

VERIFICATION OF RECOMMENDED MANAGEMENT PRACTICES FOR MAJOR AQUATIC SPECIES

Reporting Period

January 1, 1997 - August 31, 2001

Funding Level	Year 1	\$31,410
	Year 2	66,114
	Year 3	66,925
	Total	\$164,449

Participants	University of Arkansas at Pine Bluff (Lead Institution)	Carole Engle, David Heikes, Steve Killian, Pierre-Justin Kouka
	Auburn University	Jerry Crews, Greg Whitis, David Cline, Claude Reeves
	Clemson University	William "Rockie" English, Tom Schwedler, Johnny Jordan, Jack Whetstone
	Louisiana State University	Greg Lutz, Jimmy Avery (now at Mississippi State University)
	North Carolina State University	Harry Daniels, Steven Gabel, Michael Frinsko, Rebecca Dunning

Administrative Advisor	Dr. Jack Bagent, Director (Retired) Louisiana Cooperative Extension Service Louisiana State University Baton Rouge, Louisiana
-----------------------------------	--

PROJECT OBJECTIVES

The overall goal of this project is to initiate verification programs in participating states. The emphasis is on developing the interdisciplinary process and internal committees within each state. While actual field results of verification trials of different management protocols will be valuable, this project is intended as a stimulus to develop and utilize verification trials as a new extension tool. The specific objectives of this project are:

1. To develop and implement recommended management practices for catfish and crawfish production systems in participating states;
2. To publish guidelines for infrastructure development, program implementation, and assessing results/benefits of aquaculture management verification. This publication will be a joint effort of participants; and

3. To publish recommended management plans and results of Objective 1.

ANTICIPATED BENEFITS

The principal benefit of verification is to determine if the total set of research-based extension recommendations produces yields, feed conversions, and costs consistent with results from research trials. Researchers and extension personnel learn whether their recommendations are valid in commercial settings and whether or not

recommendations and research programs need to be adjusted based on what has been learned. Adoption of verification practices is expected to increase industry yields. The development of the verification management plan encourages open dialogue among researchers, producers, and extension specialists.

PROGRESS AND PRINCIPAL ACCOMPLISHMENTS

Objective 1. To develop and implement verification programs of recommended management practices for catfish and crawfish production systems in participating states.

Alabama. The Extension Fisheries team established recommendations for the production systems (levee ponds, watershed ponds, and cages) in the verification project. There are four cooperators and four levee ponds in West Alabama (two with channel/blue hybrid catfish and two with channel catfish), five cages (two in East Central and three in Southeast Alabama), and two watershed ponds enrolled in the verification program. Production and water quality parameters have been monitored and the Fishy '98 computer program is being used to track feeding and other data on most of the production units since 1998. Four levee-style ponds have been enrolled in the verification program for 2-3 years. Stocking rates have varied from 4,071 to 5,469 fish/acre per year. Harvested weights range from 5,241 to 10,749 pounds/acre per year, including fish scrapped from ponds. Three of the four ponds are pending final harvest and scrapping. Overall, survival has ranged from 57 to 91%. Gross feed conversion ratios (pounds of feed/pounds of fish harvested) ranged from 1.87 to 2.8. Both of the watershed ponds

enrolled in the program have been harvested completely. Cages in East Central Alabama were harvested. The three cages in Southeast Alabama were successfully harvested in the first year of the project. However, in the second year, under-sized fish were delivered. This, in combination with an outbreak of columnaris disease,

Results at a glance...

☆ *Analysis of the production and economic data indicate that the recommended management practices result in greater profit to the producers.*

resulted in significant mortality and probable escape of fish from the cages. The second-year cage trial was abandoned. The final, complete description of results of the Alabama verification program will be published in the upcoming year.

Arkansas. An inter-disciplinary verification committee, consisting of extension specialists, researchers, economists, and county extension agents developed specific management protocols for the verification of recommended foodfish and fingerling management practices. Record-keeping forms were developed and printed in field-booklet form on waterproof paper. A spreadsheet computer program and sampling methodology were developed to be used with the Fishy 3.2 record-keeping program. A literature search was conducted to ensure that the management protocols reflect a progressive, practical, and profitable management scenario.

