

*gW dmj Drcv`#bi tgšj bWZ I Lvgvi e`e`v*

BASIC PRINCIPLES OF FIELD CROP PRODUCTION AND FARMING  
SYSTEMS

BAE 1303

*Kwl. I cj # Dbqb `j*

SCHOOL OF AGRICULTURE AND RURAL DEVELOPMENT



*ersj v#`k D>gy3 wek|e` `ij q*

*Kul I c j n Dbq b`z*  
 SCHOOL OF AGRICULTURE AND RURAL DEVELOPMENT  
*evsj vt`k D>gy` nekpe``ij q*

BAE 1303

*gW dmj Drcv`tbi tgŠj bWZ I Lvgvi e`e`v*

BASIC PRINCIPLES OF FIELD CROP PRODUCTION AND FARMING SYSTEMS

*tKum@Wt f j ctgU wlg*

*tj LK*

***W. tgv t gnesjy Kni g***

***W. tgv Avãr mvgv`***

*Kul.ZË;wefvM, evsj vt`k Kul .nekpe``ij q*

***G.w.Gg. gnesjy Avj g***

*Lvgvi e`e`v I cwi ttek Mtel Yv cKí*

*evsj vt`k Kul .nekpe``ij q*

*m=úv`K*

***W. tgv tZvdi34j Bmj vg***

*Kul .I c j n Dbq b`z*

*evsj vt`k Dbkŷ nekpe``ij q*

***tgv mi I qvi tntmb tPŠajx***

*Kul .I c j n Dbq b`z*

*evsj vt`k Dbkŷ nekpe``ij q*

*i PbvAkj x m=úv`K I mgšqKvi x*

***W. tgv tZvdi34j Bmj vg***

*Kul .I c j n Dbq b`z*

*evsj vt`k Dbkŷ nekpe``ij q*

*m=úv`K (wZiq ms`i Y)*

***W. tgv midDj Avj g***

*Kul .I c j n Dbq b`z*

*evsj vt`k Dbkŷ nekpe``ij q*

*G tKum@Bul tidwi KZŔ wbi xŋtYi ci evsj vt`k Dbkŷ nekpe``ij tqi Kul .I c j n Dbq b`z Gi QvTt`i Rb` gwZ ntqtQ|*



# gW dmj Drcv`tbi tgšj bWZ I Lvgvi e`e`v

(MAATH FASAL UTPADONER MOULONITI O KHAMAR  
BABOSTHA)

mauv`bv cwi I`

mfvcuZ t **W. Aveynbv tgv dvi k**  
evsj v`k Dbkš wekpe`ij q  
m`m` t **W. Gg. j tnvmb**  
evsj v`k Kul .MteI Yv KvDwYj  
**W. m. g. Avj Zvd tnvmb**  
evsj v`k Kul .wekpe`ij q  
**W. tgv tZvdvšj Bmj ug**  
evsj v`k Dbkš wekpe`ij q  
**W. tgv tgvtk`y ingub**  
evsj v`k Dbkš wekpe`ij q  
**W. Av b g Augbj ingub**  
evsj v`k Dbkš wekpe`ij q  
**W. tgv kun Avj g mi Kvi**  
evsj v`k Dbkš wekpe`ij q  
**tgv mi I qvi tnvmb tPšajk**  
evsj v`k Dbkš wekpe`ij q

mweR ZEyear`b

Wxb

Kul .I c j Dvqb`z

evsj v`k Dbkš wekpe`ij q

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## ciw ubt` Rbv

ÒgvV dmj Drcv` tbi tgšj bwiZ I Lvgvi e`e`v0 tKvm@Biu wekI fite Kul. I cj# Dbqgb `ç  
Gi weGwRGW tciM@tgi QvT`i Rb` tj Lv ntqtQ| Arcub Rvttb, `f` wkq`Y wkq`Ki  
mveq`wYK Dciv`wZ tbB| ZvB cvtVi tKvtrv KwB wclq thb Avcbvi ešZ Ampeav bv nq  
tmw`tK `w0 tišLB tKvm@Biu tj Lv ntqtQ| tKvm@BiuI AwšK I Dc`vcbv ZvB cšj Z  
cW`eB t`tK wKQw wfbœaitbi | thnZzmiwmi wkq`Ki mrvh` QvovB tKvm@Biu AvcbvK  
ubtR cto ešZ nte, ZvB GuU Kxfite coteb cštgB Zv tRtb wbb| GtZ tKvm@Biu cotZ  
I ešZ Avcbvi mpeav nte|

### eBili ičtiLv

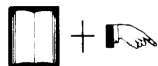
ÒgvV dmj Drcv` tbi tgšj bwiZ I Lvgvi e`e`v0 tKvm@Biu `šU Astk wef<sup>3</sup>| cšg Askui  
wktivbv ÒgvV dmj Drcv` tbi tgšj bwiZ0, GuU QquU BDubtu wef<sup>3</sup>| wšxq Askui wktivbv  
ÒLvgvi e`e`v0, GuU wZbuU BDubtu wef<sup>3</sup>| cšZuU BDubtu GKwaK cv iqtQ| cv msl`v  
wbaŋ Y Kiv ntqtQ cšZuU BDubtu wclqe`i I ci wbfP Kti | BDubtu cv, tj vK Avj`v  
Kti mrvtrv ntj I Gt`i gta` GKwU thvMm` iqtQ| GtZ Arcub BDubtu i išZB tRtb  
hrt`Ob cvtVi gj- Avtj vP`mP Kx?

### cvVi Df`k`

j`q` Kiteb cšZuU cvtVi i išZ GK ev GKwaK mrvh` Df`k` t`qv AvtQ| cšZuU Df`k`K  
tK`a KtiB cvtVi wclqe`i mnRfite eYŋv Kiv ntqtQ| cv tktl cvtVi Df`k` tj v ARŋ  
Kiv mpe ntqtQ Kx bv Zv ubtR ubtRB gj`vqb Kiteb| Gi Rb` cv tktl `šj`vqb cke  
iqtQ| GtZ Arcub cvwU KZUK ešZ cvi tj b Zv wbaŋ Y Kitz cviteb|

### AvBKtbi e`envi

cvtVi wclqe`i tj v GK`w0tZ ešS tbqvi Rb` cšqvRb Abjviti tKvm@BiuI wewfbœRvqMvq  
wewfbœaitbi cšxK ev AvBkb e`envi Kiv ntqtQ, hv t`L Arcub mntrB wclqe`i  
Dc`vcbv Ges Avcbvi Ki Yxq Kx Zv ešZ cvi teb| ubt`wG tKvm@Btu e`eüZ wewfbœaitbi  
AvBKtbi A`ubt`R Kiv ntjv-



= cob I j`q` Kily



= Avenk`K cvw/mvi gg©



= One t`Lly



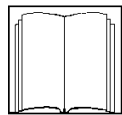
= Abkxj b/Povšlgj`vqb



= crfVĚi gj`vqb



= DĚi gvj v



= Z\_`mĤ



### e. *uj Lb*

crfVi iȳcY<sup>©</sup>ukŋYxq Asktk Avil Avklŋq Kti cĀkŋbi Rb` gŋS gŋSB Āe-  
vij Ltbi Ā gva`tg Ztj aiv ntqtQ | cĀZw Āe. *uj Lb* Ā gŋbŋthvM w`tg cob Ges gŋb ivLĤZ  
tPōv Kily|

### *Abkxj b*

Avcib cvwU fŋtjvfŋte eStZ crfVĚi Qb wK bv Zv hvPvB Kivi Rb` crfVi gŋS tKŋtv tKŋtv  
RvqMvq t`qv itqtQ *Abkxj b* | *Abkxj b*, tjv Avcbŋtk mgvav KiĤZ nte| Gme *Abkxj b*  
Avcbvi Āvb I `ŋZv ewxĤZ mnvqZv Kite|

### *mvi gg<sup>©</sup>*

cĀqvRtŋb crfVi tkŋl mvi gg<sup>©</sup> t`qv AvtQ | mvi gg<sup>©</sup> cto Avcib wŋw`Ā crfVi wclqe` m=utK<sup>©</sup>  
AwZ mnŋRB avi Yv wŋtZ crfVĚb|

### *crfVĚi gj`vqb*

cĀZw crfVi tkŋl Avcib KZUKzeStZ tctiQb Zv hvPvBtqi Rb` itqtQ crfVĚi gj`vqb |  
cvwU fŋtjvfŋte tevSvi ci crfVĚi gj`vqbtbi cŋtjvi DĚi t`qui tPōv Kily| AZci  
Avcbvi t`qv DĚi BDŋbU tkŋl t`qv DĚi i mŋ\_ wgvj tg wbb | me, tjv DĚi mŋVK ntj  
cieZ<sup>©</sup>cvw i i Kily Ab`\_vq cvwU cŋi vq cob |

### *Povšlgj`vqb*

cĀZ BDŋbtUi tkŋl itqtQ *Povšlgj`vqb* | GĤZ msŋŋB I i Pbvj-K cŋtjvi AvtQ | G cŋtjvi  
DĚi `Zwi Kivi tPōv Kily, hv Avcbŋtk cixŋvq fŋtjv djvdj KiĤZ mnvŋh` Kite| GŋŋtĤ  
Ab`vb` Z\_`mĤ i mnvŋh` wŋtZ crfVĚb | Gōvov cĀqvRtŋb Avcbvi wDUŋi i mŋ\_I K\_v ejĤZ  
crfVĚb | BDŋbtUi me, tjv cvw fŋtjvfŋte cotj *Povšlgj`vqbtbi* cŋtjv mgvartŋb tKŋtv  
Amvav nte bv |

## BDibU 1 gV dmj cwiPvZ

### BDibU 1 gV dmj cwiPvZ

gvby c0qvRtb th mKj MvQ cijvi Pvlver` Kti tm,tjvKB Avgiv dmj ej tZ cwi | t9tZ Lvgvti th mKj dmtji Avev` nq tm,tjvB gV dmj (Field crops) intmte cwiPZ | AZGe me MvQcijvB thgb dmj bq, tZgub gvV Rtb# Ggb me MvQcijvL gvV dmj bq | gvV dmtji msL`v AtbK | Gi gta` KZK,tjv teuk cwiPZ I euj e`euZ | euglx dmj Drcv`bi jt9m` mKj dmj m`utK©we`lwiZfvte cwiPvZ Avek`K | G dmj,tjv m`utK© hZB Avgiv Avb jvf KitZ cvie I ,iaZj Abgweb KitZ cvie, ZZB Zt`i Pvlver` m`c0hvi Y mnRZI nte |

evsj v`tk c0vb Lv` km`  
intmte avb I Mg euj  
e`euZ | Drcw`Z Lv`  
ktm`i kZKiv c0beYB  
fiv`Lj Kti AvtQ avb |

evsj v`tk c0vb Lv` km` intmte avb I Mg euj e`euZ | Drcw`Z Lv` ktm`i kZKiv c0beYB fiv`Lj Kti AvtQ avb | A\_90wZKfvte ,iaZcY©A\_P Aetnij Z tek wQy`vbr dmtji Drcv`b tguU Lv` km` Drcv`bi gvT kZKiv cv0fivM | `f c0nij Z `vbr`vi km` intmte f9v, KvLb, Pxbv, tRvqvi, he, evRiv BZ`w` wtklfvte Dtaj0LthvM | avb I Mtgi mnthvMx intmte c0ZKj c0KwZK cwi teuk Awak Drcv`b9jg GmKj `f c0nij Z `vbrkm` Drcv`bi ht\_0 A\_90wZK m`0ebv\_vKv mtZj | Pvlver`i KjtKSkj I G,tjv m`utK©c0p0 Avtbi Afve, Lv`vfvim cwieZ9b Abxvvi Kvity Gme Lv` ktm`i c0hvi m`e nt`Q br | 1970 mij t`tk Pttji Drcv`b e9x mtEj | RbmsL`vi e9xi Kvity Gi Mo c0c`Zv e9x cvqub | ZvQvov avb I Mg e`ZxZ Ab`vb` `vbrkm`, Wvj RvZxq km`, ^Zj exR, tMv-Lv` dmtji Drcv`b A\_90wZKfvte jvfRbK bq etj B gj-Z G`9lv c0vb Lv` ktm`i Dci Pvc metPtq teuk | m9zivs Lv` w0ivcE`v w0w0ZKiY Ges `vbr RvZxq Lv` ktm`i Drcv`b e9xi avievwKZv i9jvi mvt\_ Ab`vb` dmj,tjvi euj Drcv`b G t9t9t ht\_0 ,iaZj enb Kti |

Avgt`i t`tk c0ZeQib Kg teuk Lv`i NvUwZ t`Lv h9q | Lv` I c09i NvUwZ tgvKmejvq Lv` Avg`wb eve` K0wR9 `e9`wKk g9v mvt9qi Rb` avb I Mg Drcv`bi cvkvcwK Ab`vb` gvVdmj Drcv`bi wKí tbB | ZvQvov ktm`i mvt\_ Ab`vb` gvV dmj m`utK fvgKv cvj b, 9jav I `wi`a`hKiY Ges A\_90wZK fivmvg` i9jvi t9t9t ,iaZcY©fvgKv ivLtZ m9jg |

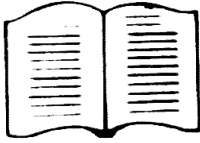
GB BDibU cvV Kti Avcub gvV dmtji cwiPvZ I c0p0MZ ,iaZj eY0v KitZ cviteb, dmj tK wewfbæfvte tk0YKiY KitZ cviteb, wewfbæcdmtji evsjv, BstiWR I Dv`c ZvE9K big wKlZ cviteb |

### cvw 1.1 dmj cwiPvZ I cymZ , iaZj



G cvV tkfI AvciB

- ◆ gvV dmtj i cwiPvZ vj LtZ cvi`teb|
- ◆ gvV dmtj i cymZ , iaZj; e`vL`v Ki tZ cvi`teb|



gvbly hfZ`e mvt\_ MvQciv v  
 tRvMvo Kti A\_`%wZK  
 , iaZj; m=ub`eth mg`l  
 Dw`m`c RvZ Drcb`e`e` gvV  
 t\_`tK Drcv`b Kti  
 tm\_`tj v`K gvVdmj  
 (Field crops) etj |

Aw`Kvj ntZB gvby weifb`ei Kg MvQmvo`v`K Lv`" nmvte e`envi Kti Avmtj I μgv`stq  
 gvby e`stZ m`f`lg nq th, weifb`ei Kg MvQciv v t\_`tK weifb`ei Kg Drcb`e`e` cvl qv hvq| tKvb  
 MvQ t\_`tK `vbr, tKvb MvQ t\_`tK v`Pvb Avevi tKvb MvQ t\_`tK Avka, BZ`w` weifb`e`Drcb`e`e`  
 cvl qv hvq| gvby GmKj Dw`m`c tK tRvMvo Kti hfZ`e mvt\_ Rb`v`tZ v`tK Ges weifb`ei Kg  
 MvQciv vRvZ `e` Drcv`b Kti vbtR`ti c`v`qvRb v`gUvq| mZivS gvby hfZ`e mvt\_ MvQciv v  
 tRvMvo Kti A\_`%wZK , iaZj; m=ub`eth mg`- Dw`m`c RvZ Drcb`e`e` gvV t\_`tK Drcv`b Kti  
 tm\_`tj v`K gvVdmj (Field crops) etj |

gv`fvi me MvQB dmj bq| gvby c`v`qvRb hv Dw`m`c t\_`tK Drcv`b Kti ZvB dmj | dmj  
 gvby i Lv`" I cymI Pwn`v v`gUvq| Avgiv th mg`l Dw`m`c RvZ c`v`Lvb, Zvi meB Lv`" bq|  
 Rxeb aviY, t`n`K m`y`mej, Kg`f`lg I t`tni e`v`x mva`tbi Rb`" th me Dw`m`c RvZ Drcv`v`tbi  
 c`v`qvRb, tmme Drcv`b mek`o e`-`tK Dw`m`c RvZ Lv`" etj | gvV dmj gvby i Lv`" i c`v`vb  
 Drcv`b

Rvg Pvl t\_`tK i`ia Kti exR Drcv`b ch`Sf c`v`ZvU c`f`f`tc c`v`qvRbx hfZ`e ZviZtg`i  
 v`f`v`E`Z gvVdmj i `eik`o`\_`tj v`v`b`e`f`c`:

1. mvariYZ gvVdmj thgb avb, cvU, Mg BZ`w` mgw`MZ fite Pvl Kiv hvq| v`K`S` Kjv,  
 Avg, Rvg BZ`w` dj RvZxq dmtj mvariYZ c`v`ZvU MvQ`K GKK fite hZ`v`bqv nq|
2. mvariYZ gvV dmj teov vbg`f`Yi c`v`qvRb nq bv| v`K`S` mevR P`f`I teov vbg`f`Yi c`v`q  
 Avek`K e`v`cvi |
3. gvV dmj mvariYZ GK mg`tq cwi`c` nq Ges GK mg`tq m`M`h Kiv nq| Aci c`f`f`  
 mevR RvZxq km` thgb- U`f`g`Uv, te\_`b BZ`w` av`c av`c cwi`c` I m`M`h Kiv nq|
4. gvV dmj thgb-avb, cvU, Wvj, `Zj exR BZ`w` mvariYZ i`v`K`q e`envi Kiv nq| v`K`S`  
 mevR I dj RvZxq dmj mvariYZ ZvRv Ae`v`q e`envi Kiv nq|

Dctiv`3 `eik`o`\_`tj v` gvV dmtj i Rb`" tKvb m`v`v`l`0 `eik`o`" bq| mvariY fite gvV  
 dmj ,`tj v`K KvlZv`E`K dmj (Agronomic crops) Ges evMvb dmj (Garden crops)  
 ,`tj v`K D`"v`bZv`E`K dmj (Horticultural crops) ej v nq|

gvVdmj ,`tj vi g`ta` avb,  
 Mg, f`f`v, he BZ`w` ZU`z  
 RvZxq km` (Cereal  
 crops) | G\_`tj vi g`ta`  
 avb Avgt`i i c`v`vb Lv`" |

G gvVdmj ,`tj vi g`ta` avb, Mg, f`f`v, he BZ`w` ZU`z RvZxq km` (Cereal crops) | G\_`tj vi  
 g`ta` avb Avgt`i i c`v`vb Lv`" | mek| RbmsL`vi c`v`q A`ta`R`B c`v`vb Lv`" nmvte Pvj e`envi  
 Kti | fvi`tZ me tP`tq teik Rvg avb P`f`I e`e`v`Z nq| evsj v`tk t`gUv Avev` Rvgi c`v`q  
 80% Rvg`tZ av`tbi Pvl nq| cymI meP`f`I avb Avgt`i i kK`Pv (Carbohydrates) RvZxq  
 Lv`" i c`v`vb Pwn`v v`gUv`q v`tK| kK`Pv Qvovl G`tZ kZKiv 8 f`vM Avv`g`I I (Protein)  
 i`f`q`Q| M`h`g`b`x (Gramineae/Poaceae) cwi`et`ii A`S`f`y GB ZU`z RvZxq dmj ,`tj v`  
 Avgt`i i c`v`vb Lv`" nmvte e`e`v`Z n`q Avm`t`Q| v`ki t\_`tK Av`v`c`K`ti mKj eq`f`mi gvby G  
 Lvevi v`biv`c`f` M`h`Y Ki`tZ c`v`ti | v`ki`f`i`f`K c`v`g k`3 Lvevi nmvte ZU`z RvZxq Lv`" B`" t`q  
 nq| gvby i cym`tZ G RvZxq dmtj i v`v`vU Ae`v`b i`f`q`Q|

gvV dmj ,`tj vi g`ta` gmj, tQjv, gvI, gM, Aoni, tLmvi, gUi, BZ`w` Wvj RvZxq dmj |  
 G dmj ,`tj v`Z c`v`z cwi`g`f`Y Avv`g`I v`v`gvb| Kvl.c`v`vb evsj v`tki f`v`g e`e`v`c`v`i Rb`" G

dmj Awak ,iazcyf RngtZ mbwofite km Pvl Kitj gmlU i Re c`v Avt`I Avt`I Ktg hvq| A\_P GB Wvj RvZxq km Pvl Kitj gmlUz igt\_vRwe cluqvq bVbtUtRb mshy nta gmlU DePZv I Drcv`b ֿIgzv mK ivtL| G dmj iaygvbtj i cyotZB bq, Mpcwv Z ci i I Ab`Zg Lv`` Dm| G me dmtj i fukl D`P Avgl mgx ci Lv`` mntme e`euZ nq|

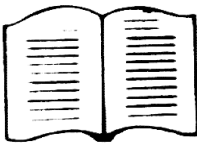
Avgt`i t`tk ci Lv``i Rb` PviY fvgi fvgKvl ,iazcyf met`tk PviY fvgtZ Nvm RvZxq ktm`i mvt\_ wewfbae Kg 0vj ,g0 (Legume) RvZxq ktm`i wgaPvl Kti Rvgi cyoKi Lv``i Pwn`v wglvbtv nq| PviYfvgtZ ci i eR`e` ֿij ,g RvZxq ktm`i Dcv`wZtZ Lv``vcr`vb Ptu i mgst mirab Kti| dtj PviYfvgtZi ֿij ,g km Lv``vcr`vb e`vcrbvq ,iazcyf fvgKv cij b Kti| gvV dmtj i Aš-fy ֿZj exR dmj Avgt`i kixi t`m RvZxq c`vt\_ P thvMvb t`q| mqvexb GKB mt½ Wvj I ֿZj exR dmj mntme cyotZ ,iazcyf fvgKv cij b Kti|

gvV dmj ,tjv Avgt`i clqvRbxq cyoi clq mKj Dcv`vbi thvMvb w`tZ cvti| Lvieti th tKvb GKw Dcv`vb μgvlMZfite AchfB ֿvKtj A\_ev mawYfite ev` cotj t`tn tm Dcv`vbi Afite tivtMi j ֿIY t`Lv t`q| G Ae`vK cyonxbZv etj| cyonxbZvi KvitY evsj vt`tk clq eQtii Kg eqtmi eu wki wewfbaetivtM Avlvšl nq ev AKvtj gZzgtL cvZZ nq| AvbgnvbK mntme evsj vt`tki clq kZKiv 80 Rb tjvK tKvb bv tKvb cyonxbZvq Avlvšl| dtj Zit`i ֿv` ֿy nta cto| Kg ֿIgzv Ktg hvq Ges Zviv AKvtj gviv hvq| gvV dmtj i eAvvbK Pvlver` Lv`` wivcEv wvōZ KitZ I cyonxbZv ֿy KitZ Dttj LthvM fvgKv ivLtZ cvti|

AvbgnvbK mntme evsj vt`tki clq kZKiv 80 Rb tjvK tKvb bv tKvb cyonxbZvq Avlvšl|

gvV dmj gvby I Ab`vb` c0Yxi cyoi thvMvb t`q| cyo cluqvq cvK`jxtZ Lv`` e` tft½ mij Dcv`vrb cwiYZ nq Ges t`tni cbMfB I ewxi Rb` Zvc mup Kti| G Qvovl cyo t`tn tivM clZti vaK ֿIgzv ewx Kti| t`tni cyo mratbi Rb` Lv`` myg cyo Dcv`vb ֿvKv clqvRb| t`tni Rb` clqvRbxq cyo Dcv`vb gj-Zt` ֿjlv Dm t`tk cvl qv hvq| G ֿjlv Dm ntjv Dw`c I c0Yx| Gi gta` Aek` clbR tclUv ֿfveZB fij RvZi tclUv| wKš wewfbae KvitY Dw`c RvZxq tclUv clbR tclUvbi tPtq ,iazcyf D`vniY`tfc clbR tclUv t`tni Rb` AtbK tֿI AvZ mntRB KvhRix ntj I ֿv`i Rb` Sdkcyf Ges Gt`i ֿvg| tewk| Lwmi gism I tlv-gism cyoi ,tj Dbz ntj I u`ti vMm wewfbae ֿv`MZ Ae`vq tek Sdkcyf GtֿI Dw`c RvZ Avgl Avgt`i kixii clqvRbxq cyoi thvMvb w`tZ cvti| Wvj I ֿZj exR RvZxq dmj AvZ mntR Kg LiP Drcv`b Kti t`tni clqvRb wglvbtv hvq| t`tki mvariY gvby ֿZj exR I Wvj RvZxq km e`envi Kti Zvt`i clqvRbxq Avgl ev gvsłmi Pwn`v wglvtq ֿvK| Wvj RvZxq dmj Avgl mgx etj Gme dmj tK Mixei gism (Poor man's meat) etj Avfuz Kiv nq|

Wvj RvZxq dmj Avgl mgx etj Gme dmj tK Mixei gism (Poor man's meat) etj Avfuz Kiv nq|



**mvi gg**<sup>©</sup>  
dmtj i mt½ gvbtj i cwiPvZ AtbK w`tbi| gvV dmj ,tjv gvby htZe mvt\_ wbtRi clqvRtb gvV Rvbtq ֿvK| gvV dmj gvbtj i Lv`` I cyoi clvb Dm| Avgiv ֿjlv Dm t`tk cyoi Pwn`v wglvB, Gi GKw c0Yx Avi Ab`w Dw`c | gvV dmj ,tjv Dw`c RvZ cyoi Ab`Zg Dm hv Kg Sdkcyf wivc`| mKj eqtmi mKj tklYi gvby Kg LiP G Dm t`tk cyoi Pwn`v ctY KitZ cvti| G dmj ,tjvi gta` avb, AvL, mwi lv, Wvj, ֿZj exR BZ`w` dmj gvbtj i cyo Pwn`v tglvbtv chfB Dcv`vrb mgx| t`tki RbmsL`vi GKw epr msl`v Acyō I Abivt i fMto| evsj vt`tki mvariY KIKivl G dmj ,tjv AvZ mntR Drcv`b Kti Zvt`i G Pwn`v tglvZ mֿIgl| GB cyo Pwn`v tglvbtv Rb` G dmj ,tjvi Dbqb I eAvvbK Dcv`vrb Pvlver` i gva`tg dj b evovbtv DwPZ|



### cuVhEi gj`iqb 1.1

mWVK DEti i cuKqUK wPy (v) w`b|

1. tKvbW gvV dmj bq?  
(K) avb (L) Kjv (M) Mg (N) tRvqvi
2. PvDtj kZKiv KZ fvM Avngl \_vK?  
(K) 8 (L) 10 (M) 12 (N) 14
3. tKvb dmj tK Mixtei gvsm ejv nq?  
(K) Wvj dmj (L) %Zj exR dmj  
(M) `vbn RvZxq km` (N) Pvi Y figi dmj |
4. tKvbW Wvj I `Zj exR dmj ?  
(K) tLmwi (L) mqvexb (M) gmjy (N) Pxbvev`vg
5. t`tni Rb` cOqvRbxq Avngl cvl qv hvq tKvb Drm t`K?  
(K) cOYx (L) DwM` (M) DwM` I cOYx (N) gvQ I gvsm



### cw 1.2 dmtj i wefba`kiv`efw

G ciV tk`l AvciB

- ◆ wefba`vte gvV dmtj i tk`Yieb`vm Ki`Z cvi`b|
- ◆ dmtj i tk`Yieb`v`mi w`f`E D`j`L Ki`Z cvi`teb|
- ◆ dmtj i tk`Y Ab`v`q`x`b`v`g` l` e`envi ej`Z cvi`teb|



gvby c`q`v`R`b` th` m`Kj` M`v`Q`v`j` vi` P`v`I`v`e`v` K`i` Z`v`K`B` Av`g`iv` d`m`j` ej`Z` c`w`i` |` G`B` d`m`j` ev` km` m`v`t`U` w`e`v`i` Z`f`v`te` ch`q`j` v`P`v`b` l` m`g`z`v`te` A`v`b`v`R`B` A`v`e`k`K`|` Kul` w`e`A`v`b` l` c`h`v`p`i` w`e`f`b`e` A`v`t`b`i` A`v`t`j` v`t`K` d`m`t`j` i` t`k`Y`ieb`v`m` K`iv` n`t`j`v`:

### gv dmtj i tk`iv`efw

gvV dmtj t`K` w`b`v`j` w`L`Z` c`K`v`i` t`k`Y`K`i`Y` K`iv` h`v`q`-

### 1. Kul`Z`w`E`K` D`c`v`q` t`k`v`K`i`Y

#### (K) ZU`z`R`v`Z`x`q` km` (Cereals)

M`h`g`b`x` (Gramineae) ev` N`v`m` c`w`i` ev`t`i` i` A`S`M`Z` a`v`b` M`g` h`e` f`j`v` ev`R`iv` t`R`v`q`v`i` P`x`b`v` K`v`l`b` i`v`B` B`Z`w` km` Av`g`v`t`i` i` w`b`K`U` c`w`i` w`P`Z`|` G` c`w`i` ev`t`i` i` A`v`v`t`i`v`c`t`h`v`M`x` `v`b`v` R`v`Z`x`q` km` t`j` v`B` n`t`j`v` Z`U`z` d`m`j` (Cereal crops)|

M`h`g`b`x` (Gramineae) ev` N`v`m` c`w`i` ev`t`i` i` A`S`M`Z` a`v`b` M`g` h`e` f`j`v` ev`R`iv` t`R`v`q`v`i` P`x`b`v` K`v`l`b` i`v`B` B`Z`w` km` Av`g`v`t`i` i` w`b`K`U` c`w`i` w`P`Z`|` G` c`w`i` ev`t`i` i` A`v`v`t`i`v`c`t`h`v`M`x` `v`b`v` R`v`Z`x`q` km` t`j` v`B` n`t`j`v` Z`U`z` d`m`j` (Cereal crops)|

#### (L) W`j` d`m`j` (Pulses or Grain legumes)

w`j` w`g`t`b`w`m` (Leguminosae) c`w`i` ev`t`i` i` c`w`i`w`c`v`j` l` t`b`w`m` (Papilionaceae) D`c`-c`w`i` ev`t`i` i` t`h` m`K`j` `v`b`v` R`v`Z`x`q` d`m`j` W`t`j` i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` W`j` d`m`j` ej`v` n`q`|` g`m`i` (Lentil), t`Q`v`j`v` (Chickpea), t`L`m`w`i` (Grasspea), g`U`i` (Pea), g`v`l` (Black gram), g`M` (Green/Golden gram), A`o`n`i` (Pigeon pea), e`i`e`w`U` (Cowpea) B`Z`w` W`j` d`m`j` i` A`S`f`v`|

w`j` w`g`t`b`w`m` (Leguminosae) c`w`i` ev`t`i` i` c`w`i`w`c`v`j` l` t`b`w`m` (Papilionaceae) D`c`-c`w`i` ev`t`i` i` t`h` m`K`j` `v`b`v` R`v`Z`x`q` d`m`j` W`t`j` i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` W`j` d`m`j` ej`v` n`q`|` g`m`i` (Lentil), t`Q`v`j`v` (Chickpea), t`L`m`w`i` (Grasspea), g`U`i` (Pea), g`v`l` (Black gram), g`M` (Green/Golden gram), A`o`n`i` (Pigeon pea), e`i`e`w`U` (Cowpea) B`Z`w` W`j` d`m`j` i` A`S`f`v`|

