Why Grow Baobab Trees?

1. Nutritional value

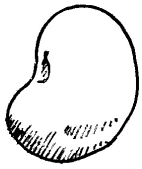
- **Leaves:** Used as a green vegetable in cooking.
- **Fruit:** Powdered pulp used to make drink, flavouring and as cream of tartar.
- **Seed:** Soup thickening agent, roasted as a snack and oil extracted by pounding seeds.



Fruit: Large (24 x 12 cm) oblong, green grey



Leaf



Seeds: Bean shaped with floury pulp

2. Socio-economic

- **Leaves:** Dried leaves sold in market.
- **Fruit:** Dried fruit powder is sold in markets, hard fruit shells are made into pots for food and drink. Also made into cream of tartar.
- **Seed:** Seed oil sold for cosmetics.
- **Bark:** Inner fibres for rope, string, nets and fishing line.
- **Wood:** Used to make canoes and paper.
- **Root:** Used to make Soluble red dye and rope.





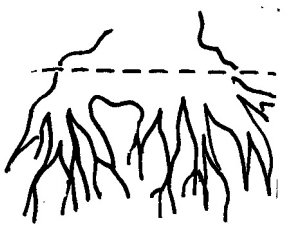
Bark



Wood

3. Environmental

- Tree canopy and roots reduce soil erosion and maintain soil structure. Baobabs may be grown in dry and de-graded areas. See part 1



Roots

BENEFITS

1a

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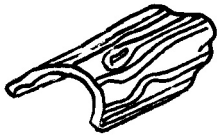
BENEFITS

4. Medicinal values

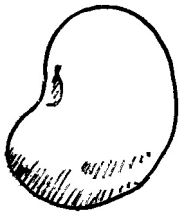
- **Leaves:** Contain vitamin A, which improves eyesight and treats dysentery, insect bites and fatigue.
- **Fruit:** Pulp contains vitamin C, which helps to prevent colds. Pulp also treats dysentery, measles and smallpox.
- **Seed:** Contains vitamin B1, calcium, iron, edible oils and proteins. Also used to treat inflamed gums and teeth disorders.
- **Bark:** Substitutes for quinine in cases of fever/malaria.
- **Gum:** Used as pain killer and disinfectant.



Leaf



Bark



Seeds: Bean shaped with floury pulp

5. Cultural

- Acts as a ceremonial focus for hunters and others.



6. Other

- **Leaves:** Animal feed
- **Trunk:** Storing water

1b

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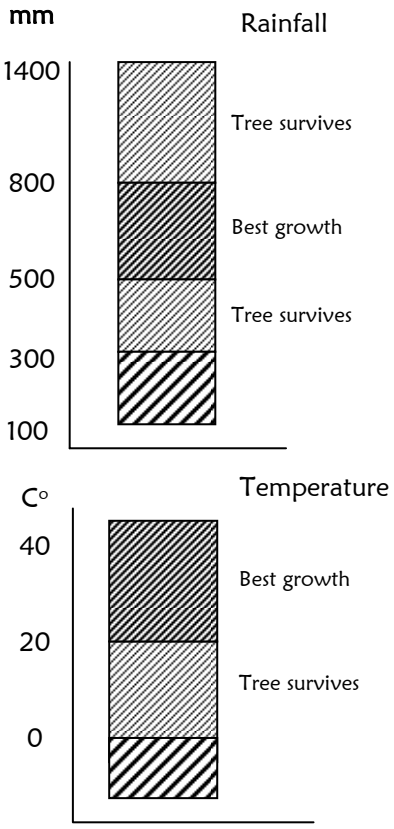
Where To Grow Baobab Trees

Baobabs grow mainly in sub-Saharan Africa, but will also grow in northern Australia, India, Sri Lanka, Indonesia, the Philippines, the Middle East and the West Indies.

1. Climate requirements

Baobab grows in tropical areas with dry winter and hot wet summers (Africa, India, Malaysia and Indonesia).

- **Rainfall**
  - Best average: 500–800 mm per year.
  - Can survive from 300–1400 mm per year.
  - Not below 300 mm.
- **Temperature**
  - Best average from 20–40°C.
  - Ability to survive low temperature but not frost.



2. Site requirements

- **Soils:** Will grow on many soils including sandy loams and laterite.

