

SEED COLLECTION AND HANDLING M A N U A L

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SOFEM

Social Forestry Extension Model Development Project

Forest Department
Kenya Forestry Research Institute
Japan International Cooperation Agency

SEED COLLECTION AND HANDLING

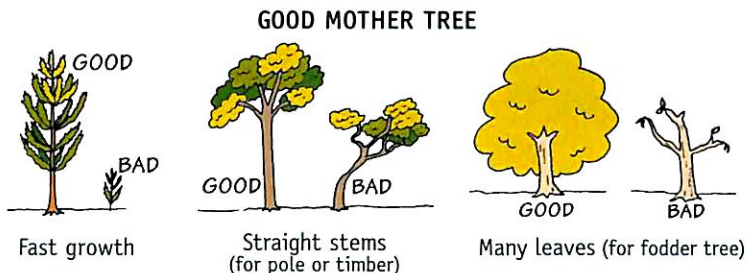
Most planting stock is raised from seeds. If you do not collect good seeds and treat them correctly, they may not germinate well and may not grow fast in your nursery.

Therefore, this manual will explain the way seeds are collected and handled; e.g. when and how you collect seeds, how to store seeds, and how to germinate seeds.

A. WHAT ARE GOOD SEEDS?

1. Seeds from good mother trees

It is important to collect seeds from good mother trees because the character of the seed is similar to its mother tree. Generally speaking, characteristics of good mother tree are big in size, straight in form and vigorously growing.



2. Mature or ripe seeds

The other important thing is to collect seeds when they are mature or ripe.

Seed collection schedule

Species	Collecting period	Species	Collecting period
<i>Acacia gerrardii</i> (Munina)	Aug-Sep	<i>Delonix regia</i>	Feb-Mar
<i>A. mellifera</i> (Muthia)	Aug-Sep	<i>Dovyalis caffra</i> (Kayava)	Feb-Mar
<i>A. nilotica</i> (Musemei)	Jun-Sep	<i>Eucalyptus camaldulensis</i>	Jan-Dec
<i>A. polyacantha</i> (Musewa)	May-Jun	(Musandoko)	
<i>A. senegal</i> (Mung'ole)	Jun-Jul	<i>Eucalyptus saligna</i>	Jan-Dec
<i>A. seyal</i> (Mweya)	Jul-Aug	<i>Grevillea robusta</i> (Mukina)	Feb-Mar
<i>A. tortilis</i> (Mwaa)	Aug-Sep	<i>Jacaranda mimosifolia</i>	Jun-Oct
<i>Adansonia digitata</i> (Muwamba)	May-Jun	<i>Leucaena leucocephala</i>	Jun-Jul
<i>Albizia anthelmintica</i> (Moa)	Sep-Oct	<i>Mangifera indica</i> (Mwembe)	Dec-Mar
<i>A. lebbeck</i>	Feb	<i>Melia volkensii</i> (Mukau)	Aug-Dec*
<i>Azadirachta indica</i> (Mwaluvaini)	Feb-Mar	<i>Moringa oleifera</i>	Jan-Dec
<i>Balanites aegyptiaca</i> (Kilului)	May-Jun	<i>Prosopis juliflora</i>	Jan-Dec
<i>Berchemia discolor</i> (Nzaya)	Feb-Apr	<i>Psidium guajava</i> (Mupera)	Mar-Apr
<i>Carica papaya</i> (muvavai)	Jan-Dec	<i>Senna siamea</i> (Ikengeka)	Jan-Dec
<i>Casuarina equisetifolia</i> (Kamuui)	Jan-Dec	<i>S. spectabilis</i> (Ikengeka)	Mar-Apr
<i>Citrus sinensis</i> (Musungwa)	Apr-May	<i>Schinus molle</i>	Jan-Feb
<i>Cordia ovalis</i> (Nthiia)	Feb-Mar	<i>Tamarindus indica</i> (Nzumula)	Aug-Sep
<i>Croton megalocarpus</i> (Muthulu)	Mar-Apr	<i>Terminalia brownii</i> (Muuku)	Aug-Sep
<i>Dalbergia melanoxylon</i> (Mpingo)	May-Jun	<i>Terminalia mentalis</i> (Mwavuli)	Mar-May

*Seeds of Mukau (*Melia volkensii*) can be collected at any time from goat's boma.

B. SEED COLLECTION (METHODS OF HARVESTING SEEDS)

1. Picking or cutting branches

This is the most common way of collecting seeds. Climb the tree, by use of ladder if necessary, and pick seeds. If it is a shrub or short tree, seeds can be easily picked by hand while standing.



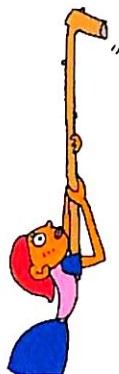
Climbing and picking seed.



Picking seed while standing or cutting branches.

2. Shaking

This method is applicable in trees whose seeds can dislodge easily from the branches. These include acacia species, mangoes and many others. Spread a piece of cloth, polyethylene sheet or net under the trees where the seeds fall, then shake the tree or its branches.



