# Caring Techniques for Robusta Coffee at Each Development Stage in Vietnam

## 1.1. Young Tree Stage (6 months – 2 years)

* **Site Preparation & Planting**
  + Select well-drained, slightly acidic soil (pH 5.0-6.5). If soil has a pH below 5, prepare acidic soil by: basal fertilizer with composted manure, biochar, bone meal or lime.
  + Prepare planting holes (50cm x 50cm x 50cm) and mix topsoil with organic compost.
  + Space plants at **3m x 3m** or **3m x 2.5m** for optimal growth and yield.
  + Plant seedlings at the start of the rainy season for better establishment.
* **Watering & Mulching**
  + Water regularly, especially in the dry season (2-3 times per week).
  + Apply organic mulch (dry grass, coffee husks) around the base to retain moisture and regulate temperature. Mulch should not touch the trunk of the young tree because it will cause fungus
* **Fertilization**
  + Apply **NPK 16-16-8** or **20-10-10** every 2 months to promote vegetative growth.
  + Supplement with **organic fertilizers** (e.g., decomposed manure or diluted fisher fertilizer) twice a year.
* **Shaping & Pruning**
  + Train the tree to a single main stem.
  + Remove weak, dead, or excessive side branches to improve airflow and structure.
* **Pest & Disease Management**
  + Monitor for common pests (e.g., white stem borers, aphids).
  + Use organic pesticides or neem-based sprays when necessary.
  + Control fungal diseases like rust and anthracnose using Bordeaux mixture (1%) or biological solution: Trichoderma.

## 1.2. Vegetative & Canopy Development

* **Fertilization**
  + Apply balanced NPK fertilizers (**30-10-10** for leaf growth, **20-10-15** for pre-fruiting).
  + Increase organic matter through compost application to enhance soil fertility.
* **Pruning & Canopy Management**
  + Remove excessive vertical shoots to encourage lateral branching.
  + Conduct light pruning after harvest to maintain an open canopy structure.
* **Watering & Shade Management**
  + Provide supplemental irrigation in dry months to prevent water stress.
  + Intercropping with shade trees (*Leucaena leucocephala*, Cajanus cajan,...) if replanting in empty areas to provide shade in the early years, then pruning to provide Nitrogen and Organic matter.
* **Weed & Pest Control**
  + Regularly weed around the base to reduce competition for nutrients.
  + Use biological control methods (e.g.,create an environment for beneficial insects to come) for pest management.

## 1.3. Flowering & Fruit Setting

* **Nutrient & Watering Strategy**
  + Increase potassium (K) application (e.g., **NPK 15-15-30**) to support flowering and fruit formation.
  + Apply enough Phosphorus with superphosphate or extract P from bone.
  + Maintain adequate irrigation during flowering to prevent flower drop.
  + Foliar sprays with boron (B) and zinc (Zn) improve fruit set and uniformity.
* **Pollination & Stress Management**
  + Avoid excessive nitrogen application, which can cause excessive vegetative growth at the expense of flowering.
  + Apply calcium and magnesium to strengthen flowers and prevent premature fruit drop.
* **Pest & Disease Prevention**
  + Monitor for coffee berry borers and take control measures (e.g., pheromone traps, biological predators).
  + Control fungal infections like coffee leaf rust using copper-based fungicides.

## 1.4. Cherry Development & Maturation

* **Irrigation**
  + Maintain consistent watering but reduce it towards the ripening stage to improve bean quality.
* **Nutrient Management**
  + Apply fertilizers rich in potassium and calcium to support cherry development.
  + Use organic manure to enhance soil microbial activity and long-term fertility.
* **Pruning & Suckering**
  + Remove water sprouts and unnecessary branches to direct energy toward fruit development.
* **Pest & Disease Management**
  + Monitor for coffee berry disease and insect infestations.
  + Apply protective sprays only when necessary to minimize chemical residues.

## 1.5. Harvesting & Post-Harvest Care

* **Harvesting Techniques**
  + Pick only ripe cherries for better coffee quality.
  + Avoid strip harvesting, as it reduces uniformity and bean quality.
* **Post-Harvest Processing**
  + Process cherries within 24 hours after harvest (wet or dry method).
  + Ferment wet-processed coffee for 24-48 hours before washing and drying.
  + Dry coffee beans to **11-12% moisture content** to prevent mold and maintain storage quality.
* **Storage & Quality Maintenance**
  + Store dried beans in well-ventilated, moisture-proof bags.
  + Keep beans in a cool, dry environment to prevent deterioration.

# Watering

2.1 The first watering

* The time for the first watering depends on the weather conditions of each year, each region, each type of soil... and is based on soil moisture or the level of flower bud differentiation.
* When the flower buds are fully developed at the outermost nodes of the branches, it is time to water.
* Normally, the required watering humidity is determined to be slightly higher than the wilting humidity because at the wilting humidity, the plant's growth and development are seriously affected.
* Coffee trees need to go through a dry period of about 2 months to stop growing and fully differentiate flower buds.
* If watered too late, the tree will be exhausted, lose leaves, and dry branches.
* However, if watered too early when the flower buds have not fully differentiated, the tree will flower less and the flowers will bloom sporadically, not concentrated, affecting productivity and hindering later harvesting.
* Watering early also increases the cost of watering and pruning because some dormant buds tend to develop into secondary branches instead of differentiating into flower buds.