



## Durian

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# Durian Tree Characteristics

**Scientific Name:** *Durio zibethinus*

**Family:** Malvaceae

## Growth Habit

- A large, long-lived tropical tree reaching **25–40 meters** in height.
- Naturally grows with a straight trunk and a broad, dome-shaped crown.
- Produces strong, thick branches capable of supporting heavy fruit loads.

## Leaves

- Simple, elliptical leaves, glossy green on top and bronze to golden-brown underneath.
- Evergreen and adapted to humid tropical climates.

## Roots

- Has a deep taproot and a wide lateral root system.
- Performs best in **well-drained, deep loamy soils** with good aeration.
- Sensitive to waterlogging — prolonged flooding can kill the tree.

## Environmental Requirements

- Thrives in **humid, tropical lowlands** with regular rainfall.
- Prefers elevations below **800 m** but can grow slightly higher depending on variety.
- Requires good sunlight exposure; avoid planting near taller forest trees that block light.

## Flowering & Pollination

- Flowers are large, pale green to white, and open at night.
- **Bats** (especially fruit bats) are the major pollinators.
- Flowering often happens once or twice per year depending on climate and cultivar.

## Fruit Production

- Begins fruiting around **4–7 years** for grafted trees, 8–15 years for seedlings.
- Peak productivity reaches 15–25 years with proper management.
- Yields vary but well-managed orchards can produce **40–80 fruits per tree per season**, depending on variety and tree size.

# Durian Fruit Characteristics

## Exterior

- Large and round-to-oval fruit weighing **1–4 kg**.
- Covered with thick, hard spines; requires careful handling during harvest.



## *Interior*

- Contains several segments filled with soft, creamy flesh (called “arils”).
- Color varies from pale yellow, golden yellow, deep orange, to white depending on the cultivar.

## *Flavor & Aroma*

- Famous for its strong aroma — complex, sweet, sulfurous, and custard-like.
- Texture ranges from custardy and buttery to slightly fibrous.

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## ***Nutritional Profile of Durian (per 100 g edible portion)***

- **Calories:** ~147–160 kcal
- **Carbohydrates:** ~27–33 g
- **Protein:** ~2.5–3.0 g
- **Fat:** ~5–6 g (mostly healthy fats)
- **Fiber:** ~3–4 g
- **Vitamin C:** ~19–25 mg
- **Potassium:** ~430 mg
- **Vitamin B complex:** B1 (Thiamine), B2, B3, B6
- **Minerals:** Copper, manganese, magnesium, folate
- Contains natural sulfur compounds responsible for its aroma.

## ***Health Benefits of Durian***

### ***1. Energy-Dense Natural Fuel***

- Durian is rich in carbohydrates and healthy fats, making it an excellent natural energy source for farmers, field workers, and athletes.

### ***2. High in Fiber***

- Supports digestion, helps prevent constipation, and contributes to a healthy gut microbiome.

### ***3. Rich in Antioxidants***

- Durian contains vitamin C, polyphenols, and anthocyanins that help reduce inflammation and support cellular repair.

### ***4. Heart Health Support***

- Contains healthy monounsaturated fats that can help manage cholesterol levels.
- High potassium content supports stable blood pressure.



## 5. Strong Vitamin B Complex

- Thiamine (B1) supports nerve function and energy metabolism — helpful for people with active lifestyles.

## 6. Improves Immune Function

- Vitamin C strengthens immune response and helps the body fight infections.

## 7. Natural Mood Booster

- Durian contains **tryptophan**, a precursor to serotonin, which may support mood, relaxation, and sleep.

## 8. Mineral-Rich for Bone and Muscle Function

- Magnesium, manganese, copper, and potassium contribute to strong bones and healthy muscle function.

# Root System of Durian

## 1. Deep Taproot (Primary Root)

- Durian naturally develops a **strong, deep taproot** during its early years.
- This taproot anchors the tree firmly and allows access to deeper soil moisture.
- It can penetrate **1.5–3 meters** depending on soil structure.

