

Aquatic Weed Control and Identification

Gary J. Burtle
University of Georgia, Animal & Dairy
Science
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How to Manage Aquatic Weeds

- Start early
- Get proper identification
- Select proper control
- Apply control effectively
- Repeat control when necessary

Pond Drawdown

- May work for LARGE LAKES
- Need some areas of deep water for fish refuge
- Only draw down in the WINTER time
- Expose bottom for at least ONE MONTH
- Spray exposed weeds when they are green
- **Drought drawdown may require frequent treatment or grass carp stocking**

Chemical Controls of Aquatics

- **Copper – algae (powder or liquid)**
- **Sodium percarbonate - algae**
- **Diquat – contact herbicide (Reward)**
- Endothal – contact herbicide (Aquathol)
- **Floridone (Sonar) – residual herbicide**
- **Glyphosate (Rodeo) – grasses, shoreline**
- **2,4-D – growth regulator**
- **Triclopyr – brush (Renovate)**
- Imazapyr – emergent weeds (Habitat)
- Carfentrazone – floating weeds (Stingray)
- **Imazamox (Clearcast) broad spectrum**
- **Penoxsullam (Galleon) Floating plants**
- Aquashade – pond water dye – part of algae control

Planktonic & Filamentous Algae



Lyngbya
Photo by Christina Jett
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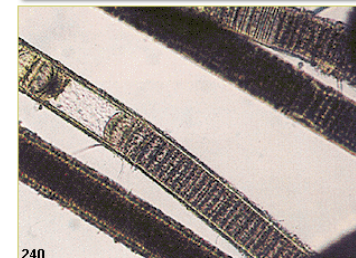
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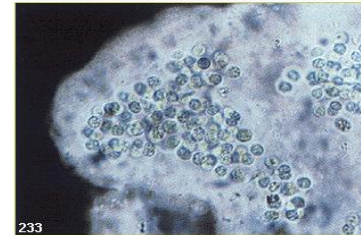
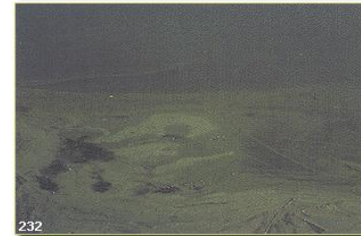
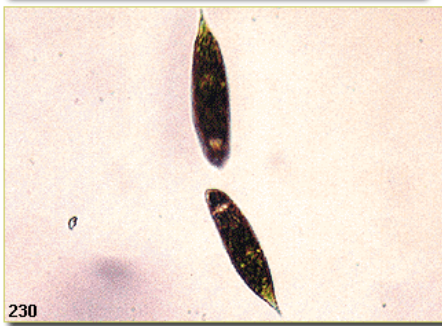
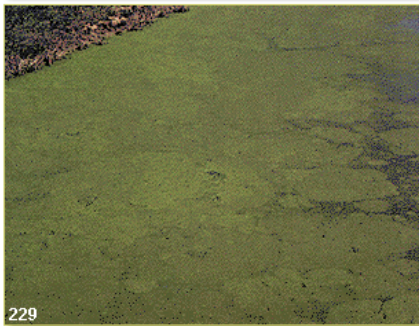
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Pithophora

