თინათინ დარსაველიძე

**teqnikuri kulturebi**

1 teqnikuri kulturebis saxalxo-sameurneo mniSvneloba.

2 teqnikuri kulturebis dajgufeba.

3 zeTovani kulturebi. mzesumziris movla-moyvanis agrokompleqsi.

teqnikur kulturebs metad didi saxalxo-sameurneo mniSvneloba aqvs, radgan iseTi farTo moxmarebis produqtebs gvaZlevs, rogoricaa Saqri, zeTi da sxva. garda amisa, maTgan amzadeben qsovilebs. teqnikuri kulturebi mniSvnelovan gavlenas axdens miwaTmoqmedebis kulturis donis amaRlebaze, maTi warmoeba xels uwyobs TeslbrunvebSi CarTuli kulturis mosavlis gadidebis pirobebis Seqmnas.

mravalricxovani teqnikuri kulturebidan metad mniSvnelovania Saqris Warxali, mzesumzira, kartofili, bamba, seli, Tambaqo da sxva.

teqnikuri kulturebi daniSnulebisa da sameurneo gamoyenebis mxriv SeiZleba Semdeg jgufebad gavaerTianoT:

z e T o v a n i k u l t u r e b i - mzesumzira, abusalaTini, perila, Sirbaxti, soia, araqisi da sxva, romelTa Teslidan sasursaTo da teqnikur zeTs Rebuloben;

S a q r i s S e m c v e l i m c en a r e e b i – Zirxvenebi - Saqris Warxali, cikori, Saqris lerwami, Saqriani palma, Saqriani nekerCxali, da sxva., romelTa moyvanis mizania Saqris, badagisa da sxva produqtebis miReba;

s a x a m e b l i a n i m c e n a r e e b i - tuberianebi: kartofili, miwavaSla (topinamburi) da sxva. romlebic mohyavT saxameblis, inulinisa da sxvaTa misaRebad;

s a r T a v i - b o W k o v a n i m c e n a r e e b i, romelTagan Rebuloben boWkos (Teslidan an Rerodan);

n a r k o t k u l i, s a m k u r n a l o, s a R e b a v i cenareebi da sxva. (Tambaqo, weko da sxva.) romelTa nedleuls xmaroben kvebis, qimiis, farmacevtul da msubuq mrewvelobaSi.

e T e r z e T o v a n e b i - gerani, rehani, qinZi, anisuli, pitna da sxva, romelTa nayofidan, yvavilebidan da axalgazrda foTlebidan Rebuloben eTerzeTebs.

**zeTovani kulturebi**

zeTovani mcenareebis Tesli didi raodenobiT Seicavs zeTs, romelsac iReben agreTve sarTavi kulturebidanac.

mcenareuli zeTi, rogorc maRalkaloriuli produqti didi sasursaTo da teqnikuri mniSvnelobisaa.

zeTis erTi wili udris Saqris 2, 25 wils an puris 4 da kartofilis 8 wils, mcenareuli zeTi cilebTan da naxSirwylebTan SedarebiT maRalkaloriulia: 1 kg zeTi 9500 kalorias iZleva, 1kg cila -4400 -5000, naxSirwylebi ki 4000-5000 kalorias.

mcenareul zeTs gansakuTrebiT didi mniSvneloba aqvs msubuqi mrewvelobis sxvadasxva dargisaTvis. mas farTod iyeneben sakonditro, sakonservo da qimiur mrewvelobaSi. hidrogenizaciiT mcenareuli zeTisagan miRebuli maRali xarisxis produqts xmaroben margarinis dasamzadeblad, dabali xarisxisas ki –sapnis warmoebaSi.

mcenareul zeTs iyeneben safeiqro, tyavisa da parfiumeriul mrewvelobaSi, laqis, linoliumis warmoebasa da mrewvelobis sxva dargebSi, samedicino preparatebis, wyalgaumtari qsovilis, xelovnuri kauCukis da sacxebi masalebis dasamzadeblad.

**m z e s u m z i r a (Helianthusannus L)**

mzesumziras TeslSi Sedis 50% -mde cximi, proteini 16, xolo 16.5 % zeTi. gamoiyeneba sasursaTe mizniT, Tevzisa da bostneulis dasakonserveblad, margarinis, maionezis, agreTve pureulisa da sakonditro nawarmis dasamzadeblad. 100kg mzesumziris koptoni Seesabameba 108 sakveb erTeuls. mzesumzira saqarTveloSi mohyavT garekaxeTis zeganze – dedofliswyaros, siRnaRis, gurjaanis, sagarejos raionebSi.

mzesumziras saSualo mosavlianoba – 15-18 c /ha-ze, magram maRali -agroteqnikis pirobebSi mosavlianoba SeiZleba gazrdili iyos 32-35c/ha-ze.

g a r e m o p i r o b e b i. zrda-giTarebis pirvel periodSi mzesumzira did moTxovnilebas ar iCens siTboze. misi Tesli gaRivebas iwyebs 30-ze. gaRivebisaTvis saWiro optimaluri temperatura 20-250-ia. moklexnovani wayinvebi (minus 5-6 ) mzesumziris aRmonacens SedarebiT advilad gadaaqvs. 300-ze maRali temperatura damrTgunvel gavlenas axdens masze.

mzesumzira gvalvagamZle kulturaa. misi gvalvaamtanoba ZiriTadad ganpirobebulia mZlavrad ganviTarebuli fesvTa sistemiT, romlis mTavari RerZis fesvs SeuZlia SeiTvisos sxva mcenareebisaTvis miuwvdomeli 2 m da met siRrmeze arsebuli niadagis wylis maragi.

Tu wylis saerTo xarjva vegetaciis ganmavlobaSi Seadgens 100% -s, maSin aRmocenebidan kalaTis warmoqmnamde igi Seadgens 25%-s, kalaTis warmoqmnidan yvavilobamde - 44-s, yvavilobidan momwifebamde -31 % -s. zrda-ganviTarebis sxvadasxva periodSi mzesumzira wyals moixmars niadagis sxvadasxva fenebidan. mzesumziris maRali mosavlis misaRebad aucilebelia Seiqmnas wylis maragi niadagis 200 sm siRrmis fenaSi da uzrunvelyofili iqnas misi ekonomiuri xarjva zrda-ganviTarebis periodebis mixedviT.

yvavilobis periodSi wylis naklebobis dros yvela yvavili ar nayofierdeba, rac iwvevs kalaTis fuWmarcvlianobas. mzesumziras kalaTSi igi ori fomisaa: kalaTis centrSi koncentrirebuli (carieli centri ) da masze gabneuli.

miuxedavad gvalvagamZleobisa mzesumzira yvelaze met produqtiulobas amJRavnebs niadagis optimaluri tenianobisas (sruli mindvruli wyaltevadobis 70%-is dros) Teslis formirebamde, ris Semdeg wyalze moTxovnileba mkveTrad mcirdeba.

mzesumzira moiyvaneba sxvadasxva niadagze. misi naTesebis ZiriTadi nawili Savmiwebzea ganawilebuli, agreTve wabla niadagebze. igi Znelad viTardeba mZime Tixnarebze, romlebsac midrekileba aqvT daWaobebisadmi, agreTve qviSnar niadagebze. mzesumzira ver itans mJave da Zlier damlaSebul niadagebs. misi zrda-ganviTarebisaTvis yvelaze xelSemwyobi pirobebia PH 6,0-6-s dros.

m o v l a –m o y v a n i s a da m o s a v l i s a R e b i s

t e q n o l o g i a. mzesumzirisTvis yvelaze ukeTesi winamorbedebia saSemodgomo kulturebi, agreTve samarcvle parkosnebi, fetvi, erTwliani balaxebi. ar aris rekomendebuli mzesumziras Zvel adgilze 8-10 welze ufro adre Tesva. mzesumziras Tanamedrove jiSebi kelaptrisadmi gamZlea, magram miwaTmoqmedebis amocana is aris, rom minimumamde Semcirdes masze kelaptris Reroebis ganviTareba, rac SeiZleba miRweuli iqnas mxolod mzesumziris morigeobiT TeslbrunvaSi. kelaptris Tesli niadagSi aRmocenebis unars inarCunebs xangrZlivi droiT, magram maTi ZiriTadi nawili 6-7 wlis ganmavlobaSi iRupeba.

g a n o y i e r e b a. mzesumziris mier niadagidan sakvebis gamotana 1 tona Tesluraze Seadgens: Aazotisa-60 kg, fosforisa- 26kg da kaliumisa – 186 kg. miuxedavad amisa, mzesumzira sustad exmaureba sasuqebis Setanas. es imitom xdeba, rom ganoyierebisagan dadebiTi efeqtis didi wili mcenaris vegetatiur nawilebze modis, romlebic warmoebis mizans ar Seadgens. saSualod iyeneben dozebs N45 P60K45  -is farglebSi.

mzesumziris fesvTa sistema niadagidan kargad iTvisebs kaliums da am elementiT TiTqmis normalurad akmayofilebs Tavis moTxovnilebebs. amitom kaliumiani sasuqebis Setana dadebiTi efeqtianobiT ar GxasiaTdeba.

n i a d a g i s d a m u S a v e b a . - mzesumziris intensiuri teqnologiiT moyvanis dros niadagis momzadeba iwyeba ZiriTadi damuSavebiT. erTwliani sarevelebis arsebobisas winamorbedis aRebisTanave TavTaviani kulturebis nawverali unda daidiskos 2-3-jer, 6-8 sm siRrmeze mravalwliani sarevelebis arsebobisas atareben fenobriv damuSavebas herbicidebTan erTad. pirveli kultivacia tardeba Tesvamde 6-12 dRiT adre; 6 -12 sm siRrmeze, meore - Tesvis win 2-3 saaTiT adre 6-8 sm siRrmeze.

T e s l i s m o m z a d e b a d a s a T e s a d d a T e s v a.

imis gamo, rom Tesli aRmocenebis unars didxans ver inarCunebs, dasaTesad iyeneben mxolod wina wlis Tesls. Teslis gauvnebloba xdeba preparat tmtd –iT tonaze 2-3 kg – is xarjviT.

mosavlis gadidebis erT-erTi mTavari rezervi optimaluri Tesvis vadaa. Cveulebriv, mzesumzira iTeseba sagazafxulo marcvleulis Tesvidan 7-10 dRis Semdeg, roca niadagi 6-8 sm siRrmeze 10-120 mde gaTbeba. gaumTbar niadagSi Tesvisas aRmonaceni araTanabari da meCxeri gamodis. amasTan naTesi zedmetad sarevliandeba erTwliani da fesvnayariani sarevelebiT.

intensiuri teqnologiiT moyvanisas mzesumziras Tesaven punqtiruli wesiT 70 sm\_iani mwkrivTaSorisebiT. saqarTveloSi mzesumziras mTesveli raionebisaTvis dadgenilia Tesvis dgomis sixSire 40-45 aTasi mcenare heqtarze. ukiduresad gvalvian mikroraionebSi - taribanis velze da mdinare ivris dinebis gaswvriv SeiZleba 25-30aTasis Tesva. Tesvis norma 1000 Teslis masaze damokidebulebiT Seadgens 6-8 kg/ ha-ze.

Teslis CaTesvis siRrme saSualod unda iyos 6-8 sm. \_ tenian niadagSi da 8-10 \_ mSralSi. mZime niadagebze CaTesvis sirRme undaME UNDA Semcirdes, xolo msubuqze \_ gaizardos.

n a T e s i s m o v l a . sarevelebis winaaRmdeg sabrZolvelad didi mniSvneloba aqvs aRmocenebamde da aRmocenebis Semdgom farcxvebs. am periodSi rac SeiZleba meti raodenobis sarevelebi unda ganadgurdes. konkretul pirobebze damokidebulebiT atareben erT-or aRmocenebamde farcxvas, pirvelis \_ Tesvidan 4-5 dRis Semdeg, roca mzesumziras Rivebi sididiT daaxlovebiT Teslis tolia, xolo sarevelebi imyofebian TeTri Zafis mdgomareobaSi, meores \_aRmocenebamde 3-4 dRiT adre. amasTan Tvalyuris midevna unda imas , rom Rivis wversa da damuSavebis siRrmes Soris manZili iyos aranakleb 1sm-sa. winaaRmdeg SemTxvevaSi SeiZleba ganadgurdes mzesumziris Rivebis 15-2 %. aRmocenebamde farcxva, rogorc wesi, tardeba nakveTis diagonalis an mwkrivebis gardigardmo mimarTulebiT.

mzesumziras aRmonacenis dafarcxva 2-3 namdvili foTlis fazaSi tardeba gansakuTrebuli sifrTxiliT, radgan norCi mcenareebis daRupva SeiZleba 6-10%-s miaRwios, rac dauSvebelia Teslis zusti normiT daTesvisas da naTesebis raime mizeziT gameCxerebisas, aRmonacenis dafarcxvis dros agregatis moZraobis siCqare unda iyos 3,5-4,0 km saaTSi. mzesumziris aRmonacenis farcxva SeiZleba dilis 11-12 saaTidan,roca mcenareebi kargaven turgors da maTi mtvrevadoba farcxvisagan Semcirebulia.

mwkrivTaSorisebis pirvel damuSavebas atareben mzesumziris 3-4 namdvili foTlis fazaSi, e.i. aRmonacenis dafarcxvidan 5-6 dRis Semdeg. meore da Semdgomi damuSaveba 10-12 dRis intervaliT mimdinareobs.

mwkrivTaSorisebis meore da Semdgomi damuSavebisas ayeneben 220 da 270 mm modebis ganis isrisebur TaTebs. damcavi zoli 12 sm-ia. mwkrivTaSorisebis damuSavebis siRrmis gansazRvris dros gasaTvaliswinebelia niadagis tenianoba. im, wlebSi, roca naTesis movla emTxveva gvalvian periods, maqsimalur mosavals iReben mwkrivTaSorisebis 6-8 sm siRrmeze damuSavebisas. naleqebis mniSvnelovani odenobiT mosvlis wlebSi vegetaciis periodSi damuSavebis siRrmis 6-8 sm –dan 8-10 sm mde TandaTan gadideba dadebiTad aisaxeba mzesumziris mosavalze.

ruxi da TeTri sidamplis sawinaaRmdegod iyeneben preparat ronilanis 50% - ian svelebad fxvnils. preparatis xarjvis norma 1,0-1,5 kg/ha. mcenareebs asxureben masobrivi yvavilobis periodSi da imeoreben 10-15 dRis Semdeg.

mzesumziras fuWmarcvlianobis sawinaRmdegod rekomendebulia futkris ojaxebis naTesSi an mis irgvliv Setana . sasurvelia TiToeul ha-ze gatanili iyos ori ojaxi.

intensiuri teqnologiis ganxorcielebisas, roca sarevelebi nadgurgeba herbicidebiT, naTesebis movla erTi-ori operaciisagan Sedgeba. herbicidebisadmi gamZle sarevelebis mosaspobad iyeneben aRmocenebamde farcxvebs da mwkrivTaSorisebis kultivacias, roca mcenaris simaRle 30-40 sm-s miaRwevs. herbicidebis moqmedebis Sesustebisas unda Catardes mwkrivTaSorisebis damatebiTi meqanikuri damuSaveba.

m o s a v l i s a R e b a . aReba xdeba fiziologiuri simwifis fazaSi (sruli yvavilobis damTavrebidan 35-40 dRis ganmavlobaSi) roca kalaTis zurgis mxare miiRebs yviTel fers. foTlebis funqcionirebis SesaCereblad da mzesumziris marcvlisa da kalaTis gasaSrobad (maTi gauwyloebis gamosawvevad), masobrivi yvavilobidan 35-40 dRis Semdeg atareben desikacias. am periodSi Cveulebriv yviTeli kalaTebi 50-60%-ia moyviTalo-moruxo -20-30, ruxi 10-20%,xolo Teslis tenianoba aWarbebs 30-35%-s. es monacemebi mzesumziras mosavlis aRebis dawyebis vadis gansazRvris safuZvelia.

naTesebs asxureben mowmendil dRes diliT haeris aRmavali dinebis gamoCenamde. saRamoTi Sesxurebas anaxleben mzis Casvlamde 3-4 saaTiT adre. unaleqo, Rrublian amindSi Sesxureba SesaZlebelia mTeli dRis ganmavlobaSi. imisTvis, rom ar daziandes sxva kulturebi, dasamuSavebeli mindvris damcveli zoli aranakleb 100 m siganisa unda iyos. Sesxurebidan 10-15 dRis Semdeg iwyeben mosavlis aRebas. desikaciis Semdeg Teslis tenianoba 12-14%-mde mcirdeba. magniumis qloratiT damuSavebuli mzesumziris kalaTebis gamoyeneba ar SeiZleba saqonlis sakvebad. aseT farTobebze mosavlis aRebis Semdeg akrZalulia agreTve, pirutyvis Zoveba.

