**s aqar T vel o s s axel mwi f o sas of l o sameur neo uni ver s i t et i**

**z ai r a t yebuCava, gi vi c agur i Svi l i c ot ne s amad aS vi l i ,**

**j emal Sengel i a, buxut i abaS i Ze, el ene maRl akel i Ze, nunu Cxai Ze**

**so f l i s meur neo bi s saf uZvl ebi**

**II nawi l i**

# Tbilis i 2008 wel i

s axel o mZRvanel o ganxi l ul i d a r eko mend ebul i a gamo sac emad agr o no mi ul i f akul t et i s agr o t eqno l o gi i s d epar t ament i s mi er (oqmi #11, 28, 2008 wel i .)

**recezentebi:** pr o f . v.z ed gi ni Ze

s r .pr o f . m. var Zel aS vi l i pr o f . v. j af ar i Ze

r ed aqt o r i : pr o f . i . s aaT aSvi l i

saxelmZRvaneloSi ganxilulia miwaTnoqmedebis, memcenareobiis, mebostneobis,

mexileobis da mevenaxeobis ZiriTadi sakiTxebi. saxnavi miwebis racionaluri gamoyenebis da niadagis nayofierebis amaRlebis RonisZiebebi. umniSvne;ovanesi mindvris, xexilis da bostneuli kulturebis saxalxo-sameurneo mniSvneloba da maTi movla moyvanis i nt ens i ur i t eqno l o gi ebi .

saxelmZRvanelo gaTvaliswinebulia ekonomikur da sainJinro spec i al o bi s bakal avr i at i s s t ud ent ebi sa d a f er mer ebi s aT vi s .

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s ameyr neo uni ver s i t et i 2008 w

# Sesavali

miwaTmoqmedebis Semdgomi ganviTarebisaTvis dasaxulia marcvleulis, bostneulis,

teqnikuri, vazis, xexilis, Caisa da subtropikuli kulturebis ganviTareba. sasoflosameurneo warmoebis umTavresi amocanaa, moamaragos kacobrioba organuli nivTierebebiTsakvebiT. dedamiwaze mcenareebis 500 000 –mde saxeobas iTvlian, maT Soris kulturuli 200-s aWarbebs, xolo gansakuTrebuli sameurneo mniSvneloba aqvs 250 saxeobas. adamianma sameurneo saqmianoba uxsovari droidan daukavSira mcenares da cxovels, memcenareobas da mecxoveleobas, rogorc miwaTmoqmedebis umTavres dargs. pirobebis regulireba, romelic produqtiulobas gansazRvravs, yovelTvis iyo sasoflo sameurneo produqciis mwarmoeblis umTavresi zrunvis sagani. sinaTle da siTbo, wyali da sakvebi miwaTmoqmedebis kanonebis saxiT da sameurneo saqmianobiT mecnierulad dasabuTebul saxes aZlevs. faqtiurad igi agrZelebs memcenareobis mier dawyebul saqmes da ufro r ac i o nal ur s axes aZl evs mT el war mo ebas .

Tanamedrove sasoflo-sameurneo kulturaTa mosavlianobisa da produqciis xarisxis amaRleba sakvanZo sakiTxia. marcvleulis warmoebis zrda sasursaTe da safuraJe fondis Seqmnis safuZvelia, igi qveynis ekonomikuri damoukideblobis umniSvnelovanesi pirobaa. memcenareobis produqtebis warmoebis teqnologia kompleqsuri mecnierebaa. romelSic gaerTianebulia agronomiuli mecnierebis yvela dargi: niadagmcodneoba, agroqimia, miwaTmoqmedeba, melioracia, mecxoveleoba, mexileoba, meCaieoba, subtropikuli kulturebi, mcenareTa mavneblebis, daavadebebi da maT winaaRmdeg brZolis RonisZiebebi. TviT CamonaTvali metyvelebs, rom erT wignSi SeuZlebelia yvela sakiTxis ganxilva. amitom avtorTa jgufma calke saxelmZRvanelod warmoadgina memcenareobis, mebo s t neo bi s , mevenaxeo bi s , mexi l eo bi s d a mevenaxeo bi s saki T xebi , r o go r c meo r e nawi l i .

# memc enar eo ba

memcenareoba soflis meurneobis ZiriTadi dargia, romlis amocanaa mosaxleobis

uzrunvelyofa kvebis produqtebiT, mrewveloba-nedleuliT da mecxoveleoba- sakvebi T . igi miwaTmoqmedebis dargia, romelic dakavSirebulia niadagis damuSavebasTan da sasoflo-s ameur neo kul t ur ebi s pr o d uqc i i s war mo ebas T an.

s as o f l o -sameurneo kulturaTa nomenklatura, romelsac planetis mosaxleoba iyenebs 20 aTas saxeobas aRemateba, Tumca SedarebiT farTod gamoiyeneba 640 saxeoba, aqedan 90 saxeoba ganekuTvneba mindvris kulturebs, romlebic Cveni Seswavlis obieqts warmoadgenen. Aam kulturebs Soris wamyvani adgili ukaviaT marcvleul pureulebs (xo r bal i , br i nj i , s i mi nd i , qer i , s o r go , Svr i a, Wvavi ), r o ml ebz ec mo d i s naT es i s 70%.

memcenareoba farTo gagebiT moicavs yvela im kulturas, romelic soflis meur neobaSi gamoiyeneba da mis erT-erT ZiriTad ganStoebas warmoadgens mindvris kul t ur ebi . aqedan gamomdinare, Tanamedrove etapze mecnieruli disciplina, romelic ZiriTadad am kulturebs swavlobs memcenareobis saxelwodebas atarebs da Seiswavlis mindvris kulturebs, maT jiSur Semadgenlobas, raTa am codnis safuZvelze daamuSaos maTi energodamzogi teqnologiebi, romelTa warmoebaSi danergva da gamoyeneba uzrunvelyofs am kulturebis maRali da xarisxiani mosavlis miRebas, ekologiur usafrTxoebas da bazarze konkurentunarianobas. imisaTvis, rom memcenareobam, rogorc mecnierebam Tavisi funqcia ganaxorcielos, is ikvlevs mindvris kulturebis biologiur Taviseburebebs, ekologiur mdgomareobas, maT introduqcias da sabolood adgens maTi mo vl a-mo yvani s mec ni er ul agr o t eqno l o gi as .

memcenareobis amocanaa SeimuSaos sasoflo-sameurneo kulturebis Tesva moyvanis mecnierulad dasabuTebuli agroteqnologi ebi . imisaTvis, rom am amocanis ganxorcieleba warmatebuli iqnes aucilebelia mindvris kulturebis klasifikacia Aar a maT i naT es aur i kavS i r i s mi xed vi T , ar amed maT i s ameur neo d ani S nul ebi s mi xed vi T .

aRniSnuls mkvlevarTa umetesoba ramdenime jgufad hyofs, romel Ta Soris wamyvani

ad gi l i ukavi a samar c vl e pur eul ebs , t eqni kur kul t ur ebs a d a s akveb kul t ur ebs . amas T an, T i T o eul am j guf S i S ed i s bi o l o gi ur i d a sameur neo T val s az r i s i T uf r o axl o s md go mi kul t ur ebi .

mindvris kulturebis is jgufi romelic marcvlis misaRebad mohyavT (xorbali, simindi, brinji, qeri, Svria, Wvavi, lobio da sxva) iTeseba mwkrivad mTliani farTobis mo T es vi T .

S emd eg j guf S i gaer T i anebul i a i s eT i mc enar eebi , r o ml ebi c mohyavT maTi vget ac i ur i masi s aT vi s . t uber i , Zi r nayo f ebi , r o ml ebi c gamo i yeneba s as ur saT o d d a s akvebad . meore jgufi, romelSic zeTis da eTerzeTebis momcemi mcenareebia gaerTianebuli,

maT i war mo ebi s mi z ani a T es l i s r ao d eno bi s a d a mas Si c xi mi s S emc vel o bi s gaz r d a.

momdevno jgufSi Tavmoyrilia sarTavi mcenareebi, romelTagan zogierTi boWkos

i viTarebs Teslz e (bamba), z o gi er T i ki mo hyavT R er o s mas i s mo s avl i s aT vi s .

memcenareobis, rogorc mecnierebis erT-erTi mTavari amocanaa, am kulturebisa da maTi jiSebisaTvis bunebriv- ekologiuri zonebis mixedviT iseTi praqtikuli sakiTxebis d amuSaveba- dazusteba, rogoricaa niadagis damuSaveba im mimarTulebiT, rom racionalur gamoyenebasTan erTad aucileblad unda gaumjobesdes niadagi da SeunarCundes maRali nayo f i er eba. saTesle masalis momzadeba da kulturisaTvis Sesabamisi winamorbedis SerCeva. Tesva (vadebi, saTesle norma, Tesvis wesi, siRrme da sxva) naTesebis movla, gamokveba, sarevelebisa da mavnebel daavadebebisagan dacva. Mmosavlis aReba, vadebis dawesebis mkacri dacva, sanawveralo narCenebisagan nakveTis drouli gawmenda- gaTavisufleba. Mmisi mzadyofna damuSavebisaTvis. aRebuli mosavlis gadamuSaveba da sxva s amuS ao ebi s d r o ul i o r gani z ac i a.

rogorc nebismier samecniero disciplinas, aseve memcenareobasac aqvs kvlevis

s akuT ar i meT o d ebi : Mmi nd vr ul i , saveget ac i o d a l abo r at o r i ul i .

bolo periodSi farTod gamoiyeneba niSandebuli atomis meTodi, romlis

gamoyenebiT wydeba mravali Teoriuli da praqtikuli sakiTxi. magaliTad, s akvebi elementebis dinamika mcenareSi, agreTve niadagidan sxvadasxva saxeobis mcenaris FfesvTa sistemis mier sakvebi elementebis SeTvisebis radiusi. Oorganuli nivTierebebis mcenareTa o r gano ebS i l o kal i z ac i a, f o t o s i nT ez i s i nt ens i ur o ba d a sxva.

# mar c vl eul i kul t ur ebi s z o gad i d axas i aT eba

marcvleul kulturebs Soris wamyvani adgili xorbals ukavia. misgan gamomcxvari puri warmoadgens kvebis ZiriTad produqts. igi yoveldRiuri sursaTia adamianisaTvis, masze moTxovnileba yovelwliurad izrdeba. amitom, dRes mwvaved dgas sakiTxi (gans akuT r ebi T ganvi T ar ebad qveynebS i ) pl anet i s mo s axl eo bi s pur i T mo mar agebaz e. saki T xs is arTulebs, rom purze moTxovnilebis zrda win uswrebs misi warmoebis dones. Seiqmna disproporcia xorblis warmoebasa da moxmarebas Soris , amis erT - erTi mizezia e.w. demografiuli afeTqeba. rogorc specialistebi miuTiTeben ukanasknel periodSi d ed ami wi s mo s axl eo ba 18-j er gai z ar d a. T u ms o f l i o s mo s axl eo bi s pi r vel gao r magebas 600 weliwadi dasWirda, meores – 230, ukanasknel gaormagebas mxolod 38 weli. maTive monacemebiT 2050 wlisaTvis mosaxleoba 9,5 miliards miaRwevs ( aqedan 8 miliardi icxovrebs ganviTarebad qveynebSi ), rasac mohyveba mosaxleobis sursaTiT momaragebis situaciis gauareseba. situacias kidev ufro arTulebs is, rom uaxloes 40 wlis periodSi erT sul mosaxleze savargulebis farTobi savaraudod dRevandelTan

S ed arebi T ganaxevr d eba.

Ppureul mcenareebs morfologiuri da biologiuri Taviseburebebis mixedviT pirobiTad or jgufad yofen: TavTavian pureulebad (xorbali, qeri, Wvavi, Svria, t r i t i kal e) d a f et vnai r pur eul ebad (s i mi nd i , f et vi , R o mi , br i nj i , s o r go ).

pureul mcenareTa fesvTa sistema funjaa. Teslis gaRivebisas pirvelad viTardeba

pirveladi, anu Canasaxovani fesvi. saSemodgomo xorbali iviTarebs 3 pirvelad fesvs, s agaz af xul o - 5-s, qeri - 5-8-s, simindi, sorgo, brinji - 1-s da a.S. odnav mogvianebiT miwisqveSa Reros naskvidan viTardeba damatebiTi anu naskvis fesvebi da mTlian fesvTa sistema Rebulobs funjis formas. pirveladi anu Canasaxovani fesvebi ar kvdeba da TavianT funqcias agrZeleben. fesvTa sistemis ZiriTadi masa ganfenilia 20-25 sm s i R r mez e.

pur eul T a **Rero** swormdgomia, Rruiani, Sedgeba 5-7 muxlTSorisisagan. Rero izrdeba

muxl T S o r i s ebi T . mi wi sqveS a R er o s nas kvi d an vi T ar d eba gver d i T i t o t ebi - nabar t yi .

**foToli** Sedgeba foTlis Rarisa da firfitisagan. foTlis Raris im adgilze saidanac foTlis firfita iwyeba, viTardeba e.w. kauWebi, romelic Semoxveulia Reros irgvliv. kauWebi yvelaze kargad aqvs ganviTarebuli qers, SedarebiT sustad xorbals da s ul ar gaaCni a S vr i as .

Y**yvavi l ed i** Sekrebilia TavTavad, romelic Sedgeba TavTavis Rerakisa da TavTunisagan. TavTunSi moTavsebulia uSualod yvavili butkoTi da mtvrianebiT. Svrias, brinjs d a zogierT sxva kulturis yvaviledi - sagvelaa, xolo simindis mdedrobiTi yvaviledia - t ar o , mamr o bi T i yvavi l ed i ki s agvel a.

**nayof i** -samarcvle pureulebisa marcvalia, romelic dafarulia kaniT, Seicavs end o s per mas, samarago nivTierebas da Canasaxs. es ukanaskneli Sedgeba fesvis, Reros da foTlisagan. sxvadasxva kulturebSi Canasaxisa da endospermis Sefardeba s xvad as xvanai r i a.

praqtikaSi mcenaris sasicocxlo ciklis dinamikas aRricxaven ganviTarebis fazebiT, esenia: Teslis gaRiveba, aRmoceneba, bartyoba, dTavTaveba, yvaviloba da simwife, es ukanas knel i i yo f a s am et apad : r Zi s ebr i s i mwi f e, s anT l i s ebr i si mwi f e d a s r ul i s i mwi f e.

**Teslis gaRiveba** rTuli procesia da misTvis aucilebelia teni. sxvadasxva kulturis Tesli wyals sxvadasxva raodenobiT saWiroebs. magaliTad xorblis Teslis

gaRivebisaTvis saWiroa misi masis 47-48 %: SvriisaTvis - 60-70%; simindisaTvis - 37-44 %; parkosani kulturebis TeslisaTvis - 100-125 % da a.S. aseve gansxvavebulia saWiro temperaturac. MmagaliTad Ppirveli jgufis pureulebisaTvis saWiroa 6-120 C; meo r e jgufisaTvi - 15-22 C; uf r o maR al i t emper at ur a - (30-350 C) af er xebs am pr o c ess .

**aRereba anu damuxleba** xorblovanebSi iwyeba roca Rero miaRwevs 5 sm-s, xolo muxlTSorisebis matebasTan erTad mcenare imatebs simaRleSi. Ddamuxleba da zrda iwyeba Reros zrdasTan erTad da roca warmoiqmneba bolo mexuTe an meeqvse muxlTSorisi am mo ment i saT vi s T avT avi gamo d i s bo l o muxl T S o r i s i s f o T l i s Rar i d an.

**yvaviloba** iwyeba d T avT avebis momentidan. magaliTad qeri yvavilobs TavTavis

gamo Cenamd e, maS i n r o c a Wvavi T avT avo bi d an 8-10 d R i s S emd eg.

yvavilobasa da Sesabamisad damtverianebaze gansakuTrebul gavlenas axdens amindis pirobebi. pureulTa marcvlis sasursaTo Rirebuleba ganpirobebulia maTi qimiuri S ed geni l o bi T .

CamoTvlili kulturebidan ZiriTadad xorbali gamoiyeneba puris gamo s ac xo bad , romlis xarisxi damokidebulia marcvalSi cilisa da webogvaras Semcvelobaze. Ppuris cxobisaTvis marcvali unda Seicavdes 14-15% cilas, xolo makaronis warmoebisaTvis - 1718%-s. puris moculoba da forianoba damokidebulia webogvaras elastiurobaze da c omis gazSemcvelobaze. webogvaras welvadoba ar unda iyos 20-ze dabali da 30-z e maRali. rbilobi unda iyos Tanabrad wvril foriani. Mmarcvals teqnologiuri xar i s xi s mi xed vi T yo f en Zl i er , s aS ual o d a s us t ad .

Zlieri xorblis marcvali unda Seicavdes -14 % cilas. Ppirveli kategoriis ar anakl eb – 28 %, xo l o webogvaras 10 %. Zlieri xorbali gamoiyeneba susti xorblis f qvi l i s gasaumj o bes ebl ad **.**

c xr . # 1 pur eul T a mar c vl i s qi mi ur i Sed geni l o ba ( %-i T )

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| kultura |  | c i l  i | eb | naxS i r wyl ebi | cximeb  i | nacari | uj r ed  ana |
| r bi l i xo r bal | i | 13,9 |  | 79,9 | 2,0 | 1,9 | 2,3 |
| magar i xo r bal | i | 16,0 |  | 77,4 | 2,1 | 2,0 | 2,4 |
| Wvavi |  | 12,8 |  | 80,9 | 2,0 | 2,1 | 2,4 |
| qeri |  | 12,2 |  | 77,2 | 2,4 | 2,9 | 5,2 |
| Svria |  | 11,7 |  | 68,5 | 6,0 | 3,4 | 11,5 |
| simindi |  | 11,6 |  | 78,9 | 5,3 | 1,5 | 2,6 |
| brinji |  | 7,6 |  | 72,9 | 2,2 | 5,9 | 11,8 |
| fetvi |  | 12,1 |  | 69,8 | 4,5 | 4,3 | 9,2 |
| wiwibura |  | 13,1 |  | 67,8 | 3,1 | 2,8 | 13,1 |

saSualo siZlieris xorbali Seicavs 11-13,9 % cilas. meore klasis saS ual o

siZlieris xorbali webogvaras Seicavs 25-27 %. Mmisi puris xarisxi damakmayofilebelia, ar saWiroebs gaumjobesebas da arc TviTon gamoiyeneba dabali xarisxis fqvilis gas aumj o bes ebl ad .

s us t i xo r bl i s f qvi l i sagan d abal i xar i s xi s pur i c xveba. Mmar c val i Sei c avs 11% z e

nakleb cilas**.** Aaucileblad saWiroebs gamaumjobesebel Zlieri xorblis fqvils. mar c vl i s xarisxis marTva SesaZlebelia agroteqnikuri RonisZiebebiT. is icvleba klimatis mixedviT, ganoyierebis wesisa da dozis , sxvadasxva stimulat o r ebi s gamo yenebi T d a c xad i a j i S ebi s mi xed vi T .

**s aSemo d go mo pureulebi**  (z o gad i d axas i aT eba)

saSemodgomo pureulebs gansakuTrebuli mniSvneloba aqvs qveynis marcvleuliT uzrunvelyofaSi. isini gacilebiT met mosavals iZlevian vidre sagazafxulo pureulebi. saSemodgomo pureulisaTvis mniSvnelovania zamTargamZleoba, mokleReroianoba, Cawo l i s ad mi gamZl eo ba d a mo savl i ano bi s maRal i po t enc i al i 80-90 c /ha.

samarcvle pureulebSi ganasxvaveben Semdeg biologiur formebs: saSemodgomo,

sagazafxulo da orTeselebs. saSemodgomoa iseTi formebi, romlebic i ar o vi z ac i i s stadiis gasavlelad pirvel etapze saWiroeben dabal temperaturas -1 - dan +10- mTeli

20-25 dRis ganmavlobaSi, amitom isini iTeseba Semodgomaze, roca mudmivi yinvebis dadgomamde darCenilia 50-60 dRe, mosavals ki Rebuloben momaval weliwads. isini gaz af xul z e d aT es vi s as r o go r c wes i bar t yo ben, magr am ver war mo qmni an R er o s d a T avT avs .

sagazafxulo formebi iarovizaciis stadiis gasavlelad moiTxoven ufro maRal t emper at ur as: **50-dan 200- mde 7-20** dRis ganmavlobaSi, amitom isini iTeseba gazafxulze da mosavl i s aR ebac i mave wel s xd eba.

orTeselebi iarovizacias gadian + 3-150 - mde. samxreTis raionebSi arian jiSebi, romlebic normalurad izrdebian da viTardebian, damakmayofilebel mosavals iZlevian r o go r c gaz af xul z e, i s e Semo d go maz e T es vi s pi r o bebS i . **xo r blis zogadi daxasiaTeba**- xorbali uZvelesi kulturaa saqarTvelosaTvisac. misi produqtiT ikvebeba dedamiwis mosaxleobis naxevarze meti. dReisaTvis xorblis saxeobas Tvlian, miekuTvneba marcvlovnebis anda TivaqasrasebTa ojaxs yvelaze metad gavr c el ebul i a mxo l o d o r i s axeo ba: r bi l i d a magar i xo r bal i .

**r bi l i an Cveul ebr i vi xo r bal s** gabat o nebul i md go mar eo ba ukavi a, ar i s s aS emo d go mo

da sagazafxulo formebi. TavTavi SedarebiT faCxatia. TavTavis piris mxare aRemateba siganeSi gverdiT mxares. TavTunis kilebi – farTo. marcvali konsis tenciis mixedviT aris fqvilisebri da cvilisebri. aris fxiani da ufxo formebi, Rero Rruiani, funja f es vebi T .

**magari xorbali -** ZiriTadad sagazafxulo formebiTaa warmodgenili. TavTavi -

grZeli, TavTunis kilebi mTlianad faravs yvavils, amitom is naklebad cvenadia, Znelad ileweba. fxebi TavTavze grZelia da mis paraleluradaa ganlagebuli; marcvali - gr Zel i , qo Co r i - s us t i an s ul ac ar gaaCni a. s anT l i s ebr i ko ns i s t enc i i T .

sameurneo TvalsazrisiT xorblis yvela saxeobas yofen or jgufad- SiSvelmarcvlian anu namdvil xorblebad da kilebian, anu aslisebur xorblebad. SiSvelmarcvlian xorblebs TavTavi aqvs mtkice, lewvis dros TavTavi ar imtvreva TavTunebad da marcvali advilad Tavisufldeba TavTunisa da yvavilis kilebisagan. am j guf s mi ekuT vneba r bi l i xo r bal i , magar i xo r bal i , xo r bal i d i ka, t ur gi d umi d a s xva.

Aaslisebur (kilian) xorblebs TavTavi aqvT mtvrevadi, momwifebisas TavTavi advilad imtvreva TavTunebad. Mmarcvali mWidrod zis TavTunisa da yvavilis kilSi. Aamitom saWiro xdeba maTi damatebiT gamo f S vna. mi ekuT vneba maxa, z and ur i , ko l xur i as l i , s pel t a, kul t ur ul i wyvi l mar c val a d a sxva.

amJamad miRebuli klasifikaciiT xorblis yvela saxeoba gaerTianebulia Semdeg

jgufebad:

I. d i pl o i d ur i j guf i (2n = 14) II. heqsapl o i d ur i j guf i (2n = 42)

III. t et r apl o i d ur i j guf i (2n = 28)

IV . o qs apl o i d ur i j guf i (2n = 56) **saSemodgomo xorblis -** naTesi farTobebis mixedviT msoflioSi pirveli adgili ukavia. s aS ual o mo savl i ano ba –25-80 c /ha d a met s S ead gens . po t enc i ur i mo savl i ano ba ki 80-90 c /has aRemat eba. saSemodgomo xorblis Tesli gaRivebas iwyebs 1-20 siTboze. optimaluria 12-150 . zamTar- zafxulis periodSi is temperaturis mimarT Zalian mgrZnobiarea. uTovlo zamTarSi - 16-180 yinvis dros iRupeba, Tumca axali seleqciuri jiSebi - 20-250 yinvas uZl eben.

s aS emo d go mo xo r bal i bar t yo bs Semo d go maz e. Ees c i kl i no r mal ur ad mi md i nar eo bs 8100 temperaturisa da normaluri tenis pirobebSi. Ggvalvian pirobebSi ki procesi Zalian nel d eba, z amT ar S i S es vl amd e mc enar e war mo qmni s 4-5 nabar t ys . xorblis fesvTa sistema aRwevs 1,5 m siRrmemde da kargad iyenebs niadagis tens. xorbalis kultura vegetaciis mTeli periodisaTvis saWiro wylis raodenobis 70 %-s yvavi l o bi d an s anT l i s ebr i s i mwi f i s f az i s per i o d S i , xo l o 20 % mar c vl i s mo mwi f ebi s as .

niadagis mimarT maRali momTxovnia. saWiroebs neitralur reaqcias (6-7,5). savegetacio periodia 240-320 dRe. gazrdil moTxovnilebas uyenebs winamorbedsac. karg mosavals iZleva aneulze. saToxni kulturebisa da parkosani mcenareebisagan gaTavisuflebul nakveTebze. 1 tona marcvlis da Sesabamisad namjis mo s aval s

(daaxloebiT 1,5 c) saSemodgomo xorbals sWirdeba 37 kg azoti, 13 kg fosfori da 25 kg kalciumi / m.n./ . saerTod is Zalian mgrZnobiarea ganoyierebis mimarT da Sesaferis ukugebas i Zl eva mar c vl i s mo s avl i ano bi s gad i d ebi T .

niadagis damuSavebis Tavisebureba damokidebulia winamorbedze, nakveTis

dasarevlianebis xarisxze da zonaze. rogorc wesi, saTesled SerCeuli unda i qnes umaRlesi kategoriis Tesli, saTanado fungicidiT damuSavebuli. iTeseba mwkrivad, mocemuli zonisaTvis dadgenil vadaSi. qarTlisa da kaxeTis maRalmTian zonebSi s eqt embr i s bo l o s . s aT es i no r maa 4-5 ml n / ha, wo ni T 180-200 kg/ha.

gazafxulze saWiroa jejilis dafarcxva da azotiT gamokveba. sarevelebisa da d aavad eba - mavneblebisagan naTesebis dacva. mosavali aiReba kombainiT sanTliseburi simwifis fazis dasasrulsa da sruli simwifis dasawyisSi, rac SeiZleba SemWidroebul vad ebS i .

# s aSemo d go mo Wvavi

saSemodgomo Wvavi TavTaviani pureulebis mniSvnelovani warmomadgenelia. Mmisi fqvilisagan gamomcxvari puri gamoirCeva dieturi daniSnulebiT da maRali kal o r i ul o bi T . gansakuT r ebul i gemo T i d a xar i s xi T . i s S ei c avs bal ans i r ebul c i l ebs d a vi t ami nebs (**A, B, B, PP** d a **E**).marcvali Seicavs 9,2 - dan 17 % cilas. misi qato da daRerRili marcvali koncentrirebuli sakvebia. namja gamoiyeneba, rogorc uxeSi sakvebi da sasilose masala. misi namjisagan SeiZleba miRebul iqnes Sesaxvevi qaRaldi, c el ul o z a, Zmar i d a s xva s aWi r o s aqo nel i .

Wvavi xorbalTan, qerTan da sxva marcvlovnebTan SedarebiT axalgazrda kul t ur aa, miuxedavad amisa is farTod aris gavrcelebuli msoflioSi, misi farTobi 18 mln ha-s aRemateba. mosavlianoba qveynebisa da jiSebis mixedviT cvalebadobs 14 - 82,3 c/ha-md e (l i t va). mi s i T es l i gaR i vebas i wyebs 1-20 s i T bo z e. aR mo c enebi s aT vi s ki s aWi r o o pt i mal ur i temperaturaa 6-120, kargad bartyobs 10-120 temperaturaze. moyvanis optimalur pirobebSi 25-300 yinvas uZlebs. kargad TavTavobs da yvavilobs 14-160 siTbos pirobebSi. ganviTarebis s r ul i c i kl i saT vi s esaWi r o eba 18000 s i T bo s j ami .

Wvavi SedarebiT gvalvagamZle mcenared iTvleba. misi transpiraciis koeficientia 340-420. SedarebiT nakleb momTxovnia niadagis mimarT. misTvis saukeTeso niadagad i T vl eba ms ubuqi t i pi s d abal i t eni ano bi s ni ad agebi .

saSemodgomo Wvavi xSirad bartyobas Semodgomazeve amTavrebs da Cqara iwyebs

aR er ebas . magr am T avT avo ba d a yvavi l o ba gaWi anur ebul i a. yvavi l o bas i wyebs d T avT avebi d an 12-14 d R i s S emd eg d a gr Zel d eba 10-12 d R e. j var ed i n-mt vr evi a mc enar ea.

s aS emo d go mo Wvavi 8-10 d R i T ad r e mwi f d eba, vi d r e s aS emo d go mo xo r bal i . T avT avo bi d an

marcvlis gamkvrivebamde saWiroebs 55-60 dRes. savegetacio periodi zonebis mixedviT 270400 dRemdea. nakleb momTxovnia winamorbedebisadmi, ukeTesia aneuli da parkosani kul t ur ebi sagan gaT avi s uf l ebul i f ar T o bebi .

**gano yi er eba**- Wvavs 1 centneri marcvlisa da Sesabamisi biomasis miRebisas niadagidan

gamoaqvs -3,5 kg az o t i , 1,4 kg f osfori da 4 kg kaliumi / m.n./. sakvebs i nt ens i ur ad mo i xmar s bar t yo bi sa d a aR er ebi s f az aS i .

TeslbrunvaSi winamorbedis mimarT didi momTxovni ar aris, ukeTes mosavals iZleva s aT o xni d a parkosani kulturebisagan gaTavisuflebul niadagebze. niadagis damuSaveba iseTivea, rogorc saSemodgomo xorblisaTvis, TiTqmis analogiuria Tesvis vadebic.

saTesi no r ma 6-7 mi l i o ni aR mo c enebi s unar i ani mar c val i ( 170-200 kg/ha).

**naT es i s mo vl a**- naT es i gaz af xul z e ms ubuqi f ar c xi T und a d af ar c xo s .

Wvavs axas i aT ebs mar c vl i s Cac vena, ami t o m aR ebul i und a i qnes r o c a mar c vl i s t eni ano ba 35-20% -i a d a r ac Sei Zl eba S emWi d r o ebul vad ebS i .

# saSemodgomo qeri

**saSemodgomo qeri** - ZiriTadad mohyavT safuraJed da saburRuled. misi marcvali cilebis mcire raodenobas (9-12%) Seicavs, rac saSualebas iZleva rom is ludis warmoebaSi farTod iqnes gamoyenebuli. saSemodgomo qeris TiTqmis yvela forma mwkriviania. qeris es forma ufro maRalmosavliania, vidre misi sagazafxulo formebi. mi s i mo s avl i ano ba 15-35 c/ha-z e c val ebad o bs .

saSemodgomo qeri ufro nakleb zamTargamZlea, vidre saSemodgomo xorbali. 120 -

yinvaze is ufro metad ziandeba , vidre xorbali da Wvavi. niadagis mimarT ki momTxovnia, r o go r c s aS emo d go mo xo r bal i .

saSemodgomo qeri mkac r i momTxovni ar aris winamorbedebisadmi. ukeTesia sufTa aneuli, Tumca mas ufro xSirad Tesaven nasimindarze, mzesumzirisa da parkosnebis S emd eg. d amakmayo f i l ebel mo s aval s i Zl eva nawver al z e T esvi s S emT xvevaS i c .

saSemodgomo qeri Zlier reagirebs sasuqebze, normaluri gadazamTrebisaTvis ur Ceven Zi r i T ad i xvni s d r o s P-40-50, K-40-50 kg/ha / m.n./ S et anas .

**niadagis momzadeba** da Teslis momzadeba dasaTesad iseTivea, rogorc saSemodgomo xorblisaTvis. saTesi norma zonebis mixedviT 3-dan 4,5 mln marcvalia heqtarze. Tesvis vad ebi a o qt o mbr i s pi r vel i naxevar i .

**naTesis movla** - gazafxulze qeri cudad izamTrebs, amitom aucilebelia adre gaz af xul z e az o t i T (35-45 kg/ha / m.n./) gamo kveba.

saSemodgomo qeri ufro adre mwifdeba, vidre saSemodgomo xorbali. momwifebisas T avTavi iRuneba da Tu droulad ar iqna aRebuli danakargebi izrdeba. mosavlis aReba xd eba er T f az ad .

# tritikale

tritikale axali marcvleuli kulturaa. gamoirCeva maRali mosavlianobis

potencialiT. cilebisa da Seucvleli aminomJaveebis gazrdili SemcvelobiT, rac ganapirobebs am kulturis farTo perspeqtivas, rogorc sasursaTod, ise sakvebad gamoyenebisaTvis. tritikale gamoirCeva maRali imunurobiT da eqstremaluri pirobebisadmi kargi amtanobiT. misi marcvali 1-1,5 % met cilebs Seicavs xorblis mar c valTan SedarebiT. misgan gamomcxvari puris moculoba ufro dabali da nakleb foriania, rac am kulturis webogvaras dabal xarisxze miuTiTebs. kargi xarisxis puri mi i R eba r o c a 70-80 % xo r bl i s f qvi l S i 20-30 % t r i t i kal es f qvi l i a S er eul i .

tritikales namja gamoiyeneba cxovelTa sakvebad, safenad da sxva. tritikales

s akvebi mi mar T ul ebi s j i S ebi kar g s as i l o s e d a mwvane mas as i Zl evi an.

tritikale axali botanikuri gvaria, romelic Seqmna adamianma seleqciiT xorblisa

da Wvavis SejvarebiT da saxelwodebac t r i t i kal e **–**pirveli nawili warmoadgens **tritikum** (xorbali) da meore nawili Sekale (Wvavis) saxelwodebebis sinTezs. genetikurad is amf i d i pl o i d ur i a.

opti mal ur i agr o t eqno l o gi ebi s d ac vi T S esaZl ebel i a mi R ebul i qnas mi s i mar c vl i - 40-50 c/ha da mwvane masa - 100-600 c/ha, rac maRali mosavlianoba . tritikales Teslis gaRiveba 20-siTboze iwyeba. optimaluri temperaturaa 200, xolo maqsimaluri 350. Tesvidan 5-7 dRis Semdeg iwyeba aRmoceneba; 18-200-ze ZiriTadi masa bartyobs, Semodgomaze nabartyis raodenoba saSualod 3-6. savegetacio periodi 250-325 dRea. tenis mimarT gansakuTrebul moTxovnilebas ar avlens, misTvis sakmarisia niadagis zRvruli t ent evad o bi s 65-75%, mo i T xo vs ni ad agi s nei t r al ur (-5,5-7,0) ar es .

tritikale winamorbedisadmi nakleb momTxovnia, Tumca misTvis kargi winamorbedia S avi aneul i , par ko sani d a saT o xni kul t ur ebi sgan gaT avi s uf l ebul i nakveT ebi .

tritikales 1 c marcvlisa da Sesabamisi biomasis mosavlisas niadagidan gamoaqvs

4-5 kg az o t i , 1,3-1,6 kg f o s f o r i d a 3,6-4 kg kal i umi . s avar aud o d gano yi er ebi s aT vi s s aWi r o a:

**N**-45-60 kg/ha, **P**-60-65 kg/ha**, K-**45-60kg/ha m.n. ni ad agi s mo mz ad eba d amo ki d ebul i a wi namo r bed z e, d as ar evl i anebi s xar i s xz e d a mo yvani s z o naz e.

tritikales Tesvis vada iseTivea, rogoricaa saSemodgomo xorblis optimaluri vada. saTesi norma meryeobs 3,5-dan 7,5 milion aRmocenebisunariani Tesli ha-ze. CaTesvis s i R r me 6-8 sm.

**naTesis movla**. igive RonisZiebebia rekomendebuli rogorc saSemodgomo xorblis naTesebisaTvis. tritikales marcvali TavTavis kilebSi mWidrod aris Camjdari, amitom ar axas i aT ebs c venad o ba d a mi s i aReba xd eba s r ul i mo mwi f ebi s er T f az aS i .

# s agaz af xul o pur eul ebi

marcvlovan pureulebs Soris wamyvani adgili ukaviasagazafxulo xorbals. didi

s ameur neo mni S vnel o ba aqvT qer s d a Svr i as , agr eT ve f et vnai r pur eul ebs .

**sagazafxulo xorbali**- mis naTesebs msoflioSi pirveli adgili uWiravs mindvris kulturebs Soris. marcvali gacilebiT meti raodenobis cilebs Seicavs vidre s aS emo d go mo r bi l i xo r bl ebi . s aS ual o mo s avl i ano bo ba 14-20 c/ha.

Tesli gaRivebas iwyebs 1-20 siTboze. naTesi vlindeba Tesvidan 7-13 dRis Semdeg temperaturis mixedviT. Tesvidan aRmocenebamde saWiroebs 100-1300 siTbos jams. aRmonaceni uZl ebs -100 wayinvebs. kargad bartyobs 10-120 temperaturis pirobebSi. maRal t emper at ur as (38-400-s ) c ud ad i t ans .

Tesli gaRiveba –aRmocenebisaTvis saWiroebs marcvlis masis 55-70% wyals. fazebis mixedviT wylis resursebi ase nawildeba: aRmocenebis win 7-80, bartyobis fazaS - 15-20, aRerebisa da TavTavobis - 50-60; rZis simwifis - 20-30; sanTlis - 3-5 % mTeli vegetaciis periodSi saWiro wylidan. sagazafxulo xorblisaTvis damaxasiaTebelia uTanabro aRmoceneba da Sesabamisad simeCxere, didi momTxovnia winamorbedis mimarTac- maR al i mosavlis misaRebad aucilebelia sufTa aneuli, kargia saToxni da parkosani kulturebidan gaTavisuflebuli farTobebi. mgrZnobiarea sasuqebis mimarTac. 1 c mar c vl i s f o r mi r ebi s a d a S esabami s ad namj i saT vi s ni ad agi d an gamo aqvs 3,8-4,2 kg az o t i , 1,1 - 1,2 kg fosfori da 3,2-2,4 kg kal i umi . o pt i mal ur ad gano yi er ebul ni ad agS i gans akuT r ebi T kargad iviTarebs fesvTa sistemas. savaraudod iyeneben **N**-30-45 kg/ha, **P** - 40-60 kg/ha**, K-** 30-40 kg/ha (m.n.)

sagazafxulo xorbali zonebis mixedviT sxvadasxva normiT iTeseba 180-dan 225 kg. T es vi s wes i d a CaT es vi s si R r me i s eT i vea, r o go r c s aS emo d go mo xo r bl i sa. **naTesis movla-** saWiroebis SemTxvevaSi unda Catardes naTesis motkepma, jejilis

d af ar c xva, s ar evel ebi s , d aavad ebebi sa d a mavnebl ebi s mi mar T br Zo l a.

**mosavlis aReba**-ZiriTadad erTjeradad xdeba kombainiT sanTlisebri simwifis d as as r ul i s . dagvianeba iwvevs marcvlis Cacvenas, amitom aReba unda ganxorcieldes rac SeiZleba S emWi d r o ebul vad ebS i .

# s agaz af xul o qer i

sagazafxulo qeri mniSvnelovani sasursaTo, safuraJe da teqnikuri kulturaa. misgan amzadeben qeris burRuls, agreTve fqvils, romlis 20-25%-s ureven Wvavis da xorblis fqvilSi puris gamosacxobad. farTod gamoiyeneba safuraJed, misi teqnikuri mniSvneloba ganuz o mel i a l ud i s war mo ebaS i .

qeri erT-erTi uZvelesi kulturaa, saadreoa da gamoirCeva formaTa mraval-

f er o vnebi T . mo s avl i ano ba mer yeo bs 15-70 c /ha d a met i s farglebSi.

qeris gvari moicavs kulturuli qeris sam saxeobas: mravalmwkr i vi an qer s ; o r mwkr i vi ans

d a S ual ed ur qer s .

1. mravalmwkriviani anu Cveulebrivi qeris TavTavis Rerakis TiToeul amonaWedSi sami nayofieri TavTuni zis, romlebic viTardebian da marcvals iZlevian. mravalmwkriviani qer i T avT avi s nayo f i er ebi s mi xed vi T T avis mxriv o r j guf ad i yo f a: s wo r eqvs mwkr i vi an d a ar as wo r i eqvs mwkr i vi an.
2. o r rigiani qeri - am jgufis qerebis TavTavis RerakSi amonabeWdSi mjdomi sam-sami T avT uni d an. mxo l o d T i T o yvavi l i a nayo f i s mo mc emi . gver d i T i yvavi l ebi s t er i l ur i a.
3. Sualeduri qeri- am qvesaxeobis TavTavis RerakSi mjdomi sam-sami yvavilidan S ei Zl eba ganvi T ar d es er T i - er T i , o r i an s ami ve.

sagazafxulo qeri kargad egueba sxvadasxva niadagur da klimatur pirobebs. misi Tesli gaRivebas iwyebs 1-20 siTboze. aRmocenebisaTvis optimaluria 18-200 s i T bo . aRmonaceni uZlebs 80-mde wayinvebs. iTvleba erT-erT gvalvagamZle kulturad. transpiraciis koeficientia-400. kargad izrdeba da viTardeba neitraluri aris niadagebze (**PH** 6,8-7,5). savegetacio periodia 60-dan 110 dRe. misTvis kargi winamorbedia saToxni kulturebi, kargad egueba nawveralsac. SeiZleba daiTesos sagazafxulo xo r bl i sgan gaT avi s uf l ebul ni ad agebz ec .

1 c mar c vl i s d a S es abami sad namj i s f o r mi r ebi sas ni ad agi d an gamo aqvs 2,503 kg az o t i , 1,1-1,2 fosfori da 2-2,4 kg kaliumi. sagazafxulo qeri yvelaze adre vadaSiiTeseba. Tesvis no r ma 3,5-6 mi l n mar c val i (160-200 kg/ha) z o nebi sa d a T es l i s mas i s mi xed vi T .

**naTesis movla-** arsebiTad ar gansxvavdeba sagazafxulo xorblis naTesebisagan.

mo s avl i s aR eba i s eT i ve wes i T xd eba, r o go r c s agaz af xul o xo r bl i s.

# Svria L

**saxalxo -sameurneo mniSvneloba.** Svria farTod gamoiyeneba, rogorc mwvane masa ise marcvali mecxoveleobaSi. marcvali Seicavs 9,0-19,5% cilas, saxamebels 40-56%-s da cximebs 4-6%-s. marcvlisgan amzadeben burRuls, risganac mzaddeba fafa, kiseli, xolo xorblis fqvilTan nareviT keTdeba namcxvari da sxva mravali. Svriisgan damzadebuli pr o d uqt ebi gansakuT r ebi T gamo i yeneba d i et ur d a bavS vT a kvebaS i .

Svriis Tesli ikeTebs oTx pirvelad fesvs, aRmocenebis Semdeg mcenare male i viTarebs funja fesvebs. Tu amindebi iqna Tbili da notio mas SeuZlia miwiszeda Reros muxlebidanac ganiviTaros fesvebi. Reros simaRle 80-175 sm-de aRwevs. foTlis firfita farToa, kargad aqvs ganviTarebuli enaki. Svriis yvaviledi – sagvelaa, gaSlili an Sekruli, TavTunebi 2-3 yvaviliania, gvxvdeba mravalyvaviliani formebic. TavTunis kili sigrZis gamo mTlianad faravs TavTuns. yvavilis kilebi TeTria an Savi. TavTunebi f xi ani c ar i s d a uf xo c . mar c val i wagr Zel ebul i a. 1000 mar c vl i s mas a 30-40 gr amamd ea.

**agroteqnika.** SvriisaTvis niadagis, saTesle masalis momzadeba, Tesva da naTesis

mo vl i s wes ebi s agaz af xul o xo r bl i s anal o gi ur i a.

Svria kargad iyenebs mis winamorbedebSi Setanil organul sasuqebs, ver itans z ed i z ed T es vas .

**mosavlis aReba.** S vr i i s sagvel a ar aT anabr ad mwi f d eba, es ki ar T ul ebs mi s i mo savl i s

aRebas. jer mwifdeba sagvelas zeda nawilSi moTavsebuli marcvali, xolo 6-8 DdRis S emd eg - danarCeni. amitom Svriis xarisxovani marcvali rom miviRoT saWiroa misi S emWi d r o ebul i aR eba.

mosavlis, rogorc adre ise gvian aReba sazianoa. Svriis namjac gvian mwifdeba, vidre marcvali. kombainiT aRebisas mo metebuli tenianobis gamo SeiZleba daobdes. yovelive zemoT aRniSnulis gaTvaliswinebiT xelSemwyob pirobebSi Svria SeiZleba aRebul iqnes dayofiTi wesiT, roca zeda TavTunebis marcvali aRwevs srul simwifes, xolo qveda s anT l i sas. Rvareulebis kargad gamoSrobis Semdeg miiReba mSrali marcvali mcireodeni meqani kur i d az i anebi T . amasT an d i d d eba sakvebi s kvebi T i xar i s xi .

imisaTvis, rom marcvali ar daimtvres dolis bruns amcireben 900-1000 brunamde wuTSi. im SemTxvevaSi Tu mosavlis aReba pirdapir kombainiT moxdeba marcvali, sanam S evi naxavT und a gamo S r es 14-15 %- t eni ano bamd e.

# s abur Rul e f et vnai r i pur eul i

pureulTa am jgufs ekuTvnis simindi – zea mays, fetvi **- Panium miliaceum L,** Romi **- Panikum italikum,** sorgo **- Sorgum,** br i nj i - **Oriza sativa L,** wi wi bur a - **milaceum A.** f et vnai r

pureulTa jgufis mcenareebi garda wiwiburasi rogorc marcvlovani ojaxis war mo mad genl ebi bo t ani kur -mo r f o l o gi ur i aR nago bi T i meo r eben T i T qmi s yvel a i m ni S nebs , rac pureulTa pirveli jgufisaTvis gvqonda aRwerili. am ori jgufis pureulTa Soris arsebiTi ganmasxvavebeli niSnebia: fetvnair pureulTa jgufis mcenareTa Tesls gaRivebis dros gamoaqvs mxolod erTi pirveladi fesvi, maTi Rero Rru ar aris da amovsebulia parenqimuli qsoviliT, miwiszeda muxlebi da muxlTaSorisebi 8-ze metia, maSin roca pirveli jgufis pureulebSi is 5-7-s ar aRemateba. fetvnair pureulTa yvaviledi s agvel aa, maT i mar c val i mo mr gval o a, uRar o d a T avz e bewvi an S ebusva ar a aqvs . meore jgufis pureulTagan gansakuTrebuli mniSvneloba aqvs simindsa da brinjs.

maT i naT es i f ar T o bi d a pr o d uqc i i s s aer T o r ao d eno ba ms o f l i o S i ganuwyvet l i v i z r d eba.

saqarTvelos soflis meurneobaSi meti mniSvneloba eZleva siminds, gansakuTrebiT mec xo vel eo bi s S emd go mi ganvi T ar ebi s aT vi s .

# s i mi nd i L

simindi erT-erTi mniSvnelovani kulturaa. is ekuTvnis marcvlovanTa ojaxs. misi samSoblo centraluri amerikaa. evropaSi igi Semoitanes amerikis aRmoCenis Semdeg, saidanac gavrcelda sxva kontinentebzec. simindma uxvmosavlianobiT, gemuri TvisebebiTa da mosavlis ufro iolad aRebis SesaZleblobiT imdenad popularoba moipova, rom mTlianad gandevna iseTi kulturebi, rogorebicaa Romi da fetvi. saqarTveloSi kaJa simindi Semotanilia ufro adre (XVII saukunis dasasruls), vidre kbila simindi, kbila simindis Semotanis TariRad miCneulia XIX saukunis dasawyisi, simindi jer gavrcel d a dasavleT saqarTveloSi, Semdeg qarTlSi, saidanac fexi moikida aRmosavleT saqarTvelos raionebSi, agreTve azerbaijanSi, somxeTsa da CrdiloeT kavkasiaSi. siminds didi mniSvneloba aqvs rogorc sasursaTo, sakveb da teqnikur kulturas. mis fqvils sasursaTod iyeneben purcxobisaTvis (mWadi, mWadpura) Romis, fafis, sxvadasxva sakonditro nawarmis dasamzadeblad, xmel marcvals iyeneben saWmelad batibutis an mo xar S ul i saxi T d a s xva. mi s gan xd i an z eT s . s i mi nd i s mar c val i S i naur i c xo vel eebi sa d a frinvelisaTvis saukeTeso koncentriuli sakvebia. Cala uxeSi sakvebia, xolo mwvane masa gamoiyeneba silosis dasamzadeblad da pirdapir mwvane skvebad. rogorc teqnikuri kul t ur a, s i mi nd i sagan mz ad d eba qaRal d i , c el ul o z a, xel o vnur i mer qani da sxva.

simindi maRalmosavliani mcenarea. rogorc saToxni kultura, simindi Tavis Semdeg niadags tovebs sarevelebisagan sufTas da fxviers, organuli nivTierebebis didi maragiT, fesvebisa da Reroeebis anarCenebis saxiT. amitom is kargi winamorbedia s xvad as xva kul t ur ebi saT vi s , maT S o r i s s aS emo d go mo mar c vl eul i s aT vi s.

simindis kultura iTeseba parkosan kulturebTan erTad sasilosed, saganaTibod, sanawveralod da ganmeorebiTi naTesebisTvis. mas Tesaven agreTve, aneulebze, kulisebis S es aqmnel ad , xo l o mS r al R er o ebs i yeneben T o vl i s d as akavebl ad .

s aqar T vel o S i maRalmTiani raionebis garda simindi iTeseba yvela raionSi. misi saheqtaro mo savlianoba saSualod msoflioSi Seadgens - 3,21, ruseTSi - 2,61, s aqar T vel o S i - 2,0 t/ha.

**j i Sebi .** simindis jiSebis raodenoba, seleqciuri muSaobis Sedegad, yovelwliurad izrdeba. saqarTvelo sxva qveynebTan SedarebiT simindis jiSebis simravliT gamoirCeva. amJamad saqarTveloSi daraionebulia Semdegi saxis jiSebi: abaSi s yviTeli, ajameTis TeTri, qarTuli krugi, geguTis yviTeli, adgilobrivi yviTeli kaJa, adgilobrivi TeTri kaJa, imeruli hibridi, sterlingi, krasnodaruli 5, hibridi “vir 42”, hi br i d i qar T ul i 9, hi br i d i i ver i a.

**simindis klasifikacia.** kul t ur aS i s i mi nd i war mo d geni l i a mxo l o d er T i saxeo bi T – Zea

mays. simindis klasifikacia jer kidev ar aris srulad damuSavebuli, rac imiTaa gamo wveuli, rom dRemde ar aris kargad garkveuli simindis warmoSobisa da misi eko l o gi ur i ganvi T ar ebi s i s t o r i a.

klasifikaciis Sesabamisad simindi iyofa Semdeg 8 qvesaxeobad an jgufad: kbila, kaJa, rbili, tkbili, buStara, cvila, rbil-tkbili da kilebian simindebad. simindis am jgufebidan sameurneo pirobebSi farTod gavrcelebulia kbila da kaJa simindebi. mcire f ar T o bi ukavi a buS t ar a d a t kbi l s i mi nd ebs .

**kbila simindi –**pirveli adgili uWiravs gavrcelebiT, ZiriTadad sagvianoa, mosavliani, marcvali misi **C** tipisaa, mogrZo T avCaWyl et i l i – kbilis msgavsad. endospermi ufro metad fqvilisebria. axasiaTebs mZlavri zrda, didi zomis taro. farTod gavrcelebulia dasavleT saqarTveloSi. savegetacio periodi 130-150 dRes aR emat eba.

**kaJa simindi –**marcvali momrgvaloa, magari, Tavamovsebuli, mbzinvare, rqisebri endospermi moTavsebulia Tavisa da periferiis fenaSi, fqvilisebri endospermi ki marcvlis SuagulSi, Canasaxis garSemoa ganlagebuli. kaJa simindi ufro mdidaria cilebiT vidre kbila. simindis es jgufi ZiriTadad saadreo formebiT aris warmodgenili. zrda-ganviTarebisaTvis siTbosa da tenis naklebi raodenobiT kmayo f i l d eba. s aveget ac i o per i o d i 100-120 d R es ud r i s .

**buStara simindi –**anu tkacuna simindi, misi marcvali TiTqmis mTlianad Sedgeba rqiseburi endospermisagan. fqvilisebri endospermi mxolod CanasaxTan aris moTavsebuli. amis gamo buStara simindi mdidaria cilebiT, misi marcvlisagan mzaddeba maRalxarisxovani burRuli. cecxlze gaxurebiT e.i. moxalvis dros tkacuniT skdeba da gad mo i S l eba T eT r i mas a f af uki s axi T , r as ac pr aqt i kaS i bat i -but s eZaxi an.

am jgufis simindisaTvis damaxasiaTebelia mravaltaroianoba, patara zomis taro,

wvr i l i mar c val i .

**tkbili simindi** –uwodeben Saqris simindsac. rZiseburi simwifis fazaSi misi endospermi Seicavs Saqrebis did raodenobas, momwifebis dros ki es Tviseba ekargeba. gamoiyeneba sakonservo mrewvelobaSi. misi marcvali mdidaria rqiseburi endospermiT, TiTqmis srulebiT ara aqvs fqvilisebri endospermi. marcvali momwifebis Semdeg Zlier CaWyl et i l i d a d anao Webul i a.

**rbili simindi** –mas saxameblian simindsac uwodeben. mis marcvalSi TiTqmis srulebiT ar aris rqiseburi saxamebeli da endospermi mTlianad TeTri feris, fxvieri fqviliseburi saxameblisagan Sedgeba, amis gamo is didxans inarCunebs sirbiles. am j guf i s s i mi nd ebi gamo i yeneba s axamebl i s a d a s pi r t i s war mo ebaS i .

**cvila s i mi nd i** –misi endospermis garegani Sre waagavs gamagrebul cvils (sanTels), konsistenciiT ki sakmaod magaria da am mxriv emsgavseba kaJa da buStara simindebis formebs. endospermis kargi monelebadobis gamo mas SeiZleba farTo gamoyeneba mieces pirutyvis sakvebad. gavrcelebulia aRmosavleT aziis qveynebSi. saqarTveloSi ar gvxvd eba.

**rbil-tkbili simindi** –warmoadgens saSualo formas rbilsa da tkbil simindebs Soris. endospermis qveda nawiliT igi waagavs rbili simindebis jgufs, zemo nawiliT ki tkbil simindebis jgufs. gavrcelebulia umniSvnelod samxreT amerikaSi. saqarTveloSi ar gvxvd eba.

**kiliani simindi** –simindis sxva jgufebisagan mkveTrad gansxvavdeba. misi marcvali Casmulia TavTunisa da yvavilis kilSi da Znelad gamosafSvnelia, amasTan erTad mar c val i md ar e R i r sebi s aa d a i s ar Sei Zl eba Cai T val o s s i mi nd i s kul t ur ul f o r mad .

**ganoyiereba.** simindis mosavlianobis gasazrdelad aucilebelia swori ganoyierebis sistemis gamoyeneba, radganac is marcvlis Sesaqmnelad moixmars 1-haze 24,5 kg az o t s , 9,9 kg f o s f o r s d a 15,5 kg kal i ums .

ZiriTadi xvnis win xdeba organuli sasuqis mTliani dozis Setana. fosforiani da kaliumiani sasuqebis Setana unda moxdes 2/3-is ZiriTadi xvnis win, 1/3-is ki TesvisTanave, aseve TesvisTanave SeaqvT azotiani sasuqis 1/3, xolo 2/3 damatebiTi gamo kvebi s saxi T 2-3 f o T l i s f az aS i .

**adgili TeslbrunvaSi.** simindi SedarebiT advilad itans erTsa da imave adgilze Tesvas da wlebis manZilze maRali agroteqnikis pirobebSi SesaZlebelia miviRoT misgan kargi mosavali. TeslbrunvaSi siminds, rogorc saToxn kulturas aTavseben TavTaviani pureulebis Sua. maTi mosavlis aRebis Semdeg sakmaod didi dro rCeba niadagis momzadebisaTvis. simindis Semdeg TeslbrunvaSi SeiZleba moTavsdes yvela mcenare, ufro xSirad TavTaviani pureuli. simindi TavTaviani pureulisaTvis ukeTesi winamo r bed i a, vi d r e T ambaqo d a mz esumz i r a, r ad gan es kul t ur ebi Zl i er f i t aven ni ad ags .

**niadagis damuSaveba.** simindi moiTxovs niadagis Rrmad damuSavebas. niadagis mo mz ad eba

simindisaTvis iwyeba winamorbedisgan mindvris gaTavisuflebisTanave. simindis dasaTesad niadagis ukeT momzadebis mizniT Tesvis win erTi - ori dRiT adre xnuli unda gafxvierdes kultivatoriT 5-6 sm siRrmeze da TanmiyolebiT daifarcxos. Tesviswina gaf xvi er ebi s a d a kul t i vac i i s d r o s S eaqvT gaT val i s wi nebul i mi ner al ur i sas uqebi .

**Teslis momzadeba da Tesva.** simindis Tesli unda iyos umaRlesi xarisxis, aRmoc enebi s unariT aranakleb 96% (I klasi) dasaSvebia 92% (II klasi). dabali aRmocenebis Tesli Zlier meCxer aRmonacens iZleva da mkveTrad amcirebs mosavals. Tesvamde 2-3 kviriT adre saTesle masala unda gadairCes, taros unda moscildes daobebuli da dazianebuli nawi l ebi . simindis Tesli unda ganiavdes, gamzeurdes, dayalibdes da Seiwamlos mindvruli aRmocenebis unaris gasadideblad. aseve saWiroa Seiwamlos sokovani d aavad ebebi s wi naaR md eg.

**Tesvis vada.** s i mi nd i , r o gorc siTbos moyvaruli mcenare sxva pureulebisagan gansxvavebiT gvian iTeseba. adre Tesvis dros is Zlier ziandeba siciveebisagan, mcenareTa nawi l i aR mo c enebamd e l peba d a i R upeba, aR mo c enebul i mc enar e ki s us t ad vi T ar d eba.

TesvisaTvis saukeTeso periodia, roca ni ad agi T es l i s CaT es vi s s i Rr mez e gaT beba 10-12 mde, niadagis -10 -siTbos pirobebSi daTesili simindi aRmocendeba me-18 dRes, xolo 12 siTbos pirobebSi -me-14 dRes. simindis Tesvis optimalur vadad unda CaiTvalos periodi 10 apr i l i d an 30 apr i l amd e. ami s S emd eg d aT es i l i s i mi nd i ukve nakl eb mo s aval s i Zl eva.

**Tesvis norma da wesi.** simindis Tesvis farTod gavrcelebuli wesia mwkrivad d a kvad r at ul bud o br i vad T es va.

mwkrivad Tesva warmoebs specialuri simindis saTesi manqanebiT uwyvet zolebad, amis gamo aRmocenebis Semdeg saWiroebs mwkrivebis gamoxSirvas xeliT, mwkrivTaSoris manZili ki S es aZl ebel i a d amuS avd es manqanebi T .

kvad r at ul -bud o br i vi T esva xo r c i el d eba as eve spec i al ur i manqanebi T . s aqar T vel o s

pirobebisaTvis kvadratul-budobrivi TesvisaTvis miRebuli sqemaa 70X70 sm, budnaSi 2 mc enar e, as eT i ganl agebi s d r o s heqt ar z e T avs d eba 40 aT as i mc enar e.

Cveulebrivi mwkrivad Tesvis dros simindi iTeseba mwkrivebs Soris 70 sm. aR mo c enebis Semdeg xdeba mcenareTa gamoxSirva, mwkrivSi mcenareTa Soris 35 sm d at o vebi T . am pi r o bebS i heqt ar z e T avs d eba 40 aT as i mc enar e.

simindis Teslis CaTesvis siRrme mraval pirobazea damokidebuli: adre Tesvis dros Tesli iTeseba mcire siRrmeze, gvian Tesvis dros ki ufro Rrmad. Teslis CaTesvis no r mal ur s i R r med i T vl eba 5-6 sm.

**naTesis movla.** xelSemwyobi amindis pirobebSi simindi aRmocenebas iwyebs 7-8 dRis Semdeg, magram xSirad simindis Tesvis Semdeg niadagi jdeba, zedapiri uxmeba da qerqs ikeTebs, am SemTxvevaSi saWiro xdeba qerqis daSla da niadagis aeraciis gaZliereba. roca simindi aRmocendeba da mcenare ganiviTarebs 2-3 foTols, naTesi ifarcxeba mwkrivebis gardigardmo, es afxvierebs niadags da spobs sarevelebs. simindis naTesis Toxnakultivaciis raodenoba damokidebulia TviT naTesis mdgomareobaze. sadac d as ar evl i aneba uf r o met i a s aWi r o a s i mi nd i s er T xel gaT o xna d a 3 kul t i vac i a.

**herbicidebis gamoyeneba.** sarevelebis winaaRmdeg farTod mimarTaven herbicidebiT Sesxurebas. erT-erTi aseTi herbicidia 2,4-d, romelic SeaqvT naTesSi simindis aRmocenebamde 1-2 dRiT adre an asxureben mas simindis aRmocenebis Semdeg 3-5 foTlis fazaSi. zogjer herbicidebTan erTad SeaqvT mineraluri sasuqebic. is SeaqvT niadagSi adre gazafxulze, 1,5-3 kg raodenobi T (m.n). karg Sedegs iZleva niadagSi her bi c i d ebi s Setana. es saSualebas iZleva sagrZnoblad Semcirdes mwkrivTaSoris niadagis damuS avebi s s aWi r o eba.

**morwyva –** sagrZnoblad zrdis simindis mosavals. dasvleT saqarTvelos teniT uzrunvelyofil raionebSi simindi morwyvas ar saWiroebs, Tumca aqac dgeba kritikuli periodi zafxulis gvalvebis Sedegad da simindisaTvis morwyva aucilebeli RonisZiebaa maRali mosavlis misaRebad. morwyvis ukeTesi wesia gaJonviT morwyva, kvlebSi wylis mi S vebi T naT es i s kul t i vac i i s d r o s .

**mosavlis aReba.** simindis mosavals iReben sruli simwifis fazaSi, roca marcvali sabolood SeSreba da gamagrdeba. am dros mas aqvs jiSisaTvis damaxasiaTebeli forma da f er i . f uCeCi ad vi l ad s c i l d eba t ar o s , mc enar i s f o T l ebi d a R er o ki yvi T l d eba d a xmeba. mosavlis aRebis dagvianeba ar SeiZleba, radgan Semodgomaze amindi uaresdeba Calac da simindic wvimebisagan sveldeba, Zlieri qarebis dros mcenareebi iqceva da rTuldeba mosavlis aReba. Semosuli simindis didxans mindorSi gaCerebas Tan sdevs marcvlisa da t ar o s d az i aneba d aavad ebebi s a d a mavnebl ebi sagan.

# br i nj i

**saxalxo-sameurneo mniSvneloba.** brinji uZvelesi da sakmaod gavrcelebuli sasoflo-

sameurneo kulturaa. dedamiwis mosaxleobis erT miliardze meti brinjiT ikvebeba da am mxr i v i s meo r e ad gi l z ea xo r bl i s S emd eg.

brinjis marcvali mdidaria naxSirwylebiT, misi kangaclili marcvali Seicavs 75%-mde saxamebels, magram SedarebiT Raribia cilebiT 7,5% da cximebiT (1,2%). misgan damzadebuli burRuli Zlier gemrielia da advilad SeiTviseba organizmis mier, ris gamo c d i et ur mni S vnel o bas ani Weben.

**brinjis Rero -** Cala Zvirfasi masalaa umaRlesi xarisxis qaRaldisa da muyaos damzadebisaTvis. brinjis Calisagan mzaddeba saukeTeso xarisxis sapapirose qaRaldi, kal aT ebi , qud ebi d a s xva.

**gavrcelebis raionebi.** saqarTveloSi brinjis kulturas uZvelesi droidan misdevdnen. brinjis kultura Semotanil iqna indoeTidan. mohyavdaT qvemo qarTlisa da alaznis gaRma mxaris sarwyav miwebze. aranaklebi gavrceleba hqonda dasavleT saqarTveloSi, ker Zo d samegr el o s d abl o b z o l S i .

br i nj i s naT es ebi s d i d i mas i vebi gavr c el ebul i a umT avr esad samxr eT -aR mo s avl eT az i aS i : indoeTi, CineTi, vietnami, birma, indonezia, korea, iaponia. amas T an brinjis warmoebis uZveles i qveynebi a S ua az i i sa d a ami er kavkas i i s r es publ i kebi .

**botanikur-morfologiuri daxasiaTeba.** brinji Oriza sativa L ekuTvnis marcvlovanTa

o j axs , mi s i f es vT a s i s t ema f unj anai r i a.

**Rero –** brinjisa swormdgomia, simaRliT 80-120 sm, Sedgeba 7-8 muxl T aS o r i s i s agan, zeda muxlTaSorisebi ufro grZelia da Rrua, qveda muxlTaSorisebi ki amovsebulia rbili qsoviliT. brinjis Reros aqvs datotvis unari. damatebiTi Reroebi gamodian miwis zedapirze moTavsebuli muxlebidan. datotvis unari damokidebulia jiSze. savegetacio per i o d i aR wevs 100-140 d R es .

**foToli –** lanceturia, sigrZiT 10-30 sm-mde. ganviTarebuli aqvs rogorc enaki, ise kavebi .

**yvaviledi**–sagvelaa, sigrZiT 10-30 sm-mde, uxvad ganviTarebuli danatotebiT,

r o mel z ed ac mo T avs ebul i a T avT unebi .

**TavTununi –** erTyvaviliania, yvavils aqvs ori kili, qveda da zeda. gvxvdeba brinjis ufxo da naxevrad fxiani formebic. zogierT qveynebSi upiratesobas aniWeben fxian formebs, radgan fxian brinjs ar ekareba ara Tu mweri an frinveli, aramed Tagvic ki, r o mel i c z o gj er anad gur ebs mT l i anad uf xo f o r mebs .

**brinjis marcvali –** kiliania mas garedanmWi d r o d aqvs Semokruli rogorc yvavilis, ise TavTunis kilebi, romelic galewvis dros Tan mosdevs marcvals. marcvlis endospermi ZiriTadad fqviliseburi agebulebisaa, mdidaria saxamebliT. marcvlis zomis mixedviT kulturuli brinji iyofa or qvesaxeobad: 1. Cveulebrivi brinji, romlis marcvlis sigrZea 5-7 mm. 2. mokle marcvliani brinji – 4 mm. ruseTSi da sxva qveynebSi gavrcelebulia Cveulebrivi brinji. brinjis mwarmoebel uZveles qveynebSi: indoeTSi, f i l i pi nebS i ki Zi r i T ad ad mo hyavT mo kl e mar c vl i ani br i nj i .

**biologiuri Taviseburebani.** brinji erTwliani tropikuli mcenarea. misi Tesli gaRivebas iwyebs 11-12 siTbos pirobebSi, magram mcenaris normaluri aRmocenebisaTvis saWiroa 14-15 siTbo. brinjis zrda-ganviTarebisaTvis saukeTeso pirobebia 25-30 s i T bo . brinji srulebiT ver itans yinvas, 0,5 wayinvebis dros Zlier ziandeba, xolo 1 yi nvaz e mT el i mc enar e i R upeba.

t eni s ad mi br i nj i s mo T xo vni l eba d i d i a. mi s i t r anspi r ac i i s ko ef i c i ent i aR wevs 500-800-s. amitom brinji mohyavT mudmivi rwyvis pirobebSi an iseT raionebSi, sadac naleqebi z af xul i s per i o d S i uxvad mo d i s .

sinaTlis mimarT brinjis moTxovnileba didia. igi warmatebiT mohyavT sxvadasxvanair nakveTebze. is moiTxovs iseT nakveTebs, romelic advilad akavebs wyals. karg mosavals iZleva agreTve organuli nivTierebebiT mdidar niadagebze, mdinaris s anapi r o ebz e d a mZi me T i xa ni ad agebz e.

**niadagis damuSaveba.** brinji saWiroebs sarevelebisagan sufTa mindors da moiTxovs niadagis Rrmad damuSavebas. ZiriTadi xvna warmoebs Semodgomaze, 23-25 sm siRrmeze. gaz af xul z e mo xnul i nakveT i f xvi er d eba o r j er kul t i vat o r i T 15-18 s m s i R r mez e.

**T es va** – brinjis warmoebis ZiriTad qveynebSi farTod aris miRebuli brinjis dargva CiTiliT, romelic winaswar gamohyavT specialurad momzadebul sanergeebSi. irgveba 12-15 sm sigrZis miwis ko S t ebi anad . Ci T i l i T d ar gul i br i nj i uf r o mo s avl i ani a, magr am es bevr muSaxels moiTxovs. amierkavkasiaSi mxolod azerbaijanSi misdeven am wesiT brinjis mo yvanas , s xva qveynebS i ki T es l i T T es aven.

brinjis Tesli unda iyos sufTa sarevelebisagan da sxva mcenareTa Teslis minarevebisagan. brinjis naadrevad, civ niadagSi Tesva dauSvebelia. misi Tesva iwyeba maSin, roca sarwyavi wyali gaTbeba 12-15 - mde. TesvisaTvis kargi periodia maisis d as awyi s i . **mosavlis aReba.** mosavalis aRebis dros brinjis marcvali zedmet tens Seicavs. teniani marcvali ki advilad ganicdis Caxurebas da kargavs aRmocenebis unars, uaresdeba marcvlis xarisxi. amitom mosavlis aRebisTanave marcvali kargad unda gaSres, tenianoba ar unda aRematebodes 14%-s, Sesanaxad Cayrili brinjis Tesli ar unda daiyaros 1,5 m-ze uf r o sql ad .

# fetvi

fetvs mniSvnelovani adgili uWiravs sasursaTo kulturebs Soris. misgan amzadeben burRuls, gamoiyeneba Sinauri frinvelebisa da Rorebis sakvebad. fetvis marcvals iyeneben agreTve spirtisa da ludis warmoebaSi. xolo fetvis Cala Zvirfasia saqonlis sakvebad. fetvis 1 kg Cala Seicavs 0,42-0,51 sakveb erTeuls. fetvis mwvane masas iyeneben s enaJ i s d as amz ad ebl ad , s i l o sad , vi t ami ni ani bal axi s f xvni l ad .

fetvis mcenare Zlier gvalvagamZlea. xasiaTdeba mokle savegetacio periodiT. i T eseba heqtarze mcire raodenoba -15-20 kg. sagazafxulo kulturebis aRmonacenis daRupvis dros SeiZleba fetviT gadaiTesos. imis gamo, rom Ffetvi mokle vegetaciisaa S ei Zl eba d ai T es o s sanawver al o kul t ur ad , S es aZl ebel i a mi R ebul i qnas i mave wel s mwvane masa an marcvali.

fetvi niadagisadmi nakleb momTxovnia, iTeseba yvelanair niadagebze. Tumca maRal

mo s aval s i Zl eva kar gad gano yi er ebul ni ad agebz e.

**jiSebi**. fetvi s yvaviledis formis mixedviT sam formas arCeven: farCxats, daxrilsa da koSturas. saqarTveloSi samive forma mohyavT, yvelaze ufro gavrcelebulia farCxata.

saqarTveloSi fetvi ZiriTadad kaxeTSi da qarTlSi (Telavis, sagarejos, gur j aanis, dedofliswyaros, axmetis, TianeTis da duSeTis raionebi) iyo gavrcelebuli, magr am d Rei s aT vi s naT es ebi mni S vnel o vnad S emc i r ebul i a.

**gano yi er eba.** 1 tona fetvis marcvalsa da mis Sesabamis odenobis namjis Sesaqmnelad fetvisaTvis aucilebelia (kg) azoti -31, fosfori- 14 da kaliumi-27. fetvs sakvebi gansakuTrebiT Warbad Wirdeba misi zrdis intensiur periodSi bartyobidan simwifemde, r o mel i c gr Zel d eba 40-45 d R e-Rames .

**agroteqnika.** fetvisaTvis niadagis damuSavebas didi mniSvneloba aqvs, radgan

sagazafxulo kulturebTan SedarebiT is cota gvian iTeseba, amasobaSi ki nakveTi sarevelebiT ifareba. aqedan gamomdinare, aucilebelia sarevela mcenareebis mocileba. d i d i mni S vnel o ba aqvs nawver al i s aCeCvas , naad r evad mz r al ad xvnas , mo xvni s s i R r mes (23-25 s m). kultivacias da farcxvas vatarebT imis mixedviT Tu rogor d asar evl i anebasT an gveqneba s aqme. i s e s as ur vel i a kul t i vac i a Cat ar d es T anmi yo l ebul i f arcxviT.

**Tesva.** fetvi iTeseba Cveulebrivi xorblis saTesiT, viwro mwkrivad an mwkrivad, mwkrivebs Soris manZi l i - 15 sm. SesaZlebelia fetvis Tesva farTo mwkrivad - 45- sm daSorebiT. saTesi norma damokidebulia Tesvis wesze. mwkrivad Tesvis dros ha-z e s aWiroa 12-18 kg /ha, xolo farTo mwkrivad Tesvis dros ki saWiroa 6-12 kg marcvali ha-z e. f et vi s saT es l e masal a gud af S ut i s sawi naaR md ego d mS r al i wes i T und a S ei waml o s.

CaTesvis siRrme damokidebulia niadagis mdgomareobaze. mTavaria Tesli moeqces ni ad agi s t eni an f enaS i . f et vi s CaT esvi s s i R r med mi Cneul i a 2-3 sm siRrme.

