

Controlling environmental weeds by herbicide-wiping

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The Hamilton Field Naturalists Club (HFNC) has been controlling environmental weeds at Fulham Streamside Reserve and Nigretta Flora Reserve for 10 years. This article outlines our experience of managing four different species of weeds that are common in many areas of southern Australia.

Cape Tulip (*Morae flaccida*) is a pest plant that spreads from waterways into bushland. Harlequin Flower (*Sparaxis bulbifera*) is a dominant weed on road reserves in south-western Victoria. Wild Gladiolus (*Gladiolus undulata*) is an increasing problem, spreading from waterways, and African Weed Orchid (*Disa bracteata*) is a new, aggressive weed in southern Victoria.

African Weed Orchid has spread across many areas of western Victoria since 2005. This orchid from South Africa produces tens of thousands of fine seeds that blow in the wind to new sites, where it germinates and produces large tubers that enable it to persist and compete with native plants. It does not require a specific fungus to grow. Whether it can ever be entirely eliminated is doubtful.

The HFNC is also involved in treating many other threatening weeds, such as Blue Periwinkle (*Vinca major*), Watsonia (*Watsonia mariana*), *Oxalis purpurea* and Gazania (*Gazania ringens*). Gazania, in particular, is a menace that spreads rapidly from street plantings in townships. It can blanket out all native species and survive with little water. Gazania currently dominates roadsides in north-western Victoria and, unless action is taken soon, our flora reserves will eventually be invaded and ruined.

Deciding on a control method

There are many ways of controlling environmental weeds. The most common are hand-digging of tuber/bulb/corm-producing plants, pulling shrub seedlings, herbicide-wiping, spot-spraying (using a back-pack with a spray-shield), and broad-scale spraying using a backpack or motorised system.

The choice of method depends on several factors. The number of plants infesting the reserve must be considered, along with the type of pest plant. The quality of the native vegetation in the reserve is also relevant. In areas of high quality vegetation great care is needed. The season the control work will be undertaken in can also be important as herbicide only works well when the plant is actively growing. It may be useful to apply herbicide to pest species in winter before native lily and many orchid species emerge. The labour available for the task is also relevant.

Hand digging

Clearly, when early action is planned, hand digging may be the best method. With tuber or corm-producing plants, such as Cape Tulip, Sparaxis, Freesia, Angled Onion, Wild Gladiolus and African Weed Orchid, the simplest and most effective way is to dig up each plant, taking care to extract all of the tubers or corms from the soil. Gazania plants can also be uprooted before they set seed.

Three or four volunteers can easily remove 1000 African Weed Orchid plants from a small reserve in half a day. No specialised training is needed or precautions required, as could be the case when herbicides are to be used. If the pest plant is well established chemical control methods may need to be considered.

Herbicide-wiping

The objective of herbicide wiping is to kill the pest plants but not adjacent native species (including orchids and native lilies) that are often closely associated. Broad-scale spraying of Cape Tulip and other weed species results in most or all of the native species in the spray zone being killed. Where the pest species are sparsely spaced such spraying creates a vast amount of bare ground that grows only Cape Tulip and other weeds in the following year. The spray is also ineffective in killing all of the Cape Tulip plants in the spray area. Cape Tulip is difficult to hit with spray and the stem/leaf surface does not wet easily. The same applies to many other bulbous species, such as Wild Gladiolus.

HFNC has used a 'pick up and reach tool' (shown in Photo 1), available now from Bunnings stores. The tool is inexpensive, lightweight, fairly robust and easy to use. Alternatively, long-handled tongs can be adapted as herbicide applicators.

Small pads cut from kitchen sponges were attached to the tool's 'cups'. After drilling four holes near the edge of the cups the pads were fixed with a thick wool thread. The pads were trimmed to size and oval shape. Alternatively, discard the cups and cut pads from kitchen scourers with foam on one side and abrasive backing. Fit a pad and a stiff plastic back support to each arm, using small bolts.

