

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Nyarushanje Central TIST Cluster in Uganda during their monthly meeting 16/06/2017.

Inside:

TIST is working, says Ann Nguna, TIST member Ndalani Cluster in Machakos County. Page 2

Nutrition a key priority. Page 2

TIST: Soil Fertility. Page 3

TIST: Clear cutting of TIST tree groves is a serious violation of TIST Values and Green House Gas contract. It hurts positive actions of thousands of TIST Farmers. Page 6



TIST is working, says Ann Nguna, TIST member Ndalani Cluster in Machakos County.

Ann Nguna is a member of Kyandani Help Group, TIST number 2015KEI39. Her group belong to Ndalani TIST Cluster in Machakos County. “When TIST program was introduced in my area, I was one of the people who happily embraced it. Since my retirement from health sector, and embarking on voluntary health services in my community, I have seen my neighbours suffer from lack of firewood – which is a health issue as well.” Ann says.

Ndalani Cluster is one of the most successful Clusters in new expansion areas for TIST. Other Clusters are Kakumini TIST Cluster, Kaluluini TIST Cluster, and Mamba TIST Cluster.

Ndalani is a leading Cluster with 43 Small Groups so far registered, followed closely by Kakumini 43, Mamaba 41 and Kaluluni 23.

Ann’s Small Group has so far planted 1,891 new trees. “My group has 6 members. We work together in our group to help each other. We also learn from each other besides getting valuable trainings from TIST at our local Cluster meeting.” Ann adds. She further says, “ I have practiced new trainings I have learned from TIST. I have a raised seed bed, a Conservation Farming plot, compost manure and very lively tree groves. My farm looks beautiful.”

Nutrition a key priority.

by Kimani Mwangi

Some 500 million people are small scale farmers globally, meaning they rely on small family plots of land for their food production. Although small scale farmers manage 80% of farmland in Africa they often sell their most nutritious food, and eat starchy foods such as rice, Ugali, and wheat products thereby lacking in key nutrients such as iron and zinc which are essential for good health.

A diverse diet that incorporates many foods can help achieve good health. A monotonous diet is likely to bring deficiencies in nutrients such as iron, vitamin A and zinc. This increases mortality and impedes brain and body development.

For a balanced diet-make sure you take at least 5 out of the following 10 food groups a day:

1. Staples-Wheat, rice, potatoes etc

2. Green leafy vegetables-Spinach, kale, amaranth etc
3. Orange vegetables-Pumpkin, carrots, capsicum etc
4. Other vegetables- Brijals, tomatoes etc
5. Fruits-Water melon, mango, pawpaw, etc
6. Eggs-fried, boiled etc
7. Meat and fish-Chicken, pork, mutton, beef etc
8. Dairy products-Milk, cream, etc
9. Nuts and seeds-cashew, peanut, almond etc
10. Beans and peas



TIST: Soil Fertility.

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.

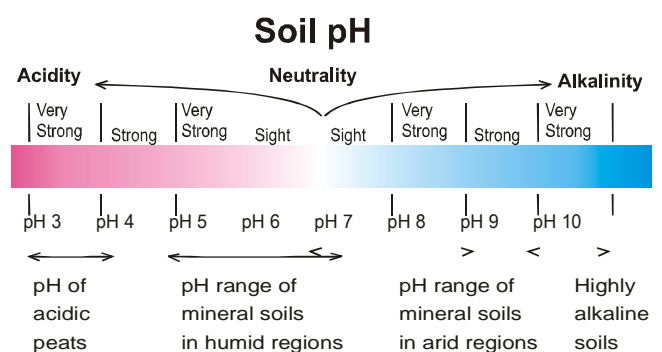
Why is soil pH important?

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 this will affect the rate of decomposition of organic matter. Most good topsoils 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 for the crops and environment. Composting is one of the easiest, cheapest and most effective ways of improving soil fertility.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t <p>• Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents.</p> <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t

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, 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, 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 leaving 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.
- 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 - 4m and 1.5m deep.
 - 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) 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) Try to water the compost pit in this way every day, or whenever water is available.
 - 16) After the 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.

1) Choose an area 4m x 4m for your compost pit.



TIST: Clear cutting of TIST tree groves is a serious violation of TIST Values and Green House Gas contract. It hurts positive actions of thousands of TIST Farmers.

Last month, we discussed about clear tree cutting during the GOCC seminar held at Gitoro in June 2014, immediately after TIST-USAID Five years of successful partnership celebration.

This month, we are carrying a reminder of last month's article with a call for information and suggestion from TIST farmers on the best ideas on how to completely avoid clear cutting. TIST's Leadership council appointed Charles Ibeere (0720 474209) to work closely with Cluster leaders, GOCC Representatives and TIST farmers in addressing this issue.

It is important to note the Green House Gas contract, which all TIST farmers are party to, stipulates an agreement by the farmers to keep trees for long-term. It only allows farmers to thin their trees (if closely spaced), prune branches for firewood, and cut up to 5% of the group trees each year when the trees are 10 years or older.

The above rule is necessary for continued participation in carbon program. Carbon buyers

want to be assured that the trees from which they buy carbon credits are kept alive. Where the farmers cut their trees, carbon buyers always decline to buy credits from such entities because they are considered high risk. This is why an action of few farmers who violate this rule could make carbon buyers shun from buying other TIST farmers carbon credits.

There have been other concerns too. A farmer who cuts down all his trees has been receiving TIST Trainings, Quantification and Mazingira Bora newsletters. All the expenses incurred by him are passed on to other farmers.

As a reminder about actions GOCC said they would implement, please contact Charles (0720 474209) about:

- a) Ideas from other farmers in Clusters meeting about the actions that should be taken on those who clear-cut.
- b) How such a farmer who clear-cut would compensate other farmers so as to cushion them from losses in the carbon business.

Mazingira Bora



TIST

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

Kimereu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Nyarushanje Central TIST Cluster in Uganda during their monthly meeting 16/06/2017.

Inside:

TIST nikurita Ngugi, ntento cia Ann Nguna , Mumemba wa TIST Cluster ya Ndalani ndene ya Kaunti ya Machakos. Page 2

Biakuria bibiega ja untu bwa gitumi. Page 2

TIST : Unoru bwa mutetu. Page 3

TIST: Ugiti bwa miti yonthe ndene ya miunda ya TIST ni kuuna na njira inene jaria TIST ikirite na kinya kandarasi ya GhG. Nikugitaragia mantu jameega jaria jakuthithua ni arimi ba TIST ngiri nyingi. Page 6



TIST nikurita Ngugi, ntento cia Ann Nguna , Mumemba wa TIST Cluster ya Ndalani ndene ya Kaunti ya Machakos.

Ann Nguna ni mumemba wa Kyandani Help Group, Namba yawe ya TIST ni 2015KEI39. Gikundi kiawe ni gia Cluster ya Ndalani ya Kaunti ya Machakos. “Riria mubango jwa TIST jwambirirue nturere yakwa, ndari umwe wa baria bajwamukire na nkeeru na kugwirua.

Kuma ndikuma ngugine yakwa ya sekta ya Ugima bwa mwiri, na ndambiria ngugi cia kwiritaniria kiri ntura yakwa, nimbonete aturi bakwa bakiaga nku cia kuruga – ni iji ni mbajua ya kimuthemba kinya yo” Ann kuuga Cluster ya Ndalani ni imwe ya iria ikurite bwega mono kiri ntura iria njeru cia TIST. Cluster ingi ni Cluster ta TIST ya Kakumini, Cluster ya TIST ya Kaluluni na Cluster ya TIST ya Mamba.

Cluster ya Ndalani niyo itongeretie na ikundi bininiini (Mirongo ina na bithatu (43) biria biandikithitue, ithingati akui ni Kakumini na mirongo

ina na bithatu (43) Mamaba na mirongo ina na kimwe (41) na Kaluluni na Ikundi mirongo iri na bithatu (23)

Gikundi kiniini kia Ann mwanka nandi nikiandite miti ngiri imwe na Magana janana na mirongo kenda na jumwe (1,891) imieru. “Gikundi giakwa kiri amemba batantatu. Turitaga ngugi amwe kiri gikundi gietu na gutethania. Nituthomaga kuuma okiri umwe wetu amwe nakwithiria tukiewa mauritani ja bata kuma kiri TIST kiri micemanio yetu ya Cluster” Ann kwongera kuuga . Akongera kuuga atiri “ ninthithitie mantu jaria nthomete kuuma kiri TIST,

Ndina munanda jwa mbegu jukiritue, ndina kamuunda ga urimi kwa kurigiria, mboreo ya kirinya na miti iri na inya. Muunda jwakwa nijuthongi mono”

Biakuria bibiega ja untu bwa gitumi.

ni Kimani Mwangi

Antu milioni ithano ni arimi ba tumiunda tuniini nthiguru yonthe, ijakuuga bategaa tumiunda tuu twao niuntu bwa kwona irio biao, kinya kethira arimi baba ba tumiunda tuniini nibageragia kurima miunda iji na kiwango gia mirongo inaana kiri igana (80%) nibendagia irio biao biria biega bagatigwa bakirijaga irio ja muchere, nkima na nkano na niuntu bubu kwaaga into biria biendekaga mono mwiri ja Iron na Zinc.

