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Aquafarm tip

What is the problem?

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

What has been the solution?

Triphenyltin (TPT) molluscicides Brestan and Aquatin

BUT

TPT is harmful to animals and people. Brestan and Aquatin are banned in the Philippines, but use of Brestan continues.

What does SEAFDEC AQD recommend?

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

Why IPM?

IPM is part 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: Bad effects on animal and human health, ecological imbalance in the ponds and mangroves

Wanted: Another weapon—another snail-killer!

New perspective: Life with *suso* and IPM

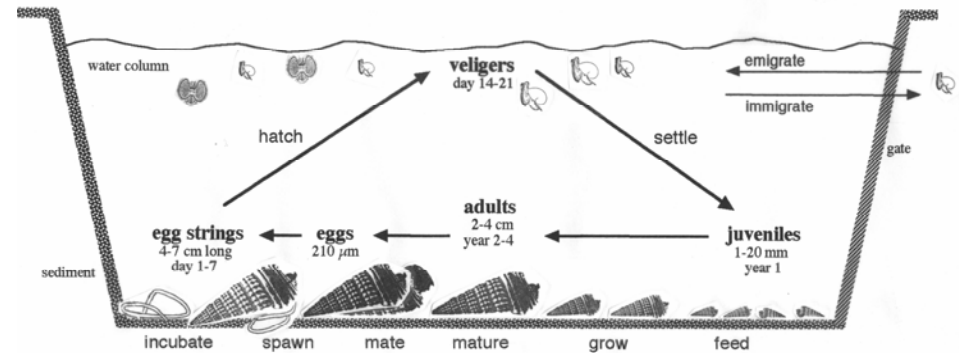
Challenge: How to manage *suso* through IPM?

Strategy:

1. Do not use pesticides in fish farms.
2. Understand the *suso*, the mangroves, and the ponds. Assign blame correctly — low *bangus* production may not be due to *suso*.
3. Sun-dry ponds thoroughly after harvest to kill *suso*. Recognize *suso* as a resource and find uses for it.



Living with *SUSO* in *bangus* ponds



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

1

Do not use banned pesticides in *bangus* ponds. Recognize that Brestan and TPT snail-killers are harmful to people.

- 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.
- 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 the fish body.
- Triphenyltin 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*.

2

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

- 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?
- *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/m²).
- *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/m²); *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.
- Ponds are also seeded with *suso* larvae carried in the water intake from the mangrove areas and pond canals.
- *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 high ammonia levels and by drying under the sun.
- *Suso* have been found to have high levels of arachidonic acid, an essential fatty acid that improves growth of fish.

3

Farm *bangus* responsibly. Apply IPM 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/m², 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.

It is good low-tech that must be reapplied.

- 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/m²) and lime (100 g/m²) to *suso* in these puddles. Or apply tobacco dust at 70 g/m² or 10% metaldehyde at 10 g/m² 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.