3. Land-use systems

- Can be planted in orchards, home gardens, grass lands and field boundaries.
- Suitable for marginal land.
- Intercropping - other crops can be grown between baobab trees to make use of land. See Technical Note 5b



Intercropping system

FIELD ESTABLISHMENT

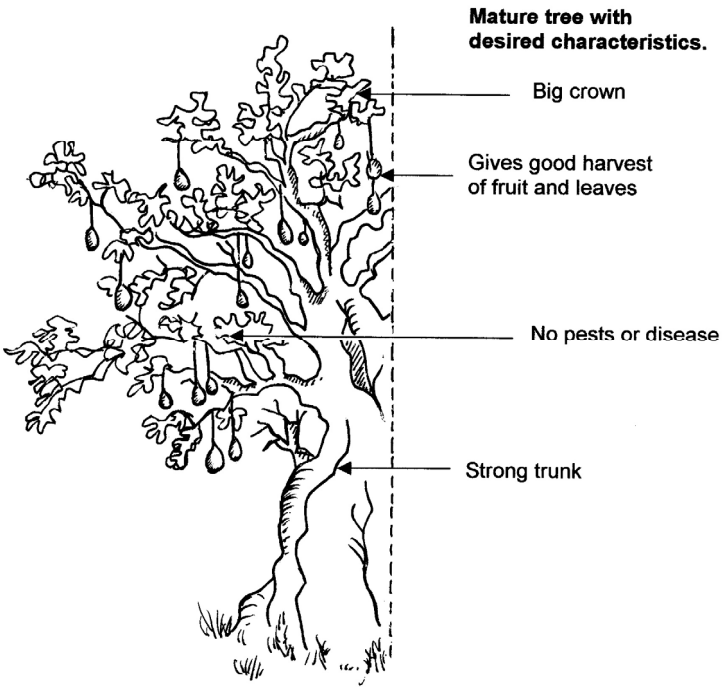
2a

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What To Grow

1. Characteristics

- **Deciduous:** Sheds its leaves each year.
- **Bark:** Smooth, silver-grey, pink or dark grey.
- **Lifespan:** Hundreds of years.
- **Height:** Up to 25 m.
- **Trunk diameter:** 6–10 m.
- **Leaves:** Palmate (like a hand).



Good characteristics

2. Selection of planting materials

- **Seeds:** Collect seeds when fruit is mature from strongly growing trees.
- **Cuttings:** Select cuttings from mature full grown trees showing desired characteristics.

3. Morphotypes

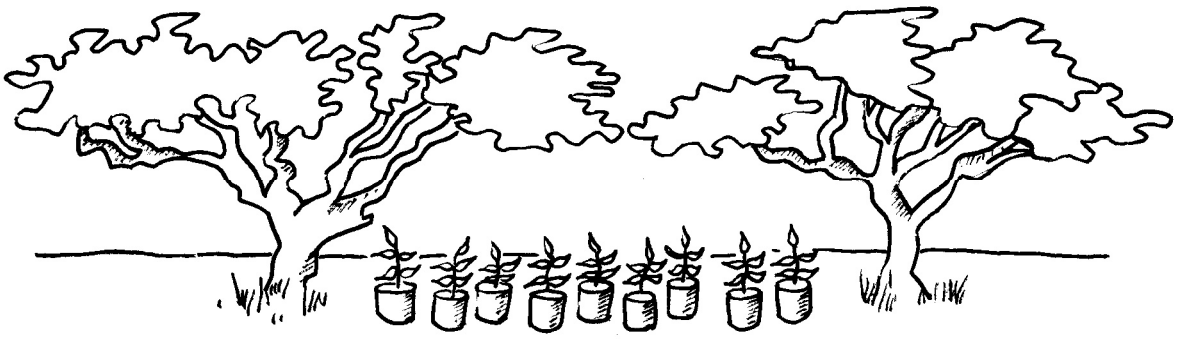
There are no commercial varieties of baobab. Morphotypes have been identified locally for different products e.g. leaves, bark, fruit. In Mali, the following are known:

- **Sirafing:** Mild flavoured leaves.
  - Bark – dark grey in colour
  - Trunk – black
- **Sirable:** Produces the highest quality, most delicious fruit.
  - Bark – pinkish purple in colour
  - Trunk – red
- **Siradie:** Recognised for its high quality fibre.
  - Bark – silver/grey in colour
  - Trunk – grey

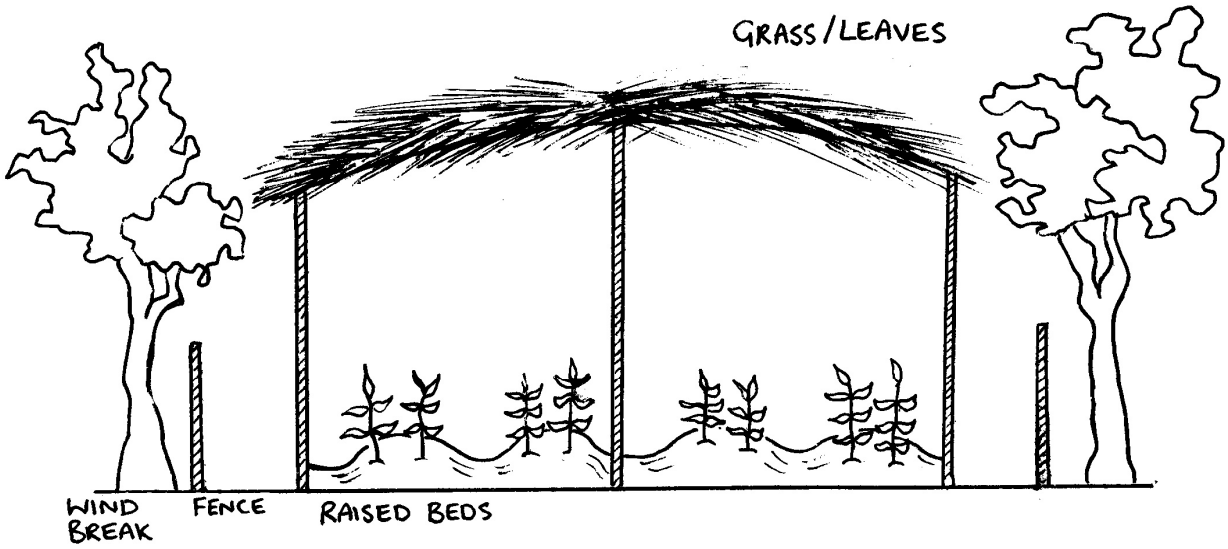
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How to Grow the Baobab Tree
- Growing Seedlings and Young Trees -

