2006

Living with suso in bangus ponds

Aquaculture Department, Southeast Asian Fisheries Development Center

Aquafarm tip

What is the problem?

Too many *suso* in brackishwater → *lablab* does not grow → not enough food for *bangus* → low *bangus* production

What has been the solution?

Triphenyltin (TPT) molluscicides Brestan and Aquatin

BUT:

Brestan and Aquatin are banned in the Philippines. Use of Brestan continues (it is smuggled at higher cost). TPT is harmful to animals and people.

What does SEAFDEC/AQD recommend?

Integrated pest management (IPM) of *suso* in *bangus* ponds

Why IPM?

IPM is an important component of responsible aquaculture. IPM is effective. IPM is easy as 1, 2, 3!

Old perspective: War against *suso*

Who is the enemy? *Suso*
What is the weapon? TPT Brestan and Aquatin
Problems in the war: *Suso* persists, TPT banned
Collateral damage: adverse effects on animal and human health, ecological imbalance in the ponds and mangrove areas.
Wanted: Another weapon—must have!

New perspective: Life with suso and IPM

Challenge: How to manage *suso* through IPM?
Strategy:

- Do not use pesticides in fish farms.
- Understand the *suso*, the mangroves, and the ponds. Assign blame correctly — low *bangus* production may be due to factors other than *suso*.
- Sun-dry pond thoroughly after harvest to kill suso. Better still, recognize *suso* as a resource and find uses for it.

www.seafdec.org.ph
AQUACULTURE DEPARTMENT
Southeast Asian Fisheries Development Center
5021 Tigbauan, Iloilo, Philippines
Tel (63-33) 511-9174, fax (63-33) 335-1008
aqdchief@aqd.seafdec.org.ph

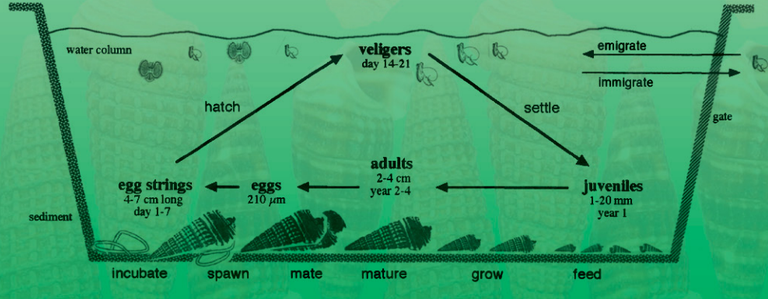
The **Southeast Asian Fisheries Development Center (SEAFDEC)** is a regional treaty organization established in December 1967 to promote fisheries development in the region. Its Member Countries are Japan, Malaysia, the Philippines, Singapore, Thailand, Brunei Darussalam, the Socialist Republic of Vietnam, Union of Myanmar, Indonesia, Cambodia, and Lao People's Democratic Republic. The policy-making body of SEAFDEC is the Council of Directors, made up of representatives of the Member Countries. SEAFDEC has four Departments that focus on different aspects of fisheries development:

- The Training Department in Samut Prakan, Thailand for capture fisheries
- The Marine Fisheries Research Department in Singapore for post-harvest technologies
- The Aquaculture Department in Tigbauan, Iloilo, Philippines for aquaculture research and development
- The Marine Fishery Resources Development and Management Department in Kuala Terengganu, Malaysia for the development and management of fishery resources in the exclusive economic zones of SEAFDEC Member Countries

The **SEAFDEC Aquaculture Department** is mandated to:

- Promote and undertake research on aquaculture relevant and appropriate to the region
- Encourage human resource development in aquaculture through training and extension
- Disseminate and exchange information in aquaculture

Living with *susò* in *bangus* ponds



Life history of 'suso' *Cerithidea cingulata* in mangrove-derived brackishwater ponds.

1 Recognize that Brestan and TPT (triphenyltin) molluscicides are harmful. Do not use banned pesticides in bangus ponds.

- TPT kills *suso*, but also kills or damages other small animals, bacteria, and algae inside and outside the ponds.
- TPT used in ponds does not kill *bangus*, but accumulates in fish tissues.
- TPT belongs to a group of benzyl or phenyl compounds that can cause cancer in mammals.
- People who eat TPT-laden *bangus* and other food products accumulate TPT in their tissues over time and TPT may reach levels that can cause health problems.
- Farmers who have worked in rice fields with Brestan have suffered from skin and nail disorders.
- Brestan and Aquatin are banned pesticides and illegal use carries penalties.
- Use of TPT might be an economically cheap quick fix to the *suso* problem, but the ecological and health costs are very high (though hidden).
- Filipinos eat a lot of *bangus*. If more Filipinos knew that the *bangus* they eat contain TPT, less of them will eat *bangus*, or many of them will eat less *bangus*.
- As much as possible, pesticides should not be used in fish farms. The FAO Code of Conduct for Responsible Aquaculture calls for farming methods that produce healthy and wholesome seafood.

