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 \( \text{CO}_3 \)
- Bicarbonates \( \text{HCO}_3 \)
- Hydroxides \( \text{OH}^- \)
Liming will:

• Increase total alkalinity by adding Calcium Carbonate (CaCO$_3$) and dolomite CaMg(CO$_3$)$_2$
• Buffers water pH to 6.5 – 9.0
• Total Alkalinity $\geq$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 $\frac{1}{4}$ 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!