

AQUACULTURE

REDUCING SIZE VARIATION IN HYBRID CATFISH CULTURE THROUGH GRADED PARTIAL HARVEST

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"REMOVING GROWING HYBRIDS THROUGH A MID-SUMMER PARTIAL HARVEST REDUCED OVERALL PRODUCTION BY AN AVERAGE OF 16% COMPARED TO PONDS NOT PARTIALLY HARVESTED."

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Large variation in fish size at harvest is an inherent problem in single-batch production systems. The problem is particularly acute with hybrid catfish because of the fish's faster growth. Two-year-old hybrid catfish commonly range from 0.75 lb to more than five pounds at harvest depending on size and size range of fingerlings used to initiate production. Most fish processors desire a range of fish sizes to meet demand for various product types; however, the greatest demand (so-called "premium-sized" fish) is generally for fish ranging from 1 to 4 lb, although specifications for desired fish sizes vary among processors and from year to year. Farmers may be penalized for oversized and undersized fish, resulting

in loss of income.

Hybrid catfish production practices are relatively new, and limited information is available on production strategies and economics. This study was conducted to determine the effect of mid-summer partial harvest of faster-growing fish on production characteristics in ponds with hybrid catfish in single-batch culture. Twelve, 1.0-acre ponds were stocked with 10,000 hybrid catfish (~0.12 pound per fish) in mid-March 2015. In August 2015, six random ponds were partially harvested to remove fish larger than ~1.25 pound using an in-pond, flexible-panel grading sock. In October 2015, all ponds were completely harvested.

Table 1. Total weight (lbs/ac ± SEM) and weight (lbs/ac ± SEM) of fish in each size class of Hybrid Catfish produced in partly harvested and control ponds. P-values are the result of an unpaired t-test between total harvest of partly harvested and control ponds.

Treatment	Total wt	Weight range categories					
		0.0-1.0 lbs	1.0-1.5 lbs	1.5-2.0 lbs	2.0-3.0 lbs	3.0-4.0 lbs	4.0-99.0 lbs
Control	18064 (374)	376 (89)	1768 (212)	3959 (329)	8426 (628)	3151 (329)	380 (100)
Partly harvested							
1st harvest	3841 (350)	10 (10)	2012 (405)	1626 (94)	176 (58)	0 (0)	9 (9)
Last harvest	11374 (533)	282 (48)	1547 (136)	3696 (201)	5027 (437)	701 (180)	125 (18)
Total	15216 (307)	292 (53)	3568 (384)	5322 (230)	5203 (444)	701 (180)	134 (14)
P-value	< 0.001	0.437	0.002	0.007	0.002	<0.001	0.035

Mid-summer, size-selective harvest removed about a quarter of fish originally stocked in partial-harvest ponds and did reduce the total number of fish in the 2-4 pound range. Partial harvest also reduced the total amount of feed fed to fish.

Final harvest in late October yielded 11,374 per acre from the partial-harvest ponds (Table 1). When final harvest weight was added to the mid-summer partial harvest, overall production from partial-harvest ponds was 15,216 pounds per acre. The single, final harvest from control ponds yielded 18,064 pounds per acre, which was significantly greater than from partial-harvest ponds.

Overall, partial harvest of faster-growing fish in mid-summer reduced the overall biomass of discounted, out-of-size fish, but higher production in control ponds resulted in greater net revenue

Category	Value or cost/ac
Benefits	
Additional revenue	
Fish sales ^a	\$0.00
Reduced costs	
Feed (2.12 ton per pond, \$368/ton)	\$780.16
Electricity for aeration (694 hp-h per pond, \$0.10 per hp-h)	\$69.40
Total benefits	\$849.56
Costs	
Additional costs	
Labor (\$200 per pond)	\$200.00
Depreciation (\$367.38/yr for 6 ponds)	\$61.23
Reduced revenue	
Fish sales ^a	\$3,133.87
Total additional costs	\$3,395.10
Net benefit	-\$2,545.54

^aBased on prices paid per size group.

(Table 2).

Although there may be marketing advantages to producing more fish in the 1-2 lb size range that is highly preferred by most fish processors, there was no direct economic benefit to mid-summer removal of faster-growing hybrid catfish in single-batch

culture. However, if fingerlings larger than 0.12 pound per fish are used to initiate culture or if harvest is delayed into the next few months of the next growing season because of market constraints (such as unmarketable, off-flavored fish), the proportion of discounted, over-sized fish would be larger and would have a greater effect on net revenues. Future research should focus on using larger, graded and ungraded hybrid catfish fingerlings to stock ponds for food fish production under the same conditions presented in this study.

Table 2. Partial budget of changing from harvesting hybrid catfish foodfish at the end of the season to partly harvesting food fish once during the production season with a second harvest at the end.