



Ragwort - Management

David McLaren and Ian Faithfull (DPI Frankston)

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*This Landcare Note details options for the management of the weed ragwort, *Senecio jacobaea*.*

See the Landcare Note LC0180: Ragwort - identification for a description and illustrations of the plant.

Common and scientific names

Ragwort

Senecio jacobaea Linnaeus

Family Asteraceae (daisy family)

Status

State Priority Weed in Victoria. Under the *Catchment and Land Protection Act 1994* ragwort is a Regionally Prohibited Weed in the Goulburn Broken Catchment and Land Protection Region, and a Regionally Controlled Weed in the Glenelg Hopkins, Corangamite, Port Phillip, West Gippsland and East Gippsland Regions. Landowners in areas where ragwort is Regionally Prohibited must eradicate or control it on their land. Landholders in areas where ragwort is Regionally Controlled must take all reasonable steps to control it and prevent its spread and growth on their land and on roadsides that adjoin their land. However, certain roadsides are exempt. Contact the regional Department of Primary Industries office for further advice.

Origin and distribution

Native to Europe and western Asia. Well established on the Mornington Peninsula and in high rainfall areas of the Strzelecki, Otway and Dandenong Ranges. An increasing threat in East Gippsland, and in western Victoria in the Stony Rises and the Western Coastal Plain. Usually found in open, unshaded areas, on heavy soils of moderate fertility and common in poorly managed degraded pastures, in areas cleared in the past but never properly developed for agriculture, on roadsides and other frequently disturbed areas. Also found in natural areas, particularly near the coast.

The problem

- Invasive on roadsides, in plantation forestry and in disturbed native forests and woodlands where it threatens biodiversity.
- Poisonous to grazing animals, both when fresh and when dried in hay or chaff. Cattle, horses and pigs are most susceptible. Contains pyrrolizidine alkaloids that cause cumulative liver damage, leading to photosensitisation, jaundice, wasting and sometimes death. Mortality from poisoning can occur many weeks after stock are removed from infested land. However crossbred sheep can eat ragwort without showing ill effects, unless continually exposed to the plant in large quantities. Dairy cattle forced to eat ragwort produce tainted milk.
- In Victoria the relatively warm, moist conditions of late autumn, plus the high winter and spring rainfall provide excellent conditions for seed germination and establishment, while the relatively dry conditions of summer and late autumn favour seed production.
- Produces dense foliage close to the ground and forms extensive monocultures, which suppress and prevent regeneration of other vegetation. Competes strongly with more desirable plants and reduces pasture productivity and the value of agricultural land.
- Regenerates strongly from the crown and root system when the top growth is damaged or removed and when cut just below the soil surface or deeper.
- A large plant can produce 250,000 seeds, a high proportion of which are viable. The vast majority of seed is deposited within 5 m of the parent plant and virtually none further than 40 m away. Wind dispersal of detached pappus (the plume-like hairs attached to the seed) and pappus with light-weight, sterile seed attached can create the impression that large amounts of seed are being carried for long distances.
- Most seeds germinate soon after they fall in autumn, but around 1% remain viable in the soil near the surface for 4-5 years and at depths greater than 4 cm for 10-16 years. Burial of seed induces dormancy.
- Seedlings establish most effectively in unshaded areas on bare or disturbed soil.
- Difficult to eradicate, requiring a long-term management program of ten or more years.
- A major pasture weed in Victoria, particularly on land grazed by cattle and horses and on dairy farms. Cattle selectively avoid grazing ragwort, so it readily proliferates in pastures.



Management

Developing a management program

Ragwort management on agricultural land should integrate a range of control measures such as cultivation, grazing and herbicide treatments, along with prevention measures and land rehabilitation, to establish desirable competitive vegetation. A typical program involves twice yearly (autumn and spring) spraying with selective herbicides and spot treatment to control isolated plants. Herbicide treatment is also the most effective approach on roadsides and in bushland. Ragwort is susceptible to shading, so vigorous competition from pasture plants or establishment of an overstorey of trees provide means of control.

