Southeast Asian Fisheries Development Center **Aquaculture Department**

SEAFDEC/AQD Institutional Repository **http://repository.seafdec.org.ph**

Journals/Magazines Aqua Farm News

1994

Pond culture of siganid on a commercial scale

Aquaculture Department, Southeast Asian Fisheries Development Center

Southeast Asian Fisheries Development Center, Aquaculture Department (1994). Pond culture of siganid on a commercial scale. Aqua Farm News, 12(5), 10-12.

http://hdl.handle.net/10862/2534

Downloaded from http://repository.seafdec.org.ph, SEAFDEC/AQD's Institutional Repository

Pond culture of siganid on a commercial scale

*(The following article is based on the paper presented by M. Urmaza, Sr. at the First National Conference of Fishpond Operators in April 1983. Featured in **Greenfields Magazine**, Vol. 13(6) June 1983)*

Two siganid species - *Siganus vermiculatus* and *Siganus teuthis corallina* - are cultured in the Philippines. These are identical except for the marks on their bodies. *S. vermiculatus* is generally light gray with very distinct spiral lines all over its body. On the other hand, *S. teuthis corallina* is also light gray, but has blue spots that are smaller than mongo seeds.

Both species are oblong, with poisonous spines on their dorsal, ventral and anal fins. Their mouths are small and lined with fine teeth. They feed on water plants, especially filamentous or green grass algae and water *digman*, and disintegrated shells of dead mollusks.

Other siganid species are not cultured for food because they don't grow big and some are raised as ornamental fishes.

These usually appear in tidal flats and near the mouth of big rivers that are not very far from gulfs. Schools of siganid fry swarm two or three days before and after the last quarter of the moon and new moon in February to early October. Sometimes, schooling is unpredictable; it may occur two days before and after the full moon.

The common breeding places of gravid siganid are near the mouths of rivers where the fry grow to about 10 mm long. As they grow bigger, they migrate to tributaries or streams with brackishwater, living under the shade of dead thorny branches of plants and other vegetation. Fish farmers buy "starter" fingerlings from fishermen who maintain fish shelters in rivers and streams.

Fry for transport over long distances are placed in double polyethylene bags (measuring 50 by 75 cm) which are, in turn, placed in buri or pandan bags.

The fry are placed in polyethylene bags filled with brackishwater and oxygen which can hold 200 10-mm fry.

Siganid fingerlings can be transferred from one pond to another by means of bamboo baskets (kaing) lined with moist green grass algae. The fish must not be kept out of water for more than 15 minutes. Don't stock siganid in freshwater. The fish may survive in a freshwater fishpond only if gradualy acclimatized. Never place fingerlings in an open container filled with brackishwater nor transfer them from one pond to another when rain is imminent.

You may also transfer fingerlings using floating bamboo or wooden baskets. After filling the baskets with fingerlings, tow these with a banca or motorboat to the stocking point.

Nursery pond. Fish farms usually have three ponds, and the smallest of these is the nursery pond - the seed bank of a fish farm, and should be at least five percent of the total fishpond area. Thus, if the total fishpond area is two hectares, the nursery should be 1,000 sq m.

The siganid nursery should be much deeper than the bangus nursery, and adjacent to a river so that, if necessary, the water can be readily replenished at high tide.

Before stocking, get rid of predators or competitors by drying the nursery pond, but not to the extent of cracking the pond soil.

The food recommended for siganid fry is the young, fine filamentous green algae (*Chaetomorpha* or *Cladophora linum* species). You may also use *Enteromorpha tubulosa* if it is available. Both species are found in fishponds and rivers.

Plant filamentous algae in small clumps throughout the nursery pond. Do this late in the afternoon or early in the evening when water is cool so the algae won't float and be exposed to the sun the following day. When

the algae have grown halfway between the pond bottom and the water surface, stock the pond with fry.

To provide fish with a continuous supply of food, construct a secondary dike across the middle of the nursery pond. Also build a small check-gate to facilitate draining and flooding, and fish food production. Alternate the planting and grazing of algae in the two lots when algae in the first lot is consumed, screen it and drive the fish to the second. Then plant the grazed lot with algae.

Stocking. Stocking the nursery pond with fingerlings should be done early in the morning or late in the afternoon. However, during cool, cloudy periods, stocking can be done anytime of the day. Stocking rate is 20-30 fry/m^2, depending on the volume of food in the pond.

Put a bamboo screen or nylon net on the check-gate or water control pipe to prevent escape of fry and entry of predators and competitors when pond is changed. Siganid fry are sensitive to stagnant water and sudden changes in water temperature and salinity, so allow new water to come in every high tide. This will also improve water aeration. Always maintain water depth at highest level in the pond.

Transition pond. The transition pond, larger than the nursery pond, is an essential part of a fish farm. In this pond, the fish farmer hastens the growth of fingerlings so that when the fish are transferred to the rearing ponds, these will reach market size within a short time.

