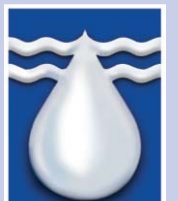


CLIMATE RESILIENT AGRICULTURE: PRACTICES FOR SMALLHOLDER FARMERS VOLUME 2 PART 7 FARMER HANDOUTS: ISIZULU

E Kruger, MC Dlamini, T Mathebula, P Ngcobo, BT Maimela & S Ntonta



**WATER
RESEARCH
COMMISSION**

TT 841/8/20



Climate Resilient Agriculture: Practices for Smallholder Farmers Volume 2 Part 7

Farmer Handouts: isiZulu

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Report to the
Water Research Commission
by
Mahlathini Development Foundation



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This report forms part of a series of 9 reports. The reports are:

Volume 1: Climate Change Adaptation for smallholder farmers in South Africa. An implementation and decision support guide. Summary report. (WRC Report No. TT 841/1/20)

Volume 2 Part 1: Community Climate Change Adaptation facilitation: A manual for facilitation of Climate Resilient Agriculture for smallholder farmers. (WRC Report No. TT 841/2/20)

Volume 2 Part 2: Climate Resilient Agriculture. An implementation and support guide: Intensive homestead food production practices. (WRC Report No. TT 841/3/20)

Volume 2 Part 3: Climate Resilient Agriculture. An implementation and support guide: Local, group-based access to water for household food production. (WRC Report No. TT 841/4/20)

Volume 2 Part 4: Climate Resilient Agriculture. An implementation and support guide: Field cropping and livestock integration practices. (WRC Report No. TT 841/5/20)

Volume 2 Part 5: Climate Resilient Agriculture learning materials for smallholder farmers in English. (WRC Report No. TT 841/6/20)

Volume 2 Part 6: Climate Resilient Agriculture learning materials for smallholder farmers in isiXhosa. (WRC Report No. TT 841/7/20)

Volume 2 Part 7: Climate Resilient Agriculture learning materials for smallholder farmers in isiZulu. (WRC Report No. TT 841/8/20)

Volume 2 Part 8: Climate Resilient Agriculture learning materials for smallholder farmers in Sepedi. (WRC Report No. TT 841/9/20)

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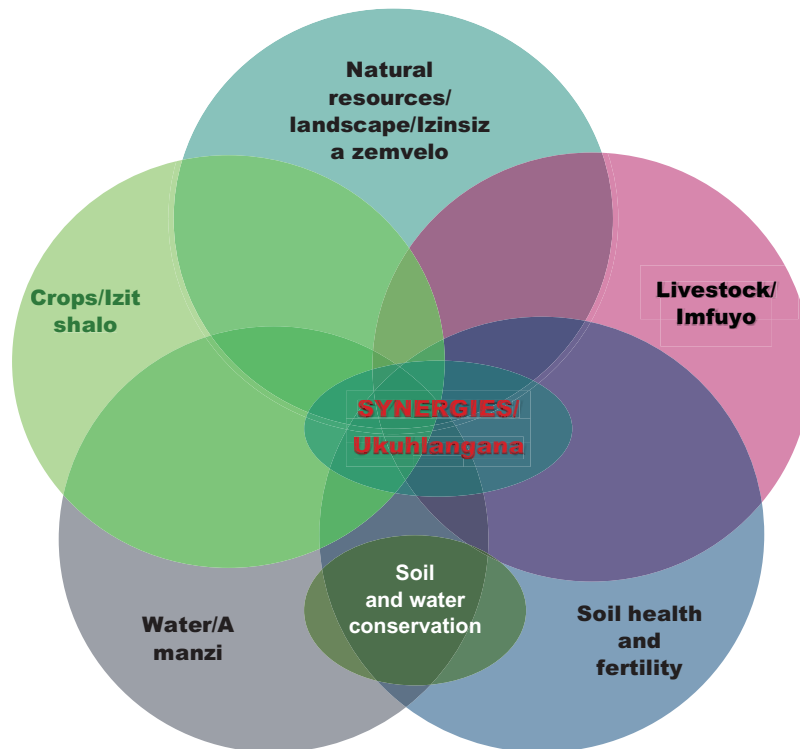
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Ezolimo ezibekezelela isimo sezulu: Izindlela zabalimi abancane

1 ZIYINI EZOLIMO EZBEKEZELELA ISIMO SEZULU?

Ezolimo ezibekezelela isimo sezulu zihlose ukukhuphula izinga lokukhiqiza nemali engenayo. Lokhu kuphinde kulekelelwe ukuvumela ushintso ezindleleni esilima ngazo olubheke noshintso olwenzeka ngasohlangothini lwezemvelo, Zibekezelela kakhulu ubungani ayi ubutha nezeMvelo. Ngale ndlela thina (balimi) kanjalo nemvelo siyakwazi ukumelana noshintso olwenzekayo kwezeMvelo . Kumayelana nokwenza izinguquko ekulimeni esimweni esishintshayo ezizokwazi ukulekelela thina kanjalo nemvelo ukumelana noshintsho.

Lapha sigcizelela kakhulu esigabeni sase khay. Ezolimo ezibekezelela isimo sezulu zihlose ukuthuthukisa ukukhiqizwa kwezitshalo nemfuyo, ukuphathwa kwamadlelo kanye nezinsiza zemvelo. Lokhu kuphinde kufake nokuphathwa kwenhlabathi kanye namanzi njengoba kuveziwe esithombeni esingezansi.



Isithombe 1: Indlela ekuhlangana ngazo izinhlobo ezahlukene mayelana nezolimo ezibekezelela ukushintsha kwezuluHousehold level implementation of ezingeni lasekhaya. (Ithathelwe ku Arslan, 2014)

Zibanzi izindlela zokulima ezingaba usizo. Umbono uthi asizame izindlela ezilungele thina, indawo esihlala kuyo siphinde siqhathise lezindlela nalokhu esivele sikwenza, ukuze sikwazi ukubona umehluko sikwazi nokuthatha izinqumo mayelana noshintsho endleleni esilima ngayo

Ukuhlanganisa izinhlobo ezahlukene zezindlela zokulima kukhuphula imiphumela yazo

Lezizindlela ziyachazwa ngezansi, Uma ufuna ulwazi ulungaphezulu xhumana nalama kheli:

www.mahlathini.org, www.amanziforfood.co.za

2 IMIGOMO

Imigomo/umqondo esigxile kuwo ekukhetheni izindlela zokulima ilena:

- Ukunciphisa ukusetshenziwa kwezinsiza kulima esingenazo
- Ukuphula ukuhluka kwezitshalo
- Ukugxila empilweni yenhlabathi nokuthola izindlela eziyimvelo zokwakha inhlabathi
- Ukunakekela imvelo
- Ukusebenzisa amanzi akhona ngendlela efanele
- Sisebenzisane, sifunde ndaonye siphinde sihle ndawonye

Zonke izindlela sesike sazizama nabilimi abancane eminyakeni esuka kwemithathu kuya kweyisishangalombili edlule. Siyazi ziyasebenza, ngakho ken awe sikufisela inhlanhla ekuzizameni kwakho zonke.

3 UKUPHATHWA KWAMANZI (UKUPHATHWA KWAMANZI ATHOLAKALAYO NOKUKUPHULA UKUFINELELA KWAWO KUBANTU)

3.1 INFILTRATION DITCHES (RUN-ON DITCHES, DIVERSION DITCHES)

Lena imisele engajulile (30 cm ububanzi Kanye 15-30 cm ukujula) embiwa ukuhambisa amanzi ngendlela ethile endaweni ethile (diversion ditches /imisele ehambisa) noma ukubabamba amanzi avunyelwe ukungene enhlabathini esendaweni etshaliwe (run-on ditches)

Ukutshala kungenziwa enhlabathini eseduze nomsele, ngokufaka umqhuba noma ikhomposi ,uphinde wenze isembozo lapho otshale khona nasemseleni kuwombono omuhle.

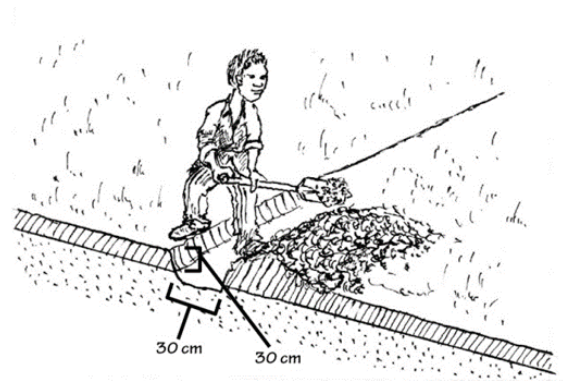
Lemisele ikhuphula ukufinyelela nokutholakala kwamazi uma kukhiqizwa ukudla nokuningi endaweni encane

Okudingayo:

- Imvula engaphuzulu kuka 150 mm ngonyaka
- Amazinga okushisha nokubanda angaphezulu kuka 5°C
- Indawo: Noma enjani
- Inhlabathi : 5-35% ubumba, ukujula >15cm

Ukwenza

- Ezingadini, amasimu
- Indawo engaphansi kuka 0,1ha, indawo esuka ku 0,1 ha kuya ku 1 ha
- Izindleko eziphansi, isinzisa ezitholakala endaweni
- Kulula ukuyenza nokuyigcina, idinga abantu abaningi abazosebenza



Umsele ohamabisa amanzi, owembozelwe kwase ku tshalwa ubhatata phezu kwenhlabathi ebhuthazeliwe



Ukumbiwa komsele endaweni ubume bayo obungu 1.5%, 30 cm ububanzi kanjalo no 30 cm ukujula, inhlabathi ibekwe ngasenhla komsele



Ukulungiselelwa kwenhlabathi ebuthazeliwe ukuze kukwazi ukutshalwa, ukuma kahle kanye nokufakwa komqhuba.

3.2 CUT OFF DRAINS/ SWALES

I-swale inhlabathi ebuthazelwe eduze komsele (40cm ukujula Kanye no 50 cm ububanzi) ohamba kwikhontolo. Inhlabathi ebuthazelwe iyaqondiswa ukuvumela ukutshala. I-swale ivimba amanzi ahamba engadini noma ensimini iwasabalalise ukuze ezokwazi ukungena ajule enhlathini. Ngokujwayelekile, izitshalo ozitshala kanye (njengezi hlahla zezithelo) zitshalwa ngezansi kwenhlabathi ebuthazelwe mase lezitshalo ozitshalo minyaka yonke zitshalwe bephuzulu kwenhlabathi ebuthazelwe.

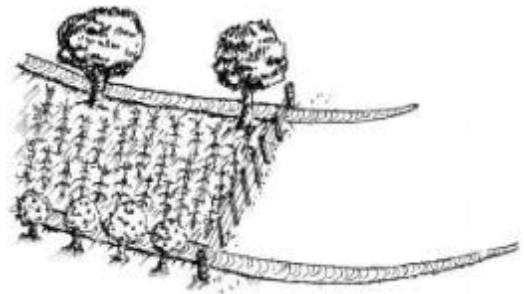
Okudingayo

- Imvula engaphezulu kuka 150 mm ngonyaka kuya kwengaphansi kuka 1200 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Indawo 5%-10%
- Inhlabathi: zonke izinhlobo - nakuba izinhlobo ezisahlabathi noma salubumba kakhulu kunzima ukuzisebenza



Ukwenza

- Izingadi, amasimu
- Indawo engaphansi kuka 0.1 ha kuya kweziphakathi kuka 01 ha kuya ku 1 ha, nangaphezulu kuka 2 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Inomsebenzi omuningi



Ukwakhiwa kwe- Swale nnesithombe isiveza indlela amanz ahamba ngayo kuma- swale amabili



Ukumbiwa kwe -swale inhlabathi ibekwa ngasohlangothini olwehlelayo



Isembozo singabekwa phakathithi emseleni naphezu kwenhlabathi ebuthazelwe



Ukumbiwa kwemibhede ejulile ngezansi kwe "swale"

3.3 FURROWS AND RIDGES

Imisele imbiwa kwikhontolo nehlabathi ibhekwe ngasenhla kwawo ibe imbundu. Ukutshala kwenzeka phezu kwemibundu kanjalo nokuchelela. Uyakwazi ukwakha ama- cross ties ukuze uqinisekise ukuchelela okuhle- lokhu kwenza amanzi agcwale emiseleni aphinde angene emhlabathini. Ukwemboza kuwumbono omuhle

Okudingayo

- Imvula engaphezulu kuka 150 mm ngonyaka
- Amazinga okushsa nokubanda angaphezulu kuka
- Ubume bendawo 0.5 -5%
- Umhlabathi: Zonke izinhlobo

Ukwenza

- Ezingadini, emasimini
- Indawo Engaphansi kuka 0.1 ha kuya kwe ohakathi kuka 0.1 -1 ha
- Izindleko eziphansi, izinsiza ezitholakala euze
- Kunomsebenzi omningi



Imisele nenhlabathi ebuthazelwe esetshenziswe emasimini, bhekisisa amatied ridges abamba amanzi



Ingadi enimsele nenhlabathi ebuthazelwe etshalwe utamatisi, izaqhathi, ispinash. Bheka imibhede ejulile engaphambili esithombeni esingakwesokudla.



Imisele emboozelwe esengadini etshalwe utamatisi. Ukuchelelela ukusazikhukhula uma kusebenziswa lemisele engadini.



Izihlahla zezithelo nazo zifakiwe mbhedeni kululuhlobo lukutshala

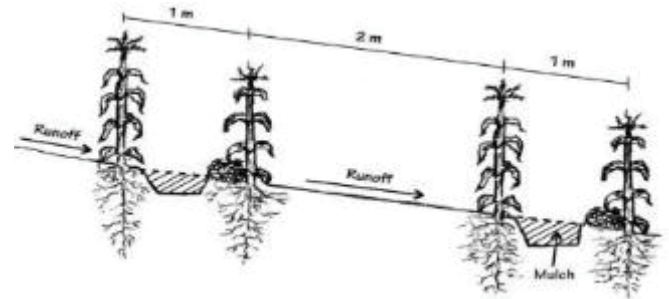
3.4 TIED RIDGES

Lendlala inyusa amanzi izitshalo ezikwazi ukuwathola ngokuqoqa imvula egeleza endaweni engatshaliwe eyehlelayo amanzi angene enhlabathini esandishi ebese ebanjwa imisele. Ukutshala kwenzeka nhlangothi zonke zomsele lapho amanzi asengene khona.

“Izindishi” zakhiwa ngokumba imisele engajulile phezu kwamakhontolo kanye nokwakha imibundu ngasohlangothini olwehlelayo lwemisele. Lokhu “kuboshwe” ndawonye imibundu engaphakeme eyakhiwa ngokushoyana ngezikhawu ezilinganayo uma ukudla umsele.

