COFFEE FARMING TOPIC 03: COFFEE NUTRITION

Coffee nutrition focuses on providing balanced nutrients that support healthy growth, strong root development, and high-quality yields throughout the coffee plant's life cycle. Key nutrients include nitrogen for vegetative growth and leaf development, phosphorus for root formation and flowering, and potassium for fruit filling, bean quality, and resistance to pests and diseases. Secondary nutrients such as calcium, magnesium, and sulfur improve soil structure, photosynthesis, and overall plant health, while micronutrients like zinc, boron, iron, and copper are required in small amounts to prevent deficiencies that reduce yield and quality. Effective coffee nutrition relies on soil testing, proper timing and placement of fertilizers, integration of organic matter (compost and mulches), and good agricultural practices to ensure nutrients are efficiently absorbed, environmentally sustainable, and economically beneficial to farmers

Importance of Plant Nutrition for the Coffee Tree

Poor soil result in:

- Poorly growing coffee trees
- Low yields
- Poor-quality coffee beans
- Bearing only once every two years (biennial bearing)
- Increased incidence of pests and diseases

Proper fertilization of the crop results in

- Healthy coffee trees
- Good yields
- High-quality coffee
- Regular annual production
- Reduced incidence of pests and diseases

Main source of nutrients

Solid and liquid organic fertilizers

- Application of solid organic manure is done at the time of seedling planting, and thereafter can be carried out throughout the year when the soil is moist. Well-decomposed manure from livestock, crop residues, grasses, or a mixture of these materials is used.
- The farmer moves the mulch aside, applies the manure in a ring around the tree while leaving about 20 cm from the stem, then replaces the mulch. At least 20 kg of manure should be applied per coffee tree.
- The farmer may prepare liquid organic manure or solid compost at home by composting it in a pit, or by making a compost heap on the soil surface without digging a pit or trench.

The required materials are:

- ✓ Crop residues
- ✓ Livestock residues
- ✓ Green or dry grasses
- ✓ Soil or ash

- ✓ Water

Compost preparation

Site selection

- ✓ **On flat or gently sloping ground** – to prevent erosion
- ✓ Under a shade tree
- ✓ **Pit size:**
  - ➢ **Depth/Height:** 1.2–1.5 m
  - ➢ **Width:** 1.5–2 m
  - ➢ **Length:** as available / as needed

- ✓ Layering the materials

1. First layer: dry materials (for aeration) (15–20 cm)
2. Second layer: green materials (15 cm)/
3. Third layer: manure (10 cm)
4. Topsoil or ash 5 cm
5. Sprinkle water on each layer. But avoid waterlogged 5L/day
6. Repeat layers until is almost full
7. Cover the pit or heap with banana leaves, grass, or soil to conserve moisture and heat
8. Turning the compost
   - Turn after 3 weeks
   - Turn after 2 weeks
   - Turn after every 2 weeks again if possible
9. **Maturation**

   Compost will be ready after **2–3 months**, depending on materials and weather.
10. **Signs of good compost**

    Dark brown or black color

    Crumbly texture

    Earthy smell

    No visible original materials

Preparation of liquid organic fertilizer:

It is a fertilizer produced from a mixture of water, organic matter, and earthworms. These earthworms are reared in a perforated container that is covered, lightly watered, and filled with crop residues or manure from animal shelters. As the earthworms feed on this organic matter, they release a liquid fertilizer that is very rich in plant nutrients and beneficial microorganisms. This liquid is highly effective in improving coffee plant vigor.

Construct a compost platform for preparing liquid compost

Lay a plastic sheet on the platform to collect the liquid compost.

Roof the platform to protect the compost from rain and direct sunlight.

Add crop residues/coffee pulp, dry grasses, livestock manure, kitchen waste, and other biodegradable materials.

Add **red worms (earthworms)**. One kilogram of worms can consume and process about one kilogram of composting material per day.
Pour in water every day, at least **5 liters**.
Wait at least **2 months** for the worms to multiply and be able to produce compost rich in plant nutrients.
Place a container where the stand allows water to drain, and install a device to collect the liquid fertilizer. The liquid fertilizer produced in the first 2 months should be returned to the worms because it is not yet rich enough in nutrients.
Mix **1 liter of liquid fertilizer** with **10–15 liters of water** and spray it on coffee leaves.
This fertilizer is applied using a sprayer to **30–40 coffee trees**, depending on the size of the tree.
This fertilizer also acts as a treatment against **coffee rust disease**.

Avoid applying it when the plants are exposed to strong sunlight. Apply early in the morning or in the evening.

Chemical Fertilizers used in coffee:

Consult a nearby agronomist to help you identify the fertilizers available that are suitable for coffee. Example: **NPK 22-6-12** (N = Nitrogen, P = Phosphorus, K = Potassium)

Nutrients required at each growth stage of the crop

Stage	**Required nutrients**	
Seedling preparation	N, P, Ca	Root development and seedling growth
Vegetative growth	N, K, Mg	Leaf development and plant expansion
Flowering	P, B, Zn	Essential for flower formation and fertilization