

Crawfish News



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More on Late-summer Crawfish Forage Planting and Forage Management

Crawfish Rice

Research has repeatedly demonstrated that there is no better forage crop to plant in crawfish monocropping systems than rice. When planted in early August, a stand of green rice provides good water quality during the early growth stages of young crawfish in the fall. The total amount of food in the pond increases until cold weather finally stops plant growth in the winter. The variety "Ecrevisse" was developed especially for crawfish forage but seed is in limited supply. Check with your seed dealers for availability of other commercial varieties of rice. Most rice varieties commercially planted in Louisiana are acceptable as crawfish rice if managed properly.

Planting rice in July and August can be difficult. Heat, insects and disease problems call for a slightly different approach to planting. The main problem with seeds and seedlings at this time of year is potential damage from very high water temperatures. Because of potential problems associated with hot water, dry-seeding is recommended over water-seeding. Plow the field and broadcast 80-90 lb of dry rice seed per acre, then lightly cover the seed. Drill-planting works well at 60-80 lb per acre. If you must resort to water-seeding, plant 100-120 lb of dry seed per acre into a shallow flood – as quickly as possible after flooding the field. Drain after 24 hours or when the seeds begin to germinate. Extended exposure to hot water can kill both ungerminated seeds and small seedlings. Flush the field to keep the ground wet, but make ditches through the field to eliminate puddles of standing water.

Once the rice is about 6 inches tall, apply 40 to 50 units of nitrogen fertilizer, and make a shallow flood. Add water as the rice grows, but keep the flood less than 6-10 inches until mid- or late September. Watch for signs of army worms or disease problems.

Sorghum-Sudangrass

Sorghum-sudangrass is a good and potentially less expensive alternative to rice as a crawfish forage crop. It grows well in the hot, dry weather of late summer, it produces a large amount of forage for crawfish in a short time, and it will persist long into the crawfish season. The seed cost is less than rice seed, and sorghum-sudangrass does not require irrigation, which will significantly reduce cost. It grows well in dry conditions. Planting date for sorghum-sudangrass is more critical than for rice. This forage should be planted in mid- to late August if you anticipate flooding the pond by early October.

If planted earlier, it may grow to over 10 feet tall and reach maturity, which is not desirable because lodging and massive leaf fall will compound water quality problems. A good height at flood up will be 6 or 7 feet. Unlike rice, sorghum-sudangrass ceases to grow significantly after flood-up, and for this reason it cannot be flooded early to achieve an earlier harvest of crawfish, as with rice. Also, another consideration during hurricane season is that excessive rainfall from tropical storms could kill or damage young sorghum-sudangrass if fields stay wet too long, which is not problem with rice. Research has shown that oxygen problems may be more severe in sorghum-sudangrass fields after flood-up than in green rice, potentially off-setting some of the cost savings in pumping compared to rice if you are required to flush fields after flood up to maintain water quality.

Sorghum-sudangrass should be drill-seeded at 20-25 lb/ac into a plowed seedbed or broadcast seeded at 25-30 lb/ac and lightly covered. Drains should be cut through the field to avoid puddles after a rain. Seedlings will die if flooded more than a day. As with young rice, watch for army worm infestations and treat if necessary. Fertilizer may help stand development, depending on soil fertility, so have your soil tested to obtain appropriate fertilizer recommendations. Be aware that sorghum-sudangrass seed has been every difficult to obtain the last two years, so if you are contemplating planting sorghum-sudangrass contact your seed supplier now to book seed!

Stubble Rice Management

Where crawfish will follow this year's rice grain crop, it is important to manage the straw and ratoon growth. The bad water quality caused by rotting straw will require frequent flushing to maintain suitable oxygen for crawfish. You can either bale or burn the straw to get it out of the pond. If you plan to burn it, let the straw fall into rows behind the combine and lightly flood the field before setting fire to the straw. Otherwise, the heat may kill the stubble plant.

Chopping and scattering the straw is better than leaving the thick rows unburned on top of the stubble plant, as long as rainfall or early flushing is sufficient to accelerate decomposition prior to the permanent flood. But you will still have a tremendous amount of rotting vegetation once you flood-up

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in the fall. So, be prepared to flush if timely rains are lacking. As soon as possible after harvest, apply 40 to 50 units of nitrogen fertilizer and then put a light flood on the field to stimulate growth of the stubble. A couple of inches of water will also start the decaying process of any straw that is on the ground. Do not let the water level get too deep because it may encourage the crawfish to emerge too early at a time when you cannot hope to maintain sufficient oxygen in the water. The hot water and low oxygen conditions in September can kill young crawfish. It is better for the crawfish to remain in the burrow until an initial decomposition of stubble and straw has occurred. Wait until mid-October to fully flood the pond.

