left: Spreading of ricestraw in the ricefield (Photo: Flora V. Clariza)
right: Spraying of trichoderma (Photo: Flora V. Clariza)

Modified Rapid Composting
Philippines

Modified Rapid Composting is the in situ decomposition of rice straw using compost fungus activator, Trichoderma harzianum or Effective Microorganism, help in utilizing the residual Nitrogen-Phosphorus-Potassium (NPK) from the decomposed rice straw.

In search of reducing the vulnerability of the small farmers to the uncontrolled price of chemical fertilizer as well as the dependency on the usage of it, the Department of Agriculture through Bureau of Soils and Water Management (BSWM) developed a fertilizer cost reduction strategy by introducing a new composting technology that will produce organic compost as substitute and eventually decrease the utilization of chemical fertilizer. This is called Modified Rapid Composting. It incorporates a farm residue management wherein the rice straw is scattered evenly in the field as compost material with the aid of fungus activator that hastens the decomposition process as compared to the traditional composting method. The compost fungus activators used are Trichoderma harzianum and/or Effective Microorganism. Eventually, this compost is mixed into the soil during land preparation. When decayed, it increases the supply of nutrients and improves soil structure.
This technology aimed to establish a cost-efficient, competitive and sustainable agricultural production system. It addresses the concern of soil fertility deterioration through organic based fertilization scheme. Further, it reduces vulnerability of small farmers to the uncontrolled prices of chemical fertilizers. It also prevent the unfavorable farmer’s practice of burning the rice straw. This also serves as a promotional tool for the gradual conversion of rice land from conventional to organic-based farming system.
Primarily, this technology is applied and incorporated as part of the land preparation activity. Shallow plowing/rotavating is done to flatten down rice stubbles. The rice straw is then scattered in the field. Irrigation is applied at about 2-3cm depth. Soak the rice straw in the field approximately for 12 hours. Drain excess water. Spray Trichoderma harzianum solution prepared by dissolving 3 packs/knapsack sprayer (20 packs/hectare) in early morning or late in the afternoon. Effective Microorganism solution can also be used aside from Trichoderma harzianum. Broadcast at least 12 kg urea to hasten decomposition. Maintain sufficient moisture in the rice paddies during the decomposition period (15-20 days). Proceed with the usual land preparation. Apply 10 bags of vermicast/chicken dung at last harrowing as basal application.
It is introduced and currently practiced in the irrigated plain rice production areas in the Philippines such as in Talavera, Nueva Ecija. The soil type in Talavera is clay loam. Mostly, farmer associations, with an average farm size of 1.50 ha, comprising of small-scale to medium-scale land users are engaged to apply this technology in their rice areas during wet (May to October) and dry (December to April) season. The average rainfall ranged from 1500-2000 mm.

Location: Talavera, Nueva Ecija
Technology area: 0.1 - 1 km2
Conservation measure: agronomic
Stage of intervention: mitigation / reduction of land degradation
Origin: Developed externally / introduced through project, 10-50 years ago
Land use type:
Cropland: Annual cropping
Climate: humid, tropics
WOCAT database reference: T_PHI058en
Related approach:
Compiled by: Philippine Overview of Conservation Approaches and Technologies, Bureau of Soils and Water Management
Date: 2015-07-22
Contact person: Flora V. Clariza, Local Government Unit of Talavera, Nueva Ecija

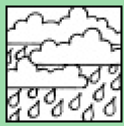
Classification

Land use problems:
- soil fertility deterioration (expert's point of view)
soil fertility deterioration (land user's point of view)

Land use

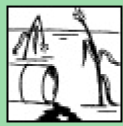
Annual cropping
full irrigation

Climate



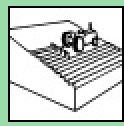
humid

Degradation



Chemical soil deterioration: fertility decline and reduced organic matter content

Conservation measure



Agronomic: Organic matter / soil fertility

Stage of intervention

- □ Prevention
- ■ Mitigation / Reduction
- □ Rehabilitation

Origin

- □ Land users initiative
- □ Experiments / Research
- ■ Externally introduced: 10-50 years ago

Level of technical knowledge

- ▒ Agricultural advisor
- ▒ Land user

Main causes of land degradation:
Direct causes - Human induced: soil management
Indirect causes: poverty / wealth

Main technical functions:
- increase in nutrient availability (supply, recycling,...)

Secondary technical functions:
- increase in organic matter

Environment

Natural Environment

Average annual rainfall (mm)

- □ > 4000 mm
- □ 3000-4000 mm
- □ 2000-3000 mm
- ■ 1500-2000 mm
- □ 1000-1500 mm
- □ 750-1000 mm
- □ 500-750 mm
- □ 250-500 mm
- □ < 250 mm

Altitude (m a.s.l.)

