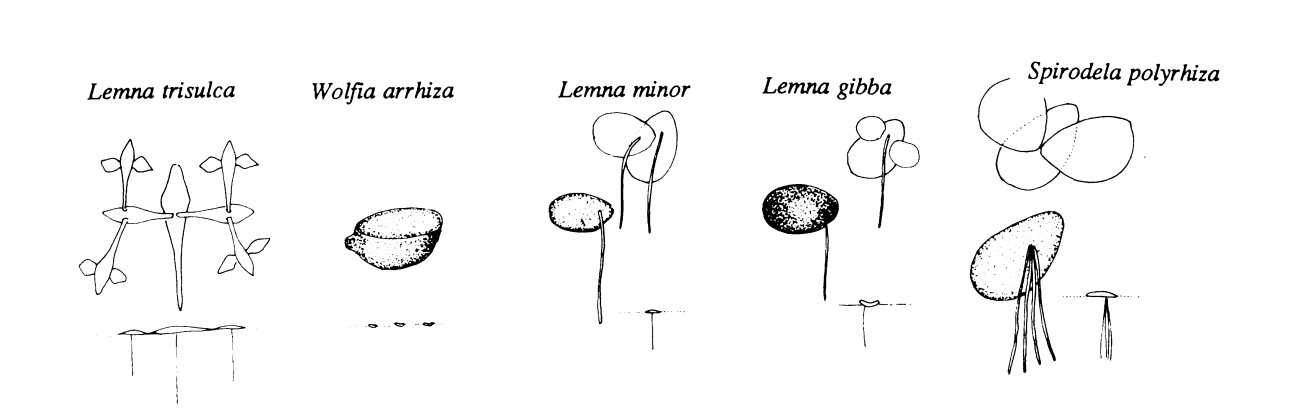
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Aquatic Plant Management

Information Sheet 16: *Lemna species* (Duckweeds)

Duckweeds are small free-floating plants often forming dense mats on the surface of still or slow flowing water. They grow best in eutrophic (nutrient rich) waters with an element of organic enrichment from leaf litter. The leaves are small, often not exceeding 5mm in length (except *Spirodela polyrhiza* which can be up to 1 cm), either single (*Lemna minuta* and *Lemna gibba*) or in groups of two or three (*Lemna minor*). *Lemna trisulca* has a more complex branched structure and grows submerged. This species is not often a nuisance. The leaves of *L. gibba* are always swollen, whereas those of *L. minor* can be slightly swollen under some circumstances. *L. minuta* has very small leaves and short roots. The leaves of *L. minuta* tend to be more ellipsoidal than those of *L. minor* and the plants do not stick together on the surface, behaving like individuals rather than as a mat.

The plants grow mainly by vegetative reproduction, two daughter plants bud off from the adult plant. This form of growth allows very rapid colonisation of new water and re-colonisation after treatment in previously infested areas. The doubling times in high summer can be as short as 2-3 days. *L. minuta* is becoming more prevalent as it tends to overwinter better than other species, remaining green throughout winter.



Mechanical control

Mechanical removal is often possible in small ponds by dragging a floating boom stretched across the pond and removing the collected mass of weed at the end of the pond. There are some harvesting machines which will remove *Lemna* quite well in larger lakes. Infestation is often prevented by stretching a boom across inflows to catch any plants coming in from upstream. It is impossible to remove every plant by mechanical means and regrowth will be inevitable. Mechanical methods of control give an instant effect which can last for a reasonable length of time. The removed weed can be composted. Continuous removal of this plant is often necessary.

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Chemical control

Lemna species are susceptible to herbicides containing, terbutryn and glyphosate. Clarosan (terbutryn) is a granule formulation applied directly to the water. It will kill all submerged plants, waterlilies are moderately resistant but may be killed if they have not been exposed to the herbicide before. There are many formulations of glyphosate which are suitable for the control of *Lemna* species, however, only formulations which state clearly on the label that they are suitable for use in water should be used. Glyphosate formulations are applied as a spray and will only kill plants that the spray touches (this includes water lilies and all emergent reeds, rushes and grasses). It is not advisable to use glyphosate on thick mats of duckweed as only the top layers will be killed and regrowth will be very rapid. However, glyphosate formulations are the best option for single layers and small infestations. Where dense mats are present use or Clarosan. *L. minuta* is resistant to glyphosate treatment.

Use glyphosate or Reglone after mechanical treatment to kill plants left in inaccessible spots in the margins or under trees.

Biological control

Grass carp will eat *Lemna* species. Further information on the use of Grass Carp for Aquatic Weed Control is available from the Environment Agency in R&D Note 57.

Environmental control

The use of shade has been successful in reducing the amount of duckweed growth although very deep shade is often required.

Shade can be achieved by planting trees on the south side of a waterbody. *Lemna* does not compete well with other floating leaved plants such as waterlilies and planting species with floating leaves can substantially reduce the nuisance level of duckweeds.

Duckweeds prefer still water and increasing the disturbance of the water surface can reduce the amount of duckweed. This can be achieved by the use of a fountain or, on canals, by increasing the amount of boat traffic. The minimum amount of boat traffic required to eliminate *Lemna* is reckoned to be about 1500 boat movements per annum. Boat traffic of less than this will reduce the competitive ability of the species and may aid in their eventual elimination.

Best option

Remove as much weed as possible by mechanical means. Spray the remainder with glyphosate if the surface layer is thin enough, otherwise use Reglone. Spot treat any re-infestation with glyphosate. Use Clarosan or Reglone at 25 l/ha for control of *Lemna minuta*.

Plant species with floating leaves to compete with the *Lemna* for space. Increase the disturbance of the water surface, by installation of a fountain or recirculating pump system.

Complete control is not possible and a careful watch should be kept on regrowth from any plants left unaffected by treatments and remedial action taken before the problem reaches nuisance proportions.

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