Shaking *Terminalia mentalis*.



3. Other method

***Melia volkensii* (Mukau):** Goats eat fallen fruits near trees and drop seeds in/around goat boma. Collect them. These seeds germinate better than ones collected from trees.



Collecting seeds of Mukau in goat boma.

(!!) In some trees, pods burst and release small seeds when they are dry and ready. Seed must be collected immediately they mature. These trees are: *Albizia anthelmintica*, *Senna siamea*, *Senna spectabilis*, *Leucaena leucocephala*, *Acacia mellifera*, *Acacia senegal*. etc.

C. SEED EXTRACTION

Seeds are collected when they are in different forms as fruits, pods, capsules or corns. The seeds must be extracted out before sowing or storage.

1. Extract by knife

***Senna spectabilis*, *Delonix regia*, *Jacaranda mimosifolia*:** Those pods are very hard. After drying for 5-7 days, open the pods with a knife to extract seeds.

2. Sun-drying

***Grevillea robusta*, *Casuarina spp.*, *Eucalyptus spp.*:** Seeds are taken by hand from the open capsules after drying for 3-4 days in the sun. The capsules are exposed to the sun by spreading on polyethylene sheet, canvas or trays.

3. Beating

***Acacia spp.*, *Senna siamea*, *Leucaena leucecophala*, *Sesbania spp.*, *Parkinisonia aculeata*:** The pods are collected from the trees as soon as they change their colour from green to brown and start splitting from one end. After drying for a few days, pods are beaten and tossed around by winnower. In order to minimize loss of seed by dispersion, the pods should be put in a sack.



Beating Eucalyptus.



Pounding acacia.

4. Pounding

***Melia volkensii* (Mukau):** When the ripe fruits are collected, they are depulped by using a mortar and pestle, then seeds are washed and sun dried for a week or so.

***Acacia nilotica*, *A. tortilis*:** After drying for 5-7 days, the pods are put in a mortar and pounded. Seeds are separated from the chaff by a winnower.

5. Squeezing

***Azadirachta indica*, *Balanites aegyptiaca*, *Tamarindus indica*:** Put the fruites in a big basin with water and sand. Squeeze them by hand to remove the pulp. The seeds are washed clean and dried for one week.

6. Other methods

Prosopis juliflora, *Terminalia brownii*, *Terminalia prunioides*: These seeds are extracted by termites. Pods are heaped on a sunken basin and covered with a layer of dry grass. Then the whole heap is watered to attract termites and covered again with black sheet in order to make the place dark. It takes 3-7 days. This method is applicable during dry period.



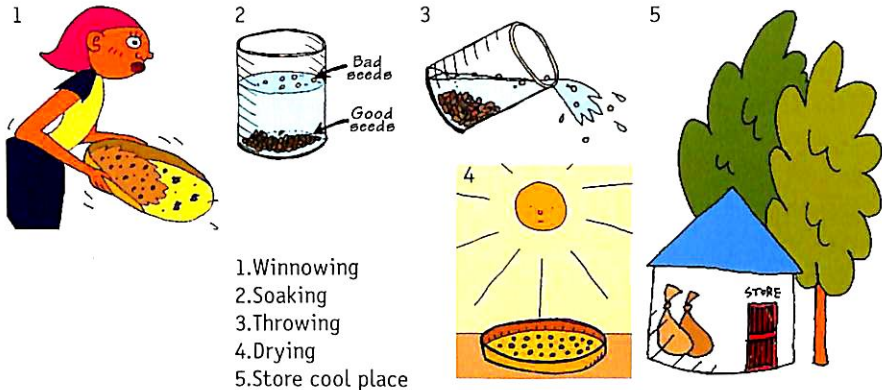
Termites extraction.

Croton megalocarpus: The nut is broken using a hammer or stone to extract the seeds.

Dalbergia melanoxylon: As seeds are very light, it is difficult to separate seeds from the pods.

D. CLEANING AND SORTING

Cleaning and sorting are necessary for good germination and protection against pests and diseases. What should be removed are dirt, immature seeds, rotten and insect infested seeds.



E. STORAGE

Store the seeds until they are planted. Put them into boxes, bottles or bags and store them in a dark, cool and dry place. Protect them from insects and rodents attack.

Many species can be stored for a long period but there are some exceptions.

Carica papaya, *Dovyalis caffra*, *Azadirachta indica*: Seeds of these species lose viability within a short time. Seeds of these species should be sown within two months after collection.

Mangifera indica: Seeds last only one month at room temperature.

F. PRE-GERMINATION TREATMENTS

Seed pre-treatment is recommended for some types of dormant seed to stimulate the germination before sowing.

1. Mechanical treatment (Nipping, Scarification)

Break, cut or scratch the cover of seed so that water and gases can enter the inside of the seed. When cracking, be careful not to expose the inner part of seed embryo. This treatment can be done with a secateurs, nail clipper, knife or needle.



Cracking by secateurs.



