

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



TIST Farmers from Karaba Cluster in Mbeere during their Cluster meeting last month.

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TIST Mobile Website: A New, innovative way to get information about your Small Group and Cluster quickly and easily.

TIST has developed a new website a mobile website. This website will enable thousands of farmers to get information about their own groups and Clusters quickly and easily. It will help us be mutually accountable, transparent, and accurate if we use it well. Now you can get information such as number of trees counted for your group, in each individual grove, the members of your group, whether your group is qualifying for payments and if it has been paid recently.

In regard to your Cluster, you will be able to view the total number of groups in your Cluster (and you can compare with other Clusters), your next Cluster meeting date, the current leaders of your Cluster and when last elections were held.

Steps to login to this mobile website

There are (2) ways you can access this mobile website. If you are a TIST member and you have been assigned a TIST email address, you can login directly using your password. Signing in this way gives you access to more information. If you do not have a TIST email address, you can sign in as a guest. You can access this site from your phone if it has Internet capabilities or from cyber cafes.

TIST Quantifiers/Cluster Servants have been asked to be available in all Clusters meetings to train and support in other activities. They have been asked to provide palms to the Clusters during the Cluster meetings and members can view information about their Small Groups or Clusters or about TIST program right at the Cluster meetings.

Here are the steps:

1. Go to www.tist.org/mobile
2. If you have a TIST email address, log in with your TIST email address and use your password.

3. If you don't have a TIST email address, you can log in as a guest. Put in your name and organization and then tap log in. Organization can be the name of your Small Group.
4. You will be directed to the next page. At the top, you will find Cluster, Groups, groves and Log out.
5. If you want to view your Cluster, tap on Cluster. You will be directed to a page that shows TIST project areas worldwide. Choose and tap an area of your interest (for example, Meru). From here, you will move to the next page where you will find a list of Clusters under Meru (or any other area you chose) with number of groups and trees listed plus the next meeting dates and last election.
6. Tap your Cluster (for example, Ciakanyinga). A new page will open and you will find Small Groups listed by their names, TIST number, Number of trees and last date of quantification.
7. Tap on your Group. (for example, TARADA). This will take you to a new page. You will find details about this group, including payment eligibility and whether the group has met requirements to take part in the carbon market.

Access to past Mazingira Bora Newsletters

1. Go to www.tist.org
2. Click on documents to download. Choose Kenya newsletters.
3. You will be directed to the next page. You can choose any previous month newsletter by clicking on it.
4. For instance, if you decide to choose month of November 2015, just click on that particular date and it will open the newsletter for that month.



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?

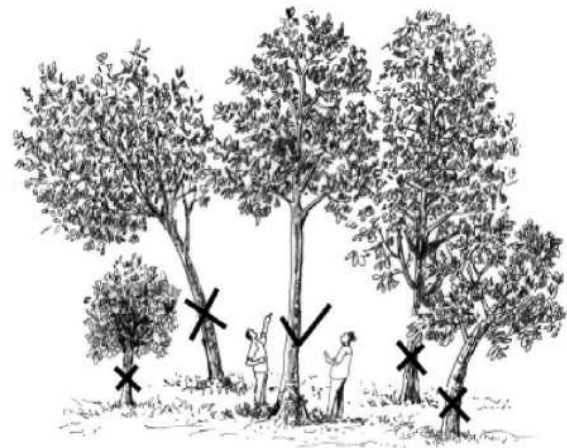
Not necessarily! Some may be difficult to control, be poisonous to your animals or use too much water. Choose ones you know will benefit your area. TIST discourages eucalyptus, for example, because planting these trees can reduce the water table.

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?

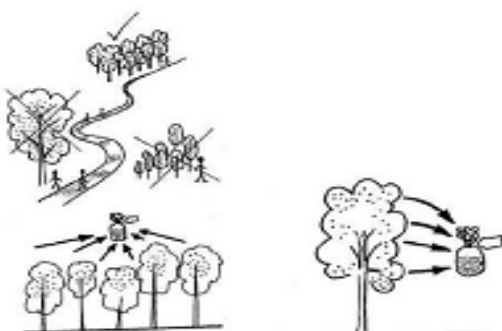
- o Collect seeds from healthy trees that are good seed producers.
- o Avoid isolated trees - in this case the seed is likely to have been self-pollinated which leads to poorer quality seeds.
- o Avoid unproductive trees and ones with a bad shape.
- o It is better to choose a tree in the middle of a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



TIST New Best Practice: Raised pot beds.

TIST is encouraging farmers to try raised pot beds. Many farmers have found that this improves survival rates of seedlings in the field. Try raised pot beds and report to your Cluster what you observe, and whether this practice works better for you.

Figure 1 represents the common way of arranging pots, as described above.



Fig 1: Seedlings of Moringa oleifera arranged as a stack on the ground

This traditional system of arranging pots on the ground can produce seedlings with weak roots. This is because the roots coil up inside the plastic pot. At transplanting, the roots can be weak and therefore not easily establish in the ground. Or, the roots go out of the pot and go deeply into the soil. This requires root pruning just before transplanting, causing major stress to the seedling. To avoid this, it is recommended to establish seedlings in **open bottom** tubes and place them on **raised beds** (Fig 2). A raised bed can easily be made from a wooden frame and wire mesh (see photo). Raised beds allow automatic root pruning because when the roots reach the container bottom, they naturally drop off (called air root pruning). This means that roots do not get injured through normal root pruning methods. The roots then tend to strengthen inside the tube without growing further out of the tube. This produces a healthy root system and the seedling has a better chance to establish fast and well in the field. It also eliminates the need for the labour of root pruning, a practice that is often forgotten or

done too late, causing serious damage to the roots just before the seedling is stressed by leaving the nursery and being planted in the field. Weed control is also easier in raised beds.



Fig 2: Seedlings of various species arranged on a raised bed.

The raised beds might appear to raise the amount of water used in nurseries. However, nursery operators have devised innovations to deal with water constraint. One innovation involves digging a trench, placing planks of wood or wire mesh across it and placing the seedlings on the planks or wire mesh. The seedlings thus appear to be on the ground level but the trench under them provides the space, which aids air root pruning. The water is trapped in the trench and will keep seedlings moist through evaporation and so reduce the need for very frequent watering. A polythene sheet can also be placed in the trench to ensure water does not seep into the ground.

Questions to ask during Cluster Trainings:

- a. **What materials have Small Groups successfully used for the pot bags? Share your best practices.**
- b. **How can Small Groups organize themselves to prepare their pot beds? How many people are needed to prepare the pots? When? How many people need to prepare the soil mixture? Where?**
- c. **Have any groups already tried raised seedbeds?**
- d. **Do people have any other advice? Share any information at the next trainers meeting.**

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Kimereu Version

An Environmental, Sustainable
Development and Community Forestry
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Arimi baTIST kuuma Karaba Cluster ndene ya Mbeere igita ria mucemanio mweri muthiru.

Inside:

Njira injeru ya kwona mantu jegie gikundi na cluster yaku ntuti na nauthu.

Page 2

TIST: Kuuthurania mbeu. *Page 3*

TIST: Njira injeru cia kuthithia minanda ya nyongu yukiritue. *Page 6*



Njira injeru ya kwona mantu jegie gikundi na cluster yaku ntuti na nauthu.

