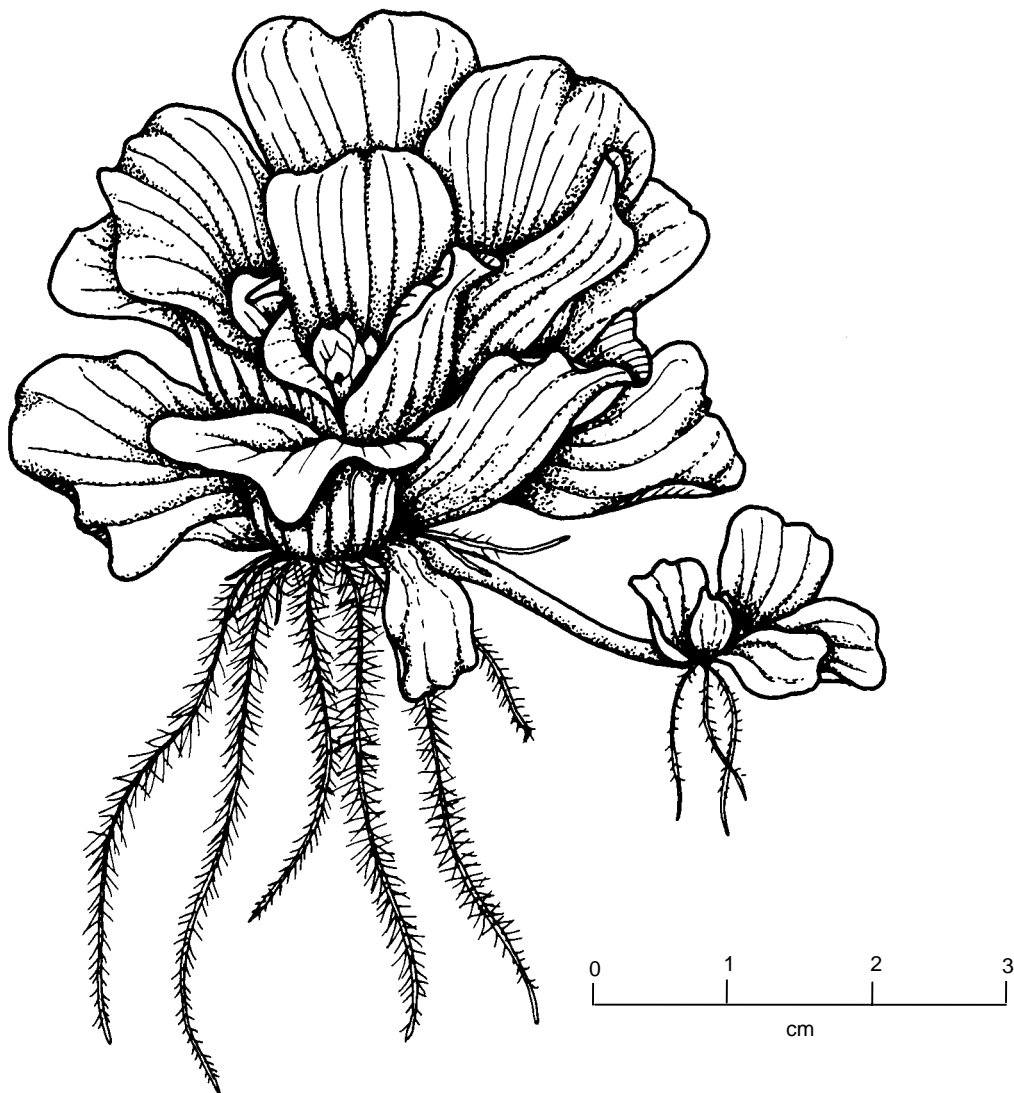


## Water lettuce

*Pistia stratiotes*

DECLARED



Water lettuce is a free floating aquatic weed that rapidly forms dense mats covering rivers, dams and irrigation canals. It can restrict water flow, increase water loss by transpiration and serve as a breeding ground for mosquitoes. Water lettuce spreads both by vegetative reproduction and by seeds.

The Murray-Darling catchment, is currently free of this weed and all efforts should be made to prevent it's introduction. In all other areas of Queensland, an integrated control strategy should be adopted to reduce infestations.

## Description

As the name suggests, the entire plant resembles a small, floating, open head of lettuce. The aquatic perennial is spongy and consists of a floating rosette of pale green, fan-shaped leaves covered with hairs that trap air giving buoyancy to the plant. It has a tuft of unbranched, fibrous roots up to 80 cm long.

Mature plants produce a large number of small, green, inconspicuous flowers in their centre. A membrane separates the male and female flowers. The fruit is a berry 5-8 cm across with seeds about 2 mm long, oblong in shape and tapered at each end.

## The problem

Under tropical conditions, growth is rapid forming dense mats, often covering rivers, dams and irrigation canals. These mats, with their long roots, can restrict the flow of water, increase water loss through transpiration and reduce light infiltration that is necessary for photosynthesis in submerged aquatic plant life.

The presence of water lettuce is especially undesirable in the Murray-Darling system as it could possibly spread into inland New South Wales, Victoria and South Australia.

Other problems include:

### 1. Increases in irrigation costs

The restrictive action of the roots of water lettuce reduces the flow of water to irrigation equipment, thus increasing pumping times and costs. The dense mats also tend to bank up during flood times, potentially causing damage to fences and irrigation structures.

### 2. Degradation of water quality

The presence of water lettuce brings about a depletion of oxygen levels and a decline of water quality and these can eventually lead to the death of fish.

### 3. Restriction of activity

Waterflow activity and recreational water sports can be restricted due to the presence of the plant.

