POND MANAGEMENT GUIDE

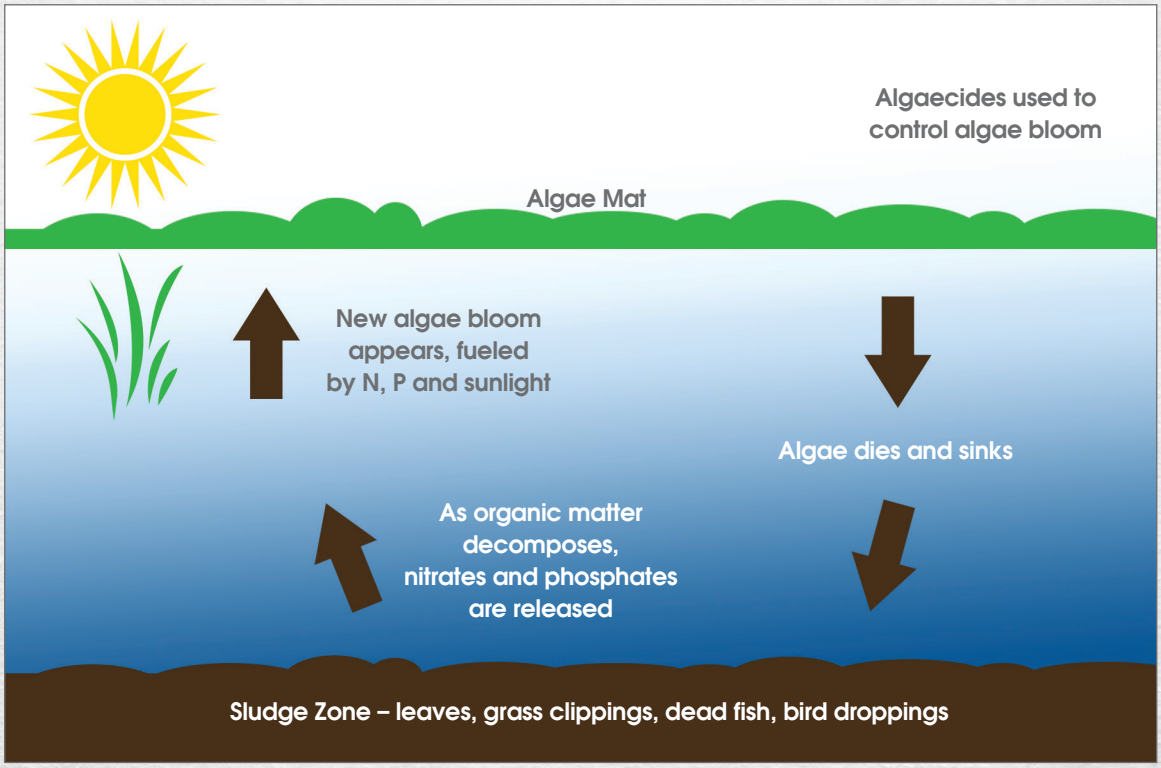
PRECISION™
LABORATORIES
Results. Expect it.®

BREAK THE AQUATIC WEED CYCLE

When algae or aquatic weeds get out of control, algaecides and aquatic herbicides are used to control the situation. However, as algae and plants die, they sink to the bottom of the lake or pond. This contributes to a sludge zone that also contains leaves, grass clippings, dead fish and bird droppings.

As organic matter in the sludge decomposes, nitrates and phosphates are released. These plant nutrients, combined with sunlight, fuel new algae development. To control algae and aquatic weeds, this "cycle" must be broken.

The products in the Cycle System break this pattern by competing for nutrients in the water column, decomposing sludge and filtering sunlight.



IDENTIFYING POND PROBLEMS

Identifying pond problems is essential to finding an effective water management solution. Described below are some of the more common pond problems.