2 Understand the suso, the mangroves, and the ponds. Suso are just making a living.

- *Suso* and *bagongon* are native residents of mangrove areas. In intact mangrove forests, *suso* and *bagongon* live together with many predators and competitors and their densities are low (1-100/m^2).
- *Bangus* ponds are built mostly in mangrove areas.
- The fish pond is a simplified, ecologically unbalanced, but food-rich enclosure that favors *bangus* growth and production, but also *suso* growth and reproduction.
- Only ponds in mangrove areas have abundant *suso*.
- Only *suso* become very abundant (100-5,000/m^2); *bagongon* are bigger and are harvested for food.
- *Suso* thrive in disturbed and polluted sediments, such as in fish ponds, where other species are excluded or killed.
- *Suso* live the entire life cycle in ponds. Adults lay eggs throughout the year, but more in March-September. Eggs hatch into larvae that are retained in the ponds for two weeks at a time between tidal water change, long enough to settle at the bottom as juveniles.
- *Suso* larvae are also carried in the water intake from the mangrove areas and pond canals to ponds.
- *Suso* eat fine sediment with bacteria and microscopic algae, but not the larger components of *lablab* or *lumut* that *bangus* eat. *Suso* do not compete with *bangus* for *lablab*.
- *Suso* eggs laid on *lumut* and *lablab* at the pond bottom are probably eaten by *bangus*.
- *Suso* compete with *lablab* for space. When the pond bottom is disturbed by too many *suso* (or otherwise becomes inhospitable to initial growth of diatoms and blue-green algae), the *lablab* mat can not get started.
- *Suso* congregate in shallow-water areas, pond banks, puddles) where they can access water, soil, and air at once.
- *Suso* are difficult to kill. They can retract into the shell for extended periods and can withstand exposure to pesticides, other chemicals, and adverse environmental conditions.
- *Suso* are killed by drying under the sun and by high levels of gaseous ammonia in the water.
- *Suso* have been found to have high levels of arachidonic acid, an essential fatty acid that improves growth of fish.
- Look at your farm and your operations and your production record. Is your low production really due to *suso*? Is your farm built and operated for optimum production?
- Record the density of *suso* in your ponds several times over one year, especially after harvest. Count the *suso* in at least three quadrats (each 1 meter x 1 meter) in each pond, choosing sections of the pond where the density seems high, medium, and low. Get the average *suso* density per square meter.
- Record the *bangus* production in the same ponds over one year. What relation do you see between *suso* density and *bangus* production?

Drain and dry the pond until the bottom soil cracks.

3 Farm bangus responsibly. Apply IPM (integrated pest management) on suso in bangus ponds.

- Commit yourself and your farm to the production of healthy and wholesome bangus— 'organic' or 'green' bangus.
- If average suso densities after the fish harvest are higher than 100/m^2, apply IPM interventions as follows.
- Drain and sun-dry the ponds completely. This requires that the pond bottom is flat and even (no puddles) and inclined towards the exit gate. Under the sun, suso die in a week and the eggs even sooner. Sun-drying also helps the lablab get started and flourish when the pond is flooded.

  Complete sun-drying is low-cost, local, low-tech.
- Collect suso by shovel and use for duck and crab feed, shellcraft, lime-making, road-filling, or as feed ingredient and source of arachidonic acid.
- Where ponds have many puddles and can not be dried, suso congregate and survive. During pond preparation, apply ammonium sulfate (10 g/m^2) and lime (100 g/m^2) to suso in these puddles. Or apply tobacco dust at 70 g/m^2 or 10% metaldehyde at 10 g/m^2 only in the puddles.
- Install adequate screens at the gate to prevent adult and juvenile suso from crawling from the canals into the ponds.
- Prevent the entry of suso larvae (veligers) into the ponds. Schedule water intake on days with low veliger counts. Check the intake water; if it has too many veligers (>100/liter) or more veligers than the pond water, postpone water intake if possible.
- During grow-out, expect lablab to be depleted by the bangus stock in 30-45 days, depending on the stocking rate. Move the stock to another pond with fresh lablab, or use commercial pellets during the last 1-2 months.

Harvest of snails from ponds effectively removes the spawning population.