

Water hyacinth

Eichhornia crassipes



Originally introduced to Australia as an aquatic ornamental plant, water hyacinth has become a major pest of rivers and dams. Not only does it destroy native habitats, but it also seriously depletes water bodies of oxygen, increases water loss and provides a breeding ground for mosquitoes.

Rampant growth of water hyacinth can destroy native wetlands and waterways, killing native fish and other wildlife.

Water hyacinth can form dense mats that spread out across water surfaces eventually choking the entire water body. Propagation can be so rapid that an infestation may double in size every week under ideal conditions.

Water hyacinth can spread rapidly through the waterways of catchments. It is particularly important that infestations are prevented from entering the Murray-Darling system where an infestation could easily spread into three southern states.

Legal requirements

Water hyacinth is a restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment without a permit. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.



At a local level, each local government must have a biosecurity plan that covers invasive plants and animals in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Water hyacinth is a floating waterweed up to 65 cm tall and the leaves are dark green rounded leaves up to 5–10 cm in diameter. Leaf stalks of young plants are swollen into spongy, bulbous structures; mature plants have elongated leaf stalks.

An erect stalk supports a single spike of 8 to 15 flowers. Flowers are light purple with a darker blue-purple with yellow centres, 4–6 cm long and 3.5–5 cm wide. They are carried in dense spikes projecting above the plant. Fruit capsules are 10–15 mm long, contain up to 300 seeds. Seeds are egg-shaped, 0.5–1.5 mm long. The root system is extensive (up to 1 m) feathery, fibrous, black to purple.

Life cycle

Water hyacinth grows from seed and through vegetative reproduction. Seeds are produced in capsules at the base of each flower. Daughter plants are produced by vegetative reproduction, remain attached to the parent plant until they are broken off by wind or other physical damage.

Flowering can begin as early as October and continue through the summer months. Each of the flowers on a stalk remains open for one to two days before beginning to wither. When all the flowers on a plant have withered, the stalk gradually bends into the water and after about 18 days, seeds are released from capsules at the base of each dead flower.

In warm climates, vegetative reproduction is rapid and enables the formation of large, dense rafts of plants within a short time.

Methods of spread

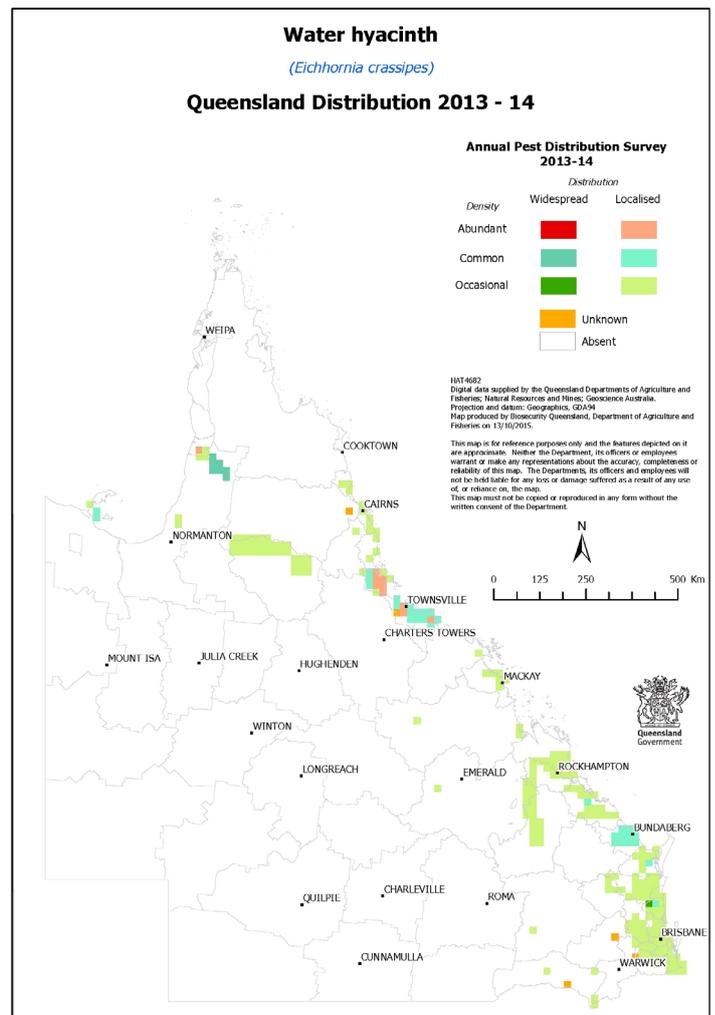
People using the plant for ornamental display. Flooding spreading seed and plant fragments into creeks, rivers, wetlands and dams.

