

**USE RESTRICTIONS FOR AQUATIC HERBICIDES
(Number of Days After Treatment and Before Use)**

Chemical	Trade Name	Company	Withdrawal	Drinking	Swimming	Eating Fish	Dairy	Other Stock	Withdrawal
			PPM						Crop Irrigation
Copper Sulfate	Copper Sulfate Crystals	Various		0	0	0	0	0	0
Copper Sulfate	Copper Z 6/2 Granular	Helena		0	0	0	0	0	0
Chelated Copper	Captain (copper carbonate)	SePro		0	0	0	0	0	0
Chelated Copper	Nautique	SePro		0	0	0	0	0	0
Copper Solution	Copper Z 4/4	Helena		0	0	0	0	0	0
Copper Solution	K-Tea	SePro		0	0	0	0	0	0
Copper Solution	Komeen	SePro		0	0	0	0	0	0
2,4-D	Navigate	Applied Biochemist		(*2)	0	0	NL	0	(*8)
2,4-D	Weedar 64	Nufarm		21 (*1)	0	0	NL	0	(*8)
2,4-D	Aqua-Kleen	Cerexagri		(*2)	0	0	NL	0	(*8)
2,4-D	Aquacide	Aquacide Co.		(*2)	0	0	NL	0	(*8)
2,4-D	Weed Rhap A-4D	Helena		21 (*1)	0	0	NL	0	(*8)
2,4-D	DMA 4 IVM	Dow		(*2)	0	0	0	0	(*8)
Diquat	Reward	Syngenta		1-3	0	0	1	1	5
Diquat	Weedtrine D	Applied Biochemist		5	0	0	5	5	5
Diquat	Littora	SePro		1-3	0	0	1	1	1-5
Endothall	Aquathol K	Cerexagri-Nisso		7-25 (*3)	0	3	7-25	7-25	7-25
Endothall	Aquathol Super K	Cerexagri-Nisso		7	0	3	7	7	7
Endothall	Hydrothol 191	Cerexagri-Nisso		7-25 (*3)	0	3	7-25	7-25	7-25
Endothall	Hydrothol 191 Granular	Cerexagri-Nisso		7-25 (*3)	0	3	7-25	7-25	7-25
Fluridone	Sonar AS	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Fluridone	Sonar SRP	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Fluridone	Sonar PR	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Fluridone	SonarOne	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Fluridone	Sonar Q	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Fluridone	Avast SC	SePro	0.15	0 (*4)	0	0	0	0	7-30 (*9)
Glyphosate	Rodeo	Dow	0.7	2 (*5)	0	0	0	0	0
Glyphosate	AquaPro	SePro	0.7	2 (*5)	0	0	0	0	0
Glyphosate	Aqua Neat	Nufarm	0.7	2 (*5)	0	0	0	0	0
Glyphosate	AquaMaster	Monsanto	0.7	2 (*5)	0	0	0	0	0
Glyphosate	Shore-Klear	Applied Biochemist	0.7	2 (*5)	0	0	0	0	0
Imazapyr	Habitat	BASF		(*6)	0	0	0	0	120 (*10)
Imazapyr	AquaPier	SePro		(*6)	0	0	0	0	120 (*10)
Triclopyr	Renovate 3	SePro		(*7)	0	0	365	0	120
Triclopyr	Renovate OTF	SePro		(*7)	0	0	365	0	120
Triclopyr	Ecotriclopyr 3 SL	Vegetation Management		(*7)	0	0	365	0	120

*1 Or less than 0.1 ppm.

2 Approved assay of less than 0.07 ppm.

*3 Depending on rate.

*4 Do not apply within ¼ mile of water intake at rates above 20 ppb.

*5 Can't be applied within ½ mile upstream of active potable water intake. Water intakes must remain off for 48 hours if application made within ½ mile of intake, unless assay determines glyphosate level below 0.7 ppm.

*6 Do not apply within ½ mile of active potable water intake.

*7 Potable water intakes must be turned off till triclopyr levels are determined to be 0.4 ppm or less.

*8 Approved assay of less than 0.1 ppm

*9 FastEST assay may be required prior to use as irrigation. Withdrawal period may also depend on crop to be irrigated.

*10 Or until residue 1.0 ppb or less.

USE OF COPPER SULFATE IN PONDS WITH FISH

Copper sulfate is a contact herbicide recommended for algae control. Copper can be toxic to fish, by interfering with gill functions, if improperly used. Trout and Koi are particularly sensitive to copper. However, most fish kills associated with copper sulfate treatments are related to oxygen depletions due to the decomposition of dead plant material or a massive phytoplankton kill.

The effectiveness and safety of copper sulfate treatments are mostly determined by water alkalinity. In water with an alkalinity below 40 ppm (mg/l), the rate of copper sulfate needed to control algae can be toxic to fish. Copper sulfate treatments at

water alkalinities below 20 ppm are extremely risky and should be avoided. This low alkalinity water is considered "soft" and is very common in Arkansas fish ponds, especially watershed ponds. In high alkalinity water (>250-300 ppm), copper sulfate quickly binds with carbonate and precipitates out and, as a result, is not effective for algae control.

The toxicity of copper sulfate to fish also increases as water temperatures increase. It is best to try and avoid copper sulfate treatments during the summer months. In most cases, do not treat more than one-third to one-half of the pond at a time.

In suitable water, the effective copper sulfate dosage can be calculated using the following formula:

Maximum safe dose in ppm = total alkalinity (ppm)/100

Amount copper sulfate needed (lbs) =
Max safe dose x recommended dose rate (ppm) x
volume (in acre ft) x 2.72

For water testing and further recommendations, contact your county extension office or one of the UAPB Aquaculture/Fisheries extension specialists.