In Situ Pond Management

Managing A Pond is Like Farming

• Soil is Important
• “Seed /Stocking Rate” Determines Productivity
• Prevention - Best Weed Control
• Weed ID - Critical
• Herbicides are Weed Specific
• IPM - Best Weed Management
Common Misunderstandings

- Clear water is productive/good
- Fish need rooted vegetation (cover/shade/habitat)
- Fish need deep water (cool/sanctuary)
- Crappie and Hybrid sunfish (bream) are OK to stock
- I need to add bass/fish to my pond ever few years

Recreational Fish Pond Stocking

<table>
<thead>
<tr>
<th></th>
<th>Unfertilized</th>
<th>Fertilized</th>
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<tbody>
<tr>
<td>Bream/Acre</td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>Bluegill:Redear</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Bass/Acre</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Channel Cats/Ac</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>* Optional</td>
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</tbody>
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*Optional*
Other Fish Species

- Triploid Grass Carp
- Tilapia

- Fathead Minnows
- Hybrid Striped Bass

Unwanted Species

- Crappie - high reproduction and competitor/predator
- Shiner minnows - eat eggs and competitor
- Gizzard shad - too large, competitor
- Bullheads/mud cats - competitor/predator
- Common carp – muddy pond, competitor
- Green sunfish - competitor/predator
- Hybrid sunfish - low reproduction (no prey) and production of green sunfish
Integrated Aquatic Weed Management

“A weed is a plant that’s out of place.”

“Beauty is in the eye of the beholder.”

Importance of Aquatic Plants

- Food, shelter, resting, and breeding habitat for fish, waterfowl, and other wildlife
- Protection against shoreline erosion
- Oxygenation of water
- Aesthetics
Why Do Aquatic Plants Become Weeds?

- Clear, shallow water
- Nutrients, particularly N and P
- Lack of natural enemies (introduced weeds)
- Metabolic characteristics greater than native plants

Prevention

- Most Important Aspect
- Proper Pond Location
- Proper Pond Design & Construction
- Regular Maintenance
- Avoidance of Weed Introductions
- Buffers
Weed Management Decisions

- Plant identification
- Budget and Equipment
- Control Period - Speed and Duration
- Use of the body of water (irrigation, potable water, livestock, fishing, etc.)
- Physical, environmental, and economic constraints
- Water quality
- Fish and wildlife populations (including threatened and endangered species)

Aquatic Weed Management Techniques

- Hand removal
- Cultural (physical)
- Mechanical
- Biological
- Chemical
- Revegetation

The best and most cost-effective approach is a combination of two or more tactics into an integrated management effort.
Attributes of Cultural (Physical) Management Techniques

Cultural management techniques (sometimes called “physical control”) modify the environment so that conditions are less suitable for the growth of undesirable vegetation.

Cultural techniques - easy and pose little threat

Cultural management techniques include:
- Fertilization
- Pond dyes
- Benthic barriers
- Water level manipulation

Advantages of Biological Control

- Permanence (classical or inoculative approach)
- Low maintenance costs, not necessary to repeat every growing season
- No chemical residues
- Minimal environmental damage
- Desirable species usually unaffected
- Usually perceived by the public as acceptable
Disadvantages of Biological Control

- Effective control may require several growing seasons
- Initial costs are relatively high (amortized over time, costs may be low, compared with other methods of aquatic weed management)
- Biological control agents are susceptible to a wide variety of human and environmental interferences.

Triploid Grass Carp

Tilapia

Alligator weed Flea Beetle
Mainly used for Filamentous Algae

Stocked *Annually* at a rate of 250 – 400 per acre

Stocked in the spring when water temps reach 60 F

Can be harvested and eaten in the Fall

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*Tilapia Broods*
### Using Triploid Grass Carp

1. Identify your weed problem!
2. Be prepared to Stock enough!
3. Beware of escapement
4. Stock a 10 -12” minimum size
5. Purchase from a licensed dealer
6. Stock in the spring
7. Be patient

### Benefits of using Triploid Grass Carp

**Multiple years of control**

Less expensive to use over the life of the fish

**Negatives ……..**

Initial cost

Takes 3 months or longer for results
Triploid Grass Carp

Common Carp
Use of Grass Carp in Aquatic Weed Management

- Grass carp - 10 years or longer & 50 lbs.
- Grass carp may provide effective, long-term control of macroalgae and submersed weeds.
- Only triploid sterile grass carp are permitted.
- Stocking in open systems usually is not permitted.

Stocking Recommendations

Triploid Grass Carp

- South Carolina requires a permit from SC DNR before grass carp may be stocked.
- Stocking rates vary but generally are 5 fish per acre for prevention or 20-25 fish per vegetated acre.
- Fish should be 10” to 12” long.
Introduction to Chemical Control

• **ONLY EPA registered** aquatic herbicides and algaecides
• Proper handling and use of these herbicides poses no significant threat to the aquatic environment or human health.
• All aquatic weed management techniques have some impact on the environment.
• The impacts of aquatic weed management activities, including herbicide and algaecide application are short in duration.

Aquatic Herbicides

Most herbicides or algaecides are available in several formulations: both liquid and granular formulations are available for some products.

- Copper
- Peroxyhydrate
- Endothall
- Diquat dibromide
- Carfentrazone
- Imazamox
- **2,4-D**
- Glyphosate
- Fluridone
- Triclopyr
- Imazapyr
- Penoxsulam
Water Use Restrictions
Associated with each herbicide (except copper formulations) are one or more water use restrictions.

- Fishing (consumption of fish)
- Swimming (any activity which immerses the body)
- Irrigation (including use for preparation of agricultural pesticidal sprays)
- Livestock watering (may include humidification of poultry houses)
- Domestic drinking water supplies

Questions

- Applicator License?
- Water Use Restrictions?
- Downstream Uses?
- Ownership?
- Local Ordinances?
- SC DHEC Buffers?
- Read and Follow The Label?
The label is the law!

Do I Need A Pesticide License?

• South Carolina Law requires individuals to possess a Commercial Pesticide Applicators License in Category 5, Aquatic Pest Control, before they apply aquatic herbicides if the work is done for compensation on the property of another. A license is also required, regardless of ownership, if the application is made to an area where public access to the treated site is expected. Private swimming lakes, where the public would be exposed to the treated waters, are the most obvious example of the latter requirement. On all public facilities, such as golf courses, driving ranges, subdivisions, condominium/apartment complexes and mobile home parks, applicators are required to possess a Category 5 License to apply aquatic pesticides. Rotenone and Habitat labels requires an Aquatic Pesticide License.
## Wildlife Around Ponds

- Source of Excess Fertilization
- Aquatic Weed Problems
- Messy Nuisance
- Horry County Ordinance – Chapter 4 Article III Sec.4-31 through 4-36
- Stop Active Feeding
- Spray Eggs With Vegetable Oil
- Repellents
- USDA APHIS Wildlife Services – Noel Myers – Contract Roundup Services