Irio bibiega bia mwiri bibwiri kwithirua na irio biria bigatethia mwiri . Irio bia gucokeria bitikugarurwa biomba gutuma mwiri jukaga biria bitethagia mwiri ja iron, Vitamin A, na Zinc. kwaga bibi gutumaga mwiri jurega gukara bwega na kurigiria utombo gukura bwega na kinya mwiri.

Kenda uria irio uria bibwiri, ona ati ukuria

bitano kiri bibi ikumi ndene ya ntuku

1. Irio bia Starch (Staple) – Nkaano, Muchere, ikwacii
2. Iria bia mabura ja green – pinach, sukuma wiki, terere na bingi ja biu
3. Irio bia mabura ja Orange – Kirenge, karati, pilipili hoho
4. Irio bingi ja Nyanya, Brijals na bingi ja biu
5. Matunda ja maembe, water melon, mababai na jangi ja jau
6. Nkaara – itherukitue kana ikarangi
7. Nyama na makuyu – Nyama ya nguku, ngurwe, mburi na ng’ombe
8. Into bia iria – Iria, kirimo
9. Nchugu na mpindi – cashew nut, nchugu karanga, almond
10. Mboco na nono



TIST : Unoru bwa mutetu.

Muthetu ni nimbi?

Muthetu ni muju juria jukunikite nthiguru iria twitagira na tukinyangaga. Jwithagiria na miruki, ruuji, mboreo na mineral.

Muthetu juthithagua atia?

Riria maiga jaunikanga , nirio muthetu jumaa na jugathethia imera gukura. Mimera nayo igacoka ikongerwa kiri muthetu juju ja mboreo. Ouria maiga jetaga jakiuminkangaga niu jwitaga jukingiaga, na ruuji kwongereka kiri muthetu na niuntu bubu gutuma mimera ikura bwega.

Niki nontu mboreo ya muthetu iria ya gitumi mono?

Mboreo ya muthetu mono mono iria yumaga kiri mimera iria irikitie kwora niyongagira mono mboreo iria itumagirwa ni mimera iria ikaandwa. Nitethagiria mono tunyomoo twa muthetu turia tuthethagiria mimera gukura, guthereria na gucunka ruuji na kugwatithania muthetu.

Imbi Itumagaa Guntu Mwanya Mwanya Kwithirua Na Muthetu Mwanya Mwanya?

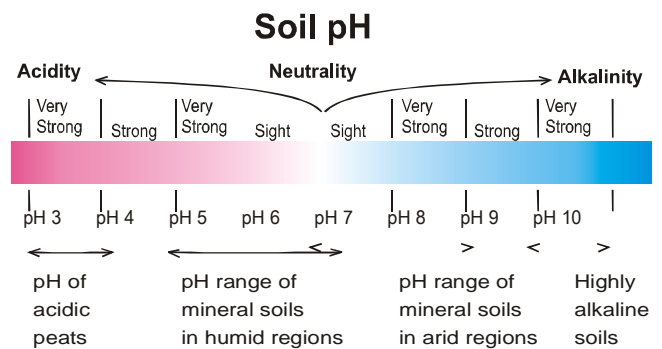
- **Riera riria rithiurukite antu au:** amwe na mwanki kana mpio ya antu au na ruuji ruria ruriakui niuntu rugatuma maiga kunikanga na mpwi nkuruki
- **Tunyomoo twa muthetune:** bacteria, fungi na tung'inyo biria bikaraga muthetune nibiritaga ngugi ya kungania muthetu. Tunyomoo tutu turi amwe itutethagia gwikira mboreo muthetune na gutetheria gwikira nitrogen kiri muthetu (Rhizobum bacteria)
- **Mukarire jwa nthiguru:** Muthetu jwa kibarine nijwithagirwa juri jumuceke niuntu kwa kwegerwa ni ruuji magita na magita.
- Iga riria muthetu juju jumiite
- **Ngugi cia antu:** Ngugi iria tuthithagia kumenyera muthetu kana kwinyangia muthetu juju nicio igatuma muthetu jwithirua junori kana jwondi. Uria muthetu jukari kinya uu gukaringana na ni munthanga jungana, na muthetu juria

jucunki na juria jungi jwa Clay (yumba) juri ndene yaju. Into bibi nobio bitumaga ruuji rungana muthetune, na uria miiri ya mimera igatonya nti

Niki nontu Acidi ya muthetu iria ya Gitumi?

Acidi iria iria muthetune kana iria itiku niyo itagagwa PH niitumaga mimera yumba gukucia ruuji na biakuria biingi kuuma muthetune na ni tumyomoo turiku tuumba gukara muthetune juju. Mono mono, irio biria bingi bia muthetu kabinyunyaga nti na kwou bikethirwa biri tayari kujukua ni mimera jutegithaniritue na muthetu jutina acidi .

Indi kethira muthetu juri na acidi inyingi, tunyomoo tutwingi tutiumba gukura na untu bubu bugatuma mimera iria ikuite itikore na mpwi. Mithetu iria miega iri acidi ya gati gati ga 5.5 na 7.5 na ni imiru kirangi.



Muthetu jumunoru ni Juriku?

Muthetu jumunoru ni juria juri na irio bionthe biria bikwendekana kenda mimera ikura

- Irio bia mbeere: Nitrogen, Phosphorus na Pottasium
- Irio bia jairi: Sulphur, Magnesium na Calcium.
- Irio Biniini: Iron, Manganese, boron, chlorine, Zinc, copper, molybdenum, nickel

Njira cia kwongera unoru bwa muthetu:

- Thuganiria njira cia kwongera Nitrogen na njira ya mboreo ya mimera iria ikaira nitrogen muthetune na phosphorus na njira ya mboroe ya phosphorus kana mboreo ya nyomoo cia ndithia



- Uthurania na utumire mboreo na maumago ja nyomoo cia ndithia. Iji ibui mono yambite gwikwa kirinyene ikooma. Yuthuranitue orio nithagirwa iri na Ammonia inyigi mono na ti injega kiri mimera na ithigarwa na kiwango gikinene gia tunyomoo turia tuumba kureta mirimo kiri mimera. Mboreo ya kirinya iri tunyomoo tuniini turia tuumba kuretera mimera mirimo. Kethira utumagira mboreo imbithi, tumira na kithimi na utige mieri iri kana nkuruki mbere ya wikira mboreo ingi.
- Ongera mboreo ya mimera gukurukira njira iji iri aja:
- Ambiria urimi bwa kurigiria ja aja o Kuthiurukia mimera mundeene kana kungania mimera
 - o Ungania miti na mimera na kwaanda mimera ya mboco ja mimera ya gukunikira.
 - o Gutiga mitaro mundeene kana gutumira Mimera ingi gukunikira (Mulch)
 - o Tumira marinya ja kurigiria
 - o Anda miti kurigiria muthetu gukamatwa ii ruuji, mitaaro, fanya juu
- Thugania kungania nchugu (cajanus cajan), Dolichos Lablab, Mucuna Pruriens, Crotalaria, canavalia.
- Thugania gutumira muju jwa riko juria juri calcium na potassium carbonate inyigi
- Ikira Lime kethira nwiji muunda jwaku juri acidi inyigi
- Ni bwega kurega kwongera mineral ingi tiga iria iri mboreone mbere ya muthetu kuthimwa umenya bwega ni irio biriku bia muthetu bikwendekana.
- Nokwithirwe na igita riria ukenda gwikira mboreo ya nduka , tumira kuringana na uria maandiko jakuga na ithithie unchukuni umenye ni mboreo iriku njega gutumira nturene yenu kuringana na muthetu. Noburie kinya Abicaa ba Agriculture.

Mboreo ya Kirinya

Mboreo ya kirinya ni mboreo ya gintwire iria itethagia mimera yaku gukura. Niyo njega nkuruki ya mboreo cia nduka niuntu itithukagia mimera ka riera rietu. Kuthithia mboreo ya kirinya niyo njira injega, imbuthu na iria iti goro buru kiri njira cia gutetheria kwongera unoru bwa muthetu.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t <p>• Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents.</p> <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t

Imbi yumba gutumirwa kuthithia mboreo ya kirinya?

