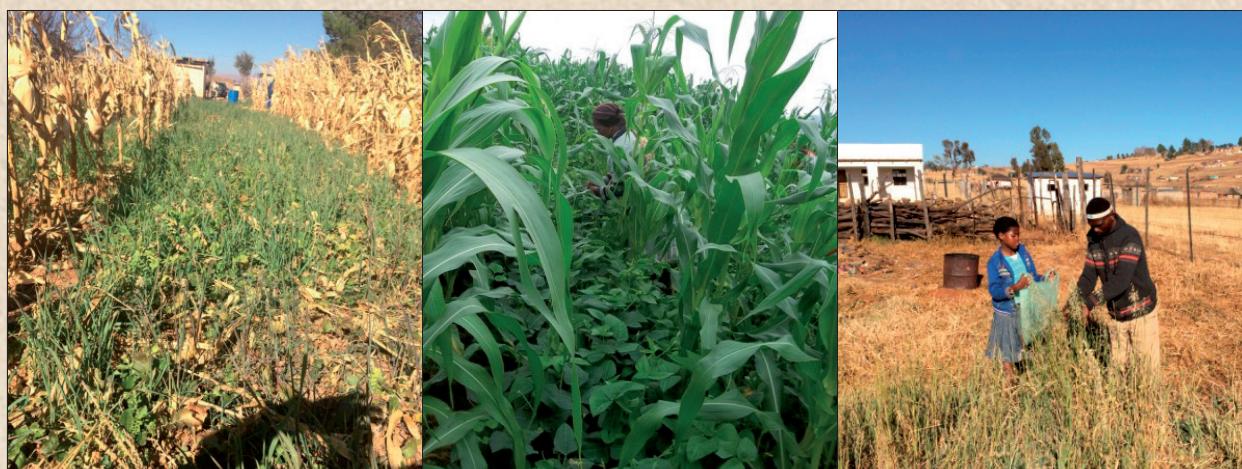


Izitshalo eziyisembozo

Ngokutshala izitshalo eziluhlaza ezifaka umquba okanye izitshalo eziyisembozo sisebenzisa zona izitshalo ukuthuthukisa siphinde sifikele inhlabathi.

Izitshalo eziluhlaza ezifaka umquba kanye nezitshalo eziyisembozo zaziwa njengezitshalo ezizikhule-layo ngenhloso enkulu yokuthuthukisa ukuvunda kwenhlabathi ziphinde zilinywe uma seziqhakaza futhi ziseluhlaza.

Ekulimeni ngokonga thina balimi abancane sisebenzisa izitshalo eziyisembozo ngemdlela ethanda ukwehluka:



*Izitshalo zesembozo sasebusika;
saia oats, fodder radish kanye
ne vetch*

*Umbila nobhontshisi
okuxutshiwe*

*Ukuvunwa kwembewu
yesembozo sasebusika*

Okokuqala, kunokuthi izitshalo eziyisembozo zitshalwe ngazodwana thina sizitshala nokudla kwethu cishe ngesikhathi esisodwa okanye kanye nokudla kwethu ngaphambi kancane nje kokuvuna. Ngale-ndlela abalimi bangathuthukisa inhlabathi yabo ngaphandle kokutshala lezi zitshalo eziyisembozo emhlaben wazo zodwa.

Okwesibili, izitshalo eziyisembozo ziyanqunywa okanye zialiswe emva kokuvunwa kwembewu yazo ukuze kusetshenziswe imbewu njengokudla kwabantu nemfuyo siphinde sikwazi ukuzitshala ngesikhathi esizayo.

Okwesithathu, izitshalo eziyisembozo ziyanqunywa okanye zilaliswe sishiywe phezu kwenhlabathi njengoba singayivukuzi inhlabathi ngokulima- isembozo esiphezu kwenhlabathi singavikela inhlabathi elangeni, emoyeni kanye nasemvuleni siphinde sinikeze inhlabathi ukuvuknda okuthe xaxa.

Okwesine, sitshala izitshalo eziyisembozo ukulawula ukhula, izinambuzane kanye nezifo. Izitshalo eziyisembozo zincintisana nokhulu zilucindezele lungakhuli. Ngenxa yokuthandwa kumbe yokungathandwa kwezitshalo eziyisembozo yizinambuzane nezifo kuphakathi kokuthi lezi zitshalo zidonsa okanye zixosha izinambuzane kanye nezifo ukuze kuvikeleke izitshalo.