### 4. Increased health risks

Dense mats of water lettuce can create a haven for mosquitoes, thus increasing the risk of the spread of disease through this medium.

## Life cycle

Seeds germinate in late November-early December after sinking to the mud bottom. The seedlings float to the surface. Flowering and reproduction commence early in the plant's life – about the 4th or 5th leaf stage, if plant densities are high. Flowers are wind pollinated. Propagation also occurs by stolons (20 cm long) which produce daughter plants. Water lettuce is sensitive to frost but can grow in polluted water.

## Habitat and distribution

Originally from Asia, water lettuce was introduced as an aquarium and water garden specimen, and has become naturalised in the Northern Territory. Through flooding and abandonment the plant is now present in a number of areas throughout eastern Queensland. The plant prefers stationary or slow-moving streams and could become established in most areas of the State.

Like other floating plants, water lettuce can survive for long periods when stranded on mud banks or in other damp situations such as a roadside culvert where it may even take root.

## Declaration details

Water lettuce is a declared plant under Queensland legislation. Declaration requires landholders to control declared pests on the land and waters under their control. A Local Government may serve a notice upon a landholder requiring control of declared pests.

## Prevention

New infestations may become established when plants are brought into new areas by flooding. Surveillance and physical removal at such times may prevent infestation. Public education to prevent disposal of plants from domestic situations is necessary.

## Control

The best form of weed control is prevention. Always treat weed infestations when small, do not allow weeds to establish. Weed control is not cheap but it is cheaper now than next year, or the year after. Proper planning ensures you get value for each dollar spent.

Look at your weed problem carefully:

- Can you realistically eradicate it?
- Or should you contain the weed to stop new infestations developing while you reduce existing ones?
- What are you required to do by legislation?
- How does weed control fit into your property management plan?
- What can you do to restore areas and prevent re-establishment?

The best approach is usually to combine different methods. Control may include chemical, mechanical, fire and biological methods combined with land management changes. The control methods you choose should suit the specific weed and your particular situation.

### **Mechanical control**

Mechanical control is only practical for small areas. The plants should be dried to prevent regrowth. For suggested methods of removal, contact the Research Information Officer, Tropical Weeds Research Centre on (07) 4787 3300. Alternatively, contact the Land Protection Officer at your nearest Department of Natural Resources and Mines office.

### **Biological control**

Two weevils (*Neohydronomus pulchellus* and *Orchetina bruchi*) have been introduced and exert good control in some areas.

The weevils have proved effective on dams from Bundaberg to Brisbane. Eggs are laid in the fleshy leaves and the larvae tunnel through the plant tissue. The openings assist the entry of fungi and bacteria, causing the tissue to rot. The life cycle of the weevil takes about three months.

Biological control is most effective on large infestations, but it may take 10 years to achieve satisfactory control if used in isolation from other methods. Supplies of these insects are available through the Department of Natural Resources and Mines, Land Protection Officers.

### **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 which is used for irrigation purposes, the withholding period should be followed in accordance with the label recommendations.

Spraying with chemicals is often the only practical method for large infestations. Autumn applications tend to be more effective than summer ones.

Table 1 lists the herbicides registered for control of water lettuce.

### **Integrated control**

In most situations, integrated control is a sensible strategy. It should include physical, chemical and biological methods. The different methods complement each other.

First make certain that the weevils are established on the weed infestation, then carry out a spray program using a selective herbicide. Spraying sections of the infestation at a time will concentrate the insects on the remaining weed which is destroyed. Mechanical removal of dead plants will avoid water degradation by masses of rotting weed.

## **Further information**

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

**TABLE 1 - HERBICIDES REGISTERED FOR THE CONTROL OF WATER LETTUCE**

Situation	Chemical	Rate	Comments
Aquatic Weed Control	Diquat 20g/L (Watrol non-residual herbicide)	50-100 L/ha or 4 L / 100 L water	Add wetting agent Higher rate for denser infestations or dirty water. Overall spray, thoroughly wetting foliage. Follow label instructions
	diquat 20g/L (Vegetrol herbicide)	50-100 L/ha or 4 L / 100 L water	Add wetting agent Follow label instructions
	diquat 200g/L (Reglone non-residual herbicide)	5-10 L/ha or 0.4 L / 100L water	Add wetting agent Follow label instructions
	Calium dodecylbenzene sulphonate (AF 100 Floating)	1L / 19 L kerosense or 1 L / 100m <sup>2</sup>	Follow label instructions
	Calium dodecylbenzene sulphonate (AF 100)	1L / 19 L kerosense or 1 L / 100m <sup>2</sup>	Follow label instructions
	glyphosate 360g/L (Roundup biactive herbicide)	9 L/ha or 13mL / L water	Follow label instructions
Channel, drain or irrigation, margins of dams, lakes and streams	glyphosate 360g/L (Weedmaster 360 herbicide)	9 L/ha or 13mL / L water	Follow label instructions
Flowing water course, Margins of dams, lakes and streams, sewer main and drain line weed control	2,4-D 300g/L (AF-300 herbicide)	1:200 Water  50mL / 10L water	Handgun application Follow label instructions

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

<p><b>Find more <i>NRM Facts</i> at &lt;<a href="http://www.nrm.qld.gov.au">www.nrm.qld.gov.au</a>&gt;; on the NR&amp;M Free Faxback Line, phone 1800 240 691 and PrimeNotes CD-ROM, phone 1800 816 541.</b></p>	<p>The control methods suggested above should be used in accordance with restrictions (for example, federal and state legislation, local government laws, product manufacturer's guidelines) directly or indirectly relating 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 the information in this fact sheet, the Department of Natural Resources and Mines does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.</p>
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