Okudingayo

- Imvula usuka ku 400- 700 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Indawo: 0.5%-7%
- Umhlabathi kumele uzinze. Umhlabathi okuyiwo ohamba phambili owubumba noma inhlabathi yangaphezulu- topsoil- ewvumela ukungena kwamanzi ephezu kwenhlabathi yangaphansi- subsoil engavumele ukungena kwamanzi



Ukwenza

- Ezingadini nase masimini
- Indawo engaphansi kuka 0.1 ha kuya endaweni esuka ku 0.1 ha kuya 1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Idinga abantu abningana ukuyenza



Imisele embozelwe engadini enama tied ridges.



Amanzi aqoqelana emiseleni ensimini etshalwe ummbila kwase kuba nama tied ridges.



Insimi encane enama tied ridges kwase kutshwala ubhatata nommbila eFreestate.

3.5 INFILTRATION PITS/ BANANA CIRCLES

Izindishi zimbiwa enhlabathini lapho kubonakala ukuthi amanzi ahamba khona (ukuze abanjwe kuohinde kuncishiswe nesivinini sawo). Lezi “ndisi” zigcwaliswa ngezinto ezibolayo ezivela ezitshalweni noma ezilwaneni. Enxube iphinde ixutshwe nomhlabathi ebese kutshwalwa izitshalo ezithanda amanzi ezifana nobhanana

Enye indlela yokwenza lokhu ukumba “indishi” lapho kuhamba khona amanzi ebese okubolayo kufakwe kancane kancane ukuze kuzobola kancane kancane. Lapha ubhanana utshalwa emphethweni noma onqenqemeni lwe “ndishi”

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushosa nokubanda angaphezulu kuka 5°C
- Ubume bendawo : 1.5% -25 %
- Umhlabathi : lonke uhlobo (5-30% ubumba) nokujula okungaphezulu kuka 30 cm

Ukwenza

- Ezingandini
- Endaweni engaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Kulula ukwenza nokugcina esesimweni, inomsebenzi omuningi



Izindishi ezincane zingenziwa, ziyambiwa mase ugqwaliswa



Indilinga kabhanana embozelwe kwase kufakwa nezinongo



Izindishi ezime sasitebhiso lapho kuhamba khona amanzi ensimini. Amatied ridges enziwa phakathi kwazi “ndishi”

3.6 ISEMBOZO

Umhlabathi umbizwa ngezinsalela zezitshalo ezahlukahlukene kanye nokubolayo ukuze kongeke amanzi, kulawulweamazinga okushisa emhlabathini nokunyusa izinga lempilo yomhlabathi

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushosa nokubanda angaphezulu kuka 5°C
- Ubume bendawo: 1.5% -25%
- Umhlabathi : lonke uhlobo (5-30% ubumba) nokujula okungaphezulu kuka 30 cm

Ukwenza

- Izingadi
- Indawo engaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Kulula ukwenza nokugcina esesimweni,
- Inomsebenzi omuningi



Ifucuza yamacembe imboze umbhede



Ilucerne noma utshani njenge sembozo endimeni elinyiwe ngokonga ngale kokunisela (dryland) ucerne or grass mulch of dryland. Conservation agriculture plot



iNapier fodder, umoba, izinsalela zombila njengesembozo emibhedeni etshalwe amaveje



Ukwemboza ngotshani kwemsele nenhlabathi ebutheziwe

I-TUNNEL

Inethi ewumbala ompunga evumela ukungena kwelanga ngamazinga ako 40% eli wu 4.2 m ubude * 6 m ububanzi, aphakeme kangako 2 m asethsenziwa ukuwakha amathaneli ngama khithi akhona. Ukugoba kwensimbi imisa ithaneli kwenziwa ngensimbi ebizwa ngokuthi ijig. Lezinsimbi ezigobayp zifakwa emhlabathini ebese inethi igaxwa phezu kwenzimbi ezigotshisiwe maqede lithungelwe kuzona izinsimbi. Ithaneli iboshelwa esikhonkwaneni nhlangothi zombili

Ngaphakathi ethaneleni kunembhede egujiwe evuleke ngo 1 m ubude 5 m. Ubhede ngamunye unikezwa ibhakede eliwu 20 l elixhunyelwe amapayipi avumele amanzi aphume kancane kancane. Inxube yezitshalo iyatshaalwa kanti namanzi asesebenzile nawo angaphinde asebenziswe.

Lama thaneli alungele zonke izindawo lapho ukutshala kungenzeka khoma, imibhede uyakwazi ukugubha kanti nokokunisela kuyatholakala

Ukwenza

- Ezingadini
- Endaweni engaphansi kuka 0.1 ha
- Izindleko nekhono eliphakathi nendawo liyandingeka kanye nokululekwa nokufunda.



Ithaneli eqeda kwakhiwa enamabhakede okunisela kancane(dripkit) kutshalwe ispinashi



Umuqa 1: Ngenhla ngakwesokunxele nangakwesokudla: ukusebenziswa kwentambo njesikhali sokumaka lapho ithaneli kumele ime khona. Ukusetshenziswa kwensimbi esambobo ukumbela izinsimbi ezigotshisiwe imigodi. Ukugotshwa kwezinsimbi kusebenziswa isimbi yokugoba 'jig', ukuxhunywa kwesinhlangatholi ezimbili ezigotshiwe ngensimbi yokuxhuma ejwayelekile

Umuqa 2 ngenhla ngakwesokunxele nangakwesokudla: "Ukutshalwa" kwezinsimbi ezigotshisiwe ezibombeni ezimbiwe, ukuthungelwa kwenethi ezinsimbini ezigotshisiwe ngaphambi kokuthi zifakwe. Ukudonswa nokuqiniswa kwenethi kuzona zonke izinhlangothi uma selifakiwe, ukuboshelwa esikhonkwaneni, ebese uqinisekisa ukufakakeka nokudonseka kahl noku qinisekisa ukuthi inethi ephansi emaceleni iyagqitshwa ukubambelisa ithaneli uma kufika imimoya enamandla

Umuqa 3: Ngenhla ngakwesokunxele nesokudla: Izibonelo zamathaneli aseqedliwe kwafakwanamabhakede okunisela kancane kancane (drip kit)

3.7 UKUKHONGOZELWA KWAMANZI

Ngokujwayelekile abalimi amanzi bawaqoqela ezitsheni, imiphongolo kanye noJojo. Kepha lokhu akubanikezi amanzi amaningi

Amathangi ambelwe ngaphansi komhlaba akwazi ukugcina amanzi athe xaxa. Lamathangi aqoqa amanzi aqhamuka ezakhiweni, emigwaqeni, nayinoma iyiphi indawo

ejwayelekile ukuze agcineke ngokubuningi (25 000- 40 000 litres) lawa ngamanzi anele ukunisela ingadi esuka ku 100- 200 m² izinyanga ezisuka kwezine kuya kweziyisithupha

Imigodi evulekile idinga ukumbiwa ebese mathangi ayakhiwa ngohlobo lwa simede oluyi “ferrocement”, izitini kanye ne geofabric kanye nebitumen

Okudingekayo

- Imvula engaohezulu kuka 450 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 1.5% -25 %
- Umhlabathi : lonke uhlobo (5-30% ubumba) nokujula okungaphezulu kuka 30 cm

Ukwenza

- Ezingadini
- Indawo engaphansi kuka 0.1 ha kuya endaweni esuka ku 0.1 ha kuya 1 ha
- Izindleko eziphezulu kumbe nomsebenzi omningi
- Izinga eliphezulu lwekhono nolwazi (isizo noqeqesho oluvela ngaphandle luyadingeka uma usaqala
- Amanzi akhiswa ngebhakede, noma aphampwe. Inzika yenhlabathi kumele ikhishwe ngebhakede njalo njalo ingakho lokhu kudinga ukwenza ngokuzimisela nokuqikelela.



Izindlela zasendaweni yaselimpopo sokukhongozela amanzi, izindishi imiphongolo 210 izigubhu 1000 L kanye nmathangi oJojo. Lezi zindlela zigcina amanzi amancane



Ilthangi leferrocement eligujelwe ngaohansi elinodonga lwezitini ukwakhela indawo yokubamba amanzi nophandla osusakhiwa



.Isbonelo sethange eligujwele phansi (18 m²) elinophandla lwathayela olusukayo (Acornhoek)



Isisefo sokuvimba inzika yenhlabathi ethangini elingu 25 000 L eliguwele ngaohansi ukunciphisa inzika yenhlabathi emanzini abekiwe



Ilthangi leGeofabric nodonga lwezitini nophanhlwa ukuze kuohephe. Umsele ofaka amanzi ungaphambili

3.8 UKUMBELWA KWAMATHANGE

oJojo bangasetshenziswa okuvuna amanzi aqhamuka ophahleni lwendlu. Kubaluk=lekile ukuqinisekisa ukuthi ogadasi namapayipi afanele ayaxhunywa

Ungakwazi ukusebenzisa uJojo ongagqitshwe wonke uma amanzi evunwa endaweni eyehlela kakhulu. Uma indawo yehlela amanzi angakwazi ukuphakwa esuka ethangini ngale ngokusebenzisa amaphampu noma amabhakede.

Ziphinde zibekhona futhi nezindlela zokusebenzisa oJojo ngaphansi komhlaba, nakuba kulezizimo kudingeka ukuba baqiniseke. Ukusebenzisa oJojo kulula kuno kulakha ithange.

Month	Average Monthly rainfall (mm)	Roof area (m ²)	Runoff coefficient	Runoff volume (litres)
Jan	115	43.6	0.9	4513
Feb	123	43.6	0.9	4827
Mar	109	43.6	0.9	4277
Apr	78	43.6	0.9	3061
May	61	43.6	0.9	2394
Jun	35	43.6	0.9	1373
Jul	30	43.6	0.9	1177
Aug	35	43.6	0.9	1373
Sep	55	43.6	0.9	2158
Oct	60	43.6	0.9	2354
Nov	80	43.6	0.9	3139
Dec	95	43.6	0.9	3728
TOTAL	876			34374

Itafula elincane eliveza inani lamanzi akakwazi okukhongozelwa endlini encane



i-Phampu ingasebenziswa ukuthela amanzi



Ogadasi namphayiphi afaka amanzi abalulekile uma kusebenziswa oJojo ukukhongozela amanzi aqhamuka ophahleni lwendlu



Amathangi angagqitshiwe wonke abekelwe ukuvuna amanzi engezayo



Amathange abelwe phansi

3.9 I-DAMU ELINCANE

Amadamu amancane angakwazi ukumbiwa enhlabathini enkwazi ukubamba amanzi (enobumba longaphezulu kuka 25%). Amadamu ajwayele ukulahlekelwa amanzi, aphinde agcware isikhathi esifishane kodwa aletha amanzi amaningi enhlabathini elapho embiwe khona.. Avamise kumbiwa lapho kuneziphethu khona ezizokwazi ukuwagcwalisa njalo njalo okanye lapho kugijima khona amanzi njalo azokwazi ukuligcwalisa.

Ungakwazi ukundlalela idamu ngopulasitiki kodwa kuphela uma kunamathuba okuthi lihlale ligcwele njengoba upulasitiki uguga kalula uma uzoshaywa ilanga.

Kuyenzeka ukuthi idamu lindlalelwe –bentonite ukuze livaleke nalapha futhi kumele kubhekwe ukuthi idamu lizohlale ligcwele yini



Izibonelo ezintathu zama damu amancane ambiwe emhlabathini ongakwazi ukubamba amanzi, inhlathi enobumba olungaphezulu kuka 25% ukuze ube nesiqiniseko. Leli elingakwesokudla idamu elikhu eliphakelwa umthombo ongasehla kwalo. Leli eliphakathi nendawo liphakelwa ipayiphi elinamanzi azihambelayo (ahamba ngale kwephampu) aqhamuka emfuleni.



Isiziba esincane esindlalelwwe ibentonite (ubumba oluphuze phakathi esizibeni) egcwaliswa esizibeni. Qaphela indlela izindonga zesiziba ezimi ngayo, zimi ngendlela evumela ukugqisheleka kwebentonite ezindogeni nangaohansi kwesiziba ukuze sivaleke (amanzi angabaleki



Isiziba esincane isimbiwe engadini yomohakathi esiphakelwa amanzi ageleza emgaqeni lase lindlalelwa ngopulasitiki.

3.10 UKUTHOLAKALA KWAMANZI

Ukuphathwa nokuthuthukiswa kwemithombo yokuthola amanzi ezindaweni akwazi ukuhamba afike emakhaya nasezi ngadini kungenzeka emiphakathini emincane yasemakhaya engamaqhembu

- Amaqembu asemiphakathi asebenzisana ndawonye ukuvumela ukuba ngubani ozoba inxenye (ayi bantu abanphezulu kwamashumi amabili isibalo) okudinga babe abantu abalimayo futhu abakhelene.
- Ibo abathola indawo okungatholakala kuyo amanzi eseduzane nalapho bakhe khona okungaba umthombo okanye indawo okungambiwa kuyo iborehole ebese bekhulumisana nonuhholi bendawo ngemvume yokuba bekwazi ukuwasebenzisa amanzi
- Emva kwalokhu kuba khona uhlelo lokuba ithangi okuyilo elizomukela amanzi ligcwaliswe ngamanzi amaqhamuka emthombeni wamanzi ngale kokusebenzisa iphamphu ahambe afike emakhaya kanye nasezingadini
- Ikomidi lamanzi kuhlela ibese libheka imithetho mayelana nokutholakala kwamanzi ikhaya ngalinye liphinde libhekelele nezezimali nezokukhokha.
- Bonke abantu abayi nxenye balindeleke ukuba babenomnikelo oyimali, basebenza ngekhathi kumbiwele amapayipi baphinde babhekelele okuphathwa kwamanzi ndawonye nabanye ozakwabo emaqenini
- Zonke izimvumo ezivela kwabaphethe ezamanzi knaye nomkhandlu kumele zitholakale kuphinde kube nehlelo lokunakekela ukuya phambili

Okudingekayo

- Rainfall: Imvula engaphezulu kuka 150mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo : noma enjani
- Umhlabathi: noma onjani
- Izindawo zokuthola amanzi imithobo okanye amnzi azombelwa

Ukwenza

- Emakhaya nasezingadini
- Indawo engapahnsi kuka 0.1 ha
- Izindleko ziphezulu, udinga izinsiza eitholakala endaweni nalezo ezingatholakali endaweni
- Kudingeka ulwazi kanti kuyasethsenswa, kudingeka ukuqeqesheka nosizo kwabanolwazi



Umthombo ombiwe kwenziwa idamu elincane. Ukuvikelwa komthombo kufaka ukufakwa kwepayipi egqitshwe emgodini ombiwe ngezanso kwedamu obe usumbozwa ngegravel, inethi kanye nomhlbathi ukuze uvikeleke. Ngalandela umthombo uyavikeleka, ngale kokuthi kuze kwakhiwe izakhiwe ezinkulu.



