



MISSISSIPPI STATE UNIVERSITY

EXTENSION

## Southeastern Aquatic Plants

Identification, Control, and Establishment

SUBMERSED

NON-NATIVE

# Hydrilla | *Hydrilla verticillata*



A pond with thick hydrilla growth.

This highly invasive species from Asia first appeared in Florida in the early 1950s. It has quickly spread across the United States; it is listed on the federal noxious weed list and many state-level noxious weed lists. Leaves often have one or more midrib teeth, making the **plant feel rough when pulled through the hand**. Leaves are medium to dark green in color, have **finely serrated edges**, and grow in **whorls of four to eight** around the stem.

This species can easily be confused with three other species in the U.S.: Canadian elodea (*Elodea canadensis*), bog moss (*Mayaca fluviatilis*), and Brazilian egeria (*Egeria densa*). Elodea has only three leaves per whorl (node), bog moss leaves aren't arranged in whorls, and egeria has three to six leaves per node. Additionally, elodea and egeria feel smooth when pulled through the hand (no midrib teeth), while hydrilla feels rough. Hydrilla has tiny flowers, egeria has larger flowers, and elodea's blooms are intermediate.

Hydrilla roots in bottom sediments with small (quarter-inch) bud-like structures called turions and sends up stems through the water column. Stems can be very long in clear water (>25 feet). Growth can be mostly submersed, or plants can top out on the surface and form mats.

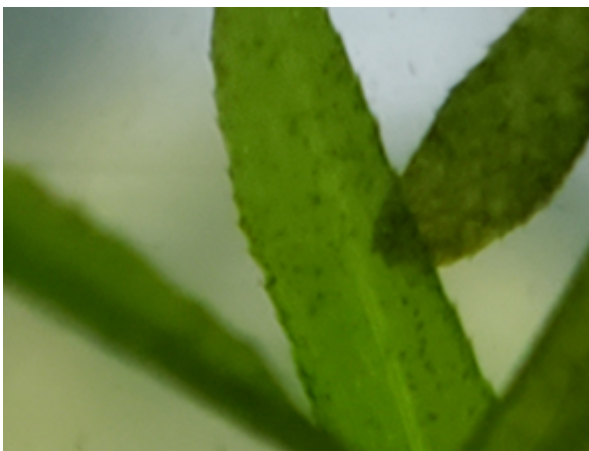
Plants mainly reproduce and spread via fragmentation and turion production. A single fragment can infest a new water body as floating fragments can grow vigorously without rooting.

### Management Value

Hydrilla is highly invasive and outcompetes native submerged aquatic vegetation. It can quickly fill a water body, obstructing boating, fishing, swimming, and other recreational uses. Although it provides habitat for fish and some water quality benefit, this species should never be introduced and must be controlled at first detection.

<b>Hydrilla</b>	<b>Brazilian Egeria</b>	<b>Canadian Waterweed</b>
<ul style="list-style-type: none"> <li>• 4-8 leaves per leaf whorl</li> <li>• Leaf margins serrated</li> <li>• Mid-rib teeth</li> <li>• Feels rough when pulled through hand</li> </ul>	<ul style="list-style-type: none"> <li>• 3-6 leaves per leaf whorl</li> <li>• Leaf serrations very fine</li> <li>• No mid-rib teeth</li> <li>• Feels smooth when pulled through hand</li> </ul>	<ul style="list-style-type: none"> <li>• Always 3 leaves</li> <li>• Leaf margins smooth</li> <li>• No mid-rib teeth</li> <li>• Feels smooth when pulled through hand</li> </ul>

Comparison of *Hydrilla verticillata*, *Egeria densa*, and *Elodea canadensis*.



Hydrilla leaves are serrated and feel rough when pulled through the hand.

# Hydrilla | *Hydrilla verticillata*

## Recommended Controls

**Option 1:** Triploid Grass Carp. Stock 5 to 10 grass carp per acre to reduce moderate hydrilla infestations; stock 15 or more per acre for severe infestations. Note that abundant grass carp can impact other fish and can live up to 20 years.

**Stock 8- to 10-inch triploid grass carp in ponds that have established largemouth bass populations to avoid predation by bass.**

**Option 2:** Flumioxazin (4.0-pound formulation). Flumioxazin (2.1 pints per acre-foot of water) should be applied as a submersed injection (application using a wand or hose). Determine pond volume prior to application. Use a buffering agent when mixing with water with pH greater than 7.0. Do not exceed annual herbicide rate limits as stated on the product label.

**Option 3:** Endothall (4.23-pound formulation). Endothall should be applied as a submersed injection (1.92 gallons per acre-foot of water). Determine pond volume prior to application. Do not exceed annual herbicide rate limits as stated on the product label.

**Option 4:** Florpyrauxifen-benzyl (2.5-pound formulation). Florpyrauxifen-benzyl should be applied as a submersed injection (5.4 ounces per acre-foot of water). Determine pond volume prior to application. Do not exceed annual herbicide rate limits as stated on the product label.

**Option 5:** Fluridone (4.0-pound formulation). Fluridone should be applied as a submersed injection (2.56 ounces per acre-foot of water); reapply at the same rate 30 days after initial treatment. Determine pond volume prior to application. Do not exceed annual herbicide rate limits as stated on the product label.

**Option 6:** Chelated Copper (0.8-pound formulation). Chelated copper should be applied as a submersed injection (3.3 gallons per acre-foot of water). Determine pond volume prior to application. Copper can be toxic to fish when water alkalinity is low. Do not use copper in catfish or koi ponds when alkalinity is less than 50 ppm. Do not exceed annual herbicide rate limits as stated on the product label.

**Option 7:** Diquat (3.73-pound formulation). Diquat should be applied as a submersed injection (0.5 gallon per acre-foot of water). Determine pond volume prior to application. Do not exceed annual herbicide rate limits as stated on the product label.

**NOTE:** Acre-foot = average depth of pond multiplied by pond acreage; average depth is calculated by taking the depth at 20 points across a water body and averaging the values.

**Treat ponds when the plants are actively growing and the water temperature is at least 60°F. It is best to treat one-third of the pond at a time for larger water bodies, with 2 weeks or more separating applications. After the entire pond has been treated, a repeat whole-pond application may be necessary to eliminate remaining plants.**

■ Read and follow all chemical label instructions, especially the section on the use of personal protection equipment.

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