

BIOINTENSIVE AGRICULTURE



PREPARED BY: TABITHA MKAZENI

Meaning of BIA

Biointensive agriculture is an organic agricultural system that focuses on achieving maximum yields from a minimum area of land, while simultaneously increasing biodiversity and sustaining the soil fertility.



Principles of BIA



Ecological Balance

Organic farming must be based on ecological systems.

Organic farming methods must fit the ecological balances and cycles in nature

Fairness

Organic farming provides good quality of life and helps in reducing poverty as well. Natural resources and life supporting systems must be judiciously used and preserved for future generations.

Health

Organic agriculture must contribute to the health and well being of soil, plants, animals, humans and the earth too. It provides pollution and chemical free, nutritious food items for humans

Pillars of BIA



Deep soil preparation



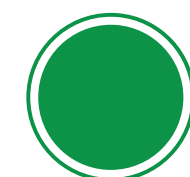
Plant spacing



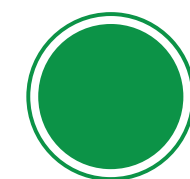
Composting



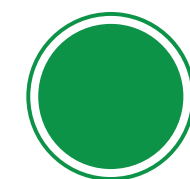
Carbon farming



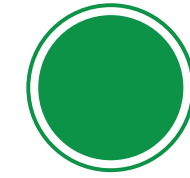
Calorie farming



Companion planting



Planting open-pollinated seeds



Natural pest & disease control



Deep Soil Preparation

The double digging technique is a gardening method aimed at improving soil structure and fertility.

It enhances soil drainage, aeration, and nutrient access, making it beneficial for gardens with compacted or poor-quality soil.



Deep Soil Preparation...



Remove the top layer of soil (about 9-10 inches/30cm) and set it aside.



Loosen the subsoil beneath (another 9-10 inches/30cm) using available farming equipment.



Incorporate organic matter/manure/compost into the loosened subsoil.



Replace topsoil over amended subsoil.

Deep Soil Preparation...



Deep Soil Preparation...





Compost

Compost is decomposed organic material that is added to soil to provide nutrients, improve soil structure, and enhance water retention. It is created through the aerobic decomposition of organic materials like grass clippings, leaves, and food scraps.

Composting not only enriches the soil but also supports beneficial microorganisms essential for plant health.

Compost Preparation

● Layering Materials

Begin with a layer of sticks or twigs for airflow, then alternate layers of brown materials (like dried leaves) and green materials (like kitchen scraps/ash).

● Add Soil and Water

Mix in a small amount of soil to introduce microorganisms, and keep the compost moist but not soggy.



Select a suitable spot for your compost pile or bin, ensuring it has good drainage and it is easily accessible.

