

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.



Churiu TIST Monthly Cluster meeting held on 20/01/2023. Next meeting on 17/02/2023.

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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 makes 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 5 cm below the surface.

Planting.

- When you plant maize seeds (1 -2 days before rains start), plant 4 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. Start working now!

Preparing Compost Manure - a natural fertilizer.

Compost manure is a natural fertilizer that helps your crops grow. It is better than chemical fertilizer because it is natural, free, and will not damage crops and the environment as some chemical fertilizers can. There are many ways to make compost manure, but the following method has been useful in some areas. Ask your neighbors in your Cluster what has worked well for them.

Preparation of compost:

1. Choose an area for your compost pit measuring 4m by 4m.

2. Clean the area.
3. Dig a hole of diameter 3 - 4m and 1.5m deep.
4. Collect all the remains of the crops you have (e.g., leaves and stalks of maize, millet, beans) and cut these remains into small pieces.
5. Put these crop remains into the hole up to a depth of 0.5m.
6. Add 5 liters of ash.
7. Next add about 30cm (or as much as available) of animal dung (e.g., dung from pig, cow, goat, or chicken).
8. Put another layer of crop leaves and stalks (0.5m).



9. Add another 5 liters of ash.
10. Repeat adding the leaves and stalks again until the hole is almost filled.
11. Finally add a layer of soil until the hole is filled.
12. While filling the hole with soil, put a long stick in the middle of the hole so it reaches the bottom.
13. Leave the compost pit for 90 days (3 months).
14. During this period use your dirty water to water the compost pit. For example, after cleaning your house or clothes, empty the used water over the compost pit. If you have animals, you can also pour animal urine over the pit.
15. This adds extra nitrogen to the compost.
16. Try to water the compost pit in this way every day, or whenever water is available.
17. After 90 days the manure will be ready.

Use the stick as a thermometer – when the compost is ready it should be hot and you may even see steam coming from the stick after you have removed it.

Use of compost:

When you have dug your holes for planting maize, millet or other crops, add one handful of your compost manure to each hole. Watch for the results!

TIST: Thinning and pruning your trees for successful growth.

In general, the purpose of thinning and pruning trees is to improve individual tree health, as well as overall forest health. This is done by selecting the “best” trees in the forest to keep. For many species, including hardwoods, grevillea, eucalyptus, and cypress, these are often the largest trees, each with a single, straight stem. Trees may have different needs for space depending on species, site, planting style (woodlot, incorporated into crop fields, or windbreak), and climate, but some general principles apply.

To grow strong, healthy trees, a spacing of two meters is recommended. This spacing works for many TIST trees (i.e., grevillea, and cypress), but remember some trees require more space (mango and macadamia, for example). Giving trees proper spacing helps them get enough water and nutrients to grow to their full potential. Closer spacing is acceptable when trees are young. As the trees begin to mature, some trees will be larger and more robust than their neighbors, and these best trees should be kept. Thin around the best trees to achieve good spacing.

Once you have determined which trees to remove, cut these at the base of the tree. In the weeks and months following cutting, many trees will begin to sprout from the stump. To keep the tree from coming back, cut or break these sprouts off at the base of the tree.

In general, if all trees of the same species in an area are close to the same age, the larger trees should be chosen to allow growing. Another good

indicator of tree health is the position of the crown of the tree in the canopy. Trees with crowns above the general canopy level can absorb more light than those lower down, and so can grow better. Finally, trees should have a single stem, with no major disease or rot. However, this does not mean that all small trees should be removed! Aim for a minimum of a two-meter by two-meter spacing so that the trees are as large and as healthy as possible to maximize carbon capture.

When making thinning choices, remember that growth rate varies greatly by species. If a mango tree is growing near lots of eucalyptus, the mango may be far smaller and slower growing than the fast-growing eucalyptus, but it certainly should not be cut simply because it is smaller! In fact, a tree like mango is of great importance due to its usefulness in producing fruit for food and sale. Mango also is better for other crops growing in the field. Eucalyptus can make other trees and crops nearby grow poorly. It is important to remember this as you select which trees to thin. There are many uses for trees, depending upon species besides carbon capture. For example, you may want trees for shade. In this case, you should give the tree more room than usual to expose the tree to more sunlight. This will stimulate the tree to produce new branches on the main stem and on larger limbs. If you want to use a row of trees as a windbreak, keep trees in that row spaced closely together, but remove trees to either side in order to increase the “bushiness” of the trees.



Pruning.

In a natural forest, trees naturally self-prune. Branches in the upper canopy shade out lower branches. As leaves on the lower branches begin to die off, so does the branch to which they are attached. Dead and rotted branches naturally fall off or are knocked off. While natural pruning may happen on TIST sites, it may be necessary, or beneficial to prune trees by hand. While each tree species requires a different pruning technique, some general principles apply to all trees as you decide which limbs to remove.

Most tree species should have a single main stem at the ground level. Trees with a single stem generally grow faster and are less prone to split during storms. If a tree with multiple stems is chosen as a crop tree, when choosing which stem to keep, generally choose the largest, but make sure it is healthy, with lots of leaves, free of rot, and relatively straight.

Many people think you should cut limbs parallel to the trunk. This is false. Cuts should be made perpendicular to the limb, slightly out from the trunk. This minimizes the amount of exposed wood, and allows the actively dividing cells in the branch collar to grow over the cut over time (see figure 3). This helps the tree to remain healthy and free of rot.

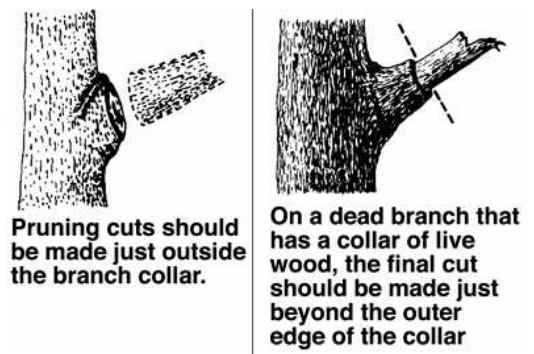
When pruning, don't be overzealous. Tree trimmings are often used for fuel wood or fodder. While this is good, remember that while pruning can improve tree health and increase growth over time, removing leaves will initially reduce the tree's ability to capture sunlight and cause stress to the tree by creating a scar, which it must heal. If you remove too many, the tree will grow slowly or may die. After removing a limb, leave the area cut alone.

Do not cover it with tar or any other material, so the tree can expel any toxic material on the wound. Don't forget that trees tend to produce new shoots near cuts from thinning or pruning. Some species do this more than others. Generally, these are very easy to remove during the first year after cutting by simply snapping off the supple shoots. Shoots will often not grow back.

Some trees, especially fruit trees, produce better yields with multiple stems. These are cut near the base of the stem when they are young in order to stimulate new growth. Once the tree has established these new shoots, they too may be cut in order to produce more growth. This process may be repeated in order to increase the bushiness of the tree, but be sure to allow at least a few months or more between trimmings so the tree can recover from the stress caused by cutting.

Remember that to take part in the carbon market, we have to commit to keep trees for the long term. We should allow trees to grow for at least 30 years, thinning and pruning to produce useful, sustainable forests that provide us benefits for years to come. Coppiced trees may not qualify for the carbon market and so may not be counted as TIST trees.

Figure 3



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?

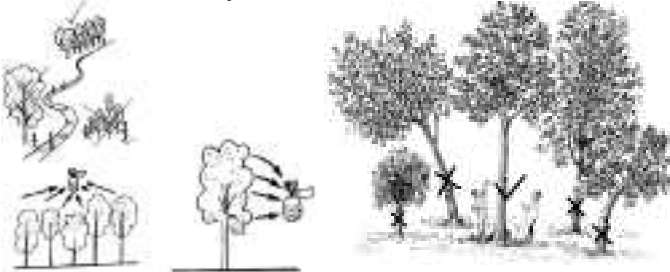
- o Collect seeds from healthy trees that are good seed producers.
- o Avoid isolated trees - in this case the seed is likely to have been self-pollinated which leads to poorer quality seeds.
- o Avoid unproductive trees and ones with a bad shape.
- o It is better to choose a tree in the middle of a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

Source: Robbins, 2004.



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.

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.

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.
- 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 that 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

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Kimereu Version

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



**Mkutano wa Nguzo wa kila mwezi wa Chuuriu TIST uliofanyika tarehe 20/01/2023.
Mkutano ujao utakuwa tarehe 17/02/2023.**

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Kunyiya na kugiita miti yaku biang'i nikenda inenea na ikura bwega. *Page 3*

TIST: Kuuthurania mbeu. *Page 2*



Ni igita ria kuthuranira munda jwaku niuntu bwa urimi bubwega.

Amemba ba ikunbi bibinini bia TIST baria bageretie kurima na urimi bubwega nibaritite ukuji ati nibuciaraga iciara ririnene na riumba gweterwa guti na uguaa 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.

- Thuriranja munda jwaku no mweri jumwe kabele ka mbura.
- Rita maria na ithaka muundene jwaku. Ukarima.
- Thuriranja 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 gia 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 ijaga.
- 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. Bubugathethia 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!

Kuthithia mboleo yaku gwengwa – fertilizer itiongeri into bia kuthithua ni muntu.

Mboleo ya kuthithia na imera ni fertilizer ya kuumania na into bitina ugwati ya gutethia imera biaku bikura bwega. Ni injega nkuruki ya fertilizer cia nduka niuntu icithithitie yongwa na itina ugwati kiri imera na kiri naria kuthiurukite. Kurina njira inyingi cia kuthithia mboleo, indi njira iji ithingatite nitethetie ndene ya guntu kumwe. Uria muturi waku ndene ya cluster yaku jaria jabatethetie nkuruki.

