

Mazingira Bora



TIST

The International Small Group & Tree Planting Program
www.tist.org

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Ragati Cluster members during Small Group tree incentive payment meeting.

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TIST: Seed Collection.

Seed Collection Questions and Answers

1. Which tree species should we grow in our area?

The best ones are those growing naturally in the area. TIST particularly encourages fruit and indigenous trees, and others that will remain in the ground for 20 years or more.

2. Are all trees good?

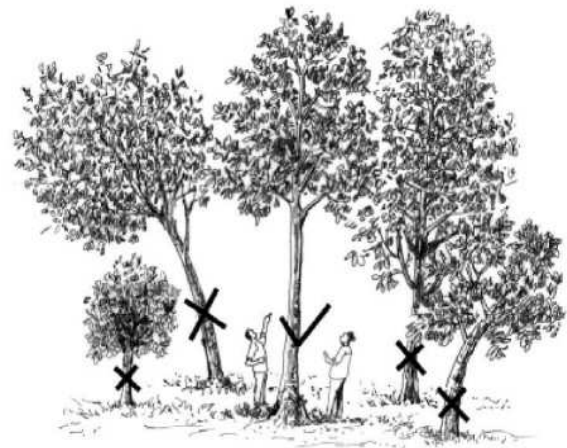
Not necessarily! Some may be difficult to control, be poisonous to your animals or use too much water. Choose ones you know will benefit your area. TIST discourages eucalyptus, for example, because planting these trees can reduce the water table.

3. Do trees produce seeds every year?

Most trees do, but observe your local trees to be sure. Some may only produce good quality seeds every 2-3 years.

4. Which is a good mother tree to collect seeds from?

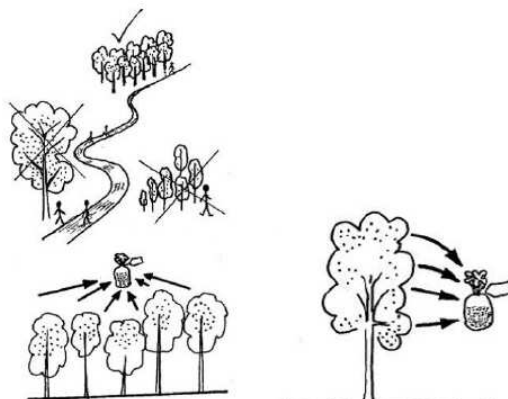
- o Collect seeds from healthy trees that are good seed producers.
- o Avoid isolated trees - in this case the seed is likely to have been self-pollinated which leads to poorer quality seeds.
- o Avoid unproductive trees and ones with a bad shape.
- o It is better to choose a tree in the middle of a healthy group of trees of the same species. Seeds will be higher quality from trees with flowers that are spread out rather than packed closely together.
- o Collect the seed from different places in the crown of the mother tree to ensure more genetic variation.



Selecting a good mother tree for seeds

- o It is a good idea to collect seeds from at least 30 trees of the same species. This helps ensure there is sufficient genetic diversity. Seed trees should be 50m-100m apart to help get more genetic variation.
- o The exact type of tree depends on what you want to use the tree for.
 - For example, good trees for timber are straight, few branches, fast growing, above average height and diameter, resistant to pests.
 - Good trees for fodder should be fast-growing, many branches with multiple stems, and fast growing leaves with the ability to recover after being pruned.
 - Good fruit trees should obviously have good quantities of healthy fruit, a uniform crown with low branches, fast growing.
- o Try to choose seeds from a tree growing at the same altitude, climate and soil type as where you want to plant.
- o Choose a mature tree, not a young one. Mature trees tend to have more seeds and younger trees may produce poorer quality seed.

Source: Robbins, 2004.



5. When do we collect the seeds?

- o Learn the time of the year when the seeds are ripe.
- o Ask other local people or observe the tree yourself.
- o Sometimes seeds are ripe when the fruit or pods change color, become dry, or break easily from the branch. Sometimes cones are ready when they change from green to brown. See table at end of the document for examples.



- o Most seeds are ready for collection when they fall from the tree naturally.
- o Remember to ensure you have permission to collect the seeds from the tree owners!
- o When you collect the seeds remember to label your bags and containers with the species name, date of collection and location.

6. How do we collect the seeds?

- o It is helpful to clear the area around the bottom of the tree first. Many seeds can be collected from the ground. However, wait for the more mature seeds to fall. Seeds left too long on the ground may perish. Inspect the seeds for insect damage. Seed of *Tectona grandis* (teak), *Gmelina arborea* (gmelina) and *Aleurites moluccana* (candlenut) are commonly collected by this method.
- o The tree can be climbed to collect the seeds, but take care!
- o Some fruit dry, open and disperse their seeds without falling to the ground. These are hard to collect if the seeds are small. Collect the fruit or pods after they are ripe but before they have split or fallen to the ground. Then dry the fruit or pod in a clean, sheltered place to obtain the seeds.
- o Some seeds can be knocked from the tree with a long stick.
- o Try putting a sheet under the tree and gently shaking the tree.
- o For tall trees a simple tool can be made by attaching one end of a pair of shears to a long, strong stick. The other handle can be attached to a rope.
- o Note that some seed species cannot be collected from the ground and have to be collected as wildlings. These are newly germinated seedlings found growing under mature trees. These can be transplanted to pots in your nursery. This is often the best method for trees that are hard to grow in a nursery or whose seeds are hard to collect.
- o All seeds must be removed from their fruit or pods. This can be done by hand, or by putting the fruit/pod in the sun and waiting for it to dry and split.

Collection of *Sesbania sesban* with telescopic shears at Muguga site, Kenya



7. How can we tell if the seed is good?

- o Firstly look at the seed and discard ones that are smaller, lighter or a different color than the others. Insects may have damaged some of the seeds.
- o Take a sample of seeds to cut into and inspect the inside for maturity and pest damage.
- o For some hard-coated species floating in water is a good test. Normally the good seed sinks and the bad seed floats (since dead embryos and insect damage causes air pockets).
- o With some seeds you can separate by blowing/ winnowing/sieving to remove the lighter ones.

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





- o You can do a simple germination test. Take a small counted number of seeds (20-100). Do any pre-treatment needed. Put the seeds on a damp cloth in a bowl. Cover with another fold of the cloth, moisten it thoroughly and put in a warm (not hot) place. Check the seeds daily for signs of germination and keep the cloth moist. When germination begins keep a record of the day and number. The test usually lasts about two weeks depending on the species. Germination of over 50% means you have good seed. Small-seeded species having only 5% germination are still worth keeping.

8. Do we plant or store the seeds?

- o Some seeds do not store well and should be planted straight away (especially soft, fleshy seeds, fruit tree seeds or seeds with high oil content). For seeds with harder coats, the basic rule is to keep the seed clean, dry and cool.
- o Seeds should be removed from the fruit/cone and dried thoroughly. To dry the seeds put them in the sun for 2-3 days.
- o Storing in a paper bag or metal container out of the sun is good (avoid plastic bags as this makes the seed sweat and rot). Make sure the container is clean and airtight.
- o Label the container with the name of the seeds and the collection date and location.
- o Remember that the germination ability of the seeds will decrease with time. If seeds have been stored for too long they may expire.

9. Do all seeds germinate?

- o The percentage of seeds, which germinate, varies greatly between species. Some seeds require some form of pre-treatment. This will be covered in the February MB.
- o When you are collecting seeds remember that some die in storage, some die in the nursery, and some die when transplanted. So factor this into your planning when considering the number of seeds your group needs to collect.

10. How do we plant the seeds?

- o Some seeds that germinate readily can be sown directly into the field or into pots. Species that require special conditions to germinate are sown into a seedbed first.

- o The time taken for germination depends on the seed type, the temperature, the amount of water available and the age of the seed.
- o Generally sowing is done just before the rainy season starts.
- o As a general guide for direct sowing, seeds should be planted at a depth of two to three times their diameter and should be covered firmly with soil. The soil should then be kept moist.
- o Details on seedbeds are given in a separate training unit.

11. Do seedlings grow only from seeds?

- o Some tree species produce root suckers (young plants growing from the mother plant's roots). These can be cut and transplanted.
- o Cuttings can be taken off a young tree branch with at least three nodes or buds. Choose a long, healthy branch and make a clean, angled cut. Strip off the leaves. Plant the cutting into soil at least two nodal lengths deep, with at least one exposed. Keep it watered until sprouting occurs. Seedlings grown in this way will have the same characteristics as the parent tree and can be useful for making sure a productive fruit tree is grown.

Cluster Meeting Exercise

At your Cluster Meeting, split the participants into groups of 6-10 people. Ask each group to pick a tree species that is good for TIST – long-term and beneficial to the environment. Remind the groups to pick a leader and co-leader.

The task is to get the following information for each tree species:

- Name of tree
- Description of seeds
- A good local place to find the seeds
- Method of collecting the seeds
- Method of storage
- Method of pre-treatment
- Method of sowing

Give people ten minutes to do the task, then ask each group to report back.

Please record the information in your exercise book and bring it to the next training session.

You may find it helpful to use a table like this:

Cluster Name:						
Tree Name	Seed Description	Local collection point	Collection method	Storage method	Pre-treatment method	Sowing method

