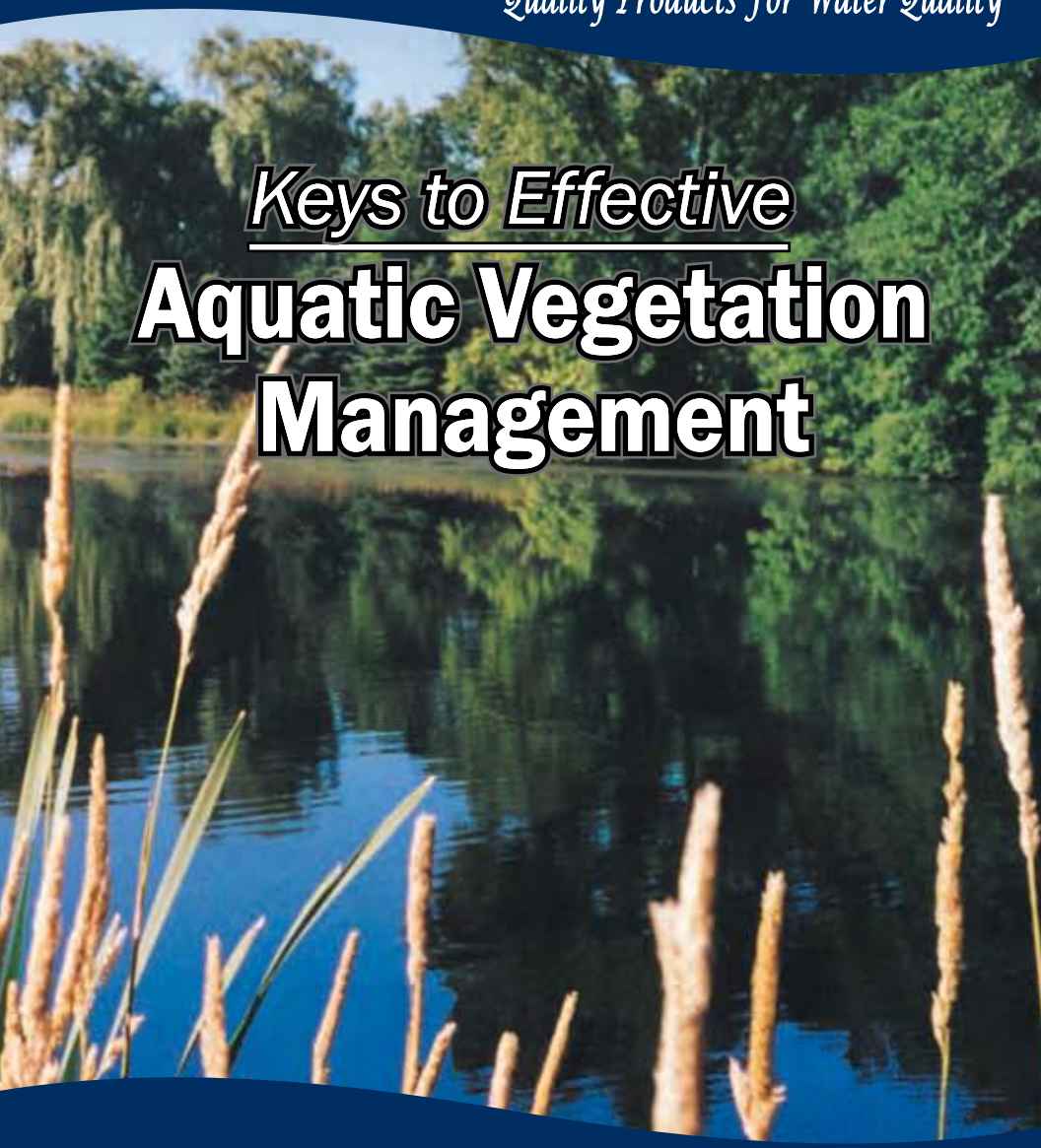
applied biochemists

Quality Products For Water Quality



Keys to Effective

Aquatic Vegetation Management

Identify • Measure • Select Chemical
Read & Follow Label • Apply

Applied Biochemists, A Lonza Business
W175N11163 Stonewood Dr. Suite 234
Germantown, WI 53022
Ph: (800) 558-5106
Web: www.appliedbiochemists.com
Email: info@appliedbiochemists.com

Keys to Effective
Aquatic Vegetation Management

IDENTIFY

Properly identify the nuisance vegetation. For more detailed identification, see *How to Identify and Control Water Weeds and Algae*, or visit our website www.appliedbiochemists.com.