1. Nursery establishment



Nursery may be under a tree or under shade



Temporary nursery using grass or leaves for shade

2. Selecting the nursery site

It should be:

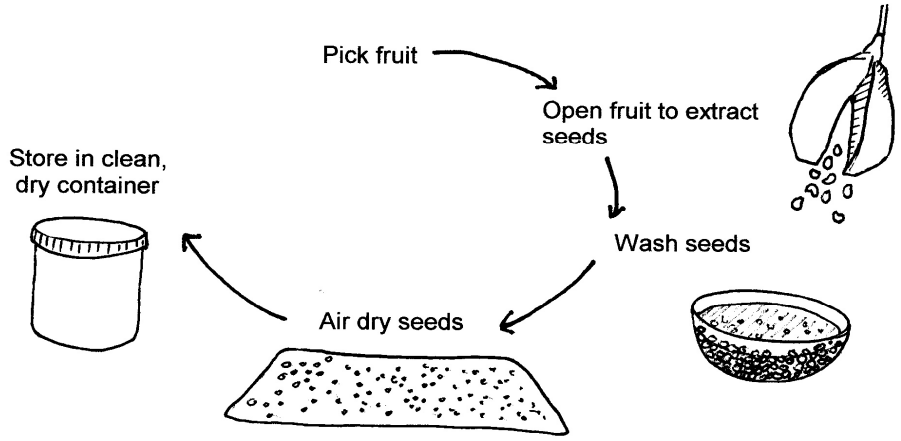
- ☞ On level ground with good drainage.
- ☞ Use raised beds to assist drainage.
- ☞ Close to regular water supply.
- ☞ Sheltered from wind.
- ☞ Not liable to flooding.
- ☞ Protected from stray or domestic animals.

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SEED PROPOGATION

How to Grow the Baobab Tree
- Propagation by Seed -

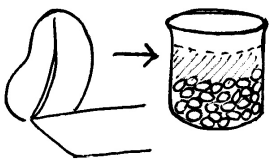
1. Stages in seed propagation



Stages in seed propagation

2. Seed treatment

- To ensure better germination, seed coat must be cut to allow water to enter.
- Cut seed coat with knife and soak in water for 3 days, or boil seeds in water for 5–7 minutes.



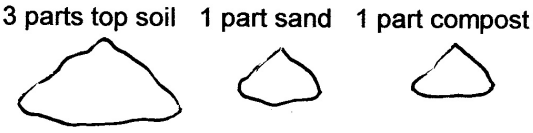
Cutting seed coat



Boil seeds

3. Potting mixture

- Mix three parts of top soil with one part sand and one part compost.



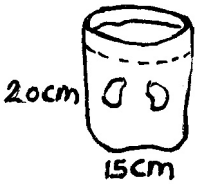
Potting mixture

4. Sowing seed

- Sow 1–2 seeds in plastic bags, clay pots or tins.



Clay pot



Plastic bag

5. New seedling

- Water seeds every 2–3 days.
- Seedlings ready for planting out when 2–3 pairs of leaves have grown.



