


Tree seed for important indigenous fruit and food trees in Zambia

A guide for tree seed collectors





“Fruit and/or food trees provide fruits, leafy vegetables, nuts, seeds oils and other edible parts. These are an easily available source of micronutrients. They also diversify and complement diets based of staples. Diversifying farms with different fruit and food trees can provide for year round harvest and nutrient-rich foods. Direct and indirect benefits of trees include other products, income generation, and ecosystem services.”

Dr Stepha McMullin, CIFOR-ICRAF

Under the guidance of COMACO, poachers have surrendered their weapons and taken on a new title, transformed poacher, and adopted a new way of life through conservation farming. They will benefit greatly through indigenous fruit trees, as they serve as a source of nutrition for their entire family, and the fruits can be collected and sold to community members. The same is true for small farmers. Adopting the trade of seed collecting creates an additional source of income.

Dr Dale Lewis, COMACO

Indigenous fruits provide a lot of benefits to the community. Through them, farmers like Lutawo Phiri, who lives by Msekera Research Station, have become better off with many customers. Some small farmers sell fruit tree seedlings and planting materials (scions and buds). Local people were also taught how to brew beer from the fruits of *Strychnos cocculoides*. Later, they collected its fruits for the genebank at Msekera. Finally, large numbers of farmers were taught by ZARI and ICRAF how to make jam from *Strychnos cocculoides* fruits. This was very welcome.

Amedeus Kasama, ZARI



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Definition of terms

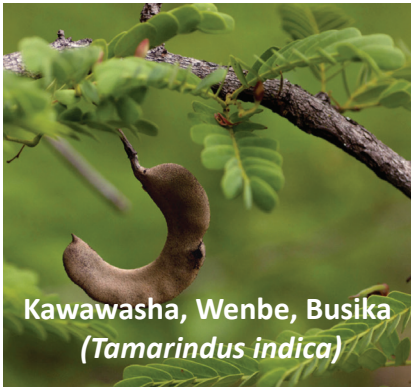
<ul style="list-style-type: none"> □ Dormancy: a state like being asleep where a seed is unable to germinate unless assisted □ Exotic trees: species introduced to an area where they do not occur naturally □ Food tree: a tree that has an edible part for humans □ Genetic diversity: the range of different inherited traits in a species. In a population with high genetic diversity, individuals have a wide variety of traits and are different from each other. □ Indigenous tree: a tree that is part of the natural vegetation of an area and is adapted to the specific ecological conditions. Sometimes called a local tree. □ Inherited: a characteristic or trait that comes genetically from parents □ Population: a group of plants that share a geographic area and can interbreed □ Portfolio: like a group. A food tree portfolio is a grouping of trees, which if a household has them, it will have tree food every month □ Mother trees: trees from which seed is collected 	<ul style="list-style-type: none"> □ Nutrient: a substance that provides nourishment essential for life and growth □ Orthodox seed: Seeds that can be easily dried and stored □ "Drying sensitive" seed: Seeds that do not live long when stored □ Seed: the unit of reproduction of a flowering plant, capable of developing into another such plant □ Seed quality: includes 1. physical quality: size, colour, presence of impurities, cracks, pests or other damage; 2. physiological quality: maturity, moisture content, ability to germinate; 3. genetic quality: positive traits inherited from parent trees such as sweetness and size of fruit □ Seed source: the stand of trees from which seed is collected. Seeds collected from a seed source should produce seedlings that are adapted to the environment where the parents grow □ Tree species: a class of trees whose members have the same main characteristics and are able to breed with each other to produce a viable offspring □ Viable: able to grow and live □ Winnowing: blowing current of air through seed to remove chaff.
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This guide is a product of the BMZ-funded project *Piloting incentive-based agricultural portfolios for nutrition and resilience in Zambia* and was assembled by L Keino, Z Kinyanjui and C Watson with input from S Moestrup, A Abraham, A Ickowitz, I Dawson, S McMullin, A Mkonda, R Katonga, and M Sichamba. It draws on the seed curricula of Botanical Gardens Conservation International, Terraformation and the Millenium Seed Bank Partnership and borrows with permission from books like Mbora and Wekesa's 2016 *Agroforestry Tree Seed Training Handbook* and Simute et al's 1998 *Agroforestry Extension Manual for Eastern Zambia*. This version of the guide was produced for a seed training for farmers in Petauke 28-30 November 2023.

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Important trees for nutrition and healthy diets in Zambia



Introduction

This book is a guide on how to collect, process, store and germinate seeds of important indigenous fruit trees as well as “food” trees that provide other foods such as leafy vegetables, seeds, nuts and oils. It gives basic guidance for anyone interested and involved in seed collection. If you follow this guidance, the seed you collect should be of high quality. It will stand a high chance of growing into a better seedling and a tree that gives the intended benefits. The basic guidance provided also applies to collecting seed of trees which have other functions, such as providing fodder, bee forage, timber, soil improvement, and shade.

Why are we interested in indigenous fruit and food trees?

