

# Mazingira Bora



# TIST

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

English Version

TIST is an innovative, time - tested,  
afforestation program led by the  
participants.

**TIST Answer Desk Number 0795 - 011 130. Call in Today!**



**Rwanyange Cluster meeting last month. Topics trained included TIST Values, Small Groups Eligibility requirements, Covid 19 prevention measures, our Cluster 2021 goals.**

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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?

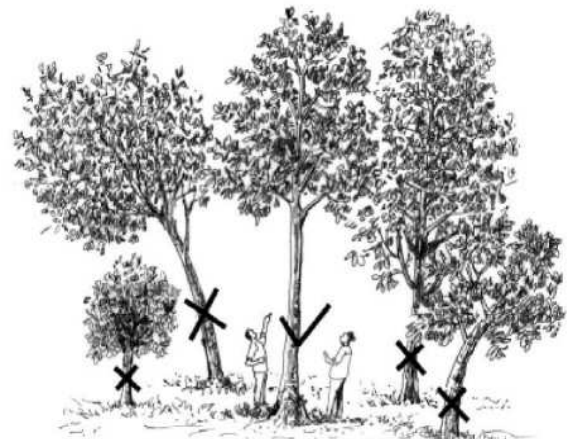
Not necessarily! Some may be difficult to control, be poisonous to your animals or use too much water. Choose ones you know will benefit your area. TIST discourages eucalyptus, for example, because planting these trees can reduce the water table.

### 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?

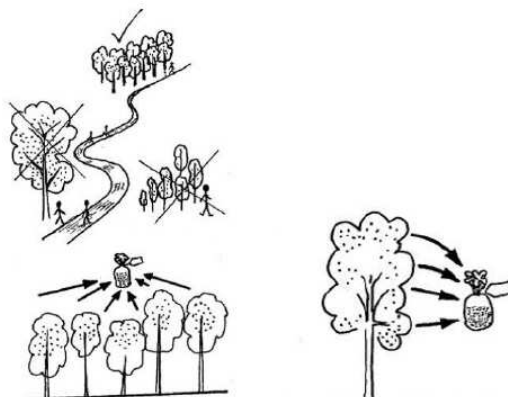
- o Collect seeds from healthy trees that are good seed producers.
- o Avoid isolated trees - in this case the seed is likely to have been self-pollinated which leads to poorer quality seeds.
- o Avoid unproductive trees and ones with a bad shape.
- o It is better to choose a tree in the middle of a 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



## Planting Trees in Dry Areas.

**A**s TIST continues to expand both in high potential and dry areas, we face challenges in tree survival. In TIST we always develop and share best practices, and this has always helped us in the TIST family get good results.

Below are some best practices that we can try in tree planting in dry areas:

1. Site selection for your nursery is especially important in dry areas. Seedlings will need to be watered once or twice each day when they are young. Consider keeping the seedlings in a convenient area near your home so you can use household water for seedlings. Using a windbreak around the nursery will reduce water use, and provide shade to protect young seedlings.
2. Early Preparation: Prepare the holes for tree planting possibly 1 month before the onset of the rain, the hole will crack and this will help in easy water penetration when it rains. After the first downpour, plant the trees and fill in the hole starting with the topsoil and manure.
3. Try using rainwater harvesting techniques, like negarims and micro-basins, so that more water reaches trees. Trees may also better survive if planted near areas where water flows seasonally.
4. Mulching: Mulch after planting the trees. This will help in moisture retention as it reduces evaporation. Using a compost manure will add nutrients to soils, but rock mulching can also provide some benefit in rocky areas.
5. Agro forestry: Let us try to practice agro forestry. The survival rate of trees planted in farm areas is higher than those planted in grassland and bushy areas since trees are better cared for and on better soil.
6. Choose species that grow well in dry areas. Often indigenous species from the surrounding area are strong survivors. Some examples include *Melia*, *Acacia seyal*, and *Muuuku (Terminalia brownii)*.
7. Protect existing trees and allow them to regenerate. These established trees are strong, and can often survive difficult seasons if we protect them. They provide an important source of locally adapted seeds as well as shade and other services.
8. Raised seedbeds or sunken seedbeds can help. When we establish the raised seedbed, we get seedlings with strong roots, so their survival rate is high. It may also help to keep seedlings a bit longer in the nursery so they can grow bigger and stronger. However, a sunken seedbed may also be a good choice since it shelters the seedlings and reduces drying. In this case, be careful to turn seedlings frequently so roots don't grow into the ground below the tubes, damaging roots in transplanting.

Let's use the best practices we have, and develop and share with others so that we can achieve more results and help TIST grow in our areas.



# Conservation Farming: Time to prepare your shamba.

TIST Small Group members who have practiced CF have testified it produces a greater harvest more reliably than traditional farming, especially when the rain is scarce. The holes help catch whatever rainfalls and make it available to the crop. This article will help you understand better how to practice kilimo hai. Following these best practices can help you get better yields this coming season.

## Preparing the land

- Prepare your land at least one month before the rains
- Clear your plot of weeds and bushes, but do not plough
- Prepare your holes oblong (rectangle) shape. They should each be 15 cm wide, 35 cm long and 15 cm deep. Space holes at least 75 cm apart.
- Take some manure or compost manure and good topsoil and mix it together. Fill the hole with the mixture up to five cm below the surface.

## Planting

- When you plant maize seeds (1-2 days before rains start), plant four seeds in the soil across the hole.
- If you are planting sorghum, plant 5-6 seeds at each end of the planting hole, after a good shower of rain.
- Cover the seeds with 2.5 cm of the rich soil and manure mixture. After this the soil in the hole should be about 2.5 cm below the surface of the field.

- The space at the top of the hole enables water to get to the plants when the rains come.

You do not need to use chemical fertilizer on the Conservation Farming plot. Your crops will still do better without chemical fertilizer, if you put enough manure.

## Weeding

- Weed around the holes regularly
- Do not weed the entire plot completely. Outside the holes, plants can cover the soil, keeping it cooler and keeping it from eroding in rain and wind. Just weed in and near the holes. Use a panga to clear weeds between the lines or spaces from one hole to the other. Weed frequently to keep weeds from going to seed and spreading in the holes.
- Leave the weed residue in the plot to rot. This will help add soil fertility.

## Post harvest practices

- Do not burn off the remains on the plot. Leave the residue on the ground so that they make the soil more fertile. Crop remainders can also be used for compost manure.
- Do not graze cattle in the plot.

We will be glad to celebrate your successful harvest and learn from best practices in your area through this newsletter as well during your cluster meeting. Take pictures as you prepare the holes, and then every two weeks take a picture of your CF as it grows. Send all of the pictures to us. Start working now!