**A table of information on seed collection for selected species.**

Botanical name	Colour of mature fruit	Seed Extraction and cleaning (Related details)
<i>Acacia mangium</i>	Dark brown to black	Fruits are placed in a sack and lightly beaten. Seeds are winnowed.
<i>Aleurites moluccena</i>	Yellowish-brown (and fallen)	Fruits are pressed or lightly beaten and then washed and dried.
<i>Alstonia scholaris</i>	Brownish-yellow	Fruits are dried under shaded until they open and seeds are extracted. Seeds are winnowed.
<i>Anacardium occidentale</i>	Reddish-yellow	Seeds are removed from fleshy fruits and dried.
<i>Azadirachta indica</i>	Yellowish-green	Fruits are hand-squeezed. Seeds are washed and then dried.
<i>Calamus manan</i>	Brownish-yellow	Fruits are rubbed together to remove the outer skin and then washed.
<i>Calliandra Calathyrus</i>	Dark-brown (and dry)	Pods are placed in a sack and lightly beaten. Seeds are winnowed.
<i>Canarium Ovatum</i>	Black (and fallen)	Fruits are pressed or lightly beaten and then washed and dried.
<i>Dalbergia latifolia</i>	Dark-brown	Pods are crushed. Seeds are winnowed.
<i>Dyera costulata</i>	Brown (and easy to snap)	Fruits are dried until they open and seeds are extracted. Seeds are winnowed.
<i>Enterolobium cyclocarpum</i>	Dark-brown	Pods are crushed and beaten until the seeds are extracted. Seeds are washed and then dried.
<i>Eucalyptus urophylla</i>	Dark brownish-green	Fruits (capsules) are dried until they open and seeds are extracted. Seeds are sieved to separate chaff and other debris.
<i>Eusideroxylon zwageri</i>	Yellow	Fruits are soaked and then rubbed to remove flesh. Seeds are washed and dried.
<i>Fagraea fragrans</i>	Dark-brown	Fruits are rubbed over a sieve until seeds are separated. Seeds are sieved again and winnowed.
<i>Gliricidia sepium</i>	Yellowish-brown	Pods are placed in a sack and lightly beaten. Seeds are winnowed.
<i>Gmelina arborea</i>	Yellow-green (and fallen)	Fruits are placed in sack and lightly beaten. Seeds are washed to remove the pulp and then dried.
<i>Hopea mengarawan</i>	Light brown (and fallen)	Wings are removed from seeds.
<i>Intsia bijuga</i>	Yellowish-green	Fruits are dried until they open and seeds are extracted. Seeds are winnowed.
<i>Leucaena leucocephala</i>	Yellowish-brown	Pods are crushed. Seeds are winnowed.
<i>Palaquium sp</i>	Yellow	Fruits are hand-squeezed. Seeds are washed and then dried.
<i>Paraserianthes falcataria</i>	Yellow	After pods turn brown they are placed in sack and lightly beaten. Seeds are winnowed.
<i>Pinus merkusii</i>	Blownish green	Dried cones are placed in a sack and crushed or rubbed together until seeds are extracted. Seeds are gently rubbed to remove wings and then winnowed.
<i>Santalum album</i>	Reddish-black	Fruits are crushed and squeezed by hand. Seeds are separated from the pulp, washed and dried.
<i>Sesbania grandiflora</i>	Yellow	Pods are placed in a sack and lightly beaten. Seeds are winnowed.
<i>Shorea javanica</i>	Brown (and fallen)	Fruits are broken open. Wings are removed from seeds. Seeds are winnowed.
<i>Swietenia macrophylla</i>	Brown (and easy to break open)	Fruits are broken open. Wings are removed from seeds. Seeds are winnowed.
<i>Tamarindus indica</i>	Yellowish-brown	Fruits are crushed and squeezed by hand. Seeds are separated from the pulp, washed and dried.
<i>Tectona grandis</i>	Yellowish-brown (and fallen)	Fruits are rubbed together to remove the skin and then winnowed.



Kiraro TIST Cluster: We are now determined to strengthen our Cluster.

By Jemima Gatwiri, TIST Cluster Servant.

We, Kiraro TIST Cluster, having multiplied from Kairuni mother Cluster and are now determined to strengthen our Cluster. We have established a Cluster nursery with a goal of planting over 30,000 trees by June 2015. We have continued to encourage our neighbours and friends to join TIST. Recently, 2 new groups have joined TIST.



Kiraro Cluster members during their monthly meeting.

Ragati TIST Cluster: Now aiming at 100,000 plus trees.

By Francis Kibe, TIST Cluster Servant

We, the members of Ragati Cluster, have so far planted over 80,000 trees with 33 Small Groups. Our goal next year is to plant an additional 20,000 trees to reach the 100,000 mark. We are determined to achieve 250,000 trees in our Cluster in the next 3-5 years.



Ragati Cluster members during Small Group tree incentive payment meeting.

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Kimereu Version

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Amemba ba cluster ya Ragati ndene ya mucemanio jwa kuria ikundi bibinini mbeba cia miti.

Inside:

TIST: Kuuthurania mbeu. Page 2

Cluster ya TIST ya Kiraro: Nandi nitugitite igamba gwikira cluster yetu inya. Page 6

Cluster ya TIST ya Ragati: Nandi barina kioneki gia kwithirwa bari na miti ngiri igana na nkuruki. Page 6



TIST: Kuuthurania mbeu.

Biuria na macokio kwegie kuuthurania mbeu

1. Ni miti mithemba iriku tubati kuanda ndene yaa ntuura yetu?

Miti iria miega buru ni iria ikuraga yongwa ndene ya ntuura iu. TIST niikagira inya mono uandi bwa mitunda na miti ya gintwire, na ingi iria igakara muthetune miaka mirongo iri kana nkuruki.

2. Miti yonthe ni imiega?

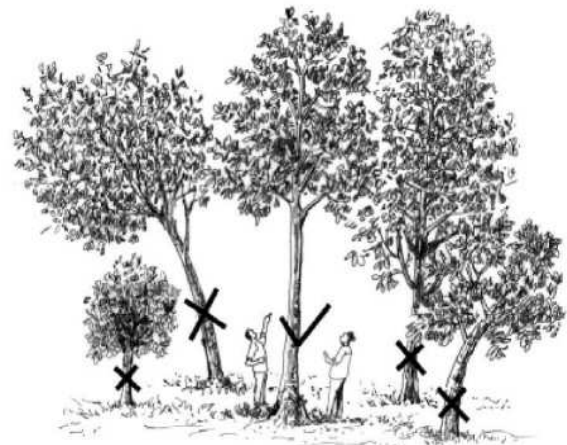
Ti mwanka! Miti imwe no igie inya gwika iria ukwenda niuntu bwa guciarana, no ithirwe iri sumu kiri ndithia ciaku kana igatumira ruuji rurwingi. Taara iria wiji ikaleta baita kiri ntuura yaku. Kujukia mung'uanano, TIST niregaga mibau, niuntu uandi bwa miti iji nobunyiye ruuji ruria ruri nthiguru ya muthetu.

3. Miti nithagirwa irina mbeu o mwaka?

Miti iria mingi niciraga mbeu o mwaka, indi tegeza miti iria iandi akui nagwe nikenda umenya na mma. Imwe ithagirwa irina mbeu injega rimwe o miaka iri kana ithatu.

4. Ni muti juriku juri jumwega jwa kurita mbeu yaku?

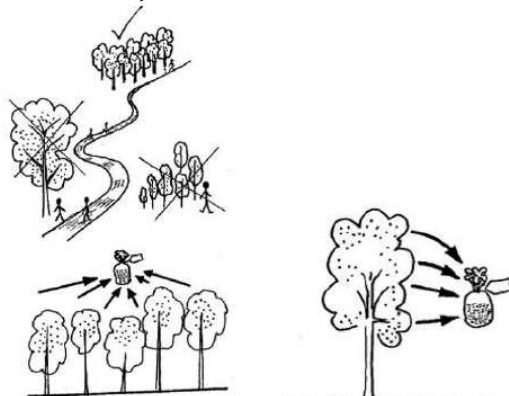
- Uthurania mbeu kuumania na miti iria irina thiria injega iria iciraga mbeu inthongi.
- Ebera miti iria iri yonka – kiri miti iji mbeu yomba mono kwithira yuumanitie na muti gwiciarithia, untu buria buumba gutuma mbeu ikwethirwa citi injega mono.
- Ebera miti itiguciara na iria ikari bubuthuku.
- Ni kaba gutara muti juri gatigati ka miti iri amwe imingi ya muthemba jumwe irina thiria. Mbeu ikethirwa ibui nkuruki kethira niumenie na miti irina maua jaria jatamburuki nkuruki ya jaria jaikonderete amwe.
- Uthurania mbeu kuuma guntu mwanya mutine nikenda umenyeera ati kurina mwanya jwa mantu jaria igakamata kiri muti juju.



Kuthuura muti jumwega jwa gwita mbeu

- Ni ithuganio ririega kuuthurania miti kuumania na miti nkuruki ya mirongo ithatu mwanya ya muthemba jumwe. Bubu nibutethagia kumenyeera ati kurina mwanya kiri miti iria ikaumania na mbeu iu. Miti ya kurita mbeu nithirwe itaarenie mita mirongo itano kana igana nikenda umenyeera ati kurina mwanya.
- Muti juria jungwa ukathuura jukalingana na niatia ukwenda kujutumira.
- Mung'uanano, miti imiega ya mpau ni imitamburuku, irina biang'i bibikai, igukura ntuti, irina uraja na warie bwa miti ya kawaida, ikuumba gukabana na tunyomoo turia tuthukagia imera.
- Miti imiega ya kuriwa ni ndithia nibati kuuma na ntuti, irina biang'i bibingi na mathangu jagukuranga na jakumba kuumanga jagitwa.
- Mitunda imiega nibati kwithirwa irina matunda jamaingi jari na thiria, muti jurina mathangujang'anene kuunthe na biang'i biri nthiguru, ikuumanga na mpwi.
- Geria kuthuura mbeu kuumania na miti iumite antu kung'uanene, kurina rera ing'uanene na muthetu jumwe na aria ukwenda kuanda muti jwaku.
- Taara muti jukuri, ti jumwithi. Miti ikuri niithagirwa irina mbeu inyingi na miti iminini noiciare mbeu itiuma muti juthongi ja ng'ina.

Kiumo: Robbins, 2004.



5. Niri tuuthuranagia mbeu?

- Menya igita ria mwaka riria mbeu ithagirwa igundi.
- Uria antu bangi ba ntuura iu kana utege muti gwengwa.
- Rimwe mbeu nigundi riria gitunda kana giti kiagarura rangi, kioma kana kiaunika na uthu kuuma kiang'ine. Rimwe, makonde jari tayari



riria jagarura rangi kuuma green gwita brown. Tega mantu jaria jaandiki aja nthi kenda wona mung'uanano

- Mbeu iria nyingi ciri tayari kuuthuranua riria yagwa yongwa kuuma mutine.
- Rikana kumenyeera ati urina rutha rwa kuuthurania mbeu kumania na eene miti!
- Warikia kwoja mbeu rikana kuandika miuko yaku riitwa ria muthemba jwa muti, tariki ya kwoja na guntu kuria woja.

6. Niatia tuuthuranagia mbeu?

- Nibutethagia kutheria akui na rungu rwa muti mbele. Mbeu inyingi no yojwe kuuma muthetune. Indi, etera mbeu iria ikuri bwega cigwe mbele. Mbeu igatigwa muthetune igita riraja nithukaga. Tega mbeu bwega itikethirwe ithukitue ni tunyomoo. Mbeu cia Tectona grandis (teak), Gmelina arborea (gmelina) na Aleurites moluccana (candlenut), niuthuranagua mono na njira iji.
- Nowitie muti kuuthurania mbeu, indi menyeera!
- SoMatunda jamwe nijoomaga, jakaruguka na kunyagia mbeu jatigwite muthetune. Mbeu iji ciri inya kuuthurania mneu ikethirwa inyii. Uuthurania matunda na macau jaria jagundi indi mbele ya jaruguka na jagwaa nthiguru. Riu uumie gitunda kana gicau antu atheru na arina kirundu kurita mbeu.
- Mbeu imwe no ciringwe kuuma mutine ugitumagira muti jumuraja.
- Geria gwita gitambaa rungu rwa muti riu winainie muti mpaari.
- Kiri miti imiraja gantu ga kurita no kathithue na uthu gukurukira kuugera rutere rumwe rwa muti jumuraja na jwina inya magasi ja kugita. Rutere rungi noruogerwe kiri murigi.
- Menya ati mbeu mithemba imwe itiojwa nthiguru na no mwanka yiuthuranue iumite yongwa. Mbeu iji ciumaga ikaa tumiti tutunini rungu rwa muti juria iumenie naju. Iji noithamirue mibukone ndene ya munanda jwaku. Iji niyo njira iria njega buru kiri miti iria iri inya kuumithia munandene kana iria mbeu itiuthuranagua na uuthu.
- Mbeu cionthe no mwanka ciritwe matundene kana macaune. Bubu nobuthithue na njara, kana gwika riuene na gwetere jauma na gwatuka.

