



FERTILIZERS

AFA1E-C



FERTILIZER

- Fertilizer is a natural or synthetic substance that is applied to the soil or the plants to improve growth and productivity. They provide nutrients to the plants.



MACRO NUTRIENTS

- **Nitrogen** – Nitrogen has the greatest influence on shoot and leaf formation. It promotes growth on size of fruits for better yield.
- **Phosphorus** – promotes a strong, deep root system and better ripening of the wood and fruits. It can also increase the specific gravity and sugar content of fruits.
- **Potassium** – potassium promotes flowering, fruit setting, ripening and even high yields due to quality of fruits.



MICRONUTRIENTS

1. Carbon
2. Hydrogen
3. Calcium
4. Magnesium
5. Sulfur
6. Boron
7. Iron
8. Zinc
9. Copper
10. Molybdenum
11. Manganese
12. Chlorine
13. Oxygen



TYPES OF FERTILIZERS

- ORGANIC
- INORGANIC



ORGANIC FERTILIZERS

- natural fertilizers obtained from plants and animals.
- increase the organic matter content of the soil, promotes the reproduction of microorganisms, and changes the physical and chemical properties of the soil.
- considered to be one of the main nutrients for green food

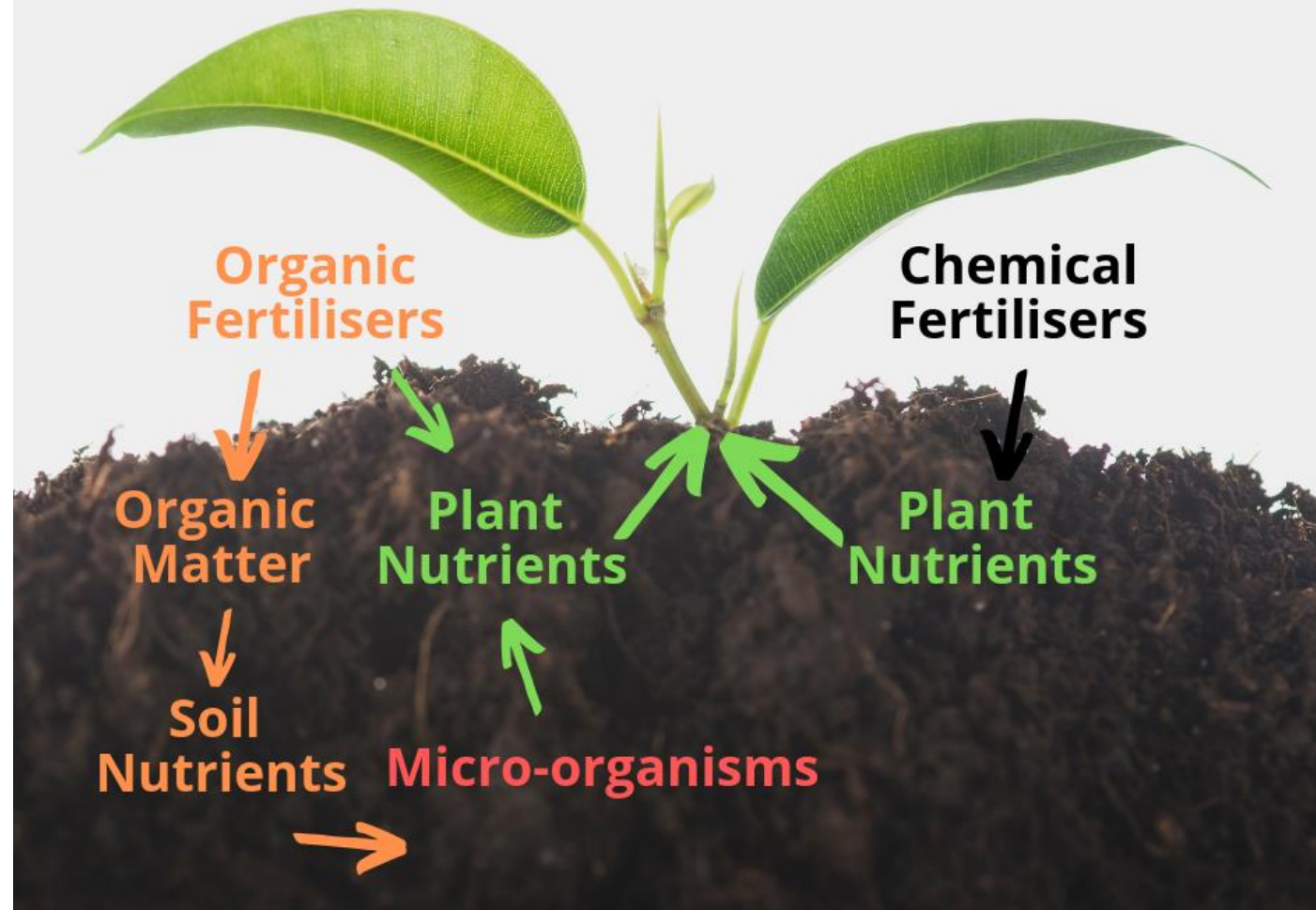


INORGANIC FERTILIZERS

chemical fertilizers that contain nutrient elements for the growth of crops made by chemical means.