Isibonelo sethangi okuyilo elithwala amanzi asabalaliselwa emakhaya ngale kwephampu



Isibonelo sokuxhunywa kwemiphongolo emakhaya. Lemiphongolo ixhumene iphinde nebhola elivalayo uma amanzi esegcwele



Ukumbiwa kwe- borehole nokufakwa kwepayipi elisuka ethangini liya emakhaya

3.11 UKUPHATHWA KWAMANZI AMPUNGA

Amanzi ampunga amanzi ebekade esebenziselwa izinto sasendlini ezifana nokuwasha izingubo, izintsha kanye nokugeza kodwa lokhu akufaki amanzi 'amunyama' okunamanzi asezingeni zangasese kanye nendle engamanzi ehamba ngamapayipi okuchitha.. Amanzi ampunga avamise ukuba nensipho eningi nokunye. Ubungozi obungakhona ukuba namaciwane kwamanzi okungeniwa insipho kanye noqweqwe ngaohezulu komhlabathi uma ezosebenziswa njalo. Ukuqikelela ukusebenziswa okuphephile nokulahlwa kwamanzi ampunga kubalulekile. Lokhu kufaka ukusebenzisa umlotha nezinye izinto ezifana nembewu yemoringa ukubamba iphinde izikise insipho kanye nezindlela zokunisela ezizogwema amanzi ampunga ukuba athinte amacembe ezitshalo

Zintathu izindlela zokusebenzisa amanzi ampunga ezichazwe lapha

1. Amabhakede okunisela kancane

. Lezi izindlela zokunisela kancane kancane ezakhelwe imibhede ehlukeneyo, evamise ukuba 1m ukuvuleka kanye 5 m ubude ebese kufakwa ibhakede elingu 20 l. Ama 'drip kit' axhunywa lapho ezofakwa khona usenzele ezibombi zokunisela usebenzisa intambo, uphinde uzikhethela ukuqhelelana kwamaphayipi nokushiyana kwembobo ezinisela kancane kancane. Ngokujwayelekile amaphayipi amabili asebenzayo ahlukene kangango 30 cm. Ukunisela kwenziwa nsuku zonke.

Lamabhakede angaphinde ashitshwe afakwe nezisifo zokusefa umhlabathi, ukusefa amanzi ampunga namanzi okunisela angcolile. Kulezizimo kundlalelwa amatshe awuhlwayi phansi ebhakedeni ebese kulandela isihlabathi sasemfuleni esigeziwe. Isihlabathi sasemfuleni sifakwa esikwameni ukuze singaxubani namatshe uma amabhakede efakwa amanzi. Lezi zisifo kudingeka zishitshwe emva kwesikhathi esithile uma sekubonakala ukuthi izinga lokuhamba kwamanzi emaphayiphini liyehla. Amaphayipi angagezwa ngokuvula lezitobha ezivala lapha kuphela khona umbhede, lokhu kuvumela inzika okungenzeka yakhele emaphayiphini



Amatshe afakwe phansi ebhakedeni



Kokubili amatshe nesihlabathi kuyagezwa ngaphambi kokusebenziswa, ukuqinisekisa ukuthi ahlazekile ukugwema ukuvimbeka kokuphuma kwamanzi emaphayiphini



Isihlabathi esifakwe esikhwameni esivaliwe esibekwe phezulu kwamatshe, ukugwema isihlabathi ukuthi singene emaphayiphini



Isibonelo samphayipi amabili okunisela kancane kancane ahlukene kangango 30 cm



Izindilinga zobumanzi ezinziwe izimbobo ezifakwe izintambo zokunisela



Amanzi ampunga ohlelweni lokunisela kancane kancane

Lezizithombe zisinikeza indlela esikwazi ukuyibon ayokuchaza ukuthi loluhlelo lokunisela kancane kancane lwenizwa kanjani



Imbobo encane yenziwa emzimbeni webhakade maphansi nalo ukuze kuzofakwa 'indololwane' okuxhuma kanye nephayiphi elehlayo



Ibhakade libekwa phezulu kwento bese kuxhunywa iphayiphi elehlayo, ukuqiniseisa ukuthi amanzi anomfutho owanele emaphiyiphini.



Izibombo zenziwa lonke iphayiphi nhlangothi zombili ebese kufakwa intambi kapulasitiki eboshwe amafindo amancane ukuvumela okonsa kancane kance kwamanzi



Iomama benza izintambo zokufakwa eohayiphini lounisela kancane kancane



Amaphiyiphi okunisela kancane kancane ahlukene kangango 30 cm axhunywe ephayiphini elehlayo



Iphayiphi livalwa ngokuligoba ebese liboshelwa emhlabathini



Uma sekwenziwe, uhlelo lungahlolwa ukuqinisekisa ukuthi ubukhulu bezindilinga zobumnazi buyafana kozona zonke izimbobo zokunisela kancane kancane

2. Tower gardens

Ama tower garden akhiwa kusukela phansi ngokusebenzisa izigxobo ezine ebese ufaka inethi elivumela ukungena kwelanga okungango 80% usuzengeze izigxobo. Phakathi nendawo, insika yamatshe yakhiwa ngokusebenzisa ibhakade elivuleke nhlangothi zombili njenge ndilinga. Umbhede ugqwaliswa ngenxube elungiselelwa ngaphambi kokwakhiwa kombhede, lenxube yakhiwa izinxenye ezintathu (inxenye inhlabathi, inxenye umqhuba, inxenye umlotha- kudingeka umlotha omuningi ozokwazi ukukhucula amanzi asesebenzile. Izimbobo ezincane senziwa emaceleni esikwama kanye nezithombo ezitshalwe zime mpo phakathi kulezimbobo ezincane- ngokujwayelekile isipinashi noma ezinye ezitshalo ezisamfino. Ingaphezulu lombhede lingasebenzisela ukutshala ezinye izitshalo- njengo tamatshi ongaphinde ukwazi ukuzithandela ezigxotsheni. Umbhede ungandiselwa ngothela amanzi ensikeni yamatshe ephakathi nendawo nombhede.

Ukwenza

- Ukulawula ukusebenza kwamanzi ampunga
- Ezingandini
- Indawo engaphansi kuka 0.1 ha
- Izindleko ezincane kuya kweliphakathi, ikhono elincane kuya kweliphakathi kubandakanya nokufunda nokwelulekwa, izinsiza zitholkakala endaweni.
- Kuncane okwenzayo ukuyilungisa- nakuba izikhwama zidinga ukushintshwa emuva kwesikhathi (eminyakeni emithathu kuya kwemihlanu 3-5 years)



Ukwenza inxube yomhlabathi, umqhuba kanye nomlotha ezogqwalisa itower garden



Ukubekwa kwamatshe- ibhakade elincane elivulekile ngaphansi libekwa phakathi nendawo kombhede



Ukwakhiwa kwe tower garden- igqwaliswa ngenxube yomhlabathi aze amatshe afakwe ohakathi nendawo ebese iyakhuphulwa.



Ukuvulwa kwimbobo ezincane esikhwameni ukuze kutshalwe izithombo



Ukuniselwa phakathi nendawo ensikeni yamatshe.



Itower garden 'esivuthiwe' etshawe isipinashi, kale, spring onion kanye ne marigold

3. Keyhole beds

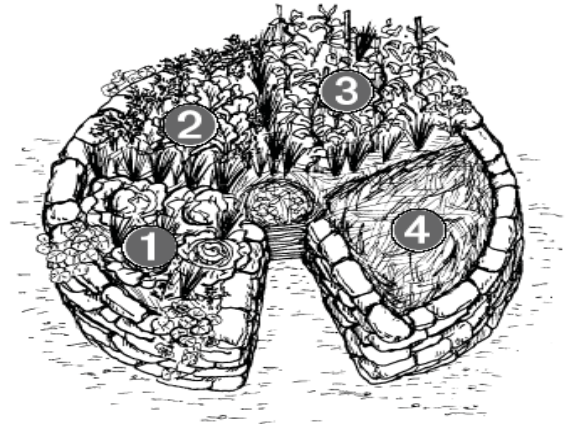
Lena imibhede eyakhiwa ezindaweni ezincane lapho iphakathi nendawo linobhasikidi wekhomposi ukuze kuchelelwe kanye nokufakwa kwamanzi asesebenzile. Imibhede elula ukuyinakekela. Imibhede emise okwendilinga evuleke kangango 3 m, ebese kuba khona “imbobo kakhiye” lapho ubhasikidi wekhomposi ugcwaliswa khona njalo njalo ngokubolayo kanye nokufakwa kwamanzi. Izindonga zakhiwe zaphakama kangango 60 cm kuya ku 80 cm ukuya phezulu ebese ugcwaliswa ngenxube yomhlabathi kanye nekhomposi okanye umqhuba kanye nomlotha. Ukelika noma l'bonemeal' nayo ingafakwa. Umbhede utshalwa izinhlobonhlobo zezitshalo noma uhlukaniswe ngesikhawu ukuze kulandelaniswe izitshalo

Ukwenza

- Ezingandini
Indawo engaothansi kuka 0.1ha
- Indleko ziphansi, ikhono elincane kuya kweliphakathi, ukufunda kanye nokwelulekwa , izinsiza saze ndaweni(amatshe kumele atholakale kalula njengob akudingeka amatshe angu 500 kg kuya ku 800 kg
- Kuncane okwenzayo ukuyilungisa



Ikeyhole eqeda kwakhiwa. Lapha iphakathi nendawo lakhiwe ngamashe amancane kunokuba kufakwe ibhasikidi wekhomposi



Umdwebo okhombisa ikeyhole kusukela ngasenhla lapha ubhasikidi wekhomposi uhlukaniswe kane ukuze kushintshaniswe izitshalo (izithelo, ukusakhaba, okunezimpane- okunemdumba)



Ikeyhole esivuthiwe etshalwe izinhlobonhlobo zezitshalo.

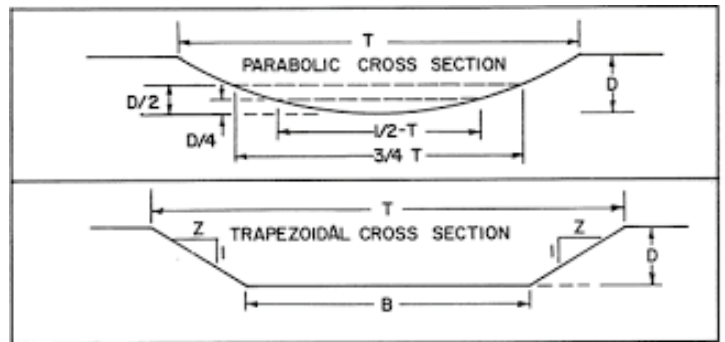
3.12 GRASSED WATERWAYS

Zindlela ezihmaba amanzi ezinziwe ngotshani zivulekile, azijulile zijwayele ukumisa okwe soso zakhelwe ukuhambisa amanzi aphezu komhlabathi ngale kokuguguleka. Lezindlela zisebenzisela ukuhambisa amanzi agelezayo emasimini ezindaweni eziphephile ezifana nemimfula.

- Ukwembozeka izitshalo kwalapho kuhamba khona mamanzi kunciphisa ukuhamba kwamanzi kuphinde kuvikele umgud u ekugugulekeni ngenxa yamanzi agijimayo.
- Ukutshala izitshalo ezinabayo notshani obungashi njenge paspalum, fescu, kikuyu kanye noqambalala kungcono kunotshala ukutshani obukhula bume obuphinde bushe.
- Uma ubuka ohlangothini kumele indela ehamba amanzi iqonde noma ibesandishi, ukujula kube okungenani okusukela ku 30 cm kuya ku 40 cm ubume bendawo ezindongeni kumele zinganyukeli okudla okukodwa kokune
(1 in 4)

Okudingayo

- Imvula engaohezulu kuka 450 mm ngonyaka
- Amazinga okushisa nokubanda angaohezulu kuka 5°C
- Ubume bendawo : 1,5%-25%
- Umhlabathi: zonke izinhlobo (5-30% ubumba), kanye nokujula okunga phezulu kuka 30cm



Ukwenza

- Emasimini
- 0,1-1ha, >1ha Indawo esuka ku 0.1 ha kuya ku 1 ha , nendawo engaphezulu kuka 1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Kulula ukwenza nokulungisa kodwa inomsebenzi omningi

Ukuma okusandishi noma okuqondile okungcinywa ukuthi kulungele indlela ezinhamba amanzi ezenziwe ngotshani. Qaphela izindonga lapho kungajulile khona (Michigan state University, (MSU Extension 2015))



Left: Erosion caused by run-off in a wheat field (MSU Extension, 2015)



The same field with a grassed waterway installed a few years later, (MSU Extension, 2015)



Paspalum (Bahia Grass) is a good option for waterways – it is tough and drought resistant



Tall Fescue remains green throughout winter



Couch grass (*Elymus repens*), is considered a weed, in cropping land but it grows well even in poor soils and provides good cover for a waterway

4 UKUPHATHWA KOMHLABATHI (UKULAWULA UKUGUGULEKA, UMNOTHO WOMHLABATHI KANYE NEMPILO YOMHLABATHI)

4.1 STONE LINES / BUNDS

Amatshe atakwa saluthango phezu kwekhontolo ukuze alawule ukuhamba kwamanzi kuphinde kulekelele ukwakheka kwenhlathi ngemuva kwawo amatshe. Amatshe “akhiyelwe” emseleni ngokuthi ambelwe umsele ongajulile lapho khona amatshe amakhulu ebekwa lapho kwehlela khona kakhulu ukuze uthango lwamatshe lungawi kuphinde kuvumele nokuhamba kancane kwamanzi phakathi namatshe. Ukutshala kungenziwa ngezansi kothango lwamatshe njengoba kujwayeleke ukuthi abemaningi amanzi akhala lapho okanye ngenhla kwalo uthango lwamatshe lapho kwakhela khona umhlabathi noma inzika yenhlabathi

Okudingayo

- Imvula engaphezulu kuka 1500 mm ngonyaka
- Amazinga okushisa nokubanda angaohezulu kuka 5°C
- Ubume bendawo 0.5%-5%
- Umhlabathi- zonke izinhlobo- nalapho amatshe etholakala khona kalula

Ukwenza

- Ezingadini, nasemasimini
- Indawo usukela kwengaphansi kuka 0.1 ha kuya kwephakathi kuka 0.1 ha- 1 ha, nangaphansi
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Inomsebenzi omningi



Stone lines- akhiwa phezu kwekhontolo kanti angenzinwa endaweni noma engakanani



Sibona amatshe “akhiyelwe” emseleni, amakhulu lapho kwehlela ngakhonaa ditch kunalawa amancane.