- Matigari ja mimera, Iria, mabura jamakuu, mimera iria itemi na maumago ja nyomoo cia ndithia ,mati jaria jamamagirwa ni nyomoo cia ndithia, matigari ja irio bia rikone kuuma matunda, mboga cia mabura, mujuu jwa riko, maratati jagitangi na kadi mbodi.
- Ugatumira into ja nyama, into bia iria, maguta, plastiki kana chuma.

Njira iria njega mono cia kuthithia mboreo ya kirinya

- Thuura antu kuri na kirundu kana kithiiki.
- Kunikira na mabura ja irigu kana karataci ka naironi.
- Minyiria ruuji igita ria thano.
- Kunukira kuuma kiri mbuura niuntu mbura gekathambia irio biu.



- Ja watho ,mwororoto jwaku ni:
 - Gicunci gia imwe kwa ithatu(1/3) ni mati ja ngreeni (Nyaki itemi, matigari ja matunda, mboga, makonyo ja nkara,mboreo, maria na mimera)
 - Gicunci gia imwe kwa ithatu ni mati ja mbrauni (Mabura jamomo,ruwa, saw dust, kadi mbodi,matigari ja mimera)
 - Gicunci gia imwe kwa ithatu mati jamarito ja mpangi cia miti na mimera iminene
 - Utumire mimera iria itiraita mbegu na iti na mirimo.
 - Mamaniria intu bibi bionthe kirinyene kiu. Riera rikendekana kirinyene giki. Kwou ungania into bibi bionthe indi ukainyiria bigwatana.
 - Ikira ruuji, kunikira na utige into bibi biore ndene ya mieri ingana ona. No uruganie into bibi oigita na ringi.
 - Into bibi biambiria kununka na gutendera , nowongere mati ja brown na unganie kairi.
 - Geria kuthuranira mboreo yaku mbere ya mbuura yambiria ja mieri iri kana ithatu mbere ya mbura.
 - Mboreo iji ibwiri kwithiria iri ya rangi ya kithetu riria yathiria kuthondekwa. Mboreo iji no icunkwe kenda withirwa na iria mbinyu buru. Iria itinyi bwega icokue kirinyene kairi igaitwa riu ringi.
 - Ikundi bimwe biri njira ciao cia kuthithia mboreo iji iria bonaga ibui nkuruki ya ingi. Aja nibaejene njira yao ya kuthithia mboreo yao.
- Njira ya kuthithia mboreo ya kirinya ni Ikundi bimwe bia TIST.**
- Thuura antu a mita inya kwa mita inya (4mx4m) gwa kuthithiria kirinya giaku kia mboreo.
 - Theria antu au.
 - Inja kirinya kia uthiururi bwa mita (Diameter 3 – 4 m) na worokeru bwa mita imwe na nusu (1.5m deep)
 - Ojania matigari ja mimera na ujagitange tunuku tuniniini (Ja mabura ma mabua ja mpempe na ugimbi na mboco.
 - Ikira into bibi kirinyene giki mwanka worokeru bwa mita 0.5.
 - Ongera lita ithano cia muju jwa riko.
 - Ikira ntaka ya ngombe mwanka centimita 30 kana inyingi nkuruki. Noithirwe iri ya nguku, ngurwe, mburi kana ngombe.
 - Ikira mabura na mabua.
 - Ikira lita ingi cia muju jwa riko.
 - Ongera mabua na mabura jangi mwanka kirinya kiende kujura.
 - Nyumene ikira muthetu mwanka kurinya kiujure.
 - Ugikira muthetu kirinyene ikira muti jumuraja gati gati mwanka jukinye nthiguru.
 - Tiga kirinya mwanka ntuku mirongo kenda (90 days) mieri ithatu
 - Igitene riri tumira ruuji rwaku rwa ruko gwikira kirinyene. Ja wathiria.
kuthambia nyomba kana kuura nguo itura ruuji rwaku kirinyene giki. Kethira uri na nyomoo cia ndithia , ikira maumago ja ciao kirinyene giki.
 - Geria gwituriria ruuji kirinya giki ntuku cionthe kana rira ruuji rukwonora.



TIST: Ugiti bwa miti yonthe ndene ya miunda ya TIST ni kuuna na njira inene jaria TIST ikirite na kinya kandarasi ya GhG. Nikugitaragia mantu jameega jaria jakuthithua ni arimi ba TIST ngiri nyingi.

Mweri muthiru, nitwaariririe ugiti miti yonthe ndene ya semina ya GOCC iria yathithirue Gitoro mweri jwa itantatu 2014, orio tukurikia kiatho gia kugwirirua uritaniri ngugi bwa TIST na USAID miaka itano buria buumbene.

Mweri juju, nitukuburikania uria twaugire mweri muthiru riria tworirie arimi ba TIST batue nteto na mathuganio kwegie njira iria njega buru ya kuthiria ugiti miti yonthe ndene ya miunda ya TIST. Atongeria ba TIST ndene ya LC nibathurire Charles Ibeere (0720 474209) kuritaniria ngugi ya akui na atongeria ba cluster, arungamiri ndene ya GOCC na arimi ba TIST kiri gutegeera untu bubu.

Kurina bata kurikana kandarasi ya GhG, iria arimi bonthe basainiti, iria yugite arimi nibagwitikiria gwika miti igita riraja. Itikagiria arimi aki gutaure miti (kethira nikuianiritie mono), kugita biang'i bia gutumira ja nku, na kugita mwanka gicunci kia miti itano kiri o miti igana ya gikundi o mwaka miti yakinyia miaka ikumi kana yakura nkuruki.

Rwatho ruru rurina bata mono kethira tukendelea kwithirwa turi ndene ya thoko ya ruugo. Aguri ba kaboni nibendaga guhakikishirwa ati miti

iria bakugurira ruugo igekwa iri moyo. Naria arimi bagiitaga miti, aguri ba ruugo nibaregaga kugura kuumania nabo niuntu boonaga kurina ugwati bwa iguru mono. Giki nikio gitumi mathithio ja arimi babakai baria baunaga rwatho ruru jomba gutuma aguri bakarega kugurira arimi bangi ba TIST ruugo rwao.

Nikwithiritwe kurina kinya mantu jangi. Murimi uria ugitaga miti nethiritwe akiritanagwa, gutarirwa miti na kuewa gazeti o mweri ni TIST. Mbeka iji itumiritwe kiriwe niciriagwa ni arimi bangi.

Kurikanua mantu jaria GOCC yaugire ikathithia, ringira Charles (0720 474209) kwegie:

- a) Mathuganio kuuma kiri arimi bang indene ya micemano ya cluster kwegie matagara jaria jabati kujukua kiri baria bagitaga miti yonthe ndene ya miunda ya TIST.
- b) Uria murimi uria ugitaga miti yonthe akaria arimi bangi nikenda abarigiria mbeca iria bakagitwa ndene ya thoko ya ruugo.

Mazingira Bora



TIST

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

Kikuyu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Klusta ya TIST ya Nyarushanje Central ya Uganda mucemano-ini wa o mweri 16/06/2017.

Thiini wa ngatheti:

TIST in iraruta wira, Ann Nguna kuga, mumemba wa TIST kuma Klasta ya Ndalani, County ya Machakos. Page 2

Murire mweka niguu mbere. Page 2

TIST: Unoru wa tiiri. Page 3

TIST: Gutema miti ya TIST ni kuna watho wa TIST values na Greenhouse Gas Contract. Nigutumaga miturire ya arimi angi a TIST ithuke. Page 6



TIST in iraruta wira, Ann Nguna kuga, mumemba wa TIST kuma Klasta ya Ndalani, County ya Machakos.

Ann Nguna ni mumemba wa Kyandani Help Group, numba ya TIST ni 2015KEI39. Gikundi kiao ni gia Klasta ya TIST ya Ndalani kuma Machakos County. “Mahinda maria mubango wa TIST wambiriirio matura maya, ndari umwe wa aria mari na gikeno kuhimbiirie mubango uyu. Kuma riria ndaritaire kuma ruhonge ra ugima wa mwiri na ngiambiriria kwirutira guteithiriria mubango-ini wa ugima wa mwiri, ni nyonete aria turigainie mari na thina wa ngu – ta imwe ya muturire mwega.” Ann akiuga.

Klasta ya Ndalani ni imwe ya Klasta iria ireka wega hari gutheremia TIST. Klasta ingi ni ta Kakumini

TIST Cluster, Kaluluni TIST Cluster na Mamba TIST Clusta.

Ndalani niyo itongoretie na ikundi nini 43 iria ciandikithitio, irumirirwo hakuhi muno ni Kakumini, 43, Mamba 41 na Kaluluni 23.