Kuthithia mboleo:

1) Taara antu aria ukeenja kirinya giaku kia warie

bwa mita inya na uraja bwa mita inya.

- 2) Theria antu au
- 3) Inja kirinya kirina warie bwa mita ithatu gwita inya na mita imwe na nusu kwinama.
- 4) Uthurania matigari ja imera biaku jaria urinajo na ugitange tue tunini. (mung'uanano mathangu na mati ja mpempe, miere na ming'au).
- 5) Ikira matigari jaja kirinyene mwanka gitigare nusu mita.
- 6) Ongeera lita ithano cia muju
- 7) Riu wongere centimita mirongo ithatu (kana o iria ikwoneka) cia mburi kana nguku).



- 8) Ongera matigari ja imera nusu mita.
 - 9) Ikira lita ingi ithano cia muju
 - 10) Ongera matigari ja imera kairi mwanka kirinya kiende kuujura
 - 11) Muthia, ikira muthetu mwanka kirinya kiujure
 - 12) Ukiujuria kirinya na muthetu, tonyithia muti jumuraja gatigati ga kirinya mwanka jukinye nthiguru buru.
 - 13) Tigana na kirinya giki ntuku mirongo kenda (mieri ithatu)
 - 14) Igitene riri tumira ruuji rwaku rwa ruko gwikira boleo. Mung'uanano, warikia kuthambia nyomba kana nguo ciaku, ituura ruuji ruru ugutumagira kirinyene. Kethira urina ndithia ituura maumago jacio iguru ria kirinya.
 - 15) Untu bubu nibwongagira nitrogen kiri mboleo yaku
 - 16) Geria wikagire kirinya kiu ruuji na njira iji ntuku cionthe kana oriria ruuji rurio.
 - 17) Ntuku mirongo kenda ciathira, mboleo ikethira iri tayari.
- Tumira muti kuthima mwanki – mboleo yayia no mwanka ithirwe irina mwanki mwanka toi yoneke ikiumaga mutine wajurita ku.

Utumiri bwa mboleo:

Warikia kwinja marinya jaku ja kuanda mpempe, muya na imera bingi, ongera nkundi ya mboleo yaku kiri o kirinya. Etera wone uria gugakara!

Kunyiya na kugiita miti yaku biang'i nikenda inenea na ikura bwega.

Antune anene, kunyiyia miti na kugiita biang'i, nigutethagia kuthongomia thiria ya muti amwe na thiria ya mwitu junthe. Bubu buthithagua gukurukira gutaara miti iria mithongi buru ndene ya mwitu. Kiri mithemba ya miti imingi, amwe na mibao, mikima na mithithinda, iji niyo miti iria minene buru, o muti juri jumwe jutimirite ingi rutere na jumutamburuku. O muthemba jwa muti nijwendaga mantu mwanya kulingana na muthemba, antu aria juri, uria juandi (iandi yonka, iandi gati gati ka imera, kana iandi kunyiyia ruugo) kana rera, indi kuri mantu jethagira jario kunthe.

Gukuria miti irina inya na thiiria injega nikwendekaga utarania miti bwega (Meter ijiri). Gutarania na meter ijiiri nikukwega buru kiri miti imingi ya TIST (ta mibao, mikima na mithithinda), indi ririkana ati miti imwe niendaga gutarania gukunene nkuruki (ta miembe na mikandamia). Gutaarania miti bwega nikumiejaga kanya ga gukinyirwa ni ruuji na irio bing'ani, biria bitethagia miti kunenea mwanka aria ibati. Kuanda miti akui nigwitikiritue riria miti ianaki. Riria miti ikwambiria gukura, kuri na miti iria ikaneneanga na kugia inya kiri ingi. Iji niyo miti iria ibati gutigwa muundene, (Imera miti). Kiri gutaara ni miti iriku ikagitwa, tega miti iji mithongi na umenye kethira nitarenie bwega. Kethira ititarenie bwega, miti iria iri akui ikendeka kugitwa.

Warikia kumenya ni miti iriku ikugitwa, migitire nthiguru buru. Ndene ya biumia na mieri iria ikathingata, miti imingi ikambiria kuumira au gitinene. Nikenda muti jutiraume kairi, iji ikuumira niigitwe kana iunirwe nthiguru buru.

Njira imwe iria mbuthu buru kumenya kethira muti nijubati kugitwa ni gutega uria jung'ana

ugiteganagiria na miti iria iri akui ya ukuru o ja bwaju. Ririkana ati gukura kwa muti gukaringana na muthetu, ruuji na jangi jamaingi. Antune aria anene, kethira miti yonthe iria iri amwe iri na ukuru akui bumwe, miti iria minene niyo ibati gutaarwa gutigwa muundene. Gintu kingi kiria umbu gutega thiria ya muti nakio ni aria mathangu jaria maingi ja muti jou jari wateganiria na ingi. Miti iria iri mathangu jamaingi iguru ria miti ingi niumbaga kujukia weru bubwingi nkuruki ya iria iri nthiguru na kwou igakura bwega nkuruki. Kuthiria, miti iria igutigwa no mwanka iithirwe iri imitamburuku itiumiriite ingi rutere na itina mirimo kana kurota. Indi bubu ti kuuga ati miti yonthe iria itinenenei igitwe. Muntu nabati gutegeera gutarania kwa meter ijiiri nikenda amenya miti ikunenea na yagia thiria injega buru nikenda ruugo rurwingi ruruthuku rumba kujukua.

Riria ukuthithia mantu jau jariau iguru, rikana ati gukuranga kwa muti ni mwanya mono kiri mithemba mwanya ya miti. Kethira muembe jurikura akui na mibao imingi, muembe nojwithirwe junii mono na jugikuraga gapori nkuruki ya mubao juria jukurangaga, indi jutibati kugitwa nontu niyu munini! Kwaria mma, muti ta muembe ni muti kimera juria juri bata niuntu bwa utumiki bwaju ja kuejana irio. Kurina utumiri bungi bubwingi bwa miti, kulingana na muthemba, tutigutara kugwatia ruugo ruruthuku. Mung'uanano, muti nojwendeke niuntu bwa kirundu kiaju. Antune aja, nubati kua muti kanya nkuruki ya ingi nikenda jukinyirwa ni riua, riria rigatuma muti jugia biang'i bibieru kiri gitina na kiri biang'i biria biri iguru. Ukenda gutumira miti kunyiyia ruugo, nubati kumenyeera ati miti iu iri lainine nikwianiritie, indi rita miti nteere cionthe nikenda juumba kwingiyia mathangu na biang'i amwe.



Kunyiya mathangu.

Ndene ya mwitu jwa kuuma jungwa, miti nicinyiagia mathangu yongwa. Biang’i biria biri iguru buru nibigwithagia biang’i biria biri rungu. Ouria mathangu jakuuma kiri biang’i bia nthiguru nou kinya kiang’i kiria mathangu jau jari kiendeleagaa kuuma. Gukurukira kugaruka kwa rera ya ntuku, biangi biria bikuite na biria biori bikagua kana bigwithue. Kinya kethira miti nicinyiagia mathangu yongwa miundene ya TIST, kwethira kubui kana kurina gitumi kunyiyia mathangu na njara. Riria ukuthuura ni biangi biriko ukugiita, nubati kuthingatira mantu jamakai. Kinya kethira o mthemba jwa muti nijwendaga njira mwanya ya kunyiyia mathangu, mantu jamwe nijathithagua kiri miti yonthe.

Mithemba imingi ya miti nibati kwithirwa irina gitina kimwe nthiguru. Miti iria irina gitina kimwe niyo ikurangaga na itiuunikangaga igita ria ruugo kana ngai inyingi. Muti jurina itina bibingi jwatarwa gutigwa muundene, kurina mantu jamaingi jaria uumba gutegeera riria ugutara ni gitina giku ugutiga. Ja uria uumba kuthugania, gitina kiria kinene nikio kibati gutarwa gutigwa. Kwongera, gitina kiu kithirwe gitikurota, kionanie kiri na thiria (ta kithirwe kirina mathangu jamaingi), na kithirwe gitamburuki.

Gintu kimwe kithuganagirua uria gitibati niati nuubati kugita kiang’i, winami bwa gitina. Bubu ni urongo. Ubati kugita uumarite bwa ome ya gitina. Njira iji ninyiagia antu aria ugukunura na igetikiria muti juumba guciorangia kirona nyuma ya igita. (Tega Mbicha I), untu buria butethagia muti gukara juri na thiria na jutikwoora

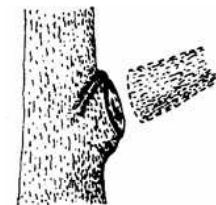
Riria ukunyiyia mathangu ukenda kuthithia uju mono. Biang’i na mathangu jaria jagitagwa nijatumagirwa mono ja nkuu kana iria. Kinya kethira bubu nibwitikiritue buru, rikana kunyiyia mathangu nogutethie kuthongomia thiria ya muti na kujuneneangia igitene, indi kurita mathangu gukamba kunyiyia kuumba kwa muti kugwatia riu na

nogutume muti jukaga inya nontu bwa kujwikira kirona, kiria no mwanka kiore. Warkia kugita kiang’i, au kugita gutibati gutongwa. Ugagakunikira na gintu kinya gikari, nikenda muti jumba kurita maira kirondene. Iji noyo njira iria mwiri jwa muntu jutumagira riria jukworia kirona.

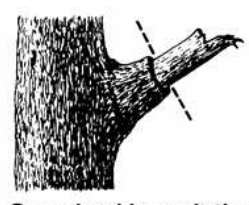
Ukorirua riria kunyiyia mathangu na ukunyiyia miti ati miti niuomagira itina bingi akui na aria kwagitwa. Mithemba imwe nithithagia uju nkuruki ya ingi. Antune anene, itina bibi nobiritwe na uuthu mwakene jwa mbele nyuma ya kugita na njira ya kuuna aki. Jaria maingi itina bibi bitiuma kairi.

