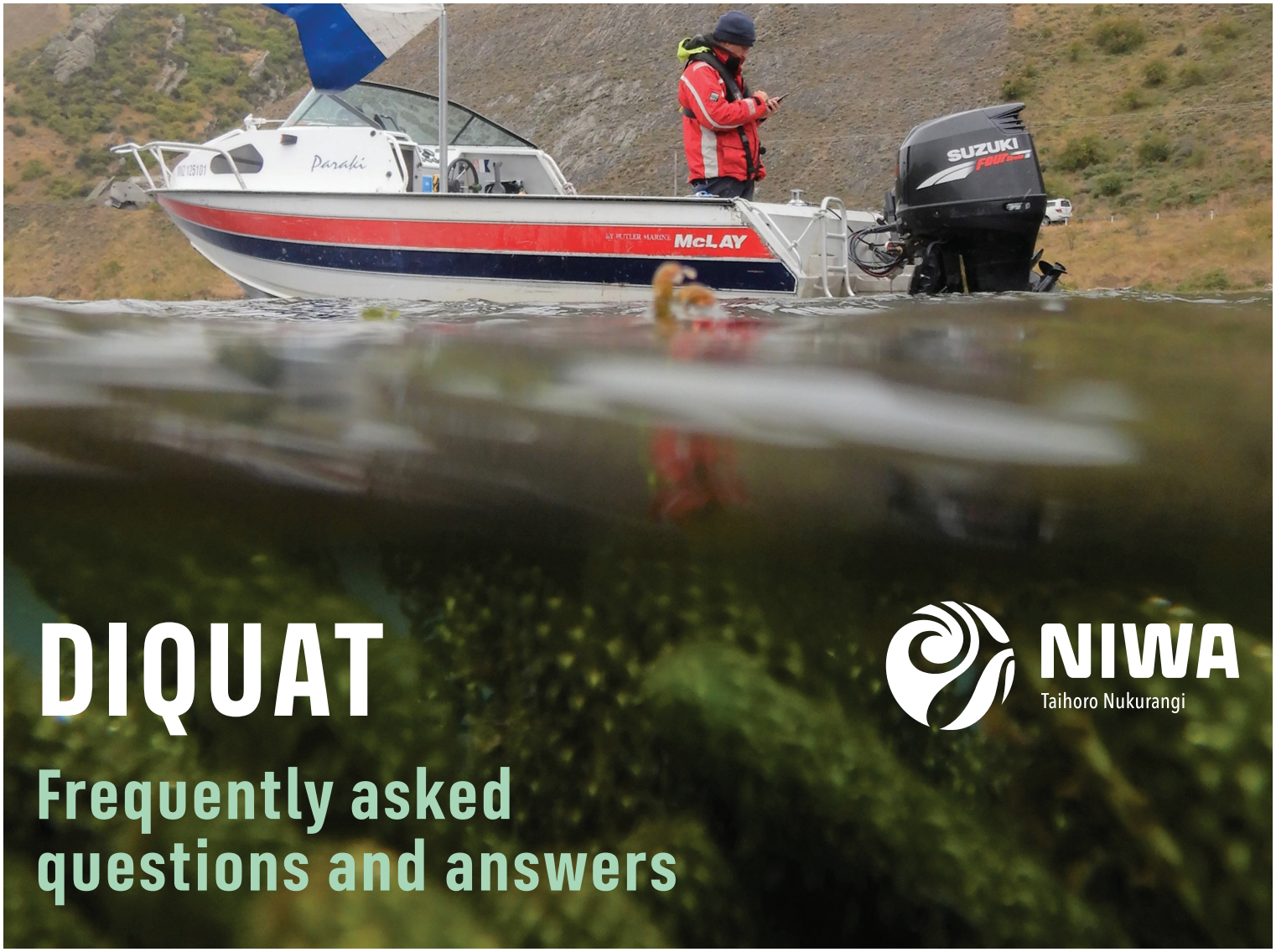


DIQUAT

Frequently asked questions and answers

NIWA
Taihoro Nukurangi

What is *diquat* and what is it used for?

Diquat is a herbicide (chemical) that has been used in New Zealand for many decades for submerged (underwater) weed control and also on agricultural crops. It is registered for freshwater use in New Zealand.

Why do we need to control submerged freshwater weeds?

Invasive submerged weeds in our lakes and rivers are not native to New Zealand and grow taller and more densely than native plants. They prevent native species from thriving in their natural environments. The size and density of these invasive weeds can also disrupt the recreational use of our lakes and rivers, takeover and interfere with the use of water for hydrogeneration or irrigation. Without control measures, these weeds will overrun our lakes and rivers.

