

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Members of Kariakomu TIST Clusters members during their meeting last month.

Inside:

Kairuni TIST Cluster: Learning by Doing
We have established a Raised Nursery Bed. *Page 2*

Ikindu TIST Cluster: Practicing Rotational and Servant Leadership Current Clusters Leaders from September 2016. *Page 2*

Benefits from Protecting Our Rivers
Planting more Indigenous and water friendly trees. *Page 3*

Soil Fertility
Get the most Benefits out of your Land. *Page 4*



Kairuni TIST Cluster: Learning by Doing We have established a Raised Nursery Bed.

By Mr. Micheu, Small Group member, Macho Group

Having learnt about raised nursery bed from the *Mazingira Bora* Newsletter, we, Kairuni TIST Clusters got interested with this Best Practice. Previously, we have been experiencing low survival rates of our trees upon transplanting. We have been trying to find a good way of ensuring that our tree survival rate improves.

When we learnt about TIST raised seedbed Best Practice, we decided to give it a try. We were impressed to learn how raised seedbeds help the seedlings roots become stronger and help avoid cutting of roots hence injuring them when transplanting. Members agreed to have a common Cluster nursery. Last month, we established a nursery bed with 3,000 macadamia, 1,000 avocados plus 10,000 indigenous seedlings. Our tree goal is

to plant an additional 20,000 trees in the next 12 months in our Clusters. Members are encouraged to do their own home nurseries as well. We are hopeful our efforts will work and will share results with you.



Group photo of Kairuni Cluster taken on 3 November 2016, during their Cluster meeting on that day

Ikindu TIST Cluster: Practicing Rotational and Servant Leadership Current Clusters Leaders from September 2016.

By Clifford Kimathi, Cluster Servant

We, Ikindu TIST Cluster are proud of having embraced TIST's Best Practice of Rotational and Servant Leadership. In Rotational leadership, we have democratically elected leaders serving in each position for 4 months. These leaders are Cluster Leader, Cluster Co-leader and Cluster Accountability person.

Cluster Leaders, Co-leaders, and Accountability people serve in each position for a period of 4 months. After 4 months of service, the Cluster leader rotates out. The Co-leader becomes the Leader while the Accountability person becomes the Co-leader. Women and men alternate in the elections. If this Accountability Person is a man, the next one elected will be a woman.

On 7th September 2016, we had Cluster Elections where the following persons were named as our Current leaders:

Leader	Margret Muthoni	+254 703 183 891
Co-Leader	Pamela Kathambi	+254 705 418 174
Accountability	Walter Muriungi	+254 726 556 033
Female Rep.	Pamela Kathambi	+254 705 418 174
Male Rep.	Walter Muriungii	+254 726 556 033

Male and Female Representatives will represent the Cluster at the Group of Clusters Council (GOCC) meetings.



Benefits from Protecting Our Rivers

Planting more Indigenous and water friendly trees.

TIST Small Groups are happy for the success in the riparian pilot program initiated by TIST to help conserve and protect our waterways. Farmers are choosing to stop cultivating near the river's edge to stop erosion and pollution of the river. Today, we have framers who have continued planting indigenous trees in their riparian areas and are following best practices for riparian areas. We are proud of their accomplishments and celebrate their work to conserve the rivers that we all depend on.

What are the benefits of indigenous trees in riparian areas (along the riverbanks)?

- (a) Indigenous trees reduce soil erosion and flooding.
- (b) Indigenous trees help to clean water in rivers, streams and wells.
- (c) Roots of indigenous trees catch and retain soil.
- (d) Indigenous trees help clean air.
- (e) Indigenous trees produce shade for preventing water evaporation.
- (f) Indigenous trees provide habitat and food for birds, animals, and insects. Preserving this biodiversity in this way can benefit our farms since, for example, some animals are important for pollinating crops and controlling pests.

Why is it important to conserve river buffers?

- (a) Plants and trees in a buffer along rivers keep the environment clean and secure as the soil fertility remains intact all year round.
- (b) Plants and trees in a buffer along rivers reduce waterborne diseases
- (C) Increases fish in rivers due to clean water without pollution

What are your successes? What advice do you have for your neighbors along the riverbanks?

- a) We have qualified to be riparian members.
- b) We have received an extra Payment for Environmental Services (PES) for our work.
- c) We have eliminated eucalyptus in the riparian areas.
- d) We have improved the quality and quantity of water in rivers and streams.
- e) We advise our neighbors to be kind to those others who are in lower parts of the river, and to protect the river so these others can also get clean water. Their own grove will also remain secure from soil erosion when they plant trees and follow these best practices.



Soil Fertility

Get the most Benefits out of your Land.

What is soil?

Soil is the uppermost layer of the earth. It contains air, water, organic matter and mineral matter.

How is Soil formed?

The weathering (breakdown) of rocks provides the minerals needed to support plant life. Plants are then added to the soil as organic matter. As more rock is broken down and more organic matter is added, so more water can be held in the soil, further promoting plant growth.

Why is organic matter important?

Organic matter (mainly formed through the decomposition of plant material) releases a lot of nutrients, which are available for uptake to new plants. It also supports the life of beneficial microorganisms in the soil, helps with water infiltration and helps to bind the soil together.

What determines the type of soil found?

- *The climate:* both the temperature and water availability affect the rate of weathering of rock.
- *Organisms:* bacteria, fungi and worms amongst many others live in the soil. Some play a key role in mixing the soil, such as earthworms. Soil organisms help decompose organic matter, and some help plants to fix nitrogen (e.g. Rhizobium bacteria).
- *Topography:* the shape of the land. For example, soil on slopes is generally thinner and more easily eroded than the soil found collected in valleys.
- *Parent material:* the type of rock the soil is formed from.
- *Human behavior:* the way we use and care for our soil (or not) will greatly affect its fertility.

The texture of the soil you have depends on how much sand, silt and clay it is made from. The diagram on the following page shows you the main categories of soil texture. The texture of the soil and structure influence how easily roots can penetrate the soil, and how much water can be retained.

Why is soil pH important?

How acidic or alkali a soil is (its pH) affects how available soil nutrients are for plant uptake and what type of soil organism life can be supported. Generally, most soil nutrients are more soluble (and therefore available for plant absorption) when in an acidic soil compared to a neutral or alkaline soil.

However, if the soil is too acidic many bacteria cannot grow, and then this will affect the rate of decomposition of organic matter. Most good topsoil's have a pH between 5.5 and 7.5 and are relatively dark in color.

What is a fertile soil?

A fertile soil is one that has an available supply of all the nutrients needed to support plant life.

- *Primary nutrients:* nitrogen, phosphorus, potassium
- *Secondary nutrients:* sulphur, magnesium, calcium
- *Micronutrients:* iron, manganese, boron, chlorine, zinc, copper, molybdenum, nickel

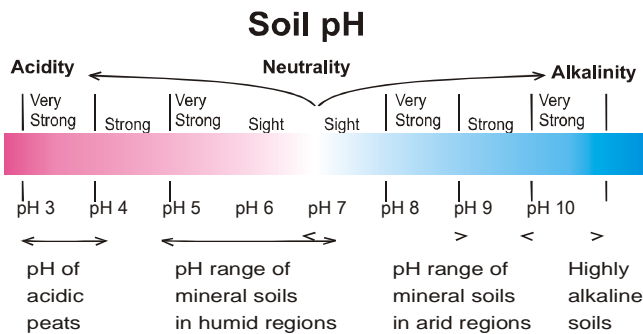
Strategies to improve soil fertility.

- Consider adding nitrogen (in the form of green manure from nitrogen-fixing plants) and phosphorus (in the form of rock phosphate).
- Collect and use livestock manure and urine. This is better in composted form. Fresh sources may contain too much ammonia



content (which may harm plants) and may contain higher amounts of pathogens (disease-causing organisms). Composted manure contains fewer pathogens. If you do use fresh manure, use moderately and leave a minimum of two months in between applications.

Add organic matter through composting (details below).



- Practice conservation agriculture best practices as described in previous units:
 - Crop rotation
 - Intercropping.
 - Agroforestry
 - Planting leguminous cover crops.
 - Leaving land fallow
 - Use of mulch.
 - Using conservation farming holes.
 - Reduce water erosion through tree planting, terraces, fanya juu.
- Consider intercropping with Pigeon pea (*Cajanus cajan*), Dolichos lablab, *Mucuna pruriens*, *Crotalaria*, *Canavalia*.
- Consider adding ash, which is rich in calcium and potassium carbonate.
- Add lime if you know your soil is too acidic.
- It is best not to add additional minerals (apart from those found in compost) without testing the soil first to see what nutrients and minerals are actually needed.

- There may be some circumstances when you need to apply inorganic chemical fertilizers. Use accordingly to the manufacturer instructions and research which ones are most ecologically sound for your area through getting advice from your extension officers.

Composting:

Compost manure is a natural fertilizer to help your crops grow. It is better than chemical fertilizer because it is natural and has no damaging effects to the crops and environment. Composting is one of the easiest, cheapest and most effective ways of improving soil fertility.

What can be used for compost?

- Crop residues, weeds, dead leaves, any trimmed vegetation, manure and urine from livestock, bedding from livestock, kitchen food waste from fruit and vegetables, ash, shredded paper and cardboard.
- Don't use meat, dairy products, fats, and oils, metal or plastic.

General best practices for composting:

- Choose a shaded area for your compost.
- Cover with banana leaves or a plastic sheet.
- Sprinkle with water during the dry season.
- Protect from rain (which will wash nutrients away)
- As a general guide aim for:
 - One third 'green vegetation' (grass clippings, fruit, vegetables, egg shells, nut shells, manure, weeds, or plants).
 - One third 'brown vegetation' (dry leaves, straw, sawdust, cardboard and fine crop residues).
 - One third bulky material such as chopped branches and larger crop residues.



- Ensure you use plant material that has not yet seeded, and do not use diseased material.
 - Layer the materials in a pile or in a hole. Air is needed for compost, so mix the materials together and do not compact the material down.
 - Water the pile of material, cover and leave so that material decomposes over the next couple of months. You can occasionally mix the material.
 - If the material becomes slimy or smelly over time it may be too wet or have too much green vegetation. Add more brown vegetation if this is the case, and mix.
 - Try to have your batch of material ready for mixing, watering, covering and leave 2-3 months before the rainy season so it will be useful for the planting season.
 - The compost should be brown and crumbly when ready. You can sieve the material to get a finer mixture, and add the larger pieces back into the compost pile for the next batch.
- 4) Collect all the remains of the crops you have and cut them into small pieces. (e.g. the leaves and stalks of maize, millet, beans).
 - 5) Put these crops remains into the hole up to a depth of 0.5m.
 - 6) Then 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) Next put another layer of crop leaves and stalks (0.5m).
 - 9) Add another 5 liters of ash.
 - 10) Add the leaves and stalks again until the hole is almost filled.
 - 11) 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)

Some of the TIST groups use a more specific method, which they have found effective. They have described the process below:

Preparation of compost manure by some TIST groups:

- 1) Choose an area 4m x 4m for your compost pit.
- 2) Clean the area.
- 3) Dig a hole of diameter 3 - 4 m and 1.5 m deep.
- 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) Try to water the compost pit in this way every day, or whenever water is available.
- 16) 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.