**NnaTesis movla**. aRmocenebisa da aRmonacenis momagrebis Semdeg saWiroa naTesi daifarcxos msubuqi farcxiT, raTa Semcirdes niadagidan wylis aorTqleba da sarevela mcenareTa raodenoba. xolo farTomwkrivad naTesi kultivatoriT unda gafxvierdes 2-3- j er .

**mosavlis aReba**. fetvis yvaviledi erTdroulad ar mwifdeba da amitom marcvali advilad cviva. dReisaTvis miRebulia fetvis mosavlis aReba or fazad. mosavals jer Wrian samklebiT, romelic Rvarulebad ewyoba da 3-4 DdRis Semdeg, Rvarulebi saTanadod r o c a S eS r eba, mas ko mbai ni T i R eben, as eT pi r o bebSi d anakar gebi nakl ebi a.

fetvis mosavlis aRebis meore gzaa pirdapir kombainiT aReba. kombainiT aReba S es aZl ebel i a f et vi s s i mwi f i s d awyebi s f az aS i , mxo l o d am S emT xvevaS i aR ebul i mar c vl i s gamo S r o baa saWi r o .

# wiwibura

wiwiburas samSoblod iTvleba indoeTi. samxreT aRmosavleT aziis qveynebi mas uxsovari droidan icnoben. wiwibura SesaniSnavi marcvlovani kulturaa. misgan amzadeben bur R ul s . wi wi bur as mar c val i saS ual o d S ei c avs : c i l as 9%-md e, s axamebel s 70%-md e, c xi ms

1,6%-mde. wiwiburas moyvanas safuZvlad udevs maRali kvebiTi Rirebuleba. aqvs mokle savegetacio periodi, ris gamoc mas xSirad Tesaven sanawveralo kulturad da iReben wel i wad S i meo r e mo saval s .

wiwibura Taflovani mcenarea. xelsayreli klimaturi pirobebis dros 1 haqtari wiwiburas naTesidan 70-90 kg Tafli SeiZleba miiRo. is swrafad izrdeba da iviTarebs f ar T o f o T l ebs , r i T ac axS o ben s ar evel a mc enar eebs .

wiwiburas sxva dadebiT TvisebebTan erTad samkurnalo Tvisebebic gaaCnia. misi foTlebisa da yvavilebisagan amzadeben samkurnalo preparats –rutins. es preparati gamo i yeneba skl er o z ul d a hi per t o nul d aavad ebaT a sawi naaR md ego d .

wiwiburas 1000 marcvlis masa 12-30 gr tolia. saSualo mosavlianoba Seadgens 8-10 centners, aris meurneobebi romlebmac miiRes 20-25 c/ha-ze. wiwibura mTavarRerZiani mc enar ea , mi waS i Cad i s 1 met r amd e.

Rero Rrua, itoteba d a50-120 sm simaRles aRwevs, momwifebisas wiTldeba. foTlebi gul i s ebr -samkuTxovania. yvaviledi-foTlis ubeSi ganviTarebuli mtevania. yvavilebi o r s qes i ani a, T eT r i , var d i sf er i , wi T el i S ef er i l o bi T . wi wi bur as yvel a yvavi l i nayo f s ar iZleva. wiwibura mkveTrad reagirebs klimaturi pirobebis mimarT. is aRmocenebas iwyebs 7-80 –z e. Zl i er i mgr Zno bi ar ea yi nvebi s ad mi .

**niadagis damuSaveba.** wiwibura kargad egueba TiTqmis yvelanair niadagebs. misTvis niadagis damuSaveba warmoebs SemodgomiT, mzralad, adre gazafxulze xnuli ifarcxeba, xolo TesviT SedarebiT gvian iTeseba. Tesvamde sarevelebis mospobis mizniT dafarcxvac da kultivaciac tardeba imdenjer ramdenjerac dasaTesi nakveTi moiTxovs. niadagis datkepna Tesvis win an Tesvis Semdeg tardeba im SemTxvevaSi Tu niadagSi sakmarisi teni ar iqneba. wiwibura tenis moyvaruli mcenarea. mas 2-3-jer meti wyali Wirdeba fetvTan S ed ar ebi T . gans akuT r ebi T yvavi l o bi s d r o s .

**ganoyirereba.** s akvebi el ement ebi d an wi wi bur as T vi s Zi r i T ad i aris kaliumiani sasuqebi,

r o mel i c mz r al ad xvni s wi n S eaqvT .

f o sf o r i an sas uqebs wi wi bur a Zi r i T ad veget ac i i s d as awyi s S i s aWi r o ebsa, r ad ganac i s aZlierebs mcenaris gamZleobas araxelsayreli kl imaturi pirobebisadmi. az o t i ani sasuqisgan Tavs ikaveben, radgan azotiani sasuqebi iwveven vegetatiuri masis Zlier zrdas mo s avl i ano bi s S emc i r ebi s xar j z e.

**Tesva, Tesvis wesi da Tesvis vada.** s aT esl e mas al ad ar Ceven ms xvi l f r aqc i as 3.5-4,0 mm diametriT. aucilebelia sokovani daavadebebis sawinaaRmdego preparatiT Teslis Sewamvla. xolo Tesvis optimalur vadad SeiZleba miCneul iqnes niadagis 120 - 150-amde myarad gaTbobis dro. iTeseba farTo mwkrivad (mwkrivTSorisebis daSoreba 45 sm). wiwibura SeiZleba viwro mwkrivad da mwkrivulad daiTesos. am SemTxvevaSi wiwiburas savegetacio periodi mcirdeba 6-8 dRe-RamiT, farTo mwkrivulTan SedarebiT. wiwibura s ar evel ebi s gan s uf T a nakveT z e i T es eba.

wi wi bur as T esvi s no r ma mer yeo bs 2,2-5,0 mi l i o n mar c vl i s f ar gl ebS i 1 ha-z e ( 35-100 kg-

mde ha-ze). Teslis CaTesvis siRrme niadagzea damokidebuli. normaluri tenianobisa da mZi me ni ad agebz e i T es eba 4-5 s m s i R r mez e, xo l o ms ubuq ni ad agebz e 6-7 s m s i R r mez e.

**mosavlis aReba.** wi wi buras mosavals or fazad iReben , vinaidan is erTdroulad ar

mwifdeba. roca mc enar eT a 2/3 gamuqd eba i s i Wr eba d a l agd eba Rvar ul ebad , 3-4 d R i s S emd eg (SeSrobis Semdeg) amkrefi kombainiT aiReba da gamoileweba. gamolewvis Semdeg marcvali und a gas uf T avd es , d axar i s xd es d a gaS r es 14-15% t eni ano bamde.

# Romi

**saxalxo-sameurneo mniSvneloba, gavrceleba, mosavlianoba.** Romi erTwliani

marcvlovani kulturaa. Romi aziuri warmoSobisaa. mas didi sameurneo mniSvneloba aqvs. misgan amzadeben burRuls, risganac mzaddeba fafa, misgan damzadebul Roms RomisRoms uwo d eben. i s mo yavT mar c vl i s , T i vi s , mwvane sakvebi s mi s aR ebad .

dasavleT saqarTveloSi warsulSi farTod iyo gavrcelebuli. Romis kultura

f et vT an er T ad f ar T o d mo hyavd aT i mer eT - guria –s amegr el o S i .

**biologiuri Tavisebureba.** R o mi s mcenares aqvs funja fesvTa sistema. izrdeba maRali

zogjer 2 metromde, aris dautotavi an sistemurad datotvili, muxlTSor i s ebi s r ao d eno ba s aS ual o d 5-7-i a. maR al mo z ar d f o r mebs S ei Zl eba hqo nd eT 12-md e.

foToli Sebusulia, Tumca Seubusavic gvxvdeba. yvaviledi mkveTrad Semkvrivebuli cocxia da iwideba Tavelad. Tavelis sigrZe 7-50 sm-mdea. marcvali wvrilia. 1000 mar c vl i s mas a 2-3 g i wo ni s .

**agroteqnika.** Romi, rogorc tipiuri saToxni kultura TeslbrunvaSi Tavsdeba or mTlian mosaTes kulturebs Soris. misTvis didi mniSvneloba aqvs niadagis damuSavebis xarisxs, gansakuTrebiT sarevelebisgan naTesis sisufTaves . igi SeiZleba daiTesos agreTve saToxni kulturebis Semdeg. xolo TviT Romi karg winamorbedad iTvleba T avT avi ani kul t ur ebi saT vi s .

**niadagis damuSaveba.** niadagis damuSaveba iseTivea, rogorc fetvisaTvis. niadagis damuSavebis dros didi mniSvneloba aqvs niadagis sarevelebisadgan gawmendas. aqedan gamo md i nar e, mi s T vi s ni ad agi mz r al ad und a mo i xnas , xvna und a Cat ar d es s r ul s i Rr mez e.

**niadagis Tesviswina da Tesvis Semdgomi** damuS avebaSi Sedis farcxva, kultivacia da T es vi s wi na kul t i vac i a.

**gano yi er eba**. Romis mcenarisaTvis niadagis ganoyiereba organul-mineraluri sasuqiT aucilebelia. heqtarze, ZiriTadi xvnis win SeaqvT 20-30 tona nakeli. mineraluri sasuqis

S et ana heqt ar z e d asaS vebi a N 30-60 P60-90 .

**Tesva, Tesvis wesi da Tesvis vada.** saTesle masala rogorc sxva dasaTesi kulturebisaTvis unda iyos gamomSrali, gawmendili da daxarisxebuli. saTesle masala mo mqmed i i ns t r uqc i ebi s Sesabami sad d amuS avebul i und a i yo s mavnebl ebi sa d a d aavad ebebi s s awi naaR md ego pr epar at ebi T .

Romis mcenaris Tesvis vada aRmosavleT saqarTveloSi miCneulia 15 aprilidan 15 maisamde, xolo dasavleT saqarTveloSi 15 aprilidan 31 maisamde, zustad es is periodia, r o c a ni ad agi 100- z e met ad aa gamT bar i .

imis mixedviT Tu Romis kultura risTvis iTeseba Tesvis wesic imis mixedviT unda SeirCes. Tu gasaTibad iTeseba -maSin mTlianmoTesilad. marcvlis misaRebad, roca i T eseba - maSin farTo mwkrivad unda daiTesos. heqtarze iTeseba 4-6 dan 12 kilogramamde. CaTesvis siRrme damokidebulia niadagis tipze, msubuq niadagebze iTeseba 4-5 sm siRrmeze, xo l o mZi me ni ad agebz e ki uf r o z er el ed 1,5 - 3 sm - mde.

aRmonacenis 2-3 foTlis fazaSi unda gaiToxnos da gameCxerdes. Romis Tavelis

gamo t anamd e gr Zel d eba naT es i s T o xna.

**mosavlis aReba.** Romis mosavlis aReba kombainiT xdeba. kombainiT aRebuli marcvali sakmaod t eni ani a d a ami t o m s aWi r o ebs gani avebas , r i s Semd eg gai wmi nd eba d a S ei naxeba.

# sorgo

sorgos mniSvnelovani adgili ukavia sasoflo-sameurneo kulturebs Soris. sorgos mravalmxrivi gamoyeneba aqvs. is ZiriTadad gamoiyeneba saqonlis sakvebad. Reros gauxeSebamde gaTibvisas misgan SesaniSnavi silosi mzaddeba. sorgos gaTibvis Semdeg amonayris gakeTebis unari aqvs, romelic SeiZleba gamoyenebul iqnas mwvane sakvebad an gasaZoveblad. sorgos marcvlisgan amzadeben agreTve spirtsa da saxamebels, burRuls. S ua az i i s qveynebS i i yeneben, r o go r c pur eul kul t ur as .

sorgos samSoblod iTvleba ekvatoruli afrika, indoeTi da CineTi. aseve sorgos

momyvan ZiriTad raionebad SeiZleba CaiTvalos aSS-is gvalviani r ai o nebi , s amxr eT ukrainis stepis raionebi, moldova, CrdiloeT kavkasia, qvemo volgispireTi, yaz axeT i , S ua az i a d a ami er kavkas i a. s aqar T vel o Si s o r go mo hyavT sac o c xed .

fesvTa sistema sorgos Zlieri uviTardeba. sorgo niadags Zlier aSrobs, amasTan

nakveT s go r o xo vans t o vebs , r i s gamo c i s c ud i wi namo r bed i a.

sorgo advilad egueba yvelanair niadags, gamoirCeva gvalvagamZleobiT. maRali agroteqnikis pirobebSi sorgo heqtarze iZleva 35-55 c marcvals da 300 c-mwvane sakvebs. s ar wyav pi r o bebS i s o r go s mwvane mas i s mo s aval i 1000 c -md e S ei Zl eba avi d es .

s o r gos yofen sam jgufad: samarcvle, saSaqre da sacocxe. sacocxe Tavis mxriv iyofa

f ar c xat d a kuS t ar a s o r go d .

**niadagis damuSaveba .**  s o r go s Tesli gaRivebas iwyebs 10-120 s i T bo s pi r o bebS i s o r go s

dasaTesad niadags Cveulebrivad amuSaveben. niadagis damuSaveba moicavs nawverlis aCeCvas, mzralad xvnas winmxvneliani guTniT 25-30 sm siRrmeze da mzralis dafarcxvasa d a kul t i vac i as ad r e gaz af xul z e d a T esvi s wi n.

**gano yi er eba**. s o r go s ni ad agi s nayo f i er ebas d i d mo T xo vni l ebas uyenebs , mas ni ad agi d an

didi raodenobiT gamoaqvs sakvebi nivTierebani, Tumca ar aWarbebs mis monaTesave kulturebs. niadagis ZiriTadi xvnis win SeaqvT 8-10 t/ha nakeli, 2-3 c/ha superfosfati da 1-1,5 c /ha az o t i ani sas uqi .

**Tesva, Tesvis wesi da Tesvis vada.** T esvi s win sorgos saTesle masala unda gaiwmindos, daxarisxdes da Seiwamlos granozaniT. sorgosaTvis, Tesvis wesis SerCevisas mniSvneloba aqvs mis gamoyenebis mizans. roca marcvlad iTeseba maSin mwkrivebs Soris manZili 60X70, kvadratul budobrivis SemTxvevaSi 60X60, an 70X70 sm daSorebaa. heqtarze daaxloebiT ixarjeba 8-10 kg Tesli. sorgos sasilosed Tesvis SemTxvevaSi, mwkrivebs S o r i s manZi l i o r j er mc i r d eba, am SemT xvevaS i T esvi s no r ma S ead gens 20-30 kg-s.

Tesvis siRrme niadagzea damokidebuli, Tu niadagi teniania 2-3 sm siRrmeze iTeseba, mSral pirobebSi ki 4-5 sm siRrmeze. aRmocenebis daCqarebisaTvis sasurvelia naTesi moitkepnos.

**naTesis movla.** sorgos naTesis movla iwyeba misi aRmocenebidan (naTess roca mwkrivebi Seetyoba). am droisaTvis rac unda Catardes es aris mwkrivebis dafarcxva gar d i gar d mo .

naT es i s mo vl i s meo r e et api ar i s mwkr i vebi s kul t i vac i a , T o xna d a gamo xS i r va.

**mosavlis aReba.** i mi s d a mi xed vi T s o r go r a d ani S nul ebi T aa Dd aT es i l i mo savl i s aR ebi s

wesic ise SeirCeva. Tu sorgo samarcvle daniSnulebiTaa daTesili mas kombainiT iReben, Tu sacocxedaa gaTvaliswinebuli maSin is iWreba xeliT. xolo saSaqre sorgos Wrian rac SeiZleba dabla, marcvlis cviliseburi simwifis fazaSi. sasilose sorgos iReben r o c a R er o s qved a f o T l ebi mwvanea d a mar c val i c vi l i sebr i s i mwi f i s f az aS i a.

**s amar c vl e par ko s ani kul t ur ebi s mo vl a mo yvani s T avi s ebur ebani .**

miwaTmoqmedebaSi parkosan kulturebs mniSvnelovani adgili ukavia. par ko san

kulturaTa ojaxs ekuTvnis: lobio, soia, barda, muxudo, cercvi, ospi, cercvela, culispira, araqisi, ugrexeli, xanWkola. parkosan kulturebs bevri saerTo morfologiuri da biologiuri niSanTvisebebi gaaCnia. parkosani kulturebi Seicaven d i d i r ao d eno bi T c i l ebs , r ac auc i l ebel i a d a saWi r o ad ami ani sa d a pi r ut yvi s sakvebad . gamo yenebi s xas i aT i s mi xed vi T par ko s ani kul t ur ebi i yo f i an S emd eg j guf ebad :

1. sasursaTo (Cveulebrivi barda, lobio, ospi) 2. sakvebi (mindvris barda, sakvebi xanWkola, sakvebi cercvi), 3. teqnikuri (soia) 4. Sereuli gamoyenebis (muxudo, culispira), 5. mc enar eebi , r o ml ebi c mxo l o d mwavane s as uqad gamo i yeneba (al kal o i d ur i xanWko l a).

parkosani kulturebi cilebis dagrovebas axdenen ZiriTadad haeris azotis SeTvisebis xarjze. parkosani kulturebi fesvebze inviTareben koJrebs sadac baqteriebis meS veo bi T xd eba at mo sf er o s az o t i s f i qsac i a. mec ni er ebi s mi er d ad geni l i a, r o m par ko sani kul t ur ebi s mo savl i s aR ebi s S emd eg 1 ha-z e gr o vl eba 50-100 kg-md e az o t i .

# l o bi o

lobios parkosan mcenareebs Soris erT-erTi mTavari adgili ukavia. lobios, rogorc xmeli marcvali ise mwvane parki gamoiyeneba sasursaTod. is cilebiT mdidari kul t ur aa. l o bi o s namj a, ki mec xo vel eo baS i s akvebad gamo i yeneba.

warmoSobis mixedviT lobio or jgufad iyofa: amerikuli da aziuri. amerikuls aqvs msxvili marcvali, brtyeli parkebi, TeTri, vardisferi an iisferi yvavilebi, xolo aziurs wvrili marcvali da mravalTesliani parkebi. lobios ise, rogorc yvela par ko s nebs aqvs mT avar i R er Zi ani f es vi Zl i er d at o t vi l i .

lobios Rero sxvadasxva formisaa: kuti, mxviara an naxevrad mxviara, romlebsac

gansxvavebuli simaRle aqvT. kuti lobios simaRle 60 sm-de aRwevs, mxviaras Rero ki 2-3z e met s aR wevs.

lobios rTuli, samnakvTiani foToli aqvs, foTolaki ki kvercxiseburia. yvavili

foTlis iRliebSi viTardeba, jgufad 2-8 calamde. yvavilis Seferiloba sxvadas xva mcenares sxvadasxva aqvs (TeTri, vardisferi an iisferi). parki moyvanilobiTac sxvadasxvaa: swori, namglisebri, brtyeli, cilindruli, xmlisebri da sxva. bewvianobis mixedviT lobios arCeven: bewvian, ubewvo da naxevar bewvians. bewvian lobios samarcvled iyeneben, ubewvo lobio sakonservo warmoebaSi, xolo naxevar bewviani orivesTvis gamoiyeneba. lobios marcvlis masa jiSzea damokidebuli, 1000 marcvlis masa 150 gramidan 1 kilogramamde meryeobs. savegetacio periodis mixedviT lobio iyofa Semdeg jgufebad: saadreo –mwifdeba 70-80 dRe-Ramis ganmavlobaSi, saSualo vegetaciis 80-120 dRe Ramis ganmavl o baS i d a sagvi ano mwi f d eba 120-180 d R eR ami s ganmagl o baS i .

saqarTveloSi gavrcelebuli lobios jiSebia: maSa lobio, Citikvercxa, canava-3, wiTeli adgilobrivi, wiTeli induri adgilobrivi, wiTladWreli, wiTeli 41, guruli qsani d a s xva.

lobio siTbos moyvaruli mcenarea. Tesli Rivdeba 100 –is pirobebSi. mas ar uyvars Warbi teni da aseve cudad itans gvalvasac. lobios zogierTi jiSi simindSi SeTesvas itans, Cveulebrivi lobio TviT gamanayofierebelia, xolo mravalyvaviliani lobio j var ed i n gamanayo f i er ebel i . l o bi o yvel anai r ni ad agebs egueba.

niadagis ganoyiereba. lobios naTesis gasanoyiereblad gamoiyeneba, rogorc organuli ise mineraluri sasuqebi. wmindad naTes lobioSi organuli sasuqi ZiriTadi xvniswin unda iqnas Setanili, mineraluri sasuqebidan superfosfati 3-5 c da kaliumis marili 11,5 c raodenobiT haze mzralad xvnis dros SeaqvT, amasTan gazafxulze unda Catardes mc enar i s d amat ebi T i gamo kveba az o t i ani sas uqebi s mc i r e d o z i T 2,5-3 c ha-z e.

**niadagis damuSaveba.** lobiosaTvis niadagi muSavdeba niadagis tipisa da saxnavi fenis

s i R r mi s mi xed vi T . ni ad agi muS avd eba s r ul s i R r mez e, r o go r c s i mi nd i s aT vi s .

lobiosaTvis niadagi kargad unda damuSavdes, radganac mas aRmocenebis dros lebani

mi wi s z evi T amo aqvs d a T anac aR mo nac eni sus t i a d a naz i .

**Tesva, Tesvis wesi da Tesvis vada.** lobio iTeseba simindSi mwkrivSi SeTesviT da wmi nd ad . wmi nd ad T es vi s d r o s s akmar i s i a 5-6 sm sant i met r s i R r mese d ai T es o s .

kuti lobiosaTvis mcenareebs Soris daSoreba 10 santimetria, mwkrivebs Soris 60-70

s m. bud naS i sas ur vel i a 3-4 mc enar e i qnes d at o vi l i .

**naTesis movla.** lobios aRmocenebis Semdeg rac ufro male Catardeba kultivacia da Toxna miT ukeTesia mcenaris zrda-ganviTarebisaTvis. pirvelsa da meore Toxna kultivacias Soris Sualedi 15 dRe dasaSvebia. Semdegi damuSaveba damokidebulia sarevel a mc enar eebi s ganvi T ar ebaz e.

simindSi SeTesili lobios movlis wesebi simindis movlis wesebs unda d aukavS i r d es .

mosavlis aReba. lobios mosavlis aReba saqarTveloSi ivlisis Tvidan iwyeba. lobios mosavlis aRebis periodi mis jiSzea damokidebuli. roca parkebi gaxmeba, lobios iReben xel i T d a i yr eba er T ad , par kebi s kar gad gaxmo bi s S emd eg xd eba mi s i gamo l ewva.

# soia

soia erTwlovani mcenarea, miekuTvneba parkosanTa ojaxs. soias marcvali Seicavs 3040% cilas. 20% cxims, 30% saxamebela, agreTve B1 vitamins, amis gamo mas didi saxalxo sameurneo mniSvneloba aqvs. misgan mzaddeba fqvili, namcxvari,makaroni, konservebi, rZe, xaWo, saWmeli zeTi, margarini, yava, xelovnuri qsovili, saRevbavi webo, laqi. 400 –mde nawar mi . soias didi gamoyeneba aqvs mecxoveleobaSi, rogorc cilebiT mdidari sakvebi. s i mi nd T an er T ad mi s i mwvane mas i s gan mz ad d eba saukeT es o xar i s xi s s i l o s i .

soia uxvfoTliani, swrafmzardi mcenarea amitom saukeTeso sasideracio kulturaa. is

mo hyavT , r o go r c s uf T a s axi T i s e s i mi nd T an S eT es i l i .

soias fesvTa sistema mTavarRerZiania, ris gamoc Rrmad Cadis niadagSi, fesvebze

ko J r i s baqt er i ebi saxl o ben, r o ml ebi c ni ad agSi agr o veben az o t s .

yvavili viTardeba foTlis iRliebidan, romelTac lurji, TeTri an iisferi aqvT. parki SeiZleba iyos: brtyeli, cilindruli, namglisebri da swori, SeferviT –ruxi yavi s f er i an Cal i s f er i .

soias marcvali formiT mrgvali, momrgvalo, Savi, yviTeli, elifsuri an mogrZo T i r kml i s ebur i a, yavi s f er i an mo wi T al o . **jiSebi.** saqar T vel o S i gavr c el ebul i d a d ar ai o nebul i a : ko l xi d a 4, i mer ul i , guruli,

Wi aT ur ul i , nat axt r i s 1, mo wi nave 7, ad r eul a6 d a s xva

**niadagis damuSaveba**. niadagi soiasTvis zustad ise muSavdeba, rogorc simindisaTvis, anu is moicavs niadagis mzralad damuSavebas, winamorbedis aRebisTanave nawverlis aCeCva da sxva.

**ganoyiereba:** soios naTesis gasanoyiereblad gamoiyeneba, rogorc organuli ise mineraluri sasuqebi. wmindad naTes soioSi organuli sasuqi ZiriTadi xvniswin unda iqnas Setanili, mineraluri sasuqebi mzralad xvnis dros, amasTan gazafxulze unda Catardes mcenaris damatebiTi gamokveba azotiT. dasavleT saqarTveloSi Setanil unda iqnas 3,5-5,0 c superfosfati da 0,7-0,8 kaliumiani sasuqi.; aRmosavleT saqarTvelos baris pirobebSi SeaqvT 2,5-3,3 c superfosfati da 0,7-0,8 c kaliumiani sasuqi. azotiani s as uqebi s mc i r e d o z a kar g ef eqt s i Zl eva z r d i s d as awyi s S i .

Tesva, Tesvis wesi da Tesvis vada. saqarTveloSi soias Tesvis vadad miCneulia 10 aprilis 20 aprilamde. soias simindTan SeTesvis dros Tesvis normaa 8-10 kg ha-ze. xolo soias sufTad Tesvis SemTxvevaSi ha-ze saSualod 30-40 kg Tesli iTeseba. farTo mwkrivebad Tesvis dros mwkrivebs Soris daSoreba 60-70 sm, xolo mcenareebs Soris 18-20 sm. iyeneben zolebriv Tesvasac, zolebs Soris manZili 60-70 sm-i s , xo l o z o l S i mwkr i vebs Soris 15-45 sm daSoreba. soia iTeseba agreTve kvadratul budobrivad 60X60 an 70X70 sm. d ac i l ebi T , bud naS i 5-6 mc enar i s d at o vebi T . s o i a i T es eba 4-5 s m s i R r mez e.

**naTesis movla.** soias naTesis aRmocenebamde da aRmocenebis Semdeg niadagma qerqi Tu gaikeTa aucilebelia misi kbilebiani farcxiT dafarcxva. amis Semdeg sarevelebis gamoCenisTanave tardeba I kultivacia da Toxna da gameCxerdes dadgenil sixSiremde, xo l o 15- 20 d R i s S emd eg II kul t i vac i a d a T o xna.

mosavlis aReba. soia iWreba, mzian amindSi foTlebisa da parkebis Sexmobisas, cvenadi

j i S ebi ki und a mo i Wr as S ua i ar us i s par kebi s mo mwi f ebi s T anave.

simindSi SeTesili soia simindis marcvlis aRebis Semdeg unda iqnas aRebuli daaxloebiT erTi kviris Semdeg. soias gamolewva SeiZleba xorblis salewi manqaniT. marcvlis damtvrevis Tavidan acilebis mizniT saWiroa Semcirdes salewi aparatis br unvaT a r i c xvi s r ao d eno ba.

# bar d a

barda erTwliani mcenarea da parkosanTa ojaxis warmomadgenelia. mis samSoblod miCneulia aRmosavleT avRanistani da Crdilo- d asavl eT i indoeTi. bardas aqvs s as ur saT e, s akvebi d a agr o t eqni kur i mni Svnel o ba. bar d i s mar c val i Sei c avs 23-36 % cilas,

3% cxims, 29,54 %saxamebels, 0,7-1,6 %Saqrebs, A, B1**, B2, C** vitaminebs. mwvane parkebi vi t ami nebs d i d i r ao d eno bi T S ei c avs .

heqt ar z e bar d i s mar c vl i s mo saval i S ei Zl eba mi R ebul i qnas 14-16 c ent ner i .

barda iTeseba, rogorc gazafxulze, ise zafxulSi. barda inviTarebs mT avar Rer Za

fsvTa sistemas, romelzedac didi raodenobiT saxlobs koJris baqteriebi, niadagSi maTi meS veo bi T ki gr o vd eba az o t i .

Rero dakuTxuli da datotvilia, Reros simaRle 40-120 sm-de aRwevs, sustia, naxevrad xvisra, zogjer Cawolili, ufro metad wveba Txlad naTesi, xSiri naTesis SemTcvevaSi er T maneT s eyr d no bi an d a Cawo l a nakl ebi a.

foToli rTulia, romlis Rero bolovdeba pwkalebiT, Reros ZirSi, gantotvis

ad gi l z e, vi T ar d eba o r i T anaf o T o l i , r o mel i c R er o z ea S emo xveul i d a mi z r d i l i .

yvavili foTlis iRliidan gamodis grZeli yunwiT. romelzedac ramdenime yvavilia (o r -ori). yvavilis feria wiTeli an iisferi, parkis forma sworia an moxrili, marcvali ki mrgvalia simwifeSi movardisferoa. sakonservod mwvanes iReben. 1000 marcvali iwonis

140-350 gr amamd e, z o gj er S ei Zl eba c o t a met i c i yo s . bar d i s barda maRali mosavlianobiT ar gamoirCeva. Tumca parkosan kulturebs Soris erT-

erTi pirveli adgili ukavia. bardis marcvlis saheqtaro mosavali 15 c-mdea ha-ze, xolo mwvane par ki s mo s aval i s aS ual o d heqt ar z e 8-25 t o na S ei Zl eba mi R ebul i qnas .

**jiSebi.** d as ako ns er vebel i j i S ebi a- prevosxodni 240; iubileini-1612; ad agums ki ; o bo l aZi s 86, samarcvle jiSebidan daraionebulia-ramonski 77, sakvebi barda axalqalaquri da mc xeT a.

**niadagis damuSaveba**. bardasaTvis niadagis damuSaveba TanmimdevrobiT, winamorbedis mosavlis aRebisTanave iwyeba, raTa nakveTi ganTavisufldes sarevela mcenareebisagan da moyvanil iqnas fxvier koStovan mdgomareobaSi. bardasaTvis niadagi aRmosavleT saqarTveloSi ixvneba mzral ad , xolo dasavleT saqarTveloSi adre gazafxulze mindorSi gasvlis SesaZleblobisTanave. Semdeg gazafxulze ifarcxeba, Tesvis win ki tardeba kultivacia 10 sm siRrmeze dafarcxviT, Tesvis win mindvris mosasworeblad da aRmonacenis siTanabrisaTvis Sleif – f ar c xi T mindors tkepnian. Tesvis dros gansakuTrebuli yuradReba unda mieqces niadagis zedapiris siswores da Teslis miwiT d af ar vas.

**gano yi er eba:** niadagis organuli sasuqiT ganoyierebis SemTxvevaSi pirvel wels barda Zlier vegetatiur masas inviTarebs, nayofianoba mcirdeba, ris gamoc marcvlis mosavali mcirdeba. amitom bardis samarcvled Tesvisas Tavi unda SevikavoT organuli sasuqis Setanisgan, an daiTesos meore kulturad. xolo mwvane sakvebad Tesvis SemTxvevaSi ni ad agi s Zi r i T ad i xvni s wi n S eaqvT o r ganul i s as uqi .

mi uxedavad imisa, rom koJris baqteriebiT barda axdens azotis fiqsacias, mainc saWiroa naTesSi gamokvebis saxiT Setanil iqnas azotis mcire dozebi, romelsac “sastarto “-s uwodeben. mosavlianobis gazrdis saqmeSi mniSvnelovania fosforiani sasuqebis roli, isini xels uwyoben mcenaris zrda ganviTarebas da marcvlis momwifebas, amasTan xels uwyoben cilis Semcvelobis zrdas. fosforiani sasuqebidan karg Sedegs iZleva superfosfati da fosforitis fqvili, romelic ZiriTadi xvniswin Seitaneba . fosforiani sasuqiT ganoyiereba TesvasTan erTad mcire doziT (10-15 kg/ha momqmedi nivTierebis saxiT) karg Sedegs iZleva. kaliumiani sasuqebi mosavlianobis gasazrdelad did efeqts iZleva ar. yvela tipis niadagebze bardis naTesSi kaliumiani s as uqebi s S es at an d o z ad d ad geni l i a 30-60 kg m.n ni vT i er eba ha-ze

**Tesva, Tesvis wesi da Tesvis vada.** saqarTveloSi bardis Tevis vadad miCneulia rac SeiZleba adre gazafxuli. bardis Tesvis wesad iyeneben viwro mwkrivad Tesvas mTlian moTesviT. Tesvis normaa 0,9— 1,2 milioni marcvalia ha-ze. bardas CaTesvis siRrmea 3-9 sm-s farglebSi meryeobs, es niadgis tipzea damokidebuli mZime niadagebze nakleb s i R r mez e i R es eba, xo l o ms ubuq ni ad agebz e uf r o Rr mad .

**naTesis movla.** bardis naTesi Tesvis Semdeg aucileblad unda daitkepnos, gansakuTrebiT mSral raionebSi. sarevelebis mospobis mizniT naTesi ifarcxeba mwkr i vebi s gar d i gar d mo an d i ago nal z e, d i l i s saaT ebS i .

**mosavlis aReba.** bardis mosavlis aReba or fazad unda Catardes, radgan parkebi sxvadasxva dros mwifdeba. jer iWreba da ganaTibi Rvareulebad ewyoba, xolo SeSrobis S emdeg kombainiT gamoileweba. bardis gamolewva SeiZleba xorblis salewi manqaniT. marcvlis damtvrevis Tavidan acilebis mizniT saWiroa Semcirdes salewi aparatis br unvaT a r i c xvi s r ao d eno ba.

**c er c vi**

cercvi erTwliani mcenarea is 70 sm dan zogierTi jiSebi 180 sm-de izrdeba. cercvi mohyavT, rogorc sdasursaTed ise pirutyvis sakvebad. misi marcvlisgan SesaniSnavi koncentriuli sakvebi mzaddeba. aqvs kargad ganviTarebuli fesvTa sistema, romelic niadagSi Rrmad Cadis. Rero swormdgomia, oTxkuTxiani, Seubusavi, zogjer itoteba fuZeSi. foToli wyvilfrTarTulia, foToli sakmaod sqelia, xorciani, Seubusavi, mo nac r i s f er o -momwvano. yvavili didi, Sekrebili mokle mtevniseburad foTlis iRliebSi, umetesad TeTri, iSviaTad movardisfero, Savi laqebiT, curnayovania, nayofi parkia, didi z o mi s , f ar T o , mo br t yo an c i l i nd r ul i , mo mwi f ebi sas par kebi muqd eba, mo S avo f er s i R ebs .

cercvi siTbos mimarT ara aris didi momTxovni. aRmonaceni 60-mde yinvas uZlebs. Rivdeba 3-40 siTboze, didi momTxovnia wylisadmi. gansakuTrebiT intensiuri zrdisa da yvavilobis periodSi. karg mosavals iZleva sakvebiT mdidar niadagze Sesabamisi kl i mat ur i pi r o bebS i .

niadagis damuSaveba. cercvisaTvis niadagis damuSaveba winamorbedis mosavlis aRebisTanave unda daiwyos, raTa sarevela mcenareebisagan nakveTi ganTavisufldes. aRmosavleT saqarTveloSi cercvisaTvis niadagi ixvneba mzralad, xolo dasavleT saqarTveloSi adre gazafxulze mindorSi gasvlis SesaZleblobisTanave. moxvnis Semdeg, gaz af xul z e i f ar c xeba ao r T ql ebi s S esamc i r ebl ad d a T esvi s wi n t ar d eba kul t i vac i a 8-10 s m si R r mez e d af ar c xvi T .

**ganoyiereba.** cercvi karg mosavals iZleva organuli sasuqiT ganoyierebul niadagebze. mineraluri sasuqebidan pirvelrigSi saWiroebs fosforian-kaliumian sasuqebs. miuxedavad imisa cercvi koJrebs ikeTebs, riTac axdens azotis fiqsacias, mas mainc Wirdeba gaz af xul z e az o t i T gamo kveba (10-20 kg m.n. ha-ze).

**Tesva, Tesvis wesi da Tesvis vada.** saqarTveloSi cercvis Tevis optimalur vadad miCneulia adre gazafxuli, Tbil adgilebSi SeiZleba Semodgomaze daiTesos. mas Tesaven farTo mwkrivad 45-60 sm mwkrivTSorisebiT. zogjer mimarTaven zolebriv Tesvasac, zolebs Soris 60 sm da mwkrivebs Soris zolSi 15 sm daSorebiT. cercvis CaTesvis s i R r me 6-8 sm-i a. T es vi s o pt i mal ur no r mad i T vl eba 100-300 kg T es l i 1 ha-z e.

**naTesis movla**. cercvis naTesi Tesvis Semdgomi damuSaveba mdgomareobs naTesis motkepnaSi, aRmocenis gamoCenamde dafarcxvaSi da mwkrivTsoreisebSi kultivaciis Cat ar ebas a, S emeCxer ebas a d a T o xnaS i .

**mosavlis aReba.** cercvis mosavlis aReba iwyeba parkebis 60-70% momwifebisa. mosavl i s

d agvi anebi T aR eba ar S ei Zl eba, r ad gan par kebi gas kd eba d a mar c vl ebi s Cac vena d ai wyeba, es ki gazrdis mosavlis danakargs. cercvis mosavlis aReba SeiZleba xorblis amRebi kombainiT. marcvlis damtvrevis Tavidan acilebis mizniT saWiroa Semcirdes salewi aparat i s br unvaT a r i c xvi s r ao d eno ba.

# t eqni kur i kul t ur ebi

teqnikur kulturaTa jgufSi gaerTianebulia botanikurad sxvadasxva saxisa da

gvaris mcenareebi, romlebic mohyavT mcenareuli nedleulis misaRebad msubuqi da kvebis mr ewvel o bi s aT vi s , s apar f i umer i o , f ar mac evt ul i d a mr ewvel o bi s s xvad as xva d ar gi s aT vi s .

teqnikur kulturebs miekuTvneba zeTovani kulturebi: mzesumzira, abusalaTini, rafsi; eTerzeTovani kulturebi: vardis gerani, rehani, qinZi; sarTavi mcenareebi: bamba, seli, kanafi, juTi; narkotikuli mcenareebi: Tambaqo, weko; Zirxvenebi: S.Warxali, t uber i ani : kar t o f i l i , mi wavaS l a.

teqnikuri kulturebis erT - erTi warmomadgenelia zeTovani kulturebi. romelTa Tesli mdidaria cximis SemcvelobiT, maTi Teslis gadamuSavebis Sedegad miiReba zeTi s as ur saT ed d a t eqni kur i gamo yenebi s aT vi s . eTerzeTovan kulturebs miekuTvneba: gerani, rehani, qinZi, anisuli, pitna da sxva. maTi gadamuSavebis Sedegad miiReba aqroladi aromatuli nivTierebani, romelTac farTo gamo yeneba aqvT s apar f i umer i o mr ewvel o baS i .

Saqrian mcenareebs miekuTvneba: Saqris Warxali, vardkaWaWa (cikori), Saqris lerwami, kartofili, batati, miwavaSla da sxva. romelTa gadamuSavebis Sedegad miiReba Saqari, saxamebeli, spirti da sxva. isini farTod gamoiyeneba saxalxo meurneobis dargebSi da kvebi s mr ewvel o baS i .

bamba, seli, kanafi, kenafi, juTi da sxva mcenareebis gadamuSavebis Sedegad R ebul o ben bo Wko s s af ei qr o mr ewvel o baSi gamo s ayenebl ad .

Tambaqo, weko, Triaqis yayaCo, katabalaxa, samkurnalo gvirila da sxva iZlevian ned l eul s : T ambaqo s , f ar mac evt ul , qi mi ur d a mr ewvel o bi s s xva d ar gebS i gamo s ayenebl ad teqnikur kulturebs, rogorc saToxn kulturebs didi agroteqnikuri mniSvneloba aqvs. teqnikuri kulturebi, xels uwyoben miwaTmoqmedebis kulturis amaRlebas. zogierTi teqnikuri kultura Zvirfasi wyliani sakvebia mecxovel eo bisaTvis. teqnikuri kulturebi toveben anarCenebs, romlebic gamoiyeneba cxovelTa kvebaSi. zogierTi teqnikuri kultura gamoi yeneba s anawver al o d .

# mz es umz i r a L

**saxalxo-sameur neo mniSvneloba.** zeTovani mcenareebidan yvelaze ufro gavrcelebulia mzesumzira, misi Tesli Seicavs 50-52 cxims, 16-16,5 proteins. mi s gan miRebul zeTs iyeneben sasursaTod. Tevzisa da bostneulis d as ako ns er vebl ad . margarinis, maionezis, pureulisa da sakonditro nawarmis dasamzadeblad da sxva. mzesumziras gadamuSavebis dros miiReba koptoni, romelic mecxoveleobaSi Zvirfasi sakvebia. mz es umz i r as saSualo mosavlianobaa 15-18 c/ha-z e. **moTxovnileba garemo pirobebis ad mi .** mzesumziras Tesli aRmocenebas iwyebs 30-z e, gaRivebis optimaluri temperaturaa 20-250. mzesumziras aRmonaceni -5 - 60 mo kl exno van wayinvebs uZlebs. mzesumzira gvalvagamZle kulturaa, magram gansakuTrebiT yvavilobis f az aS i i s ver uZl ebs 300-s , maRal i t emper at ur a mas z e d amR upvel ad mo qmed ebs .

mzesumziras gvalvaamtanoba aixsneba imiT, rom misi mTavari fesvi 2 m da met siRrmeze viTardeba. es ki xels uwyobs miwis siRrmidan SeiTvisos wyali da masSi gaxsnili mineraluri marilebi. mzesumzira maRal produqtiulobas amJRavnebs niadagis sruli mi nd vr ul i wyal t evad o bi s 70%-i s d r o s .

**moTxovnileba niadagisadmi.** mzesumzira viTardeba yvela tipis niadagebze gar d a

daWaobebisadmi midrekili mZime niadagebisa. mzesumzira ver itans mlaSe da mJave ni ad agebs , mi s T vi s yvel az e uf r o kar gi a ni ad agi s r eaqc i a, r o c a **PH-**6,0-6,8-i s t o l i a.

**gano yi eneba**. mzesumzira saqarTveloSi mohyavT nayofier yavisfer da Savmiwa niadagebze. sasilosed misi Tesva SeiZleba dabali nayofierebis mqone niadagebzec. nayofieri niadagebi gamoirCevian gacvliTi kaliumis maRali SemcvelobiT, amitom aseT ni ad agebze kaliumiani sasuqebi efeqts ar iZleva. amitom mis qveS pirvel rigSi Seitaneba 30-40 t organuli sasuqi da azot-fosforiani sasuqebi 2,5 tonaze meti maRali mosavlis mi saR ebad . s r ul i mi ner al ur i sas uqebi nakel T an er T ad gamo yenebi sas

S ei t aneba **N30-90P30-90K60-90,** nakelis gareSe **N90-120 P60-90K90-120.**

dadgenilia, rommzesumziras 1 tona Tesluras Sesaqmnelad niadagidan gamoaqvs 60 kg azoti, 26 kg fosfori da 186 kg kaliumi. niadagSi arsebuli sakvebi nivTierebis udidesi nawili ixarjeba mzesumziras vegetatiuri masis Seqmnaze, romelic moyvanis mizans ar warmoadgens. mzesumziras maRali mosavlis misaRebad didi mniSvneloba aqvs damatebiT gamokvebas, romelic unda Catardes meore kultivaciisas da kalaTis gakeT ebi s d r o s .

**niadagis damuSaveba.** mzesumzirasTvis niadagis damuSaveba ZiriTadi damuSavebiT iwyeba. naxorblarze daTesvis SemTxvevaSi nawverali sarevela mc enar eebi s mospobisa da gamotyuebis mizniT, jer unda ai CeCos 4-5 sm siRrmeze, xolo Semodgomaze moixvneba 22-25 sm siRrmeze winmxvneliani guTniT, moxnuli nakveTi zamTris ganmavlobaSi ar muSavdeba.

ad r e gaz af xul z e i f ar c xeba an kul t i vac i a t ar d eba xnul i s s awi naaR md ego mi mar T ul ebi T .

**Tesva.** saqarTveloSi mzesumziras 1 heqtarze Tesaven 40-45 aTas mcenares. iTeseba ni ad agi s 10-120-md e gaT bo bi sas , 6-8 s m si R r mez e.

mSral, gvalvian raionebSi kargi kvebis area 70X30 da 60X40 sm, SedarebiT naleqian raionebSi 60X30 da 70X20 sm. aseTi kvebis areebis SemTxvevaSi 1 ha-ze iTeseba 20-25 kg Tesli. ur wyav d a gval vi an r ai o nebS i i T es eba 7-8 sm s i R r mez e.

**naTesis movla.** naTesis movlis upirvelesi amocanaa sarevela mcenareebis winaaRmdeg brZola, romelic iwyeba jer kidev aRmocenebamde. niadagis qerqis gakeTebis SemTxvevaSi naTesi dauyovnebliv unda daifarcxos msubuqi farcxiT an aRmocenebis Semdeg gadatardes rotaciuli maToxari. pirveli Toxna tardeba 3-4 foTlis ganviTarebisas , Semdeg mas misdevs pirveli kultivacia, romelic tardeba 6-8 sm siRrmeze. meored unda gaiToxnos ori kviris Semdeg, kultivacia ki tardeba 8-10 sm siRrmeze da mesame kultivacia tardeba 20 dRis Semdeg 5 sm siRrmeze. Semdegi gafxviereba tardeba s ar evel ebi s ganvi T ar ebi s s i Zl i er i s mi xed vi T .

sarevelebis winaaRmdeg SeiZleba gamoyenebul iqnas herbicidi –treflani 1,5-2,5 kg

r ao d eno bi T heqt ar z e (m.n), r i T ac S ei Zl eba S emc i r d es d amuS avebi s j er ad o ba.

mzesumziras naTesSi, fuWi yvavilianobis Sesamcireblad iyeneben futkars, radgan futkari xels uwyobs yvavilis damtverianebas. am mizniT yvavilobis dasawyisSi ramodenime skas dgamen mzesumziras naTesTan axlos. sakmarisia 1 ha naTesisaTvis 1-2 o j axi , as eve mi R ebul i a xel o vnur i d amt ver i anebac .

**morwyva.** mzesumziras maRali mosavlis misaRebad Wirdeba didi raodenobiT wyali. gansakuTrebiT vegetatiuri masis zrdisa da yvavilobis fazaSi. niadagis tenianobis 70-80 %-i s f ar gl ebS i S enar Cunebi sas mz es umz i r as mo s avl i ano ba ha-ze 37-40 c-md e i z r d eba.

**mosavlis aReba.** mzesumziras xarisxiani da udanakargo mosavlis misaRebad, simwifis f az i s gansazRvras didi mniSvneloba aqvs. mzesumziras aReba SeiZleba, roca kalaTis zurgis mxare miiRebs yviTel fers. mzesumziras mosavlis aReba xdeba kombainiT. agr egat i s er T i gavl i T xd eba mT el i bi o l o gi ur i mo s avl i s aR eba. ko mbai ni Wr i s kal aT ebs , lewavs maT, aniavebs da gawmendil marcvals agrovebs bunkerSi. aqucmacebs da niadagis zedapirze abneves gamolewil kalaTebs da Reroebs. darCenili nawverlis simaRle 20 smia.

gawmendili marcvlebis kaloze datoveba mizanSewonili ar aris, imitom, rom aman SeiZleba gamoiwvios marcvlis Caxureba da gafuWeba. amitom Teslis aRebisTanave xdeba mi s i gawmend a d a gani aveba (S r o ba). mS r al i mar c vl i s t eni ano ba 7%-s und a S ead gend es .

# AeT er z eT ovani mc enar eebi

am jgufSi Tavmoyrilia iseTi mcenareebi, romelTa kulturis mizans warmoadgens s ur nelovani, eTerovani zeTis miReba. mohyavT 20-mde saxis eTerzeTovani mcenare, r o go r i c aa: qi nZi , ani s ul i , kvl i avi , pi t na, d i d i kama, xar i s var d a, ger ani , r ehani d a s xva.

eTerovan zeTs Rebuloben mcenareTa sxvadasxva nawilebidan; nayofebidan, Teslidan, foTlebidan, yvavilidan, Rerodan, fesvebidan. eTerovani zeTi sxvadasxva organul nivTierebaTa naerTs warmoadgens, rogoricaa: naxSirwylebi, spirtebi, fenoli, eTeri, aldehidebi, mJavebi. eTerovani zeTis Tviseba imaSi mdgomareobs, rom is advilad o r T ql d eba d a sas i amo vno s ur nel ebi T vr c el d eba gar emo S i , ami s gamo mas f ar T o d i yeneben kvebis mrewvelobaSi, parfiumeriasa da medicinaSi. zogierTi eTerzeTovani mcenare (qinZi, anisuli, didi kama da sxv.) eTerovani zeTis garda didi raodenobiT Seicavs cxims, romelsac farTo gamoyeneba aqvs sapnis warmoebaSi, safeiqro, poligrafiul da sxva sawarmoebSi. eTerzeTovan mcenareTa nayofebsa da Teslis gadamuSavebis anarCeni SesaZlebelia gamoyenebuli iqnes pirutyvis sakvebad, Rerosa da foTlis gadamuSavebis anar Cenebi ki o r ganul s as uqad .

s aqar T veloSi eTerzeTovani zeTis warmoebis ZiriTad nedleuls iZleva –

vardisebri gerani da evgenoluri rehani. maT moyvanas misdeven afxazeTSi, senakis, abaSis, T el avi s , yvar l i s , l ago d exi s d a mar neul i s r ai o nebS i .

# vardisebri gerani

**var d i s ebr i ger ani –** buCqo van bal axnai r i , mr aval wl o vani mc enar ea.

gerani ver itans – 2-3?-ian yinvasac ki, amitom CvenSi is erTwliani mcenarea. mas

amr avl eben kal mi T , kval saT bur ebS i d a gaz af xul z e gaaqvT mi nd o r S i d as ar gavad .

**mo r f o l o gi ur -biologiuri daxasiaTeba.** geranis fesvTa sistema wvrili Zaf i s ebr i

fesvebisagan Sedgeba, radgan misi gamravleba vegetatiurad – kalmiT swarmoebs. fesvebi gamoaqvs kalmis fuZidan da vrceldeba niadagSi, ZiriTadad 30sm siRrmemde, calkeuli f es vebi ki ni ad agS i Cad i s 1,5 – 2m si R r mez ec .

*mTavari Rero* mo kl ea – 4-5sm simaRlis, saidanac viTardeba muxlebisa da

muxl T S o r i s ebi sagan Semd gar i t o t ebi . i s i ni hqmni an ger ani s buCqs , r o ml i s s i maR l e j i S i s a d a ad gi l o br i vi pi r o bebi s mi xed vi T 80 – 130 s m aR wevs . ger ani s t o t ebi S ebus ul i a.

*f o T ol i* grZelyunwiania, firfita Rrmad danakvTuli da Reroze ganlagebulia morigeobiT. foToli, iseve rogorc Rero, dafarulia jirkvlebiani bususiT, romlebSiac grovdeba eTerovani zeTi. foTlis firfita ufro mdidaria zeTiT, vidre Reros nawilebi. amasT an axal gaz r d a f o T o l S i z eT i s S emc vel o ba met i a, vi d r e Zvel S i , xo l o S eyvi T l ebul f o T l ebS i i s umni S vnel o r ao d eno bi T aa.

*yvavi l ed i* gamodis foTlis iRliidan da Sedgeba ramodenime yvavilisagan. gvirgvinis furclebi vardisferia, muqi moiisfro xazebiT. yvavilSi moTavsebuli samtvere parkebi ganuviTarebeli da ZiriTadad steriluria, ris gamo gvirgvini CvenSi Tesls iSviaTad Tu ikeTebs, xelovnuri damtvervis saSualebiT SeiZleba gamoviwvioT yvavilis ganayofiereba, am SemT xvevaSi mi s xuT bud i an nas kvS i vi T ar d eba xuT i c al i T es l i .

geranis gamravleba vegetatiurad warmoebs Rerodan aRebuli kalmebis saSualebiT, misi gamravleba SeiZleba foTlebiTac. saTanado tenisa da siTbos pirobebSi geranis kalami advilad fesviandeba: gazafxulze mindorSi gadarguli imave wels sakmaod ganvi T ar ebul buCqs i Zl eva.

siTbosadmi didi moTxovnilebis mcenarea, mcire yinvac ki, rogorc avRniSneT

sruliad spobs mcenares. vegetacias iwyebs 10 ? siTbos dros, xolo normaluri ganvi T ar ebi s aT vi s s aWi r o ebs 20 - 25 ? siTbos.

aseve d i d i a mi s i mo T xo vni l eba s i naT l i s mi mar T , vi nai d an eT er o vani z eT i s maqs i mal ur i

r ao d eno bi T d agr o veba mc enar i s f o T l ebSi mo i T xo vs naT el s a d a mz i an d R eebs .

geranis mwvane masis uxvad ganviTareba didi raodenobiT moiTxovs wyalsac, niadagis tenianoba vegetaciis ganmavlobaSi ar unda iyos zRvruli wyaltevadobis 80%-ze naklebi. mwvane mas i s a d a z eT i s d i d gamo s avl i ano bas i Zl eva sar wyavi mi webi .

gerani SedarebiT kargad izrdeba sxvadasxva tipis niadagebze, magram maRali mosavlis misaRebad misTvis saukeTesoa sakvebi nivTierebebiT mdidari, kargi wyalgamtari da Rrma saxnavi fenis mqone niadagebi. gerani ver itans mZime, pirSekrul da Waobian niadagebs, s ad ac gr unt i s wyal i axl o a.

Zlier azianebs geranis plantacias qarebi, amitom mis gasaSeneblad saWiroa SeirCes Zl i er i qar ebi sagan d ac ul i , myud r o ad gi l ebi .

**adgili TeslbrunvaSi.** geranis mudmivad erTsa da imave adgilze dargva sasurveli ar

ar i s , ams T an s d evs ni ad agi s gamo f i t va d a mavnebel d aavad ebaT a gavr c el eba, r ac mkveT r ad amcirebs mis mosavlianobasa da xarisxs. geranis kulturis maRali agroteqnika moiTxovs mi s T es l br unvaS i S et anas .

aR mo s avl eT s aqar T vel o s pi r o bebS i ger ani s wi namo r bed ad T es l br unvaS i war mat ebi T S ei Zl eba i qnes gamo yenebul i saS emo d go mo T avT avi anebi , agr eT ve par ko s ani kul t ur ebi s agan da baRCeulebidan ganTavisuflebuli mindori. geranis aRebis Semdeg SeiZleba davTesoT s i mi nd i , s o i a d a sxva sagaz af xul o kul t ur ebi .

**niadagis damuSaveba.** geranisaTvis SerCeuli unda iqnes qarebisagan daculi da mziT kargad ganaTebuli sarwyavi adgilebi. sasurveli ar aris geranis gaSeneba gzis axlo mdebare nakveTebze, radgan am SemTxvevaSi plantacia ifareba mtveriT da mniSvnelovnad uar es d eba mi s i xar i s xi .

aRmosavleT saqarTvelos pirobebSi, geranisaTvis niadagis momzadeba mdgomareobs mzralad xvnis sistemaSi. winamorbedi kulturebisagan mindoris ganTavisuflebisTanave xdeba nawveralis aCeCva 5 – 6 sm-ze, xolo Semdeg niadagi ixvneba mzralad 23 – 25 sm siRrmez e wi nmxvnel i ani guT ni T , amave d r o s S eaqvT Zi r i T ad i s as uqebi d a as eT i s axi T r Ceba zamTarSi.

adre gazafxulze, rogorc ki SesaZlebeli iqneba mindvrad muSaoba, xnuli

ifarcxeba zigzagiT. geranis dargvamde erTi kviriT adre, xnuli fxvierdeba 10 – 12 sm-z e frTebmo xs ni l i s ao S ebi T d a T anmi yo l ebi T i f ar c xeba.

mravalwliani balaxebisa da sagviano saToxni kulturebis mindori Semodgomaze,

mo s avl i s aR ebi s T anave i xvneba mz r al ad .

d as avl eT saqar T vel o s pi r o bebS i , ni ad agi s Zi r i T ad d amuS aveba ger ani s aT vi s ur Ceven

ianvar-TebervalSi, 20 – 22 sm siRrmeze. geranis dargvis win 8 – 10 dRiT adre, xnuli f xvi er d eba f r T ebmo xs ni l i s ao S ebi T d a i f ar c xeba.

kolxeTis dablobze, Warbi tenianobis gamo, rekomendebulia gerani dairgos 5 – 8 metriani siganis SemaRlebul, sferul kvlebze, am mizniT TiToeuli kvali ise unda d amuSavd es , r o m kvl i s ki d eebz e naR ar i d ar Ces z ed met i wyl i s d asawr et ad .

**ganoyiereba.** gerani, sxva kulturebTan SedarebiT, didi raodenobiT saWiroebs sasuqebs. karg efeqts iZleva organuli da mineraluri sasuqebis erToblivi gamoyeneba, ger anisaTvis rekomendebulia sasuqTa saSualo normebi: 20 t nakeli, 6,0 – 7,5 c sulfatamoniumi 6,8 – 8,0 c superfosfati da 3,0 – 3,5 c kaliumis marili heqtarze. gansakuT r ebi T d i d mo T xo vnas i Cens ger ani az o t i ani s as uqebi s mi mar T .

fosforiani da kaliumiani sasuqebis 2/3 sasurvelia Setanili iqnes niadagis ZiriTadi xvnis dros. karg Sedegebs iZleva azotiani da fosforiani sasuqebis 1/3-i s budnebSi Setana, xolo azotiani da kaliumiani sasuqebis danarCeni raodenobis savegetacio periodSi Setana – gamokvebis saxiT, mwkrivTa Soris kultivaciisa da mo r wyvi s wi n.

**kvalsaTburis mowyoba.** geranis gamravleba vegetatiurad kalmebiT warmoebs. kalmebs Semodgomaze amzadeben da dasafesvianeblad Cveulebriv kvalsaTburebSi aTavseben. kvalsaTburebi ewyoba qarebisagan dacul myudro adgilas. amisaTvis arCeven swor da samxreTiT, samxreTaRmosavleTiTa an samxreT-dasavleTiT odnav daqanebul nakveTebs. niadagi unda iyos msubuqi, kargi wyalgamtari, gruntis wylebi 1 m-ze axlos ar und a i yo s ni ad agi s z ed api r i d an. nakveT i uz r unvel yo f i l i und a i yo s sar wyavi wyl i T .

kvalsaTburebSi niadags faraven 20 – 25 sm sisqeze, ayrian sakveb narevs. sakvebi narevi mzaddeba ori wili niadagis, erTi wili kargad gadamwvari nakelisa da erTi wili silisagan. TiToeuli es cal-calke unda gaicras mavTulbadis sacerSi da kargad airios erTmaneTSi. mosworebis Semdeg sakvebi narevi msubuqad unda daitkepnos da zemodan 2 sm s i s qez e mo eyar o s s uf T a s i l a. yo vel i ve es i s e und a Ses r ul d es , r o m kval saT bur S i d ar Ces sakmao are nergis ganviTarebisaTvis, e. i. kvalsaTburis samxreT kedelTan silis z ed api r i d an Car Co md e und a i yo s 20 s m d ac i l eba.

mavnebl ebi sa d a d aavad ebaT agan d asac avad , ger ani s kal mebi d ar gvamd e 15 – 20 dRiT adre kvalsaTburebs dezinfeqcias ukeTeben, Signidan mis kedlebs kiris xsnariT aTeTreben, xo l o s akveb nar evsa d a s i l i s f enas 1%-i ani f o r mal i ni s xs nar i T waml aven.

**sadede plantaciis gaSeneba da movla.** geranis sakalme masala aRebuli unda iqnes sadede plantaciidan, erTi heqtari sadede plantacia iZleva 150 – 200 aTas kalams. rac uzrunvelyofs Semdeg 5 – 6 heqtari samrewvelo plantaciis gaSenebas. sadede plantaciis gasaSeneblad kalmebi calke, misTvis gankuTvnil kvalsaTburebSi gamohyavT. am mizniT, kalmebs iReben saRi, normalurad ganviTarebuli da kargad SefoTlili buCqebidan, r o mel sac amasT an er T ad aqvT var d i s f er i ger ani s aT vi s d amaxas i aT ebel i s uni .

sadede plantaciaSi buCqebis Zlieri zrda da misi totebis wagrZeleba sasurveli ar aris, vinaidan es iZleva zedmetad wylian kalmebs, romelic sustad fesviandeba. amitom sadede plantacia ewyoba saSualo nayofier niadagze. sadede plantaciaSi nergebi irgveba 90X90 sm daSorebiT. vegetaciis periodSi morwyva warmoebs minimaluri raodenobiT, zafxulSi xdebabuCqebis formireba da maTi gasufTaveba gamxmari da dazianebuli Rerof o T l ebi s agan. am pi r o bebS i buCqi nel a i z r d eba d a mo kl e muxl T S o r i s ebs i vi T ar ebs .

**nergis gamoyvana.** kalmebis aRebamde sadede plantaciaSi mimarTaven buCqebis gasxvlas, zedmeti, damCrdilavi totebis amoWras da saRad ganviTarebul totebze wveros waWras. am operaciis mizania foTolTa iRliebSi kvirtebis ganviTareba da axali ylortebis warmoqmna, romlebic erTi Tvis ganmavlobaSi aswreben zrdis dasrulebas da teqnikurad momwifebul sakalme masalas iZlevian. kvalsaTburebSi dasafesvianeblad gatanil kalams 4 – 5 muxlTSorisi unda hqondes, xolo TviT kalmis sigrZe 12 – 15 sm-s ar unda aRematebodes. am pirobebSi sadede buCqidan aRebuli erTi toti 3 – 4 kalams i Zl eva, xo l o T vi T buCqi d an S ei Zl eba r amo d eni me aT eul i kal ami i qnes mi R ebul i .

kalmebis dargva kvalsaTburebSi warmoebs oqtomberSi, siciveebis dawyebamde mcenarem rom moaswros dafesvianeba. erTi kvadratul metrze aTavseben 400 kalams, kalams markeriT winaswar daxazul mwkrivebSi rgaven, erTmaneTisagan 5 sm daSorebiT da rwyaven. gvian Semodgomasa da adre gazafxulze mimarTaven nergis gasxvlas kargad ganviTarebuli da dabuCquli sargavi masalis miRebis mizniT. zamTris periodSi saWiroa sistematuri meTvalyureoba: kvalsaTburebis movla, Tbili amindebis dros haeris ganiaveba, yinvebis d r o s saf ar ebi T d aT buneba.

kalmebis dafesvianebis dasaCqareblad zogjer iyeneben zrdis stimulators – het er o auqs i ns . nakveTze nergis gadatanamde 8 – 10 dRiT adre mimarTaven saTburebSi mcenaris e. w. gakaJebas, risTvisac CarCoebs 4- 5 dRis ganmavlobaSi aweul mdgomareobaSi toveben r o go r c d R i s i T , i s e Rami T , xo l o S emd eg s r ul i ad i R eben mas .

**nergis amoReba da dargva.** ner gi s amo R ebi s wi n kval saT bur i uxvad und a mo i r wyas, xolo mcenareebi frTxilad unda amoviRoT fesvebis dauzianeblad. nergebis xeliT amogleja d auS vebel i a. amo R ebul i ner gi i qve xar i s xd eba. dasargavad vargisi neri sigrZiT unda iyos 15 – 18 sm da hqondes kargad ganviTarebuli

f es vT a s i s t ema d a 2 – 3 gver d i T i t o t i mai nc . dargvamde saWiroa nergs movaSoroTdid foTlebi, xolo fesvebi daumokldes 5sm-md e. amis Semdeg fesvebs amoavleben nakelian Tixanarev sqel wunwuxSi, awyoben yuTebSi vertikalurad, fesvebiT qveviT da gzavnian dasargavad. fesvebi rom ar gamoSres, yuTis fskerze sasurvelia sveli xavsi an balaxi daifinos, xolo zemodan msubuqi safeni gad aef ar o s .

geranis dargva warmoebs aprilSi, rodesac niadagis sakmaod gaTbeba. saqarTvelos dasavleT nawilSi dargvis periodia aprilis pirveli naxevari, xolo aRmosavleT nawilSi – apr i l i s meo r e naxevar i .

dargvis win saTanadod momzadebuli niadagi markeriT ixazeba gardigardmo da misi gadakveTis adgilebze – 70 sm daSorebiT erTmaneTisagan – irgveba gerani. am pirobebSi heqtarze Tavsdeba 20 aTasi mcenare. nergis dargva warmoebs 5 – 6 sm siRrmeze da maSinve r wyaven.

**plantaciis movla.** gazafxulze gerani SedarebiT nela izrdeba, am periodSi saWiroa zrunva imisaTvis, rom niadagi mudam fxvier mdgomareobaSi iyos da ar daifaros sarevelebiT. am mizniT pirvel Toxna-kultivacias mimarTaven jer kidev dargvidan 3 – 4 dRis Semdeg. ori kviris Semdeg tardeba mwkrivTaSoris meore kultivacia, xolo 20 – 25 dRis Semdeg mesame kultivacia mwkrivebis Rrma gafxvierebiT. amis Semdeg gaToxnakultivacia warmoebs saWiroebis mixedviT, vidre mcenareTa mwkrivebi Seikvrebodes d a nakveT i mT l i anad d ai f ar ebo d es f o T l ebi T .

**mosavlis aReba.** eTerovani zeTis udides raodenobas Seicavs geranis foToli, ufro naklebs misi Rero. mwvane masis aReba unda moxdes maSin, rodesac plantacia foTlis uxv masas ganiviTarebs. saqarTvelos pirobebSi geranis mosavals orjer iReben, Tbili S emo d go mi s pi r o bebS i z o gj er S es aZl ebel i a mes ame mo savl i s aR ebac .

mo s avl i s pi r vel i aR eba war mo ebs i vl i s i s meo r e naxevr i d an – agvi s t o s S ua r i c xvebamd e.

pirveli mosavlis aRebis dros, buCqze iWreba mwvane masis 70 – 75%, yvela Zi r i T ad i toti, misi 3 -4 muxlTSorisis datovebiT. garda amisa, buCqze datovebuli unda iqnes 8 – 10 cali norCi da saRad ganviTarebuli ylorti, rom buCqma Tavisi forma ar dakargos d a kvl av aR ad gi no s mwvane masa meo r e mo savl i s mo s ac emad .

geranis meore mosavlis aReba warmoebs seqtembris damlevidan – 20 oqtombramde. am

d r o s i Wr eba pl ant ac i aS i ger ani s mT el i mwvane mas a.

maRali temperaturis dros, mzis sxivebze, moWrili mwvane masa male QWkneba da eTerovani zeTis mniSvnelovani raodenoba orTqldeba, ikargeba, amitom mosavlis aReba s as ur vel i a R r ubl i an ami nd S i d i l i T an mz i an ami nd S i saRamo s .

geranis mwvane masis gadasazidi transporti unda iyos sufTa. navTiT, mazuTiT, samanqano zeTiT, an sxva suniani nivTierebiT gaWuWyianebuli transporti geranis mwvane masis gadasatanad ar gamodgeba, es mniSvnelovnad auaresebs misgan miRebul zeTis xarisxs.

# evgeno l ur i r ehani

saqarTveloSi gavrcelebul eTerzeTovan kulturebs Soris evgenolur rehans pirveli adgili uWiravs. misi mwvane nawilebis: foTlebis, yvavilebis, norCi Reroebis gadamuSavebis Sedegad evgenoluri eTerovani zeTi miiReba, rasac farTo gamoyeneba aqvs s axal xo meur neo baS i , s apar f i umer i o d a kvebi s mr ewvel o baS i , med i c i naS i . evgenoluri rehani Seicavs 0,3 – 0,75%-mde eTerovan zeTs, heqtarze SesaZlebelia

mi R ebul i i qnes 20 t -md e mwvane mas a, e. i . 60 – 140 kg-md e z eT i s mo saval i .

**botanikur-morfologiuri da biologiuri daxasiaTeba.** evgenoluri rehani mravalwlovani buCqovani mcenarea. is mohyavT, rogorc erTwlovani mcenare, mravldeba Teslidan miRebuli CiTilebis saSualebiT. kulturaSi cnobilia sami saxis rehani: evgenoluri, qafurisa da bostnis. qafuris rehanis zeTi 70%-mde qafurs Seicavs. bostnis rehani ki farTod gavrcelebulia saqarTveloSi, rogorc sanelebeli mwvanili kerZis S es akaz mad .

rehanis fesvTa sistema mTavarRerZiania, niadagSi sakmaod Rrmad Cadis. Rero swormdgomia, datotvili, buCqovani, simaRliT 1,0 – 1,7 m-mdea, foToli ovaluria, ki d eebd akbi l ul i , S ebus vi l i , yvavi l ebi wvr i l i a, S ekr ebi l i T avT avi s ebr yvavi l ed ad .

yvavili orsqesiania, nayofierdeba jvaredini damtverviT. jamis foTlebi mwvanea, Zlier S ebus vi l i , md i d ar i a eT er o vani z eT i T , T af l o vani mc enar ea, T es l i wvr i l i a.

rehani siTbos moyvaruli mcenarea, misi aRmonaceni iRupeba sul mcire yinvebis (00)

drosac ki, xolo mozrdili mcenare 15 ? siTbos pirobebSi sruliad aCerebs vegetacias.

mi s i T es l i s aR mo c enebi s aT vi s o pt i mal ur i t emper at ur aa 25 ? s i T bo . r ehani s d asar gavad s aukeT es o a ms ubuqi , no yi er i , al uvi ur i , kar gi wyal gamt ar i ni ad agebi . misTvis gamousadegaria Warbteniani miwebi., agreTve iseTi nakveTebi, sadac gruntis wyl ebi 1 m-z e uf r o axl o a ni ad agi s z ed api r i d an.

**agr o t eqni ka.** rehanis gamravleba Teslidan gamoyvanili CiTiliT warmoebs. CiTili gamohyavT kvalsaTburebSi, iseTive wesiT, rogorc es bostneuli kulturebisaTvis (pami d o r i , ko mbo s t o ) ar i s mi R ebul i .

kvalsaTburebSi 1 m2-ze iTeseba 5 g rehanis Tesli. Tesva warmoebs Tebervlis bolos,

martis pirvel ricxvebamde. erTi heqtari rehanis dasargavad saWiroa 45 m2 kval saT bur i . saTanado movlis pirobebSi kvalsaTburidan SeiZleba 30 – 40 dRis ganmavlobaSi miviRoT mi nd o r S i gad as ar gavi ner gi .

CiTilis mindorSi gadargva warmoebs 20 aprilidan 20 maisamde, rodesac aRar aris s aS i S r o eba d i l i s wayi nvebi sa.

rehanis dasargavad niadagi mzaddeba wina wlis Semodgomidanve. winamorbedi kulturis ganTavisuflebisTanave xdeba niadagis gasufTaveba narCenebisagan da Semdeg mzralad xvni s wes i T i s e, r o go r c es ger ani s kul t ur i s aT vi s i yo aR ni S nul i .

rehani ver itans mudmivad erTsa da imave nakveTze Tesvas, amitom misi TeslbrunvaSi moTavseba aucilebelia. kargi winamorbedia misTvis saSemodgomo TavTavianebi, samarcvle par ko s ani kul t ur ebi d a s i mi nd i .

rehani saWiroebs niadagis saTanadod ganoyierebas sasuqebiT. mzralad xvnis win, Semodgomaze 30 – 40 t nakelis Setana uzrunvelyofs mcenaris normalur ganviTarebas. maRali mosavlis miRebisaTvis ki saWiro iqneba mineraluri sasuqebis gamoyenebac. saqarTvelos pirobebisaTvis rekomendebulia sasuqTa aseTi saSualo dozebi: 6,0 c s ul f at amo ni umi , 6,5 c s uper f o s f at i d a 3,0 c kal i umi s mar i l i . f o s f o r i ani d a kal i umi ani sasuqebis 2/3 SeaqvT niadagSi ZiriTadi xvnis dros. danarCeni mineraluri sasuqebis 1/3 ki CiTilis dargvis dros kvlebSi, xolo azotiani sasuqebis danarCen raodenobas iyeneben mc enar i s gamo s akvebad s aveget ac i o per i o d S i S et ani T .

rehanis CiTili irgveba kvadratul-budobrivi wesiT – 70X70 sm-ze. budnaSi rgaven 2 mcenares, dargvis es wesi UsaSualebas iZleva plantaciaSi niadagi damuSavdes ori mi mar T ul ebi T – gardigardmo. Tu nakveTis konfiguraciis gamo mouxerxebelia orive mimarTulebiT niadagis damuSaveba, maSin mcenareebs rgaven mwkrivSi, mwkrivebs Soris manZili am SemTxvevaSi 70 sm-ia, xolo mcenareTa Soris TviT mwkrivSi – 35 sm. CiT i l i s d ar gva xo r c i el d eba xel kavi T gakeT ebul o r mo ebS i , d ar gvi s T anave Ci T i l i und a mo i r wyas .

dargvidan 4 – 5 dRis Semdeg plantacia mowmdeba da gacdenili adgilebiSi Cairgveba

mo i r gveba.

rehani ganviTarebis pirvel periodSi nela izrdeba, am dros mas zrdaSi aswreben

sarevelebi, plantaciis mosavlis mTavari RonisZieba imaSi mdgomareobs, rom nakveTi vi qo ni o T mud am f xvi er d a s ar evel ebi s agan s uf T a md go mar eo baS i . am mi z ni T , d ar gvi d an 4 -5 dRis Semdeg, awarmoeben pirvel Toxna-gafxvierebas 3 – 4 sm siRrmeze. Semdegi Toxna d a kultivacia warmoebs yovel 15 – 20 dReSi. zafxulis periodSi niadagis mdgomareobis mi xed vi T S es aZl ebel i a s aWi r o gaxd es mesame d a meo T xe T o xna-kul t i vac i a.

rehanis mosavals iReben im momentSi, rodesac mcenareSi dagrovilia eTerovani zeTis maqsimaluri raodenoba. garegnuli niSnebiT am dros Tesli centralur Reroze rZisebr simwifeSia, xolo gverdiT totebze masobriv yvavilobaSi. saqarTveloSi rehanis mosavlis aR eba i wyeba s eqt embr i d an d a mT avr d eba 10 o qt o mbr amd e.

mosavlis aReba iwyeba mcenareebze namis SeSrobis Semdeg, mwvane masas Wrian niadagis zedapiridan 8 – 10 sm simaRleze. moWrili masa gaaqvT nakveTidan da dauyovnebliv agzavnian qarxanaSi gadasamuSaveblad. rehanis mosavlis aRebidan qarxanaSi mitanamde ar unda gavides 3 saaTze meti. mosavlis gadazidvis didi xniT dagvianeba iwvevs mwvane masis Caxur ebas d a z r d i s d anakar gebs .

