Groundsel bush

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Introduction

Groundsel bush (Baccharis halimifolia) is a native of the east coast of North America and the West Indies. Groundsel bush is both an environmental and a forestry weed because it readily invades open to densely vegetated forests and bushland. Thousands of hectares of pine plantations in New South Wales (NSW) and Queensland are heavily infested. Thick stands of groundsel bush can inhibit the movement of stock and reduce the productivity and carrying capacity of agricultural land. Therefore, the spread of the weed is of great concern to rural communities, especially where annual rainfall exceeds 1000 mm per year.

At the moment, it has not spread to its potential range, but threatens to do so. If coordinated control programs are not maintained it may rapidly fulfil this potential, so groundsel bush is a declared noxious weed in parts of NSW.

Groundsel bush is reputed to be poisonous to livestock although it seldom causes a problem because they rarely eat enough. However, livestock will lose condition rapidly if forced to graze it.

Distribution

Groundsel bush was first introduced into Australia as an ornamental plant and by 1900 had become naturalised in Queensland.

By 1930, it was a serious weed in south-eastern Queensland. By the mid-1960s, it was present in the Tweed, Richmond and Clarence catchments in northern NSW. Since then, it has gradually spread southwards along the coastal fringe to the Taree area. It is likely that groundsel bush will spread further in Australia.

Habitat

Groundsel bush is found in humid warm-temperate to subtropical regions. It is mostly found in disturbed areas such as coastal swamps, degraded pastures and forests where the understorey has been removed.

Groundsel bush tolerates a wide range of soil types and pH levels from 3.8 to 8.2 and is very tolerant of waterlogged, acid and saline conditions. It is also resistant to damage from salt spray.

Groundsel bush is frost-tolerant and occurs naturally in North America where there are regular winter snowfalls. This means that in Australia it could spread inland to colder climates where the habitat is favourable.

Impact

Groundsel bush is a serious weed of horticulture, cropping and grazing agricultural industries as well as forestry. It is also an environmental weed.

Groundsel bush is particularly invasive in some specific situations. These situations include:

• badly-drained, poor, coastal wetlands (see Figure 1);
• abandoned cane farms;
• undeveloped land subdivisions which have been bulldozed;
• areas where groundcover has been disturbed;
• all grazing land that is overgrazed or under-vegetated – newly-cleared land is prone to invasion by groundsel bush, as is land which has suffered from fertility rundown and neglect;
• abandoned banana and stone fruit plantations, because of the effects of consistent, bare-ground management during the life of the plantation (see Figure 2);
• open or poorly-developed forest areas after logging when canopy cover is reduced and soil disturbance is at a maximum; groundsel bush can grow and form a canopy faster than the forest species regrowth;
• coastal pine forests where there is little groundcover to compete with seedlings;
• occasionally, even in dense pasture.
Description
Groundsel bush is a densely-branched shrub, usually 1.5–3 m high, although it sometimes grows into a small tree up to 7 m high (see Figure 3 and 6). Leaves are dull or pale green, waxy to touch, alternate, 2.5–5 cm long, 1–2.5 cm wide, wedge-shaped and prominently-toothed, particularly near the tip (see Figure 4). Stems are green at first but turn brown with age and have a characteristic striped bark. Numerous male and female flowers grow on separate plants (see Figure 5). Male flowers are cream and occur in globular heads. Female flowers are white and grow in head clusters at the ends of branches (see Figure 6). Seeds are very small and light, about 3 mm long and weighing only about 0.1 mg. On the top of each seed grows tufts of white hairs (the pappus) which give the female plant its characteristic fluffy appearance when in full flower. Mature groundsel bush have a deep branching taproot, with numerous fibrous lateral roots.

Life cycle
Seeds germinate when there is good moisture available, mostly during late winter and in spring. New plants can reach one metre in height by autumn. Plants do not flower until the autumn of the second year. Male plants start flowering about two weeks before female plants but continue to flower until after the female plants have finished flowering. Flowers mature and seeds drop between April and May, depending on seasonal conditions.

Spread
Each female plant can produce more than 1.5 million seeds annually. The seeds are adapted for dispersal by wind and water because of the pappus, which remains attached to the seed for several days after release from the head. Under windy conditions during flowering, groundsel bush seed can be transported over long distances. Half of the seed usually falls within 100 m of the parent bush, forming dense, impenetrable stands of the weed. However, some seeds spread further.

Control and management
A variety of measures are available for controlling groundsel bush effectively.

Mechanical control
Young plants are easy to pull out as they have a shallow root system. Care should be taken, however, to remove all the roots to prevent regrowth.
Widespread infestations of young plants can be controlled by cultivation, but seedling regrowth can occur if competitive pastures or crops are not sown soon afterwards. In the case of very large bushes, bulldozing may be the most effective first step.

**Slashing**

Large infestations of young groundsel bush are slashed in some areas. Slashing suppresses flowering and reduces the spread of seed. Frequent, regular slashing will eventually kill groundsel bush. In many large infestations, groundsel bush grows in association with blady grass and bracken fern and regular slashing of the three species together encourages a more vigorous growth of pasture. This in turn suppresses groundsel bush seedling regrowth. Regular slashing of large groundsel bush infestations is often part of a long-term program of eradication involving spraying, slashing and pasture improvement.