Amatshe amancane asebenzisela okulawula ukugeleza kwamanzi emgwaqeni awahambise ezingadini



uBrinjals utshalwe enzakeni eseyakhe ngenhla kwengadi ematsheni aluiende



uBanana utshalwe ngenzansi kwamatshe alujenge asebonakala

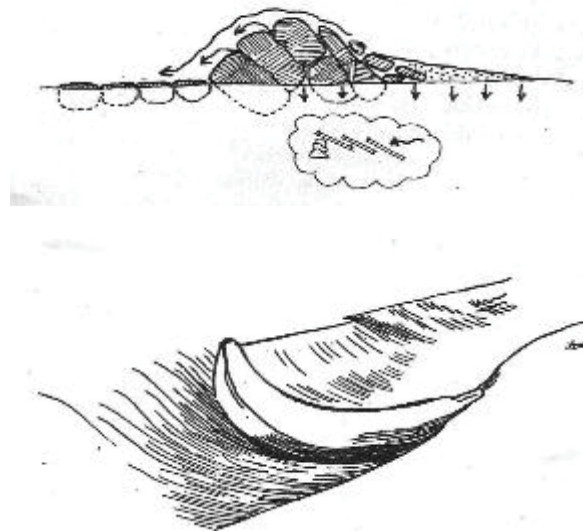
4.2 CHECK DAMS

Icheck dam idamu elincane elingakiwe inomphelo maqondana nomsele kumbe lapho kunezimpawu zokuhamba kwamanzi ukuze kunciphiswe ukuhamba kwamanzi nesivinini sawo ukuze inhlabathi ikwazi ukwakhela lapho. Ziningi izinto ezingazebenziswa okubalwa kuzona umhlabathi, amatshe, izingodo kanye nokutshaliwe. Amatshe kanye nokunye kwakhelwa endaweni eyehlelayo noma kwikhontolo ukunciphisa ukuguguleka okungenzeka kwenziwe amanzi azihambelayo. Umphumela walokhu okwakheka kwetebhisi ezinomhlabathi onothile ongavumela okutshalwa kwezitshalo

Ama check dams ajwayele ukubekwa uvundle lapho kubonakala ukuthi amanzi ayahamba khona ngemumva kwezimvula, kodwa engihambi khona unomphelo. Ayabekwa nalapho kuguguleke khona. Asebenza kahle ukwenza imigwaqo izinze noma izindlela eziqamula lapho kuhamba khona amanzi. Amatshe aziyicaba kunalawo angorawondi iwona amahle. Amatshe abekwe abekwe ngaphansi kumele avuleke ngamanani 30 cm- 60 cm ebese isindo sibe 5 – 9 kg. Amatshe amancane aphezulu nokuyiwo asa “phinifa” kumele abe 15- 22 cm ukuvuleka. Kungawumbono omuhle

Okudingayo

- Imvula engaphezulu kuka 1500 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 0.5%-5%
- Umhlabathi- zonke izinhlobo- nalapho amatshe etholakala khona kalula



Idonga oselakhela ensimini



Ukumbiwa komsele wokukhiyela amatshe echck dsam



Izibonelo secheck dam ene “phinifa” ngezansi kodonga nokuma kwayo okusabananan



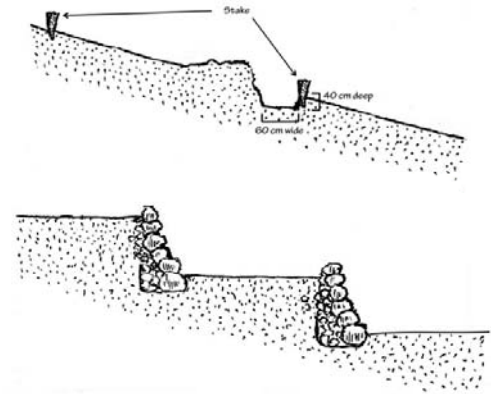
Ukuqalwa kukutakwa kwamatshe e check dam amatshe amakhulu aya ngenzasi

4.3 TERRACES

Iterrace umhhube oqondile womhlabathi owakhiwe wagudla ikhontolo endaweni eyehlelayo yase iphaswa ngehlabathi, noma amasthe noma imiqo yama thayi amadala. Ama terrace akha indawo ezinzile yokutshala obekungaba azitshaleki ngenxa yokwehlela okwekhulu . Amaterrace mase emaninngi ajike abukeke ngzitebhisi ezinciphisa amanzi agelezayo, akhuphule ukungena emhlabathini ebese esiza ekulawuleni ukuguguleka komhlabathi. Amaterreace akhiwa ezindaweni ezehlela kakhulu.

Okudingayo

- Imvula engaohezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5° C
- Ubume bendawo: 10%-40%
- Soil: all types – where stones and rocks are easily available Umhlabathi : zonke izinhlobo lapho amatshe etholakala khona kalula
- Ukwenza
- Ezingadini nasemasimini
- <0,1ha, 0,1-1ha, >2ha indawoo enngaohansi kuka 0.1 ha indawo ephakathi kuka 0.1 kuya ku 1 ha, nendawo engaphezulu kuka 2 ha
- Indleko ziphansi, izinsisa zitholakala endaweni
- Inomsebenzi omningi



Slope		Distance between terraces (meters)
Percent	Ratio	
10%	1:10	8.0
15%	1:6.7	5.3
20%	1:5	4.0
25%	1:4	3.2
30%	1:3.3	2.7
35%	1:2.8	2.3
40%	1:2.5	2.0



Amaterrace angamatshe emasimini



Sibona ubume bendawo (20%) kwakhiwa amaterrace kutshalwe umbila



Ama-Terraces angakhiwa ngokusebnzisa amasondo amadala ezindaweni lapho amatshe engatholakali



Sibona ubume bendaw (40%) kwakhiwe amaterrace endaweini eyehla kakhulu. a steep bank.

4.4 UKUPHUCULA IZINGA LOKUBOLAYO

Ukuphucula izinga lokubolayo emhlabthini kubaluleke kunayinoma isiphi isigaba sokusebenza. Izindlela zifaka:

- Ukwengeza umquba. Ukuphucula izinga lomquba ngokuqoqa kuphela lowomquba onomchamo ezibayeni, lapho kusetshenziswa khona utshani ngengombhede wokundlala ebese kuyambozwa ngocwazi. Kubekwe okungenani izinsuku ezinhlanu kuya kweziyisikhombisa ngaphambi kokuba isetshenziswe.
- Ukwengeza ikomposi ngokundlala okomile, okusuhlaza, umquba kanye nenhlathi emanzi ngokwanele.
- Izinsalela zizitshalo ezisanhlamvu, satshani, samdumba, samfino kanye nama chenopods
- Isembozo esijulile noma isiyishidi

Ukuthola zinsiza ezinezinga eliphezulu lemisoco edingekayo njenge skhuthazi Nitrogen kanye ne Carbonis kubalulekile. Ezinye izinsalela zezitshalo zinesibalo esiphezulu siminye ymisoco edingekayo efana no Potassium (comfrey) kanye ne silicon (stinging nettle)

Okudingayo

- Imvula engaphezulu kuka 150 mm ngonyaka kodwa engaphansi kuka 1200 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 5 % - 25 %
- Umhlabathi- zonkke izinhlobo nakuba umhlabathi osasihlabathi kakhulu noma salubumba kakhulu ungaba nzima ukulawula

Ukwenza

- Ezingadini nasemasimini
- Iindawo engaphansi kuka 0.1 ha indawo ephakathi kuka 0.1 kuya ku 1 ha, nendawo engaphezulu kuka 2 ha
- Indleko ziphansi, izinsiza zitholakala endaweni
- Inomsebenzi omningi

Kg/Ton	Cow	Horse	Goat	Sheep	Pig	Chicken	Rabbit	Purchased compost
N (Nitrogen)	5	6	14	7	5	13	18	5
P (Phosphorous)	2	3	2	3	4	11	13	2
K (Potassium)	3	6	6	4	6	20	6	8



Isibaya sezimbuzi sindlalelwe usthani ukuphucula izinga lomqhuba



Ingqumbi yekomposi eyendlalelwe okomile okuluhlaza, umquba kanye nenhlathi emanzi ngokwanele mase kuyamboza



Icomfrey, izinsalela zotshan nezambila nenxube yezitshalo eziyizembozo- ujika nelanga, amabele, dolichos kanye nonbhintshis

4.5 PLANTING LEGUMES AND GREEN MANURES

Izitshalo ezimdumba zibaluleke ngokuthi zikwazi ukufaka isikhuthazi iNitrogen esimoyeni enhlabathi ziphinde ziphucule nezinga notha komhlabathi nempilo yayo inhlabathi ukuze izitshalo eziseduze nezizolandela zikwazi ukuzithola lesikhuthazi. Ungakwazi ukuzitshala kanye kanye nezinye izitshalo okanye uzilandelanise nezinye.

Izibonelo zalelezitshalo ezitshala ngezikhathi ezifundumele zibandakanya ezitshala ngezikhathi ezifundumele zibandakanya ezitshala ngezikhathi ezifundumele zibandakanya ilezi sugar beans, runner beans, cowpeas, Jugo beans, ground nuts, Dolichos (Lab-Lab), Velvet beans (Mucuna), Jack bean, mung beans, chickpeas, lentils, Lucerne and Sun hemp. Zibonelo zalelezitshalo ezitshalwa ngezikhathi ezipholile ilezi peas, broad beans, vetch, and clover.

Izitshalo ezingama green manure zitshalelwa ukuphendulelwa emhlabathini, ngaphambi kokuthi ziqhakaze lapho ezisebenzisa khona imisoco eminingi ebandakanya isikhuthazi iNitrogen zibe sezi fakwa emhlabathini ukwenzela izitshalo ezizayo. Zivamise ukuba izitshalo ezinemdumba ezifana ne nevetch neclover, ukuyizinhlamvu nokusatshani njenge black oats kanye ne fodder rye ukusamfino okufana njenge foolish, radish, turnips, mustard kanye neconola kanye nama “chenopods” njengembuya

Okudingayo

- Imvula engaphezulu kuka 150 mm ngonyaka kodwa engaphansi kuka 1200 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 5 % - 25 %
- Umhlabathi- zonkke izinhlobo nakuba umhlabathi osasihlabathi kakhulu noma salubumba kakhulu ungaba nzima ukulawula

Ukwenza

- Ezingadini nasemasimini
- <0,1ha, 0,1-1ha, >2ha indawo enngaohansi kuka 0.1 ha indawo ephakathi kuka 0.1 kuya ku 1 ha, nendawo engaphezulu kuka 2 ha
- Indleko ziphansi, izinsisa zitholakala endaweni
- Inomsebenzi omningi



izindumba nexhuthswe nommbila



uLablab utshalwe njenge green manure endimeni okulandelaniswa kuyona izitshalo



Izitshalo eziyisembozo, ebusika, saia oats, fodder rye kanye ne fodder radish



Ubhontsisi, oqatha imbuva kanye ne clover ebomvu

4.6 IMIBHEDE EJULILE

These are intensive gardening beds, dug out and filled with material for in situ composting.

- A bed is dug out to 60-80cm depth, around 1 m wide and 1-10m long.
- It is filled with a range of organic matter; manure, dry material, green material and soil
- Other layers could include tins at the bottom for iron and water holding, or sticks
- Bone meal and lime can be added to increase fertility
- Bones, skins and feathers can be added for P
- Ash can be added for K
- The bed is built up in a small basin, planted and mulched

Okudingayo

- Imvula engaphezulu kuka 350 mm nginyaka
- Amazinga okushisa nkubanda angaphezulu kuka 5°C
- Topography: 0,5%-5% Ubume bendawo 0.5 % -5%
- Soil: all types

Ukwenza

- Ezingadini
- Indawo engaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsiza uzithola endaweni
- Kulula ukuyinakekela, inomsebenzi omningi



imibhede ejulile imbiwa ukujula okusukela ku 60 cm kuya ku 1 m. Ubhede undlalwa ngamathini madla namagatsha phansi



Izendlalo zokubolayo kube sekufakwa njenge zinsalela zommbila, amacembe, ukhula kanye no tshani



Kube sekufakwa umquba, ulandelwe inhlabathi yangahezulu. Loku kuyachelelwa ebese kuphinde kuqalwe phansi ne



I Uma kukhona, isendlalo sokuluhlaza okubolayo njengo khula, amacembe, amakhasi amaveje nezinsalela ziyafakwa emva kukufakwa kokomile



Imibhede ejulile yakhiwa emgodini ongajulile ebese kuba khona ukusandishi phakathi embhedeni lapho kushalwa khona izimbewu nezithombo.

4.7 IMIBHEDE ENGAJULILE

Imibhede egujiwe ayangajula iyindlela elula yokwenza imibhede egujiwe. Lembhede imbiwa ngokujula okungango 30 cm ebese igcwaliswa ngokubolayo, umqhuba, isinsalelela zezitshalo ezomile noma ezimanzi

Lemibhede ijwayele ukusebenziswa kakhulu uma kwenziwa imisele nemibundu eyakha indawo edle ngobude enmhlabathi ovundile- ilungile kakhulu izingadi ezithe ukuba nkulu kanye nama simu. Kulemibhede ukwemboza kubalulekile kanjalo nokuxubanisa izitshalo kanye nokuzishintshanisa. Lemibhede ingathatha iminyaka esuka kweithathi kuya kweyisishagalombili ukuze uphinde uyigcwalise

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 0.5-5%
- Umhlabathi-zonke izinhlobo

Ukwenza

- Ezingadini
- Indawo engaphansi kuka 0.1 ha
- Izindleko eziphansi, insiza zitholakala endaweni
- Kulula ukyinakekela, inomsbenzi omningi



Ukumbiwa komsele ongajulile 30 cm ububanzi no 15 cm ukujula phezu kwekhontolo nsimini



Ukuqala ukugcwaliswa komsele ngomqhuba, ukuluhlaza kanye nezitshalo esezomile



A garden with shallow and deep trench beds with mixed cropping and mulching Ingadi emibhede engajulile nejulile kwatshalwa izinhlobonhlobo zezitshalo kwase kwembozwa

4.8 ECO-CIRCLES

Lena imibhede emincane eziyizindilinga embiwe yaphinde yakwakwa umquba noma ikomposi. Ama Eco circle aniselwa kancane kancane mgokusenbenzisa isgubhu esingu 2 litre esibhobozwe ezimbobo emaceleni, lesi sigubhu (2l) "sitshwala" phakathi nendawo nombede.

Ama ecocircle alungele kakhulu izingadi ezincane kanti futhi iphinde ibe indlela yoqalisa ukufunda ngobuhle bokujula komhlabathi ukuze izimpande zijule, ukubaluleka kokubolayo engadini, ukwemboza kanje nendlela ehlelekile yokunisela.