Ideally, this pond should be one-fourth to one-third of the size of the total fishpond area. It should be adjacent to the nursery and rearing ponds to facilitate transfer of fingerlings and sub-adult fish. Construct a secondary dike across the middle of the transition pond to facilitate rotational planting of green grass algae.

Build a check-gate at a place where obstacles can not impede water flow when the pond is drained or flooded. Always fill the pond with fresh brackishwater every high tide.

The culture of fish food in the transition pond is the same as in the nursery pond. Gather floating algae that have turned dark brown or gray, then throw these to places in the pond where no algae are growing. When you do this, sunlight will reach the algae growing beneath the water surface, inducing these to grow faster and produce an even growth of algae. Keep the water deep, and check the pond dikes for leakage and seepage.

Stock siganid fingerlings at the rate of 6-10 /sq m, depending on the amount of fish food in the pond. You may also stock in the transition pond only the number of fish you want to raise in the rearing pond, add 5-10% of this number for mortality allowance. If the pond has thick algal growth, make pathways where fish can freely swim and graze.

Transfer sub-adult fish to the rearing pond as soon as these reach the desired size. Do this early in the morning or late in the afternoon, preferrably when tide water is entering the pond. ***Always handle fish with care.*** The rearing pond is the final place to grow siganid and 1-1.5 m deep is very ideal for growing them. The fish farmer must give more attention to fish food production, since the number of fish he can stock largely depends on the amount of fish food in it.

Rearing pond. To prepare the rearing pond for the next crop, clean and completely drain it dry for one or two days. Remove all fishes usually tilapia that may disturb the growth of the algae. Plant the filamentous green algae, following the steps discussed in page 13.

When there is enough algae in the pond, it is ready for stocking. Don't wait for the algae to float. Stock the pond with fish when algal growth has gone halfway between the pond bottom and the water surface during the highest tide. When fish are stocked at this stage of algal growth, they will have ample space to swim and graze, and the floating of the algae will be delayed.

Stocking rate is 1,500 to 2,000 fingerlings per hectare, depending on the volume of fish food in the pond and the size of the fish to be stocked.

Freshen the water of the pond by letting in tidal water before carefully transferring the

(to page 12)

10 reasons why siganids are attracting attention of mariculturists according to T.J.Lam:

1. Siganids (or at least some species) are considered excellent foodfish by many peoples in the Indo-Pacific and Eastern Mediterranean. The fish is meaty and tasty, and shows a relatively high protein content. The existing demand and market potential are high.
2. They are primarily herbivorous in nature but may turn to other diets readily. Thus, in captivity they can feed on a wide variety of foods offered.
3. During certain seasons, large numbers of siganid fry can be collected from coastal waters for cultivation in coastal ponds, enclosures, tanks or floating cages.
4. Some (if not all) species are gregarious (schooling) and thus may be able to tolerate crowded conditions.
5. They appear to be tolerant of changes in salinity and temperature.
6. They appear to adapt well to captivity and grow rapidly on a diet of natural food (algae or other plant materials) or artificial feed pellets.
7. They can tolerate any type of pond soil, provided vegetation is present.
8. Some species have already been traditionally farmed in coastal ponds either in monoculture or, as is generally the case, with milkfish.
9. Two species has been induced to spawn in captivity, both of which have even spawned spontaneoulsy in captivity. Mature fish are available from natural source for this purpose predictably at certain times of the year.
10. One species has been raised from eggs to adults in the laboratory in Japan, although in other species larval mortality remains a major problem.

from page 11...

fish using fine scoop and suspension nets at early dawn or at night. Make sure that the fish are not overcrowded in containers, and that the pond water is not turbid or freshwater.

Never transfer fish when these are undernourished or during inclement weather. If the pond is fully filled with algae, provide a path for the fish.

An ideal siganid pond is one that directly draws brackishwater from a river. ***A fishpond that relies on an adjacent fishpond for water supply will fail.*** A fish farmer who wants to raise siganid must also bear in mind that a slight rain or even a shower can kill the fish if pond water is shallow and not replenished with brackishwater.

Harvesting the siganid. Harvest siganid 90-120 days after stocking in the rearing pond. To do this, use joined screens made of woven bamboo splits, one meter tall and six meters long, supported by bamboo poles. Place the screens at one end of the pond, and push these slowly toward the opposite end. Put shading materials - small tree branches and grasses - on the corner of the pond where the catching chamber will be erected, so you won't disturb the fish.

Never allow your pond workers to go in front of the screens because siganids tend to hide in foot holes made in the muddy pond bottom. Water depth of not less than one-half meter is preferred during screening of pond.

As the screens get near the catching chamber, start removing tree branches and grass. By the time the last shading material is removed, the fish will be trapped in the catching chamber. The screens or a purse net, held up like a hapa net by bamboo poles, may serve as the catching chamber.

Catch the trapped fish with a scoop net and transfer them to big baskets (*kaing*). The fish will reach the market fresh and command a high price if you immediately transfer them to a container filled with ice water.