A young seedling

3b

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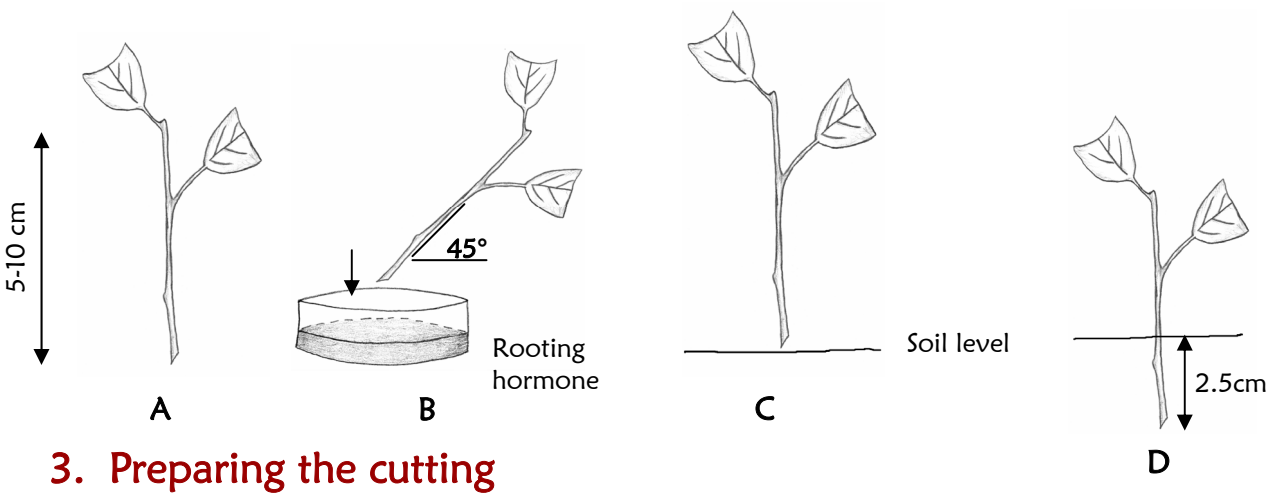
How to Grow the Baobab Tree
- Vegetative Propagation -

1. Advantages of vegetative propagation

- Ensures the characteristics of the new tree are the same as those of the mother tree.
- Trees come into bearing sooner.
- Vegetative propagation may be carried out throughout the year, but not during the hot season.

2. Stem cuttings

- Take 5–10 cm cutting from terminal shoot of mature mother tree in the morning.



3. Preparing the cutting

- **A.** Cutting with 2 leaves remaining. Cut leaves in half.
- **B.** Cut surface dipped in hormone at 45° angle to ensure an even covering. Rooting hormone IBA (Indole-3-butyric acid). Dilute with 50% alcohol.
- **C** and **D.** Cutting placed vertically in soil to a depth of 2.5 cm.

4. Success rate – usually not high

- Rooting success about 20%. (Only about 2% without rooting hormone.)
- Survival success in the field about 15%.
- Remove shoot tip to encourage root development.
- Keep soil moist all the time.

5. Grafting equipment



Secateurs

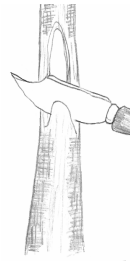
Clean, sharp knife

Plastic bags or pots

Plastic tape

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6. Rootstock selection and preparation



Root-stock

- Collect seed and sow as described in Seed Propagation. Seedling ready for grafting at three months old or when stem is just thicker than a pencil.
- Make downward slanting cut into stem.
- Make second cut below first to remove a piece of bark and wood.

7. Scion collection and preparation

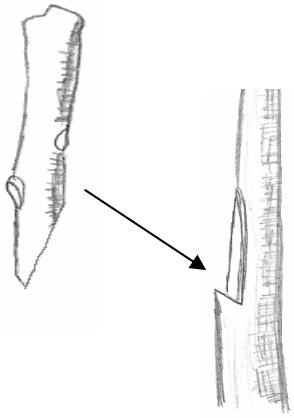


Scion

- Cut scion from mature fruit bearing mother tree.
- Choose 6–9 months old scion with one or more buds.
- Cut a 5–10 cm scion that is 1 cm in diameter.
- Cut off the top of the scion. At least one bud should remain.
- Place the blade of the knife almost parallel to the twig to make a level surface of about 4–5 cm length with one gentle cut.

8. The graft union

- Match the cut surfaces of scion and rootstock to one another.
- Bind the rootstock and scion together with plastic tape.