desikantebis gamoyenebis gareSe mzesukziras iReben iseTi simwifis dros, roca maTSi damTavrebulia cximis dagrovebis procesebi.

mzesumziris aRebas iwyeben, roca naTesSi mcenareebis 12-15% rCeba yviTeli da ruxi yviTeli kalaTebi, danarCeni 85-88 %-s aqvs muqi mSrali kalaTebi , xolo Teslis tenianoba 12-15 %. mosavlis aRebis optimalurma vadam meurneobaSi ar unda gadaaWarbos 5 dRes. gansakuTrebiT uaryofiT gavlenas axdens aRebis vadebis gaxangrZliveba optimalur vadebTan SedarebiT. periodi, romlis ganmavlobaSi Teslis tenianoba rCeba optimaluris farglebSi (12-15 %), Cveulebriv 6-8 dRea. naleqebisa,burusisa da haeris tenianobis gadidebis Sedegad Tesli SeiZleba xelaxla dateniandes.

gauwmendavi Teslis kaloze grovebSi datoveba dauSvebelia, radgan aman SeiZleba gamoiwvios Caxureba da gafuWeba. amitom aRebasTan erTad saWiroa Catardes yvela samuSao Teslis aRebis Semdgomi damuSavebisaTvis (gawmenda, Sroba ) Sesanaxad gaTvaliswinebuli Teslis tenianoba ar unda aWarbebdes 7%-s maRalzeTiani jiSebisaTvis 43%cximiT, 8%-s saSualozeTiani jiSebisaTvis 37-43% cximis SemcvelobiT, 9%-smcirezeTiani jiSebisaTvis cximis SemcvelobiT 37%-mde.

mzesumziras Teslis, rogorc sazeTe nedleulis mTavari sasaqonlo Tvisebebis maCvenebelia zeTis xarisxi (misi mJvauri ricxvi).

saWmelad, damatebiTi damuSavebis gareSe,SeiZleba gamoyenebuli iqnes zeTi 2,25 mg mJavianobisas. Tu mJavianoba sazRvris zeviTaa aseTi zeTi sasursaTe miznebisaTvis ar gamoiyeneba. imisaTvis, rom aseTi zeTi nawilobriv iyos gamoyenebuli, igi guldasmiT unda gaiwmindos, moxdes misi rafinireba (ganeitraldes mJavianoba), rafinirebisas ikargeba yvelaze ufro Zvirfasi neitraluri zeTebi TiTqmis yvela fosfatidi da vitaminebi. amis Sedegad saWmeli produqti kargavs Tavis gemur, aromatul da samkurnalo Tvisebebs. aseTi rafinirebis gareSe zeTis gamoyeneba SeiZleba mxolod teqnikuri miznebisTvis.

**rafsi**

**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 miznebisaTvis. mas iyeneben margarines warmoebaSi , sapnis, metalurgiul, safeiqro, laq – saRebavebis, poligrafiul da tyavis mrewvelobaSi. am bolo dros did interesia avtomanqanis zeTad iqnes gamoyenebuli.

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 saqarTveloSi baris dablobis sarwyav regionebSi mohyavT.

rafsis mwvane masis gvian Semodgomaze gaTibvisas 60-70 tonamde Rebuloben ha-ze.

**garemo pirobebi .** rafsis Tesli gaRivebas 1-30-s C –ze iwyebs gaRivebas. aRmonaceni itans yinvebs minus 3-50-mde. igi sakmaod maRal momTxovnia tenisadmi. did moTxovnilebas uyenebs niadagis nayofierebas. saSemodgomo rafsisaTvis kargia sakvebi elementebiT mdidari, susti mJave an neitraluri reaqciis mqone niadagebi.

**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 SeiZleba dabrundes ara ugvianes 5 wlis Semdeg.

rafsi sakvebs didi raodenobiT moiTxovs, amitom rafsisTvis gankuTvnil nakveTze Semodgomaze SeaqvT 30-60 t nakeli ha-ze. azotis Setana xdeba Tesviswina kultivaciiwin an rozetis fazaSi 120 kg/ ha-ze, saSemodgomo rafsis naTesSi azotis Setana metad efeqturia 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 mosavlis aRebisTanave unda damuSavdes (aCeCva, moxvna da xnulis damuSaveba naxevrad xnulis damuSaveba).

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 zafxul-Semodgomaze gamoyenebisas niadagis damuSaveba Sedgeba aCeCvisagan winamorbedis aRebisTanave da xvnisagan.

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 baRninjoebisagan, rac mniSvnelovnad amcirebs mosavals.

rafsi iTeseba Cveulebriv viwro mwkrivad saTesi manqaniT 12-15 kg/ha-ze Tesvis normiT, xolo farTo mwkrivad Tesvis dros 6-8 kg/ha-ze. Teslis CaTesvis siRrme 2-3 sm-ia. niadagis zedapiruli fenis gamoSrobis dros, CaTesvis siRrmes adideben 4-5 sm-mde.

sarevelebis winaaRmdeg gamoyenebul unda iqnas Sesabamisi herbicidi, romelic iqneba registrirebuli.

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 winaaRmdeg saWiroa Sesabamisi preparatebis gamoyeb\neba.

rafsis Tesls iReben gayofis wesiT. mcenareebs Tibaven Rvareulebad maSin, roca Tesli mura an Sav fers miiRebs.

mwvane masis misaRebad saSemodgomo rafsi iTeseba adre gazafxulze saadreo sagazafxulo kulturebTan erTdroulad. ori gaTibvis dros pirceli unda Catardes 50-60 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 Semdeg unda Catardes naTesis gamokveba azotiani sasuqit 60 kg/ha-ze normiT.

**AeTerzeTovani mcenareebi**

am jgufSi Tavmoyrilia iseTi mcenareebi, romelTa kulturis mizans warmoadgens surnelovani, eTerovani zeTis miReba. mohyavT 20-mde saxis eTerzeTovani mcenare, rogoricaa: qinZi, anisuli, kvliavi, pitna, didi kama, xaris varda, gerani, rehani da sxva.

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 orTqldeba da sasiamovno surnelebiT vrceldeba garemoSi, amis gamo mas farTod iyeneben 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 anarCenebi ki organul sasuqad.

saqarTveloSi eTerzeTovani zeTis warmoebis ZiriTad nedleuls iZleva – vardisebri gerani da evgenoluri rehani. maT moyvanas misdeven afxazeTSi, senakis, abaSis, Telavis, yvarlis, lagodexis da marneulis raionebSi.

**vardisebri gerani**

**vardisebri gerani –** buCqovan balaxnairi, mravalwlovani mcenarea.

gerani ver itans – 2-3º-ian yinvasac ki, amitom CvenSi is erTwliani mcenarea. mas amravleben kalmiT, kvalsaTburebSi da gazafxulze gaaqvT mindorSi dasargavad.

**morfologiur-biologiuri daxasiaTeba.** geranis fesvTa sistema wvrili Zafisebri fesvebisagan Sedgeba, radgan misi gamravleba vegetatiurad – kalmiT swarmoebs. fesvebi gamoaqvs kalmis fuZidan da vrceldeba niadagSi, ZiriTadad 30sm siRrmemde, calkeuli fesvebi ki niadagSi Cadis 1,5 – 2m siRrmezec.

mTavari Rero moklea – 4-5sm simaRlis, saidanac viTardeba muxlebisa da muxlTSorisebisagan Semdgari totebi. isini hqmnian geranis buCqs, romlis simaRle jiSisa da adgilobrivi pirobebis mixedviT 80 – 130 sm aRwevs. geranis totebi Sebusulia.

foToli -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. amasTan axalgazrda foTolSi zeTis Semcveloba metia, vidre ZvelSi, xolo SeyviTlebul foTlebSi is umniSvnelo raodenobiTaa.

yvaviledigamodis 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 SemTxvevaSi mis xuTbudian naskvSi viTardeba xuTi cali Tesli.

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 ganviTarebul buCqs iZleva.

siTbosadmi didi moTxovnilebis mcenarea, mcire yinvac ki, rogorc avRniSneT sruliad spobs mcenares. vegetacias iwyebs 10 º siTbos dros, xolo normaluri ganviTarebisaTvis saWiroebs 20 - 25 º siTbos.

aseve didia misi moTxovnileba sinaTlis mimarT, vinaidan eTerovani zeTis maqsimaluri raodenobiT dagroveba mcenaris foTlebSi moiTxovs naTelsa da mzian dReebs.

geranis mwvane masis uxvad ganviTareba didi raodenobiT moiTxovs wyalsac, niadagis tenianoba vegetaciis ganmavlobaSi ar unda iyos zRvruli wyaltevadobis 80%-ze naklebi. mwvane masisa da zeTis did gamosavlianobas iZleva sarwyavi miwebi.

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, sadac gruntis wyali axloa.

Zlier azianebs geranis plantacias qarebi, amitom mis gasaSeneblad saWiroa SeirCes Zlieri qarebisagan daculi, myudro adgilebi.

**adgili TeslbrunvaSi.** geranis mudmivad erTsa da imave adgilze dargva sasurveli ar aris, ams Tan sdevs niadagis gamofitva da mavnebel daavadebaTa gavrceleba, rac mkveTrad amcirebs mis mosavlianobasa da xarisxs. geranis kulturis maRali agroteqnika moiTxovs mis TeslbrunvaSi Setanas.

aRmosavleT saqarTvelos pirobebSi geranis winamorbedad TeslbrunvaSi warmatebiT SeiZleba iqnes gamoyenebuli saSemodgomo TavTavianebi, agreTve parkosani kulturebisagan da baRCeulebidan ganTavisuflebuli mindori. geranis aRebis Semdeg SeiZleba davTesoT simindi, soia da sxva sagazafxulo kulturebi.

**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 uaresdeba misi xarisxi.

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 siRrmeze winmxvneliani guTniT, amave dros SeaqvT ZiriTadi sasuqebi da aseTi saxiT rCeba zamTarSi.

adre gazafxulze, rogorc ki SesaZlebeli iqneba mindvrad muSaoba, xnuli ifarcxeba zigzagiT. geranis dargvamde erTi kviriT adre, xnuli fxvierdeba 10 – 12 sm-ze frTebmoxsnili saoSebiT da TanmiyolebiT ifarcxeba.

mravalwliani balaxebisa da sagviano saToxni kulturebis mindori Semodgomaze, mosavlis aRebisTanave ixvneba mzralad.

dasavleT saqarTvelos pirobebSi, niadagis ZiriTad damuSaveba geranisaTvis urCeven ianvar-TebervalSi, 20 – 22 sm siRrmeze. geranis dargvis win 8 – 10 dRiT adre, xnuli fxvierdeba frTebmoxsnili saoSebiT da ifarcxeba.

kolxeTis dablobze, Warbi tenianobis gamo, rekomendebulia gerani dairgos 5 – 8 metriani siganis SemaRlebul, sferul kvlebze, am mizniT TiToeuli kvali ise unda damuSavdes, rom kvlis kideebze naRari darCes zedmeti wylis dasawretad.

**ganoyiereba.** gerani, sxva kulturebTan SedarebiT, didi raodenobiT saWiroebs sasuqebs. karg efeqts iZleva organuli da mineraluri sasuqebis erToblivi gamoyeneba, geranisaTvis 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. gansakuTrebiT did moTxovnas iCens gerani azotiani sasuqebis mimarT.

fosforiani da kaliumiani sasuqebis 2/3 sasurvelia Setanili iqnes niadagis ZiriTadi xvnis dros. karg Sedegebs iZleva azotiani da fosforiani sasuqebis 1/3-is budnebSi Setana, xolo azotiani da kaliumiani sasuqebis danarCeni raodenobis savegetacio periodSi Setana – gamokvebis saxiT, mwkrivTa Soris kultivaciisa da morwyvis win.

**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 unda iyos niadagis zedapiridan. nakveTi uzrunvelyofili unda iyos sarwyavi wyliT.

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 sisqeze moeyaros sufTa sila. yovelive es ise unda Sesruldes, rom kvalsaTburSi darCes sakmao are nergis ganviTarebisaTvis, e. i. kvalsaTburis samxreT kedelTan silis zedapiridan CarComde unda iyos 20 sm dacileba.

mavneblebisa da daavadebaTagan dasacavad, geranis kalmebi dargvamde 15 – 20 dRiT adre kvalsaTburebs dezinfeqcias ukeTeben, Signidan mis kedlebs kiris xsnariT aTeTreben, xolo sakveb narevsa da silis fenas 1%-iani formalinis xsnariT wamlaven.

**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, romelsac amasTan erTad aqvT vardisferi geranisaTvis damaxasiaTebeli suni.

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 Rero-foTlebisagan. am pirobebSi buCqi nela izrdeba da mokle muxlTSorisebs iviTarebs.

**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 iZleva, xolo TviT buCqidan SeiZleba ramodenime aTeuli kalami iqnes miRebuli.

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 dros safarebiT daTbuneba.

kalmebis dafesvianebis dasaCqareblad zogjer iyeneben zrdis stimulators – heteroauqsins.

nakveTze nergis gadatanamde 8 – 10 dRiT adre mimarTaven saTburebSi mcenaris e. w. gakaJebas, risTvisac CarCoebs 4- 5 dRis ganmavlobaSi aweul mdgomareobaSi toveben rogorc dRisiT, ise RamiT, xolo Semdeg sruliad iReben mas.

**nergis amoReba da dargva.** nergis amoRebis win kvalsaTburi uxvad unda moirwyas, xolo mcenareebi frTxilad unda amoviRoT fesvebis dauzianeblad. nergebis xeliT amogleja dauSvebelia. amoRebuli nergi iqve xarisxdeba.

dasargavad vargisi neri sigrZiT unda iyos 15 – 18 sm da hqondes kargad ganviTarebuli fesvTa sistema da 2 – 3 gverdiTi toti mainc.

dargvamde saWiroa nergs movaSoroTdid foTlebi, xolo fesvebi daumokldes 5sm-mde. 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 gadaefaros.

geranis dargva warmoebs aprilSi, rodesac niadagis sakmaod gaTbeba. saqarTvelos dasavleT nawilSi dargvis periodia aprilis pirveli naxevari, xolo aRmosavleT nawilSi – aprilis meore naxevari.

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 rwyaven.

**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 gaToxna-kultivacia warmoebs saWiroebis mixedviT, vidre mcenareTa mwkrivebi Seikvrebodes da nakveTi mTlianad daifarebodes foTlebiT.

**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 Semodgomis pirobebSi zogjer SesaZlebelia mesame mosavlis aRebac.

mosavlis pirveli aReba warmoebs ivlisis meore naxevridan – agvistos Sua ricxvebamde.

pirveli mosavlis aRebis dros, buCqze iWreba mwvane masis 70 – 75%, yvela ZiriTadi 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 da kvlav aRadginos mwvane masa meore mosavlis mosacemad.

geranis meore mosavlis aReba warmoebs seqtembris damlevidan – 20 oqtombramde. am dros iWreba plantaciaSi geranis mTeli mwvane masa.

maRali temperaturis dros, mzis sxivebze, moWrili mwvane masa male QWkneba da eTerovani zeTis mniSvnelovani raodenoba orTqldeba, ikargeba, amitom mosavlis aReba sasurvelia Rrublian amindSi diliT an mzian amindSi saRamos.

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.

**evgenoluri rehani**

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 saxalxo meurneobaSi, saparfiumerio da kvebis mrewvelobaSi, medicinaSi.

evgenoluri rehani Seicavs 0,3 – 0,75%-mde eTerovan zeTs, heqtarze SesaZlebelia miRebuli iqnes 20 t-mde mwvane masa, e. i. 60 – 140 kg-mde zeTis mosavali.

**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 Sesakazmad.

rehanis fesvTa sistema mTavarRerZiania, niadagSi sakmaod Rrmad Cadis. Rero swormdgomia, datotvili, buCqovani, simaRliT 1,0 – 1,7 m-mdea, foToli ovaluria, kideebdakbiluli, Sebusvili, yvavilebi wvrilia, Sekrebili TavTavisebr yvaviledad.

yvavili orsqesiania, nayofierdeba jvaredini damtverviT. jamis foTlebi mwvanea, Zlier Sebusvili, mdidaria eTerovani zeTiT, Taflovani mcenarea, Tesli wvrilia.

rehani siTbos moyvaruli mcenarea, misi aRmonaceni iRupeba sul mcire yinvebis (00) drosac ki, xolo mozrdili mcenare 15 º siTbos pirobebSi sruliad aCerebs vegetacias. misi Teslis aRmocenebisaTvis optimaluri temperaturaa 25 º siTbo.

rehanis dasargavad saukeTesoa msubuqi, noyieri, aluviuri, kargi wyalgamtari niadagebi. misTvis gamousadegaria Warbteniani miwebi., agreTve iseTi nakveTebi, sadac gruntis wylebi 1 m-ze ufro axloa niadagis zedapiridan.

