Crawfish Culture

MUDBUG FARMING

Percy Viosca, Jr.

THE CULTIVATION of crawfish in man-made impoundments seems destined to grow by leaps and bounds into one of Louisiana's leading agricultural industries, judging by the success of several pioneers in this field.

In the spring of 1960, the writer visited some 16 "crawfish farms" located mostly west of the Atchafalaya floodway. Many of these "farmers" were dabbling in crawfish cultivation on a trial and error basis without scientific guidance and without knowledge of the intimate facts in the life of the crawfish upon which scientific cultivation must be based.

During the 1959-60 crawfish season, these pioneer projects already comprised over 2,000 acres, with a production potential of as much as two million pounds of the tasty crustaceans annually. Some of the persons engaged in the new enterprise on a trial and error basis were already facing difficulties and were glad to have these straightened out by consultation with the writer. A number of them had hit upon right answers, sometimes by accident, but usually by close observation of crawfish in their natural environment. Most of the latter were glad to learn the whys and wherefores of their successes.

The knowledge of successes spread more rapidly than that of the failures, and numbers of new farms were constructed during the summer of 1960, with a vastly increased acreage devoted to crawfish culture. Whenever I learned of the location of a proposed farm, I contacted the owners and advised them of the pitfalls that must be avoided in an undertaking of this kind. For example, in some cases there were too many fish in the crawfish ponds or in the irrigation ditches, and I was able to show the farmers how to get rid of these fish by the use of a fish poison which is harmless to cattle and other livestock. In other cases, the farmers were advised to draw the water off their ponds on or about July 1, so that the crawfish could dig holes in which to develop and protect their eggs until hatching time.

Some of the farmers were rearing crawfish as their main crop and managing their impoundments either solely for this purpose, or with the possibility of developing secondary crops of bullfrogs and turtles. Some projects were originally constructed as hunting preserves for attracting wild ducks during the fall migration, but crawfish crops developed quite by accident and seem destined to more than foot the bill. Other pioneers were raising crawfish in rice fields, some in rotation with rice. One impoundment was made in a swamp for the purpose of floating out the harvestable timber, and the crawfish crops developed as an incidental by-product.

Existing crawfish farms already cover a great variety of terrain. Some are in alluvial lands where both front lands and back lands, or a combination of the two, are utilized. A number are in the prairie soils of southwestern Louisiana. The latter are mainly of two types, irrigation reservoirs and rice fields proper. Some are in drained wooded swamp, others in so-called reclaimed marshland, dead end products of the drainage craze, which have been waiting for real estate agents who never showed up. Crawfish culture may salvage many of these lost acres.

Some of the rice field projects point to the intriguing possibility that rice culture may be revolutionized by rotation with crawfish. One may be complimentary to the other, crawfish being a winter crop and rice a summer crop. Full credit for this last development must be given to one Vooheis Trahan, a full-blooded Cajun whose rice fields are located five miles south of Duson, Louisiana. Although Trahan has had no formal education whatsoever and does not know how to read or write, he is a keen observer of things biological. Starting in a small way, twelve years ago, Trahan has been producing crawfish...
Gravel filter box

on an increasing scale each succeeding year. Not only does he get a royalty of 10 cents per pound for his crawfish (all he has to do is to weigh them), but the value of his rice crop has been enhanced tremendously by rotating with crawfish.

Before using crawfish, Trahan netted $30.00 per acre per year for his rice, with crawfish he is netting $90.00 per acre per year for the rice alone. With crawfish, there is no need to let the rice fields lie fallow. They can produce a rice crop as well as a crawfish crop every year, and the rice is of the best quality, with no intermixure of red rice or other weed seeds.

Besides the facts gathered at various private crawfish farms, observations made at the state pilot farm near Henderson have also been very helpful, supplementing knowledge previously gathered by the writer from field and laboratory studies over a period of many years.