Miti imwe, mono mitunda, ikaciara bwega nkuruki irina itina bibingi. Iji nigitagwa akui na muthia jwa gitina iri iminini nikenda itina bingi biumira. Muti jwarikia kuuma tutina tunini, kinyatu notugitwe nikenda tungi tuuma. Bubu nobucokerwe nikenda muti jumata, indi menyeera ati nukua muti mieri imikai kana imingi nikenda yumba kwora kuumania na kugitwa kou.

Rikana ati gutonya thokone ya ruugo, nitubati gwika wirane gwika miti yetu igita ririnene. Nitubati gwitikiria miti ikuura mwanka miaka mirongo ithatu, tukiminiyagia na kunyiyia mathangu nikenda yumba kua miitu ya bata na iria tukomba gwika itue baita miaka iria iijite. Miti iria igita yaumira itibua ya gwikua thokona ya ruugo na kwou ititarwa iri miti ya TIST.



Pruning cuts should be made just outside the branch collar.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

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 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?

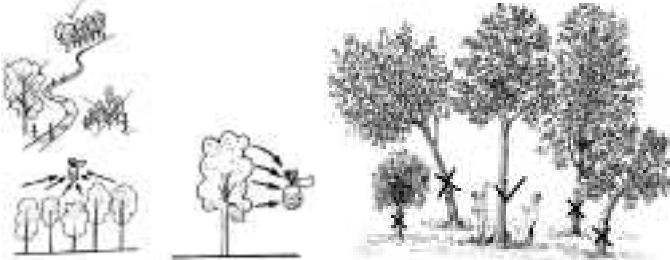
- Uthurania mbeu kuumania na miti iria irina thiria injega iria iciaraga mbeu inthongi.
- Ebera miti iria iri yonka – kiri miti iji mbeu yomba mono kwithira yuumanitie na muti gwiciarithia, untu buria buumba gutuma mbeu ikwethirwa citi injega mono.
- Ebera miti itiguciara na iria ikari bubuthuku.
- Ni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

Kiumo: Robbins, 2004.



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.

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. Uthurania 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 kumithia 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.

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 inkua na kurumua ni tunyomoo nikuretaga mibuko ya ruugo).
- Mbeu imwe no uuge/ ukeera/ugachunka nikenda wita mbeu iria mbuthu.
- 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. **Tuik 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 gukwegwa (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 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 bungu.

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 mutongerira 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 uurie o gikundi kureta macokio.

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

No bwone bugitethia kuandika na njira iji:

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

Mazingira Bora



TIST

The International Small Group & Tree Planting Program

www.tist.org

Kikuyu Version

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



**Mkutano wa Nguzo wa kila mwezi wa Chuuriu TIST uliofanyika tarehe 20/01/2023.
Mkutano ujao utakuwa tarehe 17/02/2023.**

Inside: Mahinda ma kuhariria mugunda waku niundu wa Kilimo Hai. Page 2

Kuhariria thumu wa mborera – bataraita ya kimerera. Page 2

TIST: Guceha na gutheria miti niguo ikure wega. Page 3

TIST: Ungania wa mbegu. Page 4



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 ungitethika na Kilimo Hai. Kurumirira mitaratara miega niguguteithia 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 ungitethika thumu muiganu.

Kurimira.

- Rirmira irimaini maita maingi.
- Ndukarimir mugunda wothe. Nja ya irima, mimera no ihumbiretiiri, niguo kuuiga uri mugunyu. Rimira hakuhi na irima. Huthira ruhiu kwehuthia riia riria riri gatagati-ini ka mimera. Rimira maita maingi niguo 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 niguo manorie tiiri. Matigari ma mimera nomathondeke thumu.
- Ndukariithie mahiu mugunda-ini, ririkana nitugakena tugikunguira magetha maku na guthoma kuma kuri wee.

Ambiriria wira riu.

Kuhariria thumu wa mborera – bataraita ya kimerera.

Thumu wa mborera ni bataraita ya kimerera iria iteithagia mimera gukura wega. Bataraita ino ni njega gukira ya nduka tondu l ya kimerera, ndiri thogora, ndithukagia mimera hamwe na maria maturigiciirie ta uria bataraita imwe cia nduka ciikaga. Kuri njira ngurani uria unghota gwithondekera thumu waku wa mborera. Hari njira imwe iria tuguthomithia iria ikoretwo igitumirwo ni andu aiangi. Niwega urie arimi aria angi muri mucemanio wa cluster ni njira iria matumagira.

Kuhariria guthondeka thumu:

1. Chagura handu haria ikwenja irima riaku ria mita inya kwa inya.
2. Theria handu hau.

3. Haririria kana uchimbe irima ria warie wa mita ithatu nginya inya na iriku wa mita imwe na nuthu.
4. Cokeria hamwe maragara maku moth eta mahuti, mabebe , maboco kana muhia na umatinangie tuchunji tunini.
5. Iki maragara macio irima-ini riaku kwa uriku wa nuthu mita.
6. Ongerera lita ithano cia muhu.
7. Thutha ucio, ongerera thumu wa ng'ombe kana mburi kana nguku kana nguruwe kwa uriku ta fiti imwe.
8. Ongerera maragara mangi inguru ta nuthu mita.
9. Ongerera lita ithano cia muhu.



10. Ongerera maragara maku nginya irima riaku rikirie kuiyura.
11. Wa muthia, humbura na tiiri nginya iria riyyure
12. Hindi iria urahumbira na tiri, handa kamuti nginya kahutie irimariaku gitina.
13. Eterera gwa kahinda ka thiku 90 kana mieri itatu.
14. Gwa kahida gaaka korwo ugitiriria thumu waku maai maku ma giiko. Ungikorwo ni ukuhota ona mathugumo ma mahiu maku uitiririe.
15. Mathugumo ni mateithagia kuongera nitrogen.
16. Geria guitagiriria maai na muthugomo kwa mahinda makuhi.

17. Thutha wa thiku mironko kenda, thumu waku ugakorwo uri muhiu.

Tumira kamuti karia uhandire ta githimi giaku. Hindi iria thumu waku wahia, wagiririrwo gukorwo wi muhiu na wacomora kamuti niwagirirwo ni kurata ndogo ya urugari.

Uhuthiri wa thumu waku wa mborera:

Warikia kuhariria marima maku ma mbembe kana muhia kana o mimeria iria ingi urahanda, ikira thumu muigana wa m oko maku o hari o irima. Eterera wone maciaro!

TIST: Guceha na gutheria miti niguo ikure wega.

Gitumi kinene gia geceha miti nikumihotithia ikure iri na hinya ohamwe na kwagirithia mititu. Njira ino noirumirirwo riria ugucagura miti iria iri na hinya na miega. Makiria mithemba ya hardwood na grevillea, eucalyptus na cypress niyo ikoragwo iri minene na igakorwo iri mirungaru wega. Mithemba ngurani ya miti niyendaga utaganu ngurani kuringana na kuria ihanditwo kana niyakugayania mugunda kana niyakunyahioa ruruhu. Ririkana miti ingi niibatara utaganu makiria ta miembe, mavadama kwa muhiano. Riria wahee miti utaganu wa kuigana niu miteithagia gukinyirwo ni maai na unoru wa tiiri nigu ikure. Utaganu munini nimwega riria miti iri minini tondu miti yambagiriria kugimara niinenehaga na miti ino yagiriirwo nikuigwo. Ceha miti niguo igiae na utaganu mwega.

Hingo iria wamenya ,iti iria ukwehulia, miteme haria gitianaini. Thutha wa wiki na mieri o ugitemaga miti miingi niirithundukaga na micehe ringinigu ndigakure yathunduka.

Miti yothe ya muthemba umwe kuma kundu kumwe ikoragwo iiganaine, miti iriaminene niyo yagiriirwo nigutigio. Kionereria kingi ati miti ati nimiega ni uraihu wayo. Miti iria miraihu makiria niyo miega na niyo ihotete kwamukira utheri muiganu gukira iria ingina noikure wega. Wa muico,

miti yagiriirwo gukorwo itahukite, na itari na murimu o wothe. No ningi, uu tikuga ati miti yothe iria minini yeherio! Tigrira utaganu niwa 2mX2m na miega makiria.

Riria uratua matua ma guceha, ririkana ati mithemba ya mui ni ngurani. Angikorwo muti wa muembe urakura hakuhi na muti wa eucalyptus muti wa muembe nonginya ukorwo uri munini na nimwega niundu mawegamagu ma matunda ma kuria na ma kwendia na ningui niukuranagira wega na irio mugundaini. Eucalyptus niutumaga miti iria iri hakuhi nago yage gukura na njira iria yagiriire na niwega kuririkana uu riria uraceha miti. Kuri na mwega mangi maingi ma miti kuringana na mithemba thengia ya carbon. Kwa muhiano nowende miti niundu wa kiiruru. Niundu wa uu, nouhe miti kahinda makiria ga gwota riu njira ino niukhotithia miti ikorwo na honge nyingi makiria. Angikorwo niurendamiti ya kunyahia ruruhu rekeikure ikuhaniriirie no ucehe mahuti nathi.

Guceha.

Mituini ya kinfuire, miti niyo icehaga. Honge mitiini iria minene niutumaga iria minini iguithie mahuti na ririamahuti macio makua nacio honge cigakua na cikooro. Honge icio niciguaga. Na ona igiicehaga yo



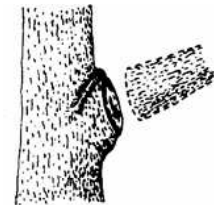
nyene thiini wa TIST niwega guceha na moko. Mitingurani niibataraga mucehere ngurani no maundu ma kawaida nimahuthikaga.