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 0.5%-5%
- Uhlobo lomhlabathi- zonke izinhlobo

Ukwenza

- Ezingadini
- Indawo engaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsisa zitholakala endaweni
- Kulula ukuyinakekela, inomsebenzi omningi



Ukumbiwa kwama ecocircle ukubamazi kusukela ku 1 m kuya ku 1.5 m, ukujula 30 cm, kwengezwe ngomunye u 15 cm kuxhutshwa khina nomqhuba., ngaphambi kokubuyisea inhlabathi ixhutshwa nomqhuba noma ikhopmosi



Ieco circle esiqediwe yase ijikelezwa ngamatshe. Unxantathu oyizinkuni usebenzisela ukutshala izitshalo izikotelayo ezifana no bhintshisi notamatisi



Ieco circle emboziwe kwase kufakwa esingu 2L phakathi nendawo kwatshala izitshalo zokunonga

4.9 UKUFAKWA KWAMANYOLO KANYE NOKELIKA

Omanyolo bafakwa ngokwezingcomo zemiphumela yokuhlola komhlabathi, ufakwa duzane nezitshalo ezikhulayo kunokuba ufazwe noma ufakwe ebandeni. lokhu konga umanyolo kuphinde kwenze umanyolo ukuthi ufakwe lapho odingeka khona kuphela, okukhuphula uzinga lokusebenza kwawo. Ukelika ufakwa emahholweni noma emiseleni phezulu kwenhlabathi- lokhu kwenzelwa ukunciphisa isimuncwana enhlabathini, ukelika ungaphinde ulinyelwe ensimini noma endimeni ngaphambi kokuqalisa ukutshala ngokonga

Okudingekayo

- Imvula engaphezulu kuka 450 mm ngonyaka
- Amanzinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo 1.5 – 10 %
- Umhlabathi: zonke izinhlobo- kulawulwa izingcomo zemiphumela yomhlabathi

Ukwenza

- Ezingadini, emasimini
- Indaawo engaphansi kuka 0.1 ha, kuya endaweni esukela ku 0.1 ha kuya ku 1 ha nasezindaweni ezingaphezulu kuka 2 ha
- Izindleko eziphakathi, kunciphisa ukusebenza kwenzisa kulima ngokuzisebenzisa ngendlela.
- Inomsebenzi omningi



Ukuphendulwa kuka kelika ngaphambi kokuqala ukulima ngokonga



Ukufakwa kuka kelika emiseleni ezotshwalwa ubhontshisi



Ukufakwa kuka kelika emahholweni/imigodi kusebenziswa isivalo njengsikali



Ukubekwa kuka manyolo (ibanda) bengezansi ngokuqelelana okungango 2 cm nembewu



Ukusebenzisa umshini wokutshala okhipha umnayolo nembewu ngesikhathi esisodwa



Ukukala umanyolo kuseneziswa i-teaspoon.

4.10 ZAI PITS / UKUTSHALA EMAHHOLWENI

I-zai wumgodi wokutshala ojwayele ukuvuleka kangango 20cm kuya ku 40 cm ebese ijula okungako 10cm kuya ku 20 cm .I zai ibamba imvula knaye namanzi agelezayo ivikele imbewu kanye nokulayo ekugugulekeni. Aphinde alekelele ukuhlaliseni amanzi nemisoco edingwa izitshalo. Imigosi imbiwa ngesikhathi lingani izulu. Umhlabathi osuke usimbiwe wenziwa imibundu sakujikeleza umgodi ukuze ukukhuphuke izinga lokubambeka kwamanzi emgodini. Emva kokumbiwa kwemigodi, ikomposi yezinto ezibolayo iyafakwa ngesikali esingango 600 g umgodi ngamunye ebese emva kwezimvula zokuqala emgodi ebese uyambozwa ngomhlabathi imbewu ifakwa phakathi nendawo nomgodi

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo : 1.5% -25%
- Umhlabathi zonke izinhlobo (5%-30% ubumba) kanye nokujula ukungaphezulu kuka 30 cm

Ukwenza

- Ezingandini, emasimini
- Indawo esukela ku 0.1ha kuya ku 1ha
- Izindleko ziphansi izinsiza zitholakala endaweni
- Kulula ukuyenza nokuyigcina, inomsebenzi omningi



Ama "zai pits" ezweni lase Kenya, kutshalwe ummbila wase wembozwa ukuze kukhuphuke izinga lokubambeka komswakamo nomnotho womhlabathi (sithathwe permies.com,2017)



Ama "zai pits" ensimini egugulekile, nekhomposi esilungele ukufakwa (sithathwe Chris Reij,2010)



Umbila otshalwe kuma "zai pits" ezweni lase Kenya (sithathwe Inadesforum.net)

4.11 UKULIMA NGOKONGA

Indlela yokutshala emasimini esebenzisa lemigomo:

- Ukuphazanyiswa okuncane komhlabathi, akulinywa, kuvulwa imigodi, amahholo kanye nemisele.
- Ukumbozeka komhlabathi, insalela zezitshalo zishiywa ensimini ukuze zizoba isembozo somhlathi, izitshalo zishiywa ensimini esikhathini eside ukuze zizositha izitshalo ezisaphila.
- Ukuxuba izitshalo: ukuzihlanganisa, nokuzishintshanisa ebesekekufakwa zitshalo eziyizembozo sasehlobo kanye nesasebusika

Ukulima ngokonga kuphucula impilo yomhlabathi, ukunotha kwayo, isivuno kanye nokubambeka kwamanzi enhlabathini. Kunciphise amanzi agelezayo, ukuguguleka kanye namazinga okushisa nokubanda emhlabathini. Kuphinde kunciphise ukuqhekeka nokugqisheka komhlabathi

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo: 1,5%-15%
- Umhlabathi: zonke izinhlobo (5%-35% ubumba)

Ukwenza

- Ezingadini, emasimini
- Indawo engahansi kuka 0.1 ha, indawo ephakathu kuka 0.1 kuya ku 1 ha nendawo engaphezulu kuka 2 ha
- Izindleko ziphakathi (imbewu, umanyolo, imithi) imishini yokutshala, izinsiza esisendaweni
- Inomsebenzi omningi



Izinhlobonhlobo zimishini yokutshala, MBLi(ozenza sageja) Haraka (isondo), Matracca(uyaphonsa) kanye nemishini edonswa izinkabi (knapik) ngezansi



Umgomo 1: Ukuphazamiseka okuncane komhlabathi



Ukutshala emiselni nase ma hholweni kusebenziswa igeya ezandla kanye nimishini yokutshala 'MBLi' ngale kokulima.



Umshini ondoswa uganda ganda otshwalo olwayini amabili ungalimanga.



Ukusebenzisa iHaraka –isondo. Lomshini ukwazi ukutshala izimbewu ezahlukenene, kodwa awukwazi ukufaka nomanyolo ngesikhathi esisodwa



Ukusebenzisa umshini odonswa izinkabi otshala ungalimanga.

Umgomo 2: Ukumbozeka komhlabathi



Ukumbozeka okuhle komhlabathi ngezinsalela zezitshalo



Ukwembozwa kwendima elinywe ngokonga ukuze ithole ukuvikeleka



Amanzi Agelezayo (akhanyayo) - 42 mm

Indima elinywe ngokonga enesinsalela zezitshalo. Amanzi agelezayo awanakho okungcola



Amanzi agelezayo anqolile 195 mm

Insimu elinyiwe enganzo insalela zezitshalo amanzi agelezayo anokungcola

Umgomo 3: Ukuxuba izitshalo



Indima etshalwe ummbila nezindumba olayini ngababili besondelene



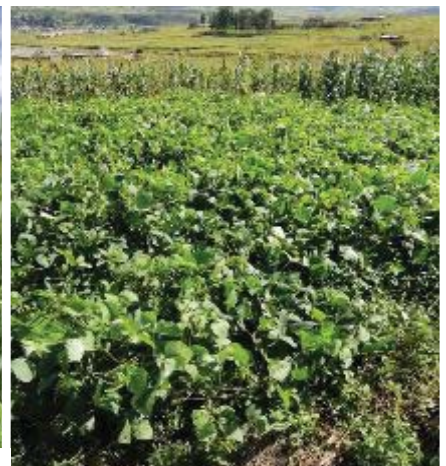
Indima etshalwe ummbila nobhontshisi olayini ngababili besondelene



Izitshalo eziyizembozo sasebusika, saia, black oats, forage sorghum, kanye ne fodder radish



Izitshalo eziyizembozo sasehlobo, ujika nelnaga amabele kanye nosunhemp



Ulab-lab (dolichos)

4.12 STRIP CROPPING

i-Strip cropping indlela yokutshala lapho ezitshalo ezihlukene zitshalwa ngemicu ngokulandelana ukuvimbela ukuguguleka komhlabathi nokukhilisa izinga lothathwa kwezakha mziimba zezitshalo enhlabathini. Utshalwa kwemicu kumele kuvundle ikhontolo. i

.Izitshalo zidinga ukukhethwa ngendlela yokuthi izimpande zijule ngokuhlukana nezidingo zezakha mziimba. Ukutshala ngemicu kwezitshalo ezimisebenzi eminingi enyahlukene kuwombono omuhle. Izitshalo ezinobuhle bezolimo nezamahlathi ezifana ne pigeon pea, moringa, sesbania sesban, leuceana zisebenza kahle. Utshani obunjenge vetiver, lemon grass, napier fodder nazo zingasebenziswa kanjalo ne Rhodes- smutsfinger(imxube ye digitaria, paspalum notatum kanye netall fescue

Okudingayo

- Imvula engaohezulu kuka 350 mm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo: 1,5%-15%
- Umhlabathi: zonke izinhlobo (5%-35% ubumba)

Ukwenza

- Ezingadini, emasimini
- Indawo enngaohansi kuka 0.1 ha, esukela ku 0.1 ha kuya ku 1 ha nengaohezulu kuka 2 ha
- Izindlekoziphansi (imbewu, izinsiza ezitholakala endaweni)
- Inomsebenzi omningi



Imicu yambila kanye neLucerne noma lesopdeza



Imicu yambila kanye nePaspalum ne Digitaria



Imicu yatshani phakathi nommbila phezu kwekhontolo



Imicu ye Pigeon pea/Leuceana kanye nommbila

5 UKUPHATHWA LWEZITSHALO (IZINDLELA ZOKUTSHALA, IMPILO YESITSHALO, UKWANDISWA, NOKUKHIQIZWA KWEZITHELO)

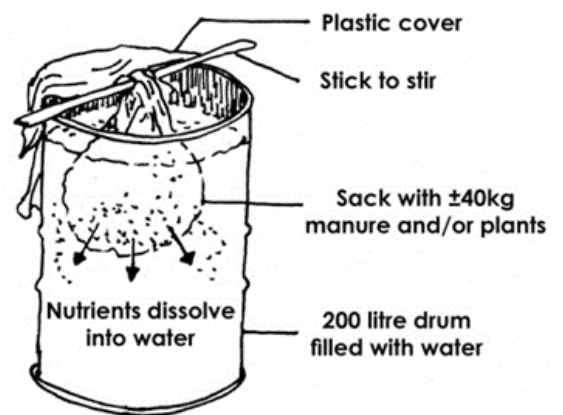
5.1 UMQHUBA WAMANZI

Umqhuba wamanzi umqhuba wezilwane ofakwe emanzini wase uqhunywa ebese uxhutshwa namanzi ngaphambi kokuthi ufuthwe ezitshalweni noma enhlabathini ezungeze izitshalo njengesengezo somnotho emhlabathini. Umqhuba wamanzi wengeza, uzinzise imisoco edingwa izitshalo ebese ifaka ixhube yezilwanyana eziliswa nezifo kanye nezilwanyana ezingadingeki

Umqhuba wamanzi ujwayele ukwenziwa ngomqhuba wezilwane(omusha, osanomcamo) njengezinkomo, izimbuzi, amahhashi, iziklabhu, kanye noqhuba wezinkukhu, kanye/noma nokhula oluhlaza satshani (isikhuthazi), iziqu zikabanana (potassium kanye nephosphate), comfreykanye nembati (izinika izitshalo izakha mzimba ezilekelela izitshalo zilwisane nezifo). Lenxube ixutshwa ngokukodwa kokodwa kokune 1:4 ngaphambi kokuba uyisebenzise

Ukwenza

- Ezingandini
- Izindawo ezingaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Kulula kanni futhi kuyashesha ukuyenza



from: Production without Destruction



Ukuqotshwa kweziqhu zika bhanana njenge tiye eliluhlaza noma njengomqhuba wamanzi ofakwe izitshalo



Ukuqotshwa kokhula oluzofakwa emqhubeni wamanzi



Umqhuba wezilwane ozosetshenziswa njengomqhuba wamanzi owezinkukhu, izimbuzi noma izinkomo muhle kakhulu. uma umusha muhle kakhulu



Izitsha izifakwe umqhuba wamanzi kumele zimbozwe ukuze kugwemwe ukuhamba nomaoya kwemisoco ehalulekile

5.2 UKUXUBA IZITSHALO

Ukuxuba izitshalo ezingadini kubandakanya ukulamanisa izitshalo, ukutshal izitshalo ndawonye, nokutshala izitshalo ngokuthi zihambiselana kanjani. Inhloso ukuba nezitshalo eziningi ezahlukahlukenek (kufakwa ezilaphayo, ezixosha izinambuzane, nezitshalo ezinemsisebenzi eminingi) engadini yakho yemimfini kanye nalapho utshale khona izithelo uma kuvuma, utshala unyaka wonke, ukuze uqinisekise ukuthi unomthombo onempilo wokudla, uphucule indlela olawula ngayo izinambuzane, iziifo kanye nokhula uphinde unciphise amathuba okushoda kanye nokungalungi kwetshalo

Ukukhethwa kwezitshalo kuncike kulokhu:

- Ukukwazi ukuvuna ukudla engadini unyaka wonke. Lokhu kuqonde ukuthi kumele kugxilwe ezitshalweni ongakwazi ukuzivuna isikhathi eside ezifana nemfini, olettuce, spring onion kanye no leek, lokhu kwenza singaxili kakhulu ezitshalweni ezifana nama klabishi kanye no anyanisi esithatha isikhathi eside ngale kokukhiqiza ukudla.
- Izitshalo ezinezakha mzimba (Vit A) njenge mfini enamacembe aluhlaza satshani (ispinashi, mustard, rape kanye nekale-ntufesh), okherothi kanye nembuya amacembe amathanga kanye nezitshalo eziyizinongo njenge parsely
- Izitshalo ezikwazi ukuxosha izinambuzane ezinjenge coriander, garlic chives nezinye ezifana no rosemary kanye ne thyme.
- Izitshalo ezinemidumba njenge bhontshisi, u-peas kanye tenephu
- Izitshalo ezikhula minyaka yonke ezinemsebenzi eminingi ezifana nomhlonyane, lemon grass, bulbinella kanye nocomfrey
- Izimbali ezinjenge marigold kanye no -calendula

Ngaphezu kwalokhu kumele ugqikelele ukuthi awutshali izitshalo zasemndenini owodwa ndawonye ukuze unciphise ukubhebhethaka kwezifo eziwayelekile nokuncintisana ngokwemisoco. Ngalokho izitshalo ezifana notamatisi, ubrinjal, amazambane kanye no pepper akumele zitshalwe ndawonye kanjalo nezitshalo ezinacembe, klabishi, broccoli, cauliflower kanye neKale nezipinashi ngokuhlukana kwazo akumele kustshalwe ndawonye

Ukulaminisa izitshalo kufakwa nhezindlela ezimbili enye ibuka ukushintshanisa izitshalo ngokuthi ezidla kakhulu ezifana neklabishi zishintshaniswe nezitshalo ezingadli kakhulu ezifana no lettuce kuphinde indlela ejwayelekile yokulamamanisa efaka okusakhaba- okunemidumba - okunezithelo