As this commission has been receiving daily requests for information relative to crawfish culture, we submit herewith a series of "Hints to Prospective Crawfish Farmers." While not the last word on the subject, we hope these hints will provide short cuts to success and enable beginners to avoid some of the pitfalls that might be encountered without some measure of scientific guidance.

Kinds of Crawfish to Rear

The red swamp crawfish (*Procambarus clarkii*) and the white river crawfish (*Procambarus blandingii*) are two large species which have been reared successfully in captivity for commercial markets. Smaller species can be reared for use as bait.

Soil Must be Water-Tight

The soil must be capable of holding water at all seasons of the year. Although the impoundments will be dry during the draw-down period (see below), there must be water in the holes which the crawfish dig to protect themselves and their eggs during the summer months.

Water Supply

Any source of water not heavily laden with objectionable minerals is suitable. It can come from wells, lakes or streams. Some artesian and well waters are too heavily charged with iron, bicarbonate of soda, or other natural chemicals, and these will be found to be unsuited to crawfish culture. Common salt (sodium chloride) is not objectionable and in moderate amounts is really beneficial. Water containing lime in the form of calcium bicarbonate is especially desirable, but if not present, lime can be added (see fertilizer).

Location of Intake Pipe

It is best to place the intake pipe near the bottom of a lake, bayou or canal, because bottom water is always richer in fertilizer values, especially phosphorous.

Screening of Intake Pipe

All intake pipes must be suitably screened to prevent entry of fish and other aquatic animals which might feed on crawfish or compete for their food supply. (See accompanying diagrams for intake screen and gravel filter box.)

No Overflow Necessary

An overflow is not only unnecessary but actually undesirable, because valuable fertilizer elements can be lost with the escaping water. In pond culture, it is only necessary to replace the water lost by seepage, evaporation, and that used up by trees or other plants whose foliage projects above the water surface (transpiration). A wooded pond requires much more water than one without trees.

Specifications for Levees

Levees with a vertical height of three feet are ample for crawfish culture. The best specifications call for a two-foot crown, a three to one slope on the wet side (pond side), and a two to one slope on the dry side (outer side). Specifications for such a levee will be as follows: height, three feet; crown, two feet; base 17 feet; section, 28.5 square feet; volume of soil per each 100 lineal feet, 105.5 cubic yards.

Depth of Water

Generally speaking, the deeper the water, the
The white river crawfish, *Procambarus clarkii*, suitable for commercial culture.

Larger the crawfish will grow before attaining maturity. Two to 2 1/2 feet of water is ample, but crawfish can be reared in water as shallow as six inches.

**Irrigation Period**

If water is available, crawfish will come out of their holes about October 1 to rear and scatter their young. Any delay after that date will delay the early crop the following spring, and this crop is the most valuable. Depending upon pump capacity and area to be irrigated, pumps can be started any time after September 15 so that there will be some water in the ponds by October 1, about the time of the first cool snap. Shallow water encourages raccoons, ibises (becroche), herons, and other animals which feed upon crawfish.

**Adequate Drainage**

It is essential to drain a crawfish pond once a year to kill off fish and other natural enemies. During the draw-down period (see next paragraph), the crawfish will dig holes for the protection of themselves, their eggs and/or young. A few small fish will sometimes survive by hiding in the crawfish holes, but the crawfish population will predominate as well as have a head start.

**Draw-Down Period**

This period should be planned to accommodate the crawfish which like to dig their holes and go below ground on or about July 1. So this is the best time to drain the water down to mud level, and then it may be allowed to evaporate down to a few inches below the surface of the mud.

**Fertilizer**

Fertilizer requirements are the same as would be given by the county agent for raising any crop requiring a high calcium fertilizer in the same type of soil, eg., cabbage, cauliflower, brussels sprouts, etc. Very acid soils (eg., sections of the Florida Parishes) will also require liming with perhaps a ton of lime per acre, but this should last for several years. Broken limestone or basic slag, the pieces being about a half-inch overall, is excellent for maintaining the proper chemical balance in acid soils for a period of years. Divide the fertilizer requirements for the given crop by 180 days (Oct. 1 to April 1) to get the average daily application per acre of water.