# r ehani s s aT es l e kul t ur a

rehanis Teslis misaRebad specialurad aSeneben saTesle plantacias. amisaTvis arCeven qarebisagan dacul myudro adgilebs. misTvis niadagis momzadeba, CiTilis gamoyvana da dargva TiTqmis iseTive wesiT warmoebs, rogorc samrewvelo rehanisa. gansxvaveba aq isaa, rom farTobis erTeulze rgaven 20 aTas mcenares e. i. naxevars, vidre samrewvelo rehanis dros. mcenareTa Soris manZili mwkrivSi da mwkrivebs Soris aq 70 sm udris, rgaven T i T o c al Ci T i l s.

saTesle rehanisaTvis gamoyenebuli unda iqnes maRali agrofoni, sasuqebiT ganoyiereba,

kul t i vac i a, mo r wyva d ani S nul vad ebS i .

Teslis momwifeba mcenareze Tanabrad ar xdeba, pirvelad mwifdeba mTavar Reroze ganlagebuli Teslebi, Semdeg ki gverdiTi totebisa. amis Sesabamisad rehanis Teslis Segroveba plantaciaSi ramdenjerme xdeba, misi simwifis mixedviT. rehanis Teslis simwifis damaxasiaTebelia muqi yvaisferi Seferva. erTi heqtari plantacia 150 – 200 kgmd e T es l s i Zl eva.

# r af s i

**saxalxo-sameurneo mniSvneloba**. rafzi Zvirfasi zeTovani kulturaa. evropis, aziis da amerikis mTel rig qveynebSi igi iTvleba ZiriTad zeTovan kulturad. formebis da jiSebis mixedviT rafsis Teslis cximianoba 43-50 % -s Seadgens. rafxis zeTs iyeneben, rogorc saWmelad ise teqnikuri mi z nebi s aT vi s . mas i yeneben mar gar i nes war mo ebaS i , s apni s , metalurgiul, safeiqro, laq – saRebavebis, poligrafiul da tyavis mrewvelobaSi. am bo l o d r o s d i d i nt er es i a avt o manqani s z eT ad i qnes gamo yenebul i .

rafsi SesaniSnavi wvniani sakvebia mecxoveleobisaTvis. igi swraf wamonazards iZleva gaTibvisa da gaZovebis Semdeg. rafsis zeTad gamoxdis Semdeg rCeba koptoni, romelic mecxoveleobaSi sakvebad gamoiyeneba. rafsi rogorc sakvebi kultura s aqar T vel o S i bar i s d abl o bi s s ar wyav r egi o nebS i mo hyavT .

r af s i s mwvane mas i s gvi an S emo d go maz e gaT i bvi s as 60-70 t o namd e Rebul o ben ha-z e.

**garemo pirobebi.** rafsis Tesli gaRivebas 1-30-s C –ze iwyebs gaRivebas. aRmonaceni itans

yi nvebs mi nus 3-50-md e. i gi sakmao d maR al mo mT xo vni a t eni sad mi . d i d mo T xo vni l ebas uyenebs niadagis nayofierebas. saSemodgomo rafsisaTvis kargia sakvebi elementebiT mdidari, s us t i mJave an nei t r al ur i r eaqc i i s mqo ne ni ad agebi .

**agroteqnika.** sagazafxulo rafsisaTvis aucilebelia SeirCes iseTi winamorbedebi,

romlebic adre aTavisufleben mindors mosavlis masisagan. aseTi kulturebia: parkosani kulturebi, sasilosed asaRebi mzesumzira da simindi, saadreo kartofili, mwvane sakvebad asaRebi Wvavi. rafsis daTesva jvarosani kulturebis (kombosto, TeTri mdogvi, Talgami da sxva) Semdeg ar SeiZleba. ar aris rafsis mono kulturad Tesva, radgan amiT xeli ewyoba mavneblebisa da daavadebebis gavrce4lebas. igi imave mindorze S ei Zl eba d abr und es ar a ugvi anes 5 wl i s S emd eg.

rafsi sakvebs didi raodenobiT moiTxovs, amitom rafsisTvis gankuTvnil nakveTze S emo d go maz e S eaqvT 30-60 t nakeli ha-z e. az o t i s S et ana xd eba T esvi s wi na kul t i vac i i wi n an rozetis fazaSi 120 kg/ ha-z e, s aS emo d go mo r af s i s naT es S i az o t i s S et ana met ad ef eqt ur i a adre gazafxulze (90-kg-mde) , xolo gamokvebaSi 30 kg/ha-ze. rafsi gansakuTrebiT mgrZnobiarea sarevela mcenareebisadmi ganviTarebis pirvel periodSi. saSemodgomo rafsis Tesvisas saTesled, adre asaRebi kulturebis Semdeg, niadagi winamorbedis mo s avl i s aRebisTanave unda damuSavdes (aCeCva, moxvna da xnulis damuSaveba naxevrad xnul i s d amuSaveba).

saSemodgomo rafsis moyvanisas sakvebad, niadagis damuSaveba damokidebulia rogorc niadagur-klimatur pirobebze da Tesvis vadaze, ise imaze Tu rodis aris saWiro mosavlis aReba adre gazafxulze, zafxulSi Tu Semodgomaze. mwvane masis zafxulSemodgomaze gamoyenebisas niadagis damuSaveba Sedgeba aCeCvisagan winamorbedis aR ebi s T anave d a xvni s agan. farcxva unda Catardes mindorSi gasvlis pirveli SesaZleblobisTanave. dasarevlianebul nakveTebze da agreTve meqanikuri Sedgenilobis mZime niadagebze. rafsisaTvis niadagis damuSaveba Sedgeba winaswar aCeCili niadagis moxvnisagan. Tesviswina damuSaveba Seicavs kultivacias dafarcxviT. roca rafsi saTesled iTeseba is iseT dros unda daiTesos, rom man Semodgomaze moaswros rozetis formireba 6-8 kargad ganviTarebuli foTlebiT. rafsi unda daiTesos saSemodgomo kulturebis Tesvamde ori sami kviriT adre. sagazafxulo rafsi saadreo marcvleuli kulturebis vadebSi unda daiTesos. Tesvis vadis dagvianeba iwvevs aRmonacenis Zlier dazianebas jvarosanTa baR ni nj o ebi sagan, r ac mni Svnel o vnad amc i r ebs mo saval s .

rafsi iTeseba Cveulebriv viwro mwkrivad saTesi manqaniT 12-15 kg/ha-ze Tesvis normiT,

xolo farTo mwkrivad Tesvis dros 6-8 kg/ha-z e. T es l i s CaT es vi s s i R r me 2-3 sm-i a. ni ad agi s z ed api r ul i f eni s gamo S r o bi s d r o s , CaT es vi s s i R r mes ad i d eben 4-5 sm-mde.

sarevelebis winaaRmdeg gamoyenebul unda iqnas Sesabamisi herbicidi, romelic iqneba

r egi s t r i r ebul i .

aRmocenebamde niadagis qerqis gaCenisas is unda daiSalos farcxiT. aRmonaceni ifarcxeba, xolo SEmdeg tardeba mwkrivTSorisebis damuSaveba. gazafxulze tardeba gamokveba da gafxviereba. movla ZiriTadad SAedgeba mwkrivTSorisebis gafxvierebisgan, mcenareTa gamokvebisagan da mavneblebTan da avadmyofobebTan brZolisagan. mcenareTa vegetaciis ganmavlobaSi mwkrivTSorisebs afxviereben orjer: ori-samifoTolakis fazaSi, Semdeg saWiroebis mixedviT mwkrivebis SeerTebamde. vegetaciis periodSi mavneblebis wi naaR md eg s aWi r o a S esabami s i pr epar at ebi s gamo yeneba.

rafsis Tesls iReben gayofis wesiT. mcenareebs Tibaven Rvareulebad maSin, roca T es l i mur a an S av f er s mi i R ebs.

mwvane masis misaRebad saSemodgomo rafsi iTeseba adre gazafxulze saadreo

sagazafxulo kulturebTan erTdroulad. ori gaTibvis dros pirceli unda Catardes 5060 dRis Semdeg aRmonacenis gamoCenidan, roca mcenareTa simaRle miaRwevs 50-60 sm-s . gaTibvis simaRle 10-12 sm, meore 45-50 dRis Semdeg pirveli gaTibvidan. pirveli gaTibvis S emd eg und a Cat ar d es naT es i s gamo kveba az o t i ani s as uqi t 60 kg/ha-z e no r mi T .

# Saqr i s War xal i

**saxalxo - sameurneo mniSvneloba.** Saqris Warxali erT - erTi Zvirfasi teqnikuri kulturaa. is naxSirwylebiT mdidaria da misgan SesaZlebelia miRebul iqnas 36 t/ha –z e S aqar s . War xl i s mo s aval i . s aqar T vel o S i S aqr i s War xl i s T es vas 1931 wl i d a mo ki d es xel i , rodesac qarelis raionis sof. agaraSi aSenda Saqri Warxlis gadamamuSavebeli qarxana.

**jiSebi.** Saqris Warxlis jiSebi sam jgufad iyofa: 1. mosavliani-Ertrag- msxvili ZiriTa

da saSualo SaqrianobiT. 2.normaluri-hormale- Saqriani mosavliani. 3. – Saqr i ani - Zucer. S aqr i s maRal i pr o c ent i T , magr am mc i r e s i d i d i s Zi r ebi T .

**biologiuri Tavisebureba.** Saqris Warxali orwliani mcenarea. pirvel wels imsxvilebs Zi r s d a i Zl eva mZl avr f o T l o van nawi l s , xo l o meo r e wel s i vi T ar ebs s anayo f e R er o ebs.

Saqris Warxlis fesvTa sistema Sedgeba mTavar RerZa fesvisa da mravali wvrili mkvebavi fesvebisagan, romlebic niadagSi Rrmad vrceldebian. amitom misTvis saWiroa R r ma, f xvi er i d a ad vi l ad S esaT vi s ebel i s akvebi ni vT i er ebebi T md i d ar i ni ad agi .

Saqris Warxali jvaredinad damtveravi mcenarea, mas axasiaTebs grZeli savegetacio per i o d i (150-180 d R e).

**adgili TeslbrunvaSi.** Saqris Warxlis karg winamorbeds warmoadgens samarcvle

par ko s nebi , magr am umet es ad i T es eba T avT avi ani kul t ur ebi s Semd eg.

Saqris Warxlis Tesva naWarxal mindorze dauSvebelia, radgan zedized Tesvis SemTxvevaSi mcirdeba mosavali , advilad ziandeba mavnebel daavadebebisagan, gansakuT r ebi T z i and eba s o ko vani d aavad ebebi T .

**ganoyiereba.** Saqris Warxaliniadagis nayofierebisadmi didi momTxovnia. 500 centneri mosavlis misaRebad is niadagidan iRebs 200 kg-mde azots, 60 kg fosfors da 330 kg kaliums. aqedan gamomdinare Cans, rom niadagis Zlieri ganoyierebis gareSe maRali mo s avl is miReba SeuZl ebel i a. TiToeuli tona Zirxvenis Sesaqmnelad saWiroa 6 kg azoti, fosfori 2 kg da kaliumi 6,7 kg. zrda - ganviTarebis pirvel fazaSi Saqris Warxali didi raodenobiT moixmars azotsa da fosfors. nakelis 20-40 tonis r ao d eno bi T Setana xdeba ZiriTadi xvnis win, xolo mineraluri sasuqebidan nakelTan erTad umjobesia Setanil iqnas fosforiani da kaliumimiani sasuqebis naxevari doza, meore naxevari ki TesvisTanave, romelTa nakveTSi Setana unda moxdes sasuqis Semtani manqanebi T , r aT a nakveT z e mo xd es s as uqebi s T anabar i ganawi l eba.

urwyav adgilebSi atareben erTxel gamokvebas ZiriTadad daTaigulebisTanave, an mwkrivebis gaswvrivi mimarTulebiT kultivaciisas. sarwyav pirobebSi Cveulebriv mimarTaven orjer gamokvebas: pirveli da meore morwyvebis win. pirvel gamokvebas atareben azot - fosforiani da meored - fosfor- kaliumiani sasuqebiT, TiToeuli el ement i s -20- 30 kg/ha mo qmed i ni vT i er ebi s d o z i T .

imisaTvis, rom swrafad gaizardos Saqris Warxlis foTlebi, saWi r o a ganxo r c i el d es gamokveba (sakmarisi tenianobis zonebSi): 30-40 -azoti, 20-30 -fosfori da 30-40 -kal i umi kg/ ha-z e angar i S i T .

**niadagis damuSaveba.** nawverali 4-5 sm siRrmeze unda aiCeCos.fesuriani sarevelebiT dasarevlianebis SemTxvevaSi aCeCva xdeba 8-12 sm siRrmeze, niadagi ki ixvneba 25-27 sm siRrmeze. adre gazafxulze mindorSi gasvlis SesaZleblobisTanave mzrali ifarcxeba , raTa niadagidan wylis aorTqleba Semcirdes. garda amisa, dafarcxvis mizania xnulis z ed api r i s mo s wo r eba, bel t ebi s a d a z ed api r ul i qer qi s d aS l a.

War xlis daTesvamde xnulis zedapiri fxvier mdgomareobaSi unda iyos. amitom Tu pirveli dafarcxvis Semdeg xnulma qerqi gaikeTa an sarevela mcenareebi aRmocenda, xnul i maS i naT ve i f ar c xeba.

Tesvis win xnuli kultivatoriT 6-8 sm siRrmeze fxvierdeba da Semdeg iTeseba Warxali. Saqris Warxlis movliT RonisZiebebSi mniSvnelovani adgili uWiravs Sesabamisi herbicidebis gamoyenebas. herbicidebis gamoyeneba umjobesia moxdes Tesviswina kul t i vac i i s d r o s , r aT a mo xd es mi s i ni ad agS i kar gad CakeT eba.

herbicidebis SerCeva xdeba im angariSiT, rom maqsimalurad daiTrgunos sarevelebis

s axeebi d a gamo i r i c xo s xel i T T o xna.

**Tesva.** Saqris Warxali adre gazafxulze iTeseba tenian raionebSi 2-3 , xolo urwyav r ai o nebS i 4-5 sm s i R r mez e. aRmo c enebas i wyebs 40 **–**z e ni ad agi s gaT bo bi sas .

**T esvi s norma.** Saqris Warxali heqtarze daaxloebiT iTeseba 30-32 kilogrami. S emeCxer ebi sas ha-z e und a d ar Ces 110-120 aT as i mc enar e.

mwkrivebs Soris manZili sarwyav zonebSi 50-X 20 sm-ia, xolo gvalvian raionebSi ki 45 X 18 sm.

**Tesvis wesi.** Saqris Warxlis Tesva warmoebs mwkrivad. mwkrivad Tesva xorcieldeba specialuri Saqris Warxlis kombinirebuli saTesi manqanebiT, romelTac TesvasTan erTad Seaqvs mineraluri sasuqi. Tesva , rogorc wesi unda warmoebdes xnulis gardigardmo mimarTulebiT, rac uzrunvelyofs naTesis Tanabar siRrmeze Tesvas da Tanabari aRmonacenis miRebas. rogorc aRniSnuli gvqonda, Tesvis Semdeg unda moxdes misi mobekna, r aT a ni ad agT an T es l s hqo nd es mWi d r o S exeba, es ki xels Seuwyobs swraf aRmoc enebas . T u niadagis zeda fenaSi teni sakmarisia sabeknela gatarebisas talaxs idebs, maSin mobekna s aWi r o ar ar i s .

**naTesis movla.** Saqr i s War xal i xel sayr el i kl i mat ur i pi r o bebi s d r o s aRmo c enebas 8-10 dRis Semdeg iwyebs. xSirad niadagi aRmocenebamde qerqs ikeTebs. amisaTvis saWiroa is d ai S al o s r o t ac i ul i T o xi T .

mwkr i vebis gamoCenisTanave 4-5 dReSi , saWiroa misi 3-4 sm siRrmeze gafxviereba imisaTvis, rom heqtarze miviRoT sasurveli raodenobis mcenareebi. gameCxer ebul i ad gi l ebi d ambal i T es l i T und a gamo i T eso s an gameCxer ebi sas amo R ebul i Zi r ebi dairgas.

savegetacio periodis ganmavlobaSi Saqris Warxlis naTesi 4-6 jer unda gafxvierdes, r aT a naT es i mT el i veget ac i i s ganmavl o baS i i yo s f xvi er i d a sar evel ebi s gan s uf T a. sarevela mcenareTa didi raodenobiT arsebobis SemTxvevaSi SeiZleba SeirCes

her bi c i d i , r o mel i c S et ani l i qneba naT esS i d ad geni l i wes i T a d a no r mi T .

**morwyva.** Saqris Warxlis morwyvis SemTxvevaSi mwkrivebs Soris unda gakeTdes sarwyavi kvlebi, saidanac wylis gaJonvis wesiT moxdeba naTesis morwyva. yoveli morwyvis Semdeg unda tardebodes gafxviereba. vegetaciis periodSi 6-8 jer Catardeba morwyva. agvistos d aml evi d an mo r wyva ar ar i s s aWi r o . mo r wyva S ei Zl eba mxo l o d saWi r o ebi s S emT xvevaS i .

**mosavlis aReba.** Saqris Warxlis aReba xdeba misi teqnikuri simwifis dadgomisas, s eqt ember -noemberSi kombainiT, romelic miwidan iRebs Zirebs, aclis foCebsa da fesvis narCenebs, asufTavebs miwisgan da yris bunkerSi. Semdeg manqanebiT igzavneba qarxnebSi an s pec i al ur s awyo bebS i .

# Tambaqo

**eko no mi kur i mni S vnel oba**. Tambaqo erT - er T i Zvi r f as i t eqni kur i kul t ur aa. T ambaqo s

xmaroben mosawevad. garda mosawevi Tvisebebisa Tambaqo gamoiyeneba medicinaSi s amkur nal o pr epar at ebi s d as amz ad ebl ad (vi t ami ni ).

Zvel ad saqarTveloSi, xalxur medicinaSi, Tambaqos fxvnils iyenebdnen Wrilobidan sisxlis denis SesaCereblad, misi naxarSiT mkurnaloben qeciT daavadebas Tambaqosgan damzadebul preparatebs xmaroben soflis meurneobis mavneblebis winaaRmdeg (Tambaqos nayeni, nikotinsulfati, nikodusti da sxva.) wekos foTlebidan SeiZleba miRebuli iqnes limonmJava. Tambaqos foTlebidan miiReba agreTve vaSlmJava, romelic ixmareba kvebisa da saparfiumerio mrewvelobaSi. Tambaqos Tesli Seicavs 40% zeTs, romelsac iyeneben sapnisa da lak - saRebavebis warmoebaSi. misi Rerosagan maRali xarisxis qaRaldi mzaddeba.

**gavrceleba.** Tambaqos samSobloa centraluri da samxreT amerika. Tambaqo pirvelad qristefore kolumbma aRmoaCina 1492 wels. saqarTveloSi Tambaqo. (weko) me-17 saukunis damlevs Semovida, xolo aRmosavluri yviTeli sapapirose Tambaqo me-19 saukunis pirvel naxevar Si .

**jiSebi.** Tambaqos jiSebi or jgufad iyofa: sapapirosed da sasigared. s apapi r o s e

Tambaqoebi ki Tavis mxriv iyofa or jgufad: aRmosavlur da amerikul tipebad. sapapirose Tambaqoebi foTlis agebulebis mixedviT, SeiZleba kidev davyoT yunwian da mjdomare f o T l i an T ambaqo ebad . yunwian Tambaqoebs ekuTvnis Semdegi jiSebi: samsuni, trapizoni. mjdomare foTlianebs: d i ubeki , amer i kani , mo l o vat a, o s t r o l i s t eni , i munur i 580, po d o l ski 39 d a s xva.

**adgili TeslbrunvaSi.** Tambaqo niadagisadmi momTxovnia, misTvis niadagi mTeli savegetacio periodis ganmavlobaSi fxvier da sarevelebisgan Tavisufal mdgomareobaSi und a i yo s .

Tambaqo TeslbrunvaSi Tavsdeba TavTaviani kulturebis Semdeg. dasavleT saqarTveloSi Tambaqos winamorbeds ZiriTadad warmoadgens simindi . Tambaqos erTi da i gi ve ad gi l z e T es va amc i r ebs mi s mo s avl i ano bas .

**niadagis damuSaveba.** Tambaqos maRal mosavals ganapirobebs niadagis drouli da

xarisxiani d amuSaveba.

T ambaqo saT vi s i yeneben niadagis mzralad damuSavebis sistemas. Tambaqos dasargavad gamoyofili adgilebi winamorbedis aRebis Semdeg unda aiCeCos da moixnas SemodgomT 25 sm siRrmeze, xolo dasavleT saqarTveloSi niadagi ixvneba Semo d go ma zamTris ganmavlobaSi, saxnavi fenis siRrmis mixedviT 18-22 sm-ze. xvna tardeba kulturuli guTniT, adre gazafxulze, mzralad xnuli unda gafxvierdes . gafxviereba unda Catardes nakveTis mdgomareobis mixedviT, farcxiT, kultivacia dafarcxviT an f r T ebmo xs ni l i s ao S i T , T anmi yo l ebul i f ar c xi T .

**niadagis ganoyiereba.** Tambaqo sakvebi nivTierebebisadmi didi momTxovnia. mwvane masis ganviTarebisaTvis is didi raodenobiT moiTxovs organul da mineralur sasuqebs. Tumca azotiani sasuqebis gamoyenebisadmi frTxili damokidebuleba unda gvqondes, radgan Warbi azoti auaresebs Tambaqos foTlis xarisxs. fosforiani sasuqebi ki xels uwyobs mcenareSi naxSirwylebis dagrovebas, foTlis momwifebas da amdenad aumjobesebs mis xarisxs.

kaliumiani sasuqebi Tu qlors ar Seicaven isini mniSvnelovnad aumjobes eben Ff o T l i s xar i s xs d a wvi s unar s .

organuli sasuqi ZiriTadi xvnis wis 40 t/ha-ze SeaqvT, xolo mineraluri sasuqebidan amoniumis gvarjila 120 kg, superfosfati 400 kg da kaliumis marili 200 kg. Zlier gaewrebul niadagebze gamoiyeneba amoniumis gvarjila 180 kg, superfosfati 500 kg da kal i umi s mar i l i 200 kg.

**Tesvis vadebi da normebi: .** T ambaqo s T esl i Zal i an wvr i l i a d a s aWi r o ebs z er el ed 0,5 sm siRrmeze Tesvas. misi ufro Rrmad Tesvis SemTxvevaSi Rivi niadagis winaaRmdegobas ver uZlebs da veRar aRmocendeba, amitom saWiroa specialuri sanerge meurneobebis mo wyo ba , r o ml i s s wo r i o r gani z ac i a d a j ansaR i ner gi s gamo yvanas d i d i mni S vnel o ba aqvs .

Tambaqos grZeli savegetacio periodi axasiaTebs, amitom saWiroa Tambaqos Tesli adre daiTesos (TebervalSi, an martSi), raTa gadargva ar dagviandes. Tambaqos dadgenil vadebSi gadargvisaTvis saWiroa CiTilis droulad gamoyvana. Tambaqos Tesli dasavleT s aqar T vel o S i kvalsaTburSi 20 Tebervlidan 10 martamde iTeseba, xolo Ria kvlebSi 20Tebervlidan 1 martamde, aRmosavleT saqarTveloSi kvalsaTburebSi 20 Tebervlidan 20 martamde. kvalsaTburebSi 1 m**2** zamTarSi unda daiTesos 0,8 g. xolo Ria kvalSi 1,0 g Tesli . mobneviT Tesvisas Tesli unda daifaros 0,5 sm sisqis miwis feniT, moitkepnos da mo i r wyas ms ubuqad kval s aT bur ebSi er T kvad r at ul met r z e 3000 c al i ner gi mi i R eba, xo l o Ria kvalze - 2500 c al i . T es l s T esaven, r o go r c mS r al , i s e wi nas war gaR i vebul s ac .

**CiTilis movla.** CiTilis movlis mizans Seadgens jansaRi CiTilis miReba, risTvisac saWiroa: morwyva, gamargvla, gameCxereba, mavnebel-daavadebaTa winaaRmdeg brZola. kval saT bur ebS i d a R i a kvl ebS i T es l i s aR mo c enebamd e ni ad agi s z ed api r i mud mi vadt eni ani unda iyos, DdReSi orjer diliT da saRamos unda irwyvebodes. dReSi erTxel sakmarisia morwyva meore da mesame stadiaSi. erTi kviriT adre CiTilis amoRebamde nakveTi unda mo i r wyas , r aT a amo R ebi s d r o s ner gs mi wa d a f es vebi amo yves .

**CiTilis amoReba.** CiTilis amoReba warmoebs , roca mi s i sigrZe 10-12 santimetri iqneba, dilis saaTebSi, xolo Rrublian dReebSi MmTeli dRis ganmavlobaSi. Tambaqo iirgveba 20 aprilidan ivnisamde. aqedan 20 aprilidan 5 maisamde irgveba mTeli farTobis 25 % da es vada iTvleba adreul vadad. 5 maisidan 20 maisamde saukeTeso vadad i T vl eba d as ar gavi f ar T o bi s 55 %, 20 mai s i d an 1 i vni s amd e - gviani vad aa d a i r gveba gegmi s 20 %.

**dargvis vadebi da sixSire.** saqarTveloSi daraionebuli jiSebisaTvis TiToeul heqtarze miRebulia Semdegi kvebis areebi da mcenareTa raodenoba: afxazeTSi samsunis j i S i s aT vi s - Zlier daqanebul ferdobebze 55 X15 sm dacviT, ha-ze 115000 Ziri. danarCen farTobze 65 X 18 sm ha-ze 81000 mcenaris varaudiT. aWaraSi-samsunis jiSisaTvis- Zl i er daqanebul ferdobebze 55 X 10 sm, ha-ze 95000 mcenare. danarCen farTobze 65 X 20, ha-z e 73000 mc enar i s var aud i T .

**dargva**. dargvis dros unda SeirCes iseTi mcenareebi, romelTac ganviTarebuli aqvT 5-6 foToli da kargad ganviTarebuli fesvTa sistema, nergi unda iyos saRi, sigrZiT 10-12 s m. Tambaqos dasargavi nakveTi kargad unda iyos gasufTavebuli sarevelebisa da mcenareTa narCenebisagan. amasTan kargad gafxvierebuli da mosworebuli, raTa nergi T amabar pi r o bebS i d ai r gas .

Tambaqo irgveba maSin, roca niadagis temperatura 10-120-iT gaTbeba. irgveba sxvadasxva vadaSi, radgan mTeli farTobis erTbaSad dargvis SemTxvevaSi mosavali erTdroulad S emo d i s d a aZnel ebs f o T l i s aR ebas d a gaS r o bas .

T ambaqo i r gveba mwkr i vS i , xel i T an Ci T i l i s s ar gavi manqani T .

aRmosavleT saqarTvelos meTambaqoebis raionebSi trapizonis jiSisaTvis: a) noyieri niadagebze 65 X 20 sm, ha-ze 73000 mcenare. b) danarCen farTobze 65 X1 8 am, ha-ze 81000 mc enar e.

**plantaciis movla.** plantaciis movlaSi igulisxmeba mwkrivebs Soris kultivacia, mwkrivSi mcenareTa Soris Toxna, rwyva, Tavebis watexva, gafurCqvna, mavnebel daavadebaTa wi naaR md eg br Zo l a d a s xva.

mwkrivebs Soris pirveli kultivacia tardeba dargvidan 5 dRis Semdeg, meore- o ri kviris Semdeg. mTeli vegetaciis ganmavlobaSi saWiroa aranakleb 6 kultivacia , sami gaT o xna d a 4-6 morwyva.

Tambaqos mcenarisaTvis Tavis watexva da gafurCqvna pirvelad sruli yvavilobis f az aS i t ar d eba, xo l o meo r ed - uf r o gvi an, yvavi l o bi s d amT avr ebi sas .

**mosavlis aReba.** Tambaqos iReben teqnikuri simwifis fazaSi, am dros foToli

yvel az e xar i s xi ani a, md i d ar i a mS r al i ni vT i er ebebi T .

teqnikuri simwifis niSnebia: foTlis napirebze yviTeli laqebis gaCena, mTavari ZarRvis gafermkrTaleba, foTlis zedapiris dafarva webovani nivTierebebiT, foTlis mo T enT va d a R er o d an yunwi s ad vi l ad mo t exva s pec i f i kur i t kac uni T .

**FfoTlis Setexva.** foTlebis Setexva xdeba cal-c al ke i ar us ebi s mixedviT eqvs (samsuni, trapizoni) an rva (diukebi) jerad. Setexva iwyeba ivlisis bilodan. Setexva umjobesia saRamos saaTebSi, rodesac foTolSi mSrali nivTiereba metia, magram SeiZleba dilis s aaT ebS i c , c var i s S eS r o bi s S emd eg.

Setexili foToli unda gadavzidoT fardulebSi da avnemsoT. anemsvis dros foTlebi winaswar unda davaxarisxoT zomis, simwifisa da dazianebis mixedviT. acmuli foTlebi erTmaneTisagan dacilebuli unda iqnes, daaxloebiT yunwis diametris manZiliT. mWi d r o d ac mul i f o T o l i ad vi l ad Caxur d eba d a d aavad d eba s o ko T i .

**CayviTleba.** CayviTleba Tambaqos foTlis damuSavebis pirveli operaciaa: is foTls gaSrobisaTvis amzadebs. CayviTlebis mizania Tambaqos xarisxis, aromatisa da feris gaumjobeseba. arsebobs CayviTlebis ramdenime wesi: 1) acmamde grovebSi CayviTleba. 2) Zafze acmuli da iatakze dawyobili, 3) Zafze acmuli da CarCoze dakidebuli. Tu CayviTlebis procesi normalurad mimdinareobs, saxamebeli mTlianad iSleba da warmoiqmneba xsnadi naxSirwylebi- Saqrebi. wvis dros foTlebSi darCenili saxamebeli Tambaqos aZlevs arasasiamovno gemosa da sxva Tvisebas. iSleba nikotini da nawilobriv c i l ebi d a s xva.

**gaSroba.** gaSroba xdeba, rogorc mzeze, ise cecxlze. amindisa da sxva pirobebis

mixedviT, gaSrobas, daaxloebiT, 18-25 dRe sWirdeba. gaSrobis Semdeg Seikvreba havangebad (s ami , o T xi ac ma er T ad ). gamS r al havangebs f ar d ul ebS i aT avs eben.

# kartofili

**saxalxo - sameurneo mniSvneloba.** kartofilis samSoblod iTvleba centraluri

amer i ki s mT i ani r ai o nebi .

saqarTveloSi kartofili XVIII saukuneSi unda iyos Semotanili, xolo gavrcelda XIX saukunidan. is umTavresad mohyavT mTian raionebSi: axalqalaqis, axalcixis, walkis, dmanisis, bogdanovkis, TeTriwyaros, TianeTis, duSeTis raionebSi, aWaraSi, svaneTSi da mcire raodenobiT imereTsa da raWaSi. saadreo kartofili didi raodenobiT mohyavT gar d abni s , bo l ni s i s d a mar neul i s r ai o nebS i .

kartofils didi mniSvneloba aqvs, rogorc nedleuls, msubuqi da kvebiTi mr ewvel o bi s aT vi s . misi tuberebi 14-22%-mde saxamebels da 2-3 % cilas Seicavs. saxamebeli gamoiyeneba sakonditro da Zexveulis warmoebaSi. kvebis balansSi mas meore adgili ukavia- pureulis Semdeg, CrdiloeT qveynebSi da mTian raionebSi kartofili erT-er T i

ZiriTadi sasursaTo produqtia. kartofili mdidaria **C** vitaminiT, ris gamoc mas s ur avand i s (R r Zi l ebi s d aavad ebebi s ) wi naaR md eg i yeneben.

kar t o f i l i sgan iReben spirts, romelic gamoiyeneba sinTezuri kauCukis, pl as t masebi s a d a xelovnuri abreSumis dasamzadeblad. kartofilisgan xdian agreTve l ud s . kar t o f i l i s gad amuSavebi s S ed egad mi R ebul i anar Ceni - naxad i gamo i yeneba pi r ut yvi s sakvebad. 1 t kartofilidan, 17,6 % saxameblianobiT, SeiZleba miRebuli iqnes 112 l spirti, 55 kg Txieri naxSirorJangi, 1500 l naxadi an 170 kg saxamebeli, 1000 kg ludi (g.badriSvili).

kar t o f i l i s aqo nl i saT vi s saukeT es o sakvebi a, r o go r c t uber i i se mi s i R er o f o T l ebi .

**biologiuri Tavisebureba.** kartofili ZaRlyurZenasebrTa ojaxs ekuTvnis da warmoadgens orleblian balaxovan mcenares. kartofilis 200 – mde veluri da kul t ur ul i s axeo ba ar s ebo bs . kar t o f i l i s buCqi s s i maR l e 60-90 sm-md e i z r d eba. S ed geba 36 Rerosagan. gorgli Reros miwisqveSa saxecvlilebaa. mis zedapirze CaRrmavebebSi 3-4 kvirtiani Tvlebi zis. gorglis forma SeiZleba iyos momrgvalo, wagrZelebuli da sxva.; garegani Seferiloba da rbilobis f er i - TeTri, yviTeli, vardisferi, wiTeli da lurji. kartofilis fesvi funjaa, sustad ganviTarebuli. foToli kentfrTisebr gankveTilia, aqvs nakvTebi da nakvTulebi, ferad momwvano-moyviTalo an muqi mwvanea. yvavili xuTwevriania, TeTri, mowiTalo-i i s f er i an mo l ur j o -i i s f er i , nayo f i s f er o s ebr i an o val ur i kenkr aa. aqvs Zal i an wvr i l i T es l ebi (1000 c al i 0,5-0,6 g i wo ni s ) kartofili mravldeba vegetatiurad - gorgliT ( seleqciis mizniT TesliT), romelic Seicavs 76,3% wyals da 23,7 % mSral nivTierebas, m.S. 17,5% saxamebels, 0,5 %

S aqar s , 1-2 % c i l as , 1 % -md e mi ner al ur mar i l ebs , agr eT ve C , B1, B2 da sxva vi t ami nebs .  **daraionebuli jiSebi.** sameurneo TvalsazrisiT kartofilis jiSebi iyofa Semdeg jgufebad: saadreo, saSualo vegetaciisa da sagviano. saadreo jiSebs aRmocenebidan tuberis Semosvlamde 70-90 dRe Wirdeba, saSualo vegetaciisas 90-120 dRe, xolo sagviano j i S ebs 120-180d R e.

gamo yenebi s mi xed vi T kar t o f i l i s j i Sebs yo f en o T x j guf ad :

1. sufris jiSebi xasiaTdebian kargi gemoTi da xarjvis unariT. sufris jiSebisaTvis damaxasiaTebelia nazi da Txeli kani, ara Rrmad Camjdari kvirtebi, T vl ebi s mc i r e r ao d eno ba (maJ es t i ki , l o r xi d a s xva).
2. saqarxno jiSebSi Semavali kartofili umTavresad sagviano, maRalmosavliani da s axamebliT mdidaria. mas umTavresad saqarxno zonebSi avrceleben saxameblisa da s pi r t i s mi s aRebad (vo l t mani , o s t bo t e d a s xva).
3. pirutyvis sakvebi jiSebi xasiaTdebian maRali mosavlianobiT, mSrali nivTierebisa da gansakuTrebiT, cilebis meti raodenobiT, gemoTi CamorCebian sufris jiSebs, magal i T ad : j i S i kr uger i , var d i sf er i mi l eT i d an d a s xva.
4. universaluri jiSebi. am saxelwodebiT erT jgufSia gaerTianebuli iseTi jiSebi , romelTa gamoyeneba SeiZleba rogorc sasursaTod, ise teqnologiuri gadamuSavebisaTvis, magal i T ad : l o r xi , mer ker i , s axal xo d a s xva.

saqarTvelos dablobis baris raionebisaTvis daraionebulia saadreo jiSi- vi l J s ki ,

javaxeTis mTagoriani zonis, TrialeTis qvemo qarTlis sarwyavi miwebis da samxreT o s eT i s aT vi s –maJ es t i ki , T r i al eT ur i .

**mo s avl i anoba.** saqarTveloSi kartofilis mosavlianoba 1 heqtarze 120 centneramde aRwevs, xelsayreli pirobebis SemTxvevaSi zogierT raionebSi SesaZlebelia kartofilis uf r o met i mo savl i s mi R eba.

**adgili TeslbrunvaSi.** kartofili TeslbrunvaSi Tavsdeba mravalwliani balaxebis, saSemodgomo TavTavianebis, samarcvle parkosnebis da erTwlovani balaxebis Semdeg. niadagis kargad damuSavebis SemTxvevaSi kartofili zedized ramodenimejer Tesvas itans.

**ganoyiereba.** kartofilis maRali mosavlis misaRebad didi mniSvneloba aqvs sakveb

elementebze misi moTxovnilebis gaTvaliswinebas. literaturaSi cnobilia, rom saSualod 1 tona kartofilis misaRebad kartofilis mcenare iyenebs 5 kg azots, 2 kg fosfors da 9 kg kaliums . s akvebi el ement ebi sad mi d i d i mo T xo vni l eba i mi T ai xs neba, r o m mi s i f esvT a s i s t ema s us t ad ar i s ganvi T ar ebul i d a d aaxl o ebi T mi wi s z ed a nawi l i s 6-7 %-s

S ead gens (l .qevxi S vi l i ) saSualo Tixnar niadagebze nakeli SeaqvT 30-40 tonis raodenobiT, mwir miwebsa da Rarib qviSnarebze nakelis normas heqtarze adideben 60 tonamdec, noyier Savmiwa ni ad agebz e s akmar i s i a 20-25 t . nakel i ni ad agS i SeaqvT mz r al ad xvni s wi n.

kartofilis maRali mosavlis misaRebad nakelTan erTad kargia mineraluri sasuqebis Setana. gansakuTrebiT fosforiani da kaliumiani sasuqebi xels uwyoben tuberSi saxameblis dagrovebas, aumjobesebs mis xarisxs, icaven mcenareebs rgoluri s i d ampl i s d aavad ebebi s agan ( sas uqebi s c no bar i ).

kartofilisaTvis mineraluri sasuqebis dozebi wesdeba agroqimiuri kart o gr amebi s mi xed vi T . ami s mi xed vi T mi ner al ur i s as uqebi s d o z ebi i c vl eba heqt ar z e saS ual o d S emd egi r ao d eno bi T **: N 60-90 P 60-80 K 60-80,** mineraluri sasuqebi umjobesia Setanil i qnas gaz af xul z e d ar gvi s d r o s .

**niadagis damuSaveba**. niadagis damuSaveba kartofilisaTvis warmoebs Rrmad 25-27 sm siRrmeze, mzralad. Semodgoma - zamTris ganmavlobaSi, ferdobebze sadac niadagis Camorecxvis saSiSroebaa, niadagi ixvneba adre gazafxulze, kartofilis dargvis win mzralad moxnuli niadagi saoSiT dargvis siRrmemde fxvierdeba Tanmiyo l ebul i z i gz agi ani f ar c xi T .

**kartofilis momzadeba dasargavad.** kartofilis mosavlianoba damokidebulia saTesle masalis xarisxze, amitom saTesle kartofili Semo dgomaze unda gadairCes, daxarisxdes, dayalibdes da calke Seinaxos. gazafxulze dargvis win sargavi masala kvlav unda Seiwamlos da gadairCes daavadebuli da dazianebuli tuberebisagan. saukeTeso saTesle masala saSualo sididis 60-70 g-iani tuberebia, met mosavals iZleva ufro msxvili tuberebi, magram sargavi masis raodenoba izrdeba, es ki xarjebTanaa dakavSirebuli. amis gamo ms xvi l i t uber ebi s i gr Zez e i Wr eba, r aT a kvi r t ebi T anabr ad mo xvd es o r i ve nawi l z e.

mTiani raionebis sarwyav pirobebSi kartofilis optimaluri raodenoba 50-55 aTasi mcenare heqtarze, urwyavebSi - 40-45 aTasi. amis Sesabamisad sargavi masalis xarjic i c vl eba Semd egnai r ad i x. c xr i l i # 2.:

kartofils dargvis win, wamlaven preparat prestiJiT, mavneblebisa da daavadebebis

s awi naaR md ego d . 1 t s aT es l e kar t o f i l s s Wi r d eba, 1 l pr epar at i .

c xr .# 2 kar t o f i l i s d ar gvi s no r ma s aT es l e t uber ebi s s xvad as xva wo ni s as

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| manZili  mwk  rivebs Soris  ,    sm | manZili | mcenareTa Soris  mwkrivebSi  , | mcenareTa  raodenoba ha  -  ze  ,    (  )  aTasi | Dd ar gvi s no r ma c /ha s aT es l e t uber ebi s wo ni s as | | | | | |
| 30 g | 40 g | 50 g | 60 g | 70 g | 80 g |
| 70 |  | 20 | 71,0 | 21,3 | 28,4 | 35,5 | 42,6 | 49,7 | 56,8 |
| 70 |  | 25 | 57,0 | 17,1 | 22,8 | 28,5 | 34,2 | 39,9 | 45,6 |
| 70 |  | 30 | 47,6 | 14,3 | 19,0 | 23,8 | 28,5 | 33,3 | 38,0 |
| 70 |  | 35 | 40,8 | 12,2 | 16,3 | 20,4 | 24,4 | 28 | 32,6 |

**dargvis siRrme.** mSralsa da fxvier niadagebze kartofilis dargvis siRrmea 12-14 sm, S ed ar ebi T mZi me T i xnar , t eni an ni ad agebz e kar t o f i l i i r gveba 10-12 s m s i R r mez e.

**naTesis movla.** kartofilisaTvis niadagis damuSavebis mizans Seadgens niadagis mudam fxvier da sarevelebisgan sufTa mdgomareobaSi qona. am mizniT kartofili aRmocenebis Semdeg ifarcxeba mwkrivebis gardigardmo, Semdeg mwkrivTSorisebi fxvierdeba kul t i vat o r ebi T , xo l o mi wi s S emo yr a war mo ebs mi wi s S emo myr el i manqanebi T .

sarevelebis winaaRmdeg kartofilis dargvis win ni ad ags asxureben herbicid zenkors,

romelic 1 ha-z e saWi r o a 90 g.

kolorados xoWos gamoCenisas kartofili SeiZleba Seiwamlos 50%-iani volotanis

f xvni l i T an 80%-i ani ql o r o f o s i s f xvni l i T (i x. mavnebl ebi s wi naaR md eg brZola)

**mcenareTa damatebiTi gamokveba.** kartofili sakvebi nivTierebebisadmi Zlier

momTxovnia, amitom is saWiroebs damatebiT gamokvebas. gazafxulze naTesis sustad ganviTarebis SemTxvevaSi azotiani sasuqebis mcire doza amoniumis gvarjila 1 c raodenobiT an sulfatamoniumi 1,5 c/haze aumjobesebs mcenaris zrda - ganviTarebas. 2 c superfosfati da 1 c kaliumis marili gamokvebis saxiT SeaqvT kultivaciis win. sasuqebis Setana damatebiTi kvebis dros warmoebs Rrmad 10-12 sm siRrmeze. sarwyav nakveTebze sasuqebis Setana damatebiTi kvebis saxiT SeiZleba mSraladac . am SemTxvevaSi buCqis ZirSi Setanili sasuqi miwaSi unda moeqces kultivatoris saSualebiT da Semdeg mo i r wyas .

**mosavlis aReba.** mo s avl i s amRebi manqanebis muSaobis gaadvilebisaTvis, kartofilis naTesi mosavlis aRebamde 3-5 dRiT adre, xolo saTesle nakveTze 10-14 dRiT adre unda gaiTibos. amiT naTess aTavisufleben mcenaris Rero-foTlebisagan. am mizniT iyeneben s aT i bel as . ni ad agi T u f xvi er i a d a qvi ani ar ar i s , mo s aval s i R eben ko mbai ni T.

**saadreo kartofilis** moyvanisas tardeba iseTi RonisZiebebi, rogoricaa: saadreo

jiSebis SerCeva, sargavi masalis winaswari gaRiveba da gaRivebuli tuberebiT dargva, ad vi l ad xsnadi mineraluri sasuqebis (amoniumis gvarjilis) gamoyeneba, morwyva, dasargavad msubuqi- fxvieri niadagebis SerCeva, adre vadebSi dargva, saadreo kartofils iReben jer isev mwvane Reroebis fazaSi, rodesac tuberebis saSualo masa 5060 g miaRwevs. adre aRebuli katrofili kargad ar inaxeba da male unda iqnes r eal i z ebul i .

**kartofilis Senaxva.** kartofilis Senaxva did sirTulesTanaa dakavSirebuli, radgan tuberi wyals didi raodenobiT Seicavs. is cocxali mcenarea da sunTqavs. yovelive amis gamo masze advilad mravldeba baqteriuli da sokovani daavadebebi, romlebic iwveven kar t o f i l i s gaf uWebas .

kartofilis SenaxvisaTvis kargia 1-30 siTbo da kargi ventilacia, amaze ufro dabal

temperaturaze tuberi iyineba. haeris optimaluri tenianobaa 85-93%. kar t o f i l i s S enaxva SeiZleba Txrilebsa da ormoebSic, romlebic saTanadod unda iqnes daTbunebuli namj i T a d a

\

c xr . 3. bunebr i vi wo ni T i d anakl i s i kar t o f i l i s S enaxvi s d r o s (%-i T )

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S enaxvi s per i o d i | specialuri kar t o f i l s anaxebS i | | T xr i l | ebS i | s xva s aT avs o ebS i |
| o qt o mber i | 1,2 |  | 1,0 |  | 1,3 |
| no ember i | 0,8 |  | 1,0 |  | 0,8 |
| dekemberi | 0,5 |  | 0,5 |  | 0,5 |
| ianvari | 0,3 |  | 0,5 |  | 0,3 |
| T eber val i | 0,3 |  | 0,5 |  | 0,3 |
| marti | 0,5 |  | 0,5 |  | 0,5 |
| apr i l i | 1,0 |  | 1,0 |  | 0,9 |
| maisi | 1,4 |  | 1,5 |  | 1,4 |
| ivnisi | 2,0 |  | - |  | 2,0 |

miwis yriliT. Txrils ukeTdeba fuZeSi ficrebisgan Sekruli saventilacio mili zedmeti tenianobis mosacileblad. kartofilis grovis simaRle Senaxvisas aqtiuri ventilaciis dros sawyobSi SeiZleba iyos 3-4 m, Cveulebriv pirobebSi ki ar unda aR emat ebo d es 1,5 m.

# s akvebi bal axebi

sakvebi balaxebis naTesebi warmoadgenen pirutyvis sakvebiT uzrunvelyofis

umni S vnel o vanes wyar o s . s akvebi bal axebi gamo i yeneba pi r ut yvi s sakvebad uS ual o d ned l i s saxiT, Tivad, sasilosed, senaJad, Tivis fqvilad. mravalwliani balaxebi saWiroa kul t ur ul i md el o s d a saZo vr ebi s mo s awyo bad . sakvebi balaxebi or did jgufad iyofa: mravalwlovan da erTwlovan balaxebad. T i T o eul i j guf i T avi s mxr i v mo i c avs par ko san d a mar c vl o van bal axebs .

mravalwlovani balaxebia ionja, samyura, esparceti, kapueta, ufxo Svriela, timoTela da sxva. mravalwlovani balaxebi aumjobeseben niadagis fizikur, qimiur da biologiur Tvisebebs da organuli nivTierebebiT amdidreben mas. mravalwlovani balaxebi kidev imiTaa sayuradRebo, rom isini niadags amagreben TavianTi fesvTa sistemiT d a xel s uS l i an er o z i ul i mo vl enebi s ganvi T ar ebas .

# mr aval wl o vani par ko s ani bal axebi

**i o nj a. saxal xo –sameur neo mni Svnel oba**. yvel a sakvebi bal axebi d an i o nj a gamo i r Ceva

d i d i mo s avl i ano bi T d a maR al i kvebi T i R i r s ebi T . mi s i bal axi s T i va S ei c avs 18% pr o t ei ns , 2,7% c xi ms , 40%-md e uaz o t o eqst r aqt ul ni vT i er ebas d a 30%-md e uj r ed anas .

i o nj i s agan d amz ad ebul i f qvi l i T avi s R i r s ebi T aR emat eba xo r bl i s qat o s . mi s i bal axi d a T i va mi ner al ur i ni vT i er ebebi T d a vi t ami nebi T md i d ar i a.

**botanikur-morfologiuri Taviseburebani**- i o nj a- Med i c ago , ekuTvnis parkosanTa ojaxs da moicavs 50-mde saxeobas. gvxbdeba maTi erTwliani, orwliani da mravalwlovani s axeebi .

mravalwlovani ionja fesvis yelidan gamotanil mraval Reros ikeTebs, roml i s

s i maR l e 70-100 sm-s aR wevs d a mc enar es buCqi sebr s axes aZl evs .

**Rero**- bal axo vani a, Zl i er d at o t vi l i , 10-20-md e muxl T aS o r i s ebi T , uxvad S ef o T l i l i .  **foToli-** rTulia, samfoTolakiani, foTolakebi sxvadasxva formisaa- el i f s ur i ,

kver c xi s ebur i , l anc et ur i an mo mr gval o , wver o s mxar es d akbi l ul i a.

**yvavili-** orsqesiania, mokle yvavilsajdomiT, gvirgvinis furclebi iisferi, lurji,

yvi T el i , c i s f er i d a Wr el i aqvs .

ionja jvaredindamamtverianebeli mcenarea, yvavilis damtverva xdeba mwerebis

s aS ual ebi T .

**nayofi** – mravalTesliani parkia, romelic spiralurad aris dagrexili an

namgl i s ebur ad mo xr i l i a.

**Tesli**-wvrilia, lobiosmagvari moyvanilobiT, pirvelad momwvano-moyviTalo, Semdeg ki muqd eba d a mo yavi sf r o f er s i Rebs . 1000 T es l i s masa 1-2,7 g-s ar aR emat eba.  **fesvTa si s t ema-** mTavarRerZiania, kargad ganviTarebuli, uxvad datotvili,

pi r vel s ave wel s ni ad agS i Cad i s 2-3 m-md e, S emd eg wl ebS i ki aR wevs 5-7 m-mde.

ionjis mravali saxeobidan sameurneo mniSvneloba aqvs or ZiriTad saxeobas: saTesi ionja, romelsac lurj ionjas uwod eben- **Medicago sativa L;** da yviTeli ionja- **Medicago falceata L.** ionjis saxeebs erTmaneTisagan arCeven gvirgvinis furclebis ferisa da parkebis moyvanilobiT. saTes ionjas aqvs iisferi yvavilebi, iSviaTad movardisfro an TeTri, misi nayofi dagrexilia spiralulad. yviTel ionjas yvavili yviTeli aqvs, parki ki mo xr i l i a namgl i s ebur ad an s wo r i a. saT es i i o nj a mr aval mo s avl i ani a, gaT i bvi s S emd eg s wr af ad i Zl eva wamo naz ar d s . wel i wad S i i Zl eva 5-7 ganaT i bs .

yviTeli ionja ufro dabali izrdeba 40-50 sm; gvian iZleva wamonazards, weliwadSi erT an or ganaTibs iZleva. yviTeli ionja gamZlea yinvebisa da gvalvebisadmi, naklebad z i and eba mavnebl ebi sa d a d aavad ebebi s agan, amasT an er T ad uf r o d i d xans c o c xl o bs .

**biologiuri Taviseburebani.** – ionja daTesvis welsve iZleva yvavils da T es l s ,

magram vegetacias amiT ar amTavrebs, mas SeuZlia 5-6 wlis ganmavlobaSi mogvces mo s aval i .

ionja siTbos moyvaruli mcenarea. magram kargad itans siciveebsac. mas SeuZlia

dauzianeblad gadaitanos 15-200 –iani yinva, Tovlis safaris qveS uZlebs 400 - mde yinvasac. wylis mimarT didi moTxovnilebisaa, kargad itans gvalvebsac da sicxeebsac, dRisiT 39-400- mde.

ionjis Tesli gaRivebas iwyebs 2-30 siTbos pirobebSi, aRmonacens SeuZlia

dauzianeblad gadaitanos 5-60 yinva, es saSualebas iZleva ionja adre daiTes o s gaz af xul z e, wamo naz ar d s i Zl eva naad r evad , gaT i bvi d an 40-45 d R i s S emd eg axal i yl o r t ebi aR mo nac ens i Zl eva maS i n, r o c a yvavi l o bi s f az as aR wevs d a kvl av gas aT i bi xd eba.

ionja grZeli dRis mcenarea da sinaTlis moyvarulia. igi mosavals iZleva s xvad as xvanair niadagebze. rux da kiriT mdidar sxva tipis niadagebze. ionja maqsimalur mosavals iZleva daTesvidan meore-mesame wels, kargi movlis pirobebSi ki Zlebs 25 wl amd e. bal axmi nd vr i an T es l br unvaS i i o nj as 2-3 wel z e met xans ar aCer eben.

# esparceti

**saxalxo-sameurneo mniSvneloba**- esparceti parkosanTa ojaxs ekuTvnis, mravalwliania. esparcetis mravali saxeoba arsebobs, maTgan mniSvnelovania sami saxeoba: Cveul ebr i vi , amierkavkasiis da banjgliani espar c et ebi . s aqar T vel o Si es par c et i gavr c el ebulia , r o go r c kul t ur ul s axi T , i s e vel ur ad bunebr i v s aT i b-s aZo vr ebz e, ar xi sa d a gz i spi r ebz e.

xal xS i i gi c no bi l i a s abegvel as saxi T (S . mT var el i S vi ul i ). esparceti iZleva saukeTeso xarisxis mwvane masas da Tivas mecxoveleobis sakvebad. Tiva Seicavs 16,6% proteins, 2,8 % cxims, 46,9 % uazoto eqstraqtul nivTierebebs, 6,6% nacars da 27,1 % ujredanas. esparceti adre aTavisuflebs mindors da amdidrebs mas azotiT. i s s aukeT es o T af l o vani mc enar ea. i T eseba, r o go r c ur wyav i s e s ar wyav r ai o nebS i .

**adgili TeslbrunvaSi .** es parceti saukeTeso winamorbedia saToxni da TavTaviani kul t ur ebi saT vi s . mi s i fesvTa sistema 2 metramde Cadis niadagSi, amitom urwyav ni ad agebz e i s kar gad gr Zno bs T avs.

**niadagis damuSaveba.** niadagi ixvneba SemodgomiT , mzralad , gazafxulze Tesvis win kar gad ifarcxeba, tardeba kultivacia. safarqveS Tesvisas niadagi muSavdeba safari kul t ur i s mo T xo vni s Ses abami sad .

**Tesva.** teniT uzrunvelyofil raionebSi esparceti SeiZleba daiTesos Semodgomaze. saerTod is iTeseba gazafxulze 100-120 kg-s raodenobiT ha/ze. safarqveS saSemodgomo kul t ur ebi s naT es S i i T es eba 3-5 s m s i R r mez e 70-100 kg no r mi T heqt ar z e.

**mosavlis aReba.** esparcetis mosavals Tivad iReben yvavilobis dasawyisSi, dagvianebiT mo s avl i s aR ebas T an s d evs c i l o van ni vT i er ebaT a d akar gva.

# samyura

**saxalxo – sameurneo mniSvneloba.** samyuras Tiva didi raodenobiT Seicavs pirutyvisaTvis saWiro sasargeblo nivTierebebs: 15,2% proteins, 3.1%-mde cxims da 44,0 % mde uazoto eqstraqtul nivTierebas. 1 kg Tiva udris 0,51 kvebiT erTeuls, mdidaria mi ner al uri marilebiT, fosforiTa da kalciumiT, agreTve karotiniT ( probiTamini A ) . kvebi T i R i r s ebi T samyur a ar Camo uvar d eba s xva mr aval wl o van d a er T wl o van bal axebs .

**botanikur-morfologiuri Taviseburebani**-s amyur a –Trifolium moicavs 300-mde saxeobas, maT Soris gvxvdeba erTwlovani, orwlovani da mravalwlovani formebic. kulturaSi ki farTod aris gavrcelebuli mxolod ramdenime saxeoba, es aris wiTeli s amyur a T r . Pr at ens e L. d a var d i s f er i samyur a T r . r ef ens .

wiTeli samyura mravalwlovani parkosani balaxia, magram mindvr i s pi r o bebS i d i d xans

ar c o c xl o bs . mi s i naT es ebi 2-4 wl i s S emd eg s ameur neo mni Svnel o bas kar gaven. **fesvTa sistema-** mr aval R er o i ania. uxvad datotvili, fesvebze iviTarebs koJrebs. unari aqvs haeris azotis dagrovebisa niadagSi. fesvebis mTavari masa saxnav f enaS i a moqceuli, magram calkeuli fesvebi niadagSi 1,5 m-mde aRwevs, isini xarbad iTviseben wyal s , f o s f o r sa d a kal c i ums .

**Rer o** -s wo r md go mi a an naxevr ad gar T xmul i , s us t ad S ebus ul i , s i maR l i T aR wevs 50-70 sm-

s. **foToli**- r T ul i , samfoTolakiani, samive foTolaki mjdomarea, uyunwo, foTolakze j i S ebi s umet es o bas T eT r i l aqebi aqvs .

yvavi l ed i -burTiseburi an momrgvalo Tavakia, diametri 2,5 sm-mde, romelzedac 100-mde wvrili yvavilebia moTavsebuli. gvirgvinis furclebi mowiTalo-iisferi. samyura j var ed i n gamanayo f i er ebel i mc enar ea, yvavi l i s d amt ver va xd eba mwer ebi s saS ual ebi T .

**nayofi-**er T i an i Svi aT ad o r s qes i ani par ki a.

**Tesli**- kver c xi s ebur i mo yvani l o bi s aa, pr i al a, mo yvi T al o an i i s f er i . wiTeli samyura or qvesaxeobad iyofa: priala da saadreo. sagviano erTsaTibiania,

ufro maR al i i z r d eba, met xans Zl ebs (3-4 wel i wad s ), mxo l o d er T ganaT i bs i Zl eva.

saadreo samyura orsaTibiania, SedarebiT dabali, zafxulis ganmavlobaSi 2-3

weliwads Zlebs, naklebad gamZlea yinvebisadmi. misi Tesli gaRivebas iwyebs 2-30 s i T bo s pirobebSi, magram is nela izrdeba. naTesis aRmocenebisaTvis optimaluri temperaturaa

10-150 s i T bo .

samyura grZeli dRis mcenarea, SedarebiT ukeTesad itans daCrdilvas, amitom xSirad

xo r bl i s saf ar i s qveS T es aven.

**agroteqnika.** samyura iseve rogorc ionja, niadags aumjobesebs Tavisi fesvebis anarCenebiT da rac mTavaria amdidrebs azotiT. is saukeTeso winamorbedia TavTaviani pureulebisa da sxva kulturebisTvisac. samyura wvrilTesliania da misi normalur siRrmeze CaTesva da Tanabari aRmocenis misaRebad saWiroa niadagis gulmodgined d amuSaveba. 20-30 t organuli sasuqis da 45 kg fosforisa da amdenive kaliumis Setana heqt ar z e 30 c -i T ad i d ebs samyur as T i vi s mo s aval s .

# Zi Zo

ZiZo (elilotus) mravalwlovani parkosani balaxia da sakveb nivTierebaTa TiTqmis iseTive SemadgenlobiT xasiaTdeba, rogorc sxva parkosani balaxebi, magram unda aRiniSnos, rom Wamadobis mixedviT is Camouvardeba sxva baklaxebs, radgan is Seicavs Zlier sunian aromatul nivTierebas kumarins, romelsac pirutyvi pirvelad erideba, magr am r amd eni me d R i s S emd eg i s eCveva d a no r mal ur ad Wams .

ZiZo mohyavT Tivis misaRebad, mwvane sakvebad da sasilosed. igi gansakuTrebiT gamoirCeva sxva parkosani balaxebisagan gvalvagamZleobiT da yinvagamZleobiT. advilad egueba mlaSobebs da damakmayofilebel mosavals iZleva iseT miwebzec, sadac sxva parkosnebi ar xarobs. ZiZos farTod iyeneben miwebis melioraciisaTvis, ferdobebisa da qvi Sa mi webi s gamagr ebi saT vi s . Zi Zo ar gvar o bs mxo l o d mJave r eaqc i i s ni ad agebz e.

**botanikur morfologiuri Taviseburebani**. ZiZos mravali saxeobidan sameurneo mniSvneloba aqvs mxolod or saxeobas: TeTr ZiZos –Melilotus albus Desr da yviTel Zi Zo s –Mel i l o t us o f f i c i nal i s Des r . pi r ut yvi s sakvebad gamo i yeneba T eT r i Zi Zo , yvi T el i d i d i r ao d eno bi T S ei c avs kumar i ns , ami t o m i s mo hyavT r o go r c samkur nal o mc enar e.

ZiZo orwlovani mcenarea magram aris misi erTwlovani formebic. ZiZo pirvel wels simaRliT 50-70 sm-s aRwevs da yvavilobs kidec. meore wels is 1,5-2 m-mde izrdeba da orjer iTibeba. pirveli gaTibvis Semdeg miRebuli wamonazardidan SesaZlebelia Teslis mi R ebac . meo r e wel s Semo d go maz e Zi Zo wyvet s s i c o c xl es .

ZiZos fesvTa sistema mTavarRerZiania, niadagSi Cadis 1,5-2 m siRrmeze. Rero swormdgomia, datotvili, uxeSi, foToli rTuli samnakvTiani, kideebi Zlier dakbiluli. yvavili - wvrili, TeTri an yviTeli gvirgvinis furclebiT, romlebic mogrZo mt evnebad ar i an S ekr ebi l i yvavi l ed ebz e. nayo f i - parki, r o mel i c r amd eni me T es l s S ei c avs .

**agroteqnika.** ZiZo ver itans daCrdilvas, amitom sjobia misi Tesva usafarod, Teslbrunvidan calke gamoyofil mindorze. misi wvrili Teslis gamo saWiroa niadagis gul mo d gi ned damuSaveba. Tesli sakmaod magaria da gaRivebis dasaCqareblad mimarTaven s kar i f i kac i as - T es l i s d akawvr as . T es va war mo ebs ad r e gaz af xul z e. heqt ar z e s aWi r o a 15-20 kg T es l i . CaT es vi s s i R r me 2-3 sm.

ZiZos mosavals iReben Tivad an sasilosed yvavilobis dawyebamde. Tesls iReben meore wlis sargeblobis naTesebidan, umTavresad meore gaTibvis dros. momwifebuli Tesli advilad cviva, amitom misi mosavlis aRebas mimarTaven maSin, rodesac parkebis erTi mesamedi gamuqdeba. misi Teslis gaRiveba iwyeba 2-30 siTbos pirobebSi, xolo naT es i s no r mal ur i aR mo c enebi saT vi s s aWi r o a 50 s i T bo .

# maRal i ko i ndar i L

maRali koindari miekuTvneba meCxer buCqovan marcvlovnebs. mindvris TeslbrunvaSi

parkosan balaxebTan erTad iTeseba narevis saxiT. maRalyuaTiani kvebiTi Rirebulebi s balaxia. Cqara izrdeba, gazafxulze adre iwyebs zrda - ganviTarebas da male iZleva pirveli gaTibvis saSualebas. gaTibvis Semdeg swrafi amonayriT xasiaTdeba. uyvars sinaTle, cudad itans daCrdilvas, damdgar wyals da gruntis wylis siaxloves. iTeseba t eni an r ai o nebS i an sar wyav pi r o bebS i . maRali koindris Tesvis normaa 15 kg/ha-ze, mTlian moTesil Cveulebriv mwkrivad T es vi s d r o s , xo l o nar evS i – 11-13 kg/ha.

narevSi Tesvisas maRali koindari iTibeba yvavilobamde. koindris Teslis aReba aucilebelia yvela Teslis momwifebamde SemWidroebul vadebSi, radgan koindris Tesli ad vi l ad c vi va.

**dabali koindari.** dabali koindari meCxerbuCqovani balaxovani mcenarea, ekuTvnis marcvlovanTa ojaxs, saukeTeso saZovaria, xasiaTdeba Zlieri bartyobiT. iyeneben sportuli moednebis zedapiris mosapirkeTeblad da saerTod gamwvanebis meurneobaSi. tenian da Tbili amindis pirobebSi didxans iZleva saukeTeso Tivas da saZovars. itans ni ad agi s d at kepnas , mr aval j er gaT i bvas d a Zo vebas , r i s S emd eg Zl i er bar t yo bs .

f es vT a s i s t ema R r mad ar Cad i s ni ad agS i . R er o s wo r md go mi a, gl uvi , s i maR l i T 30-70 s m; Tesli ufxoa. 1000 marcvlis masa saSualod 1,9-2,1 g. aRmonacens iZleva 8-10 dRis Semdeg. ganviTarebisaTvis optimaluri temperaturaa 6-210-i . ver itans zamTris yinvebs da did

Tovls. wylisadmi didi momTxovni ar aris. maRal mosavals iZleva noyier, struqturul Tixnar niadagebze; SeiZleba msubuq niadagebze moyvana, magram igi unda ganoyierdes. ar xarobs qviSnar , xirxat da Waobian niadagebze. dasavleT saqarTveloSi dablob ewer da gaewr ebul , wiTel da yiTelmiwa niadagebze dabali koindari safarqveS SeiZleba daiTesos (10-12 kg). koindari iTeseba, rogorc safarqveS ise usafrod (5-18 kg/ha-z e). iTeseba Semodgomazec da gazafxulzec. saTesled iTeseba wminda saxiT ha-ze 20 kg, T es l s i R eben meo r e ganaT i bi d an.

# mr aval saT i bi ko i nd ar i

sarwyavi miwaTmoqmedebisaTvis mravalsaTibi koindari Zvirfasi kult ururaa, aqvs

kargi SefoTvla, axasiaTebs swrafi wamonazardebi da iZleva maRal mosavals. iTibeba 6-7 jer. Tivis saerTo mosavali SeiZleba miRebul iqnas 20 t/ha-z e. mdidaria sakvebi ni vT i er ebebi T - S ei c avs 12,5 %-md e pr o t ei ns .

mravalsaTibi koindris Tesvis norma sufTad Tesvis dros aris 20 kg/ha-ze. xolo parkosan balaxebTan Tesvisas 6-14 kg/ha-ze. Teslis CaTesvis siRrme 1-2 sm-ia. Tivad mravalsaTib koindars Tibaven yvavilobamde (TavTunebis amoRebis dasawyisSi). mr aval s aT i bi ko i nd r i s T es l i s mo s aval i S ei Zl eba mi R ebul i qnas ha-z e 14-16 c .

**ganoyiereba.** mravalwliani marcvlovani balaxebis moTxovnileba diametralurad gansxvavdeba parkosani balaxebisagan, am kulturebis azotiT momaragebis wyaros Zi riTadad niadagSi arsebuli da damatebiT Setanili azotiani sasuqi warmoadgens. marcvlovani da parkosani balaxebi erTad iTeseba, an cal-calke , anda safarqves. marcvlovani da parkosani balaxebis erTad TesvisS emT xvevaS i az o t i ani sas uqebi mxo l o d Tesvis win Seitaneba 40-60 kg ha-ze /m.n /, Semdeg mravalwlovani marcvlovani balaxebis az o t z e moTxovnilebas parkosnebi akmayofileben. Tumca maRali mosavlis misaRebad saWiroa damatebiT gamokvebaSi naTesSi Setanil iqnas azotiani sasuqebi. koindari s af ar qveS r o c a i T es eba mi ner al ur i sas uqebi S egvaqvs S emd egi d o z i T : N 120P90 K60,  ZiriTadi xvnis win organuli sasuqi 20 t/ha-ze, Tesvis win fosforiani da kaliumiani sasuqebis mT l i ani d o z a, xo l o yo vel i gaT i bvi s Semd eg d amat ebi T gamo kvebi s saxi T az o t i ani s as uqi -

30 kg/ha-z e / m.n./.

f o s f o r i an-kal i umi ani s as uqebi s ar wyavebS i S ei t aneba **P90-120 K90-120**. urwyavebSi **P90 K60-**is angar i S i T d a i seT i ve wes i T , r o go r c s amar c vl e par ko s nebi s S emT xvevaS i .

# md el o s t i mo T el a

timoTela farTod gavrcelebuli mravalwlovani marcvlovani balaxia, 1 kg timoTelas Tiva 0,49 kvebiT erTeuls Seicavs, qimiuri SedgenilobiT Seicavs uazoto eqtraqtul nivTierebas - 43,2%, proteins -7,2 %, cxims - 2,2 %, ujredanas - 24,5 %, kar gi s akvebi a pi r ut yvi saT vi s .

mdelos timoTelas saSualo mosavlianoba mSral niadagebze 4,0-4,5 t/ha-ze, dablobebSi 5-6 t, damSral WaobebSi- 6-8 t/ha. mdelos timoTelas aqvs maRali saTesle produqtiuloba, maRali agroteqnikis pirobebSi iZleva Teslis mosavals-0,4-1,0 t/ha da z o gj er met s ac . timoTela tenis moyvaruli mcenarea, ver itans gvalvebs da haeris simSrales. yinvebisadmi gamZlea, kargad itans zamTris pirobebs. niadagisadmi ar aris momTxovni, kar gad gvar o bs T i T qmi s yo vel gvar ni ad agebz e.

**agroteqnika.** mdelos timoTela iTeseba umTavresad samyurasTan, ionjasTan an

es par c et T an S er evi T .

timoTela SeiZleba daiTesos SemodgomiT da gazafxulze. naTesi xSirad iCagreba sarevelebisa da zafxulis gvalvebisagan, ris gamoc mcire mosavals iZleva. adre Semodgomaze daTesili timoTela Semodgomidanve bartyobs da zamTars moRonierebuli xvdeba, gazafxulze naadrevad anaxlebs vegetacias, bartyobas agrZelebs da wlis ganmavl o baS i o r ganaT i bs i Zl eva.

timoTelas Tesli Zlier wvrilia 1000 Teslis masa 0,4-0,5 g-s ar aRemateba, amitom mis dasaTesad niadagi zedmiwevniT kargad unda iyos damuSavebuli. CaTesvis siRrme ar unda aRematebodes 1-2 sm-s. timoTela iTeseba mwkrivad saTesi manqanebiT. Tesli gaRivebas i wyebs 1-2 s i T bo s pi r o bebS i , mi s T vi s o pt i mal ur t emper at ur ad i T vl eba 15-20 **C**.

# mebostneoba

**mebostneobis mniSvneloba, ganviTareba da amocanebi.** iseT erTwlian, orwlian an mravalwlian balaxovan mcenareTa wvniani, xorciani nawilebi (fesvebi, tuberebi, Reroebi, foTlebi, ylortebi, nayofebi) romlebic adamianis mier saWmelad gamoiyeneba bostneuli ewo d eba.

winaT bostneuli kulturebi upiratesad sakarmidamo nakveTebze-bostnebSi moyavdaT, amJ amad ki i s i ni upi r at es ad s pec i al ur meur neo bebS i mo hyavT .

mebostneobas, rogorc soflis meurneobis dargs aqvs mravali Taviseburebebi, ZiriTadi maTgani Semdegia: bostneulis moyvana warmoebs, rogorc mindvris pirobebSi Ria gruntSi, aseve xelovnur klimatis pirobebS i -dacul gruntSi, farTod gamoiyeneba kulturis CiTilis meTodi, e.i. mcenares winaswar zrdian gansazRvrul farTobze, Semdeg ki gad aaqvT o pt i mal ur kvebi s ar ez e.

mebostneoba, rogorc mecniereba swavlobs bostneuli mcenareTa biologias, amuSavebs maTi moyvanis axal progresul meTodebs, warmoeba gadayavs industril relsebze, romel ic mimarTulia mosavlianobis gadidebasa da xarisxis gaumjobesebisaken, pr o d uqc i i s T vi T R i r ebul ebi s d a S r o mi T i d anaxar j ebi s S emc i r ebi saken.

bostneulis kvebiTi Rirebuleba imaSi mdgomareobs, rom is aris adamianis

organizmisaTvis aucilebeli saWiro nivTierebebis iseTi Semcveli, rogoricaa-vi t ami nebi , marilebi, mJavebi, surnelovan aromatuli eTerebi da sxva, romlebzedac damokidebulia s aWml i s gemo d a mi s i SeT vi s eba ad ami ani s o r gani z mi s mi er .

arsebobs mebostneobis oTxi tipi: sakarmidamo mebostneoba, sagareubno, bostneulis warmoeba da sxva sanergeSi gadasatanad da daculi gruntis mebostneoba. bostneul mcenareTa dajgufebas-klasifikacias didi praqtikuli mniSvneloba aqvs. bostneuli d aj guf ebul i a: 1. botanikuri niSnebis mixedviT, 2. sicocxlis xangrZliobis mixedviT, 3. s aWmel ad gamo s ayenebel i ni S nebi s mi xed vi T , 4. mo yvani s ni S nebi s mi xed gi T .