Gikundi kinini kia Ann ni kihandite miti 1,891. “Ngurubu yakwa iri na amemba 6. Turutaga wira hamwe tugiteithanagia. Oho tuthomithanagia ithui ene hamwe na githomo kiria tuthomithagio ni TIST gikundi-ini gia Klasta.” Ann agithii na mbere kuga. Oho akiuga, “ Ni njikite uria thomithitio ni TIST. Ndina tuta ya kuoywo iguru, guthondekerera mugunda, thumu na miti mithaka. Mugunda wakwa ni muthaka.”

Murire mwega niguu mbere.

na Kimani Mwangi

Andu milioni 500 ni arimi anini thi yothe, uguo ni kuga ati mehokete tumigunda tunini kurima irio ciao. Ona gukorwo arimi anini mehokete 80% ya migunda thiini wa Africa mahinda mamwe nimendagia migunda iria miega na minoru ya kurima irio, na kuriaga irio muthemba umwe ta mucere, ngima na ngano iria itari na uteithio wa iron na zinc iria ni njega ugima-ini wa mwiri.

Murire mwega ni uteithagia mwiri gukura wega. Murire muru ni utumaga mwiri wage iron, vitamin A na zinc. Indo ici inyihagia mukurire wa hakiri na mwiri.

Niundu wa kugia na ugima wa mwiri ria indo 5 hari ngurubu ici ikumi o muthenya:

1. Irio - Ngano, mucere, waru etc
2. Mboga – Spinach, thukuma, amaranth etc
3. Mboga cia Matunda – Murenge, karati, capscum etc
4. Mboga ingi – Brijals, nyanya etc
5. Matunda – Water melon, maembe, mababai etc
6. Matumbi – Makarange, macamukie etc
7. Nyama na Thamaki – Nguku, ngurwe, nyama cia mburi, nyama cia ngombe etc
8. Iria – Iria, kirimu kia iria etc
9. Mbegu – Cashew, njugu, almond etc
10. Mboco na minji etc



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?

Gwatumanga 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.

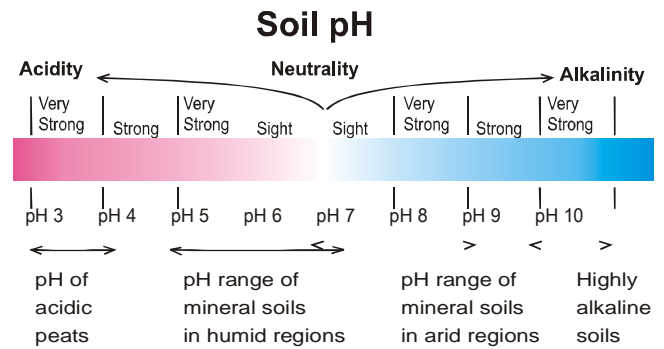
Nikii organic matter iri ya bata?

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-ihenyu 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 uuthondekete. 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.
 - o Kuhanda mithemba miingi ya irio hamwe na gucenjania imera.
 - o Kuhanda miti mugunda-ini wa irio.
 - o Gutiga mahuti mabuthire mugunda.
 - o Kuhuthira marima ma Kilimo Hai.
 - o 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 l ukoragwo na calcium na potassium carbonate.
- Ongerera lime anatarikgikorwo tiiri waku niukoragwo na acid nyingi.
- Niwega kwaga kwongerera minerals (tiga iria cikoragwo thumuini) utarorete tiiri wega niguo 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.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t 	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t
<ul style="list-style-type: none"> • Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents. <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>		

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 riuu.
- Gitira kumana na mbura(iria ingithambia unoru wothe).



- Ta njira ici, tigrira;
 - 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 Tigrira 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.
- 2) Theria handu hau.
 - 3) Enja irima ria 3-4m na 1.5 uriku.
 - 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 nichuthagira njira ngurani na makona ciri njega na magataariria haha.

Kuhariria compost manure na TIST groups

- 1) Hariria handu ha 4mx4m ha kwenja irima.

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.



TIST: Gutema miti ya TIST ni kuna watho wa TIST values na Greenhouse Gas Contract. Nigutumaga miturire ya arimi angi a TIST ithuke.

Mweri muhetuku, nitwaririe uhoro wa utemi wa miti thiini wa GOCC semina iria ya Gitoro kuri June 2014, thutha wa gukunguira TIST-USAID partnership ya miaka 5.

Mweri uuyu, nituramuirikania uhoro wa last month niguo kumuthomithia na kuigua maeoni manyu uria tungihota kunina utemi wa miti. Utongoria wa TIST niwathurire Charles Ibeere (0720 474209) niguo arutithanie wira na atongoria a TIST hamwe na arimi niguo uhoro uru wariririo wega.

Niwega kumenya ati contract ya Green House Gas, iria arimi othe a TIST mekirite kirore yugite ati arimi magiriirwo nikuiga miti iri muoyo gwa kahinda karaihu. Niitikiritie arimi kuhurura miti na gutagania (angikorwo niikuhaniriirie) kana gutema gicunji kia 5% kia miti ya gikundi rria yakinyia miaka 10.

Mawatho maya nimathiite na mbere nakuhuthika thiinwa tabaarira ya carbon. Aguri a

carbon nimendaga kuona miti iria maragura carbon credits kuma kuri yo iri muoyo. Riria arimi matema miti yao, aguri aya nimaregaga kugura carbon credits icio kuma kundu kuu tondu gutuikaga kuri na ugwati.

Giki nikio gitumi arimi magiriirwo nigutiga gutema miti niguo carbon credits ciao cigurwo.

Kuri na maundu mangi ningi. Murimi uria watema muti akoretwo akiamukira githomo, utari wa miti na ngathiti ya MB. Mahuthiro maria mari make matwaragirwo arimi aria angi.

Ta kiririkania uhoro wigii maundu maria GOCC yangire niikurumirira, araniria na Charles (0720474209) uhoro wigii:

- a) Mawoni ma arimi aria angi thiini wa micemanio ya cluster uhoro wigii makinya maria makwoerwo aria matema miti.
- b) Uria arimi aria matema miti maririhaga aria angi niguo uhoro ucio unyihanyihe.

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 Nyarushanje Centra TIST Cluster kutoka Uganda wakati wa mukutano wao wa kila mwezi 16/06/2017.

Ndani ya gazetti:

TIST inafanya kazi, anasema Ann Nguna, mwanachama wa Cluster ya TIST katika Kaunti ya Machakos. Page 2

Lishe bora, ufunzo wa kiwe. Page 2

TIST: Uzazi wa Ardhi. Page 3

Kukata miti yote katika mashamba ya TIST ni kukiuka maadili ya TIST na mkataba wa GhG wenye athari kubwa sana. Unadhuru matendo mazuri ya maelfu ya wakulima katika TIST. Page 6



TIST inafanya kazi, anasema Ann Nguna, mwanachama wa Cluster ya TIST katika Kaunti ya Machakos.

Ann Nguna ni mwanachama wa kundi la Kyandani Help Group, namba ya TIST 2015KEI39. Kikundi chake ni cha Cluster ya TIST katika kaunti ya Machakos. Anasema ya kwamba mpango wa TIST ulipowekwa katika eneo lake, alikuwa ni mmoja wa watu ambao waliukubali kwa furaha. Pia anaongezea ya kwamba tangu kustaafu kwake kutoka kwa sekta ya afya, na kuanzisha huduma za afya za hiari katika jamii yake, amewaona majirani wake wakikabiliwa na ukosefu wa kuni ambao ni suala la afya pia.

Cluster ya TIST ya Ndalani ni mojawapo ya vikundi vilivyo fanikiwa zaidi katika maeneo mapya ya TIST. Vikundi vingine ni kama Cluster za Kakumini, Kaluluni, na Mamba.

Cluster ya TIST ya Ndalani inaongoza ikiwa na vikundi vidogo takriban arobaini na tatu (43) ambavyo vimejiandikisha ikifuatwa na Kakumini

ambayo ina arobaini na tatu(43), Mamaba ikiwa na arobaini na moja (41) na Kaluluni ikiwa na ishirini na tatu (23).

Kikundi kidogo cha Ann kimepanda miti mipya elfu moja, mia nane tisini na moja (1,891). Kikundi change kina wanachama sita (6). Anasema ya kwamba wanafanya kazi pamoja katika kikundi ili waweze kusaidiana. Wanaweza pia kujifunza kutoka kwa kila mmoja wao baada ya kupata mafunzo muhimu kutoka kwa mkutano wa Cluster zao za TIST. Anaongezea Zaidi kwa kusema, amefanya mazoezi mapya kutokana na yale aliyojifunza kutoka kwa TIST. Anatumieze kwamba na kitanda cha kukulia mbegu kilichoinuliwa, shamba la Ukulima wa Hifadhi, mbolea ya mbolea na miti midogo yenye kupendeza sana. Kilimo chake kinaonekana kizuri.