Habitat and distribution

Originally from Brazil, water hyacinth was introduced to the Brisbane metropolitan area as an ornamental pond specimen in the early 1900s. Valued for its floral presentation, it was released into ponds and lagoons in public parks throughout Queensland.

Infestations now occur mostly in coastal Queensland and New South Wales where the plant prefers fresh, static or slow flowing water with high organic content.

Map 1. Distribution of water hyacinth in Queensland



Control

Managing water hyacinth

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by water hyacinth. This fact sheet provides information and some options for controlling water hyacinth.

A combination of mechanical, biological and herbicide methods are the best strategy in managing water hyacinth.

First make certain that the weevils are established on the infestation, and then carry out mechanical control or a spray program using a selective herbicide. Selectively controlling strips of the water hyacinth mats helps concentrate the biological control insects onto the remaining weed to increase damage.

Control is not cheap, but it is cheaper now when you consider the effects to you, your property and the environment if nothing is done. It is also much easier and cheaper to prevent weed establishment when small weed infestations are treated quickly.

In most cases the best management approach combines herbicide, mechanical, fire and biological control methods with land management changes. It is essential the control methods chosen suit the specific weed and the particular situation.

Prevention and early detection

Floodwater can deposit water hyacinth in dams, lagoons and in calm water areas of rivers and creeks. Attempts to physically remove plants should be made before they flower and set seed.

As water hyacinth seeds are extremely long-lived, new plants may spring up long after older plants have been removed.

Mechanical control

Water hyacinth removal by hand or machine is a practical control method often used for small areas or when plant numbers are low. Physical removal is most effective for small infestations and should be made before flowering and seed set in October.

Mechanical control of water hyacinth can help take advantage of flooding or water flushes that deposit water hyacinth in dams, lagoons and calm water areas of rivers and creeks. When using this approach it is essential water hyacinth is removed before its rapid growth commences.

Water hyacinth that is deposited or left on moist banks can survive for long periods out of the water. To help prevent the reintroduction of water hyacinth into the watercourse, it is essential it is moved from the waters edge and preferably burnt.

Biological control

Biological control is most effective on large areas of water hyacinth but may take many years to achieve satisfactory control.

Four insect species have been introduced from South America and released by CSIRO since 1975. The two weevil species *Neochetina eichhorniae* and *Neochetina bruchi*, and the two moth species *Niphograpta albiguttalis* (previously known as *Sameodes albiguttalis*) and *Xubida infusella* are present in Queensland.

The weevil *Neochetina eichhorniae* has been the most successful and has played a key role in removing large infestations in tropical areas of the state. The adult is black, 5 mm long and feeds on the leaves making small scars. Eggs are laid in the bulbous leaf stalks and the larvae tunnel through the plant tissues. Bacteria and fungi then attack the damaged tissues and under heavy attack the plant becomes waterlogged and eventually dies. The life cycle of the weevil takes three months and the insect is inactive over winter.

The other weevil, *Neochetina bruchi*, is active through the winter and complements *Neochetina eichhorniae* control. This weevil was first released in south-east Queensland in 1990 and in north Queensland in 1991. Field-testing of this weevil is ongoing and it appears that *Neochetina bruchi* is effective. It is suggested the introduction of both weevils to an aquatic system is the best possible option, because their life cycles complement each other. However, both weevils are much less effective in sub-tropical and cooler areas.