Fruit trees are an obvious and simple yet underutilized and neglected part of the long-term solution to address the lack of essential micronutrients in local agri-food systems and diets, which are dominated by starchy staple foods. Indigenous fruit and food trees provide food such as fruit, nuts, leaves and pulp around seeds. Communities that have these trees can harvest and consume these and other edible parts. These trees and the food they provide can be part of a diverse and more nutritious diet. Eating a diversity of healthy and micronutrient rich foods is good for you and your family’s health. Some of these trees are becoming hard to find, however, and very few families grow them around their homes. This training aims to provide you with information and the steps to follow to become a seed collector, and support the availability and use of these trees.

What does the government say about indigenous fruit and food trees?

The Zambian Food-based Dietary Guidelines recommends eating two fruits a day. Sour fruits like baobab and tamarind are rich in vitamin C, an essential nutrient that needs to be taken every day. A quarter of a cup of fruit from the *Mubuyu* or Baobab tree (*Adansonia digitata*) can contain as much as one large orange. They also say that fruits like *Masuka* from the *Uapaca kirkiana* tree, *Marula* from the *Sclerocarya birrea* tree. Mpundu from the *Mobola* plum tree (*Parinari curatellifolia*), and *Makole* from the *Azanza garckeana* tree are good sources of essential nutrients.

Creating a healthy home with fruit and food trees for nutrition

By having about 10-12 species (different types) of fruit or food trees on your farm – a mix of indigenous and some exotic trees like mango and papaya – families could have at least one type of fruit or other tree food available each month of the year. They never have a gap. They can also sell the surplus tree products to boost their income and so that people in towns can find these important fruits and foods in their markets.

Use this booklet to become a tree seed collector and to improve the availability of a diversity of fruit and food trees that could provide important and nutritious foods for you, your family, and the broader community.

Note: The focus of this book is on seed collection. Other methods of collection such as cuttings or marcots will be covered elsewhere.

Nutritional Benefits of Indigenous Fruit and Food Trees

Nutrients are components found in fruits and other foods that the body needs to grow strong and healthy. Eating a diverse and balanced diet ensures that the body has access to a range of important nutrients. Many fruits and tree foods provide important micro-nutrients such as pro-vitamin A and vitamin C.



Vitamin A is important for good vision and a healthy immune system. Yellow and orange fleshed fruits or dark green leafy vegetables are good sources of vitamin A in plants



Vitamin C strengthens the immune system and provides for good health. Fresh fruits and vegetables, particularly green leafy vegetables are the best sources. Vitamin C is reduced during storage and destroyed by heat, e.g. by prolonged cooking.

Many indigenous trees have fruit and other food products that are very nutritious. Mubuyu, Makole and Ngaingai are very rich in iron, which is essential for red blood cells which carry oxygen around the body. Children as well as women who are pregnant, menstruating or lactating often lack *iron*: learning and playing becomes difficult for the children, and childbirth becomes extra difficult for women. Mpundu is very rich in vitamin C. Some fruit have both iron and vitamin C. The government advises “Eat two fruits a day”.

Table 1 shows micronutrient values for selected indigenous fruits identified as commonly used by communities in Eastern, Central and Muchinga Provinces. *** means the fruit is a high source of the nutrient; ** means it is a source; and * means that the micronutrient is present but low.

Common name	Local name	Scientific name	Iron	Vitamin A	Folate	Vitamin C	Harvest season
Baobab	Mubuyu	<i>Adansonia digitata</i>	***		*	***	August – October
Wild pear	Makole	<i>Azanza garckeana</i>	***				August – November
Indian plum	Nkondo nkondo	<i>Flacourtia indica</i>	*			*	October – November
Mobola plum	Mpundu	<i>Parinari curatellifolia</i>	**			***	August – November
Tamarind	Kawawasha/wembe/usika	<i>Tamarindus indica</i>	**			*	December – January
African medlar	Ngaingai	<i>Vangueria infausta</i>	***			*	n/a
Indian jujube	Masau	<i>Ziziphus mauritiana</i>	*			**	November – December

***	**	*	Thresholds for “high source” and “source” are based on WHO, FAO (2007): Codex Alimentarius Commission, Food Labelling. Fifth edition, Rome.
high source	Source	Present, but low source	
FAO/WHO (2007)	FAO/WHO (2007)	own adaptation	

Other valuable micro-nutrients in tree fruits and foods

- Calcium is important for teeth and bones.
- Beta-carotene is important for eye sight and for immune system.
- Thiamine, Riboflavin, Vitamin B6, Niacin and Folate help brain function, turn food into energy, and support the development of the baby in the womb, among other contributions to human health.
- Zinc helps in growth of cells, building proteins, healing damaged tissue, and supporting a healthy immune system.
- Copper helps the human body make red blood cells and collagen, a key part of bones and connective tissue. It also keeps nerve cells healthy.

To be strong, a person needs to have all these nutrients. The best way to get them is to eat a variety of foods from all food groups including staple foods, legumes, green leafy vegetables, other vegetables, orange-coloured fruits and vegetables, other fruits, nuts and seeds, dairy, meat, fish and insects -as well as oil in moderation. Most people in the world and in Zambia do not eat enough fruit to meet dietary recommendations.