#### (M) `Z`j`e`x`R` (Oil seed) d`m`j`

G` km` P`w`e`q`K`se`v` t` `w`R`v`Z`x`q` D`c`v` v`t`b`i` c`a`v`b` D`r`m`|` t`h` m`K`j` d`m`t`j` i` e`x`R` t`\_`t`K` `Z`j` m`S`M`h` K`iv` n`q` t`m` t`j` v`t`K`B` `Z`j`e`x`R` d`m`j` e`t`j` |` m`w`i` l`v` (Rape or Mustard), P`x`b`v`e`v` i`g` (Peanut or Ground nut), w`Z`j` (Sesame), m`q`v`e`x`b` (Soyabean), m`h`g`v`l`x` (Sunflower), K`w`y` d`z` (Safflower), M`R`B` w`Z`j` (Niger), w`Z`w`m` (Linseed), t`i`w`O` (Castor) B`Z`w` `Z`j`e`x`R` d`m`t`j` i` D`v`n`i`Y`|

G` km` P`w`e`q`K`se`v` t` `w`R`v`Z`x`q` D`c`v` v`t`b`i` c`a`v`b` D`r`m`|` t`h` m`K`j` d`m`t`j` i` e`x`R` t`\_`t`K` `Z`j` m`S`M`h` K`iv` n`q` t`m` t`j` v`t`K`B` `Z`j`e`x`R` d`m`j` e`t`j` |` m`w`i` l`v` (Rape or Mustard), P`x`b`v`e`v` i`g` (Peanut or Ground nut), w`Z`j` (Sesame), m`q`v`e`x`b` (Soyabean), m`h`g`v`l`x` (Sunflower), K`w`y` d`z` (Safflower), M`R`B` w`Z`j` (Niger), w`Z`w`m` (Linseed), t`i`w`O` (Castor) B`Z`w` `Z`j`e`x`R` d`m`t`j` i` D`v`n`i`Y`|

#### (N) w`P`v`b` d`m`j` (Sugar crops)

t`h` m`K`j` d`m`t`j` i` i`m` t`\_`t`K` w`P`v`b` w`o` w`g`Q`w`i` B`Z`w` w`g`w`O` R`v`Z`x`q` c`v`\_`D`r`c`v` t`b`i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` w`P`v`b` d`m`j` e`t`j` |` A`v`L` (Sugarcane), e`x`U` (Sugarbeet) B`Z`w` w`P`v`b` R`v`Z`x`q` d`m`t`j` i` A`S`f`v`|` t`L`R`j`y` Z`v`j` h`v` l` g`v`V` d`m`t`j` i` A`S`f`v` b`q` G` t`j`v`l` w`P`v`b` d`m`t`j` i` A`S`f`v`|

t`h` m`K`j` d`m`t`j` i` i`m` t`\_`t`K` w`P`v`b` w`o` w`g`Q`w`i` B`Z`w` w`g`w`O` R`v`Z`x`q` c`v`\_`D`r`c`v` t`b`i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` w`P`v`b` d`m`j` e`t`j` |` A`v`L` (Sugarcane), e`x`U` (Sugarbeet) B`Z`w` w`P`v`b` R`v`Z`x`q` d`m`t`j` i` A`S`f`v`|` t`L`R`j`y` Z`v`j` h`v` l` g`v`V` d`m`t`j` i` A`S`f`v` b`q` G` t`j`v`l` w`P`v`b` d`m`t`j` i` A`S`f`v`|

#### (O) A`v`k`a` d`m`j` (Fibre crops)

t`h` m`K`j` d`m`j` A`v`k` D`r`c`v` t`b`i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` A`v`k` d`m`j` e`t`j` |` c`v`U` Z`j`v` k`b`c`v`U` (Sunnhemp), t`K`b`v`d` (Kenaf), i`v`g`x` (Ramie) B`Z`w` D`t`j` l` t`h`v`M` A`v`k` d`m`j` |

t`h` m`K`j` d`m`j` A`v`k` D`r`c`v` t`b`i` R`b` P`v`l` K`iv` n`q` t`m` t`j` v`t`K` A`v`k` d`m`j` e`t`j` |` c`v`U` Z`j`v` k`b`c`v`U` (Sunnhemp), t`K`b`v`d` (Kenaf), i`v`g`x` (Ramie) B`Z`w` D`t`j` l` t`h`v`M` A`v`k` d`m`j` |

**(P) tbkv RvZxq dmj (Narcotic crops)**

th mKj dmj tbkvRvZxq `e` Drcv`tbi Rb` Pvl Kiv nq, tm,tjv`K tbkv RvZxq dmj etj | G RvZxq dmj mivaiYZ qWZKviK c`v`\_v`K hv Ng I AjmZv Av`b Ges e`\_v te`br`i` Kti | mPmKrmv kv`i;Gmtei weiea e`enri Av`Q | wKŠ`mivaiYZ Gt`i e`enri nq gv`K `e` wnmvte | ZvgvK (Tobacco), Avwdg (Opium poppy), MvRv (Indian hempplant), K`e(Kumbhi), tnb`teb (Henbane) BZ`w` GB RvZxq dmj i AŠf` |

**(Q) cubxq dmj (Beverage crops)**

cubxq `e` Drcv`tbi Rb` th mKj dmj Pvl Kiv nq, tm,tjv`K cubxq dmj etj | G me dmj mivaiYZ t`tn c`p mieivn Kti br | Pv (Tea), Kwcd (Coffee), tKv`Kv (Cocoa), tKvjv (Cola) BZ`w` cubxq dmj | G RvZxq dmj t`\_tK D`ixcK cubxq `e` Drcv`b Kiv nq etj G,tjv`K D`ixcK cubxq Drcv`bKvix km` brtg Av`wvZ Kiv nq |

**(R) ci`Lv` dmj (Forage crops)**

th mKj dmj ci`i Lv` wnmvte Rb`tbn nq, tm,tjv`K ci`Lv` dmj etj | Avevi th mg`i ci`Lv` PviY fvgtZ Pvl Kiv nq, tm,tjv`K PviY fvgi km` (Pasture crops) ejv nq | PviY fvgtZ mivaiYZ ZY RvZxq Dw`c Pvl Kiv nq Ges ci` wPviY Kti km` Lvq | f`v (Maize), tRvqvi (Sorghum) `vbn RvZxq km` Qvovl ci`Lv` wnmvte Pvl Kiv nq Ges Avgiv c`Pij Zfvte Fodder crop etj \_wK | Avevi `eP Nvm (Bermuda grass), Kv`cNvm (Carpet grass) I wvfbacKvi tKv`vii (Clovers) PviYfvg ci`Lv` `i D`vniY |

evsj v`tki KIKMY tLmvi x ev Nvm KvjvB t`q`tZ Mew` ci` Lv` tMto teta w`Z GKmgq | dmj ,tjv` Forage crop wnmvte e`eüZ n`Zv |

th mKj dmj ci`i Lv` wnmvte Rb`tbn nq, tm,tjv`K ci`Lv` dmj etj | Avevi th mg`i ci`Lv` PviY fvgtZ Pvl Kiv nq, tm,tjv`K PviY fvgi km` (Pasture crops) ejv nq |

**(S) meR mvi dmj (Green manuring crops)**

th mKj meR km` gvUv miv` wgvktq w`tq `Re mvi `Zwi i Rb` Pvl Kiv nq, Zv`i`K meR mvi dmj etj | aB`Av (Dhaincha), kbcvU (Sunnhemp) BZ`w` meR mvi dmj |

th mKj meR km` gvUv miv` wgvktq w`tq `Re mvi `Zwi i Rb` Pvl Kiv nq, Zv`i`K meR mvi dmj etj |

**2. Drcv`tbi tgŠmg Ablyqx tkw`KiY**

K. i`e km` : t`v`iv avb, Mg, he, mvi Iv, Wvj RvZxq dmj thgb gmiy, tQvjv BZ`w` |

L. Lwi c km` : (1) Lwi c 1 km` - AvDk avb, cvU, f`v BZ`w` |

(2) Lwi c 2 km` - Avgb avb, mh`lyx, mqv`xb BZ`w` |

M. Dfq tgŠmg km` : wZj , KvI b, f`v, P`bv ev`vg BZ`w` |

**3. ci`w`q`tbi (Pollination) w`v`E`Z**

K. `^ci`vMx : avb, Mg, ZvgvK, Wvj dmj BZ`w` |

L. ci-ci`vMx : mvi Iv, f`v, d`Kw, evav Kw, MvRi BZ`w` |

M. `^i ci`vMx : Z`v, mh`lyx BZ`w` |

**4. R`ebKv`j i (Life cycle) w`v`E`Z**

K. GKelP(Annual) dmj : avb, cvU, ZvgvK BZ`w` |

L. w`-elP(Biennial) dmj : m`vi exU, MvRi BZ`w` |

M. eü elP(Perennial) dmj : Pv, Kwcd, Avg, Rvg, K`v`v BZ`w` |

**5. exRcĪi (Cotyledon) mSL'vi vfiĒtZ**

K. GK exRcĪx dmj : avb, Mg, fẏv, Pxbv, Kvl b BZ'w` |

L. w̄exRcĪx dmj : cvU, mwi Iv, ZvgvK, Wvj km BZ'w` |

**6. dĵ Drcv`tb w`tbi ẏtNq vfiĒtZ**

K. LıfUv w`em (Short day) dmj : cvU, AvL, w̄wó Avj yAvgb avb BZ'w` |

L. ẏtNq`em (Long day) dmj : mMyi exU, etavKuc, cij s kvK BZ'w` |

M. w`b wbi tCq (Day neutral) dmj : mqvexb, fẏv, AvDk avb, tevfi v avb BZ'w` |

**7. gvUli A=Źj vfiĒtZ**

K. A=amnbkxj dmj : Pv, Kucd BZ'w` |

L. q̄vi mnbkxj dmj : mMyi exU, avb BZ'w` |

M. wbi tCq gvUli dmj : cvU, Mg, AvL BZ'w` |

**8. AvfthvRb ZvcgvĪvi vfiĒtZ**

K. Dò Rj evqj dmj : AvL, cvU, avb BZ'w` |

L. AeDò Rj evqj dmj : gmj, tQvj v, Aoni BZ'w` |

M. kxZj Rj evqj dmj : Mg, he, mMyi exU BZ'w` |

**9. gvUli Av`Zvi vfiĒtZ**

K. mvariY f̄vgi dmj (Mesophyte) : cvU, Mg, w̄wó Avj yBZ'w` |

L. giæAAtj i dmj (Xerophyte) : tRvqvi, evRiv, Kivvfv, dmbgbmv, kZgj-x, Avbvi m BZ'w` |

M. Rj xq dmj (Hydrophyte) : Rj x avb, cvbKPz AvtRvj v, WvKDBW, kvcj v, cU BZ'w` |

N. jeYv<sup>3</sup> Gj vKvi dmj (Halophytes) : nvrRtMvRv, WvUvi tKvb tKvb cRwZ (Amaranthus spp.), MKĵ KvUv (Asteracantha longifolia), tKl ov, tMvovb, mÿix - hw I Gi me, tj v dmj bq |

**10. dmtj i cwi evfi vfiĒK tkvKiy**

K. Mhgbx (Gramineae) ev Nvm cwi evfi i dmj : avb, Mg, fẏv, AvL BZ'w` |

L. gvj t̄fvm cwi evfi i dmj : tKbvd, Zĵv BZ'w` |

M. wj , w̄gtbvm ev Wvj cwi evfi i dmj : gmj, tQvj v BZ'w` |

N. wUvj tqvm cwi evfi i dmj : cvU |

O. tmvj vt̄bvm cwi evfi i dmj : ZvgvK, Avj yBZ'w` |

P. μm̄tdwi cwi evfi i dmj : dĵ Kuc, etavKuc, I j Kuc, mwi Iv, gj-v, kvj Mg BZ'w` |

Q. Kt̄=úwRwU cwi evfi i dmj : mh̄gLyx, Kmg dĵ BZ'w` |

**11. dmtj i nekI tkIvefll (Special classification)**

eQtii cãvb`jlv dmtj i  
AšëZx Kij xb mgtq hw`  
GKuU`f Rieb Kij nekó  
dmtj (Short duration  
crop) Pvl Kiv nq Zte  
ZtK Catch crop ev  
AšëZx Kij xb dmtj ejv  
nq|

**K. AšëZx dmtj (Catch crop)**

eQtii cãvb`jlv dmtj i AšëZx Kij xb mgtq hw` GKUU`f Rieb Kij nekó dmtj (Short duration crop) Pvl Kiv nq Zte ZtK Catch crop ev AšëZx Kij xb dmtj ejv nq| Avgv`i t`tk tev`iv avb I tivcv Avgb avb Pvl i gvSigmS AšëZx Kij xb Pxbv ev Kvl b dmtj Pvl G dmtj i D`vni Y| AšëZx Averi GtK Gi`fc msÁmqZ Kt`itQb th, wejfc cKwZi Kvi tY cãvb dmtj mdj Kvg br n`j`f Zg msu`fB mgtq th dmtj Pvl Kiv nq ZtK Catch crop ev nekI dmtj etj (Avj g I Ab`vb`, 1988)|

**L. A`Rix (Cash) dmtj**

mivavi YZ th dmtj nekI Kti Pvl x Zvi Ab`vb` Li tPi thvMvb t`q, tmB dmtj tK A`Rix dmtj etj | thgb ZvgvK, cvU, AvL BZ`w` |

**M. Av`Qv`b (Cover) dmtj**

cãvbZ fvg`f q tiva Kivi Rb` th dmtj Oviv Rvg Av`Qv`Z Kti i vLv nq, tm dmtj tK Av`Qv`b dmtj etj | Pxbv ev`vg, tKv`fvi, Kt`cB Nvm, `e`Nvm BZ`w` G dmtj i D`vni Y|

**N. msiw`fZ tMv-Lv` dmtj (Silage crop)**

fivel`tZ ev tgSmg Ovov Ab` mgtq e`enrti i j`t`f` Pvl Kti meR I imvj Ae`vq nekI c`wZtZ c`uquRvZ Kti`Zwi dmtj tK msiw`fZ tMv-Lv` dmtj etj | f`zv, tRvqvi, tbwqvi Nvm BZ`w` dZ Avmvi cte`meR I imvj Ae`vq c`uquRvZ Kti tMv-Lv`i Rb` msiw`fY Kiv nq|

**O. w`k` (Mixed) dmtj**

GKwaK dmtj i exR GK mvt` w`k` GKB RvgtZ Pvl KZ. dmtj tK w`k` dmtj etj | gmj Wvj I MgeXR GK mvt` w`k` QuUtq tevbr Rb`v`bv dmtj B w`k` dmtj |

cãvb dmtj i mwi i gv`S  
Ab` dmtj Pvl Kivi  
c`wZtK Avš` dmtj etj |

**P. Avš` dmtj (Inter-cropping)**

cãvb dmtj i mwi i gv`S Ab` dmtj Pvl Kivi c`wZtK Avš` dmtj etj | cãvb dmtj Mtgi mvt` gmj i exRvii Kvgtq GK mvt` Pvl Ktj Avš` dmtj Pvl ejv nq|

**Q. mww (Relay) dmtj**

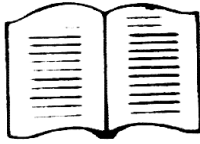
GKB RvgtZ`w` dmtj i Pvl nq Ges GKwU Rieb Pmu tkl nI qvi cteB Ab`wU H RvgtZ ecb Kiv nq| Avgb avtbi RvgtZ mww dmtj wnmite tLmwi i Pvl Gi D`vni Y|

**R. e`u`Y dmtj (Multiple cropping)**

GKB RvgtZ GK eQtii GKwaK dmtj Pvl Kiv tK e`u`Y dmtj Pvl etj | GKB RvgtZ eQtii AvDk, Avgb Ges tev`iv avtbi Pvl e`u`Y dmtj Pvl i D`vni Y|



**Ablyj b** (Activity): Avcbvi GjvKvq mPivPi Drcbenq Ggb gvVdmj mgtni tkivYefvM Kiab



**mvi gg**

dmj tk we lwi Zfvte Rvbvi Rb" we wfbte tkivYKiY Kiv ntqtQ | Kwl ZvEJ Dcvtaq dmj tk ZUj, Wvj dmj, Zj exR dmj, wPib dmj, Atk dmj, tbkv RvZxq dmj, civxq dmj, ciLv" dmj I meR mvi dmj fivM Kiv ntqtQ | Drcv`b tgSmg Ablyvqx iwekm", Lwi c km" I Dfq tgSmg ktm" tkivYKiY Kiv ntqtQ | civMvqtb i wfvEzZ ^civMx, ci-civMx, I ci-civMx ktm" tkivYKiY Kiv ntqtQ | RiebKvtji wfvEzZ GK el, wdel I eu el dmj fivM Kiv ntqtQ | exRcti msLvi wfvEzZ GK exRcti (Monocotyledonous) dmj, wOexR cix (Dicotyledonous) dmj tkivYKiY Kiv ntqtQ | dz Drcv`tb w`bi ^tnq wfvEzZ LvUv w`em dmj, `xNw`em dmj I w`b wbi`c q dmj fivM Kiv ntqtQ | gwUj A`Zji wfvEzZ A`mnbkxj dmj, qvi mnbkxj dmj I wbi`c q gwUj dmj fivM Kiv ntqtQ | Avf`thvRb gvivi wfvEzZ D` Rjevqj dmj, Ae D` Rjevqj dmj I kvZj Rjevqj dmj tkivYKiY Kiv ntqtQ | cwbi c`qvRbxqZvi wfvEzZ mvaviY fvgi dmj, giaz AA`ji dmj, I jeYv<sup>3</sup> GjvKvi Rjxq dmj fivM Kiv ntqtQ | dmj i cwi ev`ii wfvEzZ Mhgbx, gvj`fw, wj , wgtbw, wUvj`qum, tmvj`vbw, μwntdwi, Kt`úwRwU cwi ev`ii dmj wnmvte tkivYKiY Kiv ntqtQ | dmj i we`kl tkivYKiYi gva`tg AšéZxRijxb ev weKí dmj, A`Rix dmj, Av`Qv`b dmj, msiw`qZ tMv-Lv" dmj, wgv<sup>a</sup> dmj, Avštdmj, mww dmj I eu , Y dmj fivM Kiv ntqtQ |



### cuVhEi gj`iqb 1.2

mWVK DĒti i cuKqUK wPy (√) w`b

1. tKvbU tbrv RvZiq dmj ?

K. Pr L. tnbteb

M. ivgx N. tiwo

2. tKvbU Avk RvZiq dmj ?

K. tKbrd L. tiwo

M. Kæc N. exU

3. tKvbU A\_Rix dmj ?

K. avb L. tRvqi

M. ZiqvK N. gmj

4. tKvbU giæ AĀtj i dmj ?

K. avb L. cvU

M. Zjv N. tRvqi

5. tKvbU LvUv w`em DwM ?

K. cvU L. exU

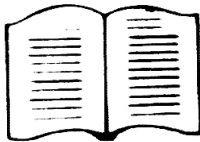
M. mqvxb N. fÆv

**cw 1.3 wefbaedmtj i BstiiR I DiiwZwEjK big**



G ciV tkfI Avciib

- ◆ wefbaedmtj i eivsv I BstiiR big wj LtZ cvi teb|
- ◆ dmtj i DiiwZwEjK MY I cRmZi big Dtj L Ki tZ cvi teb|



gvV dmj , tj vK wefbaevte bigKiY Kiv ntqtQ| tKvb tKvb dmtj i Avevi GKwaK eivsv I BstiiR big itqtQ| DiiwZwEjK bvtgi mvaviYZ ˘jlv Ask itqtQ| cUg bvgU MY big (Generic name) Ges uZixquU cRmZ big (Species name)| GB bigKi tYi cxwZ tK uOc ˘ bigKiY (Binomial nomenclature) etj | GLb wefbaegvV dmtj i eivsv bvtgi mvt\_ BstiiR I DiiwZwEjK big t`qv ntj v:

DiiwZwEjK bvtgi mvaviYZ ˘jlv Ask itqtQ| cUg bvgU MY big (Generic name) Ges uZixquU cRmZ big (Species name)| GB bigKi tYi cxwZ tK uOc ˘ bigKiY (Binomial nomenclature) etj |

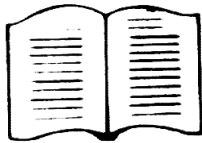
μgK bs	eivsv big	BstiiR big	DiiwZwEjK big
1.	avb	Rice	<i>Oryza sativa</i> L.
2.	Mg	Spelta wheat Duram wheat	<i>Triticum aestivum</i> L. <i>Triticum durum</i> L.
3.	uUu tKij	Triticale	<i>Titcale</i>
4.	fÆv	Maize, Corn	<i>Zea mays</i> L.
5.	he	Barley	<i>Hordeum vulgare</i> L.
6.	RB	Oat	<i>Avena sativa</i> L.
7.	tRvqvi	Sorghum	<i>Sorghum vulgare</i> L.
8.	eRiv	Bajra	<i>Pennisetum typhoides</i> L.
9.	Pxbr	Italian millet	<i>Panicum miliaceum</i> L.
10.	Kvl b	Foxtail millet	<i>Setaria italica</i> L.
11.	Aoni	Redgram, Pigeon pea	<i>Cajanus cajan</i> L.
12.	tQij v	Gram, Chickpea	<i>Cicer arietinum</i> L.
13.	gUi	Pea	<i>Pisum sativum</i> L.
14.	gvl	Black gram	<i>Vigna mungo</i> L.
15.	gM	Green gram, Golden gram	<i>Vigna radiata</i> (L.) (Wilezck)
16.	gmjy	Lentil, Chickling pea	<i>Lens culinaris</i> Medic
17.	tM-gUi	Cowpea, Yard long bean	<i>Vigna sinensis</i> L.
18.	tLmvi	Grasspea, Chickling vetch	<i>Lathyrus sativus</i> L.
19.	mqvexb	Soyabean	<i>Glycine max.</i> L.

μiγK bs	evsj v big	Bst i R big	Dw` ZwiEK big
20.	evKj v Kj vB	Broad bean	<i>Vicia faba</i> L.
21.	Pxbv ev` ig	Groundnut, Peanut	<i>Arachis hypogaea</i> L.
22.	mwi l v	Rape/Mustard	<i>Brassica napus</i> L. <i>B. campestris</i> L.
23.	f`vbe; ti ox	Castor	<i>Ricinus communis</i> L.
24.	wZwm	Linseed, Flax	<i>Linum usitatissium</i> L
25.	mhgylx	Sunflower	<i>Helianthus annuus</i> L.
26.	wZj	Sesame	<i>Sesamum indicum</i> L.
27.	Kzgy djz	Safflower	<i>Carthamus tinctorius</i> L.
28.	MRB wZj	Niger	<i>Guizotia abyssinica</i> Call.
29.	Kvj wRi v	Black cumin	<i>Nigella sativa</i> L.
30.	AvL, Bq.	Sugarcane	<i>Saccharum officinarum</i> L.
31.	mMvi exU	Sugarbeet	<i>Beta vulgaris</i> L
32.	Avj .	Potato	<i>Solanum tuberosum</i> L.
33.	wgwó Avj .	Sweet potato	<i>Ipomoea batatas</i> L.
34.	ZvgvK	Tobacco	<i>Nicotiana tabacum</i> L.
35.	MuRv	Indian hemp	<i>Canabis sativum</i> L.
36.	Awcdg	Opium poppy	<i>Papaver somniferum</i> L.
37.	f`kx cvU	Deshi jute	<i>Corchorus capsularis</i> L.
38.	f`Zv v cvU	Tosha jute	<i>Corchorus olitorius</i> L.
39.	Zzv	Cotton (American) Cotton (Deshi)	<i>Gossypium hirsutum</i> L. <i>G. arboreum</i> .
40.	tg`v	Mesta	<i>Hibiscus sabdariffa</i> var. <i>altissima</i> Wester
41.	f`Kbvd	Kenaf	<i>Hibiscus cannabinus</i> L.
42.	kbcvU	Sunnhemp	<i>Crotalaria juncea</i> L.
43.	Pv	Tea	<i>Comellia sinensis</i> L.
44.	Kwd	Coffee	<i>Coffea arabica</i> L.
45.	c`vi v Nvm	Para grass	<i>Brachiaria mutica</i> Forsk.
46.	f`wvcqv i Nvm	Napier grass	<i>Pennisetum purpureum</i>

μgK bs	evsj v big	BstiiR big	Dwmc ZwiEK big
			Schum.
47.	m̄yb Nvm	Sudan grass	<i>Sorghum sudanese</i> Stapf.
48.	Wmb Nvm	Guinea grass	<i>Paricum maximum</i> Jacq.
49.	Avj dv-Avj dv	Lucerne/Alfa-alfa	<i>Medicago sativa</i> L.
50.	evi img	Berseem	<i>Trifolium alexandrium</i> L.



**Ablyj b (Activity):** Avcbvi GjvKvq mPivPi Drcbæq Ggb gvVdmj mgfni evsj v, BstiiR Ges Dwmc ZwiEK bvtgi Zvij Kv Zwi Kiab/



**mvi gg<sup>©</sup>**

dmj m̄utK<sup>©</sup>cwi wPwZ nI qvi m̄eavt\_ ©Gi Dwmc ZwiEK big, BstiiR big I evsj v big Rvbn Avek`K/ Binomial nomenclature Gi cŭgŭtK MY (Genus) big I wŌZxqŭU cŌRwZ (Species) big ejv nq/ gvV dmj ,tjvi meŕgvU 50 ŭli evsj v big, BstiiR big I Dwmc ZwiEK big GB cvtV Dtj L Kiv ntqŕ0/



### cuVhEi gj`iqb 1.3

mWVK DEti i cu#kqUK wPy (√) w b |

1. tKvbiU MY big?

(K) Rice (L) *italica* (M) Triticale (N) *Cajanus*

2. tKvbiU cRwZ big?

(K) Corn (L) *Setaria* (M) *sativa* (N) *Coffea*

3. tKvbiU Binomial nomenclature -Gi`enkó` enb Kti ?

(K) Pigeon pea (L) Italian millet

(M) Broad bean (N) *Corchorus capusularis*

4. tKvbiU wmi qyj ?

(K) Aoni (L) tRvqvi (M) mqvexb (N) gUi

5. tKvbiU wPib dmj ?

(K) *Saccharum officinarum* (L) *Ipomoea batatas*

(M) *Glycine max* (N) *Pisum sativum*

6. tKvbiU cvbixq dmj ?

