IMPROVE YOUR SUGARLOAF PINEAPPLE PRODUCTION
ILLUSTRATED MANUAL FOR ORGANIC FARMERS IN GHANA

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INTRODUCTION

WHAT IS ORGANIC AGRICULTURE?

Organic agriculture is not only characterised by the fact that:

- no pesticides is used
- no chemical fertilisers are used

Organic farming goes further than those attributes

Organic agriculture is defined as:

- farming in an ecologically and socially responsible way
- providing an enduring supply of safe and healthy food
- having the least possible nutrient and energy losses
- with the least possible negative environmental impacts
- respecting the integrity of plants, animals, and life sustaining soil
- regulated by certification/third party agencies

PRINCIPLES OF ORGANIC AGRICULTURE

Organic farming adheres to these basic principles:

- Production of nutritional quality food
- Work in harmony with the natural ecosystem
- Promotion of biological cycles within the farming systems
- Preservation of long-term soil fertility
- Protection of environment
- Consideration of organic matter and nutrients
- Combating causes (not symptoms) in crop protection measures

On a general level

• Improve and maintain the natural landscape and agro-ecosystem

• Avoid over-exploitation and pollution of natural resources

• Minimize consumption of non-renewable energy and resources

• Produce sufficient quantities of nutritious wholesome and high quality food

• Provide adequate returns, within a safe, secure and healthy working environment

• Acknowledge indigenous knowledge and traditional farming systems

On a practical level

• Maintain and increase the long-term fertility of the soil

• Enhance biological cycles within the farm, especially nutrient cycles

• Provide nitrogen supply by intensive use of nitrogen fixing plants

• Biological plant protection based on prevention instead of curing

• Diversity of crop varieties and animal species, appropriate to the local conditions

• Animal husbandry appropriate to the needs of the animals

• Ban on synthetic chemical fertilisers, plant protection, hormones and growth regulators

• Prohibition of Genetic Engineering and its products

• Ban on synthetic or harmful methods, processing aids and other ingredients in food processing

BENEFITS OF ORGANIC FARMING

Some issues have been mentioned as problems of organic farming, namely:

- Time consuming (farmers could notice pests earlier)
- Lower yields (not necessarily)
- Storage losses (because of no agrochemical use)

Organic farming presents a lot of benefits to farmers:

- Less input – less capital needed
- Premium prices which increases farmer's income
- Less health risks for farmers and consumers
- Less damage to environment
- Can build on traditional knowledge
- Access to new (organic) markets

RECOMMENDED PRACTICES

- Soil fertility and water conservation
- Nutrient management
- Pest and disease management
- Maintenance of proper documentation
- Post-harvest handling and food safety
- Proper waste management
- Water resources protection

LAND PREPARATION

CLEARING

On newly acquired area, land preparation would involve clearing, uprooting of stumps and preparation of ground for planting.

The large mass of plant residues that is produced as a result of the land preparation could serve as a good mulching material and organic fertilizer for the soil.

WEEDING

On previously cropped area, land preparation involves weeding and reshaping of old ridges/farm for planting.

Incorporate part of your compost into the soil during the land preparation stage.

MULCHING	NO BUSH BURNING
	
Clear your land and leave the plant remains on the field to serve as mulch.	Organic land preparation strictly adheres to standards. Burning is an unacceptable practice in organic land preparation.

PLANTING

MATERIALS FOR PLANTING

There are categories of sizes of planting materials for planting.

Select the big sizes (500-550g) for early bearing (18months).

You can obtain your planting material from your own farm, your neighbours or other organic certified farm.

FIELD DESIGNS FOR PLANTING

Always divide your field into four parts.

Sub-divide each plot into four parts again for easy planting.

Distances of 30 cm (using alternating planting holes) between the plants are sufficient in double-row systems, and 30 cm between the rows, with 75 cm between the double-rows.

Let your production planning manual be your guide.

PLANTING OF PINEAPPLE

You can plant your pineapple suckers on prepared ridges or on flat land.

Plant your pineapples in a regular spacing to improve productivity and maximize your yield.

The soil should not be water-logged or completely dry.

The shoots should be pressed into soil which has been lightly loosened and then filled in again.