Fruit and food tree portfolio for Eastern, Central and Muchinga Provinces

Our project is working across three provinces and eight sites – Eastern (Chikomani, Magodi, Mwape, Nyanje), Central (Chibale, Chitambo) and Muchinga (Mukungule, Chikwanda) (Figure 1).

In discussions with communities across these sites, a total of 17 trees were identified that are commonly used for food and as a source of nutrition. Eleven of these are indigenous to Zambia. Six come from other parts of the world but are common in and adapted to Zambia. By growing at least some of these trees on a farm, your family could have fruit and food from these trees all year round.

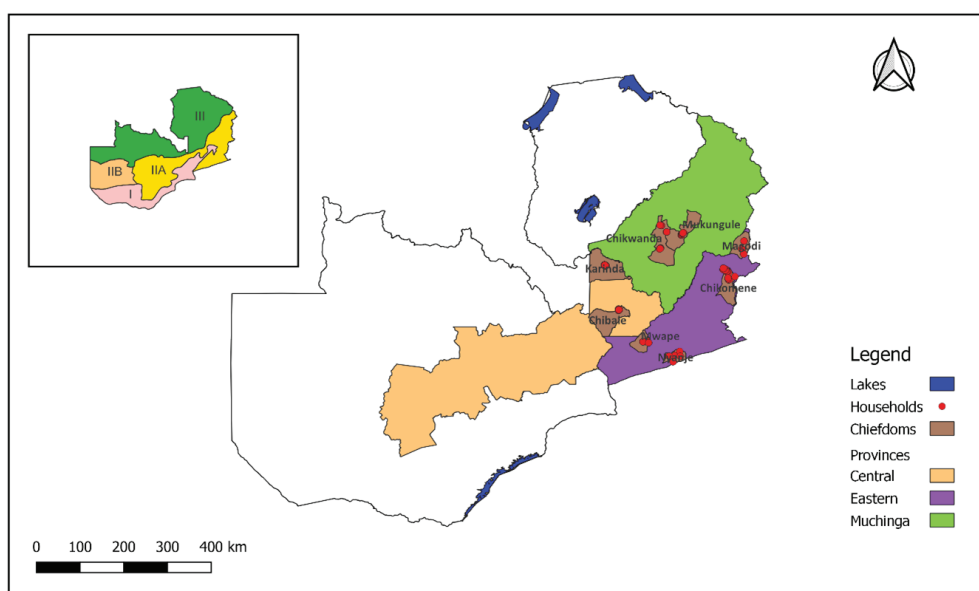


Figure 1. Map showing sites (red dots) where we are engaging with communities. Source: R.Kindt

The table below shows when these different trees produce fruit or other food. It is a “portfolio” based on household surveys and focus group discussions. In all, CIFOR-ICRAF and COMACO teams interviewed 745 people, including 168 farmers in eight chiefdoms in February and March 2022.

The left side of the table shows the names of the trees. Across the top of the table, the months of the year are shown. The green colored boxes indicate the month in which the fruit or food tree product is available for harvest. For example, Makole and Mpunde produce fruit from September through December.

If a farming family has all these species, they will have a “portfolio” of fruit and food trees that makes sure that every month they have tree food to eat and possibly some to sell. Only in August are there no food trees producing. Then the family relies on bananas and papaya.

Common Name	Local Name	Botanical Name	*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mango		<i>Mangifera indica</i>	e												
Avocado	Kota Pela	<i>Persea americana</i>	e												
Guava	Magwaba	<i>Psidium guajava</i>	e												
Orange	Amachungwa	<i>Citrus x sinensis</i>	e												
Lemon		<i>Citrus limon</i>	e												
Chocolate berry	Imfutu	<i>Vitex doniana</i>	i												
Baobab	Mu-Uyu	<i>Adansonia digitata</i>	i												
Mobola plum	Mbula/mpundu	<i>Parinari curatellifolia</i>	i												
Wild pear	Makole	<i>Azanza garckeana</i>	i												
	Mfungo	<i>Anisophyllea boehmii</i>	i												
Wild Loquat	Amasuku	<i>Uapaca kirkiana</i>	i												
Monkey Orange	Ifisongole	<i>Strychnos cocculoides</i>	i												
Wild Granadilla	Amateke	<i>Passiflora herbertiana</i>	i												

Table 2. A combined fruit and food tree portfolio derived from portfolios developed with communities in different sites across Eastern, Muchinga and Central Province.

How to collect quality seed for quality trees

Quality seed is important because we all want quality trees. Getting quality seed comes from good planning and timing of your seed collection and careful selection of the trees that you collect from. It also depends on how you collect, extract, clean, dry, package and store the seed. Each activity impacts seed quality and availability of high-quality seedlings.

