

Pereira, Carmen. *"Nationwide Markets for Crawfish, Shrimp and Lobster in the United States."* Department of Agricultural Economics and Agribusiness, Louisiana State University, Baton Rouge, Louisiana. (In review)

Unpublished Theses

Caplen, Russell T. *"Product Development in the Restaurant Industry: The Case Study of Catfish."* Clemson University, December 1990. (Thesis)

Israel, Danilo Cano. *"Total At-Home, and Away-From-Home Catfish Consumption in the United States: A Dichotomous and Ordered Logit-Probit Analysis."* Clemson University, August 1990. (Dissertation)

C. Preparation of Southern Regional Aquaculture Publications

Annual Progress Report
For The Period
October 1, 1989 to June 30, 1990

COOPERATING INSTITUTIONS:

Authors

John Jensen - Alabama Cooperative Extension Service
Leroy Gray - Arkansas Cooperative Extension Service
Charles Cichra - Florida Cooperative Extension Service
Thomas Wellborn - Florida Cooperative Extension Service
George Lewis - Georgia Cooperative Extension Service
Ronnie Gilbert - Georgia Cooperative Extension Service
Michael Masser - Kentucky State University (presently with Alabama Cooperative Extension Service)

Larry de la Bretonne - Louisiana Cooperative Extension Service
Gary Jensen - Louisiana Cooperative Extension Service
Joe McGilberry - Mississippi Cooperative Extension Service
Jeffrey Hinshaw - North Carolina Cooperative Extension Service
Ronald Hodson - North Carolina University
Andrew McGinty - Puerto Rico Agricultural Experiment Station
Thomas Schwedler - South Carolina Cooperative Extension Service
Joe T. Lock - Texas Agricultural Extension Service
Billy Higginbotham - Texas Agricultural Extension Service
George Chamberlain - Texas Agricultural Extension Service
Russell Miget - Texas Agricultural Extension Service
James T. Davis - Texas Agricultural Extension Service
James Rakocy - Virgin Islands Agricultural Experiment Station

Reviewers - In addition to the above

Mac V. Rawson - Georgia Marine Cooperative Extension Service
Robert Romaine - Louisiana Agricultural Experiment Station
Guthrie Perry - Louisiana Department of Wildlife and Fisheries
Edwin Robinson - Mississippi Agricultural Experiment Station.
Martin Brunson - Mississippi Cooperative Extension Service
Richard Noble - North Carolina State University
James Rice - North Carolina Cooperative Extension Service
Paul Sandifer - South Carolina Wildlife Resources
Jack Whetstone - South Carolina Cooperative Extension Service

Tom Hill - Tennessee Cooperative Extension Service
Delbert Gatlin - Texas Agricultural Experiment Station
Kirk Strawn - Texas Agricultural Experiment Station
Michael Haby - Texas Agricultural Extension Service
Tom Linton - Texas Agricultural Extension Service
Brian Murphy - Texas Agricultural Experiment Station
Louis Helfrich - Virginia Cooperative Extension Service
Wendell Lorio - Agricultural Research Service, USDA
Charles M. Collins - U. S. Fish and Wildlife Service
Nick Parker - U. S. Fish and Wildlife Service

ADMINISTRATIVE ADVISOR:

Milo J. Shult, Associate Director
Texas Cooperative Extension Service
College Station, Texas

PROGRESS OF THE WORK AND PRINCIPAL ACCOMPLISHMENTS:

Objective 1: Prepare a series of reference manuals for use and distribution by Cooperative Extension Services and other information-purveying agencies throughout the Southern Region for the following subjects:

A. Channel catfish in Delta ponds - Author - Tom Wellborn

1. Construction of levee-type ponds for fish
2. Site selection of levee-type fish production ponds
3. Channel catfish--Life history and biology
4. Feeding intensively cultured catfish in levee-type ponds

