Water Supply
FACTSHEET

BRITISH COLUMBIA
Ministry of Agriculture and Food

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LIMING FARM PONDS FOR ALGAE CONTROL

Background

Dealing with water quality problems is probably the greatest common experience shared by people using on-farm water storages. Liming can be an effective alternative for many farm ponds traditionally treated by copper sulphate and Reglone A for algal control. Nutrients for algal blooms become unavailable, therefore in most cases, lengthening the period of algal control and reducing the number of treatments needed.

Extensive work has been completed by researchers at the University of Alberta regarding liming. The following information is based on that research and demonstration, plus practical experience and observations of Alberta Agriculture staff regularly making recommendations on water quality in the field. Success rates have been excellent, although some work may slightly improve application procedures, rates and timing, the information and procedures following have been tried and proven effective. The addition of lime for this purpose is not seen as a health risk (Canadian Water Quality Standards) although on an operating note, hard water can precipitate out on fixtures and plumbing.

Why Lime?

Lime (Calcium hydroxide) also known as slaked lime, hydrated lime, and calcium hydrate will remove most of the algae and phosphorous from water in farm ponds. Hydrated lime induces chemical precipitation of calcite, causing both algae and phosphorous to precipitate with it.

Lime treatments will help control algal blooms in dugouts. A good maintenance program will enhance the effects of lime treatments.

Maintenance should include:

- Keeping barnyard run-off out of the dugout.
- Not allowing animals to drink directly from the dugout.
- Keeping organic matter out of the dugout, e.g. leaves, grass, hay.
- Not using excessive amounts of fertilizer close to the pond.
- Maintaining grassed waterways feeding into the dugout.

Applying Lime

Caution: Hydrated lime is a powerful corrosive chemical when mixed with water. It forms a chemical solution capable of causing burns. Protect skin and eyes from lime dust and lime/water mixture. Wear protective clothing, including dust mask, goggles, boots and rubber gloves. Plastic nozzles, piping, etc. are more suitable for the equipment used to spread lime.

- Apply hydrated lime when water temperature is above 15 degrees usually by May.
- Apply hydrated lime as a slurry for best results. Mix one part lime with four parts water and disperse onto the entire surface area of the dugout. To ensure good algal and nutrient control, apply more slurry to deeper areas of the dugout.
- Lime may be slurried and applied in many ways. **Figures 1** and **2** indicate typical slurry making and delivery methods. Estimated cost of a pump is $450 with the other parts of the setup not costing more than $100 and a little fabrication time. Thoroughly rinse equipment immediately after use.