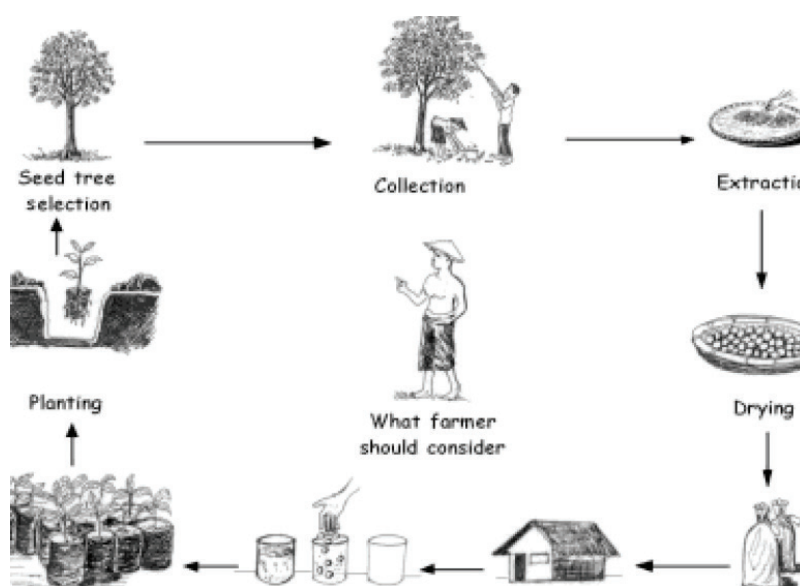


Figure 2. Seed collection and tree planting activities. Each activity influences seed quality. (Adapted from IFSP, 2000).

Planning tree seed collection

- Obtain permission and authorisation from the land-owner/manager of the site/national park/ relevant government authority
- Identify your seed source, which can be natural forests, remnant forest patches and trees, and/ or planted trees in farmland.
- Time your tree seed collection and know when seed is ready. Identify the time for seed collection. Seeding times can vary from year to year and by tree and location.

Before your seed collecting trip.

Visit the sites to monitor the target tree population

- Assess the trees/tree stands where collection will be done and base your plans on that
- Plan access routes, equipment required and a timetable
- Assemble collectors. It is best if they have been trained. Every collector should be able to recognise the target species.

Know when seed is ready (mature)

- The aim is to collect healthy mature seed at the point of “natural dispersal” when it is at maximum viability. Natural dispersal is when they would have detached from the tree anyway.
- Fruit or seed is ready to disperse when:
 - They detach easily from the parent plant
 - The fruit or seedcoat change their colour
 - Fruits split or break open
 - Seeds rattle or are hard and dry, and some seeds are already dispersed



Figure 3: Different fruit ripening stages for *Annona senegalensis*.

Selecting Trees for Seed Collection

- Look for traits such as: colour, abundant fruits or pods, big, sweet and juicy fruits, a uniform crown with low branches, absence of pests and diseases.
- Capture genetic diversity by locating a good number of trees to collect for each species of tree. At least 30 is recommended. If this not possible, aim for 15.
- For each type (species) of tree you want, collect from trees that are well spaced apart to catch more genetic diversity. The bigger the distance, the less is the likelihood that they are related. It will also be less likely that flowers have been pollinated by the same father tree. In natural forest, the recommended distance is 30-50 meters.

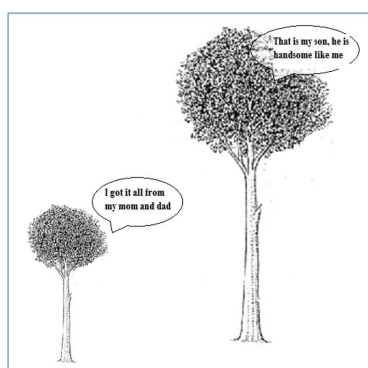


Figure 4. Trees inherit their characteristics from their parents through seed.

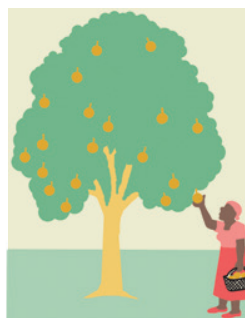


Figure 5. Collect seed for fruit trees from trees with a good amount and distribution of fruit.



Figure 6. Select parent trees with the fruit with the characteristics that you want.

