

Fact Sheet 7 A new pest organism in New Zealand

POPLAR SAWFLY *Cladius grandis*

Have you seen this unusual insect on your poplar trees? If you have spotted it we want to know! There are no other yellow/ orange caterpillars with black spots that feed on poplar leaves. Any findings outside of Dunedin could indicate this new pest is moving through the countryside and this needs to be reported. For more information on this pest see the sections and photos below.

How do I report it?

1. By uploading a photo onto the iNaturalist website and typing “poplar sawfly” under the species name: <https://inaturalist.nz/home>

2. Via the Find-A-Pest app. This app can be downloaded free from the Apple or Android app stores. Open the app, join the forestry sector from the settings menu and choose forestry on the front page of the app. You can then click on the pest image with the name “poplar sawfly”, take a photograph of the suspect caterpillar, and this will automatically notify trained entomologists.

What does it look like?

Poplar sawfly larvae are between 4 and 18mm long and may be seen on poplar leaves from December to March. They begin as pale crème, but become yellow to orange as they grow, with two rows of black spots and covered in whitish hairs. Their heads are blackish and brownish, except some yellow spots on the frontal part.

History:

The first sightings of the hairy poplar sawfly (*Cladius grandis* Serville) in the southern hemisphere were made in Dunedin, New Zealand, just recently in January 2019. The poplar sawfly is a species of sawfly (a wasp in the Family Tenthredinidae, similar to willow sawfly) that is widespread in the northern hemisphere. *C. grandis* is native to Europe and the Middle-east but invaded North America in the late 18th Century. It found American poplars to be just as suitable host trees as Asian poplars.

Host trees:

C. grandis lay eggs and feed almost exclusively on Poplar species and cultivars, but Willow may occasionally be targeted. Overseas *C. grandis* has been described as an ‘outbreak’ pest where damage is usually low, but population densities can occasionally build to very high levels, cause severe defoliation and even kill trees. Some varieties of poplar are more susceptible to infestation and damage than others, and these include *Populus nigra*, *Populus deltoides*, and their various hybrids which are commonly grown in New Zealand. At some

stage *C. grandis* populations in New Zealand could increase to the point of severe damage to poplars, and for that reason the NZ Poplar Willow Research Trust is involved in a Sustainable Food Fibre Futures (MPI-funded) project to monitor the pests' behaviour and seek resistant cultivars (<https://www.mpi.govt.nz/dmsdocument/40070/direct>).

Which cultivars does it like best?

Scientists have been studying *C. grandis* in the field in Dunedin, and so far no completely resistant varieties have been confirmed. Many of the NZ PWRT's selections are crosses that have parental trees that are either *Populus nigra* or *deltoides* which the sawfly finds palatable. We have some concerns about the future impact the pest could have.

Phenology in New Zealand:

Emerged adult sawflies were first seen at the end of October and egg-laying began in the first week of November and extended until the first week of January. Larvae of a range of instars can be found feeding from December to March.

Table. Life Stages of the hairy poplar sawfly present on *Populus* species in Dunedin. Life stages are: A Adult, E viable eggs, LG gregariously feeding early instar larvae, LS singular feeding late instar larvae

	OCT	NOV	DEC	JAN	FEB	MAR
Site 1	A	A E	A E LG	A E LG LS	LG LS	LG LS
Site 6		A E	A E LG	E LG LS	LG LS	LS

Description/biology:

Adult female *C. grandis* deposit one to two rows of eggs into the tissue of the petioles of leaves, which present as rows of bumps along the petiole. Each petiole may bear as low as 4 and as high as 36 eggs. With her serrated saw-like ovipositor, the adult female will cut a neat pocket into the tissue of the petiole which can take approximately 3 minutes before depositing a single egg, after which she will move further up the petiole to do more. If not disturbed, a single female may spend more than an hour working on laying two long rows of eggs into both sides of a single petiole, one side at a time.

Tiny white larvae with little brown heads emerge about four weeks after eggs are laid and start feeding together clustered in tight groups on the lower surface tissue of leaves, creating noticeable skeletonization damage. The larvae are usually developed enough to start chewing through the entire leaf after a couple of weeks. As the larvae grow, their body develops darker spots that run down the length of their bodies, and their mostly white colour turns pale green which is then replaced by yellow at their extremities. In their final larval stage when they are a deep orange yellow with distinctive black spots, the larvae cease feeding and begin travelling to find somewhere to pupate. Larvae have been seen

migrating from their trees and across a road to the tyres of vehicles. Earlier papers from the northern hemisphere have reported that these migrating larvae can constitute an annoyance to residents living nearby.

C. grandis like all sawflies undergo complete metamorphosis so the winged adults that emerge in late spring from the pupae are distinct but with the same orange colouration, on the abdomen. Both male and female adults have a black head, black on the back of the thorax, two black 'pentagon-shaped' plates on their 'chest', and the rest of their bodies including the legs are yellowy-orange. Females usually have a larger abdomen than the males, but a more accurate indication of sex is presence of the saw-like ovipositor which looks like a dark slit at the bottom rear-end of the female. Using a microscope or phone camera, the males can be seen to have fine hairs all over their antennae, while females in comparison have smooth hairless antennae. *C. grandis* mature eggs over time. Mature ripe eggs are about 1mm long. Adults have been observed flying about in mating swarms in early summer, sometimes several meters away from their host trees.



Defenses:

The larvae possess ventral glands where they secrete mildly odorous volatile compounds when disturbed. The bright colour of the older larvae may reflect their unpalatability, as birds have rejected them in experimental bioassays and predation has not been observed in the field. The exact reason for rejection by birds is unknown but could be due to unpalatable chemicals present in the bodies of the larvae. As the common name 'hairy poplar sawfly' suggests, *C. grandis* larvae are covered in hairs. Although the hairs are not irritating (non-urticating), they can play a role as a physical barrier or as tactile sensory accessories. Both adults and the older bright-coloured larvae have been observed to 'drop' from where they perched in response to potential threats. For example, when turning over a leaf to expose the larvae feeding underneath, some will curl up and fall to the ground perhaps in response to sudden changes in light.

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