

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Burimaria TIST Cluster during their monthly meeting. We received tree payments last month. Our goal is to plant more trees in the coming rainy season.

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TIST: Intercropping.

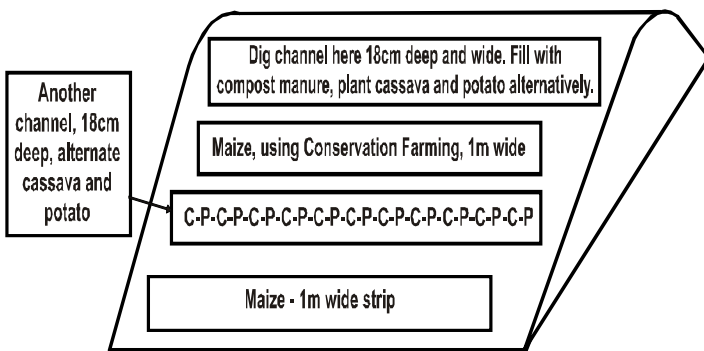
Multi-cropping is where two or more crops are grown together during a single season. With the right combinations this can help increase biodiversity on the land, increase soil fertility and reduce risk of pests and diseases.

Intercropping describes the practice where different crops are grown at the same time in the same field. It can also include growing crops with trees such as alley cropping.

Some TIST groups have tried the following technique, which is especially good for slopes

1. For the first row dig a trench 18cm deep and 18cm wide
2. Fill this trench with compost manure
3. Plant cassava and potato alternatively
4. For the next row plant a one-meter strip of maize using conservation farming holes
5. Another row of cassava and potato
6. Another row of maize, etc.

This technique uses much of what we have learned in the training: it involves using intercropping, it uses compost manure and also conservation farming.



- Try alternating rows of maize with rows of trees. Small groups have tried alternating a 3m strip of maize with a row of moringa / yellow cassia / leucaenia / bead tree trees.
- Rows of sorghum can be planted between rows of moringa or leucaenia.
- Try combinations of calliandra and bananas, calliandra and beans, calliandra and maize, maize and beans, beans and leucaenia, beans and bananas, beans and coffee (while young).
- Try intercropping cowpea with maize / sorghum or millet.

Experiment with the spacing to see what works best, and let TIST know the results.

Crop rotation ideas

Crop rotation is where farmers cycle through planting different crops over time on the same land. There is a particular order of crops followed, where the next crop chosen is from a different family than the previous one. Crop rotation can be beneficial for soil fertility as different crops have different depths of root systems, meaning the same layer of soil nutrients is not depleted year after year. This method also helps to break up the soil at different levels, which improves soil structure, and can attract different types of beneficial soil organisms.

To get the benefits of crop rotation a different type of crop must be planted in turn. This is because crops of the same type may attract similar pests and diseases, and rotating the types can reduce the risk of certain pests and diseases taking hold in the soil.

The following list categorizes crops according to groups. Crops from the same group should not be planted one after the other. Be sure to mix the groups in your rotation plan!

- Group 1: Cucumber, gourds, pumpkin, squashes, watermelon (Gourd family)
- Group 2: Broccoli, brussel sprouts, cabbage, cauliflower, collards, kale, radish, turnip, mustard, watercress (Crucifer/Brassica family)
- Group 3: Eggplant, pepper, tomato, potato (Solanaceous family)
- Group 4: Lettuce, artichoke (Aster family)
- Group 5: Maize, rice, sorghum, wheat, oat, barley, millet (Grains and cereals family)
- Group 6: Beans and peas (Legume family)
- Group 7: Garlic, leek, onions, chives (Allium family)
- Group 8: Carrot, celery, dill, parsnip, parsley (Carrot family)
- Group 9: Cassava, sweet potato, taro, yam, water chestnut (root crop family)
- Group 10: Cotton, okra (Mallow family)

If the above system is overly complicated, many farmers simplify crops to five groups to rotate between (information taken from Infonet-Biovision website):

- a) Leaf crops (broccoli, cabbages, cauliflowers, kales, spinach, etc.). They need more nutrients than other vegetables.



- b) Fruit crops (chilies, eggplants, peppers, tomatoes, etc.). They need a considerable amount of nutrients but not as many as 'leaf' crops.
- c) Root crops (carrots, beetroots, potatoes, onions, radishes, turnips, etc). They need fewer nutrients compared with leaf and fruit crops.
- d) Legumes (beans, chickpeas, cowpeas, grams, peas, pigeon peas, etc.). Their additional benefit is fixing atmospheric nitrogen into the soil.
- e) Cereals (maize, millets, sorghum etc.)

Ideas to consider:

Try planting maize and groundnuts together in year 1 and in year 2-plant sorghum. Try planting groundnuts in year 1 and then a mixture of legumes, sunflower and/or potatoes in year 2.

Another idea is to try planting maize followed by a legume such as soybeans or groundnuts. Then in the following season try a cash crop such as cotton.

Try leaving the land fallow for a whole year, then plant crops again for 3-5 years before leaving it to fallows again. This will give the land a chance to replenish its soil nutrients. Consider Napier grass for fodder if you have livestock.

In general, plant legumes before cereals. Planting crops from the Brassica family (e.g. cabbage) before and after crops from the Solanaceous family (e.g. tomatoes) can help prevent build-up of root-knot nematodes and bacterial wilt.

The following is a crop rotation idea taken from Infonet-Biovision. This takes an example of a farm with four plots covering four seasons with each season approximately 4 months.

First season:

- Plot 1: Maize / garlic / onions / or leeks
- Plot 2: Eggplant / chilies / potato / or tomato
- Plot 3: Broccoli / cabbage / cauliflower / or kale
- Plot 4: Beans / cowpeas / grams / or peas

Second season:

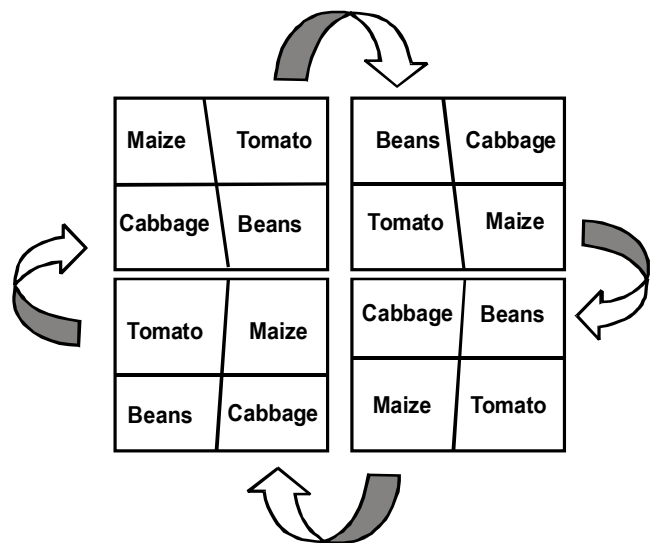
- Plot 1: Beans / cowpeas / grams or peas
- Plot 2: Broccoli / cabbage / cauliflower / or kale
- Plot 3: Eggplant / chilies / potato / or tomato
- Plot 4: Maize / garlic / onions / or leeks

Third season:

- Plot 1: Broccoli / cabbage / cauliflower / or kale
- Plot 2: Beans / cowpeas / grams / or peas
- Plot 3: Maize / garlic / onions / or leeks
- Plot 4: Eggplant / chilies / potato / or tomato

Fourth season:

- Plot 1: Eggplant / chilies / potato / or tomato
- Plot 2: Maize / garlic / onions / or leeks
- Plot 3: Beans / cowpeas / grams / or peas
- Plot 4: Broccoli / cabbage / cauliflower / or kale



Alley cropping



Ntharagwene Cluster: A New Child Cluster in Ntugi TIST Region.

We, members of Ntharagwene Cluster are happy to share our progress since we multiplied from Kiirua Cluster early this year. So far, we have established a tree nursery with over 10,000 seedlings. This will add to our present 27,288 live trees.

To date, we have 31 TIST Small Groups and we are planning to recruit more this year. We hold our monthly meeting at St. Patrick AIPCEA Church grounds every last Tuesday of the month. Please join us to work together to better our lives and our environment.



Member of Ntharagwene Cluster at their tree nursery site last month.

Kamweyendei Cluster: Our Coming Together During Monthly Cluster Meetings Helps Us Learn and Share New Ideas.

The idea of meeting every month has been beneficial to us. We share and exchange new ideas. This helps us improve our skills in many ways. Our lives become easier as we discuss various challenges in our lives and find solutions to tackle them.

During our July 2014 Cluster meeting, we learned through some of our members on how to add value to our local foods. This involved adding value to cassavas to make very delicious and nutritious chapattis.

Here are the steps and ingredients of preparing various cassava dishes:

Ingredients:

- | | |
|-----------------|---------------|
| ✓ Cassava flour | ✓ Wheat flour |
| ✓ Baking powder | ✓ Cooking oil |
| ✓ Ndengu | ✓ Raw cassava |
| ✓ Salt | ✓ Water |
| ✓ Boiling pot | ✓ Sufuria |
| ✓ Frying pan | ✓ Match box |

How to prepare Cassava Chapattis:

- 1) Take 2 glasses of cassava flour + 3 glasses of wheat flour
- 2) Mix well in a bowl



- 3) Take water and mix with salt to taste
- 4) Add water to the flour until it is mixed well
- 5) When ready to cook your chapatti as we normally do
- 6) Prepare the fire and put the pan in the fire prepare your chapatti
- 7) When ready put cooked food in a dish

How to prepare Cassava Mandazis:

- 1) Measure 2 glasses of cassava flour + 3 glasses of wheat flour
- 2) Next, add 2 spoonful's of banking powder
- 3) Mix well in a bowl
- 4) Take water and salt and mix in another bowl
- 5) Add water until it is mixed
- 6) Prepare your fire and put sufuria in the fire, after that add fat.
- 7) When it is ready to deep fry
- 8) Prepare mandazi sizes and cook like normal mandazi
- 9) When ready, put your mandazi in a dish ready to be served

How to prepare Ndengu Chapattis:

- 1) Select ndengu and put in a boiling pot ready to boil



- 2) Boil until it is well cooked
- 3) Smash your ndengu to give the soup a green color
- 4) Filter ndengu to have the soup separate
- 5) Add salt to the soup
- 6) Add 3 glasses of wheat flour.
- 7) Mix well
- 8) Put the pan in the fire and fry your chapatti
- 9) Cook normally as done for normal chapatti
- 10) When ready, put it in dish ready to be served

How to prepare Cassava Chips:

- 1) Take raw cassava
- 2) Peel the outer cover of cassava and remove the center part
- 3) Cut into chip shapes and wash well
- 4) Drain the water

- 5) Prepare your fire pan
- 6) Put in the oil and wait until it is hot and ready to deep fry
- 7) Put your cassava chips in the oil until it is cooked
- 8) When cooked put in a dish ready to serve



Preparing Cassava Chapattis.

TIST: Avocados can give you good income.

As extracted from *The Organic Farmer* (<http://www.theorganicfarmer.org/profile/2>) and Jürgen Griesbach, 2005: *Avocado growing in Kenya*. ICRAF (World Agroforestry Centre), Nairobi, Kenya.

Avocado is an important commercial fruit in Kenya both for local and export markets.

There are three main types of avocado trees, which are suitable for different altitudes. Check which avocado varieties do best under your specific local conditions. Using seeds or grafted trees from healthy and vigorous local trees and from local nurseries is recommended, such trees will be more likely to do well at your site.

Seedling production.

Seeds are collected from healthy mother trees and healthy, mature fruits. The extracted and cleaned seeds can be dipped into a fungicide solution and are then planted into seedbeds or into perforated polythene bags. Shade is important for germination. When seedbed seedlings are 20 cm high and have 2 pairs of well-developed leaves, they are uprooted, culled and transplanted into containers.

Grafting can be done after about six months. Grafted trees remain smaller and start flowering earlier (at 3 to 4 years after planting into the field) than ungrafted seedlings. The small trees will be ready to be transplanted into the field about three to four months after they have been grafted.

Tree planting and establishment.

Soils should be deep, fertile and well aerated. Avocados do not like poorly drained, heavy soils and flooding or high water tables, and they will also not tolerate salty or very acidic conditions. The most favorable planting time is at the beginning of the rainy season. Spacing between trees lies between 6 and 10 m, depending on soil fertility, climate, and variety. Planting holes are usually dug two feet wide and two feet deep, making sure to break hard pans and to allow good drainage and undisturbed root development. The excavated soil can be mixed with manure, compost and rock phosphate if available. Plant the seedlings carefully without damaging the roots at the same depth as it was in the container. Build a basin from soil around the tree for better irrigation and water harvesting. After planting, seedlings must be irrigated immediately. Use 5 to 20 liters of water depending on the size of the seedling. Mulching can be very beneficial as it reduces moisture loss and controls weed growth. Irrigation will be necessary for some time. Another important measure is to protect each seedling against livestock and wild animals.

Irrigation of fruit trees.

Irrigation is important during several stages of tree development and the fruiting cycle. During the first months of establishment, but also later during their first years of growth, trees must be checked frequently and irrigated when they show symptoms



of water requirement. Avocados develop long tap roots, but depending on the climate they may need some additional irrigation, especially during prolonged dry spells. During flowering, fruit set and fruit development sufficient moisture is critical for good fruit development.

Fertilization.

For good productivity, it is beneficial to support avocado trees with manure regularly. Between 5 and 20 kg of fertilizer can be given per tree and per year. Be careful with nitrogen – it promotes leaf growth but not flowering, and avocado roots are sensitive to high salt concentrations in the soil. Phosphorous is usually also necessary, and potassium is important for mature trees that bear fruit.

Pests and diseases

Preventive measures are central so choose an appropriate and fertile site, plant at reasonable distances, choose healthy varieties, control weeds, use mulch, do not over fertilize, and irrigate when necessary. Pests are usually not a problem in avocado production in Kenya. Use neem products, pyrethrum preparations, or tephrosia extracts etc. against insect pests such as fruit moths, thrips or scales if the damage is severe.

The following diseases can be serious:

Avocado root rot: (a Phytophthora fungus disease) Trees produce sparsely, and they have fewer leaves, which are pale and wilted. Branches are sunburnt and die back. Roots decay and the whole trees die prematurely. Affected trees should be uprooted and destroyed. Hot water treatment and fungicide treatment of seeds for seedling production are generally recommended as a preventive measure. There are two chemicals registered against this disease - Ridomil and Aliette.

Anthraxnose: Fruits develop dark brown, dry spots. Young fruits may drop, but in more mature fruits, the infection remains hidden until the fruit is harvested and ripens. Usually, copper-based fungicides are used against Anthracnose.

Cercospora fruit spot: Small, pale yellowish spots appear on the fruits and leaves. Later, they turn brown and crack, making it easy for other organisms to attack the fruits. This disease is also

controlled with copper-based fungicides.

Fruit drop: Fruit drop is not a disease and is common for many fruit species. Trees drop excess fruits that they will not be able to nourish until maturity. Avocados drop excess fruits when they are pea-sized, and a second time when they have reached the size of an egg.

Harvesting avocados

Grafted trees usually start to flourish and bear fruit 3 to 4 years after they have been planted in the field.

There are some indicators of approaching maturity:

- In dark varieties, there is a change in color from green to black or purple.
- On green varieties, the fruit stems turn yellow, the skin may appear less shiny, or the end develops rust-like spots.
- Some varieties develop a whitish appearance.
- Fruits that float on the surface when immersed into water are usually mature.

