Pond Water Quality

pH, Liming, Oxygen
pH

- pH indicates whether water is acid, neutral or base
- A range of 6.5 to 9.0 is desired for aquatic life
Fig. 2. pH scale showing recommended range (Wurts & Durborow, 1992). A pH of 7 is neutral, pH < 7 is acidic, pH > 7 is basic (alkaline).
Alkalinity

If I could teach one thing ...
Alkalinity

- Measures how much base is present in water
- Must be above 20 ppm to use copper sulfate or fertilize
- Can be increased with liming
Alkalinity & pH

• Low pH is common with low alkalinity
• Increasing alkalinity increases pH
• Alkalinity stabilizes pH
Changes in pH during a 24-hour period in waters of high and low total alkalinities (Wurts and Durborow, 1992).

Changes in pH during a 24-hour period in waters of high and low total alkalinities (Wurts and Durborow, 1992).
Usual Recommendation

• For algae in a “farm pond”
• 1.0 ppm Copper Sulfate
• 2.75 lb/acre-foot
• What about fish?
Liming

- Adding ag. limestone will increase pH & alkalinity
- Collect soil samples from pond bottom, to a depth of 6 inches
- Send samples to soil testing lab
- Use recommendation for “Alfalfa”
Ponds with Water

- Collect water sample
- Test for total alkalinity
- If total alkalinity is < 20 mg/L, pond should be limed
- Some swimming pool test kits measure alkalinity
Warning: Avoid Using

- Hydrated & Quick (Slaked & Burnt) Lime
- These compounds can cause sudden, large increases in pH
- Rapid pH changes can kill fish
Benefits of Liming

- Helps prevent wide swings in pH
- Adds Ca & Mg to water
- Improves safety for using copper
- Enhances effect of fertilizer, phosphorus
Aquatic Food Chain

- Phytoplankton
- Zooplankton
- Small Insects
- Small Fish (minnows & bluegills)
- Large Fish (bass & catfish)
Pond Oxygen

- Photosynthesis adds oxygen: 95%
- Respiration consumes oxygen: plants and animals
- Plankton consume 5 times more oxygen than fish
Daily Oxygen Cycle

<table>
<thead>
<tr>
<th>Time</th>
<th>D.O.</th>
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<tbody>
<tr>
<td>Early Morning</td>
<td>12.0</td>
</tr>
<tr>
<td>Late Afternoon</td>
<td>10.5</td>
</tr>
<tr>
<td>Early Morning</td>
<td>9.0</td>
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<td>12.0</td>
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D.O. stands for Daily Oxygen.
Extension Aquaculture Specialist

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