Mazingira Bora



TIST

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

Kimereu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Amemba ba TIST, Cluster ya Kariakomu igita ria mucemanio mweri muthiru.

Inside:

**Cluster ya Kairuni: Guciritana na mathithio
Nituthithitie minanda yukiritue. Page 2**

**Cluster ya TIST ya Ikindu:
Utongeria bwa muthiurukano na utongeria bwa uriti ngugi kuuma kiri atongeria ba
Cluster cia Nandi kuuma mweri jwa Kenda 2016. Page 2**

**Baita kuumania na umenyeeri bwa nduujji gukurukira kuanda miti ingi imingi ya gintwire
na iria ikaraganagiria bwega na ruuji. Page 3**

TIST: Unoru bwa muthetu. Page 4



Cluster ya Kairuni: Guciritana na mathithio Nituthithitie minanda yukiritue.

Kwandiki ni Mr. Micheu, mumemba wa Gakuundi kaniini ka Macho

Tukuthiria kuthoma mantu ja minanda yukiritue kuuma kiri baruga ya *Mazingira Bora*, batwi Cluster ya Kairuni ya TIST nitwagire bata na njira iji injega. Au nyumene, twari na miti iminiini iria itakuraga igita ria kuthamia miti iji. Nitutwire gucua njira injega ya gukuria miti yetu kenda miti ikura bwega.

Tukumenya mantu ja TIST ja minanda yukiritue, nitwathuganirie kugeria. Nitwagwirirue ni kuthoma uria minanda yukiritue itethagia miiri ya mbegu igia inya na kurigiria kumithukia igita ria kuthamia na kwaanda miti. Amemba nibetikaniririe kwithirwa bari na munanda jumwe jwa Cluster. Mweri jumwe juthiri, nitwambirie munanda juri na mbegu cia mikandania ngiri ithatu (3,000), mibokando ngiri imwe(1,000) amwe na miti ya gintwire ngiri 10,000. Mworoto jwetu ni kumithia miti ngiri mirongo iri (20,000) ndene ya mieri ikumi na iri ijite kiri Cluster

cietu. Amemba nibagire moyo jwa kuthithia minanda yao ya nja. Turi na wirigiro ati inya iria twikirite kiri ngugi iji ikarita ngugi injega na tukabwira mpumi igita riti kuraja.



Mbicha ya gikundi gia Kairuni Cluster iria yaringirwe 3 November 2016, ntuku ya mucemano jwa Cluster.

Cluster ya TIST ya Ikindu: Utongeria bwa muthiurukano na utongeria bwa uriti ngugi kuuma kiri atongeria ba Cluster cia Nandi kuuma mweri jwa Kenda 2016.

kwandiki nai Clifford Kimathi, muriti ngugi wa Cluster.

Batwi Cluster ya TIST ya Ikindu turi na kugwirua niuntu bwa gutwikiria urimi bubwega bwa TIST bwa muthiurukano na uriti ngugi. Kiri utongeria bwa kuthiurukana, turi na anene baaria bathuri na njira iria iri ya uma bakiritaga ngugi mieri ina. Atongeria baba ni munene wa Cluster, mutongeria mutetheria na murungamiri mantu ja umma.

Anene ba Cluster, atongeria atetheria nabaria barungamirite uma, baritaga ngugi iji o mieri ina na bakathiurukana kairi. Mutongeria mutetheria akaa munene oriria murungamiri wa uma aejaga munene mutetheria. Ekuru na Akuru bathiurukanaga okiri ithurano. Kethira murungamiri wa uma ni ntumurume, uria uthuragwa kithuranano kiu kingi ethagirwa ari mwekuru.

Ntariki mugwanja, mweri jwa mugwanja, nitwari na kithurano aria antu baba batarirwe bari atongeria betu kagitene gaka.

Mutongeria munene: Margaret Muthoni +254 703 183 891

Mutongeria mutetheria: Pamela Kathambi +254 705 418 174

Murungamiri wa uma: Walter Muriungi +254 726 556 033

Murungamiri wa Mwekuru: Pamela Kathambi +254 705 418 174

Murungamiri ntumurume: Walter Muriungi +254 726 556 033

Arungamiri ba mwekuru na ntumurume bakarungamira Cluster kiri micemano ya ikundi ya kancu ya Cluster(GOCC)



Baita kuumania na umenyeeri bwa nduuji gukurukira kuanda miti ingi imingi ya gintwire na iria ikaraganagiria bwega na ruuji.

Ikundi bibinini bia TIST birina gikeno mono niuntu bwa kuumbana gwa muradi jwa kwambiria umenyeeri bwa nteere cia nduuji juria jwambirirue ni TIST jutegete gutethia gwika na kumenyeera nduuji cietu. Arimi nibagutaara gutiga kurima akui na nduuji nikenda batigithia gukamatwa kwa muthetu na kuthukua kwa nduuji. Narua rurina arimi baria betite na mbele kuanda miti ya gintwire ndene ya ntuura ciao iria ciankene na nduuji na nibagutumira mitire iria miega buru ndene ya ntuura iji. Nitugwikumiria mono mantu jaria boombite kuthithia na gukenera ngugi ciao cia umenyeeri bwa miuro iji iria twinthe tutumagira.

Baita cia miti ya gintwire nterene cia nduuji ni iriku?

- (a) Miti ya gintwire ninyiagia ukamati bwa muthetu na kuigara kwa ruuji.
- (b) Miti ya gintwire nitethagia kutheria ruuji ndene ya miuro iminene, iminini na ithimene.
- (c) Miri ya miti ya gintwire nigwatagia na ikarikia muthetu.
- (d) Miti ya gintwire nitethagia kutheria ruugo.
- (e) Miti ya gintwire niejanaga kirundu kana kithiiki kiria kiebagia gukamatwa kwa ruuji ni riuu.
- (f) Miti ya gintwire niejaga nyoni, nyomoo na tunyomoo antu a gutuura. Gwika gukarania kwa imera na nyomoo cia mithemba mwanya na njira iji no kue miunda yetu baita nontu, mung'uanano, nyomoo imwe cirina bata kiri guciarithia imera na kunyiyia tunyomoo turia tuthukagia imera bietu.

Niki burina bata kumenyeera antu aria kuthiurukite miuro?

- (a) Imera na miti iria iri antu au niikaga aria kuthiurukite kuri atheru na kumenyeera ati unoru bwa muthetu burio mwaka junthe.
- (b) Imera na miti antune aja nterene cia nduuji ninyiagia mirimo iria igwatagwa kuumania na nduuji.
- (c) Nikwongagira makuyu miurone niuntu bwa ruuji rurutheru niuntu rutikuthukua.

Ni mantu jariku umbite kuthithia? Niatia umbu kwatha aturi baku baria bari nterene cia nduuji?

- a) Nituumbite gutonyithua murandine juu jwa kumenyeera nteere cia nduuji.
- b) Nituriitwe mbecha ingi niuntu bwa ngugi cietu cia jakumenyeera naria gututhiurukite (PES)
- c) Nituritite mibau yonthe buru miundene yetu iria yankene na nduuji.
- d) Nituthongometie utheru na wingi bwa ruuji ndene ya nduuji cietu inene na inini.
- e) Nituataga aturi betu kwithirua babui kiri baria bari nterene cia bwagaiti cia ruuji, na kumenyeera muuro juu nikenda baba kinyabo bakinyirwa ni ruuji rurutheru.

Miunda yao kinyayo ikebera ukamati bwa muthetu baanda miti na bathingatira mitire iji imiega.



TIST: Unoru bwa muthetu.

Muthetu nimbi?

Muthetu ni gicunci kia iguru buru kia nthi. Jwithagirwa jurina ruugo, ruuji, biria biorete na kinya mineral.

Muthetu juthithagua atia?

Kunangwa kwa maiga nikuejanaga mineral iria ciendekaga kiri imera nikenda bitigakue. Imera riu nibiongagirwa muthetune niuntu nibioraga na bikathuthurukanga. O uria maiga jamaingi jakuunikanga nou imera bibi biori bikwongereka, nikenda ruuji rurwingi nkuruki rumba gwikwa ndene ya muthetu, na kwou rumba gwithithia na mbele gukuria imera.

Niki into bibi biori birina bata?

Into bibi biori (mono kuumania na kwora kwa imera) nibiritaga irio bibingi, biria biithagira birio niuntu bwa imera bibieru. Kinya nibiikaga tunyomoo turia turi baita ndene ya muthetu, bigatethia ruuji gutonya muthetune na kinya bigatethia muthetu kugwatana amwe bwega.

Nimbi yugaga muthetu juria jurio ni jwa muthemba juriku?

- *Rera:* Murutira na ruuji ruria rurio niruugaga mpwi ya iiga ya kuunikanga.
- *Tunyomoo:* Tunyomoo tumwe nituritaga ngugi ya bata ya kuungania muthetu ja mang'iony jaria jetagwa earthworms. Tunyomoo twa muthetu nitutethagia kworia imera na nyomoo na tungi nitutethagia gwikira nitrogen ndene ya muthetu (ja Rhizobium bacteria).
- *Uria muunda jukari:* Mung'uanano, muthetu kibarine ni jumuceke na jukamatangagwa nkuruki ya muthetu juria jwithagirwa juri miurone.
- *Iiga riria juumenie nario:* muthemba jwa iiga riria muthetu juumite.
- *Mathithio ja antu:* uria tutumagira na kumenyeera muthetu jwetu gukauga unoru bwaju.

The texture of the soil you have depends on how much sand, silt and clay it is made from. The diagram on the following page shows you the main categories of soil texture. The texture of the soil and structure influence how easily roots can penetrate the soil, and how much water can be retained.

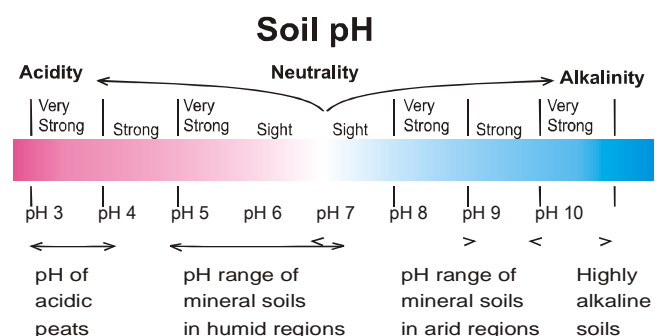
Niki pH ya muthetu irina bata?