Lishe bora, ufunzo wa kiwe.

na Kimani Mwangi

Watu milioni mia tano (500) ni wakulima wadogo wadogo ulimwenguni, na hii inamaanisha ya kwamba wanategemea vipande vidogo vya ardhi kwa ajili ya uzalishaji wao wa chakula. Ingawa wakulima wadogo wanasimamia asilimia themanini (80) ya mashamba nchini Afrika, mara nyingi wao huuza chakula chao bora, na kula vyakula vilivyo na wanga kama vile mchele, Ugali, na bidhaa za ngano ambazo hazina virutubisho muhimu ambavyo ni muhimu kwa afya njema kama vile chuma na zinki. Mlo mmoja ambao unahusisha vyakula vingi unaweza kusaidia kufikia afya njema. Chakula cha kupendeza kina uwezekano wa kuleta upungufu wa virutubisho kama vile chuma, vitamini A na zinki. Ukosefu huu unaongeza vifo na kuzuia maendeleo ya ubongo na mwili.

Kwa mlo ulio na usawa-hakikisha unachukua angalau vikundi vitano (5) kati ya vikundi kumi (10) vya vyakula kwa siku:

1. Mazao-Ngano, mchele, viazi nk.
2. Mboga ya majani ya kijani –*Spinach*, sukuma wiki, *amaranth* nk.
3. Mboga ya machungwa-Mchuzi, karoti, *capsicum* nk.
4. Mboga zingine- Brijals, nyanya nk
5. Matunda-Maji ya tikitimaji, maembe, paipai, nk
6. Mayai-kaaga na kuchemshwa.
7. Nyama ya samaki-Kuku, nyama ya nguruwe, nyama ya kondoo, nyama ya ng'ombe nk
8. Bidhaa za maziwa-Maziwa ya kunywa, *cream*, nk
9. Njugu na mbegu-kamba, karanga, *almond* nk
10. Maharage na mbaazi



TIST: Uzazi wa Ardhi.

Udongo ni nini?

Udongo ni safu ya juu duniani. Ina hewa, maji, masuala ya kikaboni na madini.

Je, Udongo huumbwaje?

Hali ya hali ya hewa husababisha kuvunjika kwa miamba ambayo hutoa madini yanayohitajika kusaidia maisha ya mimea. Mimea huongezwa kwenye udongo kama mamno ya kikaboni. Miamba zaidi inapovunjwa na masuala ya kikaboni kuongezwa, maji zaidi yanaweza kuhifadhiwa katika udongo, na kukuza ukuaji wa mimea iliyopandwa.

Je. kuna umuhimu wa masuala ya kikaboni?

Jambo la kikaboni (hasa linalotengenezwa kwa njia ya kuharibiwa kwa vifaa vya kupanda) hutoa virutubisho vingi, vinavyopatikana kwa upatikanaji wa mimea mpya. Pia inasaidia maisha ya *microorganisms* katika udongo, husaidia na upitishaji wa maji na husaidia kuufunga udongo pamoja.

Nini kinachoamua aina ya udongo unaopatikana?

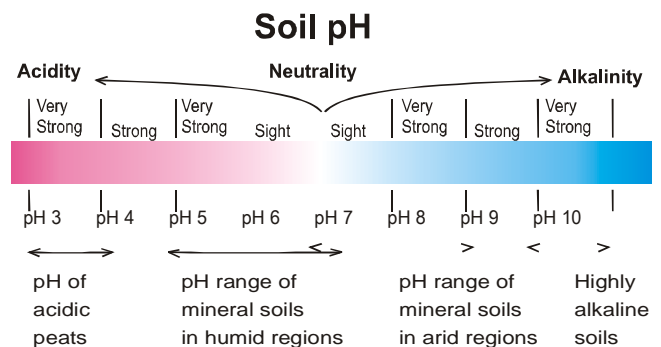
- Hali ya hewa: upatikanaji wa joto na maji huathiri kiwango cha hali ya hewa ya mwamba.
- Viumbe: bakteria, fungi na minyoo kati ya wengine wengi wanaishi katika udongo. Baadhi wanacheza jukumu muhimu katika kuchanganya udongo, kama vile vidonda vya udongo. Viumbe vya udongo husaidia kuharibu suala la kikaboni, na baadhi ya mimea ya kusaidia kurekebisha nitrojeni (kwa mfano *Bakteria ya Rhizobium*).
- Sura ya ardhi: Kwa mfano, udongo kwenye mteremko kwa ujumla ni mwembamba na husababisha urahisi zaidi kuliko udongo uliopatikana uliokusanywa katika mabonde.
- Vifaa vya uzazi: aina ya miamba udongo huundwa kutoka.
- Tabia ya kibinadamu: njia tunayotumia na kutunza udongo wetu (au la) itaathiri sana uzazi wake.

Utunzaji wa udongo unategemea mchanga, hariri na udongo unaofanywa kutoka. Mchoro kwenye ukurasa unaofuata unakuonyesha makundi makuu ya udongo wa udongo. Tabia ya udongo na muundo huathiri jinsi mizizi ya urahisi inaweza kupenya kwenye udongo, na maji mengi yanaweza kubakizwa.

Kwa nini PH ya Udongo ni muhimu?

Tindikali au alkali (pH ya udongo) huathiri jinsi virutubisho vinavyoweza kupatikana kwa udongo ni kwa ajili ya upandaji wa mimea na aina gani ya maisha ya udongo yanaweza kuungwa mkono. Kwa kawaida virutubisho vingi vya udongo hupumzika zaidi (na kwa hiyo hupatikana kwa ajili ya utunzaji wa mimea) wakati wa udongo wa tindikali ikilinganishwa na udongo wa wastani au wa alkali.

Hata hivyo, kama udongo ni kali sana bakteria haiwezi kukua, na hii itaathiri kiwango cha kuharibiwa kwa suala la kikaboni. Vipande vyema vingi vina pH kati ya 5.5 na 7.5 na vina rangi ya giza.



Je, udongo wenye rutuba ni nini?

Mchanga wenye rutuba ni ule ambao una ugavi wa kutosha wa virutubisho vyote vinavyohitajika ili kusaidia maisha ya mimea.

- Vidonge vya msingi: nitrojeni, fosforasi, potasiamu
- Vidonge vya sekondari: sulfuri, magnesiamu, kalsiamu
- 'Micronutrients': chuma, manganese, boroni, klorini, zinki, shaba, molybdenamu, nickel.

Mikakati ya kuboresha uzazi wa udongo

Fikiria kuongeza nitrojeni (kwa mfano wa mbolea ya kijani kutoka kwa mimea ya kurekebisha nitrojeni) na phosphorus (kwa mfano wa *rock phosphate* au mbolea za wanyama ..



- Kukusanya na kutumia mbolea za mifugo na mkojo. Hii ni aina bora mbolea. Vyanzo vipya vinaweza kuwa na maudhui mengi ya amonia (ambayo yanaweza kuharibu mimea) na inaweza kuwa na viwango vya juu vya vimelea (viumbe vinaosababisha magonjwa). Mbolea ya kuchimbia ina vimelea vichache. Ikiwa unatumia mbolea safi, tumia vizuri na uende chini ya miezi miwili kati ya programu.
- Ongeza jambo la kikaboni kupitia mbolea (maelezo hapa chini).
- Jitayarishie kilimo cha uhifadhi bora zaidi kama ilivyoelezwa katika vitengo vya awali:
 - Mzunguko wa mazao
 - Kuunganisha Kilimo na kupanda mimea inayotandaza matawi
 - Kuandaa mazao ya mazao ya bima
 - Kuondoa udongo wa ardhi
 - Matumizi ya kitanda
 - Kutumia mashimo ya kilimo ya uhifadhi
 - Kupunguza mmomonyoko wa maji kupitia kupanda miti, matuta, fanya juu
- Fikiria kuingiliana kwa mimea ya Pigeon pea (Cajanus cajan), Dolichoslablab, Mucuna Pruriens, Crotalaria, Canavalia.
- Fikiria kuongeza majivu, yenye matajiri ya kalsiamu na carbonate ya potassiamu.
- Ongeza chokaa kama unajua udongo wako ni mkali sana
- Si bora kuongeza madini ya ziada (isipokuwa na yale yaliyopatikana kwenye mbolea) bila kupima udongo kwanza kuona ni virutubisho vipi vinavyohitajika.
- Kunaweza kuwa na hali fulani wakati unahitaji kutumia mbolea za kemikali zisizo za kawaida. Tumia kwa mujibu wa maagizo ya mtengenezaji au kupitia kupata ushauri kutoka kwa maafisa wa ugani wa eneo lako.