Lyngbya

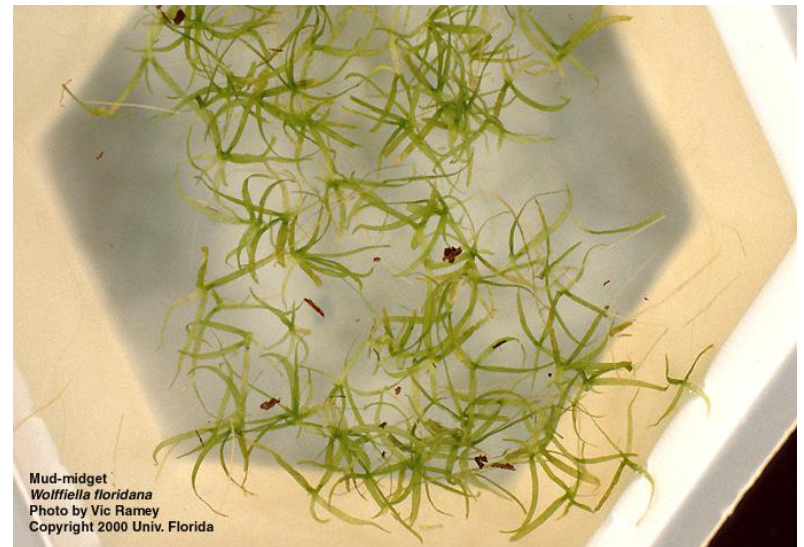
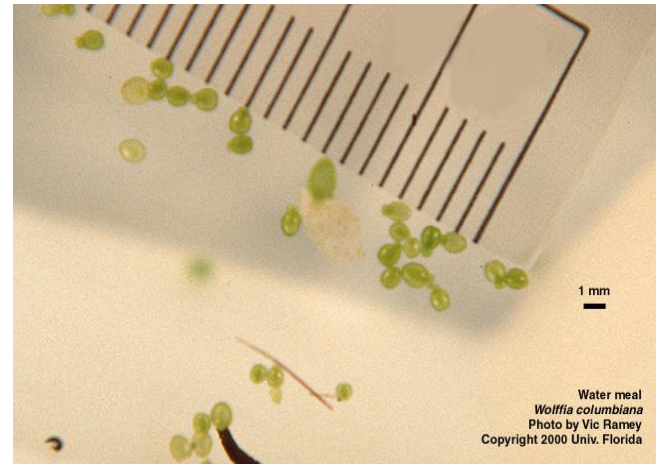
Blue-greens and Euglena



Algicides (all are short term)

- Copper sulfate powder
- Copper liquids
- Sodium percarbonate
- Hydrothol 191
- Reward
- Tank mixes of Reward and Copper liquids
- **Follow herbicide with dye or grass carp**

Duckweed & Water Meal



Water Meal

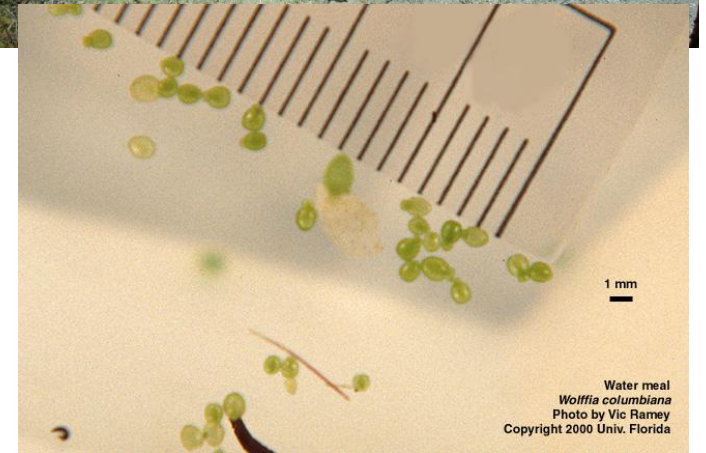
Often Mixed with Duckweed



Water meal (and other duckweeds)
Wolffia columbiana
Photo by A. Murray
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Watermeal - The Problem

- Small, fast-growing plants
- Can cover entire pond surface
- Uses structure and standing timber for points of protection
- Hard to control with weed-eating fish



Chemicals for Watermeal

- Sonar (Fluridone)
- Reward (Diquat)
- Reward + Cutrine plus (other liquid Cu)
- Habitat (Imazapyr)
- Stingray (Carfentrazone)
- Galleon (Penoxsulam)
- Clearcast (Imazamox)
- Clipper (Flumioxazin)

Relative Cost of Chemicals

(Labor is not included)

