

Darwin's barberry rust

A rust fungus (*Puccinia berberidis-darwinii*) is being proposed as biological control agent against Darwin's barberry in New Zealand.

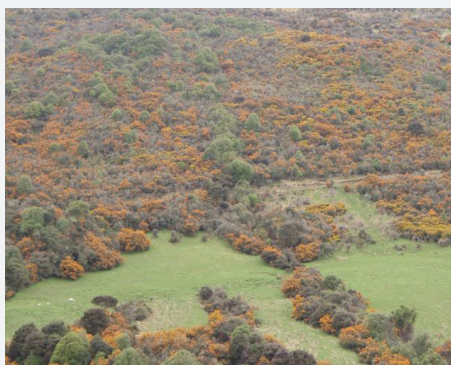
What is happening?

Weed biocontrol agents (insects, mites, plant fungi) are used to control exotic pest plants such as Darwin's barberry. Biocontrol agents won't eradicate the target weed, but the aim is to reduce infestations to acceptable levels. Rigorous host range testing ensures these agents don't harm native or desirable plant species.

The National Biocontrol Collective

(NBC, a consortium of regional councils, unitary authorities, and the Department of Conservation), must obtain approval from the Environmental Protection Authority (EPA) before releasing biocontrol agents. Environment Canterbury, representing the NBC, proposes introducing a rust fungus (*Puccinia berberidis-darwinii*) as a biocontrol agent for Darwin's barberry. A release

application to the EPA will evaluate the environmental, economic, and socio-cultural risks, costs and benefits associated with introducing the rust into New Zealand. Manaaki Whenua - Landcare Research (MWLR) is the science provider managing the EPA application process on behalf of Environment Canterbury. We are seeking feedback on the application, prior to submission to the EPA.



▲ Left to right: Darwin's barberry infestation in Southland; close-up of leaves (top); and flowers (bottom) (images provided by MWLR); records of Darwin's barberry (DOC Bioweb and Weed App data as at mid-Jan 2024).

Why is Darwin's barberry a pest?

Darwin's barberry (*Berberis darwinii*) is native to Chile. It was brought to New Zealand as an ornamental plant and was first recorded as

naturalized in 1946. Darwin's barberry is an increasingly important weed that threatens environmental and economic values throughout the

country. It aggressively invades pasture, forest margins and light gaps in disturbed or remnant forest. Darwin's barberry can grow more

rapidly than native species, destroying and replacing them, forming extensive infestations. Its seeds are effectively

spread over long distances by fruit-feeding birds. Darwin's barberry is prevalent in the lower parts of the

North Island, on the South Island especially in Southland, Otago and Canterbury, and on Stewart Island.

Darwin's barberry rust

The Darwin's barberry rust fungus is a natural enemy of Darwin's barberry in its native range of Chile. The rust damages Darwin's barberry by infecting the leaves and fruits, reducing plant growth and potentially seed production.

▶ Darwin's barberry rust on leaves (on left); on fruits (on right) (images provided by MWLR).



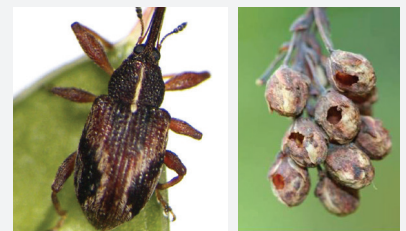
Will it pose a threat to other valued plants?

Testing was conducted to assess the risk from the Darwin's barberry rust to valued plant species in New Zealand. Testing was done on species based on their relatedness to Darwin's barberry. Closer relatives are more likely to share similarities, making them the most likely non-target hosts for specialist natural enemies. Darwin's barberry belongs to the plant family *Berberidaceae*. There are no native species in this family in New Zealand. Host range testing included thirteen non-target species in total. Results indicated that the Darwin's barberry rust is host specific to Darwin's barberry.

Darwin's barberry flower weevil (renewal)

The Darwin's barberry flower weevil (*Anthonomus kuscheli*) destroys the flower buds of Darwin's barberry, reducing seed production. The release of this weevil was approved by the EPA in 2012 but the approval has since lapsed. Re-application for its release will be included in the application for the Darwin's barberry rust fungus, based on the information contained in the original application.

▶ Flower buds damaged by Darwin's barberry flower weevil (on left and bottom right); adult (top right) (images provided by MWLR).



You can find more information about Darwin's barberry and host range testing of the rust fungus here: <https://www.landcareresearch.co.nz/discover-our-research/biodiversity-biosecurity/weed-biocontrol/approvals/application-to-release-darwins-barberry-rust-and-darwins-barberry-flower-weevil/>

Have Your Say

We value your feedback, questions, and concerns regarding the proposed release of the biocontrol agent for Darwin's barberry rust so these can be included in the application.

Please share your feedback online at es.govt.nz/biocontrol-feedback.

You will also have opportunity to submit feedback to the EPA during the public consultation process.