Collection of Sesbania sesban with telescopic shears at Muguga site, Kenya



7. Niatia tumba kumenya kethira mbeu nibui?

- Mbele tega mbeu na ute iria cinyii, ciuthi kana cirina rangi mwanya na ingi. Tunyomoo twomba kwithirwa tuthukitie mbeu imwe.
- Juukia mbeu inkai na ugite riu utege ndene kethira niikuri na kethirwa niriitwe ni tunyomoo.
- Kiri mithemba imwe iria irina gikonde gikiumo, kuerera ruujine ni kithimi gikiega. Kawaida, mbeu injega niinamaga nthi na inthuku niereraga (niuntu mbeu inkuo na kurumua ni tunyomoo nikuretaga mibuko ya ruugo).
- Mbeu imwe no uge/ ukeera/ugachunka nikenda wita mbeu iria mbuthu.

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





- No uthithie kithimi gikiuthu gia kumenya kethira mbeu ikauma. Jukia namba intare ya mbeu (mirongo iiri giwta igana).Thithiria mantu ja kuthuranira jaria ubati. Ikira mbeu gitambaene kirina ruuji na wikira mbakuline. Kunikira na gitambaa kingi, giake ruuji bwega na wike antu kuri na kutira (ti mwanki).Tegera mbeu ntuku cionthe nikenda woona kethira niikuma na wike gitambaa kirina ruuji rionhte. Riria mbeu ikaambiria kuuma, ika rekondi ya ntuku na namba. Kithimi giki nikia igita ria biumia biiri kulingana na muthemba. Kuuma gwa nkuruki ya gicunci kimwe kiri biiri ni kuuga urina mbeu injega. Mithemba ya mbeu inini irina gicunci kia mbeu ithano kiri igana niibati gwikwa.

8. Tuike kana tuande mbeu?

- Mbeu imwe itikaraga bwega na niibati kuandwa orio (mono mbeu iria iri imbuthu na irina matunda, mbeu ya mitunda kana mbeu irina maguta jamaingi. Kiri mbeu iria cirina gikonde gikiumo, watho ni gwika mbeu itheri, iumi na irina mpio.
- Mbeu niibati kuritwa kuumania na gitunda na cikomua bwega. Kuumia mbeu, miike riuene ntuku ijiri kana ithatu.
- Gwika mbeu karatasine kana gikebene gia cuuma kuraja na riuu ni gukwega (ebera maratasi ja nyloni niuntu jaja nijatumaga mbeu ikathithina na ikoora). Menyeera ati mukebe juri jumutheru na jutigutonyithia ruugo.
- Andika mukebe muthemba jwa mbeu na ntuku na antu a kwojana.
- Rikana ati kuumba kwa mbeu kuuma gukanyia o uria igita rigwita na mbele. Kethira mbeu niiki igita riraja, no ithuuke.

9. Mbeu cionthe niciumaga?

- Gicunci kia mbeu, kiria kiumaga, nikiringanaga na muthemba. Mbeu imwe niciendagwa kwamba kuthuranirwa. Jaja jakethirwa jari kiri Mazingira Bora ya mweri jwa liiri.
- Riria ukuuthurania mbeu rikana ati imwe nikujaga igitene ria gwika, ingi ndene ya munanda, na ingi igitene ria kuthamiria muundene. Kwou, ikira jaja mubangone riria ukwenda kumenya ni mpindi ing'ana gikundi giaku kibati kuuthurania.

10. Niatia tukaanda mbeu iu?

- Mbeu imwe iria iumaga na uuthu no iandwe muundene kana mibukone o rimwe. Mithemba iria iendaga mantu mwanya nikenda iuma niandagwa munandene mbele.

- Igita riria rijukagua kuuma niriringanaga na muthemba jwa mbeu, murutira, ruuji ruria rurio na ukuru bwa mbeu.
- Mbeu iandagwa mwambirio jwa mbura.
- Ja mwongozo riria ukuanda muundene o rimwe, mbeu nibati kuandwa nthiguru maita jairi kana jathatu warie bwa mbeu na niibati gikunikirwa bwega na muthetu. Muthetu riu nijubati gwikwa jurina ruuji.
- Mantu jegie minanda jakaejanwa kiri uritani bungi.

11. Miti yumithagua aki kuumania na mpindi?

- Mithemba imwe ya miti niumaga miti ingi kuumania na miri ya muti jou ng'ina. Iji no igitwe na ikathamua.
- Gicunci nokigitwe kuumania na kiang'i gitikuri aria kurina ndungu ithatu kana nkuruki. Taara kiang'i gikiraja, kirina thiria na ugite o rimwe. Rita mathangu jonthe. Anda gicunci giki muthetune ndungo ijiri kana nkuruki ciri nthiguru ya muthetu , kuri na imwe kana nkuruki itigi iguru. Menyeera ati kurina ruuji rionthe mwanka woone jukiauma. Miti iria iumithitua na njira iji ikethirwa ikari umwe ja miti Iria iumenie nayo na njira cionthe na nioitethie mono riria ukwenda kumenyeera ati mutunda juguciara bwega jukuuma.

Ngugu iri cluster ibati kuthithia mucemanione

Mucemanione jwenu jwa cluster, gaania amemba ikundine birina antu batantatu gwita ikumi. Uria o gikundi kuthuura muthemba jwa muti juria jubui kiri TIST- jwa igita riraja na jurina baita kiri naria kubuthiurukite. Rikania ikundi kuthuura mutongerina na mutetheria wawe.

Ngugi ni kuuthurania umenyo kwegie o muthemba jwa muti:

- Riitwa ria muti-Mbeu uria ikari - Antu aega akui aria mbeu iu yumba kuuma-Njira ya kuuthurania mbeu - Njira ya gwika mbeu- Uthuraniri buria mbeu igwitia- Njira ya kuumithia

Nenkanira ndaika ikumi cia kuthithia ngugi, riu urie o gikundi kureta macokio.

Aandikeni mantu jaja ndene iukune rienu na burete mucemanione jou jungi jwa uritani.

No bwone bugitethia kuandika na njira iji:

Riitwa ria Cluster:						
Riitwa ria muti	Mbeuuria ikari	Aria mbeu iriti	Njira ya kuuthurania mbeu	Njira ya gwika mbeu	Uthuraniri buria mbeu igwitia	Njira ya kuumithia

**Ona aja kuthingatiteUmenyo kwegie kuuthurania mbeu cia miti mithemba imithure.**

<i>Riitwa ria sayansi</i>	Rangi ya itunda rikuri	Kuuthurania mbeu na kutheria
Acacia mangium	Dark brown to black	Matunda jekagirwa nkuniene na kuurwa mpaari. Mbeu riu ikeerwa na gitaru
Aleurites moluccena	Yellowish-brown (and fallen)	Matunda nijainyairua kana jakaurua mpaari riu jakathambua na kuumua
Alstonia scholaris	Brownish-yellow	Matunda nijoomagua ruungu rwa kirundu mwanka jagakunuka na mbeu ikaritwa. Mbeu riu ikeerwa
Anacardium occidentale	Reddish-yellow	Mbeu niritagwa kuumania na gitunda riu ikanyarua
Azadirachta indica	Yellowish-green	Matunda nijainyagwa na njara. Mbeu nithambagua na kunyarua
Calamus manan	Brownish-yellow	Matunda nijakirithanagua nikenda gikonde kiuma riu jakathambua
Calliandra Calathyrus	Dark-brown (and dry)	Matunda nijekagirwa nkuniene na jakaurwa mpaari. Mpindi riu ikeerwa
Canarium Ovatum	Black (and fallen)	Matunda nijainyagwa kana jakaurwa mpaari. Mbeu riu ikeerwa
Dalbergia latifolia	Dark-brown	Machau nijaunagagwa . mbeu riu ikeerwa
Dyera costulata	Brown (and easy to snap)	Matunda nijomagua mwanka jakaruguka na mbeu igaitwa. Mbeu riu ikeerwa.
Enterolobium cyclocarpum	Dark-brown	Machau nijaunangagwa kana jakaurwa mwanka mbeu ikauma. Mbeu nithambagua na riu ikoomua.
Eucalyptus urophylla	Dark brownish-green	Matunda nijoomagua mwanka jakaruguka na mbeu igaitwa. Mbeu nicunkagwa nikenda iathuranwa na mati
Eusideroxylon zwageri	Yellow	Matunda nijarindagwa riu jagaikithanua kurita mbeu. Mbeu riu nithambagua na kuumua
Fagraea fragrans	Dark-brown	Matunda nijaikithanagua iguru ria gicunki mwanka mbeu ikaathuranwa. Mbeu riu nicunkagwa kairi na kuerwa
Gliricidia sepium	Yellowish-brown	Matunda (macau) nijekagirwa nkuniene na kuurwa mpaari. Mbeu riu ikeerwa.
Gmelina arborea	Yellow-green (and fallen)	Matunda nijekagirwa nkuniene na kuurwa mpaari. Mbeu ikathambua na mbeu ikoomua
Hopea mengarawan	Light brown (and fallen)	Mathagu nijaitagwa kuuma kiri mbeu
Intsia bijuga	Yellowish-green	Matunda nijomagua mwanka jakaruguka na mbeu igaitwa. Mbeu riu ikeerwa
Leucaena leucocephala	Yellowish-brown	Mati nijaunangagwa. Mbeu ikeerwa.
Palaquium sp	Yellow	Matunda nijainyagwa na njara. Mbeu riu ikathambua na ikoomua
Paraserianthes falcataria	Yellow	Mati jarikia kugaruka rangi ja brown, nijekagirwa nkuniene na kuurwa mpaari. Mbeu riu ikeerwa.
Pinus merkusii	Blownish green	Matunda nijekagirwa nkuniene na kuunangwa kana gwikithanua mwanka mbeu ikaritwa. Mbeu igaikithanua kurita mathagu riu ikeerwa
Santalum album	Reddish-black	Matunda nijaunangagwa na kuinywa na njara. Mbeu ikaathuranwa na gitunda, ikathambua na kuumua
Sesbania grandiflora	Yellow	Matunda nijekagirwa nkuniene na kuurwa mpaari. Mbeu riu ikeerwa.
Shorea javanica	Brown (and fallen)	Mathagu nijaritagwa kuuma mpindine.
Swietenia macrophylla	Brown (andeasy to break open)	Matunda nijaunagwa. Mathagu jagaitwa mbeune na mbeu ikeerwa.
Tamarindus indica	Yellowish-brown	Matunda nijaunangagwa na kuinywa na njara. Mbeu ikaathuranwa na gitunda, ikathambua na kuumua
Tectona grandis	Yellowish-brown (and fallen)	Mbeu niikirithanagua gwita gikonde riu ikeerwa.



Cluster ya TIST ya Kiraro: Nandi nitugitite igamba gwikira cluster yetu inya.

Ureteri ni Jemima Gatwiri, ntumba ya TIST ndene ya Cluster.