TIST niambiritie website ingi-ya thimu. Website iji ikoombithia arimi ngiri inyingi kwona mantu jegie ikundi na cluster ciao na ntuti na nauthu. Iगतutethia kumenyanira, kua antu ba weru na ba jaria jario jongwa twamitumira bwega. Nandi no umenye mantu ta miti iria itari gikundine giaku, ndene ya o munda, amemba ba gikundi giaku, kethira gikundi giaku gikariwa na kethira nikirii rua.

Mwegie cluster yaku, ukoomba kwona ni ikundi bing'ana biri kiri cluster yaku (na nouteganiria na cluster ingi), tariki iu ingi ya mucemanio jwa cluster, atongerira ba cluster yaku igitene riu na riria iithurano bia muthia biari. Kwongera, ukoomba kumenya uria cluster yaku ithiritwe igitumagira mbeba iria iejagwa o mweri.

Matagarira ja gutonya kiri website iji ya thimu Kurina njira ijiri uumba gutumira gutonya kiri website iji ya thimu. Kethira uri mumemba wa TIST na nuei email address ya TIST, no utonye ugitumagira namba yaku ya witho. Gutonya nanjira iji nigukwonagia mantu jamaingi nkuruki. Kethira utina email address no utonye ja mugeni. No utonye kiri website iji na thimu yaku kethira niumbaga gutonya kana kiri nduka ciitagwa cyber.

Atari miti ba TIST niboritue gwita micemanione ya cluster kuritana na gutetheria kiri mantu jangi. Niboritue kuejana Palm ciao kiri cluster igitene ria micemanio ya cluster nikenda amemba bomba kwona mantu jegie ikundi na cluster ciao kana kwegie muradi jwa TIST ndene ya micemanio ya cluster.

Jaja nijo matagarira.

1. Ita kiri **www.tist.org/mobile**
2. Kethira urina email address ya TIST, tonya na email address yaku na utumire namba yaku ya witho.

3. Kethira utina email address ya TIST, no utonye ja mugeni. Andika riitwa riaku na kambuni yaku riu uinye au kwandiki "Log In". riitwa ria kambuni no riithirwe riri riitwa ria gikundi giaku.
4. Ugaikua kiri page iu ingi. Au iguru, ukoona "Cluster", "Groups", "groves" na "Log out"
5. Kethira urienda kwona cluster yaku, inya "Cluster". Ugaikua page ikwonania ntuura cia TIST ndene yanthiguru yonthe. Taara na uinye aria ukwenda gutega (mung'uanano, Meru). Kuuma ja, ugeeta page iu ingi aria ukoona mariitwa ja cluster iria ciri Meru (kana naria naangi watara) jarina namba ya ikundi na miti iandiki amwe na tariki cia mucemanio jou jungi na tariki cia muthia cia ithurano.
6. Inya cluster yaku (mung'uanano, Ciakanyinga). Page injeru ikaruguka na ukoona ikundi bibinini biandiki na mariitwa jao, namba ciao, miti iria biri nayo na tariki cia muthia cia utari miti.
7. Inya riitwa ria gikundi giaku (mung'uanano, TARADA). Ugaikua page iu ingi. ukoona mantu jegie gikundi giki, amwe na kethira bukariwa na kethira gikundi nikithithitie jonthe jaria kibati nikenda gitonya thokone ya ruugo ruruthuku.

Kufikia gazeti za *Mazingira Bora* zilizopita

1. Enda kwa www.tist.org
2. Bonyeza tufuti uliopewa. Chagua gazeti la Kenya.
3. Utaelekezwa kwa ukulasa ufuatao. Unaweza kuchagua mwezi uliopita kwa kuibonyeza.
4. Kwa mfano, ukifikilia kuchagua mwezi wa Novemba 2015, bonyeza kwa hiyo mwezi na itafunguka gazeti la mwezi huo.



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?

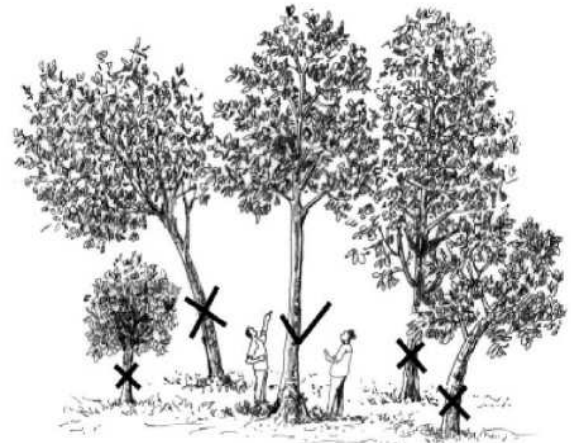
Ti mwanka! Miti imwe no igie inya gwika iria ukwenda niuntu bwa guciarana, no ithirwe iri sumu kiri ndithia ciaku kana igatumira ruuji rurwingi. Taara iria wiji ikaleta baita kiri ntuura yaku. Kujukia mung'uanano, TIST niregaga mibau, niuntu uandi bwa miti iji nobunyiye ruuji ruria ruri nthiguru ya muthetu.

3. Miti nithagirwa irina mbeu o mwaka?

Miti iria mingi niciaraga mbeu o mwaka, indi tegera miti iria iandi akuu 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?

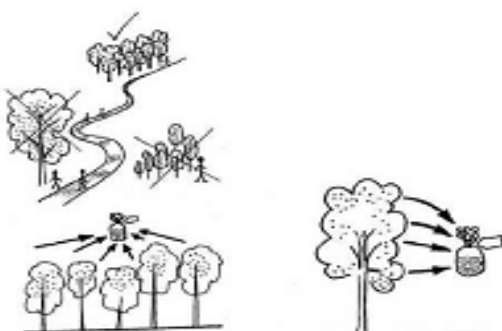
- Uthurania mbeu kuumania na miti iria irina thiria injega iria iciaraga mbeu inthongi.
- Ebera miti iria iri yonka – kiri miti iji mbeu yomba mono kwithira yuumanitie na muti gwiciarithia, untu buria buumba gutuma mbeu ikwethirwa citi injega mono.
- Ebera miti itiguciara na iria ikari bubuthuku.
- Ni kaba gutara muti juri gatigati ka miti iri amwe imingi ya mthemba 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 mthemba jumwe. Bubunibutethagia 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 kuumania 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 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 riu ni gukwegu (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 kwojania.
- 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 niringanaga 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.

II. Miti yumithagua aki kuumania na mpindi?

- Mithemba imwe ya miti niuamaga 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 mutongerira na mutetheria wawe.

Ngugi ni kuuthurania umenyo kwegie o muthemba jwa muti:

- Riiwta 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:

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



TIST: Njira injeru cia kuthithia minanda ya nyongu yukiritue.

TIST ni igwikira arimi moyo kugeria kuthithia minanda yukiritue. Arimi babaingi nibonete ati njira iji ni yukiritie na njira inene gukura kwa mbegu riria cieta kwaandwa. geria gukoria munanda jwa nyongu na uringe riboti kiri Cluster yaku mantu jaria ukona na kethira njira iji ni igugutethia bwega nkuruki .

Mbicha namba 1: irungamirite njira ya kubanga nyongu o jauria twiri au iguru:



Mbicha 1: mbegu cia Moringa oleifera ibangi nthiguru.

njira iji inkuru ya kubanga tunyongu nthiguru nitumaga mbegu ikagia na mirii itina inya .Thina iji iretegwa ni miiri gwikunja ndene ya kanyongu ga maratasi. Igitia ria kuthamia mbegu iji , miiri iria nontu itina inya igutumaa mbegu iria ikarega kugwata kana miiri igatura karatasi na igacianda mithetune kuraja mono. Untu bubu ibutumaa miiri iji yenda kutematemwa mbeere ya kuanda.na iji tumaga mbegu iria ikagia thina cia mthemba.