	Fluridone	Diquat	Diquat and Cutrine plus	Imazapyr	Carfentra- zone	Penox- sulam
Duckweed (<i>Lemna sp.</i>)	0.49 qt/A (4 ft deep)	1-2 gal/A	1 gal and 0.5 gal/A	2-3 pt/A	6.7-13.5 oz/A	2 to 5.6 oz/A
Watermeal (<i>Wolffia sp.</i>)	0.98 qt/A (4 ft deep) \$1,215	2 gal/A \$230	1 gal and 0.5 gal/A \$145	Not controlled	Not controlled	75 ppb (1.63 qt/A 4ft deep) \$1,956
Amount for Minimum Purchase	1 pint	1 gallon	1gal ea	1 quart	1 quart	1 quart
Aprox Price /Amt	\$ 620.00/pt	\$115.00/gal	\$115.00 /gal and \$30.00/gal	\$200/qt	\$200/qt	\$600/pt

Sonar for Watermeal

- Use at least 90 ppb but 120 ppb is better
- No water inflow or outflow
- Relatively high cost, but treatment lasts longer than contact herbicides
- Easier to apply than contact herbicides
- Not for irrigation ponds (30 day delay)

Reward + Cutrine plus

Cutrine plus label says 2:3, Reward:Cutrine Plus (1:1 ratio works). Then 1 gal/Acre. Also, 1% solution for spot treatment.

- Gives better control with less chemical cost
- Caution: Cutrine plus is toxic to fish at low alkalinities. Trout, koi carp.

**Reward:Cutrine-plus Effect
1% solution, 7 days post-Appl.**



Duckweed and Watermeal, 90% kill

Emergent: Slender spikerush



Submerged



On Shore

Imazamox (Clearcast)

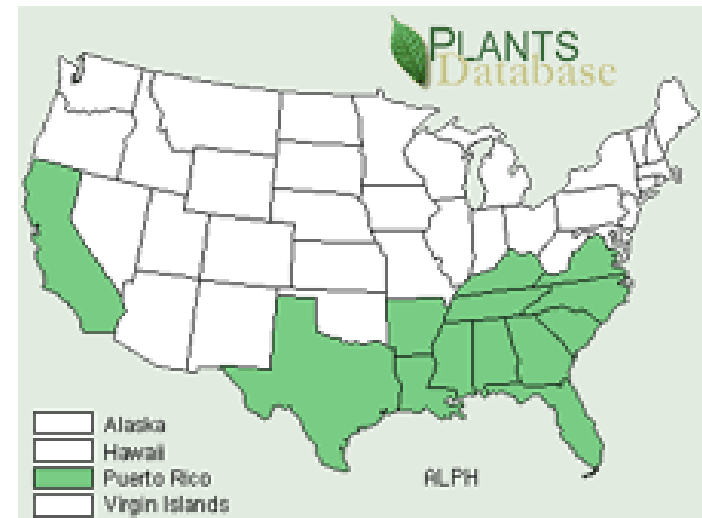
- Absorbed and translocated
- 16 to 173 ounces per acre-foot (liquid)
- 20 to 200 lb of granular per acre
- Or, 50 to 200 **ppb** for submerged weeds
- Plant-specific rates, see label
- Up to 5% solution for spot treatment
- **Works for emergent AND submerged weeds, over about two weeks**

Primary weeds for Imazamox

- **Alligatorweed**
- Cattail
- Common salvinia
- Parrotfeather
- Watershield
- Bladderwort
- Hydrilla
- Milfoils
- Pondweeds