MEASURE

Measure the surface area (acres) of vegetation and/or the volume (acre-ft). Measure average depth for volume calculations.

SELECT CHEMICAL

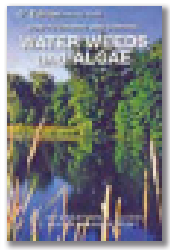
Select the proper product to control vegetation.
Make sure all required application equipment and safety wear is available.

READ AND FOLLOW THE LABEL

Prior to treatment, fully read the label. Follow specifications to prepare and plan application according to directions.

APPLY THE CHEMICAL

Apply the product according to the label, using proper application techniques and safety equipment.



Acknowledgement
Portions of this publication were obtained from "How to Identify and Control Water Weeds and Algae", editors J. Schmidt & J. Kannenberg, 5th edition, copyright 1976 Applied Biochemists.

IDENTIFY VEGETATION

Plants shown on pages 4 - 6 are some of the more common plants in residential lakes and ponds. (Recommended chemical treatment is shown after plant name.) For more specific recommendations, see 'How to Identify and Control Water Weeds and Algae.' Contact Applied Biochemists if your distributor does not stock this book.

ALGAE

Algae are primitive plants with no true leaves, stems or root systems.

Filamentous *('moss') -* ***(Cutrine-Plus® algaecide - liquid for top growth, Cutrine® Plus Granular Algaecide for bottom growth)*** *Thread-like, usually grows from bottom and rises to top as greenish surface mats*

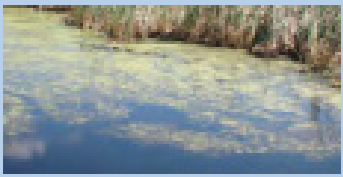
Planktonic *('Pea Soup') -* ***(Cutrine-Plus® algaecide - liquid)*** *Microscopic plants cause green or brown tinge, algae blooms can cause odor, oxygen loss and fish suffocation*

Chara *(Muskgrass, Stonewort) -* ***(Cutrine® Plus Granular Algaecide)*** *Leaf-like structures make this form of algae easily confused with submerged weeds, identify by musky odor when crushed, and bristly feel*

FLOATING PLANTS

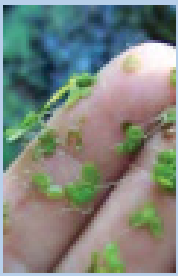
Floating plants can be divided into two basic categories: **plants rooted to the bottom with floating leaves** and **free-floating surface plants**.

Free Floating - Surface Plants



Watermeal/Duckweed *- Small floating plants with rapid reproduction often mistaken for algae*

Right: **Duckweed** *- (Weedtrine®-D Aquatic Herbicide with surfactant) small, oval-shaped plant smaller than a pencil eraser, root attached, common in quiet waters*



Far Right: **Watermeal**, *smallest flowering plant, rootless, grain-sized, extremely difficult to control*

FLOATING

Free Floating - Surface Plants

Salvinia - ***(Weedtrine®-D Aquatic Herbicide with surfactant)*** *Rounded paired leaves ½" long with root-like hairs beneath*

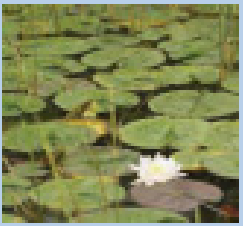
Rooted Floating - Leaf Plants

Watershield - ***(Shoreklear-Plus® Aquatic Herbicide in late season)*** *Oval-shaped leaves with slimy coating underneath and on stems of mature plants, purple flower in early summer*

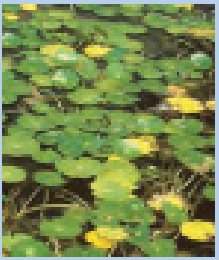
EMERGENT PLANTS

Emergent (Marginal) plants grow above water in shallow depths.

Cattail - ***(Shoreklear-Plus® Aquatic Herbicide in late season)*** *Up to 9 ft stalk with brown cigar-shaped 'flower'*

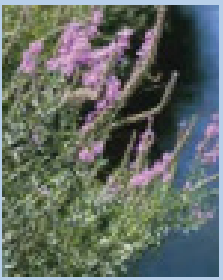


Water Lily - ***(Shoreklear-Plus® Aquatic Herbicide in late season)*** *Round notched leaves*
Similar to Spatterdock- heart shaped leaves with yellow flowers



Water Pennywort - ***(Weedtrine®-D Aquatic Herbicide with surfactant)*** *Half-dollar sized, shiny, leathery leaves, long creeping stems can form dense mats*