Kwebera mantu ja jaja , ni bwega kuumithia mbegu kiri mibira ikunuri bwa nthiguru na umirikire kiri minanda yukiritue (mbicha no 2) Munanda jukiritue nojuthithue ugitumagira mbau na waya (ona mbicha) Minanda yukiritue ni itikagiria kurita miiri iria itina inya na njira imbuthu nontu riria miiri igakinya nthiguru ya karatasi karia, gaikukaa yongwa. Iji itagwa njira ya ruuo ya gukura miiri. Guku ni ja kuuga miiri iji itithukangagua ni kumikuura jauria iringi thukangua ni njira ingi cia kawaida cia kumikura. Miiri itaga na mbeere kugia na inya itigukura ikuruka karatasi karia mbegu yaandiri. Iji itumaga mbegu ikagia miiri iri na inya bwega iria

itumaga mbegu igwata bwega na mpwi riria yathamua kuuma munandene.

Njira iji ninyiyagia uriti ngugi buria buringitumirwa gutematema miiri iu, ngugi iria yuragiria kana ikathithua icereri mono , untu buria butumaga miiri ikaaga inya mbeere ya kuthamua kwa mbegu. Kumeenyera iria kinya guti inya kiri minanda iji yukiritue.



Mbicha no 2 : Mithemba mwanya mwanya ya mbegu imbangi munandene jukiritue.

Munanda jukiritue nojukare jeka jutumagira ruuji rurwingi nkuruki ya minanda iji ingi ya nthi. Indi, baria karitaga ngugi minandene iji nabathithitie njira ya utimiri bwa ruuji rurukai. Njira imwe ni kwinja mutaro kana muguru na gwika maruku jagitangi kana waya na kurikira mbegu iguru ria maruku jau kana waya. Mbegu ciaonanagia jaka iri nthiguru indi muguru kana mutaro juria juri rungu ijutethagiria kwejana kaanya ga gukuura miiri iria itina inya. Ruuji ruria rugwatiritue mugurune / mutarone juekira mbegu iria ruuji ruria rugacikinyira riria rwaithua ii riuu. Njira iji nitumaga mbegu iria itekende gukara igikairwa ruuji othaa cionthe. Karatasi ka nailoni nogekirwe mugurune juju kenda karigiria ruuji ruru gutonya mugurune.

Kuona Mazingira Bora Newsletters Chia igita.

1. Ita kiri www.tist.org.
2. It's kiri documents to download. Ntara Kenya newsletters.
3. No utare gatheti ya tene.
4. Noo utege November 2015, kethirwa nio ukwenda.

Mazingira Bora



TIST

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

Kikuyu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Arimi a TIST kuma Karaba Cluster mari Mbeere mucemano-ini wa Cluster mweri muthiru.

Inside:

Mutambo mweru wa Website wa thimu: Njira njeru na njega ya kuhotithia arimi aingi kunyita mohoro megii ikundi na cluster ciao naihenya. Niuugututeithia kugia na uigiririki, utheri na ukinyaniru. Page 2

TIST: Ungania wa mbegu. Page 3

TIST: Njira Njeru: Giito kia metha. Page 6



Mutambo mweru wa Website wa thimu: Njira njeru na njega ya kuhotithia arimi aingi kunyita mohoro megii ikundi na cluster ciao naihenya. Niuugututeithia kugia na uigiririki, utheri na ukinyaniru.

TIST ina mutambo mweru wa website. Mutambo uyu urahuthika na thimu ya guoko. Tungiuhuthira wega. Riu nouhote kumenya muigana wa miti iria itaritwo gikundi-ini kianyu ona kana mugundai-ini waku kiumbe, amemba a gikundi kianyu kumenya kana gikundi giaku nigikinyaniirie ikiro cia gutairwo miti na kwamukira marihi ana kana nikirigite kurihwo.

Kuringana na cluster yaku, niukuhota kuona ikundi iria ciri thiini wa cluster ino(nanouroranie na cluster iingi), mucemano ucio ungi wa cluster ni wa ri, tongoria aria mari ho a cluster na riria ithurano ciekitwo. Na makiria niukuhota kumenya cluster yaku uria ikoretwo ikihuthira mbeba ciayo.

Makinya ma kuingira mutambo-ini uyu.

Kuri na njira igiri iria unghota kwamukira mutambo uyu nacio. Angikorwo uri memba wa TIST na uri na email adress ya TIST, nouhot kuingira mutambo-ini uyu orio ukihuthira password yaku. Kuingira na njira ino nouhote kwamukiauhoro muingi. Angikorwo nduri na email address ya TIST, noungire ta mugeni, no uhote kwamukira utungata uyu angikorwo thimu yaku iri na uhoti wa internet kana thiini wa cyber cafe.

Atari a miti a TIST nimoritio makorwo kuo micemano-ini ya TIST niguo mathomithie arimi kuhuthira mutambo uyu na mangi maingi. Nimoritio maheane palms kuri cluster thiini wa micemano ya cluster na niguo amemba mahote kuona uhoro uyu wa cluster na ikundi ciao kana mibango ya TIST riria mari mucemano-ini.

Makinya ni maya

1. thii [www,tist.org/mobile](http://www.tist.org/mobile)
2. angikorwo uri na email ya TIST, inira nayo na uhuthire password yaku.

3. Angikorwo nduri na email address ya TIST, no uigire ta mugeni. Ikira ritwa na kuria urutaga wira ta gikundi giaku.
4. Niugutwaro page iyo ingi. Hau iguru, niukwona “cluster”, :Group”, na “Log out”
5. angikorwo urenda kumenya uhoro wa cluster, hihinya “Cluster”. Niugutwarwo handu hagukwonia project cia TIST thi yothe. Hihinya kuria urenda kuona(kwa muhiano Meru). Kuma haha uguthii page iyo ingi kuria ukuona cluster iria iri Meru(kana gicigo kiria wathuura.) hamwe na muigana wa ikundi na miti ohamwe na muthenya wa mucemano na ithurano hituku.
6. Hihinya cluster yaku(kwa muhiano, Ciakanyinga). Page ingi niikuhinguka na niukwona ikundi nini na maritwa macio, namba ya TISY, muigana wa miti na mweri wa muico wa gutarirwo miti.
7. Hihinya gikundi giaku. (kwa muhiano, TARADA). Niugutwarwo thiini wa page ingi. Niukwona uhoro wa gikundi, hamwe na kana gikundi nigitikirikite kwamukira marihi na kana nigikinyaniirie ikiro cia gukorwo thoko-ini ya carbon.

Uria unghota guthooma ngathiti chia mieri mithiru (Mazingira Bora Newsletters)

1. Thii www.tist.org
2. Cooka uthii documents to download. Chagura Kenya newsletters.
3. Kuuma hau niukuona ngathiti ngurani chia mieri mithiru,
4. Kwa ngerekano ukorwo ukwenda ngathiti ya November 2015, ukimikora hau,



TIST: Ungania wa mbegu.

