



Organic Mulching Philippines

Organic mulching is a practice of applying thin layer of organic materials on the soil surface that decompose over time for the purpose of conserving soil moisture, reducing soil erosion, improving soil fertility, and reducing weed growth.

It is a farm residue management technique of utilizing organic materials, such as locally available grasses and weeds, into useful purposes. These grasses and weeds are cut or chop into smaller sizes then applied and spread in layers over the ground or soil surface. It will then be served as cover to the soil.

The purposes of this technology are the following: to conserve soil moisture; to reduce soil erosion; to improve soil fertility; and to reduce weed growth.

In practicing this type of mulching, these are the following steps and activities: (1) Hauling of grass and weeds available in the farm; (2) Shredding of grass and weeds using the shredder; (3) Spraying of Indigenous microorganism (IMO) solution to the shredded grass and weeds; and (4) Spreading of the shredded materials (about 1 inch thick) in the vegetable beds after transplanting the crops.

Master's Garden of Mr. Ambrocio Acosta is located at Barangay Puguis, La Trinidad, Benguet. The province is classified under Type I climate by the Coronas System of classification with distinct wet and dry seasons with an average annual rainfall of 3,879 mm. The dry season is from November to April while the wet season is from May to October. The farm has an elevation of 1,342 meters above sea level with less than 40% slope. The farm was manually terraced with UV treated plastic shed. The production system is manually managed and cultivated by Mr. Acosta and his two farm laborers.

left: Shredded grass and weeds are applied 1 inch thick surrounding the lettuce seedlings

right: organic mulching application in the vegetable bed

Location: La Trinidad, Benguet

Technology area: < 0.1 km² (10 ha)

Conservation measure: agronomic

Stage of intervention: prevention of land degradation

Origin: Developed through land user's initiative, 10-50 years ago; through experiments / research, 10-50 years ago

Land use type:

Cropland: Annual cropping

Cropland: Perennial (non-woody) cropping

Land use:

Grazing land: Extensive grazing land (before), Cropland: Annual cropping (after)

Climate: humid, tropics

WOCAT database reference:

T_PHI064en

Related approach:

Compiled by: Philippine Overview of Conservation Approaches and Technologies, Bureau of Soils and Water Management

Date: 2013-09-15


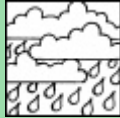

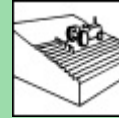
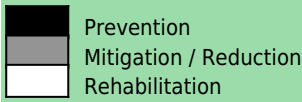
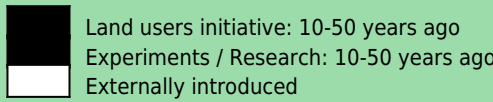
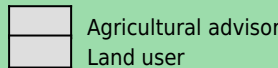
Contact person: Ambrocio Acosta, The Master's Garden, Barangay Puguis, La Trinidad, Benguet, 09179258499



Classification

Land use problems:

- soil fertility, soil erosion (expert's point of view)
- vulnerable to soil erosion, soil fertility (land user's point of view)

| | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land use  Annual cropping Perennial (non-woody) cropping Grazing land: Extensive grazing land (before) Cropland: Annual cropping (after) full irrigation | Climate  humid | Degradation  Water degradation: aridification | Conservation measure  Agronomic: Soil surface treatment Agronomic: Organic matter / soil fertility Agronomic: Vegetation/soil cover |
| Stage of intervention  | Origin  | Level of technical knowledge  | |

Main causes of land degradation:
 Direct causes - Natural: other natural causes, extreme topography

Main technical functions:

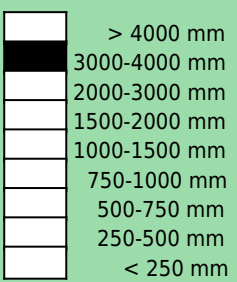
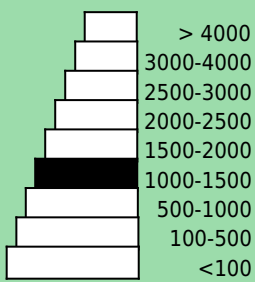
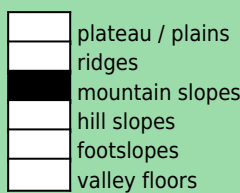

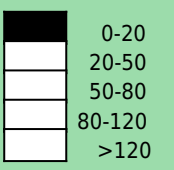
- control of raindrop splash
- improvement of ground cover
- increase in organic matter
- increase / maintain water stored in soil

Secondary technical functions:

- control of concentrated runoff: retain / trap
- improvement of topsoil structure (compaction)
- increase in nutrient availability (supply, recycling,...)

Environment

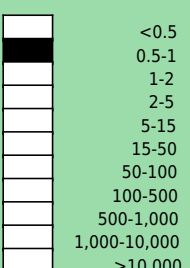
Natural Environment

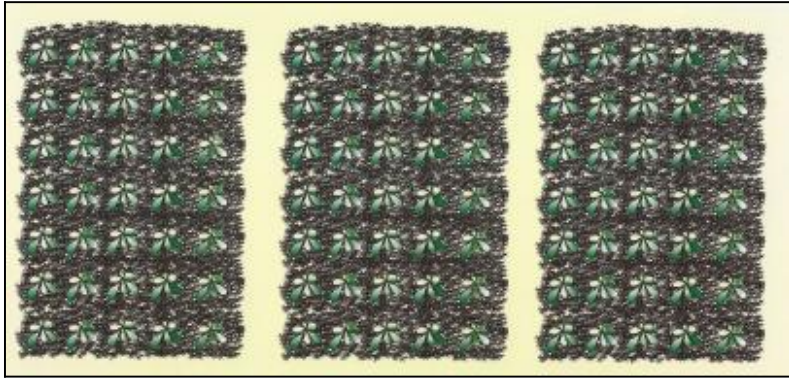
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|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Average annual rainfall (mm)  | Altitude (m a.s.l.)  | Landform  | Slope (%)  |
| Soil depth (cm)  | Soil texture: medium (loam) Soil fertility: medium Topsoil organic matter: medium (1-3%) Soil drainage/infiltration: medium | Soil water storage capacity: low Ground water table: 5 - 50 m Availability of surface water: good Water quality: for agricultural use only Biodiversity: high | |