**agroteqnika.** rehanis gamravleba Teslidan gamoyvanili CiTiliT warmoebs. CiTili gamohyavT kvalsaTburebSi, iseTive wesiT, rogorc es bostneuli kulturebisaTvis (pamidori, kombosto) aris miRebuli.

kvalsaTburebSi 1 m2-ze iTeseba 5 g rehanis Tesli. Tesva warmoebs Tebervlis bolos, martis pirvel ricxvebamde. erTi heqtari rehanis dasargavad saWiroa 45 m2 kvalsaTburi. saTanado movlis pirobebSi kvalsaTburidan SeiZleba 30 – 40 dRis ganmavlobaSi miviRoT mindorSi gadasargavi nergi.

CiTilis mindorSi gadargva warmoebs 20 aprilidan 20 maisamde, rodesac aRar aris saSiSroeba dilis wayinvebisa.

rehanis dasargavad niadagi mzaddeba wina wlis Semodgomidanve. winamorbedi kulturis ganTavisuflebisTanave xdeba niadagis gasufTaveba narCenebisagan da Semdeg mzralad xvnis wesiT ise, rogorc es geranis kulturisaTvis iyo aRniSnuli.

rehani ver itans mudmivad erTsa da imave nakveTze Tesvas, amitom misi TeslbrunvaSi moTavseba aucilebelia. kargi winamorbedia misTvis saSemodgomo TavTavianebi, samarcvle parkosani kulturebi da simindi.

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 sulfatamoniumi, 6,5 c superfosfati da 3,0 c kaliumis marili. fosforiani da kaliumiani sasuqebis 2/3 SeaqvT niadagSi ZiriTadi xvnis dros. danarCeni mineraluri sasuqebis 1/3 ki CiTilis dargvis dros kvlebSi, xolo azotiani sasuqebis danarCen raodenobas iyeneben mcenaris gamosakvebad savegetacio periodSi SetaniT.

rehanis CiTili irgveba kvadratul-budobrivi wesiT – 70X70 sm-ze. budnaSi rgaven 2 mcenares, dargvis es wesi UsaSualebas iZleva plantaciaSi niadagi damuSavdes ori mimarTulebiT – 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. CiTilis dargva xorcieldeba xelkaviT gakeTebul ormoebSi, dargvisTanave CiTili unda moirwyas.

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

rehani ganviTarebis pirvel periodSi nela izrdeba, am dros mas zrdaSi aswreben sarevelebi, plantaciis mosavlis mTavari RonisZieba imaSi mdgomareobs, rom nakveTi viqonioT mudam fxvier da sarevelebisagan sufTa mdgomareobaSi. am mizniT, dargvidan 4 -5 dRis Semdeg, awarmoeben pirvel Toxna-gafxvierebas 3 – 4 sm siRrmeze. Semdegi Toxna da kultivacia warmoebs yovel 15 – 20 dReSi. zafxulis periodSi niadagis mdgomareobis mixedviT SesaZlebelia saWiro gaxdes mesame da meoTxe Toxna-kultivacia.

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 aReba iwyeba seqtembridan da mTavrdeba 10 oqtombramde.

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 Caxurebas da zrdis danakargebs.

**rehanis saTesle kultura**

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 TiTo cal CiTils.

saTesle rehanisaTvis gamoyenebuli unda iqnes maRali agrofoni, sasuqebiT ganoyiereba, kultivacia, morwyva daniSnul vadebSi.

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 kg-mde Tesls iZleva.

**tuberiani mcenareebi**

**saxalxo - sameurneo mniSvneloba**. sasoflo-sameurneo kulturaTa Soris kartofils erT-erTimniSvnelovani adgili ukavia. gavrcelebis mixedviT msoflioSi igi mesame adgilzea pureulisa da bambis naTesebis Semdeg.

farTobis erTeulze kartofili iZleva, yvela mcenaresTan SedarebiT met saxamebels. garda amisa, kartofilis tuberi Seicavs cilas da Saqars. amis gamo saxalxo meurneobaSi kartofils mravalmxrivi gamoyeneba aqvs.

kartofils yvelgan farTod iyeneben, rogorc sasursaTo mcenares. kartofilis tuberi mdidaria **C** vitaminiT, ris gamoc is suravandis (RrZilebis daavadebis ) sawinaaRmdego saSualebad iTvleba.

kartofilisaukeTeso sakvebia, agreTve, pirutyvisaTvisac. pirutyvis sakvebad SeiZleba gamoviyenoT ara marto tuberebi, aramed kartofilis Rero-foTlebic.

kartofils, rogorc nedleuls, farTod iyeneben saxameblis misaRebad. saxamebildan amzadeben badags, deqstrins, glukozas, maltonas da sxva nivTierebebs. saxameblis produqtebs didi raodenobiT iyeneben fexsacmlis da qaRaldis dasamzadeblad, safeiqro mrewvelobaSi da medicinaSi.

**botanikur-morfologiuri daxasiaTeba.** kartofili (Kolanum tuberosum L) ekuTvnis ZaRlyurZenasebTa (Solanaceae) ojaxs da warmoadgens orlebnian, balaxovan mcenares.

kartofilis moyvanisa da misi movla-moyvanis mTavari mizania tuberi.

**t u b e r i** warmoadgens Reros saxecvlilebas. masze moTavsebulia CaRrmavebuli adgilebi, e. w. Tvlebi, romlebSiac kvirtebi sxedan. TiToeul TvalSi ramdenime kvirti zis, ufro xSirad ki sami kvirtia. Tvalis qveda mxridan tuberze kargad etyoba foTlis Canasaxi-moxrili viwro xazi, romelsac warbs uwodeben. tuberis bolos warmoadgens misi Cazneqili nawili, e. w. ,,Wipi” romliTac is mimagrebulia mcenareze stolonis saSualebiT. Wipis mopirdapire mxares tuberis wvero ewodeba.wveroze, Cveulebriv, kvirtebis meti raodenobaa Tavmoyrili da isinierTmaneTTan ufro axlo-axlo sxedan.tuberis es nawili yvelaze sicocxlisunariania, amitom Rivebis gamotana pirvel rigSi wveros kvirTebidan xdeba.

kartofilis tubets garedan sakmaod magari kani akravs, romelic mas sokovan daavadebaTagan icavs.jiSebis did umetesobas tuberis kani TeTri aqvs,zogierT jiSs ki wiTlad an lurjad aqvs Seferili. amis mixedviTerTmaneTisagan arCeven TeTr, wiTel da lurjtuberian jiSebs.

kartofilis tuberis xorci ganaWerze SeiZleba TeTri an yviTeli iyos. yviTelxorciani tuberi ufro mdidaria vitaminebiT.

kartofilis tuberis formac yvela jiSs erTnairi ar aqvs. am mxriv erTmaneTisagan arCeven mrgvals, grZelsa da ovaluri moyvanilebis tuberebs.

kartofilis dargvidan 20-22 dRis Semdeg xdeba misi aRmoceneba. erTi tuberidan ramdenime Rero aRmocendeba da amgvarad viRebT kartofilis buCqs.kartofilis buCqi normalur pirobebSi simaRliT 70-90-sm-s aRwevs. Rero datotvilia 3-4 waxnagovani, mwvanea da asimilaciaSi iRebs monawileobas. zogierT jiSSi Rero Seferilia mTelsigrZeze an Seferva intensiurad aris warmodgenili foTlis iRliebSi.

**f o T o l i** kartofilis foToli kentfrTarTulia. foTlis Reraki mTavrdeba erTi kenwruli nakvTiT, xolo gverdebze moTavsebulia 3-5 wyvili gverdiTi nakvTi. maT Soris xSirad meore da mesame rigis patara nakvTulebia, romelTa raodenoba aZlierebs foTlis danakvTas.

**y v a v i l i** kartofilis yvavilebi jgufad arian Sekrebilni yvavilsajdomze da qmnian yvavileds. TiToeuli yvavili Tavis mxriv yunwiT aris mimagrebuli yvavilsajdomze, yvavili xuTwevriania, erTad Sezrdili xuTi gvirgvinis furcliT.kartofilis yvavili jiSebis mixedviT SeiZleba iyos TeTri, mowiTalo- iisferi, molurjo-iisferi an lurji. yvavilis SigniT moTavsebulia konusrad Sekrebili xuTi mtvriana, romelTa Soris amoCrilia butko Tavisi dingiT.

yvavilis ganayofierebis Sedegad viRebT nayofs. kartofilis nayofi mrgvalia, waagavs mkvaxe pamidors da Seicavs mraval wvril Tesls.kartofilis gamravleba SeiZleba TesliTac, am wess mimarTaven saseleqcio sadgurebi da samecniero-kvleviTi dawesebulebebi axali jiSebis gamoyvanis dros .

**kartofili da garemo pirobebi**. garemo pirobebis mimarT kartofili Seguebis did unars iCens. kartofilis tuberis ganviTarebisaTvis saukeTeso temperaturaa 16-180 siTbo niadagSi. 20 siTbos pirobebSi mcenare aCerebs zrdas, xolo 20–250-ze zeviT mcenare ganicdis gadagvarebas.

kartofilisaTvis gansakuTrebuli mniSvneloba aqvs niadagis tenianobas da naleqebis raodenobas. TviT kartofilis tuberi, 75% wyals Seicavs. garda amisa, wyali saWiroa misTvis niadagidan sakveb nivTierebaTa miRebisaTvis da mcenaris mwvane nawilebis SeqmnisaTvis. kartofili ver itans zedmet sisveles: dabali Warbteniani adgilebi kartofilisaTvis gamousadegaria. aseT pirobebSi advilad vrceldeba sxvadasxvagvari avadmyofoba da kartofili iRupeba. gansakuTrebiT saWiroa wyali kartofilisaTvis yvavilobis periodSi da Semdeg, rodesac tuberebis intensiuri zrda warmoebs.

kartofilis normaluri ganviTarebisaTvis saWiroa grili da naleqebiT uzrunvelyofili hava. rac ufro didia dRe da metxans aris naTesi mziT ganaTebuli, miT metia mosavali.

kartofilis moyvana SeiZleba TiTqmis yvela saxis niadagze qviSnaridan dawyebuli mZime Tixnar niadagebamde, garda daWaobebuli niadagebisa. kartofilis tuberis normaluri ganviTarebisaTvis saWiroebs fxviersa da noyier niadags, romelic imave dros uzrunvelyofili iqneba teniT. kartofilisaTvis saukeTeso niadagebad iTvleba qviSnari da Tixnari miwebi, axoebi da neSompalaTi mdidari tyis niadagebi, mTis Savmiwa, wabla, agreTve Cveulebriv aluviur (danaleq) niadagebze.

**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 jiSebs 120-180dRe.

gamoyenebis mixedviT kartofilis jiSebs yofen oTx jgufad:

1. sufris jiSebi xasiaTdebian kargi gemoTi da xarjvis unariT. sufris jiSebisaTvis damaxasiaTebelia nazi da Txeli kani, araRrmad Camjdari kvirtebi, Tvlebis mcire raodenoba (maJestiki, lorxi da sxva).
2. saqarxno jiSebSi Semavali kartofili umTavresad sagviano, maRalmosavliani da saxamebliT mdidaria. mas umTavresad saqarxno zonebSi avrceleben saxameblisa daspirtis misaRebad (voltmani, ostbote da sxva).
3. pirutyvis sakvebi jiSebi xasiaTdebian maRali mosavlianobiT, mSrali nivTierebisa da gansakuTrebiT, cilebis meti raodenobiT, gemoTi CamorCebian sufris jiSebs, magaliTad: jiSi krugeri, vardisferi mileTidan da sxva.
4. universaluri jiSebi.am saxelwodebiT erT jgufSia gaerTianebuli iseTi jiSebi, romelTa gamoyeneba SeiZleba rogorc sasursaTod, ise teqnologiuri gadamuSavebisaTvis, magaliTad:lorxi, merkeri, saxalxo da sxva.

saqarTvelos dablobis baris raionebisaTvis daraionebulia saadreo jiSi- vilJski, javaxeTis mTagoriani zonis, TrialeTis qvemoqarTlis sarwyavi miwebis da samxreT oseTisaTvis –maJestiki, TrialeTuri.

TeslbrunvaSi kartofilisaTvis saukeTeso winamorbedadiTvleba TavTaviani kulturebi. kartofilisaTvis kargi winamorbedia agreTve erTwlovani parkosani balaxebi. saqarTvelos dasavleT raionebSi SeiZleba kartofili davrgaT simindisagan ganTavisuflebul mindorzec.

kartofili ar SeiZleba dairgas pamidoris, badrijnisa da wiwakisgan ganTabisuflebul nakveTze, radgan isini botanikurad monaTesaveni arian da TiTqmis erTi da imave avadmyofobiT avaddebian.

**niadagis damuSaveba.** karTofilisaTvis niadagis damuSavebis Tavisebureba imaSi mdebareobs, rom is saWiroebs Rrma da fxvier sanaxav fenas

kartofilisaTvis niadagis damuSavebis wesi damokidebulia mis winamorbedze, Tu kartofili irgveba TavianTi kulturebisagan

ganTavisuflebul mindorze, maSin mosavlis aRebisTanave iwyeben nawveralis aCeCvas 4-5 sm sRrmeze da niadags xnaven mzralad, 25-27 sm siRrmeze, winmxvneliani guTniT.

maRalmTian raionebsa da ferdobebze, saSemodgomoEEEE xvna Secvlili unda iqnes sazafxulo xvniT. xvnis siRrmec aseT adgilebSi ver iqneba, iseTi rogoric vake adgilebisTvis gvaqvs aRniSnuli.

gzafxulze awarmoeben xnulebis dafarcxvas ,,zigzagiani” farcxiT. dafarcxvis mizania xnulis zedapiris mosworeba, beltebis daSla, tenianobis SenarCuneba niadagSi da sarevelebis mospoba.

kartofilis dargvis win awarmoeben xnulebis aoSvas frTebmoxsnili saSoebiT 13-15 sm saRrmeze.

**ganoyiereba.** kartofili sasuqebis mimarT did moTxovnilebas iCens imis gamo, rom is iZleva farTobis erTeulze mSrali nivTierebis TiTqmis samjer met mosavals, vidre marcvleuli kulturebi. TavTavian pureulTan SedarebiT, kartofili niadagidan iTvisebs erTnaxevarjer met azots da samjer met kaliums.

nakeli Zvirfasi sasuqia kartofilisaTvis, magram didi mosavlismisaRebad igi sakmarisi ar aris**.** nakelTan erTad unda SevitanoT fosforiani da kaliumiani mineraluri sasuqebi. am sasuqebis gamoyeneba ara marto adidebs kartofilis mosavals, aramed mniSvnelovnad aumjobesebs tuberis saxameblianobas da mis xarisxs.

saqarTvelos miwaTmoqmedebis institutis monacemebiT nakelisa da mineraluri sasuqebis erToblivi moqmedeba erTi orad zrdis kartofilis mosavlianobas.

saukeTeso sasuqia kartofilisaTvis agreTve Cveulebrivi mcenareuli nacari. igi umTavresad kaliumiani sasuqia, romelic gansakuTrebiT sWirdeba kartofils. mcenareuli nacari Seicavs agreTve fosforsac. nacris Setana kartofilisaTvis saWiroa gazafxulze, dargvis win. zamTris ganmavlobaSi Segrovili nacari mSralad unda inaxebodes. heqtarze 6-7 centneramde nacaria saWiro.

**saTesle masalis momzadeba dasargavad.** kartofilis dargva rogorc wesi, warmoebs mTliani tuberebiT, msxvili tuberebi SeiZleba Suaze gaiWras. saTesle nakveTs rgaven mxolod mTliani tuberebiT. mosavlianobis gadidebisaTvis gansakuTrebuli mniSvneloba aqvs saTesle kartofilis SerCevas da mis momzadebas dasargavad.

saTesle kartofili Semodgomidanve unda gadairCes da calke inaxebodes, saukeTeso saTesle masalaa 60-70 gramiani saSualo sididis tuberi. msxvili tuberi, rogorc wesi, yovelTvis met mosavals iZleva, vidre saSualo sididis tuberi, magram misi dargva ar aris mizanSewonili, vinaidan am SemTxvevaSi didi raodenobis saTesle masalaa saWiro, amitom umjobesia msxvili tuberebi dargvis win Suaze gaiWras. tuberis daWras dargvis win awarmoeben

soflis meurneobis mowinaveebi dasargavad saSualo sididisa da msxvil tuberebs iyeneben da heqtarze 3 tonamde kartofils rgaven.

