“ MANAGEMENT OF SOIL FERTILITY »

THE DIFFERENT TECHNIQUES OF SOIL FERTILITY MANAGEMENT

There are many techniques for improving and managing soil fertility.

- Cow manure
- The different types of compost
  - Classic compost
  - Basket Compost
  - Compost 7 days
  - Liquid compost
  - Vermicompost
- Green manure
- Biochar
- Amendment by dolomite
- Ash application
- Association and crop rotation
- Traditional fallow and Improved fallow

1 - ADVANTAGES

- Increase in production
- Managing and improving soil structure
- Protection of environment
- Reduction in operating costs
- Organic products that ensure human health

2 - THE DIFFERENT TECHNIQUES OF SOIL FERTILITY MANAGEMENT

2 - 1 - MANURE APPLICATION

DEFINITION

Liquid manure (dung, urine, poultry droppings) mixed with plant debris (straw, shavings, etc.). The liquids that run off into the manure are called 'liquid manure'.

2 - 1 - 1 / MATERIALS USED : (IMPROVED MANURE)

Plant residues or rice straw

Beef yard / Oxen park

2 - 1 - 2 / OPERATING MODE

- Put plant debris such as grass or rice straw underneath where the dung and urine will fall.
- Change every week and store in a suitable location
- Return the stored debris every 15 days

TRANON-JEZIKA

Parkyard manure wall

2 - 2 - COMPOST PRODUCTION

There are several types of compost, but the substrates used are often the same

ADVANTAGES

- Increase in production
- Sustainable and healthy production
- Reduction in operating costs
- Improving soil structure

2 - 3 - THE DIFFERENT TYPES OF COMPOST

2 - 3 - 1 / CLASSIC COMPOST

SUBSTRATES USED

DRIED HERBS 1.5 CHARETTE

WATER 120 LITRES

GREEN HERBS 1 CHARETTE

ASH

COW MANURE 0.5 CHARETTE

PRODUCTS / MATERIAL PROHIBITED

EUCALYPTUS

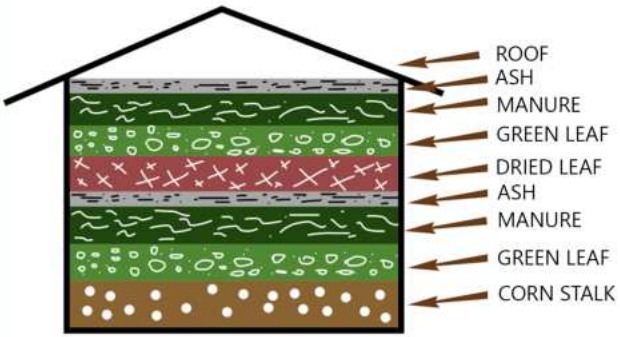
BIBASSIER

GUAVA

PINUS

COMPOST LOCATION

- Put on the ground or in a hole
- Put on the roof or in a shed without walls
- Near the cultivated land



Note: Turn every 7 days until ripe.

Compost on flat ground

OTHER METHODS: IN A HOLE

- **Width : 1m**
- **Length : 3m**
- **Depth : 60 cm**

Making a hole to make compost

STEPS IN MAKING COMPOST

Preparing the site

Installation of substrates

Installation of manure

Watering and roofing

MAINTENANCE

- **COMPOST TURNINGT :**
  - If composting for 18 days: every 4 days
  - If 30-day compost: every 15 days
- **COMPOST USE :**
  - Compost 1 charrette = terrain 1 are
  - Other mixtures can be added (bone 3kg/are, ash 2kg/are, dolomite 3kg/are)
  - To be protected against rain; heat; cold

Compost ready for use

2 - 3 - 2 / BASKET COMPOST

MAKING BASKET COMPOST

Method for planting tuberous plants. Ex: cassava

2 - 2 - 3 / 7 DAYS COMPOST

SUBSTRATES AND MATERIALS USED

ACTIVATOR

COW MANURE

RICE BRAN

GREEN HERB / LEAF

DRIED MATERIALS (HERBS, LEAFS...)