Izinto ezinhle ngokutshala izitshalo eziyisembozo

- Ukwenyuka kwezinga lwemfucuza kanye nomsoco wenhlabathi:** Izitshalo eziyisembozo lezi zifaka okungafikela ku 50 metric tons/hectare (MT/ha) okanye nangaphezulu kwemfucuza eluhlaza enhlabathini ngonyaka. Le mfucuza ke inemithelela eminingana emihle enhlabathini njengokusebenzisa iphinde ibuyisele imisoco eyahlukene enhlabathini, isondeza imisoco enhlabathini engaphezulu iphinde ikhuphule izinga inhlabathi egcina ngalo amanzi. Ngale kwalokho osekuba luliwe iphinde ikhuphule izinga lezhinlolo zemisoco etholakala enhlabathini, inanai lezilwanya-na eziphila ngaphansi kwenhlabathi ezenza izitshalo zikhule kahle ; ebese inciphisa ubumuncu benhlabathi. Imfucuza lena efakwa izitshalo eziyisembozo yakha imisoco yenhlabathi esibala kuyo naleyo efakwa ngumanyolo. Uma sibheka isimo se-phosphorus lokhu kubaluleke kakhulu ikakhulukazi enhlabathini emuncu, uma kunemfucuza eluhlaza lena izitshalo zikwazi ukuthola i-phosphorus ngokuphindaphindeke kahlanu.
- Ukubuyiseleka kwe-nitrogen:** Izithslao eziyimidumbe ziyakwazi ukubuyisela i-nitrogen ziyisusa emkhathini lapho izitshalo ziyisebenzisa khona ukwakha izicubu zazo. Ngaleylo ndlela izitshalo eziyimidumba ziyakwazi ukufakai-nitrogen eningi enhlabathini. Kwezisetshenziswa kakhulu izitshalo eziyisembozo ezinemidumba zifaka nokungaphezu kuka 50 kg N/ha; ezinye zedlule kulkho.
- Ukulawulwa kokhula nezinambuzane:** izitshalo eziyisembozo ziphinde zibambe iqhaza elibalelekile ekongeni amandla nemali ebhekele ukuhlakula. Ukusethenziswa kwemithi yokhula kuyancipha okanye kuphele ngoba izitshalo eziyizembozo ziyakwazi ukuqedu ukukhula. Ezinye izitshalo eziyisembozo zingasethenziswa esikhundleni zemithi; isibonelo i-munuca (velvet bean) kanye nobhontshisi osamacici (lablab) zibulala ama-nematodes, i-sunnhemp (*Crotalaria ochroleuca*) ingasetshenziswa ukulawula izinambuzane ezidla ummbila ogciniwe. I-Brassicas (isitshalo esisemndenini wamaklabishi) zinomthelela wokukhubaza ukuhluma kokhula olunembewu encane ngokuyivimba ukuthi iqhumbe. I-rye, ukolweni kanye ne-hairy vetch nacho kukhiqiza izinto ezivimba ukukhula kokhula.
- Ukwembozeka kwenhlabathi nokulawula ukuguguleka:** isembozo esensiwa yizitshalo ezisitembozo eziningi zingabaluleka kakhlulu ekongeni inhlabathi. Lesi sembozo siphinde sithuthukise izinga lenhlabathi lokumelana nokuswelakala kwamanzi kumbe kwasomiso. Izinsalela lezi zona zengeza imfucuza enhlabathi lokhu okuthuthukisa izinga longena kwamanzi nezinga lokubambe-ka kwamanzi enhlabathini ngaleylo ndlela okwehlisa inani lamanzi ahamba egijima ngaphezu kwenhlabathi nokuguguleka kwenhlabathi. Izitshalo eziyisembozo ziphinde zehlise inhlabathi ekushaweni imvula lokhu okwenza inhlabathi ihlukane ngokweqile.



Ngenhla: ukugijima kwamanzi ensimini etshalwe ummbila kuohela lapho esegugule khona izitshalo eziakhula nezisaqhuma.

Ngenhla kwesokudla: kulensi efanayo sesibona ummbila otshalwe nesitshalo esiyisembozo esesehlise ukugijima kwamanzi lathuthukisa ukukhula kwezitshalo.