Ama calendar okutshala asebenzisela ukuqhamuka nohla lwezitshalo ezilungele ukutshalwa endaweni ethile kubhekelelwe nesimo sezulu esishintshayo. Ngezansi sibona icalender yokutshala eyahlanganiswa ngokuthatha izimvo zabalimi basezi ndaweni Limpopo-lapho ubusika bufudmele, nehlobo lishisa kanye naba limi basezindaweni za KwaZulu Natal nase Eastern Cape lapho ubusika busuka ekupholeni buye ekubandeni . Ama calendar okutshala ajwayelekile nawo angasebenziswa

When can I plant vegetables?												
	Mrch	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Too hot to plant!		
Baby marrows												
Basil												
Beetroot												
Brinjal												
Cabbage												
Carrots												
Chilli												
Green beans												
Green pepper												
Kale and other morogo e.g. amaranthus												
Lettuce												
Leeks, spring onions												
Mustard spinach												
Onions												
Parsley												
Peas												
Tomatoes												

Ukwenza

- Ezingadini, asemasimini
- Izindawo ezingaohansi kuka 0.1ha, ezisukela ku 0.1 ha kuya ku 1 ha, kanye nezindawo ezingaohezulu kuka 2 ha
- Izindleko ziphansi (imbewu nezitshalo), izinsiza zitholakala edaweni
- Kulula ukwenza



Mama Mcanyana (Gobizembe) – utshale ubroccoli, iChinese cabbage, ispinach, ucoriander kanye nemarigold



uMagdelina Malepe (Sedawa), utshale imarigolds, no thyme, iparsley, ispinach kanjalo ne kale



uChristina Thobejane (Sedawa) – utshale ummbila, i-okra, utamatisi, ikale kanye nemarigold



Umbhede okujwe wajula ofakwe fennel, coriander, parsley kanye nama chives



uPhumelele Hlongwane (Ezibomvini) –utshale ubeetroot, imustard spinach kanye nespring onions ne parsley

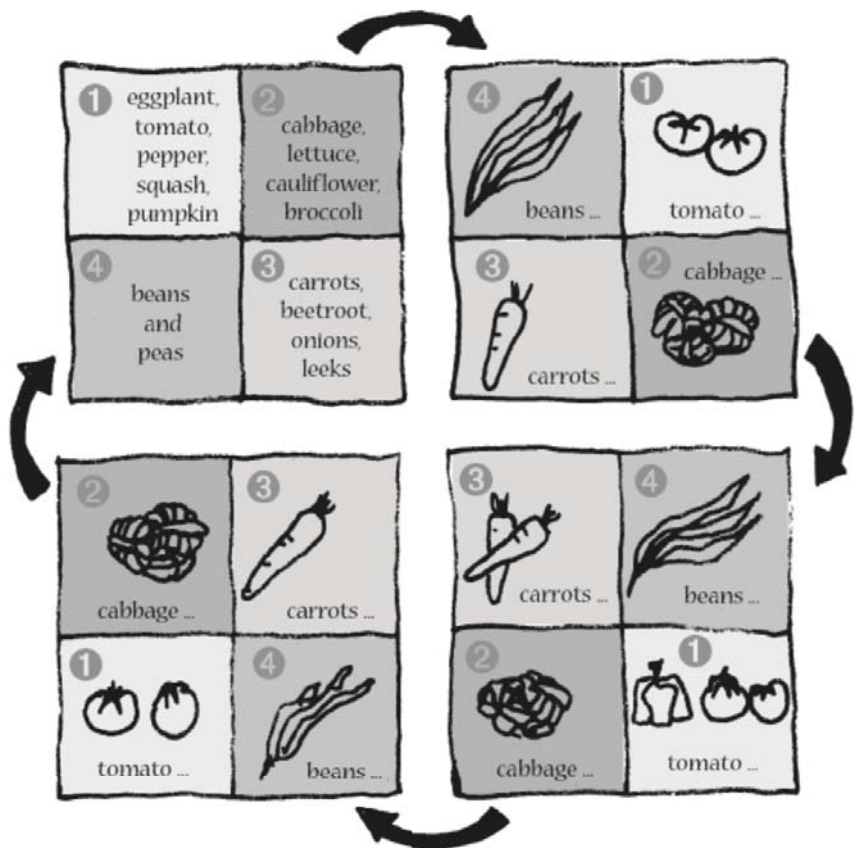
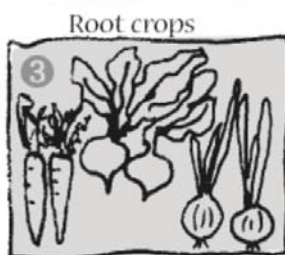
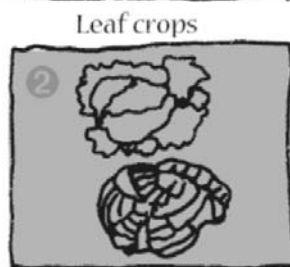
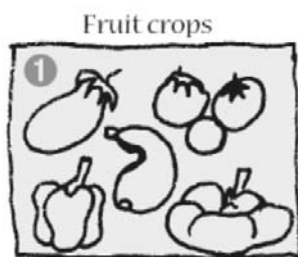
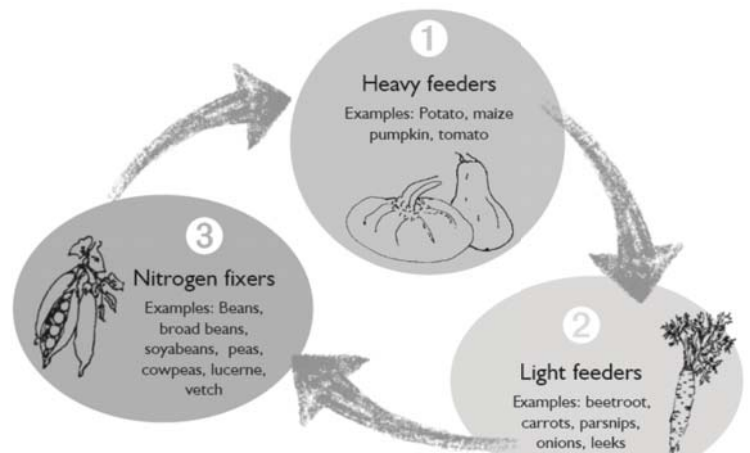


uAlex Makgopa (Sedawa)- utshale i spring onion, ispinach, izzqathi kanye nomarigold.

5.3 UKUSHINTSHANISA IZITSHALO

Ukushintshanisa zitshalo kuyindlela ebalulekile yokuphatha/ ukunakekela ingadi noma amasimu. Ukushintshanisa kwehlisa izinga lezinambuzane kanye nezifo ezakhela emhlabathi kuphinde kuzinzise izimo semisoco ephumayo emhlabathini zithuthukise nempilo yomhlabathi.

Sebenza ngesibalo zezitshalo ezintathu emasimini, Isibonelo Ummbila (udla kakhulu)ushintshaniswa nexhuba yezitshalo eziyisembozo njengo (sunnhemp, amabele, kanye no jika nelanga (ezidla kancane) nazo ezishintshwaa ngezitshalo ezinemidumba ezifana no bhontshisi, izidumba kanye nolab lab. Sebenza ngezitshalo ezintathu kuya kwezine uma ukhiqiza imifino. Enye indlela ulandelanisa embhedeni izithelo, okunamacembe, izimpande, nokusamdumb



A SIMPLE ROTATION: DIVIDE YOUR GARDEN INTO FOUR EQUAL PARTS. THE NEXT TIME YOU PLANT, MOVE EACH FAMILY OF VEGETABLES TO THE NEXT PLOT.

From: The People's Farming Workbook, EDA, 1995

5.4 IZINDLELA ZEMVELO ZOKULAWULA IZINAMBUZANE NEZIFO

Izindlela zemvelo zokulawula izinambuzane nezifo engadini yasekhaya yokukhiqiza okudla zibandakanya lezindlela ezine ezilandelayos:

- .Ukuthuthukiswa komnotho womhlabathi, impilo yomhlabathi kanye zinga lomhlabathi lokubamba amanzi ukuze kukhiqizwe izitshalo ezikhangayo ezinempilo, kususelwa ekutheni izitshalo ezingena mpilo yizo esisemathubeni okuhlaselwa izifo nezinambuzane
- Ukuxuba izitshalo nokugcina ingadi ihlanzekile ukunciphisa ukugcwala kwezinambuzane kanye nezifo ezijwayele ukuba kona uma kutshalwe isitshalo ngsasisodwa, kunjalo nathuba okuthetheleka kuphindelela ngosusa izitshalo ezihlaselekile ngendlela ephephile. Kuphinde kuqhuquzelwe nokukhona belwane ezidla izinambuzane eziluhlupho kanye nezinyosi ezidla izinambuzane ezijwayelikile zasezingadini.
- ;Ukutshalwa kwezitshalo ezinomsebenzi eminingi, ezishayo nezingashi, kufakwe nezitshalo ezikwazi ukuqhelisa izinambuzane nezikwazi ukuzilawula. Lokhu kufaka izibonelo ezinjenge:
 - Izimbali marigold kanye ne calendula
 - Amakhambi/ Izinongo lavender, rosemary, coriander, parsley, thyme, fennel, basil, rocket, lemon grass kanye ne garlic chives
 - Ezilaphayo ezifana nomhlonyane kanye ne bulbinella, inhlaba, comfrey, imbati
 - Izihlahla ezinedumba ezifana ne sesbania sesban, i-moringa, i-pigeon pea kanye ne Acacia
- Ukwenza izinxube ezikwazi ukuqhelisa izinambuzane kanye nezifo. Lapha kusethseziswa izinto zasendlini ezijwayelekile ezifana nopelepele, ugarlic, anyanisi, insipho elihlaza(ubulala kakhulu izinambuzane ezinemizimba ethambile), uparrafini kanye no anyansi(okulawula kakhulu izinambuzane ezinemizimba eqinile, kanye nogwayi ukulwisana nezinambuzane esezihluphile zasabalala kakhulu. Kepha zikhona futhi nezinye izindlela.

Ukwenza

- Ezingadini, nasemasimini
- Indawo engaphansi kuka 0.1 ha, esukela ku 0.1 ha kuya ku 1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Inomsebenzi omncane kuya kophakathi, idinga ulwazi



Indlela ehlanganisile yokunakekela ingadi, ukuphathwa kwamamanzi nomhlabathi, izitshalo ezihlukahlukene, izitshalo ezishayo nezingashi zixutshiwe ndawonye



Izilwane ezilawula izinambuzane ngokuzidla noma ukubekela amaqanda



Umbelliferae – njengo anyanisi kanye nama leek akwazi ukuhheha izilwane ezidla izinambuzane



Ilzinxube zokulawula izinambuzane- inxube yensipho, pelepele, kanye no garlic- izilwanyana ezinemizimba ethambile, inxube yaparrafini no anyanisi- ukulawula izinambuzane ezinemizimba eqinile



Marigold uvikela ezifweni ezithikameza ukukhula kwezimpande



▪ **U- Garlic – Isibonelo**

Indlela

Qoba izigaxa zibe ncane(izigaxa esikhulu esisodwa zibe mbili eziphakatho ngobukhulu) ugcwilise emafutheni aliningana namateaspoon amabili usuku olulodwa noma izinsuku ezimbili kuphalafini. Sebenzisa ujeke oyingilosi ayi ithayela.Xhuba namanzi anensipho angangohhafu welitha ebese eyasefa. Xhuba unxenye eyodwa yenxube emanzini ayizinxenye eziyishumi (1:10) ebese uyafutha. Xhukuza ngokwanele ngaphambi kokuba usebenzisa

Okuhlosiwe

Izinambuzane ezijwayelekile: mosquitoes, cotton stainers, aphids, flies, army worms, ticks, ants, beetles, caterpillars, diamondback moths, false codling moths, grubs, mites, peach borers and termites.

Fungi: Scab, mildew, bean rust and tomato blight.

Alternaria - fruit rot, early blight, purple blotch, leaf spot.

Cercospora - leaf mould, leaf spot, early blight, frog-eye.

Colletotrichum - leaf spot, anthracnose, fruit rot, smudge.

Bacteria: *Xanthomonas* spp.



Izigaxa zagarlic



Uvemvane ezigabeni zalo zokukhula



Isifo esiba kuma strawberry esidalwa *Xanthomonas campestris*



Izinkomba ze Anthracnose edalwa *Colletotrichum* ezitshalweni zondeni watamatisi

5.5 IZINDLELA EZIHLANGANISILE ZOKULAWULA UKHULA

Ukhula izitshalo ezikhula unyaka owodwa noma ezikhula ezikhathi eside ngale kokuphazamiseka, ziphinde zikhule ngamandla emasimini nasezingandini, luphinde luncintisane nezitshalo ngemisoco, indawo kanye namanzi

Izinhlobo ezihlukene zomhlabathi kanye nesimo sezulu, izindlela zokutshala kanye nezindlela zokulawula ukhula zivamise izona ezilawula ukuthi iluphi ukhula olunamandla kulezindawo. Izibonelo, zifaka inqonqodwane kanye nonqhunga oluthanda izindawo ezinombumba oluningi, lezizitshalo zingakwazi ukugcwala yonke indawo uma ukulalulwa kukhula kuwukusuza okukhula ngaphezulu kuphela, lokhu esikwenza ngegeja. Ukhula lwanda kakhulu ngezigaxa eziba ngaphansi komhlabathi

Ukhula olunolaka olukhula minyaka yonke njengocadolo knaye nembuya luvala kakhulu uma ukhula olugcinile lungakhishwanga, njengiba imbewu yazo ishesha okukhiqizeka iphinde ibekezelele izikhathi ezinde ezingena mvula

Izindlela ezihlanganisile zokulawula ukhula zifaka izinto ezahlukahlukeni ezifana nokuthuthukiswa kokwakheka komhlabathu nempilo yayo, ukwemboza, izitshalo eziyizembozo, ukulamanisa izitshalo, kanye nokutshalo usondelanise. Kuphinde kufake nezindlela ezisebenza nemishini kanye nemithi ukulawula ukhulula. Kwenza ikhopmposi nakho kuyalugqilaza ukhula uma kwenziwe ngendlela efanele, lokhu kuphinde kunciphise izinga lembewu yokhula egcwele kwemvelo. Ukulawulwa kokhula sekuhambe ishashana kutshaliwe kusiza ukunciphiseni imbewu yokhula oluvela minyaka yonke nokuyinto ebalulekile ekumele yenziwe.