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W W W . t i s t . o r g

**Kimereu Version**

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**Mkutano wa Nguzo ya Rwanyange mwezi uliopita. Mada zilizofunzwa ni pamoja na Maadili ya TIST, Mahitaji madogo ya Ustahiki, Covid 19 hatua za kuzuia, malengo yetu ya Cluster 2021.**

## ***Inside:***

**TIST: Kuuthurania mbeu. Page 2**

**Uandi miti ndene ya ntuura injumu. Page 5**

**Ni igita ria kuthuranira munda jwaku niuntu bwa urimi bubwega. 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?

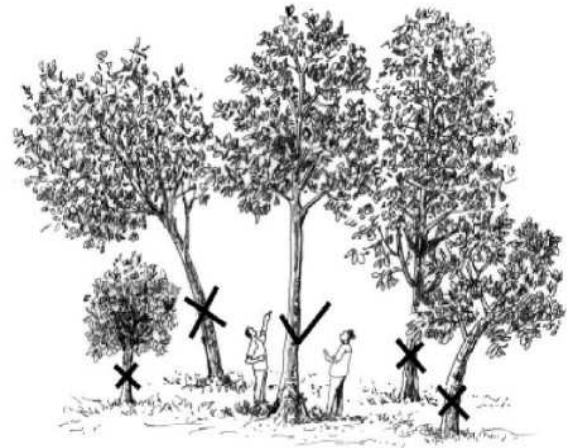
Ti mwanka! Miti imwe no igie inya gwika iria ukwenda niuntu bwa guciarana, no ithirwe iri sumu kiri ndithia ciaku kana igatumira ruuji rurwingi. Taara iria wiji ikaleta baita kiri ntuura yaku. Kujukia mung'uanano, TIST niregaga mibau, niuntu uandi bwa miti iji nobunyiye ruuji ruria ruri nthiguru ya muthetu.

### 3. Miti nithagirwa irina mbeu o mwaka?

Miti iria mingi niciaraga 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?

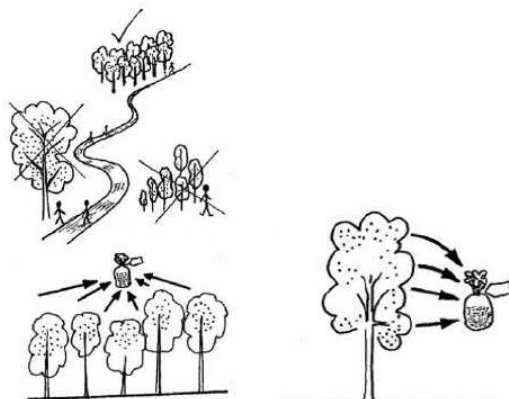
- Uthurania mbeu kuumania na miti iria irina thiria injega iria iciaraga mbeu inthongi.
- Ebera miti iria iri yonka – kiri miti iji mbeu yomba mono kwithira yuumanitie na muti gwiciarithia, untu buria buumba gutuma mbeu ikwethirwa citi injega mono.
- Ebera miti itiguciara na iria ikari bubuthuku.
- Ni 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

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



gwika riuene na gwetere jauma na gwatuka.

**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 uuge/ 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 nyoni 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 gukunikirwa 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:

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



## Uandi miti ndene ya ntuura injumu.

**O**uria TIST igwita na mbele gutamba ndene ya ntuura irina kanya gakathongi na injumu, nitugutirimana na magerio jamaingi kiri gutuura kwa miti. Ndene ya TIST nituthithagia na kugaana mitire imiega buru ya kuthithia mantu, na bubu nibututethagia batwi ndene ya nja ya TIST rionthe kwona maciara jamathongi.

Aja ni mitire imwe iria miega buru iria tuumba kugeria kiri uandi miti ndene ya ntuura injumu:

1. Utaari bwa antu a gwika munanda jwaku burina bata mono ndene ya ntuura injumu. Miti igetie gwikirwa ruuji rimwe kana jairi o ntuku riria inyii. Thugania gwika miti antu aria gukuiriteie nja nikenda ugatumira ruuji ruria rugutumirwa nja gwikira miti. Kunyiyia ruugo akui na munanda gugatethia kunyiyia utumiri bwa ruuji na kua miti iminini kirundu.
2. Kuthuranira kurio:Thuranira marinya ja kuanda miti kwombika mweri jumwe mbele ya mbura, kirinya gikaunika na bubu bugatethiakuuthioa gutonya kwa ruuji riria gukaura. Nyuma ya ngai ya mbele anda miti na ujurie kirinya ukiambagiria na muthetu jwa iguru riu mboleo.
3. Geria gutumira njira cia kugwatia ruuji rwa ngai nikenda ruuji rurwingi rukinyira miti. Miti ikoomba gutuura yaandwa akui na aria ruuji rwithagirwa ruriku rionthe.
4. Gukunikira muthetu: Gukunikira muthetu warikia kuanda miti. Bubu bugatethua gwika ruuji niuntu nikunyiagia gukamatwa ni riu. Gutumira mboleo ya imera gukoongera nutrienti muthetune indi gukunikira na maiga kinya ku no kulete baita guntune kuria kurina maiga jamaingi.
5. Kuungania imera na miti: Tugerieni kungania imera na miti. Miti iria iandagwa muundene niyo yuumbaga gutuura nkuruki ya iria iri ithakene niuntu nimenyagirwa na iri muthetune jumwega nkuruki.
6. Taara mithemba iria igakura bwega ndene ya ntuura injumu. Miti ya gintwirekuuma kiri ntuura iria ithiurukite niumbaga gutuura. Mng'uanano imwe ni *Melia*, *Acacia seyal*, na *Muuuku (Terminalia brownii)*.
7. Menyeera miti iria irio na umitikirie iciarane. Miti iji irio irina inya na niumbaga gukurukira mbura injumu twamikaria. Niejanaga kiumo kia bata kia mbeu cia gintwire amwe na kirundu na mantu jangi.
8. Minanda itiritie kana injiri no itethie. Riria twambia minanda itithitue, nituonaga miti irina miti imiriku na kwou igatuura. No itethie kinya gwika miti munandene igita riraja nikenda inenea nkuruki na igia inya. Indi minanda ya kwinjira no ithirwe iri imiega niuntu nikunikagira miti na ikanyia kuuma. Aja, menyeera kugaruria miti o nyuma ya igita nikenda miri itigakure itonya muthetune rungu rwa mubuko, na kwou igitaria miiri igita ria kuthamia.

Tutumireni mitire iria miega buru iria turinayo, na tuthithie na kugaana na bangi nikenda tukinyira maciara jamaingi na tutethia TIST gukura ndene ya ntuura cietu.



# Ni igita ria kuthuranira munda jwaku niuntu bwa urimi bubwega.

**A**memba ba ikunbi bibinini bia TIST baria bageretie kurima na urimi bubwega nibaritite ukuji ati nibuciaraga iciara ririnene na riumba gweterwa guti na uguuaa kiri urimi bwa kawaida, mono mono ririangai itikung'ana.

Marinya nijatethagia kugwatia ngai iria ikagua na gutuma ruuji ruru rwithirwa rurio kiri kimera. Mantu jaja jagagutethia kwelewa bwega nkuruki uria ubati gutumira njira ya urimi bubwega. Kuthingatira miitire iji iria miega buru gugagutethia kwona iketha ririega nkuruki mbura iji ijite.

## **Kuthuranira muunda**

Thuranira munda jwaku no mweri jumwe kabele ka mbura.

- Rita maria na ithaka muundene jwaku. Ukarima.
- Thuranira marinya jaku. Nijabati kwithirwa jari na warie bwa sentimeta ikumi na ithano, uraja bwa sentimeta mirongo ithatu na ithano na kwinama sentimeta ikumi na ithano. Taarania marinya jaku na sentimeta mirongo mugwanja na ithano kana nkuruki.
- Jukia mboleo inkai na muthetu jumwega jwa iguru na uunganie. Ujuria kirinya na muunganio juju mwanka gikinye sentimeta ithano nthiguru ya nthiguru itirimi.