Mithemba miingi ya miti yagiriirwo gukorwo itahukite kuma thi.miti tai no ikuraga naihenya na niuhuthu kumiceha. Riria wathuura miti yahukite, , cagura iria minene no utigirire iri na hinya na mahuti maingi.

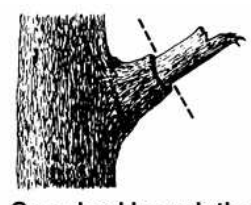
Andu angi meciragia wagiriirwo ni gutini a miti iri miigananiru. Riria urahurura miti wagiriirwo ni kuinamiabanga. Njira inoniinyihagia miti kwora Riria urahurura, ndukahuthire hinya muingi. Mitiiria yahururwo niuhuthikaga na ngu ba irio cia mahiu. Ona njira ino iri njega, niitumaga miti inyihirwo ni uhot wa gukinyirwo ni utheri wa riuua niundu wa ironda cia gutemwo iria cekaraga cingikahona.. riria wahurura ndugathumbure haria watema. Ndukahahumbire na kindu o giothe nigu muti urute giko giothe.

Ndukariganirwo ati miti niuthundukaga ringi kumana na kuhururwo. Mithemba ingi niikaga uu makiria gukira iriaingi. Niukoragwo uri uhuthu gwika uu riria miti ino iri na mwaka umwe.

Miti ingi na makiria miti ya matunda niikoragwo maciaro maingi riria iri na mياهو miingi. Mياهو ino yumanaga na muti gutinio uri munini. Riria muti wagia na mياهو ino niwega onayo itinio nigu irute ingi. Njira ino noicokerwo maita mingi niguokwongerera biashara ya miti no eterera mieri na makiria mbere ya kuhurura ringi Ririkana ati nigu gukuhotithia kuingira thoko ya carbon wagiriirwo kureke miti ikure gwa kahinda kanene. Nitwagiriirwo ni kureka miti ikure gwa kahinda gatanyihire miaka 30, guceha na kuhurura nigu ikure iri na hinya muingi na mititu ikorwo iri miega.



Pruning cuts should be made just outside the branch collar.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

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. TIS makiria nihiinyagiriria uhandi wa miti ya matunda nay a kinduire na ingi iria ingihota guikara gwa kahinda gakerite 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 nigu iikaga, no geria kurora kwanyu na miti ya kuu nigu umenye wega. Miti ingi

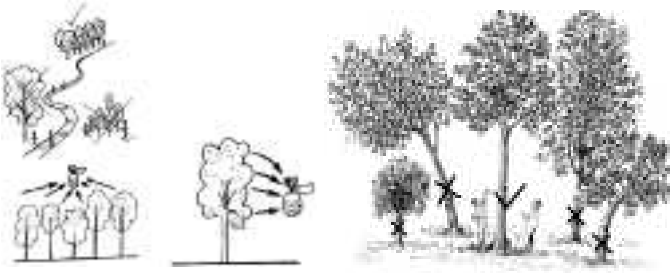
ibataraga miaka 2-3 nigu irute mbegu njega.

4. Ni muti uriku mwega wa kunganiria mbegu?

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



Source: Robbins, 2004.



Guthura muti mwega wa kugetha mbegu.

- Niwega kungania mbegu kuma kuri mithemba 30 na makiria ya miti niguo ukorwo na rurira rwega, miti ya mbegu yariirwo nigukorwo na utaganu wa 50m-100m niguo 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 macenja rangi, moma na magua thi. Maita mangi cikoragwo cirri njega riria makoni mavenjia kuma green nginya brown. Roar maandiko muico wa ngathitimbegu nyingi cikoragwo cirri njega riria ciagua kuma mutiini
- Ririkana gutigirira ati uri na rutha rwa kungania mbegu kuma kuri mwene miti
- Riria wongania mbegu ririkana kwandika haria wekira na ritwa, muthenya na kuria wongania

6. Twagiriirwo nikungania mbegu atia?

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

7. Tungimenya atia ati mbegu ni njega?

- Wambere roar mbegu na wehutie iria nini na huthu kana cirri na ngurani ya rangi kumana na iria ingi. Tutambi notukorwo tuthukitie mbegu.
- Oya muhiano wa mbegu na utinie na urore kana nicikinyitie ugima na kana nicithukitio ni tutambi
- Kuri mbegu iria cikoragwo na ngothi nyumu, cikie maaiini niguo ucigeria. Mbegu njega nicirikaga maaini na iria thuku cikareera.
- Kuri mbegu iwe nouganyie na kuhuhana gucungu niguo 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 nguo ingi na ureke hakorwo na urugari(ti maai mahiu). Roar mbegu o muthenya kana cirri na dalili cia kumera. Riria ciambiriria kumera,iga namba ya muthenya na namba. Kigerio giki giikaraga gwa kahinda ka ciumia 2 kuringana na muthemba. Kumera gwa gicunji kia 50% mikuuga uri na mbegu njega. Mithemba ya iria ikoragwo na mbegu nini iria iri na kumera gwa gicunji kia 5% no kiega.

8. Nikuhanda tuhandaga mbegu kana ni kuiga?

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

9. Ni mbegu ciothe cimeraga?

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

10. Tuhandaga mbegu atia?

- Mbegu imwe iria cimeraga naihenya nocihandwo mugundaini. Mithemba iria ibataraga maundu ma mwanya 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 niiciraga njahirira na nocitinio na cihandwo ta muti.
- Guceha nogwikwo kuri muti uteri muku 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 ungiteithia maria maturigicirii. Uria gikundu githuure mutongoria na munini wake.

Wira ni kungania uhoro wa o muthemba wa miti:

Ritwa ria muti / uhoro makiria wa mbegu – kuria kwega ungonia 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.

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

Mazingira Bora



TIST

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

Kiswahili Version

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



**Mkutano wa Nguzo wa kila mwezi wa Chuuriu TIST uliofanyika tarehe 20/01/2023.
Mkutano ujao utakuwa tarehe 17/02/2023.**

***Ndani
ya
gazetti:***

Ni wakati wa kutayarisha shamba lako la Kilimo hai. Uku. 2

Kutengeneza mbolea kutokana na mimea – mbolea ya kiasili. Uku. 2

Kupunguza na kupogoa miti kwa ukuzi mwema. Uku. 3

TIST: Ukusanyaji wa mbegu. Uku. 4



Ni wakati wa kutayarisha shamba lako la Kilimo hai.

WanaTIST 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 ikiuweka 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.

Kutengeneza mbolea kutokana na mimea – mbolea ya kiasili.

Mboleo ya majani ni mbolea ya kiasilia ya kusaidia mimea yako kukua. Ni bora zaidi ya mbolea za viwanda kwani ni ya kiasili na haina athari za kuumiza mimea na mazingira. Kuna njia nyingi za kutengeneza mbolea, lakini njia ifuatayo imekuwa saidifu katika baadhi ya maeneo. Uliza majirani zako katika cluster yako ni gani imewaonekana.

Utayarishaji wa mbolea:

- 1) Chagua eneo lenye upana wa mita nne na urefu wa mita nne la kuchimba shimo lako la taka
- 2) Fagia sehemu hiyo.
- 3) Chimba shimo la mduara lenye upana wa mita

tatu au nne na mita moja na nusu kina.

- 4) Kusanya masala yote ya mimea uliyo nayo na uyakate kuwa sehemu ndogo ndogo (kwa mfano majani na mashina ya mahindi, mtama, maharagwe).
- 5) Weka masala haya ya mimea katika shimo ilo hadi kina cha nusu mita.
- 6) Halafu ongeza lita tano za jivu.
- 7) Halafu uongeze centimita thelathini (ama kiwango kilichopo) za kinyesi cha mifugo (kwa mfano kinyesi cha nguruwe, ng'ombe, mbuzi au kuku).
- 8) Ongeza safu nyingine ya majani ya mimea na mashina (nusu mita).



- 9) Ongeza lita zingine tano za jivu.
- 10) Ongeza majani na mashina tena hadi shimo likaribie kujaa.
- 11) Hatimaye, ongeza safu ya udongo hadi shimo lijae.
- 12) Unapokuwa ukiweka udongo shimoni, ingiza fimbo ndefu katikati mwa shimo hadi ifike chini ya shimo.
- 13) Liache shimo la taka kwa miezi mitatu (siku tisini).
- 14) Katika kipindi hiki tumia maji yako machafu kuweka katika shimo hili. Kwa mfano, baada ya kuosha nguo au nyumba, yamwage maji uliyotumia juu ya shimo. Ikiwa una mifugo waweza pia kumwaga mikojo ya mifugo juu ya shimo.

- 15) Jambo hili litaongeza naitrojeni kwa mboleo yako.
- 16) Jaribu kuweka maji kila siku kwa njia hii, ama wakati maji yapo.
- 17) Baada ya siku tisini mbolea itakuwa tayari.

Tumia fimbo kama kipima joto – mbolea inapokuwa tayari lazima iwe na joto na waweza kuona mvuke ukitoka kwa fimbo hiyo baada ya kuitoa.

Matumizi ya mbolea hii:

Ukishachimba mashimo yako ya kupanda mahindi, mtama au mimea mingine, ongeza mboleo kiwango kinachotoshea katika kiganja chako katika kila shimo. Angalia ili kujua matokeo!

Kupunguza na kupogoa miti kwa ukuzi mwema.

Katika TIST, tumejitolea kutunza miti tunayopanda kwa ajiri ya TIST kuikua kwa miaka thelathini kabla ya kuikata. Hii ni sababu mojawapo ya ni kwa nini ni muhimu kufikiria vizuri kuhusu ni miti ya aina gani twataka kukuza katika mashamba yetu. Hata hivyo, kupunguza na kupogoa miti kwaweza kusaidia kuiweka miti yako ikiwa yenye afya na inayotupa vitu muhimu mti unapokua.