Creeping Water Primrose - ***(Shoreklear-Plus® Aquatic Herbicide in late season)*** *Hollow red stem with many leaves and yellow flowers*

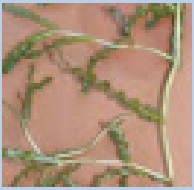


Purple Loosestrife - ***(Shoreklear-Plus® Aquatic Herbicide)*** *2-7 ft tall, purple flowers*

Phragmites - ***(Shoreklear-Plus® Aquatic Herbicide in mid to late season)*** *10-12 ft tall thick aggressive grass*

SUBMERGED PLANTS

Submerged plants are usually rooted at the bottom and entirely under water.



Pondweed -

(Weedtrine®-D Aquatic Herbicide)

There are many species of pondweed including: Curly-leaf (upper left), American (top center) and Sago (upper right).

Eurasian Watermilfoil -

(Weedtrine®-D Aquatic Herbicide tank mixed with Cutrine-Plus® algaecide - liquid)

Leaves in whorls of 4 with up to 20 leaf divisions, stalk with tiny reddish flowers may extend above surface

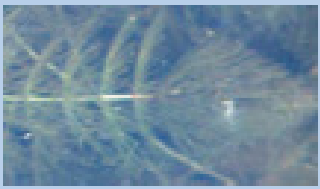
Hydrilla / Elodea -

(Weedtrine®-D Aquatic Herbicide tank mixed with Cutrine-Plus® algaecide - liquid)

Long-stemmed branching plants with whorled leaves ⅝" long. Leaves toothed in Hydrilla, not toothed in Elodea

Naiad - ***(Weedtrine®-D Aquatic Herbicide tank mixed with Cutrine-Plus® algaecide - liquid)***

Slender, branching stem with leaves <1" long that are wider at the base; spines on margins



Coontail -

(Weedtrine®-D Aquatic Herbicide)

Rootless, leaves crowded at tip

Bladderwort -

(Weedtrine®-D Aquatic Herbicide tank mixed with Cutrine-Plus® algaecide - liquid)

Bladder-like pods on leaves

2 MEASURE AND CALCULATE

to aid in purchasing the correct amount of chemical,
avoid wasting product, and avoid over- or under-dosing the water.

Useful Formulas

Rectangular Pond/Lake **Surface Acres** = $\frac{\text{Length (ft) x Width (ft)}}{43{,}560}$

Circular or Oval Pond/Lake **Surface Acres** = $\frac{\text{Length (ft) x Width (ft) x 0.8}}{43{,}560}$

Average Depth = $\frac{\text{Sum of the Depth Measurements Taken}}{\text{Number of Depth Measurements Taken}}$

Acre-Feet = Surface Acres x Average Depth

Converting Gallons to Acre-Feet

$\frac{\text{Gallons of Water}}{325{,}869}$ = Acre-Feet

Sample Calculation

A pond is a 150ft by 250ft oval. The average depth is 4 feet.

To find surface acres of the oval-shaped pond use the calculation above.
Multiply length by width by the constant 0.8, then divide by the constant 43,560.

Surface Acres = $\frac{150 \text{ (ft)} \times 250 \text{ (ft)} \times 0.8}{43{,}560}$ **= 0.689 Surface Acres**

To account for depth, find acre-feet by multiplying by the average depth.

Acre-Feet = 0.689 x 4 (ft) **= 2.75 Acre-Feet**

Make sure to read the application instructions, either acre-feet or surface acres will be needed to determine the amount of chemical to use.

SELECT CHEMICAL

by reading label to ensure product is appropriate for intended use.

AQUASHADE® AQUATIC PLANT GROWTH CONTROL

- Blue and yellow dyes absorb light critical to photosynthesis
- Maintenance dosages may be needed to restore diluted color
- May use water for animals, swimming or irrigating after 1 hour*
- 1 gallon treats 4 acre-feet (1.3 mil gal. water) at 0.8 ppm

BACTI-KLEAR® AQUATIC MICROBIAL BLEND

- Available in both liquid and pellet form
- Reduces organic muck and odors; improves water clarity
- Maintenance applications are necessary for lasting results
- Start-up application- 3 gal./acre-ft or 20 lb. pellets/acre

CUTRINE-PLUS® ALGAECIDE (LIQUID)

- Controls surface filamentous and planktonic algae
- Visible reduction in algae growth in 1 - 2 days
- May use water for animals, swimming or fishing after treatment
- 1 gallon treats ⅓ to 1⅔ acre-feet