Markets

Handle all avocados with great care! Export markets, especially the European market, have very strict quality requirements which smallholders may find difficult to meet. Local markets are less complicated but also tricky, because avocados tend to mature all at the same time, making it unprofitable for farmers to sell them. It is almost impossible for farmers to store or process avocados. Commercial avocado growers must therefore be linked closely to a good market.

Common avocado varieties:

1. **Hass and Fuertes:** These two varieties are used as scions (upper parts of grafted fruits). They are popular because of their high oil content.
2. **Puebla:** Used as rootstock by many farmers as it has no fiber and is resistant to diseases.
3. **Singapore:** This is a new variety that is fast growing and reaches maturity in 14 to 15 months. It grows to a height of 2 ft.
4. **G5 and G6:** These two varieties are popular as they can do well in both highlands and lowlands. They can be grafted with all the other varieties to improve fruit quality.

Farmers are advised to buy seedlings from certified seedling producers.

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TIST: Kuanda imera mwanya amwe.

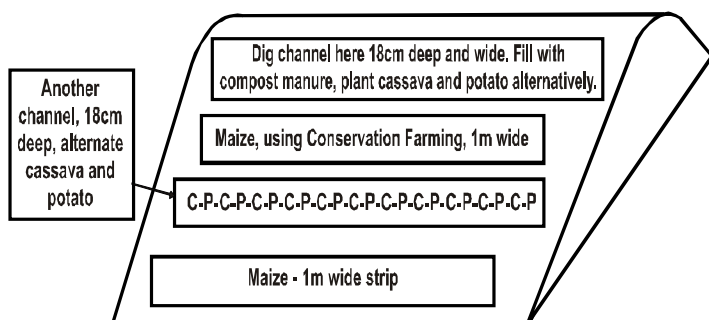
Multi-cropping ni Uandi bwa imera biiri kana bithatu mwanya amwe igitene rimwe. Uungenie bwega bubu nibuongagira gukaraniria kwa mithemba mwanya ya imera na nyomoo, kwongera unoru bwa muthetu na kunyiyia kanya ga kugwatwa ni tunyomoo na mirimo.

Intercropping nayo niaria imera mwanya igitene rimwe na muundene jumwe. No ithirwe kinya iri kuanda imera bia irio amwe na miti ja kuanda miti iri lainine muundene jwa imera bia irio.

Ikundi bimwe bia TIST nibigeretie njira iji, injega mono naria kurina ibari

1. Mulainine jwa mbeleinja mutaro jurina uraja bwa 18cm na warie bwa 18cm.
2. Ujurie mutaro juju na mboleo ya mati
3. Aanda mianga na ikwaci bithingatene.
4. Mulainine jou jungi anda mpempe mita imwe ugitumagira marinya jwa urim bubwega.
5. Aanda laini ingi ya mianga na ikwaci
6. Aanda laini ingi ya mpempe na wite na mbele o ou

Mwitire juju nijutumagira jamaingi ja jaria tuthomete kuumania na uritani: nijwegie kuandaniria imera mithemba mwanya amwe, njwegie mboleo ya mati na kinya urimi bubwega



- Geria kuthingatania milaini ya mpempe na milaini ya miti. Ikundi bibinini bimwe nibigeretie kuanda mpempe mwanka warie bwa mita inya ithingati ni laini ya moringa / yellow cassia / leucaenia / bead tree.
- Milaini ya mwere no iandwe gati gati ka milaini ya moringa kana leucaenia.
- Geria kuanda calliandra na marigu, calliandra na mung'au, calliandra na mpempe, mpempe na mung'au, mung'au na leucaenia, mung'au na marigu, mung'au na kauwa (kari kanini).
- Geria kuanda ncugu na mpempe / mwere kana muya.

Geria gutarania mwanya mwanya nikenda umenya ni mwanya jwiku juri jumwega nkuruki na wire TIST jaria ukoona.

Mathuganio jegie kuthiurukia imera

Kugarurania imera ni aria arimi bathiurukanagia bakiandaga imera mwanya o igita muundene jumwe. Gutu uria imera bibati kuthingatana, aria kimera kiria kithingatite nigitaragwa kuumania na nja mwanya na iu iraandi. Kuthiurukania imera kuri baita kiri unoru bwa muthetu niuntu imera mwanya biri miri irina uraja mwanya, kwou irio biria biri amwe aria miiri igukinyira bititumirwa o mwaka nyuma ya mwaka. Njira iji kinya nitethagia kuunanga muthetu guntu mwanya mwanya, untu buria buthongomagia uria muthetu jubangi na buria bumba kinya gukucia tunyomoo twa mithetu mwanya mwanya turina baita.

Nikenda wona baita cia kuthiurukania imera, kimera mwanya nikibati kuandwa o igita. Bubu niuntu imera bia muthemba jumwe nobikucie tunyomoo na mbajua mwanya mwanya na kuthiurukania imera nikunyiagia kwithirikua kwa tunyomoo tutu na mbajua muthetune.

Aja nthiguru ni imera biiki kiri ikundi. Imera kuumania na gikundi kimwe biti bati kuandwa kimwe nyuma ya kingi. Menyeera ati ukuungania ikundi bibi riria ukugarurania!

- Group 1: Cucumber, tukiri, malenge, squashes, watermelon (nja ya malenge)
- Group 2: Broccoli, brussel sprouts, cabbage, cauliflower, collards, kale, radish, turnip, mustard, watercress (Nja ya mpoka)
- Group 3: Eggplant, nchini, nyanya, ikwaci (Nja ya Solanaceous)
- Group 4: Lettuce, artichoke (Nja ya Aster)
- Group 5: Mpempe, muchele, mwere, nkano, oat, barley, muya (Nja ya mpindi)
- Group 6: Mung'au na nono (Nja ya ming'au)
- Group 7: Garlic, leek, matunguru, chives (nja Nja ya karati)
- Group 9: Mianga, mukuo, taro, ikwa, water chestnut (Nja ya miri)
- Group 10: Cotton, okra (Nja ya Mallow)

Kethira njira iji iri au iguru ni injumu, amemba babaingi nibekagira imera kiri ikundi bitano riu bakagarurania kuuma o kiri kimwe gwita kingi (umenyo buumenie na website igwitwa Infonet-Biovision):

- a) Imera bia mathangu (broccoli, cabbages, cauliflowers, kales, spinach, etc.). Nibiendaga irio bibingi nkuruki ya imera bingi



- b) Imera bia matunda (chilies, eggplants, peppers, tomatoes, etc.). Nibiendaga irio bibingi indi ti ta imera bia mathangu
- c) Imera bia miri (carrots, beetroots, potatoes, onions, radishes, turnips, etc). Nibiendaga irio bibikai nkuruki ya imera bia mathangu na bia matunda.
- d) Ming'au (beans, chickpeas, cowpeas, grams, peas, pigeon peas, etc.). Baita ya kwongera ni gutonyithia nitrogen muthetune kuuma ruugone.
- e) Mpindi (maize, millets, sorghum etc.)

Mathuganio ja kugeria:

Geria kuanda mpempe na njugu amwe mwakwa jwa mbele na mwaka jwa iiri uande mwere. Geria kuanda njugu mwaka jwa mbele riu muunganio jwa ming'au, sunflower na/kana ikwaci mwaka jwa iiri

Ithuganio ringi ni kuanda mpempe riu ithingati ni mung'au jumwe ja soya kana njugu karanga. Riu mbura iu ingi geria kimera kia mbeca ta cotton.

Geria gutiga munda jutiandi gitu mwaka junthe, riu uande imera kairi miaka ithatu gwita itano riu ujutige jutiandi kairi. Bubu bukaa munda kanya ga gucokia iri biria bikwendeka. Thugania kuanda thaara kethira urina ndithia.

Kijumla anda ming'au mbele ya kuanda mpindi ingi. Kuanda imera kuumania na nja ya Brassica (ja mpoka) mbele na nyuma ya kuanda kuumania na nja ya Solanaceous (ja Nyanya) nogutethie kurua na kwingia kwa kwimba kwa miiri na kunyara kuumania na bakiteria

Aja ni ithuganio ria kuthiurukia imera kuumania na Infonet-Biovision. Mung'uanano juu ni munda jurina tumiunda tuna, ndene ya mbura inya aria o mbura ikujukia mieri inna

Mbura ya mbele:

- Plot 1: Mpempe / saumu/ matunguru/ kana leeks
- Plot 2: Eggplant /nchini / ikwaci / kana nyanya
- Plot 3: Broccoli /mpoka / cauliflower / kana sukuma
- Plot 4: Mung'au/ ncugu / ndengu / kana nono

Mbura ya ijiri:

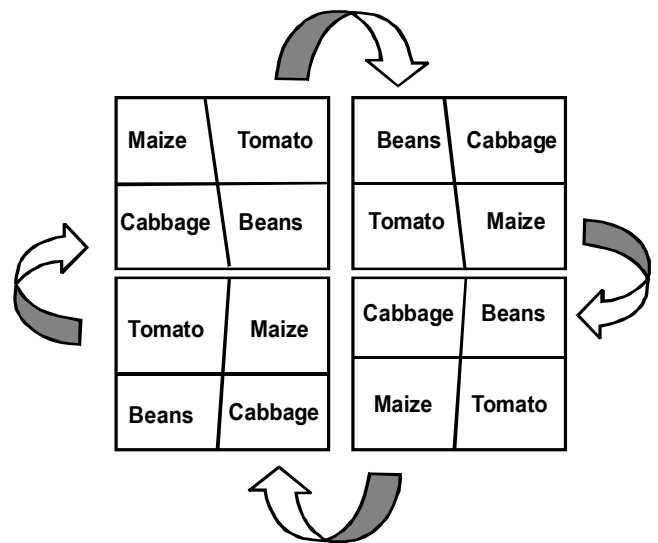
- Plot 1: Mung'au/ ncugu / ndengu / kana nono
- Plot 2: Broccoli /mpoka / cauliflower / kana sukuma
- Plot 3: Eggplant /nchini / ikwaci / kana nyanya
- Plot 4: Mpempe / saumu/ matunguru/ kana leeks

Mbura ya ithatu:

- Plot 1: Broccoli /mpoka / cauliflower / kana sukuma
- Plot 2: Mung'au/ ncugu / ndengu / kana nono
- Plot 3: Mpempe / saumu/ matunguru/ kana leeks
- Plot 4: Eggplant /nchini / ikwaci / kana nyanya

Mbura ya inya:

- Plot 1: Eggplant /nchini / ikwaci / kana nyanya
- Plot 2: Mpempe / saumu/ matunguru/ kana leeks
- Plot 3: Mung'au/ ncugu / ndengu / kana nono
- Plot 4: Broccoli /mpoka / cauliflower / kana sukuma



Kuanda miti na imere na laini.



Cluster ya Ntharagwene: Cluster injeru kuumania na cluster ya TIST ya Ntugi region.

Batwi, amemba ba Ntharagwene Cluster turina kugwirua tukigaana witi na mbele bwetu kuuma tuguciara cluster kuunania na cluster ya Kiirua mapema mwaka juju. Gukinyiira au turina munanda jwa miti jurina nkuruki ya miti ngiri ikumi. Iji ikoongera iria turinayo iria iri miti ngiri mirongo iiri na mugwanja, magana jairi ja mirongo inana na inana.

Mwankira narua, turina ikundi bibinini mirongo ithatu na kimwe bia TIST na nitubangite kuongera bingi mwaka juju. Nitwuthithagia mucemanio jwte jwa omweri kanisene ya St. Patrick AIPCEA Tuesday ya muthia ya o mweri. Iu, ija uungane natwi twite ngugi amwe kuthongomia miturire yetu na naria gututhiurukite.



Amemba ba cluster ya Ntharagwene munandene jwao jwa miti mweri muthiru

Cluster ya Kamweyendei: Kwija amwe micemanione ya o mweri ya cluster nigutethagia kuthoma na kugaana mathuganio jameru.

Ithugano ria gucemanio o mweri nirithiritwe ririna na baita kiri batwi. Nitugaanaga mathuganio jameru. Bubu nibututethagia kuthongomia jaria twiji na njira inyingi. Miturire yetu niuthaga o uria tuarairia thina iria twonaga miturirene yetu na gucua njira cia kuthiria thina iji.

Mucemanione jwetu jwa cluster jwa mweri jwa mugwanja, nitwathomere gukurukira amemba betu bamwe uria tuumba kwoongera wega bwa irio biria turijaga. Bubu ni bwari amwe na kuthongomia mianga na njira ya kuruga chapatti irina murio na ciri cia bata mirine yetu.

Aja ni matagaria na into biria biendekaga kuthithia irio bibingi bia mianga:

Into biria bikendeka:

- | | |
|--------------------|-------------------------------|
| ✓ Mutuu jwa mianga | ✓ Mutuu jwa nkano |
| ✓ Baking powder | ✓ Maguta |
| ✓ Ndengu | ✓ Mianga itirugi |
| ✓ Chumbi | ✓ Ruuji |
| ✓ Cuburia | ✓ Cuburia ya guchamukia ruuji |
| ✓ Kirai gia kuruga | ✓ Kibiriti |

Kuruga chapatti cia mianga:

- 1) Jukia gilasi ijiri cia mutu jwa mianga na gilasi ithatu cia mutu jwa nkano
- 2) Ungania bwega mukebene

- 3) Jukia ruuji na uunganie na chumbi
- 4) Ongera ruuji mutune mwanka juungane bwega
- 5) Waa tayari kuruga chapatti ruuga uria urugaga kawaida
- 6) Thuraira mwanki na wike kirai rikone riu uruge chapatti ciaku
- 7) Warikia ikira irio biu waruga dishine

Kuruga mandazi ja mianga:

- 1) Thima gilasi ijiri cia mutu jwa mianga na ithatu cia mutu jwa nkano
- 2) Riu, ongera iciko biiri bia baking powder
- 3) Ungania bwega
- 4) Jukia ruuji na chumbi unganirie dishine ingi
- 5) Ongera ruuji mwanka mutuu jungane bwega
- 6) Thuraira mwanki jwaku na wike cuburia mwankine, ongera maguta
- 7) Jaa tayari ikira kuruga mandazi jaku
- 8) Thuraira mandazi jaku jang'ani na uria urugaga jangi
- 9) Jarikia kua tayari, ikira mandazi jaku dishine jari tayari gutawa

Kuruga chapatti cia ndengu:

- 1) Taara ndengu na wikire ruujine rukutheruka kenda iya
- 2) Therukia mwanka ciye bwega



- 3) Kima ndengu ciaku mwanka cie cubu rangi ya green
- 4) Uuna ndengu nikenda wathurana na cubu
- 5) Ongera chumbi cubune
- 6) Ikira gilasi ithatu cia mutu jwa nkano
- 7) Ungania bwega
- 8) Ikira pan mwankine na uruge chapatti ciaku
- 9) Ruuga uria urugaga chapatti ingi
- 10) Warikia kuruga, ikira dishine ciri tayari gutawa

Kuruga chips cia mianga:

- 1) Jukia muanga
- 2) Chaura gikonde na urite muri jwa gati gati
- 3) Giita tue tunini na uthambie bwega
- 4) Riita ruuji
- 5) Thuraira kirai giaku gia kuruga

- 6) Ikira maguta na wetere mwanka jagie mwanki na jae tayari kuruga
- 7) Ikira mianga yaku magutene mwanka iye bwega

Yarikia ngugi ikira dishine iri tayari gutawa



Kuruga chapatti cia mianga

TIST: Mabukandu nojalete mbeca inyingi.