Acidi kana alkali iria iri kiri muthetu (PH yaju) niugaga kethira irio birio niuntu bwa imera nani tunyomoo turiku muthetune tukoomba gutuura. Jaria maingi irio bia muthetu nibitonyaga ruujine (na kwou imera nobibijukie bikijukia ruuji) riria muthetu jurina acidi nkuruki ya riria jukiri kii kana juri alkaline.

Indi, kethira muthetu jurina acidi inyingi mono bakteria inyingi itiumba gukura, na bubu bukanyia kwora kwa imera na nyomoo. Mithetu imiega ya iguru imingi iri PH ya 5.5 gwita 7.5 na nimiiru (rangi).

Muthetu jumunoru ni juriku?

- Muthetu jumunoru ni juria jurina irio bionthe biria bikwendeka niuntu bwa imera gutuura bing'ani.
- *Primary nutrients:* nitrogen, phosphorus, potassium.
- *Secondary nutrients:* sulphur, magnesium, calcium.
- *Micronutrients:* iron, manganese, boron, chlorine, zinc, copper, molybdenum, nickel.



**Kuongera unoru bwa muthetu.**

- Thugania kwongera nitrogen (mboleo itiumi kuumania na imera biria biikagira nitrogen muthetune) na Phosphorus (rock phosphate).
- Uthurania na utumire ntaka ya ndithia na maumago. Ni injega nkuruki yathithirua kirinyene. Mboleo itiumi no ithirwe irina ammonia inyingi mono (iria iumba kugitaria imera) na noithirwe iri tunyomoo turia turetaga mirimo tutwingi. Watumira ntaka itiumi, tunmira inkai na ukare mieri nkuruki ya iiri mbele e wikira yo kairi.
- Ongera mati gukurukira gwika kirinyene (ja uria ukwirwa aja nthi).
- Tumira mitire iria miega bubu ya urimi bubwega ja uria wathiri jamaingi kanyuma au:
 - Kugarurania imera.
 - Kuanda imera biungenu.
 - Kuungania miti na imera.
 - Anda imera biria bicokagia nitrogen muthetune biri bia gukunikira nthi.
 - Tiga muunda jutiandi.
 - Use of mulch.
 - Tumira marinya ja kilimo hai.
 - Nyiyia ukamati bwa muthetu gukurukira kuanda miti, kwinja mitaro.
- Thugania kuandaniria Pigeon pea (Cajanus cajan), Dolichos lablab, Mucuna pruriens, Crotalaria, Canavalia.
- Thugania kwongera muju, juria jurina calcium na potassium carbonate na wingi.
- Ongera lime kethira nwiiji muthetu jwaku jurina acidi inyingi.

- Ni bwega nkuruki kurega kwongera mineral ingi (nkuruki ya iria ciithagirwa ciri mboleone) utithimite muthetu jwaku kwona ni irio na mineral iriku cikwendeka.
- Magitene jamwe no witie gwikira fertilizer ya nduka. Ikira kulingana na uria muthithia aandikite na urie afisa ba urimi ni iriku ciri injega kiri ntuura yaku.

Kuthithia mboleo

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. Kuthithia mboleo iji ni njira imwe ya iria mbuthu, itina goro na injega ya kwongera unoru bwa muthetu.

Nimbi yumba kuthithia mboleo?

- Matigari ja imera, iria, mathangu jamoomu, imera biria bigiti, mboleo na maumago ja ndithia, mati jaria ndithia imamagira, matigari ja irio kuuma riiko na manyani, muju, maratati jagitangi na kandibodi.
- Ugatumira nyama, into kinya biriku kuumania na ndithia, maguta jamomu kana ja ruuji, sikerebu kana mikebe ya mibira.

Mitire iria miega buru ya kuthithia mboleo ya imera:

- Taara antu kurina kirundu gwa gwika int bibi biri au iguru.
- Kunikira na mabura kana kiratasi kia nailoni.
- Ikiira ruuji igitene ria uumo.
- Karia kuumania na ngai (iria yumba gukamata irio biria bikwendeka).
- Ja mutaratara tegea ati:
 - Gicunci kimwe kiri bithatu ni imera bitinyaari (manyaki, matunda, nyani, makonyo ja nkara, makonyo ja nkandi, mboleo kuumania na ndithia, maria, imera).



- o Gicunci kimwe kiri bithatu ni “imera binyaari (mathangu joomi, nyaki injumu, sondasti, makandibondi na matigari ja imera warikia guketha).
 - o Gicunci kimwe kiri bithatu ni into bibirito ja biang’i bigitangi na matigari jamanene ja imera.
 - o Menyeera ati uritumira imera biria bitirathithia mbeu na ugatumira imera biria biajitue.
 - o Rikanira into bibi amwe kana kirinyene. Ruugo nirwendekaga kuthithia mboleo iji, kwou urugania into bibi amwe bwega na ukamamiria into bibi mono.
- Ikiira ruuji, ukunikire na urekane nabio mieri imikai nikenda into bibi bikoora. No uruganie into bibi o igita nyuma ya igita.
 - Mboleo iji yeja gutendera kana kununka no ithirwe irina ruuji rurwingi mono kana ithirwe irina into bitiumi bibingi mono. Ongera imera bibiumu gwakarika ou na uruganie.
 - Geria into biaku biithirwe biri tayari kuunganua, gwikirwa ruuji, gukunikirwa na gwikwa mieri iiri kana ithatu mbele ya mbura yambiria nikenda igatethia igitene ria kuanda.
 - Mboleo iji ibati kwithirwa iria ya rangi ya muthetu na ikiunikang’aga riria iri tayari. No ucuinke mboleo iji nikenda wona iria iunikangi bwega, na wongere jau manene kirinyene nikenda ija gutumirwa riu ringi.
- Bimwe bia ikundi bia TIST nibitumagira njira imwe iria boonaga igitaga ngugi. Nibaejene matagaria jaja:
- Kuthuranira mboleo ya mati na njira iria ikundi bimwe bia TIST bitumagira:**
- 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) Ongera 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) Mutia, 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 bole. Mung’uanano, warikia kuthambia nyomba kana nguo ciaku, ituura ruuji ruru ugutumagira kirinyene. Kethira urina ndithia ituura maumago jacio iguru ria kirinya.
 - 15) Geria wikagire kirinya kiu ruuji na njira iji ntuku cionthe kana oriria ruuji rurio.
 - 16) 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.

Mazingira Bora



TIST

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

Kikuyu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Arumiriri a Kariakomu TIST Clusters mari mucemano-ini wao mweri ucio urathirire.

Thiini:

**TIST Cluster ya Kairuni: Guthoma na gwika
Nitwambiriiiirie tuta cia iguru. Page 2**

**TIST Cluster ya Ikindu:
Kuhuthira utongoria wa muthiururuko na wirutiri wa utongoria
Atongoria aria mari kuo kumagia mweri wa ikumi na umwe 2016. Page 2**

**Guteithika Kumanagia na kugitira Njui ciitu - Kuhanda miti ya Kiunduire hamwe na miti
iria yagiriire kuhandwo ndeere cia ruui. Page 3**

TIST: Unoru wa tiiri. Page 4



TIST Cluster ya Kairuni: Guthoma na gwika Nitwambiriirie tuta cia iguru.

Na Mr. Micheu, mumemba wa gakundi kanini, Macho Group

Thutha wa guthoma ugoro wa tuta cia iguru kuma ngatheti-ini ya *Mazingira Bora*, Kairuni TIST Cluster nimendire kumenya wega waki mwega. Nahau thutha nitukoretwo na uhinyiririku wa miti ya kuhanda. Ni turageria muno gwetha kihonia kia ukuria wa miti niguo wagirire.

Hindi iria twamenyire ugoro wa tuta cia kuoywo iguru kuma kwa TIST ni tweciririe kugeria. Ni twakenire muno ni kumenya ati mirita ya mimera ya tuta cia kuoywo iguru ikoragwo iri na hinya muno na guteithiriria mirita gutinuka riria turamihanda handu hangi. Arimi nimetikaniirie kugia na tuta ya Cluster. Mweri ucio urathirire nitwambiriirie tuta ya macadamia 3,000, makorobia 1,000 oro hamwe na miti ya kinduire 10,000. Wendi wa Clastar itu ni kuhanda miti 20,000 handu-ini ha

mieri 12 kuma riu. Arimi nituramoria mathondeke tuta ciao micii-ini kwao. Turehoka kwirutira gwitu nigukugia na magetha mega na kugayana na inyui.



Mbica ya gikundi kia Kairuni Cluster yahuririwo mweri 3 wa ikumi na imwe 2016, mucemano-ini wao muthenya oro ucio.

TIST Cluster ya Ikindu: Kuhuthira utongoria wa muthiururuko na wirutiri wa utongoria Atongoria aria mari kuo kumagia mweri wa ikumi na umwe 2016.

Na Clifford Kimathi, Cluster Servant

Ithui, TIST Cluster ya Ikindu nitukenete ni kunyitana na uthondeki mwega wa guthururukana kwa utongoria na TIST. Guthururukana gwa utongoria, ni tuhotete guthura atongoria aria magututongoria kwa mieri ina (4 months). Atongoria aya ni mutongoria wa Cluster, muteithiriria wa mutongoria wa Cluster, muniyitiriri andu aria mari Cluster.

Mutongoria wa Cluster, muteithiriria wa mutongoria wa Cluster, muniyitiriri andu aria mari Cluster ni marithururukanaga. Muteithiriria wa mutongoria wa Cluster agatuika mutongoria wa Cluster nake muniyitiriri wa andu aria mar Cluster muteithiriria wa mutongoria. Atumia na athuri magacanjania utongoria. Angikorwo muniyitiriri wa andu aria mari Cluster angikoriwo ni muthuri, githurano kiu kingi agakorwo ari mutumia.

Kuri mweri 7/11/2016, nitwari na githurano kia Cluster na aria mathurirwo gutongoria ni:

Mutongoria	Margret Muthoni	+254 703 183 891
Muteithia wa mutongoria	Pamela Kathambi	+254 705 418 174
Murugamiriri wa ihoto	Walter Muriungi	+254 726 556 033
Murugamiriri wa atumia	Pamela Kathambi	+254 705 418 174
Murugamiriri wa athuri	Walter Muriungii	+254 726 556 033

Murugamiriri wa athuri na atumia nio makarugamirira Cluster mucemano-ini wa Clusters Council (GOCC).



Guteithika Kumanagia na kugitira Njui ciitu - Kuhanda miti ya Kiunduire hamwe na miti iria yagiriire kuhandwo ndeere cia ruui.

Kkundi nyingi cia TIST mena ngatho niundu wa kugaciira hari kugitira njuui. Arimi aingi nimatigite kurima hakuhi na ndeere cia rui nigetha kugitira tiiri na guthukia maai. Nginyagia riu, arimi nimathiite makihandaga miiti ya kiunduire ndere-ini cia ruui. Nitukenire uhotani wao hari wira ucio nweга.

