



**NDONDOMEKO YOTSOGOLERA  
ALIMI OPHUNZITSA ANZAWO  
KUMWERA KWA AFIRIKA  
(N2AFRICA PROJECT)**

Kuchokera pa Bukhu limene linaembedwa ndi Ajeigbe, HA, Dashiell, K and Woomer, PL. 2010. Biological Nitrogen Fixation and Grain Legume Enterprise: Guidelines for Lead Farmers, TSBF-CIAT, Nairobi” ndipo lapitilizidwa ndi AD Turner ndiponso kuwonjezedwa ndi G. Kasongo, December 2011

## **TAKULANDIRANI KU NDONDOMEKO YA N2AFRICA**

Bungwe la N2Africa labwera kuno kuti lithandize alimi kupeza chuma chambiri komanso thanzi labwino pakhomo pokolora mbewu zambiri za mtundu wa nyemba monga: Soya, Nyemba, Khobwe ndi Mtedza.

Bungwe la N2Africa limagwira ntchito kudzera mu mabungwe ena mu mayiko okwana asanu ndi atatu muno mu afirika. Kuno kumwera kwa afirika ndondomekoyi ikuchitika m'mayiko a Malawi, Mozambique komanso Zimbabwe. Ndondomekoyi inayamba mu chaka cha 2010 ndipo yipitilira mpaka muchaka cha 2013 mu mwezi wa Okotobala.

Mbewu zimenezi ndizofunikira chifukwa pamene mwabzala zimathandizanso kuwonjezera chonde mu nthaka pobweretsa mchere ofunikira otchedwa nayiturojini (Nitrogen). Nayiturojini ndi mchere umene alimi amalipilira ndalama zambiri akamagula feteleza monga wa chitowe kapena 23:21:0+4S. Kwa alimi amene alima mbewu za mtundu wa nyemba potsata njira zatsopano, bungwe la N2Africa likumawapunzitsa kalimidwe kabwino kambewuyi ndicholinga choti asawononge ndalama zambiri pa feteleza wa mchere wa nayiturojini.

Alimi amene alibe ndalama zogulira feteleza amakhala ndi nkhwana kuti sakhala ndi chakudya chambiri. Ndi nthawi ngati zimenezi pamene mbewu za mtundu wa nyemba zimathandiza popeza sizilimbana ndi chimanga pamene mwabzala mosakaniza m'munda. Powonjezerapo, ngati banja liri ndi chimanga chochepa, thanzi lawo limapitabe patsogolo podya nsima yochepa pamene adya limodzi ndi mbewu za mtundu wa nyemba monga khobwe, nyemba, nandolo ndi zina zotero. Komanso ndiwo zimenezi zikhozanso kulowa m'malo mwa nyama yomwe ili yokwera mtengo kwambiri.

Powonjezerapo pothandiza alimi pa kalimidwe ka mbewu zimenezi, N2Africa imaphunzitsanso alimi za momwe angakonzere mbewuzi mwaluso kuti apeze ndalama zambiri komanso adyetse banja lawo moyenerera.

### **MCHERE WA NAYITULIJINI (NITROGEN) NDI MOMWE UMAPANGIDWIRA NDI TIZILOMBO TACHILENGEDWE**

Mbewu zonse zimafuna mchere wa nayiturojini, madzi, dzuwa komanso zinthu zina kuti zikule ndikubala zipatso zabwino, ndipo ngati masamba a m'munsi a mbewu akusanduka chikasu, ndi chizindikiro kuti mbewuyi siyikulandira nayiturojini okwanira. Ngati mbewu zimenezi zipitilira kumanidwa nayiturojini, sizikula ndipo zokoloranso zimachepa. Mbewu zimapeza nayiturojini munjira zosiyanasiyana monga:

- ku manyowa a zomwe mwakwilira m'munda
- kuchokera ku manyowa ochokera ku ndowe za ziweto
- kuchokera ku feteleza monga chitowe kapena 23:21:0+4S kapena kompaundi D,
- komanso kuchokera ku mbewu za mtundu wa nyemba.

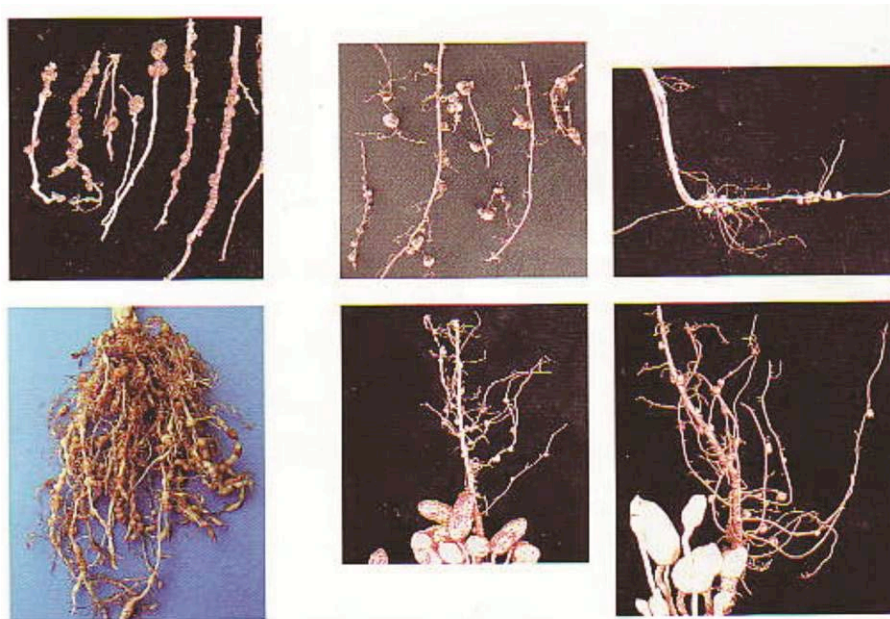
Mbewu za mtundu wa nyemba zikabzalidwa bwino, zimathandiza kuwonjezera mchere wa nayiturojini mu dothi ndipo njira imeneyi imatchedwa '*Kuwonjezera mchere mwachilengedwe*'. Chomwe chimachitika ndi njira imeneyi ndi choti mpweya wa nayitulojini omwe uli m, malere umawankhidwa ndi tizilombo tomwe timakakhala panso pa mizu ya mbewu za mtundu wa nyemba. Tizilombo timeneti tili ndi kuthekera kotenga mpweya wa nayitulojini ndi kuwusandutsa feteleza yemwe mbewu zingathe kudya.

Popeza mbewu zambiri zimachotsa mchere wa nayitulojini mu nthaka kuti zikule ndi kubereka zipatso zabwino, ndikofunikira kuwonjezeramo mchere umenewu chaka chilichonse kuti dothi likhalebe la chonde. Choncho pamene tabzala mbewu za mtundu wa nyemba, zimapangitsa kuti mcherewu ubweleremonso.

### **UBALE PAKATI PA MANDOLO (OPINDULITSA), TIZILOMBO KOMANSO MBEWU ZA MTUNDU WA NYEMBA**

Monga takambira kale, mbewu za mtundu wa nyemba zimapanga ubale ndi tizilombo tomwe timatenga mpweya wa nayitulojini ndikuwulowetsa mudothi. Tizilombo timeneti nditating'ono kwambiri, tosawoneka ndi maso, koma tikakhazikika mu mizu ya mbewu timapanga mandolo (opindulitsa) omwe amawonekera mu mizu ya mbewu za mtundu wa nyembazi. Mandolo akuluakulu ndi amene ali abwino chifukwa amabweretsa nayitulojini wambiri. Osasokoneza mandolo amenewa ndi mandolo oyipa amapezeka mu fodya kapena matimati.