They should not be pressed in too deeply, and the vegetation point where the leaves will sprout must lie above the surface.

ORGANIC FERTILIZATION MANAGEMENT

INTRODUCTION

The nutrient requirements of the crop rotation system are mainly provided by green manure (green fallow land as a first pre-crop).

All of the remnants from the pineapples production should be spread over the soil (composting or mulching).

Make compost an essential part of your fertilization programme.

If possible, the compost should be spread in two separate lots - one half before planting, and the other half to induce the flower formation.

Or the entire compost can be spread in one go before planting

FERTILIZATION

In organic agriculture, three (3) main fertilizers are recognised and they include:

1. Composting
2. Manure (poultry, cow or sheep and goats)
3. Pruning waste and other mulching material

COMPOSTING

Why to make and why to use compost?

Because...

1. It boosts pineapple production
2. It is a well balanced fertilizer
3. It increases soil organic matter content
4. It raises the pH in acid soils
5. The heating phase destroys weed seeds and disease germs
6. It suppresses soil-borne disease germs
7. It is organic
8. It is not costly to make

COMPOST PREPARATION
Compost is organic matter decomposed by the action of bacteria and other organisms over a period of time.

Making and using compost is the cornerstone of organic farming

The finished product is rich, dark, crumbly and sweet smelling decomposed matter

It is often considered a complex process but all you need to do is provide the right ingredients and let nature do the rest.

A little know-how is all you need to make better compost, more efficiently

Compost Ingredients

Use of a combination of the following:

A. Greens or Nitrogen-rich ingredients – fast to rot
B. Browns or Carbon-rich ingredients – slow to rot
C. Other compostable items in moderation

PROCEDURE FOR PREPARING COMPOST

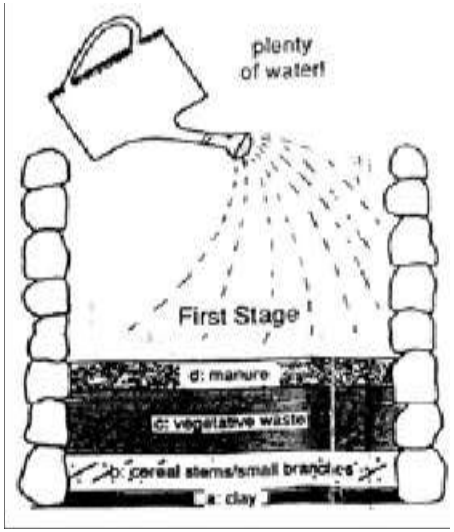
Three compost pits are dug alongside one another.

The pit should be 50cm deep, 150cm wide and of variable length.

The ingredients are pile according to a precise plan as indicated in the procedure below:

1. A lining of clay is placed at the bottom of the pit to form the first layer (a). This will prevent loss of water sprinkled onto the heap.

2. A 15cm layer of thin branches or cereal stem (b) below the composting material helps erosion.



3. After this 15-30cm of plant matter (c) such as chopped crop residue, grass, kitchen waste etc. from the main bulk of heap.

4. On top of this 10-20cm depth of manure (d) enrich the compost and speeds its decomposition.

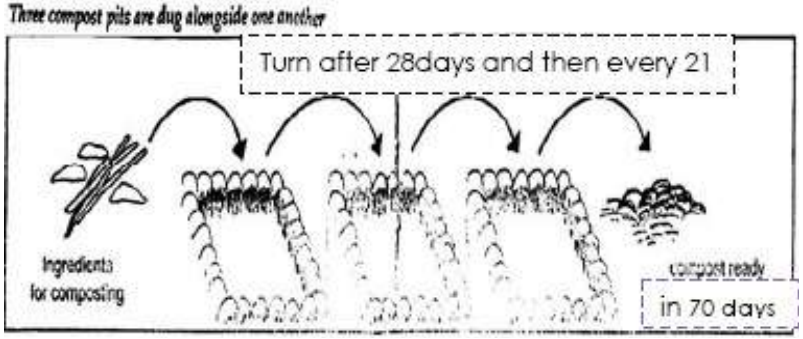
5. Thorough watering (600-800 litres of water for each cubic meter of compost) is carried out at this stage.