How does *diquat* help control submerged freshwater weeds?

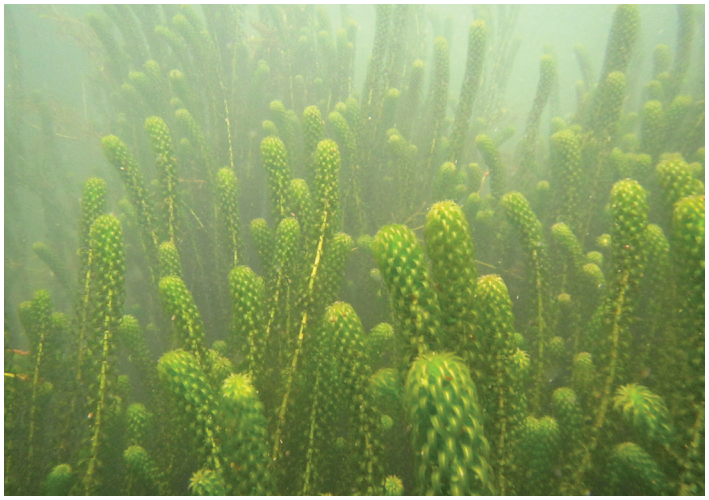
When *diquat* is applied to a water body it comes into contact with the leaves and stems of invasive weeds and is rapidly absorbed. *Diquat* dehydrates the plant tissue causing damage to the cells when plants use light for growth (photosynthesis). Only the parts of the plant that are directly in contact with *diquat* for long enough to allow uptake are affected. Plant parts buried in sediment at the bottom of lakes and rivers are not affected, therefore *diquat* does not usually kill the whole weed, but reduces the height and size of weed beds.

Does *diquat* affect people using lakes and rivers?

Diquat has no risk for human health at the concentrations used for submerged weed control under prescribed use. As a precaution, it is recommended lake and river users in New Zealand don't swim or fish in areas of lakes or rivers treated with *diquat* for 24 hours (as per label directions). Risk to human health has been assessed as low, and in the USA these precautions have been dropped, but restrictions for drinking of treated water remain at 24 hours. Signage, advertisements, or other notifications must be used to inform lake and river users of treatment timing.

Will *diquat* affect aquatic life?

Diquat use for submerged weed control has a low risk for our native plants and animals. *Diquat* has been registered for use in freshwater for more than 60 years with no identified off-target impacts on native aquatic life from toxicity.



Pest weed Lagarosiphon before Diquat application.

Pest weed Lagarosiphon after Diquat application.

But isn't *diquat* described as toxic to aquatic life?

Like many products used around the home every day, *diquat* is toxic in its concentrated form. What is most important in assessing toxicity is the dose, or exposure to a substance. An effective *diquat* concentration for weed control is less than one part in one million parts of water, resulting in a very low concentration when applied to treat submerged weeds. Just as medications need to be the right dose for our health, so the *diquat* is applied in the right dose for submerged weed control. This 'right dose' will not kill aquatic animals.

Why is *diquat* used instead of other weed control methods?

There are a handful of control methods for aquatic weeds and each has advantages and disadvantages depending on the situation. Herbicide use is currently the only method that can achieve weed control over large areas in a short space of time. Other methods are much slower to apply and may not keep pace with the growth of weed. Herbicide is generally the most cost-effective method for large scale underwater weed control.

How is *diquat* applied?

There are strict instructions for *diquat* use in New Zealand freshwater systems. Many regions require that a resource consent is granted when using an aquatic herbicide. Together the label instructions and resource consent control how much *diquat* is applied to sites in a river or lake. *diquat* is applied directly to target weed beds in the water at a rate of 30 litres of herbicide product (containing 20% *diquat*) per hectare, resulting in a very low in-water concentration. Generally, one or two applications of *diquat* are made in a year to target underwater weeds in New Zealand.

What happens to the *diquat*?

The length of time that *diquat* is present in the aquatic environment is short, concentrations in water drop rapidly after application and usually cannot be detected in water after a few days. *Diquat* is adsorbed (locked onto) by sediment particles. This deactivated *diquat* has no residual toxicity, is not biologically active and is degraded slowly by microbial organisms in the sediments.

For further information please visit:

https://niwa.co.nz/freshwater-and-estuaries/tools/biosecurity/diquat

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