5. Mycorrhizal Fungi: izitshalo eziyisembozo zikhuphula izinga lomsebenzi mycorrhizal fungus lokho okugqugquzelu ubudlelwane obuhle phakathi kwezimpande kanye nokumunceka kwamanzi nemisoco. Izitshalo zikhqiza i-polysaccharides ebese i-mycorrhizal fungus yona ikhiqize i-protein ukuze kwakheke i-glycoprotein ebizwa nge-glomalin egqugquzelu ukwakheka kwamahluli enhlabathi lokhu okwenza ukubambana ngendlela kwenhlabathi. I-mycorrhizal fungus ikhula kangcono enhlabathini engakphazanyisiwe, ukulima ngokungavukuzi inhlabathi kanye nezimpande ezisakhula zigqugquzelu lokhu okubaluliwe. Inngi lama microbes lihlala eceleni kwezimpande ezisakhula lapho singathola khona ezingama 10,000 kwi-rhizosphere ecelen kwezimpande kunasenhlabathini enquile. Inani lezinunywana zenhlabathi akhula ngokustshenziswa kwezitshalo eziyisembozo. Izitshalo eziyisembozo akhulisa iSOM, imisedlala esenhlabathini, ukuhamba kwezinto enhlabathini, ukhulu bamagaqa enhlabathi kanye nobunjalo bawo.



Fungal hyphae nalokho ezikukhiqizayp ukugqugquzelu ukubambana kwenhlabathi zigweme ukugqingqeka zithuthukise ukubambeka kwamanzi nokusethenziswa kwemisoco.

6. Imivuzo eyedlulele:

- * Izitshalo eziyisembozo zingakhiqiza ukudla kwabantu kanye ne mfuyo okubalwa kuyo izinkomo kanye nezinkukhu.
- * Izitshalo eziyisembozo zingaphinde zikungenisele imali ngokudayiswa kwazo njengokudla kwe-mfuyo okungamabhele ezinkomo kanye nokudayiswa kwembewu.
- * Izitshalo eziyizinambuzane zingehlisa izinga lokuhlasseswa izinambuzane nezinkinga ezinjengama nematodes ezitshalweni ezikhulayo kanye nezinye izinambuzane emmbileni obekiwe. Izitshalo eziyisembozo zingasetshenziswa ukucupha kubulawe izinambuzane uma ummbila utshalwaemva kokubulawa kwalezi zitshalo. Izitzhalo eziyisembozo eziluhlaza ziheha amaqoqo emisundu, umbundane, ngaleylo ndlela izitshalo eziyisembozozidinga ukubulawa emaviki amathathu kuya kwamane ngaphambi kokutshala ummbila.
- * Ukudedela izitshalo eziyisembozo zikhule ziqhakaze kungenza ukukhula kwezinambuzane ezilusizo zikhule ngenani.
- * Izitshalo eziyisembozo zingehlisa inani lezifo, ikakhulukazi ukubola kwezimpande nezinye.
- * Izitshalo eziyisembozo zingadeqa ukugqingqeka komhlaba ngezimpande nokwakheka kwenhlabathi.



Imfuyo idla edlelweni lwezitshalo eziyisembozo okuyi rye kanye ne clover (from: S Hodgson, 2014)

- * Iztshalo eziyisembozo zithuthukisa ukusetshenziswa kwelanga ekutheni izitshalo zizenzelel ukudla kwazo ukunuya i-carbon enhlabathini.
- * Iztshalo eziyisembozo ziba wukudla kwezilwanyana kanye nezilwane zasendle
- * Lezi zitshalo ziphinde zikhuphule i-organic carbon, ukungena kwamanzi kanye nobunjalo benhlabathi.

Ububi obuhambelana nokutshalwa kwezembozo

1. **Ukusebenzisa umhlaba ngokulindelekeile:** Ngokujwayelekile abalimi angeke batshale izitshalo ezizozuzisa inhlabathi kuphela okunaokutshala izitshalo abangazidla kumbe abangazidayisa. Ngaphandle kokutholakala kokudlekayo ezitshalweni eziyizembozo abalimi abakuboni ukubaluleka kokuzitshala.
2. **Imiphumela eza kancane:** ukuthuthukiswa komhlaba into eyenzeka emva kwesikhathi eside engeke ibonakale masinya kumlimi. Ngokujwayelekile ubufakazi obuqinile nobubonakalayo buze buqale ukubonakala emva kokutshala kwesibili. Lokhu kuhamba kancane kwemiphumela kokuthuthukiswa kwenhlabathi kwenza ukwemukelwa kwezitshalo eziyisembozo kube nzinyana.
3. **Izinkinga zasebusika:** kujwayele ukuthi izitshalo eziyisembozo zikhqiza imvunde kumbe imfucuza yazo ngasekupheleni kwesikhathi sezimvula ziqhubekele esikhathini sokuqala kwesikhathi sesomiso. Imfuyo kanye nezilwane zasendle, umuhlwa, ukushiswa kwamadlelo, imililo kanye nezinye izinkinga zingabulala imfucuza kumbe imvunde okungakhuba za izitshalo ezikhulayo ngaphambi kokusethenziswa umlimi ngaphambi kokutshala.
4. **Ukucupha isikhathi:** imisoco efakwa izitshalo eziyisembozo, isikakhulukazi i-nitrogen, kumele zibekhona ngesikhathi izitshalo ziwinga ukunusa izinga lokukhiqiza. Iztshalo eziyisembozo zingawukhuphula umkhqizo womlimi uma kwenza ngoba imisico itholakala ngesikhathi esifanele. Ezindlelni eziningi zokutshala ukubamba isikhathi sokutshala okuyisona sona kunzima kakhlulu ngaleyo ndlela ukusebenza ngokuphelele kokulima ngaleyo ndlela olima ngayo kuyancipha.