Uteithio wa miiti ya kiunduire ni uriku ndere- ini cia ruui?

- a) Miiti ya kiunduire niiteithia kunyita tiiri na kugitira kiguo na muniko wa ruui.
- b) Miiti ya kiunduire niiteithagia gucunga maai na tukagia na maai matheru.
- c) Miiri ya Miiti ya kiunduire ni inyita tiiri wega.
- d) Miiti ya kiunduire ni itheragia riera.
- e) Miiti ya kiunduire ni ituheaga kigunyi ikagiriria riu ihu.
- f) Miiti ya kiunduire ni ehaaga uikarwo nyoni, nyama hamwe na tumbuki turia tuteithagia mimera iitu

Baata wa kugacirithia ndere cia rui ni kii?

- a) Mimera na miti iria ihanditwo ndereini cia rui. niigacirithagia maaria maturigiciirie hamwe na kurehe unoru wa tiiri.
- b) Mimera na miiti iyo ni iteithagia kugitira mirimu iria yukaga na maai.
- c) Miiti na mimera iyo ni irio cia thamaki ningi ni itheragia maai thamaki ikona uikaro.

Uhotani wiitu ni uriku? Ni mataaro mariiku tungira andu a itura riitu?

- a) Nitukoretwo turi akinyaniru hari kugitira njuui.
- b) Nitukoretwo nikiamukira marihi kuuma TIST niundu wa wira wa kugitira njui.
- c) Nituhotete kweheria miiti ya minyua maai kuma ndere-ini cia njui.
- d) Wira wiitu niuhotithie njui igie na maai matheru na maingi.
- e) Ni turathie na mbere kuuria andu mathie na mbere na kugitira njui . Nitugukuria uthie na mbere na kuhanda miiti ya kiunduire.



TIST: Unoru wa tiiri.

Tiiri ni kii?

Tiiri ni mwen wan a-iguru wa thi. Ukoragwo na riera, maai na unoru hamwe na minerals.

Tiiri uthondekagwo atia?

Gwatakanga na kumumuthuka kwa mahiga nikuo guthondekaga tiiri uria uhotithagia mimera gukura. Mimera ningi niyongagirirwo tiiri-ini. Riria mahiga makiria mamumuthuka, noguo tiiri muingi uthondekagwo kwa uguo maai maingi nimakuigwo tiiri-ini na kwongerera gukura kwa mimera.

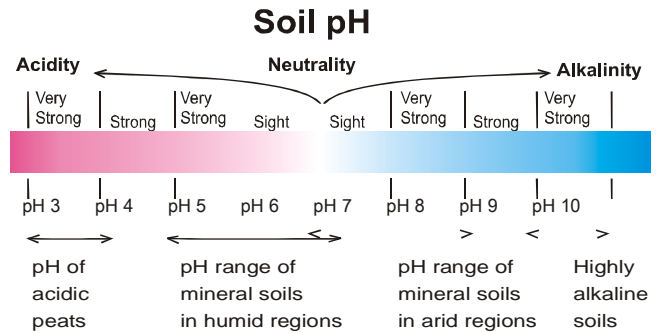
Nikii organic matter iri ya bata?

Organic matter (Iria ithondekagwo muno kumana na kubutha kwa mimera) niurutaga unoru muingi uria woyagwo ni mimera na ikanyitirira miturire ya indo cia tiiri-ini iria cikoragwo na umithio muingi kuri tiiri na ukauteithia kugia na hinya na kuhotithia maai gutonya thiini.

Nikii kimenyithanagia muthemba wa tiiri?

- *Riera*: Urugari na maai riria cioneka nicikoragwo na effect kuri kumumuthuka kwa mahiga.
- *Organisms*: Bacteria, fungi na minyongoro ni imwe cia iria ciikaraga tiiri-ini. Imwe nicinnyitaga itemi hari gutukania tiiri ta earthworms. Organisms cia tiiri niciteithagia kubutha na gueithia mimera.
- *Topography*: Uria mugunda uikare. Kwa muhiano, tiiri uri kundu kuinamu niukoragwo uri muceke na ugakuuo ni maai na-ihanya gukira tiiri ungi uri kundu kuigananu.
- *Parent material*: Muthemba wa mahiga maria mathondekete tiiri.

- *Human Behaviour*: Uria tuhuthagira na kumenyerera tiiri witu niutumaga unoru ukorwo uria uri.



Uria tiiri uhana kuringanaga na muigaa wa muthanga, silt na clay uthondekete. Diagram ino ironania mithemba ngurani ya tiiri. Muthemba wa tiiri niwonanagia uria miri ingiingira tiiri-ini na muigana wa maai uria ungiingira thi.

Bata wa soil pH nikii?

Uria tiiri uri na acini na alkali niyo pH na niyugaga nutrients iria iri tiiri-ini na muthemba wa tiiri uria ungiingira mwena ucio na unyitirirwo wega. Nutrients nyingi cia tiiri nicikoragwo na uhoti wa kumumuthuka na kwa uguo cigateithia kuiyukio ni mimera riria tiiri uri na acid gukira riria uri na alkali. Ona kuri o uguo, angikorwo tiiri uri na acid nyingi noguo bacteria nyingi citangikura na organic matter cikaremwo ni kubutha. Tiiri muingi uria wa iguru ukoragwo na pH ya 5.5-7.5 na ukoragwo na rangi muiru.

Tiiri munoru ni uriku?

Tiiri uria munoru ni uria ukoragwo na nutrients iria cibataranagia hari gukura kwa mimera.

- *Primary nutrients*: nitrogen, phosphorus, potassium.



- *Secondary nutrients:* sulphur, magnesium, calcium.
 - *Micronutrients:* iron, manganese, boron, chlorine, zinc, copper, molybdenum, nickel
Maundu ma kwongerera tiiri unoru.
 - Ongerera nitrogen(na njira ya thumu muigu) ohamwe na phosphorus(na njira ya mahiga).
 - Ungania na uhuthire thumu wa mahiu na mathugumo. Uyu ukoragwo uri mweka riria wabutha. Uria utar mubuthu noukorwo na ammonia nyingi(iria ingithukia mimera).Thumu uyu niukoragwo na pathogens nini. Ungihuthira utari mubuthu, huthira utari muingi na uutige gwa kahinda ka mieri 2 .
 - Ongerera organic matter kuhitukira composting.
 - Huthira njira iria njega na hitukie.
 - Kuhanda mithemba miingi ya irio hamwe na gucenjania imera.
 - Kuhanda miti mugunda-ini wa irio.
 - Gutiga mahuti mabuthire mugunda.
 - Kuhuthira marima ma Kilimo Hai.
 - Nyihia erosion na kuhanda miti, kwenja terraces kana fanya juu.
 - Huthira intercropping na Pigeon pea (Cajanus cajan), Dolichos lablab, Mucuna pruriens, Crotalaria, Canavalia.
 - Ongerera muhu, uria I ukoragwo na calcium na potassium carbonate.
 - Ongerera lime anbatarikgikorwo tiiri waku niukoragwo na acid nyingi.
 - Niwega kwaga kwongerera minerals (tiga iria cikoragwo thumuini) utarorete tiiri wega niguu wone kana nicirabatarikana.
 - Nikuri hiingo wagiriirwo nikuongerera inorganic chemicals fertilizers. Huthira kuringana na mawatho ma athondeki na ataalamu a maundu egii tiiri.
- ### Composting
- Compost manure ni thumu utari wa fertilizer uria uteothagia mimera gukura. Niukoragwo urimwega gukira wa chemical tondu ni wa ki-nduire na nduthukagia mimera na maria maturigiciirie. Composting ni njira imwe ya iria huthu makiria na citari na mahuthiro maingi cia kwongerera unoru wa tiiri.
- ### Nikii kingihuthika hari guthondeka compost?
- Matigari ma irio, riia, mahuti na mahuti ma miti, main a mathugumo ma mahiu, irio cia nyumba matunda, muhu na maratahi.
 - Ndukahuthire nyama, daily products, fats, oil
Cuma kana plastic.
- ### Maundu maria wagiriirwo nikurumirira riria urathondeka compost.
- Huthira handu hari na kiiruru.
 - Humbira na marigu kana plastic.
 - Itiriria maai riria kuri na riua.
 - Gitira kumana na mbura(iria ingithambia unoru wothe).



- Ta njira ici, tigurira;
 - o 1/3 “green vegetation” (nyeki, matunda, mboga, makorogoca, makoni, thumu, riia na mimera).
 - o 1/3 ‘brown vegetation’ mahuti momu, straw, nuura, cardboard na matigari ma irio)
 - o 1/3 indo nene ta miti.
 - o Tigirira niwahuthira indo citari nambegu na ndukahuthire kindu kiri na murimu.
 - o Iganirira indo ici hamwe na ndugakindire.
 - Itiriria indo icio maai, humbira na utige niguo cibuthe gwa kahnda ka mieri ta iiri. Nouikare ugitukanagia indo icio.
 - Indo icio cingiambiriria kununga, nikuga ati ciri na maai maingi kana green vegetation ni nyingi, ongerera brown vegetation na utukanie.
 - Geria gukorwo na indo ici ciothe niguo utukanie, uitiririe maai na uhumbire na utigie 2-3 months mbere ya mbura niguo ukorwo uri mwega ukihanda.
 - Thumu uyu wagiriirwo gukorwo uri wa brown na unyitanite. No ucunge thumu niguo wehutie giko na ukoro na mutukanio mwega.
- 4) Ungania matigari mothe ma irio na umatinangie tunini tunini (muhiano mahuti ma mabebe, muhia na mboco).
 - 5) Itirira mahuti macio irima-ini na utigie 0.5m.
 - 6) Ikira 5l cia muhu.
 - 7) Ongerera 30cm mai ma mahiu.
 - 8) Ikira mahuti mangi.
 - 9) Ikira 5l cia muhu ingi.
 - 10) Ikira mahuti nginya uihurie mahuti nginya uihurie irima.
 - 11) Muthia, ikira tiiri nginya iguru.
 - 12) Riria uraihuria tiiri, ikira muti miraihu gatagati niguo ukinye thi.
 - 13) Eterera thumu waku matuku 90 kannaa (3months).
 - 14) Gwa kahinda gaka, huthira maai mari na giko gwikira irima-ini. Kwa muhiano, thutha wa guthambia nyumba, nguo huthira maai macio kana mathuguma ma mahiu.
 - 15) Itiriria irima maai o muthenya na njira ino kana riria maai monekana.

Ikundi imwe cia TIST nicihuthagira njira ngurani na makona ciri njega na magataariria haha.

Kuhariria compost manure na TIST groups.

- 1) Hariria handu ha 4mx4m ha kwenja irima.
- 2) Theria handu hau.
- 3) Enja irima ria 3-4m na 1.5 uriku.