CUTRINE® PLUS GRANULAR ALGAECIDE

- Controls bottom-growing algae including Chara and Nitella
- Visible reduction in algae growth in 1 - 2 days
- May use water for animals, swimming or fishing after treatment
- 12 pounds treats 0.2 surface acres (or 8,600 square feet)

WEEDTRINE®-D AQUATIC HERBICIDE

- Contact herbicide targets a wide variety of aquatic weeds
- Tank mix easily with Cutrine-Plus Algaecide and/or surfactant
- See label for water use restrictions
- 1 gallon treats 0.1 to 0.4 surface acres of vegetation

SHOREKLEAR-PLUS® AQUATIC HERBICIDE

- Systemic herbicide for aquatic/other non-crop sites
- Up to 4 weeks for full results down to the roots
- Contains a non-ionic surfactant, no chemical additives needed
- 1 gallon treats 1 to 5⅓ acres of emergent vegetation

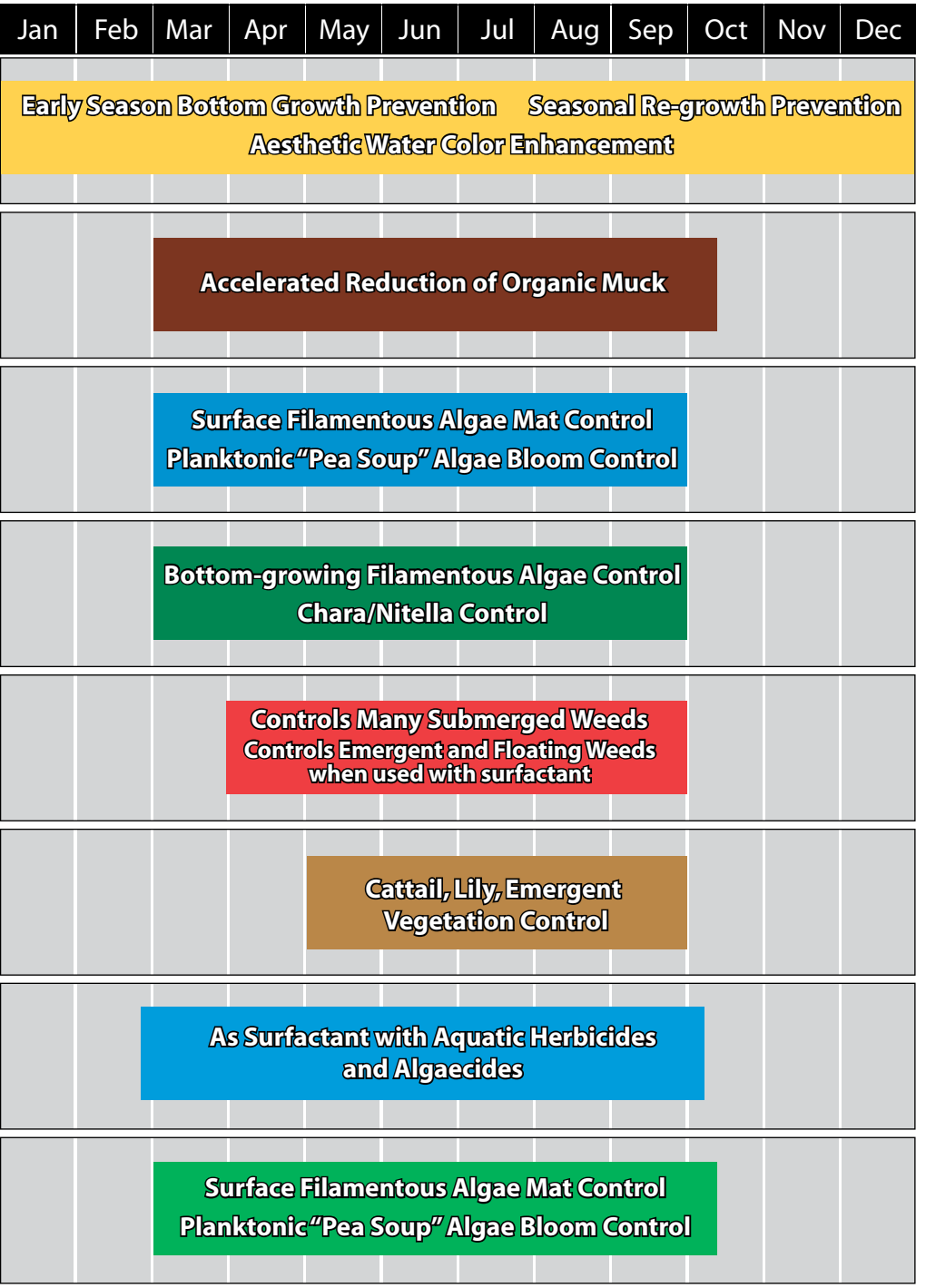
AQUATIC ADJUVANT & NON-IONIC SURFACTANT

- Helps penetrate leaf for more effective chemical uptake
- Use with algaecides and herbicides as a surfactant
- Add 1 to 3 oz. per 10 gallons of spray solution