Alligatorweed

Alternanthera philoxeroides



Emergent: Primrose

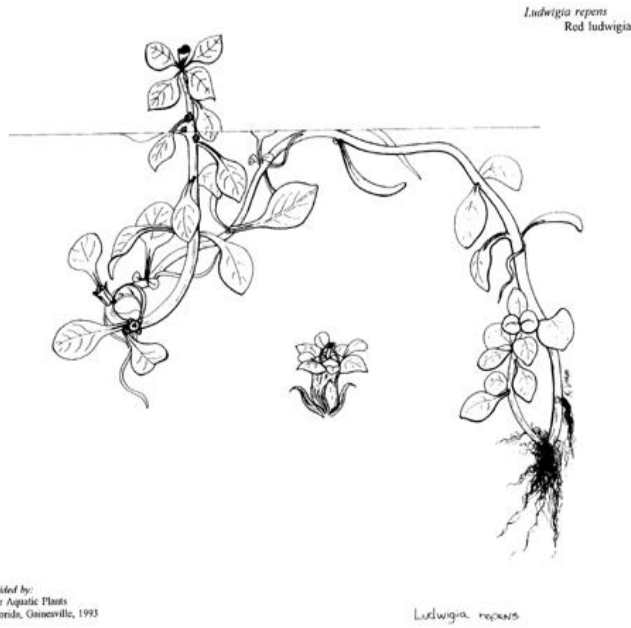
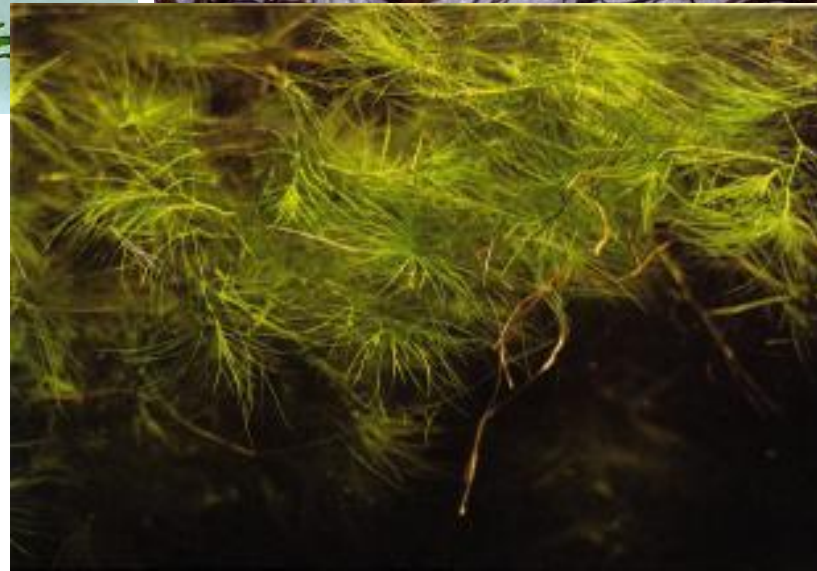
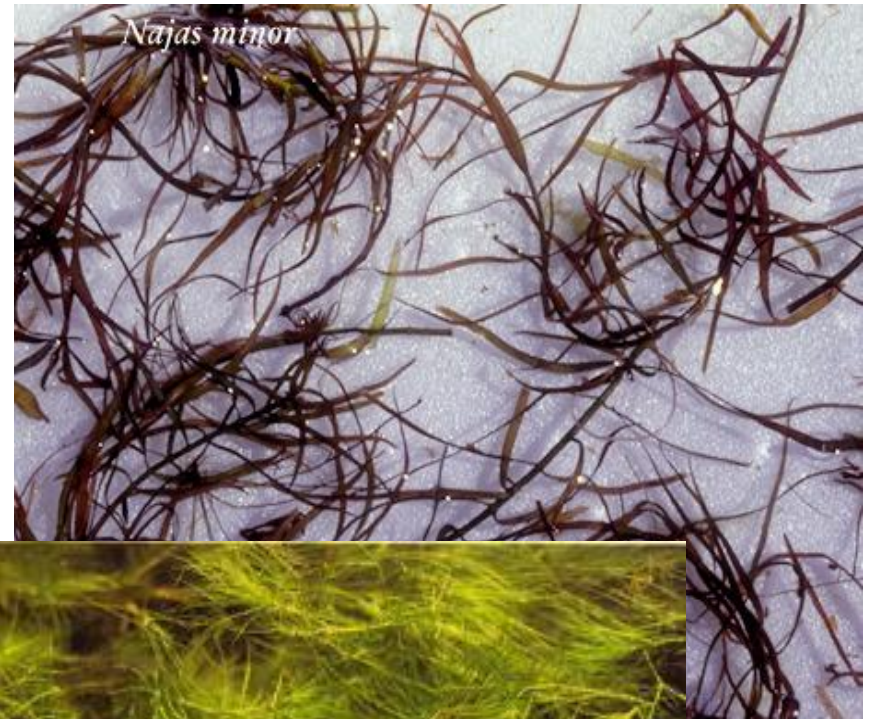
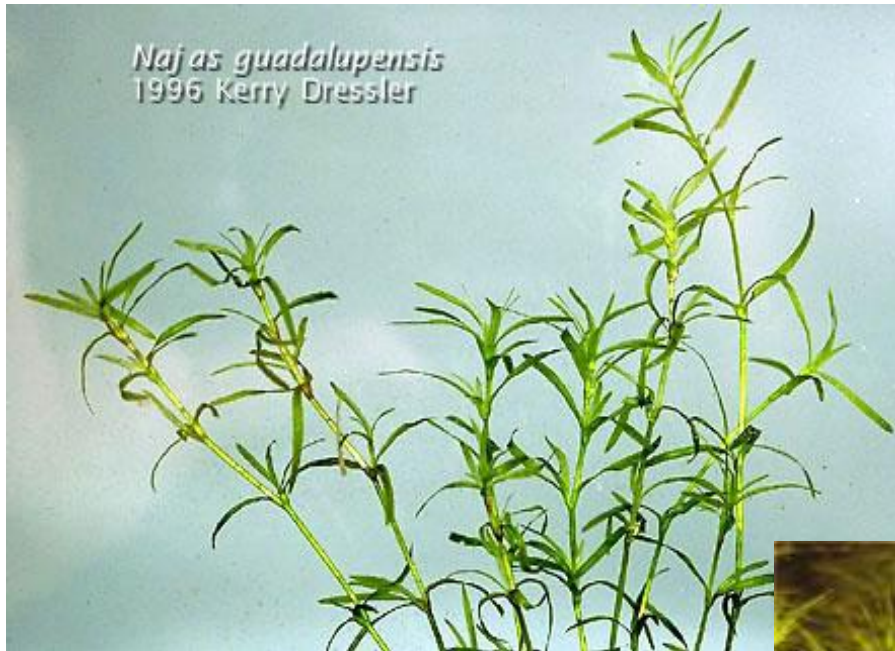