## **Kuanda**

- Waanda mbeu cia mpempe (ntuku imwe gwita ijiri mbele ya mbura kwambiria), anda mpindi inya kiri muthetu kugitania kirinya.
- Kethira ni ugimbi ukuanda, anda mpindi ithano gwita ithanthatu o muthiene jwa o kirinya ga kuanda nyuma ya mbura injega mma yaura.
- Kunikira mbeu na sentimeta 2.5 cia muunganio juria jwa muthetu jumunoru na mboleo.

Nyuma ya kwongera muunganio juju kirinya kibai kwithirwa kiri senimeta 2.5 nthiguru ya naria nthiguru itirimi.

- Kanya karia gagutigwa kirinyene iguru nigatethagia ruuji gukinyira imera riria mbura ijijaga.
- Gutina aja ya gutumira fertilizer cia kuguura kiri muunda jwaurimi jumwega. Imera biaku bikathithia bwega kinya warega gutumira fertilizer, wekira mboleo ing'ani.

## **Gukuurira iria**

- Kuurira iria akui na irinya o igita o igita.
- Ugakurira munda junthe iria rionthe. Oome ya marinya, imera nobikunikire muthetu, bikajuika jurina gapio na bigatuma jutakamatwe ni mbura kana ruugo. Kuurira iria aki marinyene na akui na marinya. Tuumira kibanga gukurira iria gati gati kalaini kana itigatinekuuma kirinya gwita kingi. Kurira iria o igita o igita nikenda maria jatiraciare mbeu na jatamba marinyene.
- Tiga matigari jam aria muundene kenda joorera ku. Bubu bugatethia kuongera unoru bwa muthetu. aria ubati kuthithia warikia guketha
- Ukaithia matigari ja muunda. Jatige nthiguru nikenda jomba gutuma muthetu junora nkuruki. Matigari ja imera no jatimirwe kinya kuthithia mboleo.
- Ukarithia ndithia muundene. Itu rikana, tukagwirua mono gukeneera iketha riaku ririnene na kuthoma kuumania na miitire imiega buru ntuurene yaku gukurukira gazeti iji amwe na igitene ria mucemanio jwaku jwa cluster.

Ambiria kurita ngugi thaa iji!

# Mazingira Bora



# TIST

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**Mkutano wa Nguzo ya Rwanyange mwezi uliopita. Mada zilizofunzwa ni pamoja na Maadili ya TIST, Mahitaji madogo ya Ustahiki, Covid 19 hatua za kuzuia, malengo yetu ya Cluster 2021.**

## ***Inside:***

**TIST: Ungania wa mbegu. Page 2**

**Uhandi wa miti kundu kumu. Page 5**

**Mahinda ma kuhariria mugunda waku niundu wa Kilimo Hai. Page 6**



# TIST: Ungania wa mbegu.

## Ciuria na macokio ci unganiam wa mbegu

### 1. Ni mithemba iriku ya mitiingikura kwanyu?

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

### 2. Miti yoothe ni miega?

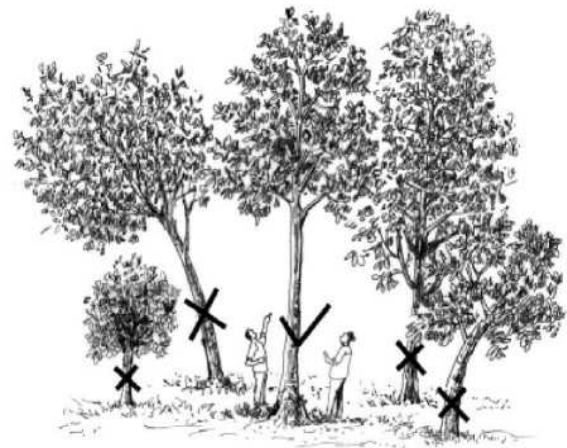
To muhaka! Miti ingi niiremaga gutungatika na ingi igakorwo na thumu kuri nyamu na ingi ikahuthira maai maingi. Thuura miti iria ingiteithia kwanyu. TIST niigiritie miti ya mbau kwa muhiano tondu niinyihagia maai tiiri-ini

### 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

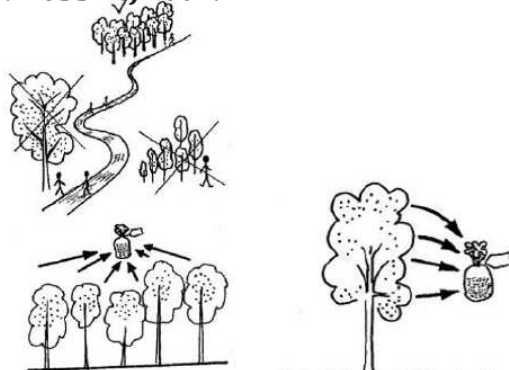


- Niwega kungania mbegu kuma kuri mithemba 30 na makiria ya miti niguu ukorwo na rurira rwega, miti ya mbegu yariirwo nigukorwo na utaganu wa 50m-100m niguu ikure wega
- Miti uria mwega uringanaga nakiria urenda kuhuthira muti ucio nakio
- Kwa muhiano, miti miega ya mbau yagiriirwo nigukorwo iri mirungaru, 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.

### 5. Twagiriirwo ni kungania mbegu ri?

- Rora ihinda ria mwaka riria mbegu cirri nguru
- Uria andua nagi kana wirorere miti.
- Maita maingi mbegu cikoragwo cirri nguru riria matunda merua na macenjia 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

Source: Robbins, 2004.





- 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 cिकारite 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 niguu 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 ciaguo cikoragwo na hinya kunganika.
- Mbegu ciothe niciagiriirwo ni kurutwo kuma makoniini. Undu uyu nowikwo na moko kana kwanika makoni riuiaini niguu mome.

**7. Tungimanya 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 niguu ucigeria. Mbegu njega nicirikaga maaini na iria thuku cikareera.

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



- Kuri mbegu iwe nouganyanie na kuhuhana gucunga niguu wehutie iria huthu
- 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 nguoini 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.

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





**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.
- Uhoru wa tuta niuheanitwo githomoini kingi.

**11. Mimera ikuraga kuma kuri o mbegu?**

- Mithemba imwe ya miti niiciaraga 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 maturigicirii. Uria gikundu githuure mutongoria na munini wake.

**Wira ni kungania uhoru wa o muthemba wa miti:**

- Ritwa ria muti / uhoru makiria wa mbegu – kuria kwegu ungitona 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 uhoru ucio thiini wa ibuku na ugoka naguo mucemanio-ini ucio ungi

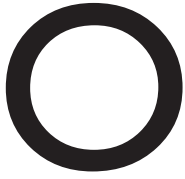
Niwega kuhuthira table tai no.

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





## Uhandi wa miti kundu kumu.



TIST igithiaga na-mbere na gukura miena yothe iria yaraga na yumaga, nitukoragwo na mathina ma gukuria

miti. Thiini wa TIST tukuragia na tugatwarithia mitaratara miega, na njira ino niituteithitie thiini wa TIST kugia na maciaro mega.

