

Duckweed

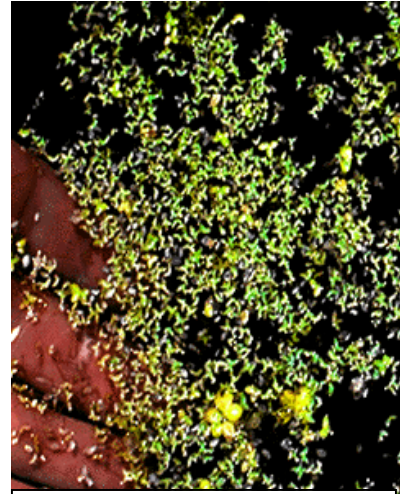
Family *Lemnaceae*

Duckweeds are very common in Iowa waters. These aquatic plants are the world's smallest and simplest flowering plants. Duckweeds are floating plants that grow on the surface of still or slow moving waters during warmer weather.

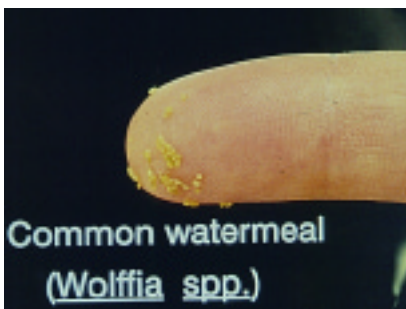
Because duckweeds usually reproduce by budding, they can multiply very quickly and cover the entire surface of a pond in a short amount of time. Small numbers of duckweeds will not harm a pond, but large numbers will block sunlight from entering the pond and upset the pond's oxygen balance, placing the fish population in danger.

The *Lemna* spp. are the most common duckweeds. *Lemna* grow up to 4 mm (5/32 in) wide and have a single root dangling from the "leaf" of the plant. Duckweeds do not have true leaves or stems; the roundish, flattened "leaf-like" part of the plant is called a frond.

Another type, watermeal (*Wolffia* spp.), are the smallest of the duckweeds. These plants are so tiny that they look like grains of green meal floating on the water surface. They are generally less than 1 mm (1/32 in) wide and barely visible as individuals. This type of duckweed does not have roots.



***Lemna* spp. of duckweed are tiny plants that can quickly spread over a pond's surface.**



***Wolffia* spp. of duckweed are so tiny, they look like green grains of meal sprinkled on the pond surface.**

Control

Many times control is necessary because the duckweeds reproduce rapidly and can cover a pond causing oxygen problems.

Biological Control

Biological control refers to the use of one organism to control the growth of another. Biological control of duckweeds may be accomplished through the use of grass carp, koi, or goldfish. These fish will all eat duckweed, but results are highly variable. Biological control is much more effective if implemented before the duckweed become a problem; once established, biological controls are not effective since duckweed reproduce so quickly.

Mechanical Control

Mechanical control refers to the actual physical removal of the plants. Some control of duckweed may be accomplished through mechanical control. Skimming the pond's surface early in the spring with a small seine net or dip-net is one method of mechanical removal. If the pond has a drain that takes water from the surface, the pond may be partially drained causing the duckweed to be pulled off the surface. Because of the rapid reproduction of duckweeds, however, mechanical control is very difficult.

Chemical Control

Chemical control (using herbicides) is probably the most effective way to control the duckweeds. Diquat and 2,4-D (liquid ester formulation) are sold under various trade names and both have good control of duckweed. Sonar™ (fluridone) has excellent control of duckweed. Only fluridone applications allow for fair to good control of watermeal.

Both 2,4-D and diquat have varying water use restrictions depending on formulation and rate. Fluridone does not have restrictions on drinking (by humans or livestock), swimming, or fish consumption after application. However, a restriction of 30 days is required before irrigation with treated water.

For good control of duckweed, 2,4-D must be used as a liquid ester formulation; however, the liquid ester formulation is toxic to fish. Therefore, 2,4-D formulations should be used with extreme caution when treating ponds with fish or only used for ornamental ponds without fish. 2,4-D is a translocated herbicide and kills plants over time. Treatment with 2,4-D formulations cost approximately \$50-100/surface acre.

One trade name of diquat, Reward™, is applied at a rate of 1 gallon/surface acre of water. At this rate, approximate cost of treatment is \$150-250/surface acre. However, diquat is a contact herbicide and may be used as a foliar application, which could reduce the cost of treatment substantially. When using diquat as a foliar application, an approved nonionic surfactant is required. Also, diquat is tightly bound to clay and is not effective in muddy water. Diquat kills plants quickly, so only small areas at a time should be treated when dense vegetation is present. Small treatments help to avoid pond oxygen depletion when large amounts of vegetation are killed.

Sonar™ (fluridone) is a translocated herbicide that kills plants over a long period of time (30-90 days). Fluridone is not effective as a spot treatment; the entire pond must be treated to control duckweeds. In water, Sonar™ is applied at the rate of 0.16 – 0.40 quarts/surface acre. The cost of treatment is approximately \$100-250/surface acre.

The rates and prices given are only approximations and will vary depending on the manufacturer, supplier, and extent of vegetation coverage. As always, read and follow label directions of the particular herbicide being used.

The **user** is always responsible for the effects of herbicide residues on livestock and crops, as well as problems that could arise from drift or movement of the herbicide from his or her property to that of others.

Prepared by Joe Morris, extension aquaculture specialist and Charles Mischke, Department of Animal Ecology, Iowa State University.

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SP 99 November 1999

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Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Stanley R. Johnson, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.