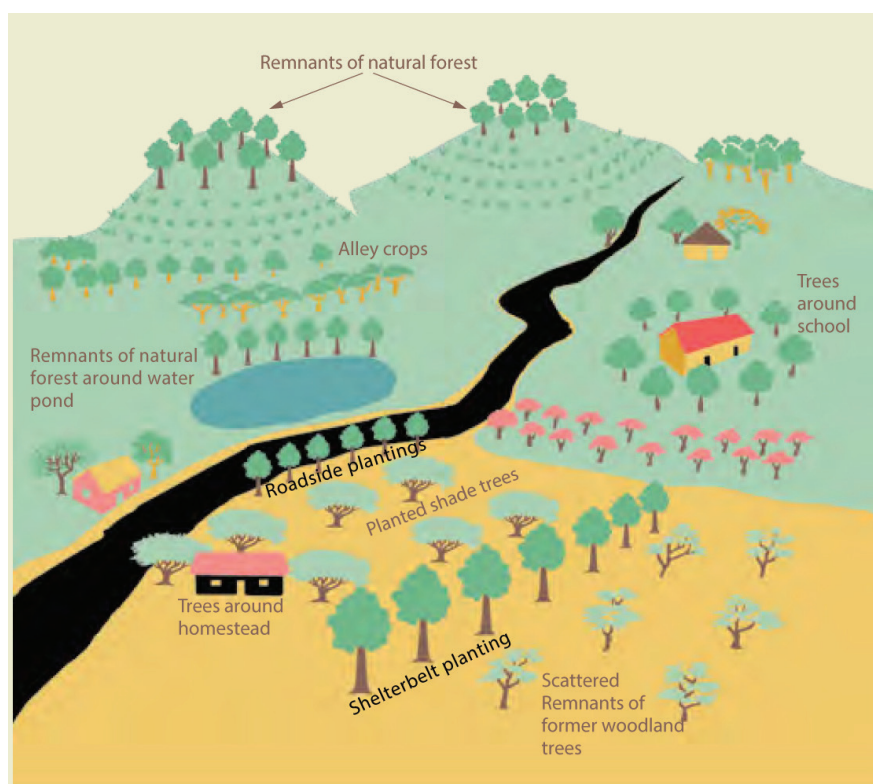


Figure 7. Seed sources include natural forest remnants and scattered trees on farms (Mborá and Wekesa, 2016)

How to Collect Seeds from the Tree

It is always best to collect seed randomly and evenly from trees in a population to capture genetic diversity

- It is generally better to collect fewer seeds from a larger number of trees than a large number of seeds from fewer trees
- Collect seed from all sides of the trees and from higher and lower branches. Flowers in different places on the tree may have been pollinated by pollen from different male trees.
- Collect no more than 20% of the total mature seeds on the tree. Others like bats, birds and squirrels need the fruit and seed, and the tree itself needs to be able to regenerate.

How you collect depends on fruit and seed characteristics, the team's skills, and the shape and height of the tree. Always minimize harm to trees when collecting.

- **Picking seed from standing on the ground** is the easiest way to collect it. You can bring branches closer with a hook or a rope.
- **Beating branches with a long pole** is a good way to dislodge seed. Place a canvas or polythene sheet on the ground to catch falling fruit and seed. If possible, avoid collecting seed that is lying on the ground. It can contain damaged seeds or insects or pathogens that will damage other seed you collect.
- **Tree shaking** is also effective, especially for species that produce large heavy fruits that fall without opening. You can shake the trunk to speed up the process, taking care not to get hit by heavy fruit. You will also need a canvas or polythene sheet.

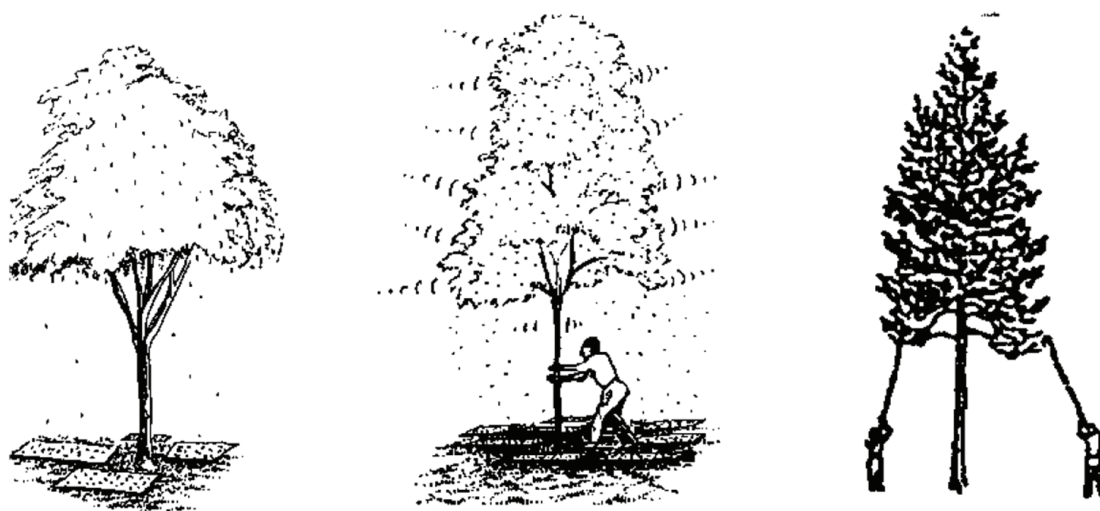


Figure 8. From left to right - Spread sacks around the tree to collecting any falling seed. A seed collector shakes a tree to bring down seed. Collectors beating branches to dislodge seed.

- **Tying mesh bags around seed heads** helps capture seeds from fruits that break open and would otherwise disperse the seeds far from the mother tree.
- **Pruning seed directly from the tree** is effective when the seeds are clustered at the end of the branches. Use a hook, a pruning shear or secateur.