Ino ni imwe ya mitaratara ya kurumirira gukuria miti kundu kumu:

1. guchagura handu hega ha ha nathari ya miti. Mimera niiribatara kuheo maai riita 1 kana maita 2 hari o muthenya riria iri minini. Cagura kuhanda mimera hakuhi na mucii niguo uhuthire maai manyumba gutiriria mimera. Ukihuthira indo ciakugitira ruhuho guthiururukiria nathari yaku nigukunyahia uhuthiri wa maai na kuhe mimera kiiruru.
2. Uhariria wa tene: hariria marima ma kuhandira miti muno mweri 1 mbere ya mbura, iria nirigwatuka na uteithie maai kuingira tiiri-ini wega mbura yaura.
3. Geria gutega maai ma mbura niguo maai maingi makinyire miti. Miti noikure wega riria yahandwo kuria maai mageraga.
4. Ikira mahuti mugundaini niguo maige ugunyu tiiri-ini.

5. Hamda miti mugundaini wa irio. Riria wahanda miti mugunda-ini niikuraga wega tondu niiramenyererwo hamwe na irio iria iri mugunda.
6. Cagura mithemba ya miti iria ikuraga wega na riuu. Muno miti ya ki-nduire niyo miega. Kwa muhiano Melia, Acacia, na Muuku(Terminalia brownii).
7. Menyerera miti iria iri kuo na umihotihie gutherema. Miti ino mikuru iri na hinya, na noiikare gwa kahinda karaihu twamimenyerera. Niiheanaga kihumo kia mbegu cia kuhanda.
8. Tuta njoe iguru nociteithie. Riria twathondeka tuta njoe iguru, nitugiaga na mimera iri na miri iri na hinya na irakura wega. Noiteithie kuiga mimera iri na hinya thiini wa nathari niguo ikure iri minene na ikure na uraihu munene. No ona kuri o uguo tuta njoe iguru noikorwo iri njega tondu niitumaga mimera ndigakue na ihenya. Niundu wa uguo, menyerera na ugarure mimera niguo miri ndigakinye thi.

Reke tuhuthire mitaratara miega na tukurania na tuthomithanie na nitukwigwatira maundu manene thiini wa TIST.



# Mahinda ma kuhariria mugunda waku niundu wa Kilimo Hai.

Arimi aria marimite na Kilimo Hai mari na uira ati magetha ni maingi gukira urimi wa ki-nduire na makiria riria mbura iri nini.

Marima nimateithagia maai ma mbura kuigika na guteithia mimera na njira iria njega.

Uhorro uyu niuguguteithia gutaukuo wega uria unguiteithika na Kilimo Hai. Kurumirira mitaratara miega niguguguteithia kugia na magetha mega.

Kuhariria mugunda waku.

Hariria mugunda waku mweri umwe mbere ya mbura yurite.

- Tuguta mahuti maria mari mugunda-ini, ndukarime.
- Enja marima ma rectangle. Magiriirwo nigukorwo na warii wa 15cm na uraihu wa 35cm na uriku wa 15cm na umataganie na utaganu wa 75cm.
- Ikira thumu na tiiri wa iguru na utukanie. Ikira mutukanio ucio na utigie 5cm.

Kuhanda

- riria wahanda mbembe(matuku 1-2 mbere ya mbura yurite), handa mbegu 4 irimaini.
- Wahanda muhia, handa 5-6 irima-ini thutha wa mbura kuura.

- Humbira mbegu na tiiri muigana wa 2.5cm.
- Haria irima ritaiyurite hateithagiriria kuiga maai.

Ndurabatara gutumira fertilizer ukihuthira Kilimo Hai. Mimera yaku no igukura wega ona hatari fertilizer ungikira thumu muiganu.

Kurimira

- rirmira irimaini maita maingi.
- Ndukarimir mugunda wothe. Nja ya irima, mimera no ihumbiretiiri, niguu kuuiga uri mugunyu. Rimira hakuhi na irima. Huthira ruhiu kwehuthia riia riria riri gatagati-ini ka mimera. Rimira maita maingi niguu riia ritikaingihe irima-ini.
- Mahuti ma riia riria watuguta matige mugunda-ini. Njira ino niyongagirira unoru tiiri-ini.

Maundu ma thutha wa kugetha.

- Ndugacine mahuti mugunda thutha wa magetha. Tiga mahuti macio mugunfa-ini niguu manorie tiiri. Matigari ma mimera nomathondeke thumu.
- Ndukariithie mahiu mugunda-ini, ririkana nitugakena tugikunguira magetha maku na guthoma kuma kuri wee.

Ambiriria wira riu.

# Mazingira Bora



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## ***Inside:***

**TIST: Ukusanyaji wa mbegu. Uku. 2**

**Kupanda miti katika maeneo kavu. Uku. 5**

**Ni wakati wa kutayarisha shamba lako la Kilimo hai. Uku. 6**

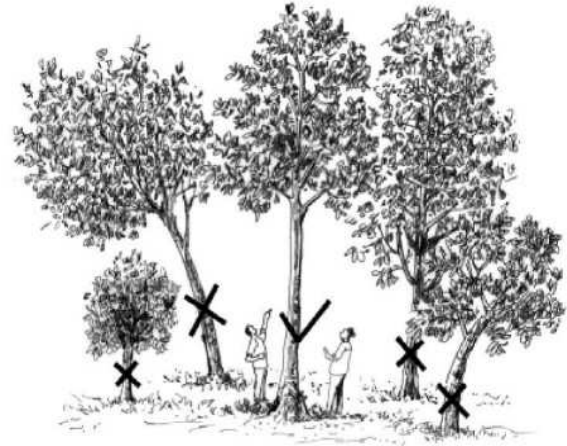


# TIST: Ukusanyaji wa mbegu.

**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?

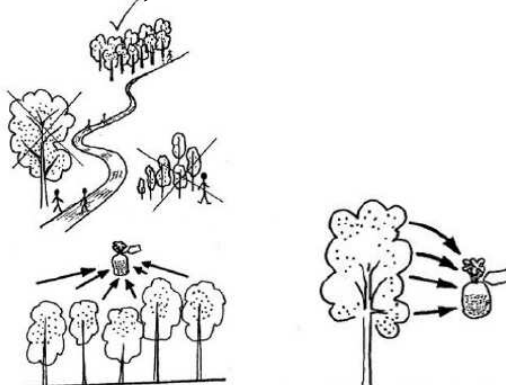
- Kusanya mbegu kutoka kwa miti iliyo na afya ambayo huzalisha mbegu nzuri
- Epuka miti iliyosimama kipweke kwa sababu mbegu yake inauwezekano wa kuwa na mbelewele yakujitegemea ambayo inapelekea mbegu ya hali ya chini.
- Epuka miti isiyozalisha na yenye sura mbaya
- Chagua mti ulio katikati ya mingine 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.

- 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.

**Source: Robbins, 2004.**





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 zinanahitaji 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.

II. **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:						
Tree Name	Seed Description	Local collection point	Collection method	Storage method	Pre-treatment method	Sowing method



## Kupanda miti katika maeneo kavu.

Jinsi TIST inavyoendelea kutamba katika maeneo yaliyo na uwezo mkuu na makavu, inakumbana na changamoto katika kuishi kwa miti. Katika TIST sisi huanzisha na kugawana mazoezi au njia bora za kufanya mambo, na hili limetusaidia kila wakati katika familia ya TIST kupata matokeo mazuri.

