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ABSTRACT—*In November 1988, three 0.04 ha ponds were stocked with juvenile (8 mm) red swamp crawfish hatched in the Rockefeller Refuge hatchery. Stocking density was 8.6/m² in ponds following an insecticide application to eradicate resident crawfish. After 190 days in the fed ponds, yield ranged from 127.8 to 206.3 kg/ha of mostly immature crawfish averaging 70 to 79 mm total length. Survival which ranged from 9.0 to 18.3% was the major limiting factor to production.*

Key words: Procambarus clarki, *crawfish culture, crawfish juveniles.*

INTRODUCTION

Crawfish culture continues to be one of the major freshwater aquaculture crops in the United States with over 60,750 ha in production. Louisiana alone reports an excess of 54,600 ha directed to this crop followed by Texas (6,800 ha) and South Carolina (400 ha) J. W. Avault, Jr., Personal communication). Twenty-five years ago, only 810 ha were in production (Lacaze 1970). With the exception of oxygenation and multi-cropping with rice, conventional culture methods have changed little. Brood animals are stocked, water levels manipulated and vegetation encouraged in the development of a food chain complex.

Generally, conventional methods provide adequate crops for market and brood stock (Avault 1973, Huner and Barr 1984); however, numerous atypical conditions suppress yields. For example, oxygen depletion, predators, levee washouts, forage depletions and pesticide drift may all lower production. In addition, conventional methods may require newly-constructed ponds to be idle till spring for stocking of brood crawfish.

Stocking of juvenile crawfish reared from hatcheries such as developed and described by Trimble and Gaudé (1988) would help a farmer recover sooner. Grow out, utilizing supplemental feeds, would complete the cycle of controlled culture of crawfish. Since 1968 (Smitherman et al. 1968) numerous reports indicate a potential for feeding (Clark et al. 1974, Huner et al. 1974, Romaire et al. 1978, Perry and Trimble 1990).

It was an objective of this study to document that red swamp crawfish (*Procambarus clarkii*) could be hatched in the laboratory and cultured to marketable size in earthen ponds.

MATERIALS AND METHODS

This trial was conducted at the Rockefeller Wildlife Refuge in southwest Louisiana. The hatchery phase began in May of 1988 with the selection of approximately 1,000 brood females (75 to 110 mm TL) from a demonstration pond at the refuge. They were placed in a hatchery very similar to the one

TABLE 1. Production of red swamp crawfish cultured in ponds from a hatchery, Rockefeller Wildlife Refuge, 1988–1989.

	Pond 46	Pond 47	Pond 48	Average
Stocking density (no./m²)	8.6	8.6	8.6	8.6
Yield (kg/ha)	127.8	186.1	206.3	173.4
Avg. size at harvest (mm±SD)	79±10.09	70±9.55	74±10.58	
Food conversion	4.1	2.8	2.5	3.1
Survival (%)	9.0	16.5	18.3	14.6

described by Trimble and Gaudé (1988). Females were placed, one each, in enclosures constructed of cross sections of 10.1 cm plastic pipe positioned vertically on trays. The trays, which each contained 10 enclosures, were stacked one on top of the other in columns of 6 to 10 and maintained inside a semi-greenhouse. Water depth in each tray was 1.9 cm and was checked at least every third day to replace water lost to evaporation. The young began hatching in September and were left with the female for 2–4 weeks. On 28 September 1988, 89 females with young were transferred into two 284 liter tanks in the laboratory. On 4 October 1988, two 0.04 ha ponds were each stocked with 3,500 juveniles. Total length averaged 8 mm and weight equaled 0.023 g. One week later a third pond was stocked with 3,500 animals of the same size. Brood females were not stocked.

The ponds were free of vegetation and contained a stand pipe to maintain water levels at approximately 0.5 m. Prior to stocking, the dry ponds were filled with approximately 0.4 m of brackish water and 10 ml of the insecticide Baytex applied (0.04 ppm). After one week, the ponds were dewatered and remained dry for a week after which they were refilled with brackish water filtered through 52-mesh saran.

A YSI Model 57 oxygen meter was used to monitor the ponds daily after sunrise. Beginning 5 October 1988, a pelletized marine ration (25% protein, Ralston Purina Co.) was distributed to the ponds.

On 15 February 1989, a 6 mm mesh sample trap placed in each pond revealed the crawfish to be approaching a harvestable size (75 mm). Beginning on 17 February 1989, crawfish were trapped from the ponds until low catches indicated the harvest was nearly complete. Also, the presence of a small size class began to appear in two of the ponds indicating that the Baytex may not have eradicated all of the resident female crawfish in burrows. Therefore the study was terminated 28 March 1989. The ponds were seined with a 24 m×1.8 m×6 mm bag seine and drained. All crawfish were weighed and subsamples taken for individual length measurements.

RESULTS AND DISCUSSION

Pond dissolved oxygen throughout the grow out period exceeded 2 ppm and water salinities ranged from 0.5 to 1.5 ppt, influenced only by rainfall. The pond temperature was 26°C when stocked, declined to 6°C 8 February 1989 and rose to 25°C at harvest 28 March 1989.