## 2. Extensive Lateral Root Network

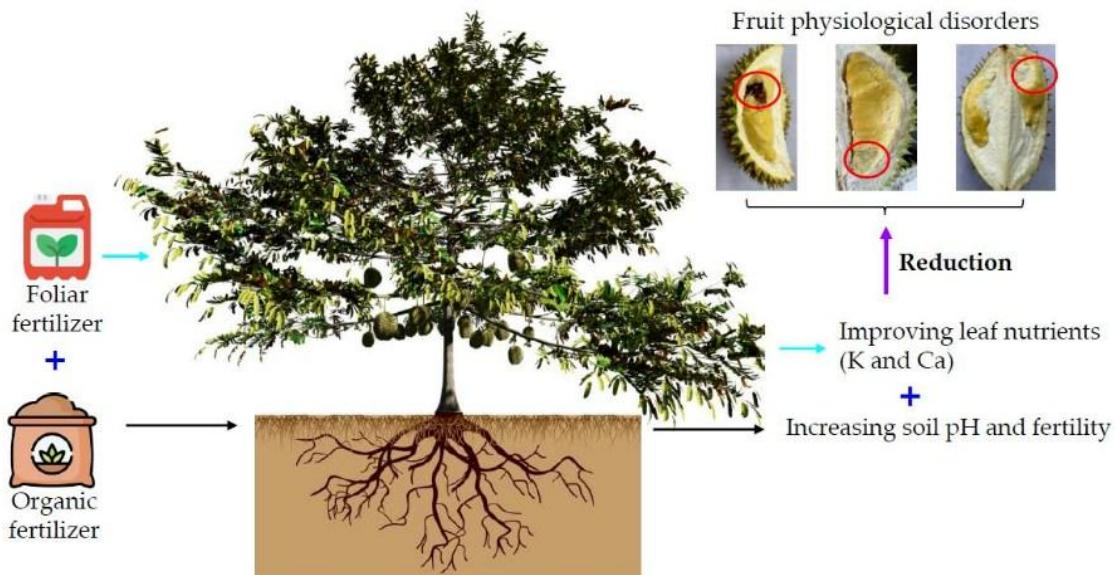
- Beyond the taproot, durian forms a **wide-spreading lateral root system** near the surface.
- Most feeder roots (fine roots that absorb nutrients) lie within the **top 30–60 cm** of soil.
- Lateral roots extend far beyond the canopy—often **1.5x the canopy diameter**.

## 3. Fine Feeder Roots

- Delicate and sensitive to soil compaction and waterlogging.
- Responsible for nutrient uptake, microbial interactions, and overall tree health.

## 4. Mycorrhizal Association

- Durian roots naturally form symbiotic relationships with beneficial fungi.
- These fungi enhance nutrient absorption, especially phosphorus.
- Healthy soil biology is essential for vigorous growth.



## Welcome Visitors

### Growing Implications of Durian

#### 1. Durian Cannot Tolerate Waterlogging

- Because feeder roots are near the surface and require oxygen, durian is **very sensitive to standing water**.
- Flooded soil quickly leads to **root rot** and tree death.
- **Implication:**
  - Avoid low-lying areas.
  - Use **mounds, ridges, or raised beds** (30–60 cm high) to improve drainage.
  - Ensure slopes and contour lines guide water away from the root zone.

#### 2. Requires Deep, Well-Aerated, Loamy Soil

- The taproot needs deep soil to grow properly.
- Hardpan layers or compacted clay restrict taproot development, weakening the tree.
- **Implication:**
  - Perform **deep ripping** or subsoiling before planting.
  - Mix organic matter to loosen the soil.
  - Avoid planting where plow pans or hard clay layers exist beneath the topsoil.



### ***3. Sensitive to Soil Compaction***

- Heavy machinery, livestock, or repeated foot traffic crush the fine roots.
- Compaction limits oxygen flow, reduces nutrient uptake, and weakens the tree.
- **Implication:**
  - No tractors or vehicles within the tree's dripline.
  - Maintain grass or cover crops to support soil structure.

### ***4. Requires Adequate Spacing***

- Because roots spread wide, overcrowding leads to competition for nutrients and water.
- Durian trees planted too close develop shallow, weak root architecture.
- **Implication:**
  - Ideal spacing: **8 × 8 m or 10 × 10 m** for standard varieties.
  - For high-density early projects: **6 × 6 m**, then thinning later.

### ***5. Benefits Greatly from Mulching***

- Lateral roots near the surface dry out quickly.
- Mulching helps maintain moisture, improves microbial activity, and prevents weed competition.
- **Implication:**
  - Apply **10–20 cm** thick mulch layer around the tree (but not touching the trunk).
  - Use organic mulch: coconut husk, rice hulls, wood chips, dried leaves.

