PRELIMINARY RESULTS ON THE PRODUCTION AND SPAWNING OF WHITE CATFISH IN PONDS

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Experiments were begun at the Auburn University Agricultural Experiment Station in 1958 with white catfish, *Ictalurus catus* (Linnaeus) to determine the value of this species as a pondfish. Fingerlings were furnished for these experiments by the U. S. Fish and Wildlife Service hatchery at Hoffman, N. C.

These fingerlings were overwintered in a holding pond and then were used in production experiments during the spring, summer, and fall of 1959. After treatments for parasites and diseases, three ponds were stocked at rates of 1,058, 2,000, and 3,000 fingerlings per acre. Each pond received one application of fertilizer equivalent to 200 pounds 8-8-0 per acre. Supplemental feeding with Auburn No. 2 pellets was used daily except Sundays at rates given in Table 1. At the end of the experiment, the ponds were drained and the fish were counted, measured, and weighed.

The results of these experiments are summarized on a per-acre basis in Table 2. It appeared from these production tests that this species compares

Table I

Feeding Schedule for White Catfish Experiments, Using Auburn No. 2 Pellets Daily Except Sunday

Dates	*Pounds fed per acre per day*
Pond E-2:	
July 14-July 18	15
July 20-Aug. 1	6
Aug. 3-Aug. 31	15
Sept. 1-Oct. 13	20
Pond E-4:	
March 25-May 30	10
June 2-July 1	15
July 2-Aug. 1	20
Aug. 3-Oct. 3	30
Oct. 5-Oct. 7	20
Pond T-2:	
May 4-May 30	15
June 1-Aug. 1	20
Aug. 3-Oct. 31	30

Table II

Production Per Acre of White Catfish Supplementally Fed

Item	*Pond E-2*	*Pond E-4*	*Pond T-2*
Period of experiment	July 14-Oct. 21	Mar. 25-Oct. 13	May 4-Nov. 25
Days in experiment	99	202	205
Number catfish stocked	1,058	2,000	3,000
Pounds catfish stocked	151.5	192.3	351.0
Survival, percent	98.2	97.9	98.3
Pounds catfish recovered	795.8	1,750.7	2,538.0
Net production, pounds *	644.3	1,558.4	2,187.0
S Conversion	1.9	2.0	1.7
Cost per pound harvestable fish, cents †	12.2	12.2	10.4
Gain, pounds per acre per day	6.5	7.7	10.7
Total feed used, pounds	1,242	3,155	3,735

* Weight at draining less weight stocked.

† Feed at 6 cents per pound and fertilization at $4.00 per acre per application.

favorably with channel catfish as a commercial fish.* Survival rates were excellent, average mortality being only 1.8 percent. *S* conversion factors ranged from 1.7 to 2.0, and, therefore, were similar to those obtained with channel catfish. In addition, gain per acre per day, total production, and cost per pound of harvestable fish were approximately the same as that obtained with channel catfish. The production in Pond E-2 was low, but it should be noted that the period of this experiment was only 99 days.

The white catfish demonstrated one characteristic that makes it a more desirable species than the channel catfish, namely its ability to survive during harvesting operations when the water became quite muddy following seining.

The white catfish survived exceedingly well, even when practically all water had been drained from the ponds and the fish remaining in the mud were picked up by hand. Under similar conditions it has been observed that channel catfish suffer high mortality. It appears that the latter species dies rapidly once its gills have become covered with mud. This ability of the white catfish to live under adverse conditions, particularly in muddy water and during hot weather, is especially important to producers and hatcherymen raising fingerlings for sale or distribution.

A limited amount of fishing was done in the pond containing 2,000 white catfish per acre. Live redworms were used for bait. However, no white catfish were caught, whereas channel catfish in the adjacent pond were caught very readily on the same bait. Additional information is needed on baits and methods of fishing to determine desirability of this species as a sport fish.

Some of the harvestable white catfish produced in these experiments were dressed, washed, packed in plastic bags, and frozen for sale. The loss of weight on dressing was 44.4 percent as compared with 40 percent for fall-harvested channel catfish, probably because of the larger heads of white catfish. The meat was light pink in color and tasted equally as good as that of channel catfish. Thus, consumer acceptance should be equally as good for the white catfish as for the channel catfish.

Because of the very favorable results obtained with white catfish in these three ponds, it was concluded that this species merited further research to determine its desirability as a sport fish and as a commercial fish, and also to find if it will spawn in ponds. Therefore, 20 pairs of white catfish were saved for brood fish for spawning experiments in the spring of 1960.