Ciuria na macokio ci ungania 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 niiremaga 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

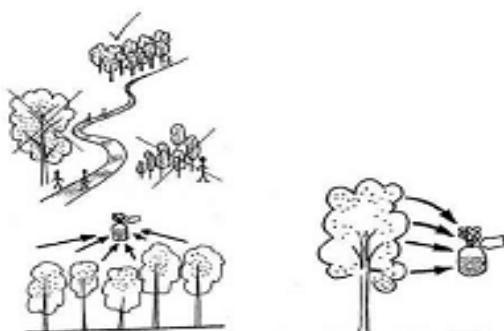


- Niwega kungania mbegu kuma kuri mithemba 30 na makiria ya miti niguu ukorwo na rurira rwega, miti ya mbegu yariirwo nigukorwo na utaganu wa 50m-100m niguu ikure wega
- Muti uria mwega uringanaga nakiria urenda kuhuthira muti ucio nakio
- Kwa muhiano, miti miega ya mbau yagiriirwo nigukorwo iri mirungaru, 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
- Riria wongania mbegu ririkana kwandika haria wekira na ritwa, muthenya na kuria wongania

Source: Robbins, 2004.





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 cिकेकानित्ते 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 cिकहन्द्वा migundaini. Nira ino niyo njega kuri miti iria ikoragwo itagukura wega nathariini kana iria mbegu ciaguo cिकोरग्वो na hinya kunganika.
- Mbegu ciothe niciagiriirwo ni kurutwo kuma makoniini. Undu uyu nowikwo na moko kana kwanika makoni riuaini niguo mome.

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



- 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.

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 cिकोरग्वो na ngothi nyumu, cिकीे मााीनि 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





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 niguo 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 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 ikuritio 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 ungitona muti ucio – njira cia kungania mbegu ciaguo – njira cia kuuiga mbegu – njira ciaguthondeka mbegu na njira cia kuhanda.
- Mahe ndagika 10 niguo 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



TIST: Njira Njeru: Giito kia metha.

TIST ni iraringiriria Arimi magerie guthondeka ciito cia kuoyo na iguru (raised seed bed). Arimi aria mena ciito ici nimonete umithio tondu miti yao niikoretwo igikura na njira njega itekuma na ihenya. Geria giito giki na umenyethie Cluster yaku kana giito gia muthemba uyu kina umuthio kana ca

Mbica ya I: Ikwonania njira ya kiunduire ya nathari ya miti.



Fig 1: mimire ya miti ya *Moringa oleifera* ibangitwo thi tiri-ini.

Njira ino ya kiunduire ya nathari iri tiri-ini niitumaga mimera yaku igie na miri itari na hinya. Gitumi ni tondu, miiri nituikaga ya gwikunja iri iratathini. Hindi ya kuhanda miti yaku, miiri ikoragwo itari na hinya na kuguo ikaremwo ni kwibanga wega tiri-ini. Ni undu wa uguo, murimi ni onaga wega agerie gukunjura miiri iyo na kumicheha na eka uguo akamikira ironda.

Kweherera thina uyu, niwega gukorwo na maratathi mena miena yeri iri utheri na kubanga thiinii wa giito kioee na iguru (mbica ya keeri). Giito kioee na iguru no giakwo na mbau na waya (wire mesh). Giito giiki nigitumaga miri ya mimera yaku ituike ya guchehwo ni riera riria yaharuruka na kuuma na thi ya iratathi. Kuguo miiri ya mimera nihotata gukorwo na hinya tondu ni riera

riramecheha na riria ukahanda muti waku, niugakorwo na hinya na umiriru munigi . Makiria ya uguo, ndugakorwo na ihinda ria wira wa gucheha miiti yaku na ukagitira ugwati wagwikira miti yaku ironda. Umithio uingi wa giito giiki ni ati ni uhuthu kurimira kana kweheria ria giito-ini giaku.



Fig 2: Mimera ibangitwo giito kioetwo na iguru.

Giito giiki rimwe nikionekaga ta gitumagira maai maingi. No nikuri njira ingi ingitumika ya kumenyerra maai na kwenja mutaro ugacooka ukabanga turubau ukaigirira mimera yaku hau iguru. Mutaro uyu niukuhota kuiga maai na ukahe mimera yaku ugonyu. Ona no ware iratathi ria munyore rrungu rwa giito giaku na utege maai maria unguhuthira oringi hari mimera yaku.

Ciirua kuri mucemano wa Cluster

- a. **Hari guthondeka mihuko wa miti, ikundi irahuthira njira iriku?**
- b. **Ikundi ingihuthira nnjira iriku guteithania gwaka giito gia kuoyo na iguru? Ni andu aigana mangibatarania? Gwa kahinda kariku? Andu aigana kuhariria tiiri, thumu na muthanga?**
- c. **Kuri ikundi cithondekete giito gia kuoywo na iguru**
- d. **Andu mena mataro ngurani? Niwega kwaririria makiria mucemano wa mweri uguka.**

Mazingira Bora



TIST

The International Small Group & Tree Planting Program
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Wakulima wa TIST kutoka Karaba Cluster wakiwa Mbeere wakati wa mkutano wa Cluster mwezi uliopita.

Inside:

Tovuti ya simu za mkononi ya TIST: Njia mpya na yenye ubunifu ya kupata taarifa kuhusu kikundi na cluster yako haraka na kwa urahisi. *Page 2*

TIST: Ukusanyaji wa mbegu. *Page 3*

TIST: Ubunifu mpya wa kutumia minanda iliyoinuliwa. *Page 6*



Tovuti ya simu za mkononi ya TIST: Njia mpya na yenye ubunifu ya kupata taarifa kuhusu kikundi na cluster yako haraka na kwa urahisi.

TIST imeanzisha tovuti mpya- ya simu za mkononi. Tovuti hii itawezesha maelfu ya wakulima kupata taarifa kuhusu vikundi na cluster zao haraka na kwa urahisi. Itatusaidia kuwa wenye kuwajibika, wenye uwazi na sahihi tukiitumia vizuri. Sasa waweza kupata taarifa kwa mfano nambari ya miti iliyohesabiwa katika kikundi chako, katika kila shamba, wanakikundi chako, kama kikundi chako kimehitimu kulipiwa miti na kama kimelipwa hivi karibuni.

Tukitilia maanani cluster yako, utawezak kuona nambari kamilifu ya vikundi vilivyomo katika cluster yako (na unaweza kulinganisha na cluster zingine), tarehe ya mkutano unaofuata wa cluster, viongozi wa cluster yako na tarehe za uchaguzi wa mwisho. Pia, utaweza kujua jinsi cluster yako imekuwa ikitumia pesa za bajeti ya cluster kila mwezi.

Hatua za kuchukuwa ili kuingia katika tovuti hii ya simu za mkononi

Kuna njia mbili za kuingia katika tovuti hii. Kama wewe ni mwanaTIST na umepewa anuani ya barua pepe, waweza kuingia ukitumia nenosiri. Kuingia hivi kutakuwezesha kuona taarifa zaidi. Kama hauna anuani ya barua pepe ya TIST, waweza kuingia kama mgeni. Waweza kuingia katika tovuti hii ukitumia simu yako kama yaweza kuingia kwa mtandao ama katika maduka yenye mtandao.

Wahesabu miti wa TIST wameulizwa kuwa katika mikutano yote ya cluster kufunza na kusaidia katika mambo mengine. Wameulizwa kuleta vifaa vyao vinavyoitwa Palm wakati wa mikutano ya cluster na wanacluster wanaweza kuona taarifa kuhusu vikundi na cluster yao au kuhusu mradi wa TIST wanapokuwa mkutanoni.

