



# ASSIST

AUSTRALIAN SCHOOL SCIENCE  
INFORMATION SUPPORT FOR  
TEACHERS AND TECHNICIANS

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[Home](#) > Plant ecology - oxygen-producing plants

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## Plant ecology - oxygen-producing plants

Posted by Anonymous on Wed, 2015-02-04 16:39

Plant ecology - oxygen-producing plants: What aquatic plants are legal to use for photosynthesis experiments in Australia, in particular Western Australia?

Good oxygen producing plants are *Ceratophyllum demersum* (fox tail, a hornwort), *Elodea canadensis* (Elodea) and *Hydrilla verticillata*. However, all three are aquatic weeds and banned in various states across Australia.

Are we allowed to grow any of these plants in the school environment for biology experiments?

### Voting:



No votes yet

### Year Level:

7

Senior Secondary

### Laboratory Technicians:

Laboratory Technicians

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Showing 1-1 of 1 Responses

## Answer by labsupport on question Oxygen producing plants

Submitted by sat on 04 February 2015

Answer reviewed 19/01/2023

## Introduction

We understand that the intended use is to allow the plants to photosynthesise under water and to observe and capture the oxygen bubbles that are generated in an inverted test tube. In the past, Elodea has been used in such activities. However, because of its declared pest status, this is no longer permitted, except in Victoria. The possible use of Hydrilla is being considered for this activity.

Although we have not field tested it, we think that under favourable conditions Hydrilla produces oxygen at a rate suitable for the above activity. Given the precautions listed above, there would seem to be no reason not to use this plant in those parts of Australia where it already occurs naturally. However, there remain significant parts of Australia where this is not appropriate, especially Tasmania and the ACT.

Science ASSIST would welcome any suggestions of other more environmentally friendly aquatic plants that may suit this activity.

## *Ceratophyllum demersum*

*Ceratophyllum demersum* is a declared weed in Tasmania, but not in other states/territories, and is a permitted organism in WA see <https://www.agric.wa.gov.au/organisms/85206>

The following link has some good information about *Ceratophyllum demersum*:  
<https://profiles.ala.org.au/opus/weeds-australia/profile/Ceratophyllum%20demersum>

### Key Points

- Hornwort (*Ceratophyllum demersum*) is a free-floating, submerged, rootless, leafy, annual or perennial freshwater herb, reproducing vegetatively and by seed.
- It occurs in sheltered sites in stagnant or slowly moving water in ponds, dams, streams and reservoirs.
- Hornwort is native to Australia, occurring in all states except Tasmania.
- In Australia, Hornwort rarely causes problems when it is in balance with the surrounding ecosystem and can be beneficial. However, when environmental change occurs, the plant becomes weedy and has a negative effect on stream flow, interferes with navigation, fishing and hydro-electric output.
- Herbicides provide the best means of controlling the growth of Hornwort.<sup>1</sup>

When the ecosystem is in balance, plants like *Ceratophyllum demersum* and *Hydrilla verticillata* do not generally cause a problem, but when there is an influx of nutrients or other changes occur that alter that balance, it can overgrow and cause problems.

Therefore, *Ceratophyllum demersum* is permitted in WA so you can use that one. Of course, as you are aware of its potential as a weed, responsible management of it would include

destroying any remaining plant material at the end of the activity to ensure that it is not allowed to enter any waterways where it does not already exist.

It seems that the plants that have the most potential to be a weed and cause environmental problems, are the best oxygen producers to demonstrate photosynthesis in science activities! Science ASSIST would welcome any suggestions for plants that may suit this activity.

The following link has some good information about *Ceratophyllum demersum*:  
<http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weedde...>

### ***Hydrilla verticillata***

According to the Western Australian Department of Agriculture and Food, you can legally grow *Hydrilla verticillata* in WA and use it in biological experiments and investigations. See <https://www.agric.wa.gov.au/organisms/126995>

However, this does not apply to all states and territories. According to the Australian Government Department of Environment, it is noted as a declared weed in Western Australia and Tasmania. Its use is permitted in WA but in Tasmania, where it does not occur naturally, it may not be sold or used. See:

- [http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weeddetails.pl?taxon\\_id=9576#](http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weeddetails.pl?taxon_id=9576#) (see management tab)
- <http://dpi.wa.gov.au/invasive-species/weeds/weeds-index/declared-wee...>

Hydrilla (*Hydrilla verticillata*) is an aquatic plant native to parts of Asia and Northern Australia (NT and Qld) where it grows in waterways, lagoons and estuaries. It now occurs naturally in all states and territories except the ACT and Tasmania. It is very similar to several other aquatic plants including Elodea.

Hydrilla is extremely robust and able to thrive in a wide range of temperature, light and salinity conditions. With the potential to create severe environmental plant blooms and waterway obstruction, this is not usually a problem in Australia. However, it is a major problem in North America.

See [http://www.dpi.nsw.gov.au/\\_\\_\\_data/assets/pdf\\_file/0007/329308/041209-DPI-RWW-PLANT-GUIDE.pdf](http://www.dpi.nsw.gov.au/___data/assets/pdf_file/0007/329308/041209-DPI-RWW-PLANT-GUIDE.pdf).

Hydrilla is not widely commercially available as live plants, however, we have located one possible source. See <http://www.watergardenparadise.com.au/submergedplants.php>.

Alternatively, as Hydrilla occurs naturally in many waterways, you may be able to collect it yourself. Responsible management of it would include destroying any remaining plant material at the end of the activity to ensure that it is not allowed to enter any waterways where it does not already exist.

### ***Elodea canadensis***

Elodea (*Elodea canadensis*) is a similar aquatic plant that is native to North America, introduced through its use in aquaria. It can also create severe blooms and clog waterways and is regarded as a greater environmental problem in Australia. For this reason, it is banned from sale in most of Australia, except for Victoria. See <https://www.southernbiological.com/living-specimens/plants-and-physarum/l2-15-elodea-anacharis-live-victoria-and-queensland-only/> (Updated May 2019)

### **Additional comments specific to WA:**

For general information regarding the importation of other plants or organisms into WA, see <https://www.agric.wa.gov.au/bam/legislation-importing-western-australia>. The status of a particular organism can be checked on the Western Australian Organism List (WAOL) see <https://www.agric.wa.gov.au/organisms>. Unlisted organisms require a permit for importation.

ESWA (Earth Science Western Australia) have done a little testing around this for the Woodside Australian Science Project (WASP) and found that it is okay to use a plentiful supply of any local waterweed, aquatic plants from an aquarium supplier or filamentous algae from the school pond (or even seaweed). These have produced oxygen using a lamp setup overnight (it is a good idea to push some of the weed up into the test tube/collection device to encourage capture of oxygen).

This investigation was done for the Year 10 WASP package (Carbon Cycle section) - <https://www.wasp.edu.au/mod/page/view.php?id=89>

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