Ukusetshenziswa ngokuphindaphinda kanye nokudedelwa kwemisoco ngokusebenzisa izitshalo eziyisembozo

Ngokujwayelekile izitshalo eziyisembozo ziyingxu-be katshani nokusazinhlamvana kanye nobhontshisi ukuze kulingane i-carbon (C) kanye ne nitrogen (N) ukwakha inhlabathi. Kokubili lokhu u (C) kanye no (N) kuyadineka ukwakha imfucuza yenhlabathi. Izitshalo eziyisembozo ezingutshani zingafaka u (N) omningi zengeza kulowo ofakwa okusabhontshisi. Izitshalo ezingutshani zona zifaka u (C) omningi kakhulu okudlula okusabhontshisi. Inani lika N no C eliqhathanisi-we likhombisa indlela izinga imfucuza yenhlabathi ebola ngalo, emva kwasikhathi esingakanani nokuthi yimiphi imisoco etholakalayo. Uma ukuqhathaniswa kuka (C:N) kungaphansi kwama-20, N yiwo odedelekayo, uma ukuqathniswa kuka (C:N) kulingana enhlabathini lokho kusho ukuthi u N uyatholakala enhlabathini.

Ukusetshenziswa kuka Nitrogen kuncika enanini lawo elikhona enhlabathini, isimo sezulu (ukushisa nobungako bamanzi), izitshalo eziyisembozo ezikhona, isikhathi sokudubula, isikhathi sotshalwa kanye nokufa. Izitshalo eziyisembozo zasebusika (njenge saia oats kanye ne rye grass) sifaka u N enhlabathini ngesikhathi sasentwasa-busika kanye nasebusika ngenxa yokushesha kokukhula kwezimpande. Emva kokukhula ngubanzi nobude besiqu akube kusabakhona nitrogen eningi efakwa utshani. Okusabhontshi si kufaka i-nitrogen isikahthi eside ukungene-la entwasahlolo. Utshani umunca uphinde uphindaphinde i-nitrogen uma iningi kakhulu esuka emquben kumbe kumanyolo. Ubhontshisi usethsenziswa ukufaka i-nitrogen ozosetshenziswa isitshalo esilandelayo uma i-nitrogen idinge-ka ukuze kuvundiswe inhlabathi.

Izhinlolo zeztshalo eziyisembozo

Ngokujwayelekile kusetshenziswa ingxube katshani, ubhontshisi kanye ne-brassicas (esemndenini wamaklabishi). Umthetho ojwayelekile wukuthi tshala ndawonye izinhlobonhlobo zeztshalo eziyisembozo ngokusemandleni. Ukuze kwakheke imfucuza eyanele ngokushesha tshala izinhlobo ezini-ngi zalezi zitshalo ukusekela impili enlhobonhlobo yezinambuzane ezibolisa imfucuza.

uma kutshalwe izinhlobo zeztshalo ezinhlanu ndawonye esingabala utshani, ama-cereal, i-brassicas, ubhontshisi kanye chenopods (umndeni weztshalo okubalwa kuzo isipinashi, ubhithiruthi, amaranthus kanye ne lamb's quarters noma chenopodium) zisebenzisana ndawonye ziphinde zihlo-mulisane. Izcicu ezenza amaphunga nokunambitheka okuthile zithola ukuthi zikhqizwe ezitshalweni kanye nasezilwanyaneni. Lezi zicicu zineqhaza ezilibambayo ekufakeni i-nitrogen kanye nasekwakheni amandla okumelana nezinambuzane kanje nokuhlaselwa izifo.