Thutha wa 90days thumu waku niugukorwo uri mwega. Huthira muti uria uhandite gatagati ta thermometer – riria thumu wagira niwagiriirwo nigukokorwo uri muhiu na waruta muti ucio.

Mazingira Bora



TIST

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

Kiswahili Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Wanachama wa Kariakomu TIST Cluster wakiwa kwa mkutano wao wa Cluster mwezi uliopita.

Ndani:

**Cluster ya TIST ya Kairuni: Kujifunza kwa vitendo
Tumeanzinsha minanda ya miti iliyoinuliwa. Ukurasa 2**

**Cluster ya TIST ya Ikindu
Kuunga mkono mfumo wa mzunguko na uongozi wa kiutumishi
Viongoziwa Cluster za sasa kutoka Mwezi wa tisa mwaka wa 2016. Ukurasa 2**

**Faida za kulinda mito yetu
Kupanda miti zaidi ya kiasili na isiyotumia maji mengi. Ukurasa 2**

TIST: Rutuba ya udongo. Ukurasa 4



Cluster ya TIST ya Kairuni: Kujifunza kwa vitendo Tumeanzinsha minanda ya miti iliyo inuliwa.

Imeandikwa na Bw. Micheu, mwanachama wa kikundi kidogo cha Macho.

Baada ya kujifunza mengi kuhusu minanda ya miti iliyo inuliwa kutoka kwa gazeti la Mazingira Bora, sisi Cluster ya TIST ya Kairuni tulipata hamu ya njia bora ya TIST. Hapo mwanzoni, tulikua na shinda nyingi ya miti yetu kutokua inapotolewa kwa minanda. Tumekua tukitafuta njia bora ya kuhakikisha ya kwamba uhai wa miti yetu inaimarika.

Tulipojifunza kuhusu minanda iliyo inuliwa ya TIST, tuliamua kujaribu. Tumefurahia vile minanda iliyo inuliwa inasaidia miche yambegu kuwa na nguvu na sababu ina nafasi nzuri zaidi ya kumea inapotolewa kwa minanda. Wanachama waliitikia kuwa na mnanda mmoja wa Cluster. Mwezi uliopita, tulipanda mbegu elfu tatu (3,000) za Makadamia, mbegu elfu moja (1,000) ya Avokado na miti elfu kumi (10,000) yakenyeji. Lengo letu ni nikuongeza mbegu elfu ishirini (20,000) za miti kwa muda wa

miezi kumi na miwili ijayo. Wanachama wanashauriwa kutengeza minanda yao ya nyumbani vile vile.

Tunahakika ya kwamba tunayofanya kwa hivi sasa yatazaa matunda na tutashiriki nyinyi matokeo yetu.



Picha ya kikundi ya Kairuni Cluster iliyochukuliwa tarehe 31/11/2016 wakati wa mkutano wa Cluster siku hiyo.

Cluster ya TIST ya Ikindu Kuunga mkono mfumo wa mzunguko na uongozi wa kiutumishi Viongoziwa Cluster za sasa kutoka Mwezi wa tisa mwaka wa 2016.

Na Clifford Kimathi, Mtumishi wa Cluster.

Sisi, Cluster ya TIST ya Ikindu, tunafurahi kwa vile tuliunga mkono mafunzo bora ya TIST na uongozi wa mzunguko na utumishi. Viongozi hawa nikiongozi wa Cluster, kiongozi msaidizi, na msimazi wa ukweli nahaki. Kwa uongozi wa mzunguko, tunachagua viongozi kwa kihalali, wanaohudumu kwa muda wamiezi nne. Alafu viongozi wanazunguka tena. Kiongozi msaidizi anachukua jukumu la Kiongozi msimamizi ilhali msimamizi wa ukweli na haki ana chukua jukumu la kiongozi msaidizi. Wanaume na wanawake wanzunguka viti wakati wa uchaguzi. Kama msimamizi wa haki alikuwa mwanamume, uchaguziujao anaye chaguliwa ni mwanamke.

Tarehe saba, Septemba, 2016, tulikua na uchaguzi wa Cluster ambapo watu viongozi wafuatao walichaguliwa

Kiongozi msimamizi: Margaret Muthoni +254 703 183 891

Kiongozi msaidizi: Pamela Kathambi +254 705 418 174

Msimamizi wa haki: Walter Muriungi +254 726 556 033

Msimamiziwa kike: Pamela Kathambi +254 705 418 174

Msimamizi wa kiume: Walter Muriungi +254 726 556 033

Wanaume na wanawake ndio watakaowakilisha Cluster zao katika mkutano wa Vikundi za Cluster (GOCC)



Faida za kulinda mito yetu Kupanda miti zaidi ya kiasili na isiyotumia maji mengi.

Vikundi vidogo katika TIST vina furaha kwa sababu ya mafanikio ya mradi wa kulinda na kutunza maeneo yaliyo karibu na mito ambao ulianzishwa na TIST ili kuhifadhi na kulinda maji yetu. Wakulima wanachagua kuacha kulima karibu na mito ili kuachisha mmomonyoko wa udongo na kuchafua mto. Leo, tuna wakulima walioendelea kupanda miti ya kiasili katika maeneo yao yanayokaribia mito na wanafuatili njia hizi bora zaidi. Tunajivunia waliyoweza kufanya na tunasherehekea kazi yao ya kuhifadhi mito ambayo ni uhai wetu.

Ni faida zipi za miti ya kiasili katika maeneo yaliyo karibu na mito (kando ya mito)?

- (a) Miti ya kiasili hupunguza mmomonyoko wa udongo na mafuriko.
- (b) Miti ya kiasili husaidia kusafisha maji katika mito mikubwa, midogo na visima.
- (c) Mizizi ya miti ya kiasili hushika na kuuzuia udongo kubebwa.
- (d) Miti ya kiasili husaidia kusafisha hewa.
- (e) Miti ya kiasili huupa mto kivuli na kuzuia maji kubebwa na joto la jua.
- (f) Miti ya kiasili huwapa ndege, wanyama na wadudu mahali pa kukaa na chakula. Kuhifadhi bionuwai hii kwa njia hii hufaidisha mashamba yetu kwani, kwa mfano wanyama wengine ni muhimu kwa mimea inayozalisha na kuthibiti wadudu waharibifu.

Ni kwa nini ni muhimu kuhifadhi mipaka ya mito?

- (a) Mimea na miti katika mipaka ya mito huweka mazingira yakiwa safi na rutuba ya udongo hubaki sawa wakati wote.
- (b) Mimea na miti katika mpaka kando ya mito hupunguza magwonjwa yanabebwa na maji.
- (c) Huongeza samaki katika mito kwani maji ni safi.

Mafanikio yako ni yapi? Ni ushauri upi utawapa majirani wako walio kando ya mito?

- a) Tumehitimu kuwa memba wa huu mradi.
- b) Tumepata malipo ya kando kwa sababu ya kazi ya kimazingira (PES) ambazo tumefanya.
- c) Tumetoa mikaratusi iliyokuwa katika maeneo kando ya mito.
- d) Tumeboresha usafi na idadi ya maji katika mito mikubwa na midogo.
- e) Huwa tunawashauri majirani kuwa wema kwa wanaoishi katika sehemu za chini za mto, na kulinda mto ili hawa wengine pia wapate maji safi.

Mashamba yao pia yatahifadhi udongo kwani mmomonyoko wa udongo utapungua wakipanda miti na kufuatilia njia hizi bora zaidi.



TIST: Rutuba ya udongo.

Udongo ni nini?

Udongo ni safu ya juu zaidi ya ardhi. Udongo una hewa, maji, viumbe hai na madini.

Udongo utengenezwa aje?

Kuvunjika kwa miamba ya mawe hutoa madini yanayoshikilia maisha ya mimea. Mimea ndipo huongezwa udongoni kama viumbe hai. Jinsi mawe zaidi yanavyovunjwa na mabaki ya viumbe hai zaidi kuongezwa ndivyo maji mengi zaidi yaweza kushikiliwa katika udongo, na kuendelea kuboresha ukuzi wa mimea.

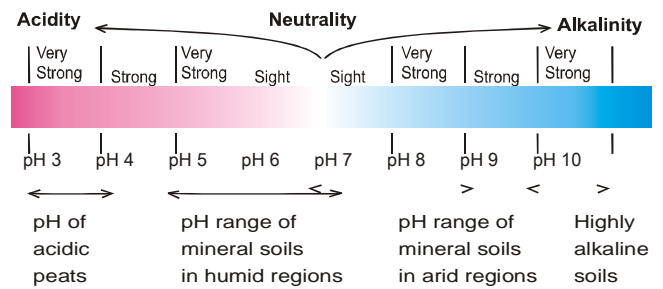
Mbona mabaki ya viumbe hai ni muhimu?

Viumbe hai (sana sana kutokana na kuoza na kutengana kwa mimea) hutoa virutubisho vingi, vinavyopatikana ili kuchukuliwa na mimea mipya. Pia hushikilia maisha ya vijidudu vyenye faida vilivyopo katika udong, husaidia maji kuingia udongoni na pia husaidia kushikilia udongo pamoja.

Ni nini huamua aina ya udongo unaopatikana?

- *Hali ya hewa:* joto pamoja na uwepo wa maji huathiri wepesi wa kuvunjika kwa mawe.
- *Viumbe hai:* bakteria, kovu na minyoo pamoja na viumbe hai vinginevyo vinavyoishi katika udongo. Baadhi yavyo hufanya kazi muhimu ya kuchanganya udongo kama minyoo. Viumbe hai katika udongo husaidia kuvunja vunjia viumbe hai na vingine husaidia kuingiza naitrojeni udongoni (kwa mfano Rhizobium bacteria).
- *Sura ya ardhi:* Kwa mfano, udongo katika miteremko ni kondefu zaidi kwa ujumla kuliko udongo uliopo katika mabonde.
- *Mawe ulipotoka udongo:* aina ya jiwe udongo ulipotoka.
- *Tabia ya binadamu:* tunavyotumia na kuhudumia udongo wetu huathiri rutuba kwa ukubwa.

Soil pH



Udongo unavyohisika kwa mkono hulingana na ni kiwango kipi cha mchanga, silt na clay kilichopo. Picha iliyopo kwa ukurasa unaofuata inaonyesha aina za udongo tukifuatilia unavyohisika kwa mkono. Udongo unavyohisika kwa mkono na ulivyojengwa huathiri wepesi ambao mizizi itaingia kwa udongo na kiwango cha maji kinachowekwa.

Ni kwa nini PH ya udongo ni muhimu?

Jinsi udongo una acidi au chokaa (PH) huathiri virutubisho vilivyopo ili kutumiwa na mimea na vijidudu vipi katika udongo vyaweza kuishi. Kwa kijumla virutubisho vingi katika udongo umumunyika (na hivyo basi huwa tayari kuchukuliwa na mimea) katika udongo wenye acidi ikilinganishwa na usio na chochote au uliona chokaa.