Arkansas conducted verification trials on six foodfish (four in northern Poinsett and St. Francis counties and two in southern Chicot County) and two fingerling ponds across the Delta production area. Production inputs and yield data were collected on a weekly basis, summarized weekly and posted on the Arkansas CYVT web site (www.uaex.edu/aquaculture/arcvvp.htm). All ponds have been harvested completely and the complete, final report and summary of all data is in preparation.

Louisiana. The verification committee was formed, a literature review completed, and fisheries/aquaculture agents, specialists, and administration were trained in verification procedures. Management protocols have been developed for three crawfish production scenarios: 1) rice-crawfish rotation; 2) permanent crawfish pond; and 3) growing crawfish behind two successive rice crops. Five cooperators participated in the Year 2 Crawfish Yield Verification Project. Cooperators included three producers from Vermillion Parish, one producer from St. Martin Parish, and one producer from Acadia Parish. There were nine ponds enrolled in the project with six ponds evaluating the rice-crawfish rotation, one pond evaluating the permanent pond scenario, and two ponds of crawfish behind double-crop rice. The

production season began in October and terminated in June. Agents collected pre-production samples of water source, forage, and soil. Forage depletion was monitored monthly. Farmers

Results at a glance...

☆ *Good feeding practices resulted in feed conversion values below 1.6:1.*

were given recommendations on trap density, bait usage, and harvest regimes. The final, comprehensive report on the Louisiana verification program will be published this coming year.

North Carolina. A five-member committee consisting of industry, university, and extension representatives established recommended catfish management protocols. These protocols have been implemented in the management of three channel catfish production ponds on three separate farms since fall 1997. Data collection continued through 2000 on different production variables (feeding, aeration, labor, etc.) on a weekly basis. Final harvests have been completed. The harvests were delayed due to extensive flooding caused by several hurricanes during the fall of 1999. A complete final report has been prepared summarizing the data collected for the cooperators' ponds over the entire three years of the project.

South Carolina. The verification committee was formed, the management protocol to be implemented developed, and a cooperator identified. Background information on financial and production performance was evaluated. A change in farm managers in the middle of the year caused some delays in the implementation of the rotational plan. The proposed phased rotation management plan was updated to work with the farm's current inventory levels, and

modified to work within the farm's restrictions of capital and equipment.

In August of 1998, a 12-acre stocker pond was stocked with approximately 240,000 fingerlings weighing 60 pounds per 1000 fish. They were fed until mid-October when approximately 60,000 fingerlings weighing about 200 pounds/1000 were moved to a vacated pond. The fish were fed until August 15, 1999, and a portion of the fish were harvested (12,000 pounds) and

sold to the processing plant. The fish were seined with a 1 3/8-inch sock to estimate true average size of the fish. The average size of the fish harvested was 1.38 pounds. There were personnel changes at the farm so that no accurate information was available on actual feed fed and no conversion rates could be calculated. The stockers were moved at approximately the correct time and size and were within 5% of the targeted market size at harvest that was projected by the model.

Objective 2: *To publish guidelines for infrastructure development, program implementation and assessing results/benefits of aquaculture management verification. This publication will be a joint effort of participants.*

A joint project publication was written that presents guidelines for developing aquaculture verification programs. This bulletin presents a brief history of verification programs in extension. Procedures for infrastructure development are discussed that include information on forming the verification committee, efficient ways to develop summaries of the relevant research base, efficient ways to develop recommended management plans, data collection procedures, and data synthesis procedures. The bulletin then describes key components of program implementation. Frequency of farm visits, the role of county extension agents

and specialists, role of cooperators, production cycles, and required resource commitments are presented based on the experiences of specialists that conducted verification in this program.

The bulletin also discusses the types of results, benefits, and impacts that verification programs can have. Potential pitfalls and problems review the types of issues that can arise among cooperators, agents, specialists, and the production environment. The bulletin concludes with discussions of information dissemination and potential funding sources.