Ukudedelwa kuka N kuncike enanini Iwezinhlolo zeztshalo eziyisembozo, izinga lokukhula, ukunakekelwa kanye nesimo sezulu, isibonelo:

- Ukubulawa ngokushesha kwezembozo zikatshani kugqugquzel ukuqhathaniswa kuka C:N okuphansi kanye nokudedeleka kuka N ngokushehsa.
- Isembozo esisabhontshisi sijwayele ukuba nokuqhathaniswa kuka C:N okuphansi kodwa uma utshani noma ubhontshisi uyekwa ukhule ngokuphelel, ukudedeleka kuka N kuyabambezeleka.
- Ukudedeleka kuka N kwenzeka kakhulu uma komile kunokuba kumanzi ngenxa yeani eliphansi lokusebenza kwezinambuza ezidinge ka ukubolisa imfucuza zikhipe u N.
- Ukuthathwa kuka N yizitshalo eziyisembozo kusukela kuma 57 kuya kuma 296 kg ka N ngehekethe. Uma amaphesenti angama 50 ka N esetshenziswe ngokuphindaphindwa izitshalo eziyisembozo zingakhiqiza u N osukela ku 25kg kuya ku 132kg ka N ngehekethe.
- Izitshalo eziyisembozo ezitshalwe emva kwasikhathi kungenzeka zingakhuli ngendlala kodwa zingathuthukisa ubunjalo benhlabathi namanzi kanye nokuguguleka kwenhlabathi.



Kwesokudla ngenhla: I-Amaranthus uhlobo oluhle lwasembozo eliphinde libe ukudla eyimifino yemvelo.

Kwesokudla ngezansi: I-Chenopodium okanye i-lamb's quarters nayo eyiveji elimomusoco kakhulu.

Ukukhetha izinhlobo zeztshalo eziyisembozo kulele esikhathini sonyaka esikuso, inani lemvula kanye nezidingo zenhabathi. Esimweni sabalimi abancane sibheka ikakhulukazi ingxube engenza amadlelo amahle kanye nokudla kwabantu.

Izibonelo zeztshalo eziyisembozo ezijwayelekile

Iztshalo eziyisembozo ezimila unyaka wonke zisetshenzisa ukushintshanisa neztshalo zasehlobo kanye nasebusika yizo ezijwayeleke kakhulu. Iztshalo eziyisembozo zidinga ukuba ukudla kwemfuyo okuhle kanye nezakhampilo zenhabathi. Kuleli lakithi eNingizimu Afrika kufanele zimelelane nesimo senhabathi emuncu futhi eyishlabathi kanye nokushisa nesomiso.

Obhontshisi

Izinhlobo zeztshalo eziyisembozo zezingobhontshisi:

Ezasehlobo	Ezasebusika
<ul style="list-style-type: none"> Dolichos (<i>Lablab purpurea</i>) Sunnhemp (<i>Crotalaria juncea</i>) Cowpea (<i>Vigna unguiculata</i>) Lucerne (<i>Medicago sativa</i>) Velvet beans (<i>Mucuna pruriens</i>) Soybean (<i>Glycine max</i>) Mung bean (<i>Vigna radiata</i>) 	<ul style="list-style-type: none"> Hairy vetch (<i>Vicia villosa</i>) Burmedic (<i>Medicago polymorpha</i>) Red clover (<i>Trifolium pratense</i>) Forage pea/field pea (<i>Pisum sativum</i>)

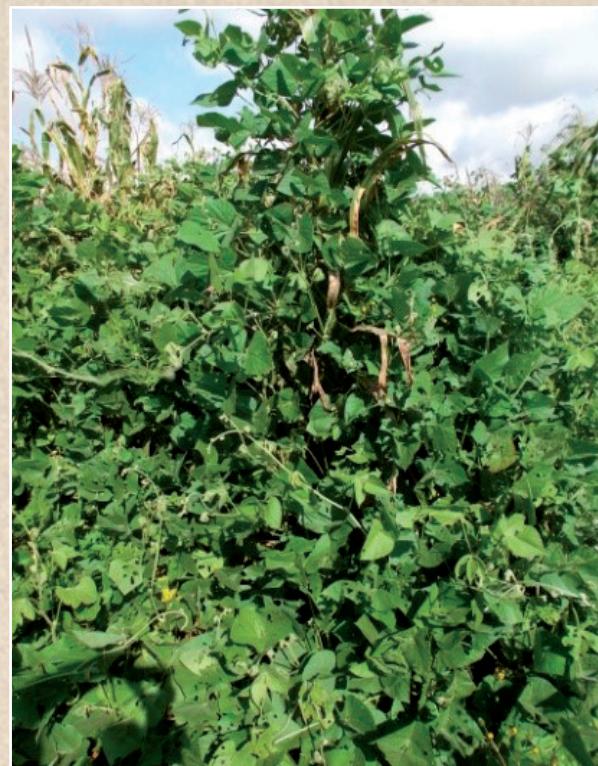
Ubhontshisi uDolichos (*Lablab purpureus*)