(K) *Camellia sinensis* (L) *Canabis sativa*

(M) *Sesamum indicum* (N) *Ricinus communis*



### Povšg j vqb

#### msvŋB I i Pbvj-K c kœ

1. Dv<sup>m</sup> RvZ Avvgl cŋbR Avvgl t\_†K vbi vc` tKb?
2. Wvj RvZxq dmj †K Mi xtei gvsm ej v nq tKb?
3. gvV dm†j i `ewkó` ,†j v vj Lb|
4. gvV dmj ,†j vi GKuU msvŋB cwi Pq Z†j ai ab|
5. gvV dmj ,†j vi cŋMZ , i æz;e`vL`v Ki ab|
6. msÁv vj Lb|

- dmj
- ZŪz RvZxq dmj
- Wvj dmj
- ^Zj exR dmj
- vPvb dmj
- Avk dmj
- tbkvRvZxq dmj
- cvbxq dmj
- ci`Lv` dmj
- meR mvi dmj
- weKí dmj
- A\_Rix dmj
- Av`Qv` b dmj
- msvŋZ tMv-Lv` dmj
- vqk<sup>a</sup> dmj
- Avš dmj
- mvv\_ dmj
- eŪ\_Y dmj |

7| vbtP D†j vLZ cŋZ`KwU v††gi Ašf<sup>9</sup> dmj ,†j vi bvg vj Lb|

- Wvj dmj
- ^Zj exR dmj
- vPvb dmj
- Avk dmj
- cvbxq dmj
- ci`Lv` dmj
- meR mvi dmj
- Df<sup>q</sup> tgšm<sup>g</sup> dmj
- ^ci vMx dmj
- ci ci vMx dmj
- GK el<sup>p</sup> dmj
- vŪ-el<sup>x</sup> dmj
- eŪel<sup>p</sup> dmj
- GK exRc<sup>†</sup>x dmj
- vŪ-exRc<sup>†</sup>x dmj
- Lv†Uv v`em dmj
- `vN<sup>9</sup> em dmj
- v`b vbi †cŋ dmj
- A=omnbkxj dmj
- ŋvi mnbkxj dmj
- vbi †cŋ gvU<sup>i</sup> dmj
- j eYv<sup>3</sup> Gj vKvi dmj
- Dò Rj evq<sup>y</sup> dmj
- AeDò Rj evq<sup>y</sup> dmj
- kvZj Rj evq<sup>y</sup> dmj
- mavi Y f<sup>v</sup>gi dmj
- gi æA<sup>†</sup>†j i dmj
- Rj xq dmj |

8. uJKv iij Lđđ

- Wvj dmj
- ci`Lv` dmj
- Drcv`đbi tgšmgy Abđvqx dmtj i tkāYKiY
- dmtj i nekļi tkāYKiY
- eū,Y dmj
- msiw[Z tMv-Lv` dmj
- A\_Rix dmj
- nekļi dmj
- wgk<sup>a</sup>dmj
- mw\_ dmj

9. th tKvb `kuU ZŪžRvZiq kđm`i evsj v, BstīwR bvg I Dīw<sup>m</sup>c ZvīĒĶ bvg iij Lđđ|

10. th tKvb `kuU Wvj RvZiq kđm`i evsj v, BstīwR I Dīw<sup>m</sup>c ZvīĒĶ bvg iij Lđđ|

11. th tKvb cūDū ŷj exR dmtj i evsj v, BstīwR I Dīw<sup>m</sup>c ZvīĒĶ bvg iij Lđđ|

12. th tKvb cūDū Avk RvZiq dmtj i evsj v, BstīwR I Dīw<sup>m</sup>c ZvīĒĶ bvg iij Lđđ|

13. uJKv iij Lđđ|

K. MY L. cRwZ M. Binomial nomenclature

14. Pvi Yfūgi km` KvđK etj ? KđqKuU Pvi Yfūg dmtj i bvg iij Lđđ|

15. tbcv RvZiq dmj KvđK etj ? cūDū tbcv RvZiq dmtj i BstīwR I Dīw<sup>m</sup>c ZvīĒĶ bvg iij Lđđ|

16. eū,Y dmj KvđK etj ? KđqKuU eū,Y dmtj i D`vni Y w`b|

17. i ne, Lwi c-1 I Lwi c-2 kđm`i cĶZ`KuU cūDū Kđi gvV dmtj i bvg iij Lđđ|



**DĒi gij v**

**cW 1.1:**

1| L    2| K    3| K    4| L    5| M

**cW 1.2:**

1| L    2| K    3| M    4| N    5| K

**cW 1.3:**

1| N    2| M    3| N    4| L    5| K    6| K

## BDibU 2 Kul.Riq I fig KIŦ

**BDibU 2  
Kul.Riq I fig KIŦ**

dmj Drcv`tbi Rb` tgvU  
LiŦPi cŦq 30% LiP  
KIŦYi Rb` e`q nq|

Aw` KvŦj gvby hivvei Rxeb hvcb KiZ| ZLb ũbtRŦ`i I cũj Z ciŦ`i Rb` djgj,  
j ZvcvZv I cũbi mŪvŦb GK `vb Ŧ\_ŦK Ab` `vŦb NŦji NŦji GK mgq Zviv `vqxŦvŦe emevŦmi  
ũPŠi KŦi | GgvbfŦe Zviv KvŦj i MvZŦZ ũkLj th, exR Ŧ\_ŦK KvP MvQ ewx tctq gvZ.MvŦQi  
b`vq ewxcŦŦB nŦq dmj Drcv` Z nq| cŦgZ brixivB tKŠZnj ekZ H mg`lMvŦQi hZætbq  
Ges MvŦQi tMvori gvU big KŦi Ŧ`q, hvŦK ejv nj KIŦ| Aw`g KIŦKiv ZLb cv\_Ŧi i  
ŦPvLv djv, eŦŦi kvLv Ŧriv gvU Lbb I AvMvQv cũi`vi KŦi ZvŦZ dmtj i exR ev Priv  
j vMvZ| Gi cieZŦhŦM gvby Miæev tNvovi kv<sup>3</sup> KvŦR j vMŦq evKv KvŦVi j vOj ũ`Ŧq Riq  
Pvl KiŦZ ũkŦL, hv AvŦRv cŦũj Z| eZŦvŦb Lvgi hvŦŠKvKiŦYi hŦM fig KIŦYi ũevŦbæ  
AvanŦK hŠcũZ D`mŦvŦbi cil dmj Drcv`tbi KIŦB mevŦŦq kv, Kó I e`q mŦcŦŦ  
ũŦqvKqŦ dmj Drcv`tbi Rb` tgvU LiŦPi cŦq 30% LiP KIŦYi Rb` e`q nq|

Kul.cävB GŦ`Ŧk AvmŦj RiqB cävB I cŦKZ.cŦKũZK m`ú` | GB RiqŦK KIŦ KŦiB bŦbv  
iKg dmj Pvl Kiv nq| ũevŦbæi Kg dmtj i Rb` ũevŦbævŦe fig KIŦ Kiv cŦqvRb| ŦKvb  
dmtj i Pvl Mfxi KŦi KiŦZ nq, Avevi ŦKvbũi Rb` AMfxi PvlB hŦ\_ó| KvŦRB GB Kul.  
RiqŦZ mŦ\_ŦvŦe dmj RbŦŦZ nŦj Gi KIŦ m`ú`KŦe `ũvi Z RŦbv Avek`K|

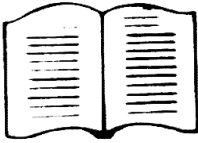
G BDibU cvW KŦi Avcũb fig KIŦYi msÁv I DŦŦk`, fig KIŦYi c`vZ, gvU i Av`Ŧv I  
fig KIŦYi mgqKij RŦvŦZ cviŦeb, gvU i eŦU I Av`Ŧv AbyvŦi Riqi PŦŦvŦhũMzv ũbYŦ  
KiŦZ cviŦeb|

### cw 2.1 Kul.Rug I fig KI`Yi aviYv I D`I`k`



G civ tk`I Avcib

- ◆ Kul.Rug I fig KI`Yi aviYv e`Lv Ki`Z cvi`teb|
- ◆ fig KI`Yi D`I`k` ij Lt`Z cvi`teb|
- ◆ KI`Y e`e`vi , Yv, Y D`tj`L Ki`Z cvi`teb|



evsj v`k GKwU Kul. c`avb t`k| Gt`tk tgvU Rugi cwi`gY 1,47,03,000 tn`i | Avev`thvM` Kul. Rugi cwi`gY 1,14,97,000 tn`i Ges Avev`x Rugi cwi`gY 1,08,33,000 tn`i | G Kul. Rug Avev D`P`fig, gvSwi D`P`fig, ga`g Rug, gvSwi ubPzGes ubPzcfuZ tk`Wt`Z nef<sup>3</sup> | D`P` fig, t`jv t`Kv mgqB c`eb 0v`v cmeZ nq br| Avev ubPzRug eQ`ti i Kt`qK gvm c`mbi ubt`P \_vt`K| Kv`RB figi D`P`Zi I ci ubf`P Kti Kul. Rug Prlver` Kiv nq|

Kul. Rug, t`jv`Z wevfb`edmt`j i Prl Kiv nq| t`Kv dmt`j i c`mbi Pvn`v tenk Avev t`KvbiUi Kg| fig KI`Y Kti g`mUt`Z wevfb`egv`vq c`mb msi`jY Kiv m`e| wevfb`edmt`j i exR Avev wevfb`e Kg| t`KvbiUi exR LvB t`vU Avev t`KvbiU tek eo| ex`Ri AvKvi Abt`vqx fig KI`Y c`qRb| evsj v`k eQ`ti Mo ep`ocvZ c`q 203 tm.ug. | ep`ocvZ eQ`ti i me mgq mgvbfv`te nqbr| t`tki me RvqMvq ep`ocvZ mgvbfv`te c`mZZ nq br| Kv`RB eQ`ti i wevfb`emgq I t`tki wevfb`eRvqMvq wevfb`e Kg Av`Zv Rugt`Z weivR Kti | tmRb` wevfb`e Kg Rugt`Z wevfb`emgq wevfb`e Kg fig KI`Y c`qRb|

t`tki wevfb`eRvqMvq g`mU GK iKg bq| t`Kv G`jvKvi g`mU tet`j, t`Kv`vI Gt`Wj Avev t`Kv`vI ev t`v`Atk g`mU| g`mU i A`z`i I j`vi Z`i wevfb`e Kg| Kv`RB fig KI`YI wevfb`e Kg Rugt`Z wevfb`e Kg n`qv hv`h`v | Gme weP`ti evsj v`k i Kul. Rug m`u`tk`I Zv`i fig KI`Y c`xwZ m`u`tk`A`v`v`RB c`qRb|

wevfb`eRugt`Z g`mU i wevfb`e`vU I MVb cwi`j`jZ nq| g`mU e`vU I MVb`f`f` fig KI`Y dmt`j i dj`b`K A`bKv`st`k c`f`meZ Kti | A`bK mgq Av`Zwi<sup>3</sup> fig KI`Y Kti g`mU t`f`SZ , Yvej`x b`o Kiv nq| Kv`RB Kul. Rugt`Z g`mU i MVb`K m`v`K ti`L fig KI`Y Kiv Dv`PZ| GRb` t`UKmB fig KI`Yi aviYv c`wZ`Z n`q`q`Q| m`Piv`Pi c`xwZi fig KI`Yi t`P`q t`UKmB fig KI`Y aviYv c`wZ`Z i`az`j t`qv n`q`q`Q| m`v`Kfv`te fig KI`Y Kti Kul. Rugi wevfb`e`f`SZ , Yvej`x Db`z Kiv hv`q|

wKQv`KQyKul. Rugt`Z gv`S gv`S wev<sup>3</sup> cwi`tek m`v`o nq| wev<sup>3</sup> i m`v`qubK c`v`g`mUt`Z R`tb` G cwi`te`ki m`v`o Kti | Rug Mfxi fv`te Prl Ki`j g`mU I j`U c`j`U n`q wev<sup>3</sup> c`v`g`mU i Dc`ti G`m m`h`j`v`K, Zvc I evq`j c`fv`te Gme wev`m`v`q A`bKv`st`k `j`xf`Z nq| P`tl`i d`j A`bK t`cv`Kv`gv`Ko, wVg I Xv`v g`mU i Dc`ti G`m gviv hv`q|

mg`y`i ubKueZ`P`A`At`j c`vet`bi d`j j`eYv<sup>3</sup> Zv` t`Lv w`t`j Mfxi Prl I c`P`z c`mb mieivn Ki`j j`eY w`g`k`Z c`mb g`mU i ub`e`f`i P`t`q j`eYv<sup>3</sup> Zv` n`m c`v`q Ges Gfv`te Kul. Rugi Db`q`b m`v`ab m`e` nq|

Re c`v`t`P` cwi`gv`t`Yi Dci g`mU i , Yv, Y A`bKv`st`k ubf`P Kti | meR` mvi c`t`Zi Rb` g`mUt`K Mfxi fv`te Prl Ki`j meR` mvi km` (Green manuring crop) g`mU i m`f`\_ f`ij fv`te w`g`k` hv`q Ges Kul. Rugi Db`q`b nq|

Re c`v`t`P` cwi`gv`t`Yi Dci g`mU i , Yv, Y A`bKv`st`k ubf`P Kti | meR` mvi c`t`Zi Rb` g`mUt`K Mfxi fv`te Prl Ki`j meR` mvi km` (Green manuring crop) g`mU i m`f`\_ f`ij fv`te w`g`k` hv`q Ges Kul. Rugi Db`q`b nq|

AṭbK Kul. Riḡ ḡḡMZ Pṛṭli dtj k<sup>3</sup> jv0j ʿṭii (Plough pan) mṛó nq| dtj RiḡṭZ cwb Rtg ʿvṭK| fiḡ KIṔYi ḡvaʿtg G iKg jv0j ʿṭii tṭṭ½ wʿṭq Kul. Riḡi Dbaqb NUṭṭv hṛq|

kṭmʿi exR ḡmUṭZ mḡzṛiṭe ecb I Zvi A¼ziṽ Mg, Pṛiv ṭivcY Ges MṭQi epṫ I Dbaqb ubiṔZ Kivi Rbʿ ḡmUṭZ ṭṭṂZ, iṽmṛiqubK I ʿRieK cṛieZṭbi ḡvaʿtg AbḲj Aeṽ ʿZwi Kṭi Kul. hṂṭmZ Ṕviv ḡmUṭi Avṭj vobṭK fiḡ KIṔ etj |

fiḡ KIṔṭK ṽwṛfbṛiṭe mṂÁmḡZ Kiv nṭqṭQ| kṭmʿi exR ḡmUṭZ mḡzṛiṭe ecb I Zvi A¼ziṽ Mg, Pṛiv ṭivcY Ges MṭQi epṫ I Dbaqb ubiṔZ Kivi Rbʿ ḡmUṭZ ṭṭṂZ, iṽmṛiqubK I ʿRieK cṛieZṭbi ḡvaʿtg AbḲj Aeṽ ʿZwi Kṭi Kul. hṂṭmZ Ṕviv ḡmUṭi Avṭj vobṭK fiḡ KIṔ etj |

Aóv`k kZvāxi cḡg wʿṭK (1739) ṭRṭ\_ṭUvj bṛtg GKRb ṽwṛUK Kul.ue` ci`kiv<sup>3</sup> Ṕviv jv0j Pwṛṭq Kṛṭiṭe DĒḡiṭc Riḡ Pṛl Kṭi dmj Drcv`b Kiv hṛq Zv ṭ`Lub| Zvi ḡṭZ Riḡ DĒḡiṭc Kul.Ṃ nṭj MvQ ṽkKṭoi mṛivṭh` Kul.Ṃ ḡmUṭi mḡṭṭ KYv Lv` ṽmṛiṭe mivmvi MḡY Kṭi| KIṔB mvi etj ṽZub Dṭj Ḳ Kṭi b|

cieZṭZ MvQcṛj vi Lv` ʿvcr`vb mṂúṭKṛieÁbriṽ mḡ`K avi Yv jvf Kṭi b| ḡmUṭi mḡṭṭ KYv MvQ Avṭ`Ṃ Lv` ṽmṛiṭe MḡY Kṭi bṛ| ḡmUṭZ ṽwṛfbṛeḲvi ṭḡṂj K Dcv`vbṭK MvQ ṽwṛfbṛe AvKṛṭi Lv` ṽmṛiṭe MḡY Kṭi| fiḡ KIṔYi dtj GB Lv` ʿvcr`vb\_ṭjv ḡṂEKw`Z cṛbi mṛṭ\_`ḡxṭZ nṭq Lv` ṽmṛiṭe AvṭmḡY (Osmosis) cḡḡḡḡḡ MṭQ ṭcṭṭQ| ḡmU Kul.Ṃ nṭ qvi dtj ḡj- I ṽkKo ḡmUṭi Mṭṭi cḡek KiṭZ cṛṭi| dtj ḡmUṭi cwb avi Y ṭḡZv epṫ cṛq Ges Ab`w`ṭK AvMvQv`gb nq|

Aabv ḡmUṭK b`bZḡ KIṔ Kṭi iṭṭYKj KIṔ cṫṽZi (Conservation tillage) avi Yv AeZvi Yv nṭqṭQ|

Dṛmṭ`i epṫi Rbʿ fiḡ KIṔ Kivi ci ḡmU th ṭṭṂZ Aeṽ cḡṂ nq ZṛṭK KIṔeṽ (Tilth) etj |

Dṛmṭ`i epṫi Rbʿ fiḡ KIṔ Kivi ci ḡmU th ṭṭṂZ Aeṽ cḡṂ nq ZṛṭK KIṔeṽ (Tilth) etj | KIṔeṽ ḡmUṭi MṽZKj (Dynamic) Aeṽi GKṽU ijc| hLb ṭKvb ḡmUṭK exṭRi A¼ziṽ Mg I dmj epṫi Rbʿ DchṔ Kṭi Pṛl Kiv nq ZLb ZṛṭK exRZjv (Seed bed) etj nq Ges ḡmUṭi H AeṽṭK fiḡ KIṔeṽ etj |

KIṔeṽ K\_ṽU GKṽU h\_ṽh\_ kā bṛ nṭj I Gi Ṕviv Kul.ue`MY ṽwṛfbṛmḡḡ ṽwṛfbṛi Kg Aeṽ etj ʿvṭKb| Avevi ṽwṛfbṛeḲvi dṽṭj i exR ṽwṛfbṛi Kg KIṔeṽi DcṭhṽMx| exṭRi AvKṛi hZ ṭQv nq, KIṔeṽi ZZ mḡṭṭ nṭ qv evÁbṛq| thḡb ZṛḡvK I ṽcqvṭRi exṭRi Rbʿ Lḡ ṽPKb KIṔeṽ cḡqvRb| Aci cṭṭṭ fṭv I ṭQvj vi exR eo AvKṛṭi i etj ḡṭi exṭRi Rbʿ ḡṽSṽi iKṭḡi KIṔeṽi DcṭhṽMx| KvṭRB KIṔeṽi eṂṭZ KIKṭi i ṽbKU fiḡ, ḡṽSṽi ev ṽbḡṽṭbi KIṔeṽi etj eṂṭv nq|

**fiḡ KIṔeṽi , Yvejx (Qualities of good tilth)**

fiḡ KIṔeṽiq Riḡi ṽbḡḡ ṽLZ , Yvejx ʿvKv evÁbṛq:

1. chṂ cwi ḡvY Av`Zv
2. chṂ evqṔj ṽṔṭj i Aeṽ
3. epṫi cṛbi ʿṂ Abḡṭek ṭḡZv
4. ḡmUṭi eÜzZv

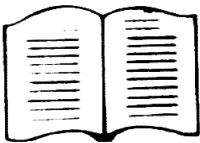
ḡmU Lḡ mḡṭṭiṭe KIṔeṽiq ʿvKṭj (Fine tilth) epṫi ci iṽKṭq ṽcVri ḡZ ṭeṭK hṛq| dtj cieZṭZ H ḡmUṭZ cwb wʿṭj , ṭm ḡmU Avi cwb ṭkṽY KiṭZ cṛṭi bṛ Ges dmj Pṛṭli Rbʿ AṭKṭRv nṭq cṭo|

### fiq KIYi Dtik

fiq KIYi gj- Dtik  
nt"Q GKiu DEg exRZj v  
`Zwi Kiv, AvMvQv ubqšp  
Kiv Ges Dm"e epxi  
Abkjtj gmlU tfsZ  
Yiej xi Dbqb mvab Kiv|

fiq KIYi gj- Dtik" nt"Q GKiu DEg exRZj v `Zwi Kiv, AvMvQv ubqšp Kiv Ges Dm"e epxi Abkjtj gmlU tfsZ , Yiej xi Dbqb mvab Kiv| G. tjt v ubqšp Dtj L Kiv ntjv:

1. c0 ugKfite `p RgvUex Piv gmlU Avj Mv Kiv|
2. iKtbr RigtZ gmlU wjv tft½ SzSzv Kiv hvZ exR gmlU mvt\_ Nubofite wgtk thZ cvti | extRi Avkcitk extRi AvqZtbi mgvb AmsL" evqzY"dvKv `vb \_vKtj extRi A½ziv Mg fij nq|
3. Avj Mv Kiv gmlUk GKUv mwi"0 `pZv `vb Kiv hvZ gmlU, evqyl Av`Zv GKiu mekl AbqvZ me`gvb \_vtK|
4. Rigi AvMvQv ašm Kiv Ges cPbtvM" AvMvQv gmlU m½ wgtkq t`qv|
5. mvi I `Re c`v\_ gmlU mvt\_ wgtkq t`qv|
6. RigtZ m0 qvZKvi K weifbac`v\_° i- Kiv Ges tcvKv-gvKo ašm Kiv|
7. iKtbr RigtZ gmlU %KukKbvj x (Capillary pore) tft½ w`tq cvmbi ev"uvqb Kgvbv|
8. gmlU DcKiv x RievYvgtni esk epxi mnRZi Kiv|
9. fiq qqtivtai Rb" Rigi Dcwi fivM mgvb Kti `Zwi Kiv|



### mvi gg

kfm"i exR gmlUz m0zite ecb I Zvi A½ziv Mg ev Piv tivcY Ges cieZPchq Pivi epxi I Dbqb mwi"Z Kivi Rb" gmlUz tfsZ, imvqubK I `RieK cwi eZfb i gva"tg Abkjtj Ae`v `Zwi Kti Kul. hšcvmZ 0v iv gmlU Avtj vobtk fiq KIY ejv nq| fiq KIYi Dtik" ntjv GKiu DEg exRZj v `Zwi Kiv, AvMvQv ubqšp Kiv Ges Dm"e epxi Abkjtj gmlU tfsZ , Yiej x Dbqb mvab Kiv| Dm"e`i epxi Rb" fiq KIY Kivi ci gmlU th tfsZ Ae`v c0B nq ZvtK gmlU KIe`v etj | gmlU KIe`v fij, gvSmi I ubqšp tbi ntZ cvti | GKiu fij KIe`v c0B RigtZ chfb Av`Zv I evqyPj vPtj i Ae`v, epwi cvmbi `z Abgdek qvgZv I gmlU f½jZv \_vKv evAbvq|



**cuVhEi gj`iqb 2.1**

mWVK DEti i cuKqUK wPy (v) w b

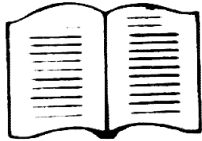
1. Pvlvef` i cUg KVR Kx?  
 K. exR ecb    L. tmP cOvb    M. fig KI?    N. mvi cOqM
2. KI?Yi mnvth` Kx ubqšY Kiv nq?  
 K. KxU cZ½    L. AvMvQv    M. tivM ejvB    N. tcvKv-gvKo
3. fig KI?Yi cAvb DfIk` Kx?  
 K. GKwU DEg exRZjv ^Zwi Kiv    L. gMUi ZvcgvTiv ubqšY Kiv  
 M. gMUtZ mvi cOqM Kiv    N. gMUi wXjv fv½v
4. tKvbuU gMUi KI?e`v?  
 K. fig KI?Yi ci gMUi tfSZ Ae`v    L. gMUi PvlvcfhwMZv  
 M. cmbi Abzdek 7lgZv    N. gMUi AvMvQv g? Ae`v
5. tKvbuUi cwigvYi Dci gMUi , Yv, Y ubfP Kti?  
 K. `Re c`vL©    L. Rjxq ev@ú    M. ZvcgvTiv    N. evqyPjvPj
6. KI?Yi dtj gMUtZ Kx ewx cvq?  
 K. cmbi cwigvY    L. mfi i cwigvY    M. ZvcgvTiv    N. AvMvQv
7. KI?Y Kx ubab nq?  
 K. DcKvix RxevYy    L. AcKvix KxU-cZ½    M. KvKov    N. tKtPv

### cW 2.2 fig KI<sup>o</sup> c<sup>x</sup>iZ, gwLi Av`Zv I fig KI<sup>o</sup>Yi mgq



G cvV tkfI Avciib

- ◆ fig KI<sup>o</sup> c<sup>x</sup>iZ m<sup>o</sup>útk<sup>o</sup>j LtZ cvi teb|
- ◆ c<sup>o</sup>ij Z fig KI<sup>o</sup> I i<sup>o</sup>YKxj fig KI<sup>o</sup>Yi avi Yv D<sup>t</sup>jl Ki<sup>t</sup>Z cvi teb|
- ◆ gwLi Av`Zv wby<sup>o</sup> K<sup>t</sup>i fig KI<sup>o</sup>Yi mgqKvj wby<sup>o</sup> Ki<sup>t</sup>Z cvi teb|



mdj`RbKfite dmj Drcv`tbi GKwU Ab`Zg ce<sup>o</sup>kZ<sup>o</sup>ntjv fig KI<sup>o</sup>| fig KI<sup>o</sup> wewfbae aitbi ntq`vtK| Rigi t<sup>o</sup>S Ae`v, Av`Zvi cwi gvY, KI<sup>o</sup>Yi mgq, kigtKi chBZv, figi eU<sup>o</sup>Zv c<sup>o</sup>uzi Dci w<sup>o</sup>fiE K<sup>t</sup>i fig KI<sup>o</sup>Yi aib wba<sup>o</sup>Y Kiv nq|

fig KI<sup>o</sup>tK c<sup>o</sup>vbZ`<sup>o</sup>gfvtM fivM Kiv nq h\_v:

#### 1. c<sup>o</sup>ugK KI<sup>o</sup> (Primary tillage)

dmj gvV t`tk mSM<sup>o</sup>ni ci H gv<sup>o</sup>V cieZ<sup>o</sup>dm<sup>o</sup>tj i exR tevbv I Priv tivct<sup>o</sup>Yi ce<sup>o</sup>chS<sup>o</sup>lth mg`IKI<sup>o</sup> Kiv Kiv nq ZvtK m<sup>o</sup>vavi Y KI<sup>o</sup>/ce<sup>o</sup>KI<sup>o</sup> er c<sup>o</sup>ugK KI<sup>o</sup> etj |

dmj gvV t`tk mSM<sup>o</sup>ni ci H gv<sup>o</sup>V cieZ<sup>o</sup>dm<sup>o</sup>tj i exR tevbv I Priv tivct<sup>o</sup>Yi ce<sup>o</sup>chS<sup>o</sup>lth mg`IKI<sup>o</sup> Kiv Kiv nq ZvtK m<sup>o</sup>vavi Y KI<sup>o</sup>/ce<sup>o</sup>KI<sup>o</sup> er c<sup>o</sup>ugK KI<sup>o</sup> etj |

G KI<sup>o</sup> KvR gwU tek fvtj v<sup>o</sup>fi<sup>o</sup>te Z<sup>o</sup>z<sup>o</sup>vgj-K<sup>o</sup>fi<sup>o</sup>te teik M<sup>o</sup>fi Zvq Av<sup>o</sup>tj woz nq| G<sup>o</sup>tZ e`eU<sup>o</sup>Z jvOj mg<sup>o</sup>r f<sup>o</sup>mi I eo Av<sup>o</sup>Kv<sup>o</sup>t<sup>o</sup>i ntZ nq| Rigi Av<sup>o</sup>Kvi t<sup>o</sup>QvU nI qvi Rb` jvOj NjvtZ Am<sup>o</sup>peav ntj eo Av<sup>o</sup>Kv<sup>o</sup>t<sup>o</sup>i tKv`vj <sup>o</sup>lvivl c<sup>o</sup>ugK KI<sup>o</sup> KvR Kiv hvq|

#### 2. Av<sup>o</sup>S<sup>o</sup>KI<sup>o</sup>/gva`ugK KI<sup>o</sup> (Inter tillage)

Av<sup>o</sup>S<sup>o</sup>KI<sup>o</sup> KvR Kiv nq exR ecb ev Priv tivct<sup>o</sup>Yi ci t`tk Av<sup>o</sup>ctK<sup>o</sup>t<sup>o</sup>i dmj mSM<sup>o</sup>h Kiv chS<sup>o</sup>|

G KI<sup>o</sup> KvR Kiv nq exR ecb ev Priv tivct<sup>o</sup>Yi ci t`tk Av<sup>o</sup>ctK<sup>o</sup>t<sup>o</sup>i dmj mSM<sup>o</sup>h Kiv chS<sup>o</sup>| Rigi tXjv`<sup>o</sup>tov Kiv, Av<sup>o</sup>Mv<sup>o</sup>Qv cwi<sup>o</sup>vi Kiv, Av<sup>o</sup>lvov t`qv, Mv<sup>o</sup>Qi tMvovq gwU Z<sup>o</sup>tj t`qv BZ`w<sup>o</sup> KvR<sup>o</sup>tK Av<sup>o</sup>S<sup>o</sup> KI<sup>o</sup> ejv nq|

fig KI<sup>o</sup>Yi c<sup>o</sup>ijZb I bZb avi Yvi Av<sup>o</sup>tj vtK`<sup>o</sup>lvv KI<sup>o</sup> c<sup>x</sup>iZi AeZ<sup>o</sup>Yv ntqt<sup>o</sup>0:

#### 1. c<sup>o</sup>ij Z fig KI<sup>o</sup> c<sup>x</sup>iZ (Conventional tillage)

G c<sup>x</sup>iZtZ RigtK wewfbae iKg fig KI<sup>o</sup> h<sup>o</sup>scwZ w<sup>o</sup>tq Pvl Kiv nq| Av<sup>o</sup>gv<sup>o</sup>t`i t`tk G c<sup>x</sup>iZB c<sup>o</sup>ij Z|

#### 2. i<sup>o</sup>YKxj fig KI<sup>o</sup> c<sup>x</sup>iZ (Conservation tillage)

G c<sup>x</sup>iZtZ KI<sup>o</sup> m<sup>o</sup>úbeK<sup>o</sup>tZ`<sup>o</sup>e<sup>o</sup>Aw<sup>o</sup>bK w<sup>o</sup>fiE<sup>o</sup>tZ b`bZg jvOj Pvl I gB t`qv nq| GLvtb i<sup>o</sup>mv<sup>o</sup>qubK Dcvtq evj vB`gtbi Dci w<sup>o</sup>etkl tRvi t`qv nq| Av<sup>o</sup>gv<sup>o</sup>t`i t`tk G c<sup>x</sup>iZi e`envi G<sup>o</sup>tKe<sup>o</sup>t<sup>o</sup>iB Kg| w<sup>o</sup>et`tk G c<sup>x</sup>iZtZ dmj Drcv`tbi Rb` wewfbae iKg h<sup>o</sup>scwZi m<sup>o</sup>nv<sup>o</sup>th` gwU<sup>o</sup>tK h<sup>o</sup>vm<sup>o</sup>e Kg Av<sup>o</sup>tj woz K<sup>t</sup>i gwLi Mv<sup>o</sup>b<sup>o</sup>tK A<sup>o</sup>Y<sup>o</sup>vt<sup>o</sup>i tL Pvl Kiv nq|

#### i<sup>o</sup>YKxj fig KI<sup>o</sup>Yi m<sup>o</sup>peav I Am<sup>o</sup>peav

m<sup>o</sup>peav (Advantages)

1. gwLi Mv<sup>o</sup>b (Structure) Db<sup>o</sup>z K<sup>t</sup>i Ges`Re c`vt`<sup>o</sup> cwi gvY ew<sup>o</sup>x K<sup>t</sup>i |
2. R<sup>o</sup>ij w<sup>o</sup>b, k<sup>o</sup>igK I h<sup>o</sup>scwZi LiP ec<sup>o</sup>p|
3. gwLi Y<sup>o</sup>vt<sup>o</sup>iva K<sup>t</sup>i Ges c<sup>o</sup>engvb c<sup>o</sup>nbi (Run off water) , Y<sup>o</sup>, Y<sup>o</sup> ew<sup>o</sup>x K<sup>t</sup>i |
4. gwLi KI<sup>o</sup>e`v Ges gwU ntZ Mv<sup>o</sup>Qi c<sup>o</sup>nb D<sup>o</sup>tE<sup>o</sup>vj b Y<sup>o</sup>gZv m<sup>o</sup>wK i vtL ev Db<sup>o</sup>z K<sup>t</sup>i |
5. dm<sup>o</sup>tj i dj b c<sup>o</sup>ij Z fig KI<sup>o</sup>Yi gZB nq|

6. gmltZ AbRitei epv Niluq gmlU RieK Ae`vi DbmZ NUvq|

**Amvav (Disadvantage)**

- 10 weirfbacKvi A\_er weikl ai`Yi fig KI` hšcwiZi c`qvRbxqZv t`Lv t`q|
- 20 mvaviYZ ivmqubKfite dmtj i evj vB `gtbi Dci wbfPkxj Zv evto | ivmqubK AvMvQv `gb c`wZ AKvhRi ntj AvMvQvi c`v fite tefo thtZ cvti |
- 30 c`vuj Z fig KI`Yi Z`bvq G c`wZtZ Pz, mvi I AvMvQvirkK (Weedicide) gmltZ fvtj vfvte uguk`q c`qvM Kiv hvq bv|
- 40 bvBtUtRb I mjj dvi RvZxq mvti i mnRj f`Zv Ktg hvl qvq teuk mvi c`qvM Ki`Z nq|
- 50 gmlU pH Ktg hvq| dtj teuk `Re c`v`q Pz c`qvM Ki`Z nq|
- 60 A`bK mgq dmtj i ecb I tivcY mgq wcuQtq hvq|