B. Channel catfish in hill country ponds - Author - John Jensen

1. Watershed fish ponds--Site selection and construction

C. Rainbow and brown trout - Author - Jeffrey Hinshaw

1. Trout production--Handling eggs and fry
2. Budgets for trout production--Estimated costs and returns for trout farming in the South
3. Trout farming--A guide to production and inventory management
4. Trout production, foods and feeding methods

D. Baitfish - Authors - Leroy Gray and Carole Engle

1. Baitfish--Biology and life history
2. Baitfish feeding practices
3. Baitfish production and feeding practices

E. Tilapia - Authors - Jim Rakocy and Andrew McGinty

1. Pond culture of tilapia
2. Cage culture of tilapia
3. Tank culture of tilapia

F. Small scale marketing - Authors - George Lewis and Ronnie Gilbert

G. Caged fish production - Author - Michael Masser

1. What is cage culture?
2. Cage culture site selection and water quality
3. Cage culture construction and placement

4. Species suitable for cage culture
 5. Handling and feeding caged fish
 6. Cage culture problems
 7. Cage culture harvesting and economics
- H. 4-H Fish production - Author - Tom Schwedler
1. 4-H Aquatic science project-- Raising catfish in a cage
 2. 4-H Aquatic science project-- Catfish cage culture record keeping project
- I. Aeration equipment and utilization - Author - John Jensen
1. Pond aeration--Principles
 2. Pond aeration--Types and uses of aeration equipment
- J. Catfish processing - Author - Joe McGilberry
1. Processing channel catfish
 2. Processed catfish--Product forms, packaging, yields and product mix
 3. Processed catfish--Product quality and quality control
- K. Striped bass hybrids - Author - Ronald Hodson
1. Hybrid striped bass--Biology and life history
 2. Hybrid striped bass--Hatchery phase
 3. Hybrid striped bass--Pond production of fingerlings
 4. Hybrid striped bass--Pond production of food fish
- L. Red drum production - Author - James T. Davis
1. Red drum--Biology and life history
 2. Red drum--Brood stock and hatchery production
 3. Red drum--Pond production of fingerlings and stockers
 4. Red drum--Pond production of food fish
 5. Red drum--Site selection and pond construction
- M. Penaeid shrimp production - Author - James T. Davis
1. Introduction of exotic shrimp
- N. Crawfish production - Author - Larry de la Bretonne
1. Crawfish culture site selection and construction
 2. Crawfish production system
 3. Crawfish production--Harvesting, marketing and economics
- O. Largemouth bass - Author - Joe T. Lock
1. Largemouth bass--Biology and life history
 2. Largemouth bass--Production and economics
- P. Forage fish production - Author - Billy Higginbotham
1. Forage species--Range, description and life history
 2. Forage species--Production techniques
 3. Forage species--Return on investment
- Q. Extra nonassigned publications
1. Aquatic weed management--Control

- methods - Authors - James L. Shelton and Tim R. Murphy
2. Aquatic weed management-- Herbicides - Authors - Tim R. Murphy and James L. Shelton
 3. Computer software for aquaculture-- description and evaluations - Authors - Rebecca Kruppenbach and James T. Davis
 4. Sorting and grading warmwater fish - Author - Gary Jensen
 5. Transportation of warmwater fish - Author - Gary Jensen - final editing and revisions in progress
 - a. Transportation of warmwater fish--Equipment and guidelines
 - b. Transportation of warmwater fish--Procedures and loading rates
 - c. Transportation of warmwater fish--Guidelines and tips by species
 - d. Harvesting warmwater fish

Objective 2: Prepare video productions to demonstrate succinct points in the production of aquacultural products for the following subjects:

- A. Induced spawning - Responsible institution - Florida Cooperative Extension Service - Script approved and filming completed - awaiting delivery.
- B. Crawfish Production - Responsible institution - Louisiana Cooperative Extension Service - Larry de la Bretonne - distribution complete.
- C. Catfish Production - Responsible institution - Louisiana Cooperative Extension Service - Gary Jensen - distribution complete.
- D. Trout Production - Responsible institution - North Carolina Cooperative

Extension Service - Jeffrey Hinshaw - being distributed.

