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 (Al₂(SO₄)₃) to precipitate phosphorus
NOTE: For fish, maintain pH 6.5 to 9.0 (death below 4.0); alkalinity > 20 g mg / L CaCO₃ (75 to 200 mg / L CaCO₃ 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 CaCO₃ / 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
Step 3: Algae killed after one week. No dead fish or macro-invertebrate observed. Retest water: Final pH = 6.1; Alkalinity = 30.1 mg CaCO₃ / L (Successfully re-treated September 2001)