DARWIN'S BARBERRY SEED WEEVIL

Berberidicola exaratus

History in New Zealand

The Darwin's barberry seed weevil is native to central and southern Chile. It was first imported from Chile by Manaaki Whenua - Landcare Research into containment to complete safety testing in 2012. Permission to release this weevil was granted by the EPA late in 2012, but releases did not begin until 2015 due to rearing and disease issues. Establishment has been confirmed in Southland and recoveries have been made in Wellington. This weevil has not been used as a biocontrol agent anywhere in the world before.

How would I find/recognise them and what is their lifecycle?

In October and November look for adults by beating bushes over a beating tray or by visually looking for adults feeding on the underside of leaves or resting in the leaf or spine axils - they cling tenaciously on to these if disturbed. Adults are blackish in colour with a slight pubescence, and are only about 3–4 mm long, Females are usually slightly larger than males. You may also notice adult feeding damage which often appears as a series of small craters on the underside

Larvae feeding inside a seed

Adult

of leaves along the leaf margin or mid rib, and puncture holes in developing and mature fruit.

Females lay a single white egg within a feeding hole made in a young developing fruit. Eggs hatch after about a week into pale larvae which feed inside the fruit and either damage or consume the developing seeds. Shrivelled fruit or fruit with a small hole in them may indicate that larvae were or are present inside. Each larva completes its development inside a single fruit, and then drops to the litter below to pupate, leaving an exit hole in the fruit.

Development from an egg to an adult can occur in as little as 6 weeks at warm temperatures. The adults are long-lived and so the females can lay eggs over many weeks to cover the whole fruiting period.
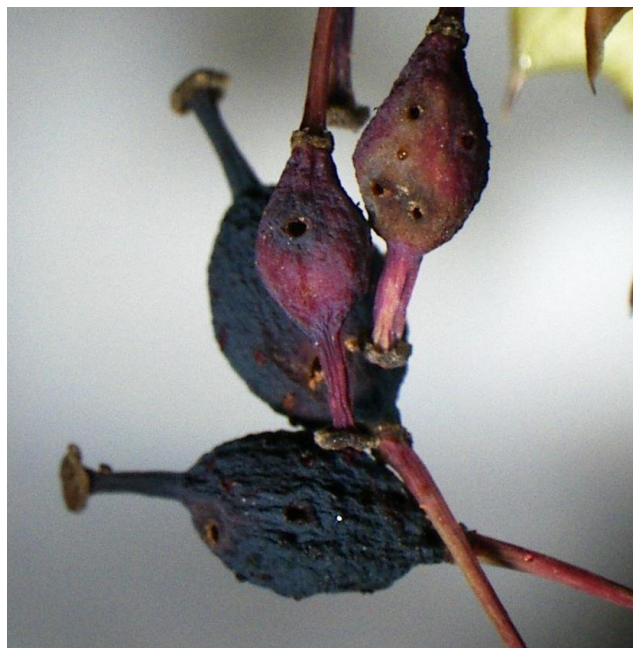
How do they damage Darwin's barberry?

The adults damage the foliage by making holes that are often punched right through the leaf and make punctures in the fruits. However, the main damage is

caused by larvae feeding inside fruits, reducing the number of viable seeds formed.

Damaged fruit with feeding and oviposition holes

Will they attack other plants?

The seed weevil is highly host-specific. As well as Darwin's barberry, it is likely to attack barberry (*Berberis glaucocarpa*), and it is possible that some other very closely-related ornamental species (such as *B. thunbergii*) may be attacked to a lesser degree. It is highly unlikely that any species other than *Berberis* will be attacked.

How effective are they?

It is too soon to know what impact the seed weevil will have here, but laboratory studies and field observations in Chile have shown that they can be extremely damaging to Darwin's barberry. Few parasitoids that are likely to attack the weevil are believed to occur in New Zealand.

How can I get the most out of this agent?

If the weevil establishes at initial release sites, it would be worth helping to establish them in all areas where they are needed. The adults can fly and will disperse over time but helping to shift them about will speed up the process.

How do I select a release site?

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

How do I collect them for release at other sites?

In spring, gently beat Darwin's barberry plants, especially the flowers, with a stick over a beating tray (or a large piece of white material or cardboard) and collect any weevils that have been dislodged with a pooter attached to a compressor. You should aim to shift at least 100 weevils to each new site. Put the weevils into a suitable container and then simply tip the contents out over Darwin's barberry bushes at the new site.

How do I manage the release sites?

Avoid any activities that will interfere with the beetles, such as herbicide application. If you need to undertake control measures, then avoid the release site.

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