**botanikur niSnebi T d aj guf ebul i a** mcenareebi, romlebic erTmaneTs gvanan aRnagobiT

da gamravlebis wesis mixedviT. i sini moiTxoven moyvanisaTvis saWiro erTnair pirobebs, , maT Cveul ebr i v er T d a i gi ve mavnebl ebi d a avad myo f o bebi az i aneben.

sicocxlis xangrZlivobis mixedviT, mebostneobaSi mcenareebi iyofian erTwlian,

o r wl i an d a mr aval wl i an bo s t neul kul t ur ebad .

saWmelad gamosayenebeli niSnis mixedviT gamoarCeven nayofianebs, Zirxvenebs,

f o T l o vanebs d a t uber i anebs. moyvanis wesis mixedviT gamoyofilia Semdegi aTi jgufi. 1. ko mbo s t o s nai r ebi , 2. Zirxvenebi, 3. xaxvnairebi, 4. tuberianebi, 5. ZaRlyurZenasebr nayo f i anebi , 6. gogrisebr nayo f i anebi , 7. parkosani kulturebi, 8. mxaleul mwvanileulebi, 9. mravalwlianebi,

10. Sampi ni o ni .

mebostneobis – sagnis amocanebia- Teoriuli meTodebis da praqtikuli Cvevebis daufleba bostneuli kulturebis maRali da myari mosavlis mosayvanad, Sromisa da s axs r ebi s umc i r es i d anaxar j ebi T .

**bo s t ni s mc enar eT a Zi r i T ad i j guf ebi .**

**Taviani kombosto**. kombosto ramdenime saxis gvxvdeba: Taviani, yvavilovani, xviti (keJera), sakvebi (pirutyvisaTvis). maTgan yvelaze metad gavrcelebulia Taviani kombosto. kombosto metad Zvirfas kulturad iTvleba. Seicavs naxSirwylebs, mineralur marilebsa d a vi t ami nebs. i Zl eva maR al mo saval s .

Taviani kombosto grili havisa da yinvagamZle orwlovani mcenarea. misi produqtiuli organoa Tavi, romelic pirvel wels warmoiqmneba. meore wels murkianad darguli Tavi ki iZleva Tesls. kombostos Tavs SeuZlia gaRivdes 30 **C**, xolo Semodgomaze darguli CiTili uZlebs 12-150 yinvas. kombostos Tesli s ganviTarebisaTvis o ptimalur temperaturad iTvleba 14-200 C . 27-300 C temperaturis dros kombostos as i mi l ac i a d a z r d a mni S vnel o vnad f er xd eba.

kombosto wylis moyvaruli mcenarea. is foTlebidan didi raodenobiT wyals aorTqlebs. erT mcenares dRe-RameSi SeuZlia daxarjos 10 litri wyali. kombosto s i naT l i s mo yvar ul i mc enar ea.

kombosto niadagis nayofierebisadmi didi momTxovnia , mas niadagidan gamoaqvs

s akvebi el ement ebi s d i d i r ao d eno ba, gansakuT r ebi T az o t i d a kal i umi .

TeslbrunvaSi Tavsdeba pirvel wels. misTvis saWiroa 1 ha-z e saSualod 40-60 t nakeli. karg Sedegs iZleva organuli da mineraluri sasuqebis erToblivi gamoyeneba. mineraluri sasuqebidan wminda saxiT SeaqvT 80-100 kg azoti, 90-100kg fosfori, 80-100 kg kal i umi . sas uqebi T uz r unvel yo f i s SemT xvevaS i T i T qmi s yvel anai r ni ad agebz e mo d i s .

kombostos moyvana SeiZleba r o gorc TesviT ise CiTilis gamoyvaniTac. farTod iyeneben kombostos CiTiliT dargvas Semodgomaze, gazafxulze da zafxulSi. Semodgomaze kombosto irgveba subtropikul zonaSi, romelic mosavals april-maisSi iZleva. Semodgomaze dasargavad gamodgeba mxolod saadreo jiSebi. adre gazafxulze kvalsaTburSi CiTili gamoyavT, Semdeg misi dargviT Rebuloben saadreo mosavals. z af xul S i i r gveba s aad r eo j i Sebi saT es l ed .

**jiSebi.** adreuli jiSebidan cnobilia nomer pirveli gribovis 147, “eqspresi”, “d er bent i ”, o qr o s heqt ar i 1432”, “xar i s gul a” (qar T ul i anu mes xur i j i S i ) d a s xva.

saSualo saadreoa- “s l ava-1305”, “slava gribovskaia-231”, “taSkentis 10”, “borjomis

i d eal i ”(qar T ul i ad gi l o br i vi ) d a s xva.

saSualo sagviano da sagviano jiSebi: “braunSveigis,” “osennaia gribovskaia 320”, “bel o r us neJ nai a”, “i uJ anka 31”, “ qar T ul i , anu mes xur i d a s xva. **adgili TeslbrunvaSi.** kombostos saukeTeso winamorbedia mravalwlovani balaxebi. Semdeg, TeslbrunvaSi meore kulturad iTvaliswineben kombostos. misTvis saukeT es o winamorbedebia: kartofili, kitri, xaxvi, saSemodgomo TavTaviani kulturebi, Zirxvenebi da sxva.

**agroteqnika.** adreuli kombostosaTvis niadags xnaven rac SeiZleba adre, rom S emo d go mi d anve d ai wyo s ko mbo s t o saT vi s S et ani l i nakel i s d aS l a- mi ner al i z ac i a.

saSualo da sagviano jiSebisTvisac niadagis ZiriTad (Rrma) damuSavebas iwyeben S emo d go mi d an.

adreuli kombostos CiTilis dargvis win atareben niadagis kultivacias 10-12 sm

s i R r mez e, s agvi ano s i 12-14 s m s i R r mez e.

dargvis dros sakvebi aris micema damokidebulia jiSze. saadreo jiSs kvebis ared rigebs Soris 70 sm eZleva, xolo mwkrivSi mcenareTa Soris -40-50 sm an orive mxriv 60-60 sm. saSualo periodis jiSs rigebs Soris 70-80 sm eZleva, mcenareTa Soris ki 60 sm, s agvi ano ebs - r i gebs S o r i s 80-90 d a mc enar eT a S o r i s 70-80 sm.

dargvis Semdeg irwyveba, xolo rwyvidan 6-10 dRis Semdeg unda gaimarglos mocdenili adgilebi, Seivsos da isev unda moirwyas. niadagis SeSrobisTanave atareben kultivacias da Toxnian. Semdegi mo vl a gamoixateba Toxnasa da kultivaciaSi s aWi r o ebi s mixedviT (2-4 jer) da morwyvaSi (jiSisa da raionis klimaturi pirobebis mixedviT 6-14-jer ). karg Sedegs iZleva damatebiTi gamokveba da dargvis dRidan mavnebel d aavad ebebT an S esabami s i pr epar at ebi T br Zo l a.

**mosavlis aReba.** kombostos iReben Tavebis Semosvlis mixedviT, radgan zogierTi mcenare mas adre iviTarebs, zogi ki gvian. saadreo kombostos mosavlis aRebas iwyeben i vni s i s mes ame d ekad i d an. kombostos saSualo da sagviano jiSebs iReben, rogorc wesi, erTjeradad. sarealizaciod axal Tavebs Wrian 1-2 mfaravi foTlis datovebiT. d asamJaveblad an sazamTrod Sesanaxad. aRebisas Tavebs unda hqondes 2-3 aramWidrod mimdebare foToli, gar egani mur ki s s i gr Ze 3 s m-s ar und a aRemat ebo d es .

kombostos saadreo jiSebis Tavebis moWris Semdeg, mindorSi darCenili mcenareebis iRliis kvirtebidan yalibdebian axali Tavakebi; rom miviRoT normalurTan sididiT daaxloebuli Tavebi, yovel mcenareze toveben TiTo Tavs, rac saSualebas iZleva aviRoT meore mosavali 150 c-mde 1 ha-dan, ra Tqma unda Tu uzrunvelyofili iqneba mavneblebis wi naaR md eg S emd go mi mo vl a d a br Zo l a. kombostos mosavlis aRebisaTvis iyeneben satransporto baqnebs “pnsu-12” da “tn-12-s. ko mbo s t o s mo savl i s as aR ebad S eqmni l i a ko mbai ni “ms k” **wiTelTaviani kombosto.** wiTelTaviani kombosto TeTrTaviani kombostosgan mxolod foTlebisa da Tavis feriT gansxvavdeba. misi siwiTle gamowveulia pigment antocianiT. moyvanis wesi iseTivea, rogorc TeTrTaviani kombostosi. ixmareba umadac, salaTis ms gavsad , j i S ebi d an aRs ani S navi a: er f r ut i s s aad r eo , qvi sT ava d a z eni t i .

**yvavilovani kombosto.** yvavi l o vani kombosto anu kalnabi, erTwlovani mcenarea. mohyavT

yvavi l ed i s aT vi s , r o mel i c mo maval i yvavi l ebi s agan S emd gar i mkvr i vi T eT r i T avi a, kvebi T i RirebulebiT yvela kombostoze maRla dgas. gansakuTrebiT Zvirfasia rogorc dieturi da bavSvebis sakvebi. yvavilovani kombostos savegetacio periodi jiSzea damokidebuli. mohyavT CiTiliT. CiTilis aRzrdas, niadagis damuSavebas d a sasuqebs TiTqmis iseTive mo T xo vni l ebas uyenebs , r o go r sac T avi ani ko mbo s t o .

subtropikul zonaSi iTeseba mais –ivnisSi Ria kvlebze irgveba ivnissa da ivlisSi, SeiZleba dairgas Semodgomazec im angariSiT, rom mosavali meore wlis april-maisSi mi vi R o T .

saadreo jiSebi irgveba 60 X 35-45 sm daSorebiT, sagviano jiSebi ki 70-60 X 50-60 sm daSorebiT. nargavs iseTive movla und a, rogorc Tavian kombostos. garda movlis saerTo wesebisa, yvavilovani kombostos SemTxvevaSi mimarTaven e.w. “Tavebis gaTeTrebas”, romlis mizania TeTri da nazi produqtis miReba. amisaTvis randenime SigniTa foTols axveven da kraven, anda Tavebis SigniT 2-3 SigniTa msxvil foTols Cazneqen (nawilobriv CaCxvleten) am R o ni s Zi ebi T T avebi s ai med o d aa d ac ul i mz i s sxi vebi s pi r d api r i mo qmed ebi s agan.

# xvi t i , anu ko l r abi

kolrabs organul nivTierebaTa maragi ugrovdeba Reros qvemoTa gamsxvilebul nawilSi, momrgvalo formis Reroa, romelic gamoiyeneba saWmelad nedli saxiT, an marilwyalSi moxarSuli, moTuSuli. gemoTi nedli Reronayofi kombostos murks mo gvago nebs , magr am i s uf r o naz i d a gemr i el i a.

**jiSebi.** gavr c el ebul i a ko l r abi s Semd egi j i S ebi : vens kai a bel ai a, o pt i mus s i ni po vi r .

kolrabis saadreo mosavlis misaRebad igi mohyavT 35-40 dRiani CiTilis dargviT imave vadebSi, rogorc saadreo kombostosi. dargvis saadreo vada ganisazRvreba niadagis s i mwi f i T d a mi s i d amuS avebi s S esaZl ebl o bi T .

ko l r abs ar uyvar s mJ ave ni ad agebi , kar gad i yenebs mi ner al ur sas uqebs .

**mosavlis aReba.** ko l r abs maR al xar i s xo vani pr o d uqc i i s mi saRebad i R eben, r o c a i s i ni 5-8 sm diametrs miaRwevs, magram araumetes 10 sm diametrisa, amis Semdeg mocda ar SeiZleba, radgan isini swrafad uxeSdebian da saWmelad uvargisi xdebian. kolrabi 1 ha-z e 150-200 c d a met mo saval s gvaZl evs .

# f o T l o vani kombos t o

foTlovani kombosto mohyavT kargad ganviTarebuli foTlebisaTvis, romlebic

ixmareba rogorc adamianis, ise saqonlis sakvebad. zogan es erT- erTi mniSvnelovani s akvebi kul t ur aa.

arsebobs foTlovani kombostos mravali forma da jiSi. foTlovani kombosto yinvagamZlea da kargad itans sxva araxelsayrel pirobebs. CiTilis gamoyvana, dargva da mo vl a i s eT i vea, r o go r i c T avi ani ko mbo s t o s Ci T i l i sa.

**keJera kombosto**

keJ er a kombosto dasavleT saqarTveloSi farTodaa gavrcelebuli. keJeras gamsxvilebuli Reros wona xSirad 2-4 kg aRemateba. Reros forma TiTistariseburia an c i l i nd r ul i , i S vi aT ad mr gval i ; S ef er vi T mo i i sf r o an mo T eT r o mwvanea.

mo hyavT Ci T i l i T , i r gveba umT avr esad apr i l S i . mo vl a Cveul ebr i vi a.

# Zirxvenebi

**stafilo.** sufris stafilos Zirxvenas didi kvebiTi da dieturi mniSvneloba aqvs. erT ha-ze kargi agroteqnikis pirobebSi SeiZleba miRebul iqnes stafilos Zirebis 200-300 c /ha mo s aval i .

**biologiuri Taviseburebani.** stafilo orwlovani, jvaredinad damtveravi mcenarea, ekuTvnis qolgosanTa ojaxs. pirvel wels iviTarebs foTlebs da Zirxvenebs, xolo meore wel s i vi T ar ebs s ayvavi l e R er o s d a T es l s .

stafilo SedarebiT sicivis amtani mcenarea, vidre Warxali uZlebs xanmokle wayinvebs 3-40 , fesvebis ZiriTadi masa gavrcelebulia niadagis 60 sm siRrmis fenaSi. marTalia , kargad sargeblobs niadagis siRrmeSi arsebuli teniT, magram mSral r ai o nebS i auc i l ebel i a mo r wyva.

**jiSebi.** stafilo SeiZleba iyos**:** TeTri, yviTeli, wiTeli da iisferi. : formiT- momrgvalo, cilindruli, blagvboloebiani da maxvilboloebiani**.** gavr c el ebul i jiSebidan aRsaniSnavia ‘Santene skvirskaia”, “Santene 2464”, “nantskaia 4”, gerandi, val er i a, “vi t ami ni ani ”d a s xva.

**adgili TeslbrunvaSi.** stafilos karg winamorbedad iTvleba kartofili, kitri,

ko mbo s t o , po mi d o r i . T avi s mi nd o r s ar und a d aubr und es 3-4 wel z e ad r e.

**niadagis damuSaveba.**  niadags amuSaveben ise, rogorc sakvebi stafilosa da sufris WarxlisaTvis. stafilosaTvis saWiroa Rrmad damuSavebuli, sarevela mc enar eebi s gan s uf T a d a f xvi er i ni ad agi .

gazafxulze stafilos dasaTesad niadagis damuSavebas iwyeben Semodgomaze mzradad xvniT 22-25 sm siRrmeze. adre gazafxulze, mindvrad gasvlis SesaZleblobisTanave mzrals 1-2-jer farcxaven. Tesvis win awarmoeben kultivacias 8-10 sm siRrmeze, mZime niadagis pirobebSi mzrals gadaxnaven 15-16 sm siRrmeze, dafarcxaven 2-3 jer da Semdeg daTesaven.

**Tesvis vada, Tesvis wesi, Tesvis norma**. s t af i l o S ei Zl eba d ai T eso s wl i s yo vel d r o S i . zamTarSi da adre gazafxulze Tesvis daniSnulebaa saadreo mosavlis miReba. zafxulSi Tesva SeiZleba kargi wvimebis an morwyvis Semdeg. iTeseba mwkrivebSi 35X45 sm mwkrivTSorisebiT an zolebSi 50-20 sm sqemiT. Tesvis normaa 5-6 kg 1 ha-ze. Teslis CaT esvi s s i R r mea 3-4 s m.

**naTesis movla.** vegetaciis ganmavlobaSi stafilos naTesebze tardeba 2-3 mwkr i vT S o r i s ebi s gaf xvi er eba. maT i s i Rr me T and aT ano bi T d i d d eba 5-6- d an 10-12 sm-md e.

sarevelebis winaaRmdeg sabrZolvelad stafilos naTesSi iyeneben niadagis her bi c i d s , r o mel i c T es vamd e ni ad agz e und a S es xur d es .

**ganoyiereba.** naTesSi saSualod iyeneben 80-90 kg azots, 60-70 kg fosfors, 60-90 kg kal i ums /m.n/ 1 ha-ze.

**rwyvis reJimi.** savegetacio rwyvebis CatarebiT niadagis 0,6 sm fenaSi SenarCunebuli

unda iqnes tenianoba aranakleb 75-80 % zRvruli tentevadobis mixedviT. st af i l o s r wyaven 4-5 –j er , r wyvi s no r maa 500-600 m3. r wyva t ar d eba kvl ebS i an z o l ebS i mi S vebi T .

**mosavlis aReba.** stafilos mosavals masobrivad iReben Semodgomaze, mcire siciveebis

dawyebisTanave. Txrian xeliT an manqaniT. foCis moWrisa da SeSrobisTanave Zirxvenebs awyoben Sesanaxad an gzavnian daniSnulebisamebr. didxans gasaSrobad datoveba ar S ei Zl eba, r ad gan i s Wkneba d a wo naS i i kl ebs , T anac gemur i T vi s ebebi uar es d eba.

# o xr axuSi

CvenSi farTod gavrcelebuli aromatuli bostneuli kulturaa. romlis foTlebi da

Zi r xvena i xmar eba s aWmel ad mwni l ad d a wvni ani ker Zebi s , s al aT ebi s a d a xo r c i ani ker Zebi s S esanel ebl ad . o xr axuS i s ar o mat i gamo wveul i a mas S i o xr axuS i s eT er i s z eT i s ar s ebo bi T .

oxraxuSis foTlebis qimiuri Sedgeniloba saSualod aseTia: mSrali nivTiereba - 14,9%, azoti - 3,7%, naxSirwylebi sul - 9%, maT Soris ujredisi - 1.-,5%, nacari - 1,7%, oxraxuSis foTlebi mdidaria vitaminebiT, Seicavs 10 mlg procent vitamins, da 100 mlg pr o c ent C vi t ami ns .

d asavl eT s aqar T vel o S i o xr axuSs maki d o s am maki nd o nel as uwo d eben.

**biologiuri Tavisebureba.** –oxraxuSi jvaredinad damtveravi orwlovani mcenarea. pirvel wels uviTardeba foTlebis rozeti da Zirxvena. xolo meore wels gamoaqvs s ayvavi l e R er o d a i Zl eva T es l s .

oxraxuSis Tesli wvrilia, nela Rivdeba, daTesvidan aRmocenebamde normalur pirobebSi saWiroebs 15-20 dRes. daTesvidan 80 dRis Semdeg uviTardeba mcire zomis Ziri da ramdenime foToli, SemdegSi mcenaris ganviTareba swrafad midis. Txeli naTesis dros rozeti gabrtyelebulia da Sedgeba mravali foTlisagan. Zirxvenas aqvs sqeli kani S i gni T ganviTarebuli merqnis RerZiT. kani da merqani TeTria da erTmaneTisagan Znelad gasarCevi.

**jiSebi.** arCeven oxraxuSis jiSebis or jgufs- foTlovansa da Ziris formas. pirveli iZleva didi raodenobis naz surnelovan foTlebs da Txel datotvil, gaxevebul, saWmelad gamousadegar Zirs. meore iZleva kargad dautotav Zirxvenas, romelic gamoiyeneba saWmelad foTlebTan erTad. CvenSi gavrcelebulia upiratesad foTlovani j i S ebi : quT ai s i s , Cveul ebr i vi f o T l o vani d a Saqr i s j i S i .

**damokidebuleba garemo pirobebTan.** Teslis aRmoceneba iwyeba 2-30 siTboze. Rivs SeuZlia aitanos sagrZnobi yinvebi yovelgvari dazianebis gareSe. mozrdili mcenare- 100 d a met yi nvasac i t ans .

**moTxovnileba niadagisadmi.** o xr axuS i d i d mo T xo vnas uyenebs ni ad ags d a mi s d amuSavebi s

xarisxs. saxnavi fena 20-25 sm-s unda Seadgendes. oxraxuSis dasaTesi nakveTi sarevelebisgan sufTa da Rrmad damuSavebuli, fxvieri, nakeliT kargad ganoyierebuli und a i yo s . wyal gaumt ar i us t r uqt ur o ni ad agebi o xr axuS i s aT vi s gamo usad egar i a.

**Tesva.** oxraxuSis Tesli wvrilia, iTeseba adre gazafxulze. misi Tesva SeiZleba Semodgomidan martis bolomde. iTeseba swor zedapirze, kvlebsa da bazoebze. iTeseba mwkrivebSi 35X45 sm mwkrivTSorisebiT an zolebSi 50-20 sm sqemiT. Tesvis norma - 5-6 kg 1 ha-z e. T es l i s CaT esvi s s i R r mea 3-4 s m.

**mosavlis aReba.** f o T l o vani jiSebis foTlebi, ganviTarebis mixedviT, ramdenimejer iWreba wlis ganmavlobaSi. Zirian formebs gvian Semodgomaze iReben, foTlebs aWrian da i naxaven.

# niaxuri

niaxuri uZvelesi kulturaa. is mohyavT Zirisa da foTlisaTvis. romelic gamoiyeneba, rogorc nedlad, ise sxvadasxva saxis wvniani kerZis Sesakmazad. ixmareba agreTve wni l ebi s d as amz ad ebl ad .

niaxuris specifikuri suni gamowveulia masSi niaxuris eTeris arsebobiT, romelic

bevr i a T es l S i , nakl ebi a f o T l ebS i d a mc i r ea Zi r ebS i .

ni axur i s mo vl a-mo yvani s t eqno l o gi a T i T qmi s ar gansxvavd eba o xr axuS i sagan.

mosavlis aRebas iwyeben dargvidan 60-70 dRis Semdeg mwkrivSi gamoTxriT. sabolood i R eben S emo d go maz e.

# Zi r T eT r a

ZirTeTra, anu rogorc mas zogan uwodeben didi niaxuri, mohyavT surnelovani, motkbo ZirxvenisaTvis sxvadasxva wvniani kerZebis Sesakmazad, aromatis misacemad. didi gamoyeneba aqvs sakonservo mrewvelobaSic. ZirTeTra Seicavs daaxloebiT mSral ni vT i er ebas - 16,8 %, azoti - 1,4, naxSirwy6lebi - 14,0 %, ujredisi - 3,6 nacari - 1,0 %, miuxedavad aseTi maRali kvebiTi Rirsebisa, saqarTveloSi ZirTeTram farTo gavrceleba ver hpo va.

**biologiuri Tavisebureba.** ZirTeTra orwlovani jvaredinad damtveravi mcenarea. misi Tesli Ria an muqia, ovaluri, afriT. nela Rivdeba, 20-25 dRis Semdeg amodis. mcenare pirvel xanebSi nela viTardeba. ivlisis bolosaTvis iwyebs swraf ganviTarebas. foTlebi uxeSi da saWmelad uvargisia. Zirxvena momrgvalo an grZelia, gulguli msxvili aqvs, odnav moyviTalo, magram wvniani, gemrieli da kvebiTi mniSvnelobis mqone. Zirebi SeiZleba Ria gruntSi davtovoT, sadac meore wels gazafxulidan amoiyris sayvavile Reros da mo gvc ems T es l s .

**jiSebi.** Zi r T eT r as o r i j i S i a gavr c el ebul i - mr gval i d a s t and ar t i .

ZirTeTra sicivis amtani mcenarea, gamoirCeva yinvis amtanobiT. saWiroebs zomier tenianobas. karg mosavals iZleva noyier niadagebze. nakeli SeaqvT mxolod sakvebiT Rarib niadagebze .ufro metad SeaqvT mineraluri sasuqebi. heqtarze dasaSvebia Semdegi d o z ebi : 60 kg az o t i , 90 kg f o s f o r i d a 60-90 kg kaliumi /m.n./.

**niadagis damuSaveba, Tesva.**  niadagis damuSaveba misTvis Cveulebrivia. iTeseba zamTarSi da adre gazafxulze. ormwkrivian zolebad, zolebs Soris 50, mwkrivebs Soris 25 sm daSorebiT. gameCxerebis Semdeg mwkrivSi mcenareebs 5-6 sm-iT aSoreben. ZirTeTras i s eT i ve mo vl a Wi r d eba , r o go r c s t af i l o s .

**mosavlis aReba.** Zi r T eT r as mosavals iReben Semodgomaze, zamTarSi, an meore wlis

gaz af xul z e.

**bo l o ki .**

boloki CvenSi gavrcelebuli bostneulia. is saqarTvelos yvela zonaSi mohyavT. misi mniSvneloba adamianis kvebis racionSi imaSi mdgomareobs, rom organizms amaragebs misTvis Zvirfasi qimiuri SenaerTebiT da fermentebiT. rac xels uwyobs nivTierebaTa cvlas da aumjobesebs saWmlis monelebas. CvenSi gavrcelebuli bolokebi iyofa or j guf ad : bo l o kad d a T vi s bo l o kad .

boloki miekuTvneba imave saxeobas da gvars, rasac Tvis boloki da botanikuri TvalsazrisiT misgan mcired ganirCeva. arsebobs gardamavali jiSebi boloksa da Tvis boloks Soris. aseTia, magaliTad, Cinuri (wiTeli) boloki, romelic Zlier gavrcelebuli saSemodgomo kulturaa Cvens sagareubno meurneobebSi, is igive Tvis bo l o ki a. magr am, mas T an S ed ar ebi T , yf r o ms xvi l i a d a z r d i s uf r o gr Zel i per i o d i aqvs .

ganviTarebis ciklis mixedviT , bolokis kulturuli formebi iyofa or jgufad: o r wl i an mc enar eebad - bo l o kad d a er T wl i an mc enar ed - T vi s bo l o kad .

**boloki** s aWmelad ixmareba bolokis Zirxvena nedli saxiT. mdidaria naxSirwylebiT,

vitaminebiT da mineraluri marilebiT. suni gamowveulia masSi bolokis eTeris zeTis arsebobiT. boloki Seicavs - 13,1 % mSral nivTierebas, - 1,9 % azots, 8,1 % - naxS i r wyl ebs , maT S o r i s 1,6 % uj r ed i ss a d a 1,1 % nac ar s . Seicavs **C** vi t ami ns 10-20 mi l i gr am pr o c ent i s r ao d eno bi T .

**biologiuri daxasiaTeba**. boloki jvaredinad damtveravi orwliani mcenarea. pirvel wels iviTarebs foTlebis rozets da Zirxvenas, xolo meore wels iRebs sayvavile Reros d a i Zl eva T es l s .

bolokis Tesli muqia, dakuTxuli da wvrili. erTi kilogrami saSualod 120-150 aTas

cals Seicavs. lebnis foTolakebi Sebusulia da Ria mwvane, namdvili FfoToli metad gaSlili, Zlier gankveTili da uxeSZarRviani. bolokis foTols Svid wyvilze meti nakvT i aqvs . Zi r xvena mr gval i an gr Zel i a, T eT r i an S avi .

**j i Sebi .** mo mwi f ebi s d r o i s mi xed vi T bo l o ki s j i S ebi i yo f a s az af xul o , s aS emo d go mo d a

sazamTro jiSebad. samrewvelo jiSebidan ufro metad gavrcelebulia maisis TeTri, gr ai vo r o ns ki s , s az amT r o mr gval i T eT r i , s az amT r o mr gval i S avi .

**damokidebuleba garemo pirobebTan.** bolokis Rivi Yyinvebs -40, -50 –is farglebSi kargad itans, magram aRmonacenis yinvebSi moxvedra ar aris sasurveli, radgan miuxedavad imisa, rom pirvel wels ar iviTarebs sayvavile Reros, dabali temperatur i s xangrZlivi da niadagis tenianobis mimarT maRali momTxovnia, gamkvrivebul niadagebze sqeli naTesi tenis simcirisas normalur Zirxvenas ar iviTarebs da kordze adre yvavilobs. aqedan gamomdinare, boilokebi, garda maisis TeTri jiSisa, gazafxulze unda d ai T es o s . saT es l ed mo yvani s d r o s ki mai s i s T eT r i j i S i c und a d avT es o T z af xul S i .

bolokisaTvis saukeTesoa Rrma saxnavi fenis mqone, organuli nivTierebiT mdidari,

t eni ani , T i xnar i ni ad agebi .

**ad gi l i T es l br unvaS i .** T es l br unvaS i T avsd eba Zi r xvenebT an er T ad .

**ganoyiereba.** bolokis mimarT organuli sasuqi ar SeaqvT., magram, Tu niadagi Zlier Raribia, mizanSewonilia nakelis Setana 40-50 tonis raodenobiT erT heqtarze. wina wlebSi organuli sasuqiT kargad ganoyierebul niadagze mineraluri sasuqebi heqtarze SeaqvT Semdegi raodenobiT: azoti ara umetes 40-50 kg-isa. xolo fosforiani 80-90 kg da kal i umi ani 40-45 kg/ha-z e (m.n).

**agroteqnika.** bolokisaTvis niadagis damuSaveba Cveulebrivia. Tesvas awarmoeben 4-5

mwkrivian zolebad, maT Soris 50 sm, xolo mwkrivebs Soris 25 sm datovebiT. Tesvis vada damokidebulia jiSze, moyvanis adgilsa da produqtis moxmarebis doneze. adre mosaxmarad, magaliTad maisis boloki, SeiZleba davTesoT adre gazafxulze, xolo Semodgomaze da zamTarSi masobrivad civ raionebSi - ivlis – agvistoSi, Tbil raiomebSi ki agvist o - seqtemberSi. Tesli unda CavTesoT 1,5-2 sm siRrmeze. mSral gvalvian r ai o nebS i nagvi anevi T es va und a Cavat ar o T wvi mi s an mo r wyvi s S emd eg. T esvi s no r ma, T es vi s wes i s mi xed vi T , c val ebad o bs 5-8 kg-md e heqt ar z e.

boloki aRmocenebas iwyebs daTesvidan 4-5 dRis Semdeg. aRmocenebidan 10-15, xolo sagviano jiSebi 15-20 dRis Semdeg unda gavameCxeroT. gameCxer汸bisas mwkrivSi mcenareebi erTmaneTs unda davaSoroT: saadreo jiSebi – 12-15, xolo sagviano jiSebi – 15-20 sm-汸汸. naTesebis gaToxna da gafxviereba vegetaciis ganmavlobaSi warmoebs 2-3 –jer, gvalvian r ai o nebS i 1-2 –j er mo r wyvac Wi r d eba.

**mosavlis aReba.** bolokis aRebas iwyeben im dros, rodesac Zirxvena miaRwevs sameurneo vargisianobas. mcenareebs Txrian, Zirxvenas dauzianeblad aWrian foCs da inaxaven s az amT r o d s xva Zi r xvenebi s ms gavs ad .

Tesva. mwkrivebi erTmaneTs unda davaSoroT 15-20 sm-iT. Tesvis norma 1 ha-ze mwkrivad Tesvisas 6 kg-ia. mobneviT Tesvisas - 8 kg. adreul naTess SeiZleba dasWirdes erTi gamargvla, erTi morwyva da gafxviereba. naTes movla ar Wirdeba. iReben noemberdekemberSi.

# Tvis boloki

Tvis boloki CvenSi farTod gavrcelebuli kulturaa, saWmelad ixmareba misi Zirxvena, nedli qorfa saxiT. misi qimiuri Sedgeniloba, daaxloebiT, aseTia: mSrali nivTiereba – 6,7 %, azoti – 1,2% naxSirwylebi – 3,9%, maTSoris ujredisi - 0,8, nacari – 0,7%, rogorc am monacemebidan Cans, Tvis boloki swrafad iZleva axal, mwvane produqts, rom igi

Seicavs 25-35 mi l i gr am-pr o c ent **C** vi t ami ns .

**biologiuri daxasiaTeba.** Tvis boloki erTwliani, jvaredinad damtveravi Zirxvena mc enar ea, misi winaparia gareulad mozardi boloki, romelic yvelgan gvxvdeba zomieri kl i mat i s pi r o bebS i .

Tesli muqi wiTelia, bolikis TeslTan SedarebiT msxvili, erTi kologrami Seicavs 100-110 aTas cals. aRmocenebis xelsayrel pirobebSi Rivi amodis 3-5 dReSi. Cveulebr iv 5-8 dReSi. Rivs aqvs msxvili ukugulisebri lebnis foTolakebi, romlebic qveda mxridan mT l i anad Sebus ul i a.

jiSis mixedviT Zirxvena mrgvali, mogrZo an grZelia. xorci nazi aqvs, wvniani,

magram gadaberebis SemTxvevaSi swrafad fuydeba. masSi moipoveba eTeris zeTi, razedac damokidebulia Tvis bolokis sfecifikuri suni. Zirxvenis garegani Seferva SeiZleba iyos : TeTri, yviTeli, vardisferi, wiTeli da iisferi. xangrZliv Senaxvas ver itans. did moTxovnilebas uyenebs niadagis tens, amitom gvalvian pirobebSi morwyva unda Catardes r egul ar ul ad .

uf r o met moTxovnas uyenebs sinaTles. Sesustebuli ganaTebis pirobebSi mcenareTa

d i d i r ao d eno ba saWmel Zi r xvenas T i T qmi s ar i keT ebs . T vi s bo l o ki gr Zel i d R i s mc enar ea. **jiSebi.** samrewvelo jiSebidan kulturaSi gavrcelebulia vardisfer-T eT r kud a,

yi nul i s l o l ua d a mo s ko vi s s akval s aT bur o .

T vi s bo l o ki s aRmo c eneba i wyeba- 2, 30 s i T bo z e, R i vi -3, - 4 yi nvas kar gad i t ans .

**moTxovnileba niadagisadmi.** Tvis boloki moiTxovs kargad damuSavebul, fxvier, t enian da sakvebiT mdidar niadags. radgan is mokle vegetaciis mqone bostneulia, yovelTvis mohyavT SemamWidroebeli kulturis saxiT, rogorc winamorbedi an momdevno kul t ur a.

**Tesva.** iTeseba adre gazafxulsa da Semodgomaze. Tbil raionebSi Tesva SeiZleba Tebervlidan maisamde. Semodgomaze ki seqtember -oqtomberSi, mTian raionebSi- apr i l - maisSi da Semdeg agvistoSi. gazafxulze iTeseba, rogorc winamorbedi kultura, pomidvris, badrijnis, sagviano kombostosa da sxvaTa dargvamde. xolo Semodgomaze, rogorc momdevno kultura- saadreo kitris. xaxvisa da saparke lobios aRebis Semdeg. amitom niadagic Sesafer dros da saWiro wesiT unda damuSavdes. CaTesvis siRrme unda i yo s 1,5-20 sm. heqt ar z e saWi r o a 15 kg T esl i .

**naTesis movla.** naTesebis movlis ZiriTadi operaciebia: sarevela balaxebis mocileba,

sqeli naTesis gameCxereba, mavneblebTan brZola (ZiriTadad rwyilTan) da morwyva. gameCxer eba war mo ebs i m angar i S i T , r o m mc enar eebs S o r i s d ar Ces 3-8 s m.

**mosavlis aReba.** Tvis boloks iReben maSin, rodesac Ziri miaRwevs normalur sidides, Zi r xvena sas ur s aT o s i mwi f es aR wevs d aT es vi d an 35-45 d R i s S emd eg.

# xaxvnai r i

xaxvnairebi SroSanasebrTa ojaxis warmomadgenlebi arian- mi ekuT vnebi an

er T l ebl i anT a kl as s . xaxvnai r ebi gamoirCevian mravalgvarobiT, Tumca kulturaSi danergilia aTamde. xaxvnairi mcenareTa mniSvneloba metad didia. isini mdidaria vitaminebiTa da cilebiT. xaxvi da gansakuTrebiT niori Seicaven baqtericidul Tvisebebs maTSi 汸i t o nc i d ebi s mqrolavi eTerovani naerTebis Semcvelobis gamo. rogorc sakazmi, xaxvnairi mcenareebi aumj o beseben saWml i s gemo s . xel s uwyo ben maT ukeT mo nel ebas d a S eT vi s ebas . xaxvnair mcenareebs Soris metad didi mniSvneloba aqvs Tavian xaxvs. **Taviani xaxvi. biologiuri Tavisebureba.** xaxvi SroSanasebrTa ojaxs miekuTvneba. nayo f i -kolofia. Tesli Savi, samwaxnaga, danaoWebuli. Tesli gvian Rivdeba. daTesvi d an xaxvi 10-14 dReSi amodis. Tu mas xelsayreli pirobebi ar eqna, maSin aRmoceneba SeiZleba SeCerdes. Teslidan pirvel wels miiReba sasaqonlo produqcia (bolqvi). Teslis aRmoceneba iwyeba 00 –is ramdenadme zeviT. zrda-ganviTarebis saukeTeso temperaturaa 15200 **C**. ganviTarebis pirvel periodSi xaxvi Zlier momTxovnia tenisadmi., magram bolqvis momwifebis periodSi wylisa da haerisadmi moTxovnileba TandaTan mcirdeba, maTi gad i d ebi T vi T ar d eba yel i s s i d ampl e.

xaxvi niadagis nay汸fierebas did moTxovnas uyenebs, radgan Zlier ganvi T ar ebul

f o T l ebT an S ed ar ebi T mas s us t i f es vT a s i s t ema aqvs .

**jiSi.** saqarTveloSi gavrcelebulia Taviani xaxvis Semdegi jiSebi: ispanski 33, kaxuri

br t yel i , s xvi l i si ad gi l o br i vi , qaba, o qt i ambr s ki , qar el i s , kar at al s ki .

**ganoyiereba.** T 汸viani xaxv汸 300 c mosavlis dros niadagidan iRebs 90 kg azots, 37 kg fosfors da 120 kg kaliums 1 ha-ze. xaxvis maRali mosavlis miReba SeiZleba mxolod Zlier nayofier niadagebze. xaxvisaTv汸s saukeTeso niadagebia- msubuqi qviSnari an TixnarneS o mpal i ani .

xaxvis dasargav adgilze Tu gadamwvari nakeli wina wels iyo Setanili maSin

momdevno wels ar SeaqvT, kmayofildebian mineraluri sasuqebiT. nakeli ha-ze saWiroa 4050 t /ha-z e. az o t i 45-60 kg, kal i umi um- f o sf o r i ani sas uqi 60-90 kg/ha-z e /m.n./.

**adgili TeslbrunvaSi.** Taviani xaxvi TeslbrunvaSi SeiZleba moeqces pirvel wels organuli sasuqebis Setanis Semdeg an meore-mesame wels mineraluri sasuqebis SetaniT. xaxvis monokulturad Tesva dauSvebelia. am SemTxvevaSi aRiniSneba daavadebebis Zlieri gavr c el eba. xaxvi i mave ad gi l z e S ei Zl eba d abr und es 3 wl i s S emd eg.

**moyvanis wesebi.** xaxvi SeiZleba moviyvanoT Teslis uSualod Ria gruntSi TesviT, CiTilisa da kviWiWis (bolqvebis) dargviT . Cvens pirobebSi ufro gavrcelebulia xaxvis T es vi T mo yvana.

**Taviani xaxvis moyvana mudmiv adgilze TesviT.** am wesiT pirvel wels Teslidan miiReba msxvili sasaqonlo bolqvebi, xolo meore wels – msxvili bolqvebidan Tesli. xaxvi SeiZleba daiTesos Semodgomaze. zamTarSi da gazafxulze. Tesvis vadis SerCeva d amo ki d ebul i a ad gi l i s kl i mat ur pi r o bebs a d a mi R ebul i pr o d uqc i i s d ani S nul ebaz e. **ni ad agi s d amuSaveba. T es va d a T es vi s no r ma.**  T xvevaS i ni ad agi i xvneba mz r al ad S emo d go maz e 20-25 s m s i R r mez e. ad r e gaz af xul z e f ar c xaven, T es vi s wi n kvl av gad axnaven s ao S i guT ni T an R r mad af xvi er eben kul t i vat o r i T d a xel axl a f ar c xaven, j er r ki ni s , xo l o Semdeg xi s f ar c xi T .

amgvarad momzadebul niadagze Tesaven rac SeiZleba adr 汸 gazafxulze. Tesaven

mwkr i vS i , S esaZl ebel i a mo bnevi s wes i T ac . ni ad agS i T es l i s CaT es vi s s i R r mea 2-3 sm.

did farTobebze xaxvs zolebSi Tesaven, zolSi mwkrivebs Soris manZili 20-25 sm-i a,

xolo zolebs Soris – 50 sm. 1 ha-ze Tesvis normaa 6-10 kg. xaxvis aRmocenebis Semdeg niadagis qerqisa da aRmocenebuli sarevelebis mospobis mizniT niadagi unda gafxvierdes. es RonisZieba unda gavimeoroT 3-7 jer vegetaciis ganmavlobaSi. bolqvebis damsxvilebis periodSi ZirebTan niadagi unda gavafxvieroT. kargi xarisxis bolqvebis misaRebad naTesi unda SemeCxerdes. pirveli gameCxereba tardeba mcenareebis kargad aRmocenebisTanave maT Soris 5-6 sm datovebiT, meore gameCxereba-pirveli gameCxerebidan 25-30 d R i s Semd eg, mc enar eebi s er T maneT i s agan 8-10 s m d aS o r ebi T .

xaxvis maRali mosavlis miRebaze dadebiTad moqmedebs organul – mi ner al ur i

s as uqebi T d amat ebi T i gamo kveba.

iq sadac rwya saWiroa da SesaZlebeli warmoebs 5-10 jer wylis norma TiTo rwyvaze 300-600 m3 –de cvalebadobs. mosavals iReben maSin roca bolqvs ewyeba fesvTa sistemis kvdoma, cru Rero da foTlebi ki uxmeba mosvenebis periodis dawyebisas. Cveulebriv es war mo ebs i vl i s -agvistoSi.

**xaxvis moyvana CiTiliT.** CiTilis gamoyvana SeiZlebakval saTburebSi, Tbil an Ria

s aCi T i l e kvl ebz e. ami saT vi s T es l i i T es eba 6-8 sm daSorebul mwkrivebSi, r o d es ac Ci T i l i miaRwevs batis frTis simsxos, irgveba imave siRrmeze, ra siRrm汸z e saCiTileSi iyo. CiTilis dargvisas mwkrivTa Soris iseTive manZils toveben, rogorsac TesliT mudmiv adgilze Tesvis dros. mwkrivSi mcenareebs erTmaneTisagan aSoreben 8-12 sm-iT. erTi heqt ar i s d as ar gavad s aWi r o a 250-350 aT as i Ci T i l i .

**xaxvis dargva kviWiWis dargviT.** am wesiT xaxvis mosayvanad pirvel wels xaxvis Tesls Tesaven metad sqlad, riTac miiReba wvrili, Txilisodena bolqunebi (kviWiWebi), romlebic meore wlis gazafxulze irgveba da miiReba msxvili sasaqonlo bolqvebi. ukanasknelTa mesame wels dargviT miiReba Tesli. amrigad, xaxvis Teslis moyvana war mo ebs samwl i ani kul t ur i s s axi T .

xaxvi sakviWiWed iTeseba gazafxulze, xaxvis TesvisaTvis dawesebul Cveulebriv vadebSi. Tesva tardeba mobneviT an mwkrivad. umjobesia mwkrivad Tesva Catardes z o l ebr i vad . mravalmwkrivian zolebad Tesvisas mwkrivebi davaSoroT erTmaneTs 10-12 smiT, zolis sigane unda iyos 1 metri. zolebs Soris unda davtovoT 50-60 sm siganis gas aval i .

Tesvis dros kvebis aresa da zolSi mwkrivebis raodenobaze damokidebulia Tesvis no r mac . i s c val ebad o bs 50-80 ki l o gr ama汸de heqtarze.

aseT sqel naTesSi mcenareebi erTmaneTs aviwroeben, ufro adre amTavreben zrdas da momwifebas, xolo bolqvebi metad wvrili miiReba, rodesac kviWiWs gareTa mfaravi qerqli Seuxmeba da SeuTeTrdeba, is gadadis mosvenebis fazaSi da swored am drosaa saWiro misi aReba. aRebis dagvianeba ar SeiZleba, winaaRmdeg SemTxvevaSi SesaZlebelia d ai wyo s kvi Wi Webi s gaRi veba, r ac ni S navs mi s i , r o go r c s ar gavi masal i s d aR upvas .

iReben xeliT, ris Semdeg Txel fenad (3-6 sm) yrian daxurul, kargad ganiavebul SenobaSi da aSroben 10-15 dRis ganmavlobaSi. gaSrobis Semdeg asufTaveben foCisa da f es vebi sagan d a axmo ben.

kviWiWi zamTris ganmavlobaSi inaxeba Tbilsa da mSral SenobaSi. 15-180 t emper at ur az e S enaxul i kvi Wi Wi gad i s i ar o vi z ac i i s s t ad i as d a gad ar gvi s S emd eg Co yd eba. gazafxulze kviWiWebi irgveba xaxvisaTvis Cveulebrivi manZilis dacviT. heqtarze bo l qunebi s s i ms xo s mi xed vi T , saWi r o a 400-900 kg sar gavi masal a.

**nior i .**

ni o r i mo hyavT bo l qvi s aT vi s ., r o mel i c i xmar eba r i go r c ned l ad , i s e s xvad as xva s aWml i s

s akaz m-saneleblad, bostneulis dasamwnilebl汸d. agreTve Zexvebisa da nawilobriv konservebis warmoebaSic. amis garda, is ixmareba rogorc samkurnalo mcenare. niori Seicavs da汸iSxanovan SenaerTebs, romlebsac samkurnalo Tvisebebs aweren. eTeris zeTis S emc vel o bi s gamo ni o r i gamo i yeneba agr eT ve r o go r c ant i s e汸t i kur i saS ual eba.

nivris bolqvi Seicavs saSualod 64,7 % wyals, 6,8% azotovan nivTierebebs, 0,8 % uj r ed i s s , 1,7% nac ar s , mas S i mni Svnel o vani r ao d eno bi T mo i po veba agr eT ve vi t ami ni **C** –s amrigad, niori friad saWiro da sasargeblo bostneulia. mis samSoblod centraluri azia iTvleba. gareuli saxiT ipova fedeCenkom pamiro-al t ai S i. kulturaSi uZvel es i d r o i d anaa S emo s ul i .

**biologiuri Tavisebureba.** niori SroSanasebrTa ojaxs miekuTvneba. mohyavT erTwliani kulturis saxiT. foToli viwro grZeli Tasmismagvari, saxazavisebri, muqi mwvane. misi vaginebi mTliania, Seadgens Txel, grZel, magram ufro magar cru Reros, vi d r e es xaxvs aqvs . c r u R er o s i gr Zi T 15-30 s汸 aR wevs . bolqvi, nivris es produqtuli nawili, moTavsebulia miwaSi rTuli bolqvis saxiT. formiT momrgvalo an gagrZelebulia da Seic汸vs 2-70 mde bartys, anu “kbils”, rogorc mas Cveulebriv uwodeben. yoveli kbili dafarulia erTi Txeli mSrali apkiT (qerqiT). yvela kbili erTad bolqvSi dafarulia aseTive saerTo 2-8 mbzinvare apkiT, anu qerqliT. kbili Tavisive apkiT, romlis SigniTac moTavsebulia wvniani rbileuli CanasaxiT SuaSi, fuZiT mimagrebulia Zirakze. Ziraki bolqvis Zlierad damoklebuli Reroa, romlis qveda mxare gaxevebulia da “qusli” ewodeba. kbilebs aqvs cxare gemo da nivrisaTvis damaxasiaTebeli s汸ecifikuri Zlieri suni. suni gamowveulia nivris eTeris zeTiT. ukanasknelis Semcveloba damokidebulia bolqvebis momwifebis xarisxze; rac ufro mo mwi f ebul i a bo l qvi , mi T uf r o met eT er i s z eT ebs S ei c avs d a pi r i qi T . zogi niori iZleva sayvavile ylorts, romelic Tavdeba qudis tipis yvavilediT. yvaviledSi, nacvlad Teslisa, viTardeba 6-86 calamde patara haeris bolquna, maT Sor i s xSirad zis moTeTro an movardisfero, umetesad ganuviTarebeli yvavilebi, romlebic T es l s ar i Zl evi an.

**jiSebi.** saqar T vel o S i d ar ai o nebul i a o r i j i S i : go r ul i d a pal i o t i .

**gamravleba.** niori umetesad vegetatiuri nawilebiT mravldeba. yinvagamZlea, niadagis iseTive damuSaveba Wirdeba, rogorc xaxvs. sasuqebi SeaqvT xvniswin. d汸rgvis win nivris gadarCeul bolqvebs anawileben kbilebad, umjobesia msxvili gareTa kbilebis gamoyeneba. dargva tardeba SemodgomiT, yinvebis dawyebamde 35-40 dRiT adre, rom mcenare zamT汸r s fesvmomagrebuli, 3 - 4 foToliT Seyves. Semodgomaze darguli niori gval vebi s dawyebamde aswrebs bolqvebis dasrulebas da adre Semodis. igive farTobi imave wels S ei Zl eba gamo vi yeno T s xva kul t ur i s d asaT esad .

Tu Semodgomaze ver moxerxda nivris dargva, unda dairgas TebervalSi an martis pirvel dekadaSi. niori irgveba kargad mosworebul da gafxvierebul farTobSi, zolebrivi wesiT. zolSi 2-5 mwkrivi, mwkrivebs Soris 18 sm, xolo zolebs Soris 50-60 sm. rgva tardeba aseve farTo mwkrivebSi 25-35-45 sm datovebiT. 45 sm-ze da maiss zeviT farTomwkrivebian nargavebSi tardeba rigTSorisebis damuSaveba kul t i vat o r ebi s gamo yenebi T , mxolo汸 25-35 sm rigTSorisebis damuS汸eba tardeba xeliT. kbilebi mwkrivSi irgveba 4-8 sm daSorebiT (25X8, 35X6 da 45X4 sm). rgvis norma icvleba kbilebis zomisa da dargvis wesis mixedviT. msxvilkbilebiani niori irgveba ha-ze 1800-2200 kg, xolo wvrilkbilebiani nivris norma 1000-1200 kg-s farglebSia. dasaTesad iyeneben xaxvisa an xi r bl i s saT es manqanebs , r o ml ebs ac ni vr i s d asar gavad mc i r eo d eni gad akeT eba Wi r d eba. niori iseTive movlas saWiroebs, rogoric xaxv汸. bar汸i niori ivnis-ivlisSi Semodis.

ni o r s i R eben mS r al ami nd S i , r o c a f o Ci gamxmar i a. mas i R eben War xl i s as aR ebi manqani T .

# Wlakvi

**汸汸汸汸汸汸** moyavT mwvaned. mas maRali gemovnuri Rirsebebi aqvs. misi axalgazrda

f o T l ebi S ei c aven 70 mg %-md e C vi t ami ns d a 6 mg % -md e kar o t i ns .

Wlakvi mravalwliani mcenarea, magram moyvaniT, erTwliani da orwliani mcenare. misi samSobloa cimbiri an Soreuli aRmosavleTi. namdvil bolqvs ar iZleva, mxolod Reros qveviT iZleva odnav gaganierebas, mohyavT foTlebis gamo, rasac mwvaneT xmaroben salaTebSi. mcenare mravldeba, rogorc gayofiT, ise TesliT. qarTuli Wlakvi Tesls ar iZleva.

# prasi

prasi orwliani mcenarea. pirvel wels iviTarebs foTlebsa da gamsxvilebul cru R er o s , xo l o meo r e wel s sayvavi l e – yl o r t ebs (i sar s ) d a i Zl eva T es l s .

saWmelad gamoiyeneba prasis foTlebi da cru Rero. mas iyeneben r o go r c umi, ise moxarSuli saxiT nigvziTa d汸 sunelebiT Senelebuls, gamoiyeneba agreTve mwnilad. prasi S ei c avs d i d i r ao d eno bi T eT er i s z eT s , r az ec d amo ki d ebul i a mi s i s uni d a gemo .

Rivi amodis daTesvidan 10-16 dReSi. misi foTlebi Rivis amosvlisas moxrilia, magram Semdeg swrafad swordeba. aqvs didi an patara sigrZis vagina da Seadgens cru Reros, romelic zeda nawilSi mwvanea, xolo qveviT – TeTri. prasis bolqvi pataraa da Sedgeba T eT r i T xel i xo r c i ani qer ql ebi sagan.

prasi pirvel wels sayvavile ylorts ar iviTarebs, magram meore wels 100%-i T

yvavis. misi gansakuTrebuli Tavisebureba gamoixateba imaSi, rom is gvan Semodgomamde ar wyvets foTlebis ganviTarebas, cru Rero sayvavile ylortis amoRebamdec ki yovelTvis rCeba wvniani saxiT. amitom prass mosvenebis periodi xaxvisagan gansxvavebiT ar axasiaTebs. aRmocenebas iwyebs 3-50 **C**-ze. itans – 4 - 50 **C**-s. saqarTvelos pirobebSi prasi SeiZleba gavaxaroT Ria gruntSi mTeli zamTris ganmavlobaSi. igi niadagis tenisadmi momTxovnia. kargi mosavlis miReba SeiZleba nakeliT kargad ganoyierebul niadagebze – 60-80 t 1 ha-ze. Tu wina wels kargad iyo ganoyierebuli niadagi, maSin sakmarisia marto mi ner al ur i sas uqi s S et ana – az o t i , f o s f o r i d a kal i umi 70-80 kg 1 ha-ze.

prasi mohyavT Ria gruntSi TesviT an CiTiliT. CiTiliT moyvanisas mas rgaven zolebad, zolebs Soris aTavseben 4 mwkrivs, mwkrivTa Soris manZili 25 sm. zolebs Soris 50 sm. 1 ha-ze daaxloebiT 300 000 mcenare eteva. prasis movla iseTivea, rogorc xaxvis, im gansxvavebiT, rom kargi Zirebis misaRebad saWiroa miwis Semoyra da foTlebis kargad ganviTarebis Semdeg maTi wakveca, rac xels uwyobs Zirebis gamsxvilebas. prasis aR eba xd eba d ar gvi d an 35-50 dReSi.

# nayofiani mcenareebi

go gr i s ebr T a j guf s ekuT vni s : ki t r i , nes vi , s az amT r o d a go gr a.

**kitri.** kitris samSobloa samxreT-aRmosavleTi azia. saqarTveloSi ZvelTaganve iyo gavrcelebuli. iTvleba sasauzme produqtad, iyeneben qorfa, zrda daumTavrebel, mwvane nayo f i s s axi T . ki t r i s gan mz ad d eba wni l i c . **biologiuri Tavisebureba.** kitri erTwliani mcenarea. gayofil sqesiani yvavilebiT. mamr o bi T i yvavi l ebi S ekr ebi l i a f o T l i s ubeebS i , yvavi l ed i s -f ar S i . md ed r o bi T i yvavi l ebi ganwyo bi l i a mar t o ul ad an r amd eni me c al i . ki t r i s f es vT a s i s t ema Zl i er d at o t vi l i a d a vi T ar d eba ni ad agi s z ed api r ul f enaS i .

kitris Tesli gaRivebas iwyebs 130-140-ze, ufro dabal temperaturaze isini ar R i vd ebi an da lpebian. optimaluri temperatura Teslis gaRivebisaTvis -25-300. ki t r i s i naT l i s mo mT xo vni , mo kl e d R i s mc enar ea. **jiSebi.** kitris jiSebidan saqarTveloSi gavrcelebulia Semdegi adgilobrivi jiSebi: muxranuli, gilanuri, SuSa kitri, Semotanili jiSebidan aRsaniSnavia neJni, yirimuli, bo s t o ni , mur o mi , ner o s i mi , t el egr af i , s ens ac i a d a s xva.

**damokidebuleba garemo pirobebisadmi.** kitri siTbos moyvaruli mcenarea. yinvas ver itans. misi zrda - ganviTarebis optimaluri temperatura 18-320 –mdea. tenisadmi momTxovnia. saWiroebs rogorc niadagis (70-80%), aseve haeris (80-90%) did SefardebiT t eni ano bas . d i d mo T xo vni l ebas ayenebs ni ad agi s nayo f i er ebi s ad mi. maR al i mo savl i s mi R eba mxo l o d kar gi s t r uqt ur i an , no yi er ni ad agz e Sei Zl eba.

**adgili TeslbrunvaSi.** kitri TeslbrunvaSi nabalaxarze Tavsdeba. unda daiTesos

o r ganul i s as uqi T kar gad gano yi er ebul ni ad agz e.

**ganoyiereba.**  organuli sasuqi 40-50 t -is raodenobiT SeaqvT ZiriTadi xvnis win I ha-z e

gaangariSebiT. Tu mindori wina wels iyo organuli sasuqiT ganoyierebuli maSin saWiroa mineraluri sasuqis Setana Semdegi doziT: azoti 100-150 kg, fosfori 90-120 kg, kaliumi 50-60 kg mo qmed i ni vT i er ebi s s axi T .

**agroteqnika.** kitris moyvana SeiZleba TesliTac da CiTilis dargviTac. iTeseba mwkrivadac da budobrivadac. mwkrivad Tesvis dros, jiSis mixedviT, rigebs Soris daSoreba 70-100 sm unda iyos. aRmocenebis Semdeg naTesi meCxerdeba da mcenareTa Soris rCeba 15-20 sm manZili. budnaSi Tesvis dros mwkrivebs Soris 40-50 sm. TiTo budnaSi 4-5 Tesli iTeseba, xolo aRmocenebis Semdeg gameCxerdeba da darCeba erTi an ori mcenare. heqtarze saWiroa 3-5 kg Tesli. kitri mudam saWiroebs niadagisa da haeris maRal tenianobas, simSrale da qari masze damRupvelad moqmedebs. amitom, qarisgan dasacavad d a nawi l o br i v saCr d i l o bl ad ac s asur vel i a s i mi nd i an s o r go (c o c xi ) d ai T es o s yo vel i s ami met r i s d aS o r ebi T o r mwkr i vad .

vegetaciis ganmavlobaSi kitris naTesis movla gulisxmobs niadagis gafxvierebasa da

gamargvla gaToxnas, saWiroebis mixedviT morwyvasa da mavnebel –avad myo f o baT a winaaRmdeg brZolas. karg Sedegs iZleva agreTve damatebiT gamokveba organuli da mi ner al ur i sas uqebi s xs nar ebi T .

# nesvi

nesvis samSobloa Sua azia, mcire azia da amierkavkasia. saqarTveloSi mas

gavr c el ebi s d i d i xni s i s t o r i a aqvs .

surnelovani, gemrieli da sasargebloa adamiamisaTvis. sakmaod didi raodenobiT (14-18%-mde) Seicavs Saqrebs da sxva mniSvlelovanvi t ami mebs , maT Soros vitaminebs, nes vi d an amz ad eben T af l s , Ci r s a d a f af as .

**biologiuri Tavisebureba.** nesvis Tesli brtyelia, kvercxisebri an wagr Zel ebul

o val ur i . Zi r i T ad ad yvi T el i a s xvad as xva el f er i T an T eT r i . 1 g Tesli 18-24 c al i a.

fesvi Zlier gantotvili aqvs. fesvebis ZiriTadi masa niadagSi gaSlilia zedapirulad (saxnav fenaSi 10-25 sm). mTavari fesvi TavSi msxvilia, Semdeg viwrovdeba; c al keul i f esvi s akmao d d i d s i R r mez e Cad i s ni ad agS i , gansakuT r ebi T f xvi er ni ad agS i .

nesvis Rero mxoxavia, momrgvalo, dakuTxuli, sigrZiT 3-4 metrs aRemateba, Reros

i s eT i ve d at o t va aqvs , r o go r c kitrs.

foToli Sebusulia. momrgvalo, xuTkuTxa. Tirkmlis an gulisebri f o r mi s ,

kidemTliani an danakvTuli, muqi mwvane an moruxo mwvane, foTlis iRliaSi moTavsebulia ul vaSebi . er T s axl i ani d a er T s qes i ani mc enar ea, magr am z o gi er T j i Ss o r s qes i ani yvavi l i c aqvs.

mamrobiTi yvavilebi yvaviledebadaa Sekrebili da foTlis iRliaSi zis, xolo

md ed r o bi T i yvavi l ebi er T eul ad aa. ganayo f i er eba mwer ebi s meS veo bi T j var ed i nad xd eba.

nayofi SeiZleba iyos mrgvali, brtyeli, cilindruli, elifsoiduri, msxlisebri. zedapiri gluvia, danaoWebuli, dasegmentebuli, meWeWiani. Seferva: yviTeli, mwvane, TeTri, mixakisferi; pirbadiani an upirbado; rbileulis feri: TeTri, mwvane, monarinjisfr o yviTeli, vardisferi, konsistencia: mkvrivi, xraSuna, fxvieri. bude, romelSic Teslia mo T avsebul i , S ei Zl eba i yo s : ganT xevad i , s vel i , mkvr i vi , t ar o s ebr i .

**jiSebi.** adgilobrivi jiSebidan aRsaniSnavia: megruli Savi nesvi ( uCa Sinka), megruli TeTri nesvi, murasa, muxianuri nesvi, kvaxnesvi, anu Savi nesvi; Semotanili jiSebidan” komunarka, areskoti, duTma, muxca nesvi; Sua aziuri jiSebidan: xandalaki, asate, i Ci ki z i l i , Co gar e d a s xva.

**damokidebuleba garemo pirobebi s ad mi .** nesvi siTbos miyvaruli mcenarea. Teslis

aR mo c eneba i wyeba 150 –z e. maR al t emper at ur az e amo d i s 7-12 d R eS i . aR mo nac eni mgr Zno bi ar ea d abal i t emper at ur i s ad mi -10 –z e i R upeba.

haeris tenianobisadmi did moTxovnilebas ar ayenebs. magram niadagis tenianobisadmi momTxovnia. kargad modis struqturian, msubuqi Sedgenilobis , karg tentevad, amave dros wyalgamtar niadagze. nesvisaTvis saukeTesoa axlad gatexili yamiri axo adgilebi, nabal axar i mi nd o r i .

**ganoyiereba.** nesvi sasuqis mimarT momTxovnia. erT ha-ze SeaqvT 30-40 t gadamwvari nakeli. Tu niadagi organuli nivTierebebiT SedarebiT mdidaria, maSin karg Sedegs iZleva mineraluri sasuqebis Semdegi doza: fosfori -50-70 kg, kaliumi -40-60, azoti -30-50 kg mo mqmed i ni vT i er ebi s s axi T .

**Tesva.** nesvi mohyavT Tesli T , iTeseba winaswar kargad daamuSavebul niadagebze budobrivad. mwkrivebs - 1,5-2 m-iT, xolo mwkrivSi budnebs - 0,5-1 m-iT acileben. movla gamoixateba gafxvierebiT, saWiroebis SemTxvevaSi morwyviT da mavnebel - d aavad ebaT a wi naaR md eg br Zo l i T .

# sazamTro

sazamTros samSobloa ekvatoruli amerika. yvelaze gavrcelebuli ori saxeobaa: Cveul ebr i vi s uf r i s s az amT r o d a c ukat i anu sakvebi s az amT r o .

sufris sazamTros iyeneben, rogorc sadeserto saWmels. misi rbilobi mdidaria naxS i r wyl ebi s , ufro metad Saqrebis didi SemcvelobiT (10-16%). mas iyeneben samurabed, T es l s i yeneben z eT i s d asamz ad ebl ad .

sazamTro erTwliani mxoxavi mcenarea . Tesli didi zomisaa, brtyeli da magar kaniani. mxoxavi Rero grZelia da Zlier datotvili . Reros axasiaTebs fesvebis gamo Reba.

FfoToli grZelyunwiania, Sebusulia rbili qinqliT. yvavili erTsqesiania, zogjer orsqesiani. igi jvaredinad gamanayofierebelia. nayofi wvniani, farTo, mr gval i , elifsuri, msxlisebri, cilindruli. nayofi TeTri, mwvane, Ria mwvane, xSir SemTxvevaSi moxatuli movarayebuli. nayofis kani magaria 0,5-2 sm-mde sisqis. saqarTveloSi gavr c el ebul i a S emd egi j i S ebi : kaxur i , muxr ani s , gr Zel i T eT r i d a a.S.

sazamTro haeris tenianobisadmi momTxovni ar aris. didi momTxovnia niadagis

d amauS avebi s a d a mi s i nayo f i er ebi sad mi .

**gano yi er eba.** s az amT r o s d asaT es nakveT z e nakel i und a S evi t ano T gad amwvar i s axi T 20-30 t 1 ha-ze. sasuqebidan saukeTeso Sedegs iZleva fosfori da kaliumis Setana. sazamTros kar g wi namo r bed ad i T vl eba ko mbo s t o , pami d o r i , bad r i j ani d a sxva.

**niadagis damuSaveba.** sazamTros dasaTesi nakveTi Rrmad unda damuSavdes, niadagi i xvneba mz r al ad , gaz af xul z e i f ar c xeba d a T es vi s wi n at ar eben kul t i vac i as .

**T es va**. sazamTros Tesva iwyeba, maSin rodesac niadagis temperatura aRwevs 13-150 .kvebi s ar e1,4-1,4 m-i a. T es l i i T es eba 4-5 s m s i R r mez e. aR mo c eneba i wyeba me-10-12 d R ees .

**mosavlis aReba.** mosavlis aRebis dros yuradReba unda mieqces sazamTros garegnul

f er s . i gi und a i yo s bz i nvar e d a mkveT r ad gamo xat ul i var ayi T .nayo f s yunwi uWkneba. d i d i yuradReba unda mieqces aRebis zust Dd ros, radgan produqtis xarisxi uaresdeba r o go r c ad r eul i s e d agvi anebul i aR ebi sas .

# go gr a

saqarTveloSi gavrcelebulia gogris sami saxeoba. esenia: msxvilnayofa, muskaturi gogra da magrenni gogra. am ukanasknels miekuTvneba yabayi da patisoni. msxvil nayofa gogridan saqarTveloSi cnobilia TaTruli gogra, TaTruli kvaxis, xapis da kopeSoias saxelwodebiT. nayofs iyeneben mwife saxiT moxarSuls an Semwvars. masSi didi r ao d eno bi T aa kar o t i nebi , naxS i r wyl ebi , S ei c avs S aqr i s d i d r ao d eno bas.

gogras axasiaTebs farTod gaSlili fesvTa sistema, Rero mxoxavi, foTlebi mdgomare. yviTeli gayofil sqesiani, nayofi msxvili, qerqi rbili, rbilobi fxvieri, T es l i T eT r i .

ms xvi l nayo fa gogra tenis moyvaruli mcenarea. foTlebi Zlieraa ganviTarebuli, fesvTa sistema Zlieri aqvs, magram gvalvas ver uZlebs, wylis naklebobis dros iwyeba yvaviloba, msxvilnayofa gogra jvaredin damamtverianebelia. Tesls Tesaven kvadratul budobrivad 210-210 sm daSorebiT. mosavlis aRebis dros gogris yunwi Semxmari unda i yo s . nayo f s i R eben pi r vel i umni S vnel o wayi nvebi s S emd eg.

**muskaturi gogra.** misi kvebiTi mniSvneloba metia vidre msxvilnayofa gogris, radgan ufro mdidaria SaqrebiT, karotinis met raodenobas Seicavs. es gogra gavrcelebulia qvemo qarTlis dablob zonaSi. muskaturi gogra ufro didxans inaxeba msxvilnayofianTan SedarebiT. Rero mxoxavia, foTlebi naxevrad mjdomare an mwoliare, nayofi saSualo zomis cilindrulia. igi siTbos momTxovnia, moiTxovs msubuq qviSnar, o r ganul i ni vT i er ebebi T md i d ar ni ad ags .

**magrenni gogra.** igi ar Camouvardeba muskats. mas sasufre gogras uwodeben. mdidaria SaqrebiT da karotiniT. rbilobis sisqe da mosavlianoba naklebi aqvs vidre ms xvi l nayo f as d a mus kat ur s . CvenS i i gi c no bi l i a s xvad as xva s axel wo d ebi T : xo ker a go gr a, xokera kvaxi, misi kani magari javSania, rac xels uwyobs transportirebas da Senaxvas. nayofi saSualoa, mwife nayofi moyviTalo forToxlis feria. kani imdenad magari aqvs, r o m mo xar S vi s S emd eg s i magr es ar kar gavs . mo vl i s wes i i gi vea, r o go r c s xva go gr i s .

# mxal eul mwvani l eul i

**s al aT a, wi wmat i , i s panaxi , c er ec o , r ehani , qo nd ar i .**

salaTa. salaTa samwvanile kulturaa. saWmelad iyeneben rozetis foTlebs umad. isini Seicaven didi raodenobiT sakveb nivTierebebs. salaTa erTwliani kulturaa. ekuTvnis r T ul yvavi l o vanT a o j axs . i gi gamo i r Ceva maRal i mo savl i ano bi T . mi s i f es vi R er Zaa, uxvad ganviTarebuli gverdiTa fesvebiT, foTlebi msxvilia, mj d o mar e, sxvada sxva formis. foToli muqi mwvane an Ria mwvanea, SeiZleba iyos moyviTalo da a.S. salaTa sicocxlis pirvelsave wels ikeTebs sayvavile Reros , romlis simaRle 60-120 sm-ia. sayvavile Rero zemoTa nawilSi Zlierad itoteba da yvaviledebis did raodenobas ikeTebs. yvaviledebSi ar i s 10-24 md e yvavi l i . yvavi l i o r s qes i ani a.

**foTlovani salaTa.** foTlovani salaTa arasdros ar ikeTebs Tavs. misi foTlebi

mT l i ani a an gankveT i l i .

**sakrefi salaTa.** iviTarebs Reros simaRliT 40-80 sm . Rero dafarulia didi nazi foTlebiT, romelsac TandaTanobiT krefen maTi zrdis mixedviT. am saxesxvaobas mi ekuT vneba j i S ebi : avs t r al i ur i d a kal i f o r ni i s .

**Taviani salaTa.** Taviani salaTa Seicavs jiSebs, romelTa foTlebic rozetSi sustad wamoweulia da formiT ovaluri, momrgvalo an Tirkmlisebri. salaTas jiSebi momrgvalo t i pi s T avs i keT ebs , z o gi T avi f uyea, z o gi ki mkvr i vi .

s al aT a yinvagamZle mcenarea . Rivis fazaSi -3-40 **C** –s dauzianeblad itans. mcenare zrdas ganagrZobs +50 temperaturis drosac. misi normaluri ganviTarebisaTvis saWiroa 18- 70 temperatura.

sinaTlisadmi salaTa Zlier momTxovnia da misi ukmarisobisas Taviani jiSebi Tavs ver iviTareben. tenis mimarT zomierad momTxovnia. tenis ukmarisobis dros mcirdeba mosavlis raodenoba da xarisxi. salaTas mokle vegetaciis periodi aqvs da kargi mo s avl i s mi saRebad saWi r o a Zl i er no yi er i s akmao d t eni ani ni ad agi .

salaTa mohyavT Ria gruntSi, daTesviTac da CiTiliTac. naadrevi mosavlis misaRebad

s as ur vel i a Ci T i l i s gamo z r d a d a S emd eg gad ar gva.

s al aT as T esaven mwkr i vebad , z o l ebr i vad s aT es i manqanebi T , z o l S i mwkr i vebS i t o veben 5-dan 10 sm –mde. CaT es vi s s i R r me 1-1,5 sm-i a. T es vi s no r ma f o T l o vani j i Sebi s aT vi s ha-ze 4-5 kg-ia. Tesvis Semdeg tardeba mwkrivTSoris pirveli Toxna - kultivacia, Semdeg ki atareben gameCxerebas da kultivacias. gameCxerebis Semdeg mcenareTa Soris manZili 3-4 sm unda iyos. daTesvidan 25-30 dRis Semdeg awarmoeben meore gameCxerebas da gafxvierebas, gameCxerebuli mcenareebi gamoiyeneba saWmelad. meore gameCxerebis dros mcenareebs Soris manZi l i 8-10 s m-i a.

salaTis CiTiliT dargviT moyvanisas, CiTili kvalsaTburebSi an Ria saCiTile kvlebSi gamoyavT. TiToeul CarCoze Tesaven 6-8 g-is raodenobiT Tesls, zrdian 10 dRis ganmavlobaSi da erTi CarCodan iReben 1500-1800 cal CiTils. gadargvas awarmoeben winaswar gamzadebul niadagze 5 mwkrivian zolebad. zolebs Soris toveben 50 sm-s, mwkrivebs Soris zolSi - 25 sm da mwkrivSi mcenareebs Soris - 20 sm. amrigad 1 ha-z e daaxloebiT 150-160 aTasi cali mcenare daeteva. CiTils dargvis Semdeg maSinve rwyaven, S emd eg T o xni an, af xvi er eben d a i sev r wyaven.

foTlovan salaTas daTesvidan 40-50 dRis Semdeg iReben, Wrian Zirze , ise rom r o z et i mT l i anad d ar Ces . sal aT as i Reben, maS i n r o d es ac f o T l ebi mS r al i a.