AB BRAND COPPER SULFATE CRYSTALS

- Fine crystals dissolve in water
- Controls surface filamentous and planktonic algae
- Controls roots in sewer lines
- 15 lb. treats 2.8 to 22.4 acre-feet, depending on algae species

*Always read and follow the label for every product in every use situation.
Seasonal temperature variations will cause treatment conditions to vary.



Read & Follow Label Instructions

to accurately determine the proper amount of product(s).

The following are mathematical formulas to be used as guidelines for calculating dosages. Always follow the product label. These formulas require arce-ft or surface acres to start calculating product amounts. See page 7 (Measure) for beginning calculations. See page 18 (Conversions) for common conversions.

AQUASHADE® AQUATIC PLANT GROWTH CONTROL

Dosage: (at 0.8 ppm) 32 ounces per acre-foot (1 gallon treats 4 acre-feet)

_____acre-ft x 32 oz./acre-ft = _____ ounces to use

This product contains blue and yellow dyes which shade the water, limiting the sunlight reaching submerged plants.
Surface weeds and algae will still be able to get sunlight to grow.

BACTI-KLEAR® AQUATIC MICROBIAL BLEND

For Start-up Application

Dosage: 20 pounds per surface acre (Pellets), 3 gallons per acre-foot (Liquid)

Pellets: _____ acres x 20 lb./acre = _____ pounds to use

Liquid: _____acre-ft x 3 gal./acre-ft = _____ gallons to use

See container label for amounts to use for maintenance application.
Use maintenance application amount once desired appearance is reached.

CUTRINE-PLUS® ALGAECIDE (LIQUID)

Dosage: varies between 0.6 - 3.0 gallons per acre-foot

Parts (by weight) copper per million parts water	*Gallons of Cutrine-Plus per Acre-ft of water
0.2 - 0.6 ppm	0.6 - 1.8
0.2 - 0.8 ppm	0.6 - 2.4
0.4 - 1.0 ppm	1.2 - 3.0

**Dosage depends on algae type, density and season. A 0.2 ppm application is standard for most types of planktonic and filamentous algae.*

_____acre-ft x 0.6* gal./acre-ft = _____ gallons to use

Cutrine® Plus Granular Algaecide

Dosage: 60 pounds per surface acre (1 pound treats 720 square feet)

_____acres x 60 lb./surface acre = _____ pounds to use

Weedtrine®-D Aquatic Herbicide

A non-selective herbicide that treats many aquatic plants. Requires a surfactant when treating emergent and floating plants. See "How to Identify Water Weeds and Algae" for recomendations on treating specific plants. Some tolerant species require a tank mix with another product to effectively control the plant.
Application rate varies by target plant, density and season.

Submerged weeds: 5 - 10 gallons treats 1 acre of vegetation

_____ acres x 5 (up to 10) gal. = _____ gallons to use

Emergent weeds: 5 gal. treats 1 acre of vegetation *(needs surfactant)*

_____ acres x 5 gal. = _____ gallons to use

Floating plants: 2.5 - 3.75 gal. treats 1 acre of vegetation *(needs surfactant)*

_____ acres x 2.5 (up to 3.75) gal. = _____ gallons to use

Duckweed: 5 gallons treats 1 acre of vegetation *(needs surfactant)*

_____ acres x 5 gal. = _____ gallons to use

Watermeal can be very difficult to control. A tank mix of 10 parts Weedtrine®-D Aquatic Herbicide, 1 part Cutrine-Plus® Algaecide with a surfactant (diluted 9:1 with water) can be successful, but re-treatment will likely still be necessary. As listed in "How to Control Water Weeds and Algae", the active ingredient fluridone has also been successful in controlling watermeal.

Aquatic Adjuvant & Non-ionic Surfactant

Dosage: 1 to 3 ozs. per 10 gallons spray solution

Mix with aquatic herbicides and algaecides at recommended dose.