Hapa chini ni njia chache bora tunazoweza kujaribu tunapopanda miti katika maeneo kavu:

1. Uteuzi wa mahali pa kuanzisha kitalu chako. Miche itahitaji kuwekewa maji mara moja au mbili kila siku ikiwa michanga. Fikiria kuweka miche yako karibu na nyumba ili uweze kutumia maji yanayotumika nyumbani kuimwagia. Kutumia miti ya kupunguza upepo kutapunguza matumizi ya maji na itaipa miche yako michanga kivuli.
2. Maandalizi ya mapema: Andaa mashimo ya kupanda miti mwezi mmoja kabla ya mvua kuanza ikiwezekana, shimo litapasukapasuka na ili litasaidia maji kuingia udongoni kwa urahisi kunaponyesha. Mvua wa kwanza ukishaanguka, panda miti na ujaze shimo kwanza na udongo wa juu halafu mbolea.
3. Jaribu kutumia njia za kushika maji ya mvua ili maji mengi zaidi yaweze kufikia miti. Miti pia itaweza kuishi ukiipanda karibu na maji yaliyopo kila msimu.
4. Kufunika ardhi: Funika ardhi baada ya kupanda miti. Hili litasaidia kuzuia kupotea kwa maji kwa sababu kunapunguza kubebwa kwa maji na jua. Kutumia boji kutaongeza virutubisho udongoni, lakini kufunika kwa mawe pia kwaweza kuleta faida zingine katika maeneo yenye mawe.
5. Kilimo mseto: Tujaribu kilimo mseto. Kiwango cha kuishi cha miti iliyopandwa katika mashamba ni juu zaidi ya iliyopandwa misituni na vichakani kwa sababu itatunzwa na ipo katika udongo bora.
6. Chagua aina inayokua vizuri katika maeneo kavu. Mara nyingi miti ya kiasili iliyotoka eneo linalozingira huweza kuishi san asana. Mifano ni *Melia*, *Acacia seyal*, na *Muuuku (Terminalia brownii)*.
7. Linda miti iliyopo na uiruhusu kuzaa. Miti hii iliyopo ni yenye nguvu na yaweza kuishi katika misimu iliyo na ugumu tunapoilinda. Inatupa chanzo la mbegu zilizozoea eneo hilo pamoja na kivuli na vinginevyo.
8. Vitalu vilivyoinuka vyaweza kusaidia. Tunapoanzisha vitalu hivi, tunapata miche yenye mizizi yenye nguvu kwa hivyo itaishi. Vinaweza pia kusaidia kuweka miche kwa muda mrefu zaidi katika kitalu ili iwe mikubwa na yenye nguvu. Hata hivyo, vitalu vilivyochimbiwa vyaweza kuwa chaguo nzuri kwa sababu vinafunikia miche na vinapunguza kufa. Hapa, kuwa mwangalifu na ugeuze miche kila baada ya wakati Fulani ili mizizi isimee na kuingia udongoni.

Tutumieni njia bora zaidi tulizonazo, na tutengeze na kugawana na wengine ili tuweze kufikia matokeo mengi na kusaidia TIST kukua katika maeneo yetu.



# Ni wakati wa kutayarisha shamba lako la Kilimo hai.

**W**anaTIST katika vikundi vidogo ambao wamelima kwa kutumia njia ya Kilimo hai wameshuhudia kuwa ukulima bora una vuno bora na la kuaminika kuliko ukulima wa kawaida, san asana wakati mvua haitoshi.

Mashimo husaidia kushika mvua wowote unaonyesha na kuyawezesha haya maji kupatikana kwa mmea.

Makala haya yatakusaidia kuelewa zaidi kuhusu jinsi ya kujaribu kilimo hai. Kufuatilia mienendo bora ifuatayo kutakusaidia kupata mavuno bora zaidi msimu unaokuja.

## **Kutayarisha shamba.**

Tayarisha shamba lako angalau mwezi mmoja kabla ya mvua.

- Ondoa magugu na vichaka kutoka shamba lako. Usilime.
- Tayarisha mashimo yako ya umbo la mstatili. Yapaswa kuwa na upana wa sentimeta kumi na tano, urefu wa sentimeta thelathini na tano na kina cha sentimeta kumi na tano. Nafasi kutoka shimo hadi lingine iwe sentimeta sabini na tano.
- Chukua mbolea na udongo wa juu na uchanganyishe. Jaza shimo kwa huu mchanganyiko hadi sentimeta tano chini ya ardhi ya kawaida.

## **Kupanda.**

- Unapopanda mbegu ya mahindi (Siku moja au mbili kabla ya mvua), panda mbegu nne kuvuka shimo.
- Kama unapanda wimbi, panda mbegu tano au sita katika kila mwisho wa shimo la kupanda baada ya mvua tosha.

- Funika mbegu kwakutumia mchanganyiko wa udongo na mbolea. Baada ya haya udongo katika shimo uwe sentimeta mbili na nusu chini ya ardhi ya kawaida.
- Nafasi iliyopo juu ya shimo itasaidia maji kufikia mimea mvua ijapo.
- Hauhitaji kutumia mbolea za viwandani katika shamba lako la kilimo hai. Mimea yako itafanya vizuri hata bila ya mbolea za viwandani.

## **Kuondoa magugu.**

- Ondoa magugu kuzunguka mashimo mara kwa mara.
- Usipalilie shamba lote. Nje ya mashimo, mimea yaweza kufunika udongo, huku ikiweka baridi na kuuzuia kumomonyeshwa na mvua au upepo. Tumia panga kutoa magugu katikati ya mistari au katika nafasi iliyopo kati ya mashimo. Palilia mara kwa mara kuzuia magugu kuzaa na kuenea mashimoni.
- Yawache mabaki ya magugu shambani ili yaoze. Haya yatasaidia kuongeza rutuba ya udongo.

## **Unayofaa kufanya baada ya kuvuna.**

- Usiyachome mabaki ya shamba lako. Yawache udongoni ili yaongeze rutuba ya udongo. Mabaki ya mimea yaweza pia kutumiwa kutengeneza mbolea.
- Usiwalishe ng'ombe shambani lako. Tafadhali kumbuka, tutafurahi kusherehekea vuno lako kubwa na kuijua mienendo bora katika eneo lako kupitia jarida hili pamoja na katika mkutano wako wa cluster.

Anza kufanya kazi sasa!



# Mazingira Bora



# TIST

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**Kikamba Version**

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**Mkutano wa Nguzo ya Rwanyange mwezi uliopita. Mada zilizofunzwa ni pamoja na Maadili ya TIST, Mahitaji madogo ya Ustahiki, Covid 19 hatua za kuzuia, malengo yetu ya Cluster 2021.**

## ***Inside:***

**TIST: Kukolany'a Mbeu. Page 2**

**Kuvanda miti isioni ila nyumu. Page 5**

**Ni ivinda ya kuseuvia miunda kwa nima ya kusuvia. 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?

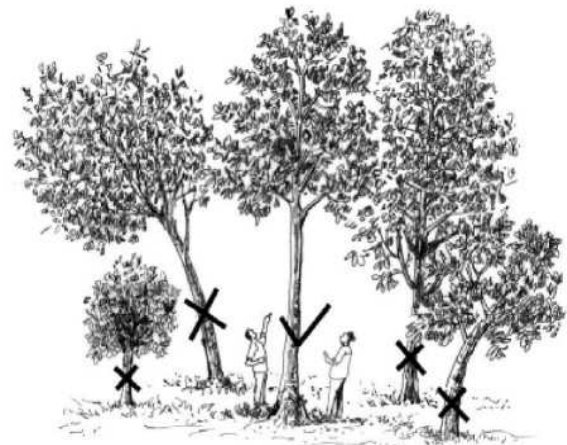
Ti lasima kila muti withiwe wi museo! mithemba imwe noyithiwe yi vinya kumiea, ingi ukethia ni sumu kwa indo, kana kwa kiw'u. Sakua miti ila wisi niya vaita kwa kisio kyaku. TIST ndyendeeawa ni aimi kuvanda misanduku nundu kuvanda miti ino nikuolaa kiw'u kila kimuthangani.