Hapa ni hatua za kufuatilia

1. Nenda kwa www.tist.org/mobile
2. Kama una anuani ya barua pepe, ingia ukitumia anuani yako ya TIST na nenosiri.

3. Kama hauna anuani ya TIST, waweza kuingia kama mgeni. Andika jina lako na kampuni halafu chagua “log in”. kampuni yaweza kuwa jina la kikundi chako.
4. Utaelekezwa ukurasa mwingine. Hapo juu, utapata “Cluster”, “Groups”, “groves” na “Log out”
5. Kama unataka kuangalia cluster, chagua “cluster”, utaelekewa ukurasa unaoonyesha maeneo ya mradi wa TIST duniani. Chagua na uguze mahali unapotaka (kwa mfano, Meru). Kutoka hapa utaelekezwa katika ukurasa mwingine ambapo utapata majina ya cluster zilizopo Meru (ama eneo lingine lolote ulilochagua) pamoja na nambari ya vikundi na miti na tarehe za mkutano unaofuata pamoja na tarehe za uchaguzi wa mwisho.
6. Chagua cluster yako (kwa mfano, Ciakanyinga), ukurasa mpya utafunguka na utaona majina ya vikundi vidogo, nambari zao za TIST, nambari ya miti na tarehe ya mwisho ya kuhesabiwa miti.
7. Chagua kikundi chako, (kwa mfano TARADA). Utaelekezwa ukurasa mpya. Utapata habari kuhusu kikundi hiki, pamoja na kama wamehitimu kulipwa na kama kikundi kimehitimisha yanayotakikana ili kuingia katika soko la hewa chafu.

Kufikia gazeti za Mazingira Bora zilizopita

1. Enda kwa www.tist.org
2. Bonyeza tufuti uliopewa. Chagua gazeti la Kenya.
3. Utaelekezwa kwa ukulasa ufuatao. Unaweza kuchagua mwezi uliopita kwa kuibonyeza.
4. Kwa mfano, ukifikilia kuchagua mwezi wa Novemba 2015, bonyeza kwa hiyo mwezi na itafunguka gazeti la mwezi huo.



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.

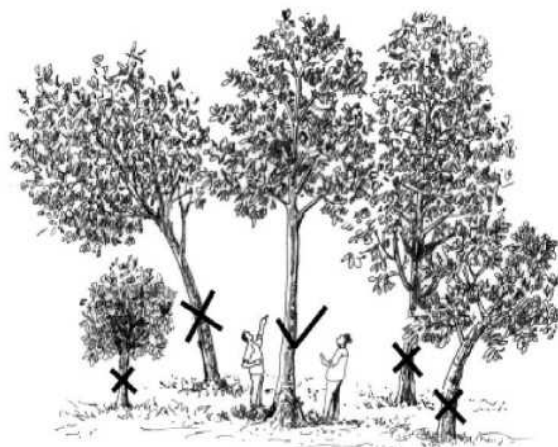
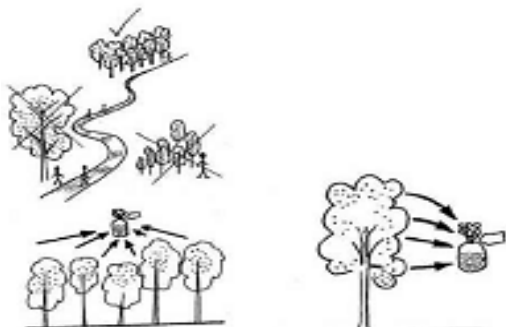
3. Ni miti yote uzalisha mbegu kila mwaka?

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.



- 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 uauliza 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. Tukusanye 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.anda 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.

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



TIST: Ubunifu mpya wa kutumia minanda iliyo inuliwa.

TIST inawahamasisha wakulima kujaribu minanda iliyo inuliwa. Wakulima wengi wamegundua kwamba njia hii inaimarisha miche wakati wa upanzi. Jaribuni minanda iliyo inuliwa na mpeane ripoti ya matokeo kwa Cluster yenu na kama njia hii ikona manufaa Zaidi kwenu.

Picha ya kwanza (1) inaonyesha njia za kawaida za kupanga nyungu kama ulivyo elezewa hapo juu.



Picha 1: miche ya Moringa Oleifera imepangwa ardhini.

Njia hii ya kitamaduni ya kupanga vyungu hivi chini inachangia miche kuwa na mizizi ilidhoufika sana. Hii ni kwa sababu mizizi inajikunja ndani ya chungu kile ilichopandwa. Wakati wa kupandikiza, ile mizizi huwa imedhoufika ki afya na kwa hivyo huwa haianzishi vizuri wakati wa upanzi. Ama ile mizizi ina mea hadi inapita kile chungu hadi kwa udongo. Hivyo inahitaji kupogoa mizizi kabla ya kuipanda.

Kuzuia haya yote, inapendekezwa kupanda mbegu zile kwa mifuko ama vyungu ambavyo havijazibwa chini na kuziweka kwa minanda iliyo inuliwa. (picha ya pili) Minanda iliyo inuliwa inaweza kutengezwa kwa urahisi ukitumia sura ya mbao na waya yenye matundu (ona picha) Minanda iliyo inuliwa inarahisisha kupogoa mizizi moja kwa moja kwa sababu mizizi ikifika chini ya mfuko iliyopandwa, inashuka yenyewe.

Hii ina maana kwamba mizizi hawapati kujeruhiwa kupitia njia ya kawaida kupogoa. Mizizi kisha huwa na kuimarika kwa afya ndani ya bomba bila ya kumea zaidi.

Hii hutoa afya mfumo wa mizizi na miche ina nafasi nzuri ya kuanzisha haraka na vizuri mahali itakapo pandwa.

Hii upunguza haja ya kazi ya kupogoa mizizi, zoezi ambalo hufanyika mara nyingi limechelewa ama linasahaulika kabisa. Kusababisha uharibifu mkubwa wa mizizi tu kabla ya miche.

Kwenda kupandwa kwa uwanja. Pia ni rahisi kuzuia kwekwe ni rahisi kwa minanda iliyo inuliwa.



Picha 2: miche ya aina mbalimbali imepangwa kwa juu ya mnanda ulio inuliwa.

Minanda iliyo inuliwa inaweza kuonekana kama inatumia maji mengi zaidi ya yale yanatumika kwenye minanda ya kawaida. Lakini wanaofanya hii kazi ya minanda wamegundua njia bunifu za kupambana na vikwazo vya ukosefu wa maji. Njia moja bunifu inahusisha kuchimba mtaro na kuweka mbao na waya yenye matundu ikitanda mahali pale na kuweka miche kwa zile mbao ama ile waya yenye matundu. Miche inaonekana kama iko kwa ardhi lakini ule mtaro utaweka miche unyevu kupitia maji kupaa kwa sababu ya jua na kwa hivyo kupunguza haja ya kuweka maji mara kwa mara. Karatasi ya nailoni inaweza kuwekwa pia kwa ule mtaro kuzuia maji kuingia ardhini.