Feeding the soil

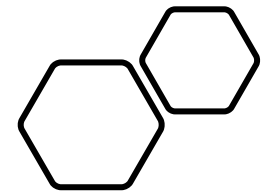
Feeding the plant





CLASSIFICATION OF FERTILIZERS BASED ON PHYSICAL FORM

- SOLID FERTILIZERS
 - GRANULAR
 - POWDERED
- LIQUID FERTILIZERS





COMPOSTING

- the process of allowing organic materials to decompose under more or less controlled condition to produce an end product that can be used as a fertilizer and or soil conditioner. It is a process by which undesirable properties of organic wastes such as foul odor, presence of pathogens and other undesirable physical properties are removed or abated.



COMPOST

- organic material that can be added to soil to help plants grow.
- made by decomposing organic materials into simpler organic and inorganic compounds in a process called **composting**.



Factors Affecting Composting Rate

- Aeration
- Temperature
- Moisture
- Carbon/Nitrogen Ratio
- pH
- Particle size

[FAST & EASY COMPOSTING FOR BEGINNERS AT HOME | MAKE
COMPOST FAST | WITH ENGLISH SUB - YouTube](#)





MATERIALS USED FOR COMPOSTING

- Agricultural wastes
- Agri-industrial wastes
- Household/market wastes
- Other sources of raw materials



STEPS IN COMPOSTING

- Collect your substrate
- Mix the materials
- Moisten then shred the materials
- Pile the shredded materials and cover it with used plastics
- Monitor moisture content and temperature
- Open the pile and turn it
- Harvest compost
- Sun or air dry the compost
- Shred the compost



VERMICOMPOSTING

the process of producing organic fertilizer from biodegradable materials with earthworms.

VERMICOMPOST



- the castings of the earthworm which contains both vermicast and bio-degraded materials that passed through the earthworm gut.

VERMICAST

- the earthworm excreta that has passed through the gut and is granular in texture



VERMICULTURE

- the culture of worms aimed to continually increase its population in order to obtain a sustainable harvest.





EARTHWORMS

- Free-living, beneficial, terrestrial invertebrates
- Not parasitic
- Improves soil structure due to their burrowing nature
- Improves soil fertility due to its humus-producing action
- Enhance microbial activity that promotes plant growth and health
- Serve as natural food for fish, birds and mammals