Hata hivyo, ikiwa udongo una acidi nyingi sana, bakteria haziwezi kuishi na jambo hili litaathiri kutenganishwa kwa viumbe hai. Udongo wa juu mwingi ulio mzuri huwa na PH ya kati ya 5.5 na 7.5 na huwa na rangi ya giza.

Udongo wenye rutuba ni upi?

Udongo wenye rutuba ni uliopo na virutubisho vinavyohitajika ili mimea kuishi kwa wingi.

- *Virutubisho vya kimsingi:* nitrogen, phosphorus, potassium.
- *Virutubisho vya sekondari:* sulphur, magnesium, calcium.
- *Virutubisho vinavyotakikana kwa kiwango kidogo:* iron, manganese, boron, chlorine, zinc, copper, molybdenum, nickel.

**Mikakati ya kuboresha rutuba ya udongo.**

- Fikiria kuongeza naitrojeni (iliyopo katika mbolea ya kijani iliyotokana na mimea inayoweka naitrojeni udongoni) na Phosphorus (iliyopo kama Rock phosphate).
- Kusanya na utumie kinyesi na mikojo ya mifugo yako. Hii ni bora zaidi ikiwa katika mbolea iliyotengenezwa katika shimo. Vyanzo safi huwa na ammonia nyingi zaidi (ambayo hudhuru mimea) na vyaweza kuwa na vijidudu vingi zaidi (vijidudu vinavyoleta magonjwa). Mbolea iliyotengenezwa katika shimo huwa na wadudu wachache. Ikiwa utatumia mbolea isiyokauka, tumia kidogo na ukae kwa muda wa miezi miwili kabla ya kuweka tena.
- Ongeza viumbe hai kupitia kutengeneza mbolea kama ilivyoelezwa hapa chini
- Tumia njia bora zaidi za kilimo hai kama ilivyoelezwa katika makala ya hapo nyuma:
 - o Mzunguko wa mimea.
 - o kulima mimea tofauti pamoja.
 - o Kilimo mseto.
 - o Planting leguminous cover crops Kupanda mimea ya kufunika ardhi inayoongeza naitrojeni udongoni.
 - o Kuacha mashamba yakiwa hayajapandwa misimu mingine.
 - o Kufunika ardhi kwa mimea.
 - o Kutumia mashimo ya kilimo hai.
 - o Kupunguza mmomonyoko wa udongo unaosababishwa na maji kwa kupanda miti, kuchimba mitaro.
- Fikiria kupanda pamoja Pigeon pea (Cajanus cajan), Dolichos lablab, Mucuna pruriens, Crotalaria, Canavalia.
- Fikiria kuongeza jivu kwani lina madini ya calcium na potassium carbonate kwa wingi.

- Ongeza chokaa (lime) iwapo wajua udongo wako una acidi kali.
- Ni bora zaidi usiongeze virutubisho vingine (isipokuwa vilivyopo katika mbolea) kabla ya kupima udongo kwanza ili kuona ni virutubisho na madini vinahitajika.
- Kuna wakati mwingine unahitajika kuongeza mbolea ya viwandani. Tumia kama ilivyoelekezwa na uulizie nizi ni ni nzuri kwa mazingira ya eneo lako kupitia kupata ushauri kutokana na wasimamizi wa kilimo wako.

Kutengeneza mbolea ya majani.

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. Kuandaa mbolea hii ni moja ya njia zilizo nyepesi, zenye gharama ndogo na bora zaidi za kuboresha rutuba ya udongo.

Ni nini hutumika kutengeneza mbolea hii?

- Masali ya mimea, magugu, majani yaliyokauka, mimea iliyokatwa, kinyezi na mikojo ya mifugo, matandiko ya mifugo, chakula kilichobaki jikoni kutokana na matunda na mboga, jivu, makaratasi yaliyokatwa na mbao nyepesi.
- Usitumie nyama, vitu vinavyotokana na mifugo, mafuta, chuma au plastiki.

Mazoezi ya kijumla yaliyo bora zaidi katika maandalizi ya mbolea hii:

- Chagua eneo lenye kivuli la kuchimba shimo lako
- Funikia kwa majani ya ndizi au kwa karatasi ya plastiki.
- Nyunyizia maji wakati wa kiangazi.
- Linda dhidi ya mvua (ambao hubeba virutubisho)
- Kama mwongozo wa kijumla, lenga:
 - o Sehemu moja kwa tatu 'mimea ya kijani' (nyasi iliyokatwa, matunda, mboga, mabaki ya mayai, mabaki ya mbegu za mafuta, magugu, mimea)



- Sehemu moja kwa tatu mimea iliyokauka (majani makavu, nyasi iliyokauka, mabaki ya mbaao, mbaao nyepesi na masalamadogo madogo ya mimea).
 - Sehemu moja kwa tatu vitu vizito kama matawi yaliyokatwa na mabaki makubwa ya mimea.
 - Hakikisha unatumia mimea ambayo haina mbegu, na usitumie mimea iliyo na ugonjwa.
 - Weka vitu hivi kwa safu au katika shimo. Hewa huhitajika kutengeneza mbolea, kwa hivyo changanya vitu hivi pamoja na usifinyilie chini.
 - Nyunyizia maji, funika na uache ili vitengane kwa muda na miezi michache inayofuata. Waweza kukuchanganya tena kila baada ya wakati.
 - Ikiwa mbolea itakuwa yenye kuteleza au inayonuka jinsi inavyoendelea, yaweza kuwa na maji mengi sana au kuwa na mimea ya kijani mingi sana. Ongeza mimea iliyokauka ili likionekana na uchanganye.
 - Jaribu kuhakikisha masala yako yapo tayari kuchanganywa, kuwekewa maji, kufunikwa na kuachwa kwa miezi miwili au mitatu kabla ya msimu wa mvua kuanza ili mbolea iwe tayari wakati wa kupanda.
 - Mbolea yafaa kuwa ya rangi ya kahawia na yenye kuvunjika kwa urahisi inapokuwa tayari. Waweza kutenganisha mboleo iliyo na vipande vidogo vidogo na ile yenye vikubwa vikubwa, na kurudisha yenye vipande vikubwa shimoni ili iwe tayari wakati utakaofuata.
- Baadhi ya vikundi vya TIST hutumia njia maalum zaidi ambayo waliiona kuwa yenye ufanisi. Wameeleza mchakato huo hapa chini:
- Hatua za Maandalizi ya mboleo zinazotumika na baadhi ya vikundi katika TIST:**
- 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 kiliopo) 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) Jaribu kuweka maji kila siku kwa njia hii, ama wakati maji yapo.
 - 16) 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.

Mazingira Bora



TIST

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

Kikamba Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Ene ma ngwatanio ya TIST ya kisioni kya kiriakimu, wumbanoni woo wa mwai muthelu.

Nthini:

**Ngwatanio ya TIST Kairuni : Kwimanyisya kwa kwika
Nitusevitye kivuio kya kitanda. Page 2**

**Ngwatanio ya TIST ya Ikindu
Itatithya utongoi wa kithyululu na uthukumi wa kwiyumya na atongoi ala mevo kuma mwai
wa keenda 2016. Page 2**

Vaita kuma kusuvia mbusi situ na kuvanda miti ya kiene na miti ila yi nduu na kiw'u. Page 3

TIST: Unou wa muthanga. Page 4



Ngwatanio ya TIST Kairuni : Kwimanyisya kwa kwika Nitusevitye kivuio kya kitanda.

Na Mr. Micheu memba wa kakundi kanini ka Macho

Itina wa umanyiw'a iulu wa kivuio kya kitanda nthini wa ithangu ya Mazingira bora. Ithi ka ngwatanio ya Kairuni nitweethiwe na wendi wa umanya umo iulu wa mawiko maseo ma TIST.

Mbeeni miti yitu kaingi ninooma ikatiala o minini itina wa umyuma kivuioni na kumivanda vala yaile. Nitwithiitwe tuimatha nzia ya undu miti yitu itonya kwikala twamina umyuma kivuioni na kumivanda vala yaile. Yila tunamanyie kana twasevya kivuio kya kitanda miti yitu yimea na iyithiwa na mii yina vinya ona twamithamya nivo tunaamuie kutata nzia ino nzeo ya TIST. Nikwithiwa nitunoonie nzia ino ndiumiasya mii ivinda ya uthamya miti. Amemba nimeetikilanile twithiwe na kivuio kya ngwatanio kimwe kila nthini wa mwai muthelu tunambiie kina mbeu ya ngandani 3,000, ikolovea 1,000 na mithemba ingi ya miti ya kiene 10,000. Kieleelo kitu ni kuvanda miti ingi 20,000

nthini wa myai ikumi na ili yukite nthini wa ngwatanio yitu. amemba nimathuthanisye kila umwe kwithiwa na kivuio kwake, na kutethania kwa kuelesya kila umwe undu uendee na wikite thini wa kivuio kyake itina wa ukwata matunda.



Visa wa ngwatanio ya Kairuni ula wakuniwe matuku 3/11/2016 me umbanoni woo wa kila mwai.

Ngwatanio ya TIST ya Ikindu Itatithya utongoi wa kithyululu na uthukumi wa kwiyumya na atongoi ala mevo kuma mwai wa keenda 2016.

Na Clifford Kimathi, muthukumi wa ngwatanio.

Ithi twi nthini wa ngwatanio ya Ikindu twina muyo na kwikathiia nundu wa kuatiia mawalanio maseo ma TIST ma utongoi wa kithyululu na na uthukumi wa kwiyumya. Nthini wa utongoi wa kithyululu nitunasakuie atongoi mathukume kila umwe kilioni kyake vandu va myai ina.

Atongoi asu ni Mungamii, munini wake, na mwii wa kinandu Itina wa uthukumi woo wa myai ina utongoi ukathyululuka ingi vla munini wa muungamii ukatwika muungamii wa kikundi nake mwii wa kinandu aitwika munini wa muungamii na tuinyuva mwii wa masavu vala ethiwa ula eiivo ni mundu muka ula ukunyuvwa lasima ethiwe munduume.

Twi matuku 7/9/2016 nitweethiwe na usakuani wa ngwatanio yitu vala aamevaa nthi nimo twasakui ta atongoi maitu.

Muungamii/mutongoi	Margret Muthoni	+254 703 183 891
Munini wa muungamii	Pamela Kathambio	+254 705 418 174
Mwii wa kinandu	Walter Muriungi	+254 726 556 033
Mutongoi wa aka	Pamela Kathambio	+254 705 418 174
Mutongoi wa aume	Walter Muriungi	+254 726 556 033

Mutongoi wa aume na mutongoi wa aka nimo makaungamiaa ngwatanio yitu nthini wa mbumbano sya kanzu (GOCC)



Vaita kuma kusuvia mbusi situ na kuvanda miti ya kiene na miti ila yi nduu na kiw'u.

