

Invasive plants and animals



Alligator weed

Alternanthera philoxeroides

DECLARED CLASS 1



Description

Alligator weed is a South American perennial plant that grows on land in damp soil, or in water (as dense floating mats).

Alligator weed is identified by the following features:

- hollow stems
- dark green leaves with a distinct midrib
- leaves are arranged in opposite pairs along the stem
- leaves have no leaf stalk (petiole)
- white paper-like, ball-shaped flowers, which appear around mid-summer and are carried on short (2–7 cm) stalks growing from the leaf-stem joint.

On land, it produces underground stems (rhizomes) which may extend to a depth of one metre in soil. Rhizomes are less obvious in semi-aquatic habitats, whilst aquatic plants only develop roots from nodes on the stem. In aquatic situations, stems build up into large, interwoven, floating mats. These mats can reach a thickness of up to one metre.

Alligator weed is often confused with two other plants which grow over the water surface from the banks. They are:

1. Water primrose, which has bright yellow flowers.
2. Smartweed, which has alternate, wavy-edged leaves, often with a dark blotch on the leaf surface and with small, pink flowers on long flower spikes.

The problem

Alligator weed poses an extreme threat to Queensland's waterways, wetlands and irrigated croplands from Cape York to the southern border. It establishes from small plant pieces in water and soil. The only limiting factor is the availability of water or rainfall. Under favourable conditions, the plant grows out from banks to form floating rafts of dense interwoven stems. These can be dislodged by water movement (especially during floods) and are soon replaced by more alligator weed. These thick, dense rafts can:

- restrict water flow in creeks, channels and drains
- impede recreational water sports and boating access
- damage pumping and irrigation equipment and other structural features
- a increase water loss through evapotranspiration;
- reduce water quality by preventing light penetration and reducing oxygenation of water
- create a favourable habitat for mosquitoes
- reduce water bird and fish activity
- make swimming dangerous
- cause the death of native, submerged water plants and fish
- replace native wetland plants.

On land, alligator weed is capable of out-competing all but the most robust plant species, including wetland crops. Data from New South Wales and overseas suggests alligator weed will affect productivity because it is costly and difficult to control. In Queensland, alligator weed has been found in some gardens and the Department of Primary Industries and Fisheries wishes to prevent its establishment in the wild. It can be controlled using herbicides.

Life cycle

Alligator weed forms new shoots in spring from nodes on existing stems or rhizomes. It flowers from midsummer to March, but does not produce viable seed. As winter approaches, stems lose their leaves. Severe frosts kill stems, but regrowth occurs quickly from stems or underground rhizomes buried in soil, when favourable conditions return. In aquatic

situations stems break and float away to form new mats or take root in shore sediments.

Habitat and potential distribution

Alligator weed grows under a wide range of conditions on land and water. Optimum growth occurs in fresh water with a high nutrient level. It can tolerate brackish water, and once established on land will survive extreme dry periods.

Considering its vigorous growth and ability to re-establish from stem fragments, alligator weed has the potential to establish in all Queensland coastal areas and inland agricultural and urban areas (where water is not a limiting factor).

FIGURE 1 – POTENTIAL DISTRIBUTION OF ALLIGATOR WEED IN AUSTRALIA



EI stands for Ecoclimatic Index, and represents the areas where alligator weed could potentially occur, given the existing climatic conditions of an area and the climatic conditions preferred by alligator weed. The higher the index, the more suitable are the local climatic conditions to support alligator weed.

Declaration details

Alligator weed is a declared Class 1 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. A **Class 1** pest is one that has the **potential** to become a very serious pest in Queensland in the future. We need to prevent the import, possession and sale of these species so that they can't escape to become pests. All landholders are required by law to keep their land free of Class 1 pests. It is a serious offence to introduce, keep or sell Class 1 pests without a permit. A Local Government may serve a notice upon a landholder requiring control of declared pests.

Prevention

Prevention is the only way of limiting alligator weed. Look for unfamiliar plants, particularly in aquatic areas. Do not allow weeds to establish and always treat any small infestations before they can spread.

