Weeds of National Significance

Blackberry Control Brochure

Blackberry – a Weed of National Significance

Blackberry, belonging to the *Rubus* genus and the *R. fruticosus* aggregate (European blackberry), is considered a Weed of National Significance (WoNS) in Australia because of the extent of its negative impacts. First introduced to Australia in the 1830s, Rubus species originating in Europe, North America and Asia have now become naturalised and infest land from south eastern Queensland to southern Tasmania and across to south-western Australia.

The *Rubus* genus comprises many different species of blackberry, including 10 that are native to Australia (which require protection), as well as those with commercial value such as raspberry species, dewberry (*R. roribaccus*) and loganberry (*R. loganobaccus*).

Problems

Blackberry can infest a large area quickly. It grows vigorously; is prickly and able to propagate vegetatively from cane tips; effectively spreads seed through fruit-eating birds and mammals; and is relatively unpalatable to most livestock. The plant can also quickly smother other vegetation under a dense canopy. Once established, blackberry causes major problems including reduced primary production, degradation of natural environments, restricted access to land and water, harbour for vermin and can be a fire hazard.

Distribution

Species in the *R. fruticosus* agg. infest about 8.8 million hectares of land in Australia (see Figure 1). They are considered weeds in all States and Territories except the Northern Territory. The aggregate is mostly restricted to temperate climates (warm summers, cool winters) with an annual rainfall of at least 700 millimetres. However, the aggregate can grow in lower rainfall areas when other environmental conditions are favourable (e.g. along the banks of water bodies). It can occur at any altitude in Australia.

The R. *fruticosus* agg. has probably reached the climatic limits of its potential range in Australia in terms of rainfall and temperature. However, individual species within the aggregate may not have done so.

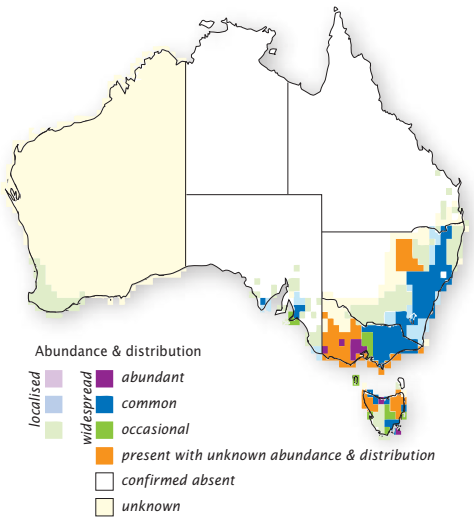


Figure 1: extent of the European blackberry (*R. fruticosus* agg.) across Australia.

Management and control options for blackberry (*Rubus* spp.) in Australia

Identification – understanding the blackberry genus

Blackberries, or the *Rubus* genus, are perennial, semi-deciduous, scrambling shrubs. The tangled prickly stems (canes) form impenetrable thickets several metres high. Species reproduce vegetatively and from seed.

There are 26 introduced *Rubus* species known to occur in Australia and 10 native *Rubus* species. Sixteen of the introduced species belong to the *R. fruticosus* agg (European blackberries) and the 10 other species originate from North America or Asia. This means there are three main groups of *Rubus* to understand and identify:

1. *R. fruticosus* agg (European blackberry). Species in this aggregate originate from Europe and can be difficult to distinguish from one another. Their general characteristics are highlighted below.
2. Other introduced *Rubus* taxa (North American and Asian origin). There are three main North American species in Australia and these are distinguished from *R. fruticosus* agg. by differing leaf shapes and leaflet arrangements.
3. Native *Rubus*. These species vary in many details, including leaf shape, flower and fruit colour.

See the 'quick reference guide' to help you understand the differences and distinguish between the three groups of blackberry. Even though resources are available, specialist skills are often required to ensure correct identification. In these cases samples should be collected and sent to your state Herbarium.

Importance of identifying blackberry species

Different *Rubus* species react differently to control options such as herbicides or biological control agents. For example, species originating from North America or Asia are not susceptible to the current biological control options available in Australia. It is also important to know whether the blackberry in question is a native species. Native blackberry species should not be controlled in their native range.

Characteristics of the *R. fruticosus* agg.

Stems or canes: erect to semi-erect and arched or trailing. Green, purplish or red and covered in sharp prickles (with the exception of *R. ulmifolius* var. *anoplothyrus*) (Birgitte Verbeek, NSW DPI).

