CONTROLLING WEEDS

In October 2009 a small group of experienced practitioners got together to compare notes about their experiences dealing with particular weeds in this catchment. This summary was produced to supplement the material which is currently available in published form. As it turned out, there was a particular focus on experience gained from using selective herbicides.

This document (slightly updated in December 2013) arises from that workshop and it makes no attempt to be comprehensive (although a few generalizations have been included). We hope it will be a useful supplement to other material (such as that referred to in our Property Management Booklet *Our Place in the Country: Managing your Acreage Property in West Brisbane*, available free on request). The information is based solely on the practical experiences of members and friends of Moggill Creek Catchment Management Group Inc.. No independent testing or research has been performed by the Group. The Group therefore makes no claims about the effectiveness of methods outlined, or about any lack of possible unwanted side effects, and therefore accepts no responsibility.

The methods are suggested for consideration by private landholders wishing to achieve good environmental outcomes on their own land. They should not be used on Council land without prior authorisation by Habitat Brisbane officers.

Some generalisations

1. Weed control aimed at maintaining and enhancing variability of natural areas is best carried out by hand, being careful to avoid damaging native plants. However, where the area of concern is large, this approach is usually not practicable.

2. Take care to identify and avoid spraying native plants. Even herbicides formulated to kill particular weeds may have an adverse effect on natives. A good technique is to mark positions with stakes or tape with flagging tape.

3. As far as possible, weed species should be killed before they seed.

4. The weed species that should be primarily targetted are those which smother and kill native vegetation. These include vines such as glycine (*Neonotonia wightii*) and Madeira vine (*Anredera cordifolia*), and grasses such as signal grass (*Urochloa decumbens*).

5. Those using herbicides should read and abide by any instructions given by the manufacturers of the products. The instructions include the Material Safety Data Sheet which generally has to be downloaded from the manufacturer's web site. Care should always be taken to ensure that adequate personal safety equipment is used at all times and that the application of the herbicide is in accordance with the manufacturers instructions so as not to cause harm to others or their property or to the operator. If in doubt contact the manufacturer of the herbicide before use.

6. In general, herbicides are most effective when applied to actively growing plants.

7. Use a hood to your spray to avoid accidentally spraying native plants (*Lomandra* spp. are particularly sensitive to glyphosate). If you accidentally spray a few leaves of a native plant, break off the branch promptly to avoid damage.

8. Never spray non-registered aquatic herbicides on water. Where weeds occur along ephemeral creeks, *Roundup Biactive* or *Weedmaster DUO* may be used when creek is dry or around margins of water / aquatic / wetlands. These formulations have more 'frog-friendly' surfactants than standard *Roundup*.

9. Herbicides may generally be divided into several groups:

- **Non-selective:** those that kill all/most plants (e.g. *Roundup* [glyphosate]);
- **Broad-leaf Selective:** those that kill only broad-leaved plants, not grasses (e.g. those based on the chemicals 2,4-D or MCPA);
- **Narrow-leaf Selective:** those that kill grasses but not broad-leaved plants (e.g. *Taskforce* [Sodium Flupropanate]);
- **Defoliants:** which kill foliage but not the root system (e.g. *Shirquat* [Paraquat + diquat]);
- **Succulent [CAM] Penetrants:** herbicides that are formulated to kill certain plant species (e.g. *Affray* / *AF300*, formulated to kill Mother-of-Millions (*Bryophyllum* spp.).

When using such herbicides in environmental areas where the objective is to maintain biodiversity of native plant species, it is important to realise that such herbicides may have unwanted adverse effects on native plants if over-sprayed on them.

Trees

The tree species of most concern in the Moggill Creek Catchment are Chinese elm (*Celtis sinensis*), camphor laurel (*Cinnamomum camphora*), tree privet (*Ligustrum lucidum*), broad-leaved pepper (*Schinus terebinthifolius*), leucaena (*Leucaena leucocephala*), tipuana (*Tipuana tipu*), guava (*Psidium guajava*) and jacaranda (*Jacaranda mimosaefolia*). Methods used are similar over all species, but some species are more difficult to kill than others. Trees killed and left standing may pose some risk through likelihood of branches falling as they die.

