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9. ABSTRACT

Fish pond owners in Alabama usually have found fertilization to be a good investment. Fertilizer nutrients increase the production of microscopic plants which in turn serve as food for microscopic animals and aquatic insects. Heavy growths of these micro-organisms (plankton blooms) and insects provide food for bream which then serve as the primary food for bass. Proper use of fertilizer in most Alabama ponds will increase fish production by four or five times. Fish in fertilized ponds are easier to catch because they are more numerous and because the abundant plankton limits their vision causing them to be less wary. Plankton also shades pond bottoms, preventing growth of troublesome rooted weeds and filamentous algae. This report outlines a simplified fertilization program for the use of 20-20-5 fertilizer at the rate of 40 lbs. per acre. Suggestions for increasing efficiency are made for fertilizers to be added to new ponds, old ponds, or those with muddy water, excess flow or weeds. Liming recommendations also are made for ponds with very soft water and for catfish ponds with or without supplemental feeding.

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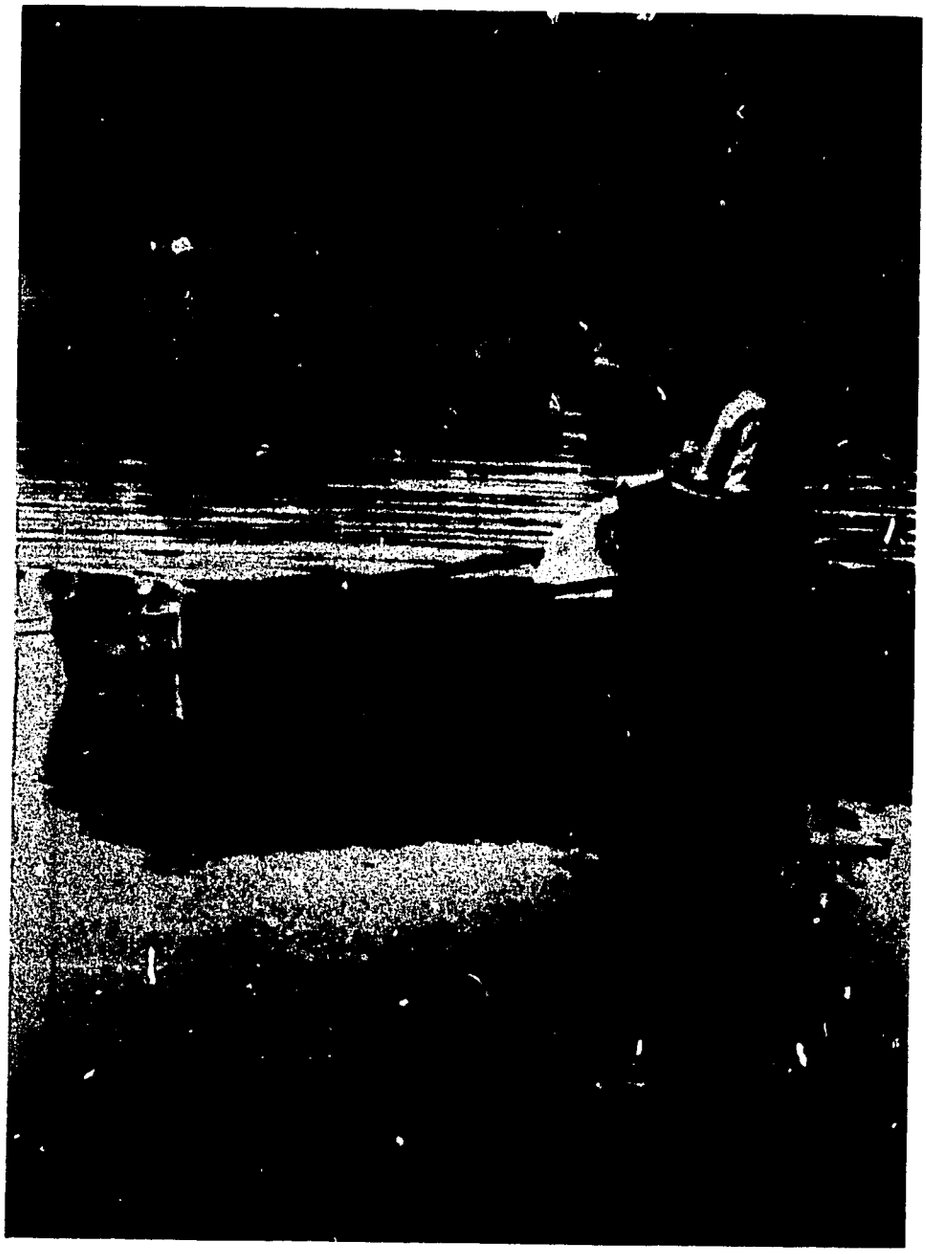
A simplified fertilization program is outlined for the use of 20-20-5 fertilizer at the rate of 40 pounds per acre. Suggestions for increasing efficiency are made where fertilizers are being added to new ponds, old ponds, or those with muddy water, excess flow or having weeds. Liming recommendations are given.