# wiwmati

wiwmati CvenSi metad gavrcelebuli mwvanileuli kulturaa. igi mohyavT sakarmidamo

bo s t nebS i , as eve d i d f ar T o bebz e. s aWmel ad gamo i yeneba axal i f o T l ebi umad .

wiwmati ekuTvnis jvarosanTa ojaxs. erTwliani mcenarea, foTlebi muqi mwvanea, yvavili TeTri. yvaviloba warmoebs mais - ivnisSi, nayofi momrgvalo kvercxisebria, romelic skdeba Suaze da TiToeul ganyofilebaSi moipoveba TiTo an or-ori Tesli. Tesli Ria yavisferia, 1 gramSi 500 - 600 cali Teslia, romelic Rivdeba 1-3 dReSi, xolo aR mo c enebi s unar s i naxavs 3-4 wel i wad s .

wiwmati yinvagamZle mcenarea, misi Rivebi Zlebs -4-50 **C**-s. mozrdili mcenare -100 –z e

ar ziandeba. ufro mkacri yinvebis dros zrdis wertili saRia, amis gamo baris raionebSi wi wmat i kar gad i z amT r ebs R i a gr unt S i .

s i naT l i s mi mar T wi wmat i nakl eb mo mT xo vni a’ t eni s mi mar T ki z o mi er i mo mT xo vni .

wiwmats Tesen mobneviT, magram did farTobze Tesen zolebrivad. mosavlis xarisxi da raodenoba damokidebulia Tesvis vadebze. wiwmati unda daiTesos adre gazafxulze, Tebervalsa da martSi. Tesva SeiZleba yovel 10-14 DdReSi. gvian gazafxulze an zafxulSi naTesi ar iZleva Sedegs. wiwmatis Tesvis meore vadaa seqtember-oqtomberi. am d r o i s naT es i kar gad z amT r o bs .

wiwmatis movla mdgomareobs sarevela balaxebisgan gawmendasa da saWiroebis mixedviT morwyvaSi. wiwmats iReben maSin, rodesac rozeti sruliad ganviTardeba da mc enar e mi uaxl o vd eba R er o s wamo Rebi s f az as , mas Wr i an Zi r z e d a kr aven ko nebad .

# c er ec o

cereco surnelovani bostneulia. mas iyeneben , rogorc sakazm saSualebas sxvadasxva saWmlis Sesakazmad. ayvavebul mcenares xmaroben, rogorc aromatul masalas mwnilebis dasamzadeblad. cereco ekuTvnis qolgosanTa ojaxs. erTwliani mcenarea, igi Rivdeba daTesvidan 16-20 dReSi. cereco araxelsayrel pirobebSi aRmocendeba 25-35 dReSi, zogjer ki mTeli wliT SeCerdeba , daRupviT ki ar daiRupeba da Sesaferisi pirobebis dadgomisas aucileblad aRmocendeba. cerecos xSirad kamas uwodeben, rac swori ar aris. isini erT ojaxSi arian gaerTianebuli, magram sxvadasxva gvarisaa. kama mr aval wl o vani mc enar ea, i s waagavs c er ec o s , magr am d i d i i z r d eba d a d i d i f o T l ebi aqvs . cereco sicivis amtania, Rivi uZlebs -5-60-s, ris gamoc baris raionebSi igi kargad z amT r o bs . ganaT ebi s mi mar T mo mT xo vni a, xo l o t eni s mi mar T nakl ebad mo mT xo vni .

c erecos Tesaven sxva kulturebTan erTad. did farTobebSi Tesaven mwkrivad da zolebrivad. mwkrivebs Soris manZili 10-15 sm-ia, z o l e Soris manZili -50 sm. Tesvis norma 10 kg/ha-z e. CaT es vi s s i R r me 1-3 sm.

movlis ZiriTadi RonisZiebaa sarevelebTan brZola, niadagis gafxviereba da

s aWi r o ebi s mi xed vi T mo r wyva.

mwvanilad cerecos iReben daTesvidan 40-50 dReSi, rodesac mcenare miaRwevs 10 sm simaRles . mwnilebis dasamzadeblad ki cerecos iReben daTesvidan 85-90 dRis Semdeg, r o d es ac mc enar e yvavi l o bs an d ayvavi l ebul i a.

cerecos moyvana SeiZleba kvalsaTburebSic. erTi CarCos qveS Tesaven 20-30 g Tesls. Tesls asveleben 4-5 dRoT adre. naTesis movla gamoixateba niadagis gafxvierebiT da morwyviT. kvalsaTburebSi gamozrdili mcenare xasiaTdeba naklebi aromatulobiT, radgan mc enar e agr o vebs nakl eb eT er i s z eT s S es us t ebul i ganaT ebi s gamo .

# r ehani

rehani surnelovani bostneulia, saWmelad gamoiyeneba misi foTlebi. rehans xmaroben sxvadasxva kerZebsa da salaTebSi, aromatis misacemad. rehani farTodaa gavrcelebuli sagareubno meurneobebSi. is erTwliani mcenarea. ekuTvnis tuCosanTa ojaxs. Rero aRwevs 10-40 sm simaRles. yvavilobas iwyebs ivlis - agvi s toSi. Tesli muqi f er i saa d a 1 g S ei c avs 600-800 cals.

rehani siTbos moyvaruli mcenarea. aRmocenebas iwyebs 20-300 **C** -ze. Rivi amodis me-12-14

d R es . T es l i i naxeba 4-5 wel s . r ehani t eni s mi mar T s akmao d mo mT xo vni kul t ur aa, i gi kar gad viTardeba da karg mosavals iZleva organuli sasuqiT kargad ganoyierebul niadagze. s as uqi SeaqvT gad amwvar i nakel i s saxi T 1 ha-z e 40-50 t.

Tesvas awarmoeben gazafxulze mwkrivad an zolebrivad. 1 ha-ze saWiroa 2-3 kg Tesli. misi moyvana CiTilis dargviTac SeiZleba, CiTili unda iyos 30-40 dRis. dargvis Semdeg unda moirwyas. naTesi aRmocenebisTanave sarevelebisgan unda gaiwmindos, niadagi gaf xvi er d es d a mo i r wyas d r o ul ad .

aR eba i wyeba maS i n, r o d esac mc enar e mi aR wevs 20 sm-z e met s i maR l es .

# qondari

qondari surnelovani bostneulia, misi Rero da foTlebi gamoiyeneba, rogorc

mwvaned i s e sakaz m-sanel ebl ad .

qondari erTwliani mcenarea. ekuTvnis tuCosanTa ojaxs. mcenaris Rero datotvilia, aRwevs 15-30 sm simaRles, foTlebi lancetaa, yvaviledi Sedgeba 3-5 yvavilisagan. Tesli wvrilia, mrgvali momwvano ruxi feris. gaRivebisaTvis saWiroa 8-10 dRe. aRmocenebis unars inaxavs 1-2 wels. igi siTbos moyvaruli mcenarea, aRmocenebas iwyebs 20-300 **C** -z e.

R i vi amo d i s 12-14 d ReS i . t eni s sakmao d kar gi mo mT xo vni a, ni ad agi sad mi nakl eb mo mT xo vni a. qondari mohyavT TesliTac da CiTilis dargviTac. qondars Tesaven aprilSi mwkrivebad an zolebrivad . Tesli ifareba msubuqad. CiTilis dargvisas manZils toveben 20-25 s m, Ci T i l i s xno vaneba 30-35 dRea.

qondars iReben yvavilobis dros, romelic iwyeba ivlisidan da grZeldeba no embr amd e. S emd eg axmo ben d a i s e i naxaven.

# ispanaxi

ispanaxi metad gavrcelebuli mxaleuli kulturaa. igi mohyavT foTlebis misaRebad, romelic gamoiyeneba mxlis saxiT. ispanaxi farTodaa gavrcelebuli sakarmidamo meurneobebSi. igi Seicavs azotovan nivTierebebs, naxSirwylebs **A, E ,C ,** B vitaminebsa da cilebs, garda amisa Seicavs kalciumsa da rkinas. ispanaxi erTwliani balaxovani mcenarea. ekuTvnis nacarqaTamasebrTa ojaxs. ispanaxi orbiniani, calsqesiani mcenarea. mcenareTa erT nawils aqvs mxolod mdedrobiTi yvavili, meores - mamr o bi T i , magram gvxvdeba iseTi mcenareebi romlebsac orive sqesi aqvs, magram aseTi mcenareebi umni S vnel o a. mamr o bi T i yvavi l ebi S ekr ebi l i s agvel aa yvavi l ed S i , md ed r o bi T i ki f o T l i s iRliaSi. mcenareebi mdedrobiTi yvaviledebiT ufro SefoTlilia da ufro produqtiulia, mamrobiTi mcenareebi swrafad iviTareben Reros da uxeSdebian. maTi Tesli 8-12 dReSi amodis, foTlebi rozetadaa Sekrebili. ispanaxi gamoirCeva metad didi yinvagamZleobiT, is SemodgomiT daTesvis SemTxvevaSi izamTrebs ara marto dablob r ai o nebS i , ar amed mT i an r ai o nebS i c . i s panaxi gaR i vebas i wyebs 2-30-ze. Rivebi uZlebs -5-60 **C**. mo z r d i l i mcenare ki-100 **C** . mkacri zamTris dros mcenaris foTolis firfitis napirebi uziandeba, xolo zrdis wertili cocxali rCeba. ispanaxisaTvis saWiro optimaluri temperaturaa 13-200. maRali temperatura iwvevs ispanaxis xarisxis mkveTr gauaresebas. ganaT ebi s mi mar T mo mT xo vni a.

ispanaxi moiTxovs organuli sasuqebiT kargad ganoyierebul niadags. iTeseba Semodgomaze, zamTarSi da adre gazafxulze. gazafxulsa da Semodgomaze ispanaxi SeiZleba ramdenime vadaSi daiTesos. Tesvas awarmoeben mobneviT. xolo gazafxulis nagvi anevi da Semodgomis naadrevad Tesavisas Tesaven mwkrivad, radgan saWiroa erTi -o r i morwyva. CaTesvis siRrme 2-3 sm-ia. Tesvis norma mwkrivad Tesvis dros 30-40 kg-ia, xo l o mobneviT Tesvisas 40-50 kg. Tesli mwkrivSi erTmaneTisgan daSorebulia 3-4 sm-i T , amitom ar saWi r o ebs gameCxer ebas .

# mr aval wl i ani bos t neul i kul t ur ebi

manravalwliani bostneuli kulturebidan yvelaze metad cnobilia revandi da gavrcelebulia: mJauna, tarxuna, revandi, satacuri, artiSoki. es mcenareebi TiTqmis yvel gan mo hyavT mc i r e f ar T o bebz e.

mr avalwlianebis miwiszeda nawilebi yovelwliurad kvdeba. maTi fesvebi Seicaven sakveb nivTierebaTa did marags ris gamoc isini male iwyeben zrdas Tovlis gadnobis S emd eg d a i Zl evi an yvel az e ad r eul pr o d uqc i as .

mravalwliani bostneuli kulturebi izrdebian ramodenime wlis ganmavlobaSi erTidaigive adgilze, amitom gamoricxulia yovelwliurad Tesva da dargva. Sromisa da s axs r ebi s d anaxar j ebi uf r o mc i r ea, vi d r e er T wl i an d a o r wl i an bo s t neul S i .

mr aval wl i ani bo s t neul i kul t ur ebi s aT vi s gamo yo f en qar ebi s agan d ac ul nakveT ebs

Teslbrunvis gareSe, nayofier-struqturul niadagebs, plantaciis Cayris wels niadagSi Setanili unda iyos 60-90 tonamde organuli sasuqebi, aseve sruli mineraluri sasuqebi, fosforiani da kaliumiani SeaqvT Semodgomaze niadagis ZiriTadi damuSavebisas, xolo azo t o vani - Tesvis an dargvis win. mzralad xvnas am kulturebis qveS atareben 30-35 sm s i R r mez e.

niadagebi unda iyos sarevelebisgan sufTa, ise rom maTTan brZola mravalwliani bostneulis zrdisas Seferxebulia. dauSvebelia herbicidebis gamoyeneba vegetaciis peri o d S i .

# revandi

revandi ekuTvnis wiwiburasebrTa ojaxs. revandi mohyavT Zlier ganviTarebuli gansxvavebuli foTlebis yunwebisaTvis, romelic gamoiyeneba saojaxo kulinariaSi, aseve rogorc nedleuli sakonservo, sakonditro mrewvelobaSi da mefrinveleobaSi. revandi warmoadgens yuaTian, samkurnalo da dietur bostneuls. revandis yunwebi Sicavs 94 % wyal s , 6% mS r al ni vT i er ebas , Saqr ebs (2%-md e) d a o r ganul mJ aveebs (3,5%-mde).

revandi yinvagamZle, Crdilis amtani mcenarea romelic iZleva produqcias adre gazafxulze. revandis fesurebi itanen 300 –mde yinvebs. gazafxulze revandis foTlebi iwyeben zrdas jer kidev Tovlis dadnobamde da 20-30 dRis Semdeg mzadaa mo s axmar ebl ad , maS i n r o c a am d r o s s xva bo s t neul i Zal z e mc i r ea.

revandis Teslebi gaRivebas iwyebs 2-30 C. revandi did moTxovnilebas uyenebs

ni ad agi s t ens , gans akuT r ebi T f o T l ebi s f o r mi r ebi s per i o d S i , ami t o m gval vi an ami nd ebS i auc i l ebel i a mo r wyva.

revandi mravldeba vegetatiurad (fesurebis dayofiT) da TesliT ( Cveul ebr i vi Ci T i l i T an z o gj er T es l i s uS ual o d gr unt S i T es vi T ).

TesliT Tesvisas revandis mosavals erTi wliT gvian iReben, vidre vegetatiuri gamravlebisas da amasTanave, araerTgvarovani xarisxisaa. revandis samrewvelo warmoebisaTvis did farTobebze upiratesobas aZleven (TesliT) CiTiliT gamravlebas, vi d r e veget at i ur s .

CiTilebi gamoyavT saCiTileebSi gazafxulze an zafxulis dasawyisSi. 1 ha-z e saCiTiled Tesaven 2,5-3 kg Tesls 2-3 mwkrivian zolad 20X50 sm an 55 X 55 X 70 sm. aRmocenebis Semdeg ameCxereben da mcenareebs Soris toveben 15-20 sm manZils. SemodgomiT an adre gazafxulze CiTilebs amoiReben, daWrian foTlebs da gadar gaven mudmiv adgilze. 1 ha farTobis dasargavad saWiroa CiTilebis aRsazrdelad 1000 m2 farTobi. CiTilebs rgaven CiTilis sargavi manqanebiT kvadratulad . saadreo jiSebs 80X80 sm, saS ual o per i o d i s j i S ebs ki 100X 100 sm an 90X 90 s m.

revandis vegetatiuri gamravlebisas sadeded sami - oTxi wlis asakis mcenareebs

ar Ceven, r o ml ebi c xas i aT d ebi an yunwebi s maR l i mo s avl i T d a kar gi xar i s xi T .

r evandis fesurebis amoTxra, maTi gayofa da dargva samxreT raionebSi warmoebs Semodgomaze, roca mcenareTa vegetacia damTavrebulia, CrdiloeTSi ki adre gaz af xul z e, s anam mc enar eebi z r d as d ai wyeben.

fesurebs Wrian mWreli daniT daaxloebiT 250 g –ian naWrebad, rom T i T o eul

naWers hqondes 1-2 kargad ganviTarebuli kvirti da fesvis 1-2 msxvili ganatoti. damzadebul fesurebs maSinaTve rgaven teniT mdidar, niadagebSi. zemodan kvirtebs ayr i an 1-2 s m s i s qi s mi wi s f enas d a mi was f es ur ebi s i r gvl i v kar gad d at kepni an.

r evand i s nargaobis movlaSi Sedis niadagis sistematuri gafxviereba - gamar gvl a,

mo r wyva, gamo kveba, s ayvavi l e i s r ebi s mo c i l eba, br Zo l a mavnebl ebT an d a d aavad ebebT an.

saCiTileebSi atareben or gamokvebas mineraluri sasuqebiT (pirvelad da meored marto fosforiT). Semdeg wlebSi yovelwliurad 2-3 jer gamokvebaven sruli mineraluri sasuqebiT yunwebis moWris Semdeg da 3-4 jer 2-3 weliwadSi SeaqvT 20-40 t organuli sasuqi.

revandis ylortebis mosavals iReben plantaciis mo wyobidan, meore - mesame wels, foTlebs iReben yunwebiT, maSin roca miaRwevs 20 sm sigrZes da 1,5 sm diametrs Sua nawilSi, vegetaciis periodSi warmoebs ramodenimejer Sekrefva xeliT. yunwebs moacileben foTlebs da awyoben sarealizaciod 30-40 kg tevadobis yuTebSi. mosavali 1 ha-z e mi i Reba 200-400 c . er T ad gi l z e Sei Zl eba d avt o vo T 10-15 wel s .

**mJauna**

mJauna ekuTvnis wiwiburasebrTa ojaxs. iSviaTad kulturaSi gvxvdeeba ispanaxisebri mJauna, romlis gemo naklebad mJavea, magram ufro mdidaria qimiuri SedgenilobiT. mJaunas foTlebidan amzadeben mwvane supebs, piures, salaTebs, mas iyeneben mSralad ispanaxTan erTad. mJaunas foTlebi Seicavs 3%-mde cilebs. 2,8 % naxSirwylebs da 1,5 % nac r i s el ement ebs , sad ac War bo bs kal i umi , f o s f o r i d a magni umi .

mJauna didi raodenobiT Seicavs **C** vi t ami ns - 60 mg 100 g-ze da karotins 5 mg-mde 100 g-ze. agreTve Seicavs **B1, B2** da PP vitaminebs, vaSlisa da limonis mJavebs. mJaunas xnier foTlebSi 1%-mde grovdeba mJaunmJava, amitom misi gamoyeneba mizanSewonilia mxolod gaz af xul z e s ayvavi l e Rer o ebi s war mo S o bamd e.

mJaunas Tesli muqi ferisaa, bzinvare, sam wibovani, wvrili. Teslis kani magaria, mSralia. Rivebi amodian me-10-15 dReze. lebnis foTolakebi grZelia da lebnis qveSa muxl T an er T ad Sef er i l i a var d i s f r ad .

pirveli namdvili foToli kvercxisebri formisaa, msxvilzoliani, mozrdili mcenareebis jiSze damokidebulebiT, muqi mwvane an Ria mwvane, grZeli an momrgvalo xo r c i ani , mT l i ani f o T l ebi aqvs . sococxlis meore wels iZleva sayvavile Reroebs 70 sm-dan 1 metramde sigrZiT. yvavilebi pataraa, moTavsebuli sagvela yvaviledebSi. mcenareebi sqes gayofilia, xSirad erTsaxliani jvaredinad damamtverianebeli. damtverva xdeba ZiriTadad qaris d axmar ebi T . f es vi pi r vel ad R er Zaa, S emd eg Zal z e i t o t eba.

mJauna yinvagamZlea, Teslebi gaRivebas iwyeben 2-30 **C**, foTlebi ki iRupeba 8-90 **C**

wayi nvebi T . zrdisaTvis optimaluri temperatura 13-180 **C**. niadagis da haeris tenisadmi didi momTxovnia. saukeTeso niadagad mJaunasaTvis iTvleba neSompaliT mdidari niadagi. ad vi l ad i t ans ni ad agi s gad i d ebul mJavi ano bas , S ed ar ebi T Cr d i l i s amt ani a.

kulturaSi mohyavT mJaunas ramdenime jiSebi: belvilski, Sirokolistni, maikopski 10,

odeski 17.

mJauna iTeseba mwkrivad, 45 sm dacilebiT , 2-3-5 mwkrivian zolad. zolebs Soris -50

sm, xolo zolSi mwkrivebs Soris -20 sm. Tesvis norma erT heqtarze 3-8 k. Tesvis sqemaze damokidebulebi T . T es l i s CaT es vi s s i R r me 1,5-2 sm. aR mo nac eni war mo i S o ba 5-12 d R ez e.

**movla:** pirvel da Semdgom wlebSi warmoebs rigTSorisebis gafxviereba, gamargvla,

mo r wyva, gamo kveba, mavnebl ebi s d a d aavad ebebi s wi naaR md eg br Zo l a.

pirvel gamokvebas atareben adre gazafxulze, SeaqvT 1 ha-ze 100 kg amoniumis gvarjila 100 kg kaliumis qloridi da 100-200 kg superfosfati. yovel sezonze gamo kvebas i meo r eben 2-4 j er kr ef i s Semd eg.

gaz af xul z e pi r vel mo saval s i R eben maS i n, r o c a mc enar eebz e war mo i S o ba 5-6 namdvili f o T l ebi . maT Wrian daniT an iReben xeliT yunwianad. Semdgom aRebas awarmoeben 20-25 dRis intervaliT sayvavile isrebis warmoSobamde. sezonis ganmavlobaSi Wrian 3-4 jer. mo Wr i l mJaunas awyo ben yuT ebS i d a gz avni an sar eal i z ac i o d .

mJaunas orwliani nargaobis s aS ual o mosavali 1 ha-ze Seadgens 13-15 t mJauna 2-3 wlis Semdeg iwyebs mosavlis Semcirebas, amitom mizanSewonilia 3 wlis Semdeg mJaunas pl ant ac i i s ganaxl eba.

# tarxuna

t ar xuns as samSoblod monRoleTi iTvleba. velurad mozardi gvxvdeba cimbirSi, Soreul aRmosavleTSi da samxreT evropaSi, tarxunas kultura gavrcelebulia ruseTSi, s af r angeT S i , ger mani aS i , i ngl i s S i , aS S d a s xvagan.

saqarTveloSi tarxunas kulturas didi xnis istoria aqvs. rogorc akad. iv. javaxiSvili aRniSnavs, igi moxseniebulia XVII saukunis qarTul d amwer l o baS i , gavrcelebulia mebostneobis yvela raionSi, gansakuTrebiT aRmosavleT saqarTvelos I mebo s t neo bi s z o naS i : T el eT S i , kumi s S i , z emo avWal aS i , gl d anS i d a a.S .

eTerzeTebis didi raodenobiT Semcvelobis gamo mas iyeneben liqioris

d as amz ad ebl ad , r o go r c sanel ebel bo s t neul s ki t r i s d a pami d vr i s d amwni l ebi s as .

t ar xunas nedli da gamxmari foTlebi gamoiyeneba kulinariaSi, misgan amzadeben

agr eT ve Zmar s .

tarxuna warmoadgens vitaminebiT mdidar mwvanils, romelsac Tbiliseli mebostneebi

mwvanilebis Sefs uwodeben. nedl tarxunaSi eTerzeTebis raodenoba 0,1-0,5 %-md ea, gamxmarS i – 0,25-0,8%-md e.

tarxuna mravalwliani surnelovani bostneulia, aqvs swormdgomi, gluvi 70-80 sm

s i maR l i s R er o . qved a f o T l ebi s amad aa gayo f i l i , z ed a f o T l ebi ki l anc et aa.

yvavilebi pataraa, TeTri feris, sferosebr yvaviledebSi Sekrebili. yvavilobs

ivlis - agvi s t o S i , mr avl d eba veget at i ur ad .

tarxuna sicivis amtani bostneuli kulturaa. kargad xarobs baris raionebSi da

kargad uZlebs zamTrisa da zafxulis yinvebs. did moTxovnilebas uyenebs sinaT l es , kargi xarisxis eTerebiT mdidari produqcia miiReba mxolod kargad ganaTebul, teniT md i d ar no yi er ni ad agebz e.

kulturaSi arCeven tarxunas or saxeobas: germanuls (muqi mwvane, viwro foTlebiT)

da rusuls ( Ria mwvane, ganieri farTo foTlebiT). pirveli Tesls ar iZleva da mxolod veget at i ur ad mr avl d eba. saqarTveloSi tarxunas nimuSebidan gamovyaviT mxolod ori ekotipi: aRmosavleT da

d as avl eT saqar T vel o s i .

t ar xunas , rogorc nedl ise gamxmar masaSi eTerzeTebi gacilebiT meti raodenobiT

aR mo Cnd a d asavl eT s aqar T vel o s eko t i pS i .

tarxunas ZiriTadad amravleben buCqis dayofiT. maisSi, rodesac TiTqmis mTavrdeba mwvane ylortebis krefa, tarxunas fesvebs anawileben ise, rom TiToeul nawils Tan gahyves mo maval i yl o r t i s s awyi s i kvi r t i .

tarxunas rgaven winaswar momzadebul, erTmaneTisgan 50 sm-iT dacilebul kvlebSi, kvlis sigane erTi metria, sigrZe ki nebismieri. tarxunas rgaven 25 sm dacilebiT 4 mwkrivad. mcenareebs Soris mwkrivSi 15 sm-ia. dargvisTanave kargad rwyaven. Semdeg movla Cveulebrivia: brZola sarevelebTan, gafxviereba, damatebiTi kveba da morwyva. z ed met i t eni xel s uwyo bs t ar xunas f o T l ebi s J angaT i d aavad ebas .

t ar xunas qorfa totebi mwvanilad gamoiyeneba gazafxulze da nawilobriv z af xul S i , xo l o s xva mi z nebi s aT vi s i Reben met i r ao d eno bi T mwvane masas d a eT er z eTebs. 3-4 weliwadSi erTxel aucilebelia tarxunas nargaobis ganaxleba, radgan mcenareebi T and aT an Ci avd eba d a mo saval i mc i r d eba.

# Sampinioni

Sampinions anu qama sokos gansakuTrebuli adgili ukavia bostneul mcenareTa kulturaSi. sokos aqvs maRali kvebiTi Rirebuleba, radgan bevr cilovan azots Seicavs. cilebi sokoSi daaxloebiT imdenivea, ramdenic xorcSi. cilovani azoti Sampinionis mS r al ni vT i er ebaS i 20%- aR wevs .

axalgazrda sokoebSi azotiani nivTierebebi metia, vidre xnierSi, Tanac qudSi ufro

met i a, vi d r e f exS i . sokos iyeneben Semwvari an moxarSuli saxiT, misgan amzadeben konservebs, inaxaven

mar i nad i s s axi T .

zamTarSi dacul gruntSi awarmoeben axali saxiT mosaxmareblad Sampinionis gamo yvanas .

soko mravldeba vegetatiurad, miceliumis ujredebis dayofiT da sporebiT. Sampinions iseve, rogorc sxva sokoebs qlorofili ara aqvs da amitom sinaTles ar saWiroebs, is i z r d eba l po bad i mkvd ar i o r ganul i ni vT i er ebi s xar j z e.

S ampi ni o ni s ZiriTadi vegetatiuri masa-miceliumi Sedgeba mravalricxovani TeTri Zafebisagan, romlebic gamjdaria organul sakveb substratSi. xelsayrel pirobebSi Sampinioni substratis zedapirze warmoqmnis sokos nayofier sxeulebs-s po r o vani gamravlebis organoebs. swrafad viTardeba , ra substratis zedapirze nayofieri sxeuli, SemdgomSi or nawilad iyofa: fexvi, romelic SeerTebulia miceliumTan da qudinayo f i er i s xeul i s z emo T a nawi l ad , r o mel i c s po r ebs i Zl eva.

qudsa da fexs ara aqvs gansakuTrebuli agebuleba da isini Sedgebian miceliumis calkeuli Zafebisagan. qudis qvemo mxareze radialurad ganwyobili firfitebia, r o ml ebS i ac viTardebian calkeuli vegetatiuri nawilebi-sporebi. erTi qudi ramdenime miliard sporas iZleva. saWmelad gamoiyeneba Sampinionis nayofieri axalgazrda sxeuli s po r ebi s mo mwi f ebamd e. nayofieri sxeulis Casaxvidan sporebis warmoqmnamde, zrdisaTvis xelsayrel piro bebSi 7-10 d R ea s aWi r o .

SampinionisaTvis saukeTeso temperaturad nayofierebis periodSi iTvleba 11-150 **C** . gruntis temperatura ki nayofierebis periodSi 14-180-ia. haeris SefardebiTi tenianoba 80-

85%-i a.

S ampi ni o ni mo hyavT spec i al ur saT bur ebS i , S eno bi s sar d af ebS i , kval saT bur ebS i , yuT ebS i d a R i a gr unt S i .

saTburs xuraven sinaTlegaumtar saxuraviT. saWiro temperaturis reJimi saSampinione saTburebSi iqmneba Sesabamisi nexviT, romelic imave dros sokosaTvis kvebis wyarosac war mo ad gens.

nexvs da nagavs winaswar agroveben da inaxaven datkepnil mdgomareobaSi. 1 m2 –ze unda damzaddes 0,5 kuburi metri. saTburSi Setanamde saWiroa misi Sexureba, amas aRweven aCeCviT. 450-ze zeviT mTeli sokovani flora iRupeba. sokos mcenarisaTvis saukeTesoa cxenis axali nexvi, romelsac ureven mcire raodenobiT namjas. nexvs iyeneben iseT mdgomareobaSi, rodesac is mTlianad ar aris gadamwvari, romelsac kidev SeuZlia simxurvalis gamoyofa. nexvis datenvis vada agvistoa. saWiroa wunwuxis damateba da S emd eg s ul f at amo ni umi s 2 kg-i s r ao d eno bi T t o naze. miceliumis dargvas awarmoeben gruntSi, misi gawyobidan 20-30 dRis Semdeg, rodesac

t emper at ur a 20-250-i a, t eni ano ba- 50%.

momzadebul substratSi mxolod sterilur miceliums rgaven, misi 1 kg sakmarisia

s aS ampi ni o nes 4 m2 s as ar gebl o f ar T i saT vi s .

sokos nayofiereba iwyeba miwis dayridan 20-40 dRis Semdeg. sokos aReba YyoveldRiurad warmoebs da grZeldeba 3-dan 7 Tvemde. aRebisas iReben ufro did, magram gauSlel sokoebs, soko unda moiWras. aRebuli soko kargad inaxeba 5-7 dRe 1-30. er T kvad r at ul met r z e Sei Zl eba mi vi R o T 3-5 kg s o ko s mo s aval i .

# d ac ul i gr unt i s mo wyoba d a gaT bo ba

mebo s t neebs SeuZlia xelovnurad Seuqmnas mcenares zrda-ganvi T ar ebi s aT vi s xel s ayr el i pi r o bebi . as eT i wes i T S es aZl ebel i a ar asez o nur d r o s mi R ebul i qnas s aad r eo bo s t neul i s mo saval i .

dacul gr unt s d i d i mni Svnel o ba aqvs s aad r eo j i S ebi s Ci T i l i s gamo s az r d el ad . daculi gruntS i saxeebia: droebiTi dacvis ubralo saSualeba Ria da SemTbar grunrSi, saCiTile, kvalsaTburebi da saTburi. aqedan pirveli ori miekuTvneba martivad d ac ul , xo l o o r i ukanas knel s r ul i ad d ac ul gr unt s .

# mar t i vad d ac ul i gr unt i

**droebiTi dacvis saSualebani.** adreuli mosavlis misaRebad bostneuli kulturebis Tesvis an dargvis dros didi minSvneloba aqvs, upirveles yovlisa, adgilis SerCevas. amisaTvis arCeven myudro, qarebisagan dacul, samxreTis odnavi daqanebis mqone adgils, radgan aseTi adgili adre Tbeba da Sreba, riTac xdeba adreuli mosavlis miReba. adgilis SerCevisas yuradReba unda mieqces , rogorc bunebrivi, ise xelovnuri safarebis gamo yenebas .

mcenareTa yinvebisgan dasacavad SesaZlebelia mcernareTa individualuri dacva qaRal d i s xuf i T , mi ni ani yuT ebi s uZi r o qo T ni T d a s xva saS ual ebebi T .

mcenareTa dacva tenian adgilebSi SeiZleba martivi wesiTac, rac miwis nazurgis gakeTebiT SeiZleba. amisaTvis iReben uZiro qoTans an 16-17 sm diametris mqone zeda nawiliT. mas Seviwroebuli boloTi gadaadgamen dargul mcenareze da xeliT Semouzurgaven miwas yoveli mxridan, Semdeg formas amoiReben da mcenaris irgvliv d ar Ceba naz ur gi mi wa.

bolis safars iyeneben gazafxulze wayinvebis Tavidan asacileblad . amisaTvis winaswar emzadebian. nakveTSi mcenareTa Tu sxvaTa anarCenebs da wayinvebis dawyebisas mo uki d eben d a war mo qmni l i kvaml i s S ed egad xd eba haer i s gaT bo ba 2,50 **C** –i . mcenareTa dacva wayinvebisagan SeiZleba agreTve SemTbari gruntis saSualebiT. ar Ceven S emT bar i gr unt i s S emd eg saxeebs : T bi l kval s , T bi l baz o s d a T bi l o r mo s .

**Tbili kvali.** Tbili kvlis mosawyobad iReben 1,5 m siganis, 30-40 sm siRrmis da nebismier sigrZis ormos, mis Zirze Wrian patara arxs, Sig awyoben qvebs an fiCxs (d r enaJ i saT vi s ), Semdeg 20-30 sm sigrZeze yrian axal nakels da zemodan moayrian fxvier miwas. dayrili miwis SuagulSi patara CaRrmavebul arxs akeTeben wvimis wylis dasawretad, radgan Tbil kvals wylovani saxuravi ar aqvs. garda amisa, kvlis irgvliv gar eT a mxr i d an S esaZl ebel i a gakeT d es uf r o R r ma s awr et i ar xi . r aT a kvl i s S ua gul S i mo T avsebul i ar xi d an wyal i T vi T d i nebi T Camo vi d es gar eT a sawr et ar xS i .

wayinvebis dros aseT kvlebze zemodan RamiT SeiZleba celofani, toli an sxva

s aS ual ebebi d aef ar o s .

**Tbili bazo.** zogjer SesaZlebelia gakeTdes saadreo mosavlis misaRebad (10-15 dRiT adre) Tbili bazoebi. risTvisac calfrTiani guTniT avleben kvlebs, romlebic erTmaneTisagan 0,7-0,8 metriT iqnebian daSorebuli. naRarebSi yrian axal nakels, Semdeg an i mave guT ni T an bar i T Rar s mi ayr i an mi was .

**Tbili ormo.** Tbili ormo da Tbili kvali iseve ewyoba, rogorc Tbili kvali da Tbili bazo. amisTvis iReben 30-40 santimetri diametrisa da 40-50 samtimetri siRrmis ormoebs, romelSic 20-30 sm- sisqeze yrian axal nakels da zemodan 10-20 sm sisqeze ayrian mi was , o r mo s S ua gul S i T es aven an r gaven bo s t neul mc enar eebs .

Tbil kvals, Tbil bazos da Tbil ormos qveS moTavsebuli axali nakeli duRilis ( wvis) dawyebis Semdeg gamoyofs siTbos, es siTbo gadaecema mis zeviT dayril miwas, rac Tavis mxriv uzrunvelyofs masze daTesili Teslis an darguli mcenarisaTvis xelsayrel pirobebs gaRiveba-aRmocenebisa da zrda - ganviTarebisaTvis. aRsaniSnavia is, rom nakelis wvis Sedegad gamoyofili temperatura gadaecema miwiszeda nawils, ris Sedegad haeris mi wi s pi r a f eni s t emper at ur as 2-30 **–C** maRl a s wevs.

# saCiTileebi

arCeven Tbil, gril da Ria saCiTile kvlebs. Tbili saCiTile kvali ewyoba iseTive wesiT, rogorc Tbili kvali, mxolod im gansxvavebiT, rom masze edgmeba xis gvirgvini, romelic mWidrodaa Sekruli da ganivbjenebiT kargad gamagrebuli. masze RamiT an cud amindSi SeiZleba daefaros Wilofi an toli, sxva Sesaferisi safari. aseT kvalSi ad r eul Ci T i l i s gamo yvana Sei Zl eba.

**grili saCiTile** kvali iseTive wesiT keTdeba, mxolod im gansxvavebiT, rom masSi nakel i ar iyreba. RamiT afareben Wil o f s an sxva safars. aseTi saCiTileebSi CiTili gvi an gamo i yvaneba, r ad gan mo kl ebul i a s i T bo s .

**Ria saCiTile kvali**. Ria saCiTile kvali warmoadgens bostnis Cveulebriv kvals, mxolod im gansxvavebiT, rom is ufro xelsayrel mikroklimatis pirobebSi ( mzian da myudro adgilas) ewyoba. aseT kvlebSi CiTilebi gamohyavT, roca mcenares dacva ar Wi r d eba.

**kvalsaTburebi.** kval s aT bur i ar i s gansakuT r ebul ad mo wyo bi l i yuT i , r o mel i c z emo d an

d af ar ul i a mi ni ani Car Co ebi T , S i gni d an ki T beba nakel i T an s xva o r ganul i ni vT i er ebebi s d uR i l i s S ed egad gamo yo f i l i s i T bo T i . mi s gasaT bo bad S ei Zl eba gamo yenebul i qnas c xel i wyl i s o r T ql i , d eni s gamaT bo bel i d a s xva.

kvalsaTburSi xelovnurad iqmneba siTbo, minaSi gaRweuli mzis sxivi da saT anad o t eni ano ba , xel s ayr el pi r o bebs qmni s mc enar i s z r d a-ganvi T ar ebi saT vi s i m d r o s , r o c a R i a gr unt S i bo s t neul kul t ur ebs veget ac i a S ewyvet i l i aqvT d a ar mi md i nar eo bs T es va.

kvalsaTburis adre gazafxulze gawyoba aucilebelia, sadac zrdian CiTilebs,

romelTa gadargva xdeba xelsayreli pirobebis dadgomisTanave Ria gruntSi. gar d a Ci T i l i s gamo yvani s a kval s aT bur ebs awyo ben saad r eo bo s t neul i s mi saRebad .

amrigad kvalsaTburebiT SeiZleba gamoyvanili iqnas CiTili da miRebul iqnas

s aad r eo bo s t neul i . kval s aT bur ebi s gamo yeneba S ei Zl eba S emo d go maz ec **.**  **kvalsaTburebi s Zi r i T ad i t i pebi d a maT i mo wyo ba**

kvalsaTburebis ZiriTadi tipebia: 1) calferda, romelSic Sedis CaRrmavebuli an rusuli kvalsaTburebi da miwis zedapiruli an prizmuli kvalsaTburebi. 2) orferda, r o mel sac ganekuT vneba mi wi s z ed a d a CaRr mavebul i bel gi ur i kvalsaTburi.

kvalsaTburebis gaTboba SesaZlebelia bioTbierebis, cxeli wylis Tbierebis,

el eqt r o T bi er ebi s d a mz i s T bi er ebi s s aSual ebi T .

saqarTveloSi ufro metad gavrcelebulia calmxriv daqanebuli CaRrmavebuli,

naxevr ad CaR r mavebul i an mi wi s z ed api r ul i kval s aT bur ebi upi r at esad bi o T bi er ebaz e.

kvalsaTburis mowyobisas didi mniSvneloba aqvs mis adgilmdebareobas, is s amxr eT i s aken daqanebuli an swori unda iyos. ni ad agS i , sadac kvalsaTburi keTdeba gruntis wyali 1 metrze ufro maRla ar unda amodiodes. daculi unda iyos wvimis , T o vl i sa d a qar i sagan.

**rusuli tipis kvalsaTburi.** rusuli tipis kvalsaTburis Semadgeneli nawilebia: CaRrmavebuli an naxevrad CaRrmavebuli kvali, 2)gvirgvini an yuTi, 3)Seminuli CarCoebi da 4) s xvad as xva saf ar i ( Wi l o bi , f i r f i c ar i d a s xva.)

TiToeuli kvalsaTburis sidide ganisazRvreba standartuli kvalsaTburis CarCos zomebiT. misi siganea 106 sm, sigrZe 160 sm, CarCoebs awyoben sami gadanatixrisagan an oTxi S emi nul i s aS uqi T .

CaRrmavebuli an naxevrad CaRrmavebuli kvali ewyoba imisda mixedviT Tu ra dros vawyobT kvalsaTburs. adreulisaTvis siRrme 75 sm-ia, saSualosaTvis 50-60 sm. adreuli kvalsaTburi CaRrmavebuli kvaliviT ewyoba zamTarSi sxvadasxva bostneulis gamosayvanad. saSualo vadis kvalsaTburi naxevrad CaRrmavebuli kvliT ufro metad ewyoba CiTilebis aRsazrdelad saadreo mosavlis miRebis mizniT. kvlis sigrZe da sigane damokidebulia CarCoebis sigrZeze da maT raodenobaze. agreTve imaze, Tu rogori gvi r gvi ni eqneba kval saT bur s .

* CaRrmavebuli kvalsaTburis Txrili (kvali) umjobesia gakeTdes ara Sveulad, aramed odnav daferdebulad. aseTi kvali xels Seuwyobs nexvis gadawvis Semdeg mis Tanabar dawevas da daicavs kedlebs Cangrevisagan. msubuq niadagebze kvalsaTburebis mowyobisas kvlis kedlebis Cangrevisagan dasacavad saWiroa misi gamagreba ficriT, RobiT an agur i T amo S eneba.
* **gvirgvini** keT d eba s xvad as xva xe-t yi s masal i sagan d a ewyo ba s xvad as xvanai r i wes i T .

kvalsaTburi SeiZleba iyos 5-10-15-20 CarCoiani, amitom kvlis sigrZe da gvirgvinebic S es af er i sad und a gakeT d es .

* C**arCo**. kval saT bur S i s i naT l i s uz r unvel yo f a d a s i T bo s S enar Cuneba Car Co s meS veo bi T xd eba. CarCos gamzadebis Semdeg xdeba misi Seminva. Sesaminad umjobesia bemis mina, r o mel sac sxvagvar ad o r anJ ei s mi nas uwo d eben.
* Wi l o f i saWiroa RamiT an civsa da qarian amindSi kvalsaTburis dasaTbuneblad, Wilofs RamiT CarCoze afareben. Wilofi SeiZleba gakeTdes Wvavisa da qeris namjisagan, Wi l i sa d a Cal a-kalmisagan.

# mi wi s z ed api r ul i kval s aT bur i s mo wyoba

miwis zedapiruli kvalsaTburi sxva kvalsaTburisagan imiT gansxvavdeba, rom is keTdeba miwis zedapirze. is erTi adgilidan meoreze SeiZleba gadatanil iqnas . misTvis ar aqvs gruntis wyalis siaxloves mniSvneloba, misi mowyoba ufro iafi jdeba da nakleb Sromatevadia. 1 ha-ze eteva 35000 cali CarCo. misi uaryofiTi mxar e isaa, rom naklebad icavs mcenareebs araxelsayreli pirobebisagan (qarebi) ris gamoc xSirad nexvi wyvets wvi s pr o c ess d a t emper at ur i s gamo yo f a wyd eba.

imis mixedviT Tu rodis viwyebT MMmuSaobas ( Tesva da dargva), kvalsaTburebi CaRrmavebul da naxevrad CaRrmavebuli iyofa saadreod, saSualod da sagvianod. kval saT bur S i muSao bi s d awyebi s d r o z ea d amo ki d ebul i s aT bo bi mas al i s r ao d eno ba. adreuli kvalsaTburebis gamarTvas dekember - ianvarSi iwyeben. kvlis siRrmed civ

r ai o nebi s aT vi s mi R ebul i a saS ual o d 0,5-0,7 m s axur avi s d axr i l o ba ki und a i yo s 8-100.

saSualo kvalsaTburebis gamarTva iwyeba Sua Tebervlidan da grZeldeba martis Sua ricxvebamde. civi raionebisaTvis kvlis siRrme dasaSvebia 0,5-0,7 m. xolo Tbili raionebisaTvis kvlis siRrme dasaSvebia 0,35-0,5 m. daxriloba ki 6-70. s agvi ano kvalsaTburebis gawyobas iwyeben martis Sua ricxvebidan Sua aprilamde. kvlis siRrmed civi raionebisaTvis miCneulia 0,30-0,55, xolo Tbili raionebisaTvis ki 0,2-0,35 sm , d axr i l o bi s kuT xe Kki 4-50.

**orferda kvalsaTburi** orferda kvalsaTburis mowyoba dasaSvebia, rogorc CaR r mavebul i ise naxevrad CaRrmavebuli. orferda kvalsaTburs sigrZiv kvals mi mar T ul ebas aZl even Cr d i l o eT i d an s amxr eT i saken.

orferda kvalsaTburSi haeris moculoba da ganaTeba calferda kvalsaTburTan

SedarebiT metia, es ki maRalmozardi mcenareebis gamoyvanis saSualebas iZleva ( pomidori, kitri). orferda kvalsaTburs aqvs uaryofiTi mxareebi, rac mdgomareobs imaSi rom, CarCoebs Soris darCenili RreCoebidan sicivis Sekaveba ver xerxdeba, rac s aT bur S i t emper at ur i s d awevas i wvevs .

# mz i s T bi er ebi s kval saT bur i

mzis Tbierebis kvalsaTburi SeiZleba movawyoT, rogorc miwaSi CaRrmavebul, ise miwis zedapiruli. miwaSi CaRrmavebuli kvalsaTburis SemTxvevaSi miwas Wrian 25-35 sm siRrmeze, romelSic saizolacio masalad yrian saqonlisaTvis gamousadegar Tivas an bzes, foTols da sxvas. es fena icavs masze dayril niadags miwis qveda fenebi s uaryofiTi gavlenisagan. xolo miwis zedapiruli kvalsaTburis gansxvaveba isaa, rom amaS i mxo l o d mz i s T bi er eba gamo i yeneba. as eT i t i pi s kval saT bur i ewyo ba maS i n, r o c a met i mzea.

# t eqni kur i kval s aT bur i

t eqnikuri Tbierebis kvalsaTburis mowyoba SeiZleba miwaSi CaRrmavebuli an naxevrad CaRrmavebuli. am SemTxvevaSi gasaTbobad biologiuris garda teqnikuri T bi er eba gamo i yeneba. (c xel i wyal i , el eqt r o gaT bo ba d a s xv).

sxva saTburebTan SedarebiT am tipis kvalsaT bur ebi s gansxvaveba isaa, organuli saTbobi masalis nacvlad ormoSi saizolacio fenisaTvis 20-25 sm sisqeze yrian widas an naxSirs, Semdeg moayrian qviSas, romelSic Caiwyoba sadenebi, zemodan isev qviSas daayrian 10 s m s i sqez e d a bo l o s s aWi r o s i sqez e- special ur ad S ez avebul mi was .

eleqtrogaTboba haeridanac SeiZleba vawarmooT. aseTi gaTbobis dros ganmxoloebuli sadenebi miyveba gvirgvinis ficars, rogorc CrdiloeTis, ise samxreTis mxareze da aTbobs kvalsaTburebSi arsebul haeris sivrces. ufro misaRebia ko mbi ni r ebul i gaT bo ba. e.i r o go r c ni ad agi d an i s e haer i d an.

# c xel i wyl i s T bi er ebi s kval s aT bur i

cxeli wylis Tbierebis kvalsaTburi, iseve rogorc eleqtronuli gaTboba, ewyoba Cveulebvrivi tipis kvalsaTburebSi. gaTbobis sistemac igivea, rogorc el eqt r o gaT bo bi sa.

# saTburi

saTburebSi SeiZleba gamovzardoT, rogorc erTwliani, ise mravalwliani

mc enar eebi d a mi vi R o T kval saT bur ebT an S ed ar ebi T maR al i mo saval i .

s aT bur ebi s S emd egi Zi r i T ad i t i pebi ar s ebo bs :

1. calferda saTburi- erTimxriv daqanebul minis saxuraviT, romelic mimarTul i a s amxr eT i s aken.
2. orferda saTburi- ormxrivad daqanebuli minis saxuraviT, romlis miniani s axur avi s agan er T i mi mar T ul i a aRmo savl eT i saken , meo r e ki d s avl eT i s aken.
3. blokis tipis saTburi-Sedgeba sawreti RarebiT dakavSirebuli ori an ramdenime orferda saTburisagan. saTburebis damakavSirebeli Rarebi dayrdnobilia mxolod boZze, S ua ked el i ut i xr o a, gaxs ni l i .

kulturis warmoebis mxriv saTburebi iyofa Taroebian da gruntis saTburebad. didi

zomis orferda gruntis saTburs, romelsac SigniT boZebi (sayrdenebi) ar awvs, ewodeba angar i s s aT bur i .

saTburis gaTboba xdeba RumeliT, cxeli wyliT an orTqliT, eleqtroniT da

biologiuri TbierebebiT. gamoyenebis drois mixedviT saTburi SeiZleba iyos sazamTromud mi v s axur avi ani d a sagaz af xul o -mo saxd el s axur avi ani .

konstruqciis mixedviT sazamTro saTburi kapitaluri nagebobaa, xolo sagazafxulo

uf r o ms ubuqi a d a gani avebi s met i S es aZl ebl o ba aqvs .

s aT bur ebi sad mi wayenebuli ZiriTadi moTxovnebia - kargi ganaTebis pirobebi da siTbos mtkice reJimi. saTburis konstruqcia imis saSualebas unda iZleodes, rom garkveul periodSi maqsimalurad gamoviyenoT mzis energia, rogorc sinaTlisa da s i T bo s wyar o .

orferda saTburs, romelic Semodgoma-z amT r i sa da zamTar - gaz af xul is

ganmavlobaSi moqmedebs sasurvelia erTi ferdi qondes samxreT dasavleTisaken. xolo iseTi tipis saTburs romelic umTavresad gazafxulidan moqmedebs, umjobesia erTi f er d i d as avl eT i saken hqo nd es d aqanebul i , xo l o meo r e -aR mo savl eT i s aken.

# bo s t neul i s mo yvana Ci T i l ebi T d a maT i aRz r d a t o r f neS ompal a qo T nebS i

**bo s t neul i mc enar eebi s mo yvana Ci T i l i s meT o d i T .**

**1. CiTilis meTodis arsi**. bostneuli produqciis saerTo raodenobis daaxloebiT 50% im kulturebisgan Sedgeba, romlebic CiTilis meTodiT moyavT. CiTilis meTods kidev uf r o met i gamo yeneba aqvs s as aT bur e-sakval s aT bur e kul t ur ebS i .

CiTils axalgazrda mcenareebs uwodeben, romelsac specialurad zrdian Semdeg mud mi v ad gi l z e d asar gavad R i a an d ac ul gr unt S i .

CiTilis meTods is upiratesoba aqvs, rom misi gamoyenebiT SesaZlebelia saadreo mo s avl i s mi R eba. mag, T u po mi d vr i s Ci T i l i d ac ul gr unt S i ad r e aR vz ar d eT d a S emd eg, 5060 dRis xnovanebis mcenareebi gadavrgeT Ria gruntSi, roca misi zrda – ganvi T ar ebi s aT vi s xelsayreli pirobebi Seiqmneba maSin mi vi R ebT 50-60 dRiT adre mosavals.

CiTilis meTods didi mniSvneloba aqvs vegetaciis mokle periodis mqone adgilebSi ( CrdiloeTi, maRalmTiani zona) grZeli savegetacio periodis mqone kulturebis moyvanis saqmeSi. mag. adgilebSi sadac mokle uyinvo periodi 100 dRe da ufro naklebia, i s eT i mcenareebis moyvana, romlebic TavianTi momwifebisaTvis 140-150 da met uyinvo dRes mo i T xo ven - mxolo d Ci T i l i s meT o d i T Sei Zl eba.

zogjer CiTilis meTodiT kulturis moyvanas im SemTxvevaSiac awarmoeben, rodesac arc saadreo mosavlis miReba surT da arc mokle vegetaciis periodis mqone adgilze moyavT. mag. saSualo da sagviano kombostos mosayvanad (saqarTvelos mebostneobis I da II zonebSi, 1000 metramde zRvis donidan) Tesls Ria saCiTile kvlebze Tesaven da Semdeg mai s - ivnisSi mudmiv adgilze rgaven. mosavali am SemTxvevaSi oqtomber-no ember S i S emo d i s . miuxedavad imisa, rom aq arc saadreo mosavlis miRebis mizandasaxulebaa da arc mokle vegetaciis adgilia- mainc CiTilis meTods mimarTaven. aseT SemTxvevaSi CiTilis meTodis upi r at es o ba S emd egS i md go mar eo bs : mc enar es Ci T i l i s f az aS i 200 j er uf r o nakl ebi kvebi s are uWiravs e.i. erTi heqtari saCiTiledan SegviZlia 150 heqtarisaTvis saWiro CiTili aRvzardoT. sagareubno da sakonservo qarxnebis zonebSi , sadac kulturaTa SemWidroeba maqsimalurad aris gamoyenebuli, sagviano kombostos CiTilis dargvis dromde misTvis gankuTvnil nakveTebze sxva mokle savegetacio periodis mqone kulturebi (ispanaxi, wi wmat i , sal aT a) mo yavT .

CiTilis meTodis aseTi didi mniSvnelobis miuxedavad unda aRiniSnos am meTodis uaryofiTi mxareebic. 1) CiTilis dargva did SromiT danaxarjs moiTxovs TesliT daTesvasTan SedarebiT da ufro Zviri jdeba; 2) saadreo CiTilis dacul gruntSi aRzrdisas saWiro xdeba Zvirad Rirebuli sakultivacio nagebobebis (saTburebis da kvalsaTburebis) mowyoba, romlebic did kapitalur dabandebebs moiTxoven, aseve Zviri jdeba saWiro saTbobis SeZena, motana, dawva da sxva. 3) yvelaze didi uaryofiTi mxare meqanizaciis dabali donea. CiTilis meTodis dadebiTi mxareebis SenarCunebiT unda vec ad o T mi ni mumamd e S evamc i r o T mi s i uar yo f i T i mxar eebi .

2. CiTilebis aRzrdis teqnika. CiTili SeiZleba aRizardos saTburebSi da kval saT bur ebS i d ayr i l gr unt z e. R i a s aaCi T i l e kvl ebz e d a t o r f - neS o mpal i an qo T nebS i an no yi er kubur ebS i , r o go r c d ac ul i s e R i a gr unt S i .

**CiTilis aRzrda saTburebSi da kvalsaTburebSi.** sakultivacio Senobebis s aeqs puloataciod gamzadebisa da Semowmebis Semdeg iwyeben saCiTile mcenaris Teslis T es vas . imis mixedviT, Tu rogoria mcenaris Tavisebureba, an misi moyvanis meTodi, Tesvas awarmoeben an uSualod kvalsaTburisa da saTburis gruntSi an saTes yuTebSi. Tesvas kvalsaTburebSi iwyeben maSin, rodesac miwa gaTbeba 25-300 mde. Tu kvalsaTburebSi miwa Zl i er t eni ani a, saWi r o a z ed met i t eni s gamo S r o ba, r i s T vi s ac mi wa und a gad abr und es , mas unda mieces talRisebri forma. amasTanave, aorTqlebuli wylis mosaSoreblad CarCoebs ramdenadme maRla weven, daTesvis win miwis zedapirs gulmodgined asworeben ficris s aS ual ebi T da Semdeg Tesaven. Tesva SeiZleba mwkrivad da mobneviT. umjobesia mwkrivad T es va, r ad gan mas aqac aqvs mT el i r i gi upi r at es o bani mo bnevi T T es vas T an S ed ar ebi T . d i d f ar T o bebz e i yeneben kval saT bur ebS i s aT es manqanas .

kvalsaTburebSi xeliT mwkrivad TesvisaTvis markeris saSualebiT xdeba saTesi kvlebis (naRarebis) moniSvna, CasaTesi naRarebis siRrme damokidebulia dasaTesi Teslis simsxoze. Cveulebriv sakultivacio SenobebSi Tesvis dros miRebulia, rom Tesli d af ar ul i i yo s mi s i s i ms xo s o r magi mi wi s f eni T .

T u miwa Cayris dros, gansakuTrebiT adreula kvalsaTburebSi svelia, morwyva ar dasWirdeba. mxolod Tu miwa mSralia, maSin daTesvisTanave rwyaven. morwyva xdeba sarwyavebiT, romlebsac ukeTeben wvril bades. daTesvis Semdeg kvalsaTburs xuraven CarCoebiT da zemodan daTbunvis mizniT afareben Wilofebs, radgan pirvel xanebSi Teslis aRmocenebamde sinaTle saWiro ar aris, aRmocenebisTanave ki dRisiT Wilfebs xsnian, CarCoebs ramdenimed asweven da amrigad aRmonaceni uzrunvelyofilia sinaTliT da haeriT. winaaRmdeg SemTxvevaSi, Tu Tavis droze ar aexada Wilofebi , kvalsaTburis maRali temperaturis pirobebSi erTi dRis ganmavlobaSic ki mcenare moiwyens da gayvi T l d eba, Semdeg misi gamosworeba metad Znel iqneba, amitom saWiroa aRmocenebis pirveli dRidanve mcenaris sinaTliT uzrunvelyofa CarCoebis awevis saSualebiT ki haeris gawmenda da saWiro temperaturis dacva. aseTive wesiT awarmoeben Tesvas s aT bur ebSi c .

**mcenaris dargva.-** dacul gruntSi xSirad gvxvdeba mcenaris gadargva. mcenarem gadargvis Semdeg, rom kargad ixaros, saWiroa gadargva Catardes wesierad, aucilebeli pirobebis dacviT. saWiroa ganvasxvavoT erTmaneTisagan mcenareTa daCiTileba anu pi ki r eba d a gad ar gva.

4. **Ci T i l ebi s aRz r d a t o r f neSo mpal i an qoT nebS i**

Zalian didi mniSvneloba aqvs CiTilis moyvanis iseT wess , rodesac gadar gvi sas fesvTa sistema naklebad ziandeba, gadarguli mcenaris zrda ar Cerdeba da amiT uz r unvel yo f i l i a s aad r eo d a saer T o d d i d i mo savl i s mi Reba.

Cveulebrivi wesiT CiTilis moyvanis dros dacul gruntSi saTburi iqneba, kvalsaTburi Tu Tbili kvali, CiTilis amoRebisas mcenares Semwovi bususa fesvebis 80% awydeba, fesvTa sistemis aseTi dazianebis gamo, gaxarebis ra gind kargi pirobebic unda SeuqmnaT mcenares, gadargvis Semdeg igi mainc zrdaSi Cerdeba, Ciavdeba, avaddeba da s abo l o o d mo s aval s mc i r e nagvi anevad i Zl eva.

CiTilis torfneSompalian qoTnebSi gamoyvanis dros, radgan es qoTnebi organuli da mineraluri nivTierebebiT mdidari mosalisagan keTdeba, mcenares ukeTesi are aqvs, vidre kvalsaTburis gruntis pirobebSi, amasTan, fesvTa sistema mas mxolod qoTnis sivrceSi uviTardeba da qoTnianad gadargvisas ar uziandeba. amitom igi aRarc zrdaSi Cer d eba, nakl ebad ac avad d eba d a s aad r eo d a maR al mo saval s ac i Zl eva.

torfneSompaliani qoTnebis dasamzadeblad gamoiyeneba: torfi, neSompala, yamiri, axali nakeli, qviSa, Semadgeneli nawilakebis Sefardeba damokidebulia am nawilebiT uzrunvelyofaze da qoTnebis daniSnulebaze. garda ZiriTadi Semadgeneli nawilebisa, nazavSi umateben agreTve mineralur sasuqebsac. amrigad, miiReba noyieri masa, romlis SemadgenlobaSi moipoveba didi raodenobis sakvebi nivTierebebi rac savsebiT uz r unvel yo f s mc enar i s mo T xo vni l ebas maT mi mar T .

qoTnebis dasamzadebeli masis SemadgenlobaSi Sedis ( moculobis mixedviT) kargad

gad amwvar i (d aS l i l i ) t o r f i 7 nawi l i . neS o mpal a ( gad amwvar i nakel i ) 2 nawi l i . yamiri miwa……--------------------------1 nawi l i

Zroxis axali nexvi---------------1 nawi l i

amis garda yovel kubur metr masaze SeaqvT mineraluri sasuqebis Semdegi

r ao d eno ba (ki l o gr amo bi T ):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Kkl t ur ebi s d asaxel eba | amoniumis gvarjila | s uper f o s f at  i | Qql o r i ani kaliumi | kiri |
| s aad r eo ko mbo s t o po mi d o r i kitri | 2,0  1,5  0,8 | 1,7  1,0  0,5 | 0,4  1,0  0,5 | 2,5  - 1,0 |

torfis uqonlobis SemTxvevaSi is SeiZleba Seicvalos neSompaliT (gadamwvari nakeliT). qoTnis dasamzadebel masas Semdegnairad amzadeben: nazavis Semadgenel nawilebs, romlebic mSralia, kargad gadaureven erTmaneTSi, gadaniCbaven da Semdeg miumateben wyalSi gaxsnil axal nakels da mTel am masas kargad aureven im varaudiT, r o m mi vi R o T c o mi s ebr i ko ns i s t enc i i s masa.

nazavi romelsac masaSi torfi ar urevia, frTxilad unda moizilos, radgan ar unda dairRves struqtura da SerCes koStovani aRnagoba. winaaRmdeg SemTxvevaSi qoTnebi gamo va yal i bi s ebr i , mal e gamo S r eba d a gaqvavd eba.

nazaviani qoTnebi SeiZleba damzaddes aguriseburad moWriT ujrian yuTSi 40-100

ujriT. qoTnebi nazavidan SeiZleba damzaddes agr eTve sxvadasxva sistemis naxevrad avtomatur

d az gebz e.

rodesac torfneSompala qoTnebSi gamogvyavs CiTili, 3% unda viangariSoT

sadazRvevo f o nd i .

vT qvaT gvi nd a gavi go T T u r a r ao d eno bi s Ci T i l i d agvet eva 5 heqt ar z e. ami saT vi s und a

vicodeT Tu ra manZilze irgveba mcenare Ria gruntSi. dauSvaT vrgavT 60X60 sm. amis Semdeg unda gavigoT erTi mcenaris kvebis are. Tu gvaqvs mwkrivad nargavi, kvebis aris gasagebad vamravlebT mwkrivebs Soris da mcenareTa Soris manZils e.i. 60X60 sm = 3600 sm2, anu 0,36 m2. e.i . axl a gavi go T r amd eni mc enar e d aet eva 1 ha-z e.

10000 r ao d eno ba BN = ------------- = 27,770 mc.

0,36

amas daumatoT sadazRveo fondi 3%-I = 833 mc + 27,770 =28603 . radgan gvaqvs mocemuli 5 heqt ar i f arTobi, ami t o m mc enar eT a r ao d eno bas vamr avl ebT 5-ze.

28603 X 5=143015 mc .

axla gavigoT ramdeni kuburi metri nazavi dagvWirdeba aRniSnuli qoTnebis dasamzadeblad. literaturidan cnobilia, rom 100 aTasi qoTnis dasamzadeblad , romlis sidide 5,5-6,5 sm-ia saWiroa daaxloebiT 25 m3 nazavi, 143015 CiTilisaTvis saWiro i qneba X r ao d eno ba.

1. ead gi neT pr o po r c i a:

1 000 000 - 25 m3 143,015 X 25

X = --------------------- = 35 m3 nazavi

143,015 - X 1000 000 gavigoT nazavis calkeuli Semadgeneli nawilebi. Tu nazavSi 7 nawili torfi, 2 nawili

neS o mpal a, 1 nawi l i yami r i mi wa d a 1 nawi l i axal i nakel i a, s ul mi vi RebT 11 nawi l s .

1. u 11 nawi l S i 7 nawi l i t o r f i a maS i n 35 m3 i qneba X . e.i . S evad gi no T pr o po r c i a:

11 – 7 35 X 7

35 – X X = ----------------- = 22,2 m3 torfi

11

11 – 2 35 X 2

35 – X X = ----------------- = 6,3 m3 neS o mpal a 11

11 – 1 35 X 1

35 – X X = ----------------- = 3,1 m3 yami r i mi wa

11 11 – 2

11 - 1 35 X 1

35 – X X = ----------------- = 3,1 m3 nakeli

11

maTi Sejamebis Sedegad miviRebT 34,7 nazavs. am nazavs emateba amoniumis gvarjila 1 m3 –

z e 1,5 kg s uper f o sf at i 1 kg kal i umi s ql o r i 1 kg.

amzadeben eqvswaxnagian qoTnebs, romlebsac qvemo nawili ufro farTe aqvs, radgan

upi r at esad aq vi T ar d eba f esvT a s i s t ema d a met ad ac ar i s uz r unvel yo f i l i s akvebi T .

eqvswaxnagiani qoTnis upiratesoba, oTxkuTxovanTan SedarebiT, isic aris rom erTi standartuli CarCos qveS meti diametrSi 60 mm, qvemoSi ki 50 mm, maSin erT CarCos qveS 400-420 mc enar e et eva.

**5. Ci T i l i s a d a nakveT i s mo mz ad eba d as ar gavad**

CiTilis dasargavad momzadebis wesi damokidebulia CiTilis aRzrdis meTodebze. kulturaze da rac mTavaria dargvis doneze. yvela SemTxvevaSi ZiriTadi yuradReba unda mi qc es gaxar ebas . kar gi gaxar eba T avi s mxr i v d amo ki d ebul i a Ci T i l i s aR z r d i s wes z e.

Cveul ebr i vi wesiT CiTilis aRzrdisas, rodesac mis moyvanas saTburis, kvalsaTburis an R i a s aCi T i l es gr unt S i awar mo eben, mT avar i a, r o m gad ar gvi s S emd eg d i d ad ar d ai r R ves damokidebuleba mcenaris miwiszeda da miwisqveda nawilebs Soris. am SemTxvevaSi CiTilis dargvis Semdeg gaxarebis ZiriTadi pirobaa mcenareSi wylis miRebasa da xarjvas Soris normaluri Sefardeba. amas aRweven jer TviT saCiTileSi CiTilis amoRebamde kargi safuZvliani morwyviT, i mi saT vi s rom CiTils amoRebisas fesvebi naklebad daawydes; Semdeg dasargavi nakveTis winaswar morwyviT ( Tu Zalian mSralia) da dargvisTanave mo r wyvi T . zogjer Tu dasargavi mcenare didia awarmoeben satranspiracio zedapiris Semcirebas didi foTlebis Secvlis gziT. gadarguli mcenaris advilad gaxarebisa da kargi dafesvianebisaTvis xelsayreli pirobebis Seqmna saTburebsa da kvalsaTburebSi ufro advilia. Ria gruntSi CiTilis dargvas amjobineben Rrublian an wvimian dRes, radgan aseT amindSi mcenare ufro kargad xarobs, Tu Rrubliani amindi ar aris da dargvis gadavadeba ar SeiZleba, maSin mzian dRes am samuSaos SuadRis Semdeg, saRamos saaTebSic awarmoeben. cxeli, mSrali qarebis qrolvis periodSi CiTilis dargvas s aer T o d er i d ebi an, r ad gan am d r o s mi s i d aR upva mo sal o d nel i a gamo S r o bi s gamo .

saadreo CiTilis gadargvamde mis gakaJebas agreTve didi mniSvneloba aqvs. gakaJebuli mcenare ufro kargad egueba garemos, ufro advilad cocxldeba da swrafad i wyebs i nt ens i ur z r d as .

kvalsaTburebSi aRzrdili CiTilis gakaJebas gadargvamde 10-12 dRiT adre iwyeben. pirvel 3-4 dRes CarCoebs xdian SuadRis saaTebSi, Semdeg 3-4 dRes dilidan saRamo md e, xo l o ukanas knel 3-4 dRes - d R e d a Rame.

torfneSompalian qoTnebSi aRzrdili saRi CiTili gakaJebis Semdeg SeiZleba mourwyavad iqnes gatanili dasargavad, magram dargvis organizacias didi mniSvneloba aqvs , r ad gan d i d i mo c ul o bi s s amuSao ebT an gveqneba s aqme.

msxvili meurneobis pirobebSi miTumetes saadreo CiTilis moyvanisas, saCiTile meurneoba mowyobilia erT adgilas da Semdeg aqedan miaqvT Teslbrunvis calkeul mindvrebze dasargavad. gakaJebul CiTils iReben da awyoben standartul saTes yuTebS i d a S emd eg awyo ben t r anspo r t z e mi nd o r S i wasaR ebad .

transportze didi raodenobis CiTilis mosaTavseblad awyoben specialur ujredebian

gal i ebs , r o ml ebS i c yuT ebi i s e i d gmeba, r o m er T maneT s ar awveba d a Ci T i l i ar z i and eba.

aseTi galiebi ewyoba manqanaze, romelSic idgmeba CiTiliani yuTebi, ris gamoc erT

r ei s z e Ci T i l ebi s d i d i r ao d eno ba S ei Zl eba i qnes gad at ani l i .

i mis gamo, rom daZleulia uxerxuloba CiTilis dasargav adgilze gadatanisaTvis

ewyoba sameurneobaTaSoriso saCiTile meurneobebi, sadac maqsimalurad iqneba gamoyenebuli meqanizacia da miiReba dabali TviTRirebulebis mqone xarisxovani CiTili, romlis dargvis adgilas gadatana manqanebiT did siZneles aRar warmoadgens. am mizniT ewyo ba agr eT ve saCi T i l e ko mpl eqs ebi .

**6. d argvis wesebi.** dasargavad winaswar kargad momzadebuli CiTili SeiZleba dairgas xeliT da manqanebiT. patara zomis meurneobebSi xeliT dargvis dros nakveTs dadgenili kvebis ares mixedviT winaswar amarageben da mownul adgilas mcenares rgaven xeliT, paloTi an ormoSi. paloTi dargva iseT SemTxvevaSia SesaZlebeli, rodesac CiTils Cveulebrivi wesiT zrdian da saCiTiledan amoRebis dros miwa naklebad moyveba xolme. amitom, mcenaris fesvTa sistemis gamoSrobisagan dasacavad amoRebuli CiTils fesvebs Txis an Zroxisnakel i s xsnarSi (6:1) amoavleben. es xsnari, ara marto icavs amoTxris Semdeg darCenil fesvebs gamoSrobisagan, aramed uzrunvelyofs dazianebuli nawilis swraf aRdgenasac. amas T anave, paloTi dargva mxolod gansazRvruli sididis mc enar i saT vi s i qneba SesaZl ebel i .

paloTi dargvisas, moniSnul adgilas paloTi gakeTebul xvrelSi CauSveben fesvebs da paloTive miutkepnian miwas im angariSiT, rom miwa fesvebs kargad mietkepnos da c ar i el i ad gi l i ar d ar Ces xvr el S i .

ufro xSirad xeliT dargvas awarmoeben an naRarebSi an ormoSi. ormoebs akeTeben ToxiT, bariT an SalTiT. amoRebul ormoSi SeaqvT sasuqi ( sasuqebis adgilobrivad S et ana), r o mel s ac mi waS i ur even d a S emd eg S i g r gaven Ci T i l s . T u ni ad agi Zal i an mS r al i a, maSin ormos morwyvas winaswar awarmoeben da Semdeg rgaven. dargvisas fesvebs MmWidrod at kepni an f esvebz e, S emd eg o r mo ebs r wyaven d a z emo d an mS r al mi was ayr i an.

sarwyavi meurneobis pirobebSi dargvas awarmoeben ufro metad naRarebSi. naR ar ebs

akeTeben guTniT an SemomyreliT, Semdeg saWiro manZilze Caarigeben CiTils da rgaven naR ar i s gver d ebz e d a r wyaven.

xeliT dargvis dros CiTili dargvis Semdeg swrafad iviTarebs Reros qvemo

nawilidan damatebiT fesvebs. amasTan dakavSirebiT iseT CiTils, romelsac Rero sustad aqvs ganviTarebuli, xolo foTlebi rozetSi aqvs Sekrebili ( kombosto, miwamxala, ni axur i , sal aT a) ver t i kal ur ad r gaven pi r vel i saR i f o T l i s d o nemd e mi waS i CaR r mavebi T .

