defoliating Sawflies

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Sawflies are very common insects on Eucalypts. They are not flies but wasps and are related to the Cherry and Pear Slug which is a pest of fruit trees.



There are many different species of sawflies which can cause serious damage to Eucalypts. The larval, or immature stages of some species defoliate trees, those of other species are leafminers. This fact sheet discusses those that defoliate trees. Leafmining sawflies will be dealt with in a later fact sheet.

The term "sawfly" refers to the ovipositor of the adult females. This is a saw-like instrument used to lay eggs. The female wasp uses it to abrade the leaf surface in preparation for egg-laying.

The young, or larval stages of defoliating sawflies are often called "spitfires" because of their habit of ejecting a yellowy-green, eucalyptus smelling liquid when disturbed.

Larvae are highly gregarious and occur in large groups or colonies often containing several hundred individuals clustered together on the branches of eucalypts.

The most common defoliating species are:
Steel-blue Sawfly (*Perga dorsalis*)
Large Green Sawfly (*Perga affinis*)
Eucalyptus Sawfly (*Perga kirbyi*)
Small Brown Sawfly (*Pseudoperga lewisii*)



Description

Adults: Adults of the Steel-blue Sawfly and the Large Green Sawfly are very similar in appearance. They are large, stout bodied wasps, dark green in colour with orange/yellow patches on the shoulders and in the middle of the back. They are approximately 25mm in length with a wingspan of 50mm. Adults of the Eucalyptus Sawfly and the Small Brown Sawfly are smaller than those described above and are pale brown in colour.



Adult Steel-blue Sawfly



Female Small Brown Sawfly guarding egg raft

Larvae: These vary in size and appearance depending on species. In general, the larvae range from medium to large in size (up to 75-80mm in length). They have three pairs of thoracic legs and no abdominal legs except for on the tip of the abdomen. They generally taper along the length of the abdomen.

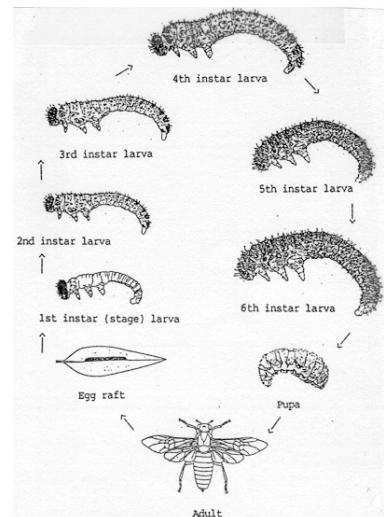
Larvae of the Steel-blue Sawfly and the Large Green Sawfly are large (80mm in length) and black in colour with numerous short, white hairs. They have a shiny black head and the tip of the abdomen is yellow. Larvae of the Eucalyptus Sawfly are 40-50mm in length and pale brown in colour with a black head. They are also covered in short white hairs but these are not as conspicuous as on the black species.

Larvae of the Small Brown Sawfly are smaller than those described above and pale brown in colour.

Life History

The different species of sawflies described above all have very similar life histories and habits. Most species have one generation per year but some only have one generation every two years.

Eggs are laid individually in "rafts" or "pods". Each raft contains from 30-90 eggs. These rafts resemble long swellings on the leaf. Some species lay their eggs parallel to the midrib, others along the leaf edge. Eggs hatch in 2-8 weeks depending on the species and the temperature. There are six larval stages. These last from 2-4 months, again depending on the species. Steel-blue Sawfly larvae are present in spring and summer as are larvae of the



Eucalyptus Sawfly and the Small Brown Sawfly. Larvae of the Large Green Sawfly are present in autumn and winter and consequently take longer to develop. When fully grown, larvae crawl down the tree en masse and burrow into the soil where they form pupal chambers or cocoons constructed from soil particles cemented together.

The emergence of adult wasps from these cocoons is spread over a considerable time. Some may emerge in a few months, others in 1-2 years. Adult wasps do not feed. They live for 7-9 days during which time they lay their eggs. Reproduction is parthenogenic i.e. mating is not necessary for the production of fertile eggs (see later).

Habits

Defensive behaviour: As mentioned previously, sawfly larvae are highly gregarious. They cluster together in the daytime, often in huge groups and then disperse to feed singly at night. This clustering behaviour offers some protection from natural enemies. Very young larvae form groups with their heads all pointing outwards - again, defensive behaviour.

When disturbed, larvae tap their abdomens up and down and regurgitate a thick, greeny-yellow fluid. This is a very effective deterrent for would-be predators and parasites.

Egg-laying behaviour: Several studies have revealed some interesting facts about the egg-laying behaviour of sawflies:

Egg-laying females avoid the shade and, particularly in winter lay their eggs on the westerly side of the tree;

Larvae grow slowly in the shade and tend not to survive to the end of the larval stage if they are in the shade; and

Females prefer young adult leaves for egg-laying. If eggs are laid on immature, glaucous (blue-green) leaves, the larvae do not survive.

Other behaviour: If several colonies of larvae occur on one tree, they eventually all link up to form one huge colony.

Most sawflies are females - males are rare. Females are able to produce fertile eggs without mating. This feature is common to many other wasps and their close relatives, ants and bees.

In some species, e.g. the Small Brown Sawfly, the female wasp remains with the egg raft until the eggs have hatched. She protects it by buzzing loudly and beating her wings if enemies approach.

Damage

In general, although sawflies are very conspicuous on the trees, they do little damage if they occur on large trees and there are few larvae. Eucalypts have a great ability to regenerate quickly after the initial attack unless such factors as drought or other insects further weaken the trees.

However occasionally major outbreaks do occur and may cause considerable damage to trees particularly if the trees are young. In large numbers, sawflies are capable of rapidly defoliating whole trees and may cause dieback, stunting or even death of small trees. For this reason, they must be regarded as having the potential to be significant pests of

eucalypts grown in plantations.

The damage is done by the larval stages. Young larvae feed only on one surface of the leaves while older larvae eat the whole leaf, often leaving only the midrib.

Control

Mechanical control: Colonies on individual trees may be removed and killed by squashing or dropping into boiling water or kerosene, however this method is not practical in plantations.

Natural control: Predators - many birds find the larvae distasteful but currawongs and cuckoo-shrikes will eat them. Pardalotes, honeyeaters and fantails will occasionally feed on the eggs and several birds will eat the adults. Larvae are also eaten by lizards and frogs. Pupae in the soil are preyed on by several different species of beetle larvae.

Parasites: Larvae and pupae are parasitised by flies and by other wasps species.

Disease: Eggs and pupae are subject to fungal and bacterial diseases particularly in warm wet weather.

Other: Many larvae die when attempting to burrow into the soil to pupate. At this time they are vulnerable to desiccation and attack from natural enemies. Larvae also do not seem to survive in colonies smaller than about 20 individuals.

Chemical: Small trees can be sprayed with maldison, dimethoate or carbaryl if it is not practical to remove and destroy larvae by hand.

Summary

When to look: Larvae of different species can be found all year round but are most common in spring and summer.

Where to look: Look on the branches and stems, very young larvae may be found on young mature leaves.

What to look for: Look for clusters or colonies of caterpillar-like larvae which, when disturbed, regurgitate a yellowy-green fluid.

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