**iarovizacia**. saadreo mosavlis misaRebad mimarTaven tuberebis winaswar gaRivebas-iarovizacias, kartofilis iarovizacia aris sargavi masalis gaRiveba mSralsa da naTel SenobaSi, iarovizacia mniSvnelovnad aCqarebs dargvis Semdeg mcenaris ganviTarebas, iwvevs mis adre Semosvlasa da mosavlianobis sagrZnob gadidebas.saiarovizacio muSaobas kartofilis dargvamde 35-40 dRiT adre iwyeben.

kartofilis iarovizaciis win SenobaSi unda gakeTdes dezinfeqciagogirdis SexrColebiT an formalinis SesxurebiT. saiarovizaciod gatanili kartofilis saTesle masala iSleba iatakze Txel fenad, ara umetes 2-3 tuberis sisqeze. amasTan erTad SenobaSi daculi unda iyos siTbo 12-150–is farglebSi. erTi tona kartofilis saiarovizaciod saWiroa 40-50 m³³ farTobi. iarovizaciis win awarmoeben kartofilis Sewamvlas 0,5%-iani formalinis xsnariT. 35-40 dRis Semdeg, rodesac tuberze ganviTardeba 1-2 sm msxvili mwvane Rivebi, iarovizacia damTavrebulia da SeiZleba is gavitanoT dasargavad mindorSi. iarovizebuli tuberebi mindvrad gaaqvT kalaTebiT Aan yuTebiT raTa Rivebi ar daimtvres da yoveli tuberis gaWris Semdeg dana unda gavavloT formalinis xsnarSi.

**kartofilis dargva**. kartofilis dargvas marneulis, bolnisis, gardabnis, TeTriwyaros da Tbilisis gareubnis dablobi zonis meurneobebSi Tebervlis damlevs iwyeben, xolo bakurianSi xSirad maisis damlevamde grZeldeba. ar aris sasurveli tuberis naadrevad dargva. Zalian adre aRmocenebuli kartofili SeiZleba daziandes nagvianevi yinvebiT.amave dros, arc dargvis dagvianebaa mizanSewonili.

kartofilis dargva gazafxulze warmoebs maSin, rodesacniadagi sakmaod gaTbeba. Tumca kartofili 4-50 siTboze iwyebs, magram misi normaluri aRmocenebisaTvis saWiroa niadagis saTbo 7-80 –ze naklebi ar iyos.

naadrevi mosavlis misaRebad kartofilis dargva CvenSi SeiZleba zamTrispirad da zamTarSic. zamTrispirad dasargavi kartofilisaTvis unda SeirCes fxvieri niadagebi da iseTi adgilebi, sadac wyali ar dgeba. am mxriv ukeTesia samxreTi ferdobebi an odnav daqanebuli adgilebi. zamTrispirad Cveulebriv siRrmeze dargul kartofils, yinvebisagan dasacavad, kargia 10-14 sm sisqeze amaRlebuli kvebis saxiT mieyaros miwa. adre gazafxulze tuberis aRmoceneba rom ar dagviandes, amaRlebuli kvlebi unda moswordes, am wesiT darguli kartofili xSirad ramdenime dRiT adre aRmocendeba, vidre gazafxulze darguli, amitomac naadrev mosavals iZleva.

kartofilis tuberi ise unda dairgos niadagSi, rom mas sakmaod fxvieri are hqondes rogorc qveS, ise zevidan. amitom mizanSewonili ar aris kartofilis dargva kvlis Zirze guTniT dargvis dros; ukeTesia misi dargva kvlis ferdobze. kartofili yvelgan erT siRrmeze ar unda dairgos. mSralsa da fxvier miwebze kartofils rgaven 12-14 sm siRrmeze, xolo tenian da SedarebiT mZime Tixnarebze 10-12sm siRrmeze.

kartofilis dargva warmoebs specialuri manqanebiT, guTniT an xeliT. kartofilis dargva SeiZleba kvadratul-budobrivad, 70X70 sm. budnaSi 2-3 tuberis moTavsebiT da Cveulebriv mwkrivadac, mwkrivebs Soris 60-70 sm daSorebiT da TviT mwkrivSi tuberebis ganlagebiT 25, 30 da 35 sm-ze, rac heqtarze iZleva 40 aTasidan 60 aTasamde mcenares.

mcenareTa aseTi sixSiriT dargvis dros heqtarze saWiroa 2,5- 3,5 tona kartofili. dargvis sixSire damokidebulia jiSebzec, saadreo da dabal buCqiani jiSebi ufro sqlad irgveba, xolo sagviano da maRal buCqiani jiSebi - ufro Txlad. mcenaris dargvis sixSire, garda sargavi masalisa, damokidebulia agreTve niadagze da mis mdgomareobaze.

Cveni qveynis mTagorian pirobebSi, gansakuTrebiT ferdobebze, kartofilis dargva umjobesia mwkrivebis ganlagebiT ferdobis gardigardmoda ara mis sigrZeze, rac mniSvnelovnad icavs niadags Camorecxvisagan wvimebis SemTxvevaSi.

**naTesis movla.** kartofilis naTesis damuSavebis mTavari amocana imaSi mdgomareobs, rom nakveTi viqonioT mudam fxviersa da sarevelebisagan gasufTavebul mdgomareobaSi.

gazafxulze darguli kartofili normalur pirobebSi **18-**20 dRis Semdeg aRmocendeba, magram xSirad gazafxulis wvimebis Sedegad,niadagis zedapirze Cndeba qerqi, romlis dasaSleladac jer kidev naTesis aRmocenebamde, ,,zigzagiT “ dafarcxvas mimarTaven. kartofilis naTesis meored dafarcxva maSin iqneba saWiro, rodesac mcanare aRmocendeba da mwkrivebi gamoCndeba.

kartofilis masobrivad aRmocenebisTanave saWiroa mwkrivTaSoris pirveli gafxviereba da sarevelebis mospoba kultivatoriT an ToxiT. kvadratul-budobrivi naTesebi muSavdeba meqanizebuli wesiT orive mimarTulebiT. mwkrivad darguli kartofilis damuSaveba traqtoris kultivatoriT SesaZlebelia mxolod erTi mimarTulebiT. TviT mwkrivSi ki buCqebs Soris arsebuli manZili xelis ToxiT fxvierdeba. amave periodSi warmoebs gacdenili adgilebis gamorgva iarovizebuli tuberebiT.

pirveli kultivacia –Toxnidan 10-15 dRis Semdeg saWiroa meore Toxna –gafxviereba an kultivacia, xolo roca mcenare 18-20smsimaRles miaRwevs, awarmoeben miwis Semoyras.

**mcenareTa damatebiTi kveba**. mcenareTa damatebiTi kvebas gazafxul-zafxulis ganmavlobaSi Cveulebriv orjer atareben. pirvelad maSin, rodesac mcenare 3-4 foTols gaikeTebs.

**mosavlis aReba**. kartofilis mosavlis aReba tuberis Semosvlis mixedviT sxvadasxva dros warmoebs. mosavlis aRebis dro damokidebulia agreTve jiSebzec, saadreo jiSebis aReba pirvel rigSi warmoebs, sagviano jiSebisa ki bolos.

fiziologiurad kartofilis tuberi Semosulad iTvleba, Tu tuberis kani imdenad gamagrebulia, rom xeliT advilad ar sZvreba. kartofilis mosavali aRebuli unda iqnes maSin, rodesac foTlebi Sexmeba an pirveli Semodgomis yinvebis Sedegad foTlebi daiRupeba.

kartofilis mosavlis aReba warmoebs xeliT, guTniT an kartofilis saTxreli manqanebiT. mosavlis AaRebis Ddros unda veridoT tuberebis gaWra - dazianebas, radgan aseTi kartofili Semdeg cudad inaxeba. axlad aRebuli kartofili ramdenime saaTiT niavze unda SeSres, daxarisxdes, gadairCes wvrili, daavadebuli da dazianebuli tuberebisagan. amis Semdeg SeiZleba mosavali Caiyaros Sesanaxad.kartofilis TiToeuli jiSi calke unda iyos DA Senaxuli, maTi erTad Sereva dauSvebelia.

**kartofilis zafxulSi dargva.** dablobsa da cxel adgilebSi saRi kartofilis misaRebad saukeTeso saSualebaa kartofilis zafxulobiT dargva.

zafxulobiT darguli kartofili ki tubers inviTarebs Semodgomis gril periodSi da ufro saRi da ukeTesi xarisxis gamodis, vidre gazafxulze darguli. zafxulobiT darguli kartofilis mosavali saukeTeso saTesle masala Semdegi wlisaTvis, rogorc gazafxulze, ise zafxulSi dasargavad.

kartofilis zafxulobiT dasargavad niadagi ixvneba Rrmad 27 sm siRrmeze. moxvnis win SeaqvT sasuqebi: nakeli 40 tona heqtarze da mineraluri sasuqebi

saqarTvelos pirobebisaTvis kartofilis zafxulobiT dargva umjobesia ganxorcieldes ivnisis damlevs da ivlisis pirvel naxevarSi. am mizniT warmatebiT SeiZleba gamoviyenoT is nawverali, romelic adre ganTavisufldeba TavTaviani pureulisagan. am SemTxvevaSi SegviZlia erT weliwadSi miviRoT rogorc xorblis, ise kartofilis damatebiTi mosavali.

kartofilis zafxulobiT dargvis wesi ( manZili mcenareTa Soris ) iseTivea, rogorc gazafxulze dargvis dros.

**miwavaSla**

**saxalxo – sameurneo mniSvneloba.** miwavaSlas iyeneben umTavresad pirutyvis sakvebad, magram rig sasargeblo TvisebaTa gamo misi moxmareba SeiZleba sasursaTod da rogorc nedleuli teqnikuri gadamuSavebisaTvisac –sakonditro, spirtisa da Saqris warmoebisaTvis. mcenaris miwiszeda nawili waagavs mzesumziras, xolo miwaSi kartofiliviT iviTarebs tuberebs. misi tuberi Seicavs ara saxamebels, aramed polisaxarids - inulins, romlisganac SeiZleba damzaddes tkbili wveni.

**botanikuri daxasiaTeba da biologiuri Taviseburebebi.** miwavaSla erTwliani tuberovani mcenarea. misi Rero sakmaod maRali izrdeba -1,5 -2,0 metramde. mzesumzirasagan gansxvavebiT, miwavaSlas Rero ufro wvrili da nazia, amasTan gvian Semodgomamde ar xmeba, am Tvisebis gamo Rero da foTlebi saukeTeso sasilose masalad iTvleba.miwavaSla kargad itans maRal temperatures, amitom samxreT raionebSi misi mosavlianoba orjer da ufro metad aRemateba kartofilis mosavlianobas.kargi movlis pirobebSi miwavaSlas tuberebis mosavali 300-400 centners Seadgens heqtarze, Rero –foTlebis mosavali ki erTiorad ufro metia.

miwavaSla ( Helianthus tuberosus L ) ekuTvnis rTulyvavilovanTa ojaxs ( Compositae) romelSic Sedis agreTve mzesumzira. kartofilis mzgavsad mcenare miwaSi inviTarebs tuberebs, romlebic warmoiqmneba miwisqveSa Rerodan gamotanil stolonebze. tuberebze moTavsebuli kvirtebi, kartofilisagan gansxvavebiT, amoburculia.

mcenares axasiaTebs kargad ganviTarebuli funjisebri fesvTa sistema, is Rrmad Cadis niadagSi da amis gamo gvalvebs SedarebiT kargad itans. erTi tuberi ramdenime amonayars iZleva, ris gamoc misi Reroebi buCqisebrad amodis da maRali izrdeba. miwavaSlas f o T o l i kvercxisebri moyvanilobisaa, Reros qveda nawilSi isini mopirdapired arian ganlagebuli, mis zeda nawilSi ki – morigeobiT. miwavaSlas y v a v i l e d i k a l a T a a, waagavs mzesumziras, mxolod masze bevrad ufro mcire zomisaa. gvirgvinis furclebi yviTelia, mtvrianebi xuTi aqvs, naskvi erTbudiania, dingi orad gayofil.

miwavaSlas nayofi warmoadgens Tesluras, romelic magar naWuWSia moTavsebuli, misi Tesli sakmaod mdidaria zeTiT.

miwavaSlas tuberi qimiuri SemadgenlobiT uaxlovdeba kartofils, oRond im gansxvavebiT, rom aq ZiriTad NnivTierebas warmoadgens ara saxamebeli, aramed inulini, uazoto eqstraqtuli nivTiereba tuberis

wonis 18% aRwevs. miwavaSlas tuberi mdidaria azotiani SenaerTebiT (3-5 %-mde ) inulini miwavaSlas tuberSi 14-15 %-s Seadgens. zogierT jiSSi ki 20% -sac aRwevs tuberis wonis daaxloebiT 75% wyalze modis.

miwavaSla g a r e m o p i r o b e b i s mimarT didi SeguebiT xasiaTdeba. is siTbos moyvaruli mcenarea. saqarTveloSi miwavaSla modis yvelgan, umTavresad baris raionebSi, magram mis kulturas vxvdebiT agreTve mTian zolSic, mcenare itans, rogorc maRal ise dabal temperatures. miwavaSlas tubers niadagSi Tovlis safars qveS SeuZlia aitanos 20-300 yinva. meores mxriv ukeTesad uZlebs zafxulis sicxeebsac.

niadagis mimarT mcenaris moTxovnileba aseve ar aris didi, is kargad egueba yvela tipis niadags, sadac ki xvna-Tesva SeiZleba.

**jiSebi**. miwavaSlas jiSebs arCeven umTavresad tuberis formisa da feris mixedviT. tuberis forma mrgvalia, cilindruli da TiTistarisebri, sada an daxorklili zedapiriT. kanis feri ki umTavresad TeTri an vardisferia. TeTrtuberini jiSebi ufro mdidaria inuliniT da ufro mosavlianicaa, vardisfertuberiani jiSebi ufro mdidaria cilebiT da ukeTesi Senaxvis unariT xasiaTdeba.

jiSebi erTmaneTisagan ganirCevian Reros simaRliTac, rasac didi mniSvneloba aqvs sasilose masis misaRebad.

**agroteqnika** miwavaSlas gamravleba tuberebiT warmoebs. tuberidan viTardeba Reros amonayari, miwaSi CarCenili wvrili tuberebis wyalobiT, Semdeg wlebSiac iZleva axal-axal mosavals da ase SeiZleba gagrZeldes 10-15 wlis manZilze. am Tvisebebis gamo miwavaSla, rogorc wesi TeslbrunvaSi ar SeaqvT. misTvis gamoiyofa Teslbrunvis gareT mdebare nakveTebi.

niadagis momzadeba miwavaSlasaTvis iseTive wesiT warmoebs, rogorc kartofilisaTvis SesaZlebelia miwavaSlas dargva SemodgomiTac. amSemTxvevaSi niadagi ise unda momzaddes, rogorc saSemodgomo TavTaviani kulturebis dasaTesad.

miwavaSlas tuberebis dargva warmoebs iseTive wesiT, rogorc kartofilisa. saTesle tuberis wona sasurvelia 50 gramze naklebi ar iyos. msxvili tuberebi SesaZlebelia Suaze gaiWras, gaWrili tuberebiT dargva mxolod gazafxulzea mizanSewonili.

miwavaSlas dargva umjobesia kvadratul – budobrivad, manZiliT 60x60 sm an 70x70sm es mniSvnelovnad aadvilebs naTesis mwkrivTaSo risebis jvaredinad damuSavebas manqanebis gamoyenebiT. roca dargva mxolod mkvrivad warmoebs, maSin sasurvelia mwkrivTaSoris manZili iyos 60 sm, xolo mcenareTa Soris mwkrivSi 40 sm.

miwavaSlas naTess esaWiroeba, mwkrivTaSoris gafxviereba, miwis Semoyra, sarevelebisagan gasufTaveba, gansakuTrebiT naTesis aRmocenebis pirvel periodSi.

miwavaSlas miwiszeda nawili iRupeba 2-2,50 yinvis dros, amitom misi Rero da foTlebi unda aviRoT yinvebis dawyebamde.

tuberebis mosavlis aReba warmoebs Semodgomaze an gazafxulze, kartofilis asaRebi manqanebiT an bariT. Tbil adgilebSi sadac niadagi ar iyineba, SesaZlebelia tuberebis aReba zamTarSi da adre gazafxulzec.

miwavaSlas tuberebi inaxeba sardafebSi an TxrilebSi grovebad, magram miwavaSla Senaxvas cudad itans, tuberebi Wkneba, Sreba da advilad kargavs Saqars. Tu nakveTSi wyali ar dgeba, an zamTarSi Tovlis safari sakmarisia, miwavaSlas tuberi ukeTesad inaxeba mindvrad- niadagSi, miwidan amouTxreladac.