Kwa ujumla, maana ya kupunguza na kuipogoa miti ni kuboresha afya ya kila mti, pamoja na ya msitu wote. Hili litafanyika kupitia kuichagua miti iliyo bora zaidi katika msitu. Kwa aina nyingi za miti, pamoja na miti ya mbao, grevillea, mikaratusi na cypress, miti hii san asana huwa miti mikubwa zaidi, kila mti ukiwa na shina moja lililonyooka. Miti yaweza kuwa na mahitaji mbalimbali ya nafasi kulingana na aina, mahali, ilivyopandwa (miti iliyo mashambani ya mimea ya vyakula ama miti iliyopandwa ili kupunguza upepo) na tabia nchi, lakini kuna kanuni zingine za kijumla hutumika.

Kukuza miti iliyo na nguvu na afya, nafasi ya mita mbili hupendekezwa. Nafasi hii ni sawa kwa miti mingi ya TIST (grevillea na cypress), lakini kumbuka kuwa miti mingine huitaji nafasi zaidi (miembe na mikandamia, kwa mfano). Kuipa miti nafasi inayofaa husaidia kupata maji na virutubisho tosha vya kuikua hadi panapowezekana. Nafasi ndogo zaidi inaruhusiwa miti ilipo michanga. Miti inapokua, miti mingine itakuwa mikubwa kuliko majirani. Hii ndiyo miti wapaswa kuacha. Kuchagua ni miti gani ya kukata, angalia miti iliyo bora zaidi na ujue kama ina nafasi ifaayo. Kama haina, wafaa kutoa miti mingine iliyo karibu.

Ukishachagua miti ya kutoa, ikatie chini kabisa. Katika wiki na miezi inayofuata kukata, miti mingi

itaanza kuchipua kutokana na kisiki cha mti. Ili kuzuia mti kuchipuka tena, kata au uvunje miche iyo chipukizi iliyo katika kisiki.

Njia mojawapo iliyo rahisi zaidi ya kujua kama mti wapaswa kukatwa ni kuangalia ukubwa wake ukilinganisha na miti iliyo karibu ya umri na aina moja. Ukuaji wa mti utatofautiana kulingana na udongo, maji yaliyopo na kadhalika. Kwa ujumla, ikiwa miti yote ya aina moja katika eneo Fulani ina karibu umri mmoja, miti iliyo mikubwa zaidi inaweza kuchaguliwa kuachwa kukua. Kiashiria kingine cha afya ya mti ni mahali taji la mti katika dari lilipo. Miti liyo na taji juu ya dari la kijumla la miti yaweza kunyonya mwanga zaidi ya miti iliyo na taji chini zaidi na kwa hivyo huweza kukua bora. Kumaliza, miti yafaa kuwa na shina moja, lisilo na ugonjwa mkuu au kuoza. Hata hivyo, ili halimaanishi kuwa miti yote midogo yafaa kukatwa! Langa kunafasisha kwa mita mbili ili miti iwe mikubwa ba yenye afya iwezekanavyo ili kuzidisha kunyonywa kwa kaboni.

Unapofanya uhamuzi wa kupunguza miti, kumbuka kuwa kiwango cha ukuaji hutofautiana kulingana na aina ya mti. Kama mwembe unakua karibu na mikaratusi mingi, mwembe unaweza kuwa mdogo na unaokua pole pole zaidi ya mikaratusi inayokua haraka, lakini kwa uhakika haupaswi kukatwa kwa sababu ni mdogo zaidi! Kwa kweli, mti kama mwembe ni wenye umuhimu mkubwa kwa sababu ya matumizi yake katika kupeana matunda ya kula na ya kuuza. Mwembe ni bora zaidi pia kwa mimea mingine iliyo shambani. Mkaratusi waweza kufanya miti na mimea mingine iliyo karibu kukua vibaya. Ni muhimu kukumbuka hili unapochagua ni miti gani utapunguza. Kuna matumizi mengi ya miti, kulingana na aina zaidi ya kunyonya kaboni. Kwa mfano, waweza hitaji miti ya kivuli. Hapa,



wafaa kuupa mti nafasi kubwa zaidi ili kuufungulia jua zaidi. Hili litasisimua mti kutengeneza matawi mapya katika shina kuu na matawi makubwa. Ukitaka kutumia miti ili kupunguza upepo, iache miti iyo katika mistari kuwa karibu zaidi, lakini kata miti iliyo pande hizo zingine ili kuongeza kichaka.

Kupogoa.

Katika msitu asili, miti hujipogoa yenyewe. Matawi katika dari la juu hufunikia matawi yaliyo chini zaidi. Jinsi majani yaliyo katika matawi ya chini ya yanakufa, ndivyo tawi lililoyashikilia pia linafa. Matawi yaliyokufa na kuoza huanguka yenyewe au kuangushwa. Hata kama kupogoa huku kwaweza kuonekana katika mashamba ya TIST, inaweza kuwa muhimu, ama kwenye faida kupogoa kwa kutumia mikono. Ingawapo kila aina huitaji njia tofauti ya kupogoa, kanuni chache za kijumla hutumika katika miti yote unapokuwa ukichagua ni matawi gani yatakatwa.

Aina nyingi za miti huwa na shina moja kuu lililo mchangani. Miti iliyo na shina moja hukua haraka zaidi na haiwezi kupasuka kwa urahisi wakati wa dhoruba. Ikiwa mti wenye mashina mengi umechaguliwa kama mti mmea, wakati wa kuchagua ni tawi gani kuacha, kwa ujumla chagua tawi lililo kubwa ziadi, lakini hakikisha lina afya, matawi mengi, halijaoza na limenyooka.

Watu wengi hufikiri wapaswa kukata matawi sambamba na shina. Huu ni uongo. Mikato yafaa kufanywa kwa upande tofauti na shina la mti, kidogo nje kutoka kwa shina. Hili hupunguza mti hulio wazi na huruhusu seli zinazojitenganisha katika tawi kukua juu ya mkato huo jinsi wakati unavyokwenda (angalia picha ya kwanza). Hili husaidia mti kukaa na afya na huzuia kuoza.

Unapopogoa usifanye zaidi ya inavyotakikana.

Matawi yaliyokatwa yaweza kutumiwa kama kuni au chakula cha mifugo. Ata kama hili ni jambo nzuri, kumbuka kuwa ata kama kupogoa huboresha afya ya mti na huongeza ukuaji jinsi wakati unavyoenda, Usisahau kuwa miti hutengeza mashina mapya karibu na kulipokatwa. Kwa ujumla, mashina haya ni rahisi kutoa katika mwaka wa kwanza wa kukata kwa kuvunja mashina. Mashina mara nyingi hayakui tena.

Miti mingine, sanasana miti ya matunda, hutupa mazao bora yakiwa na mashina mengi. Miti hii hukatawa chini karibu na mwisho wa shina ikiwa michanga ili kuisimua ukuaji mpya. Mti unapoimarisha mashina haya, kwanza uwezo wa mti wa kunyonya jua utapungua na mti utakazwa kwa sababu ya kidonda ambacho lazima kipone. Ukitoa mengi sana, mti hutakua pole pole au ufe. Ukishatoa tawi, liache eneo ilo. Usilifunike kwa chochote, ili mti hutoe sumu yoyote iliyopo katika kidonda. Hii pia ni njia ya kimsingi inayotumika katika binadamu kuponya anapokatwa.

Kumbuka kuwa ili kuingia katika soko la kaboni, twahitajika kujitolea kuikuza miti kwa muda mrefu. Twafaa kuruhusu miti kukua kwa miaka isiyopungua thelathini, kuipunguza na kuipogoa ili kutengeza misitu yenye matumizi na endelevu itakayotupa faida kwa miaka mingi ijayo.



Pruning cuts should be made just outside the branch collar.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

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! Mwingine yaweza kuwa migumu kudhibiti, yaweza kuwa na sumu kwa mifugo yako au kutumia maji mengi sana. Chagua unayojua itaifaidi inapopandwa.

3. Ni miti yote uzalisha mbegu kila mwaka?

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

4. Ni mti upi ulio mzuri wa kukusanya mbegu?

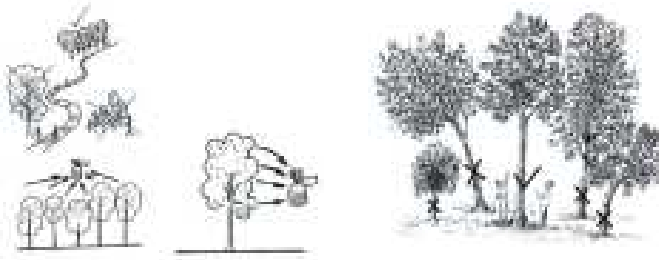
- o Kusanya mbegu kutoka kwa miti iliyo na afya ambayo huzalisha mbegu nzuri
- o Epuka miti iliyosimama kipweke kwa sababu



mbegu yake inauwezekano wa kuwa na mbelewele yakujitegemea ambayo inapelekea mbegu ya hali ya chini.

- o Epuka miti isiyozalisha na yenye sura mbaya
- o Chagua mti ulio katikati ya mingine yenye afya naya aina moja
- o Mbegu kutoka kwa miti iliyo na maua yanayoenea nje itakuwa yenye ubora wa juu badala ya yenye maua yaliyojikusanya pamoja.

Source: Robbins, 2004.



Kuchagua mti mzuri wa kutoa mbegu.

- o 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!
- o Chagua mbegu kutoka kwa mti unaokua katika eneo lililo katika muinuko na udongo sawa na unapotaka kupanda.
- o Chagua mti uliokomaa, si ulio mchanga.

