Elodea: an emerging submerged weed in Victoria

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Summary Elodea (Elodea canadensis Michx.) is a perennial aquatic plant that grows totally submerged. It is a native of North America and was introduced to Australia and other parts of the world as an aquarium plant. Large infestations of elodea were discovered in a wetland at Endeavour Hills in Victoria recently. Elodea is actively expanding its range in Victoria and is likely to continue to do so within the system it has already invaded. Every attempt should be made to limit its movement between water bodies.

Keywords Elodea, submerged, irrigation.

INTRODUCTION

Elodea (Elodea canadensis Michx.), Canadian pondweed, is a member of the monocotyledonous, Hydrocharitaceae family. The plant is a submerged, attached, much-branched perennial aquatic plant.

Elodea first appeared on the Australian mainland in 1958 in the southern Riverina of New South Wales (Aston 1973). Afterwards, it progressively spread throughout the irrigation districts of New South Wales and adjacent areas of Victoria and some parts of Tasmania. Elodea is native to temperate North America and was introduced probably through the aquarium trade in several countries besides Australia, including the United Kingdom, much of Europe and both islands of New Zealand. It was introduced to New Zealand and Tasmania in the 1960s.

It is a major weed of irrigation systems, restricting water flow to 60–80% of design capacity and sometimes causing canals to overflow. In water storages, it interferes with hydroelectric output and urban water supplies. The weed disrupts river and channel water traffic, limits recreational use of streams and significantly alters native aquatic ecosystems.

Elodea can be confused with the Australian native plant hydrilla (Hydrilla verticillata (L.F.) Royle) and Brazilian elodea (Egeria densa Planch.). Hydrilla leaves have slightly toothed margins. Egeria can be distinguished by its larger leaves that are usually in whorls of four or five. The leaves of elodea are in whorls of three.

CURRENT DISTRIBUTION IN AUSTRALIA

Elodea has been located at one of the new wetlands developed by Melbourne Water in Endeavour Hills, 35 km from the city of Melbourne in Victoria (Gunasekera 2003). This wetland was developed to purify storm water coming from a nearby creek. But six months later, elodea has invaded the wetland. This was the biggest elodea infestation in the Melbourne metropolitan area. Elodea is a popular plant in aquariums and fish bowls with a few strands floating languidly to provide cover for fish.

BIOLOGY

Elodea is a submerged, attached, much-branched aquatic plant with stems up to 3 m long. Its leaves are sessile, 15–30 mm long (Aston 1973), 2–5 mm wide and occur in whorls of three, and rarely four (Sainty and Jacobs 1988). The small inconspicuous flowers float on the water surface in summer. Flowers are insect pollinated, both male and female being carried to the water by elongation of the hypanthium. Only male flowers have been recorded in Australia while only female flowers have been recorded in New Zealand. Propagation is mainly by stem fragmentation in the autumn. This plant does not grow well in water where there is a lack of iron and appears to have a high light requirement for maximum growth.

Elodea is tolerant of low water temperatures and, in winter, will adopt a leafy dormant form. New growth of elodea occurs from September and October as water temperature rises above 15°C. The growth rate is higher during summer but declines in March as temperature falls and day length shortens (Parsons and Cuthbertson 2001). Elodea is affected by variation in light intensity, day length and light quality. The biomass varies directly in proportion to the light available at the surface (Dawson and Kern-Hansen 1979).

IMPACTS

Elodea has been one of the more important submerged aquatic weeds blocking irrigation channels in southeastern Australia. Thick infestations can reduce water flow by 50–75% and in reservoirs interfere with hydroelectric output and water supplies (Parsons and Cuthbertson 2001). They also disrupt river flow, reduce recreational use of streams and significantly alter the aquatic ecosystem. Elodea has been declared noxious in Tasmania, South Australia and the Northern Territory.
MANAGEMENT
Submerged weeds are among the most difficult to control and elodea is no exception. There is no registered herbicide to use on elodea. Acrolein has been used in the past in irrigation systems but this chemical can only be applied by specially trained personnel and treated water cannot be used for 48 hours. Mechanical/manual removal is being used in some places but it is laborious, expensive and can spread the plant by fragmentation.

In North America, elodea is kept in check by natural predators such as ducks, fish and insects. This does not happen in Australia. We need to find a better solution to manage this invader.

REFERENCES