**mevenaxeo ba**

saxalxo meurneobis ekonomikaSi mevenaxeoba yovelTvis TvalsaCino rols asrulebda da mTel rig raionebSi dResac mosaxleobis materialuri mdgomareobis gaumjobesebisa d a maT i kul t ur ul i d o ni s amaRl ebi s Zi r i T ad i wyar o a.

vazis ZiriTadi dadebiTi niSan-Tvisebebi, riTac man adamianis siyvaruli da pativiscema

d ai msaxur a, S emd egS i gamo i xat eba:

kvebis mxriv, rogorc naklebmomTxovni mcenare, daubrkolebriv viTardeba iseT niadagebzec ki, sadac soflis meurneobis mTel rig kulturaTa warmoeba SeuZlebeli da an mcire efeqtis momcemia (sakmaod an metad daferdebuli cicabo adgilebi, xirxati da qvi ani ni ad agebi , s i l nar i d a s xva).

soflis meurneobis mTel rig mravalwlian mcenareebTan SedarebiT, vazi adre iwyebs

mosavlis mocemas. saTanado movlis pirobebSi igi dargvis meore welsve iZleva mcireoden mosavals; mesame wels sakmao mosavlianobiT xasiaTdeba, xolo srul mo s avl i ano bas i wyebs meo T xe-mexuT e wel s .

vazidan miRebul i pr o d uqc i a mr aval i d ani S nul ebi T gamo i yeneba. T u pi r o bi T ad mi vi R ebT

erT heqtar wesierad movlil venaxidan 100 centner yurZnis mosavals, misgan SeiZleba miRebul iqnas Semdegi saxeobisa da raodenobis produqcia: sufris yurZeni, qiSmiSi, yur Zni s wveni , R vi no .

damzadebis Taviseburebis mixedviT arsebobs Semdegi saxis Rvinoebi: samarko sufris Rvino, ordinaluri sufris Rvino masobrivi gamoyenebisaTvis, Sampanuri Rvino, sadeserto magar i d a t kbi l i l i qi o r ul i R vi no .

vazis warmoSobis Sesaxeb myari werilobiTi masalebi ar mogvepoveba. mTeli rigi gamokvlevani, warmoebuli mcenareuli paleontologiis dargSi, saSualebas gvaZlevs vifiqroT, rom igi aTaseuli wliT ufro xnieri unda iyos TviT kacobriobaze. vazis kulturis ganviTarebis istoria ki uSualod dakavSirebulia kacobriobis ganvi T ar ebi s istoriasTan. vazis pirveli paleontologiuri naSTebi carcis periods unda aRwevdes. prof. palibinis mixedviT vazisebr mcenareTa uZveles tips warmoadgens gvari **cizetes**- winapari Tanamedrove gvaris **cisusisa**. vaznair mcenareTa winaprebi adamianis warmoSobamde gavrcelebuli yofila msoflios rogorc CrdiloeT, ise samxreT raionebSi. gamyi nvar ebi s Semd eg ki mi s i gavr c el ebi s ar eal ma samxr eT i s aken d ai wi a.

miuxedavad imisa, rom arqeologiuri kvlevis Sedegad sakmaod mdidari masala mogvepoveba vazis uZveles droSi warmoebis Sesaxeb, jer kidev sabolood dadgenili ar aris soflis meurneobis es Zvirfasi dargi – mevenaxeoba romel mxareSi iqna dawyebuli. Cvens qveyanSi, vazis kulturis istoria dakavSirebulia qarTveli eris istoriasTan da amitom saqarTvelos mevenaxeobis dasawyisi Soreul warsulSi unda veZioT. mevenaxeobis ganviTarebis sawyisebi saqarTvelos teritoriaze naTladaa warmodgenili eneoliTis epoqaSi e.i. 4 aTasi wlis win Cvens welTaRricxvamde, amis damadasturebelia yurZnis wipwebi da sxvadasxva formisa da moculobis Tixis saRvine WurWlebi. gansakuTrebiT sayuradReboa Sulaveris zonaSi arqeologiuri gaTxrebis Sedegad saRvine WurWelSi aRmoCenili yurZnis wipwebi, romelTa xnovaneba dReidan 7-6 aTas wels aRwevs. qarTveli xalxis ekonomikuri Zlierebis ganmtkicebaSi vazi da misi produqti yovelTvis udides rols asrulebda. amis dasamtkiceblad akad. i. javaxiSvils mohyavs mTeli rigi metad saintereso faqtebi. magaliTad, saqarTvelos dayofa or geografiul da botanikur nawi l ad . igi aRniSnavs, rom “ sadamdisac mevenaxeoba SesaZlebeli iyo iqamdis qveyana barad iTvleboda, saiTganac vazis moyvana ukve SeuZlebeli iyo, im xaziTgan moyolebuli ukve mTad iyo miCneuli.” amas garda, akad. i. javaxiSvili aRniSnavs: “mevenaxeobameRvineobas Zvels saqarTvelos sagareo vaWrobaSiac friad mniSvnelovani adgili ekava d a qar T ul i R vi no uZvel es i d r o i d anve saeqs po r t o s agans S ead gend a. ”i qve mo xs eni ebul i a:” saqarTvelosaTvis mevenaxeoba-meRvineobis gansakuTrebuli ekonomikuri mniSvneloba kargad esmodaT mis mezobel mtrebs da swored amiT aixsneba, rom me-14 saukunis damdegs Temur-lengma da Semdeg me-17 saukunis damdegs Sah-abasma saqarTvelos ekonomikurad d as auZl ur ebl ad T avi anT l aSqar s venaxebi s gakaf va-amo gd eba ubr Zanes .”

saqarTvelos dayofa mevenaxeobis raionebad, ZiriTadad eyrdnoba vazis jiSTa asortiments da mis sawarmoo mimarTulebas. saqarTvelo mevenaxeobis TvalsazrisiT S ei Zl eba d ai yo s S emd eg r ai o nebad :

kaxeTi. a) Sida kaxeTi. masSi Sedis axmeta, Telavis, siRnaRis, yvarlis, lagodexis, d ed o f l i s wyaros da gurjaanis (garda ukanamxrisa) administraciuli raionebi. Sida kaxeTi warmo ad gens kavkas i o ni s a d a c i v-go mbo r i s mT ebi s kal T ebi s d aqanebas d a d as er i l i a mravali xeviT. Sida kaxeTis mevenaxeobis raions erT-erTi ZiriTadi adgili ukavia. am raionSi Sedis cnobili winandlis, mukuznis, yvarlis, nafareulis, kardenaxisa da xi r s i s war mo ebebi.

b) gare kaxeTis raioni Seicavs sagarejos administraciul raions da Tbilisis gareubnis zogierT nawils. am raions aRmosavleTiT sazRvravs civ-gomboris mTa, romelic hyofs mas Siga kaxeTisagan. CrdiloeTiT da Crdilo-dasavleTiT mas akravs qarTlis mTebi, xolo danarCeni mxridan samxreT-aRmosavleTiT, samxreTisa da samxreTdasavleTiT gaSlilia. es raioni mniSvnelovania sufris yurZnis warmoebis T val s az r i s i T .

qarTli. qarTlis mevenaxeobis raionSi Sedis Tbilisis gareubani, mcxeTis, kaspis, goris, duSeTis, xaSuris, borjomis, bolnisis, marneulis, gardabnis administraciuli raionebi. qarTlis teritoriis reliefi qmnis SedarebiT mkacr klimatur pirobebs, ris gamoc mevenaxeoba moeqca zogierT bunebrivad dacul mtkvris Senakadebis xeobebSi an velebSi. qarTlis raionis cnobili jiSebia: Cinuri, goruli mwvane da sxva. aRsaniSnavia isic, rom zogierTma ucxo jiSma qarTlis raionSi ukeTesi pirobebi hpova, vidre Tavis samSobloSi. am jiSebzea dayrdnobili brwyinvale ganviTarebis gzaze damdgari Sampanuri Rvinoebis warmoeba qarTlSi. qarTli udides rols asrulebs agreTve sufris yurZnis gamo yenebi s per i o d i s gaxangr Zl i vebaS i .

z emo qarTli. axalcixe, adigenisa da aspinZis raionebi. es raionebi warmoadgenen Zvel mesxeTs, romlis materialuri kulturis Zeglebi adastureben mevenaxeobis saintereso warsuls saqarTvelos am mxareSic. venaxebis gasaSeneblad pirvel rigSi unda SeirCes qarebisagan daculi ferdobebi, samxreT-aRmosavleTisa da samxreTisaken daqanebuli nakveTebi, raTa gaadvildes vazis dacva zamTrisa da gazafxulis yinvebis uaryofiTi mo qmed ebi s agan.

qvemo qarTlis mevenaxeobis raioni warmodgenilia mdinare xramis xeobiT, romelTagan mTavaria bolnisis xevi, maSavera da Sulaveris wyali. mevenaxeobis am raions unda miekuTvnos gardabani, romelic mtkvris marcxena mxareze mdebareobs da SedarebiT msgavs pirobebSia bunebrivi faqtorebis zegavlenis mxriv. qvemo qarTlis mevenaxeobis raioni SeiZleba daiyos sam qveraionad: yular-algeTis, rotevan-bolnisisa da Saumianis qveraionebad. mevenaxeobis TvalsazrisiT, ufro sainteresoa yular-algeTis qveraioni, romlis klimaturi pirobebi Tavisebur mimarTulebas aZlevs am dargs. uxvi siTbo, mdidari da noyieri niadagebi, nakveTebis vake mdebareoba did perspeqtivas Slis mevenaxeobis ganviTarebisaTvis. am qveraionSi vegetacia adre iwyeba, rac xels uwyobs yurZnis adre damwifebas. es ki saintereso winapirobaa sufris yurZnis warmoebisaTvis farTo masStabiT. aq SesaZloa ganviTardes qiSmiSisa da sxva saxeobis ualkoholo pr o d uqt ebi s war mo ebac .

imereTi saqarTvelos mevenaxeobis erT-erTi ZiriTadi raionia, romelic dasavleTis mxridan gaSlili da daqanebulia Savi zRvisaken, rac mkveTr gavlenas axdens mis klimatze. zemo imereTSi Sedis xaragaulisa da WiaTuris administraciuli raionebi. Sua i mer eT S i - zestafonis, Terjolis, tyibulis da baRdadis raionebi da agreTve quTaisis raionis nawili. qvemo imereTi Seicavs samtrediis, xonisa da vanis admins i s t o r i ul . raionebs da quTaisis samxreT nawils. imereTis mevenaxeobis TvalsazrisiT mniSvnelovani qver ai o nebi a:

saCxeris qveraioni - venaxebi ZiriTadad gaSenebulia muqwabla, mZime da humusiT Rarib

ni ad agebz e. es qver ai o ni Zi r i T ad ad s uf r i s T eT r s a d a wi T el R vi no ebs i Zl eva.

tyibulis qveraioni – am qveraionis venaxebi ZiriTadad gaSenebulia monacisfro-yvi T el

da rux-yviTel Tixnar niadagebze. es qveraioni iZleva saSualo xarisxis Rvinoebs, magram z o gi er T ubanS i S ei Zl eba s akmao d xar i s xi ani T eT r i s uf r i s Rvi ni s mi R ebac .

zestafon-baRdadis qveraioni yvelaze did da mniSvnelovan mevenaxeobis qveraions warmoadgens. ZiriTadad imeruli tipis TeTri xarisxivani Rvinoebis raionia, xolo mis z emo nawi l S i ki xel s ayr el i pi r o bebi a Sampanur i Rvi no ebi s war mo ebi s aT vi s .

quTaisis qveraioni - Seicavs qalaq quTaisidan CrdiloeTiT mdebare mTian zonas da samxreTiT mdebare vake adgilebs. venaxebi gvxvdeba umTavresad sxvadasxva feris Tixnar niadagebze. venaxebs aSeneben agreTve, danaleq msubuq, ConCxian da ewer- ni ad agebze. am qver ai o ni s T eT r i s uf r i s R vi no ebi sakmao ener gi ul o bi T xas i aT d eba.

vanis qveraionis teritoria ZiriTadad moTavsebulia aWara-axalcixis mTis Stoebze, romlebic samxreTidan CrdiloeTisaken miemarTeba da eSveba rionis dablobSi. am qver ai o nS i mi i R eba s aS ual o xar i s xi s suf r i s R vi no .

raWa-leCxumi. raWa iyofa or nawilad - zemo raWad, romelSic Sedis onis

administraciuli raioni da qvemo raWad, romelic ambrolauris ad i ni s t r aciul r ai o ns Seicavs. raWis teritoria mTagoriania, daRarulia mTebiTa da mdinareebiT da mdebar eo bs Sua da zemo imereTis CrdiloeTiT. qvemo raWis qveraioni iZleva xarisxovan, naxevrad tkbil wiTel Rvinoebs - md. rionis marjvena napiri. misi marcxena napiris venaxebi ki gaSenebulia CrdiloeTisa da Crdilo-aRmosavleTis kalTebze, ris gamos venaxebi ar axel s ayr el pi r o bebS i a mo qc eul i , i Zl eva s aS ual o xar i s xi s T eT r Rvi no ebs .

zemo raWis mevenaxeoba adgilobrivi mniSvnelobisaa. Tumca calkeul mikropirobebSi SeiniSeba xarisxovani TeTri Rvinis miReba. am mxriv gansakuTrebiT aRsaniSnavia jiSi mcvivani.

leCxumi – d af arulia gorakebiTa da mTebiT. misi CrdiloeTisa da aRmosavleTi mxar e

moqceulia mkacri klimatis pirobebSi. leCxumis mevenaxeobis raionSi Sedis cageris ad mi ni s t r ac i ul i r ai o ni .

raWa-leCxumSi miiReba sakmaod kargi Rirsebis TeTri da wiTeli Rvinoebi. mevenaxeobis

es raioni sakmaod mdidaria vazis Zveli jiSebiT, rogorebicaa: wulukiZis TeTra, aleqsandrouli, mujureTuli, usaxelouri da sxva. es raioni ganTqmulia maRal xar i s xo vani wi T el i R vi ni T , r o mel i c c no bi l i “xvanWkar as ” s axel wo d ebi T . samegrelo md ebar eo bs s aqar T vel o s Cr d i l o -dasavleT nawilSi. misi xarisxovani Rvinis momcemi mikoraionebia: axuTi, muxuri, salxino, WkaduaSi, focxo-uS af aT i . samegrelo md i d ar i a ad gi l o br i vi j i S ebi T , r o mel T agan gansakuT r ebi T aRs ani S navi a j i S i ‘’ o j al eS i ’’.

gur i a Seicavs ozurgeTis , lanCxuTisa da Coxatauris administraciul raionebs. misi teritoriis didi nawili gamoyenebulia subtropikuli Zvirfasi kulturebisaTvis, magram maT gverdiT zogierT mikroraionSi viTardeba mevenaxeobac. guria cnobilia adgilobrivi jiSebis simravliT. gansakuTrebiT aRsaniSnavia Cxaveri, sxilaTubani, mtevandidi, al ad as t ur i , j ani d a s xva. gur i i s j i Sebi Zi r i T ad ad wi T el yur Zni ani j i S ebi a.

aWar a Seicavs baTumis, qobuleTis, qedisa da xulos administraciul raionebs. vazi

maRlaris saxiT ZiriTadad gvxvdeba rogorc zemo, ise qvemo aWaraSi, TiTqmis yvela sofelSi 900 metrsa da met simaRleze zRvis donidan. adgilobrivi jiSebidan aRsaniSnavia: xofaTuri, klarjuli, brola, butko da sxva. amJamad yvelaze gavrcelebuli j i S i a i z abel a.

# vaz i s o j axi s daxas i aT eba

vazi mxviara mcenarea da vazisebrTa ojaxs miekuTvneba. saerTaSoriso terminologiiT

am o j axs vi t ac ea (VITACE) anu ampel i d e (AIDE) ewo d eba.

vitisis gvarSi Sedis ori qvegvari – muskadinia da euvitisi. muskadiniaSi Sedis ori amerikuli saxeoba: rotundifolia da munsoniana, xolo euvitisSi – 18 amerikuli, 11 az i ur i d a er T i evr o pul i .

# vaz i s o r gano gr af i a

***fesvi*** – vazis TesliT anu wipwiT gamravlebis SemTxvevaSi mas uviTardeba erTi mTavari

f es vi , r o mel i c veget ac i i s pi r vel save per i o -d S i i t o t eba r amd eni me wyeba f es vi T .

kvirtiT gamravlebis dros, fesvTa sistema viTardeba jgufurad kvirtis mopirdapire mxridan 3-5 calis, zogjer meti raodenobiT. ganviTarebis Semdgom periodSi isini Tavis mxr i v i t o t ebi an meo r ad i d a mesame wyebi s f esvebi T d a amr i gad , s abo l o o d i qmneba mr avl ad ganvi T ar ebul i bad i sebr i f es vT a s i s t ema.

vazis rqiT gamravlebis SemTxvevaSi mas Tavidanve muxlidan uviTardeba fesvTa sistema 2-3-5 da zogjer metic, swored am niSniT gansxvavdeba igi Teslidan ganviTarebuli vazis f es vT a s i s t emi s agan.

daniSnulebis mixedviT vazis fesvze SeiZleba ganvixiloT Semdegi nawilebi: fesvi s

f ar i ; z r d i s ar e; S es r ut vi s ar e; gamt ar ebel i z o na.

***Stambi*** – vazi ekuTvnis mxviara mcenareTa jgufs da amitom igi Tavisi ganviTarebisaTvis saWiroebs sayrdenze damagrebas. Tavisufal pirobebSi aRzrdili vazi sagrZnob simaRleze viTardeba (15-20m da zogjer meti) masTan axlos mdgom mcenareebze SemoxveviTa da mimagrebiT, gansakuTrebuli organoTi pwkaliT anu ulvaSiT. amgvar pirobebSi aRzrdil vazs axasiaTebs metad maRali tani anu Stambi. igi simsxoSic mZlavrad viTardeba da xelSemwyob ekologiur pirobebSi aRwevs naxevar metramde da metsac. vazis Stambi mis mTel sigrZeze uTanabrodaa ganvi - Tarebuli da formirebis T avi s ebur ebi s mi xed vi T mas z e ganvi T ar ebul i a mxar i d a r qa.

***mxari*** – uSualod vazis tanzea dakavSirebuli da aRzrdasTan dakavSirebiT misi

r ao d eno ba d a s i gr Zec s xvad asxvagvar i a.

***rqa*** – vazis erTwlian nazards warmoadgens. am saxelwodebas igi atarebs mxolod gaxevebis anu damwifebis Semdeg. manamde ki mas ylorts uwodeben. ylorti vazze warmoiSoba savegetacio periodis dasawyisidan rqaze an Zvel nawilebze arsebuli kvi r t ebi d an. simwifis periodSi rqis moyvaniloba SeiZleba iyos: mrgvali, odnav gabrtyelebuli da mcired waxnagovani. momwifebuli rqis damaxasiaTebeli niSania gare kanis sruli Semosvla (romelic rqis gadaRunvis SemTxvevaSi advilad skdeba); agreTve d i d i r ao d eno bi T saxamebl i s d agr o veba.

***namxari*** – foTlis yunwis iRliaSi viTardeba namxaris kvirti, romlidanac ylortis Zlieri zrdis periodSi warmoiSoba damatebiTi ylorti, romelsac namxari ewodeba. saerTod, namxari vazisaTvis zedmet mwvane masas warmoadgens da igi unda moecalos mas. aRsaniSnavia isic, rom gansazRvrul farglebSi namxars sargeblobac moaqvs mTavari kvirtis ganviTarebis saqmeSi, rogorc damatebiT mkvebav organos, ris gamoc misi Secla Zi r S i ve d auS vebel i a.

***kvirti*** – vazze vamCnevT Semdegi saxis kvirtebs: mTavars anu zamTrisas, mTavari kvirtis fuZesTan mdebare samarago anu Semcvlel kvirtebs, martivs da miZinebul kvirtebs. kvirtSi Casaxuli ylorti Seicavs yvela im organos, romlebsac Cven vxvdebiT ukve ganvi T ar ebul yl o r t z e (f o T l ebi , yvavi l ed i , pwkal i ).

***pwkali*** – pwkali anu ulvaSi vazis ylortis muxlze Cveulebriv foTlis mopirdapire

mxridan viTardeba. misi ganviTareba mosavlis momcemi vazis jiSebis ylortebze mesamemexuTe muxlidan iwyeba. igi yovel or muxlze viTardeba mesame muxlis gamotovebiT, amrigad, ylortis yoveli ori muxli pwkals Seicavs, xolo mesame ki upwkloa. vinaidan pwkali da mtevani erT zonaSi mdebareoben, amitom igi ukanasknelis saxecvlilebas war mo ad gens.

***foToli*** – vazisaTvis foToli erT-erTi ZiriTadi organoa. misi mTavari Semadgeneli

nawi l ebi a yunwi d a f i r f i t a. yunwi T f o T o l i mi magr ebul i a yl o r t z e yo vel T vi s kvi r t ebi s mxridan. misi saSualebiT firfita moZraobs da sinaTlisadmi xelsayrel pirobebSi ayenebs foTols. foTlis firfita SeiZleba iyos: momrgvalo, ovaluri, grZeli, gul i s magvar i , gani v - o val ur i , kver c xi s ebr i d a s o l i s ebr i .

***yvaviledi da yvavili*** – ylortis pirveladi zrdis periodSi mas mesame-mexuTe muxlze uviTardeba mtevani, romelsac ganviTarebis pirvel fazaSi yvaviledi ewodeba. igi yovelTvis kvirtis mopirdapire mxares e.i. pwklis adgilas viTardeba. vinaidan yvaviledi pwklis adgilas viTardeba da mTeli rigi niSnebiT pwkals uaxlovdeba, amitom es organoebi urTierTis saxecvlilebas warmoadgenen. yvavili yvaviledze mimagrebulia yunwiT da maTi raodenoba yvaviledze metad cvalebadia. morfologiuri agebulebiT yvavili Seicavs Semdeg nawilebs: jami, gvirgvini da butko. butko Tavis mxriv Sedgeba: dingis, svetisa da naskvisagan. sqesobrivi agebulebis mixedviT arsebobs vazis yvavilebis Semdegi tipebi: orsqesiani anu hermafrodituli; funqcionalurad mamrobiTi; f unqc i o nal ur ad md ed r o bi T i ; wmi nd a md ed robiTi.

***mtevani da marcvali*** - ganayofierebis damTavrebis Semdeg yvavilidan cviva mtvrianebi da butkos dingi gaxmobas iwyebs, aseve xmeba sveti, xolo naskvi, romelSiac ganayo f ierebis Semdeg Tesli warmoiSoba, TandaTan iwyebs xorcis Sesxmas, Rebulobs mo mr gvalo formas da saboloo jamSi marcvlad gadaiqceva. es marcvlebi Rerukas saSualebiT damagrebulia klertis gantotebaze da amrigad, yvaviledi sabolood mtevnis saxes Rebulobs. maSasadame, mtevani morfologiurad yvaviledis agebulebisaa da Sedgeba Semdegi nawilebisagan: mtevnis yunwi, klerti, marcvlis yunwi da marcvlebi. mtevani ylortze yunwiTaa mimagrebuli. mtevnebi formis mixedviT SeiZleba iyos: cilindruli, c i l i nd r ul -konusisebri, frTiani, uformo da gantotvili. mtevnebi erTimeorisagan gansxvavdeba agreTve sikumsiT anu SekrulobiT. amis mixedviT gvxvdeba misi Semdegi t i pebi : met ad T xel i , T xel i , saS ual o s i kums i s , kums i d a met ad kums i .

mar c val i mt evanz e mi magr ebul i a yunwi T . mi s i S ef er vi s mi xed vi T vaz i s j i S ebi Zi r i T ad ad

orgvaria: TeTr da feradyurZniani. jiSebis mixedviT arsebobs marcvlis Semdegi formebi: mrgvali, momrgvalo ovaluri, ganiv-ovaluri, kvercxisebri, ukukvercxisebri, mogrZo da grZeli. marcvlis kani SeiZleba iyos: Txeli, saSualo sisqis, sqeli da metad sqeli. jiSis Taviseburebis mixedviT marcvali SeiZleba iyos: metad wvniani da mcire rbilobiT, sakmaod wvniani da sakmaod rbilobiT, nakleb wvniani da ufro rbilobiani da metad wvni ani d a mo mat ebul r bi l o bi ani . ***wipwa*** - moTavsebulia marcvlis SuagulSi. misi raodenoba marcvalSi 1-4 cals aRwevs. vazis jiSisa da saxeobis mixedviT misi forma da sidide mravalgvaria. ZiriTadad igi msxlisebri moyvanilobisaa. misi mTavari morfologiuri nawilebia: niskarti anu wveri, zurgis mxare, masze moTavsebulia CaRrmavebuli nawili e.w. qalaZa da muclis mxare ori Rerisebri CaRrmavebiT. wipwa SeiZleba iyos: Ria yavisferi, yavisferi, moyviTalo da mowiTalo elferiT. wipwis Sinagani nawili gavsebulia cilovani nivTierebiT, romelSic didi raodenobiTaa moTavsebuli mqrolavi cximebi, romelTac arasasiamovno gemo axasiaTebT. wipwa garedan Semokrulia sami wyeba garsiT. gare garsi mdidaria mwklarte ni vT i er ebi T e.w. t ani ni T .

# vaz i s bi o l o gi ur i ganvi T ar ebi s f az ebi

vaz i s c xo vr eba wl i s per i o d S i S ei Zl eba gavyo T o r xanad : pas i ur ad d a aqt i ur ad .

***pasiuri anu mosvenebis xana*** vazis cxovrebaSi foTlebis gacveniT iwyeba umetesad Semodgomaze da igi grZeldeba adre gazafxulamde - vazis tirilis dawyebamde. t i r i l i s dawyeba misi gamoRviZebis maCvenebelia. aqedan iwyeba meore didi xana vazis cxovrebaSi e.i. aqtiuri xana, romelic grZeldeba gazafxulidan gvian Semodgomamde da mTavrdeba vazis f o T l ebi s d ac veni T .

pasiur xanaSi gadasvlis win vazi winaswar emzadeba, saxeldobr, misi zrda minimumamde

mcirdeba, foToli Semodgomis elfers Rebulobs, yviTldeba da cviva. civ qveynebi foTlebTan erTad namxrevebic cviva. vazis xnovani nawilebi korpis qsovilebiT ifareba, fesvebi aCerebs zrdas da amrigad, garegnuli niSnebiT mTeli vazi gadadis dasvenebis xanaSi. am periodSi venaxebSi mimdinareobs mTeli rigi agroteqnikuri xasiaTis samuSaoebi : gasxvla, venaxis Sevseba gamorgviT, venaxis niadagis damuSaveba, sas uqi s S et ana d a a.S.

**aqtiuri xana – i gi Sei Zl eba d avyo T Semd eg bi o l o gi ur f az ebad :**

1. ***tiril i*** – igi iwyeba vazis wvenis moZraobis dawyebidan da grZeldeba kvirtebis

gamofurCqnamde, rodesac niadagSi – fesvTa sistemis zonaSi – temperatura miaRwevs 7-10 gradusamde, iwyeba fesvebSi arsebul marag nivTierebaTa gadanacvleba vegetatiur organoebSi, agreTve sawovrebis mier axal mineralur nivTierebaTa mogroveba da vazis zeda nawilebisaTvis miwodeba. vazis fesvTa sistemidan wylis miwodeba metad Zlieri ZaliT warmoebs da es wneva xSirad 1,5 atm. aRwevs. rqis zedapirze ubralo TvaliTac advili SesamCnevia amosuli wylis wveTebi. tirilis movlenebi vazSi gamowveulia ori f aqt o r i s mo qmed ebi T : s i T bo T i d a t eni T .

1. ***kvirtebis gamofurCqvna da ylortebis ganviTareba*** – aRniSnuli faza sxvad as xva

dros iwyeba da es sxvaoba 10-15 dRemde meryeobs. saqarTveloSi martis bolo ricxvebidan iwyeba. agroteqnikuri samuSaoebidan am fazaSi tardeba venaxSoi Semdegi operaciebi: ylortebis danormeba, namxrevebis Secla, sarze an mavTulze axveva, niadagis sagazaf xul o d amuS aveba, S ewamvl a s o ko van avad myo f o baT a sawi naaRmd ego d .

g) ***yvaviloba*** – es faza iwyeba yvavilobis niSnebis gamoCeniT da mTavrdeba sruli dayvavilebiTa da marcvlebis gamonaskviT. yvavilobis procesi aRiniSneba yvavilidan gvirgvinis gaxsniTa da gadaZrobiT. yvavilobis procesis sworad Catareba maRali mosavlis miRebis sawindaria. am biologiur fazaSi gansakuTrebuli movla da yuradReba esaWiroeba venaxs, saxeldobr: yvavilobis dawyebamde ylortebi axveuli unda iyos da araviTar SemTxvevaSi es operacia yvavilobis dros ar unda warmoebdes; dauSvebelia am periodSi niadagis damuSaveba, vinaidan mosalodnelia yvavilebis meqanikuri dazianeba; dauSvebelia am periodSi venaxis morwyva, radgan niadagi civdeba, rasac Sedegad yvavilcvena moyveba; ar SeiZleba Sewamvla bordos xsnariT, vinaidan mosalodnelia yvavi l i s naz i nawi l ebi s d az i aneba.

d ) ***marcvlebis gamonaskva da yurZnis SeTvaleba*** – am fazaSi venaxSi Casatarebeli

agroteqnikuri RonisZibebidan aRsaniSnavia: vazis ganmeorebiTi gafurCqvna – namxr evebi s

Secla, ylortebis axveva, niadagis perioduli damuSaveba, morwyva da Sewamvla. sadedeSi – namxrevebis Secla, mwkrivTa Soris niadagis damuSaveba, vazis mwkrivebSi sarevela bal axebi s mo c i l eba.

e) ***yurZnis sruli simwife*** – es faza iwyeba yurZenSi Tvalis SesvliT da mTavrdeba sruli simwifiT. igi grZeldeba 20-60 dRemde sxvadasxva ekologiur pirobebSi. fazis dasasruls warmoebs zogierTi vazis jiSis rTveli ( Sampanuri, adreula saRvine da sufris yurZnis jiSebi). am fazaSi venaxSi tardeba Semdegi agroteqnikuri RonisZiebebi: rqis wverebis gadaWra anu cis gaxsna, zogierT jiSze namxrevebis Secla da saWiroebis mi xed vi T axveva, ni ad agi s per i o d ul i d amuS aveba.

v) ***foTolcvena*** – aRniSnuli faza iwyeba yurZnis fiziologiuri damwifebiT da mTavrdeba foTolcveniT. foTolcvena iwyeba Cveulebriv noembris pirveli naxevridan da gr Zel d eba d ekembr i s pi r vel amd e.

# bunebr i vi f aqt o r ebi s gavl ena vaz z e

***siTbo*** – vazis zrda 80 qvemoT ar wamoebs. 25-300 pirobebSi igi intensiurad viTardeba, xolo ufro maRali temperaturis dros misi ganviTareba ferxdeba da mwvane nawilebis arujvis gamo sabolood Cerdeba. niadagis xSiri damuSaveba da morwyva amcirebs arujvis process. yinvisagan dacvis RonisZiebebidan aRsaniSnavia: gvian gaRviZebisunariani jiSebis SerCeva, vazebis dagvianebiT gasxvla, da venaxSi ubnobrivad daboleba. am ukanasknel RonisZiebas damakmayofilebeli Sedegis mocema SeuZlia mxolod im SemTxvevaSi Tu yi nvebi s d r o s kvaml i venaxi s mT el ar ez e i qneba d af eni l i .

***teni*** – vazis mwvane nawilebis mier aorTqlebuli wylis kompensacia ganuwyvetliv unda xdebodes fesvebis mier SeTvisebuli wylis miwodebiT, winaaRmdeg SemTxvevaSi moxdeba fiziologiuri funqciebis darRveva da Sedegad mcenaresac daRupva moelis. garda amisa, tenis roli mdgomareobs imaSi, rom vazSi xdeba gadanacvleba sakvebi nivTierebebis, romlebic mxolod wyalSi gaxsnili saxiT evlineba vazis vegetaciur nawilebs. tenian raionebSi Sesaferis niadagur pirobebSi aRzrdili vazis ganviTareba metad Zlieria vi d r e mS r al kl i mat ur pi r o bebS i .

***haeri*** – vazis zrda-ganviTarebis erT-erTi faqtoria. haerSi arsebuli JangbadiT warmoebs sunTqvis procesebi, xolo naxSirmJava airidan naxSirbadis aTvisebiT mcenarisaTvis saWiro naxSirwylebis warmoqmna. gansakuTrebiT mniSvnelovania haeris Jangbadis roli fesvTa sistmis ganviTarebisaTvis. amitom, fesvTa sistemis daubrkolebeli ganviTarebisaTvis, aucilebelia Warbtenian niadagSi sadrenaJo qselis mo wyo ba, xo l o mZi me ni ad agebS i qved a f enebi s d aS l a ni ad agi s gamaR r mavebl i s saS ual ebi T . ***sinaTle*** – vazi sinaTlis moyvaruli mcenarea. yvela saxis rTuli fiziologiuri

xasiaTis procesi, romlebic mimdinareobs mis nawilebSi savegetacio periodis mTel manZilze, uSualod sinaTlesTanaa dakavSirebuli. sinaTlis naklebobis uaryofiTi gavlena produqciis xarisxze gamoixateba imaSi, rom mcirdeba marcvalSi Saqrebis dagroveba, izrdebna mJavianoba, gemuri Tvisebebi uaresdeba da Semferavi nivTierebani umni S vnel o raodenobiT grovdeba. aRniSnulis safuZvelze, aucilebel saWiroebas warmoadgens venaxis gaSeneba xdebodes yovelTvis mziT uxvad ganaTebul ferdob ad gi l z e.

***geografiuli ganedi*** – saqarTvelos mevenaxeoba warmodgenilia 40,9-43,2 ganedTa Soris; am mxaris umravles raionebSi samrewvelo tipis mevenaxeobisaTvis yovelmxriv xelSemwyobi pirobebia (Tbil-zomieri hava, normaluri tenianoba), ris Sedegad vazi xasiaTdeba normaluri zrda-ganviTarebiTa da maRalxarisxovani produqciiT. vazis kulturis gavrcelebaze mkveTr gavlenas axdens adgilis zRvis donidan dacileba da temperaturaTa jamis sidide. kerZod samrewvelo tipis mevenaxeoba warmodgenilia aRmosavleT raionebSi 400-800 metris, xolo dasavleT saqarTveloSi 200-800 metris simaRleze. xarisxovani mevenaxeoba-meRvineobis warmoebis mizniT venaxebis gasaSeneblad upi r at es o ba und a mi ec es f er d o b ad gi l ebs d a aqed an pi r vel r i gS i : samxr eT -aR mo s avl eT i s , s amxr eT-dasavleTisa da aRmosavleTis Tbilzomieri raionebisaTvis, xolo CrdiloeTisa d a Cr d i l o aR mo s avl eT i s eqs po z i c i ebs - c xel i r ai o nebi saT vi s .

***qarebi*** – mniSvnelovan zegavlenas axdenen rogorc vazis zrda-ganviTarebaze, ise mosavlis raodenobasa da produqciis Rirsebaze. susti qarebi (niavi) umravles SemTxvevaSi sasargeblod moqmedebs. gansakuTrebiT uxvnaleqian raionebSi niadags acilebs momatebul tens. Zlieri qarebi ki piriqiT aSrobs niadags sagrZnob siRrmeze, amtvrevs vazis norC nawilebs, meqanikurad azianebs yvaviledebs, rasac Sedegad mosdevs masobrivi yvavilcvena. amitom aucilebel saWiroebas warmoadgens venaxebis dacva Zlieri qarebisagan, qarsafari zolebis mowyobiT. qarsafrebis gaSenebis dros angariSi unda gaewios rogorc maT dacilebas venaxis nakveTidan, ise safarad iseT mcenareTa SerCevas, r o ml ebi c ar avi T ar S emT xvevaS i venaxi s d aCr d i l vas ar gamo i wvevs .

***mdinareebi, tbebi, zRva*** - zRvebisa da mdinareebis siaxlove mniSvnelovan rols asrulebs temperaturaTa jamis sidideze. uSualod zRvis gavlenis qveS mdebare raionebi yovelTvis Serbilebuli haviT xasiaTdeba, rac produqtis Rirsebaze mniSvnelovan dadebiT zegavlenas axdens. mdinareebisa da tbebis roli zRvasTan SedarebiT mcirea, vinaidan isini ar iwveven haeris mniSvnelovan Serbilebas, magram maTgan wylis mudmivi aorTqlebis gamo xSirad warmoebs mezoblad mdebare adgilebis gaciveba, rasac Sedegad sdevs masobrivad dazaraleba. amitom, mdinareebisa da tbebis napirebze mizanSeuwo nel i a venaxebis gaSeneba, miT umetes, rom aseT adgilebSi xdeba sokovan daavadebaTa masobrivi gavr c el eba.

***setyva*** – saSineli meteorologiuri movlenaa soflis meurneobisa da kerZod mevenaxeobisaTvis. igi anadgurebs rogorc mosavals, ise azianebs, begvavs da amtvrevs vaz i s veget ac i ur nawi l ebs . saqar T vel o S i s et yva gans akuT r ebi T xS i r i a kaxeT i s r ai o nebS i .

***niadaguri pirobebis gavlena*** – niadagis ZiriTadi tipebi, romlebic sxvadasxvagvar

gavl enas axd enen pr o d uqc i i s R i r s ebaz e, Sei Zl eba Semd egnai r ad d aj guf d es :

Savmiwa, muqi-wabla da wabla niadagebi – Seicaven humusis mometebul raodenobas, amgvar niadagebze gaSenebuli vazi xasiaTdeba Zlieri zrda-ganviTarebiTa da uxvi mo s avl i ano bi T .

tyis niadagebi – mdidaria sakvebi nivTierebebiT, xasiaTdeba kargi struqturiT. es ukanas kneli Tviseba imdenad ganviTarebulia zogierT adgilSi, rom dabaqnebis S emT xvevaS i spec i al ur i ked l i s gakeT ebas ac ar saWi r o ebs .

neSompala karbonatuli niadagebi – xasiaTdeba kargi fizikuri TvisebebiT, sakmaod

didi sinoyieriT, umetes SemTxvevaSi ConCxianobiT da kalciumis karbonatebis normaluri SemcvelobiT. am tipis niadagebze gaSenebuli vazebi normaluri zrda-ganvi T ar ebi T xas i aT d eba d a mi R ebul i yur Zni s pr o d uqc i a met ad sas i amo vno gemo s R vi no s i Zl eva.

aluviuri niadagebi – warmoSobilia mdinareTa moqmedebis Sedegad, meqani kur i SedgenilobiT SeiZleba warmoadgendes lams an msubuq Tixnarebs. amgvari niadagebi saukeTeso pirobebs uqmnis vazebs, rogorc zrda-ganviTarebis mxriv, ise miRebuli Rvinis sruli harmoniulobiT, intensiuri SeferilobiT, didi sxeuliT, Senaxvis unarianobiT d a a.S.

qvian-RorRiani da kaJnarevi niadagebi – Seicavs qvebis moWarbebul raodenobas rogorc zedapirze, ise niadagis fenebSic qvebis gaxurebis Sedegad grovdeba temperaturi s didi raodenoba, ris gamoc yurZeni mdidrdeba SaqrebiT. didi qvebis moSorebiT am tipis niadagebze miiReba maRali Rirsebis produqcia xarisxovani sadeserto Rvinoebis d as amz ad ebl ad .

nacrisferi karbonatuli niadagebi – Seicaven kiris moWarbebul raodenobas da mcire

humus s . ami s gamo amgvar i ni ad agebi s aWi r o eben gano yi er ebas .

eweri niadagebi – mZime meqanikuri Sedgenilobisaa. Seicaven Tixebs an mZime Tixebs da qveda fena ki orSteins. es ukanaskneli agubebs wyals, rac metad uSlis xels fesvTa sistemis normalur ganvi T ar ebas . venaxebis gasaSeneblad mizanSewonilia mxolod sustad gaewer ebul i ni ad agebi .

d aWaobebuli da damarilebuli niadagebi – gamousadegaria mevenaxeobisaTvis, vinaidan amgvar pirobebSi vazis ganviTareba ferxdeba da amis gamo miiReba dabali Rirsebis pr o d uqc i a.

# vaz i s gamr avl ebi s wes ebi

TesliT gamravleba – mevenaxeobaSi vazis TesliT gamravleba, rogorc sargavi masalis miRebis erT-erTi RonisZieba warmoebis TvalsazrisiT gamouyenebelia, radgan wipwidan miRebuli axali vazi arsebiTad gansxvavdeba deda mcenarisagan. gansxvavebul TvisebaTa miReba gamowveulia im garemoebiT, rom TiTqmis yvela mosavlis momcemi vazis jiSi Tavis memkvidreobiT SemadgenlobaSi Seicavs deda vazebis msgavs niSnebs. gamravlebis dros xdeba am jiSur TvisebaTa daTiSva, ris Sedegadac miiReba sul sxva TvisebaTa mqone vazebi. swored vazis am TvisebebiT sargebloben mecnierebi axali vazis jiSebis gamoyvanis dros; ajvareben da Teslidan miRebul vazebs amravleben vegetatiuri gziT da R ebul o ben met ad s ai nt er es o vaz i s j i S ebs.

gasamravlebeli Teslis aReba xdeba mwife yurZnidan, vinaidan misi wipwa mTlianad damwifebulia. gasamravleblad gamoyenebuli unda iqnas mxolod wina wlis Semodgomaze damzadebuli Tesli, radgan mas aRmocenebis meti unari aqvs. yur Zni d an mi R ebul i s aT es l e masal a unda gairecxos wyalSi; Semdeg unda SeSres da Senaxul iqnas toprakebiT an qaRaldis parkebiT grilsa da ara metismetad mSral pirobebSi. karg Sedegs iZleva Teslis winaswar gaRiveba, risTvisac daTesvamde 20-25 dRiT adre saTesle masala unda moTavsdes mdinaris axlos da zomierad tenian silis safenebSi. haeris cirkulaciisaTvis da zedmeti tenis mosacileblad sastratifikacio yuTi unda daixvritos gverdebsa da Zi r z e. T es l i s mo mz ad eba S ei Zl eba agr eT ve wyal S i , r o mel S i c i gi und a mo T avs d es 4-5 dRis ganmavlobaSi. wyali yoveldRiurad unda gamoecvalos, xolo misi temperatura 25-30 graduss unda aRwevdes. karg Sedegs iZleva agreTve Teslis damuSaveba er T pr o c ent i ani naxSirmJava kaliumis xsnariT. igi nawilobriv xsnis da arbilebs Teslis magar s af ar vel s .

saTesle nakveTi unda iyos qarebisagan daculi da mziT uxvad ganaTebuli. sarwyav raionebSi wyali advilad unda udgebodes. saTesled gankuTvnili nakveTi daTesvamde 2-3 TviT adre unda daibaros 25-30 sm-is siRrmeze. saTesled gamzadebul kvlebSi unda gakeTdes 3-4sm-is siRrmis zedapiruli arxebi. arxebs Soris manZili unda i yo s 40-50sm-s . arxebSi unda daiTesos gaRivebuli Tesli, romlebic erTmaneTisagan dacilebuli unda i yos 4-5s m-iT. naTesi unda daifaros fxvieri miwis Txeli feniT, romelsac umjobesia aerios mdinaris sila an gadamwvari da gacrili nakeli. Tesvis saukeTeso droa gviani Semodgoma da adre gazafxuli. wesierad stratificirebuli saTesle masala daTesvidan o ri kviris Semdeg iwyebs masobriv aRmocenebas. savegetacio periodSi unda Catardes niadagis xSiri damuSaveba; sarevela balaxebTan brZola; rodesac Teslnergi miaRwevs 810sm-s simaRles, igi unda gamoixSiros ise, rom kvlebSi datovebul nergebs Soris d ar Ces 10sm manZi l i . T es l i d an ganvi T ar ebul i naz ar d i veget ac i i s d as as r ul i saT vi s aR wevs

1 da zogjer 1,5 metramde simaRles. Semodgomis dasasruls warmoebs nergebis daxarisxeba da amoReba. Teslidan gamravlebuli vazi zogjer mosavlis niSnebs iZleva mesame wlidan, umetes SemTxvevaSi ki 5-7 wlidan. dadebiTi SedegebiT xasiaTdeba wipwis Tesva-aR z r d i s gaumjobesebuli meTodi, rac gulisxmobs stratificirebuli Teslis mudmiv adgilze Tesvas da iqve datovebiT Teslnergebis aRzrda-gaformebas. Teslis aRmocenebis Semdeg tardeba xSiri wamloba 0,5-1%-i ani bordouli xsnariT da niadagis damuSaveba. vegetaciis periodSi tardeba sistematiuri furCqvna namxrevebis 2-3 muxlze datovebiT. gaz af xul z e vazis gaRviZebamde tardeba Teslnergebis grZeli sxvla rqaze 15-25 kvirtis datovebiT, rac saSualebas iZleva meore welsve wverisaken miRebul iqnas pirveli mosavali da d egus t ac i ur i S ef as ebi T d ad gi nd es T i T o eul i T esl ner gi s var gi s i ano ba.

Teslnergis gamorCeva SeiZleba rogorc bunebriv pirobebSi misi ganviTarebis yvela stadiaze dakvirvebiT, ise amave pirobebSi provokaciuli meTodebis gamoyenebiT da l abo r at o r i ul i gz i T . nergebze dakvirveba da gamorCeva unda xdebodes Semdegi maCveneblebis mi xed vi T : z r d a-ganviTarebis intensivoba; yinvagamZleoba; avadmyofoba-mavnebelTa mimarT amtanoba; yvavilis tipi (defeqturi, mamrobiTi sqesis yvavilebi unda gamoiTiSos); mosavlis raodenoba da xarisxi; yurZnis momwifebis periodi; yurZnis xarisxi unda Semowmdes Saqrianoba-mJavi ano bi s d a gemo s gansaz Rvr i T .

provokaciuli meTodebis gamoyenebisas SedarebiT mokle droSi xdeba sasurvel niSanT vi sebaT a mqo ne vaz i s axal i j i S ebi s gamo vl ena d a uvar gi s T a gamo T i S va.

laboratoriuli meTodiT SerCeuli jiSebi yovelTvis sasurvel Sedegs ar iZleva,

r ad gan l abo r at o r i ul i pi r o bebi mkveT r ad aa gans xvavebul i R i a gr unt i s pi r o bebi sagan.

2.2 vegetatiuri gamravleba – am gziT gamravlebis Sedegad axal mcenares SenarCunebuli aqvs deda vazis yvela niSan-Tviseba. amis gamo gamravlebis es wesi, r o go r c war sul S i , i s e amYamJ amad ac f ar T o d aa gamo yenebul i mevenaxeo bi s pr aqt i kaSi .

***kvirtiT gamravleba*** – kvirtebis Tesva xdeba adre gazafxulze. am daniSnulebiT unda SeirCes myudro nakveTi da dargvamde 2,5-3 TviT adre damuSavdes siRrmiT 30sm-mde. sakvirte masalis SerCeva xdeba sasurveli jiSis vazebidan. rqebi raionis pirobebis mixedviT unda aiWras SemodgomiT an kvirtebis daTesvamde ramdenime dRiT adre. gasamravlebeli kvirti iWreba rqis Sua zonidan, gadaWris dros kvirtis orive mxareze unda darCes 3-4 sm-is sigrZis rqis nawili. aRmocenebis dasaCqareblad gamzadebuli kvirti erTi dRiT unda moTavsdes Cveulebriv wyalSi. saTanado movlis pirobebSi nergi s aveget ac i o per i o d i s d asas r ul i s aT vi s sakmao d mZl avr ganvi T ar ebas aR wevs .

***rqiT gamravleba*** – filoqseris gavrcelebamde mevenaxeobaSi gamravlebis erT-er T ZiriTad gzad iTvleboda, radgan aRwevdnen jiSur siwmindes da gamravlebis aRniSnuli gz a mc i r e xar j ebs mo i T xo vd a. f i l o qser i T mo d ebul r ai o nebS i r qi T gamr avl ebam d ahkar ga

T avi s i f ar T o mni Svnel o ba, r ad gan mo s avl i s mo mc emi vaz i s f esvT a s i s t ema ver aR mo Cnd a am mavneblis mimarT gamZle. igi Secvlil iqna mosavlis momcem vazis jiSTa mynobiT f i l o qs er agamZl e vaz i s saZi r e hi br i d ebz e.

gasamr avl ebl ad S er Ceul i r qa und a akmayo f i l ebd es S emd eg mo T xo vnebs :

1. und a i yo s savs ebi T mo mwi f ebul i d a pl ast i kur i ni vT i er ebebi T md i d ar i ;
2. d auS vebel i a r qi s aReba avad myo f i vaz i d an;
3. r qa aR ebul und a i qnas mxo l o d wi nas war S er Ceul i s el eqc i ur i vaz i d an;
4. d as af es vi anebl ad aR ebul i r qa s aSual o s i ms xo s i und a i yo s ;
5. r qa aWr i l i und a i yo s ms xmo i ar o baS i S es ul i 7-15 wl amd e as aki s vaz i d an.

gasamravleblad SeiZleba SeirCes ubralo, yavarjniani da qusliani rqa. ubralo rqa vazis erTwlian nazards warmoadgens; yavarjniani rqa Tavis boloze Seicavs orwliani rqis mcireoden yavarjnisebr nawils; qus lian rqas boloze aqvs orwliani rqis qus l i s ebr i met ad mc i r e nawi l i .

***gadawindviT gamravleba*** – er T -erTi ZiriTadi RonisZiebaa vazis Zirebis gasamravleblad. gadawinduli nergis gaxareba mTlianad uzrunvelyofilia iseTi saxeobisa da jiSisac ki, romelic iZleva gaxarebis mcire procents. gamravlebis aRniSnuli wesiT awarmoebdnen nergebis gamoyvanas ori mizniT - venaxSi adgilze maT d as at o vebl ad d a gamo yvani l i ner gebi T axal i venaxebi s gasaS enebl ad .

gad awi nd vi s Zi r i T ad i wes ebi a:

rqis gadawindva Cveulebrivi wesiT – miznad isaxavs venaxis rigebSi mocdenili adgilebis Sevsebas da uvargisi da mousavliani Ziris Secvlas mosavliani saRi ZiriT. amrigad, gamo yvani l i ner gi gad awi nd vi s ad gi l z e d ar Ceba.

mwvane gadawindva – vazis gadawindvis Cveulebriv principzea agebuli, mxolod im gansxvavebiT, rom operacia sruldeba vazis maqsimaluri zrdis periodSi – ivlissa da agvi s t o s pi r vel d ekad aS i .

vazidan ramdenime rqis gadawindva – xdeba maSin, rodesac gaTvaliswinebulia romelime iSviaTi jiSis didi raodenobiT momravleba da isic erTi savegetacio periodis ganmavl o baS i .

yuT S i an qo T anS i r qi s gad awi nd va xd eba d eko r at i ul i T val s az r i s i T .

Cinuri wesiT gadawindva – gamoiyeneba didi raodenobis dasafesvianebeli masalis mi saR ebad . gans akuT r ebi T Znel ad d as af es vi anebel i unar i s mqo ne j i S ebi s mi mar T .

vazis mTliani gadawindva – ZiriTad RonisZiebas warmoadgens arsebuli venaxebis

rekonstruqciisaTvis. am wesiT gamoyvanili vazis nergi adgilzeve gamoiyeneba. erTi dedavaz i s S es ac vl el ad , meo r e ki mo c d eni l i ad gi l i s d as akavebl ad .

operaciis Catarebis teqnika – gadasawindad SerCeuli vazi unda gaisxlas ise, rom masze darCes sami mZlavri rqa. ori rqa gamoyenebuli unda iqnas gadasawindad, xolo mesame darCes rqis moxris dros dazianebis SemTxvevaSi Sesacvlelad. amis Semdeg und a gaiWras ormo gadasawindi vazis Ziridan mocdenil adgilamde. gadasawind vazs miwa mTlianad unda Semoecalos, raTa igi mcire Zalis datanebiT Cawves ormoSi. misi ormoSi Cawindvis Semdeg erTi rqa frTxilad unda mobrundes im adgilas, sadac vazi idga, xolo meore amoiSvas mocdenil adgilas. am operaciis damTavrebis Semdeg ormoSi jer Suamde Caiyreba miwa da kargad moitkepneba, ris Semdegac mTlianad Seivseba igi da kidev moitkepneba. gadawinduli rqa Seikveceba 2-3 kvirtze, Seedgmeba sari da miekvreba zed. gad awi nd ul rqaze fesvTa sistemis ganviTarebas didad uwyobs xels miwaSi moqceuli rqis nawilze kvirtebis dabrmaveba. radgan am zedapirul WrilobaTa miyenebiT xdeba fesvTa sistemis warmosaSobi zonis gaRizianeba. amitom sasurvelia es operacia Cawidnul r qaz e Cat ar d es mi wi s mo yr amd e.

yovelgvari gadawidvna garda mwvane gadawidvnisa, SeiZleba Catardes vazis pasiur

xanaS i , e.i . S emo d go mi d an gaz af xul amd e, z amT r i s yi nvi ani per i o d i s gamo kl ebi T .

**vazis mynobiT gamravleba** – es aris vazis qirurgiuli operacia, romlis saSualebiTac

erTi mcenaris nawili xelovnurad uerTdeba meore mcenaris nawils. im mcenares, r o mel z ed ac und a d ai myno s , ewo d eba saZi r e, xo l o meo r es - sanamyene.

mynobam mevenaxeobaSi didi mniSvneloba da gavrceleba moipova XIX saukunis meore naxevridan, kerZod mas Semdeg, rac vazis mavne mweris –filoqseras gavrcelebis Sedegad daiwyo venaxebis ganadgureba. venaxebis am mavneblisagan dasacavad yvelaze kargi Sedegi gamo i R o mo savl i s mo mc emi vaz i s d amyno bam f i l o qs er agamZl e vaz i s s aZi r eebz e.

***gruntSi mynoba*** – a) mynoba ubralo gapobiT – mimarTaven venaxSi gadaberebuli vazis Zirebis gasaaxalgazrdaveblad an maSin, rodesac surT Secvalon venaxSi erTi, ar asas ur vel i j i S i s vaz i s Zi r i meo r e ukeT es i j i S i T . am saxi s myno ba t ar d eba gaz af xul z e vazis tirilis dawyebamde. mynobis dawyebamde 8-10 dRiT adre dasamynobi vazis Zirs garSemo Semoaclian miwas 20 sm siRrmeze, ise rom fesvis yeli gamoCndes, Semdeg gadaxerxaven niadagis zedapiris qvemoT 3-4 sm-ze. gadanaxerxs asworeben maxvili daniT, saZires apoben cali gverdidan da ukeTeben xis patara sols Sig sanamyeno kalmis advilad mosaTavseblad. sanamyeno rqas 2-3 kvirtze gadaWrian da solisebrad CaTlian rqis bolo nawils ise, rom sanamyeno saZiris ganapobi naklebad gaiwios da maTi kambialuri qsovili erTmaneTs daemTxves. sanamyenes Casmis dros kvirti gareT unda iyo s mimarTuli. namyenis gakeTebisTanave mas magrad xveven kanafiT an ZafiiT da frTxilad ayrian fxvier miwas 8-10sm-s simaRleze. sanamyenos ylortebi vegetaciis dasasrulisaTvis mZl avr ganvi T ar ebas aR wevs .

b) ***mynoba mTl iani gapobiT*** – am wes i T myno bas axo r c i el eben, r o d esac saZi r e s anamyeno z e

msxvilia an orive komponenti Tanabari simsxosia. mynobis teqnika msgavsia ubralo gapo bi T myno bi s , i m gans xvavebi T , r o m xd eba saZi r i s mT l i anad gapo ba ver t i kal ur ad 3-4 smze. am saxis mynobis dros xdeba Stambis qveda zonaSi saZire komponentis mTliani gadaWra, ris gamoc igi garkveuli naklovanebiT xasiaTdeba. Tu Sexorceba ar moxda, am operaciis Sedegad vazi maxinjdeba da masze mynobis xelmeored Catareba SeuZlebeli xdeba. garda amisa, vazis Stambis mTliani gadaWriT ikargeba mosavali, riTac saerTo mosavlianoba mcirdeba. ami s Tavidan asacileblad SeiZleba gamoyenebul iqnas e.w. gverdiTi mynoba. misi mynobis wesebidan aRsaniSnavia: 1) kad i l i aki s ebr i mynoba, romelsac axorcieleben rogorc Semodgomis periodSi (agvisto seqtember i ), ise adre gazafxulze vazis tirilis dawyebamde. im SemTxvevaSi, Tu Semodgomaze gakeTebuli namyeni dazianda, an ar Sexorcda, dasaSvebia misi xelmeored damynoba Semdgomi wlis gazafxulze. xelmeored mynobisas vazze operacia unda gakeTdes winaT gakeTebuli namynobi adgilis qvemoT. 2) maiorakisebri mynoba – aRniSnuli wesi Zlier karg Sedegs iZleva iseT raionebSi, sadac Semodgoma Tbilia da vazis savegetacio periodi gaxangrZlivebulia. igi tardeba agvistosa da seqtemberSi. mynobis es wesi saSualebas iZleva namyenis Seuxorceblobis SemTxvevaSi imave vazze ganmeorebiT Catardes mynoba Semdgomi wlis gazafxulze. 3) ruminuli wesiT mynoba- igi SeiZleba gamoyenebul iqnas rogorc axalgazrda, ise xnovan saZireebzec. am wesis upiratesobaa is, rom vazis mosavali ar ikargeba arc mynobis da arc Semdgom wels. mynobis Semdeg namyens xsnian gazafxulze da amowmeben mis mdgomareobas. Tu sanamyenes kvirti ganviTarebas iwyebs, es namyenis gaxarebis niSania. am SemTxvevaSi namynob adgilze saxvevs xsnian da deda vaz i s rqebs amokleben. amrigad, namyenis ganviTarebasTan erTad SesaZloa mosavlis miReba d ed avaz i d an.

g) ***mwvane nawil ebiT mynoba*** – am s axi s myno bi s wes ebi d an aRsani S navi a:

1. gapobiT mynoba – mas awarmoeben ivnisis Sua ricxvebSi, rodesac vazi maqsimaluri zrdis periodSi imyofeba. saZired gankuTvnil vazze SearCeven ukeTesad ganviTarebul ylorts, gadaWrian muxlTSoris zonaSi am ukanasknelis 4-5sm-mde sigrZis datovebiT. sanamyened iReben sasurveli jiSis ylortis wveris nawils ori muxlis datovebiT, xolo muxlTSoris nawils Tlian soliseburad mWreli daniT. momzadebul sanamyenos dgamen saZiris ganapobSi, sasurvelia sanamyenos qveda kvirti moTavsdes saZiris zeda muxlze mdebare kvirtis adgilas. amisTvis saWiroa saZiris kvirti winaswar aecalos mWreli d ani T . namyno b ad gi l s mt ki c ed kr aven kanaf i T an r af i i T .
2. iribuli wesiT vazs amynoben maqsimaluri zrdis periodSi. am mizniT saZireze SearCeven ukeTesad ganviTarebul ylortebs da maTze akeTeben irib Wrilobebs, amave wesiT amzadeben sanamyene ylortebs TiTo muxliT, orive komponents enebis CaWris Semdeg er T maneT s uer T eben d a r ac S ei Zl eba mWi d r o d kr aven namyno b ad gi l s r af i i T an kanaf i T ,

g) kvirtiT mynoba msgavsad xexilisa warmoebs vazis kanqveS zafxulis dasawyisSi. am mizniT saZire vazze arCeven ukeTesad ganviTarebul ylortebs da maTze akeTeben msgavs Wrilobas. sanamyened irCeven ylortze ukeTesad ganviTarebul kvirts, stoveben masze foTlis yunwis mcireoden nawils, mWreli daniT metad Txel fenas iReben, am kvi r t s s vamen saZi r ez e gakeT ebul Wr i l o baS i . namyno b ad gi l s kr aven r af i i T an kanaf i T .

Dd ) SexebiTi wesiT mwvane mynoba – saZireze SearCeven ukeTesad ganviTarebul ylorts d a masze akeTeben sigrZiv gverdiT Wrilobas niadagis zedapirTan axlos, amave sididis Wrilobas akeTeben mezoblad mdgom mosavlis momcem vazis ylortze, ris Semdeg komponentebs WrilobaTa Soris zonaSi erTmaneTs miadgamen da rac SeiZleba mWidrod

S ekr aven r af i i T an kanaf i T . ami s Semd eg namyno b ad gi l s ayr i an mi was i s e, r o m i gi mT l i anad d ai f ar o s.

d ) ***iribuli wesiT e.w. kopulirebiT mynoba*** -magi d az e myno ba gr unt S i myno bi s wes ebT an SedarebiT ufro martiv operacias warmoadgens da met efeqts iZleva, Tu maRalxarisxovnad iqneba Catarebuli. aRniSnuli wesiT mynoba tardeba vazis gaxevebul erTwlian nawilebze. saZired am SemTxvevaSi gamoyenebulia ubralo daufesvianebeli filoqseragamZle amerikuli lerwi. sanamyened gamoyenebulia vazis erTwliani rqis nawili, romelzedac erTi kvirtia moTavsebuli. iribuli wesiT mynobis principi mdgomareobs saZiresa da sanamyenoze iribi Wrilobis aRebaSi da erTmaneTze damagrebaSi, e.w. enebis saSualebiT. operacia sruldeba xeliT, samynobi danis saSualebiT an SeiZleba gamoyenebul iqnas sxvadasxva tipis samynobi manqanebi. iribuli wesiT mynobis operacia t ar d eba gaz af xul z e - mar t i s meo r e naxevr i d an apr i l i s bo l o md e.

mynobis meqanizacia – mynobasTan dakavSirebul sakiTxebidan rTul da Sromatevad samuSaos warmoadgens TviT operaciis Sesrulebis wesi. aqedan gamomdinare metad didi mniSvneloba eniWeba mynobis warmoebis meqanizacias. sadReisod arsebul eqsperimentul samynob manqanebs Soris yuradRebas ipyrobs mecnier gr. papavas mier Seqmnili kombinirebuli samynobi manqana. igi samuSao meqanizmebis ganlagebiT da Sesrulebis manipulaciebiT originaluri da perspeqtiulia. samuSao dazgaze warmoebs samynobi komponentebis meqanizebuli daxarisxeba, saZiresa da sanamyeneze erTsa da imave dros Wrilobis gakeTeba, enebis CaWra da meqanizebuli wesiT komponentebis SeerTeba. samynobi manqana muS ao bs el eqt r o d eni T . mi s i war mad o ba 4000 c al amd e aR wevs .

**sasaTbure meurneoba -** lafnis moqmedi kambialuri qsovilidan klausis warmos aSo bad

saWiroa temperaturis garkveuli sidide. kvlevebis Sedegad dadginda, rom namyenis stratifikaciis optimalur temperaturad unda CaiTvalos 250. aRniSnul temperaturaze namyenebis stratifikacia grZeldeba 12 dRemde; klausi mynobis zonaSi viTardeba irgvliv da viwro zonarisebrad; sanamyenes kvirtis gaRiveba-gaf ur Cqvnac mniSvnelovnad aris S enel ebul i .

namyenis ukeT SexorcebisaTvis optimaluri tenianobaa 70-75%, xolo saZiresa da sanamyenes Wrilobebze klausis normaluri ganviTarebisaTvis da daobebis Tavidan asac i l ebl ad namyenebi s i r gvl i v und a i yo s s aR i haer i .

**siaxleni vazis namyenis warmoebaSi** – sas aT bur e meurneobasTan dakavSirebuli xarjebis acilebisa da vazis nergis gamoyvanis gamartivebis mizniT, amJamad SemuSavebulia sanergeSi ustratifikacio namyenis dargvis axali wesi da bazos dafarva gamWirvale polieTilenis afskiT. polieTilenis saSualebiT bazos mTel siRrmeze myardeba temperaturisa da tenianobis normaluri Sefardeba, rac xels uwyobs komponentTa S ez r d a-gaxarebas da namyenis daubrkolebel ganviTarebas. mynobis adgilas klausis ganviTareba iwyeba me-6-7 dRes; 20-25 dRis Semdeg namyeni iwyebs ganviTarebas. ris Semdeg polieTilenis afsks xsnian. am RonisZiebis gamoyenebiT pirvelxarisxovani nergis gamosavlianoba 60%-mdea. amave dros iZleva danaxarjebis ekonomias, romelic SeiZleba kidev ufro Semcirdes ZiriTadi samuSao procesebis – daxveva-daparafineba, bazos gakeT eba, po l i eT i l eni s d af ena-aReba meqani z ebul i wes i T S es r ul ebi s S emT xvevaS i .

aseve sayuradReboa rkinisa da magniumis Semcveli organuli mineraluri preparatis-

xelatis bunebrivi naerTis gamoyeneba namyenebis gamosayvanad. naz avS i SefardebiT 1:60 samynobi masalis dalbobiT 12sT-is ganmavlobaSi Zlierdeba fesvTa sistema, gamo s avl i ano ba ki mat ul o bs 15-17%. amave d r o s xel at i sakvebi a d a s t i mul at o r i c .

vazis namyenis stratifikacia eleqtroavtomatizebul saTburSi naxerxis gamoyenebis

gar eSe- namyenis stratifikacia da gakaJeba warmoebs erTsa da imave saTavsoSisastratifikacio kameraSi. kompleqsis gaTbobis ZiriTad wyaros warmoadgenen -100 tipis eleqtrogamTbobebi, romlebic moTavsebulia saTburis samanqano ganyofilebaSi. vazis namyenis unaxerxod stratifikaciis axali wesi tardeba Semdegi TanmimdevrobiT: mynobis dawyebis win unda gasufTavdes kamera-saTavso da SeTeTrdes kiris wyalxsnariT rkinis Taroebi, savali dgarebi, abazanebi da saerTod yvela liTonis nawili. zeTiani saRebavebiT unda SeiRebos, gaisinjos wyalgamtari mowyobiloba, Semowmdes eleqtro da Tbomomaragebis sistema, Catardes saTavsoebis dezinfeqcia gogirdis dabolebiT da Semdeg igi ganiavdes specialuri saventilacio sistemiT. vazis namyenis damzadebis Semdeg xdeba misi daparafineba. amisaTvis unda aviRoT 5-6 cali namyeni, gavSaloT maraoseburad d a amovavloT 7-80 gradusamde gamRval parafinSi, ise rom daparafindes misi zeda nawili 10-15 sm-z e. daparafinebis Semdeg namyenebi unda Caiwyos winaswar gasufTavebul kalaTaSi. amis Semdeg namyenebi gadaaqvT sastratifikacio kameraSi, sadac Seivseba qveda, Sua da bolos zeda Taroebi. kamerebis Sevsebis Semdeg iwyeba namyenebis stratifikacia, r o mel i c iyofa or periodad: pirvel periodSi xdeba namyenis teniT intensiuri gaJRenTva da temperaturuli gaRizianeba, risTvisac saWiroa kamera-saTavsSi Semdegi mikroklimatis reJimebis dacva: haeris temperatura -28-30 gradusamde; haeris SefardebiTi tenianoba 98100%-mde. haeris ganiaveba yovel 5-6 saaTSi. stratifikaciis periodSi Tu namyenebze obi ganviTarda saWiroa misi kargad Camorecxva wyliT, permanganatis an xinozolis 0,2%-i ani xsnariT. stratifikaciis damTavrebis Semdeg saWiroa namyenebis gakaJeba, ris gamoc xdeba gamTbobi mowyobilobis gamorTva da saventilacio sistemis CarTva. gakaJebis procesis d amT avr ebi s S emd eg namyenebi gad aaqvT s aner geS i d asar gavad .

**vazis sanerge meurneoba** – axlad gakeTebuli an saTburSi gamoyvanili namyenis uSualod mudmiv adgilze dargva sanergeSi gautareblad dauSvebelia. sanergeSi erTi romelime operaciis udrood an arawesierad Catareba sagrZnloblad dascems namyenebis gamosavals da SeiZleba gamoiwvios maTi mTliani daRupvac ki. amitom didi mniSvneloba eni Weba sanergisaTvis niadagis SerCevasa da momzadebas, Semdeg ki - darguli namyenebis wes i er ad mo vl as a d a aR z r d as . **bazoebis gafxviereba** – am samuSaos Catarebas gansakuTrebuli yuradReba unda mieqces. Zlieri wvimebis Sedegad itkepneba bazo da misi zedapiri ikeTebs qerqis sqel fenas, ris gamoc niadagidan ikargeba tenis didi raodenoba da mcirdeba haeris moqmedebac namynob adgilze. miwis datkepnis gamo namyenis ylorts uZneldeba sworad da droulad ganviTareba. amitom yoveli Zlieri wvimis Semdeg unda Catardes bazoebis gafxviereba, war mo S o bi l i mi wi s qer qi f r T xi l ad und a gaf xvi er d es mc i r e s i R r mez e.

**niadagis damuSaveba** – sanergis nakveTi vegetaciis ganmavlobaSi damuSavebul mdgomareobaSi unda imyofebodes. mwkrivTSorisebi xSirad unda fxvierdebodes da i wmi nd ebo d es sar evel a bal axebi s agan. saner gi s d i d meur neo baS i mwkr i vT S o r i s i d amuS aveba unda Catardes meqanikuri gamwevi ZaliT didi sifrTxiliT, raTa namyenebis meqanikur dazianebas ar eqnes adgili. sarevela balaxi bazoebze xeliT unda gamoiTxaros, wi naaR md eg S emT xvevaS i i gi xel meo r ed ganvi T ar d eba.

**morwyva** – pirveli morwyva unda Catardes nemyenebis dargvisTanave da niadagis SeSrobisTanave gafxvierdes mwkrivTSorisebi; Semdeg unda moirwyas ivnissa da ivlisSi 23-j er . sar wyavi wyal i s aner gi s mwkr i vT S o r i s ebS i S eS vebul i und a i yo s nel a.

**sanergeSi namyenebis aRmoceneba** - ganvi T ar eba iwyeba maisis meore naxevridan, swored am droidan yuradReba unda mieqces bazodan aRmocenebuli ylortebis dacvas sokovan daavadebaTa zemoqmedebisagan, ris gamoc tardeba Sewamvlis operciebi - s aqar T vel o s d as avl eT z o naS i 20-25j er , xo l o d anar Cen r ai o nebS i 12-16 j er .

# venaxi s gaSeneba

venaxis gaSenebasTan dakavSirebiT TanmimdevrobiT ganxilul unda iqnas Semd egi

sakiTxebi: savenaxe nakveTs SerCeva; savenaxe nakveTis gawmenda, xeebis, buCqebisa da qvebisagan; savenaxe nakveTis zedapiris mosworeba; wylis sawreti qselis mowyoba; savenaxe ferdobi nakveTis dabaqneba; qarsafaris mniSvneloba; RonisZiebani niadagis kulturul mdgomareobaSi mosayvanad; savenaxe nakveTis Rrmad damuSavebis mniSvneloba; savenaxe nakveTis damuSavebis siRrme; savenaxe nakveTis damuSavebis dro da wesebi; kvebis ares gansazRvra; nakveTze vazis gadaadgilebis wesebi; mwkrivebis mimarTuleba; vazis dargvis siRrme da dro; savenaxed damuSavebuli nakveTis dagegmva dasargavad; sargavi masala da mi s i mo mz ad eba d ar gvi saT vi s ; d ar gva; axal gaz r d a nar gavi s mo vl a.

s avenaxe nakveTis zedapiris mosworeba – am samuSaos Sesasruleblad iyeneben specialur manqanebs, romelTa saSualebiT amoburculi adgilidan miwa gadaitaneba tafobebSi. maTi saSualebiT SesaZlebelia gadasatani miwis raodenobis regulireba, rogorc nakveTis adgilobrivad mosworebis dros, ise daSorebul ubnebSi miwis gadatanis SemTxvevaSic. mevenaxeobis mTian zonaSi xSirad saWiroa nakveTis winaswari dabaqneba. baqnebis mowyobis dros saWiroa niadagis damuSavebis wesis winaswari gaTvaliswineba. baqnis sigane damokidebulia nakveTis daqanebaze, rac metadaa daqanebuli nakveT i , mi T uf r o vi wr o baqani a s aWi r o .

wylis sawreti qselis mowyoba (drenaJi) - misi mowyoba saWiroa iseT adgilebSi, sadac mosalodnelia araxelsayreli pirobebis Seqmna vazis zrda-ganviTarebisaTvis. igi SeiZleba moewyos Ria da daxuruli arxebiT. Ria arxebi aZnelebs manqanebis gamoyenebas venaxis movlis dros, xels uwyobs sar evel a bal axebi s gavr c el ebas . ami t o m, auc i l ebel i a daxuruli drenaJis mowyoba. daxuruli drenaJis mosawyobad iyeneben rogorc xis, aseve qvi s mas al as . mi s mo s awyo bad i Reben ar xs s i R r mi T 1,5m-md e d a s i gani T 40s m-md e.

**savenaxe nakveTis Rrmad damuSavebis mniSvneloba** – savenaxe niadagis Rrmad damuSavebis aucilebloba dakavSirebulia vazis Zlier da kargad gantotvil fesvTa sistemis miRebasTan, rac SemdegSi uzrunvelyofs vazis ukeTes zrda-ganviTarebas, misi metad datvirTvis SesaZleblobas da sabolood didi mosavlis miRebas, amave dros, Ronieri agebulebis vazebi xasiaTdeba xangrZlivi saeqsplatacio periodiT. saqarTvelos pirobebSi miRebulia savenaxe nakveTis damuSaveba 50-70sm siRrmeze; Cveni azriT ferdobebze da mSrali pirobebis mZime niadagebisaTvis mizanSewonili iqneba plantaJis s i R r mi s ki d ev uf r o gad i d eba.

plantaJis gakeTebis saukeTeso drod iTvleba Semodgoma, rodesac niadaguri da atmosferuli pirobebi xels uwyoben niadagis ukeTes ad gafxvierebas da momzadebas sagazafxulo dargvisaTvis. plantaJis gakeTebidan niadagis dargvamde saWiroa 3-5 Tve, r aT a ni ad agma mo as wr o s “d aj d o ma”.

savenaxe nakveTis damuSavebis sami saxea cnobili: mTliani plantaJiT, arxebiTa da ormoebiT. ormoebiT damuSavebis wesi gamoiyeneba, rodesac vazs aSeneben erTeuli Zirebis s axi T . umet es S emT xvevaS i savenaxe nakveT i s d amuS avebi s Zi r i T ad i s axe mT l i ani pl ant aJ i a.

amJamad plantaJis Catareba mTlianad meqanizebulia. misi Catarebis gamwev Zalad

gamo yenebul i a mZlavri traqtorebi da niadagis Rrmad damuSavebisaTvis spec i al ur ad ko ns t r ui r ebul i guT nebi ; ppn-50 an ppJ -50.

savenaxed damuSavebuli nakveTis dagegmva dasargavad – aRniSnuli farTobi winaswar i gegmeba z us t i geo d ez i ur i i ar aR ebi T , r aT a gamo yo f i l i qnas nakveT ebi - uj r ed ebi , qes mebi da gzebi, romlebic saTanado adgilebSi unda aRiniSnos myari niSnebiT. mwkrivis zusti mimarTulebis dasadgenad xdeba samkuTxedis ageba: nakveTis zedapiris sabolood mosworebis Semdeg mocemul ZiriTad xazze aRiniSneba is wertili, sadac daSvebul i und a iqnas perpendikularuli xazi, e.i. meore ZiriTadi xazi anu vazis pirveli mwkrivi. am wertilidan mocemul xazze gadaizomeba erTi kaTetis sigrZe, mag. 6 m da aRiniSneba es meore wertilic. pirveli wertilidan mosaZebni perpendikularuli xazis mimarTulebiT gadaizomeba 8 metri meore kaTeti; meore wertilidan aiReben hipotenuzas 10 metrs, maTi gadakveTis wertili iqneba is adgili, sadac unda gaiaros ZiriTad xazma anu pirvelma mwkr i vma. S emd eg xd eba mo maval i mwkr i vebi s gad aad gi l eba. maT mi s aRebad nakveT i s s aT anad o gverdebis paloebs Soris gaiWimeba mavTuli da specialuri qanCebiT gatardeba xazebi 3-5 sm siRrmis. amis msgavsad xazebi unda gatardes sawinaaRmdego mimarTulebiTac - mwkrivebSi vazebs Soris miRebuli manZilis mixedviT. am xazebis gadaWris wertilebi iqneba is adgilebi, sadac vazi unda dairgos. savenaxe nakveTis dasagegmavad vazebis gad aad gi l ebi s mi z ni T S ei Zl eba gamo yenebul i qnas f o l ad i s mavT ul i , s pec i al ur i mar ker i .

mudmiv adgilze darguli vazis zrda-ganviTarebaze da mosavlianobaze, s xva

faqtorebTan erTad, mniSvnelovan gavlenas axdens dargvis wesi da misi Sesrulebis periodi. arsebobs vazis dargvis Semdegi wesebi: paloTi, dargva ormoSi, dargva hi d r o bur R i T d a s pec i al ur i manqani T .