Ukwenza

- Izingadi, amasimu
- Izindawo zingahansi kuka 0.1 ha indawo esukela ku 0.1 ha kuya ku 1 ha
- , Izindleko eziphansi, izinsiza zitholakala endaweni
- kunomsebenzi ongemuningi kakhulu, kudingeka ulwazi oluningi



ngaphezulu



Indima exhutshwe ummbila nobhontshisi, lapha ukhula sevale yonke indima luhlula izitshalo



ukutshala usondelanise lapho oxube khoba izitshalo ukuze uzivikele ekuqilazweni ukhula, ngakwesokunxele ummbila ongahlakulelwanga kwesokudla indima exube izitshalo yase izisondelanisa eyatshalwa ngesikhathi esisodwa kepha kube kuhlakulwa ngendlela efanayo



Dock (ngezansi izikhomba zomhlabathi onesimuncwane, amaranthus (ngenhla kwesokunxele) umhlabathi ovundile kepha ongakhokile kahle kanjalo nacadolo (ngenhla kwesokudla) udla imisoco izitshalo ezinnaakwazi ukuvithola.



Ikhomposi iyakwazi ukubulala imbewu kanti iyindlela enhle yokubheka umqhuba ngaohambi kokuthi usebenze njengoba ikhomposi ikhuphula izinga lemisoco etholakala emqubeni



Inqonqodwane iyizinkomba zokushoda komoya emhlabathini, naenxa vokuqisheka nokunaakheki kahle kwawo umhlabathi

5.6 NURSERIES AND PROPAGATION

Ama nursery amancane akhiwe emnakhaya ukuze kukhiqizwe izitshalo (izithelo, izinongo kanye nemfino) kanye nezinye izitshalo ezinemisebenzi eyahlukahlukeni (ezilaphayo kanye nezi llwawulwa iziilwanyana ezingadingeki) kususelwa ezimmbewini ngokuhlukana kwazo kubalulekile ukuze ingadi ibe nezenhlobohlobo zezitshalo. Akudingi uze ubenemishini esezingeni eliphezulu ngaphandle nomhlabathi, nokusamhlabathi okuzotshalelwa kukho, izikhwama zokutshala kanye nezitsha zokukhulisa izithombo ezingabekwa ngaphansi kwehlahla esinomthunzi ekhaya.

Imibhede yezithombo yenziwa ijule okusukela ku30cm kuya ku 60 cm ebese ifakwa okubolayo okufana nekhomposi nomquba, kumele ibe sendaweni enethunzi ukuze imbewu ihlale iswakeme(kepha ingabi manzi) ngalesikhathi kumele iqhume iqhale nokukhula. Ama nursery asebenzisa izithombo ezisheshayo adinga okuphathwa okusezingeni kanti futhi kunzima uzenza lezitombo uma ungenazo izinsiza zazo. Kungono kanti futhi kulula ukuzikhulisela ezakho izithombo ebese uyazikhipha uzifae lapho ofisa khona uma sezilungile

Ukwenza

- Ezingandini
- Indawo engaphansi kuka 0.1ha
- Izindleko eziphakathi(imbwu, izitshalo, kanye nezitsha) izinsiza zitholakala endaweno
- Anomsebenzi omningi



Ukukhiqizwa kwezithombo imbhedeni efakwe ikhomposi yaphinde yambozwa ngopulasitiki ukuze kuvikeleke izithombo



Amanursery amancane enziwe phansi kwezihlahla ukuze kukhiqizwe izithelo. Izihlahla ezinemsebenzi eyahlukahlukeni kanye nezihlahla ezincanenamakhambi. Lapha zibona umango kanye nemoringa itshaliwe



Izakihiwe ezakihiwe ngamanethu ukuze kukhiqizwe imifini kanye nakhambi(iziningo)



Ummoba kanye nommango okhiqizelwa emhlabathini kuma nursery amancane



Nezindishi zingasebenziswa, kulula ukugudluza uphinde uzinakekele

5.7 UKONGIWA KWEMBEWU

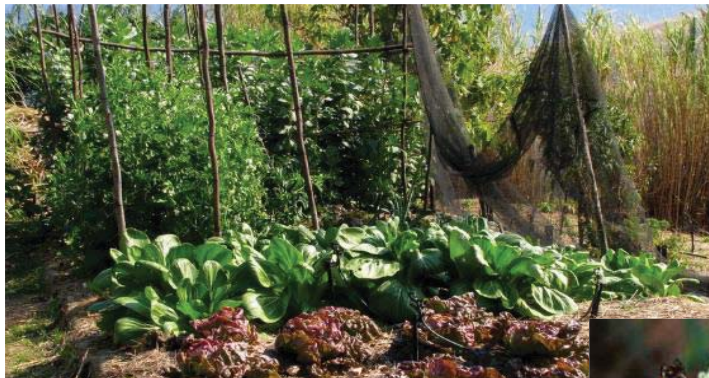
Ukongiwa kwembewu kuyindlela abalimi abalimi abayisebenzizayo kepha eya ngokwehla. Imbewu igcinwa unyaka nonyaka kepha ngenxa yobunzima bezimo ezilima ngaphansi kwazo abantu abaningi babika ukulahlekelwa imbewu eningi okumele ngabe bayigcinile. Liyangokunyaka inani labalimi bathenga izimbewu ebese begcina izimbewu uma sekuvuniwe, okuchaza ukwehla kwezinga lokutholakala kwembewu yezitshalo zomdabu. Ukongiwa kwembewu indlela ebalulekile yokuvikela izimbewu zezitshalo zomdabu njengoba abalimi bakhetha izimbewu ezimpova evulekile (sezizulu) kunalezo zesilungu, ezikwazi ukumelana nesimo sezulu, izinambuzane kanye nezifo ezihlasela ezindaweni ebazakhele.

Izinto okumele sizigcine emqondweni uma songa izimbewu ilezi ezingezansi:

- Kubalulekile ukuququzela izilwanyana ezifafaza impova ngokutshala izinhlobonhlobo zezitshalo eziifaka izimbali uphinde ugcine ingadi kanye namasimu enezitshalo eziningi izihlukene ukuze kugcine nesidingo sokusebenzisa izibulala zinambuzane.
- Gcinaimbewu evela ezitshalweni ezikhombisa impilo kuphela, ungalinge ugcine imbewu ezivela ezitshalweni ezinezikhomba zokungakhuli kahle.
- Ketha izitshalo esiyisithuoha kuya kwezingama shumi amabili nane (6-24) ozogcna imbewu yazo
- Ungalinge ugcine imbewu evela ezitshalweni ezinezifo
- Imbewu kumele kube eseyikulungele ukuvunwa, yomela ezitshalweni isikhathi esifanele kanye
- Nezitshalo okulula ukuthi zithengane kumele ziqhelelaniswe(izibonelo, okusamfino kanye no mmbila, upepper kanye no pelepele, amathanga kanye no lettuce) ngokwendawo, iskhathi noma zifakwe ema khejini

Ukwenza

- Emasimini nasezingadini
- Indawo engaothansi kuka 0.1 ha, esukela ku0.1ha kuya ku 1 ha nezindawo ezingaphezulu kuka 2 ha
- Izindleko ziphansi, ziyatholakala endaweni
- Kulula ukwenza nokunakekela, kepha idinga umsebenzi kanye nolwazi oluthe thuthu



pollinationIngadi ekhiqiza izithombo, enesakhiwo sekheji, lapho isitshalo ngasinye zibalelwa esithupheni kuya emashumini amabili nane ukuze kugcinwe imbewu- izitshalo ezinemndeneni ehlukeni zitshalwa ngandawonye ukunciphisa izinga lokuthengana



Izimbali nezitshalo ezikhuthaza ukufafazwa kwempova yizinyosi,ama-hornets kanye namavemvane



Izilwanyana ezifafaza impova ziyazithanda izimbali ezihlukahluke



Ukufafazwa kwempova ngezandla emmbileni okuzokhethwa kuwo imbewu



izitshalo sikapelepele esifakwe ekhijini ukugcina imbewu iyiyo ingathengwanga ezinye.



5.7.1 SEED PROCESSING KANYE NOKUBEKWA

.Ngaphezu kwakho konke imbewu idinga ukuphola, ubomnyama, kanye nokoma ukuze ihlale izisimweni iskhathi eside. Uma imbewu ibekwa endaweni enesifudumezi nokushisa, iyashesha ukulahlekelwa amandla ayo okuqhuma. Ngezansiimiboo ebalulekile mayelana nokubekeka kahle kwembewu

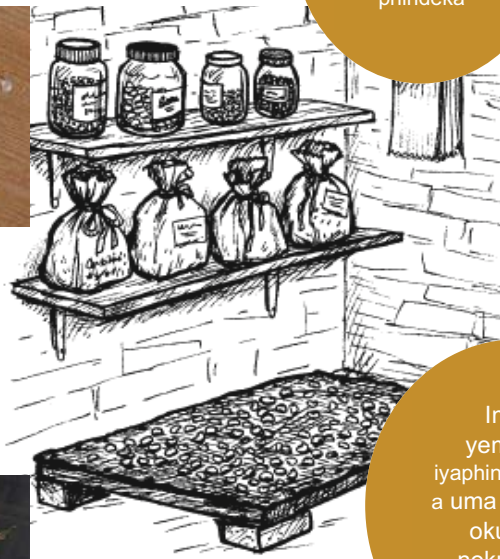
- Isifudumezi, imbewu izomunca umswakamo emoyeni. Imbewu indinga ukubekwa endaweni enomsawkamo ongaphansi kuka 10%, eyomile engangenwa umoya
- Avoid plastic packets and containers Kwema opulasitiki kanye nezitsha ezakhiwe ngawo.
- Ukukhanya kuncphisa impilo yembewu, imbewu kumele igcinwe emabhodlelno emnyama kumbe indlini emunyama. Kudingeka kuhlale kumnyama.
- Amazinga okushisa nokubanda, imbewu ihlala iskhathi eside uma ihlel endaweni ebandayo kepha eyiqwa. Imbewu yezitshalo ezifana no cucumber, kanye no yamatisi ziyambozwa ngento esa jelly evimbela mbewu ukuba iqhume. Lo jelly kumele ususwe ngaphambi kokuba imbewu ibekwe kanye nokuqhuma kwayo. Ujelly uyavutshelwa ngokuhlakaniswa namanzi noshukela kugezweimbewu ebese iyomiswa.
- Ukuquba ukomiswa kwembewu ungasebenza isilica gel
- Ukugcinwa ngomlotha, ukelika kanye amacemebe omile agxotshiwe ezinye izitshalo ezinjenege nhlaba kuyakhuthazwa ukugwema omonakalo ongenziwa izilwanyana zihlasela uuma imbewu isibekiwe.



Ukuvutshelwa kwatamatisi kanye ne gooseberry ukuze kubekwe imbewu iphinde ikwazi ukuqhuma kahle



Uma izinga lomswakamo lehla ngo 1% impilo yebewu iyaphinda phindeka



Gcina imbewu ezitsheni ezingamabhodlela



Ukusebenziswa kuka silica ukumunca amanzi embewini kanye nomlotha okusebenziswa uma kubekwa imbewu esiyomisiwe

Indlela yokubekwa kwembewu ekhaya usebenzisa amashalofu, amaphakethe amaphepha kanye nojeke abangamabhodlela

Impilo yembewu iyaphindaphindeka uma amaznga okushisa nokubanda ezokwehliswa



Gcina imbewu endawni epholile, eyomile futhi emnyama

5.8 UKUKHIQIZWA KWEZITHELO

Ukukhiqizwa kwezithelo ezahlukahlekene ekhaya, ezizovuthwa ngezikhathi ezahlukene zonyaka kubaluleke ngokuthi ubenezinhlobo ezithelo uphinde ukwazi nokumelana nezimo ngohlukana kwazo. Izithelo ungakwazi ukuzikhiqiza ususela embewini, kanye namagatsha asikiwe, izimpande kanye nezithelo uqobo. Izihlahla zezithelo kumele zitshale inhlabathini ejulile evundile ziphinde zidinge nokuniselwa ikakhulukazi umazisencane. Zidinga ukuvikela zingalizwa umoya ziphinde zisuselwa amagaya ebusika (amapetsisi, amaplamusi kanye nama aphula) ukuze zizokwazi ukukhipha izithelo (izihlahla izihlae ziluhlaza njengezo mango nokwatapheya) Izindlela zemvelo zingasebenziswa ukulawula izinambuzane ezifana ne nezimpukane zizithelo, izintuthane, aphids kanye nama scale) kanye nezifo.

Izinhlobo ezihlukene zezithelo zenza kahle ezindaweni ezihlukene. Ikakhulu, lezi izindinga ubusika obubandayo (sub tropical fruit) njema aphula, amapheya, amaplamusi, amapetsisi kanye nelezi zingakwazi ukubekezelela ubusika obubandayo njengo bana, mango, ukwatapheya kanye nama litchi. Okusa olintshi kukwazi ukumela nezimo zokushisa nokubanda ezihlukahlukene, kepha kumele zinisekele kahle

Ukwenza

- Ezingadini noma engadini yezithelo
- Indawo engahansi kuka 0.1 ha indawo esukela ku 0.1 ha kuya ku 1 ha kanye enzindawo ezingaphezulu kuka 1 ha.
- Izindleko eziphakathi (imbewu nezitshalo) izinsiza zitholakala endaweni
- Inomsebenzi kuphinde kudingeke ulwazi



Izindlela zemvelo ezifana ne pyrethrum, mineral oil, lime sulphur. Ukusebenziswa kwapowder wezimpane uma kukhiwa amagaya okutshalwa



Ukuniselwa kwezihlahla zama orange, ezindishini ezibamba amanzi



Utamatisi wesihlahla okhiqizwe kususelwa embewini uba nomsoco uVit C omningi uphinde uthole phakathi kuka March kuya ku May ngesikhathi zezinincipha ezinye izithelo



Ukukhiqizwa kususelwa embewini kwa; granadilla, kwatapheya, umango, gooseberries, kanye no tamatisi wesihlahla



Ukusebenza kwemibundu kanye nezindishi ukuseenza amanzi emvula ezihlahleni.



Indela yase khaya yokubamba izinambuzane izhlasela izihlahlazezithelo ezifana nepukane yezithelo eyenziwa ngokufaka ama rrinag noshukela emanzini



Ukutshalwa kwezihlahla imigodini ejulile egcwaliswe ngekomposi kwaze kuba nesakiwo esisandishi sokubamba amanzi uma kuniselwa sase sembozwa

5.9 ORGANIC MANGO PRODUCTION

.Umango uyabekezela wenza kahle ezindaweni ezinobusika obuphakathi nase zindaweni ezifudumele kuya kweshisa kakhulu ehlobo. Kukhona nezhlobo zikamango ezikhulula endle ezingakwazi ukukhuliswa kususelwa embewini. Izinhlobo zesimanje zikhuliselwa ukuba nkulu, zibe noshukela omningi zingabi nezintambo ngokushikwa kwenxenye yamagatsha elumbaniswa nenxenye yokusazi mpande okuphilile okungenazimpawu zokungaphili. Izibonelo ezijwayelekile zifaka keit, kent, shelley kanye ne tommy atkins. Lezizinhlobo zidayoswa njengezithelo, amajuzi kanye no mango owomisiwe nezikhumba zikamango

Ngezansi izindlela ezimbalwa zokuzikhulisela umango:

- Enza ikhomposi okungenani izinyanga ezine kuya kweziyisithupha ngaphambi kokuba utshale
- Ukusthalwa kwezihlahla ezisanda kutholakala entwasa hlobo emigodini engu 60 cm* 60 cm egcwaliswe ikhomposi, inhlabathi kanye nokelika noma ibone meal. Akha indishi yokunisela uzungeze isihlahla ebese uyamboza
- Ikhoposi ifakwa minyaka yonke, emva kokuthi isihlahla sithele
- Ukususelwa kwesihlahla amagaya kweniwa minyaka yonke emva kokuthi isihlahla sesithelile, ukuze isihlahla zivuleleke nezithelo zikwazi ukuthola ilanga kanti
- Nezihlahla ezisencane zidinga amanzi angango 20 l- 40 l ngesonto.