Mantu jaja jajukitue kuuma The Organic Farmer(<http://www.theorganicfarmer.org/profile/2>) and Jürgen Griesbach, 2005: Avocado growing in Kenya. ICRAF (World Agroforestry Centre), Nairobi, Kenya.

Mbukandu ni itunda ria thoko ria bata mono kiri Kenya na kiri thoko cietu na kinya cia oome.

Kurina mithemba ithatu iria minene buru ya mibukandu, iria ibujaga guntu mwanya mwanya. Menya ni mibukandu ya mithemba iriku ithithagia bwega nkuruki iandi kiri rera na mantu ja ntuura yaku. Gutumira mpindi kana mbeu kuuma kugita miti irina thiria na iminene na minandene iria iri akui niku kwega, miti iji niu yumba kuthithia bwega nkuruki au gwaku.

Kuumithia mibukandu

Mpindi niciritagwa mitine iria irina thiria na kuuma kiri matunda jarina thiria na jakuri. Mbeu iu ijukitue na yatherua no ikirwe kiri ndawa ya kurigiria tunyomoo tutikamirie na riu ikaandwa mibukone ya kuumithia kana maratasine ja nailoni jaturi makutho. Kirundu kiri na bata mono kiri kuuma kwa mbeu iji. Mibukandu iji yakinya centimita mirongo iiri na yagia tuthangu tuna tuumite bwega, nikuragwa, igakamatwa na gwikua mikebene.

Kurita mbeu kuumania na muti nikujukia mieri u itantatu. Miti ikurite kuumania na kugitwa kuuma kiri ingi nithagirwa iri imikui nkuruki na yambagiria guciara maua kurio (miti ithatu gwita inna yarikia kuandwa muundene) nkuruki ya iu ingi. Miti iminini ikethirwa iri tayari kuthamirua muundene nyuma ya mieri iiri gwita ithatu yarikia kugitwa.

Kuanda miti na kumirikia

Mithetu nibati kwithirwa iri imiarie, iminoru na irina ruugo rung'ani. Mibukandu itibujaga mithetune igwika ruuji na iritui mono na ikwigara kana aria kuri na ruuji rwanthi ruri akui mono, na kwou itiumagiria kinya nduji cia chumbi na cia acidi. Igita riria riega buru ria kuanda ni mwambirio jwa mbura. Kanya kuuma muti gwita kiri jungi ni mita ithanthatu gwita ikumi, kulingana na unoru, rera na muthemba jwa muthatu. Marinya jakuanda nijenjagwa jaria maingi jarina warie bwa fiti ijiri na uraja bwa fiti ijiri, ukimenyagiira ati ukuunanga mang'enyua jamanene na kumenyeera ati ruuji rutiigara na miiri igukura itikugitarua. Muthetu jou juriti kirinyene nijubati kuunganua na mboleo, mati na rock phosphate kethira irio. Anda imera biu utikugitaria miiri ukimenyaira ati uandite uraja o buria biraandi mukebene. Thithia karai kuumania na muthetu kathiurukite muti nikenda irio na ruuji rugwatua bwega.

Warikia kuanda, miti iu nibati gwikirwa ruuji orio. Tumira lita ithano gwita mirongo iri cia ruuji kulingana na uraja bwa kimera. Gukunikira muthetu kwaomba kwaithirwa kurina baita nontu nikunyiagia kuura kwa ruuji na kunyiyia kuuma kwa iria. Gwikira ruuji gukendeka igita ririkai. Untu bungu bwa bata ni kumenyeera o kimera kuumania na ndithia na nyomoo cia kithaka.

Gwikira mitunda ruuji.

Ruji ruri bata mono igita ria gukura na guciara kwa mutunda. Mieri yambele iiri ya kuuma, na kinya miaka yiayo ya mbele ya gukura, miti nibati gutegerwa o igita nyuma ya igita na igekirwa ruuji riria yonania nikwenda. Mibukando ni umaga miri



imiraja, indi kulingana na rera no yende gwikirwa ruuji rungi, mono igitene ria uumo. Igita ria gwita maua, guciara matunda, na gukura kwa matunda ruuji rung'ani ruirbata mono niuntu bia gukura gukwega kwa matunda.

Mboleo.

Niuntu bwa guciara bwega, kuri baita gwikira mibukandu mboleo o igita nyuma ya igita. Kilo ithano gwita mirongo iiri cia fertilizer no ciikirwe o muti o mwaka. Menyeera riria ugutumira nitrogen – niongagira gukura kwa mathangu indi ti kuuma kwa maua na miiri ya mibukando itiendaga muthetu jurina chumbi inyingi. Phosphorus jaria maingi niendekaga, na potassium iri bata kiri miti iria ikuri ya guciara matunda.

Tunyomoo na mirimo.

Njira cia kwebera tunyomoo na mirimo ni untu bwa bata mono kwou taara antu aega na anoru a kuanda, anda itarenie bwega, taara mithemba irina thiria, nyinyia maria, kunikira muthetu, ukanoria mono, na wikiire ruuji riria rwendeka. Tunyomoo jaria maingi ti thina kiri uandi bwa mabukandu Kenya. Tumira into bia muarubaine, bia pyrethrum kana bia tephrosia kurua na tunyomoo ta moths, thrips kana scales kethira muti nijugitaritue mono.

Mirimo iji no ithirwe iri hatari:

Avocado root rot: (murimo jwa Phytophthora fungus) Miti niciaraga maciara jamakai na irina mathangu jamakai na ikari jaka yajitue ikiendaga kunyara. Biang'i nibiithagua ni riu na bigakua. Miri no yore na muti junthe jugakua jutikuri. Miti yajitue nibati gukurwa na ikaithua. Ruuji rwa mwanki na utumiri bwa ndawa cia tunyomoo kiri mbeu iria ikaumithua niyo njira iria ikairwa inya ya kuebera murimo juju. Kurina ndawa ijiri cia kurua murimo juju - Ridomil na Aliette.

Anthracnose: Matunda nijagijaga macunci ja rangi ya brown jamoomu. Matunda jamaanake no jagwe, indi kiri jaria jagukura kura, murimo juju nijwicithaga mwaka gitunda gigakura na gikagunda. Jaria maingi, ndawa cithithitue na copper nitumagirwa kurua na Anthracnose.

Cercospora fruit spot: Macunci ja yellow jamanini nijonekaga matundene na mathangune. Kanyuma, nijagaruraga rangi ikaa brown riu jakaunikanga, na kwou gutuma tunyomoo tungi twija na uuthu. Murimo juju kinyaju nijuthiragua na ndawa cithithitue na copper

Kugua kwa matunda.

Kugua kwa mathangu ti murimo na nikwonekanaga

mono kiri mitunda ya mithemba imingi. Miti nigwithagia matunda iria jaingia na jaria jutumba kurera bwega mwanka jakura. Mibukando nigwithagia matunda jaja janyii ja nono, na kairi riria jang'ana ta nkara.

Gutua mabukandu.

Miti iria ithithiritue grafting niambagiria kurita maua na guciara matunda nyuma ya miaka ithatu gwita inna yarikia kuandwa muundene.

Kuri mantu joonanagia ati gukura kuri akui:

- Kiri mithemba imiiru, nikwithagirwa kurina kugaruka kwa rangi kuuma green gwita black kana purple.
- Kiri mithemba ya green, kiang'l kia gitunda nikiejaga yellow, ngozi no yonekane igitiga kumeta meta, kana gitina gikauma icunci bigukara jaka gukurota.
- Mithemba imwe niambagiria gukara jaka ikwerua.
- Matunda jaria jakaraga iguru riria jekirwa ruujine nijethagirwa jakuri.

Thoko.

Tonga mabukandu jonthe na umenyeeri bubwingi! Thoko cia oome, mono cia Europe, ciri mantu na mawatho jamoomo jaria arimi babanini boomba kwona jarina uumo gukinyira. Thoko cia aja citi uumo bubwingi ou indi kinyacio ciri mantu, niuntu mbokandu nicikuraga cionthe igita rimwe, na kwou gutuma arimi baaga baita kuumania na kujendia. Gwika kana kuthithia into bia mabukandu ni akui burema kuumbika. Arimi ba Mabukandu jwa kwendia kwou no mwanka bagwatane na ukui mono nikenda boona thoko injega.

Mithemba iria yonekanaga mono ya mibukandu:

1. **Hass na Fuertes:** Mithemba iji nitumagirwa kuthithia mbeu injeru (gicunci kia iguru kia mitunda ithithiritue grafting). Niendagwa mono niuntu bwa maguta jamaingi.
2. **Puebla:** Mithemba juju nijutumagirwa ni arimi babaingi kuandiraingi nontu itina mirri ndene na itigwatagwa ni mirimo
3. **Singapore:** Juju ni muthemba jumweru juria jukurangaga na jumba guciara jwakinya mieri ikumi na inna gwita ikumi na itano. Nijukinyaga uraja bwa fiti ijiri.
4. **G5 na G6:** Mithemba iji iri niendi mono nontu nithithagia bwega guntu kuri iguru na kinya kuria kuri nthi. No iumithirue kiri mithemba ingi yonthe kenda matunda jathongomua. Arimi nibakuurua bagure miti ya kuanda kuumania na aumithia baria baijikenena bena baruga.

Mazingira Bora



TIST

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

Kikuyu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Burimaria TIST Cluster during their monthly meeting. We received tree payments last month. Our goal is to plant more trees in the coming rainy season.

Thiini wa ngathiti:

TIST: Kuhanda mithemba miingi ya irio. Page 2

Cluster ya Ntharagwene: Cluster njeru biu thiini wa ruhonge rwa TIST rwa Ntugi. Page 4

Cluster ya Kamweyendei: Guka hamwe gwituu thiini wa micemanio ya o mweri nigututeithagia guthoma na kumenya maundu maingi. Page 4

TIST: Makorobia nomakuhe mbecha makiria. Page 5



TIST: Kuhanda mithemba miingi ya irio.

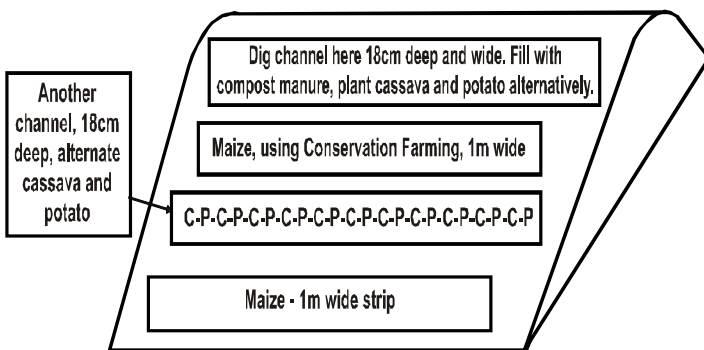
Murimi noahande irio mithemba miingi kimera kimwe. Ririawacagura mithemba iria ingitwarana wega nouteithiririe kwagirithia biodiversity migundaini, kwngerera unoru wa tiiri na kunyihia ugwati wa tutambi na mirimu.

Intercropping yonanagia kuhanda na gukuraniria iri mithemba miingi mugunda-ini umwe. Ona ningi kuhanda irio na miti hamwe.

Imwe cia ikundi cia TIST nicigeretie njira ta ici, iria ninjega na kuria kuinamu na kuri na iharuruka.

1. Muhari-ini wa mbere enja mutaro wa uriku wa 18cm na warii wa 18cm.
2. Ihuria mutaro na thumu.
3. Handa mianga na waru.
4. Huhari-ini ucio ungi, handa mbembe Im ukihuthira Kilimo Hai.
5. Cokera mianga na waru
6. Cokera membe.

Njira ino ihuthagira makiria maundu maria tukoretwo tugithoma. Ni kuhandaniria na gukuraniria irio mithemba miingi mugunda-ini umwe, ihuthagira thumu na Kilimo Hai.



- Geria gucenjania mihari ya mbembe na miti. Ikundi nicigeretie kuhanda mihari itatu ya mbembe na muhari umwe wa mringa/yellow cassia/leucaenia/bead tree.
- Mihari ya muhia noihandwo gatagati ja mihari ya moringa na leucaenia.
- Geria mutukanio wa calliandra na mboco na marigu, mboco na kahuwa (riria kari kanini).
- Geria kuhandaniria njugu na mbembe/muhia na mwere.

- Geria na utaganu niguo wone ruia mwega na uheane maciaro kuri TIST.

Gucenjania uhandi wa irio mugunda-ini.

Crop rotation ni kuria arimi macenjanagia uhandi wa irio na imera mugunda-ini umwe. Nikuri mutaratara uria urumagirirwo kuria riria uracagura muthemba uria ukurumirira wagiriirwo ni kuya kuma family ingi. Guconjania guku niguteithagia kwngerera unoru wa tiiri tondu mimera ngurani ikoragwo na miri ya uraihu ngurani kuuga ati unoru niuthiaga ugityonyaga tiiri-ini kuringana na muthemba wa irio.

Niguo kugia na mawega ma gucenjania irio, ninginya ucenjanie wega. uu

Nitundu mimera ya muthemba umwe noiguciririe muthemba umwe wa tutambi na mirimu na riria wacenjania niunyahagia ugwati wa tutambi na mirimu gutherema na guikara tiiri-ini.

- Group 1: Cucumber, gourds, pumpkin, squashes, watermelon (Gourd family)
- Group 2: Broccoli, brussel sprouts, cabbage, cauliflower, collards, kale, radish, turnip, mustard, watercress (Crucifer/Brassica family)
- Group 3: Eggplant, pepper, tomato, potato (Solanaceous family)
- Group 4: Lettuce, artichoke (Aster family)
- Group 5: Maize, rice, sorghum, wheat, oat, barley, millet (Grains and cereals family)
- Group 6: Beans and peas (Legume family)
- Group 7: Garlic, leek, onions, chives (Allium family)
- Group 8: Carrot, celery, dill, parsnip, parsley (Carrot family)
- Group 9: Cassava, sweet potato, taro, yam, water chestnut (root crop family)
- Group 10: Cotton, okra (Mallow family)

Angikorwo njira ino ninditu, arimi aingi nimahuthagia na gukorwo na ikundi 5 ci gucenjania.

- a) Mathangu(broccoli, mboga, cauliflower, kales, spinach etc) nicifataraga unoru muingi gukira mboga.



- b) Matunda (chilies, eggplants, peppers, tomatoes, etc.).nicibataraga thumu muingi no ti ta irio cia mathangu.
- c) Irio cia miri crops (carrots, beetroots, potatoes, onions, radishes, turnips, etc).citibataraga humu muingi ta mathangu na miri.
- d) Legumes (beans, chickpeas, cowpeas, grams, peas, pigeon peas, etc.).maundu mangi ma bata macio ni guthondekanitrogen tiiri-ini.
- e) Cereals(mbembe, muhia, mwere)

Maundu ma kurora mbere.

Geria kuhanda mbembe na njugu hamwe mwaka wa mbere na mwaka wa keeri uhande muhia. Handa njugu mwaka wa mbere na utukanie na legumes, sunflower na/kana waru mwaka wa keeri.

Njira ingi ni kuhanda mbembe irumiriirwo ni legumes na soybeans kana njugu na kimera kiu kirumiriire ugerie kindu ta cotton.

Geria gutiga mugunda utarimite gwa kahinda ka mwaka umwe ucoke uhande ringi gwa kahinda ka miaka 3-5 utautigite ringi. Njira ino niikuhe mugunda kamweke ga gukorwo na unoru. Geeria thaara na nyeki ya ngombe.