The pads are dipped into a container that holds the herbicide-wetter-dye mixture. We use plastic containers that originally held honey or rice. The opening of the container must be large enough to allow the pads to be inserted. Drill a hole in the centre of the lid and attach the lid to the container by a cord. The container can then be readily closed to prevent spillage in transport or walking to a site.

The herbicide is applied to both sides of the leaf or stem by simply grasping the plant near the base and lifting. No bending is required and many thousand plants can be treated without strain. The tool can also be used to dab the leaves of *Sparaxis* or *Oxalis purpurea*.

Harlequin Flower, Cape Tulip, African Weed Orchid, Wild Gladiolus or other weeds of similar structure are individually wiped with a concentrated herbicide solution (*Metsulfuron methyl*, 1 g/L, *Glyphosate* 50 mL/L, surfactant 5 mL/L, dye 5 mL/L) to deliver herbicide to the pest plant without killing other plants. Gloves and protective clothing are needed to prevent skin contact with chemicals.

Metsulfuron methyl has a very low toxicity to mammals and is safe to handle but its action on plants seems slow. *Glyphosate* speeds up the kill, a necessary attribute if the plants have flower heads and would otherwise set viable seed before dying off. If the plants have set seed the sensible option is to dig them up and burn them. Of course digging requires much more effort than herbicide-wiping.

Metsulfuron methyl solution may become inactive if stored, so only prepare a small volume for immediate use; 1 L may be enough for one person for half a day (1 g of *Metsulfuron methyl* powder is around ¼ a teaspoon measure). Omit the *Glyphosate* if there are significant native species nearby that would be affected by this herbicide (but not *Metsulfuron methyl*) if accidentally wiped.

We estimated that 40-50,000 Cape Tulip plants were wiped in 73 hours work (about 10 plants per minute) in each year in 2014 and 2015 at Fulham. For African Weed Orchid (Photos 2 & 3), where plants are more dispersed, we averaged about two plants wiped per minute at Nigretta (7-8,000 plants in each of years 2012, 2013 and 2014).

We were concerned that the herbicides we were applying to African Weed Orchid might not be destroying the tubers so in 2014 we established a trial to assess the effectiveness of *Metsulfuron methyl* and *Glyphosate*. We set up the following project: 3 blocks (replicates) of 4 herbicides with 2 times of application (21 Sept. 2014 before flower heads developed & 10 Oct. 2014 before flowering). In each block there were 5 plants per treatment, except for October-wiped plants in Block 3, where only 4 plants were used. Plants were marked with a tagged pin 5 cm away on the Sth side:

1. Control (no treatment) – total of 29 plants
2. Glyphosate (50 mL/L of wipe solution) – total of 29 plants wiped
3. Metsulfuron methyl (1 g/L wipe solution) – total of 29 plants wiped
4. Glyphosate + Metsulfuron methyl (as above) – total of 29 plants wiped

The results in 21 October 2015 when plots were inspected (and soil near the pins dug up) were:

1. Control (untreated) plots – of 29 plots, 25 had plants present and 28 had viable tubers.
2. Glyphosate plots – of 26 plots none had plants or tubers (3 pins could not be found)
3. Metsulfuron plots – of 29 plots none had plants but 6 had tubers that were a little shrivelled
4. Glyphosate + metsulfuron plots – of 28 plots 3 had small, dead plants and 4 had shrivelled tubers (1 pin could not be found)

Conclusions

Both herbicides destroyed the tubers and the results were not dependant on very early application (for each time of application only 4 tubers were found for herbicide treatments 2-4 combined). Plants are easily missed in the field (experience shows that 20-30% of plants are not seen on a first pass – walk around and look before moving on) and it is necessary to re-visit sites later in spring to wipe (if early) or dig up (if late) any untreated plants before they set and spread seed. A large screwdriver is a good digging tool to use (see Photo 4), causing less disruption to adjacent plants.



Photo 1. A weed-wiping tool adapted by members of HFNC



Photo 2. Flowering African Weed Orchid



Photo 3. Juvenile AWOs with flower stem & tubers



Photo 4. Field Nats members Rod & Reto at Nigretta, with a digging tool and plants dug up