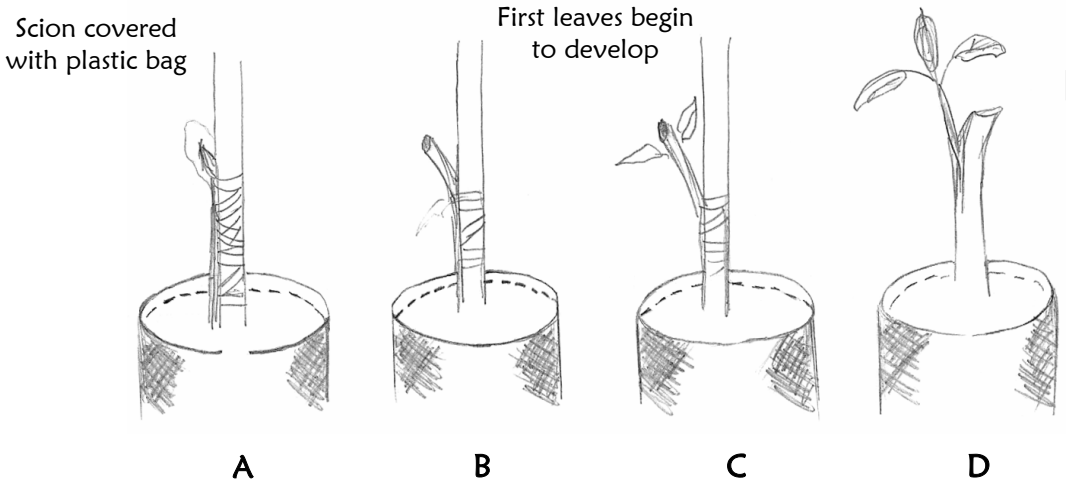


Preparation of scion

Rootstock and scion ready to be bound

9. Graft development

- **A.** Scion attached to rootstock. Cover scion with small plastic bag to prevent moisture loss.
- **B.** After 2–3 weeks.
- **C.** After 1 month. Graft is successful if new leaves appear on scion.
- **D.** After 2–3 months. Remove top of rootstock when 3–4 leaves have grown.
- Water pots regularly.
- Remove bag after 3 to 4 weeks.
- Remove the tape after 4 to 6 months, when the union has healed.



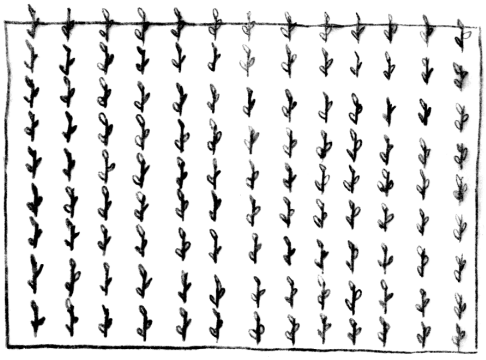
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How to Grow the Baobab Tree
- Field Establishment -

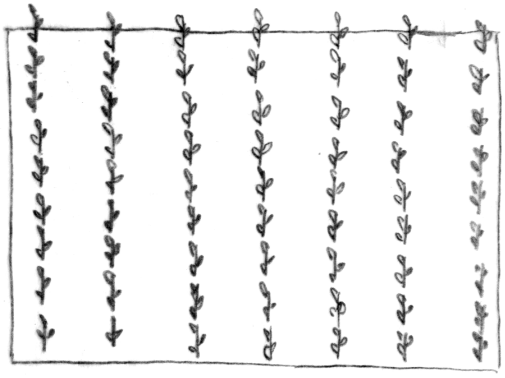
FIELD ESTABLISHMENT

1. Plant spacing

- For leaf production only, plant 0.2 by 0.5 metres.
- For leaves and fruit, 4 by 4 metres.
- For small orchards, 13 by 13 metres.
- Also plant on farm boundaries and along roadways 15 metres apart.



Spacing for leaf production



Spacing for leaves and fruit

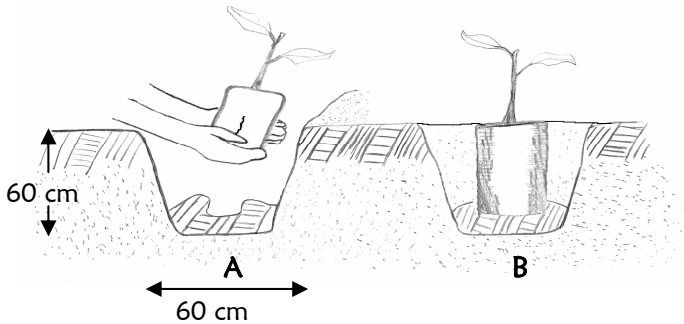
2. Planting out

- Remove bottom and slit side of plastic container.



3. Pit planting

- **A.** Dig the pit 50 x 50 cm. Mix 15–20 kg manure into planting pit.
- **B.** Place tree in centre of the hole and fill with soil to the root collar.



4. Irrigation

- 1–2 litres of water twice a week during establishment.

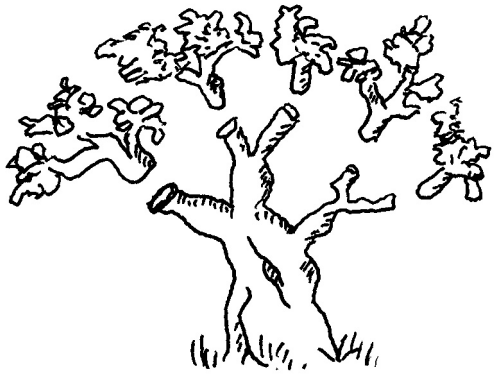
5a

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How to Grow the Baobab Tree
- Field Management -

1. Pruning

☞ Little pruning is required. Pluck leaves for eating or market sales.