- □ > 4000
- □ 3000-4000
- □ 2500-3000
- □ 2000-2500
- □ 1500-2000
- □ 1000-1500
- □ 500-1000
- □ 100-500
- ■ <100

Landform

- ■ plateau / plains
- □ ridges
- □ mountain slopes
- □ hill slopes
- □ footslopes
- □ valley floors

Slope (%)

- ■ flat
- □ gentle
- □ moderate
- □ rolling
- □ hilly
- □ steep
- □ very steep

Soil depth (cm)

- □ 0-20
- □ 20-50
- □ 50-80
- □ 80-120
- ■ >120

Soil texture: medium (loam)
Soil fertility: medium
Topsoil organic matter: medium (1-3%)
Soil drainage/infiltration: good

Soil water storage capacity: high
Ground water table: 5 - 50 m
Availability of surface water: good
Water quality: good drinking water
Biodiversity: low

Sensitive to climatic extremes: floods, droughts / dry spells

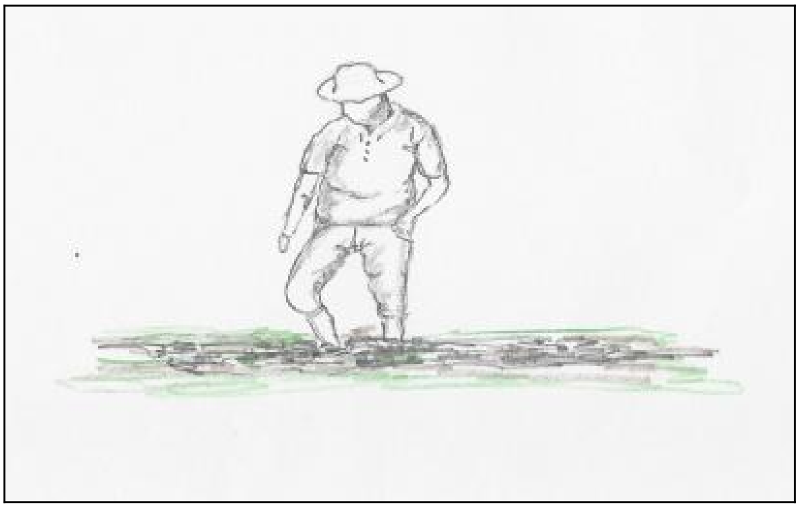
Human Environment

Cropland per household (ha)

- □ <0.5
- □ 0.5-1
- ■ 1-2
- □ 2-5
- □ 5-15
- □ 15-50
- □ 50-100
- □ 100-500
- □ 500-1,000
- □ 1,000-10,000
- □ >10,000

Land user: Individual / household, Small scale land users, common / average land users, men and women
Population density: > 500 persons/km2
Annual population growth: 1% - 2%
Land ownership: individual, titled
Land use rights: open access (unorganised)
Relative level of wealth: average

Importance of off-farm income: 10-50% of all income:
Access to service and infrastructure: high: health, education, technical assistance, employment (eg off-farm), market, energy, roads & transport, drinking water and sanitation, financial services
Market orientation: subsistence (self-supply)
Mechanization: animal traction
Livestock grazing on cropland: no



Technical drawing

Spreading of rice straw in the rice field.
(Patricio A. Yambot)

Implementation activities, inputs and costs

Establishment activities

-

Maintenance/recurrent activities

- scattering of rice straw
- spraying of Effective Microorganism solution

Maintenance/recurrent inputs and costs per ha per year

Inputs	Costs (US$)	% met by land user
Labour	26.66	100%
Agricultural		
- effective microorganism soln.	13.33	100%
TOTAL	**39.99**	**100.00%**

Remarks:

Assessment

Impacts of the Technology

Production and socio-economic benefits

++ increased crop yield
++ reduced expenses on agricultural inputs
++ increased farm income

Production and socio-economic disadvantages

Socio-cultural benefits

+++ community institution strengthening
+++ improved conservation / erosion knowledge
++ improved food security / self sufficiency

Socio-cultural disadvantages

Ecological benefits

+++ increased nutrient cycling recharge
+++ increased soil organic matter / below ground C
+++ reduced emission of carbon and greenhouse gases
++ increased biological pest / disease control

Ecological disadvantages

Off-site benefits

Off-site disadvantages

Contribution to human well-being / livelihoods

++

Benefits /costs according to land user			
	Benefits compared with costs	**short-term:**	**long-term:**
	Establishment	positive	positive
	Maintenance / recurrent	positive	positive

Acceptance / adoption:

76% of land user families have implemented the technology with external material support. Since the technology is introduced as a project of the government, the farmer-beneficiaries obtained external material support
24% of land user families have implemented the technology voluntary.
There is moderate trend towards (growing) spontaneous adoption of the technology.

Concluding statements

Strengths and → how to sustain/improve	Weaknesses and → how to overcome
Positive impact/feedback from the farmers: provided a great help to the farmers since it reduce and even eliminate the utilization of inorganic/chemical fertilizer. Less inorganic fertilizer usage resulted to decreased in the production costs since inorganic fertilizer are very much expensive. It also enhanced the characteristics of the soil according to the farmer's observation. → Boost awareness of the farmers on the benefits of organic-based farming	Additional farm labor particularly in the scattering of rice straw and spraying of compost fungus activator so some farmers still opt to burn the rice straw. → Increase advocacy campaign
Educate the farmers to become resourceful in terms of utilizing organic materials as fertilizer instead of depending on the commercially available in the market → Intensify or Strengthening the campaign of not burning rice straw	
Environment-friendly since it prevent the farmers from burning the rice straw → Increase advocacy campaign	