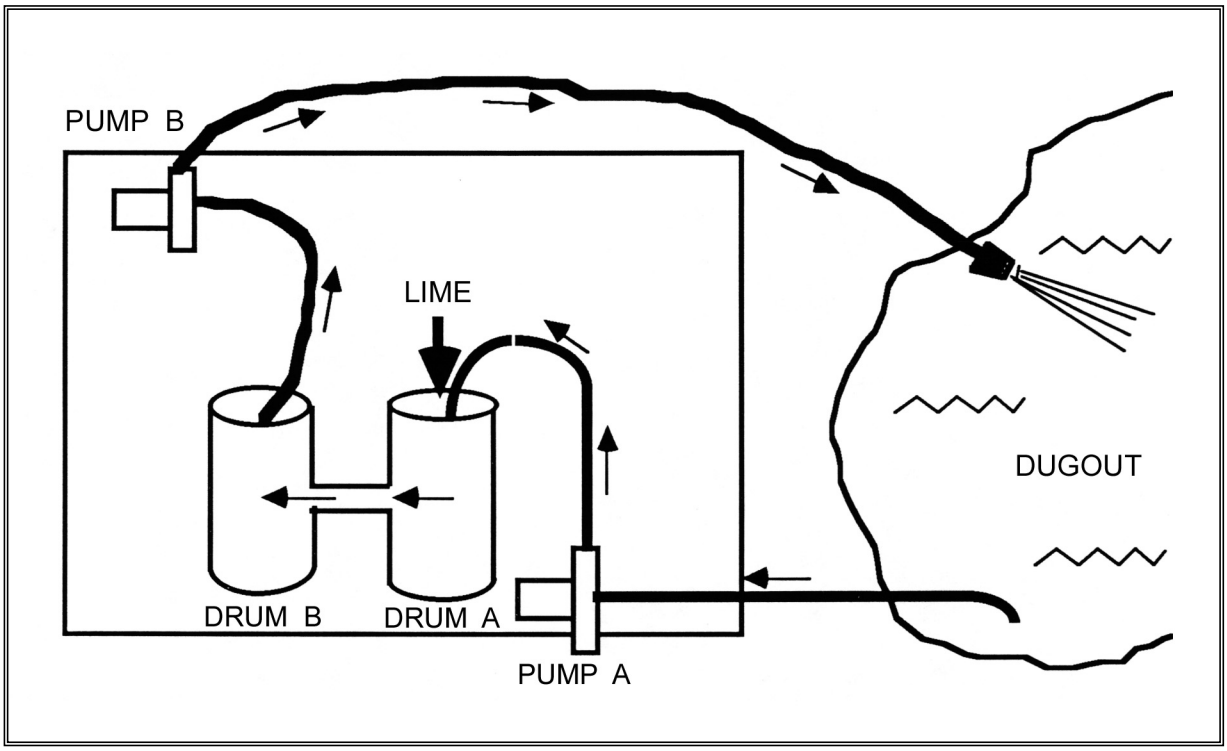

FIGURE 1 TWO PUMP / SPRAY SETUP

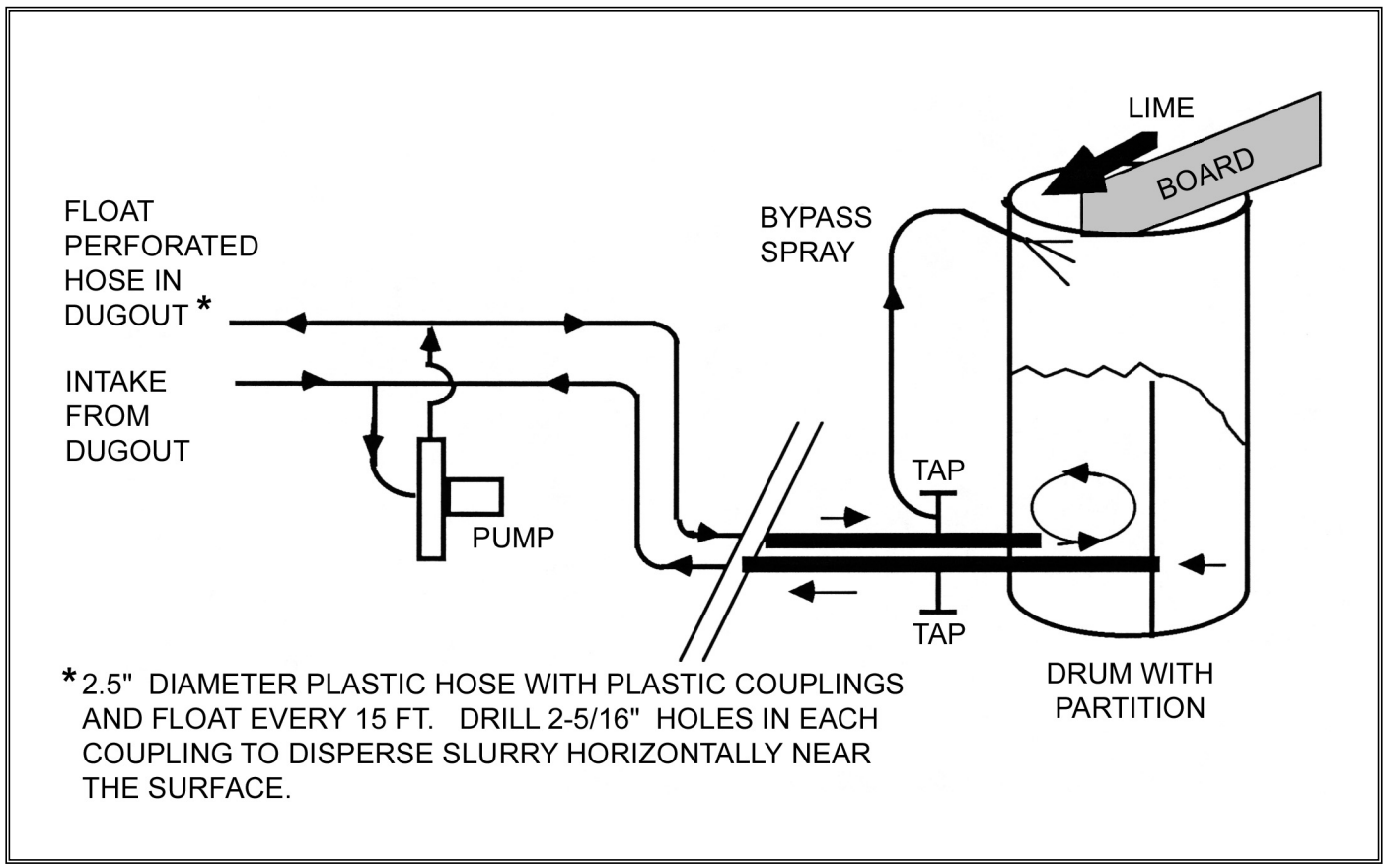

FIGURE 2 SINGLE PUMP / PERFORATED HOSE SETUP

Calculating Amount of Lime to Use

The pH of the water will increase after liming. The amount of pH increase is dependant upon:

- The natural ability of the dugout to resist a change in pH, known as alkalinity, expressed as
- mg/1 Ca CO_3 (Calcium Carbonate) and
- The amount of lime added. A water analysis available through your local health clinic or government agent can determine the alkalinity of the water.

From this, calculate the amount of lime as follows:

1. Determine the water volume of the dugout in imperial gallons.
2. Determine the alkalinity of the water in your dugout. Compare with alkalinity column.

Alkalinity (mg/1 Ca CO_3)	Dosage (mg/1 hydrated lime)	Correction Factor
50 to 100	100	0.000455
100 to 200	150	0.000602
200 or more	200	0.000910

3. Multiply the volume of the dugout (gallons) by the proper correction factor in the right hand column to determine the amount of lime (kg) needed.
4. Divide the value in step 3 by 25 to determine the number of 25 kilogram bags of lime required.
5. Apply all of the lime in one application.

For example:

A dugout 100 ft long by 60 ft wide, 14 ft deep, has a capacity of 225,000 gallons. Its alkalinity was tested at 80 mg/1 $CaCO_3$.
225,000 x .000455 = 102.4 kg lime
102.4/25 = 4.1 bags (each 25kg)
Cost of a 25 kg bag of lime ranges between $9 and $15.

CAUTION:

- Do not lime farm ponds stocked with fish. This will cause stress in the fish through an increase in pH or by clogging the gills with fine particles of lime.
- Livestock in intensive operations, e.g. feedlots, piggeries, poultry barns, dairies may object to a change in taste of the water, consuming less, therefore affecting immediate production.
- Water quality requirements within a limited pH range e.g. dairy washing, chlorination, etc. may be affected by the change in pH.
- It will take up to ten days for the lime to fully settle out and an alternative water source should be used since the lime suspended in the water can clog plumbing. After 3-4 days, water near the surface should be reasonably clear of lime and an adjustable floating intake could be used to siphon off this water if necessary.

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