Manaaki Whenua
Landcare Research

SCOTCH THISTLE GALL FLY

Urophora stylata

The Biological Control Of Weeds Book - Te Whakapau Taru: A New Zealand Guide ISBN 0-478-09306-3

History in New Zealand

Scotch thistle gall flies are native to Europe, and they were first imported from Australia (where they have also been used as a biological control agent) by Landcare Research in 1997. Two further shipments of the flies were imported from Australia and the USA in 1999. The flies have been released at a limited number of sites and have established readily, although it will be some time before they can be commonly found throughout the country

How would I find/recognise it and what is its lifecycle?

The flies emerge in late spring and you may see them resting on thistles throughout the summer. The adults have dark bodies, distinctive black stripes on the wings, and are about 4-8 mm long. They are almost identical to nodding thistle gall flies (see *Nodding thistle gall fly*) both in terms of biology and appearance, but the markings on the wings are subtly different. You may notice the male flies as they set up territories on bolting Scotch thistles and attract females by displaying their wings. You will not be able to see the eggs, as the females use their long black ovipositors to lay batches of eggs in the green unopened flower buds. The eggs are laid in the gap between the developing florets and the overlying spiny bracts.

Creamy-white larvae hatch about a week later and burrow down through the florets into the receptacle (the part of the flower that supports and nourishes the developing seeds). Larval feeding stimulates the plant to produce a swelling, or gall, around each larva. If several larvae are feeding inside the same flower head, then the individual swellings fuse to form a multi-chambered woody gall.

You can identify infested flower heads using the following method. Wearing thick leather gloves (to avoid getting spines in your fingers) carefully pick a mature dried flower head and pinch the centre of it between your thumb and forefinger. If it feels hard and lumpy then the flower head is infested, otherwise it will feel smooth and flat. Infested flower heads often still have shiny white pappus hairs attached to them and a tufted appearance. Attempt to break the flower head open, using a knife if necessary, to reveal the yellowish chipboard-like interior and creamy gall fly larvae inside. If the flower head is easy to break open and looks black inside, then it is infested with the nodding thistle receptacle weevil (see *Nodding thistle receptacle weevil*). You may also find flower heads that are infested by both agents and show some of the characteristics of each.

The larvae feed on succulent tissue on the inside of the gall for about 5 weeks, and develop at the expense of the surrounding seeds. As the flower head matures, some flies pupate inside the galled flower head and emerge as new adults to begin a second generation on late flower heads. However, the majority remain as prepupae inside the flower heads throughout the winter, and emerge as new adults the following spring.

Scotch thistle gall fly

How does it damage Scotch thistle?

The larvae are the damaging stage and they affect the thistle's seed production. A flower head may support 5-20 larvae (and sometimes more). Studies in Switzerland have shown that an average of four galls per flower head can reduce the amount of viable seed by 80%. In Canada the flies attack as many as 90% of flower heads and have reduced seed production by 60%. We do not yet know what proportion of seeds Scotch thistle gall flies destroy in New Zealand

Will it attack other plants?

No, Scotch thistle gall fly is extremely unlikely to attack any plants other than Scotch thistle (*Cirsium vulgare*) and Californian thistle (*Cirsium arvense*), to a lesser extent.

How effective is it?

The impact of Scotch thistle gall fly has not yet been measured in New Zealand.

How can I get the most out of it?

If Scotch thistle gall fly is not yet present in your area you can accelerate dispersal by shifting some from an established site.

How do I select a release site?

Read *Guidelines for selecting release sites for biocontrol agents.*

How do I collect it for release at other sites?

You need to collect infested flower heads once they have dried off in the autumn. Release between 50 and 100 infested flower heads at each new site and you should leave at least 100 infested flower heads at your collection site. We recommend that you put the flower heads in an onion bag or similar - something that is strong enough to last the winter, that has holes in it large enough to let the flies get out in the spring, but is not so large that the flower heads fall out. Divide your flower heads up amongst several bags and securely tie them up off the ground (where mice cannot get them) in a shady area.

How do I manage the release sites?

You need to collect infested flower heads once they have dried off in the autumn. Release between 50 and 100 infested flower heads at each new site and you should leave at least 100 infested flower heads at your collection site. We recommend that you put the flower heads in an onion bag or similar - something that is strong enough to last the winter, that has holes in it large enough to let the flies get out in the spring, but is not so large that the flower heads fall out. Divide your flower heads up amongst several bags and securely tie them up off the ground (where mice cannot get them) in a shady area.

Grubs in flowerhead

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