

Management of Watermeal weeds in Ponds

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Introduction

There's nothing as annoying in the garden pond as watermeal. This tiny, loathsome plant can quickly take over, ruining your beautiful landscape and forcing yet another manual cleaning of your pond to clear it up. The variety of forms found among angiosperms is greater than that of any other plant group. The size range alone is quite remarkable, from the smallest individual flowering plant, probably the watermeal (*Wolffia*; Araceae) at less than 2 millimetres (0.08 inch), to one of the tallest angiosperms, Australia's mountain ash tree (*Eucalyptus regnans*; Myrtaceae) at about 100 metres (330 feet). Between these two extremes lie angiosperms of almost every size and shape.

Examples of this variability include the succulent cacti (Cactaceae), the fragile orchids (Orchidaceae), the baobabs (*Adansonia* species; Malvaceae), vines, rosette plants such as the dandelion (Asteraceae), and carnivorous plants such as sundews (*Drosera*; Droseraceae) and the Venus flytrap (*Dionaea muscipula*; Droseraceae). To understand this vast array of forms, it is necessary to consider the basic structural plan of the angiosperms.

Cultivation Options

Water meal is a very invasive plant, and propagation should be carefully considered. Water meal can be propagated by moving a volume of plants into relatively clear, slightly acidic, shallow sheltered waters.

Experienced garden pond owners shutter when the name is uttered because water meal in ponds is big trouble for the backyard gardener. This aquatic weed can be a serious pain, but water meal in ponds doesn't have to mean draining your pond, yet again, to kill it back.

Duckweed can be recognized by its small, single or grouped, round- to elliptical-shaped floating frond or leaf, with a root that hangs from the underside of the plant. The frond or leaf of duckweed ranges in size from 2 to 6 millimeters--roughly the diameter



of a pencil eraser. Water meal is identified by its very small, oval single frond or leaf that has no roots. It has the appearance of floating grass seed on the surface of the pond. The frond or leaf of water meal ranges from 0.2 to 1.5 millimeters in length--about the size of a pin-head.

Both duckweed and water meal produce flowers. In fact, they are the smallest flowering plants known. The flowers are very small and rarely observed. Both of these plants reproduce by budding and fragmentation.

There are several methods of effective water meal control that work against the plant's basic biology. Water meal (*Wolffia* spp.) holds the unique position as the world's smallest flowering plant, but it's also one of the world's most annoying pond weeds. This 1 to 1 1/2 millimeter long, grain-like plant is commonly found embedded among colonies of duckweed, where it's barely visible to the naked eye. If you dip your hand into the pond, remove some of the duckweed and rub it between your palms, you'll feel a grainy sensation that's the water meal. It can occur on its own, but this is a much less common situation. Water meal removal is most effective with a two-fold approach that includes eliminating the material that the water meal is feeding on and employing pond creatures to feed upon the weed itself. Prevention is a much easier process than control, but both require the same tactics. Once water meal is choking the pond, it may be much easier to drain the pond and clean it completely before implementing protective measures.

Controlling Water meal Weeds

Water meal feeds greedily off of rotting material on the bottom of your pond. This black sludge may not look like much to you, but for watermeal, it's a veritable buffet. Any program of water meal control has to include management of that build-up, so if there's fertilizer or agricultural run-off moving into your pond, or the leaves from the tree above end up in your pond every year, the first step is to slow this input. Surface netting can help trap leaves, or you can fish them out of the pond daily with a pool net. Run-off may be slowed by building an earth berm around the pond.

Once the addition of nutrients is managed, it's a good idea to add a bubble aerator to the deepest area in the bottom of your pond to eliminate the stratification. The lack of oxygen in deeper waters can make it hard for bacteria to break down whatever waste does



accumulate. By adding a bubbler, you'll increase oxygen and pond circulation so that your pond plankton can consume the excess nutrients before water meal has a chance to set in.

While the water meal is at least somewhat controlled, you'll want to introduce pond fish that eat this plant, like koi or grass carp. Koi will eat water meal readily, while grass carp may eat other plants first. Another option is to add a couple of ducks to the landscape. They'll readily gobble up this annoying plant pest as long as it's kept reasonably in check by other methods.

How to Control Water meal

Non-Herbicide Management Options

1. Physical Management Options

Watermeal can be removed by raking or seining it from the pond's surface, but it is so small it is very difficult to physically remove.

2. Biological Management Options

Tilapia will consume water meal but are a warm water species that cannot survive in temperatures below 55 F. Therefore, tilapia usually cannot be stocked before mid-April or May and will die in November or December. Recommended stocking rates are 15 to 20 pounds of mixed sex adult Mozambique Tilapia (*Oreochromis mossambicus*) per surface area. Tilapias are often not effective for vegetation control if the pond has a large bass population due to intense predation. In Texas, stocking Mozambique Tilapia requires approval from the Texas Parks and Wildlife Department if the pond is in the designated "conservation zone" to ensure tilapia cannot escape and negatively impact imperiled native fishes. Tilapia must be purchased from a permitted seller regardless of zone. In other states, check with your County Extension Agent for the legality of stocking tilapia.