Volunteer Vegetation

Volunteer vegetation is a nice way of saying “weeds.” This is not what we generally recommend as forage for crawfish, but we certainly have our share of these types of ponds in Louisiana, particularly when crawfish maybe secondary to waterfowl hunting. Ponds that rely on summer weeds to pro-

vide forage usually end up having bad water quality in the fall combined with insufficient forage supply to produce a good crop of crawfish. Most of these grasses and sedges die and decompose quickly when flooded. This leads to poor survival and delayed growth of young crawfish. As for the forage value, most of the terrestrial vegetation will decompose by winter, leaving little or no food left during the spring. Although this is the least expensive forage management practice, invariably these ponds have the lowest crawfish yield. Remember, “the cheapest way in, is often the most expensive way out.”

Providing a forage crop is no guarantee that you will have plenty of crawfish next season. On the other hand, not having a sufficient food supply or having the wrong type of vegetation could result in poor survival, late production and low production. Consider the investment you already have in stock and other preparations for crawfish, and make your decision about forage and water quality management accordingly.

Crawfish Biology

Reproductive Cycle

The life cycles of both red swamp crawfish and white river crawfish have evolved to allow them to adapt to cyclical annual low water, dry conditions and high water, flood conditions common to their natural habitats, such as the Atchafalaya river basin. Commercial crawfish aquaculture simulates this hydrological cycle, but with more precise control over when ponds are flooded and drained to optimize recruitment and subsequent crawfish production. Mature crawfish mate in open water. Sperm is stored in a receptacle on the underside of the abdomen or tail. Females will mate with more than one male, and the female will eventually retreat to a burrow to spawn. Although spawning can take place in open water, the burrow provides protection while the eggs and offspring are attached to the abdomen.

Burrowing activity for reproduction can occur at any time of the year, but it is most prevalent in late spring/early

summer. Crawfish of all ages and sizes, whether mature or immature, male or female, will construct burrows or retreat to existing burrows to survive dry periods. Prior to draining, mature crawfish burrow near the water line, and as the water level drops, crawfish burrows follow the waterline. Some burrows are found on the pond bottom after draining, but those often contain a high percentage of males and immature crawfish.

Egg development in mature females usually begins prior to burrowing and is completed in the burrow. Individual eggs within the ovary become spherical, enlarge and change color from white or cream to dark brown as they mature (Photos). At maturity, the large black eggs are expelled, fertilized externally with sperm that has been stored by the female and are attached to the “swimmerets” under the tail with an adhesive substance called “glair.” Although crawfish can survive in a high humidity environment within the burrow, some free-standing water in the burrow is necessary for successful spawning. The number of eggs laid varies with size and condition of the female and will usually range from 200 to 300. Large females can have more than 500 eggs.



Female with white (immature) eggs (left) and with black (mature) eggs (right). Eggs are nestled in-between two lobes of crawfish “fat”.

The incubation period depends on temperature, but it takes about three weeks for eggs to hatch at 74°F. Hatchling crawfish remain attached to the female’s swimmerets through two molts. After hatchlings become detached from the female, they tend to remain with her for several more weeks. It is critical that the female and her young leave the burrow within a reasonable time after spawning because little food is available in burrows, and the female may cannibalize the young.

Controlling Army Worms in Late-planted Crawfish Forage Crops

Fall Armyworm can substantially threaten forage crop production for crawfish, whether the forage be rice or sorghum-sudangrass. Large populations of fall armyworms may invade the forage crop for a variety of reasons, the primary one being that their previous host has been harvested. This movement into the crawfish forage crop has typically been observed in areas where corn, grain sorghum or milo or other grass-type plants have been harvested near a rice field.

Fall armyworms have a distinct Y-marking on their head capsule that can be used to distinguish them from other species of armyworms (photo). Armyworms damage forage crops by cutting down seedlings.



Fall armyworm on young rice plant (Photo by J. Saichuk).

This damage can be extensive enough to require replanting. To scout for armyworm damage, look for cut and ragged leaves and then for the armyworm caterpillars on the plants or in the whorls.