### ***6. Extreme Sensitivity to Root Disturbance***

- Durian dislikes transplant shock.
- Seedlings with damaged roots grow slowly or die.
- **Implication:**
  - Use **polybag-grown** or **grafted** seedlings with intact root systems.
  - When transplanting, **do not disturb the soil ball**.

### ***7. Importance of Mycorrhiza***

- Mycorrhizal fungi significantly improve survival rates and reduce stress.
- **Implication:**
  - Inoculate seedlings with **mycorrhiza** during planting.
  - Maintain soil organic matter to encourage fungal colonization.



## 8. Nutrient Management Must Match Root Behavior

- Most nutrient absorption happens in the surface layers of soil.
- **Implication:**
  - Apply fertilizers **as a ring** or broadcast, not deep in the soil.
  - Drip irrigation or fertigation is highly effective.

## Sunlight Requirements of Durian

Durian is a **sun-loving tropical tree** that performs best under **full sunlight** once established. However, its sunlight tolerance varies by age:

### Seedlings (0–1 year)

- Prefer **50–70% filtered sunlight**.
- Direct, harsh midday sun can burn young leaves.

### Young Trees (1–3 years)

- Require **60–80% sunlight**.
- Partial shade is still acceptable but not too dark.

### Mature Trees (3+ years)

- Need **full sun (100%)** to maximize:
  - Flowering
  - Fruit set
  - Fruit sweetness
  - Tree vigor



## Major Durian Varieties

### 1. Puyat (Duyaya Red Pulp Hybrid Lineage)

- **Most commercially dominant variety** in the Philippines.
- Thick, firm, golden-yellow flesh.
- Sweet with slight bitterness.
- Very reliable yield, good fruit set.
- Long shelf life—excellent for transport and export.

### 2. Arancillo (Carabao Durian)

- One of the **top-quality eating durians** in Davao.



- Very creamy, almost buttery texture.
- Balanced sweetness and bitterness.
- Earlier fruiting than other varieties.
- Smaller seeds, more edible flesh.

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### 3. Duyaya (Red Durian)

- Known for its **distinct deep yellow-orange or reddish flesh**.
- Very soft, custard-like texture.
- Aromatic and intensely flavored.
- Higher market price due to rarity.

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### 4. Alcon Fancy

- Large fruits, thick creamy flesh.
- Very mild bitterness with rich sweetness.
- Preferred by consumers who like strong aroma but not overly bitter taste.

### 5. Monthong (Imported Thai Variety)

- Widely grown in Mindanao as well.
- Thick, firm, pale yellow flesh.
- Sweet, less aromatic compared to Filipino types.
- Popular for processing and export markets.

### 6. Chanee (Thai Variety)

- Better disease resistance compared to Monthong.
- Stronger aroma, creamier flesh.
- Reliable in wetter areas.

## Intercropping Tree Crops with Durian

Durian is a **sun-loving, deep-rooted, and nutrient-demanding tree**. Intercropping can provide extra income and soil benefits, but it must be carefully planned.

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## Good Tree Crops to Intercrop with Durian