Batwi, cluster ya TIST ya Kiraro, tuciaritue kumania na cluster ya Kairuni nandi nitugitite igamba gwikira inya cluster yetu. Nitwambiritie munanda jwa cluster turina kioneki gia kuanda nkuruki ya miti ngiri mirongo ithatu tugikinya mweri jwa itantatu. Nitwitite na mbele gwikira inya aturi na acore betu gutonya kiri TIST. Igita ritikuraja, ikundi biiri nibitonyete.



Kiraro Cluster members during their monthly meeting.

Cluster ya TIST ya Ragati: Nandi barina kioneki gia kwithirwa bari na miti ngiri igana na nkuruki.

Ureteri ni Francis Kibe, Nthumba ya TIST ndene ya cluster

Batwi, amemba ba cluster ya Ragati, nibaandite gukinyira au nkuruki ya miti ngiri mirongo inana iandi ni ikundi mirongo ithatu na bithatu. Kioneki gietu ni kuanda miti ingi ngiri mirongo iiri nikenda tukinyira ngiri igana rimwe. Nitubangite gukinyia miti ngiri mirongo iiri na mirongo itano ndene ya miaka iiri gwita itano iria iijite.



Amemba ba cluster ya Ragati ndene ya mucemano jwa kuria ikundi bibinini mbeccia miti.

Mazingira Bora



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Amemba a cluster ya Ragati hingo ya mucemanio wa ikundi na marihi ma miti.

Thiini wa gazeti:

TIST: Ungania wa mbegu. Page 2

Cluster ya TIST ya Kiraro: Riu nitwirutiire gwikira cluster iitu hinya. Page 6

Cluster ya TIST ya Ragati: Riu turorete miti 100,000 na makiria. Page 6



TIST: Ungania wa mbegu.

Ciuria na macokio ci unganina wa mbegu

1. Ni mithemba iriku ya mitiingikura kwanyu?

Mithemba iria miega ni iria ikuragia na njira cia kiimerera. TIST makiria ni hinyagiriria uhandi wa miti ya matunda nay a kinduire na ingi iria ingihota guikara gwa kahinda gakirite miaka 20.

2. Miti yoothe ni miega?

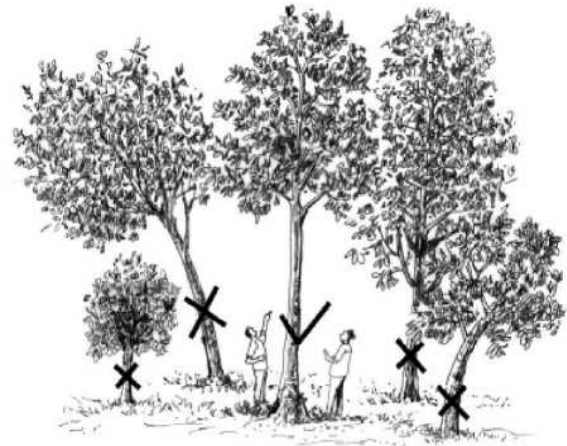
To muhaka! Miti ingi ni iremaga gutungatika na ingi igakorwo na thumu kuri nyamu na ingi ikahuthira maai maingi. Thuura miti iria ingiteithia kwanyu. TIST niigiritie miti ya mibau kwa muhiano tondu niinyihagia maai tiiri-ini

3. Miti niirutaga matunda o mwaka?

Miti miingi niguu iikaga, no geria kurora kwanyu na miti ya kuu niguu umenye wega. Miti ingi ibataraga miaka 2-3 niguu irute mbegu njega.

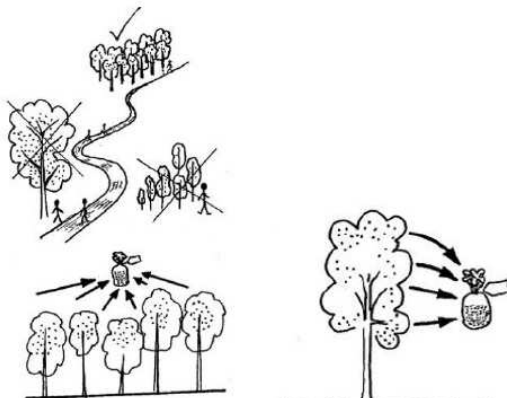
4. Ni muti uriku mwega wa kunganiria mbegu?

- Ungania mbegu kuma mitiini iria iri na hinya mwega na iria iri na mbegu njega
- Ndukonganie kuma kuri miti iri iika handu hamwe tondu mbegu ciaguo nocikorwo citaciarithanitio
- Ndukonganie kuma kuri miti itari na ugima mwega
- Ungania kuma kuri miti iria iri gatagati-ini ka iria ingi ya muthemba umwe. Mbegu nicikoragwo cirri njega makiria riria mahua mayo mariruka wega
- Ungania mbegu kuma miena ngurani niguu ugie na mithemba miingi



- Niwega kunganina mbegu kuma kuri mithemba 30 na makiria ya miti niguu ukorwo na rurira rwega, miti ya mbegu yariirwo nigukorwo na utaganu wa 50m-100m niguu ikure wega
- Miti uria mwega uringanaga nakiria urenda kuhuthira muti ucio nakio
- Kwa muhiano, miti miega ya mbau yagiriirwo nigukorwo iri mirungaru, ikorwo na honge nini na ikure naihenya na utungu muigananiru ohamwe na uraihu na iingate tutambi
- Miti miega ya mahuti ma mahiu yagiriirwo ni gukura naihenya na honge nyingi na mahuti makorwo magikura naihenya thutha wa gucehwo
- Miti miega ya matunda yagiriirwo nigukorwo iri miega na mawega ma miti ya matunda
- Geria guthuura mbegu kuma mitiini iria ikurite na riera rimwe na muthemba umwe wa tiiri na kuria urathii kuhanda.
- Thuura miti iria ikinyitie ugima iria itari miithi. Miti migimaru niikoragwo na mbegu nyingi na miti mithi ikaruta mbegu nini.

Source: Robbins, 2004.



5. Twagiriirwo ni kunganina mbegu ri?

- o Rora ihinda ria mwaka riria mbegu cirri nguru
- o Uria andua nagi kana wirorere miti.



- Maita maingi mbegu cikoragwo cirri nguru riria matunda merua na macenja rangi, moma na magua thi. Maita mangi cikoragwo cirri njega riria makoni mavenjia kuma green nginya brown. Roar maandiko muico wa ngathitimbegu nyingi cikoragwo cirri njega riria ciagua kuma mutiini
- Ririkana gutigirira ati uri na rutha rwa kungania mbegu kuma kuri mwene miti
- Riria wongania mbegu ririkana kwandika haria wekira na ritwa, muthenya na kuria wongania

6. Twagiriirwo nikungania mbegu atia?

- Gutheria haria uronganiria mbegu niguteithagia. Mbegu nyingi nociunganio kuma thi. No ningi, eterera mbegu iria cigimarite cigue. Mbegu iria cिकारिते muno thi nicithukaga. Roar wega kana mbegu nithukie ni tutambi. Mbegu cia Tectona grandis (teak), Gmelina arborea (gmelina) and Aleurites moluccana (candlenut) ciunganagio na njira ino.
- No uhaice muti iguru utue mbegu no wimenyerere!
- M atunda mangi momaga, magathanduka mbegu ona matakugua thi. Mbegu ici nicikoragwo na hinya kunganika angikorwo mbegu ni nini. Ungania mbegu kana makoni riria cirri njiru no mbere ya cirekanitie na cikagua thi. Umithia makoni niguo uhote guthandura mbegu
- Matunda mangi nouringe kuma thin a muti muraihu
- Geria kwara kinndu gitinaini kia muti ucoke uinainie
- Kuri miti iria miraihu, nouhuthire muti muraihu wohereire kindu
- Ririkana ati mithemba ingi ya mbegu ndingiunganio kuma thi na yagiriirwo ni kunganio wega. Ici ni mbegu iria cimeraga wega iria cimerete na igakura rungu rwa miti minene. Ici nnocimunywo na cihandwo migundaini. Nira ino niyo njega kuri miti iria ikoragwo itagukura wega nathariini kana iria mbegu ciagua cikoragwo na hinya kunganika.
- Mbegu ciothe niciagiriirwo ni kurutwo kuma makoniini. Undu uyu nowikwo na moko kana kwanika makoni riuiini niguo mome.

Collection of Sesbania sesban with telescopic shears at Muguga site, Kenya



7. Tungimenya atia ati mbegu ni njega?

- Wambere roar mbegu na wehutie iria nini na huthu kana cirri na ngurani ya rangi kumana na iria ingi. Tutambi notukorwo tuthukitie mbegu.
- Oya muhiano wa mbegu na utinie na urore kana nicikinyitie ugima na kana nicithukitio ni tutambi
- Kuri mbegu iria cikoragwo na ngothi nyumu, cikie maaiini niguo ucigeria. Mbegu njega nicirikaga maaini na iria thuku cikareera.
- Kuri mbegu iwe nouganyanie na kuhuhana gucunga niguo wehutie iria huthu

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





- No wike magerio manini ma kumerithia. Oya mbegu nini (20-100). Cithondeke wega uria kwagiriire na wikire mbegu nguoini hehu thiini wa bakuri. Humbira na nguo ingi na ureke hakorwo na urugari(ti maai mahiu). Roar mbegu o muthenya kana cirri na dalili cia kumera. Riria ciambiriria kumera,iga namba ya muthenya na namba. Kigerio giki giikaraga gwa kahinda ka ciumia 2 kuringana na muthemba. Kumera gwa gicunji kia 50% mikuuga uri na mbegu njega. Mithemba ya iria ikoragwo na mbegu nini iria iri na kumera gwa gicunji kia 5% no kiega.

8. Nikuhanda tuhandaga mbegu kana ni kuiga?

- Mbegu nyingi citikaraga gwa kahinda kanene na ciagiriirwo ni kuhandwo orio(namakiria cirri njigu, iria huthu, cia matunda kana iria cikoragwo na maguta maingi). Mbegu iria cikoragwo na ngothi nyumu, watho ni kuiga mbegu icio cirri theru, nyumu na cirri na riera riega.

9. Ni mbegu ciothe cimeraga?

- Gicunjikia mbegu kiria kimeraga kiringanaga na muthemba wa muti. Mbegu imwe nicibataraga guthindekwo mbere ya kuhandwo. Maundu maya nitukamona ngathitiini ya February.
- Riria urongania mbegu ririkana imwe nicikuaga riria ciigitwo, ingi igakua cirri nathariini na ingi cigakua riria urathamia kuma nathari nginya mugundaini. Kwa uguo ikira maundu maya riria urabanga muigana wa mbegu uria ukuhanda

10. Tuhandaga mbegu atia?

- Mbegu imwe iria cimeraga naihenya nocihandwo mugundaini. Mithemba iria ibataraga maundu ma mwanya niguu imere ciambaga kuhandwo tutaini mbere.
- Kahinda karia mbegu cioyaga ga kumera karinganaga na muthemba wa, urugari na muigana wa maai na kahinda ka mbegu.
- Uhandi wa mbegu wikagwo mbere ya mbura yambiriirie.