Na muno makiriahanda legumes mbere ya kuhanda cereals. Riria wahanda mimera ya Brassica(ta mboga) mbere na thutha wa Solanaceous(ta nyanya) noguteithie kugitira mirimu ya tiiri na miri.

Ino ni njira ya gucenjaniai muhandire wa irio mugundaini kuma kuri Infonet-Biovision. Iroya muhiano wa mugunda uri na plot 4 hari imera 4 na o kimera kiri na mieri 4.

Kimera 1:

- Plot 1: Maize / garlic / onions / or leeks
- Plot 2: Eggplant / chilies / potato / or tomato
- Plot 3: Broccoli / cabbage / cauliflower / or kale
- Plot 4: Beans / cowpeas / grams / or peas

Kimera 2:

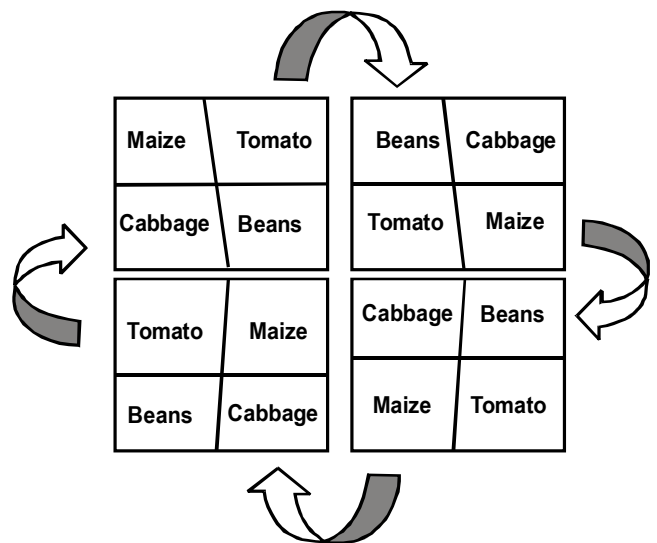
- Plot 1: Beans / cowpeas / grams or peas
- Plot 2: Broccoli / cabbage / cauliflower / or kale
- Plot 3: Eggplant / chilies / potato / or tomato
- Plot 4: Maize / garlic / onions / or leeks

Kimera 3:

- Plot 1: Broccoli / cabbage / cauliflower / or kale
- Plot 2: Beans / cowpeas / grams / or peas
- Plot 3: Maize / garlic / onions / or leeks
- Plot 4: Eggplant / chilies / potato / or tomato

Kimera 4:

- Plot 1: Eggplant / chilies / potato / or tomato
- Plot 2: Maize / garlic / onions / or leeks
- Plot 3: Beans / cowpeas / grams / or peas
- Plot 4: Broccoli / cabbage / cauliflower / or kale



Alley cropping



Cluster ya Ntharagwene: Cluster njeru biu thiini wa ruhonge rwa TIST rwa Ntugi.

Ithui amemba a Ntharagwene cluster nitukenete tukiuga ati nitutheremete kuma riria twahukire kuma cluster ya Kiirua mwaka muhituku. Kinya hau turi, nitukoretwo na nathari cia miti makiria ma 10,000. In ikwongerera iria turari nayo 27,288.

Nginya umuthi, turi na ikundi cia TIST 31 na nitubangite kuingiria ingi nyingi mwaka uyu. Nitukoragwo na mucemano witu wa o mwaka thiini wa St. Partick AIPCEA o jumanne yamuico ya mweri. Nyitanira naithui niguu turute wira hamwe niguu twagirithie miturire na maria maturigiciirie.



A memba a Ntharagwene Cluster mari tuta-ini ciao cia miti mweri ucio urathirire.

Cluster ya Kamweyendei: Guka hamwe gwitu thiini wa micemano ya o mweri nigututeithagia guthoma na kumenya maundu maingi.

Riiciria ria gucemanagia o mweri nirikoretwo na kiguni kuri ithui. Nituthomithanagia maundu meru na njira ino igatuteithia kwongerera uugi witu na njira nyingi..miturire iitu ikahutha riria twaraniria maundu megii mouritu maria mari kuo miturire-ini na tukagia na njira ya kuhurana namo.

Hingo ya mucemano witu wa July 2014, nitwathomire kuhitukira amemba amwe aitu uria tungiagirithia na twongerere bata indo iria turi nacio. Ici ni indo ta mianga niguu igie na cama na guthondeka chapatti ciri na kiguni miiri-ini.

Maya ni makinya ma guthondeka mianga.

- ✓ Mutu wa mianga
- ✓ Mutu wa ngano
- ✓ Dawa ya kuimbia
- ✓ Maguta ma kuruga
- ✓ Ndengu
- ✓ Mianga miithi.
- ✓ Cumbi
- ✓ Maai
- ✓ Nyungu
- ✓ Thaburia
- ✓ Pan
- ✓ Kibiriti



Njira ya kuhariria.

- 1) Oya glass igiri cia mutu wa mianga na glass 3 cia mutu wa ngano
- 2) Citukanirie mbakuri-ini
- 3) Tukania na maai na cumbi
- 4) Ikira mutu maai-ini
- 5) Kima mutu
- 6) Hairia mwaki na uigirire pan ya kuruga chapatti.
- 7) Warikia ikira maguta kabakuri-ini.

Njira cia kuhariria mandazi ma mianga:

- 1) Thima glass 2cia mutu wa mianga na glass 3 cia mutu wa ngano.
- 2) Ikira iciko igiri cia dawa ya kuimbia.
- 3) Tukaniria wega bakuri-ini.
- 4) Oya maai na cumbi na utukanie.
- 5) Ikira maai nginya citukane.
- 6) Hariria mwaki na uigirire thaburia na ucoke wikire maguta.
- 7) Ikira mandazi maku na uruge ota mandazi maria mangi.

**Njira cia kuhariria chapatti cia ndengu.**

- 1) Thuura ndengu na wikire nyunguini citheruke.
- 2) Therukia nginya ihie.
- 3) Uruga ndengu niguu thubu ukorwo na rangi
- 4) Cunga niguu wone thubu.
- 5) Ikira cumbi thubuini
- 6) Tukania wega.
- 7) Igirira pan mwaki-ini na uruge chapatti ciaku
- 8) Ruga ota cia kawaida.
- 9) Warikia ihurira andu aku.

Njira ya kuruga chips cia mianga.

- 1) Oya mianga mithi
- 2) Unura makoni na muri wa gatagati.
- 3) Tinangia cihane chips.

- 4) Umithia maai.
- 5) Hariria mwaki.
- 6) Ikira maguta-ini nginya mahiuhe
- 7) Ikira mianga maguta-ini macio
- 8) Warikia ihurira andu aku.



Kuhariria Chapaci cia mianga

TIST: Makorobia nomakuhe mbecha makiria.

Ta uria turutite from *The Organic Farmer*(<http://www.theorganicfarmer.org/profile/2>) and Jürgen Griesbach, 2005: *Avocado growing in Kenya*. ICRAF (World Agroforestry Centre), Nairobi, Kenya.

Makorobia ni matunda ma bata Kenya ma kwedio guku bururini ona nja ya bururi.

Kuri mithemba iria minene itatu ya makorobia, iria ikuraga miena ngurani. Roar ni mthemba uriku wa makorobia unguke kwanyu. Ukihuthira mbegu kana muciarithanio na kuma nathariini cia kwanyu nikuo kwega makiria, miti ta iyo noikure wega kwanyu.

Guthondeka mbegu.

Mbegu ciunganagio kuma kuri miti iria miega na mikuru. Mbegu iria ciarutwo nociikio dawaini ya kuninafungi na cicoke cihandwo tuta-ini kana maratathi-ini. Kiiruru nikiega niguu cimere wega. Riria mbegu ciakinyia 20cm uraihu na ciri na mahuti mana niguu cimunyagwo na cikahandwo mikebe-ini.

Guciarithania nogwikwo thuha wa kahinda ta ka mieri 6. Miti iria miciarihanie niikaraga iri minini na ikambiriria kuruta kiro tene(ta 3-4 years theta wa kuhanda mugunda-ini) gukira iria cihanditwo mugunda-ini. Miti iyo minini niikoragwo ikinyite ya kuhandwo mugunda-ini thutha wa 3-4 months thutha wa guciarithanio.

Uhandi wa miti.

Tiiri wagiriirwo nigukorw uri muriku, munoru na muhinyu. Makorobia matiendaga tiri utatemeirwo maai wega, tiiri mumu, miaraho ya maai kana ugunyu muingi, na ningi ndwendaga tiiri uri na cumbi kana acid. Kahinda karia keega muno ga kuhanda ni kimera kia mbura .utaganu wa miti wagiriirwo nigukorwo uri wa 6-10m, kuringana na unoru wa tiiri, riera na maundu mangi. Marima magiriirwo nikwenjwo mari na utaganu wa 2ft na uriku wa 2ft, ukgitigagirira tiiri nimuhinyu na maai makaunithio wega na miri ndirathuburwo. Tiiri uria wenjwo noutukanio na thumu na phosphate ya mahiga angikorwo iri ho. Handa mimera umenyereire utaguthmbura na guthukia miri na uriku ota uria irari nagui iri mikebe-ini. Thondeka handu hahana basin guthiururukiria muti niguu ukorwo na maai. Thutha wa kuhanda, mimera yagiriirwo kuheo maai orio. Huthira 5-20 lt cia maai kuringana na muigana wa mumera. Humbira na mahuti niguu ugunyu wa tiiri uikare na ikure wega. Guitiriria maai nigukoragwo kuri kwa bata makiria. Gitira miti kumanana mahiu.

Kuhe maai kwa miti ya matunda.

Kuhe maai ni kwa bata muno hingo ya ikiro ngurani riria muti urakura. Hingo ya mweri wa mbere, na ningi mwaka wa mbere wa gukura, miti niyagiriirwo



ni guikara ikiroragwo na kuheo maai riria yonania ta ing'ariirwo. Mikorobia niikoragwo na miri minene kuringana na riera niibatara ma maingi na muno kimera kia riuu. Riria iraruta kiro, matunda niwega ithondekwo niguo irute matunda mega.

Kuhe fertilizer.

Niguo ukorwo na maciaro maingi, niwega na undu wa bata gwikira mikorobia thumu maita maingi. Gatagati ka 5-20 kg cia fertilizer nociikirwo muti-ini umwe o mwaka – niitumaga mahuti makorwo mari mega na ti kuruta kiro, na miri ya makorobia ndiiguanaga na cumbi muingi tiiri-ini. Phosphorus niya bata ohamwe na potassium niya bata niguo mimera igie na maciaro maingi.

Tutambi na mirimu.

Njira cia kwigitira ni cia bata kwa uguo caria handu hari na tiiri mwega, tagania miti yaku, cagura miti iria miega, gitira kumana na tutambi, humbira na mahuti, ndugekire fertilizer nyingi makiria na uhe maai riria kwagiriire. Tutambi ti thina munene hari urimi wa avocado thiini wa Kenya. Huthira indo cia neem, kuhariria pyrethrum, kana tephrosia. Niundu wa tutambi ta fruit moths, thrips kana scales angikorwo nimaritwo muno.

Mirimu ino noikorwo na ugwati munene:

Avocado Root Rot: (**a Phytophthora fungus disease**) miti iciaraga matunda matari maingi na ikoragwo namahuti manini, maria makoragwo mari na rangi ungi na makahoha. Hongi cikoragwo ciumagariti na cikoma thutha wa kahinda kanini. Miri niibuthaga na muti wothe ukoma. Miti iria inyititwo ni murimu uyu yagiriirwo ni kumunywo na iteo. Kuhonia na maai mahiu na kuuraga tutambi nikwega niguo muti ugie na maciaro maingi. Kuri na dawa mithemba 2 iria niya murimu uyu. Ridomil na Aliette.

Anthraxnose: matunda magatuika ma brown, makagia na maroro, matutnda matari makuru makagua thi. Murimu uyu wihithaga nginya riria matunda makagethwo. Muno dawa ciri na copper nicihuthagirwo.

Cercospora fruit spot: maroro manini ma rangi wa yellow nimonekaga matunda-ini, thutha, nimacokaga magatuika ma brown n Mtunda magatukanga njira iria ihotithagia titambi guthukangia. Murimu uyu onaguo uninagwo na dawa cia copper.

Friut Drop: murimu uyu niwonekanaga muno kuri mithemba miingi ya matunda. Miti iguithagia matunda maingi makiria. Makorobia iguithagia matunda maigi riria matakinyite ma kugethwo na riria makinya muigana wa itumbi.

Kugetha makorobia.

Matunda maria maciarithanie mambagiriria guciara thutha wa 3-4 miaka thutha wa kuhandwo mugunda-ini

Ici ni dalili ati mutu niukinyite wa guciara.

- Gucenja rangi na kuiirira.
- Matunda kuhana yellow, ngothi guthenga.
- Kuhana ta maeruha.
- Matunda maria maraareramaai-ini nimo makuru.

Thoko.

Menyerera makorobia na umenyerezi munene! Thoko cia nja na makiria Europe nicikoragwo na mawatho manene maria arimi anini mangiremwo ni gukinyiria. Thoko cia guku nicikoragwo ciri nditu tondu makobia makuranagira hamwe. Arimi nimaremagwo ni kuiga na guthondeka makorobia. Kwa uguo arimi nimagiirwo kunyitithanio na thoko njega cia makorobia.

Mithemba iria yonekanaga ya makorobia.

1. **Hass and Fuertes:** mithemba ino ihuthagiwo guciarithania makorobia maria mangi. Nimakoragwo na maguta maingi muno.
2. **Puebla:** mahuthikaga guciarithania mwena wan a-thi na matikoragwo na fibre na matinyitagwo ni mirimu.
3. **Singerpore:** uyu ni muthemba mwega na ukuraga thutha wa 14-15 months ukuraga na uraihu wa 2ft.
4. **G5 na G6** mithemba ino niyo ikuraga kundu kuingi na noiciarithanio na mithemba ino ingi yothe niguo kumiagirithia.

Arimi nimarahinyirio magure mbegu kuma kuri aria metikiritio.

Mazingira Bora



TIST

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

Kiswahili Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Burimaria TIST Cluster wakati wa mkutano wetu wa kila mwezi. Tulipata malipo ya miti mwezi uliopita. Maono yetu ni kupanda miti mingi wakati wa msimu ujao wa mvua.

Ndani ya gazeti:

TIST: Mseto wa mimea. Uk. 2

Cluster ya Ntharagwene Cluster: Mpya yazaliwa katika eneo la TIST la Ntugi. Uk. 4

Cluster ya Kamweyendei: Kuja kwetu pamoja katika mikutano ya kila mwezi ya TIST hutusaidia kusoma na kushiriki mawazo mapya. Uk. 4

TIST: Avocado zaweza kukupa mapato mazuri. Uk. 5



TIST: Mseto wa mimea.

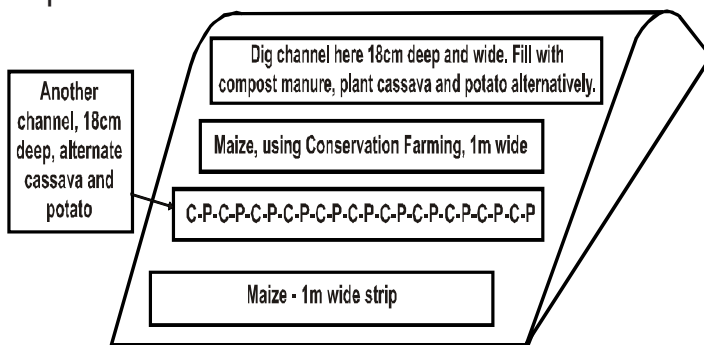
Upandaji wa mimea mingi ni ambapo mimea miwili au mitatu hukuzwa pamoja katika msimu mmoja. Kwa mchanganyiko unaofaa, hili laweza kuongeza bionuwai katika ardhi, kuongeza rutuba na kupunguza uwepo wa vijidudu na magonjwa.