**gmlU Av`Zv I fig KI`Yi mgq**

Rug Pvl menxb Ae`vq `vKtj Gi Dcwi fM k<sup>3</sup> `vtK| dtj epoi cmb mnR gmlU wFZti c`ek Ki`Z cvti bv Ges epoi cmb c`vngvb nq Mmo`q hvq| fig KI`Yi gva`tg Rugi Dcwi fvtMi gmlU Avj Mv Kiv nq| dtj epoi cmb gmltZ c`ek Kti Ges Avt`Avt`I gmlU GB cmb tkvly Kti tbq| h\_vh\_fite fig KI`Yi dtj gmlU `vby` tjj v mgsMwZ nq gmlU MvB `Zwi Kti Ges gmlU cmb aviY fvgZv epv cvq| GB mgsMwZ gmlU thgb cmb tkvlb Kti ati ivL`Z cvti tZgnb `vbi dtk dtk evqy Ae`vb Ki`Z cvti | dmtj i epv i Rb` gmlU GB Av`Zv I evqyDf`q i B c`qvRb|

gmlU Av`Zv I fig KI`Yi mgq- G `w` w`elq m`u`k`KI`Ki mivK aviYv `vKv c`qvRb| Rugi Av`Zv Abyv`ti fig KI`Yi Ki`Z nq| Rugi mivK Av`Zvq fig KI`Yi bv Ki`j fij KI`e`vi m` nq bv|

Rug Pvl Kivi Rb` c`qvRbxq cwi gvY gmlU Av`ZvK OtRv` Ae`v ej v nq| gmlU OtRv` Ae`v ej v nq| gmlU OtRv` Ae`v ej v nq| GtKB Kul.ue`MY ūgv fvgZv (Field capacity) etj b|

Rug Pvl Kivi Rb` c`qvRbxq cwi gvY gmlU Av`ZvK OtRv` Ae`v ej v nq| gmlU OtRv` Ae`v ej v nq| GtKB Kul.ue`MY ūgv fvgZv (Field capacity) etj b| GmlU Ggb GKwU Ae`v hLb gmlU m`y` dtk, tjj v (Micropores) cmb ōviv c`v`vtK Ges GKUzeo dtk, tjj v (Macropores) evZvm ōviv c`v`vtK|

mivKfvte GK LŪ Rugi gvV fvgZv wby` Ki`Z ntj gvVutK c`v`mP w`tq GKwU w`cj w`tq tXtK w`tZ nte| gmlU ev`urfeb tiva Kivi Rb` gvVutK w`cj w`tq tXtK t`I qv nq| ZvtZ gmlU mivK Av`Zvi cwi gvY Rvrv m`e| g`y` w`v`k`bi gva`tg G gmlU t`tK AwZwi<sup>3</sup> cmb w`v`nkZ nq hvte| GB g`y` w`v`nkZ gmltZ cmb I evqyGKv mgZvq Avmte| G Qvovl KtqK tKwR gmltK fij fvte w`f`Rtq GK LŪ Kvcv w`Ksev e`vq Sij`tq ti`LI gvV fvgZv wby` Kiv m`e| w`f`Rv gmlU G iKg Sij`tq ivL`tj AwZwi<sup>3</sup> cmb S`ti c`ti hvte Ges gmlU m`y` I eo dtk, tjj v cmb I evZvm ōviv c`v`vtq GKv mgZvq Avmte, hLb cmb Avi S`ti c`te bv|

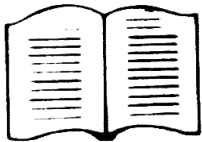
gvV ch`q Pvlxiv nvtZi Abyv`Zi gva`tg gmlU GB ūgv fvgZv ev OtRv` Ae`v wby` Kti `vtK| G c`wZtZ GK gmlU nvtZ wbtq Pvc t`qvi ci tQto w`tj h`v t`Lv hvq Zv Pvc Lvl qv AvKwZtZB i`tq`Q Zvntj G gmltK OtRv` cix`vvi cieZ`c`t`f`tc thtZ nte| nvtZi P`tc H gmlU w`tq gmlU ej `Zwi Kti 1 ugUvi Dpzt`tK mvaviY k<sup>3</sup> gmlU Dci Avt`I tQto w`tZ nte| tQto t`evi mgq ej c`qvM w`Ksev 1 ugUv`ti i Kg ev teuk nI qv DvPZ bq| `Zwi ej wU gmltZ cZtbi ci h`v t`Lv hvq th Zv Pvc Lvl qv Ae`vq i`tq`Q Zvntj e`stZ nte

gmltZ KIŦ DcŦhvlx ōtRvŦ AvŦm bvB| G Ae`vq RvŦ Pvl Kij jvŦj gml AvŦtK hvte,  
dmj i gml Dēvte bv Ges KIŦYi KvŦR mgq tek tbe| G iKg Ae`vq fvŦ KIŦY gml  
Mvb bŦ ntq hvq| Av i hv` cWZZ ej vŦ tft½ Qvotq hvq Zvntj ešZ nte gmltZ ōtRvŦ  
GŦmtQ| AvfÁ Pvlxv RvŦi gmltK G iKg gvl gv`tg ej `Zvi i cixŦv bv KŦi RvŦi  
Dci v`tg tntv vŦtqB ešZ cvŦi RvŦtZ ōtRvŦ GŦmtQ vKbv?

vŦRv RvŦtZ Kv`v PŦŦi (Pudding) Rb` gmltZ ōtRvŦ Avmvi cŦqvRb tbB| th tKvb mgq  
Kv`v Kivi Rb` RvŦ Pvl Kiv tŦtZ cvŦi | ZvB AvDk avb I cvU dmj KZŦbi ci vŦRv RvŦ  
cŦg evi KIŦ Kij dmj i AemkŦisk gmltZ vŦtq hvq Ges `Re mŦi cvi YZ nq|



**AbŦj b (Activity):** fvŦ KIŦYi cŦeŦfvŦi DchŦ Av`ZvŦK tKb , iazj t`qv DvPZ? fvŦ  
KIŦYi DcŦhvlx Av`Ae`v Kxfvte kbr³ Kiteb?



**mivg**

fvŦ KIŦ cāvz `ŦKvi - cŦvŦK KIŦ I gv`vŦK KIŦ| GŦK Avevi cvŦZb I bZb aviv  
AvŦj vŦK cŦvŦj Z KIŦ c×vZ I iŦYKxj KIŦ c×vZ AvŦvŦi AvŦj vPbv Kiv ntqŦQ| cŦvŦj Z  
KIŦ c×vZtZ RvŦtK vŦvŦvŦiKg fvŦ KIŦ hšcWZi mŦvŦth` hŦŦvŦe Pvl Kiv nq|  
iŦYKxj c×vZtZ b`bZg msl`K Pvl t`qv nq Ges ivmŦvŦbK DcvŦq AvvŦv I evj vB  
e`e`vcbvi Dci tRvi t`qv nq| gml ōtRvŦ Ae`v ešS RvŦtZ cŦg Pvl v`tZ nq| RvŦ Pvl  
Kivi Rb` cŦqvRbxq cvi gvY Av`ZvŦK gml i tRv Ae`v ev gvŦ ŦŦgZv ev nq| gml ōtRvŦ  
Ae`v vŦYŦ Kitz GK gvl gml vŦtq GKvU ej `Zvi KŦi 1 vŦvŦi DŦt`ŦK mŦvŦi Y k³ gml  
Dci AvŦ`ŦŦto v`tj hv` cWZZ ej vŦ tft½ Qvotq hvq Zvntj ešZ nte gmltZ ōtRvŦ  
GŦmtQ| vŦRv RvŦtZ Kv`v PŦŦi Rb` gmltZ ōtRvŦ Avmvi cŦqvRb tbB|



### cuVhEi gj'iqb 2.2

mWVK DEti i cuKqUK wPy (v) w b

1. mvari Y KIYi Aci big Kx ?

K. cU'igK KIY

L. gva'igK KIY

M. Avst KIY

N. fig KIY

2. Avst KIYi Aci big wK ?

K. cU'igK KIY

M. mvari Y KIY

L. ceK KIY

N. gva'igK KIY

3. i qbkxj fig KIY dmtj i dj b tKgb nq?

K. Kg nq

L. cDij Z fig KIYi tPtq Kg nq

M. tewk nq

N. cDij Z fig KIYi gZ ewx cvq

4. fig KIY tKvb Ae'iq Ki tZ nq?

K. mWVK Zvcgv'iq

L. mWVK Av'Z'iq

M. wFRv Ae'iq

N. fij KIe'iq

5. wFRv gWUtZ tKvb Ae'iq Pvl w tZ nq?

K. 0tRv0 Ae'iq

L. mWVK Zvcgv'iq

M. fij Avenl qvq

N. wFRv Ae'iq th tKvb mgq

**e`enwiK**

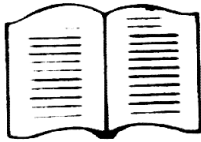
**ciW 2.3 gmiU eljU I Av`Zv Abjnti gmiU Pvlvc`thmMZv ibYq**



G ciV tk`l AvciU

- ◆ gmiU eljU kbr<sup>3</sup> Ki`Z cvi`teb|
- ◆ gmiU eljU I gmiU Av`Zv m`utK`e`enwiK Avb jvf Ki`Z cvi`teb|
- ◆ gmiU eljU I Av`Zv Abjnti gmiU KLb Pvl Ki`Z nte Zv ibYq Ki`Z cvi`teb|

**c`umvK Avtj vPbv**



gmiU DePZv ibfP Kti  
gmiU Mvb, eljU ev Mub,  
im aviY qgZv BZ`w`i  
Dci |

gmiU c`kuzK e`l gmiU ntjv Dv`c Rbvtbvi c`vb gra`g| G gmiU LvbR`e`, c`vb, evqyl  
`Re c`vt`P mgstq GKiu th`SMK c`v`q gmiU DePZv ibfP Kti gmiU Mvb, eljU ev Mub,  
im aviY qgZv BZ`w`i Dci | gmiU eljU, Avz; qviZ; `vbieUb Ges `Re c`vt`P cwi giv  
BZ`w`i Dci ibfP Kti gmiU`Z tkvb&dmj Pvl Kiv hute| dmj Drcv`tbi m`1/2 gmiU  
DePZv I Drcv`b qgZv ibeofite RwoZ| Kul. Drcv`tb mdj Zv I `qZv AR`bi Rb`  
gmiU eljU I gmiU Av`Zv mek- l`Yi gra`tg eljU I Av`Zv ubafY Qivl Avf`AZv ibfP  
c`xwZ`Z G m`utK`e`gviUgmiU Avb AR` Kiv m`e| nitZi Abjnti gra`tg G m`utK`Rvbi  
Rb` gmiU cir`qv c`xwZ` ibtP Avtj vPbv Kiv ntjv |

tKvb giv`Kvq eZ`vb emj,  
cij I K`g Kivi  
Avtci`qK Abjnti gmiU  
eljU etj |

**msAv:** tKvb giv`Kvq eZ`vb emj, cij I K`g KYvi Avtci`qK Abjnti gmiU eljU  
etj | Riq Pvl Kivi Rb` c`qvRbxq cwi giv gmiU Av`ZvtK gmiU otRv` Avmv etj | Kul.  
meAvtb G`K ogv qgZv` (Field capacity) etj |

**Z`Ej (Theory)**

1. tKvb gmiU`Z tKvb c`kvti i KYv Kx cwi giv AvtQ Zv Rvb`Z cvi`tj Giu tKvb tkbxi gmiU  
Zv e`sv hvq| gmiU newfbec`kvi KYv newfbec`Abjnti wgtk cvi``umiK mgstq newfbec`  
tkvYi gmiU m`o Kti | thgb- t`v-Atk gmiU, tetj t`v-Atk gmiU, GtWj t`v-Atk gmiU  
BZ`w`i |
2. gmiU Av`Zv tR`tb Pvlvc`thmMZv ibYq Kiv|

**KvRi aviv**

**1. gmiU eljU ibYq**

gv t`tk msMpxZ bgbv mg`ni c`Z`KiuLi 50 Mtg Kti Avjv`v Avjv`vrite nitZi Zuj`jZ  
ibtq c`vb 0vii m<sup>3</sup> Kiab| Zivci GB m<sup>3</sup> gmiU nitZi miv`th` ej, tmvRv``K, Pmu c`fuz  
AvKuz. t`qvi tPon Kiab|

μῖgK bs	chfēŋY	ḡm×vš
1	gḡmLi KYv,tjv AvVtjv AbfZ nq  ej, ḡK, Pμ, w fRvKwZ. cfwZ. wewfbæAvKwZ. t`qv hvq  gḡmU dvtU bv	GtUj gḡmU
2	gḡmLi KYv,tjv LmLtm  gḡmLi KYv,tjv PKPK Kti Ges RgU exa bv  tKvb AvKwZB t`qv hvq bv	tetj gḡmU
3	i agvI ej `Zwi Kiv hvq	tetj t`v-Auk gḡmU
4	ḡK, exKvfbv I Pμ `Zwi Kiv mæe nq	GtUj t`v-Auk gḡmU
5	tmvRv ḡK `Zwi Kiv mæe nq	t`v-Auk gḡmU

**gšé:** gḡmLi eḡU wbaŋY Kti tm Abynti dmj Pvl Kitj Awak dmj Drcv`b wbowZ nte|

**2. gḡmLi Av`Zv Abynti gḡmLi PvlcthmZv wbyq**

GK LÛ PvlthvM` RwgZt wMtq GK gḡw gḡmU nvtZ wbb| G gḡmU `B nvtZi Zvj y mrvvth` Pvc w`b| hv` GB Pvc t`qv gḡmU Pvc Lvl qv Ae`vq bv \_vtK Zte tm gḡmUz ōtRvŵ Avtm bvB| Avi hv` Pvc Lvl qv Ae`vqB \_vtK Zvntj `B nvtZi Zvj y mrvvth` gḡmLi ej `Zwi Kiab| GLb gḡmLi `Zwi GB ej wUtK GK wḡUvi Dpzt`K mvariY k<sup>3</sup> gḡmLi Dci Avt`Itŵto w`b| tŵto t`evi mgq tKvb cKvi ej cŵqvm wKsev D`PZv GK wḡUvti i Kg ev tenk nI qv DvPZ bq|

μῖgK bs	chfēŋY	ḡm×vš
1	ej `Zwi KitZ Pvc t`qvi mgq Pvc Lvl qv Ae`vq _vtK bvB	ōtRvŵ Avtm bvB
2	gḡmLi `Zwi ej wU cZtbi ci Pvc Lvl qv Ae`vq i tqtQ	ōtRvŵ Avtm bvB
3	cwZZ ej wU tft½ Qwotq ctoŵQ	gḡmUz ōtRvŵ GtmŵQ

ḡm×vš ōtRvŵ Avmv Ae`vq Rwg Pvl Kitj gḡmU mnR Pvl Kiv hvte, gḡmUz eo eo wJv `Zwi nte bv Ges KIŋYi KvR mgq Kg j wMte|



**Pəvšigj`iqb**

**msvŋŋB I iPbuĵj-K cġæ**

1. fiġ KIŲ ej tZ Avciġ Kx eġSb? fiġ KIŲYi Df`ik` eYŋv Ki ab|
2. fiġ KIŲ KZ cġvi I Kx Kx? newfbæcġvi fiġ KIŲYi msÁv ij Lġ|
3. i ŋŋbkxj fiġ KIŲYi mġear I Amġear, tĵ v ij Lġ|
4. ġmŋi ōtRvŋ Ae`v ej tZ Kx eġSb ? ŋKfivte ġmŋi ōtRvŋ Ae`v kbr<sup>3</sup> Ki tēb?
5. ġmŋi Av`Zvi mġ½ fiġ KIŲYi mæúKŲKx?
6. msvŋŋB ŋKv ij Lġ|
  - cŋij Z fiġ KIŲ
  - i ŋŋYkxj fiġ KIŲ
  - fiġ KIŲYi mġq
  - Rigi ġv ŋŋgZv
  - mvali Y KIŲ
  - Avšġ KIŲ



**DĒiġvjv**

**cŋ 2.1:**

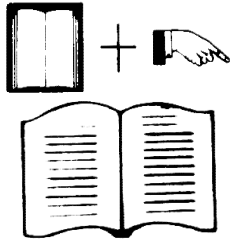
1| M 2| L 3| K 4| K 5| K 6| M 7| L

**cŋ 2.2:**

M 1| K 2| N 3| N 4| L 5| N



### cw 3.1 gwli ckwZ.Abrvfi fig KI P I Rvg `Zvi i bmvZgvj v



G cvV tkfI Avciob

◆ gwli ckwZ.Abrvfi fig KI P I Rvg `Zvi i bmvZgvj v Dfj l Ki fZ cvi teb|

me gwltZ me iKg dmj dj vfbv hvq bv| dmj dj vfbvi Dfj k`B fig KI P Kiv nq| ZvB gwli ckwZ.Abrvfi fig KI P Kiv DvPZ| fig KI P Yi Rb` ub`mj m LZ bmvZgvj v m`utK` mg`K avi Yv \_vKv ev`Abxq|

#### 1. gwli eju I MVb (Soil texture and Structure)

gwli eju Z\_v gwltZ evj , cij , K`g KYv BZ`w`i Dcv`wZ KZUv AvtQ Zv nbYq Kti fig KI P Kiv DvPZ| gwli eju m`utK`avi Yv \_vKtj RvgfZ tkvb aitYi dmtj i Pvl Kiv hvte Zv ubePfb mrvh` Kti | tkbbv, th tkvb gwltZ th tkvb dmj Pvl Kiv hvq bv|

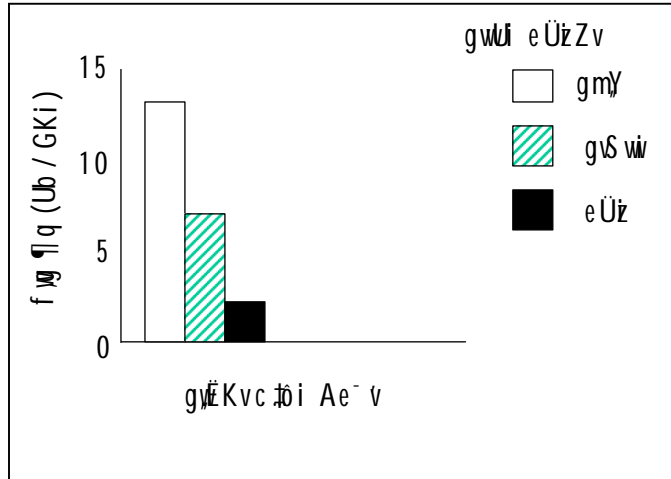
evj gwli KYv,tjv tek eo| evj gwli `jv MVb fvgZv Lg Kg | G gwltZ `Re c`vt`P cwi gvY Lg Kg Ges gwli dmj Drcv`tbi Rb` Dc`thvMx bq| c`fiv`f`i Gtlj gwli KYv,tjv Lg tQvU, Gi MVb Lg k<sup>3</sup>| Gtlj gwltZ `Re c`vt`P cwi gvY tenk \_vtK| G iKg gwli cwb aviY fvgZv AtbK tenk| G Rb` dmtj i Pvl Ki fZ ntj Gtlj gwli t`fK cwb ub`vktbi fij e`v`v`vKv `iKvi| wf`R Ae`vq Gtlj gwli gvL`tbi gZ big nq Ges Kr`v mrv Kti | Kr`v gwltZ fig KI P KóKi | Kr`v gwli i`vKtq tMj Ggb k<sup>3</sup> nq th jvOj Pjvfbv tek KóKi ntq cti | Zte avb P`fI i Rb` Gtlj gwli tek Dc`thvMx| Kr`v gwli DePZv msi fY fvgZv tenk Ges tmL`tbi m`f`f` RxevYj KivRj v`ci nvi | tenk| ZvB G gwltZ me`kl mvi c`qvm bv Kti | dmj Pvl Kiv hvq|

th gwltZ evj , cij | Kr`vi fivM c`q mgvb Absv`fZ \_vtK, tmB gwltK t`v`Avk gwli etj | G gwli MVb, cwb | `Re c`vt`P aviY fvgZv Ges ebtUi AvKvi gvSmi aitYi |

th gwltZ evj , cij | Kr`vi fivM c`q mgvb Absv`fZ \_vtK, tmB gwltK t`v`Avk gwli etj | G gwli MVb, cwb | `Re c`vt`P aviY fvgZv Ges ebtUi AvKvi gvSmi aitYi | t`v`Avk gwltZ fig KI P tek mnR| ev`ocvZ | Zvcgv`v h`v` Abfj \_vtK; ti vM-evj vB, AvMvQv BZ`w` h`v` mgqgZ `gb ev c`Zt`iva Kiv hvq, Zte t`v`Avk gwltZ th tkvb dmj Rb`fbv thfZ cvi |

#### 2. gwli eUzZv (Soil roughness)

th gwli Dcvi fivM hZ mgZj , tm gwltZ ZZ tenk duk, divUj , vPo | MZ`vKvi `iab c`vngvb cwb (Run off water) Kg Mvte| mvari bZ mgZj gwli cwb cwi`kvIY fvgZv tekx|

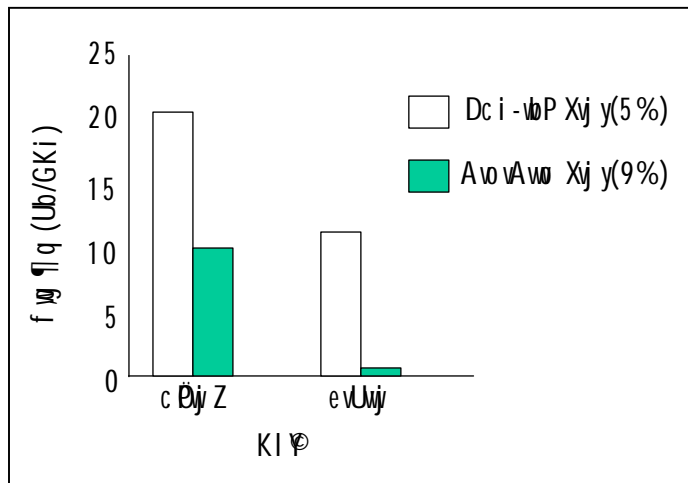


wpT - 1: fug t q gml e U z v i c f v e (Rbmb I Ab'vb", 1979)

G avi Yv t t K msi t Y fug KI t avi Yvi D m e n t q t Q | h i r d m t j i A e i k o i s k A e v A b ' v b " R v e i v R v Z i q c v g m l i D c t i v t K Z i n t j e p o i c m b i c e v t n m g Z j R i g i f u g t q K g n q , d t j g m l i m s i t Y m n R Z i n q |

### 3. fug KI t i w K (Direction of tillage)

Xij y R i g t Z d m j e c b I t i v c Y , f u g K I t B Z w K v R D c i - u b P ( U p a n d D o w n ) w t K b v K t i A v o i A m o f i t e ( A c r o s s ) K i t j f u g t q A t b K v s t k K g u t b v h i q | m s i t Y f u g K I t Y i t t t e v U m j P v l ( C h i s e l p l o u g h i n g ) \* D c i - u b P w t K b v K t i A v o i A m o f i t e P v l K i t j g m l i t q K g n q |



wpT - 2: fug KI t Y i w t K i R b c t j y Z I m s i t Y f u g K I t Y g m l i t q |

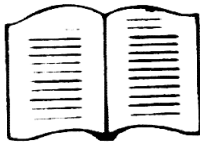
\* e v U m j P v l ( C h i s e l p l o u g h i n g ) : G c x u z t Z G K u w e t k l Q u j A v K u z i h t s j ( e v U m j ) m i n i t h k 3 g m l i w t K t f t z t q n q | D t j L t h , e v U m j P v l m a v i Y Z t e k M f x i Z v i ( 3 0 - 6 0 t m . u g ) g m l i w t f i v u n q u K S g m l i t K D i e t q t q n q b v |

2 bs ti LwP`T t` Lvfbv n`qtQ th c`Pij Z figKI`Y evUwj P`tl i tPtq A`bK tenk gmlUj `lq nq| AvovAvno P`tl gmlUj `lq c`q A`aR| AvovAvno evUwj P`tl gmlUj `lq G`KextiB Kg|

#### 4. evj vB `gb

fig KI`Yi gv`vi Dci  
(Degree of tillage)  
evj vB `gb A`bKvstK  
wbf`Kij |

fig KI`Yi gv`vi Dci (Degree of tillage) evj vB `gb A`bKvstK wbf`Kij | c`teB D`ij L Kiv n`qtQ th, msi `lY fig KI`Y c`wZ`Z AvMvQv, tcvKv-gvKo I tivM-evj vB `g`bi Rb` i vmvqubK w`qS`Y e`e`vi (Chemical control) Dci mgvaK wbf`Kij n`Z nq| msi `lY figKI`Y c`wZ`Z AvAK cwi gv`Y dmtj i Aewkóvsk gmlU`Z vKvq AvMvQvbk`Ki KvR`vi Zv Ktg th`Z cvti | G i Kg fig KI`Y P`tl i gv`v Kg vKvq wewfb`c`Kvi evj vB (Pest) gaj v AveR`vq tetP vK`Z cvti Ges cieZ`P`tgsm`tg evj vB`tqi Dc`e Zxe`n`Z cvti | avb P`tl gvRiv tcvKv (Stem borer) `g`bi t`l`l G i Kg mgm`v t`Lv w`Z cvti |



#### mwig<sup>©</sup>

me gmlU`Z me i Kg dmj djv`bv hvq bv| gmlUj c`KwZ. Abgv`ti fig KI`Y Kiv DvPZ| fig KI`Yi Rb` gmlUj e`bU I MVb, gmlUj e`U`Zv, fig KI`bi w`K I dmtj i evj vB e`e`vcbv m`ú`K`etePbv Ki`Z nq| gmlU`Z evj, c`ij, K`g Kyv BZ`w` i AbgvZ Rvbn c`q`Rb| gmlUj cwb I `Re c`v`P avi Y `lqZv, gmlUj DeP`Zv I Drcv`b `lqZv BZ`w` gmlUj MV`bi Dci A`bKvstK wbf`Kij | dmtj i Aewkóvsk `Re c`v`q`ntk`te gmlUj Dc`ti vK`tj fig`lq Kg nq Ges gmlU msi`w`Z nq| Avevi Dci-wbP P`tl i tPtq AvovAvno P`tl I fig`lq A`bK Kg nq| dmtj i evj vB e`e`vcbv figKI`Yi gv`vi Dci wbf`P K`ti | msi `lY fig KI`Y c`wZ`Z i vmvqubK evj vB w`qS`Yi Dci wbf`Kij Zv teto hvq|



**cvVvEi gj`iqb 3.1**

mWVK DEti i cvtkqUK wPy (v) w b

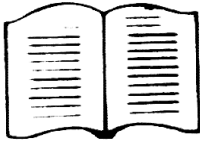
1. tKvb gmlU `j v MVb qgZv qgZv Lg Kg?  
K. evij gmlU L. cvij gmlU M. Gtlj gmlU N. t`v-Ark gmlU
2. tKvb gmlUz j vFRbKfite th tKvb dmj Rbvtbv hvq?  
K. Gtlj gmlU L. cvij gmlU M. t`v-Ark gmlU N. tetj gmlU
3. Dci-ubP Pti i tPtq AvovAmofite Pvl Kiti Kx nq?  
K. gmlU big nq L. gmlU qg tenk nq M. gmlU qg Kg nq  
N. dmtj i dj b tenk nq|
4. i qYkxj fig KIqY Kx nq?  
K. ti vM-evj vB Kg nq L. ti vM-evj vB tenk nq  
M. RigtZ tenk mL`K Pvl w`z nq N. RigtZ mvi tenk w`z nq|
5. i qYkxj fig KIqY avb Pti Kx nZ cvti?  
K. gvRiv tcvKvi Avrgb evotZ cvti  
L. RigtZ avb MtQi ewx Kg nZ cvti  
M. RigtZ tenk mvi w`z nZ cvti  
N. RigtZ avb MvQ tntj cotZ cvti |

### cvW 3.2 i`Ktbv I wFRv gmltZ KI` I exRZjv`Zni



G civ tkfI Avciob

- ◆ gmlJi Av`Zvi mt½ Rig KI`Yi m`uKqj LtZ cvi`teb|
- ◆ i`Ktbv I wFRv RigtZ fig KI`Yi avi Yv Dfj L Ki`Z cvi`teb|
- ◆ i`Ktbv I wFRv Ae`vq fij fite Pvl KZ.Rigi , Yvej x wj LtZ cvi`teb|



gmlJi Av`Zvi Dci wbfP Kti Rigtk i`Ktbv Ae`vq wKsev wFRv Ae`vq KI` Kiv nq| Avgv`i t`tk eQtii wewfbemgq Rigi Av`Zv wewfbæiKg \_v`K| Avevi Rigi Ae`v`tbi Dci wbfP Kti I gmlJi kktbv A\_ev wFRv ntZ cvti | Rigi Ae`vb Dpztj gmlJi Av`Zv Kg \_vKv `vfwek| Aci w`tk Rigi Ae`vb wPzntj eQtii Awakvsk mgq Zv cwb Øviv w<sup>3</sup> \_vKtZ cvti |

avb evsj v`tki c`vib Lv` dmj | Gml GKw AwZxq dmj hv i`Ktbv I wFRv Dfq RigtZ Pvl Kiv hvq| GRb` Avgv`i cwi`tek cwi`wZtZ i`Ktbv I wFRv Rigi c`wZ m`u`K`f`ewk Kti Rvbi AeKiv itqtQ| A\_P c`w`exi Ab`v` t`tk thLv`b avb Pvl Kiv nq bv - tmLv`b wFRv Rigi c`wZ I , Yvej x m`u`K`q qmKenj nI qv ZZUv , iazc`v`bq|

avb evsj v`tki c`vib Lv` dmj | Gml GKw AwZxq dmj hv i`Ktbv I wFRv Dfq RigtZ Pvl Kiv hvq| GRb` Avgv`i cwi`tek cwi`wZtZ i`Ktbv I wFRv Rigi c`wZ m`u`K`f`ewk Kti Rvbi AeKiv itqtQ| A\_P c`w`exi Ab`v` t`tk thLv`b avb Pvl Kiv nq bv - tmLv`b wFRv Rigi c`wZ I , Yvej x m`u`K`q qmKenj nI qv ZZUv , iazc`v`bq|

Gt`tk mavi YZ avb Pvl i Rb` `w` c`wZtZ Rig `Zni Kiv nq| Gi GKw i`Ktbv Rig `Zni Avi Ab`w wFRv Kv`vgq Rig `Zni | c`Kfite G`w` c`wZ wbtP Avtj wPZ ntj v:

### i`Ktbv Rig `Zni

AvDk avb Pvl i Rb` i`Ktbv Rig `Zni Kti exR mi`mwi gtv`ejb t`qv nq| tivcv Avgb ev tev`iv avb Kivvi ci mavi YZ gvP`gvtmi w`tk A\_ev tgsm`gi c`g ew`cv`Zi ciciB RigtZ c`g jvOj Pvl t`qv nq| H mgtq RigtZ hLb ØtRv` Avtm ZLbB GB Pvl t`evi DrKó.mgq| G m`u`K`K`w.L.Rig I fig KI` BDbtU w`w`i Z ejv ntqtQ|