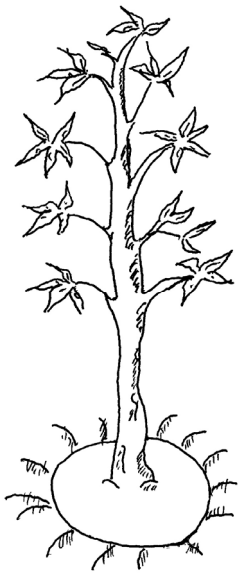
Pollarded tree

2. Pollarding

☞ As tree gets older, for leaf production.

3. Weeding

☞ Dig a basin around newly planted tree and keep basin free of weeds.



Young tree with basin free of weeds

4. Use of fertilizers

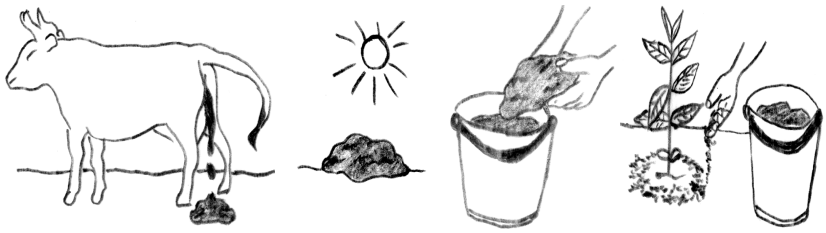
☞ Mature trees produce well without fertilizers.

☞ Fertilizers may be applied at the time of planting or for intensive leaf production.

☞ Fertilizer may be useful on sandy soils, if the tree grows poorly or has yellow leaves.

☞ Farm yard manure: 10–15 kg/tree/year. Apply before rains.

☞ Rock phosphate (if available) may be used for intensive leaf production: 150 gm/tree/year before rains.



Cow manure is dried in the sun and added to the planting holes.

5. Intercropping

☞ For first few years intercrop with pearl millet, beans or vegetables, groundnuts, cassava, maize or sorghum.

6. Windbreaks

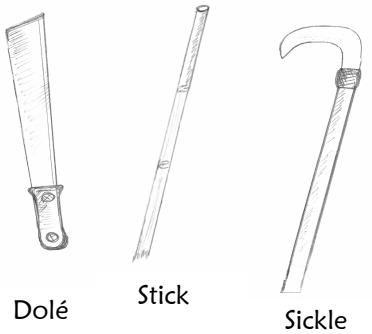
☞ Baobabs can be planted for windbreaks and soil conservation at 3–4 m spacing between trees.

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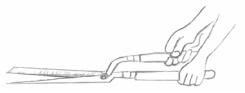
Harvesting

1. Tools used for harvesting

- **Machete or Dolé:** used when leaf stalk is fresh and easy to cut or to cut down fruit.
- **Stick:** Sometimes used to knock down fruits.
- **Sickle:** Used when leaf stalk is hard to cut at end of season. Also used for cutting down fruit.
- **Daba:** A short hoe used for cultivating and weeding.
- You may use shears if available.



Dolé Stick Sickle



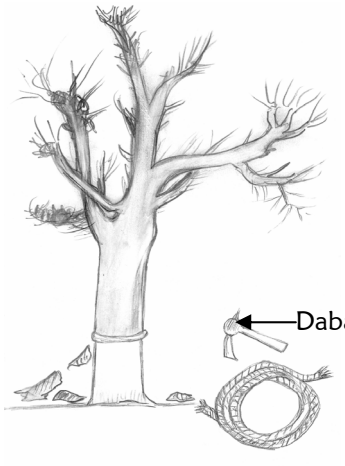
Shears

2. Leaves

- Harvest from well-established trees between March and October.



Harvesting of young baobab leaves



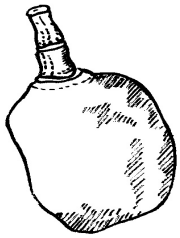
Use daba to remove bark.
Use fibres to make rope.

3. Bark

- Harvest at same time as leaves – March to October.
- Can harvest bark again in 4–5 years.

4. Fruits

- Grafted trees come into bearing in 3–4 years.
- Seedling trees come into bearing in 9–20 years.
- Harvest fruit when shell is brown, between December and April.



Immature fruit – green/grey
Mature fruit – brown



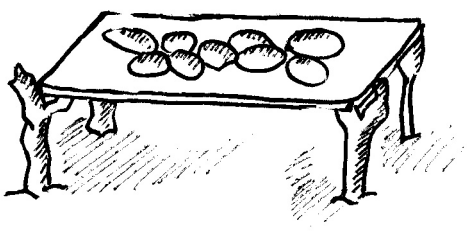
Harvesting of fruits by hand (beware of accidents)

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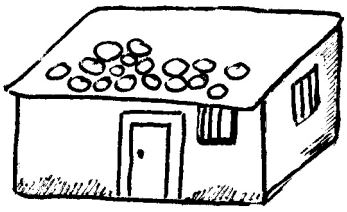
Post-harvest Handling and Storage

1. Whole fruits

- Whole fruits can be stored on shed roofs or raised platforms.
- Unopened and un-cracked fruit can last up to one year.