**vazis dargvis progresuli meTodebi:** hidroburRiTa da meqanizebuli wesiT dargva -

hidroburRiT nergis dasargavad xvreli keTdeba wylis WavliT, amis Sedegad ki nergis dafesvianebis areSi tenis optimaluri pirobebi iqmneba; meqanizebuli wesiT vazis dargva xorcieldeba specialuri sargavi manqanis saSualebiT, romelic akeTebs kvals, avt o mat ur ad sazRvravs mwkrivSi vazTa Soris manZils da nergs saWiro raodenobiT f xvi er mi was ayr i s . manqana er T i gavl i T o r mwkr i vs r gavs .

saqarTvelos pirobebSi venaxis gaSeneba umjobesia gvian SemodgomiT, radgan vegetaciis dawyebamde vazi egueba garemo pirobebs, ris gamoc nergis gaxarebisa da ganviTarebis pi r o bebi umj o bes d eba.

**axalSeni venaxis movla** – venaxis gaSenebis pirveli wlidanve gansakuTrebuli yuradReba unda mieqces Semdeg faqtorebs: a) sarevela balaxebis winaaRmdeg brZolas, raTa Semdeg wlebSi gaadvilebul iqnas niadagis kulturul mdgomareobaSi SenarCuneba; b) s o ko van d aavad ebaT a T avi d an ac i l eba, r i s T vi sac und a Cat ar d es 1%-i ani bo r d o s xs nar i s Sesxureba Wraqis winaaRmdeg, iseTive sixSiriT, rogorc sanergeSia miRebuli; g) dargvis pirvel wels vazze axlad ganviTarebuli ylortebis danormeba da maTze namxrevebis Secla; d) dargvis pirvel wels vazze unda aRvzardoT ori ukeTesi mdebareobisa da ganviTarebis ylorti, ramdenadac adre CavatarebT danormebas imdenad SevamcirebT organuli nivTierebebis usargeblo xarjvas; e) normirebuli ylortebi unda aRvzardoT sayrdenze, amitom pirveli wlis zafxulSi unda moewyos Spaleri; v) saWiroa axalgazrda nargavis morwyva 1-2-jer da amasTan erTad sasuqis Setana; z) Semodgomaze axalgazrda nargavis mwkrivebi unda gaiToxnos; T) meore wlidan ki ukve saWiroa sayrdenebis mowyoba, pi r vel i s xvl i s Cat ar eba, z ed met i yl o r t ebi s S ec l a.

**vazis sayrdeni** – vazis veluri, formebisaTvis bunebrivad arsebobs maTi sayrdenebi

xeebis saxiT. vazi, emagreba ra sayrdens pwkalebis saSualebiT, miiltvis rac SeiZleba maR l a, z r d a-ganviTarebisaTvis ukeTesi pirobebis Sesaqmnelad. vazis kultura maRlarad xels uwyobs yurZnis ukeTesad momwifebas haeris ufro mSral da mzis sxivebiT ukeT sargeblobis pirobebSi. sadReisod mevenaxeobis praqtikaSi cnobilia vazis sayrdenis sxvadasxva racionaluri wesi, romelTa gamoyeneba dakavSirebulia rogorc vazis biologiur TvisebebTan, ise yurZnis mosavlis gadidebasTan da produqciis xarisxis gaumj o bes ebas T an. sayrden saSualebaTa Soris yvelaze metad gavrcelebulia calkeuli maTganis dayeneba sarze an Spaleris mowyoba; iyeneben (Sua azia, somxeTi) vazis iseT gaf o r mebas , r o d es ac mi s i yvel a o r gano ni ad agz ea gaS l i l i , magr am yur Zni s d az i anebi s agan dasacavad mravalwliani nawilebi da ylortebi aweulia niadagis zedapiridan patara orkapi joxebiT. awarmoeben agreTve maRalStambian vazis kulturas, romelic moiTxovs maRali sayrdenebis mowyobas, risTvisac iyeneben magar boZebs gardigardmo gamagrebuli l ar t yebi T .

Spaleris tipebi – mevenaxeobis sxvadasxva raionSi gamoyenebulia sxvadasxva tipis Spaleri, adgilobrivi pirobebis TaviseburebasTan dakavSirebiT. Spaleris tipebi Zi r i T ad ad er T maneT i s agan gans xvavd eba S emd egi ni S nebi T :

1. s i maR l i s mi xed vi T : d abal i , saS ual o d a maRal i S pal er i ;
2. mavT ul i s r ao d eno bi s mi xed vi T : c al mavT ul i ani d a o r mavT ul i ani S pal er i ;
3. ZiriTadi boZebis dayenebis mixedviT (vertikalurad da daxrilad dayenebuli Zi r i T ad i bo Zebi );

Spaleris mowyoba – Spaleris mosawyobad saWiroa mwkrivis boloebSi dasayenebeli bo Zebi , S ual ed i s ar ebi d a mavT ul i .

ZiriTadi boZebis dayeneba SeiZleba sxvadasxva wesiT: 1) boZis dayeneba vertikalurad da misi daxrilad damagreba Ruzaze; 2) ZiriTadi boZis dayeneba daxrilad da misi damagreba Ruzaze vertikalurad mimarTuli mavTuliT; 3) daxrilad dayenebuli boZis d axr i l ad d amagr eba.

Sualedi boZebis dayeneba xdeba erTmaneTisagan 6-8 m. daSorebiT. amisaTvis pirvel da S emd eg yovel meaTe, meTxutmete an meoce mwkrivSi saTanado adgilebSi ayeneben Sualed boZebs da asoben saTanado simaRleze. am boZebs gausworeben darCenil mwkrivebSi boZebis dayenebas.

mavT ul i s gabma- bo Zebz e gas abmel ad umT avr es ad i Reben # 14 d a # 13 mavT ul s , R uz i s aT vis

ki umj o bes i a # 10. mavT ul i s gabmi s as xd eba mi s i mi magr eba s pec i al ur ad d amz ad ebul i o r ad moRunuli lursmniT boZebis saTanado simaRleze moniSnul adgilebSi; Semdeg axorcieleben mis daWimvas specialuri xelsawyoebiT (sxvadasxa saxeobis WonWaqi, damWimavi xraxni, berketiani xelsawyo). pirvelad unda daiWimos zeda mavTuli, romliTac ur yevi md ebar eo ba mi ec ema Zi r i T ad bo Zebs .

# vaz i s gas xvl a-f o r mi r eba

vazi lianismagvari mcenarea. bunebriv pirobebSi vazs axasiaTebs datotva umetesad misi tanis zeda nawilSi, patara mtevnebi, wvrili da naklebrbilobiani marcvali bevri TesliT, naklebi Saqrianoba da meti mJavianoba, e.i. nayofis dabali xarisxi. kulturul pirobebSi ki safuZvlianad icvleba vazis bunebrivi agebuleba da z r d aganvi T ar ebi s pirobebi im mravali zemoqmedebiT, romelsac Cven vatarebT mis mimarT. vazis kulturis gadakeTeba, rac aucilebeli Seiqmna misi kulturis dros, xdeba mravalnairi da metad rTuli RonisZiebebiT, romlebic ZiriTadad gvevlinebian sxvlis saxiT. gasxvlas did mni S vnel o bas jer kidev Soreul warsulSi aniWebdnen- Zvel romSi gausxlavi vazidan aRebuli yurZnis Sewirva akrZaluli iyo. uxsovari droidan cnobilia, rom vazi mosavlian ylortebs ZiriTadad iZleva im kvirtebidan, romlebic ganviTarebulia wliur naz ar d z e d a aqed an z us t ad ar i s Ser Ceul i s as xl avi o bi eqt ebi c .

gasxvlis Teoriis safuZvels warmoadgens kulturis mizani, rac mdgomareobs maRali xarisxisa da uxvi regularuli mosavlis miRebaSi, risTvisac gasxvlis ukeTesi wesis d as ad genad gaT val i s wi nebul i und a i qnas S emd egi Zi r i T ad i amo c anebi :

1. vaz i s z r d a-ganvi T ar ebi s Sef ar d eba ad gi l o br i v eko l o gi ur pi r o bebT an ;
2. vaz i s aT vi s gansaz R vr ul i f o r mi s mi c ema, r o mel i c ukeT esad uz r unvel yo f s agroteqnikuri R o ni s Zi ebebi s gat ar ebas d a meqani z ac i i s f ar T o d gamo yenebas , mo savl i s gad i d ebi s a d a pr o d uqc i i s maRal i xar i s xi s uz r unvel yo f as T an er T ad ;

3.vaz i s sawar mo o mo msaxur ebi s gaxangr Zl i veba ;

dasaxelebuli amocanebis gadaWras safuZvlad unda daedos sami ZiriTadi saki T xi s S es wavl a d a d az us t eba, r o ml ebi c pr o f . mer Jani ani s mi er Camo yel i bebul i a S emd egnai r ad :

* 1. vaz i s po l ar o bi s r egul i r eba ;
  2. vazis saerTo Zalisa da sxvadasxva organos ganviTarebis regulireba, maT

S o r i s ukeT es i d amo ki d ebul ebi s d amyar ebi T ;

1. vaz i s o r gano ebi s si vr c eSi ganl ageba.

vazis formebis klasifikacia – ZiriTadi maCveneblebi, romlebiTac formebi erTmaneTisagan gansxvavdebian Semdegia: 1.sxvlis wes i ; 2. sayrdeni saSualeba;

3. ylortebis ganlagebisa da maTi aRzrdis wesi. es sami ZiriTadi piroba safuZvlad udevs yvela arsebul formas, romelic mocemulia sami ZiriTadi jgufis saxiT: 1. buCqismagvari formebi ; 2.formebi, romlebic xasiaTdebian vazis yvela nawilis erT sibrtyeSi ganawilebiT ; 3. talaverismagvari formebi. dasaxelebuli sami jgufis f o r mebi s d i f er enc i r eba xd eba:

1. Stambis simaRlis mixedviT: dabalStambiani, saSualo, maRalStambiani da uS t ambo f o r mebi . M
2. mravalwliani totebis raodenobisa da sigrZis mixedviT : mokle, mravalwliani erTi an ramdenime, sivrceSi sxvadasxvanairad ganlagebuli mxriT, grZelmxriani, horizontaluri an vertikaluri ganlagebis totebiT da formebi mravalwliani totebis gareSe, romelTa sasxlavi obieqti uSualod Stambze md ebar eo bs .
3. sasxlavi obieqtebis raodenobis mixedviT : erTi, ori da ramdenime sasxlavi o bi eqt i T .

vaz i s Zi r i T ad i f o r mebi , r o ml ebi c gamo yenebul i a mevenaxeo bi s s xvad as xva r ai o nS i :

***Taviani forma*** \_ es forma masobrivad gamoyenebulia filoqseragamZle vazis sadedeSi, mo savlian venaxebSi ki mis gamoyenebas dakarguli aqvs racionaluri sxvlisa da gaf o r mebi s yo vel gvar i s af uZvel i .

***jamisebri forma -*** am formas aqvs mravali saxecvlileba da maTi erTmaneTisagan gansxvaveba gamowveulia Stambis simaRliT, mravalwliani nawilebis raodenobiTa da sigrZiT. magram maTi saerTo pirobaa mravalwliani nawilebis Tanabrad ganwyoba Stambis gar S emo . ***maraosebri forma –*** am formas mravalwliani mxrebi ganwyobili aqvs maraosebrad, erT

s i br t yeS i .

***vazis Spaleruli formebi –*** am f o r mi s Zi r i T ad i war mo mad genel i a mavTulze dayenebuli qarTuli forma. mas didi mniSvneloba aqvs ara rogorc vazis garegnul agebulebas, romelic aadvilebs mis movlas, aramed TviT sxvlis wess, romelic sxva wesebze ukeTesad Seesabameba vazis biologiur Tvisebebs, meti mosavlisa da ukeTesi produqciis xarisxis misaRebad. es aris kombinirebuli sxvlis principi, romelic warmoadgens safuZvels axal i , gaumj o bes ebul i f o r mebi s aT vi s , r o ml ebi c met i d at vi r T vi s s aS ual ebas i Zl eva.

***kordonis forma*** - am formebs axasiaTebs mTavari Rero. gamoyvanis mixedviT arCeven

ver t i kal ur , ho r i z o nt al ur d a d axr i l ko r d o nebs .

vertikalur kordonad gaformebuli vazis mTavar Reros mTlianad vertikaluri

md ebar eo ba ukavi a d a mas z e S t ambi s z emo T s ar T ul ebad ganl agebul i a s as xl avi o bi eqt ebi .

horizontalur kordonad gaformebuli vazis mTavari Rero Stambis zemoT gadaxrilia horizontalurad da qmnis mudmiv mxares uaxloes vazamde. rodesac es mudmivi nawili da vzis mTliani datvirTva ganlagebulia erT mxareze maSin gvaqvs calmxrivi horizontaluri kordoni. rodesac mudmiv nawilebs ormxrivi mudmivi ganwyoba aqvT Tanabari raodenobis sasxlavi obieqtebiT, maSin gvaqvs ormxriv horizontalur kordonad gaf o r mebul i vaz i .

vazis sxvlisa da formirebis racionaluri wesis dasadgenad, ZiriTadia ara marto

ko nkr et ul i c d i s S ed egebz e d ayr d no ba, ar amed mr aval gvar pi r o bebSi d a s xvad as xva j i S z e warmoebuli muSaobis ganzogadebuli daskvnebic, romlebic safuZvlad unda daedos am RonisZiebis dazustebas ama Tu im pirobebSi. vazis movlis axali wesi im SemTxvevaSi iqneba perspeqtiuli Tu is aadvilebs adamianis Sromas, advilad emorCileba meqanizebul saSualebebs da amcirebs yurZnis TviTRirebulebas. vazis sxvlaSi siaxled unda iqnas miCneuli Sexeduleba, romlis mixedviT msxvleli ar unda cdilobdes vazis agebuleba ucvlelad SeinarCunos da masSi cvlileba ar Seitanos. vazis biologiuri Tvisebebidan gamomdinareobs is kanonzomiereba, rom vazis sxvlis dros saWiroa Tavisufali midgoma da misi zrda-ganviTarebisaken gamovlinebuli midrekileba safuZvlad unda daedos gasxvlis wessa da datvirTvis gansazRvras. MmniSvnelovani cvlilebebia Setanili samamules SerCevaSi. ylortebis zrdis regulireba misi ZiriTadi daniSnulebaa, magram vazis sxvlis dros yovelTvis samamulis nazrdze sanayofis SerCeva Secdoma iqneba.

naz r d i s Ser Ceva Zi r i T ad ad xd eba r qi s s i Zl i er i s mi xed vi T , mi s i md ebar eo bi s ganur Cevl ad .

sxvlis saukeTeso vadad miCneuli unda iqnes periodi, dawyebuli foTolcvenidan 15-20 dRis Semdeg da gaTavebuli wvenis moZraobis dawyebamde. es periodi zomieri havis pirobebSi Seicavs 3-3,5 Tves dekembris Sua ricxvebidan martis pirveli naxevris CaTvliT. dasaxelebuli vadis farglebSi adgilobrivi pirobebisa da meurneobebis organizaciuli mxar i s mi xed vi T gas xvl i s vad a S ei Zl eba d az us t d es mi kr o per i o d ebad .

**s et yvi s a d a yi nvi s agan daz i anebul i vaz i s** **movla**

setyva did zians ayenebs soflis meurneobas. am stiqiuri movlenisagan gamowveuli zarali mevenaxeobaSi marto erTi wlis mosavlis daRupviT ar ganisazRvreba, aramed, setyva azianebs ra vazis erTwlian nazards, uaryofiT gavlenas axdens Semdegi wlis mo s aval z ed ac . s et yvi s wi naaR md eg f ar T o d gamo i yeneba amJamad r aket ul i d anad gar ebi . maT i muSaobis principi mdgomareobs imaSi, rom specialuri naRmebis saSualebiT setyvis RrublebSi SehyavT iseTi qimiuri nivTierebebi, romlebic xels uSlian yinvis kristalebis warmoSobas da maT nacvlad miiReba naleqi wvimis saxiT. amave dros mimdinareobs mTel rig mevenaxeobis raionebSi muSaoba, raTa setyvis sawinaaRmdegod S emuSavebul i qnas vaz i s d ac vi s uf r o r ad i kal ur i s aS ual eba.

setyvisagan gamowveuli vazis dazianebis xasiaTi, misi gamosworebis SesaZlebloba da movlis saTanado RonisZiebebis dadgena damokidebulia ori cvalebadi pirobisagan : dazianebis intensivobisa da dasetyvis droisagan. nasetyvi vazis gasxvlis Sedegad miRebuli ylortebi da yvaviledebi gansakuTrebiT ziandebian WraqiT da nacriT, ris gamoc aucilebelia dasetyvis me-2 da me-3 dRes 1,5-2%-iani bordos xsnaris gamoyeneba da agreTve s aWi r o a go gi r d i s S ef r qveva.

yinvebisagan vazis dazianebas SeiZleba adgili hqondes rogorc zamTris periodSi, ise adre gazafxulsa da Semodgomaze. misi dazianebis xasiaTisa da drois mixedviT arCeven s am S emT xvevas :

1. axladgaRviZebuli kvirtebisa da norCi ylortebis dazianeba adre gazafxulze wayi nvebi T .
2. f o T l ebi s a d a i S vi aT ad yur Zni s d az i aneba S emo d go mi s wayi nvebi T .
3. gaxevebuli nawilebisa da miZinebuli kvirtebis yinvebisagan dazianeba zamTris periodSi.

cnobilia wayinvebis warmoSobis ori saxeoba : adekvat ur i – r o mel i c war mo i S o ba

arqtikuli haeris civi masis SemoWriT ama Tu im raionSi. am dros adgili aqvs haeris temperaturis mkveTrad dacemas; radiaciuli – am dros temperaturis mkveTrad dacema ni ad agi s z ed api r T an axl o s xd eba. wayinvebis winaaRmdeg brZolis RonisZiebebi SeiZleba dajgufdes Semdegnairad : 1. jiSis SerCeva; 2. zemoqmedeba garemo pirobebze; 3. agroteqnikuri xasiaTis zemoqmedeba vaz i s kul t ur az e.

didi mniSvneloba aqvs jiSebis SerCevas, garemo pirobebisadmi ukeT Seguebis mizniT, ris TvalsaCino magaliTs warmoadgens saqarTvelos bunebrivi pirobebis nairsaxeobis fonze dajgufebuli vazis mravali jiSis arseboba. wayinvebis gavlenasTan dakavSirebiT, vazis jiSis gamZleoba dakavSirebulia mis Semdeg biologiur - T vi s ebebT an- kvi r t ebi s gvian gaSlasTan da ZiriTads garda, sxva saxeobis kvirtebidanac mosavliani ylortebis gamo t ani s unar T an.

# venaxi s mo vl i s Ro ni s Zi ebebi

vazis mwvane nawilebis operaciebi mimarTulia maTi zrda-ganvi T ar ebi s r egul i r ebi s aken. vaz i s mwvane nawi l ebi s o per ac i ebs mi ekuT vneba:

1. ***zedmeti ylortebis Secla*** – i gi warmoadgens sxvlis operaciis gagrZelebas da emsaxureba Semdeg miznebs: a) zedmeti ylortebis Secla ukeTesad aviTarebs Semdegi wlis sxvlisaTvis saWiro nazards, momavali samamulesa da sanayofes saxiT, romlebic gansakuTrebiT xelsayrel pirobebSi eqcevian kvebisa da aRzrdis mxriv ; b) zedmeti ylortebis Secla, ise rogorc sxvla xels uwyobs calkeuli vazebisa da maTi nawilebis i mgvar ad ganvi T ar ebas , r o m mi R ebul i qnas met i d a ukeT es i xar i s xi s mo saval i .
2. ***ylortebis wveris wawyveta*** – misi praqtikuli mniSvneloba gamoixateba ara marto ylortebis zrdis regulirebaSi, aramed is saukeTeso RonisZiebaa mtevnis gaTxelebis winaaRmdeg sabrZolvelad, rasac zogierTi jiSisaTvis garemo pirobebTan dakavSirebiT, pr aqt i kul i mni Svnel o ba aqvs.
3. ***namxrevebis Secla da misi mniSvneloba*** – namxari viTardeba ZiriTad ylortebze, vegetaciis periodSi foTlis iRliaSi isaxeba kvirti, saidanac imave savegetacio periodis ganmavlobaSi viTardeba gverdiT ylortad anu namxarad. namxaris Secla unda moxdes maSin, rodesac igi norC mdgomareobaSia, ise rom misi moSorebiT ki ar unda z ar al d ebo d es , aramed sxva organoebSi meti plastikuri nivTierebebis miwodebiT ufro unda Zlierdebodes. swored aseTi amocana SeiZleba gadawyvetil iqnas im SemTxvevaSi Tu namxrevebis Secla iwarmoebs maTi erTgvari parazituli cxovrebis dros, e.i. rodesac is s akvebi mas al i s met ad d i d r ao d eno bas xar j avs z r d az e vi d r e qmni s.
4. ***vazis Semorgol va*** – igi ar Sedis aucilebeli agroteqnikuri RonisZiebebis ciklSi da is SeiZleba gamoyenebul iqnas calkeuli jiSebisa da pirobebis mixedviT. es operacia s aukeT es o saSualebas warmoadgens vazis zrdisa da mosavlis regulirebisaT vi s . Semorgolvas uwodeben operacias, rodesac xdeba vazis ylortze an romelime ufro xnovan nawilze rgolisebri 3-5 mm siganis kanis amoWra ori paraleluri SemoserviT. am dros xdeba lafnis sacrisebri milebis gadaWra, daRmavali dena mcenaris wvenis Sewydeba d a Wr i l o bi s z emo T md ebar e o r gano ebi s kveba umj o bes d eba.
5. ***cis gaxsna*** – igi gulisxmobs mtevnebisa da nazardis ukeTes ganaTeba-aer ac i i s pirobebSi Cayenebas. misi teqnika martivia da gamoixateba ylortebis wveris mocilebaSi. c i s gaxs ni T d ad ebi T i S ed egebi s mi R eba S ei Zl eba S emd eg pi r o bebS i :
   1. vazis Zlieri zrdis dros, rodesac is gamowveulia meteorologiuri pirobebiTa d a j i S ur i T vi s ebebi T ;
   2. r o d esac am o per ac i i s Cat ar ebi s vad a emT xveva vaz i s z r d i s S eCer ebi s f az as .
   3. rodesac xdeba ylortebis wveris mxolod zrdadaumTavrebeli nawilis mo c i l eba mi s i Ses r ul ebi s d r o s .

amave d r o s c i s gaxs na uar yo f i T ad i mo qmed ebs Semd eg pi r o bebS i :

* 1. cxeli havis pirobebSi, rodesac ar aris uzrunvelyofili vazis Zlieri z r d a ;
  2. T u mi s Cat ar ebas ad gi l i aqvs yl o r t ebi s Zl i er i z r d i s f az aS i ;
  3. am operaciis uaryofiT gavlenas vazis zrda-ganviTarebaze adgili aqvs im d r o s ac , r o d esac mas Zl i er mkac r ad at ar eben.

1. venaxi s ni ad agi s mo vl a – mi s i d amuSavebi s s i s t emaS i Sed i s S emd egi s axi s s amuS ao ebi :
2. ***venaxis niadagis Rrmad damuSaveba Semodgoma-zamTris periodSi*** saWiroa imisaTvis, rom niadags mTel siRrmeze hqondes marcvlovani agebuleba. am dros niadagSi umjobesdeba da ukeTesad mimdinareobs qimiuri da mikrobiologiuri procesebi, amave dros am fenaSi mospobili unda iqnas mavneblebi da sarevelebi. zemoTa fenaSi aRniSnul i pirobebis Seqmna SeiZleba misi Semodgomaze Rrmad damuSavebiT, 20sm moxvniT. mevenaxeobis i m r ai o nebS i , sad ac vaz ebi z amT r o bi T mo i T xo ven mi waS i d amar xvas , es ukanas knel i samuS ao ufarddeba niadagis Semodgomaze damuSavebas, rac tardeba foTolcvenis damTavrebis S emd eg d a d i d i yi nvebi s d awyebamd e.
3. ***niadagis damuSaveba gazafxulze*** – am dros misi damuSaveba xdeba nakleb siRrmeze igi udris 15sm-s. misi mniSvneloba ganisazRvreba aeraciis gaumjobesebiTa da sarevela bal axebi s wi naaRmd eg br Zo l i T .
4. ***venaxis niadagis damuSaveba zafxulis periodSi*** – igi muSavdeba 7-10sm siRrmeze da mimarTulia sarevela balaxebis winaaRmdeg brZolisaken da niadagis zedapiris mudmivad gafxvierebisaken. es samuSao tardeba umTavresad specialuri sxvadasxva tipis kul t i vat o r ebi T .
5. ***mulCireba*** - uwodeben iseT RonisZiebas, rodesac niadagis sxvadasxva zedapirze d aaf enen s xvad as xva saxi s mas al as , r o go r ebi c aa : mul Ci s qaRal d i , nakel i , t o r f i , bal axi , Cala, lerwami da a.S. amgvarad, niadagi savegetacio periodSi daCrdilul mdgomareobaSi imyofeba. es RonisZieba xels uwyobs niadagSi tenis SenarCunebas da adidebs masSi temperaturas, aZlierebs mikrobiologiur procesebs da icavs vazis fesvTa sistemas gval vi s a d a yi nvi s uar yo f i T i gavl eni sagan.

venaxis niadagis meqanikuri wesiT damuSaveba xorcieldeba sxvadasxva konstruqciis

i ar aR ebi T :

1. iaraRebi niadagis Rrmad damuSavebisaTvis, beltis mTlianad an nawilobrivi gad abr unebi T ;
2. i ar aR ebi ni ad agi s R r mad d amuSavebi s aT vi s bel t i s gad abr unebi s gareSe ;
3. i ar aR ebi ni ad agi s z ed api r ul i gaf xvi er ebi s aT vi s ;
4. iaraRebi, romelTa moqmedeba arapirdapiri gziT iwveves niadaguri pirobebis gaumj o bes ebas .

venaxis niadagis dasamuSavebel iaraRebs moeTxovebaT mwkrivebisadmi axlo midgoma,

ami s aT vi s i ar aRebi s mo muSave nawi l ebi gamo weul i a t r aqt o r i s gabar i t i s gar eT .

venaxis guTani – misi daniSnulebaa venaxis niadagis moxvna Semodgoma - gazafxulze 25 s m s i R r mez e, bel t i s gad abr unebi T d a gaf xvi er ebi T . vaz i s kul t ur i s wes ebi s T avi s ebur eba, niadaguri da klimaturi pirobebis sxvaobebi moiTxovs venaxis guTnis specifikur konstruqcias, romelic advilad gamoiyeneba, axlos miudgeba mwkrivs da vazs ar daazianebs. es wayenebuli moTxovnilebebi guTnebisadmi SeiZleba dakmayofildes maTi agebul ebi s mi xed vi T .

savenaxe kultivatorebi – am tipis iaraRi gamoyenebulia mevenaxeobaSi niadagis z ed api r ul i gaf xvi er ebi saT vi s d a s ar evel ebi s wi naaRmd eg sabr Zo l vel ad .

niadagis gamaRrmavebeli iaraRebi – misi daniSnulebaa niadagis gafxviereba 70-80 sm

s i R r mez e, bel t i s gad aubr unebl ad d a ni ad agi s s xvad as xva f eni s ar evi s gar eS e.

ferdobebze venaxis niadagis damuSavebis meqanizacia - ferdobebze venaxis niadagis

damuSavebisaTvis mevenaxeobis meqanizaciis dargSi ukanasknel miRwevas warmoadgens iseTi agregatis kombinireba, romelSic Sedis motoriani jalambari da bagiris wevis niadagis dasamuSavebeli iaraRi. misi gamoyeneba mizanSewonilia mxolod im daqanebis nakveTebze, s ad ac Cveul ebr i vi t r aqt o r i s gamo yeneba ar S ei Zl eba.

**s asuqebi s gamo yeneba venaxSi** – ar Ceven s as uqebi s S emd eg s axeebs :

1. mineraluri sasuqebi, romelic Tavis mxriv iyofa azotian, fosforian da kaliumian s as uqebad .
2. az o t o vani sas uqebi a – gvar j i l a, s ul f at amo ni umi , S ar d o vana.
3. f o s f o r i ani s as uqebi a – s uper f o sf at i , o r magi s uper f o sf at i , T o mas i s wi d a.

g) kal i umi ani sas uqebi a – ql o r i ani kal i umi , kal i umi s mar i l i , s i l vi ni t i , nac ar i .

1. organuli sasuqebia: nakeli da komposti (mis dasamzadeblad SeiZleba gamoyenebul i qnas t o r f i , nac ar i , ki r i d a sxva).

venaxis gakirianeba – igi warmoadgens arapirdapiri gziT moqmedi sasuqis Setanas niadagSi. gakirianebas mimarTaven mJave niadagebze da misi fizikuri Tvisebebis gas aumj o bes ebl ad . am d r o s i yeneben d af qul ki r qvas , d amwvar ki r s , c ar c s , mer gel s , ki r i s t ut es .

sasuqebis gavlena vazis zrda-ganvi T ar ebaz e – niadagSi sasuqebis Setana xdeba sami ZiriTadi elementis – azotis, fosforisa da kaliumis mixedviT, romelsac vazi didi raodenobiT xarjavs. azoti axangrZlivebs vazis wliuri ganviTarebis calkeul fazebs da saerTod agrZelebs savegetacio periods. es elementi xels uwyobs kvirtis adre gaSlas da amiT axangrZlivebs meore fazasac. fosfori da kaliumi ki xels uwyobs yurZnisa da merqnis simwifis msvlelobas. vazis normaluri zrda-ganvi T ar ebi s aT vi s mTavaria yvela elementis erTmaneTTan kompleqsSi harmoniuli moqmedeba, romlis dros xd eba c al keul i o r gano ebi s no r mal ur i ganvi T ar ebi s uz r unvel yo f a.

# r T veli

saqarTvelos mevenaxeoba Tavisi unikaluri jiSebiT erT-erTi uZvelesi dargia

ms o f l i o S i qveynisa da xalxis ekonomikuri mdgomareobis gaumjobesebis saqmeSi mevenaxeobas erT-

erTi sapatio adgili ukavia. mdgradi da xarisxiani mosavlis misaRebad saWiroa kargad ganvi T ar ebul i , movlili vazis nargaoba, romlisTvisac saWiroa winaswar nakveTis SerCeva, damuSaveba-ganoyiereba da venaxis gaSeneba maRalxarisxiani elituri namyeni nergiT. Semdgom venaxis movlis RonisZiebebi unda Catardes agrowesebis sruli dacviT, r o mel i c saf uZvel s Cauyr i s maR al xar i s xi ani mo s avl i s mi R ebas .

rTveli erT-er T sapasuxismgeblo RonisZiebas da erovnul dResaswauls warmoadgens,

ami t o m aR ni S nul i r i t ual i s Cat ar ebi s aT vi s saWi r o a gans akuT r ebul i mo mz ad eba. rTvelis dawyebas win unda uZRodes yurZnis wvenSi gl uko ac i d o met r i ul i ko ef i c i ent i s

gansaz Rvr a (S aqar - mJavi ano bi s S ef ar d eba), r o mel i c xd eba S emd egi f o r mul i T :

Saqr ebi %

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t i t r ul i mJ avi ano ba gr /l

Tu yurZenSi Saqrianoba udris 21%, xolo mJavianoba-6 gr/l am SemTxvevaSi gl uko ac i d o met r i ul i ko ef i c i ent i = 21/6 = 3,5.

**sasufre yurZnis krefa.** yurZnis maCveneblebis mixedviT, saadreo vazis jiSebiT iwyeba, simwife ganisazRvreba: garegnuli SexedulebebiT, marcvlis gemuri TvisebebiT da qimiuri SedgenilobiT (Saqar-mJavianoba). sasufre yurZeni unda daikrifos maSin, rodesac misi Saqrianoba miaRwevs 14-18%, evropis mTel rig qveynebSi sasufre yurZens krefen r o d es ac mas S i Saqr i ano ba mi aR wevs 14-16%-s , s aqar T vel o S i ki i kr i f eba 17-18%-i s d r o s .

sasufre yurZnis rTveli warmoebs mSral amindebSi, SerCeviT, or - sam vadaSi, raTa S es aZl ebel i i yo s ko nd i c i ur i mt evnebi s gamo kr ef a.

sasufred gankuTvnili yurZeni xasiaTdeba feris, mtevnis da marcvlis mixedviT, s uf Tavdeba dazianebuli marcvlebisgan, iwyoba yuTebSi. saRi mtevnebi, Tu isini Sesanaxad aris gankuTvnili, unda Caiwyos 3-4 kilogramis tevadobis specialur yuTebSi, xolo Tu uS ual o d sar eal i z ac i o d mi d i s 8-10 kg-i s t evad o bi s yuT ebS i .

**saRvine yurZnis krefa-** sasufre yurZnisagan gansxvavebiT saRvine yurZeni ikrifeba j iSobrivi siwmindis dacviT, mTavar jiSSi gamoreuli sxva jiSis yurZeni, gansakuTrebiT TeTr jiSSi wiTeli jiSis narevi, calke unda daikrifos, winaaRmdeg SemTxvevaSi mosalodnelia Rvinis feris an sxva organoleptikuri Tvisebebis darRveva, rac t ipobriobisagan gadaxras gamoiwvevs, aseve calke ikrifeba dazianebuli, naklebad mo mwi f ebul i yur Zeni d a i gz avneba Rvi ni s s ar d af S i S es af er i s i d ani S nul ebi saT vi s .

rTvelis dawyebamde 2-3 kviriT adre iwyeba winaswari samzadisi, rac ZiriTadad iTvaliswinebs yurZnis gadasamuSavebeli marnis, manqana iaraRebis, saRvine da sakrefi WurWlis dasufTavebas. gansakuTrebul damuSavebas saWiroebs yurZnis sakrefi da sazidi Wur Wel i . maRali Rirsebis saRi Rvinis misaRebad mokrefili yurZeni 1-2 saaTis ganmavlobaSi

und a d amuS avd es .

**mexi l eoba**

**mexileobis dargis mniSvneloba da amocanebi.** mexileoba aris soflis meurneobis dargi, romlis amocanaa awarmoos maRali xarisxis xili im raodenobiT, rom mTeli wlis ganmavlobaSi uzrunvelyos mosaxleobis moTxovnileba nedli xiliT, aseve gad amamuS avebel i mr ewvel o ba mo amar ago s ned l eul i T .

mecnieruli mexileoba Seiswavlis xilis momcem kulturul mcenareebs da maTi veluri winaprebis zrdis, agebulebis, ganviTarebis, gamravlebis da ms xmo i ar o bi s kano nz o mi er ebebs , mexi l eo bi s d ar gi s S eT anawyo bi l ganvi T ar ebas s xva s o f l i s meur neo bi s d ar gebT an er T ad d a S ei muS avebs d ar gi s S emd go mi ganvi T ar ebi s mec ni er ul s af uZvlebs.

mexileba saqarTveloSi istoriulad Camoyalibebuli, tradiciuli dargia. igi

ganvi T ar ebul i a yvel gan, s ad ac ki ami s s aS ual ebas i Zl eva eko l o gi ur i pi r o bebi .

sasargeblo nivTierebebis Semcvelobis gamo, didia xilis mniSvneloba adamianisaTvis. xilis nayofi Seicavs Saqrebs, cilebs, cximebs, organul mJavebs, vitaminebs da sxva iseT biologiurad aqtiur nivTierebebs, romlebic aucilebelia ad ami ani s o r gani z mi s c xo vel myo f el o bi saT vi s .

xili Seicavs Saqrebs, ZiriTadad glukozisa da fruqtozis saxiT (6-25%); organul mJavebs \_ vaSlis, limonis da Rvinis mJavebis saxiT (0,2-6%). zogierTi xili md i d ar i a cilebiT da cximebiT. magaliTad, kakali, Txili da nuSi Seicavs cilebs \_ 17%md e d a c xi mebs 60-70%-mde . xi l i S ei c avs 20-md e saxi s vi t ami ns .

xilis nargaobas iyeneben gamwvanebisTvis, ferdob adgilebze niadagis d as amagr ebl ad , er o z i ul i mo vl enebi s wi naaR md eg, qar saf ar i z o l ebi s Sesaqmnel ad . mer qans i yeneben s axar at o mr ewvel o baS i . f o T l ebs , qer qs d a naWuWs samRebr o mr ewvel o baS i d a a.S .

mexileobis ganviTareba uxsovari droidan iwyeba. akad. i. javaxi- Svi l i

saqarTveloSi mexileobis ganviTarebas ukavSirebs msoflioSi mexileobis ganviTarebis dasawyiss. mas miaCnia, rom mebaReoba pirvelad ganviTarda wina aziaSi da Crdilo af r i kaS i .

msoflioSi baRebis yvelaze Zveli aRwera dagvitoves babilonelebma da egviptelebma (3000 wlis winaT Cv.w.aR-mde) CineTSi werilobiTi cnobebi baRebis Sesaxeb gvxvdeba 2000 wlis winaT Cv.w.aR-mde. indoeTSi \_ 1300 wlis winaT Cv.w.aR-mde. es cnobebi exeba maRalkulturul baRebs. semiramidas dakidebuli baRebi cnobilia, rogorc ms o f l i o s er T -er T i s ao c r eba.

n. xomizuraSvili aRniSnavs, rom mexileobis istoria im droidan iwyeba, rodesac adamianma binadar cxovrebas mihyo xeli da sacxovrebeli adgilis axlos gadmoitana gar eul i xi l i s f o r mebi .

asurul lursmnuli warwerebidan (3 aTasi wlis winaT Cv.aR.mde) irkveva, rom qarTvel tomTa winaprebs - muskebsa da Tubalebs mevenaxeoba hqoniaT ganviTarebuli, amitom cxadia im periodSi miwaTmoqmedebis sxva dargebic, maT Soris mebaReoba da mexil eo bac i qnebo d a ganvi T ar ebul i (i .j avaxi Svi l i 1934).

pirveli qarTuli werilobiTi cnobebi, sadac baRi moixsenieba, miekuTvneba IV

saukunes (wmi nd a ni no s c xo vr eba). V I s aukuneS i pr o ko f i kesar i el i aR wer s mes xeT i s baR ebs .

Zvel berZen istorikosebs strabons (Is. Cv.w.aR-mde) da qserofantes (IVs. Cv.w.aR-md e) s aqar T vel o yo vel gvar i xexi l i T savse qveynad aqvT d axas i aT ebul i .

XII saukuneSi ioane SavTeli abdulmesiaSi saintereso cnobebs gvawvdis s aqar T vel o s mebaReo bi s S es axeb.

1. saukuneSi zaza fanaskertelma dawera saaqimo wigni \_karabadini, romelSic aR wer a qar T ul i xi l i s s amkur nal o T vi s ebebi .
2. saukuneSi saqarTveloSi imogzaura frangma misionerma Jan Sardenma, romelmac aRwera imdroindeli mexileobis da mevenaxeobis mdgomareoba saqarTveloSi. aR ni S na qar T ul i xi l i s d a R vi ni s sauc xo o gemur i T vi s ebebi .

saqarTveloSi werilobiTi cnobebi mynobis Sesaxeb X saukunes ganekuTvneba. misi siZvelis Sesaxeb saintereso cnobebs gvawvdis akad. p. Jukovski. igi wers, rom romaelebma I saukuneSi icodnen mynobis yvela wesi, romelic dResac gamoiyeneba. romaelebma igi iswavles baskebisagan. baskebi Tavis fesvebiT dakavSirebuli arian kavkasiasTan. es ki i mas ni S navs , r o m myno bi s s amS o bl o kavkas i aa.

baRi da BbaRCa sparsuli sityvebia da XI-X IIs .s .-dan gvxvdeba qarTul l i t er at ur aS i . manamd e am t er mi nebi s S es at yvi s ad i xmar ebo d a wal ko t i , mt i l i , s amo T xe.

saqarTveloSi samrewvelo mexileoba ganviTarebas iwyebs XIX saukunis meore naxevridan. yalibdeba Tbilisis sabaRosno saswavlebeli (XIXs 70-iani wlebi). 1882 wels Camoyalibda winamZRvrianTkaris sasoflo-sameurneo skola. cota ufro mogvianebiT ki - quTaisis da iyalTos sabaRosno skolebi. samrewvelo mexileobis ganviTarebaSi didi wvlili miuZRviT i.furcelaZes, n.kecxovels, k.xeTagurs da sxvebs, romlebmac Semoitanes saqarTveloSi ucxouri jiSebi, Seqmnes sakoleqcio baRebi, Camoayalibes sanergeebi. xeli S euwyves xi l i s s as aqo nl o pr o d uqc i i s gaz r d as . saqarTveloSi pirveli samrewvelo baRebi gaSenda 1930-32 wlebSi. Camoyalibda

qi wni s i s , var i ani s , br eT i s d a a.S . s axel mwi f o meur neo bebi . saqarTvelos mexileobis ganviTarebis istoria SeiZleba sam periodad daiyos: 1. uZvel es i d r o i d an X IX s aukuni s meo r e naxevr amd e. 2. X IX s aukuni s meo r e naxevr i d an 1930-i an wl ebamd e. 3. 30-i ani wl ebi d an d Remd e.

ukanasknel wlebSi obieqturi da subieqturi faqtorebis gavleniT Semcirda xilis baRebis farTobi (6000-ha-mde). qveynis strategiuli interesebidan gamomdinare auc i l ebel i a mexi l eo bi s d ar gi s aR o r Zi neba.

saqarTvelo xasiaTdeba metad mravalferovani niadagur-klimaturi pirobebiT. xexilovani kulturebis da jiSebis sworad gaadgilebis mizniT saqarTvelo dayofilia mexileobis zonebad, romelsac safuZvlad udevs zonaSi gaerTianebuli raionebis eko l o gi ur i pi r o bebi d a mexi l eo bi s sawar mo o mo T xo vni l eba.

saqarTveloSi mexileobis 11 zonaa. kaxeTis; qvemo qarTlis; Sida qarTlis;

aRmosavleT saqarTvelos mTiani zona; mesxeTis; zemo imereTis; qvemo imereTis; gurias amegr el o s ; r aWa-l eCxumi s d a svaneT i s ; aWar i s d a af xaz eT i s z o na.

aRni S nul i z o nebi d an T es l o vani xilis warmoebis klasikur zonebad iTvleba Sida qar T l i d a mesxeT i .

**xexilovan mcenar T a kl as i f i kac i a d a mo r f o l o gi ur i d axas i aT eba** mTeli mcenareTa samyaro iyofa or did nawilad - umdables da umaRles mcenareebad. umaRles mcenareebs, umdablesisagan gansxvavebiT, aqvT rTuli mo r f o l o gi ur i agebul eba. maT i Zi r i T ad i o r gano ebi a f es vi , R er o d a f o T o l i .

dReisaTvis miRebulia xexil-kenkrovani mcenareebis Semdegi dajgufeba: I. botanikuri,

anu taqsonomiuri II. sasicocxlo (biologiuri) formebis mixedviT da III. biologiursawarmoo.

TiToeul am dajgufebas safuZvlad udevs mcenaris an misi sxvadasxva nawilis morfologiuri, da biologiuri niSan-Tvisebebi. botanikuri klasifikacia emyareba mcenareTa sistematikaSi miRebuli dayofis Semdeg sistemas: tipi, klasi, rigi, ojaxi, gvar i , s axeo ba (t aqs o no mi ur i er T eul ebi ).

am niSnis mixedviT yvela xexil-kenkrovani mcenare miekuTvneba farulTeslovnebis

t i ps d a o r l ebni anT a kl as s . magal i T ad , vaS l i s bo t ani kur kl as i f i kac i as as eT i saxe aqvs :

tipi: farulTeslianebi - Angiospermae; klasi: orlebnianebi – Dicotyiledonae; rigi: var d nai r i – Rosales; ojaxi: vardisebrTa \_ Rosaceae; qveojaxi: vaSlisebrTa \_ Pomoideae; gvar i : vaS l i s \_ Mal us Mi l l ; saxeo ba: S i naur i vaS l i – Mal us d o mes t i c a Bo r kh.

II \_ sasicocxlo (biologiuri) formebis mixedviT klasifikacias safuZvlad udevs mc enar i s z r d i s s i Zl i er e, s i c o c xl i s xangr Zl i vo ba d a s xva mo r f o l o gi ur i ni S nebi .

am ni S ni s mi xed vi T xexi l -kenkr o vani mc enar eebi i yo f a Semd eg j guf ebad :

1. xe - mcenareebi, Stambianebi \_ romlebisTvisac damaxasiaTebelia erTi mZlavrad ganviTarebuli centraluri Rero, Zlieri zrda da xangrZlivi sicocxle (msxali, bali, kakali). am jgufs ganekuTvnebian is mcenareebi, romlebsac SedarebiT sustad gamoxatuli centraluri Rero aqvT da axasiaTebT naklebi sicocxlis xangrZlivoba da susti zrda (vaS l i , ql i avi , ms xl i s z o gi er T i j i S i ).
2. buCqismagvari formebi \_ maT aqvT erTi an ramdenime sustad gamoxatuli Rero, xanmo kl e s i c o c xl e (T xi l i , l eR vi , br o weul i , f S at i ).
3. buCqebi \_ dabali mcenareebia, tolfasovani nulovani gantotvis ReroTi. Reroebs gar kveul i d r o i s S emd eg S euZl i aT ganaxl eba (J o l o , mayval i , mo c xar i , qac vi ).
4. lianebi \_ mravalwliani merqniani mcenareebi Camokidebuli (Cinuri limnura, aqt i ni d i a), an mc o c avi (vaz i ) R er o T i .
5. mravalwliani balaxovani mcenareebi \_ ar gaaCniaT gaxevebuli miwiszeda Rero. R er o ebi mi waz ea gar T xmul i (mar wyvi , xend r o ).

III \_ biologiur-sawarmoo klasifikacia emyareba nayofis morfologiur agebulebas d a gamo yenebi s xas i aT s . (es kl as i f i kac i a ar emT xveva bo t ani kur kl as i f i kac i as ).

bi o l o gi ur - sawarmoo niSnebis mixedviT gamoyofen xexil-kenkrovani kulturebis Semdeg jgufebs: 1. Teslovanebi: vaSli (Malus M); msxali (Pirus L); komSi (Cydonia M); zRmartli (Mespilus L); c i r c el i (Sorbus L); kuneli (Crataegus L); yvavt yemal a (Amelanchier M).

saqarTveloSi yvelaze meti sawarmoo mniSvneloba aqvs vaSls da msxals. ufro

nakl ebi ko mSs d a z R mar t l s . d anar Ceni kul t ur ebi ar as amr ewvel o mni S vnel o bi saa.

* 1. kurkovnebi: atami (Persica M); qliavi (Prunus M); gargari (Armeniaca MM); bali,

alubali (Cerasus L ); tyemali (Pdivaricata L); alubali (P Vachuschtii L); RoRnoSo (Pinsititia); S i nd i (Cornus L); kvr i nCxi (P spinosa); f S at i ( E laegous).

* 1. kaklovanebi kakali (Iuglanss L); pekani (Carya Nutt); Txili (Corylus L); fsta (Pistacia L); wabl i (Castaneae M); nuS i (Amygdalus LL).

kaklovanTa jgufi d an saqarTveloSi samrewvelo nargaobaSi gvxvdeba mxolod sami

kul t ur a: kakal i , T xi l i d a nuS i .

* 1. kenkr o vnebi (Gossularia M); mocvi (Vaceinium L); kowaxuri (Berberis L); aqtinidia (Actinidia hind); qacvi (Nipophae). nayofis agebulebis mixedviT amave jgufs miekuTvneba l eR vi (Ficus L); f ei ho a (Feijoa) d a c i t r usebi (f o r T o xal i , l i mo ni , mand ar i ni ) d a s xv. kenkrovnebidan saqarTveloSi farTodaa gavrcelebuli mxolod marwyvi da leRvi,

d anar Ceni kul t ur ebi gvxvd eba vel ur i s axi T .

sivrceSi ganlagebis mixedviT mcenaris yvela organo iyofa miwisqveda (fesvTa

s i s t ema) d a mi wi s z ed a (R er o , f o T o l i ) nawi l ebad .

mcenaris miwisqveda sistemas miekuTvneba fesvTa sistema, romelic amagrebs mcenares

ni ad agS i d a awvd i s wyal sa d a mas S i gaxs ni l mi ner al ur mar i l ebs .

warmoSobis mixedviT xexil-kenkrovan mcenareebs sami tipis fesvTa sistema aqvT:

* 1. gener ac i ul i warmoSobis fesvTa sistema aqvT Teslidan aRmocenebuli, an T es l ner gz e d amyno bi l mc enar eebs .
  2. veget at i ur i warmoSobis fesvTa sistema aqvT miwiszeda organoebis dafesvianebis Sedegad miRebul mcenareebs (dakalmebiT, vertikaluri da horizontaluri amonayrebiT) l eR vs , br o weul s , T xi l s , veget at i ur s aZi r eebz e d amyno bi l vaS l s , ms xal s d a s xv.
  3. d ed a - mcenaris fesvebisgan warmoSobili fesvTa sistema. axasiaTebs fesvis amonayridan miRebul mcenareebs alubals, qliavis zogierT jiSs, marwyvs, J o l o s . s i gr Zi s , s i ms xo s d a gant o t vi s mi xed vi T f es vebi i yo f i an o r j guf ad :
     1. ConCxis da naxevrad ConCxis fesvebi. sigrZiT 10-14 m-mde, simsxo 1\_3 mm-dan ramdenime sm-mde. maT miekuTvnebaT nuli, pirveli, meore da iSviaTad mesame rigis f es vebi .
     2. Semmosavi fesvebi. sigrZe ramdenime santimetria, simsxo 3-mm. maT miekuTvneba meo T xe, mexuT e meeqvs e d a uf r o maR al i r i gi s f es vebi . ni ad agS i ganl agebi s mi xed vi T f es vebi i yo f i an:
  4. ho r i z o nt al ur i , r o ml ebi c ganl agebul i a ni ad agi s z ed api r i s par al el ul ad ni ad agi s zeda fenebSi, sadac grovdeba saWiro sakvebi nivTierebebi. es fesvebi fesvTa sistemis ZiriTad mas as S ead gens . maT i s i gr Ze aR wevs 100-120 sm-s.
  5. vertikaluri, romlebic ganlagebulia niadagis siRrmeSi vertikalurad. igi aRwevs

6-12 m-md e. Semmosavi fesvebi agebulebisa da funqciis mixedviT iyofian oTx jgufad: sazrdeli, S emwo vi , gar d amaval i d a gamt ar i .

mc enar i s mi wi s z ed a s i s t ema Sed geba Semd egi nawi l ebi s agan:

* + - 1. er o \_ mc enar i s Rer Zi . i gi war mo ad gens mc enar i s mi wi s z ed a nawi l i s s ayr d ens .
      2. t ambi \_ R er o s qved a nawi l i f es vi s yel i d an pi r vel Co nCxur gant o t vamd e.

fesvis yeli \_ fesvis StambTan SeerTebis adgili. fesvis yeli aris namdvili da pirobiTi. namdvili aqvs Teslidan aRmocenebul, an Teslnergze damynil mcenareebs. pi r o bi T i \_ veget at i ur i gamr avl ebi s gz i T mi R ebul mc enar eebs .

varji \_ mcenaris mTeli gantotvis erToblioba. gantotvaTa ricxvi yovelwliurad matulobs. srul msxmo iare xe mcenar eS i gantotvaTa ricxvi 7-8- md ea, ris Semdeg gant o t vaT a r i c xvi S ed ar ebi T mud mi vi r Ceba.

centraluri gamagrZelebeli, anu lideri \_ Reros nawili pirveli ConCxuri

gant o t vi d an wver i s er T wl i ani naz ar d i s f uZemd e.

gamagrZelebeli ylorti \_ erTwliani nazardi, romliTac mTavrdeba centraluri

gamagr Zel ebel i .

ConCxis da naxevrad ConCxis totebi \_ ZiriTadi totebia, igive deda totebi, r o mel i c war mo ad gens var j i s s af uZvel s . pi r vel i , meo r e, mes ame d a meo T xe r i gi s .

Semmosavi totebi \_ ConCxis da naxevrad ConCxis totebzea ganlagebuli. igive s az r d el i d a sanayo f e war mo naqmnebi a. meo T xe, mexuT e, meeqvse d a a.S . r i gi s .

t o t i \_ gas ul i wl i s naz ar d i a anu yl o r t i f o T l ebi s Camo c veni s S emd eg.

ylorti \_ mimdinare wlis nazardia foTolcvenamde. igi Sedgeba Reros, foTlisa da kvi r t ebisagan. Rero \_ ylortis RerZuli nawilia. foTlebi da kvirtebi ki gverdiTi. Reros im nawils sadac foTlebi da kvirtebia ganlagebuli muxli ewodeba. xolo muxlebs Soris adgils muxlTSorisebi. ylortze foTlis yunwis mimagrebis adgils yunwis sajdoms uwodeben. yunwis sajdomis ubeSi isaxeba kvirti, romelsac mjdomare kvirts uwodeben. yunwis ZirSi viTardeba foTolTanebi, firfitis ZirSi ki – j i rkvlebi (kurkovanebs axasiaTebs,). am jirkvlebis Sefervis saSualebiT SeiZleba nayofis feris amocnoba.

Teslovani da kurkovani kulturebis sazrdeli ylortebi morfologiurad erTmaneTis msgavsia. ganasxvaveben Semdegi tipis sazrdel ylortebs: gazafxulis, anu normalur sazrdel ylorts, romelic viTardeba wina wels Casaxuli kvirtidan. naadrev (zafxulis) ylortebs, viTardebian imave wels Casaxuli kvirtidan. molozona, anu Solta t o t ebs , vi T ar d ebi an mZi nar e kvi r t ebi d an.

Teslovani da kurkovani kulturebis sanayofe totebi morfologiurad er T maneT i s agan gans xvavd ebi an.

Teslovan kulturebs axasiaTebs Semdegi tipis sanayofe totebi: sanayofe wkepla, sanayo f e S ubi , sanayo f e CanT a, mar t i vi meWeWi d a r T ul i meWeWi .

kurkovani kulturebisaTvis damaxasiaTebelia Semdegi sanayofe totebi: sanayofe T ai gul i , s anayo f e d ez i d a S er eul i t i pi s sanayo f e t o t i .

mcenaris ZiriTadi organoebis saxecvlilebebs miekuTvneba kvirti, yvavili da nayofi.

kvirti aris ylortis Semoklebuli Canasaxi, an misi modifikacia, romelic imyofeba

mo s venebi s md go mar eo baS i .

kvi r t i d an vi T ar d eba yl o r t i , f o T o l i d a nayo f i .

daniSnulebisa da agebulebis mixedviT kvirtebi sami tipisaa: vegetatiur i ,

gener ac i ul i d a gener ac i ul -veget at i ur i . vegetatiuri kvirtebidan viTardeba foTlebi, ylortebi da axal kvirtebi. gener ac i ul i kvi r t ebi d an f o r mi r d eba mxo l o d yvavi l i d a S emd eg nayo f i .

generaciuli, anu sanayofe kvirtebi aris martivi da rTuli, anu Sereuli (gener ac i ul -veget at i ur i ).

martivi kvirtebi Seicavs mxolod yvavilis Canasaxs. aseTi kvirtebi axasiaTebs

kur ko vnebs ; kakl o vanebi d an - kakal s , T xi l s d a c i t r us o vnebs .

rTuli kvirtebi Seicavs ara marto yvavilis, aramed foTlis da ylortis Canasaxsac. aseTi kvirtebi damaxasiaTebelia TeslovanebisTvis; kaklovanebidan axasiaTebs wabls, fstas; kenkr o vanebi d an \_l eRvs , mayval s , S av mo c xar s d a s xva.

ylortze ganlagebis mixedviT kvirtebi aris \_ kenwruli, gverdiTi, anu iRliis da

d amat ebi T i .

kenwruli kvirtebi ganlagebulia ylortis da maTi gantotvis wverebze. maTgan

war mo i qmneba s az r d el i t o t ebi , r o ml ebi c i s ev bo l o vd eba saz r d el i kvi r t ebi T .

iRliis kvirtebi ganlagebulia foTlis iRliaSi. Teslovan da kurkovan kulturebSi es kvirtebi ylortis Sua nawilSi gvxvdeba. kenkrovnebSi \_ qveda nawilSi, an ylortis f uZes T an.

damatebiTi kvirtebi isaxebian foTlis iRliis gareT, mravalwlian nawilebsa da fesvebze. maTgan warmoiqmneba axali organoebi da zrdas iwyeben mcenaris raime nawilis d az i anebi s S emT xvevaS i .

kvirtebi imis mixedviT, Tu rodis viTardeba aris sami saxis: normaluri \_ wina wlis zafxulSi isaxeba da meore wels gazafxulze iSleba. adreula \_ Casaxvis welsve viTardeba da iZleva naadrev ylorts da mZinare \_ gaRviZebas iwyebs mcenaris dazianebis, an bunebr i vi s i ber i T gamo wveul i xmo bi s d r o s .

yvavi l i ar i s sanayo f e o r gano , r o mel i c war mo ad gens saxec vl i l R er o s f o T l ebi T .

xexi l o vani mcenareebis yvavili erTsqesiani, an orsqesiania. Tu mtvrianebi da butko

moTavsebulia erT yvavilSi, igi orsqesiania (Teslovani da kurkovani kulturebi). Tu yvavilSi mxolod butkoa, igi mdedrobiTia, Tu mxolod mtvrianebi – mamr o bi T i . mcenareebs, romlebsac cal-calke aqvT mdedrobiTi da mamrobiTi yvavilebi, sqesgayofili mcenareebi ewodebaT. isini SeiZleba iyos erTsaxliani da orsaxliani. Tu mdedrobiTi da mamrobiTi yvavilebi ganlagebulia erT mcenareze, maSin igi erTsaxliania (kakali, Txili), xolo, Tu mdedrobiTi yvavilebi ganlagebulia erT mcenareze, mamrobiTi ki meo r ez e- i gi o r saxl i ani a (xend r o , l eR vi ).

Tu erTi sayvavile kvirtidan erTi yvavili viTardeba, aseT yvavils martivi yvavili ewo d eba. mar t i vi yvavi l i axas i aT ebs at ams , gar gar s , nuS s d a s xva kul t ur ebs .

Tu erTi sayvavile kvirtidan ramdenime yvavili viTardeba aseT yvavils yvaviledi ewo d eba. yvavi l ed i S ed geba er T Rer Zz e ganl agebul i r amd eni me yvavi l i sagan. es r ao d enoba meryeobs kulturebisa da jiSebis mixedviT. vaSlis yvavileds aqvs 5-6 yvavili, msxalis yvavi l ed s \_ 6-7 d a s xv.

yvaviledi formis da moyvanilobis mixedviT aris qolgis, faris, mtevnis, mWadas da

s xva t i pi s .

ganayo f i er ebi s T avi s ebur ebebi s mi xed vi T xexi l o vani kul t ur ebi ar i s : T vi T s t er i l ur i \_ romlebsac ar SeuZliaT ganayofierdnen Tavisive mtvriT da normaluri nayofierebisaTvis Txouloben jvaredin ganayofierebas da TviTfertiluri \_ romlebic i mt ver ebi an T avi s i ve mt vr i T .

nayofi aris ganayofierebis Sedegad ganviTarebuli saxecvlili butko. nayofi Sedgeba Teslisa da nayofgaremosagan. xexilis umravlesobaSi (Teslovanebi, kurkovanebi) nayo f i s s akvebad gamo s ayenebel nawi l s nayo f gar emo war mo ad gens , kakl o van kul t ur ebS i ki - Tesli.

nayo f i ar i s mar t i vi d a r T ul i .

Tu yvavilSi erTi butkoa da misgan mxolod erTi nayofi viTardeba martivi nayofi ewo d eba. as eT i nayo f i axas i aT ebs T es l o vnebs d a kur ko vnebs .

rodesac yvavi lSi ramdenime butkoa da TiToeulodan TiTo nayofi viTardeba, maSin aseT nayofs rTuli, an nakrebi nayofi ewodeba. aseTi nayofi axasiaTebs kenkrovnebs (mar wyvi , mayval i , J o l o ).

rodesac yvaviledis TiToeuli yvavili iZleva nayofs da es nayofebi erTmaneTTan mWidrod arian Sezrdili nayofedi ewodeba. aseTi nayofi kenkrovnebidan axas i aT ebs T uT as l eRvs d a s xv.

**xexi l o vani mc enar eebi s gamr avl eba** gamravlebis mizania mcenaris raodenobis gazrda da Zvirfasi niSan-T vi s ebebi s SenarCuneba. gamravlebis formebia: sqesobrivi da usqeso. sqesobrivi gamravlebis dros mcenareTa raodenobis zrda xdeba Teslis TesviT. usqeso gamravlebis dros ki - uj r ed ebi s d ayo f i T d a maT i d i f er enc i ac i i T .

TesliT gamravlebas aqvs Tavisi dadebiTi da uaryofiTi mxareebi. igi yvelaze martivi wesia, uzrunvelyofs virusuli daavadebebisagan Tavisufali mcenareebis miRebas, magram saWiroa xangr Zlivi dro daTesvidan msxmoiarobamde, agreTve Teslis aRmoceneba garTulebulia da xdeba sawyisi formebis daTiSva. TesliT gamravlebas ZiriTadad mi mar T aven sas el eqc i o muS ao baS i .

vegetatiuri gamravleba aris mcenaris gamravleba misi vegetatiuri nawil ebi T . gamr avl ebi s es saxe aer T i anebs wes ebs , r o ml ebi c i yo f i an o r Zi r i T ad j guf ad .

1. jgufSi gaerTianebulia vegetatiuri gamravlebis is wesebi, romlebic uz r unvel yo f en s akuT ar f es vi ani mc enar eebi s war mo S o bas .
2. j guf S i gaer T i anebul i a myno bi s s xvad as xva wes i d a s axe.

pr aqt i kul mexi l eo baS i mi mar T aven myno bi T gamr avl ebas (kvi r t i T d a kal mi T ). veget at i ur i gamr avl ebi s S emd egi wes ebi ar s ebo bs :

1. kalmiT gamravleba \_ kalmebi SeiZleba iyos Reroseuli, fesvis da foTlis. xexilovan mcenareebs ZiriTadad Reros kalmebiT amravleben. didi mniSvneloba aqvs kalmis aWris vadas. mwvane kalmebi dasafesvianeblad unda aiWras gazafxulze, zrdis d awyebi s S emd eg, an z af xul S i .

gamerqnebuli kalmebi SeiZleba davamzadoT foTolcvenis Semdeg kvi r t ebi s

dabervamde, ufro zusti vadebi ki unda dadgindes konkretuli garemo pirobebis da c al keul i kul t ur ebi s mi xed vi T .

kalmebis dargva xdeba Semodgomaze, an adre gazafxulze. kalmebiT mravldeba

l eR vi , br o weul i , ko mS i s z o gi er T i s axe, J o l o , mo c xar i , xur t kmel i .

mwvane kalmebiT gamravlebas gamoiyeneben dekoratiul mebaReobaSi. mexileobaSi mwvane kalmebiT ZiriTadad zeTisxils amravleben. ukanasknel xanebSi mwvane kalmebiT gamravleba gamoiyeneba vaSlis msxlisa da kurkovani kulturebis klonuri saZireebis gasamravleblad. agreTve alublis, qliavis, atmis, mocxaris, xurtkmelis, Jolos da sxva s akuT ar f esvi ani sar gavi mas al i s gamo s ayvanad .

* 1. miwis SemoyriT (vertikaluri amonayrebiT)gamr avl eba**.** xexilovan mcenareebSi gvxvdeba iseTi saxeobebic, deda mcenarisgan mocilebuli kalmebiT Znelad, an sruliad ar fesviandeba. samagierod, Tu maT totebs deda mcenaris mouSoreblad SeuqmniT xelsayrel pirobebs, isini Tavisuflad dafesviandeba. amis Semdeg isini deda mcenarisgan mocilebuli kargad xaroben sakuTar fesvebze. gamravlebis aseT wess ganapirobebs yl o r t ebi s mi er d amat ebi T i f es vebi s war mo qmni s unar i .
  2. gadawidvniT (horizontaluri amonayrebiT) gamravleba. sanergeebSi klonur saZireebs zogjer horizontaluri amonayrebiTac (gadawidvniT) amravleben. buCqis orive mxares rigis gaswvriv Wrian 8\_10 sm sigrZis Txrilebs da masSi gadaawvenen winaswar mo mz ad ebul 1\3 an 1\2 d amo kl ebul er T wl i an naz ar d s , r o mel sac ni ad agS i amagreben xis an mavTulis kavebiT. gadawvenili totis zeda mxridan ganviTarebul ylortebs 3\_4-j er ayrian miwas. Semodgomaze gadawidnul tots moacileben deda mcenares da Wrian calkeul amo nayr ebad .
  3. fesvis amonayriT gamravleba. mTel rig kulturebs, rogorebicaa alubali, Jolo, qliavis zogierTi saxeoba, axasiaTebs fesvis amonayari. amonayars acileben deda mcenares da rgaven mudmiv adgilze. aseTi wesiT gamravleba sasurveli ar aris, radgan mcenareebi sustad izrdebian, sustdeba deda mcenarec da aseT mcenareebs TviTonac uamr avi amo nayar i axas i aT ebs , r ac aZnel ebs baR S i s xvad s xva agr o R o ni s Zi ebaT a gat ar ebas .
  4. ulvaSebiT gamravleba. ulvaSi ewodeba saxeSecvlil Reros, romelic war mo i qmneba mc enar i s mo kl e naz ar d ebz e f o T l i s i R l i i d an. i gi i z r d eba ho r i z o nt al ur ad niadagis gaswriv da erTerTi muxlidan warmoqmnis axal mcenares, romelic Semdeg unda gad ai r go s . aR ni S nul i wes i T amr avl eben mar wyvs d a xend r o s .
  5. buCqis dayofiT gamravleba. am wesiT mravldeba yvela is mcenare, romelTac axasiaTebs fesvis yelidan didi raodenobiT amonayari, xurtkmeli, mocxari, nagala vaSlis tipebi, Txili, romlebisTvisac saWiroa mTeli mcenaris amoTxra da ramdenime nawilad dayofa ise, rom TiToeul nawils sakmao raodenobiT Ffesvebi da miwa gahyves. es wesi gamoiyeneba maSin, Tu plantacias auqmeben da saWiroa mcenareebis axal adgilas gad at ana.

mynoba aris erTi mcenaris gadanergva meoreze da Sedgeba ori komponent i s agan-

s anamyeni s d a s aZi r i sagan  **mynoba gamo i yeneba Semd egi mi z nebi sT vi s :**

1. iseTi klonebis SenarCunebisaTvis, romelTa gamravleba vegetaciuri gamr avl ebi s s xva wes i T Znel i a an sas ar gebl o ar ar i s .
2. saZiris dadebiTi Tvisebebis gamosayeneblad. zogierT SemTxvevaSi jiSi SeiZleba advilad gamravldes kalmiT, magram upiratesoba eZleva mis mynobas iseT saZireze, romlis fesvTa sistemasac axasiaTebs sasurveli Tvisebebi. magaliTad, cud niadagur pirobebTan Segueba, avadmyofobisa da mavneblebis winaamRdeg gamZl eo ba, s as ur vel i z r d i s s i Zl i er e d a sxva.
3. S ual ed ur i s i Zl i er i s d ad ebi T i T vi s ebebi s gamo sayenebl ad .
4. jiSis Sesacvlelad did mcenareebSi es SeiZleba dagvWirdes maSin, rodesac baRi gaSenebulia Zveli jiSebiT, romlebzec moTxovnileba aRar aris, an ar apr o d uqt i ul i j i S ebi T .
5. SerCeuli naTesrebis msxmoiarobis dasaCqareblad. naTesarebma SeiZleba msxmoiaroba daiwyos 8-15 wlis Semdeg. mynoba ki aCqarebs msxmoiarobaSi Sesvlis dros.

kvirtiT mynoba – mynobis iseTi wesia, rodesac saZireze gadaaqvT kulturuli jiSis mxolod erTi kvirti, qerqis patara fariT. Sesrulebis teqnikis simartivisa da damynobili kvirtebis Sexorcebis maRali procentis gamo kvirtiT mynoba warmoadgens xexi l i s myno bi T gamr avl ebi s Zi r i T ad wess .

kvi r t i T myno bi s S emd egi wesebi ar s ebo bs :

* 1. **T-**sebur WrilS i myno ba.
  2. kvi r t i s mi Wd o mi T myno ba.
  3. o r magi myno ba S ual ed ur i f ar i T .
  4. r go l i T myno ba.

kvirtiT mynobis ZiriTadi vadaa zafxuli, Tumca igi SeiZleba Catardes gazafxulzec. zafxulSi mynoba barSi tardeba 15 ivlisidan 15 seqtembramde. mTian zonaSi ki - 1 agvistodan 1 seqtembramde. pirvel rigSi, unda daimynos kurkovani kul t ur ebi , S emd eg ki \_ T es l o vani .

gazafxulze mynoba tardeba saZireSi wvenTa moZraobis dawyebis Semdeg. gazafxulze mynobisaTvis samynobi masala unda davamzadoT mcenaris mosvenebis periodSi da mynobis dawyebamde SevinaxoT gril adgilas. rogorc zafxulSi, ise gaz af xul z e myno bi s war mat ebi T Cas at ar ebl ad auc i l ebel i a rom saZire iyos aqtiur \_ s anamyene ki (kvi r t i , kal ami ) mo svenebul md go mar eo baS i .

mynobisaTvis saWiro kvirti unda damzaddes virusul da sxva sakarantino mavnebeli daavadebebisagan Tavisufali, uxvmosavliani xeebidan. samynobad unda aiWras kar gad ganvi T ar ebul i d a mo mwi f ebul i mi md i nar e wl i s naz ar d i , r ad ganac yl o r t i s wver s a da bazalur nawilSi kvirtebi cudad aris ganviTarebuli, amitom kalams (samynobad aWr i l yl o r t s kal ami ewo d eba) und a waeWr as T avi d a bo l o . ao r T ql ebi s gamo gamo S r o bi s Tavidan acilebis mizniT. kalams aWrisTanave unda movaciloT foTlis firfita, yunwis nawili ki davtovoT kalamze. igi saWiroa kvirtis WrilobaSi Casasmelad da Sexorcebis procesis Sesamowmeblad. aseTi wesiT damzadebuli kalami unda gavaxvioT svel tiloSi da mynobamde SevinaxoT gril, nestian adgilas. ukeTesia, Tu kalams davamzadebT uS ual o d myno bi s an mi s wi na d R es .

mexi l eo bi s pr aqt i kaS i gamo i yeneba **T**-s ebur Wr i l S i myno ba.

1. **T**-sebur WrilSi mynobis dros Tanamimdevrulad unda Sesruldes Semdegi operaciebi: T-seburi Wrilis gakeTeba saZireze, kvirtis aWra, kvirtis Casma WrilSi d a S exveva.

mynobis dros mynobeli marcxena xelSi iWers kalams ise, rom kvirtis wverebi misken iyos mimarTuli, kvirti ki, romelic unda aiWras, eyrdnobodes gaSlil saCvenebel TiTs. kvirtis aWra iwyeba kvirtis fuZidan 0,5 sm-iT qveviT. aRniSnul adgils, kalmis perpendikularulad vadebT danis pirs da mcire dawoliT vWriT kans, Semdeg dana gadagvaqvs horizontalur mdgomareobaSi da veweviT Cvensken da marjvniv, ise, rom kvirtis aWraSi monawileoba miiRos danis mTelma pirma (kanis CaWra xdeba danispiris fuZiT, aWra ki mTavrdeba danis wverTan). aWra unda damTavrdes kvirtis wveridan 0,5-1 sm zeviT (aWrili kvirtis sigrZe SeiZleba iyos sul 2,5-3 sm, sigane 3-4 mm). kanis nawils, romelic kvirts moyveba, fari ewodeba. aWril kvirts qerqis farTan erTad SeiZleba gayves merqnis patara nawili kvirtis mopirdapire mxareze. aWril kvirts iWeren datovebuli yunwiT da, rac SeiZleba swrafad svamen saZireze gakeTebul T-sebur WrilSi. T-seburi Wrilis gakeTebis dros jer unda Sesruldes vertikaluri (T-s fexi), Semdeg ki \_ horizontaluri Wrili. Tu faris zeda nawili ver Caetia WrilSi, zedmeti nawili iWreba daniT. Wriloba swrafad ixveva polieTilenis saxveviT (1 sm, siganisa da 25-30 sm. sigrZis lentiT). Sexveva iwyeba zevidan qveviT ise, rom Wriloba mTlianad daifaros. WrilSi Casmuli kvirti ki d auf ar avi und a d ar Ces .

mynobidan 12-15 dRis Semdeg amowmeben namyeni kvirtis Sexorcebas. Tu kvirtze datovebuli yunwi gayviTlda da Camovarda, an Camovarda TiTis SexebiT, kvirti Sexorcebulia. Tu daWkna da ar Camovarda, Sexorceba ar momxdara da saWiroa xel meo r ed myno ba.