Planktonic Algae

- Microscopic plants suspended in the upper few feet of water
- Pea soup green or brownish appearance
- Feed on phosphorus and nitrogen found in the water column

Filamentous Algae

- Also known as "pond scum" or "moss"
- Begins its growth along the edges or bottoms of the pond
- "Mushrooms" to the surface buoyed by the oxygen it has produced
- Increases the risk of fish kill from low dissolved oxygen levels
- Feed on phosphorus and nitrogen found in the water column

Attached-Erect Algae

- Advanced forms of algae (Chara & Nitella)
- Mistaken for higher vascular plants like Water Milfoil
- Attached, but not rooted, to lake and pond bottoms
- Feed on nutrients trapped in the sludge layer

Sludge

- Partially decomposed organic accumulation on lake and pond bottoms
- Consists of fish and fowl waste, dead algae, dead weeds, leaves and grass clippings
- Serves as a nutrient pump to feed the next algae bloom
- Unpleasant odors from hydrogen sulfide
- Murky, unappealing appearance
- Reduced recreational usage

Floating Plants

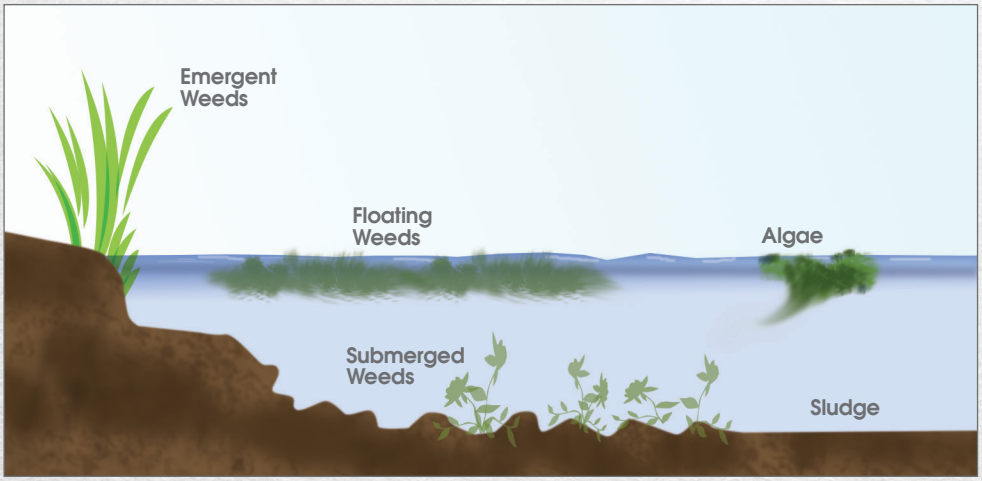
- Water Meal and Duckweed are primary species
- Derive their food source from the water column

Submerged Weeds

- Plants are rooted at the bottom and completely underwater
- Flowers may extend above the water surface

Emergent Weeds

- Plants grow above the waterline in shallow areas of ponds, lakes, irrigation ditches and rivers



TIP: Why Water Test?

- Saves money by determining proper application use rates
- Quicker results from using appropriate rates
- Documents overall improvement in water quality to monitor effectiveness

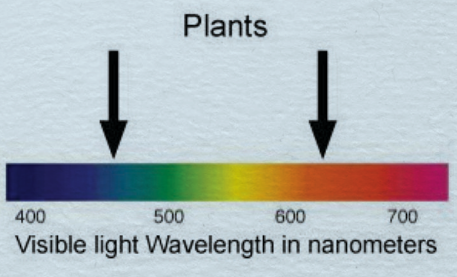
LAKE AND POND WATER QUALITY SUMMARY

Parameter	Normal Range
Water Temperature	
Surface	50°–85° F
Pond bottom	50°–75° F
Dissolved oxygen	4.0–saturation
pH	6.5–9.0
Turbidity	≤ 20 NTU
Ammonia-Nitrogen Total NH4 - N	1.0–5.0 mg/l
Un-ionized ammonia	0.28–0.06 mg/l
Nitrite	≤ 0.5 mg/l
Nitrate	3.0–10.0 mg/l
Phosphate	≤ 0.5 mg/l
Copper	≤ 0.01 mg/l
Iron	≤ 2 mg/l