Platform



Rooftop

2. Fruit pulp

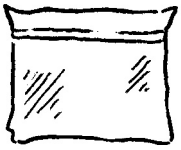
- Grind pulp to a powder and store in sealed cans, jars or plastic bags.



Tin cans



Jars

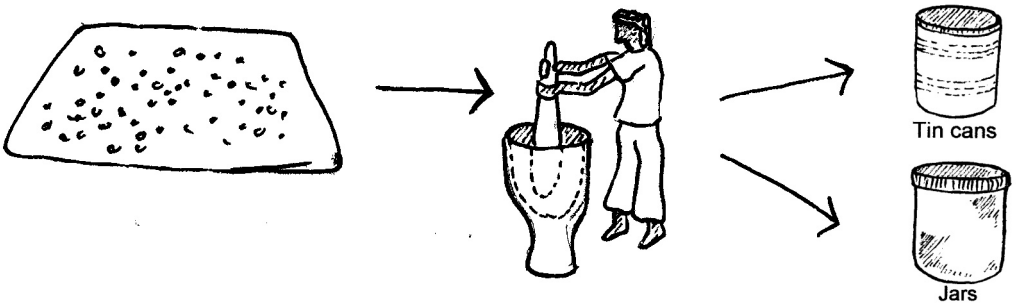


Plastic bags

Keep sealed containers in cool, dry conditions.

3. Seeds

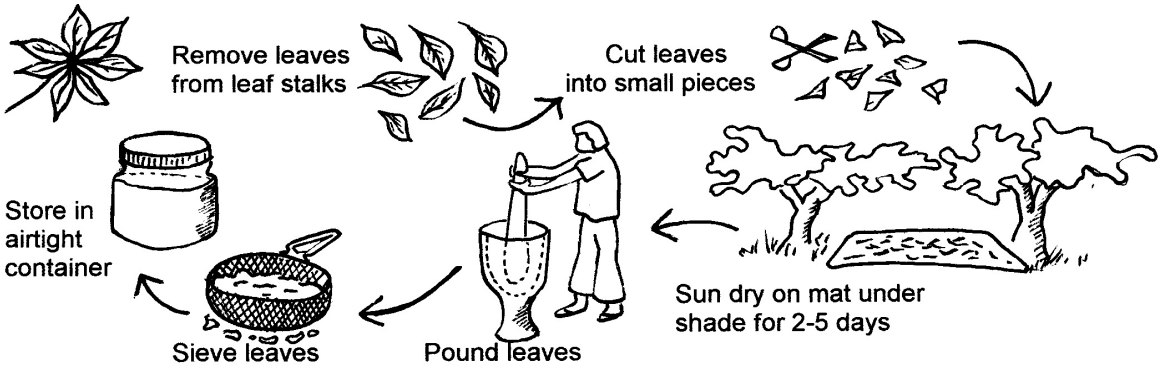
- Dry seeds and pound into powder. Store in cans or jars.



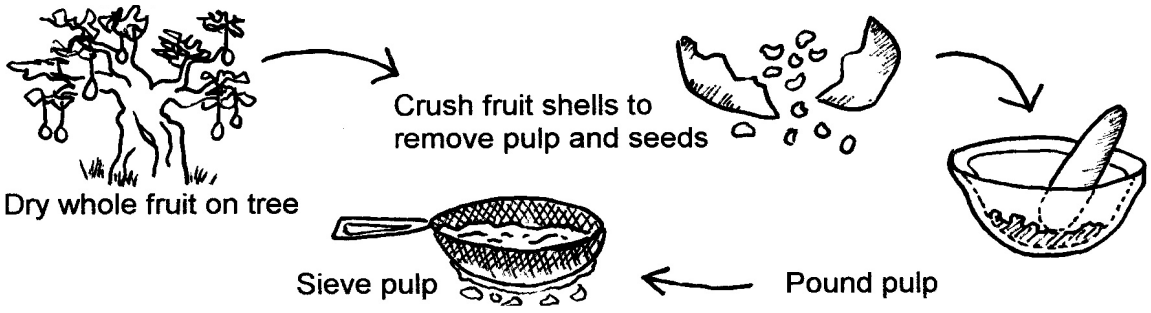
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Processing