Mbolea ya kuchimbia

Mbolea ya kuchimbia ni mbolea ya asili itakayosaidia mazao yako kukua. Ni bora kuliko mbolea ya kemikali kwa sababu ni ya kawaida na haina madhara kwa mazao na mazingira. Hii ni mojawapo ya njia rahisi, nafuu na zenye ufanisi zaidi za kuboresha uzazi wa udongo.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t 	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t
<p>• Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents.</p> <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>		

Nini inaweza kutumika kwa mbolea?

- Mazao ya mimea, magugu, majani yaliyokufa, mimea yoyote iliyopangwa, mbolea na mkojo kutoka mifugo, kitanda kutoka mifugo, taka ya jikoni kutoka kwa matunda na mboga mboga, majivu, karatasi iliyopambwa na kadi.
- Usitumie nyama, bidhaa za maziwa, mafuta, chuma au plastiki.

Kawaida bora ya utunzaji wa mbolea:

- Chagua eneo lililo na kivuli kwa mbolea yako
- Funika na majani ya ndizi au karatasi ya plastiki
- Kunyunyizia maji wakati wa kavu
- Ilinde na mvua (ambayo itaosha virutubisho mbali)



- Kama mwongozo wa jumla, lenga:
 - Thuluthi moja ya mboga za kijani (mimea ya majani, matunda, mboga, makanda ya yai, vifuniko vya nut, mbolea, magugu, mimea)
 - Thuluthi moja ya mimea ya kahawia (majani kavu, majani, uchafu, kadi na mabaki ya mazao mazuri)
 - Sehemu ya tatu ya nyenzo kama vile matawi yaliyokatwa na mabaki makubwa ya mazao
 - Hakikisha unatumia vifaa vya mimea ambayo haijajaa mbegu
 - Weka vifaa ndani ya rundo au shimo. Hewa inahitajika kwa mbolea, kwa hivyo changanya vifaa pamoja na usijumuishe nyenzo chini.
- Mwagieni kijiko cha nyenzo maji, kifunikie na uondoke ili nyenzo ziharibike miezi michache ijayo. Unaweza kuchanganya nyenzo mara kwa mara.
- Ikiwa nyenzo hiyo hupungua au hasira juu ya muda inaweza kuwa mvua mno au kuwa na mboga nyingi sana. Ongeza mimea ya kahawia zaidi kama hii ni kesi, na uchanganya.
- Jaribu kuwa na nyenzo yako tayari kwa kuchanganya, kumwagilia, kufunika na kuacha miezi 2-3 kabla ya msimu wa mvua ili iweze kuwa na manufaa kwa msimu wa kupanda.
- Mbolea inapaswa kuwa rangi ya samawi. Unaweza kupunja nyenzo ili kupata mchanganyiko bora, na kuongeza vipande vikubwa nyuma kwenye rundo la mbolea kwa kundi linalofuata.

Baadhi ya vikundi vya TIST hutumia mbinu maalum zaidi, ambayo wameipata ikiwa na ufanisi. Wameelezea mchakato hapa chini:

Maandalizi ya shimo la mbolea na vikundi vingine vya TIST

- 1) Chagua eneo la mita 4 x 4 kwa ajili ya shimo lako la mbolea
- 2) Safisha eneo hilo
- 3) Chimba shimo lenye kipenyo cha mita 3 au 4 na urefu wa 1.5m
- 4) Kukusanya mabaki yote ya mazao unayo na kuyakata katika vipande vidogo. (K.m. majani na mabua ya mahindi, nyama, maharagwe)
- 5) Weka mazao haya bado katika shimo hadi kina cha mita 0.5
- 6) Kisha uongeze lita 5 ya jivu
- 7) Kisha uongeze juu ya sentimita 30 (au kama inapatikana zaidi) ya mavi ya wanyama (k.m. ndovu kutoka nguruwe, ng'ombe, mbuzi au kuku).
- 8) Kisha weka safu nyingine ya majani ya mimea na mabua (0.5m)
- 9) Ongeza lita 5 ya majivu
- 10) Ongeza majani na mabua tena mpaka shimo limejaa
- 11) Hatimaye, ongeza safu ya udongo mpaka shimo lijae
- 12) Wakati wa kujaza shimo na udongo, weka fimbo ndefu katikati ya shimo ili ifike chini.
- 13) Acha shimo la mbolea kwa muda wa siku 90 (miezi 3).
- 14) Katika kipindi hiki utumie maji yako chafu ili kumwagilia shimo la mbolea. Kwa mfano, baada ya kusafisha nyumba yako au nguo, tupu maji yaliyotumiwa katika shimo. Jaribu kumwagiza shimo ya mbolea kwa njia hii kila siku, au wakati wowote maji yanapatikana.
- 15) Baada ya siku 90 mbolea itakuwa tayari. Tumia fimbo kama kipimajoto wakati mbolea iko tayari inapaswa kuwa moto na unaweza hata kuona mvuke ukitoka kwenye fimbo baada ya kuiondoa.



Kukata miti yote katika mashamba ya TIST ni kukiuka maadili ya TIST na mkataba wa GhG wenye athari kubwa sana. Unadhuru matendo mazuri ya maelfu ya wakulima katika TIST.

Mwezi uliopita, tulijadili kuhusu ukataji miti yote katika semina ya GOCC iliyofanyika Gitoro mwezi juni mwaka 2014, mara moja baada ya sherehe za ushirikiano wenye mafanikio wa miaka mitano kati ya TIST na USAID.

Mwezi huu, tunabeba kumbusho la makala mwezi uliopita tukiitisha taarifa na fikira kutoka kwa wakulima wa TIST kuhusu mawazo bora zaidi yatayosaidia kumaliza kabisa ukataji miti yote. Chama cha Uongozi wa TIST kilimchagua Charles Ibeere (0720 474209) kufanya kazi ya karibu na viongozi katika cluster, wawakilishi katika GOCC na wakulima katika TIST kushughulikia suala hili. Ni muhimu kujua kuwa kandarasi ya GhG ambayo wakulima wote wa TIST walitia saina, ina mkataba wa wakulima wa kuweka miti kwa muda mrefu. Inaruhusu tu wakulima kupunguza miti (ikiwa imekaribiana sana), kukata matawi ili kupata kuni, na kukata miti hadi asili mia tano ya miti iliyo katika kikundi kila mwaka miti inapfikisha miaka kumi au zaidi.

Kanuni hii ni muhimu ili kuendelea kuhusika katika mradi wa kaboni. Wanunuzi wa kaboni

huhitaji uhakika kwamba miti ambayo wananunulia kaboni ipo hai. Ambapo wakulima hukata miti yao, wanunuzi wa kaboni hukataa kila wakati kuwanunulia kwani wao huona ni kufanya kazi yenye hatari kubwa. Hii ndio sababu tendo la wakulima wachache wanaokiuka kanuni hii laweza kuwafanya wanunuzi wa kaboni kukataa kuwanunulia wakulima wengine katika TIST.

Kumekuwa pia na wasi wasi zinginezo. Mkulima anayekata miti yake yote amekuwa akipata mafunzo ya TIST, kuhesabiwa miti na kupata gazeti la Mazingira Bora. Gharama hizi zote zilizotumika kwake upitishwa kwa wakulima wengine.

Kama kumbusho, kuhusu hatua GOCC walizoamua kuchukua, tafadhali ongea na Charles (0720 474209) kuhusu:

- a) Mawazo ya wakulima wengine katika mikutano ya TIST kuhusu hatua zinazofaa kuchukuliwa kwa wanaokata miti yote.
- b) Jinsi mkulima aliyekata miti yote anafaa kuwafidia wakulima wengine ili kuwaepusha kutokana na hasara katika biashara ya kaboni.

Mazingira Bora



TIST

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

Kikamba Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Ngwatanio ya TIST Nyarushanje central kuma Uganda ivindani ya wumbano woo wa kila mwai matuku 16/06/2017

Inside:

TIST ni iendee na uthukuma, niw'o Ann Nguma ukwasya, ula ni memba wa ngwatanio ya TIST Ndalani, kauti ya Masaku. Page 2

Liu ni kindu kya vata muno munduni. Page 2

TIST: Unou wa muthanga. Page 3

TIST: Kutema miti ngulutu yoothe ila nitalikite nthini wa TIST ni ikosa inene nundu nuuvitya kwialana wiw'ano na walany'o wa TIST na nyumba sya ngilini sya nzeve. Ni iumiasya memoko maseo ma makili ma aimi ma TIST. Page 6



TIST ni iendee na uthukuma, niw’o Ann Nguma ukwasya, ula ni memba wa ngwatanio ya TIST Ndalani, kauti ya Masaku.

Ann Nguna ni umwe wa ene ma kikundi kya Kyandani kila ni namba TIST 2015KEI39.

