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FACT SHEET

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TILAPIA CULTURE

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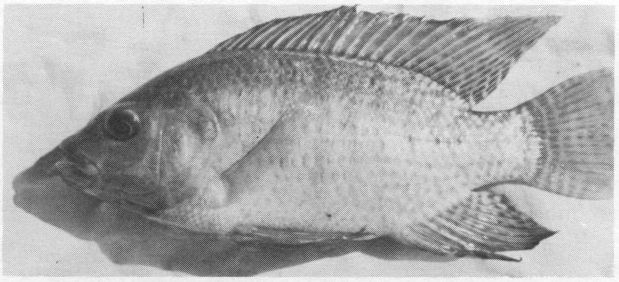

Tilapia were introduced into Texas during the 1960's, and they rapidly became established in power plant cooling lakes and portions of the Rio Grande Valley. Originating in north Africa and the Middle East, tilapia have been distributed throughout the tropics and in many subtropical regions. They are utilized primarily for food in much of the world, although some are used for aquatic vegetation control.

Tilapia resemble sunfish. They are the second most widely cultured group of fishes in the world today, surpassed only by the carps, which enjoy little popularity in the United States. Tilapia have been reared and marketed successfully in several states, including Texas.

The primary advantage of tilapia is their hardiness. They tolerate low levels of dissolved oxygen when skimming the surface of the water, high ammonia levels and a wide range of salinity. Some species can be reared in salinities ranging from freshwater to that of the open ocean. In fact, some species can be dropped from one salinity extreme directly into the other with no apparent damage.

Because of their tolerance for degraded water quality, tilapia are reared at substantially higher densities than those presently used by channel catfish farmers. Aeration is generally not necessary, even when production reaches 2 tons or more per acre. Conventional catfish ponds are adequate for tilapia culture. No alterations in facilities are required if fish producers expand into tilapia rearing.

Research in ponds and circular raceways shows that while it is possible to deteriorate water quality to the point that fish are killed, extremely high levels of organic manuring are tolerable. The manure leads to the production of single-celled algae which are consumed by the tilapia. Thus, it is possible to reduce the length of the food chain, rear large numbers of fish with low feed cost and help eliminate odor and fly problems associated with manure deposited on the ground. Public health aspects of fish production in manured ponds have not been addressed in detail. Limited bacteriological testing indicates that pathogenic bacteria rarely are found on fish produced in such systems. The practice has been used widely in the Far East for hundreds or, perhaps, thousands of years and is now common in Israel and portions of Europe.

Alternatively, inorganic fertilization accomplishes the same results as organic wastes when added to fish ponds. In addition, a variety of agricultural wastes could be utilized by tilapia either directly as food or indirectly if the agricultural waste acts as a fertilizer. Such things as coffee pulp waste, egg processing

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Tilapia are usually harvested by seining.

waste, paper pulp waste and others have been used successfully as nutrient sources for tilapia and other fishes.

Even though the advantages associated with tilapia are many, the fish also have some undesirable characteristics. Of primary concern in Texas is that *Tilapia aurea* and *T. mossambica* begin to die when the water cools to about 50° F. Though highly resistant to diseases and parasites at warmer temperatures, tilapia become susceptible as the water temperature approaches 55° to 60° F. Overwintering of brood stock is relatively simple if the fish farmer has an indoor, heated area or if an adequate supply of heated water is available. Warm springs, deep wells and the discharge waters from electrical generating stations have been utilized in the past. Large amounts of geothermal water allowed one tilapia producer to initiate year round production in southern Idaho.

Another problem which has plagued tilapia producers is that the fish begin to reproduce at a very early age, often before they are 6 months old. Overpopulation and stunting can be severe problems. Tilapia males dig nests on the pond bottom. They lure females into the nest and fertilize the eggs as they are deposited. The female then picks up the fertilized eggs and incubates them in her mouth. The newly hatched fry also remain there until they can forage for themselves. Survival of fry is very high. An average female may lay as many as 1,000 eggs every 30 days during warm weather.

Overpopulation can be controlled in various ways. The fish can be reared in cages so that eggs fall through the bottom and cannot be picked up by the female. Another method is to stock suitable predator fish to consume the fry as they leave the females' mouths. Thirdly, monosex fish can be stocked which generally involves stocking males, because they grow much more rapidly than the females. The fish can be handsexed once they reach a length of about 2 inches, but this is a time-consuming process and is not 100% accurate. Newly hatched fry can be brought into a hatchery building, placed in raceways and fed feed treated with male sex hormone. Since the sex of young fry is not fixed, it is possible to change all the females into functional males. This must be done before the fish reach a length of about ½ inch. The hormone-treated feed is fed for 3 weeks. A final method of producing all male stock is to hybridize certain tilapia species. This technique has limited value in Texas because most of the desired crosses involve species which are not currently legal for use in this state.

Tilapia eat pelleted feeds. When stocked in ponds with channel catfish, the growth of the catfish may suffer because of the aggressiveness with which tilapia feed. Tilapia consume some types of rooted aquatic plants and may indirectly limit aquatic vegetation through increased turbidity. When other food is withheld, they do a good job of removing all vegetation in a pond, unless a high level of fertilization is used to promote continued plant production.

Tilapia have been called "Superfish" for they are very hardy, have excellent flavor and bring a good market price. Tilapia are one alternative for the prospective or active fish farmer to consider. In addition, the potential for tilapia in integrated agriculture (utilizing tilapia in waste recycling) and polyculture with other aquatic animals appears very promising.

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