Rural Training Center-Thailand

2008 Winter Farm Update 3

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Community-based environmental education for the self-sufficiency and sustainability of small rural family farms

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Commercial fish food is an off-farm expense we try minimize.

OFF (On-farm Fish Food)

In our continuing effort to reduce off-farm expenses, we began exploring on-farm alternatives to commercial fish food. We raise tilapia and catfish in our ponds. Tilapia are omnivores, but we feed them mostly plant materials. Catfish are mostly carnivores, but also eat some plant materials. Commercial feed can cost about 450 THB (~$13 USD) per bag. (This is about 3 days wages.) We were using about 1 bag a week to feed fish in our 3 ponds.

Plant materials were our first source of alternative fish food. Rice bran (husk removed in the milling process) from our family rice supply is fed to the fish. Naturally occurring aquatic plants (water morning glory and duckweed) were logical choices. These are considered renewable food sources and thus help us along the path to sustainability.

Duckweed is a small fast growing water plant.

Water morning glory grows in our fish ponds.

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The water morning glory (naturally growing in the ponds and on land) is cut into smaller pieces and fed to the fish

Catfish coming up to eat on leftover rice via hand feeding..

Selected Kitchen Scraps

Vegetable kitchen scraps from food preparation and from the table can be used for fish food. We were rinsing some dishes in the fish pond before taking them home to wash. That's when we discovered the catfish loved to eat the leftovers from the dishes.

Normally, we compost all the vegetable materials from the kitchen and table. But now we can also use these "wastes" to replace of the expensive commercial fish food. This is one more way of getting money to enable small farmers to help pay off their debts.

Fresh Fly Larvae to Feed Fish

Waste meat scraps put in a plastic bag and left out for flies to produce maggots (fly larvae). This happens very quickly. The maggots (the small white spots in the right-hand photo) and meat scraps are then fed to the catfish. This takes advantage of a naturally occurring insect and process freely available on many farms. This is another free fish food found on the farm.

Termites

Termite mounds are readily found in the forest.

Termites are commonly found on the farm and in the forest watershed above the farm. The termite mounds are dug out and carried down to the fish ponds. Using a knife to cut open the mound, you can readily extract the termites to feed the fish.

Catfish are carnivorous and seem to relish the fresh termites. Insects are well known for their ability to reproduce in large numbers. Termites as fish food can be considered a renewable resource.

The mound is dug out and carried to the fish pond where it is cut open.

Termites are a free source of fish food. It is doubtful we will ever run out of termites on the farm or in the nearby forest. So termites are an abundant free fish food.

Using termites for fish food is also a form on Integrated Pest Management (IPM). It does not require any synthetic chemicals. This is an environmentally friendly way to get rid of termites. The lack of chemicals also improves the food quality and security aspects of our farm fresh diet.

. We use a knife to cut open the mound, expose the termites and shake them into the water.

The catfish seem to relish the fresh termites (the small white spots on the water..

Crickets

Common field crickets are readily available in most farm fields. They are easy to raise and reproduce in captivity. It is fairly light work to raise crickets. This can be done by the elderly or very young children. In many rural farm families, the more able workers may have left the farm to earn money to support the family.

We use pre-cast concrete barrels to raise crickets. A dish with sand or burnt rice hulls is provided for egg laying. Food consists of cut grass. Dried leaves provide bedding. A shallow dish of water or a wet sponge is adequate for their water supply.

Window screening is secured over the concrete barrel using an elastic band. The screening isn't to keep the crickets. It's to keep lizards, spiders, and ants out.

Both catfish and tilapia will eat crickets thrown into the fish ponds. The catfish tend to be more aggressive and pursue the crickets. The tilapia seem to have more difficulty getting the crickets. But once the cricket breaks the surface tension of the water, the tilapia eat them quickly.

Crickets can also be fed to chickens and other poultry (e.g. ducks, geese, etc.). This can also reduce the cost of buy commercial feed for these animals on the farm, too.

Crickets fed to fish in lieu of commercial fish food.

Common crickets caught on the farm are raised as supplementary fish food.

Raising crickets in pre-cast concrete barrels is not labor intensive. It can be done by the elderly and children.

Fried crickets are also a northern Thai delicacy and can be included in the family meals as well. The crickets can also be sold to restaurants to generate added income for a farm family.

The multiple uses for crickets on a family farm and the low cost make raising crickets an ideal sustainable farm practice. Multiple uses of farm resources is also an aspect of farm integration. The more integrated the farm systems become, especially when fitting with local ecosystems, the closer we come to a sound ecological balance.

Crickets can also be sold to restaurants as appetizers.

Worms

Earthworms are used for worm composting of plant materials and animal manure. The earthworms work as living organic plows on the farm. Many people use earthworms for bait when they go fishing. So it is quite natural to use earthworms as fish food. The worms can also be used to supplement the feed for fowl (e.g. chickens, ducks, etc.).

Other useful earthworm by products are worm castings (solid waste combined with soil particles) and worm "tea" (liquid waste). We raise worms in pre-cast concrete barrels to collect the worm tea. When diluted 1 part concentrate to 10 parts water, we get an effective liquid fertilizer to use on our crops along with the worm castings. …..Raising worms is not heavy work. It can be easily done by the elderly and very young children. Selling worms and worm by-products could be a way for the elderly and children to generate revenue for a small rural farm family. And they can be improving their farm soil at the same time.

Earthworms in the worm-manure composting pile.

Earthworms raised in barrels allows for collection of worm castings and worm "tea" fertilizer materials.

Compost & Compost Tea

Compost can also be part of the On-farm Fish Food program. Compost tea can be easily made and added to fish pond water to feed plankton and algae. These are part of the diet for the fish, especially young fry. Compost can be made in the pond. Larger fish can feed on compost directly. All compost materials are found free on the farm.

Making compost tea.

Adding compost tea

Composting in the fish pond to feed fish.

Land Crab Eradication Project

The target "pest" is a land crab; a non-swimmer.

Smooth-sided pot or bucket 25 cm wide, 40 cm deep.

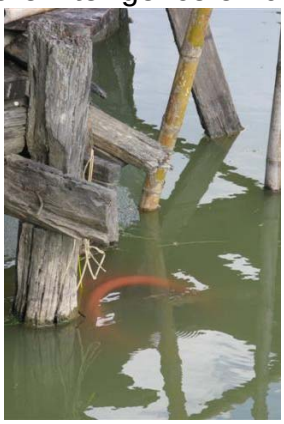
Land crabs have begun to pose a major threat to our fish ponds and rice paddies. Their burrow into the berms and dikes adds to the potential erosion and failure of these structures.

Last season, there was a major breach in the berm of the central fish pond and 3 breaches in rice paddy dikes. The central fish pond is slated for a major overhaul this coming dry season. The rice paddy dikes also need to be inspected and the breaches permanently repaired.

The main culprit is a land crab. The challenge in eradicating these land crabs is to NO use synthetic toxic methods and materials. Thankfully, there is a traditional Thai farming method to trap the crabs that we adapted to our ponds.

We learned about this from a paper by Anand Tunsutapanich, Fisheries Biologist Chacheongsao Fisheries Station, Freshwater Fisheries Division, Department of Fisheries, Ministry of Agriculture and Cooperatives.

This traditional method seems to have lapsed into disuse in modern times. But resurrecting it is a good example of using local knowledge adapted to current times. It is also a demonstration of mutual respect, mutual benefit. Not all "old ways" are useless and out of date. And this crab trap shows the intelligence of rural folks even though they may lack much formal education.



The trap is set with "smelly bait" and crabs are caught.

The crabs will be used for fish food and compost.