**Application of Fertilizer**

Fertilizer can be applied in one of several ways, whichever is most economical in a given instance. (1) Daily or weekly applications can be scattered from the shore, taking advantage of the direction of the wind. (2) Place the sacks of fertilizer on small tables or platforms placed in convenient locations and anchored so that the tops are about four inches below the water surface. (3) Place one sack on each table, cut it open with hatchet or knife, and let the wave wash dissolve and scatter it over the pond. (4) The best plan, however, is to scatter the fertilizer through the irrigation system. The cut open sacks can be placed in the gravel filter box and the pumps turned on as required. If applied weekly, use seven times the daily application. Longer than weekly intervals are not recommended.

**Vegetation**

We are experimenting with various types of vegetation at the pilot crawfish farm, however, for the present, we recommend no aquatic plant life other than the algae and underwater growths which come naturally in the water without artificial stocking. During the draw-down period (July 1 to September 1), land grasses and wild legumes will grow; or cow peas, lespedeza or other legumes can be planted over the area. These will die when the water level is raised on September 1, and their tissues will furnish food for the coming crop of young crawfish. This will be sup-

(Continued on Page 19)
APPROXIMATELY 65 MEMBERS of the technical section of the Mississippi Flyway council, along with U.S. Fish and Wildlife service personnel and prominent wildlife personnel from Canada, the Atlantic and Central Flyways, held their spring meeting February 14-16 at the Rockefeller Wildlife Refuge, as guests of the Louisiana Wild Life and Fisheries Commission.

The three-day meeting near Cameron, Louisiana, drew flyway council technical representatives from the 14 states comprising the Mississippi Flyway. It marked the first time that members of the council have met in Louisiana.

In addition to committee reports, covering a wide range of subjects ranging from major migration waves in the flyway, pollution and parasites, to crop depredation and other problems connected with management of migratory waterfowl and migratory birds, representatives at the meeting discussed mutual problems, plans and programs in which the flyway council is concerned.

Highlights of the meeting included an orientation talk about the Louisiana marshes and the Rockefeller Wildlife Refuge by Richard Yancey, assistant director of the Louisiana Wild Life and Fisheries Commission; and field trips into the refuge by marsh buggies and boats.

Those attending made numerous aerial inspections of the sprawling 85,000-acre wildlife refuge donated to the state by the Rockefeller Foundation, September 28, 1920.

Under the deed of donation, the Louisiana Wild Life and Fisheries Commission manages the refuge which provides sanctuary for approximately 600,000 ducks and about 35,000 geese.

In addition to providing winter refuge for migratory waterfowl, Rockefeller refuge also winters millions of migratory birds.

The objective of the council is to coordinate the efforts of all professional waterfowl workers and to assure a sustained population of waterfowl in the Mississippi Flyway in harvestable numbers.

At the first meeting of the Mississippi Flyway council in St. Louis in January 1952, the admin-
Baited nets are used in shallow water in the taking of crawfish.

Implemented by insect life which grows naturally or falls into the water. When the crawfish crop is alternated with rice, it is wise to leave the stubble and straw in the fields. This will not only furnish food, but the piles of straw will provide hiding places to protect the young crawfish from predatory birds.

Where to Secure Broodstock

Broodstock can be secured from commercial crawfish catchers and from dealers in market crawfish. Both Henderson and Pierre Part, Louisiana, are prolific sources of wild crawfish. Most of the rice field crawfish farms in southwestern Louisiana will sell broodstock for the initial stocking of new crawfish farms. A 50 lb. sack of live crawfish per acre seems ample for initial stocking. It is best to secure this stock whenever it is available at the lowest market price, which is usually about the end of May or early June, when the crawfish reach adult stage and get too tough and hard for market. Sometimes a source of broodstock develops in late summer or early fall when equinoctial rains or floods drive them out of their burrows, and they crawl overland at night. At this season it is only necessary to stock with females, as the eggs are already fertile. The males will die off anyhow and are only equal to so much fertilizer.