Figure 9: Seed collection using an improvised pruning shears

- **Tree climbing** allows for more careful selection of target fruits and seed. There are two types of climbing:
 - Climbing without any equipment: you climb up the tree, hand pick the fruits or seeds, and put them in a bag.
 - Climbing using a ladder: you collect fruits or seed from a crown of the tree by pulling twigs or small branches with your hand.
 - You can also climb with spurs and ropes but you need to be trained first.

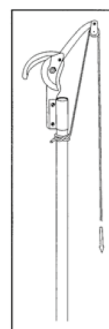


Figure 10: Collection of seed by tree climbing using a ladder (left) and spurs and a rope (right)

Equipment for Seed Collection

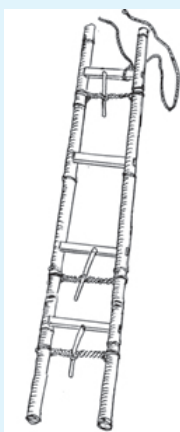


Secateurs: used to cut branches or fruits off branches. A large selection exists, the main difference being durability and ability to stay sharp.



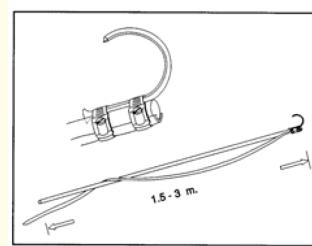
Pruner head with hook: used to cut branches or twigs attached to fruits by pulling using a rope.

Tarpaulins (canvas/polyethene sheet): very useful spread under trees during collection, and can also be used to cover seed from rain and direct sun, and as a clean surface on which to dry fruits and seeds before and after extraction.



Ladders: these can be locally made from bamboo. For smaller trees, light wooden ladders are perfectly adequate.

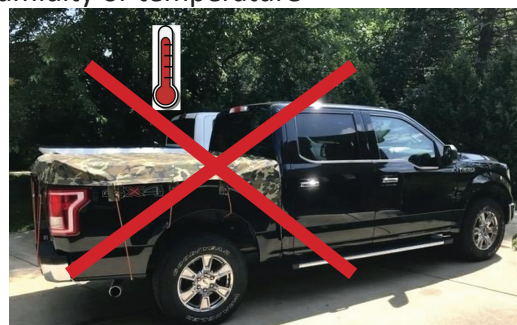
Hook stick: very useful to pull branches closer so that seeds can be picked.



Good Handling of Fruit and Seed after Collection

Immediately after collection, remove leaves, twigs and other debris from fruits and seeds. Try to combine (bulk) the fruit or seed in the field. Aim to have good contributions from many trees in the bulking. It is also possible to bulk the seed later after processing.

- To avoid loss of seed viability (death of the seed)
 - If possible, do not allow seeds to have a direct contact with the ground. This will help minimize exposure to pathogens and pests.
 - Avoid putting the seed in a situation of extreme humidity or temperature
 - Air dry any wet seeds before putting them into containers
 - Use containers with good aeration (holes) and made of jute or nylon mesh.
 - Do not place containers or bags in large piles
 - Put containers in a sheltered place out of direct sunlight.
 - Never park vehicles with seed under direct sun.



Processing the Fruit and Seed

Seed processing involves extraction, cleaning and drying. It is what you do after harvesting. The aim is to get the best seed possible.

Extraction

Seed extraction involves removing seed from fruits. The first action is fruit sorting. Mature fruits should undergo seed extraction without delay. In contrast, you need to place immature fruit under a shade with good air circulation to ripen for 2-3 weeks. Throw away underdeveloped or infected fruit or seed.

Extraction then depends on whether the fruit is fleshy or dry. In Zambia, fruits that are fleshy include Mpundu (*Parinari curatellifolia*), Amasuku (*Uapaca kirkiana*), Mufutu (*Vitex doniana*), Vizimbili (*Strychnos cocculoides*), Mufungu (*Anisophyllea boehmii*), Ngaingai (*Vangueria infausta*), Masau (*Ziziphus mauritiana*), Busika (*Tamarindus indica*), Makole (*Azanza garckeana*) and Nkondo Nkondo (*Flacourtia indica*). Fruits that are dry include Busika (*Adansonia digitata*) and *Piliostigma thonningii*.