FERTILIZING FARM FISH PONDS

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FERTILIZING FARM FISH PONDS

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Fish pond owners in Alabama have usually found fertilization to be a good investment. Fertilizer nutrients increase the production of microscopic plants (phytoplankton) which in turn serve as food for microscopic animals (zooplankton) and aquatic insects. Heavy growths of these microorganisms are called "plankton blooms." Plankton and insects serve as food for bream, which in turn serve as the primary food of bass. Proper use of fertilizer in most Alabama ponds will increase fish production by four or five times *(7,8)*. Fish in fertilized ponds are easier to catch because they are more abundant and because the abundant plankton limits their vision causing them to be less wary *(6)*. Plankton also shades pond bottoms preventing growth of troublesome rooted weeds and filamentous algae. *(5)*.

A SIMPLIFIED FERTILIZATION PROGRAM

A plankton bloom dense enough to restrict vertical underwater visibility to 12 to 24 inches is adequate for weed control and good fish production. Plankton turbidity should be established in late winter or early spring and maintained throughout the growing season *(8)*. The effect of a fertilizer application usually lasts for about 1 month, and if not repeated, plankton abundance diminishes. Fertilizer can be broadcast over shallow water areas of ponds, but more efficient use results from placing it on underwater platforms *(2)*, shown in the figure. Platforms should be 1 to 2 feet underwater and one platform is adequate for 5 to 10 acres. Fertilizer is poured onto the platform and wave action distributes the soluble nutrients.

Techniques for analyzing pond muds and waters to accurately determine fertilizer application rates have not been developed. However, the simplified procedure outlined below is widely used and suitable for most ponds.

(1) In mid-February or early March apply 40 pounds per acre of 20-20-5 fertilizer. Follow with two additional applications at 2-week intervals.

(2) Make three more applications of 40 pounds per acre of 20-20-5 at 3-week intervals.

(3) Continue applications of 40 pounds per acre of 20-20-5 at monthly intervals or whenever the water clears so that a piece of white metal attached to a yardstick is visible to a depth of 18 inches.

(4) Discontinue applications for current year by last week in October.

SUGGESTIONS FOR INCREASING EFFICIENCY

Some ponds will not respond, without remedial preparation, to the simplified fertilization program outlined above. In other ponds, use of the simplified program will result in wasteful overfertilization. Information presented below will

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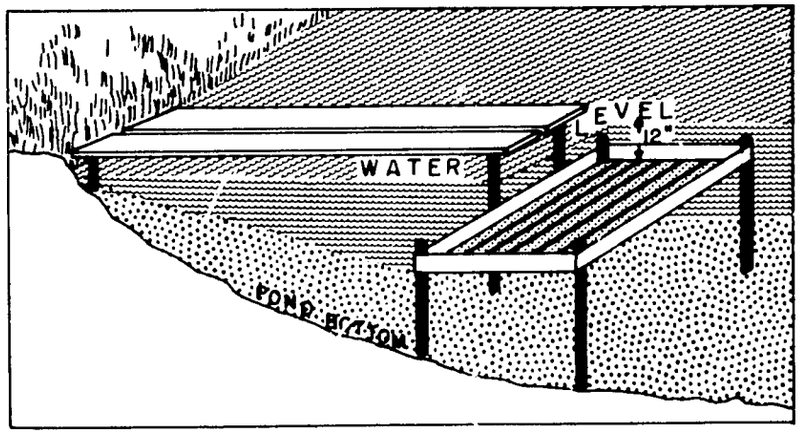

FIG. A fertilizer platform.

be useful in developing the most efficient method for fertilizing a pond.

New Ponds

Test bottom soils for lime requirement, and if necessary, lime before the pond is filled *(1)*. The simplified fertilization program is suitable for most new ponds, but a 5-20-5 fertilizer may be used on a trial basis. If adequate phytoplankton growth is not obtained, use 20-20-5 fertilization. Although the more expensive 20-20-5 fertilizer is sold as a fish pond fertilizer, it was no more effective than 5-20-5 fertilizer in recent preliminary experiments at the Fisheries Research Unit of the Auburn University Agricultural Experiment Station.

