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HOME & GARDEN INFORMATION CENTER

Chemical Control of Aquatic Weeds

Aquatic weeds in ponds or lakes can be controlled by physical removal, biological control, or herbicides. The method or combination of methods, used will depend on factors such as target weeds, non target plants, and the uses of the water (fishing, swimming, livestock watering, and irrigation).

Physical removal can be accomplished manually or with machinery. It is time consuming, expensive and normally used alone if other methods are not feasible. However, a certain amount of physical removal may be necessary in combination with the use of biological control and herbicides.

Imazypyr being sprayed to kill lily pads.
W. Cory Heaton, ©2015, Clemson Extension

Biological control is an option for certain aquatic weeds. The major advantages are ease of application and no concern over damage to plants irrigated with treated water. Triploid grass carp can be very effective for controlling many submerged vascular aquatic weeds. Grass carp are usually used to control all vegetation in a pond, rather than selectively controlling certain vegetation.

Replacement stocking of grass carp is necessary when fish are lost. A permit is required to stock grass carp, and only triploid fish can be legally used in SC. Tilapia are stocked in the spring and control most algae species. The concern with tilapia is that they are tropical animals and usually die during cold winters thereby requiring an annual stocking. Tilapia are legal for use in SC. The South Carolina Department of Natural Resources (SC DNR) now requires a free of charge permit to stock tilapia and triploid grass carp for aquatic weed control in SC. You can obtain a permit from SC DNR at 803-734-3891 or from registered dealers in SC. The short permit can be FAXed (803-734-4748) for a rapid turn around. A permit number from SC DNR is required prior to stocking tilapia and triploid grass carp. Check with your Department of Natural Resources to determine if grass carp and tilapia are legal to stock and if a permit is required in your state.

A free of charge permit from SC DNR is required to stock tilapia.
W. Cory Heaton, ©2015, Clemson Extension.

After spraying Imazypyr, there is a significant kill of waterlilies (*Nymphaea odorata*) on the pond.
W. Cory Heaton, ©2015, Clemson Extension

2,4-D, carfentrazone ethyl, copper, diquat, endothall, fluridone, glyphosate, imazapyr, sodium carbonate peroxyhydrate compounds, and triclopyr are registered for use in ponds by US EPA and can be used safely in ponds if the manufacturerï¿½s label directions are followed. Certain waiting periods may be required before certain water uses are allowed after the herbicide is applied, while in some cases waiting periods are not required. Various chemicals have different product formulations; only aquatic labeled pesticides and surfactants/adjuvants may be used in aquatic applications, by law. **Labels change frequently; refer to the current herbicide label for specific application information. Never exceed the rates recommended on label of the specific product applied. The label is the law.**

Amount of Formulation for Application

Herbicide	**Rate***
Aquathol	0.3 to 2.6 gal/acre foot of 4.2 L or 13 to 108 lb of 10G/acre foot or 2.2 to 22.0 lb of 63G/acre foot.
Hydrothol	0.3 to 3.4 gal/acre foot of 2L or 11 to 136 lb of 11G/acre foot.
Diquat	1 to 2 gal/surface acre of 2L.
2,4-D	1 to 2 gal/surface acre of 3.8 L or 150 to 200 lb of 20G/surface acre.
Copper Compounds	0.6 to 3.4 gal of Chelated Copper/acre foot or 0.1 to 0.5 ppm elemental copper.
Fluridone	0.25 to 0.5 gal/surface acre. Check with Company rep for exact rates.
Glyphosate	4 to 7.5 pt/surface acre of 5.4L.
Triclopyr	2 to 8 quarts per surface acre of 3L
Sodium Carbonate Peroxyhydrate	3 to 170 pounds per acre-foot of 50G
Imazypyr	1 pint to 6 pints per surface acre of 2 lb. per gallon. Aquatic Pesticide Applicator License required
*Acre foot = 1 surface acre of water (43,560 ft ^{2}) 1 foot deep. Rates vary with weed species, water quality, percent active ingredient of formulated product and specific company label. Follow the label exactly.	

