

AQUACULTURE

ADOPTION OF ALTERNATE CATFISH PRODUCTION TECHNOLOGIES

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"HIGH YIELD AND GREATER CONTROL OVER THE PRODUCTION PROCESS ASSOCIATED WITH ALTERNATE-PRODUCTION TECHNOLOGIES WERE THE MAJOR REASONS FOR ADOPTION ON FARMS, WHILE THE HIGH INVESTMENT COSTS AND INCREASED RISK WERE THE MAIN DETERRENENTS."

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Technology developments have played a key role in the global aquaculture development and increase in productivity. Catfish production technologies that intensify production have advanced rapidly in the recent years, but not all technologies have been adopted readily by farmers. A recent survey of the catfish producers in Alabama, Arkansas, and Mississippi reveals some important factors that influence technology adoption among catfish farmers.

The most rapid adoption has been of the split

ponds, with 1,700 acres in 2013, followed by intensively aerated ponds (1,200 acres). High yield and greater control over the production process associated with the alternate-production technologies were the major reasons for technology adoption (Table 1). High investment costs and increased production and marketing risks associated with these technologies were the main deterrents for not adopting the new technologies. Econometric analysis suggested that characteristics of the technology such as productivi-

Table 1. Primary reasons for adoption and non-adoption of alternate production technologies, 2013 survey. Values with different superscripts indicate statistically significant differences ($P \leq 0.05$) among reasons as indicated by a Z-test.

Reasons for technology adoption/non-adoption	Percentage response
Primary reason for adoption	
To achieve higher yields	59%^a
To reduce production and economic risk	15%^b
To have greater control over production process	11%^b
Because of productive available results from technologies	11%^b
Other reasons	4%^b
Primary reason for non-adoption	
High investment cost	44%^a
High economic and production risk	22%^{ab}
Lack of proven results of technologies	16%^b
Getting out of business	12%^b
Other reasons	6%^c

ty, perceived risk, and upfront adoption costs influenced technology choices. Producers who adopted these alternate technologies had significantly larger farms and more numbers of ponds. Adopters of alternate technologies were significantly employing complementary technologies like hybrid catfish (Table 2). Institutional factors such as prior involvement in extension/research programs and farm characteristics of the scale of operation also shaped adoption decisions.

Current estimates of acreage under alternate catfish production technologies suggest that intensively aerated ponds with ~2,500 acres have outpaced the

area under split-pond production (2,200 acres). Increase in acreage of intensively aerated ponds are mainly happening in Alabama and Mississippi, while split ponds are mostly embraced in Mississippi and Arkansas. Currently, there is no acreage devoted to catfish production from in-pond raceways systems. An ongoing technology-monitoring program will provide improved understanding of the factors that drive farmers to make complex adoption decisions about alternate-production technologies. This information will help address existing farm constraints and will contribute to formulate researches that addresses these on-farm problems.

Table 2. Characteristics of adopters and non-adopters of technologies, 2013 survey. Values with different letters indicate statistically significant difference ($P \leq 0.05$) among producer categories.

Characteristics	Units	Adopter	Non-adopters
Farm characteristics			
Farm size	(ha)	290^a	130^b
Number of ponds	(nos.)	71^a	33^b
Pond size	(ha)	4.1	4.2
Proximity to extension assistance	(km)	55	50
Producer characteristics			
Own the farm	(%)	85%	73%
Prior involvement in extension/research programs	(%)	59%^a	20%^b
Take research/extension assistance	(%)	93%	88%
Farming experience	(yrs)	27	27
Manager's experience	(yrs)	19	21
Equity capital for renovation	(%)	70%	63%
Use of complementary technology			
Use hybrid catfish	(%)	67%^a	39%^b
Use dissolved oxygen monitors	(%)	81%	69%