5. Tukusanye mbegu lini?

- o Jua wakati wa mwaka mbegu zinapokuwa zimeiva na uwauliza wengine wanaoishi hapo au kuuangalia mti wewe mwenyewe.
- o Mara nyingine mbegu huiva matunda au maganda ya mbegu yanapogeza rangi, kukauka, au kuvunjika kwa urahisi kutoka kwa tawi.
- o Mbegu nyingi huwa tayari kukusanywa zinapoanguka kutoka mtini zenyewe.

6. Tukusanye mbegu vipi?

- o Kuwazisha eneo lililozunguka mti kwanza husaidia sana. Mbegu nyingi zaweza kukusanywa kutoka kwa ardhi, lakini kwanza angalia mbegu kama imeumwa na wadudu.
- o Mtu aweza kupanda mti na kuchukua mbegu, lakini jichunge!

- o 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
- o Jaribu kuangusha mbegu zingine kutoka kwa mti kwa kugonga kwa mti mrefu.
- o Jaribu kuweka shuka chini ya mti na kuutingiza mti kwa upole.
- o 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.
- o 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.
- o 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.

7. Tunawezaje kujua kama mbegu ni nzuri?

- o 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.
- o Kwa mbegu zilizo na ngozi ngumu, kuelea kwa maji ni jaribio zuri. Kwa kawaida, mbegu nzuri huzama kwa maji na mbegu mbaya huelea.
- o 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 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?**

- o 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).
- o Kwa mbegu zenye ngozi ngumu zaidi, mwongozo wa kimsingi ni kuziweka mbegu zikiwa safi, zilizokauka na penye baridi.
- o Mbegu zitolewe kutoka kwa tunda na kukaushwa vizuri. Kukausha mbegu, ziweke kwenye jua kwa siku mbili au tatu.
- o 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.
- o Andika mkebe jina la mbegu na tarehe ya kukusanya.
- o 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?

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

- o 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:

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

Mazingira Bora



TIST

The International Small Group & Tree Planting Program

www.tist.org

Kikamba Version

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



**Mkutano wa Nguzo wa kila mwezi wa Chuuriu TIST uliofanyika tarehe 20/01/2023.
Mkutano ujao utakuwa tarehe 17/02/2023.**

Inside: Ni ivinda ya kuseuvia miunda kwa nima ya kusuvia. Page 2

Kuseuvia vuu wa yiima - Vuu ute na kemikoo. Page 2

TIST: Kutaanisa na kusea miti yaku kwoonda wa kwiana kwailu. Page 3

TIST: Kukolany'a Mbeu. Page 4



Ni ivinda ya kuseuvia miunda kwa nima ya kusuvia.

Tukundi tunini twa TIST tula twithiitwe tuitumia nzia ino ya nima ya kusuvia (CF) nimaendee 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 kivakui kwa mimema. Ithanguu niyikutwetheesya 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. Ndukaime.
- 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 uyusuya 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.
- Ndukaime 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 yimani useuvye vuu/mbolea.
- lilikana ndukaingiie 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 oyul!

Kuseuvia vuu wa yiima - Vuu ute na kemikoo.

Vuu wa yiima ni vuu useuvitw'e vate ndawa na mimea kuma muundani na nutumaa mimea yiana nesa. Ni museo kwi vuu wa kuaa ula wina kemikoo nundu niwakuma mniemani na niwamana ti wakuu na nwanangaa liu kana mawithyululuko ta vuu /vatalisa wa kuaa. Ve nzia mbingi sya useuvia vuu uyu, lakini ve nzia imwe nzeango kwi syothe isioni imwe. Kulya mutui waku wa ngwatanio nyenyu kila kithukumite nesa kwoo.

useuvia vuu wa yiima.

- 1) Kusakua kisio kya matambya 4 x 4m na kwisa yiima.

- 2) Enga kisio.
- 3) Inza yiima uthathau wa 3 - 4m na 1.5uliku.
- 4) Kolany'a matialyo ma mavemba, muvya, mavoso na uutilanga tulungu tuniini.
- 5) Ikiya yiimani itumie uliku wa 0.5m.
- 6) Ikiya muu wa lita itano.
- 7) Ongela kyaa kya indo ethiwa kivo kya uliku wa 30cm ethiwa vaii oundu kiana (uyu ni vuu wa nguluwe, ng'ombe, mbui kana nguku).
- 8) Ongela matu na makusa uliku ungi wa 0.5m.
- 9) Ikiya muu ungi wa lita itano.
- 10) Ongela matu na makusa withie yiima notayausua.



- 11) Ususya yiima na muthanga.
- 12) Uyususya yiima ikia muti muasa kati withie utinite yiimani ungu.
- 13) Eka yiima yiu yiyiue vandu va myai itatu kana mithenya miongo kenda.
- 14) Ivindani yii yonthe osaa kiw'u kila kina kiko uketa vo ngelekany'o kila wavua nakyo kana kuthambya miio. Ethiwa wina maumao ma indo no wite vo.
- 15) Kii nikyongelaanzeve ya Nitrogen nthini wa vuu.
- 16) Tata navinya ungithye yima yii kila muthenya kwa nzia ila utonya.

- 17) Itina wa mithenya miongo keenda vuu wiithiwa wi tayali.

Tumia muti uyu wikati ta kithimi kya uvyuvu. Vuu wasuva ukeethiwa wimuvyu na nowone muti uuyu waumya uitoa.

Utumii wa Vuu wa yiima:

wenza maima ma uvanda mbemba, muvya kana o mimea ingi ikia ngundi imwe ya vuu kila yiimani. Syaaisya wone kila ukwata kuma vo!

TIST: Kutaanisa na kusea miti yaku kwoondu wa kwiana kwailu.

Kwa indi, kitumi kya kutaanisa na kusea miti ni useo wa uima wa kila muti, na kwa useo wa uima wa mutitu w'othe.

Undu uyu wikawa kwa kusakua miti ila miseo thini wa mutitu. Kwi mithemba mingi ila ni ta Misanduku, Mikuvulya na Minyoonyoo ino ni miti mala maingi yithiawa yi minene, na yina muthamba umwe (itena ngava). Kila mithemba wa muti niwithiawa na mawendi kivathukany'o nikana wiane kwa mituki na wina uima museo. Kwongelelea ni kana miti imwe niyithiawa iyenda usuvio kivathukany'o na ila ingi kwianana na vata wayo kana vala ivanditwe. Yila miti ivanditwe ta ya uimi wa muvango wa TIST ni ivandawa na nzia syi kivathukangany'o (ngelekany'o ni miti ya kusii kiseve muundani) thini wa isio syi kivathukany'o (ngelekany'o ta w'umiloni wa sua kiimani kya Mt. Kenya na uthuilono wa sua kiima kiu kya Mt. Kenya) na kivathukany'o kya seve na mawendi amwe ma miti uyithia ni mavwanene.

Kwa miti kwiana na ulumu yi na wailu matambya eli (2metres) ni maile kwa utaaniu wa miti. Kutaaniw'a kuu kwa miti kaingi ni kwailaa kwa miti ila ivanditwe ni TIST imwe yayo yi ta mithemba ya miti ta, misanduku, mivengele na mikuvulya kana minyoonyoo. Tulilikane kana miti imwe niyendaa utaaniu munene kwi ingi ta iembe na ikandania.

Kutaanisa miti nikutumaa miti itonya kumya liu na kiw'u kuma muthangani nesa vatekuaania, undu uu nutumaa miti yiana muvaka kiwango kila yaile. Miti ithengeanie niyaile miti yi minini indi miti yaendee na kwiana niw'o miti imwe niyithiawa yi minene na uthui mwingi kwi ingi. Miti ino niyo yaile kuekwa ikeana ("crop tree"). Thini wa kuamua ni muti wiva ukuvetwa na niwiva ukutiwa niwaile ni kusisya kana mwanya ula wi katikati wa miti isu kana niwaile, ethiwa ndwianiie niwailwe ni kumya miti imwe.

Itina wa kusakua miti ila ukumya, mitilile

vaaya nthi, mithenya yukite kitina kiiu nutonya kwona kithongoote, nikana thongoo isu iikaendee kwiana niwaile kuitila ingi kuma kitinani.

Nzia imwe ya kumanya kana kusakua muti ula ukuveta ni kwa kusianisa undu muti wiana kwianana na miti ila ingi yavanditwe imwe. Elewa kana miti yianaa kivathukany'o kwianana mithemba wa muthanga, undu kiw'u kiana na vuu. Kwa vamwe, ethiwa miti ila yi vamwe ni ya ivinda yimwe miti ila minene niyo yailwe kuekwa ikena muvaka kuima "crop trees". Kingi kitonya kutuma muti withiwa wi mwailu ni undu wina matu maingi kana tukava vala tui. Miti wina matu kana tuukava kuu yulu withiawa utonya kwosa kyeni nesa na kwi miti ila matu me itheo na nitonya kwiana nesa. Mwisoni kana muti wa kuima "Crop tree" waile kwithiwa na muthamba /kitina kimwe, kiteni uwau kana muinyu. Onavala kuu tikwasya miti yothe minene niyaile kumw'a lakini kieleelo ni vethiwe na mwanya wa matambya eli (2metres) katikati wa miti in kana miti ila imeaa na ngava mbingi yithiwe yimianie na yiane nesa na kwosa kwa seve ila itumiawa ni miti (carbon capture) kwithiwe kwa iulu.

Yila uutumia nzia ithi syi vaa iulu lilikana kana kwiana kwa muti kuendanasya na mithemba wa muti. Kethiwa muti wa kiembe ni wianite vamwe na musanduku, kiembe kithiawa ki kinini na kianite mbola kwi musanduku ula wianaa na mituki, niw'o ndutonya kutema kiembe kiu nikwithiwa ni kinini kwa kusisya. Niw'o muembe ni wavata nundu nutumiawa ta liu na ona kutwika wianaa kavola, na kwi miti mithemba mingi itumikaa maunduni kivathukany'o na ti kwa kwosa seve thuku tu (carbon capture). Ngelekany'o ni ta muti wa muunyi, muti uyu niwaile kuunenga mwanya munene nika wose kyeni na sua nesa nikana umesye mbonje na ngava mbingi kwa mituki. Ethiwa wienda miti ya kusii seve nayo niwailwe kumivanda kwa musitali ithengeanie nikana ithunge.