Tukundi tunini twa TIST twina utanu kwithiwa twambiiite uvandi wa mbee wa kuvanda miti nguumoni sya mbusi walany'o ula wambiiwe ni TIST na utetheesye kusuvia kiw'u na nzia syakyo. Aimi nimasakuite kulea kuima nguumoni sya mbusi nikana kusiiia kukuwa kwa muthanga na kuthokoanw'a kwa mbusi. umunthi twina aimi ala maendee na uvanda miti ya kiene isioni sya nguumoni sya mbusi na nimaatii mawalany'o maseo ma uvandi wa miti nguumoni. Nitukwikathiia nundu wa wia woo kutata kusuvia mbusi ila ithyoothe tutumiaa.

Vena vaita mwau wa miti ya kiene kuvandwa nguumoni sya mbusi?

- a) Miti ya kiene ni iolaa kutuuka kwa muthanga na muthanga kukuwa ni kiw'u kana nzeve.
- b) Miti ya kiene nitetheesya kuthesya kiw'u kila ki mbusini, mikaoni, silanga na ithimani.
- c) Mii ya miti ino nilumasya muthanga na kuusiia kuthi.
- d) Miti ya kiene nitheesya nzeve.
- e) Ingi nietae muunyi ula uolaa kiw'u kungala.
- f) Miti ino niyithiawa yi liu kwa nyamu syakitheka na mawikalo masyo vamwe na tusamu na nyunyi sya yaya. li nitumaa kisio kyaila nundu imwe ta nyunyi niisaa tusamu tula twanangaa malaa na kutetheesya mbeu kunyaiika vamwe na moseo angi na kwongela unou wa muthanga.

Niki ve vata wa kusuvia Nguumo na syanda sya mbusi?

- a) Uthui, ikuthu na miti nisuviaa nguumo sya mbusi na kwikalya mbusi syi ntheu na muthanga kwikala wi munou uteukuwa.
- b) Miti ila yi nguumoni sya mbusi ni iolaa mowau ala maumanaa na kiw'u kwa kusunga kiko.
- c) Ingi miti nitumaa makuyu mongeleka nundu kiw'u ni kitheu.

Nata wikite utalika ta ukilyo? Ni utao mwau utonya unenga atui na anyanyau ala matwie nguumoni sya mbusi?

- a) Nituvitukithitwe ta ene ma usuvia nguumo sya mbusi.
- b) Nitukwatite ndivi ya iulu nundu wa wia witu wa usuvia mawithyululuko (Payment for Environmental Services (PES)).
- c) Nituvetete misanduku nguumoni sya mbusi.
- d) Nitwailitye uso wa kiw'u na kikongeleka kila ki mikaoni na mbusini.
- e) Twi taa atui na anyanya maitu methiwe na inee kwa ala meutumia kiw'u kila kimbusini ila mevakuvi nasyo meutumia kiw'u kiu naku itheo kula usi welekele na kusuvia mbusi nikana mavikiwe ni kiw'u kitheu.

Ingi miti yoo nikwikala yisuviiku na muthanga uteukuwa yila mevanda miti na kuatii mawalany'o maseo ma TIST.



TIST: Unou wa muthanga.

Muthanga nikyau?

Muthanga nikaseemu ka yiulu ka nthi. Kethiawa na kiw'u, nzeve, unou, na uthwii wa nthi.

Muthanga useuvaw'a ata?

Mavia mathiana nimo maseuvasya muthanga ula wendekaa ni miti kumea na kwikala. Ingi miti/mimea nisyokaa ikongeleelwa muthangani kuseuvya unouc wa muthanga. Oundu ivia yiendee na kuthiwa now'o mitiyongelelete na unou wa muthanga kwaila nukana kiw'u kingi kithiwe kitonya ukwatwa ni muthanga na kuendeesya miti/mimea kumea na kwiana.

Niki unou wa muthanga wa vata?

Unou wa muthanga (kaingi useuvitw'e kaingi kuma kwoani kwa miti/matu) ila yumasya unou mwingi naw'o uyo swa ni miti ingi nikana yiane. Ingi unou uyu nutetheesyaa tusamu tula twikalaa muthangani ta yiumbi, mithowe, ngongoo, ing'au, kukwata liu nayo itetheesyaa muthanga kukwata nzeve nakiw'u kwikala muthangani.

Nikyau kiamuaa muthemba wa muthanga?

- Nzeve: uvyuvu na uthithu wa vandu na kiw'u nisyoy itetheesyaa ivia kuthiwa yila yiseuvasya muthanga.
- Organisms: tusamu ta bacteria na fungi vamwe na mithowe, syingolondo na tusamu tula tungi twikalaa muthangani nitetheesyaa muno kuvulany'a muthanga na ingi kutuma matialyo ma mimea na matu moa na kuseuvya nzeve ya nitrogen ila yikiawa muthangani ni bacteria yitawa rhizobium.
- Utheeu wa vandu: (topograpohy) ethiwa vandu ni vathee niw'o muthanga wavo ukuawa na mituki na kutheew'a syandani.

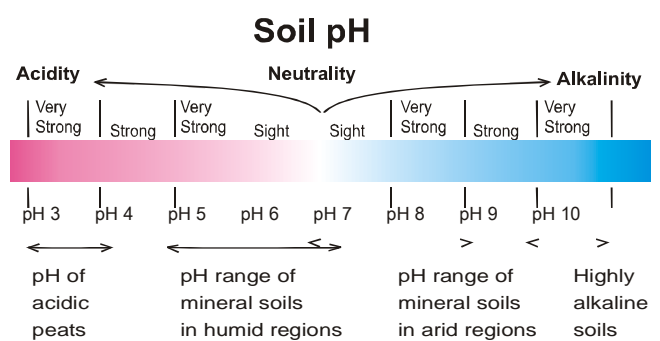
- Muthemba we via: Undu ivia yila yithiikite yiilye.
- Mwikalo wa mundu: undu twatumia muthanga na kuusuvia nikuutumuma unou wa muthanga ueleeka.

Ingi muthanga ula winaw'o uamuawa ni kithangathi, mututu na yumba yila yiuseuvitye. Ve ivisa yi ithangu yila yiatiiie yiukwony'a uaaniku wa muthanga. Uvinyu wa muthanga na undu uaanikite nuamuaa undu mii ya muti ikulika muthangani na undu kiw'u kitonya kwikala muthangani.

Niki asiti kana PH ya vata?

Muthanga kwithiwa wina asiti mbingi kana wi alkali kii niamuaa undu miti ukumya unou muthangani na ni tusamu twau kana bacteria itonya kwikala muthangani usu. Kaingi monou maingi ma muthanga nimethiawa matonya uvikia mimea/miti malika kiw'uni yila memuthangani wina asiti mbingi kwi ula wikatikati kana muthithu ute asiti.

Onakau muthanga wina aciti mbingi bacteria na mithowe mingi nditonya kwikala muthangani usu kwoou kwoa kwa matu/mavuti kutwika vuu uyithia kwi nthi na kwoou kusisiia kwiana kwa miti. Kaingi muthanga museo waile ithiwa na PH ya 5.5 kana 7.5 na wimwiu kwa langi.



**Muthanga munou niwiva?**

Muthanga munou nula wina nutrients syonthe ilasyikwendeka kwa muti kumea na kwikala.

- Nutrients sya mbee: Nitrogen, Phosphorus na Potassium.
- Nutrients ya keli: Sulphur, magnesium, calcium.
- Ila syendekaa niini: Iron, manganese, boron, chlorine, zinc, copper, molybdenum na nickel PH ya muthanga Nzia sya kwongela unou wa muthanga.
- Ongele Nitrogen kwanzia ya vuu wa ngilini na phosphorus kwa ivia ya phosphate).
- Kolany'a vuu na maumao ma indo ula withiwa wi museo waindwa kwi wumite indoni na nokwithiwa wina tusamu twingi twa pathogens. vuu uyu useuvaa waindwa vandu va ivinda ya mai ili.
- Ongela vuu kwa nzia ino yivaa nthi.
- Tata utumie nzima ya kusuvia undu uvundiitw'e nii TIST.
- Kukuany'a mimea.
- Kuvandanisya.
- Kuvanda mitii na liu.
- Kuvanda osyindu sya uvwika ta nthooko, na mboso.
- Kutia muunda kwa ivinda.
- Kutumia mavuti kuvwika.
- Kutumia maima ma nima ya kusuvia.

- Kuvanda miti kusii muthanga kikuwa kana kwisa mitau, fanya juu Kuvandanisya uitumia Nzuu, Dolichos Lablab, Macuna Pruriens, Crotalaria, Canavalia.

Ongela muu ula withiawa na calcium, potassium carbonate Ongela lime ethiwa niwisi muthanga waku wina asiti mbingi

Ti useo kwongela minerals mbiongi eka ila syinthini wa vuu wa yiima utathimite muthanga ukamanya ni mineral yiva itevo na ikwendeka.

Ve ivinda yithiawa ukethia no wongelile vuu wa ndukani yaani vatalisa. Tumia kwiana na uelesyo wa ala masevisye kwianana na kisio kyaku na eka maovisa ma nima ala me kisioni kyaku mautae iulu wa w'o.

Kuseuvya vuu wa yiima Vuu wa yiima niwakuseuvya vate kemikoo na nutetheeasya mimea kwiana. Withiawa wi museo nundu utumiaa syindu sya kwimesya itena kemikoo na ndwanangaa mimea na mawithyululuko. vuu uyu nilaisi kuseuvya na ndwingalama nene ta wakuu na nimuseo mbee kwa kwongela unou wa mithanga.

Nitrogen Phosphorus (P O) Potassium (K O) 2 5 2

Nikyau kitonya utumiwa kuseuvya vuu wa yiima?

- Makusa/mavuti ma matialyo ma liu kuma muundani kana matu, usese, kyaa kya ngombe, maumao ma indo, matialyo ma liu wa andu, matunda, muu, mboka, mathngangi matilange na ingi mbingi.
- Ndukatumie nyama, maia, mauta, syuma kana plastic. Nzia nzeo sya kuseuvya vuu wa yiima.
- Inza yiima vandu vena muunyi.
- Vwika na matu ma maiiu.
- Ngithya na kiw'u yila kute kwiu.