#### **Chithunzi 1: Kusiyanitsa kwa mizu yomwe yagwidwa ndi mandolo oyipa ndi mizu yomwe yili ndi mandolo opanga nayitulojini**



**Kumanzere:** Zithunzi zowonetsa mizu yogwidwa ndi mandolo oyipa

**Kumanja:** Zithunzi za mizu ya mandolo opindulitsa opezeka mu mbewu za mtundu wa nyemba

monga soya (M'mwamba) komanso mtedza (munsi)

Mandolo opindulitsa amapezeka mu mbewu za mtundu wa nyemba zokha ndipo ngati akugwira ntchito bwino akuyenera kukhala achikasu mpakana ofiirira mkati. Nthawi zina mandolo amatha kupangika koma amalephera kubweretsa nayitulojini mu nthaka. Mandolo amenewa amakhala a ang'ono ndipo mukawang'amba amawoneka oyera kapena obiliwira mkati. Koteru nayitulojini amapangidwa ndi mandolo amene ali a akulu komanso achikasu mkati.

Ntchito ya mandolo opindulitsa imakhala yambiri mu dothi lomwe liri ndi mchere ochepa wa nayitulojini. Chifukwa choti tizilombo timakhala tikupanga mchere umenewu, mbewu zimapeza chakudya kuchokera ku nayitulojini ameneyu ndipo wina amatsala mu nthaka ndipo amawonjezereka pamene mwakwilira zina mwa zinyalala mudothi ndipo zawolerana.

## **MBEWU ZIMENE A N2AFRICA AKULIMBIKITSA; NDI KASAMALIDWE KAKE**

### **1. NYEMBA**

#### **Mawu Oyamba**

Nyemba ndi imodzi mwa mbewu zimene zimalimidwa kwambiri m'dziko muno. Nyemba zimadyedwa kwambiri pa banja komanso m'masukulu ochuluka. Nyemba zimakulitsa. Pali mitundu yambiri ya nyemba ndipo zimamera m'malo a nyengo zosiyanasiyana. Nyemba zinayambira ku dziko la amerika ndipo zinafalikira kuno ku afirika.

Nyemba zambiri zimafuna mvula yocheperapo kuti zichite bwino komanso zimafunika kuti kumapeto kwa nyengo ya mvula kukhale kowuma kuti ziche bwino. Dothi la asidi (acid) wambiri si labwino kubzalapo nyemba.

Mu afirika anthu ambiri amakolera makilogalamu 530 (matumba osaposa 11) pa hekitala koma ndi chisamaliro komanso kutsatira malimidwe oyenerera, mlimi angakolole matumba osachepera 20 pa hekitala imodzi.

#### **Mitundu ya Mbewu ya Nyemba**

Nyemba zilipo za mitundumitundu komanso zili m'magulu awiri; zoyanga ndi zosayanga. Ndipo mitundu ya nyemba ilipo motsatira magulu awiri a nyembawo, motere:

1. Nyemba Zoyanga – Kanzama, Bunda 93, Namajengo.
2. Nyemba Zosayanga - Maluwa, Nagaga, Bwenzilaana, Napilira, Sapelekedwa, Sapatsika, Chimbamba, Kholophete, Kalima.

#### **Mabzalidwe a Nyemba**

a) Pezani mbewu motere:

- Ngati mubzale nyemba zokha, mupeze mbewu yochuluka makilogalamu 80 ya mbewu pa hekitala iliyonse.
- Ngati mubzale limodzi ndi mbewu zina (chimanga), pezani mbewu yochuluka makilogalamu 60 pa hekitala iliyonse.
- Ngati zabzalidwa pazokha, kumafunika nyemba zokwana makilo 70-80 pa hekitala imodzi.

b) Konzani mizere yotalikirana masentimitala 75 (malula awiri ndi theka).

c) Kubzala nyemba mosakaniza ndi chimanga zomwe zimathandiza kuchepetsa tizilombo komanso matenda ogwira mbewuyi.

d) Ngati mukulima mbewu ya nyemba yokha mmunda:

a. Nyemba Zosayanga

- Pangani mizere iwiri pamwamba pa mzere
- Bzalani njere imodzi pa phando
- Mapando atalikirane ma sentimita khumi (10 cm)

b. Nyemba Zoyanga

- Bzalani njere imodzi pa phando
- Mapando atalikirane masentimita 15 (theka ya lula)
- Yikani milimo kuti nyemba ziyangirepo

- e) Ngati mukulima mbewu ya nyemba ndi mbewu zina:
- a. Nyemba Zosayanga
    - Pangani mizere iwiri pa mzere
    - Bzalani njere imodzi pa phando
    - Mapando atalikirane masentimita khumi (10 cm)
  - b. Nyemba Zoyanga
    - Ngati mwabzala chimanga pobzala chimanga chitatu pa phando, bzalani nyemba poyika mapando anayi pakati pa mapando a chimanga aja.

### **Kuthira Feteleza**

Mbewu zonse za gulu la nyemba zimakula bwino ngati tagwiritsa ntchito feteleza wokhala ndi mchere wa Fosifolasi (Phosphorus). Mchere umenewu umapezeka mu mitundu ya feteleza monga D Compound, Super D, SSP, TSP, Sympal ndi wina. Feteleza ndi ofunika pa ulimi wa nyemba. Ngati feteleza palibe, alimi akulimbikitsidwa kuthira manyowa.

### **Kupalira**

Wonetsetsani kuti mmunda ndi mopanda udzu nthawi zonse; koma musapalire pamene nyemba zapanga maluwa kupewa kuthothola maluwawo. Ngati pali pofunikira kupalira, gwiritsani ntchito manja koma mosamala.

### **Kuteteza Nyemba ku Matenda ndi Tizilombo**

Pali matenda ndi tizilombo tambiri timene timagwira nyemba. Koma mbewu zambiri za makono za nyemba zimapilira ku matenda ochuluka. Choncho ndi bwino kumabzala mitundu ya nyemba yatsopano. Ngati matenda agwira mbewu yanu ya nyemba, monga a chiwawu (kupanga madonthomadontho a m'masamba) poperani mankhwala a Daconil pa mlingo wa 35 g mu mpopi. Ndipo ngati tizilombo tikudya masamba a nyemba zanu, poperani Cypermethrin pa mlingo wa 50 g mu mpopi. Koma matenda ambiri a nyemba angathe potsatira njira zamakono za ulimi monga; kasinthasintha wa mbewu motsatana ndi chimanga ndi mbewu zina, kugwiritsa ntchito mbewu yovomerezedwa, kukwirira masangwi a nyemba, pophimbira nthaka.

### **Kuchotsa Nyemba ku Munda**

Chotsani nyemba pamene nyemba zambiri pa phando zayamba kuwuma. Kololani pamene mame kulibe koma uli mmamawa. Mukachotsa nyemba dzuwa litakwera, zambiri zimasweka nkutayikira mmunda. Kapitilizeni kuyanika mukafika kunyumba kuti ziwume moyenerera.

### **Kumenya/Kuwomba Mbewu ya Nyemba**

Wombani nyemba zanu mosamala kuti musazisupulesupule. Yanikani nyemba musanayambe kuwomba. Wombani ndi mtengo pamene zawuma kwambiri.

Sankhani nyemba bwinobwino kuti muchotse zinyalala zonse. Chotsaninso nyemba zimene zili zofutwa, zonyala, zogwidwa ndi matenda kuti mutsale ndi nyemba zowoneka bwino mofanana.

## **Kusunga Mbewu ya Nyemba**

Sungani mbewu ya nyemba imene ili yowuma bwino. Thirani mankhwala a Actellic Super pa mlingo wa 25 g pa thumba la 50 kg lililonse, kuti titeteze mbewu yathu ku namkafumbwe wa mu nyemba.

## **2. KHOBWE**

### **Mawu Oyamba**

Khobwe ndi imodzi ya mbewu za mtundu wa nyemba zimene zimalimidwa mdziko muno. Alimi amalima khobwe kwenikweni chifukwa cha ndiwo kapena kufuna kupeza ndalama akagulitsa. Masamba a khobwe amagwiritsidwanso ntchito ngati ndiwo ndipo zotsalira mukakolora ndi zakudya zabwino za ziweto. Khobwe anayambira ku Afirika konkuno ndipo amapilira ku kutentha komanso dothi la mchere wambiri (asidi); koma amabvuta ku malo a madzi ambiri.

Pamene khobwe wabzalidwa payekha, pamafunika mbewu yokwanira makilo 25-35 pa hekitala imodzi. Mbewu ikachita bwino mlimi amatha kukolora makilo 340 (matumba osaposa 7) pa hekitala. Pali tizilombo tambiri mu afirika tomwe timakapanga mandolo opindulitsa mu mizu ya nandolo ndikuwonjezera nayitulojini mu nthaka.

