

Liming Ponds to Improve Total Alkalinity in Water

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Acid Soils

- Are present in much of southern, eastern and western Kentucky
- Low pH conditions may exist even when limestone formations are present



Total Alkalinity in Water – is the ability of the water to buffer acids and reach a certain pH

- Water will be influenced by its surrounding geology and soil types.
- Acid soils = poorly buffered water



Submit pond soil sample to CES office

- Take pond mud samples from 3-6 locations per acre from the pond basin, or 10 samples from small ponds.
- Mix samples together and dry
- Pulverize soil and put into a soil sample box marked pond mud sample
- Or ask for an alfalfa liming recommendation

Most important components of total alkalinity for fish production

- Carbonates CO_3
- Bicarbonates HCO_3
- Hydroxides OH^-

Liming will:

- Increase total alkalinity by adding Calcium Carbonate (CaCO_3) and dolomite $\text{CaMg}(\text{CO}_3)_2$
- Buffers water pH to 6.5 – 9.0
- Total Alkalinity ≥ 20 mg/L
- Ideally, 50 – 150 mg/L
- Increases water hardness (Ca, Mg)

Adding Agricultural Limestone

- **Maintain soil pH to 7.0**
- **Add in tons per acre, fall is best**
- **Add ¼ initial rate every year thereafter**
- **Easier to add and disk lime into empty, dry ponds**
- **It is difficult to add too much aglime!**
- **May come in large quantities!**
- **Cost \$8 – 20 per ton,**
- **Quality varies between quarries!**

Lime quality

- Particle size: $<.0098''$ or $.025$ cm is desirable
- 90% should pass a #10 sieve and 35% should pass a #50 sieve
- Neutralizing value of at least 70%,
- 90-100% is preferable

Do not use – Too hot!

- Hydrated lime Ca(OH)_2 (136%)
- Burned lime or quicklime CaO (179%)
- May raise pond pH too fast and provide only short term increases in alkalinity!