Management actions

- Contact the Cape to Cape Catchments Group and neighbours to develop a neighbourhood wide control program.
- Map the arum lily infestation.
- Take photos to enable evaluation of the success of the control program.
- Spot spray small populations or isolated plants.
- Target infestations in good vegetation before they spread. These areas are often quickly recolonised by natives.
- Develop a plan for control of large infestations.
- Apply the appropriate herbicide between July and November – when plant is actively growing. Glyphosate is not effective at killing arum lily.
- Assess regeneration of native species and undertake direct seeding or planting of local native species if necessary.
- **Do follow up control – don't waste your efforts by failing to follow up in subsequent years.**

References and further information

Brown, K & Brooks, K (2002) *Managing Weeds in Bushland – Arum Lily.* Environmental Weeds Action Network

Moore, J & Wheeler, J (2008) *Southern Weeds and their control.* Department of Agriculture and Food WA.

HerbiGuide www.herbiguide.com.au - *Detailed information about weed species and control methods.*

Brown, K & Brooks, K (2002) *Bushland Weeds A practical guide to their management.* Environmental Weeds Action Network

Australian Government

Cape to Cape Catchments Group

'Our Environment - Our Future'

A GUIDE to ARUM LILY CONTROL

Why control arum lilies?

Arum lily *(Zantedeschia aethiopica)* is native to South Africa and was introduced to Australia as an ornamental garden plant. It is the worst environmental weed in the Capes region. It occurs in both pasture and bushland, particularly in damp areas but also invading drier sites. Arum lily is spread by birds and invades areas of good quality native vegetation. Often forming dense monocultures it out competes native species reducing biodiversity and decreasing habitat and food resources for native animals.

Arum lily is poisonous to most stock, pets and humans. Symptoms can include swelling of the tongue and throat, stomach pain, vomiting and severe diarrhoea. Ingestion of the plant may be fatal.

Arum lily is listed as a Declared Plant under the *Biosecurity and Agriculture Management Act 2007.* Under the Act landholders are required to manage arum lily to reduce the size of infestations and prevent the spread of the weed.

Planning and monitoring arum lily control

Arum lily control will be most effective if it is coordinated across the landscape to reduce reinfestation. Contact your neighbours and discuss your control program with them. Contact the Cape to Cape Catchments Group for assistance.

Step 1: Developing a control plan

Where to begin? Protect areas of good quality native vegetation. Keep uninfected areas clear and remove isolated infestations within intact bushland before they spread. Consider working from intact bushland out towards more disturbed areas to limit the spread – especially where the infestation can not be controlled in one concentrated effort. Where an infestation is extensive and a number of years spraying will be required develop a plan to be implemented over time.

Step 2: Monitoring effectiveness of control

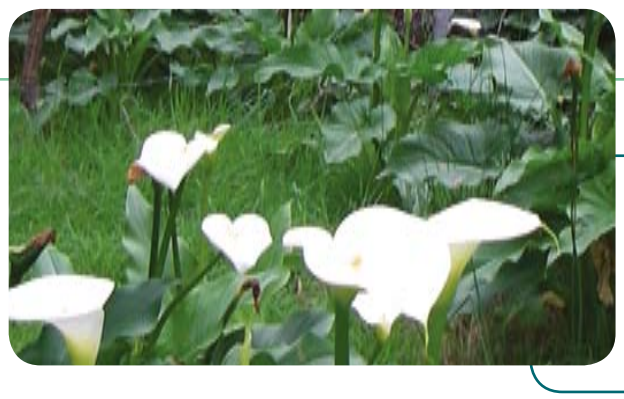
Recording information about the extent of the arum lily infestation prior to undertaking control will enable you to evaluate the success of the control program. Monitoring methods include mapping the extent and density of the infestation and photo monitoring. Mapping the arum lily infestation will also enable a targeted control strategy to be developed.

Step 3: Undertaking an on-going control program

Physical Control: Hand removal of the plant is only effective if the tuberous rhizome and daughter rhizomes are removed. The resulting soil disturbance may encourage germination and establishment of other weeds. Removal of flowers will prevent birds spreading seeds.

Chemical control: Correct application of the appropriate herbicide is very effective at killing arum lily and is expected to result in a 90% kill rate. However, the small rhizomes attached to the main arum lily tuber are not always killed by the herbicide application that kills the parent plant. Follow up spraying is therefore essential. Plants growing from the surviving daughter rhizomes are not usually visible until two years after the initial spraying.

The likelihood of reinfestation from surrounding areas also necessitates an on-going program of control.



Chemical control

The herbicides chlorsulfuron and metsulfuron provide good control. They should be applied when the plants are actively growing between July and October. The optimum time to spray is when at least 50-70% of flowers are present but spraying is effective as long as applied before the flowers start to wither. Rhizomatous tubers that begin actively growing later in the season will be missed if spraying occurs early in the season. In winter wet areas, spray before the water levels have risen or after they have fallen.