6. A thin layer of soil (e) then seals the previous layer keeping the heat in.

7. The pile is build up by repeating layers (a) to (d), the watering and then layer (e).

8. Finally the heap is capped with 20cm of grass or straw 'thatch' (f).

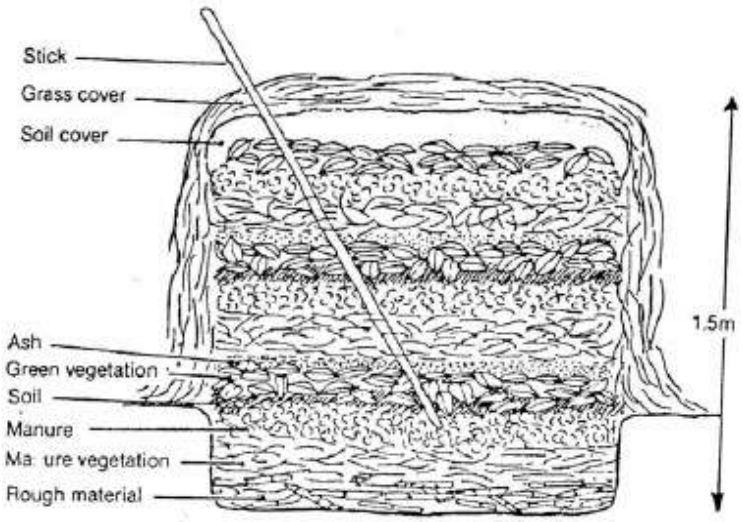
The complete pile is left to decomposed for 28 days at which point it is turn from pit 1 to pit 2 where it stays for a further 21 days before being turned into pit 3.



The final good quality compost is ready to use after another 21 days (70 days in total).

Note: **To help check its temperature, a long stick is pushed into the compost heap right from the beginning.**

A hot stick indicates that decomposition is taken place and a cold stick indicates that decomposition has reduced.



Compost pile

HOW TO APPLY COMPOST AS FERTILIZER

Use your compost promptly when it is ready (should be dark and crumby with sweet scented smell).

If not, it will still make a good soil amendment, but Nitrogen may be lost through leaching.

Compost should be added annually if it is being used to build a good soil.

Best time to apply your compost is during land tilling where compost is incorporated into the soil.

It can be added to the soil when planting your pineapple.

When your pineapple is already established, apply your compost about two (2) inches away in a circular form.

Also, you can apply your compost as mulch (when composting has not completely finished)

WEED MANAGEMENT

Tilling weeds is difficult to mechanise on pineapple plantations.

When all possible niches are already occupied with plants, weeds will have little chance of gaining a footing, and can also easily be uprooted by hand.

When enough weeds have accumulated, cut them down with a knife or pulled out and then cut up to be used for mulching.

A preventive measure is to sow non-climbing legumes before the pineapples are planted (e.g. beans, pea, and groundnuts among others).

MULCHING

Another way of preventing weeds and conserving moisture is mulching.

Mulching is accomplished by use of plant remains (refer to page 4) or the use of polythene sheet as in the picture above.

PEST AND DISEASE IDENTIFICATION & CONTROL

It is important to improve your observational skills and decision-making abilities.

Farming involves the need to make management decisions based on close observation of your pineapple ecosystem.

The other farming practices discussed in this manual also help to prevent pest problems (e.g. fertilization, rotation).

NO USE OF CONVENTIONAL CHEMICALS

Always remember that you are an organic farmer.

Do not use any chemical inputs (fertilizers, insecticides, fungicides, herbicides/weedicides, etc).

Only naturally grown (botanical) fertilizers/pesticides can be used, but announce to your internal control officer before you do so.

Use of any input must be documented.

It is also important to observe what chemical your neighbour (especially conventional farmers close to your farm) is using, and take adequate precautions to avoid spill-over.

CROP ROTATION

Pineapple monoculture is not permitted in organic agriculture and will also increase the occurrence of pests.

Integrate organic pineapple with other crops (groundnut, beans, rice, vegetables, etc.) in a rotation.