Integrated management programs must be well planned if they are to be successful. Such programs require the setting of priorities for controlling different levels of infestation. New infestations should be eradicated as they occur. Clean areas should be kept free of ragwort and managed to prevent infestation. Lightly infested areas should be cleaned up as soon as possible. Extensive infestations should be quarantined to help contain them, and tackled progressively as part of pasture improvement or revegetation programs. Grazing with sheep can prevent or reduce flowering and seed production. Sheep should be used with caution because of the danger of liver damage.

A ragwort management plan should be a component of a whole farm plan or weed management plan for the particular area. Local or regional plans for ragwort exist in many areas and these usually contain goals of containment, eradication or prevention for particular areas that determine the way government enforcement activity is undertaken. Contact your local DPI/DSE office for details.

Prevention

The aim of prevention is to avoid the deposition of ragwort seed in areas free of the weed. Although the seed is widely dispersed by flowing water and to a lesser extent by wind, its movement on vehicles and machinery and in fodder and soil is preventable. Preventative management is a good investment because it requires fewer resources than control of infestations.

- Destroy isolated plants with herbicides or manually, before they set seed.
- Ensure hay and other fodder is free of seed and that seed for planting is not contaminated. Obtain verification from fodder and seed suppliers that their products are grown in clean areas and are free of contamination. If contaminated fodder must be used, feed it out only in areas that are already infested, or in a defined area that is regularly monitored and can be readily treated should an outbreak occur.
- Apply the same standards to soil, sand and gravel as are applied to fodder. Work towards an infested area when earthworks are undertaken, not away from it.
- Seed can be carried on the hooves and coats, and in the digestive tracts of livestock, however little is known about the extent to which this occurs. Livestock do not usually eat flowering heads so seed

dispersal via gut transmission is unlikely unless contaminated fodder has been consumed. Sheep that have recently been shorn are less likely to have contaminated fleeces. Stock that have grazed in infested areas should be quarantined in a special area for several days. The quarantine area should be regularly inspected and any plants which appear should be destroyed before they flower.

- Use only vehicles, machinery and equipment, including those of contractors, which have been thoroughly cleaned after being used in infested areas.
- Where a property already has infested areas, internal quarantine measures should be practised. Produce from infested areas should be separated from that grown in clean areas. Weed-free buffer zones should be maintained between infested and uninfested land. Wet areas should be permanently or temporarily fenced to exclude grazing until drier months.
- Areas such as gullies and shelter belts from which stock are excluded should be designed to enable effective weed treatment.
- Contractors, roadside maintenance staff, etc. should be trained to identify and report infestations, to treat them at the appropriate time, and to manage them in a way that will prevent spread.
- When removing plants in flower or seed, be very careful to bag all the material, as seed are easily detached from the head. Destroy seed heads and seed-contaminated material using fire or deep burial.

Hand pulling, hoeing and slashing

Ragwort that is slashed, pulled, cut or broken close to the soil surface will produce new growth from the cut crown or small pieces of root that are left in the soil. Plants can regenerate from root fragments less than 2.5 cm long within 2 months. Effective manual control methods require removal of the crown and all the larger roots. Hand pulling is not generally effective during winter or spring as seedlings and small plants are difficult to remove, larger plants are often very strongly anchored into the ground, and root fragments often regrow. Disturbance of the soil also exposes buried seed to light, resulting in more germination.

Hand pulling can be used to control flowering ragwort, but the flowering heads should be placed in bags to prevent spread of seeds and later burnt to prevent seed germination. Small infestations can be chipped out using a shovel or mattock.

Ragwort quickly grows back after slashing or mowing, often within a few weeks. The plants that grow back tend to have multiple crowns, be longer-lived and to flower outside the normal flowering period. Slashing must be followed up with chemical application and/or cultivation.

Seeds continue to ripen on cut flowering stems which therefore need to be collected and destroyed, or cutting needs to be timed to take place before flowering.