AvDk avb Pvl i Rb` i`Ktbv Rig `Zni Kti exR mi`mwi gtv`ejb t`qv nq| tivcv Avgb ev tev`iv avb Kivvi ci mavi YZ gvP`gvtmi w`tk A\_ev tgsm`gi c`g ew`cv`Zi ciciB RigtZ c`g jvOj Pvl t`qv nq| H mgtq RigtZ hLb ØtRv` Avtm ZLbB GB Pvl t`evi DrKó.mgq| G m`u`K`K`w.L.Rig I fig KI` BDbtU w`w`i Z ejv ntqtQ|

AvDk avtbi exR mi`mwi gtv` teivri Rb` 5-6 evi jvOj I gB w`tq Rig `Zni Ki`Z nq| mavi bZ c`Z jvOj Pvl I AvovAwv jvOj Pvl i ciciB gB w`tZ nq| AvMvQv I ce`Zx` dmtj i AveR`v gmlJi mit` w`g`ktq t`qv nq A\_ev msM`b Kti c`v`tq tdjv nq| h`w` c`g Pvl I exR teivri mg`qi `N` L`y msKxY`nq, Zte Gme AveR`v tRvMv Kti c`v`tq tdjvB fij | Zv bv ntj AveR`v cP`bi mgq A`w`i Z Pvi v `w`Z Ki`Z cvti | extRi mt½ gmlJi mshy` w`b`eo nI qvi Rb` Rigi KI`e`v DEg nI qv DvPZ| h`w` exR teivri ciciB ew` nq Zvntj exR I gmlJi mshy` mgm`v t`qv t`q bv|

AvDk avtbi Rb` i`Ktbv Kiv`Z RigtZ w`w`ij wLZ `enkó` , tjv \_vKv DvPZ:

- 10 fvtjv ntZ gvSwi ai`tbi KI`e`v \_vKtZ nte hvi dtj exR w`b`eo fite gmlJi mit` mshy` \_v`K Ges Gi Ask`zi v` Mg mnRZi nq|
- 20 w`kKo gmltZ fvtj v`fite w`w`i j`v`fi Rb` KI`Yi c`w`vRbxq Mfxi Zv eRvq \_vKtZ nte|
- 30 Rigtk AvMvQv I ce`Zx`dmtj i AveR`v t`tk g`y` i vL`Z nte|
- 40 gvSwi w`PzRigtZ ew`i cwb at`i i vLvi Rb` ØAvBj Ø \_vKv DvPZ|
- 50 KI`Yi ci RigtZ t`kvb AKw`Z dmj \_vKte bv
- 60 extRi A`z`v` Mg I Pvi v ew`x`i Rb` gmltZ chw`B i m` \_vKtZ nte|

**wfRv Kv`vgq Rwg`Zwi**

tivcv Avgb I teftiv avb  
Pvfl i Rb` wfRv Kv`vgq  
Rwg`Zwi Kiv nq| Rwg`Z  
4-5 evi AvovAwio j v½j  
Pvl I gB w`tq Rwg`Zwi  
Kiv nq|

tivcv Avgb I teftiv avb Pvfl i Rb` wfRv Kv`vgq Rwg`Zwi Kiv nq| Rwg`Z 4-5 evi AvovAwio j v½j Pvl I gB w`tq Rwg`Zwi Kiv nq| cŁg 2 evi jv0j Pvl I gB t`qv nq Rwg`Z `Re c`v\_©AvMvQv I Ab`vb` AveRĐv gmlU mvt\_ wgwktq t`evi Rb`| GtK Rvei t`qv ejv nq| Gici big Kv`vgq Rwg`Zwi i Rb` cieZPvL\_ t jv t`qv nq| tivcv Avgb avtbi Rb` Kgc t`q tivctYi 15 w`b ctePvl i iæKiv DvPZ| GB mgtaqi gta` `Re c`v\_©ctP Ggb GKUv Ae`vq Avtm hLb cPbkj `Re c`v\_©ntZ A`vtgmbqv wBMZ nq hv tivcYKZ. Pvi i Rb` Mhb Dc`thvMx | Avi hw` mgq 15 w`tbi Kg nq Zvntj AvsukK cPbkj `Re c`v\_©ntZ KveB-WvB-A· vBW, `Re GmW Ges Ab`vb` Aevqexq cPbkj `e` wBMZ ntZ cvti hv tivcYKZ. Pvi i Rb` qvZKi ntZ cvti | teftiv tgdmtg G mgtaqi `N`15 w`tbi tenk nI qv DvPZ| tKbbv GB mgq A`v Wtm`f I Rvbgvni gvtm Zvcgvv Kg\_vKvq `Re c`v\_©cP`bi nvi Kg ntq\_vtK|

wfRv Kv`vgq gmlU`Zwi i  
mgq Rwg`Zwi cmbi D`PZv  
Kg\_vKv DvPZ| G aitYi  
Rwg`Zwi jv0j Pvl I gB  
w`tq\_K\_`tK Kv`vgq Rwg`  
Zwi Kiv hvq|

wfRv Kv`vgq gmlU`Zwi i mgq Rwg`Zwi cmbi D`PZv Kg\_vKv DvPZ| G aitYi Rwg`Zwi jv0j Pvl I gB w`tq\_K\_`tK Kv`vgq Rwg`Zwi Kiv hvq| Avi hw` Awak cmbi Rb` Rwg`Wze\_vtK Zvntj Pvl x jv0j dvij i mivK `vb wvK t`Ltz cvti bv| dtj AKwZ Ragi dvij t`tK thtz cvti Ges fvtj vfvte Rwg`Zwi nq bv|

fvtj vfvte `Zwi wfRv Kv`vgq Ragi w`v`ij wLZ `enkó`\_ t jv\_vKv DvPZ:

- 10 `Re c`v\_©thgb- AvMvQv, ceZP`dm t j i Lo I AveRĐv m`úYfvte ctP gmlU mvt\_ wgtk hvq|
- 20 Rwg`K`g`v` Ges mygfvte Rwg`Zwi cmbi weivR Kti |
- 30 AvBj k`v`fvte evav\_vKte Ges `fvmeK evocvZ I tmtpi cmbi Dc`P cov evavM` nte|
- 40 cmbi Mfxi Zv GiKg\_vKte hvtz tivctYi ci Pvi v Wze bv hvq|
- 50 gmlU\_K\_`tK Kv`vhy` ntj Pvi v tivcY mnRZi nte|
- 60 Rwg`Zwi cmbi a`i iLv i Rb` k`v` jv0j `ti (Plough pan) tKvb fv½tbi miv nte bv|

QK 1: i`Kt`v I wfRv gmlU`Z Rwg`Zwi i Z`vbgj-K wP`

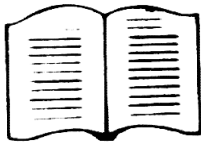
i`Kt`v gmlU`Z Rwg`Zwi	wfRv gmlU`Z Rwg`Zwi
1. G Rwg`Zwi tZ mivavYZ 5-6 evi jv0j Pvl I gB cŁqvRb nq	1. G Rwg`Zwi tZ Pvfl i Rb` mivavbZ 4-5 evi jv0j Pvl I gB Pvfl i cŁqvRb
2. Rwg`Zwi gmlU Av`Zv ev ōtRvō Ae`vi Dci wbfPkvj	2. Rwg`Zwi ōtRvō Ae`vi Dci wbfPkvj bq eis Rwg`Zwi cmbi mivav KtiB Pvl Kiv nq
3. gmlU MvB Ggb nI qv DvPZ thb exR gmlU mvt_ t j tM_vtK	3. Kv`v Rwg`Zwi gmlU tKvb mivK MvB_vtK bv
4. `Re c`v_© evqexq Ae`vq ctP  cP`bi nvi tenk	4. `Re c`v_© Aevqexq Ae`vq ctP  cP`bi nvi Kg
5. bvBtU`Rb RvZxq `Re c`v_© ctP	5. bvBtU`Rb RvZxq `Re c`v_© ctP

biBtUtU cwi YZ nq/	Gtgmbqivq cwi bZ nq/
6. biBtUtRtbi NH <sub>4</sub> <sup>+</sup> Ges NO <sub>3</sub> <sup>-</sup> Dfq Ae <sup>-</sup> itZB MtQi Rb` KvhRix/	6. biBtUtRtbi i'ay NH <sub>4</sub> <sup>+</sup> Ae <sup>-</sup> itZB KvhRix/
7. pH Acwi emZ` _vtK/	7. pH ubi t`c¶Zvi w` tK cwi emZ` nq/
8. mvari bZ Zn Gi Afve t`Lv hvq bv/	8. Zn Gi Afve t`Lv w` tZ citi /
9. wi W. ctUbukqj ** tenk/	9. wi W. ctUbukqj Kg/

RigtZ exR ecb I Priv tivctYi Rb` Rwg `Zwi Qvovl arfbi Priv `Zwi tZ i`Ktbr I wFRv Dfq cxwZtZB exRZjv `Zwi Kiv nq/ arfbi Priv `Zwi i Rb` exRZjv `Zwi m`umKZ ZEj I Z` 3.7 bs e`enwi K citv me`mwi Zfite Avtj vPbv Kiv nte/



**Ablyj b (Activity):** i`Ktbr I wFRv Ae<sup>-</sup>vq DEgi f`c `ZixKZ.Rwgi `enkó` \_tjv Avtj vPbv Kiab/



**mvi gg<sup>©</sup>**

gmUj Av`Zvi Dci wbfP Kti arv Pitli Rb` i`Ktbr Rwg A\_er wFRv Kiv`vgq Rwg `Zwi Kiv nq/ AvDk arfbi exR tevvi Rb` i`Ktbr RigtZ 5-6 evi jv0j Pvl I gB w` t`q gvSwi n`Z fitjv Kl`e`vq Avbv nq/ tivcv Avgb I tev`iv arfbi Rb` 4-5 evi jv0j Pvl I gB w` t`q wFRv Kiv`vgq Rwg `Zwi Kiv nq/ kktbr Rwg `Zwi i Rb` gmUj OtRv0 Avmtj c`g Pvl w` tZ nq/ Kiv`v Rwg `Zwi OtRv0 Ae<sup>-</sup>vi Dci wbfPkj bq eis RigtZ cwb mieivn KtiB `Zwi Kiv hvq/ i`Ktbr RigtZ gmUj mt`/2 extRi mshyP ubieo Kiv ubw0Z KitZ nq/ wKs` wFRv Kiv`vgq RigtZ gmUj tKiv mivK Mvb \_vtK bv/ dtj gmU I extRi ubieo mshyP tKiv mgm`v wvmt`e t`Lv t`q bv/ i`Ktbr RigtZ `Re c`v`\_P cP`bi nvi I wi W. ctUbukqj tenk A\_P wFRv Kiv`vgq RigtZ Kg \_vtK/ gmUj w.GBP i`Ktbr gmU tZ Acwi emZ` \_vtK wKs` wFRv gmU tZ ubi t`c¶Zvi w` tK cwi emZ` nq/ exRecb I Priv tivcY Qvovl arfbi Priv `Zwi i Rb` i`Ktbr I wFRv cxwZtZ exRZjv `Zwi Kiv nq/

\*\* tKiv gmU tZ me`gvb i`mivqibK c`v`f`g n`K H gmU KZR.Rwi Z ev wFRwi Z Kivi c`eYZvtK H gmUj wi W. ctUbukqj (Redox potential) etj/ Gi GKK ntjv t`fiv`e A\_er wgvj t`fiv`e Ges GtK E<sub>h</sub> Ovi c`Kik Kiv nq/ tKiv gmUj E<sub>h</sub> abizK ev tekx ntj tm gmU Rvib ¶lgZv m`ubwGes FYvZK ev Kg ntj wFRvib ¶lgZv m`ubw GkUj mjb`wKZ Rwgi E<sub>h</sub> mvari YZ 0.4 t`\_tK 0.7 Volt n`q \_vtK/



### cuVhEi gj'iqb 3.2

mWk DEti i cuKqUK 1Py (v) w`b

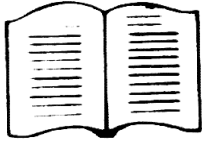
1. AvDk arbi exR mi vmi gvV tevri Rb` Riq `Zwi KitZ KZevi j v2j Pvl I gB w`tZ nq?  
 K. 3-4 evi      L. 4-5 evi      M. 5-6 evi      N. 6-7 evi
2. tivcv Argb arbi Rb` Kg ctq KZ w`b AvM Pvl ii€ Kiv DmPZ?  
 K. 10 w`b      L. 15 w`b      M. 20 w`b      N. 25 w`b
3. i Ktbr gmltZ Riq `Zwi wKmi Dci wbfPkj?  
 K. 0tRv0 Ae`v      L. ZicgrIv      M. `Re c`v\_©      N. ebu
4. i Ktbr RigtZ bvBtUtRb Riviq `Re c`v\_©ctP Kx i vmiqbK c`v\_©wi YZ nq?  
 K. bvBtUU      L. A`vtgmbqv      M. BDwi qv      N. A`vtgmbqv mij tdu
5. wFRv Kv`vgq RigtZ gmlU pH tKgb\_vtK?  
 K. Acwi ewZ      L. wbitcq      M. qvixq      N. A`iq

### cw 3.3 weifbædm̄tj i Rb` Rwg `Zwi i bwiZgvj v



G civ tk̄tI Avciḅ

- ◆ weifbædm̄tj i Rb` weifbæi Kg Rwg `Zwi i Kvi Y ij LtZ cviṭeb|
- ◆ dmj Ablyq̄x Rwg `Zwi i bwiZgvj v Dt̄j L KiṭZ cviṭeb|



Avt̄MB ej v nt̄qt̄Q th, weifbædm̄tj i Rb` weifbæfv̄tē Rwg `Zwi Kiv nq| Avevi GKB k̄tm̄`i weifbædm̄tj i Rb` Rwg `Zwi i c×wZ Avj v`v nt̄Z cviṭi | huṭnuK Rwg `Zwi i m̄vavi b bwiZgvj v ub̄t̄P eYḅv Kiv nt̄j v:

#### 1. dm̄tj i tḡšm̄g

dm̄tj i tḡšm̄g Ablyq̄x Rwg `Zwi i bwiZgvj v ubaṭi Z nq| thgb av̄t̄bi wZb̄w dmj - AvDk, Avgb I teṭiv- GKB eQt̄i Pvl Kiv th̄t̄Z cviṭi | Kv̄t̄RB AvDk tḡšm̄g avb Pvl Kivi Rb` thfv̄tē Rwg `Zwi Kiv nq, teṭiv tḡšm̄g tmfv̄tē `Zwi Kiv nq bv| Avevi ṭKvb ṭKvb km` i ue I Lwi c-`tḡšm̄gB Pvl Kiv nq| thgb- Pxbv ev`vg, f̄ḅv, ḡM Kj vB BZ`w̄ | Gme dmj P̄t̄I i Rb` weifbætḡšm̄g weifbæi Kg Rwg `Zwi i c×wZ Abyvi Y KiṭZ nq|

#### 2. km` Drcv`b c×wZ

GKB km` GKwaK c×wZt̄Z Pvl Kiv th̄t̄Z cviṭi | thgb: t̄Mvj Avj ygvj P&c×wZt̄Z, A\_ev m̄vvi t̄Z D̄P̄K̄t̄i ḡm̄U Z̄t̄j w`t̄q Pvl Kiv nh| gvj P&c×wZt̄Z t̄Mvj Avj yivcY K̄t̄i KP̄i cubv, Lo BZ`w̄ w`t̄q t̄X̄t̄K ṭ`qv nq| GB `Re Av`liṭ̄Yi gv̄t̄S Avj yDrcv`Z nq| wK̄S` Ab` c×wZt̄Z Avj ym̄vvi t̄Z j w̄M̄t̄q D̄P̄K̄t̄i ḡm̄U Z̄t̄j w`t̄q (Earthing up) Pvl Kiv nq| Kv̄t̄RB G`w̄ c×wZt̄Z Rwg `Zwi i w̄fbæc×wZ Abyvi Y Kiv nq|

#### 3. ecb I tivcY c×wZ

ecb I tivcY c×wZi Rb` w̄fbæw̄fbæfv̄tē Rwg `Zwi Kiv nq| AvL P̄t̄I cwi Lv c×wZ, Gm̄.w̄.w̄c (Spaced transplanting) ev Ab`vb` c×wZi Rb` w̄fbæw̄fbæfv̄tē Rwg `Zwi Kiv nq| cwi Lv c×wZt̄Z m̄vi cwi Lvq mieivn Kiv nq A\_P Ab`vb` c×wZt̄Z Zv Kiv nq bv| G ṭ̄ḅ̄t̄I Rwg `Zwi i w̄fbæc×wZ Abyvi Z nq|

#### 4. ch̄ȳMZ m̄ȳav

Avgiv Avt̄MB ṭR̄t̄b̄w̄ th, AvDk avb i K̄t̄bv Rwḡt̄Z A\_ev w̄fRv Rwḡt̄Z f̄vg KIḅ K̄t̄i Pvl Kiv hvq| ch̄ȳMZ m̄ȳav-Am̄ȳav i Rb` G Pvl c×wZ Abyvi Y Kiv nq| hv̄ tm̄t̄Pi ch̄ḅ m̄ḅw̄M m̄ȳav `v̄t̄K Zvnt̄j Rwḡt̄Z Kv`v K̄t̄i (Puddling) AvDk avb Pvl Kiv nq, Avi tm̄ m̄ȳav bv `v̄K̄t̄j i K̄t̄bv Rwḡt̄Z f̄vg KIḅ K̄t̄i G avb Pvl Kiv nq|

#### 5. f̄vg KIḅ c×wZ

c̄ḅ̄j Z f̄vg KIḅ I m̄si ḅ̄Y f̄vg KIḅY Rwḡt̄Z `Zwi i c`K c×wZ iṭ̄qt̄Q| c̄ḅ̄j Z f̄vg KIḅ c̄ḅ̄vq Rwḡt̄K D̄Ēḡiṭ̄c Pvl K̄t̄i exRZjv `Zwi Kiv nq| wK̄S` m̄si ḅ̄Y f̄vg KIḅ c×wZt̄Z ḡm̄U t̄f̄S `Yvej ṭ̄K Db̄Z Kivi Rb` b`ḅZg msL`K Pvl w`t̄q `Zwi Kiv nq| m̄si ḅ̄Y c×wZt̄Z evUw̄j Pvl I m̄ivm̄vi w̄M̄j s K̄t̄i Rwḡt̄Z exR ecY Kiv nq| Aṭ̄k M̄gq f̄vg KIḅY i w̄eK̄i w̄m̄v̄tē AvM̄vQv̄b̄iK̄K e`en̄vi Kiv nq|

c̄ḅ̄j Z f̄vg KIḅ c̄ḅ̄vq Rwḡt̄K D̄Ēḡiṭ̄c Pvl K̄t̄i exRZjv `Zwi Kiv nq| wK̄S` m̄si ḅ̄Y f̄vg KIḅ c×wZt̄Z ḡm̄U t̄f̄S `Yvej ṭ̄K Db̄Z Kivi Rb` b`ḅZg msL`K Pvl w`t̄q `Zwi Kiv nq|

**6. exRi AvKvi I AvqZb**

dmTj i exR hZ tQvU tm  
dmTj i Rb` ZZ teik  
cwi cwiU Kti exRZjv`Zwi  
Kiv nq|

exRi AvKvi I AvqZb Ablyvq Riq`Zwi KiZ nq| th dmTj i exR hZ tQvU tm dmTj i Rb` ZZ teik cwi cwiU Kti exRZjv`Zwi Kiv nq| exRZjvq exR ectbi ci exRi m1/2 gwiU ms`uk`hZ wbeo nq, exRi AvZiv`Mtgi nvi I tm Ablyvq ZZ teik nq| exRi AvKvi eo ntj Kg msL`K PtlI c0qvRb nq| thgb tQvjv I fXv PtlI Rb` thfite RigTz Pvl w`tZ nq ZivgK A`ev ucqvRi Rb` Zvi tPtq AtbK teik Pvl w`tq mxi I cwi cwiU Kti exRZjv`Zwi KiZ nq| KvRB exRi AvKvi I AvqZb Ablyvq Riq`Zwi cxiZ cwi ewZ nq`vK|

**7. AvMvQv e`e`icbv**

AvMvQv e`e`icbvi Rb` wfbwfdmTj i Rb` Riq`Zwi wfbwfbwecxiZ Ablyvq Kiv nq| dmTj i t1/2 AvMvQv cwi Pvl R cxiZ, i vqvubK cxiZ Ges`RweK cxiZtZ`gb Kiv hq| th dmTj i AvMvQv`gTbi Rb` i vqvubK cxiZ e`envi Kiv nte Zvi tPtq thLvB cwi Pvl R e`e`v tbqv nte- G t1/2 wfbwfbw t1/2 wfbwfbw Riq`Zwi Kiv nq| MRvTbvi AvMB AvMvQv bvkK c0qM (Pre-emergence application of weedicide) Kti AvMvQv`gb Kiv hq| evsvt`tk thtnZz AvMvQv bvkK e`envi miKwi Abtgv`b tbB, ZvB cwi Pvl R cxiZtZ AvMvQv`gb KiZ RigTz exR ectbi cteB fvtjv Riq`Zwi cwi`vi Kti Riq`Zwi KiZ nq| Avevi AtbK AvMvQvbvkK thgb c`vvtKivU fig KIYi weKí wmvte e`envi Kti mgwSZ AvMvQv`gTbi t1/2 AvMvQv gwiU mvt` wgvktq w`tq Riq`Zwi Kiv nq| KvRB AvMvQv`gTbi Rb`I Kul..Riq`Zwi cxiZ wfbwfbw cvti|

**8. gTj i MfxiZv**

wfbwfdmTj i gj` wfbwfbw MfxiZv chS tctQ| A`P tKvb dmTj i gj` gwiU Mfxi c0ek Kti Avevi tKvbU gwiU Dcti i`tiB`vK| wbtP KtqKwU dmTj i gTj i MfxiZv t`qv ntjv|

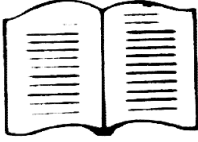
QK 1: KtqKwU c0vb dmTj i gTj i MfxiZv

kTm`i bug	gTj i MfxiZv (`N`tm.wg.)	gTj i MfxiZvi gvTv
avb	27	AMfxi
Avj	50	gvSwi Mfxi
mwi Iv	60	gvSwi Mfxi
gmj	60	gvSwi Mfxi
Mg	120	Mfxi
AvL	150	Mfxi

KZ MfxiZvq Riq`Pvl  
Ktj dmTj i dj b fvtjv  
nte Zv wbfP Kti dmTj i  
gTj i`ewkt0`i I ci|

KvRB KZ MfxiZvq Riq`Pvl Ktj dmTj i dj b fvtjv nte Zv wbfP Kti dmTj i gTj i`ewkt0`i I ci| avb GKwU AMfxi gj`x dmj| Gi Rb` Mfxi fite PtlI c0qvRb nq bvl Ab`w`tK AvL dmTj i Rb` Riq` Mfxi fite PtlI c0qvRb itqtQ|

Aveni Pi GjvKvq gwUj Dcti i t`i Ar Mfxi Zim`ubæcij ev tetj t`v-Auk ebtUi mbtP  
tgUv emj \_vKtj Mfxi fite Pvl bv KivB fvj | c`qvRtbi AvZwi<sup>3</sup> Mfxi Zvq Pvl Kitj  
tKej ktj, mgq I At`PB AcPq nq bv, AtbK t`t`Rigi Drcv`b t`lgZvl Ktg thtZ  
cvti |



**mvi gg<sup>©</sup>**

wefbædmjtj i Rb` wefbæi Kg Rwg `Zwi KitZ nq| dmtj i tgsmtg, Drcv`b cxwZ, ecb I  
tivcY cxwZ, chw<sup>2</sup>MZ mjev, fvgKI<sup>9</sup> cxwZ, extRi AvKvi I AvqZb, AvMvOv e`e`vcbv,  
gtj i Mfxi Zv BZ`w` wltqi c`Z j`j` ti tL Rwg `Zwi KitZ nq| GKB dmj iwe I Lwi c  
tgsmtg Pvl Kitj wfbævte Rwg `Zwi KitZ nq| Aveni GKB dmtj Drcv`b cxwZi wfbævi  
Rb` Rwg `Zwi tZl cv`R` t`Lv hvq| ecb I tivcY cxwZi wfbævi Rb` GKB dmtj  
wfbævte Rwg `Zwi KitZ nq| tmtPi mjev \_vKtj AvDk avtbi Rwg Kv`v Kti Pvl Kiv  
hvq| Zv bv \_vKtj i Ktbr RwtZ Pvl cxwZ Avjv`v| c`vj Z fvg KI<sup>9</sup>Yi tPtq msi tY fvg  
KI<sup>9</sup>Y AtbK Kg Pvl t`qv nq| extRi AvKvi I AvqZb Abjvqx Rwg `Zwi wfbæng| extRi  
AvKvi tQvU ntj Rwg wgvn (Fine) Kti `Zwi KitZ nq| dmtj i gtj i Mfxi Zv Pvl i  
Mfxi Zvi mt½ m`uK<sup>9</sup>| dmj Mfxi gj-x ntj Rwg Mfxi Kti Avi AMfxi gj-x ntj Rwg  
AMfxi Kti Pvl Kiv nq|



### cuVhEi gj`iqb 3.3

mWVK DEti i cuVhEi UK wPy (√) w b

1. KZ Mfxi fite Rig Pvl Ki tZ nte Zv wKtmi Dci wbfP Kti?

K. Rig DePZvi Dci                      L. exRi IRtbi Dci

M. gj i Mfxi Zvi Dci                      N. Rig i tmi cwigvYi Dci

2. Rig KZ wgn (Fine) Pvl nte Zv wKtmi Dci wbfP Kti?

K. Avenl qvi Dci                      L. exRi AvKwZi Dci

M. gwLi i tmi cwigvYi Dci                      N. gwLi `Re c`vt\_P cwigvYi Dci

3. tmPti mear wKtj tKvb Rig tZ AvDk avb Pvl mearRbK?

K. iKtbr Rig tZ                      L. wFRv Kiv`vgq Rig tZ

M. DEzRig tZ                      N. UtRv Ae`vq Pvl t`qv Rig tZ

4. tKvbU mWVK?

msi wY fvg KlPY gwLi , Yv, Y Dbz Kivi Rb` -

K. tewk msL`K Pvl t`qv nq                      L. Kg msL`K Pvl t`qv nq

M. tKvb Pvl B t`qv nq bv                      N. Rig wgn Kti `Zwi Kiv nq|

5. tKvbU mWVK?

c`vi vtKvqu e`envi Ki tj -

K. tewk Pvl w tZ nq                      L. fvg KlPYi weKí aiv nq

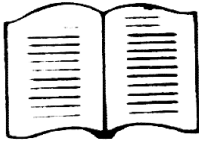
M. Rig cwi cwU Kti `Zwi Ki tZ nq                      N. dm t j i Drcv`b Kg nq

**cw 3.4 exR ecb I Priv tivcY**



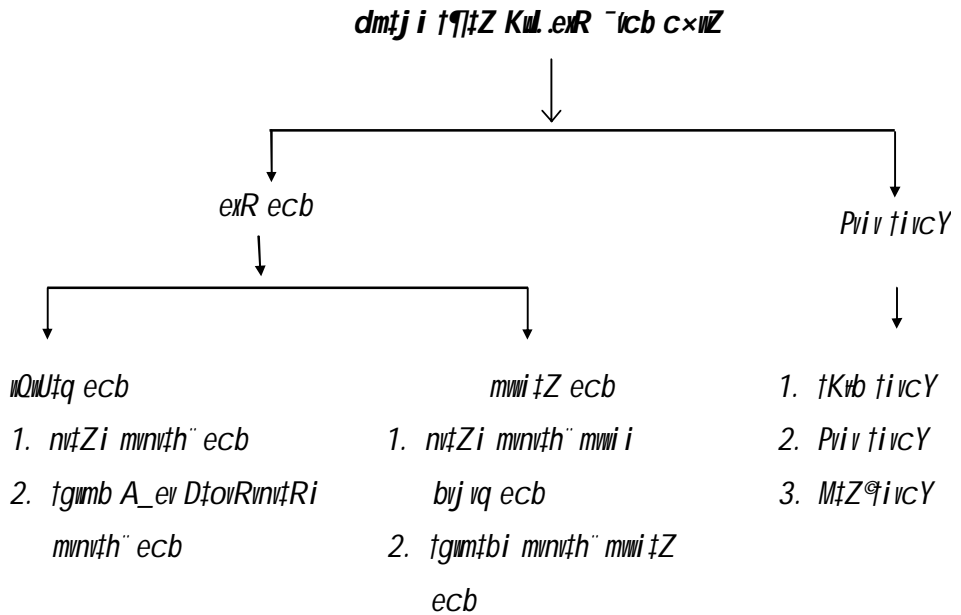
G cvV tkfI Avcb

- ◆ dmtji tftZ exR `vcb cxwZ DttZ KitZ cvi teb|
- ◆ exR ecb I Priv tivcY cxwZi mjev I Amjev, tjuj LtZ cvi teb|
- ◆ dmtji exR ecb I Priv tivcY cxwZi vbePb KitZ cvi teb|



dmj Prtli AwZ ,iaZcY©DcKiY ntjuv exR| exR Dwt`i esk me`tti i gva`g| ZUj dmtji km`vbn (Food grain) thgb avb, Mg, fZv BZ`w` cKZ.exR (True seed); Avevi Dwt`i kvimmi K Ask t\_tK Avcb RvtZi bZb Dwt`i Rbft`qvi ftgZv ivtL GB At\_ AvtLi KvU, tMj Avj y Kt`i (Tuber) gZ kvimmi K Ask t\_tK iiaKti avb ev Mg extRi gZ RvbubK Ask meB Kul.exRi Astf| Gvubfvte kvLv Kjg, ivBtRvg, K`, ejvej, ,uOK`, K`gj-, tkvIK, ukKo Kjg, cvZv BZ`w` t\_tKI MvQ Rbftbvr hvq| AZGe Gme, tjuv Kul.exRi Astf| extRi iKg tft` ecb I tivcY cxwZ wfbang| thgb cKZ. cvU exR wQuUtg tevrv hvq A\_P cvtUi WmV tivcY KitZ nq| km` Prtli Rb` exR `vcb cxwZmg ntK vbtPi QtK t`Lvtrv ntjuv:

ZUj dmtji km`vbn (Food grain) thgb avb, Mg, fZv BZ`w` cKZ.exR (True seed); Avevi Dwt`i kvimmi K Ask t\_tK Avcb RvtZi bZb Dwt`i Rbft`qvi ftgZv ivtL GB At\_ AvtLi KvU, tMj Avj y Kt`i (Tuber) gZ kvimmi K Ask t\_tK iiaKti avb ev Mg extRi gZ RvbubK Ask meB Kul.exRi Astf|