Because the crop you are trying to protect will soon be food for crawfish, it is important to avoid applying any products to that crop that could potentially kill crawfish. Most synthetic insecticides are highly toxic to crawfish. This is true because crawfish have physiology that is similar to insects. At this time, there are

limited options for control of fall-armyworm attacking crawfish forage crop. The first option is the application of *Bacillus thuringiensis* (Bt foliar spray). It is important that Bt be applied to young caterpillars. First and second instar caterpillars are most susceptible to Bt.

A second option for rice is to flood the field for two to three days to drive armyworms up onto plants where they will be more susceptible to attack by predators such as birds. The flooding also may drown the armyworms. Be sure to avoid completely submerging plants to avoid plant mortality from the flooding. Flooding in young sorghum-sudangrass is not an option in most cases because fields cannot be flooded and drained quickly enough to prevent crop failure or set back from waterlogged soils. Finally, try to avoid planting a forage crop near a host field that will be harvested soon.

So, is insecticide use for control of armyworms a potential option? Crawfish in capped or sealed burrows are probably not exposed to insecticides used in foliar applications for control of fall armyworms, but the potential impact of residues on crawfish health is not known. The insecticides Karate Z, Mustang Max, Prolex and Proaxis, labeled for use in controlling fall army worms in rice, have label restrictions that state, "Do not use treated rice fields for the aquaculture

of edible fish and crustaceans." Other insecticides used to control fall armyworms in pasture and forage crops, including sorghum-sudangrass, include Sevin, Lannate, Tracer and Methyl Parathion. Although the labels for these chemicals do not specifically state that the fields cannot be used for the aquaculture of edible fish and crustaceans, most have specific warnings as to their toxicity to aquatic invertebrates, which of course, includes crawfish. Contact your local county agent if fall armyworms attack your crawfish forage crop. They can provide you with the latest information and best course of action for fall armyworm control.

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Frequently Asked Questions

Question: Is early season crawfish yield in the fall limited if I hold water and trap well into the summer the season before, say June and July?

Answer: This is good question for which we have no pat answer because no research has been conducted on this subject. There are two general thoughts as to the implication of harvesting into June and July on the next season's early crawfish crop. One view is that harvesting into June and July will significantly decrease the prospects of having an early crawfish crop, based on the theory that the population will be sufficiently reduced resulting in fewer holdover crawfish that will be available to harvest in fall and early winter. Holdover crawfish (those not trapped the previous production and survive the summer in burrows) contribute heavily to early season crawfish production. The contrasting view is that trapping later in the summer may have no significant effect on reducing the early season catch of holdover crawfish. The rationale here is that by holding water later into the summer, some late recruits of red swamp crawfish that enter the population in March and April potentially have time to reach a size that allows them to survive the summer better, plus the time they are in burrows is shorter if the pond is kept flooded later into the summer. This potentially results in higher survival in burrows, and thus more would be available for early fall harvest. There is research that shows small, immature crawfish that are forced to burrow when ponds are drained in May or early June may not survive the summer as well as larger, mature crawfish. If you see large numbers of young crawfish in May and June you may want to consider holding water for a while to let them mature, whether you choose to harvest them or not. Until such time that research information is available on this topic, the decision on whether to fish late into the summer is ultimately yours to make.

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Additional information on crawfish aquaculture is available on the LSU AgCenter Web site at

www.lsuagcenter.com/en/crops_livestock/aquaculture/crawfish

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Crawfish Production Economics Survey to be Conducted

Dr. Jeff Gillespie, Department of Agricultural Economics and Agribusiness, LSU AgCenter, with graduate student Narayan Nyaupane, will conduct an in-depth survey of Louisiana crawfish farming production practices. The survey will address two main areas: (1) the range of production systems and inputs used by producers and (2) the adoption of technology by crawfish producers. Results will be used primarily to update the production practices annual cost estimates for Louisiana crawfish production. The survey will be mailed to about 500 crawfish farmers. If you are chosen for the survey, please take the time to answer the questions. All responses are confidential. The survey is anticipated to be mailed in late July and early August.



The Louisiana Crawfish Promotion and Research Board met at the La. Department of Agriculture and Forestry building in Baton Rouge on May 8. A new board, appointed by Commissioner of Agriculture Dr. Mike Strain, was sworn in. The major topic of discussion was development of written protocols and guidelines for conducting business at future board meetings. The Louisiana Crawfish Farmers Association, Louisiana Crawfish Promotion and Research Board, and the Louisiana Catfish Farmers Association hosted a legislative aquaculture luncheon on June 18 at the Pentagon Barracks near the state Capitol to show their appreciation to the state legislature for their efforts on behalf of the state's crawfish and catfish aquaculture industries.

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