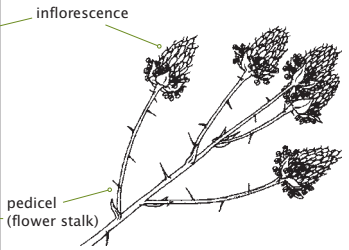
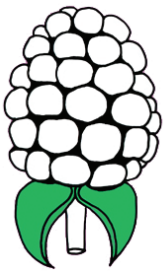
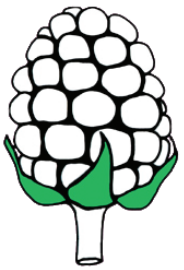
Leaves: usually dark green on top with a lighter green underside (Birgitte Verbeek, NSW DPI).

Flowers: white or pink and 2– 3 cms in diameter. Flowering occurs from late November to late February (Birgitte Verbeek, NSW DPI).

Fruit: 1–3 cm diameter berry, which changes colour from green to red to black as it ripens and produce seed. Fruit are found from late December to April (Alyssa Schembri, NSW DPI).

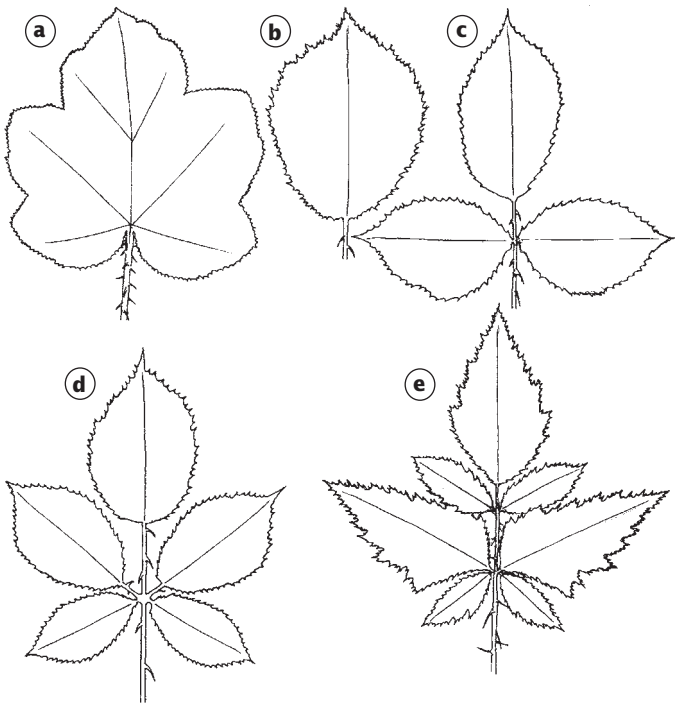
For further information on the species present in Australia or for more detailed taxonomic information see the Blackberry Control Manual or the lucid key for blackberry identification (Barker and Barker, 2005).

Quick reference guide - distinguishing between the different groups of blackberry

	***R. fruticosus* agg.**	**NORTH AMERICAN SPECIES**	**NATIVE SPECIES**
Inflorescence (flowers)	**In** panicles (branched flower head) 	**Not** in panicles 	*R. parvifolius* is the most common native species in Australia. It is easily distinguished from other *Rubus* species by its **distinct red to pink flowers** and **pinnate leaves**. 
Pedicel (flower stalk) length	Mostly **less** than 1.5 cm	Mostly **more** than 1.5 cm	
Glands on primocane	**No** sessile (stalked) glands	**With** sessile non-stalked glands	
Sepals (in fruit)	Reflexed (bent backwards from the fruit) 	**Non** reflexed (surrounding the base of the fruit) 	

Native *Rubus* photo: Birgitte Verbeek, NSW DPI. Drawings by Beth Chandler from Barker and Barker 2005 and Evans *et al.* 2007.

Leaf characteristics of R. fruticosus agg. and North American Rubus species in Australia.



A–entire lobed leaf as found in *R. rugosus*.

B–simple (reduced trifoliate) leaf found in the upper parts of the floricane in many taxa of the *R. fruticosus* agg.

C–typical leaf found subtending base of most inflorescences in the *R. fruticosus* agg.

D–typical leaf found in taxa of the *R. fruticosus* agg.

E–pinnate leaf as found in *R. loganobaccus*, *R. idaeus* or *R. parvifolius*.

Developing a blackberry management plan

There are five main steps to developing a management plan and achieving success in blackberry management:

1. Assess, record and map the problem
2. Prioritise the areas for management
3. Set realistic and measurable goals
4. Prepare, document and implement an integrated management plan
5. Monitor, record, retreat and rehabilitate.