- E. Alligator Production - Responsible institution - Louisiana Cooperative Extension Service - Larry de la Bretonne - distribution complete.
- F. Hybrid Striped Bass Production - Responsible institution - North Carolina Cooperative Extension Service - Ronald Hodson - being distributed.
- G. Penaeid Shrimp Production - Responsible institution - Texas Agricultural Extension Service - Russell Miget - awaiting delivery.
- H. Red Drum Production - Responsible institution - Texas Agricultural Extension Service - Russell Miget and George Chamberlain - distribution complete.
- I. Pond management, water quality and instrument use - Responsible institution - South Carolina Cooperative Extension Service - Tom Schwedler - final editing and distribution in progress.

Objective 3: Catalog all of the computer software available on aquaculture production in the Southern Region and evaluate the possibilities of developing a common format.

This objective was expanded to include analysis of all aquacultural or related software available in the United States. Because there were insufficient funds in the project to buy software, we limited our evaluation to those programs which were in the public sector and available for a minimum charge or those which the owning institution would send as a demonstration program or on a loan basis.

As a result of this effort, a publication was

prepared as indicated in Objective 1.

Objective 4: Perform all management services necessary to allow the maximum output with the least travail on cooperating Extension Services.

At the completion of this year, there are over 52 fact sheets completed and available for distribution through cooperating Extension Services in the Southern Region. In addition at least two are being processed. Five more manuscripts have been received for review and editing.

Because the Southern Region has the only products of this nature and completeness in the world today, requests for copies have proliferated. Little effort has been made to advertise their availability. Because the expense of answering the requests is more than any single state can bear, a distribution policy was recommended to the Regional Center Directors. Additional SRAC funding was made available to cover increased distribution costs not included in the initial proposal for this project.

USEFULNESS OF FINDINGS:

The best statement about the usefulness of this project is the number of requests to receive, market or stock the materials. The interest has overwhelmed our ability to respond. Future projects must allow a greater percentage of project funds for editing and distribution.

WORK PLANNED FOR NEXT YEAR:

Project terminated.

PUBLICATIONS APPROVED DURING THE YEAR:

These are described previously in this report.

D. Preparation of Southern Regional Aquaculture Publications

Termination Report
For The Period
March 24, 1988 to June 30, 1990

COOPERATING INSTITUTIONS:

Authors

- John Jensen - Alabama Cooperative Extension Service
- Leroy Gray - Arkansas Cooperative Extension Service
- Charles Cichra - Florida Cooperative Extension Service
- Thomas Wellborn - Florida Cooperative Extension Service
- George Lewis - Georgia Cooperative Extension Service
- Ronnie Gilbert - Georgia Cooperative Extension Service
- Michael Masser - Kentucky State University (presently with Alabama Cooperative Extension Service)
- Larry de la Bretonne - Louisiana Cooperative Extension Service
- Gary Jensen - Louisiana Cooperative Extension Service
- Joe McGilberry - Mississippi Cooperative Extension Service
- Jeffrey Hinshaw - North Carolina Cooperative Extension Service
- Ronald Hodson - North Carolina University
- Andrew McGinty - Puerto Rico Agricultural Experiment Station
- Thomas Schwedler - South Carolina Cooperative Extension Service
- Joe T. Lock - Texas Agricultural Extension Service
- Billy Higginbotham - Texas Agricultural Extension Service
- George Chamberlain - Texas Agricultural Extension Service

Russell Miget - Texas Agricultural Extension Service

James T. Davis - Texas Agricultural Extension Service

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Richard Noble - N. Carolina State University