**Zirxvenebi**

mcenareebi, romelTa damaxasiaTebeli Tvisebaa gamosayenebeli produqtis gamsxvilebuli Reros an Ziris saxiT Seqmna miwaSi cnobilia Zirxvenebis saxelwodebiT.

nayofis ganviTarebis mixedviT Zirxvenebi iyofa or qvejgufad:

1. mcenareebi, romelTa mTavari fesvi gamsxvilebulia da gadaqceulia Saqrisa da nivTierebis saTavsod; 2. mcenareebi, romelTa miwisqveSa Rerosagan viTardeba gamsxvilebuli nawili, gorglis (tuberis) saxelwodebiT.

pirveli jgufis mcenareebs ewodeba Zirnayofiani, xolo meores-tuberiani.

**Zirnayofianebi.**

1. Warxali - (Beta vulgaris) nacarqaTamasebrTa (Chenopodiaceae) ojaxidan.

2. sakvebi stafilo - (Daucus carota) qolgosanTa (Umbelliferae) ojaxidan.

3. cikori anu vardkaWkaWa - (Cichorium intybus) rTulyvavilovanTa (Compositae) ojaxidan.

4. turnefsi, anu sakvebi Talgami - (Brassica raparapiferra DC)jvarosanTa ojaxidan.

5. Talgamura, anu miwamxala - (Brassica rapifera DC) jvarosanTa ojaxidan.

**tuberebianidan:**

**1.** kartofili - ( Solanum tuberosum L) ZaRlyurZenasebrTa (Solonaceae) ojaxidan da 2. miwavaSla, anu topinamburi (Helianthus annus) rTulyvavilovanTa ojaxidan.

# Zirnayofebi E

saerTo daxasiaTeba**.** am jgufis warmomadgenlebs ekuTvnian, rogorc aRvniSneT, Warxali, stafilo, Talgamura da Talgami.kulturaSi isini orwlovani mcenareebia. pirvel weliwads Teslidan viTardeba gamsxvilebuli fesvi da foTlebis kona. foTlis yunwis iRliebSi moTavsebulia kvirtebi, romlebic pirvel weliwads mZinare mdgomareobaSi arian. vegetaciis meore wels mZinare kvirtebi iRviZeben zrdas iwyeben da warmoqmniai Reroebs, romlebzedac, Tavis mxriv warmoiSveba foTlebi. amrigad, daTesvidan nayofis Semosvlamde mcenares esaWiroeba ori weli.

am jgufis mcenareTa Tesli orlebniania. mcenaris aRmoceneba imiT iwyeba, rom TeslSi arsebuli lebnebis qveda muxli iwyebs gaZlierebul zrdas da miwis zeviT amodis, Tan amoaqvs lebnebic. gaRivebis pirvel dReebSi mcenare ikvebeba lebnebSi moTavsebuli sakvebi nivTierebebiT, xolo aRmocenebis Semdeg lebnebi mwvane Sefervas iReben, iwyeben asimilacias, zomaSi matuloben da pirveli fiTlebis daniSnulebas asruleben. aRmocenebidan ramodenime dRis Semdeg lebnebs Sua moTavsebuli kvirtidan warmoiSveba pirveli namdvili foToli, Semdeg meore da a.S.

mcenaris Semdgomi ganviTareba imaSi mdgomareobs, rom uxvad warmoebs fesvis warmoqmna niadagSi da foTlebis gamotana zeda nawilidan. mTavari fesvi iwyebs gamsxvilebas da sakveb nivTierebaTa dagrovebas.

zrdasruli Ziri Sedgeba sami nawilisagan: Tavi, yeli da tani. Tavi Ziris zeda nawilia da moTavsebulia miwis zeviT, maszeSemWidroebuladsxedan foTlebi, romelTa iRliebSi kvirtebia.

yeli Ziris is nawilia romelic mdebareobs Tavis qveviT, is ar Seicavs arc foTlis da arc fesvis nasaxs. moTavsebulia miwis zedapirze , Tumca nawilobriv SesaZlebelia ijdes niadagSi.

tani warmoadgenssakuTriv Zirs,mTlianad miwaSia Camjdari da masze moTavsebulia gverdiTi fesvebis nasaxebi. sakuTriv Ziri mdidaria sakvebi nivTierebebiT.

meore wels, Warxlis Ziri Tavze moTavsebuli kvirtebidan inviTarebs datotvil Reros, romelzedac moTavsebulia ufro patara zomis foTlebi da yvavilebi Reroze jguf-jgufad sxedan 2-6 cali erTad. yvavili Sedgeba xuTnakvTiani Tanayvavilisa da xuTi mtvrianasagan, naskvi erTbudiania samad gayofili dingiT, Saqris Warxali jvaredinad imtvereba qaris an mwerebis saSualebiT. yvavilis ganayofierebis Sedegad Teslkvirtidan warmoiqmneba Tesli xolo TviT yvavili nayofad ganviTardeba. vinaidan Warxlis yvavilebi jguf-jgufad sxedan Reroze, nayofad ganviTarebis dros erTmaneTs uxorcdebian da vRebulobT e. w. ,, rTul Tesls “ –gorgluras, romelic ramdenime Tesls Seicavs. daTesvis Semdeg erTi gorgluridan ramdenime mcenare aRmocendeba.

**Saqris Warxali**.

**saxalxo – sameurneo mniSvneloba.** Saqris Warxali (Beta vulgaris L), zomieri sartylis qveynebSi warmoadgens ZiriTad nedleuls, romlis gadamuSavebis Sedegad vRebulobT Saqars, Saqari ki aucilebeli produqtia adamianisaTvis. garda amisa, Saqari farTod gamoiyeneba sakonditro da Rvinis warmoebaSi mrewvelobis sxva dargebSi.

Saqris Warxali iZleva anarCenebs foTlebis, Tavebis, boloebis wanaWrebis saxiT, rac pirutyvisaTvis kargi sakvebia. 300 centneri Saqris Warxlis Zirebis mosavali 200centneramde foTls iZleva, romelic kvebiTi RirsebiT ar Camouvardeba saSualo xarisxs balaxs. is Seicavs agreTve vitaminebs.

**botanikuri daxasiaTeba.** Saqris Warxali (Beta vulgaris L) V. saccharifera) ekuTvnis nacarqaTamasebrTa ojaxs…(chenopodiaceae.) Saqris Warxlis fesvTa sistema Sedgeba gamsxvilebuli Zirisa da wvrilad daqselili fesvebis danatotebisagan. Saqris Warxlis Ziris zrda da misi gamsxvileba warmoebs rgolebis ricxvis gadidebisa da maT Soris arsebuli parenqimuli qsovilis ujredebis gamravlebis gziT. normalurad ganviTarebuli Saqris Warxlis Ziri TeTri ferias da konusiseburi moyvanilobisaa. foToli mTliania da farTo, yunwiani, foTlis firfita sadaa da danaoWebuli, rac jiSisaTvis damaxasiaTebelia.DAdanaoWebul foTlebiani jiSebi met Saqars agroveben.

qimiuri Semadgenloba. Saqris Warxlis Ziri mdidaria wyliT, Mmisi raodenoba 75% aRwevs, danarCeni 25% mSrali nivTierebaa. Saqris raodenoba WarxalSi Ziris wonis 16-18%-Seadgens. sxva nivTierebebs, romlebsac araSaqrebs uwodeben, 4-7% ukavia, aseTia magaliTad: ujredana, cilebi, azotiani da mineraluri nivTierebani da sxva.

Saqris Warxlis biologiuri Taviseburebani. Saqris Warxali, orwliani mcenarea. pirvel wels Teslidan viTardeba farTo foTlebis kona da gamsxvilebuli Saqriani Ziri, romelic kulturis mTavar mizans warmoadgens. meore wels, gadarguli Ziris foTlebis iRliebSi moTavsebuli mZinare kvirtebidan mcenare iviTarebs datotvil Reroebs gamravlebis organoebiT.

vegetaciis periodi pirvel wels grZeldeba 150-180 dRemde, meore wels ki-100-120 dRemde.

Teslis gaRvivebis dros pirvelad zrdas iwyebs fesvis Canasaxi da Senmdeg Reros lebnebiT da zrdis kvirtiT. lebnebi miwiszeviT amodis, male iRebs mwvane Sefervas da did rols asrulebs mcenaris cxovrebis fazaSi. Semdeg ki zrdis kvirtidan warmoiqmnebian namdvili foTlebi, yovel 2-3 dReSi TiTo foToli Cndeba, sul wlis ganmavlobaSi mcenare iviTarebs 90-mde foTols, romlis saerTo farTi 3000-5000 sm aRwevs.

Saqris Warxlis ganviTareba SeiZleba sam periodad daiyos: pirvrl periodSi-mcenare iviTarebs foTlebsa da fesvTa sisitemas,meore periodSi-intensiurad warmoebs foTolTa masisa da Ziris gamsxvileba, dRe-Rame,mesame periodSi- intensiurad warmoebs Saqrebis dagroveba.

Saqris Warxlis damokidebuleba garemo faqtorebTan. Saqris Warxlis Tesli normaluri aRmocenebisTvis saWiroebs 10-12 siTbos. am pirobebSi mcenare daTesvidan ori kviris ganmavlobaSi aRmocendeba.

did gavlenas axdens mcenaris ganviTarebasa da Saqrebis dagrovebaze ganaTeba. Saqris Warxali grZeli dRis mcenarea. naxSirwylebis sinTezi da dagroveba normalurad mimdinareobs kargi ganaTebis pirobebSi, ,mcenare ver itans daCrdilvas.

Saqris Warxali Tumca didi raodenobiT wyals saWiroebs ganviTarebis pirveli periodidan TiTqmis Ziris Semosvlamde. wylis did raodenobas moiTxovs mcenare Zirisa da foTolTa masis zrdis periodSi, ivlis-agvistoSi. misi normaluri ganviTarebisaTvis saWiroa, rom niadagis tenianoba misi mindvruli tentevadobis 65-75% farglebSi iyos.

Saqris Warxlis maRali Mmosavali didad damokidebulia niadagis pirobebzec. mcenarisaTvis saukeTesod iTvleba struqturiani, organuli nivTierebebiT mdidari, Savmiwisebri niadagebi. karg mosavals iZleva Warxali yavisfer Tixnar niadagebzec, sadac gruntis wylebi niadagis zedapiridan 1,5-2,0m-ze ufro axloa.

**adgili TeslbrunvaSi.**  Saqris Warxali ver itans gamudmebiT erTsa da imave adgilze Tesvas. Saqris Warxlis maRali da myari mosavlis misaRebad aucilebeli pirobaa misTvis yovelwliulad nakveTis Secvla, misi wesieri gadaadgileba mindvris kultureTa Soris.

TviT Saqris Warxali, rogorc saToxni mcenare, kargi winamorbedia TavTaviani pureulisaTvis.

**sasuqebiT ganoyierebis sistema.** Saqris Warxali did moTxovnilebas ayenebs sasuqebis mimarT 500 centneriani mosavlis misaRebad mcenarem unda aiRos niadagidan 200 kg-mde azoti, 60kg fosformJava da 330kg kaliumi. xolo 800-1000 centneriani mosavlis misaRebad saWiroa am nivTierebaTa gaormageba.

sasuqis Setanis gareSe Znelia Cveulebriv pirobebSi niadagma daakmayofilos mcenaris es moTxovnileba, amitom Saqris Warxlis misaRebad organuli da mineraluri sasuqebis gamoyeneba erT-erTi aucilebeli pirobaa.

Saqris Warxali gansakuTrebiT did moTxovnilebas iCens sakveb nivTierebaTa mimarT Sua zafxulis periodSi, rodesac intensiurad warmoebs Ziris gamsxvileba, fesvTa sistemisa da foTolTa masis zrda.

WarxlisaTvis sasuqebiT ganoyierebis sistema miznad isaxavs mcenaris uzrunvelyofas misTvis saWiro sakvebi nivTierebebiT mTeli misi sicocxlis ganmavlobaSi. mcenaris biologiuri moTxovnilebis Sesabamisad Tanamedrova agroteqnikam Camoayaliba Saqris Warxlis sasuqebiT ganoyierebis Semdegi sistema:

**ZiriTadi ganoyiereba**, rac niSnavs sasuqebis Setanas niadagSi Semodgomaze , mzralad xvnis win, sasuqebis ZiriTadi doza ( naxevari) am dros SeaqvT.

**mwkrivuli ganoyiereba**. anu sasuqebis Setana TesvasTan erTad. misi daniSnulebaa sakveb nivTierebaTa miwodeba axalgazrda mcenarisaTvis uSualod Teslis CaTesvis siRrmeze.

damatebiTi ganoyiereba. rac gulisxmobs sasuqebis Setanas mcenaris zrda-ganviTarebis periodSi, umTavresad zafxulis ganmavlobaSi, rodes Warxali xarbad iTvisebs sakveb nivTierebebs. sasuqebis damatebiTi Setana,anu e.w. gamokveba warmoebs vegataciis manZilze 2-3 jer. pirvel rigSi SeaqvT azotiani mineraluri sauqebi,Semdeg fosforiani da kaliumiani.

ukanasknel dros praktikaSi Semodis Saqris Warxlis fesvgareSe gamokvebac, romelic mniSvnelovnad adidebs Saqrianobas da xelsELuwyobs mcenaris mier sakveb nivTierebaTa SeTvisebas. fesvgareSe gamokveba sruldeba Warxlis foTlebze superfosfatis xsnaris SesxurebiT. foTlebs aqvT unari SeiTvison sasuqi da gadascen mcenaris ujredebs sakvebad. es RomisZieba 1% iT adidebs Saqrianobas. Catarebul cdebiT, fosforianma sasuqebma sakontrolosTan (usasuqo) SedarebiT, Saqris Warxlis mosavali gazarda.

**niadagis damuSaveba.** Saqris Warxlis normalurad ganviTarebisaTvis aucilebelia niadagis Semodgomidanve momzadeba-mzralad xvna. mzralad xvnis sistema arsebiTad Sedgeba 2 nawilisagan: nawveralis aCeCva da ZiriTadi (Rrma) xvna.

Tu Saqris Warxali iTeseba saSemodgomo xorblisagan ganTavisuflebul mindorze, maSin WarxlisaTvis niadagis momzadeba iwyeba xorblis mosavlis aRebisTanave-nacveralis aCeCviT.nawveralis aCeCva xorcieldeba diskoebiani kultivatorebiT Aan brTebmoxsnili saoSebiT. NA

**niadagis TesviswinaAdamuSaveba.** gazafxulze, siTbos matebasTan dakavSirebiT, matulobs niadagidan tenis aorTqleba.

pirveli RonisZieba, romelic am mizniT unda iqnes ganxorcielebuli, es aris mzralis dafarcxva, romlis amocanas Seadgens xnulis zedapiris mosworeba, beltebisa da zedapiruli qerqis daSla da aorTqlebisaTvis xelis SeSla. es RonisZieba gazafxulze unda Sesruldes rac SeiZleba adre da swrafad, 2- 3 dRis ganmavlibaSi, rogorc ki niadagis zedapiri SeSreba da SesaZlebeli iqneba mindvrad farcxebiT muSaoba. nakveTis dafarcxva am SemTxvevaSi warmoebs gardigardmo an mis iribad.

ra mdgomareobaSic ar unda iyos mzrali gazafxulze, Warxlis Tesvis win saWiroa misi kultivatoriT gafxviereba 6-8 sm siRrmeze da TanmiyolebiT msubuqi farcxiT dafarcxva. Tesviswina kultivaciis dros xdeba agreTve xnulSi gatanili sasuqebis niadagSi areva da sarevelebis mospoba.

**Teslis xarisxi** Saqris Warxlis Teslis xarisxs gansazRvravs misi sisufTave, gaRivebis unari, energia da simsxo. garegnulad Tesli unda iyos Ria Calisferi, ruxi.

kargi xarisxis Tesli sufTa unda iyos, masSi arunda erios sakaraitino sarevelaTa Teslebi da beRlis mavneblebi, erT sm-ze ugrZelesi Warxlis Reros namtvrevebi da TviT Rero SenarCunebuli Tesli ar unda aRematebodes 20 cals erT kg saTesle masaleSi.

saxelmwifo standartebiT dawesebuli normebiT, Saqris Warxlis Tesli unda akmayofilebdes moTxovnebs: aRmoceneba unda hqondes ara naklebi 75%, gorglurebis simsxo araneklebi 2mm(dm-Si) sisuftave araneklebi 97% da tenianoba araumetesi 14.5%.