## 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?

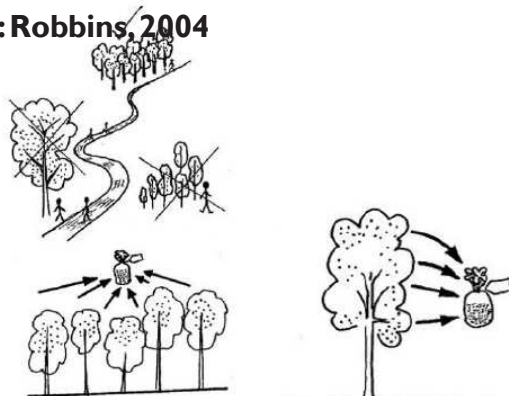
- Kolany'a mbeu kuma miti ila yina uima museo
- Ndukendeew'e ni mbeu sya miti ila imeete vandu yiyoka
- Ndukendeew'e ni miti ila itasyaa nesa na yina mbeu syina umbo muthuku.
- Nikaa kuyuva muti ula ukwosany'a mbeu wi katikati wa miti ingi miseo ya muthemba umwe nundu ninenganae mbeu nzeo ya muthemba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



*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.

**Kuma: Robbins, 2004**



## 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 siite 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. Nituuwanda 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) Ikkithya vala weekia ni vatheu na niwakunika nesa.
- Vandika kathangu kena isyitwa ya mbeu, matuku ala woosanisyu na niva wamyumisyu.
- 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 uuvanda kana kikundi kyenyu kiuvuia kina kieleelo kya kwithiwa na miti kiasi kina nonginya mongele mbeu ila meuvuua 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 mwiu.
- Umanisyo iulu wa kuseuvya ivuio ukanenganwe ivinda ya uvundisyo ungi.

**II. 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 uvoou uulu 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

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



## Kuvanda miti isioni ila nyumu.

**O**undu TIST iendee kwiana isioni ila itembunu na ila mbumu, now'o kuendee kwithiwa na uito wa miti kwikala. Nthini wa TIST nitwianasya na kumanyiana iulu wa nzia nzeo, na uu nututethetye ta musyi wa Tist kukwata ueti museo.

Vaa ve nzia imwe nzeo tutonya utata kutumia tuivanda miti isioni mbumu

1. Kisio kya kivuio. kivuio nikyaile ungithwa keli kwa muthenya, Sisyawikie kivuio vakuvi vandu utonya kungithya na kiw'u kila uutumia vu musyi. Uitumia kusii nzeve niikuola utumiku wa kiw'u na uimanthia muunyi kusuvia miti isu minini.
2. Inza maima tene ta mwai umwe mbee wa mbua kwambii, yiima yii niyikwatuka na na kutuma kiw'u kilika na nthi. itina wa mbua ya mbee kua vanda miti na uyusunya yiima na muthanga wa yiulu na vuu.
3. Tata utumie nzia ya uketha kiw'u kya mbua ta tutila na kuikiithya kiw'u nikyavikia miti. Miti ingi noyikale nakwika nesa ethiwa yandandwa vala kiw'u kisilaa.
4. Kwikia muunyi ungu kana matu. kii nikitetheasya kwia kimeu na kuola kukuwa kwa kiw'u ni nzeve. Kutumia vuu wa yiima nikwongeleela unou wa muthanga na ingi ithiwa vai matu ona ivia noyitumike kuvwika muthanga.
5. Ingi tutate uvanda miti miundani nundu muti uvanditwe muundani withiawa na ivuso inene ya kwikala kwi ula uvanditwe kithekani nundu vaa muundani nusuviawa na muthanga wavo nimuseo.
6. Nzakua mithemba ya miti ila yikaa nesa isioni nyumu kuma mawithyululukoni. Ngelekany'o ni Melia, musemei, Muuku (terminalia brownii)
7. Nzuvia miti ila yivo noimieka iendee na kusaana. Miti ino yithiawa yi milumu na kaingi nivitukaa mawumu othe ala yeethiana namo. Yithiawa yi ya vata kunengane mbeu na ninenganae muunyi na moseo angi.
8. Ivuio syi kitandani nitethasya. Yila twavua itandani nitukwataa mbeu yina mii milumu na niyithiawa itonya kwikala na kumiisya. Ingi noitetheesye miti kwikala kivuioni ikaneneva na kwithiwa na vinya. Ingi kitanga kii ethiwa nikiliku nokisiie sua na kiw'u kuthi na mituki. Ingi ithiwa uivindua miti yikivuieni kusuvia mii ndikamee ilike na muthangani ungu na kwanangika ivinda ya kumithamya kuma kivuioni.

Ekai tutumie nzia nzeo ila twinasyo, twiane na kumanyianya' a ithyothye tuvikie ukwati museo na kutethye Tist kwiana isioni situ.



## Ni ivinda ya kuseuvia miunda kwa nima ya kusuvia.

**T**ukundi tunini twa TIST tula twithiitwe tuitumia nzia ino ya nima ya kusuvia (CF) nimaandee na kukwata ngetha mbingi na nzeo kwi yila mana tumiaa nzia sya kitene sya nima ona yila mbua nini.

Maima nimatetheeasya kutumaninia kiw'u yila mbua yaua kwoou uyithia kivakuvi kwa mimema.

Ithanguu niyukutwetheesya kuelewa na kumanya mbee iulu wa Kilimo hai. Kuatiia nzia ithi nikuukutetheesya kukwata ngetha nzeo mbua ino yukite.

### **Kuseuvia muunda.**

Seuvia muunda waku vainyiva mwai umwe mbee wa mbua kwambiia.

- Thesya kisio withie kiina yiia kana ikuthu. Ndukaima.
- Seuvia maima maku mema kona inya. Kila yimwe yaile ithiwa yina uthathau wa 15cm, uasa wa 35cm and uliku wa 15cm. Utaaniu wa maima waile ithiwa wi 75cm.
- Osa vuu na muthanga wa iulu uvulany'e na uyususya yiima yii ta 5cm na muvulany'o usu.

### **Kuvanda.**

- Yila ukuvanda mbemba (mithenya ili ka umwe mbee wa mbua kwambiia) vanda matonya ana muthangani usu ikelene ma mbemba.
- Ethiwa wi vanda muvya vanda matonya 5-6 kithyululu mwisoni wa yiima itina wa mbua kua nesa.

- Vwika mbeu na muthanga muvulanye na vuu uliku wa 2.5cm itina wa uu yiima yitiwa yina mwanya wa 2.5cm.
- Mwanja uyu watiwa niw'o utetheeasya kiw'u kuvikia mbeu/ngii yila mbua yaua.
- Tilasima utumie mbolea ya kuaa (fertilizer) yila ukwika uimi wa kusuvia muundani waku. mime yaku noikwika nesa watumia vuu wa yiima.