Yakwazi ukumelana nezimo eziningi ezinhlobonhlobo kanye nenhlabathi enobumuncu obusuka ku 4.4 kuya ku 7.8. njengoba ingubhontshisi iyakwazi ukuthatha i-nitrogen emkhathini iwufake enhlabathini ukufikela kuma 170 kg ngehekethe singakakubali ukushiya izinsalela eaznele ukunonophalisa inhlabathi ngemfucuza. lyisitshalo ezikwazi ukumelana nesomiso futhi esikhula kahle ezindaweni ezomile ezinemvula encane. Lesi sitshalo sithanda ke isimo sezulu esiphophile (ukushisa okusuka ku 14 kuya ku 28°C) uma kuzotshalwa ngo ngoNtulikazi kuya kuMfumfu. Kuwukudla okubaluke kabi ekudleni kwemfuyo ngesikhathi sesomiso futhi engeke ikwazi ukukhiqiza imbewu.

(Truter et al 2015)

(<http://www.lablablab.org/html/general-information.html>).

Kwesokudla: ULablab ukhula kahle kakhulu nembewu eqhuma ekupheleni kwesizini ukungena ebusika. Yenza isembozo esihle lapho ummbila usufa.



Lucerne/Alfalfa (*Medicago sativa*)

Lesi isitshalo esikhula unyaka wonke esivela emndenini wamapheya esitshalwa njengokudla okubalulekile kwemfuyo. Sisphinde sibe isitshalo esihle ekugqugquzelni ubukhona bezinambuzane ezibalulekile. Siyisitshalo esiqinile nesimelelana nesomiso. Izimpande eziujilile zalesi sitshalo sihlukanisa inhlabathi eqinile isebeenzise ngokuphindaphinda imisoco. Ingasikwa yenziwe amabhele emfuyo okanye idliwe isamile ensimini. Yona itshalwa entwasahlobo ebese ifaka u-nitrogen osukela ku 180 kuya ku 250kg ngehekethe. www.agricol.co.za

Sunnhemp (*Crotalaria juncea*)

Lesi isitshalo esisabhontshisi esithanda indawo eswakeme engaba yisembozo esihle kakhulu. Le sitshalo sitshalwa ngesikhathi sezimvula sikhule unyaka wonke sikhiqize eningi imfucuza le. Siwukudla kwemfuyo okuhle kakhulu kanti sikhula nasenhlabathini esasihlabathi evunde kancane. Lesi sitshalo iyakwazi ukucindezela izilwanyana ezingezinhle zifake u-nitrogen ongafikela ku 120kg ngehekethe. www.biomassproducer.com.au

Kwesokudla: Sunnhempukhula ube mude uqonde kanti ithela masinya okukhiqiza imfucuza nomsocoomningi.



Kwesokudla: ILurcene engasikwa inikezwe imfuyo kabilu kuya kathathu ngesizini. Yenza amabhele amahle ngemisoco.

Bur Medic (*Medicago polymorpha*) yisitshalo esisabhotshisi esihlobene kakhulu ne lucerne. Zifaka into engangama 120kg ka nitrogen ngekethe. Lesi sitshalo siqhakaza unyaka wonke ebese sikhipha imbewu sife emva kwezinsuku ezingama 60 kuya ku 100. Ziqhuma ziphinde zikhule ngokushehsa ebese zikwazi ukumelana nenhlabathi emuncu. <http://ucanr.org/sites/asi/db/covercrops.cfm>

Kwesokudla: iMedics sisetshenziswa kakhulu endaweni eyomile enenhlabathi ebuthaka.



iRed Clover (*Trifolium pratense*)

Lesi sitshalo sitshalwa sitshalwa njengesitshalo lapho kuphole khona ekwazi ukumelana nethunzi lommbila ngasekupheleni kwesizini. Yona ifaka unitrogen oyi 140kg ngehekethe.

<http://www.plantcovercrops.com>

Kwesokudla: iClover yenza kahle enhlabathini esalubumba nasenhlabathini emuncu lapho inhlabathi izitshalo eziyisembozo zingathola ubunzima khona. Ziyamelelana nendawo emanzi epholile.