Bzalani khobwe mvula yobzalira ikayamba kugwa mpakana kumapeto a mwezi wa Disembala. Ku malo omwe amalandira mvula yochuluka, mbewu ya khobwe ibzalidwe mochedwerako kuti isamphane ndi matenda komanso tizilombo timene timabwera ngati mvula ili yochuluka ndithu.

### **Mitundu ya Khobwe**

Khobwe alipo wa mitundumitundu, monga: Sudan-1, IT82E-16 ndi wina.

### **Kubzala Mbewu ya Khobwe**

- Pangani mizere yotalikirana ma sentimitala 75 (ma lula awiri ndi theka).
- Yesetsani kubzala khobwe yekha mmunda kuti mupindule.
- Pezani mbewu yochuluka makilogalamu 12 mpakana 30, malingana ndi mtundu wake. Khobwe wina amakula motambasuka pamene wina amakula mowongoka. Khobwe wokula motambasuka amafuna mbewu yocheperako pamene wokula mowongoka amafuna mbewu yochuluka ndithu.
- Kubzala:
  - Sudan 1: Bzalani njere ziwiri pa phando ndipo mapando atalikirane 20 cm.
  - IT82E-16: Bzalani njere imodzi pa phando ndipo mapando atalikirane 20 cm.

### **Kupalira**

Wonetsetsani kuti mmunda wa khobwe ndi moyera nthawi zones. Udzu umapangitsa kuti mbewu zisakule bwino ndipo zokolola zimachepa. Koma tipewe kupalira pamene khobwe wapanga maluwa; chifukwa maluwa amathothoka chifukwa chogwedzedwa popalira.

### **Kuthira Feteleza**

Khobwe komanso mbewu zonse za gulu la nyemba zimakula bwino ngati tagwiritsa ntchito feteleza wokhala ndi mchere wa Fosifolasi (Phosphorus). Mchere umenewu umapezeka mu

mitundu ya feteleza monga D Compound, Super D, SSP, TSP, Sympal ndi wina. Thirani matumba awiri (makilogalamu 100) pa hekitala iliyonse ya mbewu ya khobwe.

### **Kuteteza ku Tizilombo ndi Matenda**

Khobwe amagwidwa tizilombo komanso ndi matenda osiyanasiyana amene amatha kuchepetsa zokolora. Chonde pezani alangizi anu ngati khobwe wanu wagwidwa tizilombo kapena matenda.

Ngati khobwe wagwidwa ndi tizilombo tobowola maluwa ndi zitheba komanso toyamwa masamba, poperani Carbarly wochuluka ma galamu 85 mu malita khumi (10) a madzi mu mpopi. Ndipo ngati khobwe wagwidwa ndi nsabwe ndi ziwala, poperani Dimethoate (Rogor) pa mulingo wa magalamu 34 mu malita khumi a madzi mu mpopi.

Mungathenso kugwiritsa ntchito Katupe (Mthuthu, Wombwe) ngati mankhwala otetezera mbewu ya Khobwe ku tizilombo.

Malimidwe a Katupe:

- Bzalani katupe ndi mvula yoyamba.
- Bzalani njere zitatu pa phando. Bzalani katupe pambali pa mzere kudutsa mapando a chimanga atatu aliwonse.
- Dziwani kuti mbewu ya katupe siyimapikisana ndi mbewu yanu ya chimanga.

Kathiridwe ka Katupe

- Yoyolani masamba okwanira kilogalamu imodzi (1)
- Nyenyani masambawo ndipo sakanizani ndi madzi okwanira ma lita asanu (5).
- Sefani pa ka nsalu.
- Sakanizani ndi sopo wochepea kuti zizimata ku mbewu.
- Poperani.
- Mankhwalawo amakhala kwa sabata yatunthu akugwira ntchito.

### **Kukolola Khobwe**

Kololani pamene khobwe wawuma ndipo kapitilizeni kuyanika mukafika kumudzi. Kololani pozula mtengo wonse.

### **Kusunga Khobwe**

Wonetsetsani kuti khobwe yense wawuma bwino. Khobwe ngati sanawume bwino samachedwa kugwidwa ndi tizilombo timene timabowola khobweyo. Thirani mbewu yanu ya khobwe Actellic pa mulingo wa 25 g pa thumba la makilogalamu 50 lililonse.

Muwonetsetse kuti matumba amene mukusungiramo khobwe ndi aukhondo powawiritsa ndi madzi otentha kuti tizilombo komanso mazira a tizilombo onse afe.

Sungani pa malo abwino, owuma. Sanjani matumba anu pa mitengo kapena pamwamba posafika chinyontho.



### **3. SOYA**

#### **Mawu Oyamba**

Soya ndi imodzi mwa mbewu zofunika kwambiri pa moyo wathu wa tsiku ndi tsiku. Pakadali pano ndi alimi ochepe kwambiri amene akulima mbewu imeneyi moyenerera. Koma alimi ambiri samatsatira malimidwe oyenerera ndipo kakolodwe kawo ndi kosapindulitsa. Alimi akukolola ma kilogalamu 700 (matumba 14) pa hekitala mmalo mwa makilogalamu oposa 2000 (matumba 40) pa hekitala. Izi zikupangitsa kuti tilephere kukwaniritsa kuchuluka kwa soya yemwe akufunika pa msika.

Soya amadziwika ndi masamba komanso makoko ake ndi a ubweya. Mbewu imeneyi ikhoza kubzalidwa m'malo okwera komanso otsika ndipo imatha kuchita bwino pa dothi la mchere wambiri ngakhalenso ndi mvula yochepe. Mbewuyi siyichita bwino m'malo ozizira komanso a mthunzi ndipo n'chifukwa chake siyichita bwino ikabzalidwa mophatikiza ndi mbewu zina zitalizitali. Mbewuyi imafuma makilo ochuluka 50 mpakana 80 kuti ikwane pa hekitala imodzi.

Mitundu yambiri ya soya imafuna kuthiridwa inokulanti kuti apange nayitulojini okwanira mu dothi, koma palinso mitundu yina ya mbewu yatsopano yomwe imatha kupanga nayitulojini popanda kuthira inokulanti.

#### **Ntchito ndi Ubwino wa Soya**

- Amathandizira kuwonjezera chonde mu nthaka
- Amathandiza pa ulimi wophimbira nthaka choncho chinyezi chimakhalitsa nthaka
- Amathandiza kukweza chuma cha dziko pogulitsa kunja.
- Masamba ndi mitengo yake zimathandiza popanga manyowa.
- Ali ndi chakudya chothandiza kumanga ndi kukulitsa matupi.
- Tingathe kukonza zakudya za ana komanso akuluakulu, monga phala, nsima, chigumu, zitumbuwa, mkaka, nsinjiro
- Mutha kupangira nyama ya soya komanso masoseji ya soya.
- Amapangira zakudya za ziweto
- Amapangira mafuta ophikira.
- Amathandiza kubweretsa ndalama pakhomo.