- Ta wato wa kuhanda mbegu, ciagiriirwo ni kuhandwo na uriku wa maita matatu ma utungu wacio na cihumbirwo wega ni tiiri. Tiiri ucio wagiriirwo nigukorwo uri mugunyu.
- Uhoro wa tuta niuheanitwo githomoini kingi.

11. Mimera ikuraga kuma kuri o mbegu?

- Mithemba imwe ya miti niiciraga njahirira na nocitinio na cihandwo ta muti.
- Guceha nogwikwo kuri muti uteri mukuru muno uria uri na marungo matanyihire matatu. Thuura karuhonge karaihu na karia kari na hinya na utinie na njira njega. Hurura mahuti na uhande tiiriini na uriku wa marungo meri na iringo rimwe utigitie. Itiriria maai nginya uthunduke. Mimera iria ikuratio na njira ino niikoragwo na mauthi ma muti uria waumite kuriguo na nimwega gutigirira matunda mega nimonekana

Maundu ma Micemanio ya cluster.

Thiini wa mucemanio wa cluster, gayania arimi na ikundi 6-10. Uria o gikundi kioye muthemba wa muti uria niwitikiritwi thiini wa TIST uri wa gutuura miaka miingi na ungitethia maria maturigiciriiie. Uria gikundu githuure mutongoria na munini wake.

Wira ni kungania uhoro wa o muthemba wa miti:

- Ritwa ria muti / uhoro makiria wa mbegu – kuria kwegu ungiona muti ucio – njira cia kungania mbegu ciaguo – njira cia kuuiga mbegu – njira ciaguthondeka mbegu na njira cia kuhanda.
- Mahe ndagika 10 niguu marikie uguo na ucoke umorie makurehere macokio.
- Andika uhoro ucio thiini wa ibuku na ugoka naguo mucemanio-ini ucio ungi

Niwega kuhuthira table tai no.

Riitwa ria cluster:						
Riitwa ria muti	Uhoro makiria wa mbegu	Kuria ungiungania	Njira cia kungania	Njira cia kuiga	Njira cia guthondeka	Njira cia kuhanda

**Rora makiria maundu ma unganja wa mbegu cia mithemba ya miti iria icaguritwo**

Botanical name	Rangi wa itunda rierua	Ungania wa mbegu
Acacia mangium	Dark brown to black	Matunda mekiragwo ikonia na makahurwo niguu mathanduke
Aleurites moluccena	Yellowish-brown (and fallen)	Mahihinyagwo kahora na makahurwo ningimagathambio na kumithio
Alstonia scholaris	Brownish-yellow	Matunda momithagiorungu ra muti nginya maatuke na mbegu cिकारुतुवो
Anacardium occidentale	Reddish-yellow	Megu cirutagwo kuma matundaini na cikomithio
Azadirachta indica	Yellowish-green	Matunda mahihinyagwo na hinya na mbegu cigathambio na cikomithio.
Calamus manan	Brownish-yellow	Mbegu cibiragwo niguu urute ngothi ya iguru na ningi cigathambio
Calliandra Calathyrus	Dark-brown (and dry)	Ciikiragwo ikonia na cikahurwo kahora niguu cithanduke.
Canarium Ovatum	Black (and fallen)	Matunda mahihinyagwo kahora na magathambio ningi makomithio
Dalbergia latifolia	Dark-brown	Makoni nimoragagwo na mbegu cिकारुतुवो
Dyera costulata	Brown (and easy to snap)	Matunda momithagio nginya mbegu ciime. Mbegu cithambagio na cikomithio
Enterolobium cyclocarpum	Dark-brown	Makoni moragagwo niguu mbegu cirutwo ningi mbegu cigathambio na cikomithio
Eucalyptus urophylla	Dark brownish-green	Matunda momithagio nginya mathanduke na mbegu cिकारुतुवो. Mbegu cicungagwo niguu wehutie mahuti na ingi nyingi
Eusideroxylon zwageri	Yellow	Matunda marindagwo maai-ini na magacoka makabirwo na kumithio wega
Fagraea fragrans	Dark-brown	Matunda mabiragirwo gicungiini nginya citigana na makoni
Gliricidia sepium	Yellowish-brown	Makoni mekiragwo ikonia na makahurwo kahora
Gmelina arborea	Yellow-green (and fallen)	Matunda mekagirwo ikonia na makahurwo kahora na magacoka magathambio na makomithio
Hopea mengarawan	Light brown (and fallen)	Mathagu nimehutagio kuma mbeguini
Intsia bijuga	Yellowish-green	Matunda momithagio nginya mbegu cिकारुतुवो
Leucaena leucocephala	Yellowish-brown	Makoni nimoragagwo na mbegu cigathandurwo
Palaquium sp	Yellow	Matunda mahihinyagwo na hinya na magathambio magacoka makomithio
Paraserianthes falcataria	Yellow	Thutha wa makoni kuhana brown, mekagirwo ikonia na makahurwo kahora na mbegu cिकारुतुवो
Pinus merkusii	Blownish green	Iria nyumu ciikagirwo ikonia na cikahurwo kana cikabirwo nginya mbegu ciime. Mbegu onacio nicibiragwo niguu mathagu maume.
Santalum album	Reddish-black	Matunda mahihinyagwo na moko. Mbegu cirutagwo kuuma makoniini cigathambio cigacoka cikomithio
Sesbania grandiflora	Yellow	Makoni mekagirwo ikoniani na makahurwo kahora na mbegu cिकारुतुवो
Shorea javanica	Brown (and fallen)	Mahuti nimarutagwo mbeguini
Swietenia macrophylla	Brown (and easy to break open)	Matunda nikuragwo moragagwo na mahuti makoragwo na mbegu cिकारुतुवो
Tamarindus indica	Yellowish-brown	Matunda morragagwo na makahihinywo na moko. Mbegu cिकारुतुवो cigathambio na cikomithio
Tectona grandis	Yellowish-brown (and fallen)	Matunda moragagwo na makahihinywo na moko na mbegu cिकारुतुवो cigathambio na cikomithio



Cluster ya TIST ya Kiraro: Riu nitwirutiire gwikira cluster iitu hinya.

Mwandiki: Jemima Gatwiri, ndungata ya cluster TIST

thui, cluster ya Kiraro thiini wa TIST, nitwagairwo kuma cluster nene ya Kairuni na riu nitwirutiire girikira cluster ino iitu hinya. Nituhotete nginyagia riu gukorwo na nathari ya cluster turi na kioneki gia kuhanda miti makiria ma 30,000 tungigakinya june 2015.

Nituthiite na mbere kuhinyiriria aria tuhakaine na araata aitu maingire TIST. Kahinda gakuhi, ikundi igiri makiria nicingirite TIST



Amemba a cluster ya Kiraro hingo ya mucemanio wa cluster wa o mweri.

Cluster ya TIST ya Ragati: Riu turorete miti 100,000 na makiria.

Mwandiki: Francis Kibe, ndungata ya cluster TIST

thui turi ta amemba a cluster ya ragati, nginyagia hau tukinyite nituhandite miti makiria ma 80,000 na turi na ikundi 33.

Kioneki giitu mwaka wa 2015 ni kuhanda miti ingi makiria ma 20,000 niguu tukinyie miti 100,000. Nitwirutiire gukinyithia miti 250,000 thiini wa cluster gwa kahinda ka 3-5 years



Amemba a cluster ya Ragati hingo ya mucemanio wa ikundi na marihi ma miti.

Mazingira Bora



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Memba wa cluster ya Ragati katika mkutano wa kulipa motisha kwa vikundi vidogo.

Ndani ya gazeti:

TIST: Ukusanyaji wa mbegu. Ukurasa wa 2

Cluster ya TIST ya Kiraro: Tuna nia kubwa ya kuimarisha cluster yetu.
Ukurasa wa 6

Cluster ya TIST ya Ragati: Sasa tumelenga miti elfu mia moja na zaidi.
Ukurasa wa 6



TIST: Ukusanyaji wa mbegu.

Maswali na majibu kuhusu ukusanyaji wa mbegu.

1. Ni aina ipi ya miti tunafaa kukuza katika eneo letu?

Iliyo bora zaidi mi ile inayokua yenyewe katika eneo hilo, kwa hivyo chagua miti itakayokidhi mahitai yako. TIST sanasana hupendekeza mitunda na miti ya kiasili. Kumbuka kuwa unajitolea kuweka miti yako ikiwa hai kwa muda wa miaka thelathini au zaidi. Chagua ambayo itakupa faida unazohitaji kwa wakati huu; matunda, chakula cha mifugo, udongo bora kutokana na kupunguza mmomonyoko wa udongo au naitrojeni kutokana na miti ya familia ya kunde, kuni kutokana na matawi yaliyopuguzwa na faida nyinginezo.

2. Miti yote ni mizuri?

Si lazima! Mingine yaweza kuwa migumu kudhibiti, yaweza kuwa na sumu kwa mifugo yako au kutumia maji mengi sana. Chagua unayojua itafaidi inapopandwa.

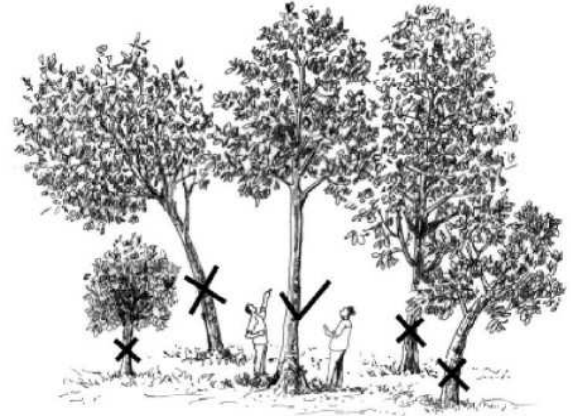
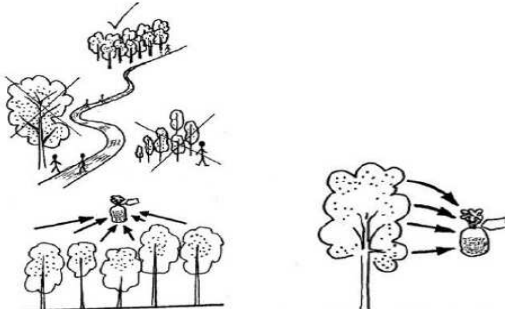
3. Ni miti yote uzalisha mbegu kila mwaka?

Miti mingi huzalisha, lakini angalia miti iliyo hapo ili kupata uhakika. Mingine huzalisha mbegu nzuri tu baada ya miaka miwili kufika mitatu.

4. Ni mti upi ulio mzuri wa kukusanya mbegu?

- Kusanya mbegu kutoka kwa miti iliyo na afya ambayo huzalisha mbegu nzuri
- Epuka miti iliyosimama kipweke kwa sababu mbegu yake inauwezekano wa kuwa na mbelewele yakujitegemea ambayo inapelekea mbegu ya hali ya chini.
- Epuka miti isiyozalisha na yenye sura mbaya
- Chagua mti ulio katikati ya mingine yenye afya naya aina moja
- Mbegu kutoka kwa miti iliyo na maua yanayoenea nje itakuwa yenye ubora wa juu badala ya yenye maua yaliyojikusanya pamoja.