Hairy Vetch (*Vicia villosa*)

Lesi sitshalo esisabhotshisi sitshalwla entwasa-busika noma sithatha isikhathi ukuzikhombisa njenge sitshalo esingamelana namazinga okushisa aphansi nesomiso. Ziyakwazi ukukhula ezinhlobeni ezingafani zenhlabathi naloyo oyishlabathi imbala. Zikhombisa ukufaka u-nitrogen omuhle ongafinyelela e140kh ngehekethe.

[https://commons.wikimedia.org/wiki/File:Hairy-Vetch_\(4709732410\).gif](https://commons.wikimedia.org/wiki/File:Hairy-Vetch_(4709732410).gif)

Kwesokudla: iHairy vetch enye yezitshalo ezihlomulisa kakhulu. Ukuba namaqabunga amancnane kwaso nemfucuza eningi kuchaza ukushesha kokukhula nokukhula kwemfucuza ngokushesha.



Forage pea (*Pisum sativum*)

Lesi isitshalo esisabhotshisi sasebusika esiwukudla kwemfuyo okuhle. Asikwazi ukumelana kahle nesomiso futhi zidinga inhlabathi engekho muncu ukuze zikhule kahle.

Kwesokudla: Iforage peas zithanda ukwenza kancane ukuqhuma futhi kazikwazi ukumelana nenhlabathi eqinile nendawo eyomile.

Okuwutshani, okusanhlamvana nokusaklabishi

Izinhlobo eziwayelekile kulamaqoqo abalwe ngenhla yilezi ezilandelayo:

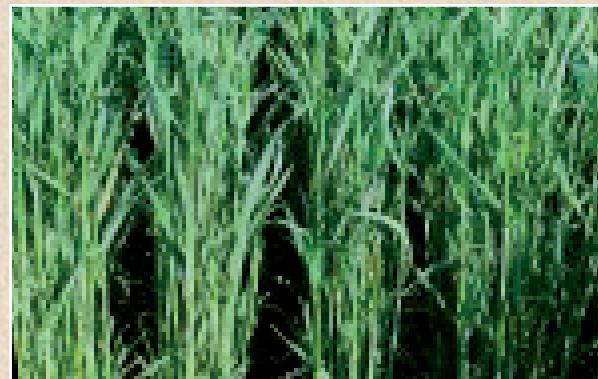
Ehlobo	Ebusika
<ul style="list-style-type: none"> Babala/ pearl millet (<i>Pennisitum glaucum</i>) Forage sorghum (<i>Sorghum bicolor</i>) Sunflower Buckwheat Teff 	<ul style="list-style-type: none"> Black/saia oats (<i>Avena strigosa</i>) Fodder rye (<i>Secale cereale</i>) Fodder radish (<i>Raphanus Sativus Olieformis</i>) Other bassicas including: kale, rape, turnips and mustard Barley White oats Stooling rye

Okusanhlamvu/okusakudla kwemfuyo (iSecale cereale).

Lesi sitshalo sitshalwa entwasabusika sakhe ihlathi elime mpo elinezimpande ezinkulu. Siyakwazi ukumelana nesomiso nendawo ebandayo futhim siyisisombululo esihle senhlabathi enamatshe neyishlabathi.

<http://www.kingsagriseeds.com/cool-season-annuals>

Kwesokudla: Namahlanga ommiba angagcinwa njengokudla kwezinomo nabantu kanti kunomsoco.



Babala/pearl millet (*Pennisitum glaucum*)

Lesi isitshalo esikhula unyaka wonke esikhula ngokushesha esingasetshenziselwa ukudla kwemfuyo. Sinezimpande ezinhlel futhi siyakwazi ukumelana nesomiso. Siphinde sikwazi ukumelana namazinga okushisa aphezulu nehlabathi engavundile. Senza kahle ezindaweni ezinenhlabathi emuncu ngaleyo ndlela siyakwazi ukukhula ezindaweni lapho ezinye izitshalo ezifana nommbila nokolweni zingeke zaphila khona esingalinganisa ngelaseNdiya lapho lidliwa khona njengomdokwe noma kukhandwe ngaso umqombothi. Kubuye kwenziwe ngaso izinkwa ezocabalele, amakhekhe.

www.en.wikipedia.org www.great-secret-of-lifecom

iBlack oats (*Avena strigosa*)

Lesi isitshalo esihle sesikhathi sonyaka esipholi le esiwukudla kwemfuyo okuhle esinomsoco. Siyisitshalo esiqinile esikwazi ukumelana nenhabathi emuncu ekwazi ukuthuthukisa ubunjalo benhlabathi siphibde sihambise ne Calcium (Ca) enhlabathini.

<http://www.kingsagriseeds.com/cool-season-annuals>

Kwesokudla: Iblack oats yenza ezinye zezingxube zeztishalo eziyisembozo eziwayelekile ekhuthaza impilo yenhabathi nempilo yezinambuzane.