Any suspected infestations of alligator weed should be reported immediately to the nearest Department of Primary Industries and Fisheries office (Land Protection Officer).

Control

A number of control methods are available for alligator weed. It is important that nothing is planted in the area being treated until it is certain the infestation is controlled. Landholders should contact the Department of Primary Industries and Fisheries (Land Protection Officers) to discuss the most appropriate method for control in each situation.

Mechanical

Successful mechanical/physical removal of this plant is extremely difficult since the plant is able to re-establish from very small pieces.

Do not attempt to physically remove this plant. Contact your local Land Protection Officer, Department of Natural Resources and Water, if you find a plant you suspect may be alligator weed.

Spread to other areas is likely to occur by two methods if care is not taken. These are:

- re-establishment from stem fragments that are left behind
- loss of spillage at the dump site or in transit.

Equipment, vehicles and clothing (especially soles of shoes) should be inspected before leaving the affected area. Drying and burning or deep burial of the desiccated weed material is essential. Follow-up inspections of both the removal and disposal areas are essential to check for regrowth. In NSW coastal areas, excavation equipment (especially those with tracks) have been the main cause of alligator weed spread.

Herbicide

Alligator weed grows in different situations, each requiring particular herbicide controls. Table 1 shows herbicides, and application rates recommended for the control of alligator weed.

Biological

Three biological control agents from South America have been introduced into New South Wales for the control of alligator weed. Two of these insects are established and contribute to control of alligator weed growing in the aquatic habitat but not when it grows on land.

The two insects that are established are:

The Flea Beetle (*Agasicles hygrophila*)

Both the adults and larvae feed on the underside of leaves and aerial parts of alligator weed. The insect causes a reduction in photosynthesis (energy production), which weakens the plant.

If insect numbers are high, the beetles also feed on the stems, which become prone to infection from pathogens or desiccation. Pupation occurs inside the hollow stems and newly emerged adults cut a hole and exit the stems. The stems are then prone to water logging and secondary rotting as water enters the emergence hole, contributing to the demise of the weed.

The Stem Boring Moth (*Vogtia malloï*)

Larvae bore into the internode and down the hollow stem causing it to collapse. One insect can destroy between five and nine stems of alligator weed.

Biological control has proven to be very effective on aquatic infestations of alligator weed. However, terrestrial plants have proven to be far less susceptible to insect attack.

The limited infestations in Queensland are primarily terrestrial and have been targeted for eradication using other control techniques.

Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.



TABLE 1 – HERBICIDES FOR THE CONTROL OF ALLIGATOR WEED

Situation	Herbicide	Rate	Comments
Terrestrial plants	Metsulfuron methyl (Brushoff®) + 1mL/L non-ionic wetter	80g/ha + 1mL/L non-ionic wetter or 10g/100L water + 1mL/L non-ionic wetter	<p>Apply in terrestrial situations only. Follow-up applications over at least two seasons are essential for complete control.</p> <p>A 'two-hit' strategy (with second application one-two weeks after the initial treatment only to any plants missed in the initial treatment) in January, March and May is recommended.</p> <p>Allow maximum regrowth before re-treatment and time the final treatment as close to the start of winter so as to ensure maximum movement of the herbicide to the rhizomes.</p> <p>Ensure all plants and regrowth receives at least 3 double treatments during the season. Boom spray large infestations and (if necessary) use pneumatic sprays or brushes to apply in garden-type settings or where uptake by neighbouring plants may be a problem. Follow up with spot treatment if necessary and inspect the area for regrowth in the next growth season.</p>
Free floating plants	Glyphosate (Roundup Biactive®)	10 mL/L	Apply any time when actively growing, from summer through winter. Floating form only.

Fact sheets are available from DPI&F service centres and the DPI&F Information Centre phone (13 25 23). Check our web site <www.dpi.qld.gov.au> to ensure you have the latest version of this fact sheet. The control methods referred to in this Pest Fact should be used in accordance with the restrictions (federal and state legislation and local government laws) directly or indirectly related to each control method. These restrictions may prevent the utilisation of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the Department of Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.