Mseto hueleza zoezi la kupanda mimea tofauti wakati mmoja katika shamba moja. Pia yaweza kuhusisha kukuza mimea pamoja na miti kwa mfano kilimo mseto.

Baadhi ya vikundi wamejaribu mbinu zifuatazo, nzuri hasa kwenye miteremko

1. Kwa mstari wa kwanza, chimba mtaro wenye urefu wa centimita kumi na nane na upana wa centimita kumi na nane
2. Jaza mtaro huu na mbolea ya mimea
3. Panda mihogo na viazi vikifuatana
4. Kwa safu ya pili panda ukanda wa mahindi mita moja ukitumia mashimo ya kilimo hai
5. Mstari mwingine wa mihogo na viazi
6. Mstari mwingine wa mahindi na kadhalika

Mbinu hii hutumia mengi ya tuliyosoma katika mafunzo: ina kilimo mseto, ina mbolea ya mimea na pia kilimo hai.



- Jaribu kufuatanisha mistari ya mahindi na miti. Vikundi vidogo vimejaribu kufuatanisha ukanda wa mita nane wa mahindi na msatri wa miti ya moringa / yellow cassia / leucaenia / bead tree
- Mistari ya mtama yaweza kupandwa kati kati ya mistari ya moringa au leucaenia.
- Jaribu mchanganyiko wa calliandra na migomba ya ndizi, calliandra na mahagwe, calliandra na mahindi, mahindi na maharagwe, maharagwe na leucaenia, maharagwe na ndizi, maharagwe na kahawa (ilipo changa).
- Jaribu kuchanganya kunde na mahindi / mtama au uwele.

Jaribu nafasi mbali mbali ili uone ni gani bora zaidi, na ujulishe TIST matokeo.

Mawazo kuhusu mzunguko wa mazao

Mzunguko wa mazao ni ambapo wakulima huzunguka huku wakipanda mimea mbali mbali katika ardhi moja. Kuna utaratibu maalum wa upanzi wa mimea, ambapo zao litakalofuata hutoka familia

tofauti na iliyopandwa kabla. Mzunguko wa mimea waweza kuwa wenye faida kwa rutuba ya udongo kwani mimea tofauti huwa na urefu tofauti wa mifumo ya mizizi, kumaanisha si safu moja ya virutubisho vya udongo humalizwa mwaka baada ya mwaka. Mbinu hii pia husaidia kuvunja udongo katika safu tofauti, jambo ambalo huboresha mfumo wa udongo, na laweza kuvuta aina tofauti za viumbe hai wenye faida katika udongo.

Ili kupata faida za kuzungusha mimea, lazima aina tofauti ya mimea ipandwe kila wakati. Hili ni kwa sababu mimea ya aina moja huvuta vijidudu na magonjwa sawa, na kuzungusha aina kwaweza kupunguza uwezekano wa baadhi ya vijidudu na magonjwa kuchukua umiliki kwatika udongo.

Orodha ifuatayo inaweka mimea kulingana na vikundi. Mimea kutoka kikundi kimoja haifai kupandwa moja baada ya nyingine. Hakikisha umechanganya vikundi vyako katika mpango wako wa mzunguko!

- Kundi la kwanza: Tango, vibuyu, malenge, squashes, tikiti maji (Familia ya mtango)
- Kundi la pili: Broccoli, Brussel sprouts, kabichi, cauliflower, collards, sukuma, radish, turnip, haradali, watercress (Jamii ya crucifer / Brassica)
- Kundi la tatu: Mbilingani, pilipili, nyanya, viazi (Jamii ya solanaceous)
- Kundi la nne: Lettuce, artichoke (Jamii ya Aster)
- Kundi la tano: Mahindi, mchele, mtama, ngano, oat, shayiri, mtama (Jamii ya nafaka)
- Kundi la sita: Beans na mbaazi (jamii ya kunde)
- Kundi la saba: Vitunguu, leek, vitunguu saumu, chives (Jamii ya Allium)
- Kundi la nane: karoti, celery, dill, parsnip, parsley (Jamii ya karoti)
- Kundi la tisa: Muhogo, viazi vitamu, taro, viazi vikuu, water chestnut (Jamii ya mizizi)
- Kundi la kumi: Pamba, okra (Jamii ya Mallow)

Iwapo mfumo ulio hapo juu ni mgumu sana, wakulima wengi hurahisisha kazi hii kwa kuweka mimea katika vikundi vitano na kuzunguka kati ya vyenye (taarifa imetoka katika tovuti ya Infonet-Biovision):

- a) Mimea ya majani (broccoli, kabichi, cauliflowers, sukuma, mchicha na kadhalika). Huhitaji virutubisho zaidi ya zinginezo
- b) Mimea ya matunda (Pilipili, mbilingani, pilipili kali, nyanya na kadhalika.). Huhitaji kiwango kikubwa kiasi cha virutubisho lakini si kama mimea ya majani.
- c) Mimea ya mizizi (Karoti, beetroots, viazi,



vitunguu, radishes, turnips, na kadhalika). Huhitaji virutubisho chache ukilinganisha na mimea ya majani na ya matunda.

- d) Jamii ya kunde (maharagwe, chickpeas, kunde, ndengu, mbaazi, na kadhalika.). faida yao nyongeza ni kutia naitrojeni iliyo katika hewa udongoni.
- e) Nafaka (Mahindi, mtama, uwele na kadhalika

Mawazo ya kuzingatia:

Jaribu kupanda mahindi na njugu pamoja mwaka wa kwanza na mwaka wa pili upande mtama. Jaribu kupanda njugu mwaka wa kwanza halafu upande mchanganyiko wa jamii ya kunde, alizeti na/ au viazi katika mwaka wa pili

Wazo lingine ni kujaribu kupanda mahindi halafu jamii ya kunde ifuate kama vile soya au njugu. Halafu msimu utakaofuata jaribu kupanda mmea utakaoleta pesa kama pamba.

Jaribu kuacha shamba bila chochote mwaka mzima, halafu upande mimea tena miaka mitatu hadi mitano kabla ya kuliwacha tena bila chochote. Hili litaipa ardhi nafasi ya kurudisha virutubisho udongoni. Fikiria kupanda nyasi iwapo una mifugo.

Kwa jumla, panda jamii ya kunde kabla ya nafaka. Kupanda mimea kutoka jamii ya Brassica (kama Kabichi) kabla na baada ya mimea kutoka jamii ya Solanaceous (kama nyanya) kwaweza kuzuia mjengo wa mafundo ya viwavi na kukauka kunaoletwa na bakteria.

Lifuatalo ni wazo la kuzungusha mimea lililochukuliwa kutoka Infonet-Biovision. Linachukua mfano wa shamba lenye viwanja vinne huku kila msimu hukiwa takriban miezi minne.

Msimu wa kwanza:

Kiwanja cha kwanza: Mahindi / saumu / vitunguu / au iliki
 Kiwanja cha pili : Mbilingani/ pilipili /viazi / au nyanya
 Kiwanja cha tatu : Broccoli /kabichi / cauliflower / au sukuma
 Kiwanja cha nne :maharagwe / kunde /ndengu / au mbaazi

Kirimo Mseto



Second season:

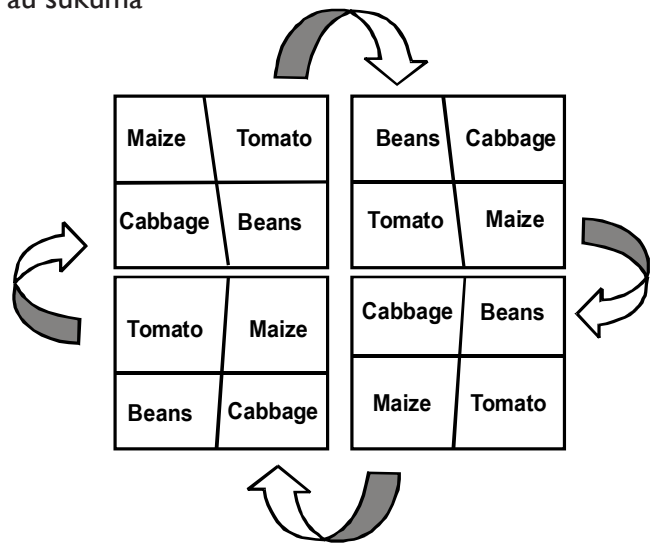
Kiwanja cha kwanza: maharagwe / kunde /ndengu / au mbaazi
 Kiwanja cha pili: Broccoli /kabichi / cauliflower / au sukuma
 Kiwanja cha tatu: Mbilingani/ pilipili /viazi / au nyanya
 Kiwanja cha nne: Mahindi / saumu / vitunguu / au iliki

Third season:

Kiwanja cha kwanza: Broccoli /kabichi / cauliflower / au sukuma
 Kiwanja cha pili: maharagwe / kunde /ndengu / au mbaazi
 Kiwanja cha tatu: Mahindi / saumu / vitunguu / au iliki
 Kiwanja cha nne: Mbilingani/ pilipili /viazi / au nyanya

Fourth season:

Kiwanja cha kwanza: Mbilingani/ pilipili /viazi / au nyanya
 Kiwanja cha pili: Mahindi / saumu / vitunguu / au iliki
 Kiwanja cha tatu: maharagwe / kunde /ndengu / au mbaazi
 Kiwanja cha nne: Broccoli /kabichi / cauliflower / au sukuma



Cluster ya Ntharagwene Cluster: Mpya yazaliwa katika eneo la TIST la Ntugi.

Sisi, wanacluster ya Ntharagwene tuna furaha kushirikisha maendeleo yetu tangu tulipozalisha kutokana na cluster ya Kiirua mwaka huu. Kufikia leo, tumeanzisha kitalu cha miti kilicho na zaidi ya miche elfu kumi. Hii itaongeza miti yetu tuliyo nayo hai ambayo ni elfu ishirini na saba, mia mbili themanini na nane.

Kufikia sasa, tuna vikundi vidogo thelathini na moja vya TIST na tunapangia kuongeza vingine mwaka huu. Sisi hukutana katika mikutano ya kila mwezi pale kiwanja cha kanisa la St. Patrick AIPCEA kila Jumanne ya mwisho katika mwezi. Tafadhali jiunge na sisi ili tufanye kazi pamoja ili kuboresha maisha na mazingira yetu.



Wanacluster ya Ntharagwene palipo kitalu chao cha miti mwezi jana.

Cluster ya Kamweyendei: Kuja kwetu pamoja katika mikutano ya kila mwezi ya TIST hutusaidia kusoma na kushiriki mawazo mapya.

Wazo la kukutana kila mwezi limekuwa lenye faida kwetu. Tumeshiriki na kubadilishana mawazo mapya. Hili hutusaidia kuboresha ujuzi wetu kwa njia mbali mbali. Maisha yetu hukuwa rahisi kwani huwa tunajadili changamoto mbali mbali katika maisha yetu na tunapata njia za kukabiliana nazo.

Katika mkutano wetu wa cluster wa mwezi wasaba 2014, tulifunzwa kupitia baadhi ya wanacluster wetu kuongeza thamani ya vyakula vyetu. Hili lilihusu kuongeza mihogo thamani kwa kupika chapatti zilizo tamu na zenye virutubisho vingi.

Zifuatazo ni hatua na viungo vya kuandaa vyakula mbali mbali vya mihogo:

Mchanganyiko:

- | | |
|-----------------------------|-----------------|
| ✓ Unga wa mihogo | ✓ Unga wa ngano |
| ✓ Baking powder | ✓ Mafuta |
| ✓ Ndengu | ✓ Muhogo |
| ✓ Chumvi | ✓ Maji |
| ✓ Chungu cha kuchemsha maji | |
| ✓ Sufuria | ✓ Kikarangio |
| ✓ Kiberiti | |

Jinsi ya kuandaa chapati za mihogo:

- 1) Chukua gilasi mbili za unga wa mihogo na gilasi tatu za unga wa ngano
- 2) Changanya vizuri katika bakuli
- 3) Ongeza chumvi kwa maji ili kutia ladha



Ongeza maji kwa unga hadi uchanganyike vizuri

- 5) Ukiwa tayari kupika chapati zako pika kama za kawaida
- 6) Tayarisha moto na uweke kikaangio motoni ili kupika chapati
- 7) Zikiwa tayari, ziweke katika bakuli

Jinsi ya kuandaa mandazi ya mihogo:

- 1) Pima gilasi mbili za unga wa mihogo na gilasi tatu za unga wa ngano
- 2) Halafu, ongeza vijiko viwili vya unga wa kuoka (hamira)
- 3) Changanya vizuri katika bakuli
- 4) Chukua maji na chumvi na uchanganyie katika bakuli nyingine
- 5) Ongeza maji hadi uchanganyike vizuri
- 6) Tayarisha moto na uweke sufuria jikoni, halafu uongeze mafuta.
- 7) Yanapokuwa tayari kaanga
- 8) Tangeneza mandazi kwa ukubwa na mapishi ya kawaida
- 9) Yakiwa tayari, yaweke katika bakuli yakingoja kuliwa.

Jinsi ya kuandaa chapati za ndengu:

- 1) Chagua ndengu na uzitie katika chungu chenye maji yanayochemka
- 2) Chemsha hadi zipikwe vizuri



- 3) Zibonde ndengu hadi zikupe supu yenye rangi ya kijani
- 4) Zichuje ndengu ili hupate supu ikiwa peke yake
- 5) Ongeza chumvi kwa supu hii
- 6) Ongeza gilasi tatu za unga wa ngano
- 7) Changanya vizuri
- 8) Weka kikaangio jikoni na uzikaange chapati zako
- 9) Pika kama unazopika chapati za kawaida
- 10) Zikiwa tayari, ziweke katika bakuli, zikiwa tayari kuliwa

Jinsi ya kuandaa chips za mihogo:

- 1) Chukua mihogo isiyopikwa
- 2) Toa ngozi ya nje na pia kipande cha kati kati
- 3) Kata mihogo view vipande vidogo dogo na uoshe vizuri
- 4) Mwaga maji
- 5) Tayarisha kikaangio chako

- 6) Weka mafuta na ungoje hadi yawe na joto jingi tayari kukaanga
- 7) Weka vipande vyako vya mihogo kwa mafuta hadi vipikike vizuri
- 8) Ikishakuwa tayari, weka katika bakuli ikingoja kuliwa



Kuandaa chapati za mihogo

TIST: Avocado zaweza kukupa mapato mazuri.

Kama ilivyotolewa katika *The Organic Farmer* (<http://www.theorganicfarmer.org/profile/2>) na Jürgen Griesbach, 2005: *Avocado growing in Kenya*. ICRAF (World Agroforestry Centre), Nairobi, Kenya.

Avocado ni tunda lenye umuhimu la biashara Kenya katika masoko ya hapa na pia ya nje.

Kuna aina tatu za miti ya avocado ambayo hufaa katika miinuko tofauti. Angalia ni aina zipi za avocado hufanya vizuri zaidi katika hali maalum za kwako. Kutumia mbegu au miti ya kupandikizwa kutoka kwa miti iliyopo tulipo na pia kutoka katika vitalu vilivyopo katika maeneo tulipo yenye afya na mikubwa hupendekezwa, kwani miti hii itakuwa na uwezekano mkubwa wa kufanya vizuri katika eneo hilo.