After each pineapple cycle, break for two or three years to fallow or grow those other crops on that piece of land.

FLOWER INDUCTION

Flower formation is induced only by ethylene.

Special preparations used to induce flower formation in conventional pineapple production are not permitted on organic farms.

The use of carbide is also not permitted in organic agriculture.

Consult your organic partners on possible use of ethylene to induce flower formation.

HARVESTING OF PINEAPPLE

The fruits must be chopped down with a clean cut of a knife.

If the fruits are torn off, the wounds will leave behind ideal spots where fungus can develop.

The fruits should be harvested at the best time for export/processing; i.e. harvest when green-ripe or half ripe.

Harvest into your crates to minimize bruising and ensure quality fruits for processing.

During harvesting, ensure that your organic fruits are not mixed with any other fruits.

Keep records of all your harvesting activities.

All growers and harvesters must maintain a high standard of personal hygiene, keep clean clothing and women must wear headscarves and men hats or caps.

All personnel must wash their hands in the hand washing facility provided on the farm.

POST-HARVEST HANDLING OF FRESH FRUITS

After harvesting, clean the fruits and cut the stalks to 2cm.

Sort out the fruits to make sure that only half-ripe or green-ripe fruits, which are free from damage and pest and disease, are presented for sale.

When handling pineapple, avoid scratching or touching the ear, nose, mouth or other body orifices.

Always wash your hands before and after you handle pineapple produce.

Classify your fruits into the required sizes
- Above 1.5kg in one class
- 1-1.5kg in another class
- Below 1kg in another class

(This may vary according to the requirements of your buyer)

Always make sure that your harvested fruits are packed in the crates for ease of transportation and for quality assurance.

Personnel must not smoke, eat or drink while working with produce, whether in the field or in the collection shed.

Personnel must not work with produce, if suffering from infectious sickness (e.g. diarrhoea).

QUALITY ASSURANCE

Your farming practices and management decisions influence the organic supply chain.

Collaborate with your Internal Control System (ICS) staff and inform them of your activities and plans, as well as records of your activities, inputs and yields.

By helping your ICS staff to keep good records, you will be assisting in maintaining your organic certification.

Organic products have to meet strict standards in the international market.

You have a role to play:

- supply only organic fruits
- do not mix organic and conventional fruits
- document all your activities
- cooperate with your ICS staff who manages your organic certificate

ORGANIC GROUPS AND ASSOCIATION

It might have been very challenging and demanding for you to have become an organic smallholder farmer.

Strengthening your association/group through regular meetings is crucial for growth and improvements.

Effective communication with your executives is the key to long term success of the association.

Discuss issues calmly and learn to respect and tolerate each other's views and opinions.

Organic farming present challenges that are usually common to farmers of the same association.

Discuss your problems and find solutions together.

Work together to ensure compliance with other certification standards.

This will help your association to expand your market share and increase your premium and hence income.

ORGANIC GROUPS AND ASSOCIATIONS (cont.)

You may be producing pineapple or other fruits in a 'natural' way, but that does not make you a recognized organic farmer.

To become a certified organic farmer, you need to:

Register as an organic farmer with recognised/certified organic producers association.

Abide by the organic standards and the constitution and bye-laws of the group/association.

Have your farm inspected by the group and the ICS staff and get training in good management practices and standards

Cooperate with your ICS staff to ensure compliance and smooth certification of your farm.

CAPACITY BUILDING OF ORGANIC ASSOCIATION

Make capacity building programmes a major component of your management plan.

Learn how to improve your farming practices and be abreast with organic standards and quality assurance.

Encourage others to convert to organic – it is the surest way to conserve the environment and ensure sustainable livelihood

COMMUNITY RELATIONS

Organic farming involves building trust and understanding among members of the community.

Involve your community in the organic discussions and the impact of your activities on their livelihood.

Educate your community on environmental issues and contribute to sustainable development.

REFERENCES

Agro Eco (2007) General organic agriculture training manual.

Constitution and bye-laws of EAWOFA.

Agro Eco (2006) FAO project GCP/404/RAF/GER final report.

Participatory learning and interviews with EAWOFA farmers.