Kusea.

Nthini wa mititu ya kwimesya, miti niyi sea yo mbene. Ngava ila syi yiulu nivithaa tuukava kana tuvonge tula twi nthi wasyo na matu ma mbonge syithi mayambiia kuma na kwoa kila kitumaa nasyo mbonge/ngava isu syuma na kwoa na iyitila kuma mutini. Oyila kwisea kwa miti kutonya kwithiwa thini wa mititu ya TIST, nivaile vala ve vata na ni useo kusea na moko. Yila uutw'a /kuamua ni ngava/mbonge syiva ukumya niwaile ni kuatiia nzia imwe, nikwithiwa miti yothe ndiseawa undu umwe.

Miti mithemba mingi yailwe ni kwithiwa na muthamba umwe kuma nthi. Miti ya muthamba umwe niyanaa mituki na ndithiawa na thina wa kwatuka yila kwina kiuutani. Ethiwa muti wina mithamba mingi na niwasakuwa ta muti wa kuima "crop tree" ve syindu waile niumannya ta muthamba ula munou/munene niwaile, na ndwaile kwithiwa wi mwou kana kwoneka wina matu maingi ni waile ithiwa wi mulungalu.

Kindu kimwe kyosawa nai nthini wa kusea ni kana mbonge ila syianite vamwe na muthamba nisaile kutemwa.

Uu ti w'o kutilwa kwaile kwa ngava ila yivaasa na muthamba. Kiikitumaa muthamba uyu waile wiana na kuvwika kitau kiu nundu wianu wa ukava usu niwianaa uvoetye kitau kii vate kwoa. Sisy visa namba 3 ula uatiie.

Yila ukusea miti ndukasee na itomo ati nikwithiwa kaingi nitumikaa ta ngu kana uithyo wa indo. Lilikana kana kusea nikutumaa miti yiana yina uima mwailu na ingi kwa ivinda ikuvi ikiana na mituki, kumya matu kutiaa muti utena vinya mwianu wa kwosa sua na kwoou uituma muti withiwa na thina wa kwosa sua na uyithiwa na kitau kila kyaile uvoa. Itina wa kusea vala wasea nivaile kuekwa vakavoa, ndwaile kuvwika kitau kiu kiikatume muti usu wambiia kwoa kana kulikwa ni sumu, nundu muti

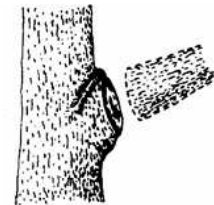
uyu uvoaa uta mundu atemwa.

Undu ungi ni kana muti wasewa vala vaumw'a ukava vambiia uthongooa ovau utee kwoou nuseo kutila thongoo isu itaneana kaingi iisyokaa uthongooa ingi na ninzeeeka na mituki.

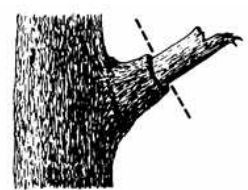
Miti imwe ta ya matunda niyiekaa na kusyaa nesa yina ngava mbingi. Kwoou miti ino niseawa yi minini ngava ila syi vakuvi na muthanga nikana itonye kuthongoo ingi kuu yiulu na iyiana na mituki. Muti uyu wa mina kwiana wambiia kuthongooa ingi thongoo ithi noitilwe ni kana muti uyu withiwa na usyao museo na muti uthunge nikana usyae nesa. Ithiwa wisi niwaile unenge muti ivinda itina wa kusea mbee wa utana usea ingi nikana muti withiwe unavoa itau na ukakwata vinya.

Lilikana kana thini wa soko wa seve thuku (Carbon market) nitwaisye nitwaile kwikalya miti vandu va ivinda iasa.

Miti niyailwe ni kwiana na kwikala ta vandu va myaka ta miongo itatu. (30years). Tusea na kuimbia na kumitaanisa miti kwa useo wa myaka yukite. Miti imeete ta ikuthu nditonya utalika nthini wa soko ya nzeve itavisaa kwoou nditonya uvitukithwa nthini wa TIST ta miti italika.



Pruning cuts should be made just outside the branch collar.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

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?

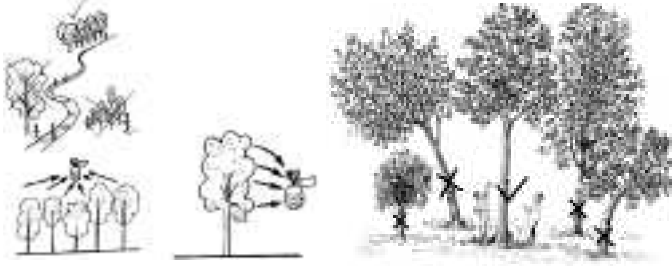
Miti mingi kwaw'o nisyaa na kunengane mbeu kila mwaka, Indi niwaile usyaaisya miti ila yi kisioni kyaku nikana umanye nesa. Miti imwe no ithiwa yumasya mbeu /mbindi nzeo itina wa myaka ili kana itatu.

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

- o Kolany'a mbeu kuma miti ila yina uima museo
- o Ndukendeew'e ni mbeu sya miti ila imeete vandu yiyoka
- o Ndukendeew'e ni miti ila itasyaa nesa na yina mbeu syina umbo muthuku.
- o 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.



- o Umbany'a mbeu kuma ngavani kivathukany'o sya muti ula wa sakua.

Kuma: Robbins, 2004**Nzakua muti mbeu kuma mutini musyai museo.**

- o 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.
- o 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 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.
- o Tata usakue mbeu kuma mitini ila yianaa na mituki muthangani, nzeveni, na utuluni umwe na vala ukwenda uvanda.
- o Nzakua miti miimu na ti ila yesanga. Miti miviku yithiawa na mbeu /mbindi mbingi kwi muti munini.

5. Ni indii tukolanasya mbeu?

- o Ivundisye kuwosany'a mbeu yitunda yeew'a
- o 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 kikusuni (ngilini) kutwika langi wa kaki/muthanga. Syisya musolo itina ithanguni yii wone ngelekany'o.
- o Mbindi mbingi syithiawa tayali syavaluka kuma mutini
- o Lilikana kuvoya mwanya wakwosa mbeu/mbindi / ngii kuma kwa mwene muti
- o Wa mina kumbanya mbeu weekia vala weekia lilikana kuandika isyitwa ya muti, matuku ma kumivuua na niva wamyumya.

6. Nata tukolanasya mbeu?

- o 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* (candle-nut) nikolanaw'a kwa nzia ino.
- o Mundu no kulisa mutini kwuvuua mbeu lakini wisuvia kuvaluka!
- o 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 mbeu 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.
- o Mbeu imwe nutonya ukuna na muti muasa ivaluke.
- o Tata wie kyandalua ungu wa muti ula ukumia mbeu na uithingithya o kavola wite mbindi/ngii.
- o Kwa miti ila miasa nutonya umiseuvisya mboloi uitumia muti muasa kwa kuwoveea mukasi kwokoni kumwe na ikanda kula kungi.
- o 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.
- o Mbeu syoothe nisyale umwa miki kana matundani. uu nutonya kwikwa na kw'oko kana kwanikia sua syiyatue.

7. Nata utonya umanya mbeu ni nzeo?

- o Mbee ni kwa kusisya na kuveta ila nini kwi ila ingi, ila syina langi utailye ta iingi, ila mbanange ni tusamu.
- o Osa mbeu imwe watue usisye nthini kana ni mbiku na kana niyithiwa na muiinyu.
- o 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)
- o Kwa mbeu imwe nuvathukanasya kwa kusunga kana kuulukya na nzele kuveta ila mbuthu.
- o Nutonya kusyimithya mbeu umanye kana nitonya umea. Osa namba nini ya mbeu ila ukolanitye ya ngii ta (20-100) ethiwa nisyale 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. Isezo 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. Nituvanda kana twikita kwia mbeu?

- o 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.
- o Mbeu niyaile kumwa ikondeni na kwanikwa inyae nesa. Kwanika mbeu syanike suani vandu va mithenya ili kana itatu.
- o 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.
- o Vandika kathangu kena isyitwa ya mbeu, matuku ala woosanisyee na niva wamyumisye.
- o 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?

- o Kilio kya mbeu/ngii/mbindi ila iume muno iamuwawa ni muthemba wa muti ula syumite. Imwe nisyendaa kuiitwa be na uu ukalew'a ithanguni ya mwaini w keli.
- o 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?

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

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

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

- o 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.
- o Matilo ma miti ni mosawa kuma ngavani sya miti na methiawa na metho kana kundu kwa kuthongooela kuinnyiva 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:

Ilyitwa ya muti, uelesyo wa mbeu yaw'o, vandu ve vau vakuvi utonya kwosa mbeu, Nzia ya ukolanya l mbeu, Undu wa kumia, undu wa kumiita 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

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

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 participants.



**Mkutano wa Nguzo wa kila mwezi wa Chuuriu TIST uliofanyika tarehe 20/01/2023.
Mkutano ujao utakuwa tarehe 17/02/2023.**

Inside: Kasarta nepo, chopet 'tap imbaret kokany. *Page 2*

Ketoo keturrek chebo minutik. *Page 2*

TIST: Serishet ak chororet ketiguk sikobwa komie. *Page 3*

TIST: Kayumetab kesuwek. *Page 4*



Kasarta nepo, chopet ‘tap imbaret kokany.

Groupishek 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 rururu.