BUCKET

RAKE

CUTTING CUTTING

WATERPROOF COVER

WATERING CAN

PRODUCTION OF FERMENT

Making 7-day compost requires the use of activator. There are several ways of making this activator

1ST METHOD: USE OF TOMATO

- Press the ripe tomatoes 3 days before and macerate for 3 days.
- Boil 3 kg of bran in 10 litres of water and leave to cool
- Put 1 kg of sugar in 1 litre of water
- Mix them all in a 20 litre can and macerate for 20 days
- Shake every 3 days, aerate (a small nail hole to prevent bursting)
- Never contact with iron
- Put in a place not exposed to the sun
- Never open before 20 days

SUBSTRATE	DOSES
TOMATO	3 kg
RICE BRAN	3 kg
SUGAR	1 kg
CLEAN WATER	20 LITER

MATERIALS: Cooking pot, bowl, bucket, Þrewood, Þre

OTHER REMARKS

The smell of the activator resembles the fermented smell but not the bad smell (rotten) after 8-15 days

2ND METHOD : RICE BRAN + BEEF RUMEN JUICE

SUBSTRATES	DOSE
ACTIVATOR	Boîte yaourt
RICE BRAN	0,25 kg
DRIED DEBRIS	3 kg
GREEN HERBS: Those preferred by rabbitss	3 kg
COW MANURE	6 kg
WATER	
BANANA STEM	

EQUIPMENT: angady; fork, cutter

2 - 3 - 4 / VERMICOMPOST

DEFINITION :

Vermicompost, also known as worm compost, is the result of the decomposition of organic matter (OM). It is broken down by macro-organisms (compost worms) and micro-organisms (bacteria, fungi, yeasts).

TYOE OF VERMICOMPOST

Eisenia Andrei

Eisenia coli

WORM FEEDING

PRE-COMPOST

PLANT RESIDUES

REMAINING ACID-FREE FOODS

WORM FARMING SITE

BRICK

BIN AND PLASTIC BAG

PLANK

STEPS IN THE PRODUCTION OF VERMICOMPOST

RECOMMENDATIONS

PLACE: IN A DARK PLACE, AWAY FROM ANIMALS THAT COULD DESTROY IT.

- Use of bamboo to protect against rats / rodent
- Black plastic bag to cover the swath
- Roof: protection against rain and sunburn

2 - 3 - 5 / LIQUID COMPOST

There are 2 types of liquid compost : the 1st is the liquid compost obtained after cleaning the park, which has been collected in a hole called "purin". The 2nd is the compost obtained from the maceration of green plants and cow dung.

SUBSTRATES USED

PLANTS / CROPS

URTICA

SHREDDED LEAF

COMFREY

TITHONIA

PLASTIC CONTAINER

TOMATO

FALSE-NEEM

BETON / CONCRETE

MANUFACTURING PROCESS

Source : CEFFEL

2 - 3 - 6 - CROP ROTATION AND ASSOCIATION

DEFINITION

The arrangement of crops on a given plot of land is known as rotation, and involves alternating heavy crops with improving crops such as legumes to fertilise the soil.
Rotation should also be applied to market garden crops. A well-planned rotation can help increase yields and combat disease.

OBJECTIVES

- Increase in production
- Improvements in soil nutrients
- Management of soil fertility
- Pest and disease control