Twenty males weighing 31.3 pounds and 20 females weighing 22.7 pounds were held in a ¼-acre pond from October 13 to May. They were fed 2 pounds Auburn No. 2 pellets daily except Sundays. Some of these brood fish were caught by seining on May 10 and inspected for ripeness and general condition. Both males and females appeared in good condition and some of the females had well developed egg sacs and appeared about ready to spawn. The females weighed 1.8 to 2.0 pounds and the males, 2.2 to 2.8 pounds. One pair of these fish was transferred to another pond and placed in a wire pen containing a wooden spawning box. These wooden boxes were 42 inches long, 15 inches wide, and 9 inches deep. They were placed along edges of the pond, with tops 1 foot under water. Eggs 1 or 2 days old were found May 17.

On that date the water level in the brood fish holding pond was lowered 1.5 feet and the brood fish were removed by seining. During the seining operations the five spawning boxes previously added were inspected and white catfish had already laid in three of the boxes. The eggs in one box had started hatching, while the other two spawns appeared to be 2 or perhaps 3 days old. On May 18 while the water was still down, one school of day-old fry was found dead in a nest in the dam. Apparently either a muskrat burrow had been used as a spawning place, or the catfish had made a hole in the bank for spawning purposes.

Five pairs of brood fish were transferred May 18 to another ¼-acre pond into which five spawning boxes had been added. The spawning boxes were inspected for eggs every 2 or 3 days. On June 2, spawns were found in three of the boxes. No other spawns were found, although the boxes were checked periodically through July.

* Swingle, H. S. Experiments on Growing Fingerling Channel Catfish to Marketable Size in Ponds. Proc. Ann. Conf. S. E. Assoc. Game and Fish Com. 12:63-72, 1958.

Nine pairs of brood fish were transferred May 18 to wire pens in a ¼-acre pond. Each pen contained a wooden spawning box as previously described. Eggs were found in three of these boxes on May 25, May 31, and June 16. Although the boxes were checked every 2 or 3 days through July, no other spawns were found.

The five pairs of brood fish left were those that appeared either to have spawned previously or not likely to spawn. These were returned to the holding pond from which they were taken. Only one later spawn, found June 6, was observed in this pond.

The white catfish laid eggs in masses very similar to those of channel catfish. However, the individual eggs of the former were slightly larger than those of channel catfish. The time required for the eggs to hatch was 6 to 7 days at water temperatures between 75° and 85° F. The egg masses from these 2-pound females were relatively small. A total of 4,000 fry was counted from one of the larger spawns, while the count was 2,500 from one of the smaller spawns. White catfish fry became progressively darker after hatching, and at 4 days of age they were a dark brown color except on the belly. Several of the spawns were successfully hatched in a paddlewheel trough, while the majority was left to hatch in the spawning boxes. The males apparently "fan" the eggs the same as channel catfish, but did not appear to be as ferocious when disturbed as the latter species.

SUMMARY

Two-year-old white catfish were spawned successfully in ponds and in wire spawning pens constructed in ponds. Usually the eggs were laid in the provided wooden spawning boxes, although some fish spawned either in muskrat burrows or in holes they made in the pond banks. The spawning season at Auburn, Alabama extended from May 11 to June 16. Surface water temperatures in early morning at the beginning of the spawning season were about 68° F. No spawning occurred when early morning surface water temperatures were 80° F. or higher.

Two-pound female white catfish produced between 2,500 and 4,000 fry per spawn. Where water temperatures averaged 80° F., the eggs required 6 to 7 days to hatch. Eggs hatched successfully if left in spawning boxes and also when transferred to a paddlewheel hatching trough.

With supplemental feeding white catfish fingerlings stocked March 25 at a rate of 2,000 per acre gave a net production of 1,558.4 pounds in 202 days, whereas 3,000 fingerlings stocked May 4 gave a net production of 2,187.0 pounds in 205 days. Mortality averaged 1.8 percent; *S* conversion factors ranged from 1.7 to 2.0, and gains per acre per day ranged from 6.5 to 10.7 pounds. The quality of the meat was as good as that of channel catfish. In addition, both white catfish fingerlings and adults lived exceptionally well during harvesting operations under conditions of muddy water, hot weather, and low oxygen concentrations. Because of these characteristics, this species appears to be a very promising pondfish, especially for commercial production. Further data are needed on baits and methods of fishing to determine the value of this species as a sport fish.

SPAWNING OF CHANNEL CATFISH BY USE OF HORMONE

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ABSTRACT

Early in 1958, due to the tremendous demand for channel catfish fingerlings, the decision was made to construct a separate hatchery for the production of same. Several hatcheries were visited, and methods observed to determine those best suited for our use. Our aim for this hatchery was production in large numbers at minimum cost.

Considerable time was spent at the experimental station at Tishomingo, Okla., where Mr. Kermit Snead was in charge. We felt the methods used at this station, though in the early stage, appeared to be most applicable for mass