**saTesle norma Tesva.** Saqris Warxlis saTes normad miRebulia 30-32 kg heqtarze. soflis meurneobis mowinaveebi sTesen ufro gadidebuli normebiTac 35-40 kg heqtarze. saTesi norma 32kg srulebiT sakmarisia imisTvis, rom gaxilva-SemCxrebis Semdeg miviRoT heqtarze 115-120 aTasi Ziri mcenare.

ukanasknel wlebSi farTod mimarTavdnen punqtirul Tesvas erTTesliani TesliT, am SemTxvevaSi heqtarze sakmarisia 12-15kg Tesli.

Saqris Warxlis mosavlianoba bevrad aris damokidebuli mcenareTa sixSireze, anu TiToeuli kvebis arxze.

Warxlis normanul naTesSi SemeCxrebis da Semowmebis Semdeg unda iyos, rogorc zemoT iyo aRniSnuli 115-120 aTasi mcenare, anu TiTeuli mcenaris kvebis are unda iyos 800-1000sm2-ze meti.

mcenari kvebis are ganisazRvreba mwkrivTaSoris manZiliT da TviT mwkrivSi mcenareTa Soris datovebuli manZiliT saqarTvelos pirobebisTvis dawesebulia Warxlis Tesva urwyavebSi 44.5 sm manZiliT, sarwyavSi----50 mwkrivis Soris. SemeCxrebis dros mcenareTa Soris manZili mwkrivSi unda iyos urwyavebSi 18sm sarwyavebSi 20sm, es Seadgens urwyavebSi 120 aTas mcenares, xolo sarwyavebSi 100 aTas mcnares heqtarze. Saqris Warxlis Tesva warmoebs mwkrivad

Saqris Warxlis Tesva, rogorc wesi, unda warmoebdes xnulis gardaigardmo mimarTulebiT rac uzrunvelyofs Tanabar siRrmeze Tesvas da naTesis erTdroulad aRmocenebas

**naTesis movla.** Warxlis naTesis movlis Ter-erTi mTavari amocanaa davicvaT is sarevelebisa da mavnebisagan, amasTan arTad SevinarCunoT farTobis erTeulze mcenareTa saWiro sixSire da vizrunoT imisTvis, rom SevuqmnaT mas zrda-ganviTarebis mTeli xnis manZilze saukeTeso pirobebi, rogorc mosavlianobis, ise Saqrianobis gadebisTvis**.**

Warxlis naTeTesis normalurad agmocenebas xSirad xels uSlis niadagis zedapirze qerqis gaCena gansakuTrebiT ustruqturo da mZime niadagebze. wvimis Sedegad xdeba useTi niadagis wakirva.

naTesi ver Rebs haeris Jangbadis saWiro raodenobas da amiT aZnelebs Teslis normalur aRmocenebas.garda amisa wakiruli niadagi didi raodeniobiT aorTqlebs wyals. ZrdaSi wasuls, magram qerqis qveS mocemul Rivs Zala ar Seswevs dasZlios gamagrebuli niadagiss zedapiris winaaRmdegoba, is igrixeba, cdilobs Semouaros qerqs da aRmocendes sadme, qerqis napralebs Soris amitom aris, rom odnav wakiruli niadagidanac ki Warxlis naTesi dagvianebiT amodis da uTanabro naTess iZleva

niadagis wakirvis winaaRmdeg sabrZolvelad mimarTavdnen rotaciuli moTxovnis gamoyenebas. misi kbilebi Cxvleten da amtvreven qerqs iseTnairad, rom niadagis nawilakebi amave adgolebze rCeba. niadagi zedapiruli qerqis daSlas unda SevudgeT maSinve, rogorc ki us warmoiSveba.

naTesis aRmocenebis dasaCqareblad da im uaryofiTi movlenis winaaRmdeg sabrZolvelad, rac dakavSirebulia qerqis warmoSobasTan, soflis meurneobis mowinaveni mimarTaven e.w.” brmad” gafxvierebas. brmad gafxviereba gulisxmobs Warxlis naTesis mwkrivebs Soris manZilis gafxvierebas mcenaris aRmocenebamde da mwkrivebis gamoCenamde. imisaTvis, rom am dros ar daziandes mwkrivSi naTesi mcenareebi, sargebloben saTesi manqanis CamTesebis mier datovebuli nakveTiT, an zogjer am mizniT WarxalTan erTad mcired raodenobiT Tesaven iseT mecenarebs romlebic swrafad aRmoCendebian da mwkrivs gamoaCenen ( aseTia, magaliTad qerqi, Svria, mzesumzira da axva)

**mwkribTaSoris pirveli gafxviereba.** Cven ukve avRniSneT, rom aRmocenebis dros Warxals amoaqvs ori lebani, romlebic mzis sxivebis moqmedebiT mwvane fers iReben da foTols emsgavsebian. namdvili foToli mcenares uCndeba ramdenime dRis Semdeg. imisaTvis, rom mcenares Seeqmnas ukeTesi pirobebi aeraciisa da tennis mxriv, agreTve sarevelebis mospobis mizniT, saWiroa naTesi gafxvierdes maSinve, rogorc ki mwkrivebi gamoCndeba. amas mwkivTaSoris pirvel gafxvierebas uwodeben. mwkrivTaSoris pirveli gafxviereba warmoebs xelis patara ToxebiT an meqanizebuli wesiT, manqanebis saSualebiTac. amave dros warmoebs gacdenili adgilebis gamoTesva dambali Warxlis TesliT.

**naTesis gaxilva-SemeCxreba**.mcenareTa normaluri sixSiris misaRebad saWiroa mwkrivSi mcenareTa Soris datovebul iqnes 16-17 sm manZili.

Warxlis naTesis SemeCxreba unda daiwyos pirveli wyvili namdvili foTlis gamotanis dros da damTavrdes or-sam dReSi. es muSaoba umetesad xelis patara ToxebiT warmoebs da sakmaod Sromatevadia, heqtarze saWiroa 20 kacdRe.

naTesebis SemeCxrebas akeTeben eqvsmwkriviani da Tormetmwkriviani rotaciuli kultivatorebitac, romliTac SeiZleba, rogorc daTaiguleba ise calkeul mcenareTa datoveba winaswar dadgenil manZilze.

**naTesebis Semowmeba da damatebiTi gafxviereba.** naTesebis gaxilva-SemeCxrebis Semdeg saWiroa damatebiTi gafxviereba; amave dros warmoebs naTesis Semowmeba, rac gulisxmobs yvela zedmeti mcenaris mocilebas, Tu raime mizeziT darCa an Semdeg aRmocenda. am dros mwkrivTaSoris gafxviereba warmoebs ufro Rrmad 10-12 sm-ze da damTavrebuli unda iqnes mcenareze 3-4 wyvili foTlis ganviTarebis fazaSi.niadagis gafxviereba im varaudiT unda warmoebdes, rom naTesis Semowmebidan mwkrivebis Sekvramde Catardes ori damatebiTi gafxviereba. gafxvierebasTan erTad warmoebs mcenareTagamokvleva sasuqebiT.

mesame damatebiTi gafxviereba naTess dasWirdeba zafxulis meore naxevarSi an mis damlevs, rodesac Warxlis SemosvlasTan dakavSirebiT,mcenaris ganapira foTlebi iwyeben Wknobas, gaxmobas da amis Semdeg mwkrivebi kvlav gaixsneba.

**morwyva.** Warxlis uxvi mosavlis misaRebad gadamwyveti mniSvneloba aqvs niadagis tenianobas da mcenaris uzrunvelyofas wyliT mTeli vegetaciis ganmavlobaSi.

Saqris Warxlis 1 mcenare dRe-RameSi daaxloebiT 1 litr wyals xarjavs, xolo qarebisa da maRali temperaturis dros zafxulSi zogjer 2 litrsac. Tu heqtarze 100 aTasi mcenarea, es imas niSnavs, rom wylis yoveldRiuri xarji am farTobze 100aTas litrs gadaaWarbebs. morwyvis gavlena Warxlis ganviTarebaze uaRresad Zlieria da is xSirad 7-jer ufro metad adidebs mis mosavals.

**mosavlis aReba.** Saqris Warxlis mosavlis aReba warmoebs Ziris teqnikuri simwifis fazaSi. es is momentia, rodesac Ziris ganviTarebam miaRwia maqsimalur wonas da aRar xdeba misi zrda, amasTan foTlebSi Seqmnili naxSirwylebi sabolood iwyeben gadasvlas da dagrovebas ZirSiSaqrebis saxiT.

Saqris Warxlis mosavlis aReba mdgomareobs SemdegSi: Zirebis amoTxra, foTlebisa da boloebis waWra, miwisagan gasufTaveba da grovebad dawyoba. miwidan Warxlis amoTxra sakmaod mZime samuSaoa, is sruldeba xelis saTxrelaTi an meqanizebuli wesiT-manqanebis saSualebiT.

aRebuli Warxlis didi xniT mindorSi gaCereba mizanSeuwonelia, radgan mzisa da qarebisagan Ziri Sreba da wonaSi klebulobs. Tu raime mizeziT ar xerxdeba mosavlis droulad gatana, is droebiTunda iqnes Senaxuli mindvrad; amisaTvis Warxlis Zirebs mosaxerxebel adgilze konusurad agroveben zvinebad da gverdebidan ayrian miwas, zvinis zeda nawils ki Wilobebs afareben.

**Warxlis Senaxva.** Warxlis Zirebis Senaxva did yuradRebas moiTxovs. siTbos pirobebSi Ziri sunTqvasaZlierebs, Saqris raodenoba mcirdeba,agreTve Zlierdeba daavadebani, rac Zlier lpobas iwvevs. amasTan erTad sul mcire yinvac ki, 1-20-is farglebSi, iwvevs Zirebis moyinvas da lpobas. Warxlis Zirebi kargad inaxeba 1-30 siTbos pirobebSi. Warxlis Senaxva warmoebs mimReb punqtebSi miwiszeda zvinebad, romlis fuZe 2-2,5 m udris, xolo simaRle 1-1,5 m, sigrZe ki SeiZleba iyos 10-20 m-mde.

zvinebs gverdebidan ayrian sveli miwis fenas 10-15 sm sisqeze, xolo Semdeg zamTris yinvebis gaZlierebasTan dakavSirebiT miwis fenas adideben 30-40 sm-mde. es savsebiT sakmarisia Warxlis Zirebis dasacavad yinvebisagan. zvinebs zemodan afareben Wilobebs, erT an or wyebad.

**Saqris Warxlis saTesle kultura.**Saqris meTesleoba saxelmwifo RonisZiebaa da dakisrebuli aqvs kargad mowyobil specializeburmeTesleobis meurneobebs. Warxlis saTesle kultura ori ZiriTadi nawilisagan Sedgeba: sadede Zirebis aRzrda da misgan Teslis miReba.

sadede Zirebad ar gamodgeba arc zedmetad msxvili da arc zedmetad wvrili Ziorebi. Tu Ziris wona 100-ze naklebia, sadede ar gamodgeba. am mizniT uvargisia davadebuli an datotvili Ziri. sadede Zirebs inaxaven TxrilebSi, miwis moyriT fenobrivad ise, rom Zirebi erTmaneTs ar exebodnen. yinvebisagan dasacavad Txrils ayrian miwis sqel fenas40-50 sm-mde.

gazafxulze Warxals iReben Txrilebidan, gadaarCeven dazianebul da daavadebuli Zirebisagan da gaaqvT mindorSi saTesle nakveTze dasargavad. Teslis uxvi mosavis misaRebad saWiroa, rom saTesle nakveTi saTanadod iyos momzadebuli. mzralad xvna, adre gazafxulze kultivacia da dafarcxva, sasuqebis Setana iseve saWiroa, rogorc safabrike Warxlis moyvanis dros. saTesle nakveTebze Zirebis dargva warmoebs rac SeiZleba adre gazafxulze, xelis barebis saSualebiT.

am wesiT heqtarze Tavsdeba 20-22 aTasi Ziri. dargvis win TiToeul ormoSi SeaqvT organuli da mineraluri sasuqis narebi daaxloebiT aseTi doziT 200 g nakeli, 5g gogirdmJava amoniumi da 12g superfosfati. Ziris dargva ormoSi warmoebs ise, rom misi Tavi miwis zedapiridan 1-2 sm-iT qveviT iyos, amis Semdeg Zirs miaykepnian miwas, rom is mWidrod Cajdes, zemodanac daayrian 2-3 sm sisqiT miwas, raTa daicvan zrdaSi wasuli kvirtebi dilis yinvebisagan.

rogorc ki daiwyeba kvirtebis gaRiveba da Reros amotana,saWiroa mas Semoecalos zemodan miyrili miwa, gatardes mwkrivTaSoris gafxviereba jvaredini mimarTulebiT, gamoimarglos sarevelebi. Catardes damatebiTi gamokveba sasuqebiT da morwyva.

wesiere movlis pirobebSi Saqris Warxlis Teslis mosablianoba20- 25 c udris heqtarze, samecniero dawesebulebebSi aReben orjer ufro met mosavals.

**Warxlis saTesle kultura Zirebis gadaurgavad**. Zirebis gadaurgavad Teslis miReba imaSi mdgomareobs , rom Warxali iTeseba ara gazafxulze , aramed zafxulSi. Semodgomaze mas ar iReben miwidan da adgilze toveben zamTris ganmavlobaSi. am wesiT miRebuli Warxlis Ziri WurWlovani rgolebis met raodenobas Seicavs, ukeTesad uZlebs yinvebsa da gvalvebs. am SemTxvevaSi SeiZleba Warxali daiTesos TavTaviani pureulisa da sxva saadreo kulturebis mosavlis aRebis Semdeg, saTanadod momzadebul sarwyav nakveTze. Tesva warmoebs Cveulebbrivi Warxlis saTesi manqanebiTim wesiT, rogorc safabriko WarxlisaTvis, mxolod im gansxvavebiT, rom mcenareTa manZili mwkrivSi ar unda iyos 15 sm metri, raTa farTobis erTeulze miviRoT Zirebis meti raodenoba 150-200 aTasi Ziri heqtarze. naTesis mola iseTive wesiT warmoebs, rogorc gazafxulze naTesisa.

meore wells adre gazafxulidan iqyeba naTesis dafarcxva, misi mizania mcenaris ganTavisufleba Zveli foTlebisagan, niadagis gafxviereba da aeracia, agreTve tenis SenarCuneba niadagSida axlad aRmocenebuli sarebelebis mospoba. movlis wesebi iseTivea, rogorc sadede Zirebis gadargvis SemTxvevaSi.