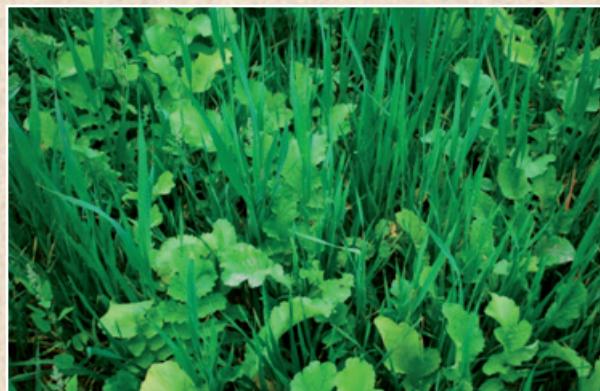
Kwesokudla: IPearl milletukudla okuhle kwabantu kanye nemfuyo

iForage sorghum (*Sorghum bicolour*)

Lolu hlobo lwamabele lukhula lube lude lukhiqize inani elikhulu lamacembe namaqabunga. Iyakwazi ukumelana nesomiso namazinga okushisa aphezulu siphinde sikhiqize ukudla okuhle kwemfuyo. Iphinde yaziwe ngelika sweet sorghum.

www.youtube.com

Kwesokudla: iForage sorghum ukudla okuhle kwemfuyo ephinde yaziwe nge sweet reed ngokwesintu kanti idliwa njengomoba.

**iFodder radish (*Raphanus Sativus Olieformis*)**

Yisitshalo esikhula ngokushesha ngesizini epholile esikwazi ukumelana nezifo ezinjenge club-root. Siyakwazi ke ukucindezela ukhula siphinde sibe ukudla okuhle kwemfuyo. Siyakwazi ukumelana nezimo ezipholile sibe nomthelela omuhle nhlanbathini. Ikhula ibe nkulu ngokushehsa ebese idla unitrogen ongama 20kg ngehekethe. Iphinde iguquele inhlabathi emuncu ifake iAluminium (Al).

http://msue.anr.msu.edu/news/cover_crop_grazing_with_sheep_lessons_learned_from_recent_msu_extension_dem,
www.cdiowa.org

Kwesokudla: iFodder radish kanye ne oats ezixutshiwe nezimpande ezinkulu ezivula iminkenke zenze indawo yokuhamba komoya.

Izikhuthazi kumila:

Ukukhuthaza ukumila lokhu singakuchaza ngesenzo sokufaka izikhuthazi embewini ukwenzela ukuthi isheshe iqhumé ngaphambi kokutshala. Inhoso ukuqinisekisa ukuthi kukhona izilwanyana ezanele zohlobo oluhle oluzogqugquzela ukwakheka kwezimpande eziningi eziba nezinwele ezithatha unitrogen emkhathini siwukake esitshalweni ukuze sikhule kahle. Lezi zikhuthazi kumila siyathengwa ebese zifakwa ezimbewini ezisabhonthisi ngaphambi kokuthi zitshalwe, uhlobo nohlobo lwembewu luba nesikhuthazi kumila esiqondene naso.

www.groworganic.com.

Muva nje izikhuthazi kumila ezequkethe i-fungi enhle njenge mycorrhizae sezakhiwe. Lokhu kona kusiza ekukhuleni kwesitshalo nenhlabathi ephilile.



Cover crop mixes

Umthetho ojwayelekile owokuxuba utshani, okusabho-ntshisi kanye ne-brassicas. Nanoma iyiphi ingxube yalezi ingasebenza kuncika ezimweni zasendaweni. Khumbula nje ukusebenzisa izinhlobo ezahlukene ngokusema-ndleni.

Ingxube yezitshalo eziyisembozo zasehlobo

Ingxube enhle yile elandelayo:

- uDolichos (Lab-Lab beans)
- iFodder sorghum
- kanye neSunnhemp.

Kwesokudla: Yindima yesibonelo enengxube yezitshalo eziyisembozo zasehlobo. (from: H Smith, 2014)



Ingxube yezitshalo eziyisembozo zasebusika

Izingxube ze-black oats ne-fodder rye, ne-vetch fodder radish kanye ne-fodder peas zingeneka.

Kwesokudla: Yindima ene foofer pea, yi-oats kanye ne rye grass kanti kwesokudle ngaphesheya ingxube ye hairy vetch, i-fodder peas kanye ne-fodder rye .
(From S Hodgson SACCS, 2014)



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