

Reducing Soluble Phosphorus Content to Control Algal Growth in Farm Ponds

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The Issue: Dirty Farm Ponds in Tennessee

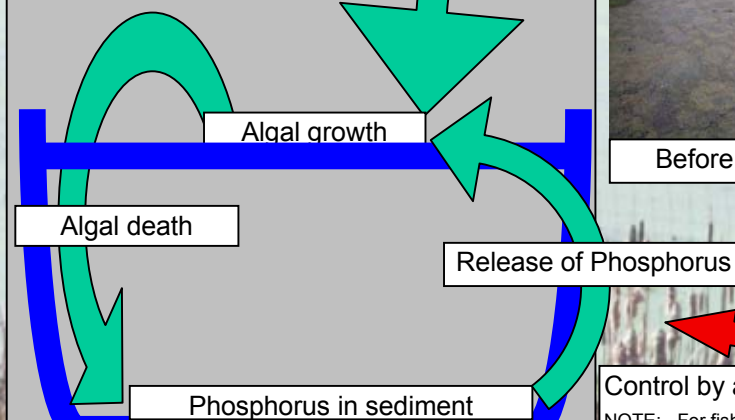
Most of the **90,000** farms in Tennessee have one or more ponds

Ponds are used for watering livestock (over 2 million **beef cattle**), irrigation, fishing and swimming. Are valued for their aesthetics

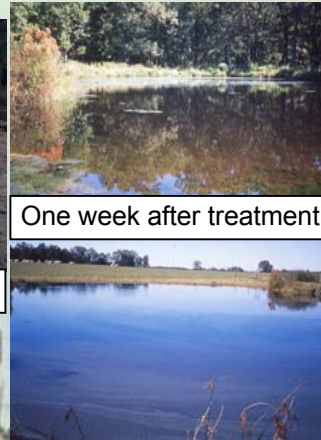
Water quality in many ponds is poor due to poor management: sediments, excessive nutrients (especially **PHOSPHORUS**), causing algal growth, low dissolved oxygen, fish kills, odors

Herbicide technologies for controlling algae **do not treat the problem** but rather the symptoms. Control is often temporary

Excessive Algal Growth? Take a look at the Phosphorus Cycle!



Phosphorus Runoff and Direct Deposition of Cattle Manure

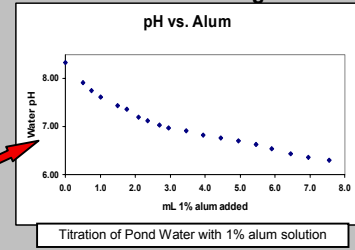


Control by addition of alum ($Al_2(SO_4)_3$) to precipitate phosphorus
NOTE: For fish, maintain pH 6.5 to 9.0 (death below 4.0); alkalinity; > 20 g mg / L $CaCO_3$ (75 to 200 mg / L $CaCO_3$ for fish culture)

Demonstration Pond: Coffee County- Sept. 2000

Water for beef cattle and fish (bass, carp etc.) pH = 8.3; alkalinity = 56.3 mg $CaCO_3$ / L; Soluble P: < 0.5 mg / L in pond water; 26.1 mg / L in sediment. Annual algal blooms.

Step 1: Calculate quantity of alum needed: estimate water volume (0.8 million liters), run titration test with 1% alum solution and measure pH drop 8.3 to 6.2



Step 2: Mix 45 kg (100lbs) dry alum with water and apply over pond



Equipment used to mix dry alum with water: pump and 55-gallon drum



Surface application of alum solution and initial reaction of alum with water

Step 3: Algae killed after one week. No dead fish or macro-invertebrate observed. Retest water: Final pH = 6.1; Alkalinity = 30.1 mg $CaCO_3$ / L (Successfully re-treated September 2001)