Illustration provided by:
IFAS, Center for Aquatic Plants
University of Florida, Gainesville, 1993



Grows from shore to deeper water

Submerged: Naiads



Variable-leaf Milfoil



Two-leaf watermilfoil
Myriophyllum heterophyllum
Photo by A. Murray
Copyright 2002 Univ. Florida

Myriophyllum heterophyllum

Myriophyllum heterophyllum
Variable-leaf milfoil

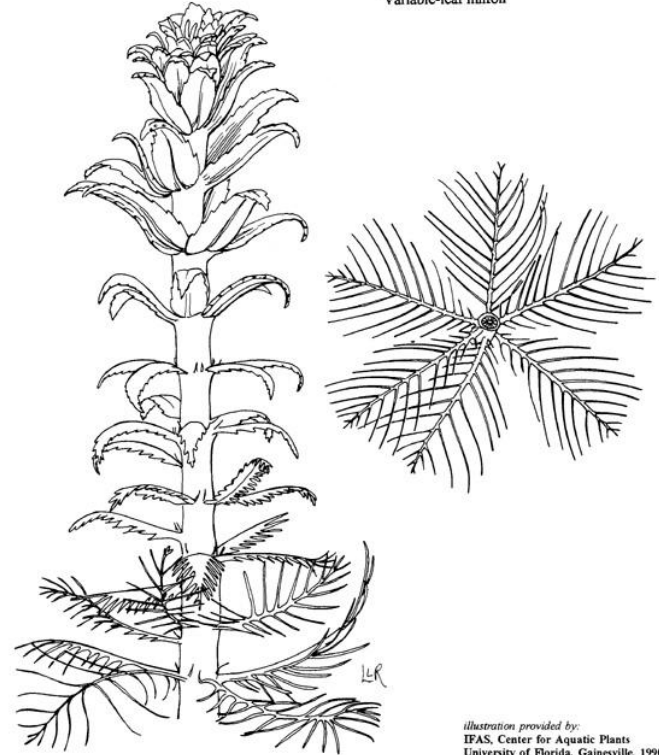


illustration provided by:
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University of Florida, Gainesville, 1990