The moth *Neochetina albiguttalis* is well established in north and South East Queensland and in northern New South Wales. The larva of this moth tunnel into the

petioles and buds and although effective on young plants the impact is often temporary and patchy.

The other moth, *Xubida infusella*, also has larvae that tunnel in petioles and buds and was first released in Ingham in 1981. New stocks were released in Queensland from 1996 to 1999 by CSIRO but the success of this release is currently unknown.

Herbicide control

Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label. When treating water that is used for irrigation purposes, the withholding period should be followed in accordance with the label recommendations.

Spraying an entire heavy infestation can cause water hyacinth to sink and result in pollution from the rotting weed. This problem can be avoided by spraying strips of the weed or by mechanically removing much of the weed before spraying. For this reason it is vital to destroy scattered plants when they appear rather than delaying treatment until the entire water body has been choked. Heavy infestations on shallow water bodies should be physically removed to avoid putrefaction of the water.

Diquat is the only herbicide registered for use in water storage areas used for human consumption. Note that 14 days must elapse after treatment before water can be consumed.

Note that there are many formulations of both glyphosate and 2,4-D, but not all are registered for water hyacinth or for use in aquatic areas. Products not registered for this use may contain ingredients that are harmful to non-target organisms and must not be used.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit www.biosecurity.qld.gov.au.



Table 1. Herbicides for the control of water hyacinth

Situation	Herbicide	Rate	Comments
Waterways, non potable water, drains, dam margins, lakes and streams	2,4-D acid 300 g/L (e.g. Affray 300)	50 mL/10 L water or 500 mL/100 L water	Knapsack: coverage: 10 L spray solution/100 m ² Hand gun: 200 L spray solution/1000 m ² Avoid causing submersion of sprayed plants
		1 L/20 L water	Sprinkler sprayer ¹ Coverage 20 L spray solution/1000 m ²
		5 L/200 L water/ha	Boom application by helicopter Raindrop D8 nozzles angled back at 45° to minimise spray drift
Aquatic areas, channels, dams, bore drains and waterways	Amitrole 250 g/L + Ammonium thiocyanate 220 g/L (e.g. Amitrol T [®])	280 mL/100 L	Apply immediately prior to flowering If infestation is large, treat in sections to avoid eutrophication of water
	Diquat 200 g/L (e.g. Diquat 200 (various brands) Reglone [®])	400 mL/100 L water + 150 mL Bonus wetting agent (permitted under Permit PER81236 APVMA permit expires 30/06/2020)	Small areas Thoroughly saturate About 1 mL of product (250 mL of spray mix) should be sufficient to treat 1 m ² Do not use water for 10 days after application
		5–10 L/ha	Thoroughly wet foliage Clear water is necessary for best results Use higher rate for heavy infestations or for deep or dirty water (consult label) Do not use water for 10 days after application
	Glyphosate 360 g/L (e.g. Ken-Up Aquatic 360, Weedmaster Duo) and other formulations registered for use in aquatic areas (numerous products)	1–1.3 L/ 100 L water or 6–9 L/ha (for other formulations consult labels for correct rates)	Apply when actively growing and at or beyond the early bloom stage of growth Use the higher rate on dense infestations (consult label)
Pastures, rights-of-way and industrial	2,4-D amine 635 g/L (e.g. Crop Care Amine 625, Ken-Amine 635 and many other products) and other formulations where label includes water hyacinth	3.5–5.3 L/ha (for other formulations consult label for correct rate)	Apply to 2200–3300 L water/ha (consult label)

Notes

Diquat is the only product registered for use in water storage areas used for human consumption. Do not use treated water for human consumption, livestock watering or irrigation purposes for 10 days after application of diquat.

¹A sprinkler sprayer consists of a micro sprinkler connected to a hollow fibreglass rod attached to a pneumatic knapsack sprayer. It is used at low pressure (50 to 200 kPa) with a slow sweeping action over the top of the plants to ensure an even coverage of the leaves.

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.



This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet 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 use 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, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.