**Chemical control**

Herbicide application is an effective method of managing groundsel bush, but follow-up treatments are essential. A number of techniques can be used to apply the herbicide, including cut-stump, basal bark and foliar spraying. If you are unsure of which combination of chemical and application technique is most suited to your situation, contact your nearest Industry & Investment NSW office or your local council Weeds Officer.

In NSW several herbicides are registered for controlling groundsel bush. Herbicides recommended for the control of groundsel bush and details on herbicide application techniques are provided in the *Noxious and Environmental Weed Control Handbook*. Obtain the latest version from Industry & Investment NSW offices or at www.dpi.nsw.gov.au/weeds

**Grazing with goats**

Control of widespread infestations of groundsel bush by goats is also worth considering. However, investment in goats as a control measure will require goat-proof fencing and some knowledge of goat husbandry. Goats are only effective if the infested area is grazed intensively. Goats can also destroy other desirable vegetation unless precautions are taken to protect it with effective tree guards or other deterrents. Goats are not suitable where wild dogs are a problem. Consult your local Industry & Investment NSW Livestock Officer or council Weeds Officer before undertaking a management program with goats.

**Pasture improvement**

Pasture improvement is an important part of any program to control groundsel bush. Well-managed, competitive pastures help to reduce the establishment of groundsel bush seedlings. Abandoned banana plantation areas, newly-cleared land and overgrazed infertile paddocks, especially in swampy areas, are all less susceptible to groundsel bush invasion after the establishment of a vigorous pasture. Pasture improvement costs must be compared with the cost of future noxious weed control costs. Consult your local agronomist or your agronomic advisor for advice on the pasture plants and establishment techniques most suitable for your situation.

**Reafforestation**

Reafforestation to control groundsel bush has been tried in a number of situations. This is only successful when good forest management methods are adopted. Chemical control of groundsel bush during the establishment of the plantation may be necessary. Groundsel bush is also shade-tolerant and can still grow and produce seed under heavy canopies. Therefore, once the plantation is established it will be necessary to continue to undertake a chemical management program during this stage as well.

**Biological control**

In Australia, groundsel bush does not suffer from predation by the range of natural enemies which are found in its native habitat. Biological control of groundsel bush involves introducing these natural enemies to reduce its vigour and competitive ability. Six insects have established in Australia, three of which, a fly and two stem-boring agents, have had a minor impact on groundsel bush in NSW. A rust fungus has also been released in NSW. Biological control of groundsel bush is only a management tool in core infestation areas. At this stage, biological control cannot be relied upon for short-term, comprehensive control; other techniques should be used, including mechanical and chemical means.
Gall-forming fly

The gall-forming fly, *Rhopalomyia californica*, lives for only 4–5 hours, in which time it emerges from its pupal stage, mates, finds another groundsel bush, lays eggs and dies. Eggs are laid on the shooting tips and stems and after hatching from the eggs the larvae burrow into the stems.

The plant then forms a gall of spongy tissue around the burrowing larvae, which grow and develop into pupae and eventually emerge as adults (see Figure 7).

The effect of the galls is to reduce the growth and vigour of the plant and prevent flowering. Once flowering stops, the spread of seed is reduced, making it easier to eventually control the weed.

Stem borers

In the mid-1980s, two stem boring agents, *Megacyllene mellyi* and *Oidaematophorus balanotes*, were introduced into northern NSW. Larvae of both agents tunnel into the stems of groundsel bush, causing dieback and even death of the plants in some cases.

The stem borers, particularly *O. balanotes*, have successfully established and can be found over a wide area. However, their effect has been sporadic, mainly reducing the vigour of the plant or causing partial dieback.

Rust

A rust fungus, *Puccinia evadens*, was first released into south-eastern Queensland in 1998. During the following years, numerous releases were undertaken, including a number of sites in northern NSW. Early indications showed promising results for the establishment of the rust. It is hoped this rust will be able to complement other biological control agents and assist with the long-term, integrated management of the weed.

Legislation

Groundsel bush is declared a Class 3 noxious weed in many areas of NSW under the *NSW Noxious Weeds Act 1993* (see Figure 8). Class 3 weeds require that ‘the plant must be fully and continuously suppressed and destroyed’.

The responsibility for the control of noxious weeds on private land rests with the land owner or occupier of the land. This responsibility extends to the middle line of any adjacent watercourse, river or inland water (tidal or non-tidal).

A full list of noxious weeds and requirements under the *NSW Noxious Weeds Act 1993* can be found at www.dpi.nsw.gov.au/weeds

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References


Publications available

A complete list of Industry & Investment NSW weed publications can be found at www.dpi.nsw.gov.au/weeds
Printed copies are available by contacting the Industry & Investment NSW Bookshop on 1800 028 374 or visit www.dpi.nsw.gov.au/bookshop

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PASTURE IMPROVEMENT CAUTIONS

Pasture improvement may be associated with an increase in the incidence of certain livestock health disorders. Livestock and production losses from some disorders are possible. Management may need to be modified to minimise risk. Consult your veterinarian or adviser when planning pasture improvement.

The *Native Vegetation Act 2003* restricts some pasture improvement practices where existing pasture contains native species. Contact your local Catchment Management Authority office for further information.

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