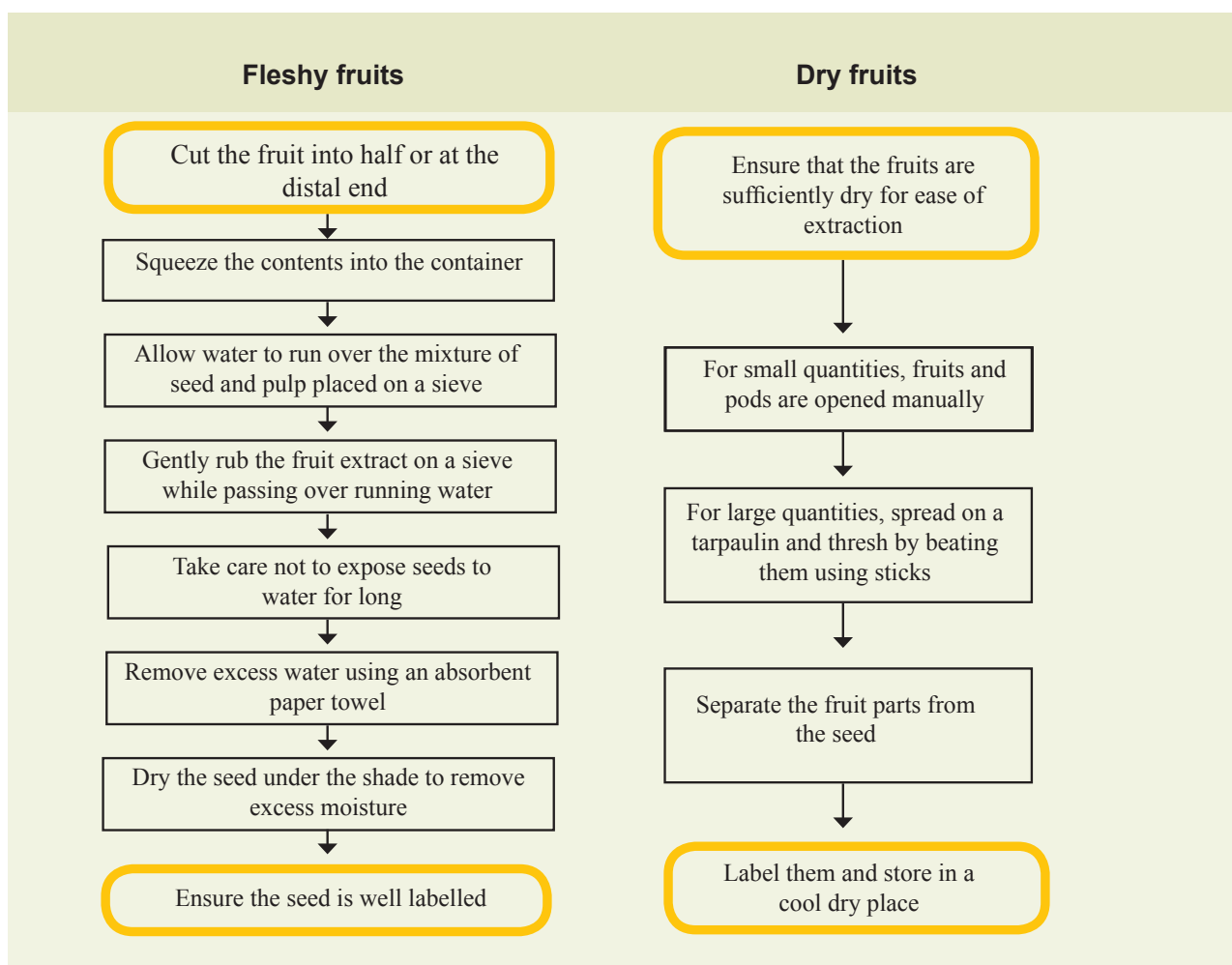


Figure 11. This graphic shows the steps to handling fleshy and dry fruits.



Figure 12: Left: extraction of seed from a fleshy fruit. Right: removal of mucilaginous (sticky gluey) pulp from a seed. Ash can be useful in such cases.

Seed Cleaning, Drying and Grading

To keep seed alive during storage, remove empty seed and fragments of stems, leaves, fruit, wing and flesh. Winnowing and sieving are the most common and effective methods. With winged seeds, wings are detached by crushing or rubbing the seed. Large, firmly attached wings can be removed by hand and discarded. Winnowing can be done after.

To clean seed clean:

- Place the seeds in a labelled tray and assess the need for cleaning
- If cleaning is required, check that the seeds are dry enough to be cleaned without damage
- If the seeds are still moist, place them in a cool dry room or under the shade to reduce the moisture content to < 15%.
- Separate lightweight material by gentle winnowing
- Discard any damaged, shrivelled, infected or infested seeds that you can see
- Destroy any waste material to prevent the spread of the disease or insects to other material.



Figure 13: Seed cleaning by winnowing

Seed drying

Seed drying involves reducing moisture content to the recommended levels for storage. This should begin as soon as possible after receiving the seeds to avoid unnecessary deterioration.

- Whether seed requires drying or not depends on whether it is “orthodox” and tolerates drying or “Drying sensitive” and does not tolerate drying
- Orthodox seed can be dried as follows;
 - Dry seed under a shade for 2-3 days by spreading thinly on canvas clothes, screens or trays elevated from the ground. Under humid conditions or periods of heavy rains, it requires 5-7 days.
 - Due to increase in relative humidity at night, seed should be placed in containers and moved indoors.
 - When there is rain during drying, seed should be moved to the shelters
- To check whether the seed is dry enough, note these facts.
 - Dry seed is easy to bite, crack or cut; and elicits a sharp snapping sound.
 - When mixed or shaken, dry seed elicits a rustling or crackling sound.
 - Weighing seed over consecutive days of drying reveals a constant weight.



