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ROSY RED AND NORMAL-COLORED FATHEAD MINNOW CULTURE

Fathead minnows (*Pimephales promelas*) and rosy red minnows (a yellow-red color variety of fathead minnows) are, respectively, the second and third most important baitfish raised in Arkansas. More than 65% of all cultured baitfish in the United States is produced in Arkansas. Large fathead minnows are used for bass and walleye bait, smaller minnows are used for crappie bait, and the smallest minnows are sold as feeders to the aquarium trade.

HIGHER PRICE BUT HIGHER RISK FOR ROSY REDS

Baitfish culturists report that rosy red minnows, which sell for a higher price than normally pigmented fish of baitfish size (\$3.75/lb vs \$2.75/lb), have lower survival rates than the normal-colored fathead minnows. The problem of survival is more acute in winter, when entire stocks of rosy red minnows can disappear before they are harvested in spring. Losses are greatest during mild, wet winters, which are conducive to minnow growth but can prevent farmers from feeding their fish because the roads around their ponds become impassible. The conflict between higher price and higher risk is a major consideration in deciding which variety to raise. Performance of the two types of fathead minnows was compared under similar cultural conditions to develop techniques that increase fathead minnow production.

GROWTH AND SURVIVAL COMPARED

During 1992-93, minnows were cultured in both deep (average depth 1.1 m) and shallow (average depth 0.6 m) ponds during August to October and from November to April to determine if the more brightly colored rosy reds would suffer higher mortality from predation than the normal colored variety and if increased pond depth would

reduce that mortality. Greater pond depth also may temper environmental extremes in the ponds such as diurnal temperature and dissolved oxygen changes. During 1993-94, the minnows were cultured with different feeding rates. From November to April, the fish were offered a crumbled, 32% protein, 3.5% fat, commercially prepared catfish feed at the rate of 2.0% or 0.1% of body weight daily. From August to November, the fish were offered the same type of feed at the rate of 3.0% or 0.3% body weight daily.

FEW DIFFERENCES BETWEEN COLOR VARIETIES FOUND

Differences in pond depth did not result in significant differences in survival or growth of either variety of fathead minnow. The rosy reds and normal-colored fish had the same survival rates and total pond production. However, the rosy reds in deep and shallow ponds had slightly slower summer growth rates and were less robust when harvested in October. Coefficients of condition of overwintering fish were lower for rosy reds than for normal-colored fatheads in both deep and shallow ponds.

Fish weight of both varieties in overwintering ponds that received the 2% rate increased about 100% over the stocking weight, whereas fish in ponds that received the 0.1% rate lost about 6% of the stocking weight. Production was slightly, but not significantly, less for rosy reds than the normal-colored fish. This difference was reflected in slightly lower average individual fish weights and lengths for rosy reds.

Production of fish cultured from August to November had a pattern similar to that in the overwinter experiment: there were minor differences between the color varieties, but major differences between ponds receiving the high or low feeding

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rate. Net production from ponds receiving the 0.3% feeding rate averaged 43%, while net production in ponds receiving the 3% rate was 550%. Differences in production between varieties were not significant. Rosy reds in ponds that received the least feed were smaller in length and weight than normal-colored fish in similar ponds, but in the ponds that received the higher amount of feed, rosy reds were heavier and more robust than the normal-colored minnows.

PROPER FEEDING MAY AVOID LOSSES

The results of these experiments indicated that when fathead minnows are stressed by low feeding rates (or no feeding), rosy reds may have slightly lower growth or production rates than normal-colored fish. This may be exacerbated to the point where fish losses occur during winters with mild temperatures which would increase the minnows' metabolic rates, decrease their condition and consequently increase the chance of disease, parasitism or starvation. If these fish can be offered feed at a rate of 2% daily during the winter or 3% during late summer and fall, growth and production of both color varieties should be high and risk of losing fish minimal. Farmers should be sure that they are able to get feed to their fathead minnow ponds during all types of weather.

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