Cage Trout Production

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RAINFLOW TROUT
(Onchorhynchus mykiss)
CAGE CULTURE
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• An intensive system with fish stocked and fed in a confined area.
• Water is continuously exchanged in and out of the cage.
• The water volume and associated organisms in the pond serves as a bio-filter.
Not new concept

- Multiple web based publications from different areas
- My presentation is based on the situation in Virginia
- Consumer awareness and can afford

Virginia has a well established raceway trout production industry in the western mountainous region.
Rainbow trout live in highly oxygenated cool water streams.
TRADITIONAL TROUT RACEWAY
TANK SYSTEM
MODIFIED STREAM
CAGE CULTURE

ADVANTAGES

• Double cropping
• Allows for alternative uses of pond
• Economics/Low investment
• Observation is simple
• Management is simple: Feeding, Harvesting
• Low labor requirement
• Deep ponds with obstructions can be used
• Multiple species and sizes can be in same pond
CAGE CULTURE DISADVANTAGES

- Complete feed required
- Dissolved oxygen/water flow more critical
- Environment impacts on fish health
- Vandalism
- Pests
- Cage Maintenance
MANAGEMENT INPUTS

• Arranged Market
• Regulator needs: permits?
• Site evaluation: water impoundment
  – Water quality
  – Water quantity
• Cage
• Trout
• Feed
• Supplies, security and labor
MARKETS

Gary Martel, fisheries director at the Department of Game and Inland Fisheries, throws an assortment of brown and rainbow trout into Richmond's Shields Lake. The trout came from Virginia State University's aquaculture center, and 1,500 were stocked at Douglas Park Lake and Shields Lake on Friday.
Value Added Processed Products
Suitable Pond

- Sufficient volume with $\frac{1}{2} - \frac{1}{3}$ of pond deeper than the depth of a cage
- Place cages for wind exposure to increase water circulation
- Anchored so at least 2 ft of water is between the cage and pond bottom
- Ponds with runoff from septic tanks and barn lots should not be used.
- A stable water level (even in dry weather) is desirable.
Un-Suitable Ponds

Muddy

Organic Debris
SOME PRODUCERS HAVE USED CAGES FOR SALE

OR

FISH CAGE KIT
$200.00

http://aqua.ucdavis.edu/DatabaseRoot/pdf/340FS.PDF

http://haywood.ces.ncsu.edu/CageConstruction/

Team cage building
CAGE MATERIAL

1. FRAME
2. MESH: largest size to prevent fish from escaping
3. LID: prevent bird problems
4. FEED COLLAR: 1/8” mesh to keep floating feed in cage
5. FLOATATION
Before Stocking

- Monitor water temperatures
- What will you do with the fish?
- Do you have feed?
- Do you have?
  - dip net
  - 5-gal bucket
  - record book
1. Graded trout from a quality source
2. Approximately 300 fish per 4’ square cage
3. Cage is ready to receive fish and is accessible by truck
4. Farmers can transport their own fish from hatchery
Practical Feeding Guide

• Afternoon feedings (warmest)
• Floating feed (>32% protein)
• Observation
• If fish don’t eat, don’t feed
• Excess handling is not good
• Purchase estimated quantity of feed to be used from the fingerling supplier
FEEDING

• Proper nutrition is the most important aspect of cage culture because trout are unable to obtain any natural food.
• Feed is the highest single variable cost.
• Caged trout need to be provided with a complete commercially available floating trout feed of at least 36% protein.
• Expected feed conversion: better than 2:1.
FEEDING FLOATING PELLETS FISH IN CAGE

TEMPERATURE EFFECT

• Optimum feeding is between about 50 - 68 °F (10 to 20 °C)
• Feed will be consumed down to 40 °F. (feed at about 1% body weight)
PELLET SIZE

SMALL TROUT WILL NOT EAT LARGE PELLETS
5/32” PELLET WILL BE EATEN BY 6-9” FISH
FEED STORAGE IS IMPORTANT

COOL, DRY, CLEAN, NOT PACKED HIGH
 Cooler, oxygenated water means cage culture of rainbow trout has fewer management concerns.
Trout Growing Months in Most of Virginia – Nov. thru April
Water temperature less than 68°F
RECORD KEEPING
Safety should always be a concern.
Is it profitable?

• Example: Rainbow Trout in one cage

• 2012 Est. Total Cost of producing 300 lbs. trout $500.00

• If selling price per pound is:
  – $2.50 net return is: $230
  – $4.50 net return is: $820
Thank you