### **Kuimia.**

- ima uthyululukite maima kaingi
- Ndukaima kisio kiu kyothe savali umwe vuu. Nza wa maima, mimea noivwike muthanga na kutetheesya kuuthithya na kusiiia kukuwa kwa muthanga ni nzeve kana mbua. Ima tu vakuvi na yiima na yimani. Tumia kilovoo/kivanga kwenga yiia yila yi mwanyani ula uaanitye maima. Ima kaingi kusiiia yiia kuvikia mimea .
- Tia mavuti aya na yiia moee kisioni kiu, nundu moa meendee na kuete unou wa muthanga.

### **Kuvutha Itina wa ngetha.**

- Ndukavivye matialyo/mavuti muundani. Ekana namo nundu ni unou wa muthanga, kana ukue ukamainde yiimani useuvye vuu/mbolea.
- lilikana ndukaingie indo muundani wamina ngetha.
- Kwa ndaia lilikana kana tukatana naku weethiwa na ngetha nzeo itina wa kwimanyisya na kuatiia nzia nzeo sya uimi wa kusuvia kwisila ithanguni yii na mbumbanoni sya ngwatanio yaku sya kila mwai.

Ambiia uthukuma oyu!

# Mazingira Bora



# TIST

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

**Kipsigis Version**

*TIST is an innovative, time - tested,  
afforestation program led by the  
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**Mkutano wa Nguzo ya Rwanyange mwezi uliopita. Mada zilizofunzwa ni pamoja na Maadili ya TIST, Mahitaji madogo ya Ustahiki, Covid 19 hatua za kuzuia, malengo yetu ya Cluster 2021.**

## ***Inside:***

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**Minet av'ketik en emet ne ya'mat. Page 5**

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# TIST: Kayumetab kesuwék.

## Kesuwék tebutik ak Wolutik.

### 1. Miten ketik chegimuchi kemin ek kaa Ochon ketik choton?

Ketik chegororonen kochon kiinyortoi icheget ko kigorut. En TIST kemwoe kele kemin kou Logoek ak cheboo kipkaa ak alak cheimuchi kotar kenysisiek 20 ak kosir.

### 2. Kororonen ketik Tugul?

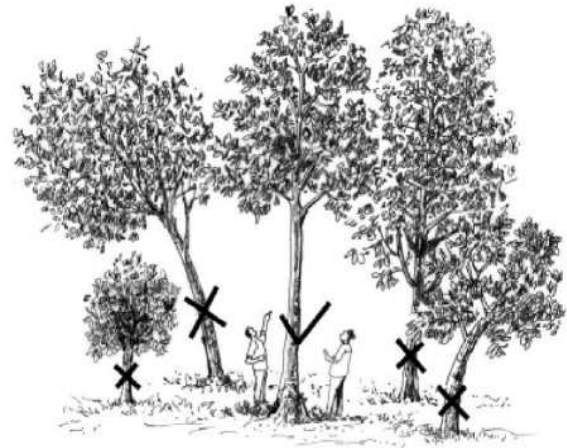
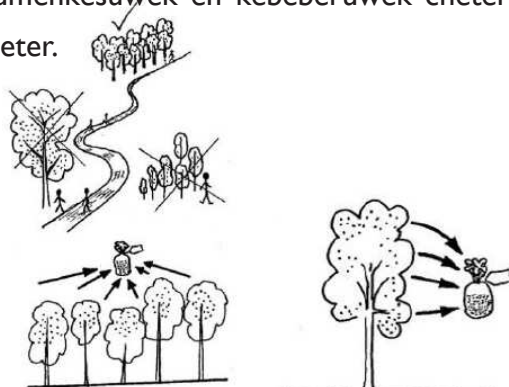
Ketik tugul komogororon, amun alak komokimuchi kerib amun tinye sumu alagei koebek chechang. Konyol ye gole ketik ichigil chenomegei ak ole imenye. Ketik cheu Chepkogutgei (Eucalyptus) ko bose beek en Emet.

### 3. Tos tinye keswék ketik en keniyit?

Ee unoton en ketik alak. Akomising Iger en ketik chemiten kaa. Alak Komuchi kotar kenysisiek 2-3.

### 4. Oinon ketik neimuchi kenyorunen keswék chegororonen?

- Lewen kesuwék chebo ketit nekararan
- Ketik nemiten inegen komat inemu kesuwék, motinye chekororonen.
- Ketit ne motinye iton komat ibut
- Cheng ketit ne miten kwenutab ketik cheninan chegergei.
- Iyumenkesuwék en kebeberuwék cheter ak cheter.



## Lewen Ketik Chetinye Kesuwék Chegororonen.

- Karan missing iyum kesuwék en ketik chechang kegetoton, ago che motinye kosibiny.
- Tiyengei Kesuwék cheimoche imin boisiet ne imoginigei kou;
- ❖ Kou chebo bogoinik komoche che kiteta, che motinye temenik chechang ak sogek
- ❖ Chebo tuga kemoche chechogu ago chetinye sogek chechang ak temenik chechang.
- ❖ Chebo logoek ,kotinye togek chegororonen chetinye temenik che ngerinen ago chechogu.
- ❖ Lewen keswék chenomegei ak Ole imenye; Konamgei ak ngungunyek.
- ❖ Lewen ketik ne kongat amun ketit ne ngarngar komotinye kesuwék chegororonen.

### 5. Kasarta ainon ne Keleweni Kesuwék?

- Rib kasarta keniyit ye rurio Logoek.
- Teben biik alak alan isochigen ak inye





- Bitunen waletabgei en Logoek konam alak kobotiyo anan koyatak motogoik kometo kesuwek.
- Ye inyoru chemiten nguong ko tinya koborunet kole kogongiyo.
- Nyoru chomchinet en nebo imbaret iyum kesuwek.
- Cheng motoget negararan nebo kesuwek ak isir torigit ak kainetab kesuwot.

**6. Ole Komuchi Kiyumta Ano Kesuwek?**

- Nebotai ko Isuach ketit kel kolabait asi kobuti nguong kesuwek ak irib amun alagei ko kigochut susurik.
- Alage kelonye asi kinem logoek
- Imuchi iite Tantaruwet ak itumtum ketit.
- Alagei komogimuchi kenyor kesuwek amun ibe koristo koloe gitun-ketik kon;Aonet ,Nadi flame ak alak.
- Alagei koyoche ketorms ak ketor kesuwek
- Ketit angetugul kotinye Oret ne kimuchi kinemunen kesuwek.

**7. Ole kimuchi kamwa kele kororon kesuwek?**

- ✓ En Keret kotinye besiet amun alak komengechen alak kotinye itondo ne magergei ago tugul ko kesuwek chebo kot agenge.
- ✓ Ker kesuwot angenge ngo kongat anan kotinye sususrik.

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



- ✓ En kesuwekchuton miten cheimuchi koib koristo koboru kole mogorororen.
- ✓ Yon imoche igue igogorororon kesuwek imuchi inemu kesuwek (20-100) ak inde ole inyuot amta inde bek,Rib anyun en kila betu kotgoit wekisiek Oeng ingany Ole kimoguto kesuwek.

*Sesbania sesban* – cleaning seed by blowing



*Tephrosia vogelii* – cleaning seed by flotation





**8. Komuchi Kemin anan Kagonor Kersuwek?**

- Kesuwek alagei komotinye Kagonor asi tu kemin .Kimine en kasarta amun tesetai kongoti alak kotinye Magatet neu neyoche kebetes asi kinem kesuwot.
- Ye igonori kesuwet ko mat inde sabebe amun igochi konun kesuwot.
- Inde kainet ak torigit lolet ne gende kesuwek.
- Mat kogage kesuwek amun tun komonyor bitet ne kararan.