Cultivation

Ploughing to a depth of at least 15 cm in spring, followed by cultivations in summer and autumn will kill existing plants, regrowth and seedlings. However cultivation is only recommended if carried out systematically and when followed with an improved pasture or cropping program that will suppress ragwort which germinates from the soil seed bank. A good option is two crops of cereal such as oats, with cultivation between the two cropping seasons, followed by pasture establishment.

If cultivation is contemplated, the danger of soil structure decline and erosion, especially on steep country, must be considered. Ragwort seedlings that appear after cultivation should be spot-sprayed as a priority.

Grazing

Grazing with sheep is a major method of control in agricultural areas. Sheep can develop a taste for ragwort and will actively seek out flowering plants. Their digestive systems are able to detoxify much of the poison, and because the toxic effects develop over a long period, sheep can play a major role in a management program. However they should be used with care and with due consideration to their welfare.

Sheep at an appropriate stocking density will eat the plant down to ground level and prevent flowering, but regrowth will occur as soon as stock are removed, even after years of intensive grazing. Deer are less effective and cattle are generally ineffective, while goats and horses provide no control. Where herbicides cannot be used, or in areas that are difficult to access, fencing off the area and grazing with sheep may be the best control option.

Pasture Management

Sound pasture management for ragwort suppression involves the maintenance of a continuous, dense sward of competitive grasses and clover to reduce seedling establishment through competition. Good cover is most necessary in autumn, when ragwort seed germination is prolific.

Where a pasture contains a significant proportion of desirable plants, control can be assisted by improving pasture competitiveness by application of fertiliser (including superphosphate and urea) or by improved grazing management. Where undesirable species are dominant, pasture renovation or establishment of new pastures may be required. Consult DPI Catchment and Agriculture Services staff or an agronomist for advice on suitable pasture species and mixes.

Chemical control

Under Victorian legislation there are controls on various aspects of the uses of agricultural chemicals. It is the responsibility of chemical users to familiarise themselves with these controls.

Choose only products registered for use on ragwort in your particular situation. Read the product label and follow all label instructions carefully.

Not all products containing the same active constituent will be registered for the same uses. You should use a product with a label recommendation for the situation in which you wish to use that product.

See your chemical retailer for further advice.

Legal use of some chemicals requires the user to possess an Agricultural Chemical User Permit (ACUP). Other chemicals have restrictions on their use in Chemical Control Areas (CCAs). Refer to the Agriculture Note: Agricultural chemical user permits (ACUP) and chemical control areas (CCA).

Information on ACUPs, CCAs and other chemical information can be found under Chemical Use in the General Farming section under Agriculture and Food at the website www.dpi.vic.gov.au or ring the Chemical Information Service on (03) 9210 9379. The service is available from 9.00am until 4.30pm Monday to Friday.

No herbicide will completely eradicate ragwort infestations in one application. The herbicides most commonly used in ragwort control are taken up by the leaves and transported to all parts of the plant, especially to the crown and roots, where they start to kill the weed. Because ragwort has a large proportion of biomass in the crown and root system below ground level, getting an effective amount of herbicide into the crowns and roots is one of the main challenges of herbicidal control. To best achieve this, it is important that the plants are not under stress (eg. from drought or extreme temperatures) at the time of spraying, and are actively growing.

A herbicide treatment program should primarily be targeted at seedlings and rosettes during autumn and spring. Boom or aerial spraying of seedlings in autumn should be followed by spot spraying of mature and large plants in spring. An approach used by dairy farmers is to spot spray or apply granular herbicide at the time stock are rotated from a particular paddock, with successive treatment of paddocks as cattle are moved around the farm.

Herbicidal control becomes progressively less effective with larger plants. Infestations often consist of plants in different growth stages (seedlings, rosettes and mature), and this can compromise the effectiveness of herbicidal treatments. If treatment cannot be undertaken before the plants become large, it may be better to slash the infestation and treat the regrowth. Chemical treatment of mature plants should be a last resort and is an indication of an ineffective management strategy.

Repeated treatments may be required during the one season to prevent rosettes maturing and setting seed. Some herbicides may be available that will prevent seed production from plants near the flowering stage.