Parameter	Normal Range
Total hardness	20–300 mg/l
Carbon dioxide	≤ 15 mg/l
Alkalinity	
Calcium Carbonate Hardness	50–100% of TA
Hydroxide	0% of TA
Carbonate	0.40% of TA
Bi-carbonate	75–100% of TA
Total dissolved solids	≤ 400
Calcium	10–160 mg/l
B.O.D. 5	≤ 5–20 mg/l species dependent
Sulfate	≤ 75 mg/l
Secci Disk	> 3.0 ft.

LIGHT SPECTRUM

Plants use energy from light for photosynthesis. Plants use blue and orange-colored light efficiently and green light reflects off the plants, which is why we see plants as green. Dyes containing both blue and yellow dyes are the most effective at filtering light.



SOLUTIONS

Aquatic solutions are dependent on conditions. No single solution addresses all problems. Described below are various water management options and their advantages and disadvantages.

Options	Advantages	Disadvantages
Mechanical Harvesting & Dredging	• Environmentally friendly • Quick results	• Slow • Nonselective • Costly • Can aggravate problems by dispersing plant fragments, causing new plant formation • Increases turbidity and reduces water quality • May create disposal problems
Chemicals	• Most effective method of control • Longer lasting than mechanical methods • Selective or broad spectrum • Application can be made in areas that cannot be reached by other methods	• Some chemicals restrict water usage for swimming, drinking and irrigation • Product efficacy can be affected by weather and water flow • Increases risk of fish kill • Other precautions include: Handling - clean-up - disposal methods • Continues nutrient build-up cycle • Short-term solution
Dyes & Colorants	• Assists other water quality control methods by filtering out sunlight which supports photosynthesis • Gives water a natural blue or black color • Harmless to fish and wildlife	• Provides no knockdown control of algae/ weeds • Ineffective in water depths under 3 feet • Color may be transient depending on conditions
Biologicals	• Environmentally friendly • Long-term solution • Improves water quality & clarity • No risk of fish kill • No special permits/licenses • Easy to use, handle and store • Restores ecological balance • No water-use restrictions	• Short-term results not as visual as some chemicals • Narrow spectrum of control • Results can be negatively effected by lack of water hardness
Integrated Approach	• Utilizes chemicals for short-term improvement in visual appeal • Utilizes biologicals for long-term quality improvement • Utilizes dyes for reducing sunlight penetration and improving aesthetics • Reduces chance of developing resistant algae strains	• May need license or permits for chemical applications • May require more scouting

THE CYCLE SYSTEM

The Cycle System™ is a unique concept in aquatic management utilizing "function-specific" products to provide long-term solutions to address specific aquatic problems. The innovative Cycle System helps restore the natural ecological balance in small bodies of water by removing organic and inorganic nutrients. It is the first lake and pond restoration system to use four separate, but complementary products: Spectrum™, Devour™, True Blue™, Jet Black™, and Precise Pond™.

- Spectrum is a "function-specific" bacterial formulation that digests excess phosphorus and nitrogen in the water column, which are the primary food sources for excessive aquatic plant growth.
- Devour will effectively reduce sludge buildup from lake and pond bottoms by accelerating the decomposition process of organic residues that make up the sludge layer and contribute to offensive hydrogen sulfide odors and murky water. Left untreated, sludge will re-release phosphorus and nitrogen into the water column.
- True Blue lake and pond dye, available in liquid or EZ SoluPaks, is a proprietary blend of environmentally friendly, nontoxic, water-soluble dyes formulated to reduce sunlight penetration and impart a natural blue color when applied to ponds, lakes and fountains.
- Jet Black lake and pond dye, available in liquid or EZ SoluPaks, is a proprietary blend of environmentally friendly, nontoxic, water-soluble dyes formulated to reduce sunlight penetration and impart a natural black color when applied to any water feature.
- Precise Pond is a combination of enzymes and bacteria that preemptively digest phosphorus and nitrogen in the water column, while accelerating the breakdown of partially decomposed organic matter, waste and sludge accumulation on lake and pond bottoms.