AB Brand Copper Sulfate Crystals

Dosage: 0.67 - 5.32 pounds per acre-foot

Parts (by weight) Copper Sulfate per million parts water	*Pounds of Copper Sulfate per Acre-ft of water
¼ ppm - ½ ppm	0.67 - 1.3
½ ppm - 1 ppm	1.3 - 2.6
1 ppm - 1½ ppm	2.6 - 3.9
1½ ppm - 2 ppm	3.9 - 5.32

**Dosage depends on algae type and water hardness.*
Have local authorities help with identification prior to application. If identification is not possible, start at low dose of 0.67 pounds per acre-foot and increase if necessary.

_____acre-ft x 0.67* lb./acre-ft = _____ pounds to use

Shoreklear-Plus® Aquatic Herbicide

1. Refer to Table 3 in the product label to locate the name of the target plant. Use the chart to determine the amount to use. Refer to Spray Concentration column for hand-held sprayers.
2. Refer to Table 1 in the label for the amount of product to mix with water based on spray concentration.

Example,

From Table 3

Weed Species	Spray Concentration
Spatterdock *(Water Lily)*	2.75%

From Table 1

Amounts of product for Spray Concentrations		
Volume of Water (gallons)	2.75%	3.50%
1 gallon	**3.50 fl. oz.**	**4.50 fl. oz.**

In Table 3, the recommended spray concentration on Spatterdock is 2.75%. Table 1 shows that the spray concentration of 2.75% requires 3.50 fluid ounces of product diluted into 1 gallon of water to obtain the properly mixed solution for spot-treatment. The amount of solution needed will vary by density and plant. The concentrations are based on applying enough product to thoroughly wet the plant.

In areas of dense vegetation, treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead plants. This oxygen loss can be harmful to aquatic life. To minimize this hazard, do not treat more than ½ to ⅓ of the water at a time and wait 10-14 days between treatments.
Do not use copper-based products in ponds containing koi or hybrid goldfish.
Do not use copper-based products in soft water (<50 ppm) if trout are present.

APPLY THE PRODUCT

according to label instructions.

For liquid products, the table below is to be used as a guideline in dilution. Always properly dilute liquid products according to the label.

LIQUID PRODUCTS	DILUTION RATE	APPLICATION
CUTRINE-PLUS® ALGAECIDE	**9:1**	9 parts water to 1 part product (12.8 oz. per gal.)
WEEDTRINE®-D AQUATIC HERBICIDE	**5:1** see label	Submerged weeds (21 oz. per gal.)
	19:1	Emergent weeds (6.5 oz. per gal. + surfactant)
	25:1	Duckweed (5 oz. per gal. + surfactant)
	64:1	Floating weeds (2 oz. per gal. + surfactant)
SHOREKLEAR-PLUS® AQUATIC HERBICIDE	**varies**	Dilution varies with plant species, see label
AQUASHADE® AQUATIC PLANT GROWTH CONTROL	**none**	Apply by pouring directly into water

Purchase a sprayer that will be used exclusively for compatible pond chemicals.

Dilution increases volume to ensure even distribution, but does NOT reduce product's potency. **First calculate how much chemical to use, then dilute for application.**

For example, CUTRINE-PLUS® ALGAECIDE is applied at a rate of 0.6 gallons per acre-ft for planktonic algae. If the area to be covered is 0.33 acre-feet, you would need 0.2 gallons (or 25.6 ounces) of product to cover the area.

Based on the 9 to 1 dilution, a one gallon sprayer would contain 12.8 oz. of CUTRINE-PLUS® (and 115.2 oz. of water). So using two tankfuls of solution would apply the needed 25.6 oz. to cover the area.

For granular products, evenly distribute according to the label.

Before applying remember to:

- Correctly identify the target vegetation, and make sure you're using the proper chemical to treat
- Measure the treatment area and calculate the dosage needed, then dilute
- Obtain necessary permits or approvals
- Read and follow product label completely

PRODUCT USE

Questions & Answers

AQUASHADE® AQUATIC PLANT GROWTH CONTROL

Can pets drink the water? Can kids swim in it?

Allow at least 1 hour for the product to disperse evenly, then the water can be used for swimming and animals drinking the water. Always follow label.

Why is this product different than a colorant?

Colorants only change the color of the water. **AQUASHADE®** AQUATIC PLANT GROWTH CONTROL is EPA registered as a pesticide because it absorbs specific wavelengths on sunlight to limit photosynthesis.

How often do I apply this product?

Apply in season maintenance dosages, as needed, to restore loss of color due to dilution or dye degradation.

I spilled some product; how do I clean it up?