Two-leaf watermilfoil
Myriophyllum heterophyllum
Photo by A. Murray
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Other milfoils



Eurasian milfoil



Parrotfeather milfoil

Precautions with Imazamox

- Avoid spray drift
- Limit of 500 ppb
- Do not irrigate greenhouses, nurseries or hydroponics
- **Stop all irrigation for 24 hours**
- No restrictions for livestock watering, swimming, fishing, domestic use, or for agricultural sprays
- Less than 50 ppb near potable water intakes

Clipper

- Flumioxazin 51%
- 5 day wait for irrigation uses
- Okay for swimming, fishing, livestock
- 6-12 oz per surface acre
- 2.1 to 8.5 pounds per acre if treating 4 feet of water depth for submerged weeds
- Buffer to pH 7.0 or less

Weeds Controlled with Clipper

- Duckweed
- Watermeal
- Hydrilla
- Naiad
- Milfoil
- Alligatorweed
- Filamentous algae

Grass Carp Stocking

Triploids ONLY

- New Pond
 - Existing Weeds
 - Floating mats of algae
- 5 to 10 per acre
 - 20 to 40 per acre
 - 50 or more per acre
 - (better to control with chemicals first, then stock 10 per acre)

Grass Carp Size at Stocking

- For new ponds can use 3-5 inch carp (\$5.00 each)
- For ponds with large bass and weed infestations use **1 pound carp** (\$15.00 each)

One Pound and 14 inches

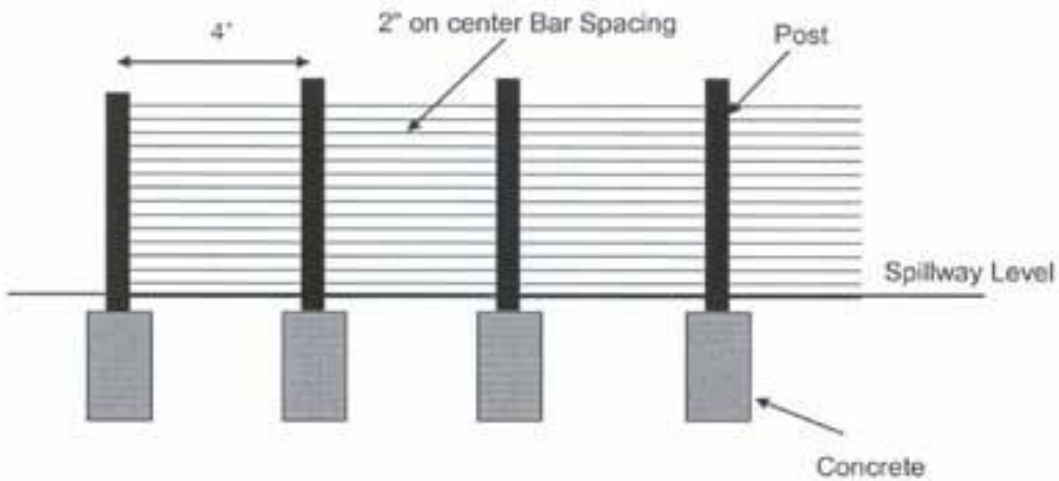


Limits of Grass Carp

- Effective for about **6 years**
- Large carp do not eat aggressively
- Grazing is a slow control method
- Heavy grass carp stocking can interfere with bream spawning activity

Spillway Barriers

Keep Carp in the Pond



Keys to Aquatic Plant Management

- Start Early
- Proper Weed Identification
- Select Appropriate Control
- Apply the Control Effectively