#### **Zomwe Zikulepheretsa Kukolola Soya Wochuluka**

- Kusabzala pa mulingo woyenera
- Kubzala mochedwa.
- Kutsika kwa mitengo ya soya
- Kuchedwa kapena kusapalira mbeu ya soya.
- Mbewu yake siyimafunika kusungidwa nthawi yayitali.
- Kusatsatira mitundu ya soya polima.
- Kutenga soya ngati mbewu yosafunikira (anthu ena amati ndi mbewu ya Amayi)

#### **Mitundu ya Soya**

Ndi bwino kulima soya motsatira mitundu yake. Komanso alimi ambiri amalima soya mosatsatira mitundu yake. Mitundu ya soya ilipo yambiri m Malawi muno ndipo alimi akulimbikitsidwa kutsatira mitundu imeneyi. Ina mwa mitundu ya soya ndi iyi:

**a) Tikolore (TGx1740-2F)**

- Yobereka kwambiri ndipo mlimi angathe kukolola moposa 3200 kg pa hekitala
- Yokucha mwamsanga, masiku 98
- Imathawa matenda a Dzimbiri (Soybean Rust) chifukwa chokucha mwamsanga
- Imakhala ndi bweya woderako (Brown)
- Imabereka mpakana mmwamba
- Mbewu zake sizazikulu (komanso sizazing'ono)
- Siyimafunika kuthira Inokulanti

**b) Nasoko**

- Mlimi angakolole mpakana 2600 kg pa hekitala
- Mbewu yake ndi yayikulu
- Imafuna kuthira Inokulanti
- Imacha pakatha masiku 106
- Imakhala ndi bweya woyererako

**c) Makwacha**

- Mlimi angathe kukolola 2800 kg pa hekitala.
- Imacha pakatha masiku 106
- Imafuna kuthira Inokulanti
- Mbewu yake ndi yayikulu
- Imakhala ndi bweya woyererako

**d) Ocepara 4**

- Yobereka kwambiri ndipo mlimi angathe kukolola moposa 3500 kg pa hekitala.
- Imapilila ku mandolo
- Maluwa ake ndi oyera
- Imawoneka yotuwa ikawuma
- Imaberekera pa mtengo
- Imatalika komanso ndi ya masamba akulu
- Imatenga masiku pafupi 23 ikakhwima kuti iyambe kuthetheka

**e) Duocrop**

- Yobereka kwambiri 4000kgs pa hekita.
- Yovuta kusunga ngati mbeu – sichedwa kutha mphamvu.
- Imatenga masiku pafupi 21 ikakhwima kuti iyambe kuthetheka
- Imabelekera pa mtengo ndi thambi

**f) Santarosa**

- Imabereka bwino 3000 kgs pa hekita.
- Imabelekera pa mtengo ndi thambi
- Imawoneka yachikasu

**Kukonza Minda**

- Minda ikonzedwe mwa msanga kuti tibzale ndi mvula yoyamba.
- Tigawule mokwanira kuti tisunge chinyezi mokwana
- Mizere italikirane 75cm kapena 90cm
- Mizere ikhale ya thyathyathya pamwamba (flat top).

- Nthaka yake ikhale yosadikha madzi

### **Kusankha Mbeu**

- Ikhale mbewu ya mtundu umodzi.
- Ikhale yosasweka.
- Ikhale yokhwima osati mphwephwa.
- Ikhale yoti sinasungidwe kopitilira miyezi isanu ndi umodzi.
- Ikhale yosawola kapena kufumbwa.

### **KATHIRIDWE KA INOKULANTI**

Thirani inokulanti ku mbeu musanabzale. Inokulanti amathandiza kuti mukolole zochuluka. Gulani inokulanti kwa ogulitsa obvomelezeka, makamaka ku malo a kafukufuku a Chitedze ndi ena. Musasunge inokulanti pa dzuwa, sungani pamalo ozizirira bwino. Pamene mukuthira inokulanti mukhale pamthunzi. Pothira inokulanti, tsatirani izi:

- Pezani madzi okwanila
- Pezani chidebe cha pulasitiki
- Yesani mbeu ikwane makilogalamu 20.
- Yesani madzi mu botolo la fanta koma lisadzadze kwambiri (200 ml).
- Yesani shuga mu paketi (chibiliti) ya macheso.
- Sakanizani madzi a mu botolo la Fanta lija ndi shuga wa mu chibiliti cha macheso uja.
- Sakanizani madzi a shuga aja ndi inokulanti wa mu paketi imodzi.
- Ikani mbewu mu chidebe cha pulasitiki.
- Sakanizani mbewu ndi inokulanti wosakaniza uja. Musakanize bwino kuti mbewu yonse iphimbike ndi inokulanti uja.
- Yanikani mbewu yanu panthunzi kwa mphindi makumi atatu (30 minutes) kuti iwume, musanayambe kubzala
- Bzalani pasanathe tsiku limodzi mutasakaniza inokulanti.

### **Kabzalidwe**

Mbewu yonse ya soya idzipakidwa mankhwala monga Thiram tisanabzale. Mankhwala amateteza mbewu ku tizilombo timene timadya ndi kuwononga mbewu tikangobzala. Bzalani soya motere:

- Tibzale ndi mvula yoyamba (November mpaka pakati pa December)
- Mikwasa iwiri yotalikirana 30 cm pa mzere.
- Njere imodzi pamapando otalikirana 5cm.

### **Kupalira**

- Palirani udzu ukangowoneka makamaka pa milungu 6 yoyambirira.
- Kupalira kumachepetsa matenda ndi tizilombo.
- Kupalira kumathandiza kuchulukitsa zokolola.

### **Kuteteza Soya ku Tizilombo**

Soya amagwidwa ndi matenda osiyanasiyana monga dzimbiri (Rust) ndi ena. Tetezani soya ku dzimbiri pobzala mwakasinthasinthha ndi mbewu zina. Pali mitundu yina ya mbewuyi muno mu afirika yomwe yimapilira ku matenda a dzimbiri.

Mandolo owononga amagwiranso soya ndipo mbewu zimalephera kukula komanso zimanyala kenako ndi kuwuma. Choncho tetezani soya ku mandolo owonongawa pochita kasinthesintha

ndi mbewu zimene sizimagwidwa ndi mandolo komanso pobzala mbewu zopilira monga mtundu wa Ocepara 4.

Ziwala, ziyabwe, nthemberezandonda, mbalame ndi zilombo zina zimavuta kwambiri mu mbewu ya soya. Poperani masamba a mthuthu kuti muteteze mbewu yanu ya soya.

### **Kukolola**

- Soya okhwima komanso woyenera kukololedwa amawoneka wa chikasu koma ali wodera.
- Masamba amagwa.
- Soya wokhwima amachita phokoso mukagwedeza.
- Kololani soya asanayambe kusweka chifukwa chouma mopitirira muyezo.
- Kololani m'mawa dzuwa lisanakwere kupewa kusweka kwa soya.
- Zulani mitengo wonse ndi kumuyanika pa thandala podikira kumenya.
- Wombani soya wanu pamene wawuma moyenerera.

### **Kusankha Soya**

Sankhani soya pochita izi:

- Chotsani soya yense amene ali owola.
- Chotsani soya yense amene ali wonyala.
- Chotsani zinyalala zonse mu soya wanu monga makoko a mbewu ndi zina.
- Petani soya kuti zinyalala zonse zichokemo.

### **Kusunga Soya**

Sungani soya moyenerera motere:

- Ikani soya wosankhidwa bwino uja mu matumba abwino, ochapa komanso owuma bwino.
- Sokani matumbawo.
- Sungani pa malo owuma bwino, opita mphepo komanso opanda chinyonho kuti asapange chuku (aflatoxin).
- Ngati tikusunga mbewu ya soya, wonetsetsani kuti musasunge kwa nthawi yopitilira miyezi isanu ndi umodzi (miyezi 6).

## **4. MTEDZA**

### **Mawu Oyamba**

Mtedza ndi mbewu ina imene ikulimidwa m'madera ambiri m'dziko muno. Mtedza, kuti uchite bwino, umafunika mvula yokwana mamilimita 600 motsatana ndi nyengo ya dzuwa kuti uche bwino. Mtedza umachita bwino pa dothi la mchenga ndipo umatha kubereka ngakhale pa dothi la asidi (mchere ochuluka) koma umafunika mchere wa kashiyamu kuti upange makoko.

Mtedza umagwiritsidwa ntchito popanga mafuta ophikira, zakudya za anthu ndi ziweto, kuwonjezera chonde nthaka, kuphimbira nthaka ndi ntchito zina. Mtedza umafuna makilo okwana 50 a mbewu pa hekitala imodzi ndipo tingathe kukolora makilogalamu okwana 950 (matumba 19) pa hekitala. Bzalani mtedza ndi mvula yoyamba yobzalira kuti mukolore moyenerera.

Mtedza, monga mbewu yina ya mtundu wa nyemba, imakhala ndi mandolo opindulitsa. Mandolo mu mizu ya mtedza amapangidwa mosavuta mu dothi la kuno ku Afirika ndipo

kumakhala kovuta kuwawona chifukwa amakhala ang'onoang'ono komanso amadzadza mizu yonse ngati zithupsa.