Uzlishaji wa miche.

Mbegu hutolewa kwa miti iliyo na afya na kwa matunda yaliyo na afya na yaliyokomaa. Mbegu zilizochukuliwa na kusafishwa zaweza kuloweshwa katika maji yenye dawa ya kukabili vimelea halafu zipandwe katika matandiko ya vitalu au katika mifuko ya nailoni iliyotobolewa. Kivuli ni muhimu kwa ukuaji. Miche iliyo katika vitalu inapofikisha urefu wa centimita ishirini na kuwa na jozi mbili za majani yaliyokomaa vizuri, hung'olewa, kubebwa na kupandwa katika mikebe.

Upandikizi waweza kupandwa baada ya miezi sita. Miti iliyopandikizwa huwa mifupi zaidi na huanza huzalisha maua mapema zaidi (miaka mitatu au mine baada ya kupandwa shambani) ya miche iliyopandikizwa. Miti hiyo midogo itakuwa tayari

kuhamishiwa shambani miezi mitatu au mine baada ya kupandikizwa.

Upanzi wa miti.

Udongo wafaa kuwa wenye kina kirefu, rutuba na hewa tosha. Miti ya avocado haipendelei udongo usio lowa haraka na wenye uzito. Wakati mwafaka zaidi wa kupanda ni mwanzoni mwa msimu wa mvua. Nafasi kati ya miti yafaa kuwa mita sita kufika kumi, kulingana na rutuba ya udongo, hali ya hewa, na aina. Mashimo ya kupanda huchimbwa sana sana yakiwa na upana wa fiti mbili na kina cha fiti mbili, hakikisha umevunja udongo ulioshikamana na kuwa mgumu ili kuruhusu maji kulowa vizuri na kuruhusu mizizi kukua bila ya usumbufu. Udongo uliotolewa waweza kuchanganywa na mbolea, mbolea ya mimea au madini ya phosphate ikiwa yapo. Panda miche kwa utaratibu bila ya kuumiza mizizi katika kina kimoja kama ilivyokuwa katika mikebe. Jenga bonde kutokana na udongo likizunguka mti ili kupata maji zaidi na kushika maji.

Baada ya kupanda, miche yafaa kutiliwa maji papo hapo. Tumia lita tano hadi ishirini za maji kulingana na ukubwa wa mche. Waweza kufunikia udongo kwani ni faida kwa sababu hupunguza upotevu wa maji na kudhibiti ukuzi wa magugu. Kutia maji kutatakikana mara kwa mara. Jambo linguine lenye umuhimu ni kulinda kila mche kutokana na mifugo na wanyama pori.

Kutilia mitunda maji.

Kunyunyuzia maji ni muhimu katika hatua nyingi za ukuzi wa mti na uzalishaji wa matunda. Katika



miezi ya kwanza ya kujishikilia, na pia katika miaka ya kwanza ya ukuzi, miti lazima iangaliwe kila baada ya wakati mfupi na itiliwe maji inapoonyesha alama za kuhitaji maji. Miti ya avocado huwa na mizizi mirefu, lakini kulingana na hali ya hewa yaweza kuhitaji kuongezwa maji sana sana wakati wa kiangazi ukiongezeka. Wakati wa kupata maua, matunda kuanza kutokeza na matunda kukomaa, maji tosha ni muhimu ili matunda yakomae vizuri.

Mbolea.

Ili upate uzalishaji mzuri, ina faida kusaidia miti ya avocado kwa kutia mbolea kila baada ya wakati mfupi. Kilo kati ya tano hadi ishirini zaweza kuwekewa kila mti kila mwaka. Kuwa mwangalifu na naitrojeni – huwa inaongeza ukuzi wa majani bali si wa maua, na mizizi ya avocado huharibiwa na chumvi nyingi katika udongo. Phosphorus sana sana huhitajika pia, na potassium ni muhimu katika miti iliyokomaa inayozaa matunda.

Wadudu na magonjwa.

Hatua za kuzuia ni muhimu kwa hivyo chagua mahali panapofaa na palipo na rutuba, panda ukinafasisha vizuri, chagua aina zilizo na afya zaidi, dhibiti magugu, funikia udongo, usirutubishe zaidi ya inavyohitajika, wekea maji yanapotakikana. Wadudu si shida kwa uzalishaji wa avocado Kenya. Tumia vitu vinavyotokana na Muarobaini, bidhaa za pareto na maji ya yephrosia na kadhalika dhidi ya wadudu kama nondo, chiriku na magamba ikiwa uharibifu ni kali.

Magonjwa yafuatayo yanaweza kuwa hatari: Avocado kuoza kwa mizizi: (a Phytophthora fungus disease) Miti huzalisha kwa uhaba, na ina majani chache zaidi, yaliyogeuka rangi na kuanza kukauka. Matawi huchmwa na jua na kufa, mizizi huoza na miti yote inakufa bila kukomaa. Miti iliyoahirika yafaa kung'olewa na kuharibiwa. Maji ya moto na dawa ya wadudu ikitumika kwa mbegu zinazokuza miche hupendekezwa kama njia ya kuzuia. Kuna kemikali mbili zilizothibitishwa dhidi ya ugonjwa huu - Ridomil na Aliette.

Anthraxnose: Matunda huwa na madoa ya hudhurungi yaliyokakuka. Matunda machanga yaweza kuanguka lakini katika yaliyokomaa zaidi, ugonjwa hujificha hadi tunda linapovunwa na kuiva. Sanasana, madawa ya wadudu yenye copper hutumika dhidi ya Anthracnose.

Cercospora fruit spot: Madoa madogo yenye rangi ya njano hutokeza kwa matunda na majani. Baadaye hugeuka na kuwa hudhufungi na kuanza kuvunjika, nhivyo basi kurahisishia viumbe hai kazi

ya kushambulia matunda hayo. Ugonjwa huu pia hudhibitiwa na dawa za wadudu za copper.

Kuanguka kwa matunda: Kuanguka kwa matunda si ugonjwa na huonekana sana katika matunda ya aina nyingi. Miti huanguka matunda yaliyozidisha na ambayo haitawezi kulisha hadi yafike ukomavu. Miti ya avocado huanguka matunda yaliyozidi yakiwa na ukubwa wa kunde na mara ya pili yakifikisha ukubwa wa yai.

Kuvuna avocado.

Miti iliyopandikizwa huanza kupata maua na kuzaa matunda miaka mitatu au mine baada ya kupandwa shambani.

Vifuatavyo ni viashiria vya ukomavu unaokaribia:

- Katika aina zilizo na rangi nzito, kuna mabadiliko katika rangi kutoka kijani kuenda nyeusi au zambarau
- Katika aina za kijani, mashina ya matunda hugeuka njano, ngozi yaweza onekana ikimeta meta kidogo zaidi, au madoa yanayofanana na kutu kuonekana katika mwisho wa matunda.
- Aina zingine huchukua rangi nyeupe.
- Matunda yanayoelea juu yanapoingizwa majini sana sana huwa yamekomaa.

Soko.

Shughulikia avocado zote kwa utaratibu mkubwa! Masoko ya nje, sana sana ya uropa, yana mahitaji magumu sana ambayo wakulima wadogo huona yakiwa magumu sana kutimiza. Masoko ndani ya nchi hayana ugumu huo mwingi lakini pia yana ni magumu kiasi. Kuweka au kutibu avocado zilizovunwa ni jambo lililo karibu kushindwa kuwezekana. Wakulima wa avocado za kuuza hivyo basi, lazima wawe na ushirikiano wa karibu sana na soko.

Aina za avocado:

1. **Hass na Fuertes:** Aina hizi mbili hutumiwa kama sehemu ya juu ya matunda yaliyopandikizwa. Zinajulikana sana kwa sababu ya mafuta mengi.
2. **Puebla:** Hutumika kama vipandikizi na wakulima wengi kwani hayana ufumwele na ni sugu kwa magonjwa.
3. **Singapore:** Hii ni aina mpya inayokua haraka na kufika ukomavu katika miezi kumi na nne au kumi na tano. Hupanda hadi urefu wa fiti mbili.
4. **G5 na G6:** Aina hizi mbili hupendwa sana kwani zaweza kufanya vizuri katika nyanda za juu na za chini. Zaweza kupandikizwa na aina zingine zote ili kuboresha tunda.

Wakulima wanashauriwa kununua miche kwa wazalishaji wa miche waliothibitishwa

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 Burimaria ya TIST yila maina umbano woo wa kila mwai. Ni twakwatie ndivi yitu mwai muthelu. Mwolooto witu ni kuvanda miti ingi mingi mbuani ino yukite.

Inside:

TIST: Kuvulany'a na kuvandanisya mimea/maliu. Page 2

Ngwatanio ya Ntharagwene. Kana keu kasyaikite kuma kisioni kya Ntugi TIST. Page 4

Ngwatanio ya Kamwiyendei: Kukwatana kwitu mbumbanoni sya kila mwai nitumite tumanyiany'a maundu maingi kivathukany'o na mawoni. Page 4

TIST: Mavokoto/Makolovea nimatonya ukunenga ueti museo. Page 5



TIST: Kuvulany'a na kuvandanisya mimea/maliu.

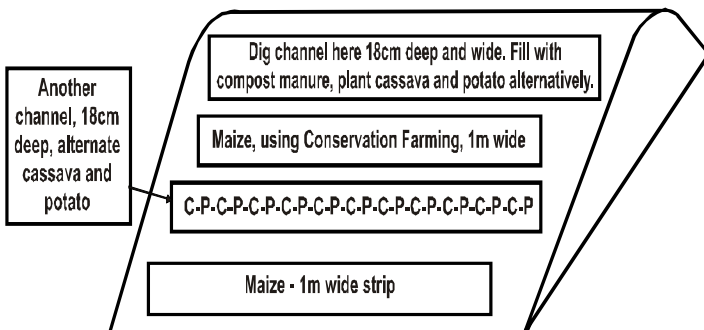
Kuvandanisya nivala mithemba ili kana mingaingi ivanditwe vamwe ivulene mbuani imwe. Kwa mithemba ila yaile ivokanyw'a nitonya kuete useo kwa muthanga, kwongela ngetha ona kuaa mitutu na mowau ula ukwataa mimea yi muundani.

Nima ya kuvandanisya/kivulany'o ni nzia ya kuvata mithemba kivathukany'o vamwe savali umwe ikethiwa na mbua imwe na no yithiwe yiya kuvandanisya miti na mimea/liu.

Ikundi imwe sya aimi ma TIST nitatite nzia ino yivaa nthi ila ninzeo kwa miunda ila mivauuku (yina itheso).

1. Mukululo /laini wa mbee ni kwisa levu/mutau wina uliku wa 18cm na uthathau wa 18cm.
2. Ususya levu/mutau uyu na vuu wa yiima.
3. Vanda manga na maluu ivulene.
4. Mukululo/laini ula uatiie vanda kasio kena uthathau wa itambya mbemba uitumia nima ya kusuvia vala wisaa maima mauvanda.
5. Laini ungi wa manga na maluu.
6. Laini ungi wa mbemba.

Nzia ino itumiaa nzia imwe kati wa ila twimanyiitwe sya nima ya kivulany'o na itumiaa vuu wa yiima na nimaya kusuvia



- Tata nzia ingi ya kuvanda mbemba na laini sya miti. Ikundi imwe nitatite kwa kuvanda mbemba na miti ta Moringa/Yello cassia/Leucaenia/Bead tree.
- Laingi sya muvya muvandwa katikati wa miti ya Moringa kana Leucaenia
- Tata uvulany'a maiu na Calliandra, Calliandra na mboso, calliandra na mbemba, mbemba na mboso, mboso na leucaenia, mboso na maiu, mboso na kaawa kekanini.
- Tata kuvulany'a nthooko na mbembakana muvya kana mwee.

Tatithya na myanya wone nikiva kiika nesa na uitavwa tist kila wona na wamanya.

Kuvanda uivinduan'y'a mivai kivathukany'o kisioni kimwe

Kuvanda uivinduan'y'a ni undu ukuanasya vala wiivandite ithiwa unavandite mbemba mbua mbitu

kisioni kii mbua ino uivanda mboso. Ve nzia ila iatiiawa ukethia niwavanda mimea kuma mivaini kivathukany'o ya mimea. Kii nikitethasya muthanga muno ona muimi nundu muthanga nukwataa unou na vaita kivathukany'o kuma mimeani kivathukany'o ya mivai kivathukany'o nundu mii ya mimea kivathukany'o nitumaa mimea yosa liu kuma muthangani kwa uliku kivathukany'o. Kii ingi nikitumaa muthanga ulekany'a nundu mii yithiwa na uliku kivathukany'o na kuete utethyo kwa tusamu tula twikalaa muthangani na kutuma ona twongeleka.

Kukwata vaita wa nima ino ya kuvinduan'y'a kwa mithemba na mivai kivathukany'o nonginya kila ivinda uvanda. Kitumi nundu muvai umwe niwendeeasya kiinyu na mitutu imwe na uwau umwe ndi wavinduan'y'a mivai ethiwa ve uwau kana mitutu inai inambiia kulika muvaini ula unavandite nuvikiiiaa na kuthela nakulea kwikinyia muthangani.

Vaa ve mithemba ya mivai kivathukany'o ya mimea. Mimea ya muvai umwe ndyaile uvandwa vandu vamwe mbua siatanie. Lilkana uvulkany'e na uikuany'a. Ikundi sya mivai kivathukany'o nita:-

- Kikundi 1. Cucumber, lkuu, malenge, Mongu, matikitiki (gourd Family).
- Kikundi 2. Broccoli, Brussel Sprouts, Makavisi, Coulflower, collards, sukuma, radish, turnip, mustard, watercress (Crucifer/ Brassica family).
- Kikundi 3. Eggplant, matulu, manyanya, maluu (Solanaceous family)
- Kikundi 4. Lettuce, artichoke (Aster family)
- Kikundi 5. Mbemba, musele, muvya, ngani, museleku, barley, wimbi (grains and cereals family)
- Kikundi 6. Mboso, mivai ya mbiisi, nzuu, (legume family)
- kikundi 7. Saumu, Leek, kitunguu, chives (Allium family)
- Kikundi 8. Kalati, celery, dill, parsnip, parsley (carrot family)
- Kikundi 9. Manga, makwasi, ikwa, water chestnut, taro (root crop family)
- Kikundi 10. Vamba okra (Mallow family)

Ethiwa walany'o uu wivaa iulu winavinya kuulewa nusyokete ukailwa ukoka ikundi sya mithemba itano vandu va ikumi ila ni waile ukuany'a kila mbua kwianana na walany'o wa (kisomo kya Infornet-biovision Website)

- a) Mivai ya matu (sukuma, sivinakiyi, broccoli, makovisi etc) Nundu niyendaa liu mwingi kwi mivai ingi.
- b) Mimea mithemba ya mitunda (matulu, eggplant, ndulu, manyanya naingi mbingi) nisyendaa unou



wa muthanga o kiasi lakini ti mwingi ta wa mimea ya matu.

- c) Mimea ya mii (kalati, betroots, maluu, kitunguu, radishes, turnips, makwasi, manga) nimendaa liu munini kuma muthangani masianiw’a na mimea ya matu.
- d) Mimea muthemba wa mavoso (mboso, mbiisi, ndengu, thooko, nzuu na ingi mbingi. nisyithiawa na useo ungi nundu nisyongelaa muthanga unou wa nitrogen.
- e) Mimea muthemba wa cereals (mbemba, uimbi, mweee, muvya, uimbi na ingi mbingi).