- **Ringbarking** - this method should kill most trees (including Chinese elms) above the cut but it may take more than a year for them to die. Also, sprouting often occurs below the cut or suckering from roots, which requires further treatment. It is important that parallel over-lapping cuts are made to the full thickness of the bark (that is, to remove the cambium layer) and the bark collar removed from the entire circumference of the tree;
- ***Sidewinder*** - device used for injecting herbicide (e.g. 1:1 *Roundup* in water) into tree trunks. Drilled holes should be no more than 10 cm apart around basal circumference and not drilled much beyond the cambium layer (to avoid wasting herbicide to the heart-wood, which is insensitive to herbicide). They should be drilled at a slight down-wards angle to hold liquid. Alternatively a hand drill may be used and the mixture syringed / squirted in until full. There may be advantages in plugging the holes after the poison is inserted to prevent leakage;
- **Stem Injection -** A similar method involves cuts with a narrow / small (e.g. *Savco)* axe and the mixture (e.g. 1:1 *Roundup* to water) syringed (e.g. via *Drench* / *Splatter Gun)* at 1 mL / inch [2.5 cm] of cut. The cuts should not over-lap; but be less than 3 cm spacing apart;
- **Basal bark spraying** - involves no cutting; but works in any season. The sprayed area should be from ground level right round the base of the tree. The width of the spray band should be at least the diameter of the tree and to above any basal forks. *Starane Advanced* (21 mL / Litre diesel) is effective, particularly for leucaena and broad-leaved pepper. For guava and privet, *Access* (17 mL / L diesel) has been found to be effective; but contains residual picloram effect so application should be restricted to the target plant's bark. If using a spray with herbicides in diesel, a compression sprayer is preferable to a backpack, as leakage could be deleterious. Also, when using diesel, be sure to wash out knapsack seals daily after use with water;
- **Paint-brush treatment -** Similar to basal bark spraying for small jobs: reduces risks associated with skin contact with diesel;

- **Cut stump method** - requires that the herbicide is applied within 15 seconds of making the cut. The cut should be made within 15 cm of the ground. Usually Roundup in water (1:1) is used, but 1:16 has also been shown to be effective on susceptible species.

Shrubs

The main shrub of concern in the Moggill Creek Catchment is ochna (*Ochna serrulata*). Although lantana (*Lantana camara*) is widespread and classed as a "Weed of National Significance", it provides good habitat value and is easily killed by the 'cut stump method' (see above).

- Where it is not practicable to remove lantana by hand, *Hotshot* may be used (5 mL / Litre of water) or *Lantana spray* = *DP600* (5 mL / L water), but hand treatment is preferable as both these herbicides may kill other over-sprayed broad-leaved plants;
- For smaller trees and shrubs, stems may be part-cut and then bent back or twisted until they splinter (but not broken right through) and 1:1 *Roundup*applied to the break within 15 seconds. This method has been reported to be more effective than the cut stump method, especially for ochna;
- Another method which is successful on ochna is to spray foliage with Starane Advanced (3 mL / L water)

Vines

The main weedy vines in the Moggill Creek Catchment are glycine (*Neonotonia wightii*) Madeira vine (*Anredera cordifolia*), climbing asparagus (*Asparagus africanus*), cat's claw (*Dolichandra unguis-cati*), Dutchman's pipe (*Aristolochia elegans*) and balloon vine (*Cardiospermum grandiflorum*). It is usually best to cut basal stems to save host, then spray regrowth c. 3 months later. Optimal treatments differ, so the species will be covered individually:

1. Madeira vine - there are several techniques - it is important to try to kill stems ascending into the canopy and their associated tubers:

- **a.** Part fill a c. 1 litre container with 1:10 *Roundup* in water, cut large stems under the surface and leave to soak up herbicide mixture for 15 seconds.
- **b.** Part fill a small container with 1:1 *Roundup*, cut stem and insert cut end of upper portion, secure with light wire or a rubber band and leave overnight (remember also to treat lower portion either similarly or by squirting *Roundup* on cut surface);
- **c.** As for 'a' above, but use *Starane Advanced*, 21 mL concentrate in 1 litre of water and leave ends in solution for 20-30 seconds;
- **d.** A quicker approach with larger infestations is to lightly scrape stems over several centimeters and spray with 1:1 *Roundup* in water. This method may not kill all tubers above and below ground, but is speedier where infestations are large;
- **e.** For large plants, cut and apply *Vigilant* gel to both cut ends;
- **f.** Foliar, tuberlings etc. spray *Starane Advanced,* 3 mL / L water;
- **g.** Frequently small plants and adults attached to root tubers may be gathered / hand-pulled;
- **h.** All stems and tubers should be disposed of safely to avoid further infestations

2. Climbing asparagus:

- **a.** Small plants may be removed by hand or a garden fork; cutting the horizontal root system of medium sized plants allows them to be lifted successfully;
- **b.** Spray with *Roundup* (1:10 in water) before plants start to climb;

- **c.** With larger plants, cut back to ground level and spray crown with *Roundup* (1:10 in water). Cutting into the crown before spraying improves effectiveness;
- **d.** Climbing asparagus can be killed with neat diesel over crown after cutting stems;
- **e.** Basal bark spray 21 mL *Starane Advanced* / L diesel kills all sizes (also kills other weed vines).