**sakvebi Warxali**

sakvebi Zirxvenebidan, yvelaze farTod gavrcelebulia sakvebi Warxali. farTobis 85 % am kulturaze modis. sakvebi Warxlis moyvanis mTavari mizania wvniani masis miReba pirutyvis sakvebad. sakvebi Warxali mosavlianobiT mniSvnelovnad aRemateba Saqris Warxals. 500-600 c mosavali heqtarze iSviaTi ar aris, sakvebi Warxali SaqrebiT SedarebiT Raribia. Tu Saqris WarxalSi azotiani SenaerTebis siQarbe uaryofiTi faqtoria, sakveb WarxalSi piriqiT, msi didi raodenobiT arseboba aumjobesebs Ziris kvebiT Rirsebas pirutyvisaTvis.

gansakuTrebiT Zvirfasia am mxriv sakvebi Warxlis naxevradSaqriani jiSebi, rom;is 1kg masa Seicavs 0,15 kvebiT erTeulsa da 14 g monelebad proteins.

sakvebi Warxali – (Beta vulgaris V. Crassa) iseve, rogorc Saqris Warxali, orwliani mcenarea, botanikur - morfologiuri da biologiuri TvisebebiT didad ar gansxvavdeba Saqris Warxlisagan. sakveb WarxalSi ufro metad aris ganviTarebuli Tavisa da yelis nawili, jiSebis mixedviT, masze modis Ziris wonis 25-65%, sakuTriv Ziri ki SedarebiT sustad aris warmodgenili. sakvebi Warxlis jiSebi gansxvavdebian Saqris Warxlisagan Ziris moyvanilobiT, SeferviT da niadagSi ganlagebiTac, maTTvis damaxasiaTebelia elifsuri, mogrZo-ovaluri, cilindruli, burTisebr mrgvali moyvaniloba. Sefervis mixedbiT:TeTri,wiTeli, yviTeli, vardisferi, sxvadasxva gardamavali ferebiT. Tu Saqris Warxlis Ziri TiTqmis miwaSia moTavsebuli, naxevradSaqriani Warxlis Ziris ¼ miwis zeviTaa, jiSebiS: BAbarresa da mamutis 1/3, ekendorfisa da arnimkrivenis 2/3, xolo oberndorfis ¾ miwiszeviTaa amosuli. is jiSebi, romlebic intensiurad inviTareben Ziris nawils, tenis mimarT met moTxovnilebas iCenen, ufro wyliania da mSrali nivTierebebis nakleb raodenobas Seicaven.

anatomiuri agebulebiT, sakvebi Warxlis Ziri WurWlovani rgolebis nakleb raodenobas ikiTebs, rgolebs Siris manZili ufro metia daparenqimuli ujredebic ufro msxvilia.

sakvebi Warxlis vegetaciis periodi ufro moklea, 125-150 dRe, vidre Saqris Warxlisa, amitom misi kultura ufro Sors midis CrdiloeTiT.

saqarTvelos pirobebisaTvis daraionebulia sakvebi Warxlis jiSebi: TeTri naxevradSaqriani, Bbarresi, pobedituli da ekendorfis yviTeli.

sakvebi Warxali TiTqmis orjer ufro nakleb mSral nivTierebebs Seicavs vidre Saqris Warxali.amis gamo niadagidan sakveb nivTierebaTa SeTvisebac naklebia mcenaris mier, magram Tu gaviTvaliswinebT, rom sakvebi Warxali TiTqmis orjer met mosavals iZleva vidre Saqris Warxali, sasuqTa dozebi misTvis daaxlovebiT iseTive iqneba, rogorc Saqris WarxlisaTvis: 15-30 t nakeli,EL 3-5 c sulfatamoniumi, 4-6 csuperfosfati da 1,5 - 2,0 c kaliumis marili.

sakvebi WarxlisaTvis niadagis damuSavebis wesebi, Tesva, naTesis movlada sxva agroteqnikuri RonisZiebani iseTivea, rogorc Saqris WarxlisaTvis. imis gamo, rom sakvebi Warxali da saerTod, sakvebi Zirxvenebi wylis did raodenobas Seicavs da Sor manZilze gadatana ar aris rentabeluri, maTi naTesebi sasurvelia moewyos fermebTan axlos.

sakvebi Warxali, rogorc vTqviT, Ziris mniSvnelovan nawils miwis zeviT iviTarebs, amitom misi mosavlis aReba gacilebiT ufro advilia. mosavlis aReba SeiZleba im teqnikisgamoyenebiT, rac Saqris WarxlisaTvis iyo aRniSnuli.

foTlisa da fesvis narCenebisagan gasufTavebuli Zirebi igzavneba Sesanaxad im wesiT, rac Saqris WarxlisaTvis iyo aRwerili.

**narkotikuli mcenareebi**

narkotikuli mcenareebis mravali saxeobidan, farTo sameurneo mniSvneloba da gavrceleba aqvs Tambaqosa da wekos. isini Seicaven alkaloidur nivTierebas – nikotins, romelic adamianis centralur nervul sistemaze gamabrueblad, damTrgunvelad an aRmgznebad moqmedebs.

Tambaqo da weko botanikurad erTi gvaris - Nicotiana L warmomadgenlebia, romelic ZaRlyurZenasebrTa ( Solanaceae) ojaxSi Sedis. kulturaSi farTo gamoyeneba miiRo orma saxeobam: - namdvilma Tambaqom – Nicotiana tabacum L da wekom – Nicotiana rustica L .

# Tambaqo

**saxalxo-sameurneo mniSvneloba**. Tambaqos iyeneben umTavresad mosawevad, misi CayviTlebuli da fermentirebuli foTlebidan mzaddeba papirosi, sigarebi, sigaretebi, saCibuxe Tambaqo. garda mosawevi Tvisebebisa, Tambaqos iyeneben medecinaSi samkurnalo preparatebis dasamzadeblad ( vitamini PP ), Tambaqosagan damzadebul preparatebs iyeneben soflis meurneobis mavneblebis winaaRmdeg (Tambaqos nayeni, nikotinsulfati, nikodusti da sxv.) wekos foTlebidan SeiZleba miviRoT limonmJava, romelsac is 3-15% -MmdeDE Seicavs. Tambaqos foTlidan miiReba agreTve vaSlmJava, romelsac xmaroben kvebisa da saparfiumerio mrewvwlobaSi.

Tambaqos Tesli 40%-mde zeTs seicavs, is SeiZleba farTod iqnes gamoyenebuli sapnisa da saRebavis warmoebaSi. rafinirebuli wekos zeTi saWmeladac gamodgeba. weko heqtarze 8 c–mde Tesls iZleva. Tambaqosa da wekos Rerosagan SesaZlebelia damzaddes maRalxarisxovani qaRaldi.

**botanikur-morfologiuri daxasiaTeba**. Tambaqo - **Nicotiana tabacum** L

erTwlovani, balaxnairi mcenarea, swormdgomi, momrgvalo, an dakuTxuli ReroTi, romlis simaRle 1,0-1,5 m da zogjer 3m aRwevs. Rero damuxlulia da bususiT aris dafaruli. centraluri nawili amovsebulia gulgulis rbili qsoviliT.

f e s v T a s i s t e m a. mTavarRerZiania, kargad ganviTarebuli, da sakmaod Rrmad vrceldeba niadagSi.

f o T o l i. mokleyunwiania an mjdomi, ovaluri, gulisebri moyvanilobis an elifsis formis, kide mTliania wawvetebuli wveroTi, firfitis zedapiri sadaa an danaoWebuli. sigrZiT 10-dan 50sm-mdea, siganiT ki-8-30sm mde. foTlis fuZeSi zogierTi Tambaqos jiSi ikeTebs danamatebs, e. w. bibiloebs. foTlebis raodenoba mcenareze 10-50-mdea.

Tambaqos Reros wveri Tavdeba yvavilediT, romelic sakmaod Sekruli an gaSlili sagvelaa.

y v a v i l i. xuTtipiania, orsqesiani, yunwiani, misi gvirgvinis furclebi milisebrad an Zabris msgavsad aris erTmaneTTan N Sezrdili. gvirgvinis furclebis nakveTebi Ria vardisferi an mowiTaloa. Tambaqo TviTgamanayyofierebeli mcenarea, Tumca SesaZlebelia sxviT ganayofierebac. naskvi zedaa, orbudiani.

n a y o f i. kolofia, orbudiania, mravalTesliani, ovaluri formis, momwifebisas yavisferia, ixsneba ori sagduliT.

T e s l i. yavisferia, ovaluri, wvrili, 1000Teslis wona 0,06-0,08g-s udris, erT gramSi 10-15 aTasi Teslia. Tesli5-6 wlis manZilze inarCunebs gaRivebis unars.

**jiSebi -** meTambaqoebaSi, saerTod miRebulia Tambaqos jiSebis dayofa or ZiriTad jgufad: sapapirose da sasigared.

sapapirose Tambaqoebi ki Tavismxriv iyofa or jgufad: aRmosavlur da amerikul tipebad.

foTlis agebulebis mixedviT, Seizleba davyoT yunwian da mjdomarefoTlian Tambaqoebad. yunwian tambaqoebs ekuTvnis jiSebi: ssamsuni, trapizoni, tik-kulaki. mjdomarefoTlianebis jiSebia: diubeki, amerikeni, molovata.

Tambaqo mowevis Rirebulebis mixedviT, iyofa aromatul da ConCxian TambaqoebaT.

gavrcelebuli da daraionebuli Tambaqos jiSebidan aRsaniSnavia: samsuni 27, samsuni 155, hibridi 417, trapizoni 285, diubeki 44, Havana 1112, sumatara 341 da sxva.

**qimiuri Sedgeniloba**. Tambaqos weviTi Rirebuleba, surneleba, aromati, simagre, gemo, wvis unari damokidebulia foTlis qimiur Sedgenilobaze. Tambaqos mza produqtSi mSrali nivTierebis raodenoba 85-90%-s aRwevs, wylisa 8-13%-s. mSrali nivTiereba, Tavis mxriv SeiZleba davyoT organul da araorganul naerTebad. organul naerTebze modis daaxloebiT 80% da araorganul naerTebze 20%-mde.

organuli naerTebidan aRsaniSnavia ori ZiriTadi jgufi: azotiani da uazoto nivTierebani. azotian nivTierebaTa jgufs ekuTvnis alkaloidebi, cilebi, amidebi, amoniaki. uazoto nivTierebebs: naxSirwylebi, fisi, organuli mJaveebi, eTerzeTebi da sxva.

alkaloiduri jgufidan aRsaniSnavia n i k o t i n i, igi ufero cximisebri siTxea, haerze iJangeba, muqdeba, advilad ixsneba wyalSi, spirtSi, eTerSi.

nikotini sufTa saxiT Zlieri Sxamia. Tambaqos umaRlesi xarisxis nedleulSi misi raodenoba 1,2-1,5%-s Seadgens, dabalxarisxian TambaqoSi ki 2,0-2,5%-s, wekoSi is 2-dan 10%-mdea. nikotinis didi raodenobis Semcveloba auaresebs Tambaqos xarisxs, ukargavs sasiamovno aromatsa da gemos, aZlevs mas simwares.

Tambaqos nedleuli 10-12% cilas Seicavs, cilebis didi raodenobiT Semcveloba auaresebs Tambaqos xarisxs, misi wvis dros warmoiqmneba cudi sunissa dam ware gemos aqroladi nivTierebani.

Tambaqos foToli mdidaria nacris elementebiT (12%), Seicavs 4-dan 7%-mde fisebs da 1,0-1,3-mde EeTerovan zeTebs. maTi monawileoba foTolSi gansazRvravs surnelebasa da aromats, saukeTeso jiSebi, diubeki, afxazuri samsuni, maqsimaluri raodenobiT Seicaven eTerovan zeTebs.

nacris Semadgenlobazea damokidebuli Tambaqos wvis unari, kaliumis Semcveloba dadebiTad moqmedebs wvaze, qloris naerTebi ki xels uSlis wvas. uaryofiTad moqmedebs agreTve wvaze sulfatebi.

naxSirwylebis raodenoba Tambaqos foTolSi 23%-mde SeiZleba iyos, foTlis fermentaciis dros is iSleba.saxamebeli martiv Saqrebad, umTavresad fruqtozad gardaiqmneba.naxSirwylebisa da cilebis Sefardeba foTolSi gansazRvravs mis xarisxs (Smukis ricxvi). rac ufro didia es Sefardeba, miT ukeTesia Tambaqos xarisxi. umaRlesi xarisxis TambaqoebSi Smukis ricxvi 1,5-2,0 udris, e. i. naxSirwylebis raodenoba 1,5-2,0-jer sWarbobs cilebis raodenobas. mdore xarisxis TambaqoebSi es ricxvi 0,5-0,3 erTeulamde ecema, e.i. cilebis raodenoba aq sWarbobs naxSirwylebis raodenobas. naxSirwylebiT ufro mdidaria Tambaqos zeda foTlebi, amitom maTi xarisxic ufro maRalia vidre qveda da Suawelis foTlebisa.

**damokidebuleba garemo faqtorebis mimarT**. Tambaqo siTbos moyvaruli mcenarea. Teslis gaRivebisaTvis saWiroa 10-110 siTbo. mcenaris normaluri ganviTarebisaTvis ki optimaluri temperaturaa 20-250. Zlier marali temperaturis dros (350) mcenare aCerebs zrdas. siTbos saerTo moTxovnileba savegetacio periodSi, jiSebis mixedviT, Seadgens 1900-34000.

did moTxovnilebas iCens Tambaqo sinaTlis mimarTac. Tambaqos maralxarisxovani produqcia miireba mzit kargad ganaTebul samxreTis ferdobebze. uxvi da maralxarisxovani mosavlis misaRebad sawiroa mcenaris Seuferxeblad momarageba teniT.gansakuTrebit sawiroa wyali CiTilis dargvis dros, fesvta sistemis momagrebisa da foTlebis masobrivi formirebis fazaSi, rodesac mcenaris mwvane masa uxvad izrdeba. am dros wylis nakleboba Zlier abrkolebs mcenaris ganviTarebas.

**Tambaqos moTxovnileba sakveb nivTierebaTa mimarT.** heqtarze 15c-iani mosavlianobis dris Tambaqos gamoaqvs niadagidan 90kg azoti, 25 kg fosfori, 70kg kaliumi da 100kg-mde kiri.

zedmetad noyier, humusiT mdidar niadagebze Tambaqos moyvanas ar urCeven, radgan am SemTxvevaSi mcenare laRad izrdeba, uxvad iTvisebs niadagidan azots, maRal mosavals iZleva da foTlis xarisxi mkveTrad ecema.

**adgili TeslbrunviSi**. iq, sadac Tambaqos xvedriTi wili naTesebis struqturaSi maRalia, dasaSvebia TeslbrunvaSi Tambaqos dargva naTambaqoar mindorze kidev erTi wlis ganmavlobaSi. Tambaqos xSirad dabruneba erTsa da imave nakveTebze Tan sdevs bevri uaryofiTi movlena: niadagis gamofitva, struqturis darRveva, mavneblebisa da daavadebebis gavrceleba, produqciis xarisxis gauareseba da mosavlianobis Semcireba. amitom Tambaqos TeslbrunvaSi moqceva aucilebeli RonisZiebaa myari da xarisxovani mosavlis misaRebad.

karg winamorbedad iTvleba TambaqosaTvis erTwlovani parkosani balaxebi, agreTve saSemodgomo TavTavianebi da simindi, gansakuTrebiT im SemTxvevaSi, Tu maT Semdeg daiTeseba Sualedi kulturebi : barda, cercvela, xanWkola,pirutyvis sakebad an mwvane sasuqad.

**ganoyiereba.** organuli da mineraluri sasuqebis gonivruli gamoyenebiT, Tambaqos mosavlianoba TiTqmis erTiorad izrdeba, amasTan ar uaresdeba foTlis xarisxi.

kaliumiani sasuqebi Tumca mcired iwveven mosavlis gadidebas, magram Tu kaliumiani sasuqebi qlors ar Seicaven, isini mniSvnelovnad aumjobeseben Tambaqos foTlis xarisxs da mis wvis unars.

organuli sasuqebis- nakelis didi dozebi (40t/ha) Tumca iwvevs mosavlianobis mniSvnelovan gadidebas, magram amas Tan sdevs foTlis xarisxis gauareseba, amitom TambaqosaTvis ukeTesia gamoviyenoT misi SedarebiT mcire doza, 20t raodenobiT heqtarze,mzralad xvnis win.

mineraluri sasuqebis dozebi saqarTvelos meTambaqoeobis sxvadasxva raionebSi damokidebulia adgilobriv pirobebze, niadgis Sedgenilobaze, Tambaqos jiSebze, winamorbedebze.

**niadagis damuSaveba.** niadagi moxnuli unda iqnes winamxvnelianiguTniT, mzralad, 25-30sm siRrmeze, niadagi unda moixnas ara ugvianes 1 dekembrisa.

adre gazafxulze mzrals farcxaven, Semdeg sarevelebis wamozrdasTan dakavSirebiT atareben kultivacias dafarcxviT.

Tambaqos dargvamde 8-10 dRiT adre xnuls afxviereben 10-12 sm sirrmeze da Tan miyolebiT farcxaven.

# Tambaqos nergis gamoyvana

Tambaqos Tesli Zalian wvrilia, misi aRmocenebisaTvis saWiroa Zalian mcire siRrmeze (0,5 sm-ze) CaTesva, amasTan saWiroa, rom niadagis es fena sakmaod teniani iyos Teslis gaRivebisa da armocenebisaTvis. Tambaqo yvelgan mohyavT, mxolod winaswar gamoyvanili nergis dargviT.

nergi mohyavT kvalsaTburebSi an Ria kvlebSi. mindorSi darguli nergi adre viTardeba da foToli adre Semodis.

rekomendirebulia nergis moyvana kvalsaTburebSi mTeli moTxovnilebis 40-50% is raodenobiT. am SemTxvevaSi angariSoben, rom1m2 kvalsaTburidan miiReba 1200cali nergi, xolo Ria kvlebze-700-800cali.

kvalsaTburebi sami saxisaa: Tbili, naxevrad Tbili da civi. saqarTvelos pirobebSi gavrcelebulia naxevrad Tbili da civi kvalsaTburebi.

farTod iyeneben meTambaqoeobis raionebSi nergis gamosayvanad sinTezur apks.

Tambaqos Tesva kvalsaTburebSi warmoebs: zamTris pirad 1 dekembridan 25 dekembramde, gazafxulze Tesvis .dros – 1 Tebervlidan 10 martamde. Ria kvlebSi Tambaqo ZiriTadad iTeseba Teberval-martSi 10%-mde, danarCeni iTeseba aprilis pirvel dekadaSi.

kvalsaTburebSi Tesvis dros 1m2-ze saWiroa zamTarSi 0,8m Tesli, gazafxulze\_0,4 da Ria kvlebSi Tesvis dro\_0,6g

adre vadebSi Tesvisas, iTeseba mSrali Tesli, xolo gvian vadebSi gaRivebuli Tesli.