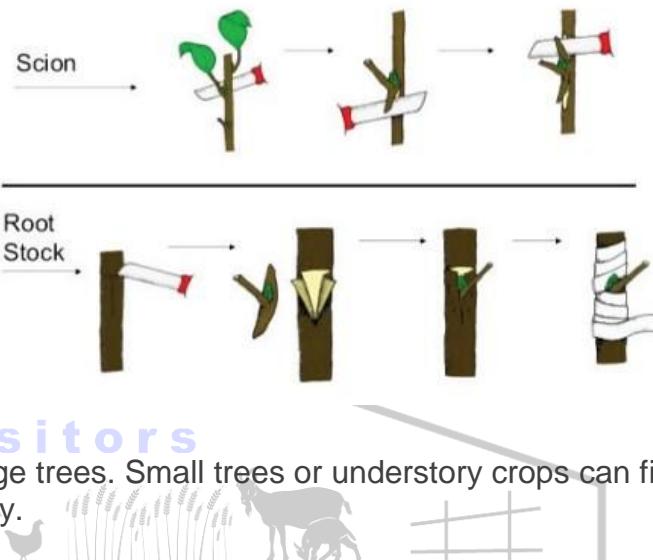
Tree Crop	Pros	Notes / Growing Tips
Banana	<ul style="list-style-type: none"><li>Provides <b>temporary shade</b> for young durian seedlings.</li><li>Quick cash crop while durian matures.</li><li>Helps reduce soil erosion and retain moisture.</li></ul>	<ul style="list-style-type: none"><li>Remove or thin bananas as durian canopy expands (around 3–4 years).</li><li>Plant outside main dripline to reduce root competition.</li></ul>
Papaya	<ul style="list-style-type: none"><li>Fast-growing, early-yielding fruit for income.</li><li>Does not form deep shade.</li></ul>	<ul style="list-style-type: none"><li>Keep spacing from durian dripline to avoid competition for nutrients.</li><li>Short-lived, will need replacement after 3–4 years.</li></ul>
Mangosteen	<ul style="list-style-type: none"><li>Can grow alongside durian in well-drained soil.</li><li>Medium canopy tree—minimal shading if spaced properly.</li></ul>	<ul style="list-style-type: none"><li>Slow-growing; ensure durian gets full sunlight.</li><li>Good as long-term companion with proper pruning.</li></ul>
Rambutan / Lanzones / Longkong	<ul style="list-style-type: none"><li>Similar soil and climate needs.</li><li>Offers harvest diversification.</li></ul>	<ul style="list-style-type: none"><li>Maintain spacing to avoid excessive shading.</li><li>Suitable only after durian seedlings are 2–3 years old.</li></ul>
Cacao / Coffee (understory trees)	<ul style="list-style-type: none"><li>Thrives under partial shade of young durian.</li><li>Provides continuous cash flow.</li><li>Improves soil organic matter.</li></ul>	<ul style="list-style-type: none"><li>Remove shade-tolerant intercrops if durian canopy becomes dense.</li><li>Regular pruning is necessary to prevent durian suppression.</li></ul>
Coconut (dwarf / tall)	<ul style="list-style-type: none"><li>Can work if durian is spaced wide (&gt;10 m).</li><li>Provides windbreak and extra income.</li></ul>	<ul style="list-style-type: none"><li>Only plant coconut on edges or in wide rows to minimize shading of durian.</li><li>Tall coconuts may reduce durian flowering if too close.</li></ul>

## Bad Tree Crops to Intercrop with Durian

Tree Crop	Cons / Risks	Why to Avoid
Jackfruit	<ul style="list-style-type: none"><li>Large, fast-growing canopy causes <b>heavy shade</b>.</li><li>Aggressive root system competes for nutrients.</li></ul>	Reduces durian growth, flowering, and fruit quality.
Mahogany / Timber Trees	<ul style="list-style-type: none"><li>Tall, dense canopy.</li><li>Takes decades to harvest, no short-term benefits.</li></ul>	Blocks sunlight, slows durian flowering, and root competition is high.
Rubber (Hevea)	<ul style="list-style-type: none"><li>Deep-rooted, competes for water and nutrients.</li><li>Dense canopy reduces sunlight.</li></ul>	Can stunt durian growth and reduce yield.
Large Mango / Avocado	<ul style="list-style-type: none"><li>Can overshadow durian and limit airflow.</li></ul>	Risk of fungal diseases due to poor ventilation; slows durian maturation.
Cassia / Fast-Growing Shade Trees	<ul style="list-style-type: none"><li>Provides excessive shade.</li><li>Rapid nutrient depletion.</li></ul>	Reduces young durian vigor and delays fruiting.

## Key Growing Implications

- Sunlight Priority** – Durian requires full sunlight for flowering and fruiting. Avoid permanent shade from large trees.
- Root Competition** – Avoid aggressive or deep-rooted trees close to the durian root zone.
- Temporal Intercropping** – Short-lived, fast-growing crops (bananas, papaya, cacao) are ideal **for the first 2–4 years**.
- Pruning Management** – Regular pruning of both durian and intercrops is essential to maintain airflow, light, and reduce pest pressure.
- Spacing Strategy** – Maintain **8–10 m spacing** between durian and other medium-to-large trees. Small trees or understory crops can fit within the canopy dripline initially.