Kikundi kyoo ki nthini wa ngwatanio ya TIST ya Ndalani ila yi Masaku kauti. “Yila walanio wa TIST waetiwe nthini wa kisio kyakwa , in umwe ula wendeiw’e ni walanio wayo na nalika.

Kuma noosa litaya kuma kwa uthukumi wa muvea wa uima wa mwii, na kukunaa wia wa uiiti wa kwiyumya, ninonete atui makwa maithina ni kwaiwa ni ngu ila ni imwe katika maundu ala masangiaa nthini wa uima wa mwii” Ann niwaisye.

Ngwatanio ya TIST Ndalani ni imwe kati ka ngwatanio ila sianite na kuthathaa. Kula kuvikiitwe kwisila ngwatanio ya Ndalani nivamwe na ngwatanio ya Kakumini, Ngwatanio ya Kaluluini

na ngwatanio ya Mamba.

Ndalani niyo itongoetye yina ikundi nini 43 ila mbandikithye, ikaatiwa ni Kakumini ila yina 43, Mamba 41 na Kaluluini 23.

Kikundi kya Ann kina miti 1891 myeu ila kivandite. “Kikundi kitu kina ene / amemba 6. nituthukumaa vamwe na kutethania. Ingi nitumanyianasya umwe kwa ula ungi onaeka kwithiwa tuendaa ukwata umanyi kuma kwa mbumbano sya TIST vamwe”. Ann niwongelile kwasya “nindatithitye maundu meu ala tumanyiitw’e nthini wa TIST ta kusevitye kivuio kya kitanda, kaseuvya kasio ka nima ya kusuvia (CF), ngaseuvya vuu wa yiima, na kuvanda miti ya vamwe, muunda wakwa yu nimwanake”.

Liu ni kindu kya vata muno munduni.

na Kimani Mwangi

Andu mbee wa milion 500 ni aimi ma nima nini nthini wa ikonyo inya sya nthi yonthe, kuu nikwasya kana matengemeaa tumilunda tunini kwa kuima liu. Onakau aimi anini nimo mena kilungu kya mingo nyaanya iulu wa yiana (80%) nthini wa Africa nimatesaa liu woo ula wina lato mwingi na kutiwa na liu ila syina liu wa une mwii vinya w’oka ta musele, ngima na nganu ila itethiawa na moseo ta ula wina iron na zinc ila syendekaa muno kwa uima wa mwii.

Kuya liu wa mithemba mingi nikuseo nikutumaa uima museo wa mwii uvikiwa. Kuya liu muthemba umwe kwa ivinda iasa nikutumaa mwii ukosa syindu sya vata ta Iron, Vitamin A na Zinc. Kii nikyongelaa ikw’u na iliko iteseo, na mauwau ma mwii.

Kwa kunya liu wina useo wa kila muthanga winene tatithya uye maliu atano ma mithemba ino yivaa ikumi.

1. Staples - Nganu, Musele, Maluu etc
2. Mboka ya ngilini - Spinach, sukuma, na w’oa, telele
3. Mboka iilyi Masungwa - malenge, kalati, capscum etc
4. Mithemba ingi ya mboka ta Krijals, manyanya etc
5. Matunda - Matikitiki, maembe, mavavai etc.
6. Matumbi, mautheukya kana fried
7. Nyama kana ikuyu, sya nguku, ngulue, malondu kana sya ngombe etc
8. Syindu kuma indoni ta - yiia, kilimu, mauta mauthuka etc
9. Mithemba ya mbuti, mbindi ta - njugu, ndende, ngandania, cashewnut, almond etc
10. Mboso kana nthooko, ndengu etc.



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

Nikyau kiamuaa muthemba wa muthanga?

- Nzeve: uvyuvu na uthithu wa vandu na kiw'u nisyo itetheesya ivia kuthiwa yila yiseuvasya muthanga.
- Organisms: tusamu ta bacteria na fungi vamwe na mithowe, syingolondo na tusamu tula tungi twikalaa muthangani nitetheesya 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 vatheeu niw'o muthanga wavo ukuawa na mituki na kutheew'a syandani.
- Muthemba we via: Undu ivia yila yithiikite yiilye.

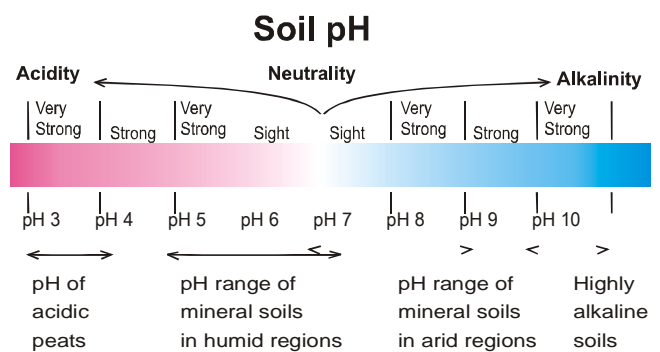
- Mwikalo wa mundu: undu twatumia muthanga na kuusuvia nikuutumuma unou wa muthanga ueleeka.

Ingi muthanga ula winaw'o uamuawa ni kithangathi, mututu na yumba yila yiusevitye. Ve ivisa yi ithangu yila yiatiee 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 uwika 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.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t <p>• Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents.</p> <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t

Ongela muu ula withiawa na calciulm, 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 yooe na ilikana nesa Wooni 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 iitumia 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. Ethywa 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.



TIST: Kutema miti ngulutu yoothe ila nitalikite nthini wa TIST ni ikosa inene nundu nuuvitya kwialana wiw'ano na walany'o wa TIST na nyumba sya ngilini sya nzeve. Ni iumiasya memoko maseo ma makili ma aimi ma TIST.

Mwai muthelu nitwa neenanisye iulu wa miti kutemwa yonthe yila twai na semina ya GOCC twi Gitoro mwai wathathatu, itina wa kutania wiw'ano wa TIST-USAID wa myaka itano kwithiwa wina wailu.

Mwai uyu nitukumulilikany'a oili iulu wa uzoo na mawoni ma aimi ma Tist undu wa kutema miti ute kwenga. Utongoi wa kanzu ya TIST niwa sakuie Charles Ibeere (0720 474209) kuthukuma kwa vakuvi na atongoi ma ngwatanio(cluster), GOCC na aimi ma tist kuisya undu uu.

Ni useo kumanya kana kondulakiti ya nzeve ya nyumba sya ngilini (Green House Gas) ila aimi othe ma TIST me nthini ya kwikalya miti kwa ivinda iasa. Wiw'ano uu niunengae muimi uthasyo wa kuola miti ila ithengeani, kunzea ngava kwa ngu na kutema miti kilio kya 5% kwa miti a kikundi kila mwaka yila miti yavitukya myaka ikumi kana mbeange.

Mwiao uyu ni wavata nundu kuendee kwithiwa nthini wa soko wa nzeve itavisaa. Aui ma nzeve ino nimekwenda kuikiithw'a kana miti ila mekuuia nzeve itavisaa yivo. Vala aimi matemanga

miti, muui wa nzave ino itavisaa nuleaa kumauia nundu aasyaa nukwasya. Kii nikyo kitumi kwa itambya ya muimi umwe kutemanga miti yikutuma aimi angi matist matauiwa nzeve yoo nundu wa kwithiwa ula wikite uu e ngwatanioni yoo kana kikundini kyoo.

Ingi muimi ukutema miti yake yoothe no ethiwe anakwataa ndivi, umanyisyo wa tist na ithangu ya Mazingira.

Bora. Muimi uyu nutumaa ngalama yake itwawa kwa ala me ngwatanioni/kikundini kimwe nake kwoou.

uyithia niwamanenga ngalama iteyoo.

Ta ulilikany'o iulu wa matambya kuma GOCC kunia Charles (0720 474 209) iulu wa:-

- a) Leleelo kuma imini ma ngwatanio ingi undu wa itambya yila yaile osewa ula watemanga miti yake atekuatiia walany'o wa TIST.
- b) Undu muimi usu utemangite miti yake ukuiva imi ala angi kwa wasyo ula meukwata kuma kwa viasala wa nzeve itavisaa.

Mazingira Bora



TIST

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

Kipsigis Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Kilasta nebo Nyarushanje en Uganda komiten en tuiyet nebo kila arawa 16/06/2017.

Inside:

Boisie TIST, Mwoe Ann Nguna, membaek chebo TIST nebo Ndalani Kilasta en County nebo Machakos. Page 2

Omituwokik ko yoteiwot nebo Tai. Page 2

TIST okwoindab ngungunyek. Page 3

TIST tiletab ketik en imbarekab TIST ko moiboru kit negararan amun mogitegis tolochigab TIST ak koyonchinet ne kigeyai oak ghg. Page 6



Boisie TIST, Mwoe Ann Nguna, membaek chebo TIST nebo Ndalani Kilasta en County nebo Machakos.