Maswali ya kuuliza wakati wa mikutano mafunzo ya Cluster

- Ni vifaa gani ambavyo vikundi vidogo vidogo wametumia kwa mafanikio kutengeneza vyungu ya mifuko? Shiriki njia zilizo nzuri kabisa.
- Je, vikundi vidogo vidogo vinaweza aje kujipanga minanda yao ya vyungu? Ni watu wangapi wanaohitajika kuandaa vyungu hivi? Ni watu wangapi wanaohitajika kuandaa mchanganyiko huu wa udongo? Wapi?
- Ni vikundi vingapi vimejaribu minanda ya vyungu iliyo inuliwa?
- Kuna watu wana ushauri mwingine? Shiriki maelezo katika mkutano ujao wa mafunzo

Mazingira Bora



TIST

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

Kikamba Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Aimi ma TIST kuma ngwatanioni ya Karaba ila yi nthini wa Mbeere me wumbanoni woo wa mwai muthelu.

Inside:

Mwinamo na ni indii mwasakuanie. Ingi ni ukwithiwa utonya umanya undu mbesa syenyu sya kila mwai itumikite. *Page 2*

TIST: Kukolany'a Mbeu. *Page 3*

TIST: Nzia nzau sya uthukumi: mbisu sya kivuio kya kitanda. *Page 6*



Mwinamo na ni indii mwasakuanie. Ingi ni ukwithiwa utonya umanya undu mbesa syenyu sya kila mwai itumikite.

Matambya ma kulika kana kulogin nthini wa mobile website ino
Ve nzia ili (2) ila utonya utumia kuvikia

kusisya uvoo nthini wa mobile website. Ethiwa wi umwe wa ene ma TIST na nunengetwe E-mail address, no ulogin imwe uitumia password yaku, uitumia nzia ino withiawa na ivuso ya kuvikia uvoo mwingi. Ethiwa ndwina email address ya TIST no ulogin ta mueni (login as guest). No uvikiie website ino uitumia simu yaku ya kw'oko ethiwa yina internet kana kuma kwa cybercafes.

Avitukithya ma TIST (quantifiers) nimakulitw'e methiwe me mbumbanoni syonthe sya ngwatanio nikana mavundisye ene ngwatanio isu. Ni makulitw'e manengane Palms nthini wa kila ngwatanio yila kwina mbumbano nikana ene ngwatanio masisye uvoo wa ikundi na tukundi vamwe na ngwatanio ithi iulu wa walany'o wa TIST na kuikiithya ni waw'o na kana mbumbano isu sya ngwatanio syina uvoo ula waile.

Vaa ve matambya makuatiia uilogin

1. Wavika kwa itaneti andika **www.tist.org/mobile**
2. Ethiwa wina Email address ya Tist lika kwa itaneti na utumia address yaku vamwe na passwork kuvingua website ino.
3. Ethiwa ndwina email address ya Tist no ulogin ta mueni (guest). Andika isyitwa yaku na ngwatanio na uivinyiia log in. isyitwa no yithiwe ya ngwatanio, kikundi kana kakundi.
4. Kuma vau nuu tongoew'a kuthi itambya yila yingi nundu nukwithia vaa iulu vaandikitwe "Cluster", "Groups", "Groves" kana "log out"
5. Ethiwa wienda kwona ngwanio yenyu sakua "Cluster" kuma vau nukwona kula kw'othe kwi ngwatanio sya TIST nthi yonthe. Sakua

ngwatanio ila ukweda kuma ngwatanioni isu iandikitwe vau (ngelekany'o Meru) wamina usakua twasye Meru nuukwithia ngwatanio ila syi ungu wa meru na nukwithia kila kikundi kiandikitwe vamwe na miti yakyo na ni indii mena wumbano na usakuani woo wi indii.

6. Sakua kikundi kyenyu (ngelekany'o Ciakanyinga) na nukwithia tukundi twothe tula twi ungu wa ciakanyinga tuandikitwe kwa masyitwa, namba yoo ya TIST, utalo wa miti yoo na muthenya wa muthya ula miti yoo yavitukithiw'e.
7. Nzakua kakundi kaku (ngelekany'o, TARADA). vaa nukwithia uvoo wa kakundi kau vamwe na kethiwa nimavikiie ndivi na kana kakundi kaa nikavikiite kwika mawendekethyo other ala mendekaa nthini wa soko ya nzeve itavisaa.

Wenda mathangu ma Mazingira Bora Newsletters ala maseuviw'e mbeeni kana mavituku ika uu

1. Vingua internet na uithi kwa web yitu kwa kuandika www.tist.org
2. Click kana uvinyiie download documents, sakua Kenya Newsletters
3. Nuutongoew'a kuthi ithanguni yiu yingi. No usakue newsletter ya mwai w'othe ukwenda na mwaka kwa kuviyiia mwai ula wina mwaka ula ukwenda
4. Kwa ngelekanio, ethiwa wienda usakua mwai wa ikumi na umwe 2015, vinyiia mwai usu wina mwaka waw'o na ithangu ya mwai wa November 2016 (newsletter Nov. 2015) niyiuvinguka na uitonya usoma kila ukwenda kuma vo



TIST: Kukolany'a Mbeu.

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

1. Ni mthemba 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?

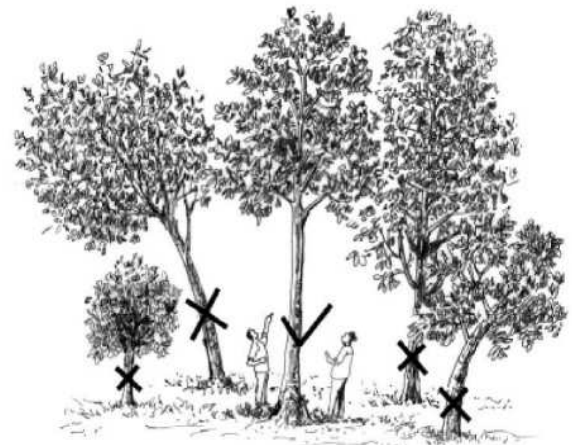
Ti lasima kila muti withiwe wi museo! mithemba imwe noyithiwe yi vinya kumiea, ingi ukethia ni sumu kwa indo, kana kwa kiw'u. Sakua miti ila wisi niya vaita kwa kisio kyaku. TIST ndyendeeawa ni aimi kuvanda misanduku nundu kuvanda miti ino nikuolaa kiw'u kila kimuthangani.

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?

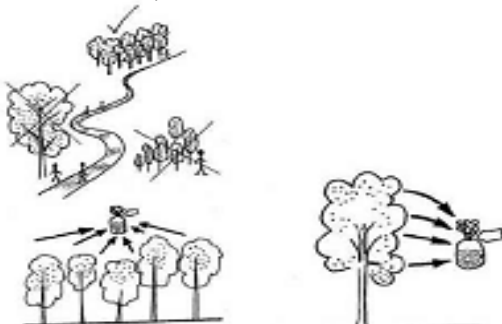
- Kolany'a mbeu kuma miti ila yina uima museo
- Ndukendeew'e ni mbeu sya miti ila imeete vandu yiyoka
- Ndukendeew'e ni miti ila itasyaa nesa na yina mbeu syina umbo muthuku.
- Nikaa kuyuva muti ula ukwosany'a mbeu wi katikati wa miti ingi miseo ya mthemba umwe nundu ninenganae mbeu nzeo ya mthemba usu 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 utaanu wa 50m - 100m nikana ukwate mbeu kivathukany'o na syaile.
- Mthemba 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 yianaa 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 yianaa 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 usyaaisye 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 syithiwa 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 nisyaiile umwa mikaeni kana matundani. uu nutonya kwikwa na kw'oko kana kwanikia sua syiyatue.