1. kvirtiT miWdobiT mynoba**.** kvirtis miWdobiT mynobas mimarTaven maSin, rodesac saZires raime mizeziT kani ar Zvreba, aseTi mynobisaTvis kvirtis aWra xdeba zemoT aRwerili wesiT, saZires ki aaTlian kans iseTi zomiTa da formiT, rogorc aWril kvi r t s aqvs , anaT al z e mi ad eben aWr i l kvi r t s d a Seaxveven.
2. rgoliT mynoba. rgoliT mynoba gamoiyeneba kaklisa da zogierTi sxva sqelkaniani kulturebis samynobad. am dros specialuri orpiriani danis saSualebiT (pirebs Soris manZili unda iyos 25-30 mm) saZireze SemoaWrian da Semoaclian kans rgolis saxiT, mis adgilze svamen sanamyenedan aWril imave zomis kvirtian kans. mynobis Semdeg Wriloba unda daifaros baRis malamoTi da Seixves. mynobisaTvis saWiroa, rom saZiresa da sanamyenes hqondes erTnairi diametri, dasaSvebia odnav ms xvi l i sanamyene.

kalmiT mynobis wesebi, teqnikuri siZneleebisa da sxva naklovanebaTa gamo, gamoiyeneba mxolod gamonaklis SemTxvevaSi. magaliTad, gadazrdili saZireebis d as amyno bad , ar as as ur vel i j i S ebi s S es ac vl el ad d a s xva.

kalmiT mynobis mraval wess Soris gavrcelebulia da mexileobaSi gamo i yeneba:

1. ko pul i r eba (Cveul ebr i vi d a gaumj o bes ebul i ),
2. kanqveS myno ba,
3. gapo bi T myno ba,
4. myno ba gver d i T ganaWer S i ,
5. xi d i T myno ba. **ko pul i r eba.** Cveulebrivi kopulireba i SviaTad gamoiyeneba. mexileobaSi gaumjobesebul, anu enakebiT kopulirebas mimarTaven zamTris mynobis dros. amisaTvis saZiresa da sanamyenes almacerad Wrian, gadanaWerze ukeTeben enakebs da aerTeben erTmaneTTan ise, rom saZirisa da sanamyenes kambialuri qsovilebi erTmaneTs daemTxves. mynobisaTvis aucilebelia, rom saZire da sanamyene erTnairi sisqis iyos.

**kanqveS mynoba.** mynobis es wesi swrafia da advilad Sesasrulebeli. iZleva

gaxar ebi s maRal pr o c ent s . mi s i gamo yeneba S ei Zl eba 2,5-dan 30-sm-md e d a met i d i amet r i s mqone totebis gadasamynobad. mynoba SeiZleba CavataroT maSin, rodesac mcenareSi wvenTa Zlieri moZraoba iwyeba, radgan igi aadvilebs kanis aZrobas. mynobisaTvis saZires gaWrian swored, Caseraven sigrZeze da kans frTxilad acileben merqans, Semdeg kalams iribad wauTlian qveda nawils da Casvamen kanis qveS. Wrilobas d af ar aven baR i s mal amo T i d a mWi d r o d axveven.

**gapobiT mynoba.** misi gamoyeneba ukeTesia iseT mcenareebze, romlebsac axasiaTebT merqnis sworfenovani wyoba. am dros miiReba swori naxleCi. mynoba SeiZleba Catardes mosvenebis nebismier periodSi, magram ukeTesi Sedegebi miiReba adre gaz af xul z e, kvi r t ebi s d aber vi s per i o d S i .

myno bi s Casat ar ebl ad saZi r es gad aWr i an, gad anaWer s mo as uf T aveben bas r i d ani T

da frTxilad gaapoben. Semdeg kalmis bolo nawils 3-4 sm sigrZeze CaWrian soliviT (solis gare mxares unda darCes kanis zoli) da Casvamen ganaxleCSi ise, rom kalmisa da saZires kani da kambialuri qsovilebi daemTxvnen erTmaneTs. Tu saZire sqelia, mopirdapire mxares SeiZleba Caisvas meore kalami. mynobis damTavrebisTanave gad anaWer i und a d ai f ar o s baR i s mal amo T i d a S ei xves mWi d r o d .

**mynoba gverdiT ganaWerSi.** mynobisaTvis saZireze akeTeben irib CanaWers 20-300 kuT xi T . s anamyene unda iyos 7-8 sm sigrZis da hqondes ori-s ami kvi r t i . sanamyenes qved a bo l o z e akeT eben 2,5 s m-i s s i gr Zi s s o l s . kal mi s Cas mi s S emT xvevaS i , s aZi r e d a sanamyene mWi d r o d er T d ebi an, S emd eg Wr i l o ba und a d ai f aR ObaR i s mal amo T i .

**xidiT mynoba.** xSirad mcenares uziandeba Stambi da dedatotebi. dazianebuli adgilebis aRdgenis mizniT mimarTaven xidiT mynobas, rac imaSi mdgomareobs, rom dazianebuli adgilis qvemoT da zemoT kans seraven, aWrian Sesaferisi sigrZis kalams, cerad wauTlian Tavsa da bolos, Casvamen gakeTebul WrilobaSi, dazianebul adgils gaasufTaveben, dafaraven baRis malamoTi da Seaxveven Sexorcebis Semdeg wvenT a mo Zr ao ba aR d geni l i Ai qneba kal mebi T .

**miaxloebiTi mynoba.** miaxloebiTi mynobis dros samynobi komponentebi erTmaneTs uerTdebian dedamcenarisagan moucileblad. erT-erTi komponentis (sanamyenes) dedamcenarisagan mocileba SeiZleba mxolod sruli Sexorcebis Semdeg. es wesi, Zi r i T ad ad , gamo i yeneba Znel ad S es axo r c ebel i mc enar eebi s samyno bad .

samynob mcenareebs zrdian erTmaneTis gverdiT qoTnebSi an sxva WurWelSi. saZiresa da sanamyenes gverdebze erT simaRleze ukeTdebaT anaTalebi, am adgilebs aerTeben erTmaneTTan da mWidrod axveven. Sexorcebis Semdeg, saZires gadaWrian S exo r c ebul i ad gi l i s z evi T , s anamyenes ki S exo r c ebul i ad gi l i s qvevi T .

# xexi l i s s aner ge

intensiuri mexileobis ganviTareba damokidebulia sargavi masalis raodenobasa da xarisxze. xexilis sargav masalas nergi ewodeba, xolo meurneobas, sadac nergis aRzrda warmoebs sanerge meurneoba. sanerge meurneobis ZiriTadi daniSnulebaa awarmoos xexi l -kenkrovani kulturebis standartuli da perspeqtiuli, elituri sargavi masala. sargav masalaze moTxovnileba ganisazRvreba baRebis tipis mixedviT. Cveulebrivi baRis gasaSeneblad 1-ha-ze vaSlis Zlier saZireze damynili 100-125 namyenia saWiro, maSin, rodesac intensiuri CaxSirebuli baRi 300-400-nde namyens saWiroebs, xolo spuri tipis xexi l i s baR i ki 1500-3000-md e namyeni sWi r d eba d a a. S .

sanerge meurneobis ganyofilebebia: 1. sadede nargaobis ganyofileba, romelic Sedgeba sadede saTesle baRisagan, saidanac meurneoba iRebs saZireebs gamosazrdelad saWiro Tesls da sadede sakalme baRisagan, sadac gaSenebuli unda iyos gasamravlebeli kulturebis standartuli da perspeqtiuli jiSebi. man unda uzrunvelyos meurneoba s akvi r t e masal i T . sad ed e baRebi und a gaSend es uvi r us o mas al i T .

1. gasamravlebeli ganyofileba, romlis daniSnulebaa saZireebis miReba. es ganyofileba Tavis mxriv ori nawilisagan Sedgeba: naTesarTa skolisgan, sadac saZireebs TesliT amravleben da vegetatiuri gamravlebis nakveTisagan, sadac gaSenebulia sadede plantacia klonur saZireTa amonayrebiT gasamravleblad. sadede plantacia erT adgilze S ei Zl eba ar s ebo bd es ar a umet es 15 wl i sa.
2. formirebis ganyofileba, sadac warmoebs gasamravlebel ganyofilebaSi aRzrdili saZireebis dargva, mynoba, namyenis aRzrda da formireba. formirebis ganyofileba sami mindvrisagan Sedgeba, romlebic erTmaneTisagan aRsazrdeli namyenis xnovanebiT gans xvavd ebi an (kur ko vnebi saT vi s i gi o r mi nd vr i ani a).

pirvel mindorze gazafxulze an wina wlis Semodgomaze rgaven saZireebs, an T es aven kur ko vnebi s T es l s , r o mel s ac z af xul S i amyno ben, amitom am mindors okulantebis mi nd o r s ac uwo d eben.

meore mindorze, anu erTwlianebis mindorze xdeba gasuli wlis okulantebis Stambze gadaWra, erTwliani namyenis aRzrda da kurkovanTa namyenis amoReba s ar eal i z ac i o d . mesame mindorze xdeba orwliani namyenis aRzrda, formireba da namyenis amoReba. ami t o m am mi nd o r s xS i r ad f o r mi r ebi s mi nd o r s , an sal i kvi d ac i o mi nd o r sac uwo d eben.

sanergisaTvis adgilis SerCevisaTvis saWiroa vicodeT Tu ra moculobis farTobi

d as Wi r d eba T i T o eul ganyo f i l ebas d a mT l i anad saner ges .

Tu sanerge, romelsac vaSenebT dagegmilia 1 milion cal TeslovanTa nayenis sawarmoeblad, maSin mas dasWirdeba 33,3 ha pirveli mindori (ha-ze 30 aTasi cali s t and ar t ul i namyeni s mi R ebi s S emT xvevaS i ), xo l o T es l br unvi s gaT val i s wi nebi T , r o mel i c f o r mi r ebi s ganyo f i l ebi sT vi s yvel az e xSi r ad r va mi nd vr i ani a \_ 266,6 ha (33,3X 8).

arsebobs pirveli mindvris gaSenebis ramdenime wesi. yvelaze xSirad pirvel mindors aSeneben saZireebis dargviT (Teslovani kuturebisTvis), Teslis TesviT (kurkovani kulturebisTvis) da zamTris mynobiT miRebuli okulantebiT. saZireebis dargva SeiZleba SemodgomiT da gazafxulze. Semodgomaze Tesen mSral (Werami, nuSi, nawilobriv atami) an naxevrad stratificirebul Tesls (balamwara, balRoji, tyemali, drogana YyviTeli). Tesva warmoebs mwkrivSi, mwkrivTaSoris manZili da Tesvis vadebi i gi vea, r ac s aZi r eebi s d ar gvi s d r o s .

dargvis Semdeg saZireebis movlis ZiriTadi amocanaa is, rom saZireebs hqondeT Zlieri zrda da maRali kambialuri aqtivoba. amisaTvis saWiroa sarevelebTan brZo l a ni ad agi s xS i r i gaf xvi er ebi T , mo r wyva d a mavnebel d aavad ebebT an br Zo l a.

rodesac saZireebi miaRweven standartul zomas unda Catardes mynoba, mynobis dawyebamde unda gaviTvaliswinoT sanamyenos kvirtis momwifebis done. mynobis dros niadagi Zalze itkepneba, amitom mynobis damTavrebisTanave saWiroa niadagi gafxvierdes da moirwyas. mynobis damTavrebidan 10-15 dRis Semdeg unda Catardes namyenis gaxarebis

Semowmeba. Tu kvirtze datovebuli yunwi gayviTlda da Camovarda, an advilad vardeba TiTis SexebiT, aseTi kvirti Sexorcebulia, Tu yunwi damWknaria da kvirts ar scildeba es ni S navs , r o m namyeni ar S exo r c ebul a.

sanergis meore mindorze warmoebs wina wlis okulantebis gadaWra da erTwliani

standartuli zomis namyenis aRzrda. adre gazafxulze, sanam namyeni kvirti gaiRviZebdes, amowmeben gaxarebuli kvirtebis raodenobas (gazafxulis revizia) da yvela kvirtmiRebul s aZi r es Wr i an c er z e an uc er o d .

ceris ZiriTadi amocanaa namyenis swori, vertikaluri aRzrda da CamoxleCvis Tavidan acileba, magram igi dakavSirebulia zedmet xarjebTan (cerze akvra, ceris gasufTaveba amonayrebisagan, ceris amoWra) da Zalze Sromatevadia. amitom xexils aner geebma Zi r i T ad ad uar i T qves namyeni s c er i T aR z r d az e d a maT uc er o d z r d i an.

sanergis mesame mindvris ZiriTadi amocanaa namyenis Stambis gamoyvana da varjis Casaxva. sabolood ki kargad formirebuli standartuli, orwliani sargavi masalis miReba.  **xexilovani kulturebis saZireebi** . saZires unda axasiaTebdes Semdegi Tvisebebi: uxvi da myari mosavlis miRebis uzrunvelyofa; advilad gamravleba sanergeSi da s t and ar t ul i ner gi s mi R eba; r ai o ni s ni ad agur -kl i mat ur pi r o bebT an Segueba.

xexilovani kulturebidan vaSlis saZireebi yvelaze ukeTesad aris Seswavlili. mas gaaCnia rogorc TesliT namravli, aseve vegetatiur saZireTa yvelaze farTo as o r t i ment i .

zrdis siZlieris mixedviT vaSlis saZireebi iyofa sam jgufad: sust (nagala), s aS ual o d a Zl i er i z r d i s saZi r eebad .

Zlieri zrdis saZireebidan saqarTveloSi daraionebulia kulturuli jiSebis naTesarebi da maJalo, saSualo zrdis saZireebidan, romlebsac dusenebsac uwodeben M2,  M4 susti zrdis saZireebidan ki M9, anu paradisi. perspeqtiul saZireebad iTvleba MM109, MM106.

msxlis saZireebi gacilebiT naklebad aris Seswavlili vidre vaSlisa, amitom misi saZireTa sortimenti SedarebiT Raribia. msxals ara aqvs mkveTrad gamoxatuli saSualo zrdis saZire, xolo susti zrdis saZired gamoyenebulia sxva gvaris warmomadgeneli \_ ko mS i , r o mel s ac ms xl i s yvel a j i S i ar uTavsdeba.

saqarTveloSi msxlis Zlieri zrdis saZireebidan daraionebulia kulturuli jiSebis naTesarebi da panta, susti zrdis saZired ki - komSi. msxali SeiZleba daimynos ber yenaz ec .

komSis saZired saqarTveloSi daraionebuli da yvelaze metad gamoyenebulia komSis naTesarebi. Tesli unda damzaddes adgilobrivi, an daraionebuli jiSebidan. naTesarebze damynobili jiSebi SedarebiT gvian Sedian msxmoiarobaSi. zogierT SemTxvevaSi ki amJRavneben SeuTavseblobas. komSis saZired SeiZleba agreTve gamoviyenoT veget at i ur i gamravl ebi s f o r mebi : AC d a pr o vans i s ko mS i .

z R mar t l i s saZi r ed i yeneben ko mS i s d a z R mar t l i s naT esar ebs .

atmis ZiriTad saZireebs warmoadgens: atami, Werami, nuSi da tyemali. atami SeiZleba

davamynoT agreTve kvrinCxze, RoRnoSoze, qeCisebur alubalze. rogorc veget at i ur i s aZi r e, S ei Zl eba gamo vi yeno T at am-nuS i s hi br i d ebi .

qliavis ZiriTad saZires saqarTveloSi warmoadgens tyemali da qliavis kulturuli jiSebis naTesarebi. qliavi aseve warmatebiT SeiZleba daimynos atamze, Weramze da nuSze (qliavis saZired SeiZleba gamoviyenoT, agreTve, kvrinCxi, qeCiseburi al ubal i d a at mi s d a nuS i s hi br i d ebi ).

gargaris ZiriTad saZires Werami warmoadgens, garda amisa, niadagur-klimaturi pirobebis gaTvaliswinebiT igi SeiZleba davamynoT tyemalze da atamzec, SedarebiT c ud ad uT avs d eba nuSs .

bals amynoben: balamwaraze, kulturuli jiSebis naTesarebze, alubalze da bal R o j z e. alublisaTvis gamoiyeneba igive saZireebi, rac blisaTvis, oRond am SemTxvevaSi, ZiriTad saZires alublis naTesarebi warmoadgens. d anar Ceni kulturebisaTvis, romlebsac mynobiT vamravlebT, gamoiyeneba Semdegi saZireebi: SindisaTvis \_ Sindis naTesarebi, nuSisaTvis \_ mware da tkbili nuSi, kaklisaTvis \_ Cveul ebr i vi d a S avi kakal i , T xi l i saT vi s - T xi l i s naT es ar ebi d a d aT vi s T xi l i .

s aZi r eebi s amoReba xdeba SemodgomiT, noember-dekembramde. Tu amoRebis drois saZires foToli ara aqvs Camoyrili, mas xeliT aclian, rac Zalze Sromatevadi s amuS ao a. zogierT meurneobaSi foTlis xeliT Seclis magivrad praqtikaSi danergilia saZireebis miwiszeda nawilis gaTibva (gaTibvas awarmoeben 20 sm simaRleze, Tivis saTibi manqaniT KCK \_ 2,1.) saZireebs iReben kavis tipis guTniT. amosaRebi saSualebis SerCeva xdeba dargvis sqemis mixedviT. erTrigiani naTesis amosaRebad gamodgeba mevenaxeo baS i gamo yenebul i kavi .

sanergis pirvel mindorze darguli saZireebis xarisxi gadamwyvet gavlenas axdens

namyenis gamosavlianobaze, rac ufro cud pirobebSi xdeba namyenis gamozrda (Raribi niadagebi, mSrali klimati, mokle savegetacio periodi), miT ufro kargi ganviTarebis und a i yo s pi r vel mi nd o r z e d ar gul i saZi r e.

s aZireebs or jgufad axarisxeben: pirveli xarisxis saZireebs fesvis yeli 6-7mm da meti diametri simsxosi unda hqondeT (kaklis SemTxvevaSi 10 mm), fesvTa sistema kargad ganviTarebuli sami ZiriTadi gantotvili fesviT, uxvi bususa fesvebiT. meore xarisxis saZireebis fesvis yelis sisqe 5-7 mm toli unda iyos. fesvTa sistema ori ZiriTadi gant o t vi l i f es vi s agan S ed geba, mc i r e bus us a f es vebi T d af ar ul i .

# xexilis baRi

mexileobis ganviTarebis ZiriTad mimarTulebad iTvleba misi intensifikacia. intensiuri baRis gaSenebisas saWiroa ramdenime pirobis dacva: farTobis erTeulze mcenareTa raodenobis gazrda. jiSebis SerCeva, romlebic adre Sedian msxmoiarobaSi da gvaZleven uxv mosavals. saZireebis SerCeva, romlebic gvaZleven mcire moculobis mcenareebs, aCqareben msxmoiarobas da zrdian mosavlianobas. baRSi samuSaoTa maqs i mal ur i meqani z ac i a. qi mi z ac i i s d a mel i o r ac i i s maqs i mal ur i gamo yeneba.

arsebobs intensiuri nargaobis ramdenime tipi: CaxSirebuli nargaoba momrgvalo-

mobrtyo varjiT; nagala tipis; spuris tipis; palmeturi nargaoba; gruzbekis; pilaris an T i T i s t ar i s ebur i ; md el o s baR i s t i pi s nar gao ba d a s xv.

intensiuri tipis msxvili samrewvelo baRis gaSenebamde saWiroa mravali sakiTxis

kompleqsuri gadawyveta, rogorebicaa: mexileobis mimarTuleba da amocanebi, misi SeTanawyoba sxva dargebTan, adgilis SerCeva baRisaTvis, teritoriis organizacia, jurebis da jiSebis Semadgenlobis gansazRvra da varjis tipebi, xilis warmoebis t eqno l o gi ur i s qema.

baR i s gas aS enebel i ad gi l i s s wo r ad Ser Cevas uaR r esad d i d i mni S vnel o ba aqvs , r ad gan igi gansazRvravs xexilovani mcenareebis zrda-ganviTarebis xasiaTs, mosavlis raodenobas mis xarisxsa da, aqedan gamomdinare, baRis ekonomikur efeqtianobas. adgilis S er Cevi s d r o s und a S evi s wavl o T kl i mat i , r el i ef i d a ni ad agi .

kl i mat i s S ef as ebi s d r o s und a gavi T val i s wi no T abs o l ut ur i mi ni mal ur i t emper at ur a

da maTi ganmeorebis sixSire; aqtiur temperaturaTa jami; uyinvo periodis xangrZlivoba; wayi nvebi s s aS i S r o eba; haer i s S ef ar d ebi T i t eni ano ba, qar ebi s s i Zl i er e d a s xva absoluturi minimaluri temperatura da misi sixSire gansazRvravs ama - Tu im

kul t ur i s an j i S i s gavr c el ebi s SesaZl ebl o bas mo c emul r ai o nS i .

aqtiur temperaturaTa jamis gansazRvruli raodenoba ki saWiro ama Tu im jiSis

nayofis mosamwifeblad da savegetacio fazebis normaluri msvlelobisTvis. winaaR md eg SemTxvevaSi aseT adgilebSi jiSis gavrceleba ar SeiZleba. magaliTad, vaSlis sagviano jiSebi SeiZleba vawarmooT mxolod iseTi adgilebS i, sadac aqtiur temperaturaTa jami udris 3000-35000.

wayinvebi aris gazafxulis gviani da Semodgomis naadrevi. saqar T vel o S i gansakuTrebiT saSiSia gazafxulis gviani wayinvebi, radganac igi emTxveva yvavilobis da gamonaskvis periods, ris gamoc SeiZleba mosavali mTlianad dakargos. baRis gasaSeneblad ar unda gamovyoT iseTi adgili, sadac wayinvebi xSirad meordeba. aseTebia: f er d o bi s wi na gavakebani , Cavar d ni l i ad gi l ebi , qvabul ebi , vi wr o xeo bebi d a s xva.

reliefs erT-erTi gadamwyveti mniSvneloba aqvs sabaRe adgilis SerCevis dros, reliefi gamoixateba sami elementis erTobliobiT, esenia: wyalgamyofi zegani, dablobi vake d a maT i S emaer T ebel i f er d o bebi .

wyalgamyofze saukeTeso pirobebia xexilis zrda-ganviTarebisaTvis tenian klimatis

pi r o bebSi .

ferdobebis Sefaseba xdeba Semdegi elementebiT: eqspozicia, daqaneba da zRvis donidan

s i maR l e. eqspo z i c i a c vl i s s i T bo s , s i naT l i s d a t eni s r eJ i ms .

vinaidan aRmosavleT saqarTvelos mexileobis dablob da mTiswina zonaSi siTbo da sinaTle yvelgan sakmarisia malimitirebel faqtors warmoadgens teni. TeslovanTa baRebis gasaSeneblad upiratesoba eZleva CrdiloeTis, Crdilo-dasavleTis, dasavleTis da samxr eT -dasavleTis ferdobebs. mTian zonaSi ki piriqiT - upiratesoba eZleva s amxr eT i s eqspo z i c i as .

ferdobis mTeli daqaneba iyofa sam nawilad: zeda, Sua da qveda nawilebad. daqanebis

matebasTan erTad uaresdeba misi wyliuri da kvebiTi Tvisebebi; Zneldeba niadagi s damuSaveba, morwyva, aucilebeli xdeba eroziasTan brZola. amitom, xexilis baRis gasaSeneblad unda SevarCioT SeZlebisdagvarad swori, an 5-60 daqanebis mqone ferdobebi. Cveulebrivi wesiT baRi SeiZleba gavaSenoT 80-mde daqanebis ferdobzec. 8-100-i an d aqanebaze baRi unda gaSendes konturuli wesiT, 100 meti daqanebis ferdobi ki unda d at er as d es.

zRvis donidan yoveli 100m-is Semdeg temperatura 0,50-iT klebulobs, amitom zRvis

d o ni d an 1000m-i s z emo T ukeT es i pi r o bebi a s amxr eT i sa d a mo naT esave f er d o bebz e.

niadagis Sefasebis dros yuradReba unda mieqces Semdeg elementebs: sakvebi

ni vT i er ebebi s (o r ganul i d a mi ner al ur i el ement ebi s ) r ao d eno bas ; gr unt i s Semad genl o bas ; fesvebis momcveli fenis sisqes; simkvrives; mavne marilebis raodenobas; niadagis reaqcias (PH) da gruntis wylis dones. zogadad ki, xexilis baRis gasaSeneblad saWiroa kargi aeraciisa da tenis mqone Rrma struqturuli niadagebi. gruntis wyali niadagis z ed api r T an ar und a i yo s 2,5 – 3 m. uf r o axl o s .

ni ad agur -klimaturi pirobebis Sefasebis Semdeg unda moxdes baRisaTvis gamoyofili

t er i t o r i i s o r gani z ac i a.

baRSi teritoriis organizacia gulisxmobs: farTobis gamoyofas administraciuli, sameurneo, gadamamuSavebeli da sxva damxmare nagebobisaTvis, sarwyavi da sagzao qselis racionalur ganlagebas, qarsafarebis tipis, maT Soris manZilisa da mimarTulebis dadgenas, kvartlis zomisa da masSi nargaobis tipis gansazRvras, kvartalSi jiSebis S er Cevas d a kvebi s ar es d ad gena.

baRis dagegmvis dros, Zalze mniSvnelovani sakiTxia kvartlis racionaluri konfiguraciis, mimarTulebisa da optimaluri zomis dadgena. yvelaze moxerxebulad iTvleba sworkuTxedi kvartali gverdebis SefardebiT formis 1:2 an 1:2,5 (100-200 an 100250), ukeTesia, Tu kvartlis grZeli mxare mimarTuli iqneba CrdiloeTidan samxreTisaken. ferdobze kvartali mimarTuli unda iyos daqanebis perpendikularulad. Zlieri qarebis z o naS i ki gabat o nebul i qar ebi s per pend i kul ar ul ad .

baRSi gahyavT sami tipis gza: mTavari, anu magistraluri, kvartalTSorisi da irgvlivi. mTavari gza gahyavT baRis SuagulSi. misi sigane unda iyos 10 metri. kvar t alTSorisi gza gahyavT kvartlis sazRvrebze. misi daniSnulebaa momijnave kvartlebis urTierTdakavSireba, kvartalTSorisi gzis siganea 4-6 metri. irgvlivi gza gahyavT mT el i baR i s i r gvl i v. i r gvl i vi gz i s s i gane und a i yo s 5-6 met r i .

qarsafari nargaobis daniSnulebaa daicvas baRebi qarebis mavne moqmedebisagan da gaaumjobesos baRis mikroklimati. amitom, qarsafari nargaoba baRis gaSenebamde 2-3 wliT ad r e und a gaS end es. qar s af ar i , d ani S nul ebi s mi xed vi T o r i t i pi s aa:

1 . ZiriTadi qarsafari zolebi, romlebic gaSenebulia baRis gareTa sazRvarze, gabat o nebul i qar ebi s per pend i kul ar ul ad . as eT qar saf r ebs aS eneben s us t i qar ebi s z o naS i \_2-4 r i gi sagan, Zl i er i qar ebi s z o naS i ki –6-8 r i gi ans.

2. qaramridi zolebi**.** maT aSeneben baRis SigniT, kvartlis sazRvarze. qaramridi zolebi Sedgeba 1-2 rigisgan. baRis teritoriaze qarsafari zolebis erTmaneTisagan daSoreba damokidebulia maT mier qarebisagan dacul manZilze, romelic misi simaRlis 15-20 jeradia.

dargvis win sabaRe nakveTi unda moswordes (moSandakdes) da daplantaJdes. pl ant aJ i s

siRrme damokidebulia niadagis tipze. Rrma Savmiwebze, aluviur, mdelosa da tyis yavisfer niadagze plantaJi unda Catardes 60-70 sm-is siRrmeze. fxvier, qviSnar niadagze plantaJis Catareba araefeqturia. am SemTxvevaSi tardeba Cveulebriv xvna. saplantaJ o xvna Cavat ar o T d ar gvamd e 3-4 T vi T ad r e.

plantaJis dros sasuqebis Setanis normebi diferencirebulia. zonisa da niadagis

t i pi s mi xed vi T nakel i SeaqvT 30-40 tonidan 80-100 t o namd e 1 ha-ze. fosfori da kaliumi 90120 kg (mo qmed ni vT i er ebaz e gad aangar i S ebi T ).

baRSi mcenareTa ganlagebis swori sistemis SerCevasa da kvebes aris sididisa da konfiguraciis gansazRvrazea damokidebuli mosavlis raodenoba, xarisxi, mcenareTa meqanizebuli movlis pirobebi da krefis samuSaoebis Sesruleba. mexileobis praqtikaSi yvelaze metadaa gavrcelebuli baRSi mcenareTa ganlagebis Semdegi wesebi: kvadratuli, s wo r kuT xo vani , Wad r akul i d a ko nt ur ul i .

kvadratuli ganlagebis dros mcenareebi irgveba kvadratis kuTxeebSi, e. i. manZilebi mwkrivebsa da mwkrivTa Soris Tanabaria. aseTi sistemiT dargvis dros SeiZleba gvqondes S emd egi kvebi s ar eebi : 10X 10 m; 8X 8 m; 7X 7 m. d a a. S .

kvadratuli ganlageba saSualebas iZleva baRSi niadagis movlisa da sxva samuSaoebi meqanizebuli wesiT CavataroT mwkrivis da mwkrivTaSorisebis mimarTulebiT, magram aseTi ganl agebi s d r o s f ar T o bi s er T eul z e et eva mc enar eT a nakl ebi r ao d eno ba. sworkuTxovani ganlagebis dros mcenareebi irgveba sworkuTxedis kuTxeebSi, e.i. manZili mwkrivSi mcenareTa Soris ufro naklebia, vidre mwkrivTa Soris - 10X8 m, 8X6 m, 7X5 m. ganlagebis aseTi wesi saSualebas gvaZlevs SevinarCunoT ganieri mwkrivTaSorisebi da farTobis erTeulze mcenareTa raodenoba gavzardoT mwkrivSi manZilebis SemcirebiT. sworkuTxovani ganlageba Tanamedrove baRebSi mcenareTa dargvis yvel az e met ad gavr c el ebul i s i s t emaa.

konturul ganlagebas iyeneben 8-dan 100-mde daqanebis ferdobebze. am dros baRis

r i gebs mi mar T ul eba s wo r i ki ar ar i s , ar amed i gi emT xveva nakveT i s ho r i z o nt al s an o d nav gadaxrilia misgan. amitom aseTi dagegmvis dros mwkrivSi mcenareTa Soris manZili T anabar i a. mwkr i vT aS o r i s i manZi l i ki i c vl eba f er d o bi s d axr i l o bi s mi xed vi T .

Wadrakuli ganlagebisdros mcenareebi irgveba tolgverda samkuTxedis wverebze. am wesiT dargvis upiratesoba isaa, rom mcenareebi ukeT iTviseben maTTvis gamoyofil ares, gaumjobesebulia ganaTeba, varjebi viTardeba Tanabrad, magram meqanizebuli movlis gaZnelebis gamo, gaSenebis am wess iyeneben mxolod moyvarulTa da sakarmidamo nakveT ebz e.

kvebis ares, anu baRSi mcenareTa Soris manZilis dadgenis dros unda gaviTvaliswinoT Semdegi faqtorebi: ni ad agur -klimaturi pirobebi, jiSisa da saZiris zrdis siZliere, varjis formirebis wesi, agroteqnikis done da manqana-i ar aR ebi s gamoyenebis SesaZlebloba. am faqtorebis gaTvaliswinebiT, SemuSavebulia rekomendaciebi calkeuli kulturebisaTvis saWiro kvebis ares gamosayofad. magaliTad, vaSlis Zlier saZireze damynobili, Zlieri zrdis jiSebisaTvis unda gamoiyos kvebis are - 8X7 m, s aS ual o z r d i s j i S ebi saT vi s - 8X 6 m, s ust i z r d i s j i S ebi saT vi s -8X5 m.

j urebisa da jiSebis SerCevis dros, aucileblad unda gaviTvaliswinoT baRis tipi da im zonis niadagur-klimaturi pirobebi, sadac baRs vaSenebT. yovel zonaSi unda gaSendes iseTi jiSebi, romelTa biologiuri Taviseburebebi zustad Seesabameba zonis eko l o gi ur pi r o bebs . s amr ewvel o baR S i S ei Zl eba gavaS eno T 3-4 kultura da TiToeuli kul t ur i s 4-6 jiSi. er T i j i S i T d akavebul i f ar T o bi und a i yo s 25-100 ha-md e.

kvartali unda gaSendes erT saZireze damynobili erTi jiSiT, magram jiSebis didi umravlesoba saWiroebs damamtverianebel jiSebs. ToToeuls jiSs baRSi unda hqondes 2 d amamt ver i anebel i e. i . kvar t al S i und a gvqo nd es ar anakl eb 3 j i S i .

urTierT damamtverianebeli jiSebis SerCevis dros, gansakuTrebuli yuradReba unda mieqces imas, rom jiSebi erTdroulad Sediodes msxmoiarobaSi, yvavilobdnen erTdroulad, kargad anayofierebdnen urTierTs da erTmaneTs emTxveodes jiSebis s i mwi f i s per i o d ebi . samrewvelo baRis gasaSeneblad gamoyofili farTobi Cveulebriv igegmeba. Sidakvartaluri dagegmva SeiZleba Catardes TvalzomiT, anu vizualurad, niSnulebiani mavTuliTa da markirebiT. aRniSnuli wesebidan yvelaze xSirad gamoiyeneba niSnulebiani mavTuliT dagegmva, romelic SemdegSi mdgomareobs: kvartlis grZel mxareebs hyofen 100100 m. monakveTebad da gahyavT maT Soris swori xazebi. amis Semdeg, rigTaSorisebis gaadgilebis dasadgenad, am xazebze Wimaven niSnulebian mavTuls, romelzec niSnulebs Soris manZili Seesabameba rigTaSoris manZils, yvela niSnulTan asoben paloebs da, amrigad, mTel kvartalze iReben damatebiT rigebs, sadac dafiqsirebulia rigTaSorisi manZilebi. Semdeg, damatebiT rigebSi (kvartalis grZeli mxaris par al el ur ad ), Wimaven niSnulebian mavTuls, romelzec niSnulebs Soris manZili Seesabameba mwkrivSi mcenareTa Soris manZils. niSnulebTan asoben paloebs, romlebic aRniSnaven mcenaris dargvis ad gi l ebs . mavT ul i s s i gr Ze und a i yo s 110 m.

Wadrakuli dagegmva SeiZleba CavataroT samkuTxedis saSualebiT, romlis gverdebis sigrZe unda Seesabamebodes mcenareTa Soris da rigTa Soris manZils. magaliTad, Tu xexi l i i r gveba 7X 7 m, maS i n yo vel i gver d i s s i gr Ze und a i yo s 7 m.

dagegmva Semdegnairad xdeba: pirveli rigis adgilas gahyavT swori xazi an Wimaven

Toks, Semdeg moZebnian pirveli xis dargvis adgils da am adgilidan iwyeben samkuTxedis Tokze gadaadgilebas. yoveli gadaadgilebis dros samkuTxedis ori kuTxe Tokze aR ni S navs o r i mc enar i s d ar gvi s ad gi l s , wver i ki - mc enar i s d ar gvi s ad gi l s meo r e r i gS i .

pi r vel i r i gi s d agegmvi s Semd eg s amkuT xed i gad aaqvT meo r e r i gi s pi r vel xes T an. am SemT xvevaSi samkuT xed i s wver i aR ni S navs mes ame r i gi s meo r e xi s d ar gvi s ad gi l s .

axalgazrda baRSi mcenareTa gaxareba didad aris damokidebuli dasargavi ormoebis

s wo r ad mo mz ad ebaz e, s ar gavi masal i s xar i s xsa d a d ar gvi s d r o z e.

dasargavi ormoebis amoRebis dro da zoma damokidebulia niadagis dargviswi na

damuSavebis wessa da droze. Tu dargvas vatarebT plantaJis Catarebis wels, maSin ormoebi unda amoviRoT uSualod dargvis win 50 sm siRrmesa da siganeze. Tu namyens vrgavT iseT adgilze, sadac raime mizezis gamo plantaJis magivrad xvna Catarebulia, an baR s vaSenebT wi na wel s pl ant aJ i r ebul ni ad agz e o r mo ebi und a amo vi R o T 100X 50 s m-z e.

dargvis dros sasuqs iyeneben mxolod maSin, Tu igi ar SeutaniaT plantaJis dros. aseT SemTxvevaSi yovel ormoSi SeaqvT winaswar miwasTan kargad Sereuli 10 kg nakeli an ko mpo s t i , 1-1,5 kg s uper f o s f at i , 0,1-0,2 kg kal i umi s mar i l i . dasargavad iyeneben mxolod pirveli an meore xarisxis erT an orwlian namyens. dargvis win namyeni guldasmiT unda davaTvalieroT da movaciloT yvela dazianebuli an gadatexili fesvi. fesvebze yvela Wrilobis ganaxleba rekomendirebulia mxolod S emo d go maz e d ar gvi s d r o s . gaz af xul z e am o per ac i i s Cat ar ebas ar ur Ceven.

xexilis dargva SeiZleba SemodgomiT da gazafxulze (kvirtis dabervamde).

s aqar T vel o s mexi l eo bi s Zi r i T ad r ai o nebS i d ar gvi s s aukeT es o vad aa S emo d go ma.

# baRSi niadagis movl i s s i s t emebi

s as o f l o -sameurneo kulturaTa mosavlianoba damokidebulia mTel rig faqtorebze, rogorebicaa: kulturuli mcenareebis biologiuri Taviseburebani; garemo pirobebi da adamianis zemoqmedeba garemo pirobebze da mcenareze maRali mosavlis mi R ebi s mi z ni T .

adamianis zemoqmedeba garemo pirobebze Semoifargleba wylisa da sakvebi nivTierebebis regulirebiT. es ki xdeba niadagis movlisa da damuSavebis gansazRvruli s i s t emebi s d r o s .

ni ad agi s mo vl i s S emd egi wes ebi ar s ebo bs:

1. Savadxnuli (Savi aneuli), romelSic igulisxmeba niadagis damuSavebis iseTi wesi, rodesac niadagi mTeli wlis ganmavlobaSi inaxeba sufTad, gafxvierebul md go mar eo baS i .
2. sideracia aerTianebs im wesebs, romlis drosac mwvane masa ixvneba niadagSi (erTwliani balaxebi). niadagSi Caxvnis Semdeg ixrwneba da gardaiqmneba organul ni vT i er ebebad . amr i gad es wes i amd i d r ebs ni ad ags o r ganul i mas i T .
3. dakordeba. rogorc bunebrivi aseve kulturuli dakordebis dros niadags amuSaveben mxolod Stambis garSemo wreebSi. danarCen farTobze xangrZlivi periodis ganmavlobaSi Tavisuflad izrdeba mravalwliani balaxi, romelsac yovelgvar i zemoqmedebis gareSe toveben an Tibaven Tivad an saZovrad iyeneben. es sistema efeqturia memi nd vr eo baS i .
4. mulCireba \_ yvelaze efeqturi da ekonomiuri wesia. iTvaliswinebs niadagis mTlianad an nawilobriv dafarvas CaliT, torfiT, nakeliT, gaTibuli balaxiT an s pec i al ur i mi z ni T d amz ad ebul i qaRal d i T .

Savadxnuli, anu Savi aneulis pirobebSi niadagis damuSavebas aqvs mTeli rigi dadebiTi mxareebi: tenis maragis dagroveba da niadagis dacva zedmeti aorTqlebisagan; niadagis haeraciis gaumjobeseba; mikroorganizmebis cxovelmyofelobis gaumjobeseba; s ar evel ebi s mo s po ba.

aR mo s avl eT saqar T vel o s pi r o bebS i s aWi r o a 3-4-j er ni d agi s kul t i vac i a (veget ac i i s

pirobebSi). Savad xnulis dros niadagi saWiroa 6-7-jer daifarcxos. amas aqvs Tavisi uryofiTi mxareebi: niadagis struqturis daSla\_gamtverianeba; niadagis gaRaribeba, nayofierebis dakargva; niadagis Camorecxvis, anu eroziis gaZliereba; garda amisa, Savad xnul i s pi r o bebS i baR i s f ar T o bi s mni S vnel o vani nawi l i auT vi s ebel i r Ceba agr eT ve d i d i a d anaxar j ebi .

sideraciuli sistemis gamoyenebis dros unda sworad moxdes sideratebis SerCeva

d a gani saz R vr o s T es vi s vad ebi . as eve s i d er at ebi s Caxvni s d r o d a wes ebi .

sideratebis Tesvis saukeTeso vadaa Semodgoma da adre gazafxuli. aRmosavleT saqarTveloSi sideratebad gamoiyeneba: culispira, cercvela; cercvi. dasavleT saqarTveloSi \_ xanWkola, barda, soia. sideratebis Caxvna unda moxdes yvavilobis periodSi. Caxvnis dros belti amobrundeba, ase niadagis datoveba dauSvebelia, radgan xdeba tenis aorTqleba, amitom sideratebis Caxvnis Semdeg unda moxdes niadagis d af ar c xva.

niadagis damuSavebis es sistema amdidrebs niadags organuli masiT. (miuxedavad ami s a, aucilebelia sideratebis Tesvis dros organuli Dda mineraluriAsasuqebis gamoyeneba. mineraluri sasuqebi xels uwyobs didi raodenobiT mwvane masis war mo qmnas ), aumjobesebs niadagis aeracias, ewi naaRmdegeba niadagis gadarecxvas, adidebs xexilis yi nvagamZl eo bas d a z r d i s mo s avl i ano bas.

dakordeba\_niadagis damuSavebis es wesi \_ zrdis neSompalis raodenobas da aumj o besebs ni ad agi s f i z i kur -meqani kur md go mar eo bas .

xexilis baRSi mravalwliani balaxebis Tesva dasaSvebia mxolod sarwyav pi r o bebSi

meoTxe, mexuTe wlidan i s e, rom maT niadagis damuSavebis saerTi sistemaSi hqondeT ara umetes 10%-isa da erT adgilze mravalwliani balaxis Tesva SesaZlebelia 1,5-2 wliT. d i di mniSvneloba aqvs aseve balaxis Tesvis vadebs. aRmosavleT saqarTvelos pirobebSi umjobesia zafxulSi Tesva parkosnebisa da marcvlovnebis narevis, romlebic pirvel wel s ve kar g naT i bs i Zl eva d a meo r e wel s S emo d go maz e Cai xvneba.

subtropikul zonaSi mravalwliani balaxebis Tesva SeiZleba Semodgomaze \_ s eqt ember sa d a o qt o mber S i .

ukanasknel xanebS i d i d i mni Svnel o ba eni Weba kulturul dakordebas. am dros xdeba gaTibuli balaxis mulCad datoveba. sarwyav pirobebSi ionjas weliwadSi 12-15-jer Tibaven, rodesac balaxi 15-sm-s miaRwevs naTibs toveben safrad. ukanaskneli naTibi ki und a Cai xnas .

niadagis movlis sistemebidan yvelaze efeqturia mulCireba. mulCi aumjobesebs da icavs niadagis struqturas, aregulirebs tens, haeris da temperaturis reJims, saukeTeso saSualebaa eroziisa da sarevelebTan sabrZolvelad, aZlierebs nitrifikaciis process da ekonomiuria niadagis damuSavebis sxva wesebTan SedarebiT. mulCi sagrZnoblad aumjobesebs niadagis fizikur-meqanikur Sedgenilobas. mulCis qveS o r ganul i nivTierebebis raodenoba 1,5-2%-mde izrdeba, xolo sarevelebis raodenoba daumulCavTan SedarebiT 10-jer ufro metad mcirdeba. sarevelebis Semcireba pirdapir pr o po r c i ul i a mul Ci s s i s qes T an.

mulCireba tardeba aprilis bolodan maisis pirvel naxevramde, morwyvis Semdeg gafxvierebul niadagze. damulCuli niadagi Semdgom gafxvierebas aRar moiTxovs. organuli mulCis (namja, balaxi, bze) sisqe dajdomis Semdeg ar unda iyos 10-15 sm-z e nakl ebi .

bolo xanebSi xexilis baRebSi sarevelebis mosaspobad sul ufro da ufro xSirad iyeneben herbicidebs. es ganapirobebs niadagis damuSavebis jeradobis Semcirebas, struqturis SenarCunebasa da produqciis gaiafebas. sistemuri moqmedebis herbicidebi (dalaponi da misi analogebi) niadagSi SeaqvT gazafxulze sasuqebTan erTad an asxureben sarevelebs aRmonacenebis gamoCenis Semdeg. dozebi damokidebulia preparatis efeqturobaze, romelic ganpirobebulia niadagis temperaturiTa da tenianobiT, agreTve, s ar evel as as aki T a d a mi s qs o vi l ebS i wyl i s S emc vel o bi T .

baR S i ni ad agi s gasano yi er ebl ad i yeneben: o r ganul , mi ner al ur d a baqt er i ul s as uqebs . organul sasuqebs miekuTvneba: nakeli, wunwuxi, torfi, komposti da mwvane sasuqi (s i d er at ebi ).

mineraluri sasuqebs miekuTvneba azotiani (sulfat amoniumi , amoniumis gvarjila, Sardovana, kaliumis gvarjila), fosforiani (superfosfati, fosforitis fqvili, Tomasis wida), kaliumiani (kaliumis qloridi, gogirdmJava kaliumi, silviniti) s as uqebi da mikro sasuqebi (boris mJava, manganumis sulfati, Savi qvis Slami, TuTiis sulfati, spilenZis sulfati d a s xva).

baqt er i ul i sas uqebi d an i yeneben az o t baqt er i ns , ni t r agi ns , f o s f o r o baqt er i ns .

sasuqis dozebis dadgenisas unda gaviTvaliswinoT niadagis tipi, mcenaris asaki, mosavlis raodenoba da baRSi niadagis movlis wesi. niadagi, tipebis mixedviT msxmoiare baR ebi saT vi s , rekomendebulia: azoti 90-120 kg, fosfori 60-160 kg, kaliumi 60-160 kg/ha (mo qmed ni vT i er ebaz e gad aangar i Sebi T ).

s as uqi s d o z ebi i z r d eba mc enar i s asaki s a d a mo savl i s r ao d eno bi s pr o po r c i ul ad .

f o s f o r i an-kaliumiani sasuqi da nakeli (40-60 t/ha 3-4 weliwadSi erTxel) niadagSi Segvaqvs Semodgomaze, R r mad damuSavebis win. azotiani sasuqi Segvaqvs gazafxulze. umjobesia, Tu msxmoiare baRSi azots SevitanT sam vadaSi: pirvel dozas vegetaciis d as awyi s S i ; meore dozas nayofis damsxvilebis periodSi da mesame dozas – sayvavi l e kvi r t ebi s d i f er enc i ac i i s f az aS i .

xexilis baRis morwyva warmoebs sxvadasxva wesiT: moRvarviT, jamebSi, kvlebSi, anu

gaJ o nvi T , d awvi mebi T , mi wi sqveSa wveT ur i d a t end amagr o vebel i mo r wyvi T .

baRSi morwyvis wess ganapirobebs nargaobis tipi da asaki, niadagis qimiuri da

f i z i kur i T vi s ebebi , nakveT i s r el i ef i d a s xv.

mo R var vi T mo r wyvi s d r o s ni ad agi mT l i anad und a d ai f ar o s wyl i s f eni T , r ac mT el r i g

uaryofiT movlenebTanaa dakavSirebuli: saWiroa wylis didi raodenoba, adgili aqvs niadagis gadarecxvas, morwyvis Semdeg niadagi ikravs pirs, rac auaresebs aeracias, aseve S ei Zl eba gamo i wvi o s d aml aS eba.

jamebSi morwyva SedarebiT efeqturia axalgazrda baRebisaTvis, yoveli mcenaris Stambis irgvliv keTdeba 1-1,5 m. diametrisa da 20-25 sm-is siRrmis wreebi, romlebic Tanmi md evr ul ad i vs eba wyl i T .

kvl ebS i an gaJonviT morwyvis dros rigTaSorisebSi, erTmaneTisagan 80- 120 sm-is daSorebiT gahyavT 20-30 sm siRrmisa da 100-150 m sigrZis kvlebi; rac ufro msubuqi meqanikuri Sedgenilobisaa niadagi, kvlebi miT ufro axlo-axlo da Rrmad unda gaviyvanoT. maTSi gaSvebuli wyali gaiJoneba orive mxares da daatenianebs mTel f ar T o bs .

dawvimebiT morwyva morwyvis Tanamedrove progresiuli wesia. baRebSi idgmeba stacionaluri dasawvimebeli aparatebi, romelTa saSualebiTac, wvimis saxiT, xdeba wyl i s T anabar i d a z o mi er i ganawi l eba mT el t er i t o r i az e.

miwisqveSa morwyva SezRudulad gamoiyeneba, rac gamowveulia miwisqveSa sistemis siZviriTa da konstruqciis sirTuliT. aseTi morwyvis dros miwaSi Calagebuli perforirebuli milebis, wvrili naxvretebidan wyali da zogierT SemTxvevaSi masSi gaxsnili sasuqi , saWiro raodenobiT miewodeba uSualod aqtiur fesvebs maTi gavrcelebis zonaSi. morwyvis aseTi wesi Txoulobs did danaxarjebs, xSiria naxvr et ebi s d ac o ba an s xva d abr ko l eba, r ac aZnel ebs mi s eqspl uat ac i as .

wveTuri morwyvis dros yovel mcenares wyali miewodeba individualurad minimaluri doziT. aseTi morwyvisaTvis wyali gulmodgined unda iqnes gawmendili. igi gaivlis wnevis stabilizators da Stambis simaRleze ganlagebuli 10-20 mm diametris plastmasis milebiT miemarTeba rigis gaswvriv yovel mcenaresTan. arsebuli sawveT ur ebi d an gamoedineba saaTSi 2-dan 12 l-mde wyali. wveTuri morwyva rwyvis yvelaze perspeqtiuli wes i a, magr am mi s i mo wyo ba mo i T xo vs d i d d anaxar j ebs.

tendamgrovebeli rwyva tardeba mosavlis aRebis Semdeg. mas didi mniSvneloba aqvs mosavlianobis gadidebisa da mcenaris yinvagamZleobis uzrunvelyofisaTvis. igi adidebs niadagis tenianobas da qmnis fesvebis zrdis ukeTes pirobebs mosavlis krefis Semdeg. es ki dadebiTad moqmedebs Semodgoma-zamTris periodSi mcenareSi organuli azotis d agr o vebas a d a mi s yi nvagamZl eo baz e.

morwyvis vadebi da normebi damokidebulia fesvebis momcvel fenaSi arsebul wylis maragze. baRi unda movrwyaT maSin, rodesac niadagis zRvruli savele tentevadoba daiwevs: mZime meqanikuri Sedgenilobis niadagebze 80-75%-ze dabla; saSualod meqanikuri S edgenilobis niadagebze 75-70%-ze dabla da msubuqi meqanikuri Sedgenilobis niadagebze -65-60 %-z e d abl a.

morwyvis Semdegi saorientacio vadebia: pirveli rwyva unda Catardes yvavilobamde 2-3 kviriT adre; meore – ivnisis naskvTacvenis Semdeg, mesame – nayo f isa da ylortebis gaZlierebuli zrdis periodSi; meoTxe morwyva unda Catardes mosavlis aRebis Semdeg da bo l o s gvi an S emo d go mi T , an z amT ar S i mo svenebi s per i o d S i .

morwyvis norma aseve unda dadgindes analizis safuZvelze, saSualod miRebulia,

rom erTi heqtaris mosarwyavad saWiroa: qviSian niadagze 400-450 m3, msubuq Tixnarebze – 600-700 m3, s aS ual o T i xnar ebz e 800-900 m3, mZi me T i xnar ebz e – 900-1000 m3 wyali.

**xexi l o vani mc enar eebi s var j i s f o r mi r eba da s xvl a**  gas xvl a d a f o r mi r eba met ad r T ul i d a sapasuxi s mgebl o agr o t eqni kur i R o ni s Zi ebaa. sxvlis amocanaa mcenareebis zrdis da msxmoiarobis procesebis regulireba, f o r mi r ebi s ki , s as ur vel i f o r mi s mi c ema, var j i s d a St ambi s Camo yal i beba.

s aer T o j amS i s xvl i s d a f o r mi r ebi s d ani S nul ebaa:

1. xexilis varjisaTvis kompaqturi formis micema movlis operaciebis gaadvilebis mizniT.
2. xexi l i s Co nCxi s nawi l ebi s s i mkvr i ve d a s i myar e.
3. var j i s S i d a nawi l ebi s o pt i mal ur i gaSuqeba d a haer ac i a.
4. ms xmo i ar o bi s d r o ul ad d awyeba.
5. meqani z ac i i s gamo yenebi s gaad vi l eba.

s xvl a damokidebulia mcenaris morfologiur agebulebaze; biologiur

T avi s ebur ebebz e (z r d i s d a ms xmo i ar o bi s T avi s ebur ebebi ); asako br i v per i o d ebz e.

formirebis wesebi unda SeirCes juris, jiSis da klimaturi pirobebis Sesabamisad. ar S ei Zl eba S abl o nur i s xvl a d a f o r mi r eba.

arsebobs gasxvlis ori ZiriTadi wesi: damokleba da gamoxSirva. saWiroa gasxvlis

d a f o r mi r ebi s d r o s am o r i ve wes i s S eT anwyo bi l i gamo yeneba.

gamoxSirvis dros toti mTlianad iWreba rgolze. damoklebis dros iWreba totis nawi l i .

xexilis sxvla tardeba Semodgomaze, foTolcvenidan 20-25 dRis Semdeg da adre gazafxulze vegetaciis dawyebamde. Tu kargi pirobebia sxvla SeiZleba Catardes zamTarSic. rac Seexeba formirebas igi iwyeba sanergeSi da SeiZleba gagrZeldes xexilis baR S i .

xexi l o vani mc enar eebi s var j i s t i pebi i yo f i an o r Zi r i T ad j guf ebad :

1. bunebrivi, anu Tavisuflad mozardi varjebi. miekuTvneba lideriani varjebi (i ar us i ani d a ui ar us o f o r mebi ) d a ul i d er o var j ebi anu j ami s ebur i .
2. xelovnuri varjebi, romlebic xelovnuri wesiT formirdeba, gamoiyeneba intens i ur i t i pi s baR ebi s gaSenebi s d r o s . xelovnuri varjebi, sivrceSi totebis ganlagebis mixedviT, iyofian or jgufad: brtyel da sferul, anu moculobiT varjebad. brtyel varjSi ConCxis totebi ganwyo bi l i a er T ver t i kal ur , an ho r i z o nt al ur s i br t yeS i (ko r d o nebi d a pal met ebi ).

sferul varjebs aqvs moculobiTi, sferuli forma sivrceSi sxvla unda t ar d ebo d es asako br i vi per i o d ebi s gaT val i s wi nebi T .

pirvel or asakobriv periodSi (zrdisa da zrdis da msxmoiarobis) mcenareebi intensiurad izrdebian, iviTareben Zalian grZel nazards. am periodSi sxvlis mizans Seadgens ConCxis totebis da varjis formireba. amitom saWiroa pirvel or weliwads mosavlis mocemamde Catardes Zlieri sxvlebi. Semdeg ki rekomendebulia yovelwliuri z o mi er i s xvl ebi t o t ebi s gamo xS i r vi T .

mesame da meoTxe asakobriv periodSi (msxmoiarobis da zrdis; ) mcenaris nazardi s us t eba. mTavrdeba ConCxis sistemis zrda, mosavali aRwevs maqsimalur raodenobas. didi raodenobiT isaxeba sayvavile kvirtebi, iwyeba mewleoba. am periodSi rekomendebulia ko mpl eqs ur i sxvl ebi t o t ebi s d amo kl ebi T d a gamo xS i r vi T .

mexuTe asakobriv periodSi (msxmoiarobis da xmobis) SeiniSneba Semmosavi totebis xmoba da Solta totebis warmoqmna, mosavlis Semcireba. am periodisaTvis urCeven gamaaxal gaz r d avebel gas xvl ebs .

gamaaxalgazrdavebeli sxvlis dros unda moxdes ConCxis, naxevrad ConCxis d a Solta totebis Zlieri damokleba (Zlieri sxvlebi) moberebuli da gamxmari totebis gamo xS i r vi T . gamaaxal gaz r d avebel i gas xvl ebi und a Cat ar d es d i f er enc i r ebul ad .

saqarTvelos mexileobis raionebisaTvis sxvlis Catarebis saukeTeso vada dgeba foTolcvenodan 20-25 dRis Semdeg da grZeldeba kvirtebis dabervamde. am periodSi t o t ebi yvel az e mc i r e r ao d eno bi T S ei c avs saxamebel s .

calkeul kulturaTa gasxvlis dros, aseve gaTvaliswinebuli unda iyos jurisa da j i S i s bi o l o gi ur i T avi s ebur ebani. im jiSebze, romelTac ylortebis warmoqmna SedarebiT mcired axasiaTebT (rozmarini), saWiroa Catardes grZeli totebis 1/3-is wakveca, raTa ganiviTaron didi raodenobiT Semmosavi totebi, xolo im jiSebs (kanaduri reneti, londonis pepini da sxv.) romelTac unari aqvT ylortebis uxvi raodenobiT warmoqmnisa, saWiroa Cautardes susti gasxvla\_umetesad varjis gamoxSirva, raTa gaizardos sanayofe totebis sicocxlis unari da produqtiuloba. im jiSebs, romelTac CaxSirebuli varji axasiaTebT, sWirdeba zogjer axlo-axlo ganviTarebuli totebis gamoxSirvac. varjis Sida nawilebis ukeT ganaTebis mizniT. jiSebs, romelTac axasiaTebT mtirala varji saWiroa SeeWraT Zirs daSvebuli totebi zemoT mimarTuli totis saxsramde \_ ConCxis totebis simkvrivisa da niadagis meqanizebuli wesiT damuSavebis dros maTi xelisSeSlis T avi d an ac i l ebi s mi z ni T .

gasxvlis dros mxedvelobaSi unda iqnes miRebuli, agreTve, zrdisa da msxmoiarobis Taviseburebani. magaliTad, vaSlis jiSebi, romelTac axasiaTebT didi raodenobiT meWeWa totebze msxmoiaroba da iviTareben SedarebiT mcire raodenobiT wliur nazardebs, unda gaisxlas Semdegnairad: wliuri nazardebi saWiroa damokldes daaxloebiT 1/2 \_ 1/3 sigrZemde da regularulad Catardes meWeWa totebis nawilobrivad gamosxvla. vaSlis jiSebidan aseTi msxmoiarobis tipi axasiaTebs Sampanur r enet s , zamTris oqros parmens, vagneris jildos. msxlebidan ki- ber e-ardanpons, zamTris dehans d a ki f er i s T es l ner gs .

kurkovan kulturaTa sxvlis dros, iseve rogorc Teslovanebisas, gaTvaliswinebuli unda iyos xis asaki. kurkovanTa axalgazrda xeebis sxvlis d aniSnulebaa varjis formireba, risTvisac unda moxdes ZiriTadi totebis damokleba da var j i s gamo xS i r va s aR i d a Zl i er i ganvi T ar ebi s d ed a t o t ebi s gamo yvani s mi z ni T .

srul msxmoiarobaSi Sesvlis Semdeg kurkovanTa gasxvlis dros gaTvaliswinebuli

und a i yo s ama T u i m kul t ur i s a d a j i S i s bi o l o gi ur i T avi s ebur ebani .

atmis gasxvla Zlier gansxvavdeba kurkovanTa danarCen kulturaTa sxvlisagan. atami msxmoiarobs ZiriTadad erTwlian nazardebze da mcire raodenobiT - sanayo f e

Taigulebzec. amitom, mosavlis erTxel mocemis Semdeg, toti unayofod rCeba, xolo mis gverdze gawyobili sazrdeli kvirtebidan viTardebian gverdiTi totebi, romlebzedac xd eba S emd eg wl ebS i ms xmo i ar e z ed api r i s gad anac vl eba.

amgvarad, atmis xeebis gausxlavad datoveba an maTze yovelTvis susti gasxvlis Catareba miuRebelia, radgan aseT SemTxvevaSi misi totebi SiSvldeba da msxmoiarobac kl ebul o bs .

bals axalgazrdobis periodSi axasiaTebs Zlieri zrda da saerTod susti gant o t va, r i s gamo c ganvi T ar ebi s S emd go m per i o d S i mi s i var j i T xel i r Ceba d a R ebul o bs mkveTrad gamoxatul iarusian formas. bali msxmoiarobs ZiriTadad sanayofe Taigulebze d a S ed ar ebi T nakl ebad er T wl i ani naz ar d ebi s qved a mxar es .

varjis formirebis Semdeg, blis xeebze yovelwliurad saWiroa xmeli da dazianebuli totebis gamosxvla da susti totebis damokleba, romelic SemdgomSi unda

S ewyd es.

qliavi da gargari mosavals iZleva Taigulebze, dezebze da zogjer erTwlian t o t ebz ec . qliavs axasiaTebs gverdiTi totebis didi raodenobiT ganviTareba, ris gamoc SemdegSi Zlier CaxSirebuli gamodis. amitom, formis micemis Semdgom wlebSi, saWi r o a pirvel rigSi tardebodes varjis gamosufTaveba gamxmari, daavadebuli da zedmetad

CaxSi r ebul i t o t ebi sagan gargars saerTod praqtikaSi naklebad sxlaven, rasac imiT amarTleben, rom gargaris xe Wrilobebis miyenebas ver itans da aseT SemTxvevaSi ufro metad avaddeba homoziT. magram gargaris xeebis gasxvlac Cveulebriv unda Catardes da is uaxlovdeba ql i avi s gas xvl as . xexilovani kulturebidan im kulturebis gasxvla ar aris miRebuli, romlebic: msxmoiaroben mimdinare wlis nazardebze an wliuri totebis wverze, rogorebicaa, leRvi, Txili, kakali, TuTa da sxva. aseT kulturaTa xeebze unda Catardes xmeli da d az i anebul i t o t ebi s S eWr a d a t o t ebi s gamo xS i r va saWi r o ebi s SemT xvevaS i .

palmeturi nargaobis gasxvlisas xes mTeli sicocxlis periodSi unda SevunarCunoT brtyeli formis varji. ar unda davuSvaT, rom varjis zeda nawilebma d af ar o n qved a nawi l ebi , r aT a var j i s S i gni T a nawi l ebi yo vel T vi s gaS uqebul i i yo s .

sxvlis dros dauSvebelia palmetis formis Secvla. ar unda davuSvaT grZeli Semmosavi totebis ganviTareba, ris gamoc varji brtyeli ki ara ganieri viTardeba. aseTi t o t ebi s us t ad und a d avamo kl o T . palmetur nargaobaSi dauSvebelia sarTulebs Soris manZlis gaSiSvleba. sarTulebs Soris unda davtovoT mokle da zomieri zrdis moxrili totebi. Zlieri da ver t i kal ur i t o t ebi ki und a amo i Wr as.

brtyeli xelovnuri varjebi totebis raodenobisa da sivrceSi ganlagebis mixedviT i yo f i an: ko r d o nebad d a pal met ebad .

kordonebs aqvT erTi, an ori ConCxis toti, romelic mTel sigrZeze dafarulia S emmo s avi t o t ebi T .

totebis ganlagebis nixedviT kordonebi aris martivi da rTuli martivs miekuTvneba vertikaluri, talRiseburi, daxrili, horizontaluri erTmxriani. rTuls \_ V -s magvar i , ho r i z o nt al ur i sammxr i ani , YY-s magvar i d a s xv.

palmeta varjis iseTi formaa, rodesac ZiriTadi totebi rigis gaswvriv erT

ver t i kal ur s i br t yeS i ar i an ganl agebul i . pal met ebi ar i s s wo r i d a ar as wo r i .

Tu varjs simetriuli forma aqvs, e.i. centralur gamagrZelebelze ConCxis totebi garkveuli wesis dacviT arian ganlagebuli (sarTulebs Soris manZili da totebis d axr i s kuT xe er T nai r i a) ewo d eba s wo r i pal met a.

Tu ConCxis totebi centralur gamagrZelebelze garkveuli wesis dacviT ki ar arian ganlagebuli, aramed uwesrigod, araswori palmeta ewodeba. yvelaze gavrcelebuli formaa araswori (iribi) palmeta. araswori palmetebidan yvelaze miRebulia daxril totebiani araswori palmeta. palmetebis formirebis wesebi erTnairia. swori palmetisagan gansxvavebiT daxril totebiani araswori palmetis ConCxis totebi erTmaneTis sapirispirod ki ar arian ganlagebuli, aramed garkveul manZilze daSorebiT. Zlier da zomierad mozard saZireebze damynobil palmetaze formirdeba 3, sustad mo z ar d s aZi r eebz e ki 4-5 s ar T ul i . pal met i s s aer T o s i maR l e ar und a aR emat ebo d es s 2,5\_3,5 met r s . var j i s s i gane ki 1,5\_2 met r s .

**xexi l i s mos avl i s aReba da mo vl a**

mosavlis krefa savegetacio periodis ganmavlobaSi baRSi gatarebuli agroRonisZiebebidan yvelaze sapasuxismgeblo da Sromatevadia. mis swor organizaciaze d i d ad ar i s d amo ki d ebul i xi l i s sasaqo nl o R i r ebul eba.

xilis krefis vadis zust gansazRvras udidesi mniSvneloba aqvs produqciis xarisxisa da Senaxvisunarianobis gazrdisTvis. arCeven xilis sakref, teqnikur da mosaxmar simwifes. nayofis sakrefi simwife dgeba maSin, rodesac igi miaRwevs jiSisaTvis damaxasiaTebel zomas, Sefervas da advilad scildeba nayofs. simwifis xarisxis gansaz Rvr a, garda garegnuli niSnebisa, ukanasknel xanebSi warmoebs, nayofSi saxameblis r ao d eno bi s mi xed vi T .

teqnikuri simwife niSnavs imas, rom nayofi vargisia gadamuSavebisa da Sor manZilze transportirebisaTvis. simwifis es xarisxi praqtikulad dgeba sakref simwifeze 2\_4 dRiT gvian. nayofis mosaxmari simwife dgeba maSin, rodesac nayofSi dasruldeba d amwifebis fiziologiuri procesi da nayofi SeiZens jiSisaTvis damaxasiaTebel gemur T vi sebebs , S ef er vas d a ko ns i s t enc i as .

naadrevad dakrefili xilis danakargebi wonaSi jiSebis mixedviT Seadgens 10-15%, xo l o S aqr ebi s -30-50%.

xilis krefis simwifis vadis zustad gansazRvra metad mniSvnelovania. krefis

s i mwi f e gani saz R vr eba nayo f i s mo r f o l o gi ur i , bi o l o gi ur i , f i z i kur i d a qi mi ur i ni S nebi s mi xed vi T .

Teslovnebi simwifis periodebis mixedviT aris sazafxulo, saSemodgomo da zamTris simwifis periodis. kurkovnebi simwifis periodebis mixedviT iyofa sam mTavar j guf ad : saad r eo , saS ual o d a sagvi ano . mosavlis droulad aReba didad aris damokidebuli Sromis swor organizaciaze. krefis dawyebamde unda iqnes momaragebuli xvadasxva kibeebi, xilis sakrefi CanTebi, yuT ebi , ko nt ei ner ebi d a sxv.

xexi l i s baR S i i yeneben xi l i s kr ef i s o r wes s :

* 1. xeliT krefas \_ romlis drosac gamoiyeneben martiv saSualebebs: sakref magi d ebs , ki beebs , s xvad as xva ko ns t r uqc i i s T vi T maval an mi sabmel baqnebs .
  2. meqani z ebul s \_ s pec i al ur i sakr ef i manqanebi s gamo yenebi T .

Teslovani kulturebis Sesanaxad gaTvaliswinebuli jiSebis krefa warmoebs mxo l o d xel i T .

krefis dros unda davicvaT Semdegi wesebi: 1. krefa unda Catardes mSral amindSi, 2. krefa unda daiwyos xis qveda totebidan, 3. nayofebi aucileblad unda moikrifos yunwiT, 4. krefis dros ar SeiZleba xeze asvla, 5. unda veridoT krefis dros nayofis kanis dazianebas, 6. unda gavufrTxildeT (ar davamtvrioT) sanayofe war mo naqmnebs .

gamo yenebul i l i t er at ur a

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s ar Cevi

|  |  |  |
| --- | --- | --- |
| Sinaarsi | | gv |
| Sesavali | | 3 |
| memc enar eo ba | | 4 |
| Mmar c vl eul i kul t ur ebi s z o gad i d axas i aT eba | | 6 |
| s aSemo d go mo pur eul | ebi -saS xo r bal i | 9 |
| s aSemo d go mo Wvavi |  | 11 |
| t r i t i kal e |  | 13 |
| saSemodgomo qeri |  | 13 |
| s agaz af xul o pur eul | ebi | 15 |
| s agaz af xul o qer i |  | 16 |
| Svria |  | 17 |
| simindi |  | 18 |
| brinji |  | 24 |
| fetvi |  | 27 |
| wiwibura |  | 28 |
| Romi |  | 30 |
| sorgo |  | 32 |
| lobio |  | 35 |
| soio |  | 36 |
| bar d a |  | 37 |
| c er c vi |  | 39 |
| t eqni kur i kul t ur ebi | | 41 |
| mz es umz i r a L | | 42 |
| AeT er z eT o vani mc enar eebi | | 44 |
| var d i sebr i ger ani | | 45 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| evgenoluri rehani | | | | 51 |
| rafsi | | | | 54 |
| Saqris Warxali | | | | 56 |
| Tambaqo | | | | 60 |
| kartofili | | | | 64 |
| s akvebi bal axebi | | | | 69 |
| mr aval wl o vani par ko s ani bal axebi - i o nj a | | | | 69 |
| esparceti | | | | 72 |
| s amyur a | | | | 72 |
| Zi Zo | | | | 73 |
| maRal i ko i nd ar i | | | | 75 |
| mr aval s aT i bi ko i nd ar i | | | | 75 |
| md el o s t i mo T el a |  | | | 76 |
| mebo s t neo bi s mni S vnel | o ba, ganvi T ar eba d a amo c anebi . | | | 76 |
| kombosto. | |  |  | 78 |
| Zi r xvenebi : s t af i l o | |  |  | 80 |
| oxraxuSi | |  |  | 82 |
| niaxuri | |  |  | 86 |
| Zi r T eT r a | |  |  | 82 |
| boloki | |  |  | 83 |
| Tvis boloki | |  |  | 85 |
| xaxvnairi | |  |  | 97 |
| ni o r i . | |  |  | 90 |
| Wlakvi | |  |  | 92 |
| prasi | |  |  | 93 |
| nayo f i ani mc enar eebi | |  |  | 93 |
| kitri. | |  |  | 93 |
| nesvi | |  |  | 94 |
| s az amT r o | |  |  | 95 |
| go gr a | |  |  | 96 |
| mxal eul mwvani l eul i | |  |  | 97 |
| c er ec o | |  |  | 104 |
| rehani | |  |  | 105 |
| qondari | |  |  | 100 |
| ispanaxi | |  |  | 101 |
| mr aval wl i ani bo s t neul | | i kul | t ur ebi | 107 |
| revandi | |  |  | 101 |
| mJauna | |  |  | 103 |
| t ar xuna | |  |  | 105 |
| Sampinioni | |  |  | 106 |
| d ac ul i gr unt i s mo wyo ba d a gaT bo ba | | | | 108 |
| mevenaxeo ba | | | | 120 |
| vaz i s o j axi s d axas i aT eba | | | | 125 |
| vaz i s o r gano gr af i a | | | | 125 |
| vaz i s bi o l o gi ur i ganvi T ar ebi s | | | | 128 |
| bunebr i vi f aqt o r ebi s gavl ena | | | | 130 |
| vaz i s gamr avl ebi s wes ebi | | | | 1.33 |
| venaxi s gaS eneba | | | | 144 |
| vaz i s d ar gvi s pr o gr es ul i meT o d ebi : | | | | 156 |
| vaz i s gas xvl a-f o r mi r eba | | | | 148 |
| s et yvi s a d a yi nvi s agan d az i anebul i vaz i s mo vl a | | | | 151 |
| venaxi s mo vl i s R o ni s Zi ebebi | | | | 152 |
| s as uqebi s gamo yeneba venaxS i | | | | 155 |
| rTveli | | | | 156 |
| mexi l eo ba -mexi l eo bi s d ar gi s mni S vnel o ba d a amo c anebi . | | | | 158 |
| xexi l o van mc enar T a kl as i f i kac i a d a mo r f o l o gi ur i d axas i aT eba | | | | 160 |
| xexi l o vani mc enar eebi s gamr avl eba | | | | 166 |
| xexi l i s s aner ge | | | | 174 |
| xexi l i s baR i | | | | 178 |
| baR S i ni ad agi s mo vl i s s i s t emebi | | | | 185 |
| xexi l o vani mc enar eebi s var j i s f o r mi r eba d a s xvl a | | | | 190 |
| xexi l i s mo savl i s aR eba d a mo vl a | | | | 95 |
| gamo yenebul i l i t er at ur a | | | | 197 |

dedani momz ad d a gamo sac emad saqar T vel o s s axel mwi f o sasoflo sameur neo uni ver s i t et i s sar ed aqc i o sagamo mc eml o

ganyo f i l ebi s mi er

redaqtori: gamo mS vebi s aaR r i c xvo –s agamo mc eml o T abaxi t i r aJ i 300 gamo mc eml o ba

Tbilisi