As a general rule of thumb:

First, protect blackberry-free areas at risk of becoming infested, second, deal with areas where blackberry is present in a few well-defined populations, finally, tackle large, well-defined areas of infestation, starting with the smaller outlying populations and working towards protecting important assets from these larger infestations. Remember to monitor outcomes and adjust the plan if necessary and consider the need for follow-up treatment and rehabilitation.

Ongoing follow-up treatment and rehabilitation to reduce regrowth and prevent reinvasion is essential! To be successful these activities need to be factored into the management process.

Blackberry control practices

The challenge

Blackberry is able to reproduce and spread both by seed and vegetatively. It has a perennial root system that is capable of producing new canes (and then new plants) year after year and can produce root suckers from a depth of at least 45 centimetres. Regrowth of blackberry post-control is a common occurrence as it takes time to effectively kill or remove the root and crown. Follow-up treatments are essential to achieving success and this means control of blackberry is a long-term process – it cannot be achieved with one-off effort.

There are a range of management options available for controlling blackberry and rarely will one single control option used in isolation succeed. A control program should be well planned to consider all the available management options and to ensure they are appropriately integrated for maximum control.

Detailed information on each of the control practices outlined below can be found in the *Blackberry Control Manual* (management and control options for blackberry (*Rubus* spp.) in Australia).

Accessibility is often an issue for blackberry control. Tracks cut into a blackberry infestation allow access for spraying at Mountain Creek, NSW (Tom White, Greater Hume Shire Council).

Control with herbicides

Herbicides are highly effective tools for controlling blackberry, and their use is the most reliable method for achieving local eradication. However, herbicides should be used as part of an integrated weed management program involving a range of control strategies.

There are a large range of herbicides available for blackberry control. The effectiveness and suitability of each herbicide varies depending on your situation and management goals. Four factors should be considered when controlling blackberry with herbicides:

1. There are two main modes of action. Most herbicides used for blackberry are absorbed through the foliage, stems or leaves, but some are also absorbed through the roots and can remain active in the soil for some time.
2. A large proportion of a blackberry plant is underground (crown and roots), therefore herbicides will need to be translocated here to kill the plant. Selection of the most appropriate chemical and application technique is important.
3. A number of different techniques are available to apply herbicides, for example, foliar, cut stump, granules or gel, and aerial applications. The most suitable will depend on a range of site factors such as accessibility, other vegetation, cost, resources and proximity to waterways. Be wary of legislation that may require an accreditation for applying some herbicides.

4. The level of control with herbicides is variable and is influenced by a range of factors, including application, timing, plant condition and age, weather, plant species, water quality, and type and rate of herbicide. Always refer to the product label before using any herbicides.

Monitoring the success of herbicide applications is very important to identify any areas that require follow-up treatment. Further detail (including advantages and disadvantages of each herbicide) to help you select the right herbicides for your situation can be found in the *Blackberry Control Manual*.

Follow-up treatment of the infestation and/or rehabilitation will almost certainly be necessary – you need to consider this when planning your control.

Burning

Burning will not kill blackberry. Anecdotal evidence suggests that burning can increase the size of the infestation because of increased tip rooting, increased seedling recruitment and increased growth owing to reduced competition. Nevertheless, burning can be used as a tool for managing blackberry. Two scenarios should be considered: burning before herbicide application and burning after herbicide application.

Biological control

Biological control is the use of natural enemies such as diseases, mites and insects to suppress and weaken the target weed. Biological control programs assess the pests and diseases found on overseas populations of the weed.

Currently the only biological control agent tested and released into Australia is leaf rust fungus (*Phragmidium violaceum*), which attacks only European blackberry (*R. fruticosus* agg.).

The rust spreads by natural means and where environmental conditions are suitable it will colonise blackberry. There are a range of situations in which the rust may, or may not, be suitable for control, including the size of the infestation, your management plans and goals, and climate. To determine whether biological control might be a useful tool for your situation, visit the *Blackberry Control Manual*.

Burning is a tool that can only be effective when combined with other control practices. (Tom White, Greater Hume Shire Council).

The blackberry leaf rust fungus – *Phragmidium violaceum* (middle) and with powdery summer spores (bottom) (CSIRO Entomology).

Physical control methods

The use of physical control methods alone often gives poor results. Physical removal of blackberry top growth will result in the death of only the crown, even when the regrowth is repeatedly removed for three to five years. Blackberry can produce root suckers from a depth of at least 45 centimetres, so it is important to remove as much of the root system as possible when using these methods. Regrowth from crowns, root fragments and seed is inevitable, making follow-up control and site rehabilitation essential.