Ann Nguna ko agenge en membaek chebo Kyandani Help Group, TIST number 2015 KE 139. Kurubinyin ko Nodalani en Machakos “ kin anyun ko kakamwata agobo TIST ole boisiyoto en olibo kaa, ko kiyoboiboenchi ak osom, kin kogomongu en boisietab konyoiset onyon anyun ogonugei keboisien ak mengik chebo kaa, kiyogere kotinye kewelnatet nebo kwenik ago niton ko agengeen kebeberta nebo Tililindo” Mowe Ann.

Ndalani kilasta ko agenge niton en

cheyoe nemie en komosuwek che Tese tai TIST. Kilastaisiek alak ko: Kakumini, Kaluluini ak Mamba TIST. Ndalani Kotinye kurubisiek 43 che iyonotin, kosibu Kakumini 42, Mamba 41 ak Kaluluini 23.

Kurubitab Ann kotinye ketik cheminotin 1,891.“ Kurubinyun kotinye membaek 6. Kitoretige keboisiechinige tugul en kibagenge. Kitinye kora cheretab kobuwotutik en kimiten en tuiyetab Kilasta.” Kotes Ann mwaatiton.” Kironyoru konetisiosieken TIST ne eniguni otinye betik nebo ketik, CF, Katurek, ak ketik che kororonen.

Omituwokik ko yoteiwot nebo Tai.

Mwoe Kimani Mwangi

Biik 500 million ko chetinye imbarenik che mengechen ago temik che kiiruruchok, chetinye kap chiisiek che imongu omituwokik en imbarenik chuton. Agandan kitinye imbarenik che mengech komuchi kogon 80% chebo omituwogik en emetab Africa, kou muchelek, Bandek ak Inganuk che motinye chumbik kou iron ak zinc ago chuton ko chetoreti borto.

En omituwogichu komoche chetinye munyuk asi kenyorunen Tililindo ne kararan. Ingenyuru omituwogik che kergei en abogora ko moginyoru kou Iron, Vitamin A ak Zinc, chuton ko cheteche borto.

Asi inyuru kimnotet en omituwogik konyol inyuru 5 en chu taman en betut:

1. Chekonu burgeiyet – wheat, rice ak potatoes etc.
2. Ingwek chenyalilen – spinach, kale, Isoik etc
3. Logoek chenyalilen
4. Monget, Carrot, capscum etc.
5. Ingwek alak – Brijals ak nyayek etc.
6. Logoek – water melon, mango, pawpaw etc.
7. Mayat – fried, Boiled etc.
8. Bendo ak ichiryot – igokiet, pork, mutton, beef etc.
9. Dairy product – cheko, cream etc.
10. Nut and seeds – cashew, peanut, almond etc.
11. Ngendek ak chorogek.



TIST okwoindab ngungunyek.

Ngungunye ko nee?

Ngu ngunyek ko kebeberta nebo emet netinye koristo, beek nunanikab ketik ana ko tiongik ak kotinye munyuk.

Chebtogei ono ngungunyek?

Bitu murmuraniakab koik kotinye munyuk chetoreti sobetab minutik, kotesin minutik en ngungunyek, so ye yoose kouni kotesin beek kotuiyo ak kogochi minutik kobwa.

Amunee asi kobo komonut ngetunonik?

Bo komonut amun yekagonunchi nguwendet kotinye omitwogik che igochin minutik korut toreti kora kutik chemiten ngungunyek ak kotoretich koyomo anan kutuiyo koik agenge.

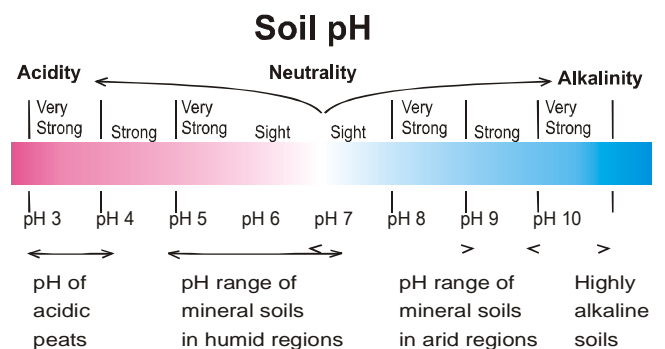
Nee ne ibesto ngungunye yekinyor?

- Burgeyet, burge burgeiyet ak beek kogochin koik kobusbusak.
- Kutik chang kutik che menye ngowindet anak koburucheni ngungunyek anak kogochi nunet asi kobit emitwogikab minutik.
- Ole emet niton anyun kotiyengei ole kiiburto emet, en tunonok konyumnyum ibetab koik kosir ole soet.
- Uketab nhungunyek niton kotiyengei ole kigi tounto koik ngungunyek.
- Otebetab kimulmet otebetab biik ak ole koribto ngungunyek asi moibet okwoindo.

Koyometab ngungunye kotingei chongitab ngainet, menet, ak ole gigitounto, miten anyun koborunet nebo ngungunyek en pichaini koyomoniton bo ngungunyek konyumnyum en tigikab ketit kosib, ak koboru beek chemiten,

Amunee asi kobo komonut PH?

Miten anyun ngungunye che tinye munyuk chechang kot kosir anak niton koweche (PH) ak omitwogikab minutik, kimuchi ketoretito ono kutik che menye ngungunye en munyu chuton ko chechang ko eiyomogei ak beek ko chotos akosigi minutik omitwogik, ole miten munyuk chechang komosigin kutik kochanga niton ko gochin nunet kwo nguwoy, ngungunye chegororon kotinye PH kongeten 5.5 ak 7.5 ago tueen en keret.



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.

ichugei en kwong kou, robuwonik, chebololet ak sotonik.

Koguwoutik 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

- 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.

Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)
<ul style="list-style-type: none"> • Leguminous crops that are used as green manures or as mulch provide between 20 to 80 kg N / acre which can be used by subsequent crops. • Blood meal/ leather meal 12-15% N. They are applied directly to the crops. • Urines from all species contain pure urea (up to 1% N)- It is not a stupid idea to urinate on the compost heap! • Poultry manure 8-20 kg N/t • Pig manure 3-5 kg N/t • Goat / sheep manure 2-4 kg N/t • Cattle manures 2-3 kg N/t • Compost * 1 kg N/t • Manure teas and plant teas provide easily available nitrogen and can be used as top dressing or foliar feeds. 	<ul style="list-style-type: none"> • Rock Phosphate 20-33% • Bone meals 12-25% • Poultry manure 10-25 kg/t • Pig manure 3-6 kg/t • Goat/sheep 2.5-4 kg/t • Cattle manure 2-3 kg/t • Compost * 4kg/t 	<ul style="list-style-type: none"> • Wood ash 3-7% • Goat / sheep manure 12 kg/t • Cattle manure 5-12 kg/t • Poultry manure 5-12 kg/t • Compost * 6 kg/t • Pig manure 3-7 kg/t • Urines: 1-3 kg/t
<p>• Content of purely vegetative compost. If compost is prepared with livestock manures, rock phosphate and wood ash, the product will have higher nutrient contents.</p> <p>Nutrient contents of manures and composts are highly dependent on handling and storage and on feed quality!</p>		

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 chenyolilen 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.



TIST tiletab ketik en imbarekab TIST ko moiboru kit negararan amun mogitegis tolochigab TIST ak koyonchinet ne kigeyai oak ghg.

K ingalalen biik chegimiten ketik ne sobe amun bose koristo, agot komogirib
tuiyetab gocc en komolo june niton kogochin temik chechang asent amun
2014 ye kigiba igorto negibo monyoru melekwa.

koyometabgei tist ak usaid en kenysisiek mut.

Ogibwat kele chito negayai kounoton

En arawani ketinye kabwata noton asi
kemwochin temik kelenchin magararan noton en
TIST, en betunoton kelewen charles ibeere
(0720474209) korib ak korigi kondoikab kilasta
gocc ak temik asi komwata agobo niton.

kogochin korubit asi kowegta rabisiechon amun
kiginet, kigiiti ketik, ak nyoru en kila arawa gosetit,
chi negenyoru iyote youtionon kwo (0720 474 209)

Bogonut neo kibwate agobo koyochinenyo ak
ghg nebo minetab ketik chebo kasarta negoi tinye
temik chomchinet ko choror ak kotil temenik,
agotil 5% en kurubit ago ketik chetinye kenysisiek
10 magat niton amun moiyni chemungarainik ketil

a) Ogemwochigei en tuiyosi kab kilasta agobo
niton.

b) Chito negayai kounoton koyochie kurubit asi
mo kitononsi kurubin en mungaretab koristo