Old Ponds

Pond muds and waters contain organisms which assimilate elemental nitrogen, nitrate, or ammonia into protein *(3)*. As ponds age, remains of these organisms accumulate in bottom muds and upon decay release inorganic nitrogen. Plankton production is low in unfertilized ponds, little organic matter accumulates in muds, and the amount of inorganic nitrogen released upon decay is inadequate to support abundant phytoplankton growth. More organic matter accumulates in muds of fertilized ponds and after about 5 years the rate of release of inorganic nitrogen is adequate to support dense plankton growth *(9)*. Potassium also accumulates in waters and soils of fertilized ponds and within a few years additions of this nutrient are usually no longer required *(9)*. Therefore, an old pond with no history of fertilization should be fertilized in the same manner as a new pond. In an old pond with a history of fertilization, apply 40 pounds of superphosphate or 18 pounds of triple superphosphate per acre per application. A plankton bloom may not develop quickly in the spring in some ponds which receive only phosphate fertilizer. In such situations, apply a fertilizer containing nitrogen and phosphate until a satisfactory bloom develops and then continue with phosphate – only fertilization. The nitrogen supply in ponds receiving phosphate – only fertilization is maintained by nitrogen fixing algae and bacteria which abound in fertile waters *(3,9)*.

Muddy Waters

Ponds with muddy water in which underwater visibility is less than 12 inches cannot respond to added nutrients because of insufficient light penetra-

tion for phytoplankton growth. Two or three applications of barnyard manure at the rate of 1 ton per acre per application at 3-week intervals will normally clear water so that fertilization will be effective *(8)*. The use of 75 pounds of cottonseed meal and 25 pounds of superphosphate per acre at 2-to-3-week intervals will also clear muddy water *(8)*. However, such procedures are ineffective if ponds receive large amounts of muddy runoff water after each rain. Unless erosion of the watershed is prevented by revegetation or the muddy runoff diverted, fertilization is not advisable.

Excess Flow

The detention or resident time of water in a pond must exceed 3 to 4 weeks, otherwise fertilizer nutrients are flushed out of the pond before they can be used to produce fish food. Methods for increasing detention time of water include; diversion of excess water, enlargement of pond, and construction of another pond above the existing pond. Some ponds have excess flow only during winter and spring and may respond to fertilization during dry weather.

Weeds

Weed control must be effected in ponds which are choked with weeds, otherwise fertilizer nutrients will stimulate weeds rather than phytoplankton. Applications of fertilizer in late winter and early spring to weed infested ponds will produce filamentous algae which grow over and smother weeds. The filamentous algae will normally be replaced by plankton in warm weather *(5)*. Chemical weed control may be necessary in some ponds.

Liming

Ponds with waters softer than 20 milligrams per liter total hardness or alkalinity may not respond to fertilization *(1,10)*. Applications of agricultural limestone to such ponds will neutralize acidity of the mud, and increase total hardness and alkalinity of the water, thereby increasing the effectiveness of fertilizers *(1)*. The Auburn University Soil Testing Laboratory makes lime requirement determinations of muds for pond owners for a small fee. If a bottom mud analysis seems desirable, collect muds from different areas of the pond bottom where water is deeper than 3 feet and mix the muds to make one sample. An adequate sample from a 5-acre pond would contain mud from 12 to 15 different areas of the bottom. Dry the sample and ship about 1 quart to the laboratory for analysis. Mailing cartons are available from county extension chairmen.

If lime is needed, apply agricultural limestone during winter months in ponds which are full of water. In new ponds, the limestone should be applied prior to filling with water. The limestone should be spread over the entire pond area. However, if this is not possible, beneficial results can be obtained by spreading limestone around the shallower water edges.

Fertile Watersheds

Follow recommendations for old fertilized ponds. Some ponds in well fertilized pastures may require little or no additional fertilization for satisfactory fish production.

Catfish Ponds with Supplemental Feeding

Begin applications of fertilizer in spring after filling pond. Suspend fertilization when feeding rates reach 10 pounds per acre per day or when turbidity restricts underwater visibility to 18 inches. Usually only 2 or 3 applications of fertilizer are needed *(4)*.

Catfish Ponds without Feeding

Follow the fertilization procedure recommended above for bass-bluegill ponds.

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