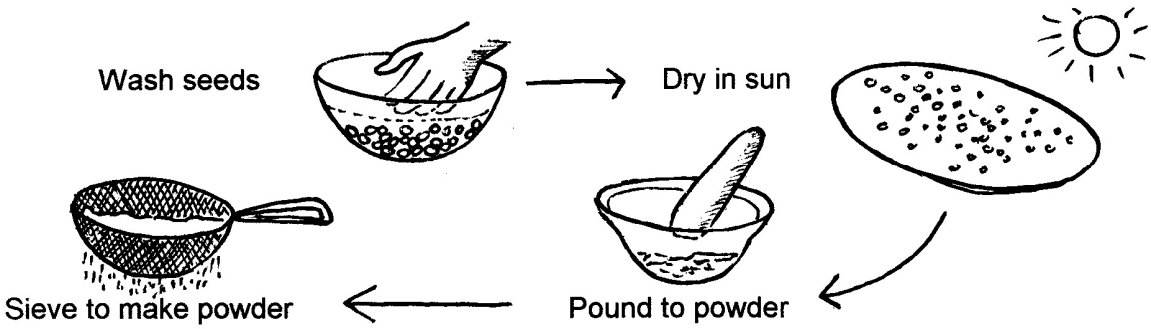
1. Leaves



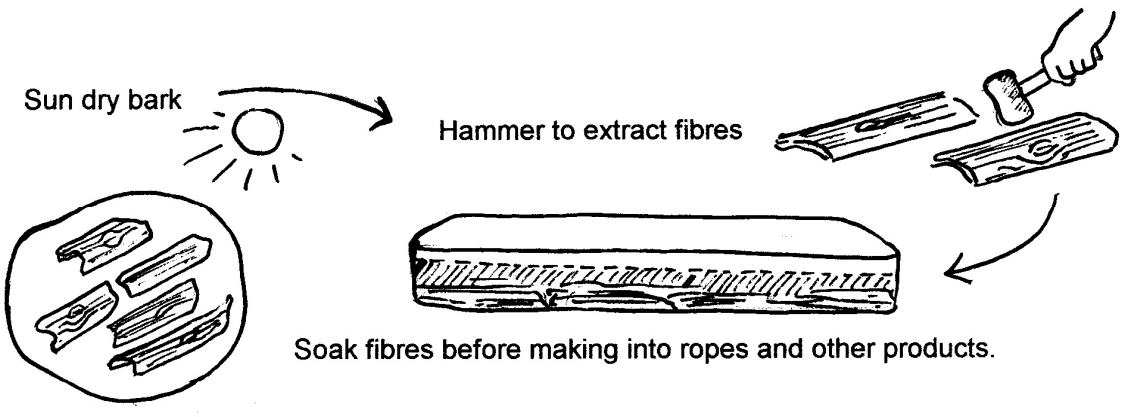
2. Fruit pulp



3. Seeds



4. Bark



PROCESSING

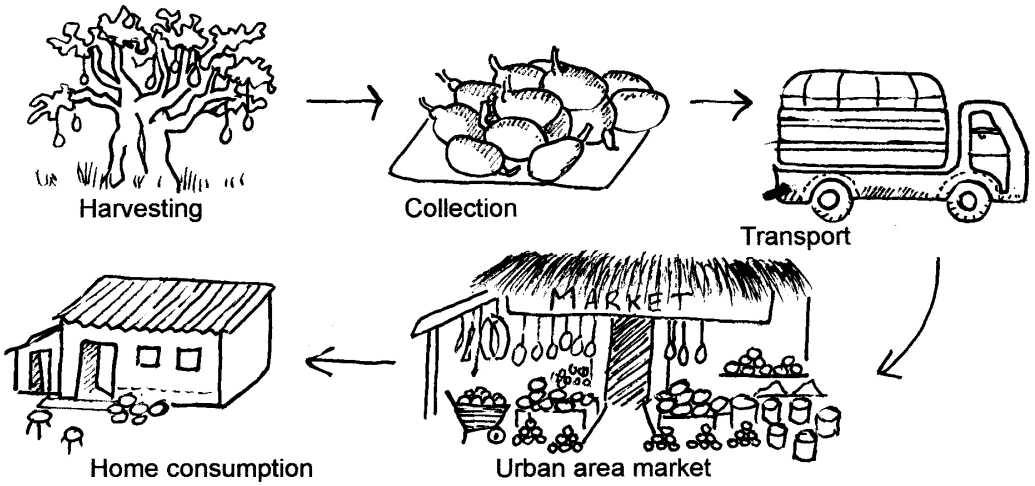
7a

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Marketing and Economics

1. Local marketing

☞ Baobab products usually sold as fresh or dried fruits, pulp, leaves, bark (fibres) and craft products.



Marketing chain

1. International market

☞ Products usually sold as pre-processed pulp and fibres.

3. Income potential

☞ Yields vary greatly depending on location, soils and tree management.

☞ For example fruit pulp prices in December 2004 in Burkina Faso were:

Retail: Approximately 50€ per 250 g.
Wholesale: Approximately 35€ per kg.
Supplier: Approximately US $ 3 to US $ 20 per kg (FOB*).

Prices depending upon the quantity, quality and other trade terms.
Organic and Fair Trade certified fruits, with certification costs, may increase the price fetched by US $ 5 per kg FOB.
(*free on board)
Gruenwald, J. and Galizia, M. 2005 The United Nations Conference on Trade and Development, BioTrade Initiative / BioTrade Facilitation Programme.

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