**exR ecb**

dmj Prtli Rb` Rvg fvj fvte juvJ Prl I gB Prl w`tg `Zwi Kti exR ebtZ nq| exR tevrv mgq RvbtZ nte extRi A/ztv`Mtgi Rb` RvgZ Dchj im AvtQ wKbv| gvUtg chfB im \_vKtj extRi A/ztv`Mg fvj nq Ges Priv my` I mej ntq teto Dtv| Gifc Rvgi OtRvU estS exR ebtj Prtli mvdj` AtbKvstK Avkv Kiv hvq|

extRi AvKvi I AvqZb Abjvqx exRZjvi gvU `Zwi KitZ nq| mvavi bZ exR hZ tQuU AvKwZi nq exRZjv ZZ cvwU Kti `Zwi KitZ nq| tevrv ci extRi mt` gvUj mshj hZ vbeo nte, extRi A/ztv`Mtgi nvi ZZ temk nte| ZvB cvU, mvvi Iv, wqvR, ZvgvK,

mvavi bZ exR hZ tQvU  
AvKwZi nq exRZjv ZZ  
cwi cwi Kti Zwi KiZ  
nq|

BZ`w` dmtj i exR ecb KiZ ntj gwi KiL`v fij ntZ nq| tek KtqKevi jvOj Pvl I  
gB Pvl w`tq Riq `Zwi KiZ nq| A\_P extRi AvKvi eo ntj gvSmi iKtgi Kl`vB  
ht\_ó| f`v, tQvj v, gUi BZ`w` dmtj i exR ectbi Rb` A`bKuv Kg Pvl Kti exR ebtj I  
dmtj i dj`b tKvb Zvi Zg` NtUv| Avevi extRi AvKvi AvKwZi Dci exR ectbi Mfxi Zv  
w`f`Kxj | extRi AvKvi tQvU ntj Kg Mfxi Zvq ebtZ nq Avi eo ntj w`KQytenk Mfxi Zvq  
ecb Kiv nq|

exRZjvi cKvif` i lci l exR ecb w`f`Kxj | exR ectbi Rb` i Ktbr l w`Rv GB `jKg  
exRZjv `Zwi Kiv nq| mvavi YZ th mg`l extRi tLmv cvZjv l big tm,tjv ectbi cje`  
w`Rv`bvi c`qvRb nq| thgb cvU, mwi lv, gmy BZ`w` dmtj i exR i Ktbr Ae`vq i Ktbr  
exRZjvq ecb Kiv nq| w`KŠ` tLmwi tQvj v, gUi c`wZ dmtj i exR 2/1 w`b w`Rv`q ebtZ  
nq| Avevi avb Pvl i Ktbr exRZjvq i Ktbr exR Avi w`Rv exRZjvq w`Rv exR ebtZ nq|  
tgsmg t`f` l exR w`Rv`bvi t`f` Zvi Zg` i tqtQ| AvDk l Avgb tgsmg avb exR c`q 48  
Nuv Ges textiv tgsmg c`q 72 Nuv w`Rv`q ivL`Z nq| w`bP exR ecb c`wZ,tjv Avtj vPbv  
Kiv ntjv:

**w`Qv`q exR ecb**

**1. n`Zi m`v`h` w`Qv`q tebv**

G c`wZ`Z GKwU cv`T exR w`bq g`v g`v exR w`Qv`q tebv nq| GKwU Riqi `N`A`ev c`  
eivei cijv Kti tntU mg`l Riq`Z exR w`Qv`q t`qv nq| G`f`f` Aek`B tLqj ivLv Riavi  
h`Z Riqi tKvb RvqMv ev`bv h`q| G c`wZi m`v`v l Am`v`v,tjv w`bP t`qv ntjv:

**m`v`v**

- ZrovZwv ecb Kiv m`v`v`nq|
- mgq, kigK l LiP Kg j`v`M|

**Am`v`v**

- exR mgvbfv`te mgM`gv`v tebv m`v`v bq|
- extRi cwi gvY tenk j`v`M|
- AvMvQv evQvB l dmtj i cwi Ph`K`i`Z Kó nq Ges mgq A`bK tenk j`v`M|
- AvŠ` cwi Ph`K`i`Z Kul.hšc`wZ e`envi evavi m`v`v nq|
- dmtj i Drcv`b LiP tenk nq|
- AvMvQvi c`Kvc Ly tenk ntj Pvlxiv dmj bó Kti w`tq cieZx`dmj Pvl i D``v`M  
tbq|
- dmtj i m`½ msNex AvMvQv (Crop associated weed) `gb Kiv mnR bq|

**2. tgumb A`ev D`ovR`v`Ri m`v`h` ecb**

G c`wZ`Z ectbi KivRwU i aytgumb A`ev D`ovR`v`Ri m`v`h` m`v`v`Kiv nq| G c`wZi  
m`v`v l Am`v`v,tjv n`Z w`Qv`q tebv gZB|

**mwi tZ exR ecb**

mwi tZ `fite exRecb Kiv nq| nvtZi mnvth` jvOj A\_ev Ab` tKvb UvBb e`enri Kti ecb Kiv A\_ev tgm tbi mnvth` ecb Kiv| eZv tbi newfbæi Kg exR ecb hš; cvl qv hvq| Avgv t` i t`tk ersj t`k Kul.Mtel Yv KvDwYj KZR.D`weZ exR ecb hš; mnvth` GK ev GKwaK jvB tbi avb, cvU, Mg, gUi BZ`w` exR ecb Kiv hvq| we t`tk AvaybK exR ecb hš; mnvth` mōzI mygfite exR ecb Kiv hvq| GB c×wZi mjeav I Amjeav, t jv w tP D t j L Kiv n t j v:

**mjeav**

- dmtj i Avš t cwi PhP thgb AvMvQv evQvB, mvi cōqm BZ`w` hveZiq dmj cwi PhP Kiv mn t R m=ubæKiv hvq|
- Zj b v g j - K f i t e e x t R i c w i g v Y K g j v t M |
- mgvb Mfxi Zvq exR ecb w b q š Y K i v h v q |
- e x t R i A ½ z i v ` M g f v j n q |
- dmtj i m t \_ m s N e x A v M v Q v ` g b K i v m n R Z i n q |
- mwi tZ Aew`Z MvQ, t j v t g v U v g v d m g f i t e A v t j v, e v Z i m I L v t ` i c r ` v b c v q e t j m v a r i Y Z d j b t e w k n q |
- dmj KivUv I tZij v mnR nq|

**Amjeav**

- mgq I kigK teuk jv t M e t j L i P A t b K t e u k | A e k ` A v a y b K h š ; t h g b ÷ ` i b t n t c m k b w f (Stan Hay Precision drill) e`enri Kij mgq I kigtKi AcPq Ktg hvq| mwi tZ exR ectbi Rb` cōmK LiP teuk n t j I c i e Z i t Z d m t j i A v M v Q v e v Q v B m n A b ` i b ` A v š t c w i P h r m n R n q e t j m e f i v K t j ` D r c r ` b L i P K t g h v q G e s g l v c l v t e f o h v q |

**exR tivcY**

dmj Drcv` tbi Rb` Kul.exR tivcY Ki t Z nq| AvL, tMj Avj y w g i o Avj y B Z ` w ` d m t j i K u l . e x R A b ` i b ` d m t j i e x t R i g Z t e i b v h v q b v | A v e v i A t b K d m j t h g b P v, K u d, a v b, Z v g v K B Z ` w ` d m t j i P r i v ` Z w i K t i R u g t Z t i v c Y K i t Z n q | n e w f b æ c K i v i e x R t i v c Y c × w Z w t P e w Y Z n t j v:

**K. tKvb tivcY (Clone planting)**

tKvb thgb Av`v, n j y B Z ` w ` i e x R R u g ` Z w i K t i m w i t Z t i v c Y K i v n q | A t b K m g q G t j v t g t j v f i t e l t K v b t i v c Y K i v n q |

**L. Piv tivcY**

Rug `Zwi Kti cōqvRbxq mvi mieivn Kti Priv tivcY Kiv DvPZ| avb P t l i R b ` c ũ t g e x R Z j v q P r i v R b t b v n q | P r i v t i v c t Y i R b ` R u g t Z c w b m i e i v n K t i K r ` v (Puddling)

tKvb thgb Av`v, n j y BZ`w` i exR Rug `Zwi Kti mwi tZ tivcY Kiv nq|

KwL.1 cji Dbq b ˘z

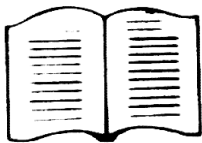
KiZ nq| big Kiv`vhy RwgZ wbr` ˘ ˘Z; tMvQv tMvQv KtqKw Kti Priv GKfT tivcY Kiv nq|

**M. MZ©ivcY (Dibbling)**

G cxiZtZ MZ©Kti exR tivcb Kiv nq| AvDk avb A\_ev mewR Rivxq dmtj i tŋtŋ MZ© Kti exR ˘nivcb Kiv nq| Gfite exR Gtj vtgtj vFite A\_ev mwiZ tivcY Kiv nq| exR wQwUq ebtj hw AvDk avbi MvQ tntj covi mtebr ˘vK Zvntj exR MZ©ivcY Kiti mslj cvl qv thZ cvti |



**Ablyj b (Activity):** wQwUq exR ecb I mwiZ exR ecb cxwZi myear I Amyeav, tjv Avtj vPbv Ki ab |



**migg©**  
dmj Drcv`tbi Rb` KwL exR ecb ev tivcY Kiv nq| tŋtZ KwL exR ˘nivcbi cxwZtK exRecb I Priv tivcY fM Kiv hvq| exR wQwUq I mwiZ nvtZi mvrth` A\_ev tgmvtbi mvrth` tevbr hvq| Priv tivcYI Gtj vtgtj vFite A\_ev mwiZ Kiv nq| wQwUq exR ebtj mgq, ktgK I LiP Kgj vM| wKŠ` dmtj i cieZx©cwi Phŋ LiP temk cto| mwiZ exR ecb Kiti cŋwK LiP temk ntj I cieZx©Z AvMvQv evQvB mn Ab`ib` AvŠtcwi Phŋ KivR mnR nq etj meŋvKzj` Drcv`b LiP Ktg hvq Ges gbdv teto hvq| mwiZ exRecb ev Priv tivcY Kiti dmtj i mt½ msNex AvMvQv mntR `gb Kiv hvq| wQwUq ev Gtj vtgtj v fite exRecb ev Priv tivcY Kiti MtQi msLv mlyg ivLv hvq br etj dj b mvariYZ Ktg hvq| wKŠ` AvavbK Dbz hšcwZi mvrth` RwgZ mlyg I mŋz fite wbr` ˘ msL`K dmtj i MvQ Rub#q KwLZ dj b jvf Kiv hvq|



### cvWĒi gj`iqb 3.4

mWk DĒti i cvkqUK wPy (√) w`b|

1. dmj i cKZ.exR Kx?

K. DwMf` i kvixi K Ask

L. DwMf` i RvbubK Ask

M. kvixi K I RvbubK Ask

N. tKvbUvB bq|

2. wbPi tKvbU cKZ.exR ?

K. kvLv Kj g

L. K` gj-

M. cvU exR

N. w K`

3. wbPi tKvbU Kvl.exR bq ?

K. AvLi KvU

L. AvLi cvZv

M. tMj Avj y K`

N. cv\_i KPi cvZv

4. ZvgvKi exR ectbi Rb` gWU K l`nv tKgb nŕZ nq?

K. fvj nŕZ nq

L. gvSwi nŕZ nq

M. fvj nŕZ gvSwi nŕZ nq

N. gvSwi nŕZ wgvvbi nŕZ nq|

5. cvU I mwi Iv exR tKvb ai tbi exRZj vq ebtZ nq ?

K. i Ktbr exR i Ktbr exRZj vq

L. i Ktbr exR wFRv exRZj vq

M. wFRv exR i Ktbr exRZj vq

N. wFRv exR wFRv exRZj vq|

6. tev i v tgsnjg avb exR wFRv exRZj vq teiv i cteAvbgmbK KZ N>Uv wFRtq i vLŕZ nq?

K. 24 N>Uv

L. 48 N>Uv

M. 60 N>Uv

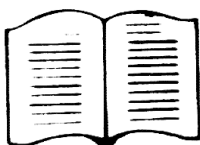
N. 72 N>Uv|

### cw 3.5 Pvi NbZ; ubaŋ Y I mte` dj b



G ciV tkŋl Avci b

- ♦ dmtj i exR nvi Ges dmtj i tŋŋZ Pvi NbZ; ubaŋ Y KiŋZ cvi teb |
- ♦ dmtj i tŋŋZ Pvi NbZ; Zvi Zg` Ges Gi Kvi Y e`vL`v KiŋZ cvi teb |



GKwU ubw`ŋ GKK cwi gvY RigtZ mv`R fite GKwU dmj dj vtZ th cwi gvY exR ecb KiŋZ nq ZvtKB H dmtj i exRnvi eŋvq | GKwU ubw`ŋ AvqZŋbi RigtZ th cwi gvY Pvi v MvQ \_vKtj GKwU dmtj i D`P dj b nq, tm cwi gvY Pvi v Dcv`wZŋK H dmtj i Pvi v NbZ; etj | Pvi v NbZ; Dci dmtj i dj b AŋbKLmb wbfP kxj | AZGe RigtZ Kw`LZ Pvi v NbZ; Rb` GKwU ubw`ŋ cwi gvY exR RigtZ ecb Kiv nq | ubw`ŋ GKK RigtZ ubw`ŋ mSL`K MvQ mŋg` ŋZ; Ae`vb Kŋi fij fite Rbvtj B mte`P dj b cvl qv mte` | extRi nvi Kgtewk ntj MtŋQi NbZ; mSL`v Kg ev tewk nq | dtj dmtj i ew` I Dbaq b Zvi Zg` nq hv dj ŋbi Dci cŋve tdtj |

GKwU ubw`ŋ GKK cwi gvY RigtZ mv`R fite GKwU dmj dj vtZ th cwi gvY exR ecb KiŋZ nq ZvtKB H dmtj i exRnvi eŋvq | GKwU ubw`ŋ AvqZŋbi RigtZ th cwi gvY Pvi v MvQ \_vKtj GKwU dmtj i D`P dj b nq, tm cwi gvY Pvi v Dcv`wZŋK H dmtj i Pvi v NbZ; etj |

exRnvi extRi weifbæ` Yv`ŋYi Dci wbfP Kŋi | G mg`l` Yvej xi gŋa` itqtQ extRi weix`Zv, Aŋzi v` Mg ŋgZv, IRb, AvKvi, AvKwZ, mgveqeZv, cwi c`Zv BZ`w` | exR hZ weix` nq exRnvi ZZ Kg nq Ges extR tRvtj i cwi gvY hZ tewk nte exRnvi tm nvti evote | Avevi extRi Aŋzi v` Mtgi nvi hZ tewk nte exRnvi tmB AbsvtZ Kgtel extRi AvKvi AvKwZi Zvi Zg`i Rb` exRnvi Kg ev tewk nte | extRi IRŋbi Zvi Zg`i Rb` tMj Avj yexRnvi tnŋti 20 t`ŋK 75 gY chŋl I Vbvgv KiŋZ cvti | G Qvovl extRi mgveqeZv I cwi c`Zvi Rb` exRnvi Kg ev tewk ntZ cvti |

AvtMB ej v ntqtQ, dmtj i tŋŋZ Pvi NbZ; I dj b ubw`eofite RwoZ | Kw`LZ dj ŋbi Rb` Pvi v NbZ; ubaŋ ŋY cŋve we`vi Kvi x Kvi Ymga` wŋtP Avtj vPbv Kiv ntj v:

#### 1. Kw`ŋZ Dv`c` mSL`v (Desired plant population)

GKwU ubw`ŋ GKK cwi gvY RigtZ ubw`ŋ mSL`vi MvQ msKŋvb nevi ci dj b mte`P mŋgq tcŋvq | GB ubw`ŋ mSL`vi MvQ H GKK RigtZ cwi tetki fvi mŋg` i ŋv Kŋi | RigtZ Kw`LZ MtŋQi mSL`v evotj A`ev Kgtj dmtj i tŋŋZ MtŋQi Lv` Dcv`vb cŋbi Zvi Zg` t`Lv`r`ŋZ cvti, tŋŋZi Av`Zv, evqPj vPj, mŋhP Avtj v Kg ev tewk ntZ cvti | MtŋQi mSL`v Awak ntj dj b KgtZ \_vKte | AZGe, GKK RigtZ meŋak hZUv MvQ \_vKtj dmtj i dj b meŋak nq, tmB MtŋQi mSL`vtKB H RigtZ Kw`LZ Dv`c` mSL`v etj | weifbædmtj i Rb` GB mSL`v weifbæi Kg ntq \_vtK, Avevi GKB dmtj weifbæKvi ŋY weifbæntZ cvti |

GKK RigtZ meŋak hZUv MvQ \_vKtj dmtj i dj b meŋak nq, tmB MtŋQi mSL`vtKB H RigtZ Kw`LZ Dv`c` mSL`v etj |

#### 2. cŋZŋ gvŋv (Establishment allowance) ev ubivc`v/ msi ŋYx gvŋv (Percent safety allowance)

AŋbK extRi MtelYvMtj Aŋzi v` Mg nq wKŋ gvŋv cŋZKj Ae`vq Aŋzi v` Mg nq bv | Kvi Y`ŋc` ej v hvq gvŋvi me`P mgvb im \_vtKbv | Avevi AŋbK exR gvŋvi tek Mfxti A`ev GŋKeŋi B Dcti \_vtK | k<sup>3</sup> exR (Hard seed) mvari bZ MtelYvMtj Aŋzi v` Mg nq bv wKŋ gvŋvi cŋZKj Ae`vq k<sup>3</sup> extRi Aŋzi v` Mg ntZ cvti |

GQvovl weifbæcKvi Rie thgb KxU cZ½ ev cML exR tLŋq tdtj Z cvti | dtj dmtj i tŋŋZ Pvi v NbZ; Kŋg ŋŋZ cvti | Gi Kg wKQy Pvi v ŋwZŋK cŋZŋ ŋwZ (Establishment

mvaviYZ gvW dmtj Priv  
tivctbi tjt 5-15%  
niti Ges exR ectbi  
tjt 10-15% niti  
cZB giV thM Kiv nq

loss) ejv nq| G aitYi cZKj Ae`vtK KwUtq IWi Rb` exR ectbi mgq A\_ev Priv  
tivctYi mgq cZB giV Abjvqx teuk exR ecb Kiv nq| mvaviYZ gvW dmtj Priv tivctYi  
tjt 5-15% niti Ges exR ectbi tjt 10-15% niti cZB giV thM Kiv nq, hvtZ  
cZKj Ae`vi ci I KwLZ Privi msL`v WK`vtK|

**3. Rigi DePZv I Drcv`b tjtZv (Soil fertility and Productivity)**

Rigi DePZv I Drcv`b tjtZv weifbweletqi Dci wbfPkj | MtQi ep` I Dbq Rigi  
DePZv I Drcv`b tjtZv mt` Nibofvte RvZ| Kg DePZv m`ubegmUtZ MtQi ep` Kg  
nte Ges tm Abjvqx teuk msL`K MtQi msKjvb nte| Avevi thLvtb gmi Drcv`b tjtZv  
teuk tmLvtb MtQi ep`i nvi teuk etj Kg msL`K Privi msKjvb nte| KvRB Privi NbZ;  
wbaftY gmi DePZv I Drcv`b tjtZv cive itqtQ|

**4. dmtj i e`envi (Use of crop)**

dmtj i e`envi Privi NbZ; wbaftY cive we`vi Kti | D`vniY`tfc tMv-Lv` I `vbm dmj  
wmmte fZv Pvl i K\_v ejv hvq| `vbm dmj wmmte Pvl Kitj Privi th NbZ;`iKvi Zvi tPtq  
A`bK teuk Privi NbZ; cqvRb tMv-Lv` wmmte Pvl Kitj | G iKg aBv, kYcvU, BZ`w  
dmj meR mvi wmmte A\_ev exR Drcv`b ev Atk dmj wmmte Pvl Kitj Privi NbZ;A`bK  
cv`R` i vLv nq|

**5. dmj Rbvtbvi FZz (Growing season)**

hiv` tKib dmj iwe Ges Lwi c Dfq tgsmtg Pvl Kiv nq Zte Privi NbZ;ji Zvi Zg` nZ  
cvti | Zzv dmj iwe tgsmtg Pvl Kiv ntj MtQi `wK ep` Kg nq| ZvB G FZz Privi  
NbZ; emotq w`tZ nq| Aci w`tK Lwi c tgsmtg GKB RvtZi Zzv dmtj `wK ep` teuk  
nI qvi Rb` Privi NbZ; Kwgtq t`qv nq|

**6. dmj jvMtbvi cxwZ (Planting method)**

tjtZ Privi NbZ; dmj jvMtbvi cxwZi vvin cive mSZ nq| thgb, AvL dmj Pvl Pj gvb  
mmitZ AvLi KvU tivcY Kitj tn`icZ c`q 100 gY AvL exR LtUi cqvRb| A\_P  
AtKvetKv cxwZtZ tivcY Kitj Gi w`Y AvL exR LtUi cqvRb nq| cvU Pvl i tjt hiv`  
cvU exR wUtq tevbn nq Zte tn`i cZ 10-12 tKwR exR Ges jvBtb ecb Kitj 5-8 tKwR  
exR `iKvi nq|

hiv` cvU exR wUtq tevbn  
nq Zte tn`i cZ 10-12  
tKwR exR Ges jvBtb ecb  
Kitj 5-8 tKwR exR  
`iKvi nq|

**7. Priv jvMtbvi mgq (Planting time)**

exR ecb ev tivctbi mgq Abjvnti Privi NbZ;Kg teuk nZ cvti | dmj hLb tgsmtgi c`g  
w`tK jvMtbv nq ZLb Priv, tjv ep`i Rb` cZ mgq cvq etj Privi NbZ; Kwgtq w`tZ nq|  
wKŠ tgsmtgi tktli w`tK jvMtbj MvQ `wK ep`i Rb` mgq Kg cvq| dtj Privi NbZ;  
emotq w`tZ nq| tivcv Avgb avtbi tjt tgsmtgi c`g w`tK cZ tMvQ 2-3w Priv Ges  
tgsmtgi tkl w`tK 3-4w Priv tivcY Kiv nq|

### 8. Kk Drcv`b cKwZ. (Tillering habit)

avb, AvL, Mg, he, Pxbv, Kvl b BZ`w` ZUj RvZiq dmtj i (Cereals) Privi NbZ;ubYqj Rb` G mKj dmtj i weifbaRvZi Kk Drcv`b qgZv wePbv KiZ nq|

Mngbx (Gramineae) cwie`ti i Ašf` km` RvZi Kk Drcv`b qgZv Privi NbZ; ubaſi`Y cſve we`vi Kti | th RvZi Kk Drcv`b qgZv teuk tm RvZ Privi NbZ; Kugtq w`tZ nq| D`vni Y`fc ejv hvq Mtgi BDubKj g (Uniculm) RvZ i agv` GKw Kk B`v`K wKŠ` Ab`vb` RvZ GKw Kk Drcv`b qgZv avb, AvL, Mg, he, Pxbv, Kvl b BZ`w` ZUj RvZiq dmtj i (Cereals) Privi NbZ;ubYqj Rb` G mKj dmtj i weifbaRvZi Kk Drcv`b qgZv wePbv KiZ nq|

### 9. Pti cKvi (Type of cultivation)

dmtj Drcv`b i j`q` Rugi mge`en`ti i Rb` `ſai`Yi Pvl c`wZ Abyri Y Kiv nq| Gi GKUv e`vck Pvl (Extensive cultivation) Avi Ab`w ubweo Pvl (Intensive cultivation) | G `w`K Avei h`v`tg Avb`v`gK we`li (Horizontal expansion) Ges Dj`w`e`li (Vertical expansion) | ejv nq| e`vck Pti Rb` GKw t`tki ev Lvg`ti mKj Pvl`th`M` Rug Pti Avl Zvq Avbv nq| Pti`v`th`M` c`Z Bw` Rug Pvl Kti Drcv`b evoi`bvi tPov Kiv nq| Aci c`q` ubweo Pti GKB Rug`Z mKj cKvi ch`y` e`envi Kti dmtj i m`ebvgq dj b (Potential yield) Drcv`b Kiv nq| ubweo Pti h`v`f`te mvi, tmP I D`P dj b`xj RvZ e`envi Kti dj b evoi`bvi tPov Kiv nq| dtj GKB Rug`Z ubweo Pti Rb` Privi NbZ; e`vck Pti t`tq teuk ubaſi`Y Kiv nq|

**Abyj b (Activity):** tKvb dmtj i exRnvi I Privi NbZ; ej`tZ Kx eſ`Sb? exR ecb ev Privi tivc`Yi t`q`T c`Z`B gv`v (Safety allowance) m`u`K`Av`j vPbv Ki ab|



**migg®**  
GKw ubw`ſ AvqZ`bi Rug`Z th cwieg`Y Privi MvQ Rb`ſtj GKw dmtj i m`e`P dj b nq, tmB cwieg`Y Privi MvQi Dcw`wZ`K H Rug`Z H dmtj i Privi NbZ; eſj | Avei GKw ubw`ſ AvqZ`bi Rug`Z th cwieg`v exR ecb Kij GKw dmtj i Kw`LZ dj b cvl qv hvq Zv`K H dmtj i exRnvi eſj | exRi we`x`Zv, A`z`v` Mg qgZv, I Rb, AvKvi, AvKwZ, mgveqeZv, cwic`Zv BZ`w` i Dci exRnvi ubf`P`xj | t`q`Z Privi NbZ; I dmtj i dj b ubweof`te m`u`K`ſ | GKUv ubw`ſ msl`vi MvQ GKK Rug`Z cwit`tki fvimig` i qv Kti dmtj i Kw`LZ dj b w`tq `v`K | H ubw`ſ MvQi msl`vi t`tq H GKK Rug`Z MvQi msl`v Kg ev teuk n`j dmtj i t`q`Z Avenrl qv I Ab`vb` Lv` Dcv`vb c`w`ſi cv`K`i Rb` dmtj i dj b cſve`w`S`Z nq| dmtj i t`q`Z Privi MvQi Kw`LZ NbZ; Rb` exRi c`K`Z`gvb tR`b c`Z`B gv`v c`q`M Kiv Dv`P`Z | DeP g`w`t`Z MvQi ew`xi nvi teuk eſj Privi NbZ; cſve we`li Kti | Avei dmtj i e`envi, dmtj Rb`ſt`bvi FZ`dmtj j`v`Mv`bvi c`w`Z, Privi j`v`Mv`bvi mgq, Pti cKvi Ges Privi Kk Drcv`b qgZv dmtj i t`q`Z Privi NbZ; ubaſi`Y cſve we`li Kti | cw`w`Z t`f` dmtj i exRnvi A`ev Privi NbZ; Kugtq wKsev ewo`tq dmtj i Kw`LZ dj b cvl qv m`e`|



### cvVĒi gj`iqb 3.5

mWV DĒti i cvkqUK wPy (√) w b|

1. tKvbU mWV? exR hZ wei x nq exRnvi ZZ -  
K. Kg nq L. tewk nq M. Dj x^nvti evto N. AvbyugK nvti Ktg
2. gvV dmtj Priv tivcYi mgq cĒZĒ gvĪv (%) KZUKzi tZ nq?  
K. 5-10 L. 5-15 M. 15-20 N. 10-15
3. gvV dmtj exR ectbi mgq cĒZĒ gvĪv (%) KZUKzi tZ nq?  
K. 5-10 L. 10-15 M. 10-20 N. 5-15
4. cvU exR wUutq ebtj tn±i cĪZ KZ tKwR extRi cĪqvRb ?  
K. 10-12 tKwR L. 5-8 tKwR M. 10-15 tKwR N. 12-15 tKwR
5. cvU exR jvBb Kti ebtj tn±i cĪZ KZ tKwR extRi cĪqvRb ?  
K. 5-10 tKwR L. 5-8 tKwR M. 8-12 tKwR N. 10-12 tKwR
6. wweofvte Pvl i gva`tg dmtj i dj b evovtvtK Kx ejv nq?  
K. AvbyugK we`li L. Dj x^ we`li M. mi vmi we`li N. m`tebvqg we`li

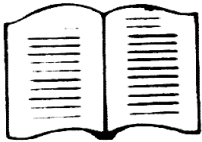
e˘enwiK

cw 3.6 t˘kxjvOj I gBtqi mrvth˘ fig KIŸ



G cvV tkfI Avcwb

- ♦ tKb jvOj w˘tq Rwg Pvl Kiv nq Zv ej tZ cvi˘eb|
- ♦ KLb Ges Kxfvte jvOj w˘tq Rwg Pvl w˘tZ nq Zv ej tZ cvi˘eb|
- ♦ Kxfvte iKtbr I wFRv Rwg ˘Zwi Ki tZ nq Zv eY˘v Ki tZ cvi˘eb|
- ♦ Rwg ˘Zwi m˘uukZ AvblywK w el qvej x ej tZ cvi˘eb|
- ♦ jvOj I gB ˘viv Rwg Pvl Ki tZ cvi˘eb|



mrvviY fig KIŸY jvOj I gB ˘viv KtqKevi AvovAmofvte Pvl w˘tq Rwg ˘Zwi Kiv nq| jvOj PftI ci gB w˘tq gwU tft˘ mgvb Kiv nq| Rwi Dci Ae w˘Z AvMvQv I cteŸ dmtj i AveR˘v cwi ˘vi A\_ev gwUj mvt\_ wgwktq w˘tq DEg tFŠZ Ae˘vi GKwU Rwg ˘Zwi Kiv nq| jvOj I Pvl gB m˘utK˘w˘w Z Avtj vPbv wbt˘˘ qv ntj v:

Kx Rb˘ jvOj w˘tq Rwg Pvl Kiv nq ?

