

14. Minimal Tillage

Minimal Tillage is *Fundamental #8*. It will preserve soil life and structure, save labor and increase profits. The soil food web is disturbed when continual plowing is practiced. The hoofs of the carabao (water buffalo) or tractor compact the soil while the plow causes disruption in microorganism activity.

As the soil compacts, a pan develops, where sub soil at the depth of the plow can form a barrier layer that roots cannot penetrate. Then rainwater is kept from penetrating the ground and easily floods. The water is stuck at the upper levels of the soil. So are the earthworms.

A Natural Farming System for Sustainable Agriculture in the Tropics

Earthworms retreat and are slowed down in feeding and breeding with regular plow activity. It is important to keep the soil healthy with earthworms, but tilling prevents the build up of high populations of these helpful creatures. When the initial plowing is finished we only use hand tools to add rice hull, charcoal and compost into the soil. Here in the tropics, by the second year we are mainly direct seeding, hand drilling and transplanting into mulched beds.



On a small scale, blocks can be stacked to produce a handsome vegetable bed that prevents flooding and keeps soil friable.

The rapidly accumulating topsoil is loose, friable and high in organic matter. Earthworms and roots will promote macro porosity, opening the soil for water absorption and microbial activity.

We use raised beds that are 3 ft. wide. This allows us to reach in without compacting the soil. The more we traffic on the soil, the

more compressed it gets. This prevents microbial activity and earthworms are also encumbered by the heavy soil where feet have stepped. Filipinos tend to be just over 5 feet, so a four-foot wide bed causes them to step into the bed and compact the soil.



The raised beds are never walked on. Workers reach into the bed from the side to plant and harvest. This minimizes compaction.



The broad fork is used to put air in the soil without turning it. It is designed to minimize stress to the body while creating great soil. Use the mechanics of your legs and shoulders and save your back.

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If you don't turn the soil, microorganisms, insects and worms are not disturbed. They benefit from the added oxygen and keep the soil open and friable. We just keep the soil open with the broad fork. We can do a lot of area in one day with this clever invention.



In the green house we use seedling bags to grow out our tomatoes, bell pepper and our other special crops. We mix specialty soils for filling bags instead of tilling the soil.



The tractor is a big help in turning the soil. We use water buffaloes or tractors the first time, we never need them again. With root activity and low traffic, the soil in our raised beds doesn't become compacted. There are also tractor attachments for aerating the soil without having to turn it.



Even the plowing from your livestock can form a layer of soil below the surface that will cause a pan. The pan causes flooding and prevents roots from going deep into the subsoil.



Vine ripe tomatoes are possible if your insect balance is achieved. You have to allow the predators to find an environment to populate.