Herbicides selective for broadleaf weeds are preferable so that other vegetation is left to compete with any ragwort that is not killed. Non-selective herbicides leave bare ground that favour germination of ragwort seed.

Application by weed wand or other spot application can be a more efficient use of the chemical than spray applications, and also reduces the risk of off-target damage and spray drift.

Boom spraying of large infestations should be undertaken after the autumn break and should be followed in spring with spot treatment of surviving plants. Rope wick applicators and boom weed wipers can be used to control plants taller than the general level of a pasture and can provide a good kill.

Granular herbicides can be useful for the treatment of isolated plants on roadsides and in difficult to access areas, and for plants with large crowns or which have survived other control measures. Rain is needed to wash the chemical into the crown or down to the roots of the plant.

Eradication of established infestations can be achieved by effective herbicide treatments each year for 8-10 years, by which time the soil seed bank will be depleted to very low levels.

Check all targeted plants and treated areas several weeks after treatment and treat them again if necessary before major flowering commences.

Afforestation and land use change

Ragwort control in poorly accessible areas may be best achieved by fencing off the area and allowing it to return to bush, or by the establishment of tree plantations. The control is achieved mainly by shading, with a contribution from plant competition (particularly in regenerating bush) and reduction in seed dispersal due to windbreak effects. Radiata pine is the most effective plantation species but eucalyptus plantations can also successfully suppress ragwort. Where infestations are dense, successful establishment of tree plantations requires weed control in the preparation period. Ragwort will still need to be controlled by other means until the canopy closes over.

Contact a farm forestry adviser or bush regeneration specialist for further advice.

Biological control

Biological control is a long-term program which is best used on large, chronic infestations with a low priority for control due to inaccessibility, remoteness or low threat of spread. Five insect species introduced to control ragwort are established in Victoria: the crown boring moth *Cochylis atricapitana*, the cinnabar moth *Tyria jacobaeae*, the plume moth *Platyptilia isodactyla* and the flea beetles *Longitarsus flavicornis* and *L. jacobaeae*.

Many attempts were made to establish the cinnabar moth, a flower and leaf feeder, from the 1930s to the 1990s, but the first successful establishment was not reported until 2003, at one site on the Mornington Peninsula. The large black and yellow striped caterpillars feed openly on the plant and can cause severe defoliation.

Larvae of the flea beetles, introduced in the 1970s, feed on ragwort roots, and older larvae may bore in the root crown. In Victoria they have only established in high altitude, high rainfall locations, where they have spread slowly. Flea beetles have reduced ragwort infestations to less than 5% of their former density at some sites but have had little impact at many sites.

The crown boring moth was introduced from Spain in 1986. Larvae of this insect destroy the rosette crown and

often kill plants. The moth is widely established and is having a measurable impact on ragwort size and growth.

The plume moth, first released in 1999, is well established and spreading but its impact will not become apparent until populations have built up. Larvae feed in rosettes and flowering stems.

Larvae of two native moths, the blue stem borer *Patagonoides farinaria*, and the cineraria moth or magpie moth *Nyctemera amica*, commonly attack ragwort and sometimes cause severe damage. A native leaf mining fly *Chromatomyia syngenesiae* also attacks the plant, as does the redlegged earthmite *Halotydeus destructor*.

For more detailed biological control information contact DPI Frankston on (03) 9785 0111.

Ongoing management

- Contact your local Landcare or Friends group for further assistance and support. Groups can often assist with coordination of contractors and chemical bulk buying.
- Work together with your neighbours. Form a neighbourhood or local action group if none exists.
- Make a long-term plan and stick to it or amend it as appropriate. Set realistic targets, year by year.
- Seek professional advice.
- Always follow up the previous season's work and do not let plants set seed.

Further advice

- Contact your local Catchment Management Officer or Ragwort Facilitator for further advice.
- Call the DPI/DSE Customer Service Centre on 136 186 and visit the DPI website at www.dpi.vic.gov.au

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