### **Mitundu ya Mtedza**

Mtedza ulipo wa mitundumitundu, monga: Nsinjiro, Chalimbana, CG 7 ndi yina.

### **Kubzala Mbewu ya Mtedza**

- Pangani mizere yotalikirana ma sentimitala 75 (ma lula awiri ndi theka).
- Bzalani mtedza umodzi pa phando ndipo mapando atalikirane motere:
  - CG 7: 10 cm
  - Nsinjiro: 10 cm
  - Chalimbana: 15 cm
- Wonetsetsani kuti mbewu yonse yamera bwino ndipo pakizani mwachangu m'malo amene siyina mere kuti tipewenso tizilombo tina timene timabweretsa matenda ku mtedza wathu.

### **Kupalira**

Wonetsetsani kuti mmunda wa mtedza ndi moyera nthawi zonse. Udzu umapangitsa kuti mbewu zisakule bwino ndipo zokolola zimachepa. Koma tipewe kupalira pamene mtedza wapanga maluwa; chifukwa maluwa amathothoka pamene tikugwedeza popalira. Komanso udzu umathandiza kusunga tizilombo ndi matenda timene timawononga mbewu yathu.

### **Kuthira Feteleza**

Mtedza ngati mbewu ya mu gulu la nyemba zimakula bwino ngati tagwiritsa ntchito feteleza wokhala ndi mchere wa Fosifolasi (Phosphorus). Mchere umenewu umapezeka mu mitundu ya feteleza monga D Compound, Super D, SSP, TSP, Sympal ndi wina. Thirani matumba awiri (makilogalamu 100) pa hekitala iliyonse ya mbewu ya mtedza. Thirani feteleza pa tsiku limene mwabzala mtedza kuti feteleza agwire ntchito yake bwino ku mbewuyi.

### **Kuteteza ku Tizilombo ndi Matenda**

Mtedza umagwidwa ndi tizilombo komanso ndi matenda osiyanasiyana amene amatha kuchepetsa zokolora. Zina mwa tizilombo ndi matenda a mtedza ndi, monga:

- Dzimbiri – dzimbiri imapangitsa kuti munda uwoneke ngati wapsa, ndipo mbewu imawoneka ngati yachita dzimbiri. Tetezani mtedza wanu ku matenda a dzimbiri pozula mtedza wonse umene umamera wokha, komanso potsatira kasinthisintha wa mbewu.
- Khate - matenda a khate amafalitsidwa ndi nsabwe za mu mbewu. Khate ndi matenda owopsa amene amachepetsa zokolora ndipo nthawi zina mlimi samakolora chilichonse. Bzalani mtedza wa mtundu wopilira ku khate.
- Nthomba Yochedwa ndi Yofulumira – mtedza umene wagwidwa ndi nthomba umawoneka ngati wakhwima, masamba amakhala amadonthomadontho. Nthomba ina imabwera mofulumira pamene mtedza uli wawung'ono pamena nthomba yochedwa imabwera pamene mtedza wakula. Tsatilani kasinthisintha wa mbewu kuti mupewe matendawa.

### **Kukumba Mtedza**

Kumbani mtedza pamene wakhwima bwino. Tikuyenera kuyesa mtedza ngati wakhwima motere:

- Zulani mtedza m'malo ochepa ndipo iswani mkati makoko. Ngati mkati mwa makoko mukuwoneka mwa madonthomadontho ndiye kuti mtedza wakhwima.
- Werengerani masiku amene mtedza umene mwabzala umatenga kuti ukhwime.
- Iswani mtedza, ngati ukuwoneka wodzadza m'makoko komanso wofiira, ndiye kuti wakhwima.

### **Kuyanika ndi Kuthothola Mtedza**

Mukakumba mtedza, yanikani moyenerera m'munda mommo kuti uwume bwino musanathothole. Yanikani potembenuza masangwi kuti mtedza wa m'makoko ukhale mmwamba pamene masangwi ali pansi. Izi zimathandiza kuti ngati mvula yagwa pamene tikuwumitsa mtedza, usanyowe. Mtedza ukanyowa umapanga nguwi ndi chuku. Chuku china chimakhala cha matenda owopisa amene amatha kuyambitsa matenda aakulu mwa anthu. Thotholani mtedza wonse pamene wawuma.

### **Kusunga Mtedza**

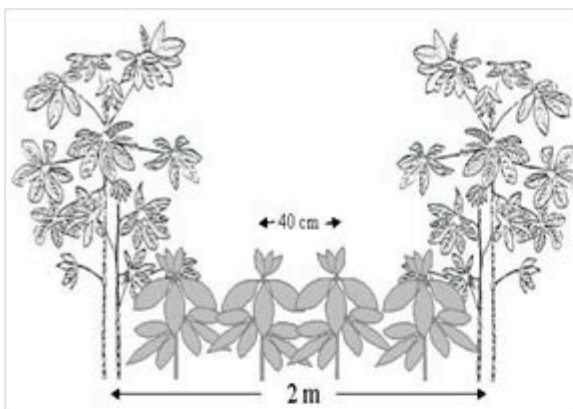
Wonetsetsani kuti mtedza wanu wasungidwa pa malo oyenera popanda chinyontho komanso popita mphepo. Sungani mtedza uli mmakoko. Sungani mu nkhokwe komanso m'matumba. Sungani pa malo abwino, owuma. Sanjani matumba anu pa mitengo kapena pamwamba posafika chinyontho.

Iswani mtedza pamene mukufuna kugwiritsa ntchito kapena kugulitsa. Pokuswa musathire madzi kapena kunyowetsa kwa mtundu wina uliwonse. Kunyowetsa mtedza kumapangitsa kuti matenda a chuku asavutike kulowa mu mtedza wathu.

## KABZALIDWE KA MBEWU ZA MTUNDU WA NYEMBA

Mbewuzi zikhoza kubzalidwa mu njira zosiyanasiyana. Mbewuzi zitha kubzalidwa mosakaniza ndi mbewu zina monga chimanga. Nthawi zambiri alimi amabzala mizere ya mbewuzi mosachita kasinthasintha. Ndi njira imeneyi mbewu za mtundu wa nyemba sizichita bwino kwambiri chifukwa cha mthunzi ndipo alimi amakonda kubzala ndi njira imeneyi chifukwa zimachepetsa ntchito yolima.

Njira yabwino yobzalira nyemba mosakaniza ndi mbewu zina, ndi monga kubzala m'munda wa chinangwa chomwe chabzalidwa kumene. Mbewu monga nyemba kapena khobwe, zimayenera kubzalidwa m'munda wa chimanga kutatsala masabata ochepa kuti mukolore chifukwa nthawi imeneyi chimanga chimakhala chikuwuma ndipo sichibweretsa mthunzi ku mbewuzi. Koma ndikofunikanso kuti mbewuzi zibzalidwe nthawi yabwino kuti ziche madzi asanathe mu nthaka.



Cassava may also be intercropped with grain legumes (above). Climbing beans require support from either stakes or companion crops (below).



Intercropping arrangements of maize and grain legumes with alternate (above) and staggered rows (below).



## **KUGWIRITSA NTCHITO FETELEZA MU MBEWU ZA MTUNDU WA NYEMBA**

Dothi la asidi wambiri limachepetsa kakulidwe ka mbewu za mtundu wa nyemba komanso kapangidwe ka nayitulojini kuchoka ku mbewu zimenezi makamaka mbewu za soya ndi nyemba. Kuthira layimu m'munda kumathandiza kukonza vutoli. Mbewu za mtundu wa nyemba zimafuna mchere wa mtundu wa fosifolasi (phosphorous) kuti zithe kupanga nayitulojini. Pamene mchere umenewu wasoweka, mbewuzi zimakhala ndi masamba a chikasu komanso zimakwinimbira (kupinimbira, kusakula, kutitimira).