- Siia mbua ndikakue unou.
- Atiia matambya aya 1/3 ya ngilini ethiwa ni matu, nyeki, matunda, yiia kana miti 1/3 Matu momu kana ma langi wa muthanga (brown) ta mavemba, makusa, mutu wa musumeno etc 1/3 syindu ngito ta ngava ndilange Ikiithya watumia kiko kya miti/mimea itanamba usyaa Nzeve niyendekaa kuseuvya vuu kwoou ikiithya niwavilany'a nisa na nduvinyiie muno vena nzeve.
- Ikala uinginya, uvwikite na kueka vandu va myai kauta nikana yoee na ilikana nesa Woono yambiia uyunga muno veonany'a wikiite kiw'u kingi kana matu ma ngilini nimmo maingi kwoou ongela syindumbumu ta matu, mavemba, makusa na uivulany'a. Tata withiwe na syindu sya uvulany'a na kueuvya vuu tayali mwai ta ili kana itatu mbee wa mbua kwambiia nikana utumie ivindani ya mbanda. Vuu uyu waile ithiwa ulyi muthanga(brown) na ulekanitye wavya. No usunge vuu uyu kumywa ikuli ila itaneevya na uitungia yiimani iendee uvya.

Ikundi imwe sya tist syithiitwe itumia nzia ino yivaa nthi kuseuvya vuu wa yiima nundu kwasyo yithiitwe yi nzeo useuvya vuu wa yiima kwa ikundi imwe sya TIST:-

- 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 uitilanga tulungu tuniini.
- 5) Ikiia yiimani itumie uliku wa 0.5m.
- 6) Ikiia muu wa lita itano.
- 7) Ongela kyaa kya indo ethiwa kivo kya uliku wa 30cm.
- 8) Ongela matu na makusa uliku ungi wa 0.5m.
- 9) Ikiia muu ungi wa lita itano.
- 10) Ongela matu na makusa withie yiima notayausua.
- 11) Ususya yiima na muthanga.
- 12) Uyususya yiima ikiia 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) Tata navinya ungithye yima yii kila mithenya kwa nzia ila utonya.
- 16) 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.

Mazingira Bora



TIST

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

Kipsigis Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Membraek chebo Kariakomu TIST Klusta en tuiyet ne kosirto arawanikonye.

Inside:

Kairuni TIST Kilasta: En Konetisiet ne kigenyuru Ko kiginam ketou kabeti ne kanabtaat.
Page 2

**Kilasta nebo Ikindu:
Kotinye tetetab kandoinatet ak kandoik chemiten en inguni kong'eten arawetab sogol
2016.** *Page 2*

**Kelunoik che kinyoru ye kirib oinosiek ak kemin ketikab kipkaa che nomegei ak
beek.** *Page 3*

TIST: Okwoindab ngungunyek. *Page 4*



Kairuni TIST Kilasta: En Konetisiet ne kigenyoru Ko kiginam ketou kabeti ne kanabtaat.

Mwoe Mr. Micheu, nebo kurubit ne mingin, ak kurubitab Macho.

Kigenyorunen kelchin en konetisiet nebo baronogab kila arawa, konetech anyun borotet ole kimuchi ketounto kabeti nebo kasari. Keboiboenchi echek bik chegemi en kilasta nebo Kairuri mising agaobo boisiet ne kararan. En tai ko kimiten begunetab ketik kosibgei ak yekisibto en kabeti. En inguni komegonyoru waletab kab beti ne mousosei ketik.

Kigeyomde agabo niton kenyorunen borotet amun megotinye en kasari kasambutet nebo tigitik komiten kabeti. Kosibgei ak nito konyoru ketik en kabeti kogimegitun ak kogoronegitun.

Kiiyonchi membaek chebo kurubit kotinye kabeti neu noton. En arawet nekoibotoito, ko kogibit keswek ab Macadamia 3000, Avocado 1000 ak chebo kipgaa ketik 10,000 kitinye maket keitin

ketik 20,000 en arowek taman ak aeng chebuonen en kilasta nenyon. Kitinye kora maket kitinye chii tugul en kabeti ne nenyin. En komongunet nekitinye ko koiti chii tugul asi konyorunen kelchin.



Niton ko bichait ab Kairuni kilasta ne Kinyoru en 3th November 2016 yekin komi tuiyet.

Kilasta nebo Ikindu:

Kotinye tetetab kandoinatet ak kandoik chemiten en inguni kong'eten arawetab sogol 2016.

Mwoe kiboitiot nebo Kilasta –Clifford Kimathi.

Kiboiboi mising en boisionikab kandoik che miten amun en boisiet ne kararan. En niiton kotinye Kondointet boroindo nebo arowek ang'wang asi komanda. En chuuton ko kondointet nebo kilasta, rubeiywot ak chemotoko. Ako yeibata arawek ang'wanu kobit wallet nebo kandoinatet kou rubeiywot koigu kandointet nebo kilasta ko chemotoko koigu rubeiywot en kwenutab choton komiten kobogorisiek ak ichek en kandoinatet.

En 7th September 2016 kokitinye lewenisiet nekikilewen kandoik kou ni,

Kondointet	Magrate Muthoni	+254 703 183 891
Rubeiywot	Pamella Kathambi	+254 705 418 174
Chemotoko	Wolter Muriuki	+254 726 556 033
Netononji kotab korko	Pamella Kathambi	+254 705 418 174
Netononjin kotab murenik	Walter Muriungii	+254 726 556 033

Murenik ak korgo ko ichek chetononjin tuiyetab (GOCC) nebo kilasta en kila arawa.



Kelunoik che kinyoru ye kirib oinosiek ak kemin ketikab kipkaa che nomegei ak beek.

Boiboen kurubisiek chemengechen agobo TIST ye kigonam konet biik korib kotametusiekab beek komenchi ketik chebo kigaa. Kigolewen temik korib ngeusiekab onosiek ko magitem asi komuch koter ngungunyek komasut beek. En inguni komiten temik chechang che isibi koborunet ne kararn nebo TIST en minetab ketik en ngengusiek. Kiboibo mising en temik che kiimuch korib onosiek amun yoton ko ole miten sobosiekab biik tugul.

Nee komonutiyet nebo kelunoik ye kimin ketikab kipkaa en tobonik ab onosiek?

- (a) Ketichu kotoret ngungunyek ak maranetab beek.
- (b) Ketichu kotoret kotilil beek en onosiek che mengechen ak en silangok.
- (c) Tigiti gab ketichuton ko nome ngungunyek komoib beek.
- (d) Ketichuton ko tinye boisiet neo mising en kotililetab koristo.
- (e) Tere beek koma iyeso koba bolik en kasarta nebo kemeutan anan betut neo asista.
- (f) Tere kogochin Emet itondo ne kararan, nyorunen torik omituwogik, kutik ak tiyongik. Toreti mengotosiekab chemenye yoton.

Amun nee asi kerib ngeusiekab beek?

- (a) Timuwek ak ketik igosib ngengusiek ko toreti ngungunyek konyor okwoindo ak konyor Emet itondo en betusiek tugul.
- (b) Timwek ak ketik koribe beek komonyor miondab kowek.
- (c) Nyorunen inchirenik iyotenyuan beek che kororonen che monyobirotin ak tiyony agetugul ne ne menyee Beek.

Nee borotengu? Nee kotigonet ne iyoe en chitab kokwengu agobo ngeusiek?

- (a) Ligu chito neribe ngenusiek.
- (b) Kinyorunen borotet ne tesat ye kirib ngeusiek en boisiyonik kiyok.
- (c) Keisten chepkogutgei(blugam)en oinosiek kiyok che kitinye.
- (d) Koribok ak kogororonegitun beek en oinosiek tugul cheech ak chemengechen.
- (e) Kitigon mengik che negitin ak oinosiek,ngengusiek korib komie asi komuch koiti biik chemenye legemosiek beek che kororon.

Asi koiti agichek kiribok imbarenik kwak kotoretok komoibet ngungunyek ye mine ketik.

**Nee okwoindab ngungunyet?**

Ngungunyat ne kararan kotinye omitwogik che igochin sobet minutik.

- Omitwogik che tai; nituogen, phosphorus, potassium.
- Chebo oeng; sulphur, magnesium, calcium.
- Ak chechang; iron, manganese, boron, chlorine zinc, copper, molybdenum, nickel.

Koguwoitik che kitisin ngungunyek

- Ketesi omitwogik keboisien kegot rurutik che teche nitrogen.
- Keboisien keture chebo tuga ak sogororek kiruruche asi komumiyo mogiboisien ko morurio.
- Tesin ngetunanikab minutik.
- Kegol imbaret ma kibat.
- Kemin minutik che besiotin.
- Kemin ketik che moweche minutik ak che ichugei en kwong kou, robuwonik, chebololet ak sotonik.

- Kemin ketik asi koter ngungunyek.
- Miten ketik che tinye ngendek –pigeon.
- Kitesin orek tinye (calcium, potassium, carbonate).
- Momeche ketesi komenai anan kotomo ichigil ngungunyek, karara mising itenyoru chitab minutik as kuwororun abo noton.

Keturek

Keturek ko omitwogikab minutik che kitounen kinun en kasrta nenin che mogitesi chemical, motinye weget en minutik, amoweche ngungunyek.

Kitounen nee keturek

- Ngetunonikab minutik, sogek, ak kitage tugul ne yamat ana ko nyali.
- Matiboisien kou bendo, mwanik, chumoinik anan ko plastic.

Ole kimumto

- Lewen ole miten uluwet.
- Tugen sogek kab itisio/chebebe.
- Tumchin beek en kasartab kemeut.



- Tekten en robta.

Kosibet

- Agenge en somok (minutik che nyolilelen, susuwek, ingewek, logoek, sorowekatugal nego ngechinek).
- Agenge en somok sogek che tolilionen.
- Agenge en somok ko sogekab ketik.
- Ker ile neboisien tuguk cheyachen amun weche keturek.
- Tugul anyun ki nto keringet orit amat igony amun kimogin koristo en orit.
- Igoteb en kasarta nebo orowek asi iburuch tugul koik agenge.
- Ye igas nguunet beo itesi sogek chenylilen ak iburuchen.
- Ye kainte tuguchuton tugul kou beek igotebi orowet 2-3 asi iib koba imbar.

Miten kosibet ne kigochob temikab tist kou yeisibu

1. Lewen ole itounen keturet 4mx4m.
2. Igot tililit yoton.

3. Tem keringet 3-4m ak 1.5m orit.
4. Iyumchin kayumanik tgugul yoton.
5. Rongik kot koit 0.5m.
6. Tesin orek che keburuch ak orek.
7. Neisibu ites kot goit 30cm ngototokab tuga anan kobo ngororek.
8. Tesin sogek kot korigta konyi.
9. Nebo let anyun ite ngungunye kot konyi.
10. Rutin keti ne tenten kuwenetab keringet kot kotiny kel.
11. Igo munyo en kasarta betusiek 90.
12. Tesin beekab orek 5 litres.
13. Tesin sogek ak mobek (0.5m).
14. En kasariton iyumchi beek chon iboisien imweten ingoroik anan ko keun kot.
15. Tumchin beek en betut angetugul yon kobit beek.
16. Ye ibata betusiek 90 ko gorurio keturek boisien ketit asi koborun mat nemi orit, imuch iger kabusetab karisto nebunu keringat.