

DISCUSSION

Shrimp Session

Discussion Leader: R. A. Wade

Discussion Panel: L. Demarest, S. Dobkin, E. M. Rome

Some Economic Aspects of Pink Shrimp Farming in Florida

L. G. Anderson

- Q. Provenzano:* What is the feeding ratio in pounds of food to pounds of shrimp?
- A. Anderson:* Twenty pounds of food per day for 180 days produced 1,000 pounds of food shrimp, or a conversion ratio of 3.6 to 1. I realize the biological significance of such conversion ratios but as an economist I must point out that there are many other things necessary to carry out this conversion. It's the high cost of these other items: (land, labor, and capital) that make the gloomy predictions of this paper necessary.
- Q. Feddern:* Why did you discontinue your economic analysis after fifteen years?
- A. Anderson:* The economic rationale for such a step is that we are uncertain as to what will really be happening even next year (i.e. prices, costs, and even the social and legal situation may change). It is not wise to count your profits too far in the future. Also when it is considered that profits in the future have to be discounted by the interest rate to compare them with money today, it is realized that the discounted value of profits 15 years from now is quite small. For example the

present value of \$40,990, the net cash flow of the 1,000 acre food shrimp farm 16 years from now is \$19,100 when the interest rate is 5% and \$2,200 when it is 20%. It can be seen then that you really don't add much to the present value of a project, and hence to its internal discount rate, by extending the project for long periods. For this reason it was decided to cut off the project after 15 years.

Refining Shrimp Culture Methods: The Effect of Temperature on Early Stages of the Commercial Pink Shrimp

A. Thorhaug

Q. Dobkin: Your results showed survival time for various temperatures for each shrimp larval stage. Were other physical conditions also investigated?

A. Thorhaug: We attempted to use optimum conditions for all the other variables so that we only varied temperature. However, we know that the combined effect of two nearly lethal factors is greater than either single factor acting alone. For instance, a shrimp stressed for both temperature and salinity will die more readily than one stressed for salinity alone. This same type of experiment should be carried out varying salinity, food, oxygen, light, and other important factors to determine the optimum combinations for rearing shrimp as well as the danger points. The shrimp seemed to require 31 ‰ salinity and vigorous air bubbling in our conditions. These have been previously discussed by Idyll *et al.* 1970.

Q. Rome: Did you conduct experiments with other species of shrimp?

A. Thorhaug: Yes. We were fortunate to receive some larvae of *Penaeus californiensis* several months ago. Although we do not have results comparable to the ones I just showed, they appeared slightly less tolerant of high temperatures in the later larval stages. There has been work on the temperature tolerance of the white shrimp by workers at the National Marine Fisheries Service Galveston biological laboratory, as previously mentioned.

Q. Demarest: Has there been experimentation with deeper tanks to increase larval survival?

A. Thorhaug: We have not personally experimented with different tank depths. It is obvious that the heat capacity and thus the fluctuations in temperature will partly depend on the depth of water in the tank. At Turkey Point three types of holding facilities are used: large indoor, temperature controlled tanks for the first naupliar stage; then out-of-doors, covered deep concrete tanks with running saltwater for stages up to post-larval; at this point shrimp are put into uncovered, relative shallow, large ponds.

The Distribution of Sediment Properties and Shrimp Catch on Two Shrimping Grounds on the Continental Shelf of the Gulf of Mexico

John R. Grady

- Q. Dobkin:* Is the organic content of the sediments high on the Tortugas grounds because of the presence of shrimp there rather than the reverse?
- A. Grady:* Shrimp would add to the total organic matter on the grounds although I have not computed how much this could be. Organic matter, when present in any amount, generally is held in higher concentrations by the finer particle sizes. Sediments just north of Rebecca Shoal and the Dry Tortugas have a slightly finer median diameter compared to the sediments outside the grounds, therefore, on the basis of the sediments alone, one could expect a slightly higher content there unless organic production was much lower than the other areas.

Management Guidelines for Predicting Brown Shrimp, *Penaeus aztecus*, Production in Louisiana

T. B. Ford

- Q. Demarest:* Do you need wider latitude and more time to control the brown shrimp season?
- A. Ford:* We do need more time. The revised law provides more leeway now. We are involved in a mixup, i.e., which group within the shrimp industry gets the first opportunity to catch the shrimp. We feel that we have good indications as to how it can be handled. The question is one of people management -- will the industry accept and abide by good management.
- Q. Rome:* Is there an overlap with brown shrimp and white shrimp cognizant with the season?
- A. Ford:* Yes, at times. During the past several years, we could have had a one week open season in certain areas for white shrimp prior to the brown shrimp season.
- Q. Dobkin:* Can you do this predicting by areas?
- A. Ford:* Generally we feel that this approach by itself is poor because it would concentrate the fishermen in one area. It is regretful to us that the opening date for each area cannot be satisfied now. We could not change it 3 or 4 weeks. Previously, it had to be May 1st to the 15th.
- Q. Good:* Does there appear to be any deterioration in the area?
- A. Ford:* In general, at the present time, some 3 or 4 areas are deteriorating rapidly. There is a possibility of retardation of this by the use of the river water and its sediments to

re-create land. We think that there are management opportunities for such a land-building process; however, it will cause numerous people management problems.

Q. Good:

Do you have other factual information relative to it?

A. Ford:

We have no specific information about regulating the flow of water on the upper tributaries of the Mississippi River but strongly suspect that it is practiced for flood control and navigation.

Q. Idyll:

I am interested in the people management thought. All regulation is not people management. Among the fishing industry in Louisiana, the boats could do certain things relative to harvest.

A. Ford:

The fisheries there are as we represent them. We hope we can gradually set aside these nursery grounds by a good management program. The first review of shrimp data was made with representatives of the shrimp industry in 1962. There has been good appreciation of these data. Nevertheless, we have a long way to go.

Q. Feddern:

Have you done anything with pesticides?

A. Ford:

We have not done anything relative to pesticides, such as bio-assays, at our marine laboratory. We hope to get into that. One of our difficulties has been time and competently trained personnel to handle this. All we know is that if crude oil is highly toxic, it is difficult to explain the high level of shrimp production in view of the substantial amount of oil offshore and inshore that occurs periodically. We found no evidence of damage in inside waters from the Chevron wild wells off Main Pass in 1970.

Q. Whiteleather:

Why are you having difficulties obtaining pond stock?

A. Ford:

One of the limiting factors in shrimp mariculture is postlarval shrimp for stocking ponds. The first culture efforts were made some time ago and considerable progress has been made, however, interest developed too rapidly without permitting time for solving the basic problems. I think we are about to see a reverse. Many are alert to the progress that is occurring and are watchfully waiting for a major breakthrough on the culture of brown and white shrimps. Another problem is ownership of wild shrimp entering private marsh ponds.