Okudingayo

- Imvula engaphezulu kuka 350 mmngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka >5°C
- Ubume bendawo- indawo ezinzile
- Umhlabathi : noma onjani
- Ukunisela- uyadinga ukuba namanzi okunisela

Ukwenza

- Ezingadini, Ezingadini zezithelo
- Indawo engaphanzi kuka 0.1 ha indawo esukela ku 0.1ha kuya ku 1 ha.
- Izindleko eziphakathi, izinsiza ezithola ngaphandle kwazendaweni nangaohakathi endaweni, nokutholakala kwezihlobo ezintsha
- Kulula okunakekela nakuba kudingeka ikhono nolwazi



Ukwengezwa ngokubungakho ngokwenza ama juzi, nokomiswa kuka mango



Isihlahla sika mango esisikelwa amagaya esesinezikhomba sokukhula okusha, ikhomposi ifakwe endishi yokunisela kwase kwembozwa



Ingadi yesithelo yomlimi omcane endaweni yase Limpopo, lapho uphaathi wengadi ezithelo eyihlola



Ukusikwa kwamagaya, ukufakwa kwekhomposi kanye nokunisela okwenziwe esihlahleni esidala sika mango ukuze siphinde sikwazi ukukhiqize futhi.

6 UKUBANDAKANYWA KWEMFUYO

Lezi izindlela zokuphathwa kwemfuyo ezingenelela ezitshalweni noma eziyi nxenye yokuzama ukuhlanganisa ukuphathwa kwemfuyo kanye nokwezitshalo ukuze kukwazi ukusebenzisana. Lapha zisobheka izindlela ezingasi siza sikhuphule siphinde siphucule ukudla kwemfuyo kanye nezinhlobo ezahlukene zokudla kwemfuyo

6.1 EZOLIMO EZIBADNAKANYA EZAMAHATHI

Izihlahla zixhutshwa emasimini ngezindlela eziningi okungaba okutshalwa zodwa, , noma zitshalwe phakathi kwezitshalo ezikhula minyaka yonke(ngokujwayelekile zivame ukuba imihhube phakathi kwezitshalo). Izinhlobo zezihlahla eziwukudla kwemfuyo njenge pigeon pea- (udali), acacia species(umhlalankwazi), Sesbani, sesbani (umsokoko), Moringa olifeara kanye ne leauceana spp zonke zijwayekile

Okudingayo

- Imvula engaphezulu kuka 350 mmm ngonyaka
- Amazinga okushisa nokubanda angaphezulu kuka 5°C
- Ubume bendawo: 1,5-15%
- Zonke izinhlobo



Izibonelo zokutshalwa kwezihlahla ngezihlahla ezihlukene endaweni onayo

Ukwenza

- Ezingadini nasemasimini
- Indawo engaphansi kuka 0.1 ha indawo esukela kuc0.1h akuya ku 1ha nendawo engaphezulu kuka 2 ha
- Izindleko eziphakathi (imbewu/ okutshala) izinsika zitholakala endaweni
- Kunomsebenzi



Isihlahla sika sesbania sikhula njengo hesho ensimini



Izimbuzi zidla lapho kuthalwe khona udali



izihlahla zemoringa zitshalwe zalandelana ensimini



Leaucena tshalwe sa heshi ensimini etshalwe ubhontshisi (ngapahmbili) knaye nommbila (ngemuva)

6.2 EZOLIMO EZIBANDAKANYA (IZIHLAHLA, IZITSHALO KANYE NOTSHANI NDAWONYE)

Lendlela ibandakanya ukusebenziswa kwezolimo oluxhutshwe nezemahlathi kanye nezolimo, fukakwa izitshalo kanye nezihlahla zezithelo ngenhloso yokukhuphula ozokuzuka endaweni onayo. Izindlela zokwenza ezitholakala kule ndlela yokwenza ilezi:

- iAlley cropping- lapho kutshalwa izitshalo esizakhuni njengohheshi okanye izinhlobo zezitshalo phakathi nednadwo nezi tshalo ezitshalwe sahheshi
- Ukuphucula izinga noma kungatshaliwe- izitshalo ezisakhuni ziyatshalwa bese zishiywa uma ngabe sekungasatshaliwe. Lezi zithalo ezisakhuni yizo eziphucula izinga lomnotho emmhlabathini ziphinde zikhuphule nezinga lokubambeka kwamanzi.
- Ezingadini esisemakhaya, izihlahla ezisondelene ezihyanayo ngobude zitshalwa zizungeze ikhaya ezinemisebenzi eyahlukene ebandakanya ithunzi, amakhambi, izithelo, kanye nokudla kwefuyo
- Izihlahla ezinemisebenzi eminingi endaweni etshaliwe: izihlahla eziqeqene noma eziqoqelene ndawonye ukuze zime ngendlela ethile ezindaweni ezizungezile zoma ezivulekile. Lezi zihlahla zikhethwa ngokufaka kwazo isikhuthazi kanye nokuletha izithelo, izinkuni zokubasa kanye nokudla kwemfuyo

Ukwenza

- Ezingadini, emasimini, nemfuyo
- Indawo engaphansi kuka 0.1 ha, indawo ephakathi kuka 0.1 ha kuya ku 1ha indawo engaphezulu kuka 1 ha
- Izindleko eziphakathi (imbewu nezitshalo) izinsiza zitholakala endaweni
- Udinga ulwazi kanti iyasebenzisa



Utshani bohlobo isesbania sesban-butshalwe ngohlelo lwe Alley cropping endawweni yakwa KwaZulu NAtala



Umbila utshalwe emuva kweminyaka emibili kwakukade kutshalwe udali



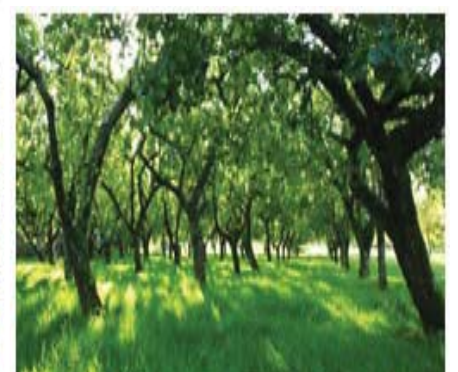
Izihlahla ezincane ezinemidumba ezitshalwe emadlweni ukuze imfuyo ikwazi ukudla



Indlela ephucukile yokulalisa insimu-udali otshalwe unyaka owodwa kwase kwangatshalwa lutho emuva kwawo



Ingadi yasekhaya endaweni yakwa Mhlabayalingana,, KwaZulu Natal: Inxube yezihlahla zezithelo,, imifino kanye nezitshalo



Amadlelo atshalwe phakathi nezihlahal engadini yezihlahla zama kinati ukuze imfuyo ikwazi ukudla iphinde ithola nethunzi

6.3 UKULUNGISELELA AMANKONYANA UKUKHUNYULWA KONINA KANYE NOKWENGEZA UKUDLA

Ukwengezwa kokudla indlela ebalulekile ekuphathweni kwefuyo esebenziselwa ukunikiza imfuyo imisoco eyidingayo amadlelo angasenayo. Loku kubaluleke kakhulu ebusika, lapho sekushoda khona ukudla emadlelweni noma madlelo esengena msoco. Izindlela zokwengeza ukudla ilezi

- Ukudla okunesakhamzimba iprotein iziwukudla okanye amanzi njenge Voermol Premix 450 (esampuphu) kanye ne LS 33 (engamanzi)
- Okusahlamvu kanye nembewu njengo mmbila ogqakaaaziwe, amabele njalo njalo
- Izitini zimisoco kanye nezakhamzimba zemfuyo

Ukwengeza kungaphinde kube ngendlela yokutshalwa kotshani obungu kula kwemfuyo. Lokhu kufaka ukukhuliswa kwezitshalo ezinomspco ongaphezulu kwalowo ukungaba ukhona ngalesosikhathi. Iningi lalezitshalo litshalelwa ukunikeza ukudla okuseluhlaza ngasekupheleni kobusika. Izibonelo zifaka: Lucerne, fodder rye, black saia oats, vetch, teff, fodder radish, Japanese radish, kale, turnips. Izinhlobo zotshani ezingashi noma ngabe isebusika zifaja ukikuyu, kanye ne tall fescue nayo iwumqondo omuhle

Ukuphakela kancane kancane kuyindlela elula yokuphatha imfuyo yakho ikhakhlu amankonyane ukuze athole ukudle ngokungena mkhawulo ngalesikhathi esancela. Amankonyane athola lokhu kudla ngokuncusha phansi kocingo oluvulekile noma isango elivuleke ngokwanele ukuthi amankonyane akawazi ukudla kepha amabe mancane ezinkomeni ezincane zingakwazi ukungena

Ukwenza

- Imfuyo
- Indawo engaphansi kuka 0.1 ha noma indawo esukela ku 0.1 ha kuya ku 1 ha
- Izindleko ziphakathi, izinsiza zitholakala endaweni
- inde udinge nolwazi



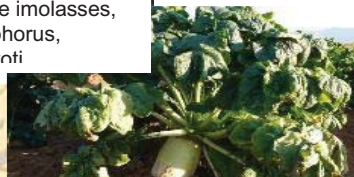
Izitini zokudla kwemfuyo zokuzenzela ezifakwe imolasses, urea protein meal, isakamzimba esingu phosphorus, amamanzi ucembe omncane kanye nosawoti



Isibonelo sendlela yokuphakela amankonyane emapulazini amakhuluse creep feeder



Ukudla kwemfuyo okwenziwe ngamacembe sesbania eyomisiwe, agqotshwa kwafakwa umgqakazo wommbila kanye nosawoti



Japanese radish



LS 33 and premix 450



Izitshalo okwendulelliswe ngazo ivetch kanye ne saia oats lapho kutshalwe khona ummbila ukuze imfuyo ithole ukudla kwasebusika

6.4. Ukuphakelwa kwemfuyo ezibayeni nokwenziwa kwamabhele

Lendlela iyindlela yokusika nokubbhekwa kotshani ukuze kuphakelwe imfuyo lapho edlela khona kungaba isezibayeni noma ama stalls, lokhu kunciphisa umonakala okungenzeka wenziwe infuyo emasimini kuphinde kuqinisekise ukuthi imfuyo zithola ukudla ezikudingayo

Utshani buyomiswa ukuze kuphakelwe imfuyo lokhu kungenziwa ngenkotha, utshani obuthile obuna nolucerne, izindumba, uteff noma izinsalela zezitshalo. Ambhele osthani angenziwa emahaya kusebenziswa umshini osebenza ngezandla owenza amabhele. Olungele abalimi basebancane



Ibhele lika Eragrostis Teff



Ibhele laLucerne

Ukwenza

- LivestockImfuyo
- Indawo esukela ku 0.1 ha kuya ku 1 ha nenzindawo ezingaphezulu kuka 1 ha
- Izindleko eziphakathi, izinsiza zitholakala endaweni
- Labour and knowledge intensi Udinga ulwazi, kuyasebenzisa



SUkuphakelwa kwemfuyo ezibayeni



Izinhlanga zommbila



Umshini wezandla wokwenza amabhele, bebhele lenkotha eliziwe ngawo lomshini



Okusamdumba: Izinhlanga zika ndumbanjane

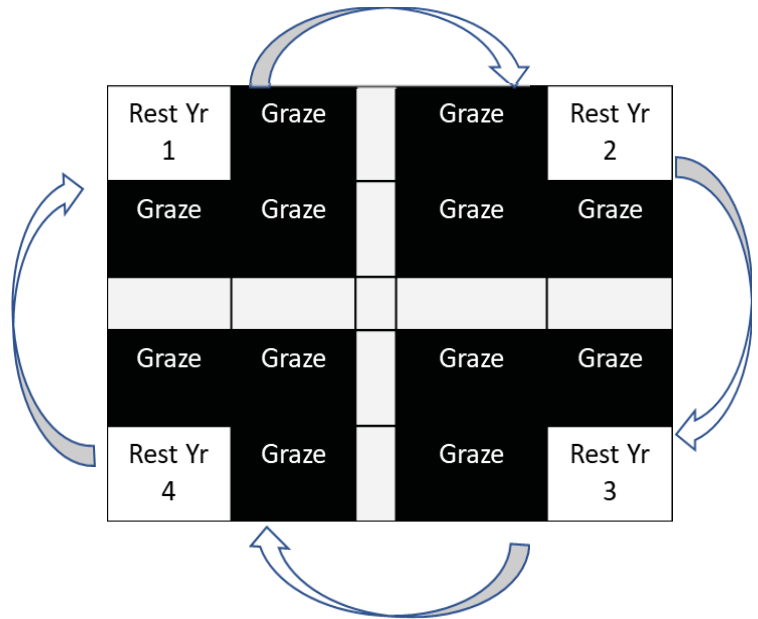
6.5 UKUSHINTSHANISA AMADLELO

Ukudliwa njalo kothani obumnandi imfuyo kubenza bubentekenteke kuphinde kwenze ukuthi inkotha okuyiyo engalungele ukudliwa imfuyo kube iyo eningi. Ukuze amadlelo akwazi ukukhiqiza ukudla okudingwa imfuyo kubalulekile ukuthi enye inxenye iphunyuzwe ngesikhathi kudliwa ngalowonyaka. Lokhu kwenza ukuthi izitshalo zatshani zikwazi ukugcina imisoco ezimpandeni zazo okwenza utshani bube nomsoco omuningi

Kungakuhle ukuthi inxenye eyodwa kwezine iphunyuze njalo emva kweminyaka emine. Kubalulekile ukuthi abanikazi bemfuyo basebenzisane ukwakakha indlela yokuphumuza amadlelo ngoshintshana kwawo

Ukwenza

- Imfuyo
- Indawo engaphezulu kuka 1ha
- Izindleko eziphakathi, izinsiza zitholakala endaweni
- Udinga ulwazi kanti kunomsebenzi uthe ukuba mningana



Inkotha yasemadelweni edliwe khakhulu ebinakala ngokuthi yonke ibemfushane, nobufakai bokuguguleka (ekuqaleni kwesikhathi sokutshala)



Inkotha ephatheke kahle, enotshani obubomvu bo hlobo lwethemeda triandral) ukukhombiswa imbova enombala obuvu. Utshani busabalele kahle kanti futhi buhlukahlukene