- jvOj w˘tq Rwg PftI dtj k˘ gwU tft˘ hvq|
- AvMvQv wbtqŠZ nq|
- ˘Re c˘v\_Ÿ i mrvqwbK mvi gwUtZ wgtk hvq|
- Piv tivctYi DcthwMx Kv˘vhŸ big Rwg ˘Zwi nq|
- RwtZ GKwU k˘ jvOj ˘t˘i mrv nq hv cwb I Lv˘vcv˘vb at˘i ivL tZ mrvth˘ Kt˘i|
- iKtbr RwtZ evqPj vPj mnRZi nq|

Avgt˘i t˘tk hM hM at˘i t˘kxjvOj w˘tq Rwg ˘Zwi Kiv nt˘Q| G hŠjUi MvB I wbgŸ AvZ mrvviY| GtZ GKwU w˘tKvYvKvi Kv˘vi kixi (Body) AvtQ| kixt˘i wQb w˘tK\_vtK GKwU nvZj (Grip)| GB nvZj at˘i KIK Rwg Pvl Kt˘i| kixt˘i AMftM tjrvvi avitjv I m Pftjv dvj (Share) j vMv˘v\_vtK| GB dtj i mrvth˘ Rwg Pvl Kiv nq| kixt˘i gvSLv˘b wQ˘Kt˘i KxjK w˘tq Kv˘vi GKwU CI (Beam) j vMv˘v\_vtK| Ct˘i AMftM tRvqj teta GK tRvov Mi˘ev gwU w˘tq jvOj Uvbn nq| GB t˘kxjvOj i mrvth˘ 8-10 tm.wg. Mfxi Kt˘i Rwg Pvl t˘qv hvq| c˘Zw˘b G hŠjw˘tq c˘q GK wNv Rwg Pvl Kiv hvq|

t˘kxjvOj i mrvth˘ 8-10 tm.wg. Mfxi Kt˘i c˘Zw˘b c˘q GK wNv Rwg Pvl Kiv hvq|

Rwg ˘Zwi cKvi

mrvviYZ t˘kxjvOj w˘tq ˘cKvi Rwg ˘Zwi Kiv nq:

1. iKtbr Rwg ˘Zwi Kiv nq AvDK, Mfxi cwb i Avgb avb ev tevbn Avgb avb, cvU, mvi Iv BZ˘w PftI i Rb˘|
2. wFRv Kv˘vhŸ Rwg tivcv AvDK, Avgb I tev˘iv avb PftI i Rb˘|

DtjL˘ th, GLv˘tb jvOj I gBtqi mrvth˘ iKtbr Rwg ˘Zwi c˘wZ Avtj vPbv Kiv nt˘Q|

**Kxfite jv0j w`tq Riq Pvl Kiteb?**

1. tRivqtj i mvrith` GKtRivov ej t` i mvt\_ jv0j Rto w`b|
2. gvtVi GK c0slnfZ jv1/2j Pvl AvicKily| mgvšlij `itZj Avmiv-hvl qv Kti Pvl w`tZ \_vKb hZqY bv mduYRiq Pvl nq|
3. Zvi ci AvovAmofite Aci c0st\_tK Pvl AvicKily|
4. Dctii gmlU `li fv Mvi Rb` hZevi c0qvRb cb: cb: Pvl w`tZ \_vKb hZqY chS| GKUv mgvb mslmZcY© pZv bv Avtm|

**Kxfite iKtbn Riq `Zvi Kiteb?**

1. teviv A\_ev tivcr Avgb ev tgsmtgi c0itac0g e0i Ae`einZ ctib Riq Pvl i Rb` Dbtj Kily|
2. RiqfZ gvV qIgzv (0tRv0 Ae`v) \_vKv Ae`vq jv0j w`tq Pvl w`b| GK g00 gmlU nrtZi Zvj fZ wbtq cixqIv Kily| nrtZ GKUv gmlU ej `Zvi Kti mvariY k3 gmlU Dci t0to w`b| hv `Zvi gmlU ej uU cZtbi ci tft% Quotq hrv Zvntj eSteb Riq 0tRv0 Ae`vq Gtm0 Ges jv0j Pvl i Rb` Dchj ntqt0|
3. jv0j I gB w`tq 5-6 evi Pvl w`b| GtZ Riq AvMvQvgj nte A\_ev AvMvQv\_ tj v gmlU mvt\_ wgtk hite Ges mgvb mslmZcY© pZvq Riq `Zvi nte| jv0j Pvl I gBtqi cwi gYv Riqi Ae`vi I ci wbfP Kti |
4. hZ` ym=é Mfvi Kti Riq Pvl Kily|
5. AvMvMvov Riq Pvl Kti gB w`tq fvtj vfvte mgvb Kily|

**tKb gB Pvl t`qv nq?**

1. gmlU tXj v fv1/2i Rb`|
2. Riq mgvb Kivi Rb`|
3. A`zi Z AvMvQv\_ tj vtK gmlU mvt\_ wgtk t`qvi Rb`|

Gt`tk Awv Kyj t`tKB edki `Zvi gB w`tq gB Pvl t`qv nq| GB gB-Gi AvKvi, AvKwZ t`tki weifbæRvqMvq weifbæi Kg| tKvbuU eo Avevi tKvbuU tQvU| tKvbuU `w evi (Bar) Avevi tKvbuU wZbuU evi mshj| c0vb evi \_tj v tQvU tQvU µmeri (Cross bar) w`tq AvUvU Kti jvMvbn\_vtK|

tRivqtj i mvt\_ gB teta GK tRivov A\_ev `B tRivov ej ` ev gmlU w`tq gB Pvl t`qv nq| gB Pvl t`evi mgq tKv`vj I Swo mt1/2 ivLv DwPZ| tKv`vj AKwZ Riq I AvMvQv DfEvj tb e`envi Kiv nq hv jv0tj i mvrith` Kiv hqvub| Avi Swo w`tq mslmZ AvMvQv I gqv AveR0v cwi`vi Kiv nq|

KwL.I c j n Dbq b -z

**Kxfite gB Pvl w` teb?**

1. tRiqvj Rto ej t` i mrt\_ gB teta w` b|
2. gvtVi GK cš/nZ gB Pvl Avl Kily| mgvšij `tZ; Gcvk I cvk Pvl Kti mg`l Rvg Pvl Kily|
3. Zvi ci AvovAmo fite Ab` cš/nZ gB Pvl w` b|
4. Zvi ci j n^l AvovAmo fite Avei I gB Pvl w` tq Rvg mgvb Kily|

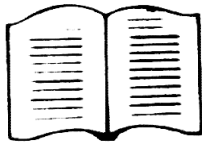
### e`enwiK

#### civ 3.7 exRZjv `Zwi



G civ tk`l Avciab

- ◆ wefbaexRZjvi cwiwPZ ej tZ cvi teb|
- ◆ GKw Av`k exRZjv nvtZ Kj tg `Zwi Ki tZ cvi teb|
- ◆ exRZjvi hZaGes cwi Phm`utK`ej tZ cvi teb|



#### c`umwK Avtj vPbv

avb evsj v`tki GKw c`avb Lv` dmj | mvari bZ exRZjvq Priv Drcv`b Kti tmB Priv RigtZ tivcY Kti G dmj Pvl Kiv nq| evsj v`tk eQti i wefbaemgtqi Avenl qvi Dci wbfP Kti exRZjv `Zwi Kiv nq| mvariYZ tev`iv tgsmtg wFRv Kv`vgg exRZjv, AvDk I Avgb tgsmtg i`Kbv I wFRv - Dfq cKvi exRZjvB `Zwi Kiv nq| thme GjvKvi Rig DEz Ges gml t`v-Atk cKwzi tmLvtb mvariYZ i`Ktbv exRZjv `Zwi Kiv nq| Gtlj gmltZ c`avbZ wFRv exRZjv `Zwi Kiv nq| i`Ktbv I wFRv exRZjv Qvov WvtcM I cwi ewZ WvtcM c`wZtZ exRZjv `Zwi Kiv hvq| Avevi wefc cKwzK Ae`vq fimgvb exRZjv `Zwi Kiv nq|

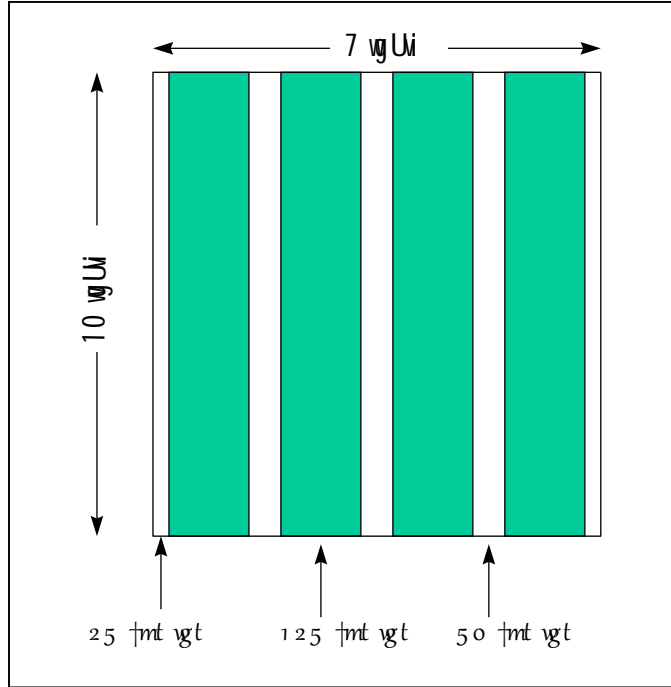
**msAv:** th gmltK exRi m`zAv`ziv`Mg I Priv MRvtbvi Rb` `Zwi Kiv nq ZvtK exRZjv etj |

avb Pvl i t`jt` GK weNv RigtZ Priv tivcYi Rb` mvari bZ GK Kwv RigtZ Priv Drcv`b Kiv nq| A`v` GK Kwvi Drcv` Z Priv w`tq 20 Kwv ev GK weNv RigtZ Priv tivcY Kiv hvq| Gt`tk Rigi cwi gvY KIK ch`q weNvtZB m`zviwPZ| exRZjv`K m`z`vte hZa I cwi Ph` Rb` w`v` cwi gv`c `Zwi Kiv nq| w`v` cwi gv`c i`Ktbv ev wFRv RigtZ `Zwi GK Kwvi GB exRZjv`K GKw Av`k exRZjv ej v n`q \_v`K|

avb Pvl i t`jt` GK weNv RigtZ Priv tivcYi Rb` mvari bZ GK Kwv RigtZ Priv Drcv`b Kiv nq| A`v` GK Kwvi Drcv` Z Priv w`tq 20 Kwv ev GK weNv RigtZ Priv tivcY Kiv hvq| Gt`tk Rigi cwi gvY KIK ch`q weNvtZB m`zviwPZ| exRZjv`K m`z`vte hZa I cwi Ph` Rb` w`v` cwi gv`c `Zwi Kiv nq| w`v` cwi gv`c i`Ktbv ev wFRv RigtZ `Zwi GK Kwvi GB exRZjv`K GKw Av`k exRZjv ej v n`q \_v`K|

#### Av`k exRZjv `Zwi i K`Ri aviv

GKw Av`k exRZjv `Zwi i Rb` 10 wUvi `N`I 7 wUvi c`v`RvqMv tgc wbb| `N`P GK cvk t`tK 25 tm.wg. RvqMv ev` w`tq evi cwi w`v`k I Priv MvtQi cieZP`cwi Ph` Rb` 125 tm.wg. Plov Pviw c`K c`K exRZjv wP` Abv`ti f`M Kti wbb| c`Z `B LÜ exRZjvi gv`S 50 tm.wg. RvqMv brjv `Zwi i Rb` ivL`|



**ԻՔՒ 3 : GK KvVi GKՈՍ exRZj v/**

exRZj vi gmlU cwi cmlU Kti `Zwi Kti i Ktbr exR mgvbfvte exRZj vi Dci յՈւժտգ Էյb gmlU mrt\_ fvtj vfvte յցւկտգ ւ`b/ exR\_ tjt v bvoivProvo Kti 2.5-4.0 tm.ւց. gmlU Mfxti `vcb Kib/ cՊqvRb տեժա նյ Kv gmlU Av`li Y ւ`տգ exR\_ tjt v tXtK ւ`տZ Երբ b/

Dtj և th, GK KvVi exRZj vi Rb` Dctiv<sup>3</sup> gvc tbqv nq/ cՊqvRb տեժա `N°10 յցՄրտի i Էւկ Եւոտգ tbqv հրե/

**Ab`b` exRZj vi cwi PivZ**

**ԻՔՐv Kv`ւցգ exRZj v**

ԻՔՐv exRZj v `Zwi i Rb` RւցտK Եւոժ թւււ յմ<sup>3</sup> Kti 2/3ՈՍ j vՕj Pvl I gB Pvl ւ`տգ 7-10 ւ`b chՏԻ Եւոժ AvՄտK i vLv nq GB Ae`տK Rvei տ` I qv Էյ v nq/ Rvei տ` Էրի dtj Rւցi AvMvՕv, ԵԷZԹԵմտյ i Aեւկօւսկ BZ`ւ` ԵՔP gmlU mrt\_ յցտK `Re մրտի i KvR Kti | Gici RւցտK j vՕj Pvl I gB ւ`տգ \_K\_տK Kv`ւցգ KտZ յե/ i Ktbr exRZj vi gZ Եժտգ 25 tm.ւց. I PրիւՍ exRZj vi ԵժZ `յժի գրտS 50 tm.ւց. Եւկ տիտL exRZj v `Zwi KտZ յե/ Եւկ i vLv RւցMv տ`տK 10 tm.ւց. Mfxti gmlU Ztj `Երտկի exRZj vi Dci ւ`տZ յե/ exRZj vi Dctii gmlU յւZ, Եւկ Էր KvՎi մրտի` մցւ Kti `Zwi KտZ յե/ exRZj vi Kv`v Lթ big յե/ Եր տեւրի մցգ Kv`ւց Wթե հրե ZvB G i Kg Ae`ւգ KտգK ՆւՍ տիտL ւ`տj Kv`v ԿՕՍv Rտգ հրե Ges Gici A`ւի Z Եր տեւր հրե/

**ՄտԵւՄ exRZj v**

Ետժկ cwi ւ`ւտZտZ ՄրտԵւՄ ԵxւտZտZ exRZj v `Zwi Kiv nq/ մրտի bZ Էրօxi DVտԵ Էր th տKւժ i Ktbr RւցMւգ GK ԵM`ւցՄրի GKՈՍ Եյւ\_Ե Է՛Մ Եւոժտգ GB exRZj v `Zwi Kiv nq/ gmlU mgZj Kti gvSLտԵ GKՄMfxti Kti Եյւ\_Ե Եւոժտգ տ`qv nq/ Gici ԵժZ ԵM'ւցՄրտի 2.5-

3.0 tKwR A%mi Z exR uQuUtg cje Kti etj w`tz nq| exR hvzZ i`iKtg bv hvq tmRb` extRi Dci Ar Kti cwb uQuUtg nq| G iKg exRZj vq PviMvQ exRcI t`tK c`qRbxq Lvei MhY Kti etj GB exRZj vi mekl hZæbtZ nq| cwb t`evi mgq cwb mvt\_ BDm qv ugnkZ Kti w`tj Pvi vi epx fvtj v nq|

eb`v Kewj Z GjiKvi Rb` cwi ewZ` WtvcM exRZj v `Zwi Kiv thtZ cvti | cwi ewZ` WtvcM c`wZtZ Kv`ugq mgZj RigtZ Kv, KjvcvZv, KjvMvtQi evKj w`tq tPstKvYv Nti gZ KitZ nte| exRZj vi wbtP KjvcvZv ev cwi u\_b weUtg Zvi gta` A%mi Z exR ebtZ nq| gnuU t`tK tKvb cKvi Lv`vcv`vb MhY KitZ cvti bv etj GB exRZj vi mekl hZæbtZ nq, Ab`vq Pvi MvQ Lv`i Afite gvi hvq|

**fimgub exRZj v**

eb`v Kewj Z nq hw` iKtbn I wFRv exRZj v Kivi gZ RvqMv bv `vtK Ges hw` eb`vi ci ciB, Pvi vi c`qRbxqZv `vtK Zte fimgub exRZj v `Zwi Kiv nq| eb`vi cwb, cktz, tWvev I Ltji Dci GB exRZj v `Zwi Kiv nq| G c`wZtZ exiki PUVB Øviv `Zwi gvPv A`ev KjvMvtQi tfjv `Zwi Kti Zvi Dci 2-3 tm.ug. cvZjv Kv`vi Av`li Y w`tq wFRv exRZj vi gZ Dcwi fiv mgub Kti GB exRZj v `Zwi Kiv nq| G exRZj v cwb Dci fimgub `vtK etj tmP t`qv c`qRb nq bv| exRZj v th cwbZtZ tftm bv hvq tmRb` GtK Ljdi mvt\_ teta ivLv evAbxq| c`Z eMtgUvti G iKg exRZj vq 80 t`tK 100 Mtg A%mi Z avb exR ecb Kiv nq|

**exRZj vi hZæ**

mY` I mej Pvi vi Rb` exRZj vi hZætbqv DvPZ| wFRv exRZj vq me mgq cwb ivLv DvPZ| WtvcM exRZj vq Si Yvi mrvth` cwb w`tz nte Ges exR, tj v GK mt½ tPtc ivLtz nte|

**tmP I cwb w`vkb**

exR ectbi ci t`tK Pvi MRvtbv chS` cwb Øviv bji v fiv`ivLtz nte| exRZj vq cwb AvUtk `vKtj Zv w`vkb KitZ nte|

**mvi c`qum**

mrvavi YZ DeP I gvSmi DeP RigtZ mvi bv w`tqB exRZj v `Zwi Kiv nq| Rigj DePZv Kg `vKtj c`Z eMtgUvti `B tKwR cPv tMvei ev Kt`uv÷ ev Lvgi RvZ mvi c`qum Kiv thtZ cvti |



**Pəvšigj`vqb**

**msuŋB I iPbvj-K cke**

1. gvuji cKwZ. Abvnti fig KIŋYi Rb` Kx Kx bwiZgij v Abvni Y Kiv DvPZ?
2. gvuji eŋU I MVb Abvnti Kxfvte fig KIŋ Kiv hvq?
3. gvuji eÜžZvi m½ fig KIŋYi m`úKŋKx?
4. fig KIŋYi w` K cwi eZŋbi gva`tg Rvq Pvl Kti Kxfvte fig msi ŋY Kiv hvq?
5. AvDk avtbi Rb` `Zwi i`Ktbr KwlZ Rvqi `enkó` , tj v wj Lj|
6. avb Pvl i Rb` wRv Kv`vq Rvqi `enkó` , tj v wj Lj|
7. i`Ktbr gvUžZ Rvq `Zwi I wRv gvUžZ Rvq `Zwi i cv`ŋ` wj Lj|
8. i`Ktbr I wRv gvUžZ Rvq `Zwi Kivi c`wZ eYŋv Ki ab|
9. iPbvj-K cke wvfbadmtj i Rvq `Zwi i bwiZgij v Avtj vPbv Ki ab|
10. exRi AvKvi Abvqx fig KIŋ Kitz nq tKb?
11. dmtj i gŋj i Mfxi Zvi m½ Pvl i Mfxi Zvi m`úKŋKx?
12. dmtj i Drcv`b c`wZ wfbzvi Rb` Rvq `Zwi žZ tKvb cv`ŋ` AvtQ wK?
13. GKB dmj wvfbatgšmžg Pvl Kitz Rvq `Zwi žZ cv`ŋ` nq tKb?
14. Kwl exR `vcŋbi wvfbacKvi c`wZi bvg wj Lj|
15. exRecb I Priv tivctYi c`wZ , tj v Avtj vPbv Ki ab|
16. dmtj i tŋžZ wvfbacKvi exR `nvcb c`wZi mjev I Amjev , tj v wj Lj|
17. msÁv wj Lj: K. Privi NbZj; L. exRvni M. KwlZ Dv`c msL`v N. cžZŋ gvŋv
18. Priv tivctY I exR ectb cžZŋ gvŋvi , ižZ; eYŋv Ki ab|
19. dmtj i e`enitii Dci wfiE Kti dmtj i exRvni Kxfvte cŋvewšZ nq?
20. KwlZ dj žbi j tŋ` dmtj i tŋžZ Privi NbZj; wbaŋ žY cŋve w`li Kvi x Kvi Ymgr e`vL`v Ki Lj|



**DĒ igjv**

**cW 3.1:**

1| K    2| M    3| M    4| L    5| K

**cW 3.2:**

1| L    2| L    3| K    4| K    5| L

**cW 3.3:**

1| M    2| L    3| L    4| L    5| L

**cW 3.4:**

1| M    2| M    3| L    4| K    5| K    6| N

**cW 3.5:**

1| K    2| L    3| L    4| K    5| L    6| L

**BDibU 4 gmlU DePZv msi ǞY**

**BDibU 4  
gmlU DePZv msi ǞY**

evsj v`tki gmlUz AtbK ai`bi dmj Rb`q| wKš` dj b me RvqMvq GKIKg nq bv|  
dm`j i wewfbraai`bi Pwn`v ci-Y bv n`j Zvi `rfweK ep`x I weKvk NtU bv, ZvB dj bl  
Avkvb`jfc nq bv| dm`j i Pwn`vi gta` i tq`q c`p ev Lv`", cimb, mha`j vK, evZvm, Zvcgv`v,  
gmlU i fšZ , Yvej x, Drcv`b e`e`vcbv BZ`w` |

gmlU`K Dv`m` i Lv`"vcv`v`bi `rfweK Drm wntmte aiv nq| μgvmZ dmj Drcv`tbi d`j  
dmj KZR.c`Zv`bqZ Lv`"vcv`vb` ,tjv cwi`tkml Z n`q gmlU t`tk P`j h`q| Gme Lv`" c`yt  
mieivn bv n`j gmlUz Lv`"vcv`v`bi NvUwZ t`Lv t`q| we`tkl Kti thme Lv`"vcv`v`bi  
cwi`gvYMZ Pwn`v tewk (thgb t`bvBtU`Rb, dmdivm, cUw`kqvg BZ`w`) tm` ,tjvi NvUwZB  
tewk NtU Ges Zv` i Afive AvtM t`Lv h`q| Avi Acwi`nvh`Lv`"vcv`v`bi th`tkvb GKmlU  
Afive ev Abg`w`w`ZtZ dm`j i `rfweK ep`x wewNvZ nq|

evsj v`tki gmlU DeP Ges  
eü iKg dmj P`tli  
Dc`thvMx| wKš` μgvmZ  
dmj Drcv`tbi d`j  
gmlU DePZv I Drcv`b  
ǞgZv w`b w`b Ktg  
Avm`q|

evsj v`tki gmlU DeP Ges eü iKg dmj P`tli Dc`thvMx| wKš` μgvmZ dmj Drcv`tbi  
d`j gmlU DePZv I Drcv`b ǞgZv w`b w`b Ktg Avm`q| mv`Rfivte dmj Drcv`tbi `t`  
t`ǞtZi DePZv I Drcv`b ǞgZv a`i ivL`tZ nte Ges GiRb` c`qvrB` f`ugi DePZvi Dci  
c`fve we`li Kvi x Kvi Ymgn` m`u`K m`PZbZv I DePZv i Ǟvi Rb` c`qvrB`xq c`t`Ǟc M`hY|  
Zv bv n`j gmlU DePZv I Drcv`b ǞgZv A`i f`iel`tZ tjvc c`vte, dm`j i Drcv`b nwm  
c`vte Ges Lv`"v`fve t`eto h`vte|

`Re c`v`\_gmlU DePZv w`bqš`fY gy` f`ugKv cvj b Kti | `Re c`v`\_P Kvi`fY gmlU , Yvej xi  
Zvi Zg` nq Ges dm`j i dj b c`fweZ nq| evsj v`tki gmlUz `Re c`v`\_P cwi`gvY w`bZvšB  
A`i | ZvB Rvq`fZ `Re c`v`\_P msi ǞY I ep`xi c`t`Ǟc w`b`tZ nte Ges c`qvrB`xq Kwl.Zv`w`ZK  
Dcvq` ,tjvi Dci , i a`z;w`tq dj b`tk w`w`Zkxj t`tk Dbz` Kivi c`t`Ǟc M`hY Ki`tZ nte|

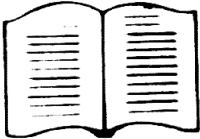
GB BDib`tU cv`vU cv`v Rvq`i DePZv, DePZvi c`fveKmg`n, gmlUz `Re c`v`\_P Drm, %Re  
c`v`\_P Kvi`fY gmlU , Yv` ,fYi Zvi Zg`, gmlUz `Re c`v`\_ep`xi mgm`v I m`v`ebv Ges gmlU  
DePZv k`v` eRvq` i vLvi Kwl.Zv`w`ZK Dcvq` Avtj`vPbv Kiv n`tq`q|

### cw 4.1 Rigi DePZv - msAv I figKv



G cvV tkfI Avciib

- ◆ Rigi DePZvi msAv ej tZ cvi teb |
- ◆ gmi DePZv m`utK`ej tZ I vj LtZ cvi teb |
- ◆ gmi DePZv I Drcv`b f`lgZvi gta` cv`R` mbYq Ki tZ cvi teb |



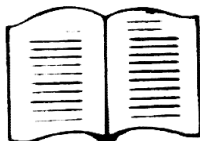
GKuU Rigi DeP bv AbgP Zv gmi cix`lv Kti Rvbr hvte | gmi DePZvi mt½ gmi Drcv`b f`lgZvi mvgAm` \_vKtj I G`\$lv gmi vfbæ`enkó` | thgb - gmi DeP ntj I Drcv`b f`lg bvl ntZ cvti | GKU RigtZ me, tju Acwi nvh`Lv`vcr`vb c`qvrBxq cwi gvtY I AbgvtZ \_vKvi ci I hv` t`Lv hvq th, tmLvbKvi ZvcgvIv Lv Kg ev AZ`sl`teuk A\_er RigiUtZ c`qvrBxq cwi gvtY cwb tbB A\_er tmLvrb Rjve`Zv AvtQ | H RigtZ dmj ecb Kij Zv Rbvt`e bv A\_er Rbvtj I fuj dj b cvl qv hvtebv | Zvntj t`Lv tmj RigtZ c`qvrBxq cwi gvtY Lv` (DePZv) \_vKv mtEj RigiU Kg Drcv`bkxj ev Drcv`b f`lg bq | DeP gmiUtZ Lv`vcr`vb hv`ó cwi gvtY \_vKtj I A`tbK mgq Zv MvtQi MhY`thvM` Ae`vq \_vtK bv | ZLb H gmiUtK DeP ev ntj I Drcv`b f`lg ev hvte bv | gmi Drcv`b f`lgZv nj tKvb Rigi dmj Drcv`tbi mvg`ev f`lgZv | gmi Drcv`b f`lgZv dmj Drcv`tbi nvi ev dj b Øviv vbi f`cZ nq | c`Z GKK RigtZ dmj Drcv`b Kg ntj tm RigtK Kg Drcv`bkxj Ges Drcv`b teuk ntj teuk Drcv`bkxj ev nte |

DeP gmiUtZ Lv`vcr`vb hv`ó cwi gvtY \_vKtj I A`tbK mgq Zv MvtQi MhY`thvM` Ae`vq \_vtK bv | ZLb H gmiUtK DeP ev ntj I Drcv`b f`lg ev hvte bv |

DeP gmiUtK Drcv`bkxj bv Kiv ntj tKvb jvf nq bv, KviY dmtj i dj bB hv` bv cvl qv hvq Zte tm Rigi \_vKv bv \_vKv GKB K\_v | ZvB DeP gmiUtK Drcv`bkxj Ki tZ ntj gmi e`e`vcbv AZ`vek`K | thgb - nvj -PvI, mvi c`qvrM, exR ecb, tmP c`qvrM, AvMvQv, tcvKgvKo I ti vMevj vB `gb BZ`w` | GQvor thme Kvi tY DeP Rigi Drcv`b f`lg nq bv Zvi gta` i tq`Q AvZvi`³ A`vZj ev f`lv Zj j eYv`³ Zv, vbo`vktbi AcL`Zj Zv, vevl v`³ `te`i Dcv`vZ BZ`w` |

dmtj i Pvn`v Ablyqx tKvb Rigi Lv`vcr`vb mieivtni f`lgZvtK figi DePZv etj |

dmtj i Pvn`v Ablyqx tKvb Rigi Lv`vcr`vb mieivtni f`lgZvtK figi DePZv etj | GKU Rigi gmi hv` dmtj i Pvn`v Ablyqx me, tju Acwi nvh`Lv`vcr`vb mieivtni Kti Zvntj H gmiUtK DeP gmi ev nte | vKs` Acwi nvh`Lv`vcr`v`tbi gta` th`Kvb GKU Afie \_vKtj ZvtK DeP gmi ev hvtebv, AbgP gmi ev nte |



**mvi gg®**  
dmj Drcv`tbi Rigi DePZv AZ`sl` i az`cY` DePZv msi f`lv I evxi c`t`f`lc MhY` bv Kiv ntj dj tbi Dci vevj c`Zv`vqv nte | dtj dmj Drcv`b vevl vZ nte, Lv`v`vve teto hvte |



### ci#V#i gj`iqb 4.1

m#VK D#ti i ci#k#UK #P#y (√) #` b

1/ figi Lv` `icr`vb mieiv#ni #lgZv#K Kx ej v nq?

K) figi Drcv` b #lgZv

L) figi De#Zv

M) figi c#b avi Y #lgZv

N) figi p<sup>H</sup> gvb

2/ De# ev Ab#P g#U#K Kxfi#e kbr<sup>3</sup> Kiv hvq?

K) g#U cix#lv K#i

L) g#U#Z dmj Drcv` b K#i

M) g#Ui is t` #L

N) g#Ui `Re c`#t`\_#P c#i gvc K#i

3/ g#Ui Drcv` b #lgZv Kx #viv #bi #icZ nq?

K) g#U #e#k#Y K#i

L) g#Ui p<sup>H</sup> gvb t` #L

M) dm#j i dj b #` #q

N) g#Ui MVb t` #L

4/ De# g#U#K Drcv` b#xj Ki#Z Kx Kiv c#qvRb?