Harvesting

Although harvesting can be done in any pond as experience dictates, the early crop always brings the best prices. Standard crawfish nets and traps are the usual methods employed. A recent innovation is the use of floats from which hang lengths of cord which reach bottom. Fish hooks, preferably barbless (homemade hooks can be made by bending wire), are attached to the bottom ends of the cords and the baits are attached to these. The baited floats are placed in rows in the crawfish ponds. The crawfish catchers follow these rows of baits, scooping up each bait in turn with all of the crawfish which have gathered around it. The size of the mesh of these scoop nets should be sufficient to permit the escape of all crawfish under acceptable commercial size. Each baited hook with its float is then thrown back into the water a little distance to one side, thus forming another row. The crawfish are dumped from the scoop net into bushel baskets, floating tubs, or small boat-like floats.

Crawfish stew

- 30 lbs. live crawfish
- 2 cups flour
- 1 cup cooking oil
- 3 onions chopped
- 1 sweet pepper chopped
- 5 cloves garlic
- parsley and onion tops
- 2 cups water

Wash and cull crawfish. To approximately 10 gal. of boiling water add crawfish and scald for 5 min. or until half cooked. (This is very important, because they will break up and become mealy while cooking if they are not scalded long enough.) Cool and peel at once, separating the fat from the tails.

Make a golden brown roux with flour and oil. Add onions and saute. Add crawfish fat and stir constantly over low heat until oil comes to the top of mixture. Add water slowly. Add sweet pepper and garlic and seasoning to taste. Put on a very low heat and simmer for about an hour. Add tails and cook for 20 minutes. Cook in an uncovered pot. Add parsley and onion tops just before serving.

Feeds approximately 10 people.
Bednarik, waterfowl biologist, and biologists Lawson Reau and R. K. Martinson.

Missouri State Conservation Commission: Dick Vaught, Secretary-Treasurer, Mississippi Flyway Technical Section, Ted Shanks, waterfowl management, Harold Terrill, management, George Brakhage, waterfowl management and Robert L. Duncan, biologist.

Kentucky Department of Conservation: Frank Dibble, waterfowl biologist, Arnold Mitchell, Director, Division of Game Management and James Moynahan, biologist.

Tennessee Department of Conservation: Calvin Barstow, Supervisor, waterfowl management.

Arkansas Game and Fish Commission: Dave Donaldson, waterfowl biologist.

Louisiana Wild Life and Fisheries Commission: Richard Yancey, Morton Smith, Allan Ens minger, Bob Chabreck, Bob Harmon, Clarke Hauffpauri, and other commission personnel.

Mississippi Game and Fish Commission: John Pharis, P-R Coordinator, Henry Bobbs, Supervisor, Western Management Areas and Joe B. Sills.

U.S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife: Ed Addy, Atlantic Flyway Representative, Art Hawkins, Mississippi Flyway Representative and Raymond Buller, Central Flyway Representative.

Region III: Al Studholme, Chief, Division of Wildlife, Biologists Jerry Pospichal and Harvey Nelson, and Ross Hanson, pilot-biologist, Management and Information.

Region IV: Francis Gillett, Chief, Division of Wildlife, wildlife management biologists Royston Rudolph and Jake Valentine, wildlife research Biologists Ralph Andrews and John Lynch, and Jack Perkins, Refuge Division.


Canadian Wildlife Service: Bernie Gallop, biologist supervisor.

Wildlife Management Institute: Field Representatives Larry Jahn and Bill Allen.


Also attending the meeting from Louisiana State University were:

Dr. Leslie L. Glasgow, Professor, Game Management, and game management students John L. Bardwell, Ernest Jemison, Hugh Junca and John Davis.