Effectiveness of Herbicides for Aquatic Weed Control

Weed	**Copper complexes, copper sulfate (various)**	**2,4-D (various)**	**Diquat (various)**	**Endothall**		**Fluridone (various)**	**Glyphosate (various)**	**Sodium Carbonate Peroxyhydrate**	**Triclopyr**	**Imazapyr**
				Aquathol K Aquathol G	**Hydrothol G Hydrothol 191**					
Algae										-
Filamentous	**E**	**P**	**P**	**–**	**G**	-	-	**E**	-	-
Planktonic	**E**	**P**	**G**	**–**	**G**	-	-	**E**	-	-
Branched (Chara)	**E**	**P**	**G**	**–**	**G**	-	-	-	-	
Nitella	**E**	**P**	**G**	**–**	**G**	-	-	-	-	-
Floating Plants										
Bladderwort	**P**	**P**	**E**	**–**	**–**	**E**	**–**	-	-	-
Duckweeds	**P**	**G**[1]	**G**	**P**	**P**	**E**	**P**	-	-	*

Water hyacinth	**P**	**E**	**E**	**–**	**–**	**P**	**G**	**-**	*****	*****
Watermeal	**P**	**P**	**P**	**–**	**–**	**G**	**P**	**-**	**-**	**-**
Submersed Plants										
Broadleaf watermilfoil	**P**	**–**	**E**	**E**	**E**	**E**	**P**	**-**	*****	**-**
Coontail	**P**	**G**	**E**	**E**	**E**	**E**	**P**	**-**	**-**	**-**
Egeria	**P**	**P**	**G**	**F**	**F**	**E**	**P**	**-**	**-**	**-**
Elodea	**P**	**–**	**E**	**F**	**F**	**E**	**P**	**-**	**-**	**-**
Eurasian watermilfoil	**P**	**E**	**E**	**E**	**E**	**E**	**P**	**-**	*****	**-**
Fanwort	**P**	**F**	**G**	**E**	**E**	**E**	**P**	**-**	**-**	**-**
Hydrilla	**F**[2]	**P**	**G**	**G**	**G**	**E**	**P**	**-**	**-**	**-**
Naiads	**P**	**F**	**E**	**E**	**E**	**E**	**P**	**-**	**-**	**-**
Parrotfeather	**P**	**E**	**E**	**E**	**E**	**–**	**F**	**-**	*****	*****
Pondweeds (Potamogeton)	**P**	**P**	**G**	**E**	**E**	**E**	**P**	**-**	**-**	**-**