Figure 14: Seed drying; A - drying under the shade after extraction, B - drying in a room using mesh bags.

Seed Storage

Why should I store seeds?

- To keep them in good condition until they are planted
- To be use during years when trees produce less seed
- To conserve for their genetic diversity
- To have enough stocks for future increased demand
- To protect them from pests and disease attack

How are seed prepared for storage?

- Seeds should be stored as quickly as possible after extraction and drying to increase their lifespan
- Species can be classified into storage classes as related to temperature and moisture content
 - **Drying sensitive seeds** are sensitive to low moisture content and high temperature. They should not be dried to low moisture content.
 - **Orthodox seeds** not sensitive to low moisture and low temperature. They store for long when dried to low temperature and low humidity.

How should I store orthodox seeds?

- Put in clean dry airtight containers. These might be metal tins, clay pots, thick polythene bags which can store the seed for up to 1 year. For longer period tough plastic containers such as drums, barrels, sealed jerrycans, glass jar can be used
- Containers should be stored in a cool, dry, dark, well-ventilated place.

How should I store “drying sensitive” seed?

- To maintain the necessary moisture in the seed, they should be stored under room temperature
- They should be placed in permeable containers to allow some ventilation
- To maintain humidity, store the seed in a medium that is slightly moistened. Storage media include sawdust, vermiculite, peat, sand

How to keep relative humidity low during storage

- Maintain seed in airtight container and store in cool dry dark place
- Do not open the containers frequently
- If containers are not completely airtight, or if samples are frequently taken out, seeds may be stored with a desiccating (drying) chemical like silica gel or charcoal
- If seed is to be removed on a regular basis, put in several smaller containers rather than in one large container.



Figure 15: Left: seed storage using airtight containers. Right: a traditional store suitable for seed.

Testing Seed to See if it is Alive/Viable

- The germination/viability test is conducted to identify the capacity of a seed lot to produce healthy and vigorous seedlings.
- Seed dormancy: live seeds are said to be dormant when few or none of them germinate within the reasonable time when placed in good germinating conditions with right amount of light, temperature and moisture for the species.
- What stops dormant seeds from germinating:
 - Hard seed coats around the fruit or seed, which prevent the entry of water and/or oxygen
 - Fruits or seeds which contain inhibitors of germination
 - Seeds that have special requirement for light and temperature requirements.
 - Immature embryos
- How to make hard seeds germinate;
 - Shaking smaller seeds with a sharp grit and little water in a closed container, to scratch the coats
 - Rubbing larger seeds with sandpaper or making a small nick (cutting) with nail clippers or scissors and the soaking in water
 - Placing seed in a small amount of almost boiling water and leaving until cool or putting in hot water (80°C) for 2 minutes.
- Carrying out germination tests;
 - Randomly select 100 seed in four replicates from the sample and apply the pre-sowing treatment appropriate for that species
 - After applying the presowing treatment, sow the seed in a tray containing a good quality germination media (nursery soil).
 - Maintain the media under moisture conditions to promote germination
 - After 1 week count the number of germinated seed and continue until no additional seeds germinate. *Note: Some species require 3 -4 weeks or even longer to achieve complete germination.* The test should be monitored daily and continue until no additional seeds germinate.
- Calculate the percent germination by dividing the number of germinated seeds by the number of seeds tested.



Figure 16: Seed of Mubuyu (*Adansonia digitata*) germinating

Conclusion

Now you have finished reading this book, we hope that you will organize with others in a group to collect seed of indigenous fruit and food trees. This will benefit you economically. Many NGOs, government offices and people, like nursery operators, need those seeds. It will also benefit the health of your families as those trees grow and produce fruit and other tree foods.

We were delighted to spend time with you. We leave you with these key messages:

- **On seed collection**

- Collect from 15-30 individual trees per population of a tree species, and as many populations as possible.
- Collect as close as possible to the point of natural dispersal when the fruit or seed would have left the tree anyway.
- Avoid collecting seed from the ground: it hosts molds and insects, which can damage your seed.

- **On seed handling and processing**

- Remove seeds from fleshy fruit as soon as possible; moisture degrades them.
- The sooner you begin processing and drying seeds and the drier the seed, the longer they will last.
- Dry seed in the shade not in the sun. Heat degrades the seed.

- **On sharing the seed with others in the ecosystem.**

- Never collect more than 20% of the seed on a tree on any day. Squirrels, birds, lizards and other animals need it too.

We look forward to hearing about your progress, and we will be in touch as you plant these trees around your homes. Remember people in towns need these fruits and tree foods too. See if you can build a business.



Figure 17: In a focus group, community members identify which indigenous trees they would like to see more of.

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Indigenous fruits and food trees are a livelihood opportunity for rural people. When they are sold in markets, people in towns benefit from their vitamins and other nutritional elements