**9. Igotos Kesuwek Tugul?**

- Tinye besiet kesuwek kosibgei ak terchinetab ketik alak kotore betusiek che ngerin ko alak koibe betusiek chechang.
- Ye imine kesuwek Komuchi alak komeiyo alagei kobegu en kabet.

**10. Kimuchi keminta ano kesuwek?**

- ❖ Kesuwek alak komuchib kemin ko moginde kabeti alak kindo motogoik asitun kemin.
- ❖ Kesuwek alak kotinyengei kasarta bek ak burgeiyet.
- ❖ En abogora k o kararan kegol kesuwet en kasarta ne momite Robta

❖ Tagenyoru Lesonit nebo kabeti en kasta nenyo

**11. Kinyorunen Ketik kasuwek kitiyo?**

- a) Ketik alagei kimuchi kenyor en tigitikab ketik kinemu a kemin.
- b) Miten kora chemotinye kesuwek ago kimuchi ketil ak ketumda en ngunguyek,alak kotinye chego toreti missing korut alak kobo logoek.

**Boisiet en tuiyetab kilasta.**

En yon miten tuiyetab kilasta kebchei biik koyob kobureito nebo biik (6-10) asi Komuchi kogo agetugul kesuwek chebo ketik nenin ne kararan negoi ago neimuci kowal itondab Emet .Ingolewen kodoidet ak Rubeiwot asi Komuchi kosir kou ni kainetab keti- kesuwot - Ole kimuch kenyorchi-Kigesto Ono – Konorenyin-Keribto- Kolenyin. En let anyun Kogon kurubit agetugul Karen्यान. Konor wolutichuton asi tun koik Konetisiek en tuiyet neisibu.

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



## Minet AB'ketik en emet ne ya'mat.

**K**otese ta TIST kotese tai en ole yamaat ak ole moginyorunen bek, Kiger komi yomutyet en sobet 'ab ketik. En TIST Kogibche kila ak kila practices che impya, ak kigo toretch niton en family nenyon nebo TIST kenyorun wolutik cheyachen.

Che isubu ko oratinwek che kimuche keboishen en emotinwek che yomyotin:

1. Lewenet 'ab ole ichoben nursery neng'unget ko kit nebo maana. Seedlings koyoche kinde bek yon kagemin. Imuche imin seedlings en ole negit ak kaa asi konyumnyumit kondeet 'ab bek. Kora kimuche iboishen windbreak en kaa koter korito komabar seedlings.
2. Preparation ne taa: Chob keringoik 'ab ketik en arawet ageng'e kotomo koit robwek, Toreti inoniton keringoik kochut pek . Yon kagoit robta neta imin ketik .Min ketik ak ikonaam ngungunyek chebo barak kosibu mbolea.
3. Yom iboishen oret 'ab harvesting bek 'ab robta, kou negarims ak micro-basins, Asi koitchi ketit beek chechang'. Kora ketik kosobtos zaidi en ole neg'it ak bek.
4. Mulching: mulchen ketik yon karimiin . inoniton kobose komoib asista anan ko koristo, beek . Kora yon kogiboishen mbolea che compost kotese rurutik, Lakini en ole miten koik kimuche keboishen rock mulching .
5. Agro forestry: ongeyom kinetge , ak keyai agro forestry . Ketik che kagemin en imbarenik kotinye nafasi newon koechegitun kosir che minotin en ole miten osnoshek ak suswek angamun riboksek komye ago nyoru ng'ung'unyek che kororon.
6. Chaguan species cherutu en korotinwek che yomyotin. Sanasan ketik chebo komosoton che indeginous ko choton che yechegitun kosir igo. Ketik cheu *Melia*, *Acacia seyal*, ak *Muuuku (Terminalia brownii)*.
7. Rib ketik che miten en inguni ak itoret icheget koregenereten . Ketichuton kogimen , ago ichek komuche kosobcho ogot en betushek che momiten robwek. Konu ichek seeds che kimuche kenyor en oret ne nyumnyum ak uronok.
8. Raised seedbeds anan ko sunken seedbeds komuche kotoret. Yon kogichob seedbed ne kitogos , kenyoru seedlings che kimen , so ingunon kosobtos. Kora kotoreti seedlings koyechegitun en petit agoik che kimen . lakini seedbed ne sunken komuche kora kogararan angamun tere asista komabar seedlings . En komositon ibwaat iwisowisi seedlings asi mochut tigitik ngweny, tun kowe chok yon kisibto.

Ongeboishen practice che kitinye, ak keendelezan oratinwechuton asi kenyorun rurutik ak koyet TIST en komoswechok.



## **Kasarta nepo, chopet ‘tap imbaret kokany.**

**G**roupishek chepo TIST che kikonetke akopo CF, kokobaoryan kole chang’ ruutik kosir yon kakiminso keboishen oratinwek chepbo keny, sanasana yon wo robta.

Toreti kering’oik chhoton bek koma rwai en imbar, ak ko’kochi minutik bek che yomotin.

Ng’alek chuton kotoretin inai kilimo hai komye ak ole kiboishoten. Ang’ kot isib oratinwek che choton kochong’oite ruru.

### **Ole kitayorishondo imbarenik.**

I’ngol imbaret arawet ageng’e kotomo kobwa robwek.

- I’tilil imbaret koisto ke chema’si .Amati ng’ol.
- Bal kering’oik che rectang’ular . Nyolunot ko 15 cm en boroindo , 35 cm koindo and 15 cm loindab kering’et. Lochindap kering’oik keyoche ko 75 cm.
- inde mbolea safi che ing’olotin ak mbolea chebo duka, ng’ung’unyat ‘ab barak. Inyit kering’et ak kong’olanik choton agoi 5 cm.

### **Minet.**

- Yon imine keswek ‘ab andek (betushek 1-2 kotomo konam robta),Min kewek 4 kong’et kering’et.
- Ang’ot imine , min 5-6 keswek en mwisho nebo keringoik yon kokorobon.
- Tuch keswek ak ng’ung’unyek ak mbolea 2.5 cm. Kobocho yuton konyolunot koloindab ng’weny ko 2.5 cm kong’eten barak.

- Nafasi nemiten barak ko’kochin.
- Molazima iboishen mbolea chebo fertilizer en Conservation Farming plot. Keswek kuk korurtos ogot ang’o meboishen mbolea chebo fertilizes .

### **Istoet ‘ab saratik en imbar.**

- Isten saratik en kering’et kila weekit.
- Mati’iste saratik en imbaret tugul.Tobonwokik ab kering’oik ,Minutik kotuche ng’ung’unyek, koko’koite ng’ung’unyek agityo koter komoib robta ana ko koristo. Iten saratik chemi yebo kering’et kityo. Boishen panget Itilil imbaret koistoke saratik. Isten saratik kila mara asi maibista kochut kering’et.
- Bakaten saratik che’ketutu en imbar asi konuno. Tese bombonindab imbaret.

### **Tuguk che kiyoe yon kakebutis.**

- Matibel saratik che kong’et en imbar.Bakagten saratik choton en imbar asi kotes mbolea en imbar. Kimuche kora keboishen ke chobe manure .
- Amati bokokchi tuga koaget en imbaret. Kaikai ibwat ile,Tun kiboiboienchini tugul tun koruryo minutik kuk ak inetke en youtik che miten en erea neng’unget ak tuyoshek ‘ab cluster asi kotesak rurutik.

Inam ing’unon!