Kya usisya ni:-

Tata uvandanisye mbemba na nzuukaranga mbua ya mbee na mbua iatiie uivanda muvya. Tata uvande nzuu karanga mbua na uivulanya ni muvai muthemba wa mavoso ta ilaa(sunflower) na kana maluumbua ya keli.

Kingi kiseo kya utata ni kuvanda mbemba iatiwe ni muthemba wa mavoso ta soybeans kana nzuu kalanga. Na mbua ila iatiie uivanda muvai ungi wa uete mbesa ta vamba.

Tata ingi kwa kueka muunda uteuima kana kuithya vandu va ilungu ya mwaka na indi uisyoka uvande myaka ta 3 - 5 mbee wa kueka ingi kwa ivinda o yamwaka. Kii nikiunenga muthanga ivinda ya kwitungiania na kutunga unoi. No wikie kitwethya vau utekuima ethiwa wina indo.

Kwavamwe nikana niwaile uvanda muthemba wa mavosvo mbee wa kuvanda mbemba kuvanda mumea kuma muvaini wa Brassica kana makovisi mbee na itina wa kumya muvai wa solanaceous(eg manyanya) ni usiia uwau ula withiawa makovisini na miini witawa nematodes na mbaa.

Vaa itheo ve kieleelo kya undu wa ukuanya mivai kivathukany’o kuma kwa infornet-Biovision. Vaa vosetwe ngelekany’o ya muunda wina vuloti inya kana levu inya ila ikukua ivinda ya mbua inya kila mbua yina ymai ina.

Kuvanda uatiie milaini



Mbua yambee

- Levu 1: Bemba/kitunguu saumu/kitunguu/kana leeks
- Levu 2. Eggplant/chilies/maluu/na manyanya
- Levu 3. Broccoli/lkovisi/Cuuliflower / na sukuma
- Levu 4. Mboso/NzUU/ndengu/ mbiisi

Mbua ya keli

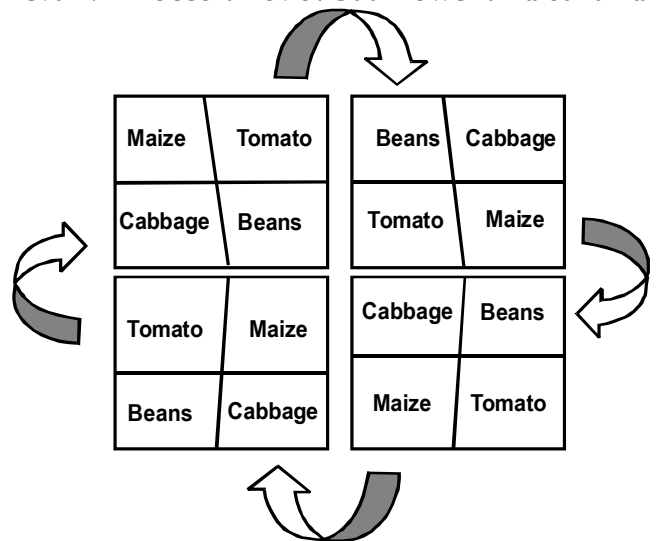
- Levu 1: Mboso/NzUU/ndengu/ mbiisi
- Levu 2. Broccoli/lkovisi/Cuuliflower / na sukuma
- Levu 3. Eggplant/chilies/maluu/na manyanya
- Levu 4. Mbemba/kitunguu saumu/kitunguu/kana leeks

Mbua ya katatu

- Levu 1: Broccoli/lkovisi/Cuuliflower / na sukuma
- Levu 2. Mboso/NzUU/ndengu/ mbiisi
- Levu 3. mbemba/kitunguu saumu/kitunguu/kana leeks
- Levu 4. Eggplant/chilies/maluu/na manyanya

Mbua ya kana

- Levu 1. Eggplant/chilies/maluu/na manyanya
- Levu 2. mbemba/kitunguu saumu/kitunguu/kana leeks
- Levu 3. Mboso/NzUU/ndengu/ mbiisi
- Levu 4. Broccoli/lkovisi/Cuuliflower / na sukuma



Ngwatania ya Ntharagwene. Kana keu kasyaikite kuma kisioni kya Ntugi TIST.

Ithi ene ma ntharagwene twina utanu kuweta na undu tuendee kuma tasyauka kuma ngwatanioni ya Kiirua mwambiioni wa mwaka uyu. Kwayu notwasye twina kivuio kina miti mbee wa ngili ikumi. Ila ikwithiwa yongeleela ila twinayo yi 27,288 miti yivo.

Kuvika umuthi twina tukundi tungi 31 ovala nituendee na umanyisa angi moka tulikane. Nitwithiwa nao wakila mwai vala tumbaniaa kanisani wa AIPCEA kila wakili wa kila kyumwa kya mwiso wa mwaiKwandaia kwatania naitu kwa kuka vala tukumbania tuendee na kwailya mwikalile wittu na mawithyululuko maitu.



Ene ma ngwatania ya Ntharagwene me kivuioni kyoo mwai muthelu.

Ngwatania ya Kamwiyendei: Kukwatana kwitu mbumbanoni sya kila mwai nitumite tumanyiany'a maundu maingi kivathukany'o na mawoni.

Woni wa kukomanaa kila mwai nututethetye vanene nundu nituolelaniaa umanyi na mawoni. Ingi mathayu maitu nimethiawa na uthaliku nundu twakomana nituneeniasya maundu kivathukany'o na mauito ala tukomanite namo kana twinamo mathayuni maitu na tuyithiwa tutonya ukwata usungia kwa vamwe nundu kila mundu ena woni wake iulu w amaito kivathukany'o.

Yila tunai na umbano wa July 2014 nitwamanyiiw'e ni amwe maitu undu wa kwongela liu useo tuitumia maliu maitu. Ngelekany'o kwongela manga useo a kwa kuaa kyavati kina manga kila kina useo kwa mwii na kimuyo.

Vaa ve matambya ma kuaa kyavati kya manga.

Kila ukwenda

- | | |
|-----------------|-----------------|
| ✓ mutu wa manga | ✓ Mutu wa nganu |
| ✓ Mbota ya kuaa | ✓ Mauta ma kuaa |
| ✓ Ndengu | ✓ Yanga yithi |
| ✓ Muyu | ✓ Kiw'u |
| ✓ Mbisu | ✓ Isilia |
| ✓ Kikaangi | ✓ Kiliviti |

Undu wa kuaa kyavati cha manga

- Osa ngilasi ili sya mutu wa manga vulany'a na ngilasi itatu sya mutu wa nganu.



Vulanya nesa

Osa kiw'u uvulany'e na munyu kiasi kila ukwenda

- Ongela kiw'u ula mutuni waku muvulany'e mbaka ulikanen nesa.
- Kima undu ukimaa mutu wa nganu wiw'oka na uyiua undu uuaa o kyavati kya kawaita.
- Nzeuvia maki na uyiliila kikaangi na uyiua kyavati
- Ua wikiite mbakulini yina nguniko.

Mandasi ma manga

- Mutu wa manga ngilasi 2 + ngilasi 3 sya mutu wa nganu
- Ongela tusiko twili tusie mbota ya kuaa
- Vulany'a nesa
- Osa kiw'u uvulany'e na munyu mbaka kiasi kila ukwenda
- Vulany'a kiw'u na mutu oundu uvulanasya tene uyiua mandasi
- Akany'a mwaki noyiliila kalai ka mandasi kana isilia yina mauta.
- Eteela mavyuve kiasi kya kuaa
- Kanda mutu waku na uutilanga ilungu sianiiie undu ukwenda mandasi meana. Ua undu uaa mandasi.
- Mamina uvya ikia mbakulini na uyivua

**Undu wa kuua kyavati sya ndengu**

1. Nyuva ndengu noyikia iko utheukye ivye.
2. Ua ivye vyu.
3. Kima ndengu syaku itwike suvu wa ngilini
4. Sunga wumy'e usuvu
5. Ongela munyu usuvuni
6. Ongela ngilasi itatu sya mutu wa nganu
7. Vulany'a nesa
8. Iliila kikaangi mwakini na uyiua kyavati syaku
9. Ua undu uuaa kyavati kya nganu they
10. Syavya ikia mbakulini weteele kwivua.

Undu wa useuvya chips cha manga

1. Osa yanga yinhi
2. Sua na uyimya muti wa kati
3. Tilanga ilungu ta sya chips na uithambya
4. Ita kiw'u
5. Iliila kikaangi mwakini

6. Ikiu mauta na uyeteela mavyuve nikana maue nesa
7. Ikiu tulungu twaku twa manga na uyiua nginya mavye
8. Mamina kuvya ikia mbakulini na uyivua muye.

**Andu ma ngwatanio ino ya Kamwiyendei mayiua kyavati kya manga**

TIST: Mavokoto/Makolovea nimatonya ukunenga ueti museo.

Uvoo uuni kuma kwa The Organic Farmer (www.theorganicfarmer.org/profile 2) na Jurgen griesbach, 2005:

Mavakato ala mameaa Kenya . ICREF (World Agroforestry Centre), Nairobi, Kenya.

Makolovea ni Itutnda yivata muno Kenya kwa utandithya wa kenya na nthi sya nza.

Ve mithemba itatu ya makolovea ila yikaa nesa isioni kivathukany'o. Sisyu ni muthemba wiva wikaa nesa kisionikyaku. Uitumia mbindi kana miti misikany'e kuma ikoloveani sya kisio kiu na ingi kuma vandu vangi syikwika nesanga nundu miti ila imeteete kisioni kiu niyikaa nesa muno kwi muti wa kuete.

Undu wa useuvya mbeu.

Mbindi nikolanaw'a kuma itini ila itena uwau na nzeo. Mbindi ithi no siindwe ndawani kuola fungi na ivaandwa kivuioni kana mikeveni ona kana mathanguni ma nailoni mena maima. Muunyi niwavata kwa kumea. Mamina umea mena uasa wa 20cm kana mena matu eli meanu nesa niw'o makuawa na kutwawa kuvandwa vala maile. ingi kusingawa nikwikawa itinia wa myai thathatu. Makolovea ma usingany'a nimasyaa tene (itina wa myaka 3-4 itina wa kuvanda kithekani vala yaile) kwi ala mataasinganw'a. Itina wa kusinganya nutwaa

muundani itina wa myai itatu kana ina.

Kuvanda miti na kwikinyia kwayo.

Muthanga nonginya withiwe wi muliku, munou na wina nzeve nesa/ulekanitye. Makolovea manyendete muthanga uteutwaa kiw'u na mayumiasya munyu kana kiw'u kina asiti. Ivinda iseo ya uvanda mikolovea ni mbua iyambiia na uyiikiithyya yina utaaniu wa matambya 6 kana ikumi kwianana na unou wa muthanga, nzeve na muthemba. Maima ma kuvanda nimethiawa na uliku wa viti ili na uthathau o wa viti ili. Ethiwa yiima niyooma isanga muthanga ulekany'e nikana kiw'u kitonye uti. Muthanga ula waumya uyisa maima aya no utumie kuvulanya na vuu uvanda miti ino. vanda ute kwana nga mii ya miti ino na uliku oula wiinaw'o kivuioni. seuvya katindio ungu wa kamuti utumia muthanga nikana withie ona wangithye kiw'u nikiutumana. Itina wa kuvanda ngithya. tumia lita 5-20 kwianana na undu muti wiana. Nouwike ungu wa muti uuyyu na mavuti kiw'u kiekie uny'aa na mituki. ethiwa kuna mbua nonginya ungithye kwa ivinda na uisuvia indo kana nyamu sya kitheka kwanga miti ino.

Kungithya Miti ya matunda

Kungithye ni kuseo kwia nana na muti undu wianite. mbee mwai yambee wavanda, na itina mwaka



wambee mbee wa muti uyu utanamba kwikinya. Miti niyaile usiw'a kaingi na kungithw'a na kusiw'a kana niyithiwa na wonany'o wa kwenda kiw'u. Ikolovea nisyithiwa na mwii muasa wa kiw'u kwina na nzeve ya kisio munamuno yila kwina munyao niwaile ungithya. Yila miti yina malaa, matunda kwikika na kwina miti ino niyendaa kiw'u kianu.

Mbolea /Vuu

Muti wa kikolovea niwendaa kwikala uyikiwa vuu ta wa kilo 5 kuvika 20 kwa kila muti kila mwaka. Syisya nitrogen yongelaa matu no ti matunda na ingi mii ya kivokoto nimenanite na munyu. Phosphorus na potassium nisyavata kwa muti kuima ula ukusyaa matunda.

Mitutu na mowau al;a makwataa ikolovea

Kusiia kwithiwa kwa vata muno. Ni useo kuisya vandu vanou, ikiithya utaniu mwailu wivo, vanda mivai ila miseo na kisio kyaku, ndukaake yiia (imia) ndukekie vuu mwingi. Na ingi mitutu l thina munene kwa makolovea nthini wa Kenya. tumia syindu sya neem kuiita matunda maku na kuaa tumitutu.

Mowau aya nomethiwe muisyo kwa mikolovea yaku Kwoa kwa mii (Phytophthora fungus disease) Miti yithiwa na usyao munini na matu mate maingi na mauluku mavovu. Ngava nisyumaa. mii niyoaa na muti uyuma. miti ila yina uwau uyu niyaile ukuwa na kwanangwa. Kiw'u kiyu niw'o muiito na ndawa sya fungicide kuiita mbeu kwoondu wa kusiia uwau uyu. Ve ndawa ili undu wa uwau uyu ila ni:- Ridomil na Aliette

Anthracnose: Matunda/Makolovea kumesya ikonde ya muthanga, kuma, kwitika matunda memanini na kwa itunda iviku ona uwau withiwa wivithite two nekaa muvaka yikew'e niw'o uwona. Ingi vaa ndawa ya uwau uu ni Cooper based fungicides nitumiawa kuiita Anthracnose.

Cercospora Fruit Sport. Kaa ni kasio kaniini ka yelo kakwataa itunda kana matu utethia no matonatone. itina nimekalaa muthanga na mayatuka na makatuma mowau angi makwata itunda yiu. Uwau uyu onaw'o uitawa na Copper based fungicide.

Kuvaluka kwa matunda: uu ti uwa na niundu withiwa na mithemba ingi ya miiti ya mitunda. Miti nivalukasya matunda ala ikwiw;a itetonya kuea mavike memanii na meananga weethia meana itumbi.

Kuketha makolovea

Miti ya usikanya yambiia usya yina myaka 3 kana 4 itina wa kuvandwa.

Ve mawonany'o muti uyu kana makolovea ni maviku na nimekwenda kiw'u

- Ala maiu nimavinduaa langu kuma ngilini makaia kana makekala puple
- Ala ma ngilini tukome tula tumakwatiie twikalaa yelo na ikonye yiieka umetameta kana muthya ikekala ta wina nganga.
- Mithemba ingi niyikalaa ta yeeuva
- Matunda ala mathambalalaa maindwa kiw'uni methiwa me maviku.

Ndunyu/Soko

Kwata makolovea nesa usuviite! Soko sya nza ta European market syithiwa na ulumu muvyu undu wa useo wa itunda yila mekwenda. ula ni vinya kwa aimi anini kuvikia. Soko sya vaa kenya iithina muno nundu makolovea kaingi makothaa uvika othe iimwe kwoou aimi uyithia maina kwata vaita nesa mata. Ni undu muto kwa imi kwia makolovea kwa ivinda iasa. Kwoou ala maimaa na kuvanda makato/ makolovea kwa undu wa utandithya nimaile ukwatanw'a na aimi anini kwoondu wa soko wina vaita kwa muimi.

