

The many-coloured Russell lupins (*Lupinus polyphyllus*) are a familiar feature of the roadsides in the Upper Waitaki Basin. They were first introduced to New Zealand about 1930 by settlers of the Mackenzie Basin.

Russell lupins grow each spring from roots that survive the winter, or from germinating seed. They grow well in damp, infertile, gravel soils and are able to tolerate soils low in nutrients – conditions most other plants find unsuitable. They can also withstand hot, dry winds and hard frosts. The gravel roadsides and braided riverbeds are therefore ideal lupin habitat.

In the braided rivers, streams constantly shift as the gravel islands are eroded by the force of water. Birds have adapted to breeding and feeding in this fragile environment. Native river birds need wide open spaces and good all-round visibility so that they can see predators coming.

On these islands, the natural vegetation is low-lying and sparse with scattered lichens, tufty herbs and mat species. However, as lupin seed is carried down the rivers, the scouring of the seed coat aids germination. Now, lupins have become a weed on the gravel islands in the riverbeds and are drastically altering the habitat needed by native plants and animals. Tall vegetation like lupins can easily hide cats, stoats and ferrets.

Weed control of Russell lupins is being carried out on the riverbed gravels, but not on roadsides. Ground application of herbicides to lupins, gorse, broom and willow is the main method used, with occasional spraying from the air by helicopter. (Non-chemical methods of control were trialled, but they did not work). The preferred spray is Grazon, a broadleaf herbicide containing triclopyr. Helicopter spraying can be done in still weather with an accuracy of 1-2 metres, so the waterways on the riverbed are not sprayed.

Grazon was chosen as the herbicide because:

- it is effective on Russell lupins, gorse, broom and willow
- if it accidentally gets into the water it is broken down rapidly, so that it is not detectable half a kilometre downstream
- it is not toxic to humans, birds, stock, bees or fish at normal rates of application
- it does not require a period for keeping stock away
- it is broken down in the soil
- it does not accumulate in food chains
- it does not contain dioxins as an impurity.



Activities

- 1 Many locals regard Russell lupins as an attractive feature of roadsides. List the arguments for and against removing lupins in riverbeds.
- 2 Find out how lupins spread. Use this knowledge to decide where you would remove lupins, and where you would allow them to stay.
- 3 Explain why Russell lupins are able to colonize rough, stony ground so well.
- 4 What is special about the plant family, Leguminosae, that lupins belong to?
- 5 Find out about tree lupin, *Lupinus arboreus*, where it lives, and whether it can also be a weed in riverbeds.
- 6 Role play the situation where you are having to justify your use of Grazon to get rid of weeds in the braided rivers to someone who is unhappy that you are using a herbicide.
- 7 Identify different views about the use of herbicides in the area of your local river.