Don't add water. Soak up as much as you can with absorbent cloths. Scrub stain with oxygenated cleaner or mild bleach solution. Contact Applied Biochemists at 1-80-558-5106 for additional assistance.

CUTRINE-PLUS® ALGAECIDE and CUTRINE® PLUS GRANULAR ALGAECIDE

Are there any swimming restrictions?

Treated water can be used immediately for swimming after proper application.

Can domestic animals drink from treated water?

Yes. There are no restrictions for animals drinking treated water when applied at label rates. (Sheep, on average, tolerate up to 10 ppm copper in their diet. Be careful of overdosing in water where sheep drink.)

Will it harm my fish?

Copper based products are toxic to koi and hybrid goldfish. Trout are sensitive to copper in soft water (<50ppm carbonate hardness).

Why use Cutrine-Plus Algaecide instead of Copper Sulfate Crystals?

CUTRINE-PLUS® ALGAECIDE is chelated, which protects the copper from binding with carbonates in the water. This allows the copper to stay active against algae longer. The chelated formula is more effective and longer lasting, especially in hard water.

What do I do if the algae comes back?

Chelated copper products stay in the water at a high enough copper concentration to kill algae for about 24 hours. If the algae starts to grow back or turn green again, you will need to reapply.

WEEDTRINE®-D AQUATIC HERBICIDE

What is a non-ionic surfactant? And do I need it?

A non-ionic surfactant is a necessary additive when applying this product to emergent or floating plants. The surfactant helps the chemical "stick" to the plant and penetrate the waxy leaf coating.

Is this product toxic to fish?

There is no toxicity when used at label rates. However, as vegetation dies it consumes oxygen; to avoid dissolved oxygen depletion treat only ⅓ to ½ of the pond at a time using ⅓ to ½ of the required chemical. Wait 1-2 weeks between treatments.

SHOREKLEAR-PLUS® AQUATIC HERBICIDE

When will I see results?

Initially 4 -5 days, but complete control can take 2 weeks or more.

Do I need a surfactant?

No, it is included as an additive in **SHOREKLEAR-PLUS®** AQUATIC HERBICIDE. (See question in **WEEDTRINE®-D** AQUATIC HERBICIDE section for more information.)

BACTI-KLEAR® AQUATIC MICROBIAL BLEND

What does the microbial blend do?

Microbial blends have naturally occurring bacteria that help to breakdown organic muck. Breakdown is more effective in aerated water.

POST-TREATMENT

Questions & Answers

When will I see results?

Planktonic algae should subside in 1 to 2 days. Filamentous algae often turn pale yellow or white in 3 to 4 days. Plants take longer, typically wilting or showing discoloration in up to 2 weeks.

What happens to the dead material?

Decaying plants/algae usually sink to the bottom where microscopic organisms break down plant materials. Plants with thick stems may require manual removal if not broken up by wind or waves action.

Will my water quality change?

When large masses of vegetation decay, recycling of the plant materials may occur. Nutrients may end up in sediment or enter the water column.

How long will control last?

Many weeds can be controlled for an entire season with one properly timed treatment. However, herbicides do not kill seeds and some do not get into root systems, which can result in regrowth. Algae often require treatments every 3 to 6 weeks because they are able to rapidly reproduce.

Will I have fewer plants next year?

Once well established, nuisance plants will often continue to be a problem each year. Treating prior to seed production will yield better long-term results. But improving the water quality is the optimal way to decrease plant growth long-term, including lowering nutrient levels, aerating the water and keeping the pond edges steep.

What happens to the chemical in the water?

Products recommended in this book do not remain in the water in their original state for extended periods of time (excluding copper sulfate). Chemical and biological actions break down these compounds into common by-products, which are recycled in the environment.

Are these products safe for my fish?

Decomposing weeds/algae consume oxygen which can results in oxygen depletion which suffocates fish. Treat small sections of the water at a time to reduce this risk. Koi and goldfish are sensitive to copper products; these products are not labeled for ornamental ponds.

What are common reasons for failure?

Failures can occur, typically due to one or a combination of the following reasons.

- Not completely following the directions on the product label
- Misidentification of target plant (using the wrong product)
- Miscalculation of treatment area (using the wrong dosage)
- Adverse weather conditions (high winds or rain storms) during or closely following treatment
- Water conditions (high turbidity, low temp., etc.) interfering with product action
- Weed re-growth or appearance of new vegetation
- Improper timing of treatment - too early or too late
- Rapid water exchange causing chemical dilution

GENERAL RESTRICTIONS ON USE OF

(Amount of time to wait after application, before specified water use.)