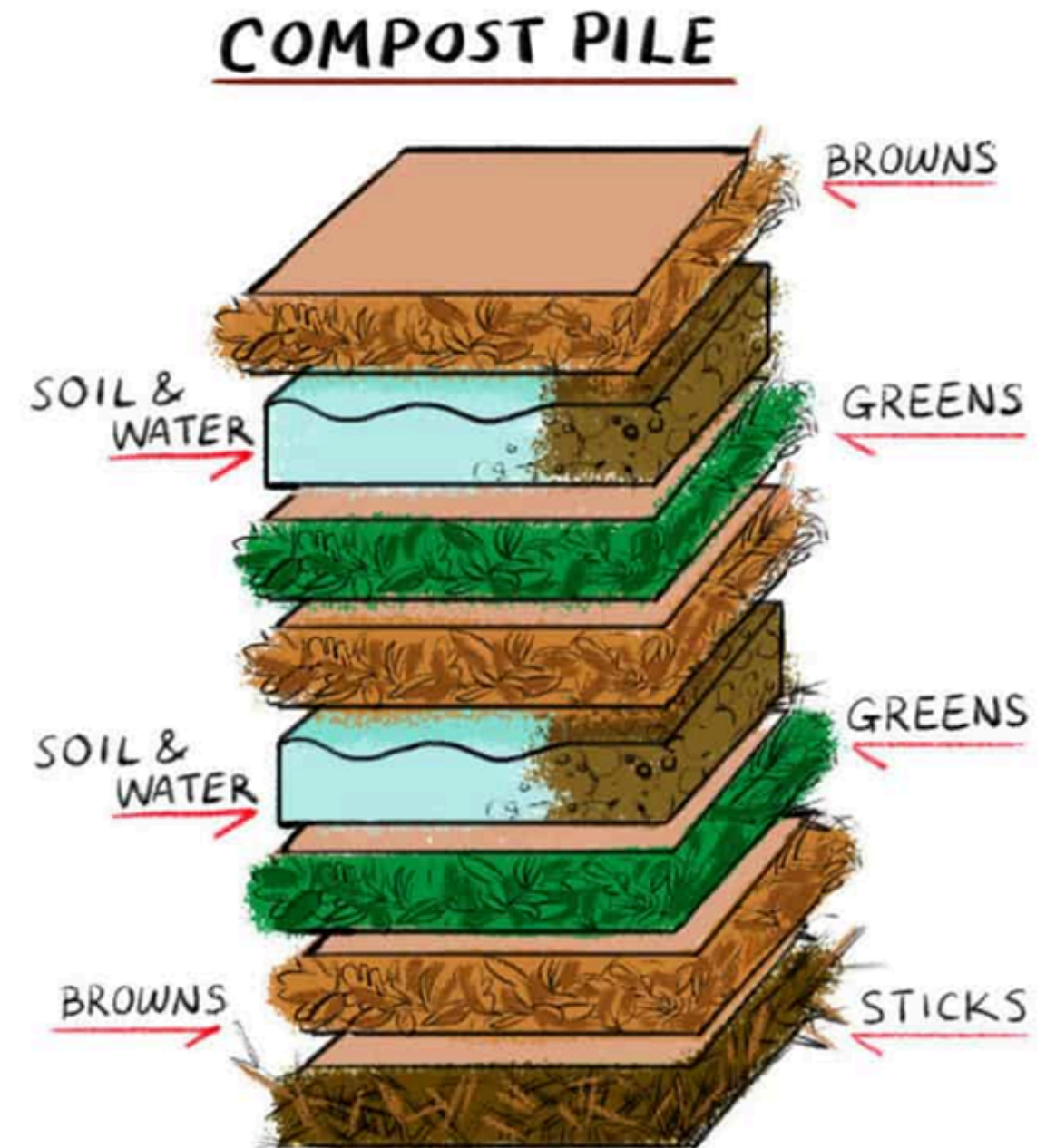


Compost Preparation...

● Monitor and Turn

Regularly check moisture levels and turn the compost every few weeks to aerate it, which helps speed up the decomposition process.

Allow the compost to mature over time, and it will eventually turn into nutrient-rich humus for your garden.



Compost preparation...



Plant spacing

Proper plant spacing is crucial for healthy growth, preventing over crowding, and maximizing yields in your garden.

When planting seeds or seedlings, it's essential to give them enough room to grow.

Avoid close spacing it causes stunted growth.

Poor air circulation increases disease risk.

Plants compete for nutrients when spaced too closely

Spacing needs vary by plant type and growing method

Plant spacing



Companion planting

Is the practice of growing different plants together to boost growth, repel pests, attract beneficial insects and improve yields.

Involves strategically pairing plants that can benefit each other when grown in proximity.

This method maximizes space, boosts plant health and yields, as some plants provide nutrients, attract beneficial insects, or repel pests.



Companion planting...



Marigolds:

Known for their ability to repel nematodes and other harmful soil-dwelling pests.



Nasturtiums:

These vibrant flowers not only add beauty to the garden but also repel aphids, whiteflies, and squash bugs.



Calendula:

Also known as pot marigold, this flower attracts pollinators like bees and butterflies while deterring tomato hornworms.

Companion planting...



Basil:

Planted near tomatoes, basil can improve their flavor and help repel pests such as mosquitoes and flies.



Dill:

Its strong aroma can attract predatory insects that feed on common vegetable pests like aphids and caterpillars.



Parsley:

When planted near asparagus or tomatoes, parsley can enhance their growth and flavor while attracting beneficial insects.

Companion planting...



Open pollinated seeds

Open pollinated seeds come from plants fertilized by natural agents like wind, insects, or birds.

This natural pollination promotes genetic diversity while preserving the parent plant's traits. When saved and replanted, these seeds reliably produce plants similar to the original process known as "true to seed."

Since they are naturally pollinated, resulting in plants that grow true to type and can be saved for future planting.



Open pollinated seeds...



Carbon Farming

The use of agricultural practices that capture and store carbon in soil, roots, and vegetation.

The goal is to reduce carbon dioxide in the atmosphere and fight climate change by boosting carbon storage in farms and landscapes.

Soil naturally holds carbon, but disturbance releases it into the atmosphere, worsening global warming. Sustainable farming helps reverse this by keeping carbon stored in the soil.



Carbon farming techniques like cover crops, mulching, agroforestry, and companion planting boost the soil's ability to trap and store carbon long-term

Calorie farming

Focuses on producing a complete diet in the smallest space possible by focusing on special root crops that are calorie dense and yield well in a small area.

Key crops include potatoes, sweet potatoes, parsnips, leeks, garlic, Jerusalem artichokes, and salsify.





Pest & disease control naturally

Organic and natural pest and disease control methods are designed to manage pests without using synthetic chemicals.

These methods focus on working with nature to prevent and control pest problems in a way that is safe for humans, animals, and the environment.

Some natural methods include
Companion planting and Use of
biopesticide

Pest and disease.....

Companion planting

Places certain plants together to repel pests and boost growth.

Marigolds, with their strong scent, deter soil pests and work well around garden borders or between crops.

Nasturtiums serve as trap crops, drawing aphids away from key plants. Basil planted near tomatoes repels hornworms and enhances



Other effective companion plants include garlic, lemongrass, wild marigold, chives, mint, and rosemary. These help repel pests, attract beneficial insects and improve overall plant health.

Pest and disease.....

Use of biopesticide

Biopesticides are pesticides made from natural sources like plants, animals, bacteria, and minerals. They are safer for humans and the environment because they occur naturally.

They help farmers to produce food safely and efficiently

They support sustainable farming as they target specific pests, are safer for other organisms, and break down faster than chemical pesticides.



Pest and disease...

Uses of Biopesticides

- Eco-friendly and support sustainable farming
- Low or no toxicity compared to chemical pesticides
- Target-specific, affecting only harmful pests
- Effective in small amounts
- Protect environment and maintain soil health
- Boost crop yields
- Produce healthier, organic food safe for consumption



Pest and disease.....

The preparation of biopesticides depends on the level of infestation. If there is no infection, use a low concentration, such as 1:15. For mild infestation, slightly increase the concentration to about 1:10.

If the infestation is severe, use a stronger solution, such as 1:5.

These natural methods are meant to repel pests, not kill them, so it's best to apply them early to help preserve nature.



Plants Used for Biopesticide Preparation Include: Papaya leaves, wild sunflower, castor leaves and neem plant.

THANK YOU!