Tolerant of climatic extremes: temperature increase, seasonal rainfall increase, seasonal rainfall decrease, heavy rainfall events (intensities and amount), floods, droughts / dry spells, decreasing length of growing period

Sensitive to climatic extremes: wind storms / dust storms

Human Environment

| | | |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cropland per household (ha)  | Land user: Individual / household, medium scale land users, common / average land users, mainly men Population density: 10-50 persons/km ² Annual population growth: 3% - 4% Land ownership: individual, titled Land use rights: individual Relative level of wealth: average, which represents 100% of the land users; 100% of the total area is owned by average land users | Importance of off-farm income: less than 10% of all income: Access to service and infrastructure: moderate: health, financial services; high: education, technical assistance, employment (eg off-farm), market, energy, roads & transport, drinking water and sanitation Market orientation: mixed (subsistence and commercial) |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Technical drawing

Vegetables covered with shredded weeds and grasses. (Patricio A. Yambot)

Implementation activities, inputs and costs

Establishment activities

- Shredder
- Sprayer

Establishment inputs and costs per unit

| Inputs | Costs (US\$) | % met by land user |
|--------------|----------------|--------------------|
| Equipment | | |
| - shredder | 2222.22 | 100% |
| - sprayer | 22.22 | 100% |
| TOTAL | 2244.44 | 100.00% |

Maintenance/recurrent activities

- Spreading of shredded grasses and weeds to the soil surface
- Shredding of grasses and weeds
- Spraying of IMO to the shredded grasses and weeds
- Hauling of grasses and weeds available in the farm

Maintenance/recurrent inputs and costs per unit per year

| Inputs | Costs (US\$) | % met by land user |
|--------------|--------------|--------------------|
| Labour | 61.12 | 100% |
| TOTAL | 61.12 | 100.00% |

Remarks:

purchase of shredding machine

Assessment

Impacts of the Technology

Production and socio-economic benefits

- +++ reduced demand for irrigation water
- +++ reduced expenses on agricultural inputs
- + increased crop yield
- + increased farm income
- + decreased labour constraints
- + decreased workload
- + simplified farm operations

Production and socio-economic disadvantages

Socio-cultural benefits

- +++ increased recreational opportunities
- +++ improved conservation / erosion knowledge
- +++ improved health

Socio-cultural disadvantages

Ecological benefits

- +++ increased soil moisture
- +++ reduced evaporation
- +++ reduced surface runoff
- +++ improved soil cover
- +++ reduced soil loss
- +++ reduced soil compaction
- ++ increased biomass above ground C

Ecological disadvantages

Off-site benefits

Off-site disadvantages

Contribution to human well-being / livelihoods

- ++ Organic mulching prevents risks of the farmers from exposure to harmful effects of chemical fertilizer and herbicides. It also protects the consumer on the adverse effects of chemicals on the farm produce. Furthermore, it increased awareness and market demands including premium price for organic crops making the Organic Farming an impressive source of livelihood and business.

Benefits /costs according to land user

| Benefits compared with costs | short-term: | long-term: |
|--------------------------------|---------------|---------------|
| Establishment | positive | very positive |
| Maintenance / recurrent | very positive | very positive |

Acceptance / adoption:

100% of land user families (1 families; 100% of area) have implemented the technology voluntary. Voluntary adoption of the technology was been observed since the land owner, Mr. Ambrosio Acosta, was a member and a previous officer of a small group of organic farmers, the La Trinidad Organic Producers (Latop) and was also an accredited resource speaker /trainer for Organic Agriculture-related events/forum.

There is moderate trend towards (growing) spontaneous adoption of the technology.

Concluding statements

Strengths and → how to sustain/improve

Organic mulching lessens the frequency of irrigation, weed control and fertilizer application; It hereby eliminates the use of chemical herbicide and fertilizer. Moreover, it prevents surface runoff by providing soil cover and also reduces soil water evaporation by modifying or keeping the soil temperature constant. → Increase awareness towards organic farming.

Increase the ability of the land users to become resourceful. → Possible incorporation of other organic materials.

Turning farm residue or waste into useful material. → Impose proper waste segregation to ease the collection and hauling residue/waste to be used.

Simplicity of the procedure. → Keep the procedure simple or if there are some modification, it should be practical and can be easily adopted by the land users.

Organic mulch conserves soil moisture therefore reduces the need for frequent irrigation. →

Prevent soil erosion by protecting the soil surface. →

Organic mulch contributes nutrients and organic matter to the soil when decomposed. →

Organic mulch encourages earthworm activity and other beneficial soil microorganisms. →

Weaknesses and → how to overcome

High cost of investment for the shredding machine. → Look for an alternative method of shredding or reducing the size of raw materials to be used such as manual chopping when farm operation is small scale. Otherwise, invest on shredder when farm operation is at large.



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