The Cycle System has been researched and tested to ensure superior performance. Utilizing an integrated approach to lake and pond management can provide quick and effective results. Depending on conditions, employing aquatic control products in conjunction with the Cycle System can produce a long-term solution that minimizes the need for reactive treatments.

USE RATES AND RECOMMENDATIONS

Product	Water Testing	Initial Treatment	Maintenance Treatments Biweekly
Spectrum	Yes	3.0–6.0 lb/surface acre	1.5–2.0 lb/surface acre
Devour	Yes	3.0–6.0 lb/surface acre	1.5–2.0 lb/surface acre
Precise Pond	Yes	3.0–6.0 lb/surface acre	1.5–2.0 lb/surface acre
Jet Black	No	Liquid: 20 oz/acre foot SoluPak: 1/acre foot	—
True Blue	No	Liquid: 1 qt/acre foot SoluPak: 1/acre foot	—

SPECTRUM™ *Nutrient Balancing System*

A proprietary blend of naturally occurring bacterial strains, enzymes, dispersing agents and carbon-enhanced medium specifically formulated to remove excess inorganic nutrients in the water column of lakes and ponds.

- Spectrum preemptively digests nitrogen and phosphorus, competing for the food source of algae and aquatic plants.
- Reduces dependency on pesticides and environmental loading
- Improves long-term water quality and clarity

DEVOUR™ *Aquatic Waste and Sludge Reducer*

A proprietary blend of specialized enzymes, buffering agents and bacteria that thrive in both aerobic and anaerobic conditions.

- Reduces sludge on lake and pond bottoms by accelerating decomposition
- Consumes N and P released during accelerated decomposition process
- Reduces hydrogen sulfide odors
- Improves long-term water quality and clarity

PRECISE POND™ *Nutrient & Sludge Metabolizer*

A combination of enzymes and bacteria that preemptively digest phosphorus and nitrogen in the water column, while accelerating the breakdown of partially decomposed organic matter, waste and sludge accumulation on lake and pond bottoms.

- Concentrated "function specific" formulation provides 20 to 30 times more activity than ordinary biologicals
- Improves water clarity and quality
- More concentrated than ordinary biologicals
- Reduces the need for harvesting, dredging and algaecides
- Easy to use 1/2 pound water-soluble packets
- Eliminates foul odors
- Improves long-term water quality and clarity

TRUE BLUE™ Liquid and EZ SoluPaks™ Lake and Pond Dye

True Blue is the professional way to bring a natural blue appearance back to your lakes and ponds. Odorless and nontoxic, True Blue provides an attractive, beautifying effect to natural or man-made ponds, water hazards, lakes and fountains. True Blue EZ SoluPaks are protected by a unique, waterproof, foil-lined overpack to prevent accidental staining while handling.

- Long-lasting, natural blue color
- Easy to use and highly concentrated
- Harmless to fish and wildlife
- Formulated to filter sunlight penetration needed for photosynthesis

JET BLACK™ Liquid and EZ SoluPaks™ Lake and Pond Dye

Jet Black is a liquid formulation of environmentally friendly, non-toxic dyes that reduce sunlight penetration and impart a natural black color when applied to any water feature. Jet Black EZ SoluPaks are protected by a unique, waterproof, foil-lined overpack to prevent accidental staining while handling.

- Long-lasting, natural black color
- Easy to use and highly concentrated
- Harmless to fish and wildlife
- Formulated to filter sunlight penetration needed for photosynthesis

EZ SOLUPAKS™:

- Unique packaging eliminates risk of staining during handling
- Each overpack is fully labeled to prevent misapplication
- No irrigation or recreational restrictions and nontoxic

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