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Sustainable Aquaculture for a Secure future

Title: Attributes of Tropical Pond-Cultured Fish

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Abstract: Food fish culture may be described as environmental management for growth of an edible product. The environment is managed contingent on a complex interaction of social, biological, and physical factors (Shell, 1993). The pond environment is demanding, and the marketing requirements for fish are even more restrictive, so only a few species of fish have been found suitable for culture. There are 20,000 to 40,000 species of fish (Lagler et al., 1977), but Hephner and Pruginin (1981) estimated that the number of documented species being cultured was only about 70. Fewer species are commercially cultivated.

Fish must meet certain requirements for culture. The requirements may differ depending on the culture system and aquacultural experience of the fish culturist. Bardach et al. (1972) listed four areas of consideration when selecting a fish for culture: reproductive habits, requirements of the eggs and larvae, feeding habits, and adaptability to crowding. Huet (1972) listed seven requisite conditions for cultured fish. Fish must adapt to the climate where cultured, have fast growth rate (reach a large size), reproduce under culture conditions, accept feed, be satisfactory to the consumer, support high population densities, and resist disease.

This chapter describes seven attributes that a fish should have for semi-intensive culture in tropical or subtropical ponds:

- Handling tolerance
- Crowding tolerance
- Low susceptibility to disease
- Tolerant of poor water quality
- Efficient conversion of natural foods and feed

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- Controllable reproduction
- Marketability

This list does not include some of the requirements listed by Bardach et al. (1972) and Huet (1972), because CRSP experience and culture systems differ from theirs. For example, the requirements of eggs and larvae are important considerations for marine species that produce very small, delicate eggs and larvae that are difficult to propagate. Marine mollusks and invertebrates have various larval developmental stages as a further complication to seed production. However, larvae of most tropical freshwater fish species are comparatively large and uncomplicated to raise, so larval culture is not a chief concern. Huet (1972) emphasized climate adaptability. Indeed, adaptation to a particular temperature regime is an assumption underlying all other attributes. A tropical fish should be raised at tropical temperatures for the best expression of growth and other attributes. Failure to possess all attributes does not imply that the fish cannot be cultured, but success may be marginal dependent on local conditions, and not easily transferable to other sites. This chapter is organized to (1) discuss attributes of culture fish and suggest best management practices to enhance the attributes and (2) describe the attributes and biology of tilapia, a model culture fish.

This abstract is excerpted from the original paper, which was in H.S. Egna and C.E. Boyd (Editors), *Dynamics of Pond Aquaculture*. CRC Press, Boca Raton, pp. 183–198. (1997)

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