APPLICATION

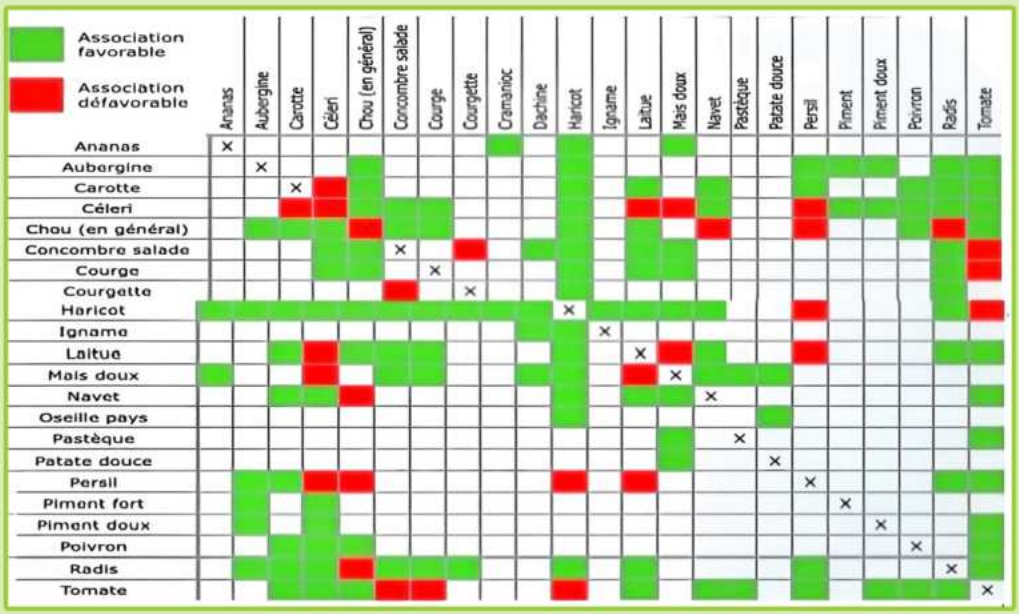


PHOTO : CROP ASSOCIATION

Crop association (ProSar Project)

Crop association (PLAE)

2 - 4 - GREEN FERTILIZERS

ADVANTAGES

Reconduction de la fertilité des sols

SUBSTRATS UTILISÉS

COW MANURE

TEPHROSIA

DRIED CROPS / LEAVES

HERBS

OPERATING MODE

- Green manures should be planted shortly before ploughing.
- Green manures should be planted at least 1 month before ploughing so that they are ready to be assimilated by the roots
- These techniques can be applied to all crops.

2 - 5 - CONTRIBUTION OF DOLOMITE

DEFINITION :

These are natural whitish-coloured rocks used to correct soil acidity so that nutrients in the soil are available to plants.

ADVANTAGES

- Corrects soil acidity
- Opportunities for plants to assimilate nutrients
- 2 times increase in yield
- Suitable for all plants

INSTRUCTIONS FOR USE

- Working the soil in good time
- Depending on soil compactness: one man can plough 1 acre per day
- Scatter the dolomite at a rate of 5kg/are and mix with the soil before cultivation

REMARKS :

Dolomite is not a chemical fertilizer

2 - 6 - BIOCHAR

- BIOCHAR = 2 words:
- Bio= Organic
- Char= Charcoal

Biochar is a solid residue obtained by pyrolysis of biomass, i.e. by chemical decomposition of the organic compounds that make up the biomass under the effect of high temperature.

ADVANTAGES

- Improving soil structure
- Improvement of pH
- Increase in organic matter
- Increase in soil moisture capacity
- Increase in fauna/soil engineering
- Increase in production

MATERIALS

Pyrolizers and materials to be used for the biochar preparation, angady, watering can

PYROLIZER

WATERING CAN

ANGADY

OPERATING PROCEDURE

- Light the fire
- Put on the pyrolizer and add firewood + manure evacuator
- Cover the pyrolyzer when it is hot
- see the product after a few minutes
- Stir to avoid ash sticking to the pyrolizer
- When the substrate is 95% carbonised, remove the pyroliser and spray the products with water to reduce the temperature.
- Water with liquid compost when the temperature is ambient
- Put the biochar in a bag in a cool place
- Water with liquid compost during storage for more than 30 days. Do this at least 3 times

2 - 7 - THE USE OF ASH

DEFINITION

It should be noted that it is not the raw manure that is assimilated by the plants but the mineral salts that it contains when it is at the mature stage. The manure added to the soil improves its structure, but it takes time for it to release the mineral elements that are useful to plants.

To improve production, there are types of fertilizers that can immediately provide mineral salts to plants, including ash and liquid fertilizer.

Ash is a powdery product that remains when certain organic materials have been burned. When organic matter has become ash, it is immediately transformed into mineral salts in contact with water in the soil

When organic matter has become ash, it is immediately transformed into mineral salts in contact with water in the soil

All residues can be burned, even those showing signs of disease

2 - 9 - THE PROCESS OF FALLOWING LAND

- The soils should be left to rest for at least a year if there is any sign of a decrease in production
- The agro-ecological technique has opted for fallowing the cultivation of leguminous plants such as mucuna, cajanus, sesbania

REMARKS

Soils become fertile again depending on the length of time they are left fallow, but the possibilities of each household must be taken into account.

Photo : Plots of demonstration School Igararana Itasy