- Layimu: ndiwabwino pothandiza kuchepetsa asidi mu dothi ndipo amawonjezeranso zinthu zina zofunikira mu dothi monga mchere wa kashiyamu (calcium) womwe uli wofunikira ku mtedza.
- TSP (Triple Super Phosphate): ameneyu ndi feteleza wofunikira kwambiri chifukwa amakhala ndi fosifolasi wambiri koma ndiwokwera mtengo. Pamafunika feteleza wochuluka makilo osachepera 50 pa hekitala.
- SSP (Single Super Phosphate): fetelezayu amafunika kuthira wambiri kuposa TSP (makilo 250 pa hekitala) chifukwa amakhala ndi fosifolasi wochepa.
- Ground Rock P: ali ndi fosifolasi wochepa koma amakhalitsa mudothi. Vuto ndi loti Ground Rock P amakhala wochuluka choncho amavuta kunyamula.

## **Kugwiritsa ntchito Rhizobium Inoculant**

Mitundu ina ya mbewu ya soya komanso nyemba ilibe tizilombo tokwanira tobweretsa nayitulojini mudothi kuti mbewuzi zithe kuwonjezera nayitulojini mu nthaka. Pamene pamafunika kuwonjezera Inokulanti ku mbewuzi kuti nthaka yathu ikhale ndi tizilombo tochuluka kuti ipange mchere wa nayitulojini wochuluka, powonjezera tizilombo tothandizati. Inokulanti si wovuta kugwiritsa ntchito koma ndikofunika kumuteteza posamuyika malo otentha kwambiri. Malamulo ena akagwiritsidwe ntchito ka mankhwala a Inokulanti ali motere:

- Gwiritsani ntchito inokulanti woyenelera ku mbewu yina yiliyonse monga inokulanti wa soya ku mbewu ya soya, inokulanti wa nyemba ku mbewu ya nyemba; ndi mbewu zina.
- Tetezani inokulanti ku dzuwa, kutentha ngakhalenso kuzizira kwambiri kwa mtundu wina uliwonse. Choncho Inokulanti asungidwe pa malo ozizira kuyambira 4°C kulekeza 26°C.
- Sungani inokulanti mu ma paketi otsekedwa bwino. Gwiritsani ntchito supuni yotsuka bwino pamene mukutenga Inokulanti kuti mugwiritse ntchito.
- Gwiritsani ntchito zinthu zomwe zingathandizire kuti inokulanti amate bwino ku mbewu zanu monga shuga, uchi, unzonono, utomoni, ndi zina.
- Gwiritsani ntchito mulingo woyenerera wa inokulanti pa mulingo woyenerera wa mbewu.
- Sakanizani mbewu yanu ndi Inokulanti pamene mukukabzala ndipo musasiye mbewu yanu yothira Inokulanti pa dzuwa chifukwa pakutero tizilombo tija timafa ndipo Inokulanti wanu samagwira ntchito yake.
- Bzalani mbewu zosakaniza ndi Inokulanti mu dothi lonyowa bwino kuti mbewu zithe kumera inokulanti adakali wabwino. Inokulanti amatha mphamvu (tizilombo tija timafa) ngati mwabzala pa dothi lowuma kapena ngati ngati dothi lawuma mutangobzala mbewu yanu.



### **Kathiridwe ka Inokulanti ku Mbewu ya Soya**

Pamene mvula yobzalira yagwa, Mlangizi wa Kumudzi akuyenera kuyitanitsa alimi ndikupanga mwachitsanzo momwe anganiyikire Inokulanti ku mbewu ya soya komanso kabzalidwe kake. Mlangiziyu akuyenera kuyika pamodzi zipangizo zonse zofunikira posakaniza mbewu ku inokulanti ndipo awonetse anzake momwe angasakanizire Inokulanti ku mbewu ya soya motere:

#### **Zofunikira**

Mbewu ya Soya

Madzi

Sugar

Inokulanti

Botolo la fanta lopanda kanthu

Chibiliti cha machesi chopanda kanthu

#### **Kathiridwe Kake**

1. Yezani mbewu yochuluka makilogalamu 20 (makumi awiri).
2. Yezani shuga wodzadza mu chibiliti cha machesi chimodzi.
3. Yezani madzi ochuluka ma mili-lita 200 (kapena okwanira mu botolo la Fanta, koma losadzadza).
4. Tengani inokulanti, paketi imodzi.
5. Sungunulani shuga ndi madzi aja, mpakana zisungunuke bwinobwino.
6. Thirani inokulanti ku madzi a shuga aja, sakanizani bwinobwino mpaka asungunuke bwinobwino.
7. Yikani mbewu yanu mu ndowa yayikulu bwino.
8. Thirani madzi a inokulanti ndi shuga aja mu mbewu yanu; sakanizani bwinobwino mpakana mbewu iliyonse itasakanizidwa bwino ndi inokulanti uja.
9. Yanikani pa nthunzi popita mphepo bwino kwa mphindi makumi atatu (30 minutes) mpakana zitawuma bwino. Mukhoza kuyanika pansu pa mtengo.
10. Kabzalani soya tsiku lisanathe.

#### **Kumbukirani Izi**

- Pamene mukubzala wonetsetsani kuti soya wanu akusungidwa pa nthunzi.
- Bzalani pamene dothi likadali lonyowa.
- Shuga amathandiza kuti inokulanti amate ku mbewu bwinobwino.
- Mlangizi wakumudzi awonetse alimi momwe angabzalire mbewuzi pobzala pa munda wachiwonetsero.
- Mlimi aliyense awone ndikuyesera payekha ndipo izi zithandiza kuti aphunzire mosavuta.
- Akatha kuphunzira mlimi aliyense atenge mbewu yake ndikukabzala pa munda wake tsiku lomwelo. Osagoneka mbewu yopakidwa inoculant.
- Tsiku lomwelo bzalaniso soya wina osapaka inoculant pa mizere yochepa (10) kuti musiyanitse kakulidwe ndi kaberekedwe ka mbewu ziwirizi.



Kuthira Inokulanti ku mbewu ya soya pogwiritsa ntchito utomoni ngati chomatitsira Inokulanti ku mbewu

## KUYESA NDONDOMEKO ZATSOPANO ZAKALIMIDWE KUDZERA PA MUNDA WA CHITSANZO

Ndi thandizo lochokera ku N2Africa, Alangizi a Kumudzi azikonza ndi kuyang'anira minda ya chitsanzo ndi cholinga chogawana nzeru pa njira ndi ndondomeko zatsopano za ulimi ndi alimi ena, makamaka a mu gulu lawo. Alangizi aliwonse akuyenera kugwira ntchito ndi gulu lawo ndipo ayesetse kukhala ndi mamembala amene akuchokera kufupi ndi kumene iwo ali. Gulu la alimi likhala ndi munda wawukulu wa chitsanzo umodzi omwe uzitsogoleredwa ndi Alangiziwo. Pa munda umenewu palimidwa motsatira njira zosiyanasiyana za kalimidwe ndi kasamaliridwe ka mbewu za mitundu yosiyanasiyana.

Minda yina yachitsanzo yimapangidwa ndi cholinga chofuna kudziwa ngati njira zatsopano zomwe abweretsa a N2Africa zingathandize kugonjetsa mavuto amene alimi akukumana nawo kapena ayi. Mwachitsanzo, alimi amene amalima chimanga chochuluka akhoza kuyesa njira zosiyanasiyana zobzalira chimanga mosakaniza ndi mbewu za mtundu wa nyemba. Mlimi aliyense ayang'ane mwachidwi pa munda wake komanso munda wa Alangizi.