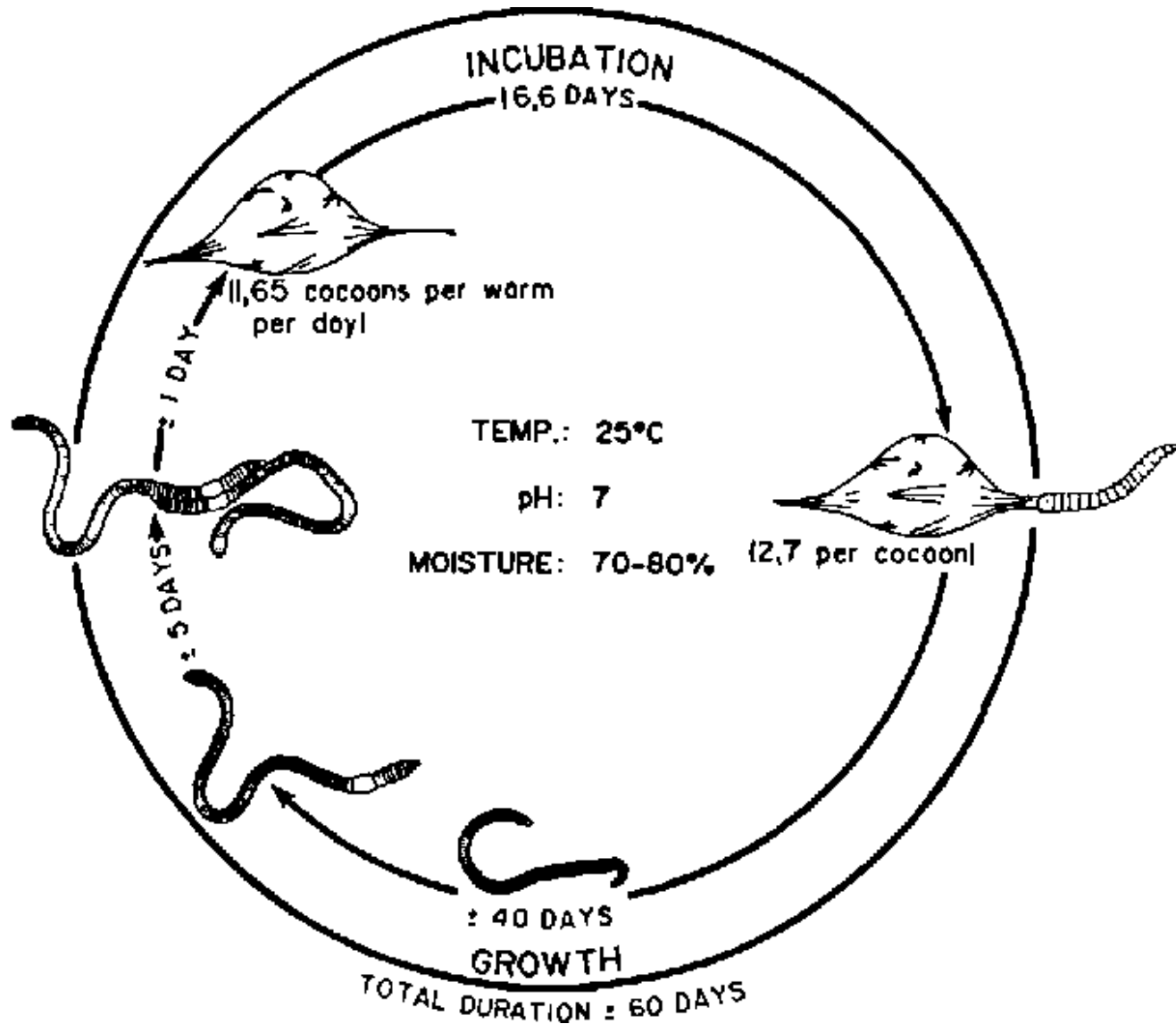
- Breathe through their skin
- Hermaphroditic (have both sex organs)
- Feed on microorganisms (fungi and bacteria) in the soil
- Active at night
- Migratory
- Reach sexual maturity in four to six weeks.
- Mature worms make two or three capsules a week.



African night crawler

- *Eudrilus eugeniae*
- the most suitable worm for vermicomposting in the Philippines.
- Dark mauve or pink throughout
- Generally 8 to 12 cm in length but can grow up to 30 cm
- Clitellum covering segments
- Has male and female pores but the latter are prominent and widely-placed
- Can weigh up to 3 grams each

ANC REPRODUCTION



- Reproduces approximately 7 young per week under ideal conditions.
- Average number of young per cocoon is 2.
- The young emerges from cocoon at approximately 15 to 30 days under ideal conditions.
- Sexually mature at approximately 30 to 95 days under ideal conditions.



CULTURAL REQUIREMENTS FOR EARTHWORMS TO LIVE

- Organic Matter
- Moisture
- Aeration
- Temperature



SUBSTRATES

- Worm food composed of biodegradable materials
- Composed of Nitrogenous (Animal Wastes, green biomass) and Carbonaceous (dry matter) materials
- Must have a Carbon: Nitrogen ratio of 25-35:1 for efficient bacterial decomposition.
- Materials high in Carbon are made to mimic dried leaves on the forest floor which is the worms' natural habitat.
- Should be moist and loose to enable earthworms to breathe and facilitate aerobic decomposition.
- Should be partially decomposed before feeding to worms.



Recommended Farm Wastes

- Rice straws
- Corn cobs and stalks
- Banana leaves and trunk
- Vegetable wastes
- Coconut coir
- Sawdust
- Spent mushroom substrate with 1% lime added



Urban/ Industrial Wastes

- Mud press
- Brewery
- Paper sewage
- Restaurant
- Food Market



ANIMAL MANURE

- Chicken
- Goat
- Cow or cattle
- Carabao
- Pig
- Any kind of manure except those from dog and cats due to high pathogen presence.



VERMICOMPOST PRODUCTION

- STAGE 1: Partial Decomposition of Biodegradable Materials (10-15 days)
- STAGE 2: Incorporation of worms to the partially decomposed materials
- STAGE 3: Harvesting (40-60 days)



STEPS IN VERMICOMPOSTING

1. Select the site based on the type of operation to be established
2. Procure materials, tools and equipment
3. Prepare the substrates for partial decomposition
4. Prepare the Vermi Bed
5. Put the substrates in the Bed
6. Procure the Worm
7. Load the Worms in the bed
8. Maintain the Beds
9. Harvest the compost
10. Airdry and bag the compost