Source: Robbins, 2004.



Kuchagua mti mzuri wa kutoa mbegu.

- Fikiria unavyotaka kuutumia mti kabla ya kuchagua aina ya mti. Kwa mfano, miti mizuri ya mbao ni iliyonyooka, iliyo na matawi machache na inayokua kwa upesi. Miti mizuri kama lisho kwa mifugo ni inayokua kwa upesi, yenye matawi yenye mashina kadha, na majani yenye kukua haraka yenye uwezo wa kujitibu haraka baada ya kupuguzwa. Miti mizuri ya matunda kwaudhahiri inafaa kuwa na matunda mengi yenye afya!
 - Chagua mbegu kutoka kwa mti unaokua katika eneo lililo katika muinuko na udongo sawa na unapotaka kupanda.
 - Chagua mti uliokomaa, si ulio mchanga.
- 5. Tukusanye mbegu lini?**
- Jua wakati wa mwaka mbegu zinapokuwa zimeiva na uwauliza wengine wanaoishi hapo au kuuangalia mti wewe mwenyewe.
 - Mara nyingine mbegu huiva matunda au maganda ya mbegu yanapogeuzwa rangi, kukauka, au kuvunjika kwa urahisi kutoka kwa tawi.
 - Mbegu nyingi huwa tayari kukusanywa zinapoanguka kutoka mtini zenyewe.



6. Tukasanye mbegu vipi?

- Kuwazisha eneo lililozunguka mti kwanza husaidia sana. Mbegu nyingi zaweza kukusanywa kutoka kwa ardhi, lakini kwanza angalia mbegu kama imeumwa na wadudu.
- Mtu aweza kupanda mti na kuchukua mbegu, lakini jichunge!
- Matunda mengine huvunjika na kutawanya mbegu bila kuangusha chini yanapokauka. Haya ni vigumu kukusanya kama mbegu ni ndogo. Kusanya matunda au magi kupata mbegu. and a yanapoiva lakini kabla ya kuvunjika na kuanguka ardhini. Halafu ukaushe tunda au ganda mahali palipo pasafi na penye kivuli i
- Jaribu kuangusha mbegu zingine kutoka kwa mti kwa kugonga kwa mti mrefu.
- Jaribu kuweka shuka chini ya mti na kuutingiza mti kwa upole.
- Kwa miti mirefu, kifaa rahisi chaweza kutengenezwa kwa kufungilia upande mmoja wa jozi la makasi kwa kijiti kirefu na chenye nguvu. Upande mwingine waweza kufungiliwa kamba.
- Jua kuwa baadhi ya aina za mbegu haziwezi kukusanya kutoka kwa ardhi na ni lazima zikusanywe zikiwa zimemea kiasili. Miche hii ni iliyoota hivi karibuni na inayopatikana chini ya miti iliyokomaa. Miche hii yaweza kupandikizwa hadi kwa mikebe katika kitalu chako. Hii ni njia iliyo nzuri zaidi kwa miti inayoleta ugumu kuotesha katika kitalu na iliyo na mbegu zenye ugumu kukusanya.
- Mbegu lazima zitolewe kutoka kwa matunda au maganda yake. Toa kwa kutumia mikono au kwa kuweka tunda au ganda kwa jua na kulingoja kukauka na kuvunjika husaidia.

Collection of *Sesbania sesban* with telescopic shears at Muguga site, Kenya



7. Tunawezaje kujua kama mbegu ni nzuri?

- Kwanza angalia mbegu na utupe yoyote iliyomwa na wadudu, ni ndogo zaidi, nyepesi zaidi au ya rangi tofauti na rangi ya mbegu zilizo na afya bora.
- Kwa mbegu zilizo na ngozi ngumu, kuelea kwa maji ni jaribio zuri. Kwa kawaida, mbegu nzuri huzama kwa maji na mbegu mbaya huelea.
- Unaweza fanya jaribio lenye urahisi la kuota. Chukua mbegu chache zilizohesabiwa (ishirini hadi mia moja). Fanyia matayarisho yoyote yanayohitajika. Weka mbegu katika nguo yenye unyevu katika bakuli. Funika kwa kipande kingine cha nguo, tia unyevu vizuri na uiweke mahali penye joto (si moto). Angalia mbegu kila siku ili kuona dalili za kuota na uweke nguo ikiwa yenye unyevu kila wakati. Kuota kunapoanza, weka rekodi ya siku na nambari

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





ya mbegu zinazoota. Kuota kwa zaidi ya asilimia hamsini humaanisha una mbegu nzuri, lakini upesi ya kuota waweza kutofautiana sana kulingana na aina ya mti. Aina yenye mbegu ndogo ambapo asilimia tano pekee inaota bado ni nzuri ya kuweka.

8. Tupande au tuweke mbegu?

- Mbegu zingine hazikai kwa muda mrefu na lazima zipandwe mara moja (san asana mbegu nyororo na zilizo ndani ya matunda yenye maji maji, mbegu za miti ya matunda ama mbegu zenye mafuta mengi).
- Kwa mbegu zenye ngozi ngumu zaidi, mwongozo wa kimsingi ni kuziweka mbegu zikiwa safi, zilizokauka na penye baridi.
- Mbegu zitolewe kutoka kwa tunda na kukaushwa vizuri. Kukausha mbegu, ziweke kwenye jua kwa siku mbili au tatu.
- Kuziweka katika karatasi au mkebe nje kwenye jua ni vizuri (epuka makaratasi ya mipira kwani huzifanya mbegu kutoa jasho na kuoza). Hakikisha mkebe ni safi na usioingiza hewa.
- Andika mkebe jina la mbegu na tarehe ya kukusanya.
- Kumbuka kuwa uwezo wa mbegu wa kuota hupungua wakati unapopita. Kama mbegu imewekwa kwa muda mrefu sana, inaweza kuharibika. Baadhi ya aina hupoteza uwezo wa kuota kwa haraka zaidi ya aina zingine.

9. Mbegu zote huota?

Asilimia ya mbegu zinazoota hutofautiana sana kati ya aina. Mbegu zingine huhitaji aina ya maandalizi ya kabla.

10. Tutapandaje mbegu?

- Mbegu zingine zinazoota kwa urahisi zaweza kuoteshwa moja kwa moja shambani au mifukoni. Aina zinanazohitaji hali maalum ili kuota huoteshwa katika kitalu kwanza.
- Kumbuka kuwa mbegu zingine zitahitaji matayarisho ya kabla.
- Muda unaotumika na mbegu kuota hulingana na aina ya mbegu, joto, kiasi cha maji kilichopo na umri wa mbegu.
- Kwa ujumla, kupanda hufanyika kabla ya msimu wa mvua kuanza.
- Kama mwongozo wa kijumla, kama mbegu zinapandwa moja kwa moja shambani, zinafaa

kupandwa kina mara mbili au tatu upana wake na zafaa kufunikwa ilara kwa udongo. Udongo lazima ubaki wenye unyevu baada ya kupanda.

- Maelekezo kuhusu vbitalu yanafuata.

11. Je, miche hukua tu kutoka kwa mbegu?

Baadhi ya aina za miti hutoa vioteo (yaami mimea change kukua kutokana na mizizi ya mmea mzazi). Hivi vyaweza kukatwa na kupandikizwa,

Chukua kitawi kutoka kwa mti mchanga kilichona pingili na utumie vipandikizi hivi. Chagua tawi refu lenye afya na ukate mara moja kwa upande na kutoa majani. Panda kipandikizi udongoni angalau kina cha pingili mbili, na ngalau tumba moja likionekana juu ya udongo na ukiweke kipandikizi hiki kikiwa chenye maji hadi kuchipuka kuonekane. Miti inayokuzwa kwa nia hii itakuwa na sifa sawa na zile za mmea mzazi na yaweza kuwa saidifu wakati unahitaji kuhakikisha kuwa mti wa matunda wenye uzalishaji umekuzwa.

Kazi ya kufanywa na wanacluster katika mkutano

Katika mkutano wa cluster yako, gawa washirika katika vikundi vya watu tano kufika kumi. Uliza kila kikundi kuchagua aina ya mti iliyo nzuri kwa TIST-mti hutakaokaa muda mrefu na ulio wenye faida kwa mazingira. Wakumbushe kuchagua kiongozi na msaidizi wake.

Kazi hii ni kutafuta ujuzi ufuatao kuhusu kila aina ya mti:

- Jina la mti–Maelezo kuhusu mbegu - Mahali karibu pazuri pa kupata mbegu hiyo- Ukusanyaji wa mbegu- Njia ya kuweka–Njia ya kutayarisha mbegu–Njia ya kukuza

Wape dakika kumi za kufanya kazi hiyo, halafu huwaulize kila kikundi kuleta ripoti.

Tafadhali andika ujuzi huu katika kitabu chako na uje nacho katika mkutano huo mwingine wa mafunzo.

Waweza kuona njia iliyo hapa ya kunakiri haya ikiwa mwafaka:

Cluster Name:						
Jina la mti	Maelezo kuhusu mbegu	Mahali karibu pazuri pa kupata mbegu hiyo	Ukusanyaji wa mbegu	Njia ya kuweka	Njia ya kutayarisha mbegu	Njia ya kukuza