**dargva.** dasargavad vargis nergs unda hqondes 5-6 foToli da kargad ganviTarebuli fesvTa sistema. nergi unda iyos saRi, misi sidide 10-12sm unda aRwevdes.

kvalsaTburidan nergis amoReba xdeba misi mindvrad dargvis dRes, dilis saaTebSi, Rrublian amindSi SesaZlebelia nergis amoReba da dargva mTeli dgis ganmavlobaSi.

sanergidan CiTilis amoReba warmoebs Tambaqos dargvis vadebis Sesabamisad 30-45 dRis ganmavlobaSi,15 aprilidan maisis damlevamde.

Tambaqos dasargavad gamzadebuli nakveTi unda iyos kargad damuSavebuli, sarevelebisagan sufTa, gafxvierebuli da mosworebuli. dargvas iwyeben Tbil amindSi, rodesac dilis wayinebis saSiSroeba gaivlis da niadagi 10 sm siRrmeze 10-12 iT mainc gaTbeba.

Tambaqos dargvis sixSire damokidebulia pirvel rigSi jiSze da Semdeg adgillobriv niadagur pirobebze.

Tambaqos rgaven 60x15sm\_ze, rac heqtarze udris 105 aTas mcenares 65x18sm\_ze, anu 81 aTas mcenare hektarze, ferdob adgilze mcenareTa sixSire kidev ufro metia: 55x15sm\_ze anu 115 aTasi mcenare heqtarze.

Tambaqos dargva warmoebs xeliT an manqanebiT, xeliT dargvis dros iyeneben palos, romliTac akeTeben niadagSi ormos, CiTils CauSveben ormoSi fesvis yelamde, imave paloTi miatkepnian miwas da maSinve rwyaven.

xeliT dargva did Sromas moiTxovs, amitom vake adgilebSi, sadac ki es SesaZlebelia, mimarTaven Tambaqos manqaniT dargvas.

**plantaciis movla.** Tambaqos plantaciis movlis erT-erTi didmniSvnelovani RonisZiebaa mwkrivTaSorisebis gafxviereba. plantaciis mwkrivTaSoris gafxviereba warmoebs 3-4-jer dReSi zafxulis ganmavlobaSi.

pirveli kultivacia-Toxna sruldeba dargvidan 8-10 dRis Semdeg, meore kultivacia-Toxna\_pirveli kultivaciidan 15 dRis Semdeg, xolo Semdegi kultivacia\_ or kviraSi erTxel.

pirveli kultivacia SedarebiT mcire siRrmeze warmoebs\_5-6sm-ze, meore da Semdegi kultivaciebi 8-10sm siRrmeze.

iq, sadc Tambaqo uzrunvelyofili ar aris bunebrivi naleqebiT, maRali mosavlis misaRebad aucilebelia morwyva.

sofls meurneobis mowinaveebi farTod iyeneben plantaciis gamokvebas, e.i. mineraluri sasuqebis Setanas vegetaciis periodSi. movlis es RonisZieba win unda uswrebdes mwkrivTaSoris kultivacias an morwyvas.

Tambaqos mcenare yvavilis gamotanidan wyvets simaRleze zrdas da foTlebSi Seqmnil alastikur nivTierebaTa did nawils xarjavs Teslis ganviTarebasa da namxrevebis warmoqmnaze. nivTierebaTa es gadanacvleba iwvevs foTlebidan maTi zrdis Senelebas, organuli nivTierebaTa dagrovebis Semcirebas, foToli ufro faSari da msubuqi xdeba da uaresdeba misi xarisxi. am movlenis sawinaaRmdegod mimarTaven Tambaqos Tavebis wawyvetas. mcenareze Tavebis waWra sruldeba maTi ganviTarebis mixedviT. sustad ganviTarebul mcenares yvavileds aclian pirveli yvavilis ganviTarebisTanave, amasTan yvaviledis waWra ufro Rrmad xdaba, maT Tan ayoleben 3-4 foTols. saSualod ganviTarebul mcenareebs Tavebs aWrian yvaviledSi yvavilTa 10-15% is gaSlis dros, am SemTxvevaSi yvavileds Tan ayoleben 2-3 foTols. Zlier ganviTarebul mcenareze Tavebis waWra xdeba yvaviledSi yvavilTa 50% is gaSlis periodSi, am SemTxvevaSi gasxvla warmoebs msubuqad foTlebis gauyoleblad.

**mosavlis aReba.** Tambaqos foTols iReben teqnikuri simwifis fazaSi. foTolis firfita am dros Ria mwvane fers iRebs, misi wvero da kideebi odnav yviTldeba, foToli ufro webovani xdeba, mTavari ZarRvi Ria fers iRebs da foToli specifikuri tkacuniT advilad scildeba Reros. foTlebi mTel mcenareze erTbaSad ar mwifdeba: pirvelad Semodis qveda\_Zveli foTlebi, Semdeg Suawelisa da bolos zeda foTlebi.

Tambaqos umetes jiSebSi foTlis momwifeba 5-6 iarusad xdeba, amis Sesabamisad foTlis Setexvac 5-6-jer warmoebs. samsunis jiSebi\_7-jer, diubekisa da amerikenis jiSebze ki 8-10 Setexvas mimarTaven.

Tambaqos yvela iarusis foToli erTnairi xarisxisa ar aris, umaRlesi xarisxis Tambaqos iZleva zeda iarusis foTlebi. foTlebis Setexva sruldeba xeliT, dRis meore naxevarSi, namis SeSrobis Semdeg. kidev ufro ukeTesia saRamos an RamiT Setexva.erTdroulad warmoebs mxolod erTi iarusis foTlebis Setexva. Setexili foTlebi mcire dastebad ewyoba mwkrivebs Soris. mwkrivSi Setexvis damTavrebisTanave dastebi gaaqvT nakveTidan, awyoben kalaTebSi an yuTebSi da miaqvT fardulSi asanemsad.

**anemsva.** Tambaqos foToli Setexvidan erTi dRe-Ramis ganmavlobaSi unda ainemsos 5-6 metrian zonarze. amisaTvis foTols winswar axarisxeben, simwifis, sididis, meqanikuri Tu mavnebel-avadmyofaTa mier dazianebis niSnebiT. daxarisxebuli Tambaqos foToli ufro Tanabrad Sreba da xarisxovan produqcias iZleva.

zonarze anemsil foTlebs Soris garkveuli manZili unda iqnes datovebuli, rom foToli ukeTesad gamoSres.

Tambaqos foTlis anemsva warmoebs rogorc xeliT aseve meqanizmebiTac.

**foTlis Sroba.** zonarze anemsili Tambaqos foToli, vidre is gaigzavnebodes safermentacio qarxnebSi, sadac unda gaSres.

Tambaqos foTlis Sroba arsebiTad rTuli procesia, is 2 fazisagan Sedgeba: es aris CayviTleba da fiqsacia anu sakuTriv Sroba.

CayviTleba normalurad mimdinareobs 25-30% siTbosa da haeris fardobiTi tenianobis 80-85%-is pirobebSi. am dros foTolSi mimdinareobs rTuli bioqimiuri procesebi: cilebi iSleba, saxamebeli Saqrebad gardaiqmneba, daSlas ganicdis qlorofili, nikotinis semcveloba mcirdeba, aromatul nivTierebaTa raodenoba matulobs, mkveTrad mcirdeba tenianoba 6-7-mde, Cayvilebis procesSi mSrali nivTierebis raodenoba foTolSi klebulobs 10-16%-iT.

yovelive amis Sedegad Tambaqos xarisxi umjobesdeba, foToli yviTel fers iRebs.

Tambaqos CayviTlebas sxvadasxva wesiT axdenen, es aris: anemsvamde-grovebSi CayviTleba, zonarze acmuli foTlebis iatakze dawyoba da zonarze acmuli da CarCoebze dakiduli foTlebis CayviTleba.

praqtikaSi farTod gavrcelebulia CarCoze dakidebuli foTlebis CayviTleba. erT standartul CarCoze Tavsdeba farTofoTliani jiSis 18-20 zonari, xolo saSualo da patara foTliani jiSebis 22-24 zonari.

CayviTleba damTavrebulad iTvleba Tu samsunis jiSis Tambaqos foTlis erTi meoTxedi kargad iqneba gayviTlebuli, xolo foTlis danarCeni nawili moyviTalo fers miiRebs.

trapizonis jiSisaTvis sWiroa, rom foTlis firfitis naxevari srul gayviTlebamde iqnes miyvanili.

Tambaqos foTlis fiqsacia anu Srobas axdenen mzeze an specialur cecxlsaSrobSi.

Tambaqos foTlis Sroba warmoebs foTlis mTavari ZarRvisa da yunwis srul gaSrobamde, magram amave dros unda veridoT foTlis firfitis zedmtad gaSrobas, mis daxrukvas mzeze.

Tambaqos foTlis mzeze Srobis dros maRalxarisxovani nedleulis miReba TiTqmis mTlianad amindis pirobebzea damokidebuli, es procesi, sakmaod did drosa da Sromas moiTxovs. iyenaben Tambaqos cecxlze Srobas. temperatudris, haeris tenianobisa da ventilaciis regulirebiT, specialur cecxlsaSrobebSi aRweven Tambaqos foTlis CayviTlebisa da Srobis procesis TiTqmis erTdroulad Sesrulebas, rac Zlier aCqarebs muSaobas.

Tambaqos mSral foTols standartis mixedviT axarisxeben, damatebad (dastebad) awyoben da calebad kraven, ris Semdeg gzavnian damamzadebel punqtebSi. Tambaqos foTlis saboloo damuSaveba xdeba safermentacio qarxnebSi, amis Semdeg is igzavneba Tambaqos fabrikebSi.

**Tambaqos meore mosavlis aReba.** ZiriTadi mosavlis aRebis Semdeg, siciveebis dawyebamde, kidev sakmarisi dro rCeba, rom mcenarem gaagrZelos zrda da foTlis damatebiTi mosavali mogvces. soflis meurneobis mowinaveebi mcenaris am SesaZleblobas unarianad iyeneben.

meore\_damatebiTi mosavlis miRebas sxvadasxva wesiT aRweven:

pirveli wesi. mosavlis aRebis damTavrebisTanave Reroebs Wrian miwidan 20 sm simaRleze. plantaciaSi SeaqvT mineraluri sasuqebi\_60 kg amoniumis gvarjila, 100 kg superfosfati da Toxnisa da kultivaciis meSveobiT mas niadagSi aTavseben. Tu niadagSi teni sakmarisi ar aris , mas rwyaven. am pirobebSi mcenare namxreebs ikeTebs. normaluri ganviTarebisTvis saWiroa, rom datovebuli iqnes mxolod erTi an ori namxrevi.

meore wesi. Reros zeda nawilSi kargad ganviTarebuli sam naxrevs toveben. Tavebs waaWrian da iRliidan gamotanil namxreebs aclian. datovebul namxreebs ki 6-8 foTols unarCuneben.

mesame wesi. ukanaskneli SetexvisTanave Reroze toveben erT an ors kargad ganviTarebul namxrevs, mis zemoT ki Reros Wrian.

lagodexis raionis pirobebSi am wesebis gamoyenebiT haqtarze 6-8 centneri damatebiTi mosavlis miReba SeiZleba.

**weko**

**ssaxalo-sameurneo mniSvneloba.** weko mniSvnelovani teqnikuri mcenarea. misi foTlebi Seicavs didi raodenobiT nikotns da organul mJavebs. wekos Tanamedrove jiSis foTlebSi 5-dan 15%-mde nikotinia da 25-20%-mde organuli mJavebi, maT Soris 10%-ze mets limonmJavas Seadgens, wekos foTolSi orjer metia limonmjava, vidre TviT limonis nayofSi.

weko mohyavT umTavresad mosawevad, mis fxvnils (burnuTs) iyeneben saynosavad, nikotinsulfati da sxv; romlebsac farTod iyeneben soflis meurneobaSi mavneblebis winaaRmdeg, pirutyvis qecis samkurnalod, cxvris gasabaneblad da sxv.

wekos nedleuls amuSaveben nikotinis mJavas (vitaminiPpp) da limonmJavas misaRebad, rasac farTo gamoyeneba aqvs kvebisa da safeiqro mrewvelobaSi.

weko sakmaod maRalmosavliani mcenarea, heqtarze iReben 30-35 c wekos foTlis mosavals.

**botanikuri da biologiuri daxasiaTeba.** weko \_ Nicotiana rustica L

erTwlovani mcenarea, simaRliT 1.2 m-mde. misi foTlebi yunwiania, gulisebri an kvercxis moyvanilobis, foTlis firfita danaoWebulia, Ria mwvane an moyviTalo-mwvane ferisaa, foTolTa raodenoba mcenareze 20-mdea.

yvavili orsqesiania, Sekrebilia yvaviledad. mTeli mcenare dafarulia Tavakebiani da martivi bususiT, romlebic specifikur surnelebas gamoscemen. wekos axasiaTebs TviTganayofiereba, magram gamoricxuli ar aris mwerebis saSualebiT jvaredin ganayofierebis SesaZleblobac.

nayofi or budiani kolofia, romelSic bevri Teslia. wekos Tesli Zlier wvrilia, 1000 Teslis wona 0.25-0.35 g-s udris, magram is gacilebiT ufro msxvilia vidre Tambaqos Tesli.

fesvTa sistema mZlavrad aqvs ganviTarebuli, niadgSi Cadis 1.5 m-mde, magram fesvebis mTavari masa niadags 30-40sm fenaSia moqceuli.

wekos Tesli normaluri aRmocenebisaTvis optimaluri temperaturaa 20-25 gradusi.

weko saWirobs humusian noyier niadagebs, kargia misTvis Savmiwa Tixnarebi, qviSiani da Tixiani kordian-eweriani niadagebi, Rarib niadagebze weko umniSvnelo mosavals iZleva.

niadagis damuSaveba wekosaTvis warmoebs mzralad xvnis wesiT 25-30 sm siRrmeze.

weko mohyavT ori wesiT: CiTilis dargviT da uSualod mindorSi Teslis TesviT.

CiTili irgveba aprilis damlevs, maisis dasawyisSi, CrdiloeT raionebSi kidev ufro gvian. dasargavad iyenaben CiTilis sargav manqanebs.

mcenareTa sixSire farTobis erTeulze ganisazRvreba jiSisa da niadaguri pirobebis mixedviT, Cveulebriv, heqtarze Tavsdeba 60-65 aTasi mcenares. (farTofoTliani jiSebi) an 70-80 aTasi mcenare (wvril sfoTlovani jiSebi).

Teslis Tesvis dros, wekos Tesaven adre\_ sagazafxulo pureulTan erTdroulad. dasaTesad iyeneben winaswar gaRivebul da mSrali Teslis Tanabar narevs. mSrali Tesli 8-10 dRiT gvian amodis,. Tu wayinvebisagan adre aRmocenebuli gaRivebuli Tesli daiRupa, mSrali Tesli iwyebs aRmocenebas da naTesis sisrule uzrunvelyofili iqneba. wekos Tesaven farTo mwkrivebad 50-60 sm-ze. heqtarze saWiroa 2-3 kg Tesli. Teslis CaTesvis siRrme ara umetes 1 m-ia, amis gamo wekos dasaTesad niadagi kargad unda iqnes damuSavebuli da gafxvierebuli.

pirveli mwkrivTaSoris gafxviereba unda Sesruldes rac SeiZleba adre, rogorc ki mwkrivebi gamoCndeba, Semdeg gafxviereba tardeba sistematurad da amasTan erTad mwkrivSi imargleba sarevelebi.

ori namdvili foTlis fazaSi mimarTaven naTesis daTaigulebas kultivatorebiT, Taigulebis sigrZe mwkrivSi 10-15 sm-s udris, Taigulebs Soris manZili ki kvadratul-budobrivad datovebis dros\_50 sm-s, Cveulebriv mwkrivad gamoxarSvisas 25-27 sm-s. 2-3 dRis Semdeg Taigulebi gamoixSireba da rCeba 3-5 Kkargad ganviTarebuli mcenare. 10 dRis Semdeg saboloo gamoxSirvas atareben.

maRalxarisxovani nedleulis misaRebad, iseve, rogorc Tambaqos kulturisas, saWiroa mcenares waeWras Tavebi da moscildes namxrevebi.

mosavlis aReba xdeba foTlis teqnikuri simwifis fazaSi. am dros foToli ufro mkvrivia, maRali, ris gamoc gadaxrilia Zirs. mcenares aqvs misTvis damaxasiaTebeli wekos Zlieri suni.