Ole kitayorishondo imbarenik.

- l’ngol imbaret arawet ageng’e kotomo kobwa robwek.
- l’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. Koboch 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 ltilil 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!

Ketoo keturrek chebo minutik.

Keturek ko toreti mising minutik kochok en ngungunyek. Ago kororonon amun motinye ngemet en rurutik ago nyumnyum kenyor ago motiye oliyet neo mising, motiye ngemet en agobo ltondab emet. Miten anyun orinuwek chechang che kimuchi ketounen keturek en koborunet ne isibu ko kigoyomnda biik chechang temik. Otebenge en Kilasta ole kiboisioto biik alak.

Tounet ketoo kechob keturek.

1. Lewen ole imuchi ichoben keturek (4m by 4m).
2. ltilil yoton.
3. Bal keringet netinye kokwoutik 3m - 4m - 1.5m kochut orit.
4. Iyum anyun ngetunanikab imbar tugul ak itonaton komengegitun ak itorchi keringet chon ko kou (sogegab ketik mobekkab bandek , ngendek) ak alakau.



5. Torchi keringt koit 0.5m.
6. Tesin beekab 5ls chebo orek.
7. Tesin sorowekab tuga,neng,Igogenik kot koit 30cm.
8. Tesin ngetunanaik kot koit 0.5m.
9. Tesin beek 5ls chebo orek.
10. Testai itesi ngetunanik got konyi keringet.
11. Tesin baragut ngungunyek.
12. Ye itestai icheng bitoiyot ne koi ak ilumchi kwenutab keringet kot kotiny kwony.
13. Igomuny keringet kotar betusiek 90 (orowek somok).

14. En kasariton tugul itestai itumchi beek chon kiunen tuguk en kaa.Ingot itinye tuga imuchi iyum sogororek asi itesi keringet.
15. Niton kotesin nitrogen.
16. Yai kouniton en betusiek tugul.
17. Ye kagobata orowek 3 ko koruriyo keturek.

Togunen burgeyet ne mi keringet.

Boisietab keturek:

Ye kagoit ichob imbaret inam ibal keringonik kosibgei ak minutik cheimoche igol. Keringet angenge koibe keturekab rubeito, rib anyun wolutik che bitunen imbarengu.

TIST: Serishet ak chororet ketiguk sikobwa komie.

Tugul en tugul, boisietab serishet ak istoetab sakek chechang kotetat kotoret chametabgei nebo ketit ak timdo tugul komugul. Niton keyaei kokakewei ketik chekararon en timdo tugul. En ketik chechang kou chebo gaa,krivelia,blukam ak saipres ,chuton ko ketik che echen en tugul ak kotinyei temet agenge ne chulat. Makchingei ketik poroindo ko tiengei ole pitei, ole kakikolda ak etaptab barak lakini imuche kobais tuguk alak.

Sikopityo komie ketik, komakatin mitainik aeng en kwenetab ketik. Niton ko eng ketik che chang chebo TIST kou krivelia ak saipres nganda mache ketik alak paraindo neo cheu maembe ak makademia. Igochin paraindo ne mie ketik kosich bek ak tuguk che igochin kurut komie. Iyanat paraindo ne kiten yontakomengech ketik. Yan ekitu ketik, koegitu alak kosir alak. Kisere ketik si korut en boraindo ne yamei.

Yekailwen ketik che kiistoi, ketilei chuton en ng'wony. Yeipata wikisyek ak arawek, kotoi kobityo

ketik alak eng ketatan amu ing'ata. Kiiriye ketichuton mengech en ng'ony yon imache mapityo.

Ngot ko chang ketik chekergei en oldo agenge keistoi ketik chemengech ak kebakakta cheechen kobityo. Atebetab metitab ketit ko kit age nebo komon. Ketik che tinyei metoek che baraen komuche konam kimnatetab asista kosir chemiten ng'wony ak komuch kobwa komie. Ne letunen, temik chetinyei kwenut agenge chematinyei mianwogik anan ko kiging'em. Nesire komoibaru kole ketik tugul che nuagen konyoru keisto! Barchingen baraindop mitaishek aeng sic kjomuch kokimegitun ak koechegitun akomuch koam koristo neo.

Yan imache iseraser ketik, konyolu inai ile ketik che terterchin koechegitu kotiengei kineu. Ngot konyonen maembe ak yemi blakam che chang, komuch kominginit kosir olemiblukam che kachan'ga. Maembe komuch korut kosir blukam chechagu, noto anyun konyalu ketil amun mingin.en imanit, ketit neu maembe kobokamanut missing



amun en tuguk che konu cheu lokoek che kiamei ak kialdoi. Maembe kora ko karan en minutik alak che rutu en im bar. Blukam komuch kowech ketik alak ak minuti komarut komie. Bo kamanut kibwat niton yan ileweni ketik che iseraseri.miten boisionik che chang chebo ketik kotiengi kit neu ketit kotabala ametab koristo. Kou en kabarunet, imuch imache ketik che konin uruet. En niton, konyolu igochi paraindo ketik kosir ole chamikochindoi sikonyorf asista neo. Niton kogochin ketit koet ak kogochin temenik che chang en ketit. Kot ketik che tertai koristo en lainit imuch inde ketik korupkei nganda nyolu keisto ketik chemi komoswek si kotes timwek.

Chororet.

En timdo nebo ketikab kipгаа kochororigei echegen. Temenik chemiten barak kotuchei chemite ng'wony. Yon inamei komeyo sokek chemitei ng'wony komeei kora temenik chenamei sakechuton. Temenik chekikosaiyo ak che kikochoroty kobutos ichegen. Imuche kochororak sagek ichegen en imbarenikab TIST nganda toreti

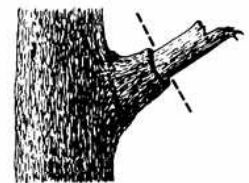
ngeisto sokek keboisie eunek. Nganda mache ketik cheterter olekichortai koterterchis komiten oratinwek che ratinwek che boisie en ketik tugul.

Ketik che chang ko magat kotinye temet agenge en ngwony. Ketik che tinyei ketit agenge koetu en chokchinet ak ketile yon miten robta. Ketit ne tinyei bitunwek che chang keibe koek minutik, yon kichenge ketit ne kiribe, cheng ne o en tugul ak inai ile matnyei miando age tugul ,ak kotinyei sogek ak ko tomo konun ak ko chulat.

Bik che chang kobwate kole kitile temenik en che matuitos al temenik. Inoni ko lembech. Tilet ko nyolu kotuiyo ak temenwet konegitchi ketit. Inoni koboose ole yataat ak kobagachi en orititab ketit si kogochi ketit koet komie en kasarta ne mie.



Pruning cuts should be made just outside the branch collar.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

TIST: Kayumetab kesuwek.

Kesuwek tebutik ak Wolutik.

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

Ketik chegororonen kochon kiinyortoi ichegot ko kigorut. En TIST kemwoe kele kemin kou Logoek ak cheboo kipгаа 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 keswek ketik en kenyt?

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

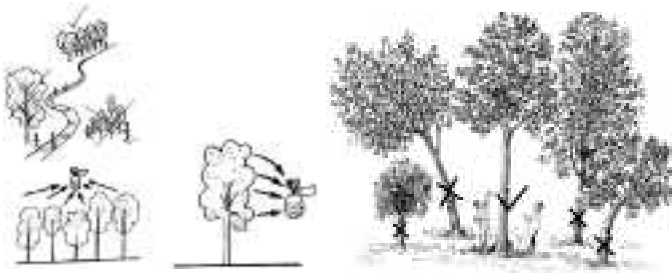
4. Oinon ketik neimuchi kenyorunen keswek chegororonen?

- o Lewen kesuwek chebo ketit nekararan
- o Ketik nemiten inegen komat inemu kesuwek, motinye chegororonen.



- o Ketit ne motinye iton komat ibut.
- o Cheng ketit ne miten kwenutab ketik chenin anan chegergei.
- o Iyumenkesuwek en keheberuwek cheter ak cheter.

Source: Robbins, 2004.



Lewen Ketik Chetinye Kesuwek Chegororon.

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

5. Kasarta ainon ne Keleweni Kesuwek?

- o Rib kasarta kenyit ye rurio Logoek.
- o Teben biik alak alan isochigen ak inye
- o Bitunen waletabgei en Logoek konam alak kobotiyo anan koyatak motogoik kometo kesuwek.

- o Ye inyoru chemiten nguong ko tinye koborunet kole kogongiyo.
- o Nyoru chomchinet en nebo imbaret iyum kesuwek.
- o Cheng motoget negararan nebo kesuwek ak isir torigit ak kainetab kesuwot.

6. Ole Komuchi Kiyumta Ano Kesuwek?

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

7. Ole kimuchi kamwa kele kororon kesuwek?

- o En Keret kotinye besiet amun alak komengechen alak kotinye itondo ne magergei ago tugul ko kesuwek chebo kot agenge.
- o Ker kesuwot angenge ngo kongat anan kotinye sususrik.
- o En kesuwekchuton miten cheimuchi koib koristo koboru kole mogorororen.
- o 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.



8. Komuchi Kemin anan Kagonor Kersuwek?

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

9. Igotos Kesuwek Tugul?

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

10. Kimuchi keminta ano kesuwek?

- o Kesuwek alak komuchib kemin ko moginde kabeti alak kindo motogoik asitun kemin.
- o Kesuwek alak kotinyengei kasarta bek ak burgeiyet.

- o En abogora k o kararan kegot kesuwet en kasarta ne momite Robta.
- o Tagenyoru Lesonit nebo kabeti en kasta nenyo.

11. Kinyorunen Ketik kasuwek kitiyo?

- o Ketik alagei kimuchi kenyor en tigitikab ketik kinemu a kemin.
- o 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 kodointet 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.

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