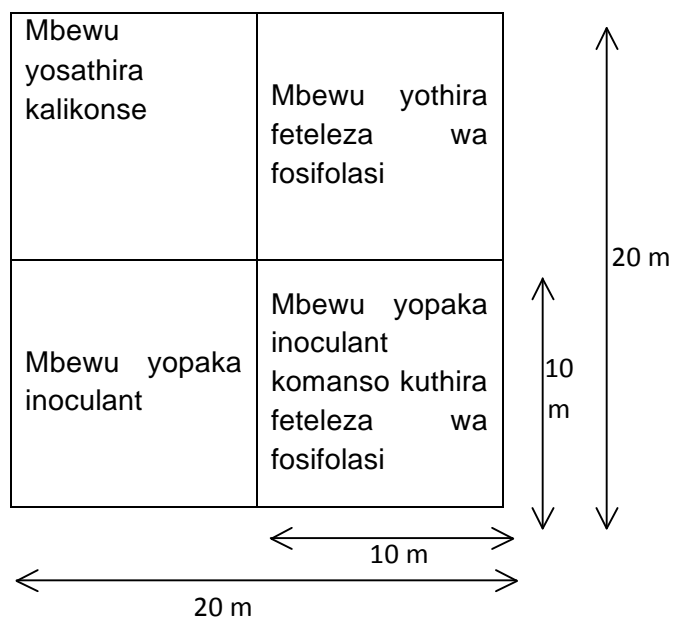
Mlimi wa pa gulu aliyense analandira mbewu ndi zipangizo zina ndikukayesa njira zomwe akuphunzira, kuchokera kwa Alangizi a Kumudzi, pa munda wake ndi cholinga choti adzitha kusiyantsa ndi momwe amalimira. Munda wa chitsanzo wa Mlangizi wa Kumudzi ndi wa magawo anayi ofanana ndipo ukuyenera kukhala pa malo oyandikana.

Kusiyantsa kwa mbewuzi kuli ndi magawo angapo, monga:

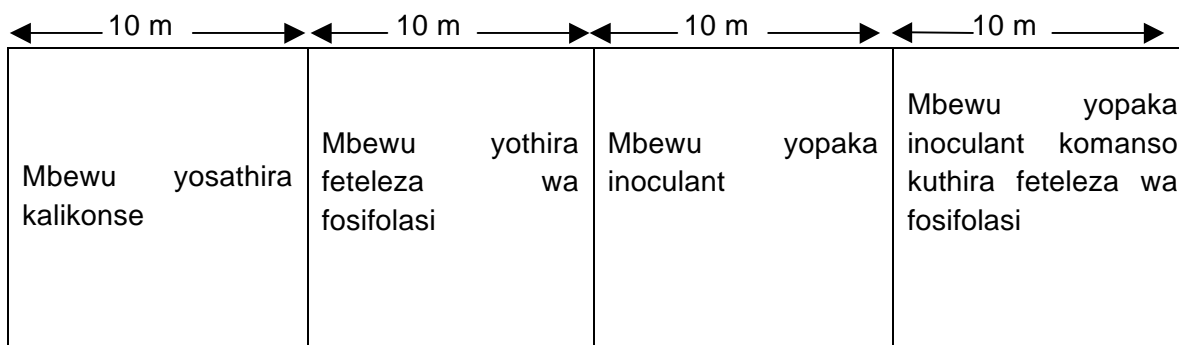
- kuwona ngati muli kale tizilombo tobweretsa nayitulojini mu dothi kapena ayi;
- kuwona ngati mbewu yikukula bwino ikathiridwa Inokulanti.
- popeza feteleza okhala ndi fosifolasi (phosphorous) ndiwabwino ku mbewu za mtundu wa nyemba, ndikofunikira kusiyantsa ngati mbewu zikukula bwino ndi feteleza ameneyu.
- kuwona ngati mbewu ikule ndi kubereka bwino pamene taphatikiza inokulanti ndi feteleza wa fosifolasi.
- Ngati palibe kusiyana pakati pa minda yonse, ndiye kuti mbewu sizinavomere ku mankhwala a inoculant komanso feteleza wa fosifolasi.
- Ngati munda omwe mbewu zinapathiridwa Inokulanti zachita bwino kwambiri ndiye kuti ndikoyenera kugwiritsa ntchito inoculant.
- Ngati mbewu zothiridwa feteleza wa fosifolasi zachita bwino kwambiri ndiye kuti ndikoyenera kugwiritsa ntchito feteleza ameneyu.
- Ngati munda othira feteleza komanso inoculant wachita bwino kuposa yina yonse ndiye kuti njira imeneyi ndiyofunika kulimbikitsidwa.

Magulu a alimi akonze masiku omwe alimi ena akhonza kuzawona minda yawo nthawi zosiyanasiyana pamene abzala kufikira kukolora kuti athe kuphunzira komanso kusiyantsa njira zimenezi. Ndikofunikira kuyitana alimi amene sakuchita nawo ulimi umenewu ndi cholinga choti athe kuphunzira nawo njira zatsopanozi.

Izi zingathe kutheka ngati tingabzale mbewuzi monga tawonetsera pansipa:



Kagawidwe kena ka munda kakhoza kukhala kotere:



## **MAGULU A ALIMI KOMANSO UDINDO WA ALANGIZI A KUMUDZI: MLIMI NDIYE MPHUNZITSI WABWINO WA ALIMI ANZAKE!**

### **Mawu Oyamba**

N2Africa imagwira ntchito ndi magulu a alimi ndipo gulu lililonse liri ndi mlimi otsogolera kapena 'Mlangizi wa Kumudzi' osankhidwa ndi mudzi. Alangizi akumudzi amakhazikitsa magulu omwe angathe kuyesa ndondomeko zatsopano zomwe abweretsa a NAfrica potsata mitu yomwe yili yosangalatsa kwa alimi ena. Akatha kuyesa ndondomekozi, alimi amanena ngati njirazo ziri zothandiza kapena ayi. Iwo amafotokoza ndondomeko zomwe zapindula komanso zomwe sizinapindule ndikupereka zifukwa zake. Uthenga umenewu umapelekedwa kwa Mlangizi wa Kumudzi yemwe amakatulanso kwa Alangizi a ku delaro komanso omwe akuyendetsa ndondomekoyi.

### **Udindo wa Magulu a Alimi**

- Kulandira ndi kugwiritsa ntchito ndondomeko imeneyi pa ulimi wawo
- Kunena za momwe ikuyendera ndondomeko imeneyi komanso kunena mavuto omwe akukumana nawo mu ndondomekoyi
- Kufalitsa uthenga wa ndondomekoyi kwa alimi ena kuti nawonso ayesere
- Kuyitana Alangizi kumisonkhano komanso kuwona momwe minda yachitsanzo ikuchitira
- Kuthandiza kukonza masiku a chiwonetsero kuti nawonso alimi amene asali m'magulu abwere kudzaphunzira
- Kusankha ndondomeko zomwe zili zabwino atatha kuziyesa kuti apitilize kugwiritsa ntchito mu ulimi wawo
- Alimi a gulu limodzi akuyenera kuyesetsa kukhala ndi minda moyandikana ndi cholinga choti athe kuyenderana mosabvuta
- Kupanga maphunziro okhudza ndondomeko imeneyi kuchokera kwa Alangizi awo a Kumudzi ndi Alangizi ena

### **Udindo wa Alangizi a Kumudzi**

Alangizi a Kumudzi ali ndi udindo, monga kukhala:

- Mlangizi
- Mphunzitsi
- Mlumikizi

Choncho Alangizi a Kumudzi akuyembekezeka kuchita izi:

- Kuthandiza kukonza ndondomeko pamodzi ndi alimi amene akuwatsogolera
- Kuthandiza Alangizi kuti aphunzitse magulu a alimi komanso alimi ena
- Kuphunzitsa mamembala a gulu lawo zokhudza ntchitoyi kudzera pa munda wawo ngakhalenso m'malo ena okumanira.
- Kutsogolera nthawi yowona minda yachitsanzo ngati yapindulitsa, pa nthawi ya ulimi komanso nthawi yokolora
- Kuthandiza kufalitsa ndondomeko zatsopanozi ku dera lomwe akukhala kuti alimi onse adziwe

- Kukonza misonkhano ndi alimi ndikupereka zotsatira ku gulu komanso kwa Alangizi
- Kukhala mkhala-pakati olumikizitsa alimi ndi Alangizi a boma kapena bungwe
- Kuthandiza kukonza ziwonetsero
- Kulemba zochitika pa munda wawo wa chitsanzo
- Kutsogolera pa zochitika zokhudza ntchitoyi
- Kulimbikitsa alimi kutenga nawo gawo pa ulimi wa makono
- Kupereka mapempho, zabwino komanso madandaulo a alimi a gulu kwa anthu oyenerera
- Kukhala mlangizi wa gulu lawo
- Kusamalira minda ya chitsanzo
- Kuyendera mamembala kuwonetsa kuti nawonso akutsatira malimidwe oyenerera