**Ujuzi kuhusu ukusanyaji wa aina chache za mbegu**

Jina la kisayansi	Rangi ya tunda lililokomaa	Kutoa mbegu na kusafisha
Acacia mangium	Hudhurungi yenye giza kufika nyeusi	Mbegu huwekwa kwa gunia na kupigwa kwa wepesi. Mbegu ndipo hupepetwa.
Aleurites moluccena	Hudhurungi yenye njano	Matunda yanafinyiliwa au kupigwa kwa wepesi halafu kuoshwa na kukaushwa.
Alstonia scholaris	Njano yenye hudhurungi	Matunda hukaushwa chini ya kivuli hadi yanapofunguka na mbegu kutolewa. Mbegu ndipo hupepetwa
Anacardium occidentale	Njano yenye wekundu	Mbegu hutolewa kwa matunda na kukaushwa
Azadirachta indica	Kijani chenye njano	Matunda hufinyiliwa kwa mkono. Mbegu huoshwa na kukaushwa.
Calamus manan	Hudhurungi yenye njano	Matundwa yanasuguliwa moja dhidi ya linguine ili kutoa ngozi ya juu na kuoshwa.
Calliandra Calathyrus	Nyeusi (na lililokauka)	Maganda huwekwa katika gunia na kupigwa kwa wepesi. Mbegu ndipo hupepetwa. Matunda yanafinyiliwa na kupigwa kwa wepesi halafu kuoshwa na kukaushwa.
Canarium Ovatum	Hudhurungi yenye giza	Maganda yanavunjwa. Mbegu ndipo hupepetwa
Dalbergia latifolia	Hudhurungi (na rahisi kuvunja)	Matunda hukaushwa hadi yanafunguka na mbegu kutolewa. Mbegu ndipo inapepetwa
Dyera costulata	Hudhurungi (na rahisi kuvunja)	Matunda hukaushwa hadi yanafunguka na mbegu kutolewa. Mbegu ndipo inapepetwa
Enterolobium cyclocarpum	Hudhurungi yenye giza	Maganda yanavunjwa na kupigwa hadi mbegu kutoka. Mbegu inaoshwa na kukaushwa
Eucalyptus urophylla	Kijani chenye Hudhurungi yenye giza	Matunda yanakaushwa hadi yanapojifungua na mbegu kutoka. Mbegu ndipo hutolewa kutoka kwa uchafu na kupepetwa.
Eusideroxylon zwageri	Njano	Matunda huloweshwa kwa maji na kusuguliwa ili kutoa sehemu majimaji. Mbegu inaoshwa na kukaushwa.
Fagraea fragrans	Hudhurungi yenye giza	Matunda yanasuguliwa dhidi ya kichungi hadi mbegu inapotawanyika. Mbegu inachungwa tena halafu kupepetwa.
Gliricidia sepium	Hudhurungi yenye njano	Maganda huwekwa katika gunia na kupigwa kwa wepesi. Mbegu ndipo hupepetwa.
Gmelina arborea	Kijani chenye njano (na lililoanguka)	Matunda yanawekwa katika gunia na kupigwa kwa wepesi. Mbegu inaoshwa ili kutoa sehemu majimaji.
Hopea mengarawan	Hudhurungi nyepesi (na lililoanguka)	Mabawa yanakatwa kutokana na mbegu.
Intsia bijuga	Kijani chenye hudhurungi	Matunda yanakaushwa hadi yanapofunguka na mbegu kutolewa. Mbegu ndipo inapepetwa.
Leucaena leucocephala	Hudhurungi yenye njano	Maganda yanavunjwa. Mbegu inapepetwa
Palaquium sp	Njano	Matunda yanafinyiliwa kwa mkono. Mbegu inaoshwa na kukaushwa
Paraserianthes falcata	Njano	Maganda yanapokuwa hudhurungi yanawekwa katika gunia na kupigwa kwa wepesi
Pinus merkusii	Kijani chenye njano	Maganda yaliyokauka huwekwa katika gunia na kuvunjwa kwa kusuguliwa hadi mbegu inapotoka. Mbegu inasuguliwa kwa wepesi ili kutoa sehemu majimaji, inaoshwa na kukaushwa.
Santalum album	Nyeusi yenye wekundu	Matunda yanavunjwa na kufinyiliwa kwa mkono. Mbegu inatolewa kwa sehemu majimaji, kuoshwa na kukaushwa
Sesbania grandiflora	Njano	Maganda yanawekwa katika gunia na kupigwa kwa wepesi. Mbegu ndipo hupepetwa.
Shorea javanica	Hudhurungi (na lililoanguka)	Mabawa yanatolewa kutoka kwa mbegu
Swietenia macrophylla	Hudhurungi (na rahisi kuvunja)	Matunda yanavunjwa. Mabawa yanatolewa. Mbegu inapepetwa
Tamarindus indica	Hudhurungi yenye njano	Matunda yanavunjwa na kufinyiliwa kwa mkono. Mbegu inatolewa kwa sehemu majimaji, kuoshwa na kukaushwa
Tectona grandis	Hudhurungi yenye giza	Matunda yanasuguliwa moja dhidi ya linguine ili kutoa ngozi halafu mbegu inapepetwa



Cluster ya TIST ya Kiraro: Tuna nia kubwa ya kuimarisha cluster yetu.

Umeletewa na Jemima Gatwiri, mtumishi wa TIST katika cluster.

Sisi, cluster ya TIST ya Kiraro, ambao tulizaliwa kutokana na cluster yetu mama ya Kairuni na sasa tuna nia ya kuimarisha cluster yetu. Tumeanzisha kitalu cha cluster tukiwa na lengo la kupanda Zaidi ya miti elfu thelathini kufikia mwezi ya sita mwaka 2015. Tumezidi kuwahamasisha majirani na marafiki kujiunga na TIST. Hivi karibuni, vikundi viwili vipya vimejiunga na TIST.



Memba wa cluster ya Kiraro katika mkutano wao wa kila mwezi.

Cluster ya TIST ya Ragati: Sasa tumelenga miti elfu mia moja na zaidi.

Umeletewa na Francis Kibe, mtumishi wa TIST katika cluster.

Sisi, memba wa cluster ya Ragati, kufikia hapo tumepanda Zaidi ya miti elfu themanini tukiwa vikundi thelathini na tatu. Lengo letu mwaka ujao ni kupanda miti elfu ishirini nyongeza ili tufikie elfu mia moja. Tuna nia ya kufikia miti mia mbili hamsini elfu katika cluster yetu katika miaka tatu kufika tano ijayo.



Memba wa cluster ya Ragati katika mkutano wa kulipa motisha kwa vikundi vidogo.

Mazingira Bora



TIST

The International Small Group & Tree Planting Program
www.tist.org

Kikamba Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Amemba ma Ngwatanio ya Ragati ivindani ya tukundi tunini kuivwa ndivi ya uthyuthio me umbanoni.

Thiini:

TIST: Kukolany'a Mbeu. Page 2

Ngwatanio ya Kiraro TIST: yu nitwiyumitye kwikia vinya ngwatanio yitu. Page 6

Ngwatanio ya Ragato TIST: Yu twina mwolooto wa miti mbee wa 100,000. Page 6



TIST: Kukolany'a Mbeu.

Makulyo undu wa kumbany'a na kukolany'ambeu na mausungio

1. Ni muthemba wiva wa muti waile umea kisioni kyaku?

Mithemba miseo ya miti ni miti ila itonya umea kisioni vate mundu kulikiliila. Ala methiwa nthini wa TIST nimathuthaw'a kaingi kuvanda miti ila itonya kwimesya isioni syoo kana miti ya kiene na mithemba ingi na kwikala iteutemwa vandu va ilungu ya myaka miongo ili kana mbeange.

2. Ni miti yoonthe miseo?

Ti lasima kila muti withiwe wi museo! mithemba imwe noyithiwe yi vinya kumiea, ingi ukethia ni sumu kwa indo, kana kwa kiw'u. Sakua miti ila wisi niya vaita kwa kisio kyaku. TIST ndyendeeawa ni aimi kuvanda misanduku nundu kuvanda miti ino nikuolaa kiw'u kila kimuthangani.

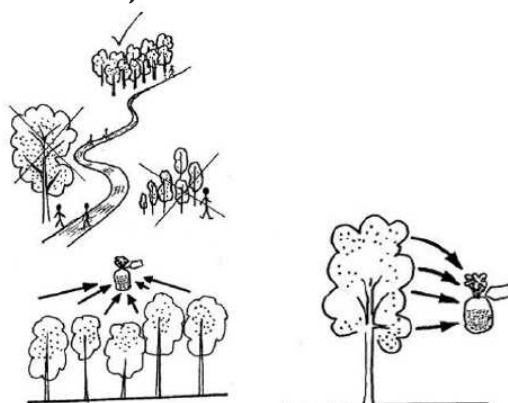
3. Miti nuyumasya mbindi/ mbei kila mwaka?

Miti mingi kwaw'o nisyaa na kunengane mbeu kila mwaka, Indi niwaile usyaaisya miti ila yi kisioni kyaku nikana umanye nesa. Miti imwe no ithiwa yumasya mbeu /mbindi nzeo itina wa myaka ili kana itatu.

4. Ni miti yiva yina usya museo wa kwa kwosa mbeu?

- Kolany'a mbeu kuma miti ila yina uima museo
- Ndukendeew'e ni mbeu sya miti ila imeete vandu yiyoka
- Ndukendeew'e ni miti ila itasyaa nesa na yina mbeu syina umbo muthuku.
- Nikaa kuyuva muti ula ukwosany'a mbeu wi katikati wa miti ingi miseo ya muthemba umwe nundu ninenganae mbeu nzeo ya muthemba usu wa muti.
- Umbany'a mbeu kuma ngavani kivathukany'o sya muti ula wa sakua.

Kuma: Robbins, 2004



nzakua muti mbeu kuma mutini musyai museo.

- Ni useo kwosany'a mbeu kuma mitini inyiva mithemba 30. Kii kitetheeasya kwithiwa na mithemba mingi. Osany'a mbeu kuma mitini yina utaaniu wa 50m - 100m nikana ukwate mbeu kivathukany'o na syaile.
- Muthemba wa muti kaingi uamuawa ni vata wa muti ula ukwenda.
- Ngelekany'o, kwi miti minzeo kwa mbau nayo ni ila imeaa ukethia ni miasa na ndina ngava mbingi na yanaa kwa mituki na ndithuthawa.
- Miti miseo kwa uithyo wa indo nayo yaile ithiwa yi miti ikwiana mituki, yina uthui na ngava mbingi, na itonnya kuthongooa na mituki.
- Miti miseo ya matunda yaile ithiwa yina usyao museo wa matunda, ngava syi nthi kana syi vakuvi, na itonya kwiana na mituki.
- Tata usakue mbeu kuma mitini ila yanaa na mituki muthangani, nzeveni, na utuluni umwe na vala ukwenda uvanda.
- Nzakua miti miimu na ti ila yesanga. Miti miviku yithiawa na mbeu /mbindi mbingi kwi muti munini.

5. Ni indii tukolanasya mbeu?

- Ivundisye kuwosany'a mbeu yitunda yeew'a
- Kulya andu ma kisio/atui maku kana usyaiisye muti we mwene. Ingi mbindi/ngii nisyithiawa syeew'a yila ikonde yavindua langi, syooma kana itonya utilika mituki kuma ngavani. Ingi nzuu nisyiw'aa kwa kuvindu ikonde kuma langi wa kisusuni(ngilini) kutwika langi wa kaki/muthanga. Syisya musolo itina ithanguni yii wone ngelekany'o.



- Mbindi mbingi syithiawa tayali syavaluka kuma mutini
- Lilikana kuvoya mwanya wakwosa mbeu/mbindi / ngii kuma kwa mwene muti
- Wa mina kumbanya mbeu weekia vala weekia lilikana kuandika isyitwa ya muti, matuku ma kumivuua na niva wamyumya.