Use a mixture of 1 gm of chlorsulfuron or metsulfuron per 10 L water. A wetting agent or detergent should be added to improve the performance of the chemical. A penetrant such as Pulse can be used to improve effectiveness, particularly on older, well established plants. Spray leaves to the point of runoff. Off-target species can also be killed so it is important to apply the herbicide carefully to the arum lily leaves only. Chlorsulfuron and metsulfuron are very slow acting chemicals.

Roundup (glyphosate) is ineffective in killing arum lilies. It will make the leaves yellow off but will not kill the plant. A small quantity of glyphosate (no more than 50 ml per 10 L) can be added to the spray mix and the resultant yellowing of the leaves will indicate within two weeks which areas have been sprayed. Any more glyphosate than this will compromise the effectiveness of the spray mix.

Understanding the plant biology

Arum lily is a perennial plant. Each year the above ground part of the plant dies back to an underground tuberous rhizome. New leaves begin to regrow in autumn and flowering generally occurs from August to December. The plant then dies back in summer.

As well as reproducing via seed, arum lily reproduces vegetatively. Vegetative propagation is by small rhizomes, which are produced on the sides of the main tuber. A 2 cm tuber can produce 25-30 small rhizomes in a year. Even very small rhizomes are capable of producing new growth or new plants if they are detached or the tuber dies.

Plants produce large amounts of seed towards the end of the flowering season. The seeds are held within succulent berries and birds are the main vectors of dispersal. Seed rarely remains viable in the soil for more than four months.

Weed mapping

Mapping the distribution and density of the arum lily infestation prior to undertaking control and then again in subsequent years will provide an indication of the effectiveness of the control program. The location and the estimated density of the weed should be mapped.
When weed mapping, it is practical to enlarge the image of the area to A4 so it can be used with a standard clipboard. A clear overlay can be placed over the map. A grid pattern drawn on the overlay may be helpful. If the site is dissected by paths, roads or creeklines mapping within the sections of the property created can be useful. A GPS can also be used.

Label and date the map. The date is essential if the map is to be used as a monitoring tool.

Suggested categories of weed cover and associated colours for weed mapping are shown below.

Categories of % cover	Colour code
Absent	clear
Less than 1%	green
1% to 10%	blue
11% to 50%	orange
Greater than 50%	red

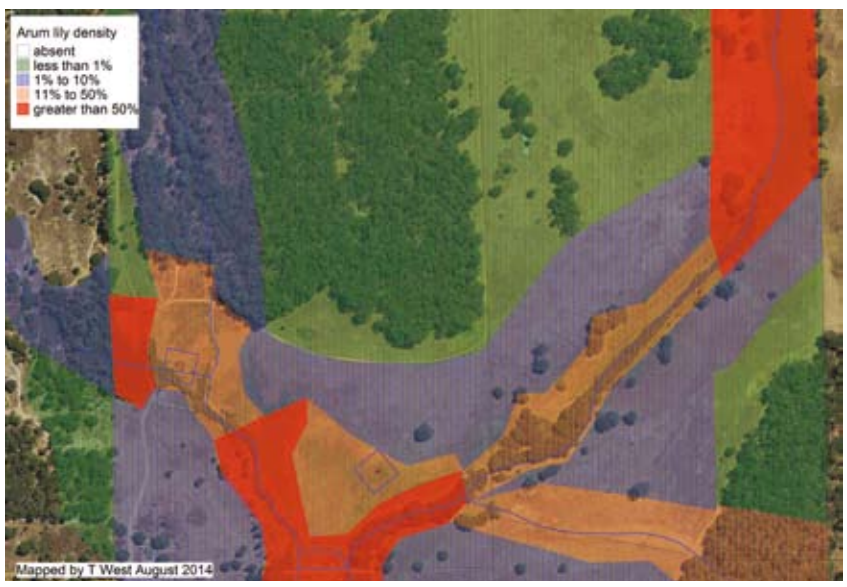


Photo monitoring

The aim of photo monitoring is to take photos of the same sites regularly to enable comparison.

- Mark on a map the photo locations so that you return to the same locations.
- Include a recognisable feature in the photo.
- More is not necessarily better – stick to a few good locations and take good photographs.
- Take photographs on a cloudy but bright day – try to avoid shadows.
- Take a copy of the previous photographs with you to ensure the new photographs will be taken the same way.
- Do not use a wide angle or telephoto lens as this alters the perspective of the photograph and makes it difficult to repeat.
- Sometimes an elevated position, such as standing on the back of a vehicle, can give a better result, especially if you wish to show understorey density.

August 2013

August 2014

Restoration of the native plant community

Where arum lily occurs sparsely or in isolated patches in good quality native vegetation, the gap created by removal is small and quickly colonised by native species. However, where arum lily grows as a dense monoculture removal will leave an area susceptible to invasion by other weeds. Control of these weeds may help facilitate establishment of native plants. Consideration should also be given to direct seeding or revegetation with local native species.