Alangizi a Kumudzi aphunzitsidwa njira zonse za ndondomekoyi kuti athe kuphunzitsa bwino alimi anzawo. Alangizi a Kumudziwa tsopano azipanga dongosolo lokambirana pa gulu lawo njira zatsopanozi, monga:

- Njira zomwe zikuthandiza komanso zomwe sizikuthandiza ndikupereka zifukwa zake
- Kodi angazisinthe bwanji njirazi kuti ziyanjane ndi nyengo ya malo
- Ndi luso lina lotani limene alimi akufuna kuti athe kupindula kwambiri ku mbewu za mtundu wa nyembazi komanso kuchoka kunjira zatsopanozi (monga bizinesi ya ulimi komanso kusamalira bwino zokolora)

### **Kupanga Ziwonetsero**

Pamene mbewuzi zikukula, mlangizi, alimi komanso anthu ochokera ku N2Africa ndi mabungwe ena ogwira nawo ntchito akhala akusiyantsa mbewu mu minda yinayi imeneyi pa nthawi zosiyanasiyana pofuna kuwona pa kakulidwe, kaberekedwe, komanso kachulukidwe ka tizilombo tobweretsa nayitulojini powona kuchuluka kwa mandolo.

### **Kuwona ndi kuphunzira**

Alangizi akonze masiku osachepera awiri omwe alimi adzawona ndi kuphunzira pa munda wa chitsanzo. Izi zichitike pakati pa sizoni, pamene wina aliyense akhonza kuwona kusintha komwe kukuchitika, komanso kumapeto a sizoni pamene aliyense akhonza kuwona momwe zokolora zasinthira pofanizira ndi minda yina. Njira zomwe zagwiritsidwa ntchito komanso chisamaliro chomwe chaperekedwa zikuyenera kufotokozeredwa bwino kuti wina aliyense amvetsetse.

Alangizi akhonzanso kukonza ziwonetsero za kapakidwe ka inoculant ku mbewu pamene mvula yobzalira yagwa. Izi zikuyenera kuchitika ngati mlimi aliyense wagulu walima munda wake ndipo akabzala mbewu yake akangoyipaka inoculant.

### **Masiku a chiwonetsero**

Alangizi a Boma kapena Bungwe amene akugwira ntchito ndi Alangizi a Kumudzi adzakonza masiku a ziwonetsero pamene mbewu ziri m'munda pofuna kuwonetsa kugulu kusintha komwe njira za kalimidwe za N2Africa zabweretsa.

## **ZINA ZOFUNIKA KUTI TIDZIWE PA ULIMI WATHUWU**

### **Ndi chani chingapangitse kuti tizilombo tilephere kubweretsa nayitulojini mu nthaka?**

- Zolepheretsa inoculant kugwira ntchito:
- Kugwiritsa ntchito inoculant olakwika
- Kulakwitsa ndondomeko yopakira inoculant
- Kuchedwetsa kubzala mbewu mutatha kupaka inoculant
- Kubyala mbewu yopaka inoculant pa dothi lowuma
- Ng'amba
- Kuzizira kapena kutentha kwambiri
- Dothi liri ndi asidi wambiri ndipo silinathiridwe layimu
- Dothi liri ndi fosifolasi ochepa
- Dothi liri ndi nayitulojini ochuluka ndi kale kuchokera ku fetereza wa nayitulojini yemwe wathiridwa kapena anathiridwa sizoni yatha.

### **Kuchulukitsa mbewu**

Pofuna kuti ulimi wa mbewu za mtundu wa nyemba ufikile anthu ambiri komanso kuti upite patsogolo ngakhale ndondomeko ya N2Africa yitafika kumapeto kwa ntchito zake, mlimi aliyense amene akutenga gawo mu ndondomekoyi akuyenera kupereka zina mwa mbewu zimene wakolora kudera lake kuti zigwiritsidwe ntchito mu ulimi wa chaka chamawa. Lamulo ndi loti pa kilo imodzi iliyonse imene mlimi alandire kuchoka ku ndondomekoyi, akuyenera kuzabweza makilo awiri akakolora.

Kuchulukitsa mbewuku kukhoza kuchitika pa munda wa mlimi aliyense kapena pa munda omwe mudzi kapena gulu lingasankhe kuti akhale ndi mbewu yambiri. Alangizi pamodzi ndi mlimi motsogozedwa ndi ogwira ntchito ku N2Africa akuyenera kugwirizana ndondomeko yambwino yakabwezedwe ka mbewu yomwe angatsate.

Zokolora zomwe zalimidwa ngati zochulukitsira mbewu zikuyenera kusamalika bwino potola mosamala, kusungidwa malo osamalika komanso ngati kungatheke, kuthira mankhwala pofuna kuteteza ku matenda ndi tizilombo.

Ku malo komwe kuli makampane opanga ndi kugulitsa mbewu, pakhoza kukhala mgwirizano ndi alimi osankhika omwe ali ndi minda yayikulu komanso omvetsetsa ndondomekoyi kuti achulukitse mbewuyi pa malonda a mgwirizano. Izi zimathandiza kuti mbewu ikhale yochuluka komanso yapamwamba kuti alimi ambiri athe kuyipeza akayifuna.

### **Kasamalidwe ka mbewu pamene mwakolora**

Mbewu zikuyenera kukoloredwa nthawi yoyenelera pamene zacha. Mukakolora, mukuyenera kusenda, kuwumika, kusankha komanso kusunga bwino. Kasamalidwe kamasiyana malingana ndi mbewu yomwe mwalima koma pali zinthu zina zomwe zimafana monga izi:

- Kolorani nthawi yabwino kuti mupewe kuwonongeka kwa mbewu zanu. Mukachedwa kukolora, zamiri zimathera pansu komanso mukafulumira kwambiri mumakolora zosawuma bwino.

**Kuwumika mbewu zidakali mu makoko:**

- Mbewu zomwe mwakolora zikuyenera kuyanikidwa zidakali mu makoko. Mukasenda zisanawume, zimawonongeka.
- Yanikani mbewuzi zidakali ku mtengo wake pa mkeka kapena pepala la pulasitiki kapenaso pa thandala osati padothi pomwe zingade ndikutenga matenda.
- Yanikani malo omwe sizinganyowe ndi mvula kapena munthu akhale pafupi yemwe angachotse pamene kukubwera mvula kapena kuthamangitsa ziweto zomwe zingathe kuwononga.

**Kusenda:**

- Pamene mukusenda onesetsani kuti mbewu zanu sizukusweka, osakaniza ndi dothi kapena zinyalara, kapena kumwaza mowononga.
- Osatibulira mbewu zanu pa dothi, pezani malo oyela bwino komanso pomwe sizimwazika.

**Kuyanika mbewu zosenda:**

- Yanikani mbewu zanu pa malo osamalika bwino monga mkeka kapena mphase komanso pomwe ziweto sizingawononge.
- Mwazani mbewu zanu kuti pazidutsa mpweya kuti ziwume bwino.
- Yesani ngati mbewu zanu zawuma poluma kapena kufinya. Ngati zawuma zimasweka osati kupindika.

**Kusankha mbewu zanu:**

- Yambani ndi kupeta kuti muchotse fumbi ndi makoko.
- Chotsani mbewu zonse zosweka, zamatenda, komanso zomwe ziri za mtundu wina.

**Kasungidwe:**

- Konzani malo osungira powayeretsa bwino komanso kuchotsa mbewu zonse za kale.
- Osasunga mbewu zanu za chakudya pamodzi ndi mankhwala omwe akhopza kuwononga moyo wanu.
- Gwiritsani ntchito matumba kapena zipangizo zoyera bwino zosungira mbewu. Ngati munagwiritsapo kale ntchito, zichapeni kapena kubwatitsa kuti tizilombo tife. Onesetsani kuti matumba ndi owuma bwino musanayikemo mbewu.
- Musagoneke matumba a mbewu zanu pa dothi kapena pa simenti koma muyike kaye mitengo pansu kuti matumba abwere pamwamba.
- Mupitilize kuyang'anira pakadutsa masiku ndi kuchotsa mbewu zomwe zawola.

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