James Rice - N. Carolina Cooperative Extension Service

Paul Sandifer - South Carolina Wildlife Resources

Jack Whetstone - South Carolina Cooperative Extension Service

Tom Hill - Tennessee Cooperative Extension Service

Delbert Gatlin - Texas Agricultural Experiment Station

Kirk Strawn - Texas Agricultural Experiment Station

Michael Haby - Texas Agricultural Extension Service

Tom Linton - Texas Agricultural Extension Service

Brian Murphy - Texas Agricultural Experiment Station

Louis Helfrich - Virginia Cooperative Extension Service

Wendell Lorio - Agricultural Research Service, USDA

Charles M. Collins - U. S. Fish and Wildlife Service

Nick Parker - U. S. Fish and Wildlife Service

ADMINISTRATIVE ADVISOR:

Milo J. Shult, Associate Director
Texas Cooperative Extension Service
College Station, Texas

REASON FOR TERMINATION:

Objectives completed.

MAJOR ACCOMPLISHMENTS:

The preparation of regional aquaculture publications is a direct result of the Regional Aquaculture Center legislation. In the Southern Region less than half the states had fact sheets covering the major species in their state. By pooling regional expertise, over 50 fact sheets were made available covering most aspects of culture of the major species in the region. Due to limited time and finances, some subjects remain to be covered and additional species information is needed. These needs will be addressed in subsequent projects.

The use of videos seems destined to become the major educational medium for the coming decade. With this in mind, videos on production of individual species and information common to all species were prepared. Again this was a regional effort which brought together the best expertise available to produce and direct these educational products. The eleven videos available, or soon to be available, constitute over one-half of the aquaculture production videos available in the world today. One producer observed: "When there is nothing I really want to watch on television, I put your video cassette into my VCR. So far I have seen it at least six times and I continue to learn something new each time I see it." This is the purpose of these videos, and they are being put to good use in homes as well as the high school and college classroom. Not only producers but the general public can begin to understand the many technical aspects of being involved with aquaculture.

APPLICATION OF RESULTS:

Providing the best information from which to make decisions is one facet of Extension responsibility. The materials made available through this project will assist producers and potential producers to make informed decisions. The economic value of this is difficult to measure but is estimated to exceed \$1,000,000 annually in cost savings in just the State of Texas. The other 14 regional states and territories should realize similar savings. Another facet served by educational publications is to make the general public aware of the immensity and complexity of the aquaculture industry. No method has been devised to measure the value of an informed public making rational, intelligent decisions affecting land use planning, water allocations and food safety, but most professionals consider it even more important to the future of the industry than information to the target audience.

PUBLICATIONS:

These are described previously in the Annual Progress Report.

E. Performance of Aeration Systems for Channel Catfish, Crawfish, and Rainbow Trout Production

Termination Report
For The Period
March 1, 1988 to September 30, 1990

COOPERATING INSTITUTIONS:

Auburn University - Claude E. Boyd
Louisiana State University - F. Eugene Baker, J. David Bankston, Thomas B. Lawson, and Robert P. Romaine
Mississippi State University - Craig S. Tucker

North Carolina State University - Jeffrey M. Hinshaw
Texas A&M University - James T. Davis

ADMINISTRATIVE ADVISOR:

David H. Teem, Associate Director
Alabama Agricultural Experiment Station
Auburn, Alabama

REASON FOR TERMINATION:

The project objectives were completed and the termination deadline was reached.

MAJOR ACCOMPLISHMENTS:

Auburn University

A water circulator was designed, fabricated, and tested. This 3-hp device consists of a large casing, fan-blade impellers, flow stabilizer surfaces, bearings, drive system, motor, and support frame. It was tested at several combinations of shaft speeds, fan-blade sizes, and fan-blade widths. The best results were obtained with a 6-inch wide fan blade of 24-inches in diameter. Results for this fan-blade width are summarized below:

SPEED (RPM)	NO. FAN BLADES	ELECTRIC POWER	
		CONSUMED PER HOUR (KW)	DISCHARGE (GPM)
90	1	0.47	7,200
	2	0.58	7,400
	3	0.61	7,500
	4	0.67	8,000
120	1	1.40	9,500
	2	1.68	10,600
	3	1.79	11,000
	4	1.73	10,400
144	1	2.77	12,900
	2	3.40	12,400