Effectiveness of Herbicides for Aquatic Weed Control Continued

Weed	Copper complexes, copper sulfate (various)	2,4-D (various)	Diquat (various)	Endothall		Fluridone (various)	Glyphosate (various)	Sodium Carbonate Peroxyhydrate	Triclopyr	Imazapyr
				Aquathol K Aquathol G	Hydrothol G Hydrothol 191					
Emergent Plants										
Alders	**P**	**E**	**F**	**P**	**P**	**P**	**E**		*****	**-**
Alligatorweed	**P**	**F**	**P**	**P**	**P**	**G**	**E**		*****	*****
American lotus	**P**	**E**	**P**	**P**	**P**	**F**	**G**		*****	**-**
Arrowhead	**P**	**E**	**G**	**G**	**G**	**--**	**E**	**-**	*****	*****
Buttonbush	**P**	**E**	**F**	**P**	**P**	**P**	**G**	**-**	**-**	**-**
Cattails	**P**	**G**	**G**	**P**	**P**	**F**	**E**	**-**	**-**	*****
Common reed	**P**	**P**	**P**	**P**	**P**	**P**	**G**	**-**	**-**	*****
Fragrant & white waterlily	**P**	**E**	**P**	**P**	**P**	**E**	**E**	**-**	*****	*****
Frogbit	**P**	**E**	**E**	**--**	**--**	**--**	**--**	**-**	*****	*****
Maidencane	**P**	**P**	**F**	**–**	**–**	**F**	**E**	**-**	**-**	
Most grasses	**P**	**P**	**P**	**P**	**P**	**P**	**G**	**-**	**-**	*****
Pickerelweed	**P**	**G**	**G**	**--**	**--**	**P**	**F**	**-**	*****	*****
Pond edge annuals	**P**	**–**	**G**	**–**	**–**	**E**	**E**	**-**	**-**	**-**
Rush	**P**	**P**	**F**	**P**	**P**	**F**	**E**	**-**	**-**	*****
Sedges and rushes	**P**	**F**	**F**	**P**	**P**	**P**	**G**	**-**	**-**	**-**
Slender spikerush	**P**	**--**	**G**	**--**	**--**	**G**	**P**	**-**	**-**	**-**
Smartweed	**P**	**E**	**F**	**--**	**--**	**F**	**E**	**-**	*****	*****
Spatterdock	**P**	**E**	**P**	**P**	**P**	**E**	**G-E**	**-**	*****	*****
Southern watergrass	**P**	**P**	**--**	**--**	**--**	**G**	**E**	**-**	**-**	**-**
Torpedograss	**P**	**P**	**P**	**--**	**--**	**F**	**G**	**-**	**-**	*****
Watershield	**P**	**E**	**P**	**--**	**--**	**G**	**G**	**-**	**-**	
Water pennywort	**P**	**G**	**G**	**P**	**P**	**P**	**G**	**-**	*****	*****
Water primrose	**P**	**E**	**F**	**--**	**--**	**F**	**E**	**-**	*****	*****
Willows	**P**	**E**	**F**	**P**	**P**	**P**	**E**	**-**	*****	*****

E=excellent control (90 to 100%); G=good control (80 to 89%); F=fair control (70 to 79%); P=poor control (<70%). A blank space indicates weed response is not known.

[1]Ester formulations only.

[2]Copper complex only.

*=new herbicides – these plants are listed on the label as being controlled by these herbicides.

Read and follow the label on the herbicide container. Labels change frequently and the label is the law

Waiting Period (Days) Before Using Water After Application of Herbicides for Aquatic Weed Control

Common Herbicide Name	Trade Name	Irrigation	Fish Consuption	Watering Livestock	Swimming
Copper	Crystalline copper sulfate and various liquid organic copper complexes	NR[1]	NR	NR	NR
2,4-D	Various formulations and manufacturers[2]	Water use restrictions vary by formulation and manufacturer. In general, if water is used for irrigating crops, 2,4-D should not be used. Certain labels allow irrigation if an approved chemical assay has reached acceptable levels. A few labels allow irrigation with specific waiting periods.			
Diquat	Reward	3 to 5[3]	NR	1	NR
	Weedtrine D	5	NR	5	NR
Endothall	Aquathol K	7 to 25	NR	7 to 25	NR
	Aquathol granular	7	NR	7	NR
	Aquathol Super K	7	NR	7	NR
	Hydrothol 191	7 to 25	NR	7 to 25	NR
	Hydrothol 191 granular	7 to 25	NR	7 to 25	NR
Fluridone	Avast, Sonar AS, Sonar SRP, Sonar PR, Sonar Q	7-30+	NR	NR	NR
Glyphosate	Rodeo, AquaNeat, Eagre, AquaMaster, AquaPro	NR	NR	NR	NR
Sodium Carbonate Peroxyhydrate	GreenClean, PAK 27	NR	NR	NR	NR
Triclopyr	Renovate 3	120[4]		NR[5]	NR
Imazapyr		120			

[1] NR = No restrictions.

[2] Most formulations do not permit application to ponds used for irrigation or for watering dairy cattle.

[3] Three days for irrigation of turf and nonfood crops; five days for irrigation of food crops (including tobacco) or for preparation of agricultural sprays.

[4] No restriction for established grasses.

[5] 14 Day restriction on grazing site and growing. Season grazing restriction on lactating livestock after irrigating pasture.

Reviewed by W. Cory Heaton, Agriculture & Natural Resources Agent, Clemson University 12/15. Originally prepared by Jack M. Whetstone, Extension Aquaculture Specialist, Clemson University. New 11/07. Images added 12/15.