

RENOVATION OF FARM PONDS

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Texas farm ponds are tremendous resources for recreation and food production. They cover more than one million surface acres and are used for live-stock watering, irrigation and recreation. However, only a small percentage of these ponds are properly managed for fishing; therefore, many contain undesirable fish, such as gar, carp and bullheads, or stunted game fish populations. As a result, fishing is generally poor.

Need for Renovation

Ponds containing undesirable or stunted fish populations are good candidates for renovation. When a pond's history is unknown, management by renovating and restocking produces the best results.

Materials

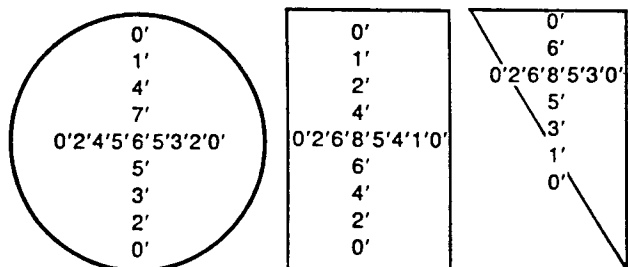
Five percent concentrations of rotenone in liquid or powder forms are recommended for pond renovation. Rotenone kills fish by constricting gill capillaries and inhibiting cellular respiration (suffocation).

Advantages of rotenone include its low toxicity for other animals and its availability in most farm and ranch supply stores. Livestock do not need to be removed from watering areas during treatment. Fish treated with rotenone are safe to eat if picked up while their gills are still red. Wash the fish thoroughly in fresh water before cleaning.

Determining Acre-Feet of Water

To determine the proper amount of rotenone necessary for renovation, estimate the pond's water volume in acre-feet. Failure to estimate water volume accurately leads to incomplete fish kills or unwarranted chemical expense. If the pond's water level can be lowered with a drainpipe or siphon hose, reduce the chemical dosage accordingly.

To estimate the water volume, first determine average depth in feet by measuring depths with a weight line or calibrated pole. Take several measurements every 10 to 20 feet along the short and long axis of the pond for good results.



Number of Readings	17	16	13
Total Readings	49	45	39
Average Depth	$\frac{17}{49}$ 2.9 feet	$\frac{16}{45}$ 2.8 feet	$\frac{13}{39}$ 3 feet

Figure 1. Determining Average Depth of Ponds

Second, determine the surface area of the pond in acres. To calculate surface area, measurements must be taken which are used in the surface area formulas as shown in Figure 2. A measurement of the entire shoreline is needed (250 feet) to determine length of a circular pond; the length and width (200 × 100) is measured for a rectangular pond and the base and height (200 × 100) is needed for a triangular pond to determine the surface acre. Multiply the average depth and surface area to determine water volume and acre-feet.

Application of Rotenone

Use 1 gallon of liquid rotenone or 10 pounds of powdered rotenone per acre-foot of water.

Example 1. 0.33 acre/feet × 1 gallon liquid rotenone .33 gallons	Example 2. 1.3 acre/feet × 1 gallon liquid rotenone 1.3 gallons
or	or
0.33 acre/feet × 10 lbs. powder rotenone 3.3 lbs.	1.3 acre/feet × 10 lbs. powder rotenone 13 lbs.
Example 3. 2.8 acre/feet × 1 gallon liquid rotenone 2.8 gallons	
or	
2.8 acre/feet × 10 lbs. powder rotenone 28 lbs.	

Figure 3. Calculating Amount of Rotenone for Ponds

Since rotenone is more effective at water temperatures about 70 degrees F., apply it during the warm months. The equipment needed to apply rotenone depends on the size and depth of the pond. Dilute liquid rotenone at 1:5 ratio with water. Mix powder forms with enough water to make a slurry, then dilute at a 1:5 ratio with additional water.

Treat small, shallow ponds from the bank by applying rotenone along the upwind shore and allowing wave action to dissipate the chemical. Pump-up sprayers are effective when applying rotenone by this method.

For larger ponds, apply rotenone by pouring the chemical solution into the motor prop wash while slowly moving the boat across the ponds.

If the pond is deeper than 8 feet, rotenone applications with a weighted hose may be necessary to assure good coverage. Drill holes in the last 4 to 5 feet of the hose and siphon rotenone out of a tub or barrel in the boat. If hose is not available, downspout guttering commonly used on houses will effectively carry rotenone to deep water.

Regardless of the method used, evenly distribute the chemical over the entire pond to avoid leaving refuge areas for fish to escape. Shallow water and heavily vegetated areas require particular attention.

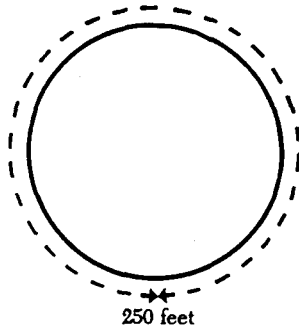
Limitations of Rotenone

The effectiveness of rotenone depends on the fish species. Shad, sunfish, shiners, carp and bass are easily killed, but bullhead catfish and gar can be difficult to kill.

Rotenone is most effective in slightly acidic ponds characteristic in the eastern part of the state. In addition, muddy ponds decrease the effectiveness of the treatment. Therefore, do not stir up sediments during application. Apply rotenone only when water temperatures are above 70 degrees F.

Restocking

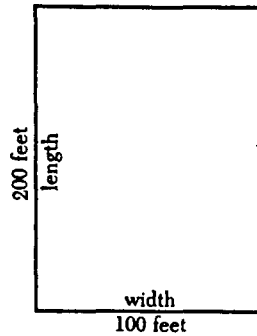
Rotenone dissipates quickly in water; therefore, all residue usually disappears within 2 weeks after treatment. To determine when it is safe to restock, place 4 to 5 goldfish or sunfish in a minnow bucket and submerge in the pond. If no deaths occur after 1 or 2 days, restock the pond.



Example 1.
$$\frac{\text{shoreline length} \times \text{shoreline length} \times \text{average depth}}{547,390}$$

$$\frac{250' \times 250' \times 2.9'}{547,390}$$

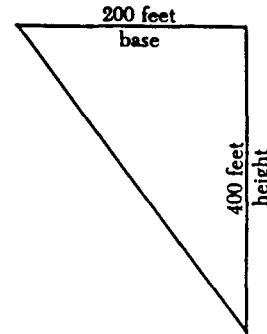
Water Volume:
0.33 acre/feet



Example 2.
$$\frac{\text{length} \times \text{width} \times \text{average depth}}{43,560}$$

$$\frac{200' \times 100' \times 2.8'}{43,560}$$

1.3 acre/feet



Example 3.
$$\frac{\frac{1}{2} \times (\text{base} \times \text{average height}) \times \text{depth}}{43,560}$$

$$\frac{\frac{1}{2} \times 200 \times 400 \times 3'}{43,560}$$

2.8 acre/feet

Figure 2. Determining Pond Water Volume

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