3. Glycine:

- **a.** Smaller stems may be pulled out by hand.
- **b.** Larger stems should be cut back to ground level and sprayed with *Roundup* (1:10 in water)
- **c.** Original infestations and regrowth may be controlled with *Kamba M* (1:80 [12.5 mL / L] in water) - without residual effect.
- **d.** Often, glycine can form a dense ground cover, between trees or in the open; foliar spraying with *Roundup* (1:100 in water)is effective.
- **e.** On steeply sloping land glycine has been used successfully for soil retention in re-afforested areas, but care needs to be taken to prevent smothering of establishing trees. With canopy closure, the glycine may be controlled.

4. Cat's claw creeper:

- **a.** Cut back (low) from trees to prevent flowering and spray regrowth with *Kamba M* (1:80 in water. A second spray is recommended. (*Starane* is not very effective).
- **b.** Smaller infestations may be cut back with a brushcutter and regrowth sprayed with *Roundup* (10 mL / L water). Care should be taken to avoid spraying regenerating natives.
- **c.** Isolated stems can be cut stumped and swabbed with 1:8 [125 mL / L water] *Kamba M* or *Roundup*.
- **d.** Two biocontrol agents have been released. At this stage (2009) the tingid has not proved to be very effective. A jewel beetle has recently been released (2013) and will be evaluated in our Catchment in 2014.

5. Dutchman's pipe: generally controlled by hand pulling / grubbing. To prevent regrowth, the tuberous root needs to be removed.

6. Balloon vine: hand-pull / grub or cut stump / foliar spray mature or regrowth with 2,4-D, *Kamba M, Starane* or *Glyphosate* (easier to kill than glycine)

Understorey plants

Major understorey environmental weeds in the Moggill Creek Catchment include mother-of-millions (*Bryophyllum* spp.), purple succulent (*Callisia fragrans*), creeping lantana (*Lantana montevidensis*), coral berry (*Rivina humilis*) and freckle face (*Hypoestes phyllostachya*). The tussock grasses (*Sporobulus* spp.), signal grass (*Urochloa decumbens*) and Guinea grass/ green panic (*Megathyrsus maximus*) and other introduced grasses including molasses grass (*Melinis minutiflora*) and Rhodes grass (*Chloris gayana*) as well as several other grass species may also be invasive.

1. Creeping lantana: *Hotshot* or *Lantana 600* (recommended rates 5 mL / L water for both) may be used for this species but they are not specific and will kill other broad-leaved plants. Autumn treatment is most effective. Some landholders consider that creeping lantana is not very competitive and therefore not a high priority.

2. Mother-of-millions: may be killed with *AF300* (current name *Affray*) at 7 mL / L water or hand pulling (carefully bag all plants for disposal). Reinfestations are almost inevitable. *AF300* also kills various other broad-leaved plants (including cobbler's pegs)

and care should be taken to avoid spraying broad-leaved natives. Alternative herbicides effective for mother-of-millions are 2,4-D + wetting agent e.g.*Amicide 625* (3mL + 1 mL wetting agent e.g. *BS1000* / litre water). Experience suggests that spraying mother of millions at night can be more effective than in the say time. This is not unreasonable, as this group of plants has a different photosynthetic pathway than others, taking in carbon dioxide at night and hence keeping its stomata (pores) open at night.

3. Purple succulent: may be removed by hand (take care to remove crowns / plant bases and all runners), piled up in a heap and covered with black plastic for several months or disposed to land fill dump via council refuse, not recycled as mulch.

4. Grasses, in general, may be cut back with brushcutter or sickle and the actively growing regrowth sprayed with *Roundup* (10 mL / Litre water). Careful cutting of tussock-forming grasses with a sickle allows for spot-spraying and protection of native grasses and other plants between tussocks.

5. Signal grass may be controlled with *Fusilade* (4 mL / L water)

6. Giant rat's tail (*Sporobolus pyramidalis* and *S. natalensis*) may be controlled with minimal damage to pasture grasses using *Taskforce*(2 mL / L water or 2 litres / ha).

7. Coral berry and freckle face may be controlled by hand pulling or foliar spraying 3 mL *Starane Advanced* / L water.

Other useful information:

Starane in water does not affect *Lomandra* spp.

Basket asparagus, Singapore daisy, Bahia grass and many introduced broad-leaved annuals + legumes / vines are controlled using over-all sprayed 10 g *Brushoff* + *100 mL BS1000* / 100 L water (this herbicide does affect ferns and Casuarinas are susceptible by root uptake; but does not kill most other natives).

Amicide 625 (3 mL + 1 mL *BS!000* / litre water) is effective and is registered for control of water hyacinth in non-potable water.

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