Objective 3: *To publish recommended management plans and results of Objective 1.*

Management protocols have been developed for use in all participating states. The management protocols and final, comprehensive reports of

the results are the responsibility of each participating state. North Carolina has completed theirs.

WORK PLANNED

Commercial fish production requires complex management decisions on stocking, harvesting, and marketing. There are numerous factors

such as market requirements, drought, disease, and hurricanes, that are outside the control of the manager that affect the operator's ability to

manage the fish farm according to a pre-set schedule. These same factors and conditions have prevented final harvest of several of the ponds enrolled in the verification program. Much of the work planned for the coming year includes final harvest followed by final data summaries, and synthesis. When all data have been synthesized, complete reports with complete data will be published in each state.

In Arkansas, a comprehensive report is under preparation that summarizes all data collected over the project period for all ponds and includes an economic analysis of the results. Alabama still has ponds to harvest. Complete data analysis along with an economic analysis will be completed upon harvest of all ponds. Louisiana crawfish crops lag about 6 months behind fish crops. Upon final harvest, a report to summarize all findings will be completed and published.

IMPACTS

Alabama. There has been an increased awareness of actual inputs required to produce a crop of catfish, more attention paid to tracking all the real costs of catfish production, and increased attention to and analyses of water quality in pond production. There is now an awareness that close monitoring of water quality and equipment condition (aerators, tractors, feeders, etc.) can prevent problems and decrease fish mortality. There is increased attention paid to record-keeping and tracking costs of production. One producer who normally stocked ponds in the 12 to 15,000 fish/acre range has reduced his stocking rates because of the production data in his verification pond. Also, the verification program showed that the routine use of a 1.75-inch mesh seine results in an average size of fish sold of 2 pounds, not the 1.25 pounds previously assumed. Overall, the project demonstrated without a doubt that current extension guidelines will result in profitable production.

Arkansas. Of particular interest is the impact that this program has had on producers in the northern half of Arkansas. Prior to this program, county agents had very little exposure to catfish producers and many producers have turned to non-Extension sources of information for years. Since the initiation of this program, word has spread through fish farmer networks

Results at a glance...

☆ *These results demonstrate the importance of careful feeding and the positive effect feed management has on profitability.*

that Extension has important information and the county agents have seen a tremendous increase in the number of aquaculture-related calls in their counties. The agent in Poinsett County has asked specifically that we continue catfish verification in his county indefinitely. Also, the number of producers from the northern counties submitting disease cases to Extension Fish Diagnostic Laboratories in Arkansas has increased, indicating an increased level of trust with Extension services.

Louisiana. The major impact of the project to this point has been the interest of the field agents in participating in a proactive program. Field agents have increased awareness of the importance of population structure at the end of the previous season, summer management of natural forage or rice, precipitation patterns while crawfish are aestivating in burrows,

pesticide use, and fall flooding protocols. Two of the cooperators reported that they realized the difference that higher trap densities had on overall catch rate. Some cooperators have shared previous years' records with agents in an attempt to further refine their production

practices.

North Carolina. The cooperating farmers have expressed their satisfaction with the results of this project and, where practical, have implemented these same practices on the rest of their ponds.

PUBLICATIONS, MANUSCRIPTS, OR PAPERS PRESENTED

Papers presented

- Daniels, H., S. Gabel, M. Frinsko, and R. Dunning. In review. Channel Catfish Production Manual: Recommended Management Practices for North Carolina Producers.
- Heikes, D. L. 1998. Catfish Yield Verification Update. Poster presentation. Catfish Farmers of Arkansas Annual Convention, Little Rock, Arkansas. 22-23 January.
- Heikes, D. L. and C. Davidson. 1998. Catfish Verification Web Site. Poster presentation. 1890 Extension System-Wide Conference, Atlanta, Georgia. 22-25 June.
- Heikes, D. L. 1998. Catfish Fingerling Verification. Presentation. Catfish Farmers of Arkansas Annual Convention, Little Rock, Arkansas. 22-23 January.