PRODUCT NAME
AQUASHADE® AQUATIC PLANT GROWTH CONTROL
BACTI-KLEAR® AQUATIC MICROBIAL BLEND
CUTRINE-PLUS® ALGAECIDE (LIQUID)
CUTRINE® PLUS GRANULAR ALGAECIDE
WEEDTRINE®-D AQUATIC HERBICIDE
SHOREKLEAR-PLUS® AQUATIC HERBICIDE
AB BRAND COPPER SULFATE CRYSTALS

* See product label for specific use restrictions.

** See product label for set-back distance required from potable water intake.

TREATED WATER

HUMAN			DOMESTIC ANIMAL	IRRIGATION		
DRINKING	SWIMMING	FISH CONSUMPTION	DRINKING	TURF	FORAGE	FOOD CROPS
*	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
*	*	*	*	*	*	*
**	0	0	0	0	0	0
0	0	0	0	0	0	0

Always read and follow product label for each product in every use situation.

CALCULATIONS

ACREAGE CALCULATION CHART

AREA (in surface acres)																
WIDTH (in feet)	*LENGTH (in feet)*															
	30	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**
30	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.10	0.14	0.17	0.21	0.24	0.28	0.31	0.34
40	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.14	0.18	0.23	0.28	0.32	0.37	0.41	0.46
50	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.17	0.23	0.29	0.34	0.40	0.46	0.52	0.57
60	0.04	0.06	0.07	0.08	0.10	0.11	0.12	0.14	0.21	0.28	0.34	0.41	0.48	0.55	0.62	0.69
70	0.05	0.06	0.08	0.10	0.11	0.13	0.14	0.16	0.24	0.32	0.40	0.48	0.56	0.64	0.72	0.80
80	0.06	0.07	0.09	0.11	0.13	0.15	0.17	0.18	0.28	0.37	0.46	0.55	0.64	0.73	0.83	0.92
90	0.06	0.08	0.10	0.12	0.14	0.17	0.19	0.21	0.31	0.41	0.52	0.62	0.72	0.83	0.93	1.03
100	0.07	0.09	0.11	0.14	0.16	0.18	0.21	0.23	0.34	0.46	0.57	0.69	0.80	0.92	1.03	1.15
150	0.10	0.14	0.17	0.21	0.24	0.28	0.31	0.34	0.52	0.69	0.86	1.03	1.21	1.38	1.55	1.72
200	0.14	0.18	0.23	0.28	0.32	0.37	0.41	0.46	0.69	0.92	1.15	1.38	1.61	1.84	2.07	2.30
250	0.17	0.23	0.29	0.34	0.40	0.46	0.52	0.57	0.86	1.15	1.43	1.72	2.01	2.30	2.58	2.87
300	0.21	0.28	0.34	0.41	0.48	0.55	0.62	0.69	1.03	1.38	1.72	2.07	2.41	2.75	3.10	3.44
350	0.24	0.32	0.40	0.48	0.56	0.64	0.72	0.80	1.21	1.61	2.01	2.41	2.81	3.21	3.62	4.02
400	0.28	0.37	0.46	0.55	0.64	0.73	0.83	0.92	1.38	1.84	2.30	2.75	3.21	3.67	4.13	4.59
450	0.31	0.41	0.52	0.62	0.72	0.83	0.93	1.03	1.55	2.07	2.58	3.10	3.62	4.13	4.65	5.17
500	0.34	0.46	0.57	0.69	0.80	0.92	1.03	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74

CONVERSIONS

Area

1 acre	=	0.405 hectares 4,047 square meters 43,560 square feet	1 hectare	=	2.47 acres 10,000 square meters 107,639 square feet

Distance

1 foot	=	0.0003 kilometers 0.305 meters 0.00019 miles	1 meter	=	0.001 kilometers 0.00062 miles 3.28 feet

Weight

1 pound	=	0.45 kilograms 453.6 grams 16 ounces	1 kilogram	=	2.2 pounds 1000 grams 35.27 ounces

Volume

1 ounce	=	2 tablespoons 6 teaspoons 0.125 cups	1 mL	=	0.068 tablespoons 0.2 teaspoons 0.034 ounces
1 acre-foot	=	43,560 cubic feet 325,869 gallons	1 cubic meter	=	35.3 cubic feet 264.2 gallons
1 gallon	=	128 ounces 3.78 liters 4 quarts 8 pints 16 cups	1 liter	=	33.8 ounces 1.06 quarts 0.26 gallons 2.11 pints 4.23 cups

NOTES

V12GEN