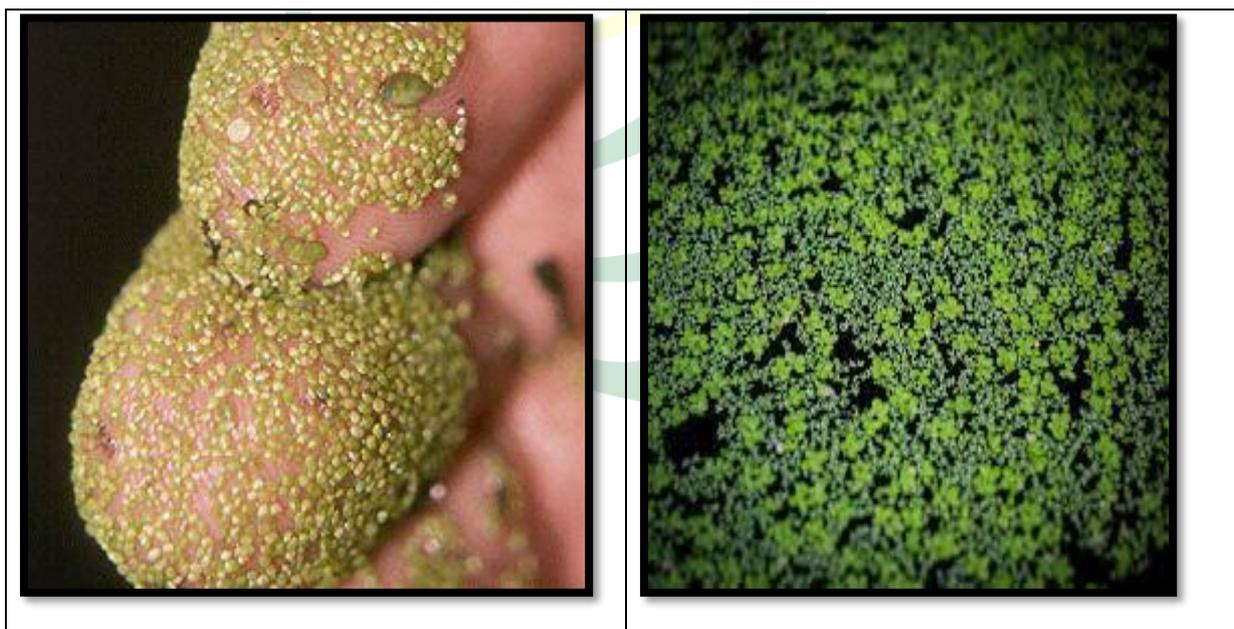
Herbicide Control Options.

The active ingredients that have been successful in treating Water meal include:

- Flouridone (Rated: Good)
- Flumioxazin (Rated: Excellent)
- Penoxsulam (Rated: Good)

These rating are based upon the U.S. Army Corps of Engineers aquatic herbicide trials.

- **Fluridone:** Fluridone is a broad spectrum, systemic herbicide. Systemic herbicides are absorbed and move within the plant to the site of action. Systemic herbicides tend to act more slowly than contact herbicides. Common trade and product names include but are not limited to:
 - Sonar
 - Avast
- **Flumioxazin:** Flumioxazin is a water dispersible granule that is to be sprayed or injected after mixing. It is a broad spectrum, contact herbicide. Contact herbicides act quickly. Flumioxazin should be applied to actively growing plants and a surfactant (a substance that reduces water tension) will be needed if the herbicide is applied to foliage of floating or emergent plants. Water pH needs to be below 8.5 or flumioxazin will rapidly degrade and lose effectiveness.
- **Penoxsulam:** Penoxsulam is a broad spectrum, systemic herbicide. Systemic herbicides are absorbed and move within the plant to the site of action. Systemic herbicides tend to act more slowly than contact herbicides. It may be sprayed directly onto emergent plants or applied directly into the water. Penoxsulam should not be applied in areas where it will be diluted rapidly. This herbicide will need a registered surfactant (see the label) for leaf and exposed sediment applications.





Precautions

One danger with any chemical control method is the chance of oxygen depletion after the treatment caused by the decomposition of the dead plant material. Oxygen depletion can kill fish in the pond. If the pond is heavily infested with weeds it may be possible (depending on the herbicide chosen) to treat the pond in sections and let each section decompose for about two weeks before treating another section. Aeration, particularly at night, for several days after treatment may help control the oxygen depletion. One common problem in using aquatic herbicides is determining area and/or volume of the pond or area to be treated.

Refernces

<https://www.gardeningknowhow.com/ornamental/water-plants/watermeal/managing-watermeal-in-ponds.htm>

<https://extension.okstate.edu/fact-sheets/aquatic-weed-mangement-control-methods.html>

<https://aquaplant.tamu.edu/management-options/watermeal/>