### ✓ Summary:

- **Good companions:** Banana, papaya, cacao, coffee, mangosteen, rambutan, small coconut.
- **Avoid:** Jackfruit, mahogany, rubber, tall mango, large fast-growing shade trees.
- **Strategy:** Use fast-growing, short-term crops early; phase out or prune as durian matures.

## What is the Broader Durian Market

### High Export Demand

- The Philippines (particularly Mindanao) is tapping into **lucrative export markets**, especially China. [BusinessMirror+2MindaNews+2](#)
- Export access is growing. [MindaNews+2BusinessMirror+2](#)
- This export demand could drive up local farm-gate prices if you target export-quality durian varieties.



## Domestic Supply-Demand Imbalance

- According to an agricultural economics study, *demand continues to outpace supply*. [AgEcon Search](#)
- Local consumption is relatively low in the Philippines (estimated at only ~0.2 kg/person/year) compared to other Southeast Asian countries. [AgEcon Search](#)
- This suggests that increasing local production (e.g., in Bukidnon) can help satisfy both **local and export markets** as supply expands.

## Durian Prices Can Be Volatile Locally

- In Davao markets, durian prices fluctuate heavily depending on supply. [SunStar Publishing Inc.](#)
- There is also a segmentation in pricing: “export varieties” like Puyat may command  $\geq$  P100/kg locally. [Mindanao Times](#)
- For growers, this means **timing** (harvest, transportation) and **quality** (variety, grade) will be crucial to maximize returns.

## Strong Mindanao Consumption

- Historically, Mindanao is a **strong durian consumer base**. One older source claims that ~80% of people in Mindanao are durian eaters vs. only ~20% non-eaters. [Edge Davao](#)
- This suggests that local markets in Bukidnon (or nearby) likely have a decent acceptance, especially among durian lovers.

## Production Presence in Bukidnon

- According to a Value Chain Analysis (VCA) document, Bukidnon is listed among provinces with significant durian activity. [Google Cloud Storage](#)
- This means there is some production infrastructure or participation already in the durian value chain in the province.

## Inferences for Southern Bukidnon

Based on the broader market data and the specific characteristics of Don Carlos, Maramag, Kadingilan, Kibawe, etc., here are some **opportunities** and **risks** for market acceptance

### Opportunities

- **Local Demand Potential:** Because of Mindanao's strong durian-eating culture, there is likely a robust **local market** for quality durian in southern Bukidnon.
- **Export Orientation:** If you produce high-quality or export-standard durian (e.g., **Puyat**, other premium varieties), you can tap into export channels, especially as the export market continues to grow.



## Risks / Challenges

- **Price Volatility:** Durian prices locally can swing a lot. Harvest timing, fruit grade, and market access will strongly influence profitability.
- **Logistics:** To target export or even high-end local markets, you need good post-harvest handling (cold chain, packaging) to preserve quality.
- **Market Saturation Risk:** If many farmers ramp up durian production in Mindanao, local supply could flood markets and depress farm-gate prices, especially for lower-grade fruit.
- **Cost of Production:** Establishing a durian orchard is capital-intensive (seedlings, land, labor). Without efficient operations, returns could be delayed.
- **Competition with Davao:** Davao Region is still the biggest player in durian production. Competing on volume or price may be difficult unless you differentiate (variety, quality).
- **Climate Risks:** Durian is sensitive to climatic conditions; unfavorable weather could reduce yield or fruit quality, affecting both local and export sales.

## Assessment: Likely Market Acceptance in Southern Bukidnon

- **Moderately Strong:** Given Mindanao's historical durian consumption, and Bukidnon having some durian production, there is a **good base of local demand**.
- **High Growth Potential:** Because of growing export avenues and the existing supply gap, durian from your area could be very competitive—especially if you produce well.
- **Value-Add Advantage:** Focusing not just on fresh durian but on processed pulp or frozen could help stabilize profitability and expand market share.
- **Value-Added Products:** Given volatility in fresh durian prices, there may be room for **processed durian products** (frozen pulp, candies, pastries) that can stabilize income.
- **Supply Gap:** If local production is still low relative to potential demand, new orchards in your area could fill a **niche or underserved market**.
- **Premium Pricing Seasonally:** During peak seasons or low-supply periods, good-quality durian may fetch premium prices in local or regional markets.