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.
- Nutonya kusyimithya mbeu umanye kana

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





nitonya umea. Osa namba nini ya mbeu ila ukolanitye ya ngii ta (20-100) ethiwa nisyaille kuiitwa 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. Ileso yii ya kusyimithya mbeu yaile ikala vandu va ilungu ya syumwa ili kwianana na muthemba wa muti. Ethiwa 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 ikondenani 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 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 iamuawa ni muthemba wa muti ula syumite. Imwe nisyendaa kuiitwa be na uu ukalew'a ithanguni ya mwaini w keli.
- Yila uukolany'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 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 muthemba 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.

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. Endee 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 muthemba 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 muthemba 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	Kuiita mbee wa uvanda	Nzia ya uvanda



TIST: Nzia nzau sya uthukumi: mbisu sya kivuio kya kitanda.

TIST nithuthasya aimi kutumia nzia ya kivuio kya kitanda. Aimi aingi nimonete kana undu uu utumaa withiwa na ivuso iseo ya miti yaku mingi kwiyumiisya na kuelea kuma. Tatai nthini wa ngwatanio yenyu museu vyve kivuio kii kya kitanda nikana mwone undu kiuthukuma nesa kwenyu.

Visa uu I. wionania nzia ya tene ya kwia miti kivuioni kya nthi.



Visa I. ii nimiti muthemba wa Moringa Oleifera ila ivangitwe kivuioni kya nthi.

Ndia ino ya tene ya kuvanga miti kivuioni kya nthi itumaa miti yithiwa na mii itena vinya. Kii nikwithiwa mii yikunziaa mathanguni aa. Yathamiiw'a muundani uyinyia mii nimyosu na kukwata kwa muti uyithia kwina vinya nindu iyisa utambuuka na kwambiia kuthi na nthi nikukua ivinda. Ingi ethiwa ti uu ukethia ethiwa mathangu ti makunike ungu niyamea na kutwaa mii na nthi vala ivuitwe na ithamw'a ila mii nitilikaa na kutuma muti usu wathamw'a withiwa mwosu kukwata. Nikana kumanwa na nthina uyu vuia miti mathanguni **matemakunike itina** na kwia **kivuioni kya kitanda** (Visa.2). Kitanda kya kivuio ni useuvya okwa nzia ite vinya kuma mbwauni/mitini na waya wa kisungi kina maima mathathau. Kivuio kya kitanda nikitumaa mii yinzea na ukethia niyamea kuinanthi nundu ithangu ti ikunike itina. Mii yaasava na kuvituka ithangu nisuaa na ikaendee na kwithiwa na vinya na tumili tula twanzeve nitwinzeaa kwoou muti nduumia usewa mii. Kwoou muti uyu watwawa muundani withiawa utonya ikwata na kumea kwa mituki. Ingi wia wa kusea mii withiawa waoleka ula ni wia kaingi wulaa kana

ukekwa wi muselee muno, na uiete wanangiko munene kwa miti ino iyumwa kivuioni. Ingi vayithiawa na yiia kwoou kuimia kivuio kuivo.



Visa 2: mithemba kivathukanio ya miti kivuioni kya kitanda.

Ivuio sya kitanda nitumaa kiw'u kitumika kingi. Onakau ala mena ivuio ii mena nzia ya usiia kiw'u kuthi kingi. Nzia imwe ila menayo ni kwisa mutau, kwikia matilo ma miti na kwiliila miti vo. Ingi miti yeekiwa kivuioni takii withiaa yioneka ta yinthi onakau ungu va mutau .Kiw'u kila kyalika mutauni uu nikikalaa vo na kwikalaya miti yina kimeu kwoou uyuthia ndiungithw'a kaingi. Ingi nutonya kwalania ithangu ya nailoni kukolania kiw'u kila kyetika kikanthi.

Makulyo ma ukulya yila kwina umayisyo wa ngwatanio.

- a. **Ni matilio syiva mutumiite kuseuvya mbisu sya uvanda miti? (mathangu ma nailoni kana)**
- b. **Tukundi tunini nata tutonya kwiyumbanisa kivuio kya kitanda? Na nia andu meana ata mendekaa kuseuvya imbisu? Indii? na ni andu meana ata mendekaa kuseuvya na kuvulania muthanga? va?**
- c. **Ve kikundi kimwe kitatite kivuio kya kitanda?**
- d. **Vena mundu wina utao ungi? Nenanisyai uvoo uu yila mwina umbano wa amanyisya.**

Mazingira Bora



TIST

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

Kipsigis Version

An Environmental, Sustainable
Development and Community Forestry
Program.



TIST Temic chebo Karaba Klasta en Mbeere en arawet ne kosirto.

Inside:

Mobile website nebo TIST: Oret ne nyumnyum ne imuche inyorunen logoywek chebo groupit neng'unget. *Page 2*

TIST: Kayumetab kesuwek. *Page 3*

TIST kotinyei boisiet ne kararan neton ko kabeti ne kanabtaiyat. *Page 6*



Mobile website nebo TIST: Oret ne nyumnyum ne imuche inyorunen logoywek chebo groupit neng'unget.

TIST koko'kochop website ne mpya – ne kimuche kero en simuit. Oranito komukyini temik che chang' konyor lokoywek chebo groupishek kwai ak cluster chechwaget. Niton kotoretch keigun che iyonotin, chebo lobkeyet, ak che. Ingunon imuche inyoru logoywek chebo numbait 'ab ketik chemi groupit ngung', en grovit agetugul, membaek chebo groupit ngung', angot ko qualifyeni groupit neng'ung ke liban ak angot kokokeliban.

Agobo cluster nengung, imuche inyoru logoywek chetinye'ge ak numbait 'ab groupishek chemiten en cluster nengung' (ak imuche ikerchine ak clusters alak), petut nebo cluster meeting, kondoik chebo cluster chemiten en kasaraton petut nikikiyoe lewenishet neletu. Kora imuche inyoru logoywek chetinye ge ak budget nebo cluster neng'unget nebo kila arawet.

Oret ole kiloge^ndo kechut mobile website initon.

Miten oratinwek oengu che kimuche kechuten website initon. Angot ko l'membayat 'ab TIST ak itinye email address nebo TIST, imuche ichut website ak iboishen password neng'ung'. Yon keboishen oraniton kokonin inyoru ngalek chechang'. Angot kometinye email address nebo TIST, imuche I signen – in ko guest (tondet). Imuche ichut website initon iboishen simuit angot kochu'te internet simuit ngung, anan iro en cybercafé .

Kogesom TIST Quantifiers komiten en tuyoshek chebo clusters asi kotoret en traing ak konet membaek . Kokisom icheket kokochi palms koba clusters en tuyoshek chebo clusters ak komuche koker membaek ngalek chetinye ge ak groupishek chemeng'echen anan ko clusters anan ko programs chebo TIST en tuyoshek chebo clustres.

Ichochu ko oratinwek.