Combining a range of physical control methods with the strategic use of herbicides is a more reliable approach.

Hand and mechanical removal

Manual removal can be successful if enough of the root is removed, but is very time consuming, so is most suitable for small and isolated infestations.

Grubbing

Mechanical grubbing is suitable for scattered infestations of mature plants. With this method, whole blackberry plants are removed by an implement attached to a tractor, backhoe or excavator. This technique completely removes the infestation with relatively low site disturbance, allowing immediate regeneration of the area.

Scalping

Scalping to a depth of 20 – 30 cms with a root rake or similar equipment can be very successful on accessible infestations. Caution needs to be taken to remove as much of the root system as possible.

Cultivation

A single cultivation can spread blackberry rather than help control it, because root fragments are distributed over the cultivated area. Cultivation needs to be frequent and undertaken at the appropriate time of the year (usually summer) to achieve good control.

Large earthmoving equipment

Using large earthmoving equipment may be an option in specific situations. However, it is unlikely that all root material will be removed, and follow-up treatment with herbicides will be required to achieve control.

Slashing

Slashing should be considered only as a short-term control method. It may be useful for inaccessible areas to reduce plants to a more manageable size, or to open up dense infestations for follow-up treatment using other techniques. Irregular slashing can leave the plant with a stronger root system and little top growth, reducing the effectiveness of any follow-up herbicide application.

Combining physical control methods with herbicides and rehabilitation helps achieve success in blackberry management. The Huonville Landcare Group with assistance from the Huon Valley Council has been rehabilitating the Huonville black gum forest using integrated controls. They have reduced blackberry to ground cover using brush cutters (top) and then sprayed with herbicides. After these controls (middle) the Group will rehabilitate the site (bottom). Photos: Richard Greenhill (Huonville Landcare Group Inc.).

Community-led action for long term blackberry control

Community members working together to control blackberry across a local area is a Blackberry Action Group is one example of how this can be achieved.

Case study prepared by Michael Reid (DPI Victoria) for the National Blackberry Taskforce

The North East Blackberry Action Group (NEBAG) was formed in 2005 as a result of community desire to address the impacts of blackberry on agricultural productivity and biodiversity in the Upper Murray catchment within North East Victoria. An initial community meeting of stakeholders was convened that included private land managers, key government agencies and the plantation industry, where a basic action plan was developed.

The group successfully lobbied funding from the state government to fund their program. This included the employment of a community-based project officer for six weeks a year who undertakes landholder visits, maps blackberry infestations, develops voluntary blackberry management agreements, and provides incentives if required.

A project executive group, representing over eight Landcare groups, covering 120,000 hectares, meets regularly to manage the project and seek funding opportunities. Incentives are provided to land managers using a cost-sharing approach to build access tracks or fencing off areas to protect from blackberry invasion or for holding goats.

Previously, government funded programs provided spray subsidies to land managers. However, the NEBAG identified that some of the regions with significant blackberry problems were those that had also received spray subsidies but not carried out works. The NEBAG concluded that this had occurred because land managers were not effectively engaged and therefore held little responsibility for the wider blackberry problem. Over time the NEBAG have been able to slowly bring these community members on board, with the momentum of blackberry control within the rest of the community being a catalyst to success.

To date NEBAG has over 145 landholders on voluntary management agreements, with over 5370 hectares of blackberry infestations mapped, 2800 hectares treated and a 40 percent reduction in roadside blackberries from 330 kilometres to 200 kilometres. Some key learning's identified by the group include:

- Blackberry control is more than science: there are a variety of socio-economic factors inhibiting its control, and these can be negotiated between project officer and land manager.
- A community-led approach is appropriate because it:
    - Involves everybody, and blackberry doesn't stop at fence lines.
    - Caters for the diversity that exists within the community and the diversity of the blackberry infestation.
    - Is trusted because it is driven by the community.

A documentary has been developed on NEBAG, to view this please visit:

www.vicblackberrytaskforce.com.au/documentary/

Control of blackberry in the north east of Victoria has been very challenging, but persistence in community effort is paying off. (DPI Victoria)

References and further information

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To obtain a copy of the Blackberry Control Manual, or for further information on the Weeds of National Significance Program and the National Blackberry Taskforce please visit:

Weeds Australia website –
www.weeds.org.au/WoNS

This brochure has been developed as a summary of the National Blackberry Control Manual (NSW Department of Primary Industries Weed Management Unit, 2009) and uses information contained in this manual. Copies can be downloaded or ordered from the Weeds Australia website (listed above).

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Disclaimer

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National Blackberry Program

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