Mithemba ya mikolovea ila yi kenya

1. **Hass and Fuertes.** Mithemba ino ili nitumikaa kwa kusikany'a nundu yithiwa na mauta maingi.
2. **Puebla:** Niyendekente nbi aimi aingi nundu ndiwaangaa na ndithiwa na ndii
3. **Singapore:** Kikolovea muthemba uu wianaa mituki na uvikaa kusyaa wina myai l4 kana l5 na withiwa na uasa wa viti ili
4. **G5 na G6:** Mithemba ino ili nimiseo nundu niyikaa nesa isioni syothe na niyendekete ni aimi nundu ona nisinganaw'a na mivai ingi na ikeka nesa.

Aimi mekulw'a maue mbeu kwa nduka ila mbitikilya.

Mazingira Bora



TIST

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

Kipsigis Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Burimaria TIST Cluster during their monthly meeting. We received tree payments last month. Our goal is to plant more trees in the coming rainy season.

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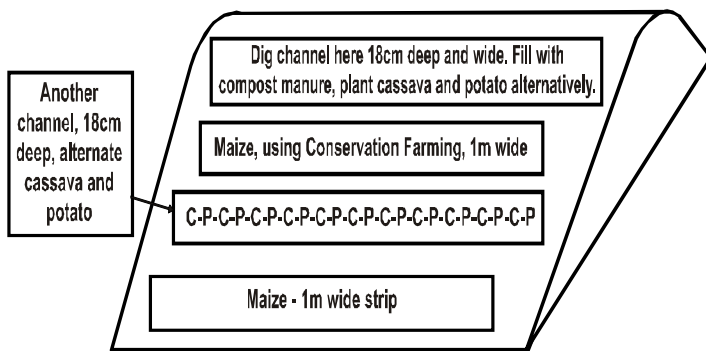
TIST: Koyometab minet chebo minutik.

Koyometab minutik chesire oeng en imbaranan kochechang en kasarta agenge niton kotoreti kotes timuwek kotesin ngungunyek kisich okwointo ak kongem suswe ak miyonuek.

Koyometab minutik komoe kole minetab rurutik chebesiotin en kasarta nenin kobo menetab ketik kou alley cropping miten anyun temik chebo TIST chekigoyom en tulonok.

1. En lainit netai kebole 18cm orit ak tebesinto
2. Kinte keturek
3. Kemin mogoak biasinik kosibngei
4. Lainit nebo oeng komin bandek 1m
5. Lainit ne isibu keminchi mogo ak biasinik
6. Lainit neisibu kemin bandek . E.t.c

Kigeboisien oraniton mising amun kigenyoru konetisiet kou koyometab minutik koboisien keturek imbaret ne makibat



- Yumten bandek ak ketik en lainitab kiyomta kurubisiek alak 3m chebo bandekak moringa /yellowcassia /eucaenia/bead tree.
- Lainitab mosoniking ak moringa ak leucaenia.
- Koyometab calliandra ak indisinik ,calliandra ak ngatek calliandra ak bandek, bandek ak ngeutek, ngeudek ak leucaenia ngendek ak indisinik ngedek ak kawek [komenge chen]
- Koyometab cowpea ak bandek /songhum /bek. Yomten tuguchu asi inyoru wolutik ak imwochi TIST.

Kibwate nebo waletab minutik.

Noton anyun kominetab minutik cheter chin en imbaret ne agenge en kasarta neter kararan mising noton amun igochin imbaret kouyon okwoiyet amun minutik alak kotinye tigitik.

Chebenti kwony mising konyoru omitwogik Chemoten kwony, nyorunen kotik che miten ngungunyek kotesak amun bosbus ngungunyek Miten cuyun keiunet neo yon kagimin rurutik che besiolin en imbar amun agotkemin minutiet ne agege ko nyunmnyum kenyor susutik ak miyonuek ek minutik.

Che isibu ko minutik chemonyolu kemin kosibgel en kasarta egenge

1. Cucumber,gourd,pumpkin,sguashes,watermelon,gurd famliy,
 2. Broccoli, brussel sprouts, cabbage, couliflowers, collard, kale radish, turnip mustard, watereress (brassica family)
 3. Eggplant, pepper, tommatoes, potatoi (solanaceus)
 4. Lettuce, artichoke (aster family)
 5. Maize, rice, sorghum, wheat, cat, barley, millet, (grain and cereals family)
 6. Beans, and peas (legume family)
 7. garlic, leak, onion, clive (allium family)
 8. Carrot, celery, dill, parsnip, parsley (carrot family).
 9. Cassava, sweet potato, taro, yam, water chest nut(root crop family).
 10. Cotton, okra (mallow family).
- A) Sogegab (broccoli, cabbage, cauliflowers, kale, spinach atc) komoche missing omtuwokik chechang kosir nkewe alak.
- B) Logoek (chillies, eggplant, pepper, tomatoes) komoche omituwoki chechang ago mogou, che tinye sogek.



- C) Minutikab tigitik (carrot, beetroots, potatoes onion, radishes, turnips etc) moche ichek omituwogik che ngerin omoguu chebo logoek anan chebo sogek.
- D) Minutik kou (beans, chiek peas, cow peas, gram, peas, pigeon peas etc) toreti koyomti omituwogik en koristo ak kotesi ngungunyek
- E) Minutik (bandaek, mosogik, ak beek).

Okibwat kabwatani

Yomten imin bandaek ak ichuguk en kenyt agenge nebo imin mosonik min ichuguk kenyt anenge nebo oeng imin legum, sunflower, potatoes yomten bndaek agosib, legume kou soybeans or groundnuts ne isibu imin kou cotton.

Yomten ibagach imbaret kenyt agenge komagitem, yeisibu imin kenysisiek 3-5, niton kogochin koret konyor omituwogik, kol napar agot intinye tuguka.

Entugul isib imin minutik chebo tai kou ngendek asi igote bandek, min minutik kou cabbage (brassica family kou ye isibu imin family solanaceous) kou nyanyik.

Che isibu ko minutik che kigole kosibgei yeibata age.

Minet netai:

Plot 1. Maize/garlic/onion/leeks

Plot 2. Eggplant/chillies/potato/tomato

Alley cropping



Plot 3. Broccoli/cabbage/couflower/kale

Plot 4. Beans/cowpeans/gram/peas

Koletab oeng:

Plot 1. Beans/cowpeans/gram/peas

Plot 2. Broccoli/cabbage/couflower

Plot 3. Eggplant/chillies/potatos/tomotoes

Plot 4. Maize/garlic/onion/leeks

Koletab somok:

Plot 1. Broccoli/cabbage/caouliflower

Plot 2. Beans.cowpeans/gram/peans

Plot 3. Maize/garlic/onion/leeks

Plot 4. Eggplant/chillies/potomatos/tomatoes

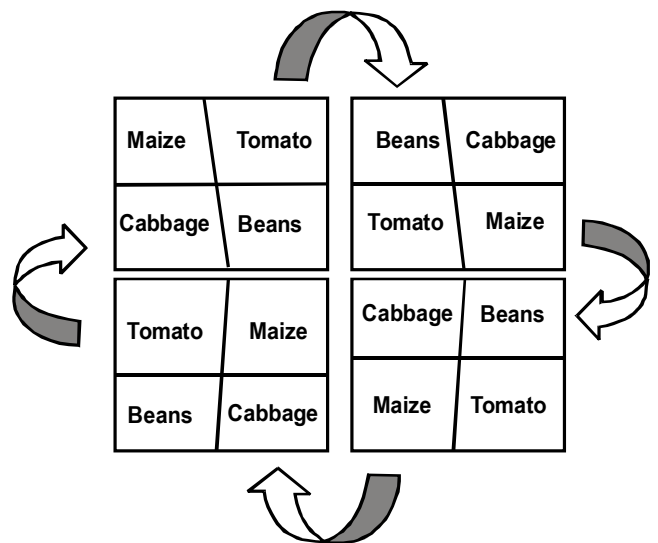
Koletab angwan:

Plot 1. eggplant/chillies/potato/tomatoes

Plot 2. Maize/garlic/onion/leeks

Plot 3. Beans/cowpees/gram/pees

Plot 4. Braccoli/cabbage/couflower



Ntharagwene kilasta; kilasta ne lel nemiten ntugi TIST region.

Eche bikab kilasta nebo ntharagwene ko kiboiboi mising amun kigemongunen kilasta nebo kiirua en kenyini, kinye ketik chemegeche chemiten kabeti che sire 10,000 ketesen ketik che kigemin 27,288 che sobtos

En kilasta neyon ketinye kurubisien 31 ago kinye komongunet ketes kurubisiek, en kila arawa ketinye tuiyet en st. Patrick aipcea kasitab oeng obwan ketesagen



Member of Ntharagwene Cluster at their tree nursery site last month.

Kamweyendei kilasta: en kotuye nyon kila arawa ko kigotesach en bcheetab kobwotutik.

Kigotoretech niton amun kinyorunen konetisosiek, ye kichee koimutik che sobenyony, en koyomenyon bo ge ko kigenyoru konetisie agobo omituwogik keboisien mogo (cassava)

ugu che kimoche

- | | |
|------------------|----------------|
| ✓ Cassaflows | ✓ Wheat flours |
| ✓ Barking powder | ✓ Cooking oil |
| ✓ Ngengu | ✓ Raw cassava |
| ✓ Sait | ✓ Water |
| ✓ boiling pot | ✓ Sufuria |
| ✓ Frying pan | ✓ Match box |

Kiyomdos kouni – chapatti.

1. Take two glasses of cassavaflour of three glasses of wheatflour
2. Mix well in a bowl
3. Take water and mix, salt to taste
4. Add water flour it is mixed well
5. When ready to cook your chapathi as well as we normally do
6. Prepare the fire and put the pan in the fire prepare your chapathi

7. When ready put cooced in adish



Cassava mandazi.

1. Two glasses of cassava flour plus three glasses wheat
2. Add two spoonful of banking powder
3. Mix well in a bawl
4. Take water and salt and mix in another bowl
5. Add water until it is mixed
6. Prepare your fire and put sufuria in the fire, after that add fat
7. When it is redy to deep fry
8. Prepare mandazi sises and cook like normally mandazi
9. When ready, put your mandazi it adish ready to be served

Nglengu chapathi.

1. Select ndegu and put in a boiling pot ready to boil
2. Boil until it is well cooked
3. Smash your ndegu to give the soup agreeen color
4. Filter ndegu to have the soup separate



5. Add salt to the soup
6. Add three glasses of wheatflours
7. Mix well
8. Put the pan in the fire and fry your chapathi
9. Cook normal as done for normal chapathi
10. When ready, put it in dish ready to served

Cassava chips.

1. Take raw cassava.
2. Peel the outer cover of cassava and remove the centre part.
3. Cut into chip shapes and wash well.
4. Drain the water.
5. Prepare your fire pan.

6. Put in the oil and wait until it is hot and ready to deep fry
7. Put your cassava chip in the oil until it is cooked.

*Preparing Cassava Chapattis.***TIST: Konu avacado melekwek.**

As extracted from *The Organic Farmer* (<http://www.theorganicfarmer.org/profile/2>) and Jürgen Griesbach, 2005: *Avocado growing in Kenya*. ICRAF (World Agroforestry Centre), Nairobi, Kenya.

Bokomut avacado en kenya kipoisien en kaa ago kararan en mungaret kiyokto koba bitonin.

Miten anyun ketik smogu chegororon che nomege ak ole menet .boisien tenterek anan ko avacado ne kiginamsi koyop ketik che kororonen ana ko inyorunen kabetisiek chenegiten en inye. Ole kinyor chin tenterek. Kinyorunen ketik chekororonen ogo che kigogongio.

Logoek.kiiume ak kubit en betit anan ko en muturaisiek ak keur en roboruo asi kogochi kobityo. Yon kagibit en kwony kegonye ye kait kointab 20cm kitut ak kinte mutura kotinye itik oeng.robet kerobe kobo orowek 100. Tebiye kenyisiek [3-4] asi kosich tobtok yekagemin

kotagomi kabeti kotore orowek somok kot koit angwan.

Minetab ketik ak ribet.

Nyolchin ole miten ngungunyek che kororon che tinye okwoindo.momoche ole menet neu mising,ole tononen beek che tinye munyek chechang.kararan ingemin en kasarta nebo kanametab robta.en kokwoutik komoche 6cm ak 10cm kotiyenge oleu emet [soin anan embwen] .keringet koibe 2ft ak 2ft kwo kwony,ker ile keiste mugugugik asi kochomchi tigitik koba orit ketesin keture asi komuchi ketit konyor omitwogik en oret ne nyumnyum.

Ye kaimin ingonyor beek. Ingonyor 5-20 litres chebo beek kotiny e gei kiit neten ketit.ye kemin ketit iur kel asi kour tigitik ak kogochi beek koteben keringet nebo let ko ngerib komaus tuga anan ko tiony.

**Ka nagetab beek.**

Bogomonut mising en keti beek en kasarta ne eetu ak kasarta ne tegose ketit . Rigin anyun ketit asi iguye sobenyin ak kinemoche en kasarta nenin.

Kotontoleiwek.

Ketit nebo avocado komoche mising konyor kotontoleiwek en abagora. En kenyit komuche konyor ketit agenge 5-20kg . Nitrogen kogochin koet ketit ak sogek .Tigitik anyun kotinye kolewen igochang munyuk en ngugunyek.

Susurik ak mionuek.

En teretab susurik komoche imbaret ne akwai igochin kokowoutik cheyome, rib komanam timto imbar amat in de keturek chechang kosir ,ak konyor beek .motinye ketitab avocado emenyon kewelnatet.

Mionuek che isubi ko chayach.

Nunetatab tigitik ;inyoru kotinye ketit sogek che tuten che motinye iton .temenik kololiotin, ye testai koyome en let koyam ketit ne tinye miondo kengusu en imbar .miten anyun kerichek che iyonotin che kimuche keriben miondo-ridomil anan ko alietler

Anthracnose; inom e soge k kotuwegitun ak konyor chen igosenik.logoitat ne m ingin komuche kotormosgei ko yon koet logoyat kotebie agoi korur ,kitere anyun copper base fungicide.

Cercospora fruit spot; mongui kotolelionit

logoiyat ak sogek en kosernonit ak koter niton koyochin susurikn kochut lo goiyat kiteren kora copper based fungicide .

Fruit drop; niton ko momiondo baten bitu en logoek chechang amun moyome omitwogik koriben miten .

Keset ;avocado ne kiginam si kosib korure en kasartab kenyisiek 3-4 yon kagemin.

- Miten koborunoik cheiboru yon koet; miten walet en logoek magotet konyalit kot tuiit
- Nyone komegotinye logoiyat iton
- Inge torchi bek logoiyat ko moinisi

Ndonyo; temik che mengechen komoitin amun tinye olik cheole mogutik chechang mising, moitintos kururiyo tugul en kasarta ne agenge; ko moitin temik konyor anan kowal koik tuguk alak

Ketik che nootin.

1. Hass ak fuartes- togunotin anan nootin amun tinye muwanik che chang
2. Duebla; keti komotinye usisiek ago monomin mindo
3. Singapore; kararan amun chogu en etune konge kotinye orowek 14-15
4. G5 ak g6; keti kochang en ole miten robta ak ole momiten kinomchitos ak ketik alak, asi konyor logoek chegororon

Temik ocheng ole omuche onyorunen ketik cheyomokse.