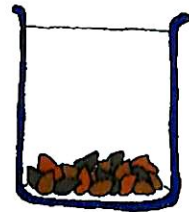
Nipping by razor.

2. Soaking in hot water

Soaking seeds in hot water soften the seed coat to allow moisture to enter inside. The temperature and soaking time vary from species to species.

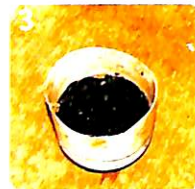
3. Soaking in lukewarm or cold water

Soaking in lukewarm or cold water stimulates and causes uniform and faster germination.



Soaking seeds in water.

Germination of *Melia volkensii* (Mukau)



- 1.Extraction
- 2.Nipping
- 3.Soaking
- 4.Slitting
- 5.Sowing

Pre-germination treatments applicable to various tree species

Species	Pre-treatment	Expected germination ratio(%)	Sowing month
<i>Acacia abyssinica</i>	Soak 80°C water for 15min.		80 Mar
<i>A. gerrardii</i> (Munina)	Nipping, soak cold water for 12hrs.		75 Mar
<i>A. holosericea</i>	Soak 80°C water for 7min.		85 Feb
<i>A. mellifera</i> (Muthia)	Soak cold water for 12hrs.		90 Feb
<i>A. nilotica</i> (Musemei)	Nipping, pierce with burned wire		60 Feb
<i>A. polyacantha</i> (Musewa)	Soak 80°C water until water cools		85 Mar
<i>A. senegal</i> (Mung'ole)	Soak cold water for 12 hrs.		85 Feb
<i>A. seyal</i> (Mweya)	Nipping, soak cold water for 12hrs.		65 Feb
<i>A. tortilis</i> (Mwaa)	Nipping, pierce with burned wire		70 Jan
<i>Adansonia digitata</i> (Muwamba)	Crack seed coat and soak cold water 12hrs.		70 Dec
<i>Albizia anthelmintica</i> (Moa)	Soak cold water for 12hrs.		90 Jan
<i>A. lebeck</i>	Nipping, soak cold water for 12hrs.		70 Mar
<i>Azadirachta indica</i> (Mwaluvaini)	None (Direct sowing is possible)		95 Mar
<i>Balanites aegyptiaca</i> (Kilului)	None (Direct sowing is possible)		60 Feb
<i>Berchemia discolor</i> (Nzaya)	Soak cold water for 3days		75 Jan
<i>Carica papaya</i> (Muvavai)	None		90 May
<i>Casuarina equisetifolia</i> (Kamuui)	None		90 Apr
<i>Cordia ovalis</i> (Nthiia)	Soak cold water for 12hrs.		90 Feb
<i>Croton megalocarpus</i> (Muthulu)	None (Direct sowing is possible)		95 Mar
<i>Dalbergia melanoxylon</i> (Mpingo)	None		90 Dec
<i>Delonix regia</i>	Nipping, soak 60°C water for 3min.		70 Apr
<i>Dovyalis caffra</i> (Kayava)	None		85 Mar
<i>Eucalyptus camaldulensis</i> (Musandoko)	None		95 Jun
<i>E. saliguna</i>	None		- May
<i>Faidherbia albida</i>	Nipping, pierce with burned wire, soak cold water for 12hrs.		80 Feb
<i>Grevillea robusta</i> (Mukina)	None		90 Feb
<i>Jacaranda mimosifolia</i>	None		70 Feb
<i>Leucaena leucocephala</i>	Soak 60°C water for 15min.		95 Jun
<i>Mangifera indica</i> (Mwembe)	None		80 Mar
<i>Melia volkensii</i> (Mukau)	Nipping, soak cold water for 12 hrs., slitting		75 Jan
<i>Moringa oleifera</i>	None (Direct sowing available)		80 May
<i>Prosopis juliflora</i>	Soak 80°C water for 20 min.		80 Feb
<i>Psidium guajava</i> (Mapera)	None		85 Apr
<i>Senna siamea</i> (Ikengeka)	Soak 60°C water for 20 min.		90 Mar
<i>S. spectabilis</i> (Ikengeka)	Soak 60°C water for 15 min.		85 Mar
<i>Sesbania sesban</i>	Soak 60°C water for 20 min.		90 Jun
<i>Schinus molle</i>	None		95 Apr
<i>Tamarindus indica</i> (Nzumula)	Soak 60°C water for 3min.		95 Dec
<i>Terminalia brownii</i> (Muuku)	Nipping, soak cold water for 12hrs.		40 Jan
<i>T. mentalis</i> (Mwavuli)	Nipping, soak cold water for 12hrs. Soak 80°C water for 15min.		65 Apr 60
<i>T. prunioides</i> (Mutoo)	Nipping, soak cold water for 12hrs.		50 Feb
<i>Zizyphus mauritiana</i> (Ngunasi)	Remove round stone just before sowing		- Apr

Sowing month: When you plant seedlings in November, you should sow seeds not later than the above mentioned sowing month to get plantable seedlings.

Now, You are ready for sowing!



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