1. Inyorunen **www.tist.org/mobile**
2. Angot itinye email address nebo TIST, ichuten email address inoten ak iboishen password.
3. Angot kometiche email address nebo TIST, imuche logen-in ko itondet . Inyit kainet ng'ung ak organization akityo I logen-in. Organization komuche koik groupit ng'ung.
4. Kikonin directions en pagit ne isupu. En parak inyoru Cluster", "Groups", "groves" ak "Log out"
5. Yon imoche iker Cluster, ichile en " Cluster". Kiborun pagit ne tinye projects chebo TIST en ng'wony. Imuche iker komoswek che kemokyinike (kou, Meru) kong'eten yu imuche iwe pagit ne isupu asiro Clusters chemiten en Meru (anan ko komoswek alak che imokyinike) koboto ketik che miten en komosoton ak petushek chebo tuyoshek ak election che ko'koibota.
6. Chill cluster neng'unget (kou, Ciakanyinga). Ko yotoksek pagit ne impya ne iboru groupishek che meng'echen, numbait nebo TIST, ak numbait ketik petut ne ki-quantification ketik.
7. Chill en Groupit ng'ung. (kou, TARADA). Kosipten inoniton iwe pagit ag'e. Inyoru ngalek che tiny eke ak groupit noton, chetinyege ak ole kilibonden ak angot kokoitchi groupit magutik chebo carbon market.

Kiit ne miten tai en kasetitab Mazingira Bora

1. Ui www.tist.org
2. Ui olemiten sirutik ak isuwe. Lewen kasetitab Kenya.
3. Koborun ole iwendi en bechit ne isubu. Anan ko ne kigobata nebo arawetagei.
4. Kou koborunet agot ilewen arawetab November 2015 ko itinye torigit nebo arawanaton kogonu chebo arawet ne isibu.



TIST: Kayumetab kesuwek.

Kesuwek tebutik ak Wolutik.

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

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

2. Kororon ketik Tugul?

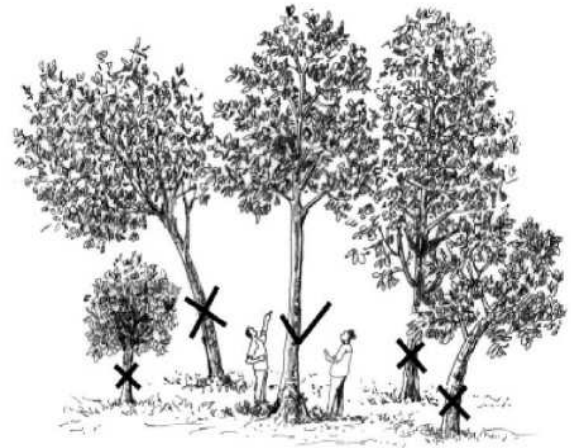
Ketik tugul komogororon, amun alak komokimuchi kerib amun tinye sumu alagei koebek chechang. Konyol ye gole ketik ichigil chenomegei ak ole imenye. Ketik cheu Chepkogutgei (Eucalyptus) ko bose beek en Emet.

3. Tos tinye keswek ketik en kenyit?

Ee unoton en ketik alak. Akomising lger en ketik chemiten kaa. Alak Komuchi kotar kenyisiek 2-3.

4. Oinon ketik neimuchi kenyoronen keswek chegororon?

- Lewen kesuwek chebo ketit nekararan
- Ketik nemiten inegen komat inemu kesuwek, motinye chekororon.
- Ketit ne motinye iton komat ibut
- Cheng ketit ne miten kwenutab ketik cheninan chegergei.
- Iyumenkesuwek en kebeberuwek cheter ak cheter.

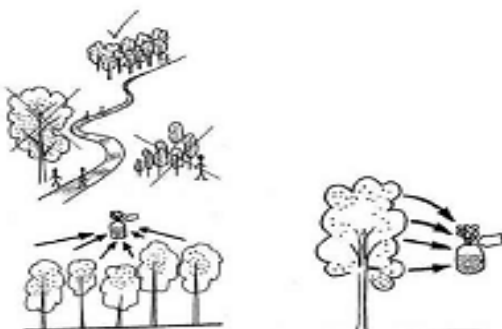


Lewen Ketik Chetinye Kesuwek Chegororon.

- Karan missing iyum kesuwek en ketik chechang kegetoton, ago che motinye kosibiny.
- Tiyengei Kesuwek 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 chegororon chetiny temenik che ngerinen ago chechogu.
- ❖ Lewen keswek chenomegei ak Ole imenye; Konamgei ak ngungunyek.
- ❖ Lewen ketik ne kongat amun ketit ne ngarngar komotinye kesuwek chegororon.

5. Kasarta ainon ne Keleweni Kesuwek?

- Rib kasarta kenyit 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 tinye kaborunet kole kogongiyo.
- Nyoru chomchinet en nebo imbaret iyum kesuwek.
- Cheng motoget negararan nebo kesuwek ak isir torigit ak kainetab kesuwot.

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



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.



- ✓ Ker kesuwot angenge ngo kongat anan kotinye sususrik.
- ✓ En kesuwekchuton miten cheimuchi koib koristo kaboru 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.

7. Ole kimuchi kamwa kele kororonen kesuwek?

- ✓ En Keret kotinye besiet amun alak komengechen alak kotinye itondo ne magergei ago tugul ko kesuwek chebo kot agenge.

Sesbania sesban – cleaning seed by blowing



Tephrosia vogelii – cleaning seed by flotation





8. Komuchi Kemin anan Kegonor Kersuwek?

- Kesuwek alagei komotinye Kegonor 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 komeiyu 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 kodoindet 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



TIST kotinyei boisiet ne kararan neton ko kabeti ne kanabtaiyat.

Igimiti TIST temik kotoi kabeti ne kanabtaiyat anan ko nemiten barak. Konyor temik che chang koguiyo kole kororonon ketik en kabetinon amun sobtos yekimin, yomten akoboniton itou en gaa ak yeibata ibu wolutik chegenyuru kobwa kilasta.



Fig 1: Seedlings of *Moringa oleifera* arranged as a stack on the ground

En koborunet nebo tai koboru ole kagitetita akoboniton **F1 koboru keswekab moringa ak** chebo emitik che kakitet en ngwony. En koborunoni kotinyei konyor keti nyalunatet amun tinyei tigitik kaimetab gei. Amu rotegei tikitit en tiubit orit, anan alake komuji komantaen kot konam ngwony, en niton kotomo kemin koyochai getil tikitit niton kogochin konyor ketit kaimet. Keistoen gei oraniton kogecheng tiubisiek che isengengotin komoswek twan ak **gekanaba kabeti kwo** barak asikosiki **tigitik komantaen** F2 kkoboru oletebtoi niton. Nyumnyum keisto amun iboisien biremisiek ak inte waiyat netere ketik imuche iger en bichait. Ye kaichum tikitik koyomtos amukonyor koristo, mou che yoche kisambut tikitik. Ikochin ketit konyor tililinto ak kogimit, asi yekibe kemin komotinyei konogut. Nyumnyum ka semberet amumonyoru timto neo



F2. koboru kombot ketik che kigiruruch en kabeti.

Kabeti initon kkoboisien beek che chang amun miten barak. Mwoe anyun biik chegikoboisien kole ingoyum tounik oleimiche kobosto beek amun chang, kou gebal bereisit ak getet ak waiyat ak kinte baragut ketik asikomuch tikitik komantaen. Ak konyor ketit koititindo en abakora. En ngwony kemasta takolkol asikobos beek che miten kwony.

Tebutik che kimiche keteb en tiuyetab kilasta.

- (a) **Tos kimuchi keboisien nee ne kararan asi kibitin kitik en kabetisiek?**
- (b) **Imukto ano bikab kurubit koyumak ak kotoi kabeti? Ou? Biik at ache mokotin kobat ngungunyek? En ou?**
- (c) **Tos miten kurubit ne kiyomta? Akoboniton?**
- (d) **Tostinyei biik alak kabwatet agei? Obchei ak biik en tuyetab kilasta.**