6. Nata tukolanasya mbeu?

- Nuseo kuthesya ungu wa muti ula tukwosany'a mbeu. Mbindi/Ngii mbingi nitonya kwosyanw'a ungu wa muti sya valuka. Onakau niwaile eteela ila ukwo syi mbiku nesa ukethe syo sya valuka. Ndukaeke syikale muno vau uthi nundu nitonya kwaa. Syisya kana ni ndonye, syina uwau kana ni mbanangiku mbee wa kusyosania. Ngii/mbindi ta sya *Tectona grandis* (teak), *Gmelina arborea*(gmelina) *Aleurites moluccana* (candlenut) nikolanaw'a kwa nzia ino.
- Mundu no kulisa mutini kwuvuua mbeu lakini wisuvia kuvaluka!
- Matunda amwe ma miti momaa na kwatuka na kunyaiikya mbeu nthi. Kwosany'a mbeu ino yavaluka kwivinya muno ethiwa ngii/mbindi syayo ni nini. Osany'a mika kana matunda ma miti taino meew'a vandu va kweteela yatuke na kuyaiikya mbeu. Anika vandu vaseo vatheu wisi syaatuka ii nutonya kumbania na kwosa mbeu.
- Mbeu imwe nutonya ukuna na muti muasa ivaluke.
- Tata wie kyandalua ungu wa muti ula ukumia mbeu na uithingithya o kavola wite mbindi/ngii.
- Kwa miti ila miasa nutonya umiseuvisya mboloi uitumia muti muasa kwa kuwoveea mukasi kwokoni kumwe na ikanda kula kungi.
- Manya mithemba imwe ya mbeu nditonya ukolany'a yavaluka indi no yeemesya ungu wa muti usu. Niwithiaa tumiti tumeete ungu wa muti uyu na vaa nivo waile usakua tula tuseo na kutwaa kivuioni na tuvisu. Ino niyo nzia ila nzeo muno kwa mithemba ya miti ila yi vinya kumea kana mbeu syayo syi vinya kukolany'a.
- Mbeu syoothe nisyale umwa mikeani kana matundani. uu nutonya kwikwa na kw'oko kana kwanikia sua siyatue.

Collection of *Sesbania sesban* with telescopic shears at Muguga site, Kenya



7. Nata utonya umanya mbeu ni nzeo?

- Mbee ni kwa kusisya na kuveta ila nini kwi ila ingi, ila syina langi utailye ta iingi, ila mbanange ni tusamu.
- Osa mbeu imwe watue usisye nthini kana ni mbiku na kana niyithiwa na muiinyu.
- Kwa ngii/mbindi imwe ila syina kikonde kyumu no uivathukany'e kwa kwikia kiw'uni nundu ila nthuku nithambalalaa (Nundu maima ma ngulu na itema ya ngii ino enthiwa ti iviku niyitiaa maima ma nzeve)
- Kwa mbeu imwe nuvathukanasya kwa kusunga kana kuulukya na nzele kuveta ila mbuthu.

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





- Nutonya kusyimithya mbeu umanye kana nitonya umea. Osa namba nini ya mbeu ila ukolanitye ya ngii ta (20-100) ethiwa nisyaille kuitwa siiite na syikie ikulani yiu na uilinga, ia vandu vena muutia na tivavyu na uyikalya ikula yii yi yiu kila ivinda na uisiasya kila muthenya wone kana nikumya minguthe. Syambiia umya minguthe ia lekoti ya undu imeete kila muthenya. Iseso yii ya kusyimithya mbeu yaile ikala vandu va ilungu ya syumwa ili kwianana na mthemba wa muti. Ethywa 50% ya mbeu ila uusyimithasya niyaumya minguthi nuumanya wina mbeu nzeo. Mbeu yina mbindi/ngii nini yina kumea kwa 5% ve vata wa kwiwa.

8. Nituvanda kana twikita kwia mbeu?

- Mithemba imwe ya mbeu ndiakaa yendaa kukethwa ivanditwe (mithemba ila yi na matunda moaa na mituki na ngii ila mbololo, na mbindi/ngii sya miti ya matunda muna muno ila yina mauta maingi). Kwa mbindi ngii ila syina mbindi nyumu mwio wasyo ni ia syi theu, vandu vomu na vathithu.
- Mbeu niyaile kumwa ikondeni na kwanikwa inyae nesa. Kwanika mbeu syanike suani vandu va mithenya ili kana itatu.
- Kwia ithanguni kana mukeve wa kyuma vandu vate sua (nuseo kuleikia ithanguni ya nailoni nundu syanyala nikwoa) lkkithya vala weekia ni vatheu na niwakunika nesa.
- Vandika kathangu kena isyitwa ya mbeu, matuku ala woosanisyeye na niva wamyumisyeye.
- Lilikana utonyi wa kumea wa mbeu uendaa uolekete kwianana na ivinda yila uendee na kwia mbeu ino.

9. Ni mbeu syoothe sumasya ming'uthe kana kumea?

- Kilio kya mbeu/ngii/mbindi ila iume muno iamuwawa ni mthemba wa muti ula syumite. Imwe nisyendaa kuitwa be na uu ukalew'a ithanguni ya mwaini w keli.
- Yila ukolany'a mbeu lilikana imwe waia nikusaa, imwe nikwiiiaa kivuioni, na ingi iithamwa kuma kivuioni. Kwoou uyu nundu wa ikia maanani yila uvanda kana kikundi kyenyu kiuvuia kina kieleelo kya kwithiwa na miti kiasi kina nonginya mongele mbeu ila meuvuiia na yila meukolanya mbeu.

10. Nata tutonya uvanda mbeu?

- Mbeu ila imeaa vate thina no ivamwe imwe vala yaile. Mithemba ila yendaa kusesengwa niyaile uvuiwa kivuioni mbee wa utwawa kithekani.

- Ivinda yila mbeu ikukua kumea yitengemea mthemba wa mbeu, uvyuvu, kiw'u na ivinda yila mbeu yiithiitwe yitwe.
- Uvandi niwambiia oyila mbua yambiia.
- Kwoondu wa ukutongoesya kwa uvandi ni vanda ngii uliku wa kundu kwili kana kutatu kwa uthathau wa ngii/mbindi na ikalya muthanga wi mwiiu.
- Umanisyo iulu wa kuseuvya ivuio ukanenganwe ivinda ya uvundisyo ungi.

11. Niw'o mbeu ya mbindi/ngii noyo itonya utune tumiti?

- Mithemba imwe niyumasya nthongoo ila (nthongoo ithi syithiawa imeete kuma miini ya miti ila iisyaite) itumiawa ta mbeu kwa kutemwe kana kukuwa na kuvandwa vandu vangi.
- Matilo ma miti ni mosawa kuma ngavani sya miti na methiawa na metho kana kundu kwa kuthongooela kuinyiva kutatu. Usakua itilo sisya ukava ula utena kitau, uwau na mutheu tila ta usavite. veta matu vanda itilo yii muthangani metho eli me ungu wa muthanga na yimwe yisa. Endeea na ungithya nginya wone niyakwata na yambiia kuthongooa. Muti wa uvanda uu withiawa uilyi ta muti ula waumisye mbeu na nundu utonya utuma uvanda muti museo wa matunda.

Umbano wa ngwatanio

Yila mwina umbano wa kila mwai aanai ikundi sya andu 6-10. Kulya kila kikundi kisakue mthemba wa muti ula museo kwa TIST kwa ivinda iasa nawina vaita kwa mawithyululuko. Lilikanya kila amwe masakue mutongoi na munini wake. kii nikutetheesya kwosa uvoo uu iulu wa kila mthemba wa muti:

- Isyitwa ya muti, uelesyo wa mbeu yaw'o, vandu ve vau vakuvi utonya kwosa mbeu, Nzia ya kukolanya I mbeu, Undu wa kumia, undu wa kumiiita na nzia ya kuvanda. Manenge ivinda ya ndatika ikumi kwika undu uu na uikulya kila kikundi kitunge livoti.

Andika livoti ino ivukuni na uyuuka nayo ivindani yila yingi kwina umanyisyo. Nowone yui useo kuvanga ta uu

Isyitwa ya ngwatanio:						
Isyitwa ya muti	Uelesyo wa mbeu	Vala utonya umikwata ukuvini	Nzia ya ukolany'a	Nzia taKwia	Kuita mbee wa uvanda	Nzia ya uvanda

**Vaa ve uvoo iulu wa undu wa ukolany'a mithemba mina ya mbeu**

Isyitwa ya Botanical	Langi wa itunda iviku	Undu wa kumya mbeu na kithesya
Acacia mangium	Dark brown to black	Matunda maanikwa suani mekiawa ikuniani na kuvuwa na mayiulukw'a
Aleurites moluccena	Yellowish-brown (and fallen)	Matunda maw'o mavuawa na kuthambw'a na kwanikwa
Alstonia scholaris	Brownish-yellow	Matunda manikawa muunyini na mooma mayatuka na kumya mbindi/ngii ila iulukaw'a
Anacardium occidentale	Reddish-yellow	Ngii nisumawa itundani na kwanikwa
Azadirachta indica	Yellowish-green	Matunda nimavinyiiawa na kw'oko. Ngii nithamasya na kwanikwa iny'ae
Calamus manan	Brownish-yellow	Matunda nimakiithawa vamwe kumya kikonde kya sana naiithambw'a
Calliandra Calathysus	Dark-brown (and dry)	Mikie yikiawa ikuniani na kuvuwa na ngii kuulukw'a
Canarium Ovatum	Black (and fallen)	Matunda nimatuawa kana kuvuwa na iithambw'a na kwanikwa
Dalbergia latifolia	Dark-brown	Mikea nivuawa na mbeu kuulukw'a
Dyera costulata	Brown (and easy to snap)	Matunda nimanikawa na mooma mayatuka na ngii kuma vala iulukaw'a
Enterolobium cyclocarpum	Dark-brown	Mikea ni vuawa na ngii kumwa ila ithambawa na kwanikwa
Eucalyptus urophylla	Dark brownish-green	Matunda nimanikawa maba makatuka na kumya ngii ila isungawa
Eusideroxylon zwageri	Yellow	Matunda nimaindawa na kutitianwa kumya nyama na ngii ithambw'a na kwanikwa
Fagraea fragrans	Dark-brown	Matunda nimatitianaw'a na kisungi kumya ngii na indi iisungwa na kuulukw'a
Gliricidia sepium	Yellowish-brown	Mikea yikiawa ikuniani na kuvuwa na yiulukw'a
Gmelina arborea	Yellow-green (and fallen)	Matunda mekiawa ikuniani na kuvuwa ngii nithambaw'a na kwanikwa
Hopea mengarawan	Light brown (and fallen)	Makonde twaumia mbeuni
Intsia bijuga	Yellowish-green	Matunda manikawa nginya makatuka na kumya ngii ila iulukaw'a
Leucaena leucocephala	Yellowish-brown	Mikea nivuawa na ngii kuulukw'a
Palaquium sp	Yellow	Matunda mavinyiiawa na kw'oko. Ngii nithambaw'a na kwanikwa
Paraserianthes falcataria	Yellow	Mikea yooma yikiawa ikuniani na kuvuwa na ngii iyulukw'a
Pinus merkusii	Blownish green	Syooma nititianaw'a kana kuvuwa syatuke na ngii syauma iyulukw'a
Santalum album	Reddish-black	Matunda mavinyiiawa na kw'oko na ingii iithambya na kwanikwa
Sesbania grandiflora	Yellow	Mikea yikiawa ikuniani na kuvuwa na ingii iyulukw'a
Shorea javanica	Brown (and fallen)	Matunda nimatuawa na thwau sya mbindi kuvetwa na iyulukw'a
Swietenia macrophylla	Brown (and easy to break open)	Matunda nimatuawa na thwau sya mbindi kuvetwa na iyulukw'a
Tamarindus indica	Yellowish-brown	Matunda nimatuawa na kuvinyiwa na kw'oko. Ngii nithambaw'a na kwanikwa
Tectona grandis	Yellowish-brown (and fallen)	Matunda nimakiithanaw'a na ngii kuulukwa kumya ikonde.