K) R#q P#l#em Kiv

L) R#q#Z m#i c#q#M Kiv

M) exR ecb Kiv

N) g#Ui m#ze`e`#c#v Kiv





Re mvi tMvei, Kt`uvó I meR mti i gva`tg c`qum Kiv thtZ cti |

Pj vPtj i mthvM mvo Kti | Re c`v`gmltZ c`qum Kiv ntj gmlU Dckvix AYRtpei msL`v I Kvh`gZv ep` Kti, RlUj Re imvqubK wep`uqv NuUtq Lv`vcv`vb MhY`thvM Ae`vq AvbtZ mnvqZv Kti | Re c`v`gmltZ wef`bætMSY Lv`vcv`vb thvM Kti gmlU DePZv msi`qY I ep`tZ mnvqZv Kti | Re mvi tMvei, Kt`uvó I meR mti i gva`tg c`qum Kiv thtZ cti |

**N) dmj Pti i ubeoZv**

GKw RigtZ GK ermti hZevi dmj DVt`bv nq Zvi kZKiv mmve gvb`tk dmj Pti i ubeoZv etj | thgb, GKw Rigt t`tk GK ermti GKw cvU dmj I GKw tivcv Avgb avb Pvl Kij G Rigi dmj Pti i ubeoZv nte 200% | dmj Pti i ubeoZv hZ teuk nte Rigi DePZv ZZ Kgte | KriY GKw RigtZ hZ teukevi dmj Pvl Kiv nte, tm gmlU Lv`fvUvi I ZZ ZvovZvvo tkl nq DePZv Ktg Avmte |

**O) AvMv`gb**

dmj Drcv`tbi mgq Aek`B AvMv`gb Kitz nq | GtZ AvMv`gb KZR MpxZ wKQycvi gv`Y Lv`vcv`vb RigtZ tdir`t` I qv m`e nq, hv` AvMv`gb RigtZ cPZ t` I qv hvq | GtZ gmltZ wKQyRe c`v`thvM nq v`K | Zte AvMv`gb hv`Z Rigt t`tk Lv`MhY Kti Rigi DePZv Kgv`Z bv cti, tmw`tk j`q` ti`L mgqgZ AvMv`gb Zrci nte |

**P) meR mvi dmj Pvl**

meR mvi dmj thgb-`aAv, kbcvU, ei euU (tMv-gUi) BZ`w` dmj Pvl Kti big Ges meR Ae`vq gmlU mt`u`uguk`q w`tj gmltZ cPZ cwi gv`Y Re c`v`thvM nq | GtZ gmlU DePZv evto Ges gmlU t`fS`Z` Yvejxi Dbw`Z nq |

**Q) km`chq**

dmj Drcv`tbi thme t`q`t` Dch` km` chq Ae`b Kiv nq, tmme t`q`t` gmlU DePZv msi`qY nq v`K | thgb, GKw m`wi Kuv`Z km` chq Mfvi I AMfvi g`x dmj gmlU vbt`Pi Ges Dctii`t`i Lv`vcv`vb cwi tkv`Y Kite | ZUj RvZiq dmj, mwa` dmj I Avk ev`K`j RvZiq dmj Lv`vcv`vb`tjv mgfv`te MhY Kti bv | Ab`w`tk RigtZ GK RvZiq dmj evi`evi Pvl Kij w`tkl KZK`uj Lv`vcv`vb teuk cwi gv`Y cwi`tkv`l nq | dtj Aí mg`q Gme Lv`Dcv`v`bi NuUw`Z t`Lv`w`tZ cti | m`wi Kuv`Z fv`te km` chq Ae`b Kij Lv`vcv`vb m`y`g fv`te e`eu`Z nq | GRb` m`wi Kuv`Z km` chq gmlU DePZv msi`qY mrvh` Kti | km` chq meR mvi dmj RigtZ cPZ cwi gv`Y Re c`v`thvM Kti | Av`Qv`b dmj I cwi`Qb`k`l`P dmj (thgb- Ziv`u`K, Avj`y`AvMv`gb` mrvh` Kti |

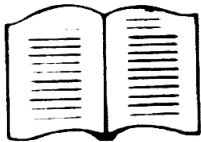
m`wi Kuv`Z km` chq gmlU DePZv msi`qY mrvh` Kti |

**R) cvb e`e`icbv**

dmj Drcv`tbi wef`bæch`q RigtZ cvbi Afve t`Lv`t`q, w`tklZ hLb ep`ocvZ Kg nq A`ev Av`S` nq bv ZLb t`m`Pi gva`tg cvb mieivn Kiv nq v`K | cvb t`m`Pi dtj Lt`vcv`vb cvb`Z``ex`fZ nq AvqubK AvKv`i Mv`Q c`ek Kti | Ab`w`tk AvZep`, eb`v`ev Rigi Rjve`x`Zri mgq cvb Acmvi`Y bv Kiv ntj Mv`Qi k`m`Kv`h`w`K`g`Z Pj bv | Zivov A`tb`K Lv`vcv`vb Acwi`tkv`l`b`thvM AvKv`i i`f`c`v`sh`i`Z nq gmlU DePZv Dci we`f`c` c`Z`u`u`q mvo Kti |

**S) Pvlver` cxiZ**

eisjvt`tki me AA`tj Pvlver`i cxiZ c`q GKIKg ntjI gvtS gta` Zvi e`wZmgl  
cwi j w`fZ nq| thgb, cwnmo AA`tj i Sg Pvl | cwnvtoi Mtq wKQyMrQciv v cwp`q tek wKQy  
RvqMv cwi`vi Kti gwU Kuc`q ZvtZ wvfbæRvtZi dmtj i exR GKmt½ j vMv`bv nq| dmj  
e`envtvc`thvMx ntj wvfbædmj wvfbæmg`q mslMh Kiv nq| Aí w`tbi gta` tm`v`tbi gwU  
Abg`P n`q Avmtj Avevi bZb`v`tb GKB c`uq`q Pvlver` Ptj | G`Z gwUi DeiZv Ktg  
AvmtQ| Gme GjvKvq K`bUvi Pvl (Contour cultivation) (mg D`PZvq mwi ex`fivte MvQ  
j vMv`bv), w`-c Pvl (Srtip cultivation) (mg D`PZvq GK RvtZi MtQi KtgK mwi i ci  
Ab` RvtZi MvQ KtgK mwi tZ) A`ev tUt`im Pvl (Terrace cultivation) (cwnvtoi Xij  
RvqMvq mg D`PZvi miætmvcvb ev wmwotZ) Pvl Kiv ntj fvg`f`q Ges DePZv n`tmi gv`v  
Kg nq| Zte`xN`f`gqvt` Sg P`f`li wKí cxiZmg` Sg P`f`li Z`b`vq tenk DcKvix wK bv  
tm m`u`tk`M`tel Yij ex` Avb GLbl Ac`Z`z |



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dmj t`f`Zi DePZvi c`fveKmg` c`vbZ`y`ckvi | h\_v - c`kuzK ev`v`fveK c`fveK Ges  
Kw`lg c`fveK | c`kuzK c`fveK`\_tjv ntjv: gwUi Aw` w`k`j`v, gwUi eqm, Rj evqyl MvQciv,  
fvgi eU`z`v, Rjv ex`z`v, gwUi pH`v`b, fvg`f`q Ges gwUi e`b`U | Kw`lg c`fveK`\_tjv ntjv:  
fvgKI`P, gwUtZ mvi c`q`vM, `Re c`v`f`\_P c`q`vM, dmj P`f`li w`b`eoZv, AvMvQv`gb, meR  
mvi dmj Pvl, km` ch`q, c`vb e`e`v`cbv Ges Pvlver` cxiZ | DePZvi c`fveKmg`K  
h\_vh`\_iæz; c`vb Kti dmj Drcv`b Ktj dmtj i djb fij nq Ges gwUi DePZv  
msi`f`Y Kiv hvq |



**civhEi gj`iqb 4.2**

mivK DEti i civkqUK iPy (v) ir b

1/ givUi eqm teik n`ij givUi DePZv kv<sup>3</sup> tKgb nq?

K) evto

L) Ktg

M) tKvb civ eZ<sup>8</sup> nq bv

N) C/r civ eZ<sup>8</sup> nq

2/ K`gKYvi e`im KZ?

K) 0.02-2.0 igig

L) 0.002-0.02 igig

M) 0.0002-0.002 igig

N) 2.0-2.5 igig

3/ dmj Drcv`tbi Rb` tKvb ai`tbi givU mePvBtZ fij?

K) t`vAuk

M) tetj t`vAuk

L) tetj

N) GtUj t`vAuk

4/ bxtPi mel q<sub>2</sub> tj vi tKvbU fig`q Zj mšZ Kti?

K) mvi c`qM

L) `Re c`v<sup>2</sup> c`qM

M) AvZvi<sup>3</sup> fig KI<sup>2</sup>

N) km` chq Aej =b

5/ bxtPi Lv`vcr`vb<sub>2</sub> tj vi gta` Dv<sup>m</sup> tKvbU teik civ givY MhY Kti?

K) `i (iR<sup>1/4</sup>)

L) bvBtUitRb

M) MUK (mij divi)

N) K`ij imqig

6/ bxtPi mvi<sub>2</sub> tj vi gta` tKvbU `Re mvi?

K) meR mvi

L) BDvi qv

M) iUc`j mgvi dmtDU (iUGmuc)

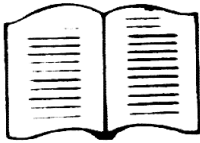
N) igDti U Ae cUrk |

**cw 4.3 gwltZ `Re c`vt\_P Dm, `Re c`vt\_P Kvi tY gwlti , Yv, tYi Zvi Zg`**



G cvV tktl Avci b

- ◆ gwlti `Re c`vt\_P Dm m=utK@ej tZ cvi teb|
- ◆ `Re c`vt\_P Kvi tY gwlti , Yvej xi Zvi Zg` e`vL`v Ki tZ cvi teb|



`Re c`v`\_civPnU tgšij K Dcv`vbi GKwU| Ab`vb` Dcv`vb, tju n tju LubR `e, evqycmb I AYRxe| `Re c`v`\_PK gwlti cŃY etj AwfwnZ Kiv nq, Kvi Y `Re c`v`\_B gj-Z gwlti DePZv ubqšY Kti \_vtK|

**gwltZ `Re c`vt\_P Dm**

Dw`c I cŃYxi t`nvetkl gwltZ `Re c`vt\_P cŃvb Dm| gwltZ emevmKvix weifbœaitbi Rxe, AYRxe Ges Ab`vb` cŃYxi gZt`n, gj gT BZ`w` cŃZw` bB gwltZ thwM n t`Q| `Re c`vt\_P Dm wntmte cŃYxi PvBtZ Dw`t` i Ae`vb m=ez A t b K teuk| Kvi Y dmtj i cwi Z`<sup>3</sup> Ask- thgb wkKo, cvZv, LoKlv, dmj mSMŃni ci Rwg tZ td t j Avmv gj-mn Mv t Qi w t Pi Ask, AvMvri t`nvetkl BZ`w` Qvovl emŃNi, iv`-iNv t Ui AveRlv I ebr`Atj i MvQcvjvi AsmL` Siv cvZv, tQvU Wj cvj v, d j d t j i Ask we t kl cŃZw b q Z gwltZ cPž cwi g t Y `Re c`v`\_qhwM Kti P t j t Q|

Re c`vt\_P Dm wntmte cŃYxi PvBtZ Dw`t` i Ae`vb m=ez A t b K teuk|

gwltZ cŃqMKZ. `Re mvi thgb- tMvei, K t =úv÷, Lvgrv RvZ mvi, meR mvi, `Lj, nvt oi , av, g t Qi , av BZ`w` I gwltZ `Re c`vt\_P Dm|

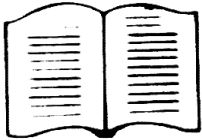
**`Re c`vt\_P Kvi tY gwlti , Yv, tYi Zvi Zg`**

`Re c`v`\_gwlti , Yv, tYi Dci `úo cŃve we`li Kti thgb -

- K) `Re c`v`\_gwlti `j veÚt b mivv` Kti | n v j K v e b t U i R w g t Z ( t e t j g w l t Z ) `Re c`v`\_ wntgtUi gZ emj KY t K GK t T a t i i v t L, h v i d t j g w l t i d u k v `v b K t g h v q G e s c w b a v i Y q g Z v e p x c v q | A b `w `t k f v i x e b t U i G t l j g w l t Z `Re c`v`\_gwlti K Y v, t j v t K c i `ú i t `t k `t j t v t j w t q G t `i g t a` Ae`vb MŃY Kti, h v i d t j g w l t i g t a` d v k v R v q M v e r t o G e s A v t j v e v Z v m I c w b i P j v P j m n R Z i n q |
- L) `Re c`v`\_gwltZ Dw`t` i weifbœLv t `vcv`vb thwMvb t`q etj gwlti DePZv e p x c v q | `Re c`vt\_P gva`tg wKQybvB t U t R b, d m d i v m I c U w k q v g Q v o v l A t b K, t j v t M S Y L v t `vcv`vb thwM n q etj gwltZ mvavi YZ t M S Y L v t `vcv`v t b i A f i e n q b v |
- M) `Re c`vt\_P w t q v R t b i d t j g w l t Z w n D g v m ( H u m u s ) m j o n q h v g w l t Z L v t `vcv`v b t K a t i i v L v i q g Z v e p x K t i | h v i d t j g w l t Z A e w `Z A \_ e v c Ń q u M K Z . m v i I t m t P i c w b i A c P q K g n q | w n D g v m m g x g w l t b i g \_ v t K, G t Z f i g K l P m n R Z i n q G e s e x R Z j v t `t K P r i v I V t b v i m g q w k K t o i t Z g b q i w Z n q b v |
- N) `Re c`v`\_gwlti DcKvix RvexYj Lv` mi e i v n K t i, Z v t `i e s k e p x I K v h R j v c e p x t Z G e s w n D g v m M V t b m n v q Z v K t i | G Q v o v % R e c `v t \_ P w e t q v R t b m o K v e b K G i m W I A b `v b `Re G i m W t K v b t K v b L v t `vcv`v b t K A `e r f Z A e `v t `t K `e r f Z A e `v q A v b t Z m n v q Z v K t i G e s g w l t i D e P Z v e p x K t i |

Re c`v`Rigi A`Zi I  
¶vi KZ; mn`R I Vibv  
Ki`Z t`qbr A`¶ gml`Z  
evd`ti i (Buffer) gZ  
KvR Kti |

- 0) Re c`v`Rigi A`Zi I ¶vi KZ; mn`R I Vibv Ki`Z t`qbr A`¶ gml`Z evd`ti i (Buffer) gZ KvR Kti | dtj , gml`Z Lv`v`v`b Dv`¶ i Mh`Y`h`M` Ae`vq`\_v`K |
- P) Re c`v`Rigi ¶q ti va Kti hvi dtj Rigi De`Zv msi ¶Z nq |



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Re c`v`gml`i c`Y` t`c | Re c`v`gml`i De`Zv ¶bq`¶ Kti , gml`i t`f`Z` Yvej xi  
Db`Z m`ab Ges ¶K`Q`y` Lv`v`v`b mn` ¶¶¶¶¶¶¶ Lv`v`v`b mi ei vn Kti dj b evovq |



### cvfVvEi gj`iqb 4.3

mivK DEti i cvfkqUK wPy (v) w b

1/ gmvUtz `Re c`vt\_P cAvb Dm tKvbwU?

K) DvM c t`nvetkl

L) cOYx t`nvetkl

M) gmvUi Rxe I AYRxe

N) DvM c I cOYxi t`nvetkl

2/ fimi ebtUi gmvUtz `Re c`v\_@Kx Kvr Kti?

K) gmvU KYvtK ati ivtL

L) gmvU KYvtK ci`ui t\_tK`ti tvij t`q

M) K`vj wmqg thvM Kti

N) fvgq q Zji wSZ Kti

3/ `Re c`vt\_P wetqvRtbi dtj gmvUtz Kxtmi mwo nq?

K) j efiYi

M) wDgvfmi

L) qvti i

N) Av tRtbi

4/ `Re c`v\_@qM Kivtz gmvUtz Kx Kvr nq?

K) AvZjevx cvq

L) qvti Zjevx cvq

M) AvZ Ktg hvq

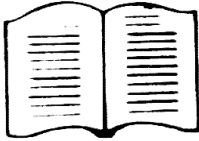
N) evdvti i gZ Kvr Kti

### cvl 4.4 gmltZ `Re c`v`e`xi cizeUKZv I m`tebv



G cvl tk`l Avci`b

- ◆ gmltZ `Re c`v`e`xi Dr`mi AcP`ti Kvi Y ej tZ cvi`teb|
- ◆ `Re c`v`e`xi Dcvq, t`j v`ij LtZ I ej tZ cvi`teb|
- ◆ gmltZ `Re c`v`e`xi Rb` AvBbMZ Kx c`t`c` t`bqv hvq Zv ej tZ cvi`teb|



dmt`j i RigtZ kZKiv c`q 5 f`m AvqZb`v`f`EK `Re c`v`e`xi v`Kv DvPZ| mK`S` evsj v`k`i gmltZ `Re c`v`e`xi c`v`i`gvY AZ`S`l Kg, kZKiv gv`I 0.3-2.1 f`m| t`f`S`M`ij K Ae`v`b`MZ Kvi`t`Y evsj v`k`i Rj`evq`D`o I Av`e`nevi d`j Ges`v`b`e`o P`r`l`i Kvi`t`Y gml`i `Re c`v`e`xi AvZ`e`z` me`t`q`m`RZ I c`v`i`t`k`v`l Z n`t`q` v`b` v`b` K`tg hv`t`"Q| d`j gml`i De`P`Zv I Drcv`b` t`gZv Df`qB` n`m` cv`t`"Q|

evsj v`k`i gmltZ `Re c`v`e`xi c`v`i`gvY AZ`S`l Kg, kZKiv gv`I 0.3-2.1 f`m|

### gmltZ `Re c`v`e`xi cizeUKZv

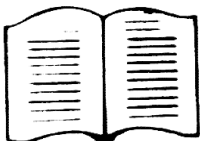
evsj v`k`i KmltZ me`P` c`i`k`v`<sup>3</sup> e`e`u`Z n`t`j I Av`R`K`ij RigtZ t`m`ei e`e`nvi Kiv hv`t`"Q` b`v`| Kvi Y M`ig M`t`A` R`j`v`v`bi c`K`U Af`ie t`g`l`v`t`v`i Rb` c`P`z` c`v`i`gvY t`m`ei R`j`v`v`b` v`n`t`m`te e`e`u`Z n`t`"Q| Ziv`ov` v`e`v`f`b`e`d`m`j t`h`g`b`-`a`r`b, M`g BZ`v`v` m`S`M`o`ni m`g`q M`t`Q`i t`M`v`oi v`t`K`i t`h Ask`U`K`z`R`igtZ t`\_`t`K hv`q t`m`U`K`z` M`ix`e t`j v`K`R`b R`j`v`v`b` v`n`t`m`te e`e`nvi Kivi Rb` t`K`t`U` v`b`t`q hv`q| Av`g, R`ig, K`v`l`ij I e`b`v`A`t`j i S`iv`c`v`Z`v`l Av`R`K`ij gmltZ `Re c`v`e`xi t`h`v`M` K`i`t`Z` cv`i`t`Q` b`v`| c`q` c`i`Z`v` b`B` G, t`j`v` K`v`o`t`q R`j`v`v`bi Rb` v`b`t`q hv`l` q`v` n`q| D`b`z` t`\_`t`k` m`e`R` m`v`i v`n`t`m`te `a`A`v, k`b`c`v`U, e`i`e`v`U BZ`v`v` i P`v`l n`q| m`K`S` Av`g`v`t``i t`\_`t`k` t`j`v`K`m`S`L`v`i A`b`g`v`t`Z` Av`e`v`x` R`ig Kg`\_`v`K`v`i Rb` c`a`v`b` d`m`j (t`h`g`b`-`a`r`b, cv`U) e`v` v`t`q` m`e`R` m`v`i d`m`j Av`e`v` Kiv m`e` n`t`"Q` b`v`|

### gml`i `Re c`v`e`xi Dcvq

1. t`m`ei, K`t`a`v`v`÷, cv`Z`v` c`P`r` m`v`i RigtZ v`b`q`v`gZ` c`q`v`M` Kivi g`v`a`t`g` R`ig`i `Re c`v`e`xi`\_`P` c`v`i`gvY` e`v`x` Kiv t`h`t`Z` cv`i`t`|
2. `t`j`v` c`a`v`b` dmt`j i g`a`e`Z`x`m`g`t`q` G`K`v`U` m`e`R` m`v`i d`m`j P`v`l Kivi g`v`a`t`g` R`ig`t`Z` c`P`z` c`v`i`gv`t`Y` `Re c`v`e`xi`\_`Kiv t`h`t`Z` cv`i`t`|
3. d`m`j m`S`M`o`ni m`g`q dmt`j i t`M`v`oi v`K`Q`v`v` Ask` R`ig`t`Z` t`i`t`L` t`\_`q`v` t`h`t`Z` cv`i`t`|
4. f`v`g`v`l`q` t`i`v`a` Kivi g`v`a`t`g`l` R`ig`i `Re c`v`e`xi`\_`m`S`i` t`j`Y` Kiv t`h`t`Z` cv`i`t`|
5. Av`D`k` a`v`t`b`i m`t`z` v`g`k`d`m`j v`n`t`m`te `a`A`vi P`v`l K`t`i`l R`ig`t`Z` `Re c`v`e`xi`\_`t`h`v`M` Kiv t`h`t`Z` cv`i`t`|

`t`j`v` c`a`v`b` dmt`j i g`a`e`Z`x`m`g`t`q` G`K`v`U` m`e`R` m`v`i d`m`j P`v`l Kivi g`v`a`t`g` R`ig`t`Z` c`P`z` c`v`i`gv`t`Y` `Re c`v`e`xi`\_`Kiv t`h`t`Z` cv`i`t`|

Av`B`b` c`v`q`t`b`i g`v`a`t`g` t`m`ei, M`t`Q`i S`iv`c`v`Z`v`l dmt`j i c`v`i`Z`v`<sup>3</sup> Ask` R`j`v`v`b` v`n`t`m`te e`e`nvi v`b`v`l`x` K`i`t`Z` n`t`e`| Z`t`e` t`m`B` m`v`t`\_`g`v`b`t`j` i `b`v`v`b` e`e`n`v`t`i` i Rb` R`j`v`v`bi m`S`v`b` K`i`t`Z` n`t`e`|



### mvi gg<sup>o</sup>

t`m`ei, M`t`Q`i S`iv`c`v`Z`v`l, dmt`j i c`v`i`Z`v`<sup>3</sup> Ask` BZ`v`v` R`j`v`v`b` v`n`t`m`te e`e`u`Z` n`e`v`i` d`j R`ig`t`Z` G, t`j`v` `Re c`v`e`xi`\_`v`n`t`m`te` t`h`v`M` n`t`"Q` b`v`| t`m`ei, m`e`R` m`v`i, K`t`a`v`v`÷, cv`Z`v`c`P`r` m`v`i BZ`v`v` R`ig`t`Z` c`q`v`M` K`i` gmltZ `Re c`v`e`xi`\_`Kiv m`e`| t`m`ei, S`iv`c`v`Z`v`l, dmt`j i c`v`i`Z`v`<sup>3</sup> Ask` BZ`v`v` R`j`v`v`b` v`n`t`m`te e`e`nvi e`U` Kiv AZ`v`e`k`K`| Z`t`e` G`m`e` R`j`v`v`bi v`e`K`i` D`c`K`i`t`Y`i` m`S`v`b` G`K`B` f`v`t`e` AZ`v`e`k`K`|



**cvVĒi gj'iqb 4.4**

mWk DĒti i cvkqUK wPy (√) w`b

1/ dmtj i RvgtZ kZKiv KZ fM `Re c`v`vKv DvPZ?

- K) 7 fM
- L) 3 fM
- M) 5 fM
- N) 2 fM

2/ tMvei dmj tvtZ e`eüZ bv ntq Ab`T Kx wntmte e`vcKfvte e`eüZ nq?

- K) Ni tj cvtZ
- L) gvqQi Lvevi
- M) Rvj vb
- N) nva-gjvMi Lvevi

3/ GKw c`vb dmj tK ev` w`tq Kxmi Avev` Kiv m`e nt`Q bv?

- K) avtbi
- L) AvtLi
- M) meR mvti i
- N) `Zj dmtj i

4/ AvDk avtbi m`½ tKvb dmtj i w`k`PvI Kti Rvgi `Re c`v`vKv Kiv thtZ cvti?

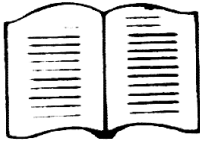
- K) Avgb avb
- L) cvU
- M) tMlv` dmj
- N) `aAv

### cw 4.5 gwli DePZv kir<sup>3</sup> eRvq ivLvi Kul.ZwEjK Dcvq



G cvV tkfI Avciob

- ◆ gwli DePZv kir<sup>3</sup> eRvq ivLvi Dcvq, tju eY<sup>0</sup> Ki tZ cvi teb|
- ◆ gwli DePZv kir<sup>3</sup> msi q<sup>1</sup>Yi Dcvq, tju wj LtZ l ej tZ cvi teb|
- ◆ fvg<sup>1</sup>q c<sup>0</sup>uqv Kxfvte gwli DePZv bó Kti Zv ej tZ cvi teb|
- ◆ fvg<sup>1</sup>q ti va Kivi e`e`v m<sup>0</sup>útk<sup>0</sup>ej tZ cvi teb|



gwli DePZvK ati bv ivLv tMtj ev epx Ki tZ bv cvi tj A`i fivel`tZ km` Drcr`b Am<sup>0</sup>e ntq `wvte|

evsj v`tki gwli L<sup>0</sup> DeP etj L`vZ ntj l tjuKmsL`v epx i P<sup>1</sup>tc Rvq dmj Drcr`tb e`vcKfvt e`eüZ nt`Q Ges Acwi Kir Z eb`v ubqšy` eta `Zwi Kivi dtj RvgtZ AvtMi gtZv cwj gwli Avtm bv| dtj gwli DePZv w`biv b Ktg hv`Q| gwli DePZvK ati bv ivLv tMtj ev epx Ki tZ bv cvi tj A`i fivel`tZ km` Drcr`b Am<sup>0</sup>e ntq `wvte| Gi Rb` gwli DePZv kir<sup>3</sup> tKej ati ivLvB ht`ó nte bv, epx i c<sup>0</sup>PóvI ubtZ nte|

bivbwa Dcvq gwli DePZv i q<sup>1</sup>v l epx i c`t<sup>1</sup>q M<sup>0</sup>Y Kiv thtZ cvi | Zte t`Lv tMtQ th, th tKvb GKwU c<sup>0</sup>wzi t<sup>1</sup>tq GKwaK c<sup>0</sup>wzi mgšy` AwaKi Zi dj c<sup>0</sup>h`ntq`v<sup>1</sup>K|

gwli DePZv i q<sup>1</sup>vi Kul.ZwEjK Dcvq, tju vubtP mst<sup>1</sup>q<sup>1</sup>tc Avtj vPbv Kiv ntj v t

#### 1. mlyg mti i e`envi

thme mti dmtj i c<sup>0</sup>qvRbxq Lv`vcr`vb thgb bivU<sup>1</sup>Rb, dmdim l cUmmqvg AvbgwZK gv<sup>1</sup>vq me`gib`v<sup>1</sup>K Zvt`i tK mlyg mvi etj |

m<sup>0</sup>e` mKj c<sup>0</sup>wzi gta` mlyg mvi c<sup>0</sup>qv<sup>1</sup>Mi gva`tg AZ`ší Aí mg<sup>1</sup>q l Kg Li tP Rvqi DePZv kir<sup>3</sup> msi q<sup>1</sup>Y l epx Kiv m<sup>0</sup>e| thme mti dmtj i c<sup>0</sup>qvRbxq Lv`vcr`vb thgb bivU<sup>1</sup>Rb, dmdim l cUmmqvg AvbgwZK gv<sup>1</sup>vq me`gib`v<sup>1</sup>K Zvt`i tK mlyg mvi etj | tKej GKwU ev`<sup>0</sup>U Lv`vcr`vbm<sup>0</sup> mvi c<sup>0</sup>qvMB ht`ó bq| me, tju mvi B dmtj i cwi<sup>1</sup>kv<sup>1</sup>tbi AvbgwZK nvti c<sup>0</sup>qvM Ki tZ nq| Kvi Y gwli tZ me, tju Lv`vcr`vbi gta` GKwUgv<sup>1</sup> Dcr`v<sup>1</sup>bi AvbgwZK ev Afive NU<sup>1</sup>tj l DePZv i q<sup>1</sup>v nq bv| AwaKš` emn`Kfvt e`f mg<sup>1</sup>q gta` tKvb GKwU mti i DcKvix c<sup>1</sup>ve cwj j<sup>1</sup>qZ ntj l Zv gwli Ges dmtj i Rb` AZ`ší Lv<sup>1</sup>vc c<sup>0</sup>Zuqv<sup>1</sup> m<sup>0</sup>ó Ki tZ cvi | D`vni Y`f<sup>1</sup>c ej v hvq 1950 Gi`ktK mi Kvi KZR.c<sup>0</sup>É Gtgmbqvg m<sup>1</sup>jdU, wJGm<sup>1</sup>c, Ges Gg<sup>1</sup>c mti i gta` Pvlxv tKej gv<sup>1</sup> Gtgmbqvg m<sup>1</sup>jdU e`envi Kti Rvqi DePZv Ges dj b q<sup>1</sup>gZv Df<sup>1</sup>qib c<sup>0</sup>U q<sup>1</sup>wZ mvab Kti tQb| DePZv i q<sup>1</sup>vq (w<sup>1</sup>kl Kti gwli A<sup>0</sup>z`i`Kti Yi Rb`) Gtgmbqvg m<sup>1</sup>jdU mti i m<sup>1</sup>z eva`Zvgj-Kfvt P<sup>0</sup> bv ubtj mvi t`qv eÜ Kti t`qv ntj Pvlxv wKB P<sup>0</sup> M<sup>0</sup>Y Ki tZb wKš` t`Lv thtZv wKQy`-AM<sup>0</sup>hi ntq iv`li wKv<sup>1</sup>ti P<sup>0</sup> tdtj w`tq tKej mvi ubtq hv`Q| Gi Kvi Y wQj m<sup>0</sup>eZ mvi e`envi Pvlx<sup>1</sup> i AAZv| Gici Kul.m<sup>0</sup>úthvi Y KgRvÜ epx cvevi dtj RvgtZ P<sup>0</sup> e`envi Kti Rvqi DePZv msi q<sup>1</sup>Y Kivi th e`e`v Kiv ntq wQj Zv tek Kvh<sup>1</sup> i dj c<sup>0</sup>h, ntq wQj | ZvB m<sup>0</sup>úthvi Y KgRvÜ i m<sup>1</sup>vqZvq gwli DePZv msi q<sup>1</sup>Y m<sup>0</sup>útk<sup>0</sup>Pvlx<sup>1</sup> i tK D<sup>0</sup>y Kivi c<sup>0</sup>qvRb i tqtQ|

gwli A<sup>0</sup>z; t<sup>1</sup>fo hvevi Rb` Gtgmbqvg m<sup>1</sup>jdU mvi evRvi RvZ Kiv nt`Q bv| ZvQvov t`tki mvi Kvi Lv<sup>1</sup>v, tju tZ c<sup>0</sup>z BDwi qv mvi `Zwi nt`Q| eZ<sup>0</sup>v<sup>1</sup>b BDwi qv Ges WvBA`v<sup>1</sup>tgmbqvg dmt<sup>1</sup>dU (wJGm<sup>1</sup>c) mvi w<sup>1</sup>u nt`Q hv gwli A<sup>0</sup>z; Kg<sup>1</sup>v<sup>1</sup>tZ m<sup>1</sup>vqK|

#### 2. `Re mvi c<sup>0</sup>qvM

ivm<sup>1</sup>qv<sup>1</sup>bK mti i e`envi gwli msh<sup>1</sup> i AebwZ NtU hv`Re mvi c<sup>0</sup>qvM mst<sup>1</sup>kvab Kiv m<sup>0</sup>e|

Re Drm t`tK c<sup>0</sup>š ev c<sup>0</sup>ZKZ.mvi B ntju `Re mvi | ivm<sup>1</sup>qv<sup>1</sup>bK mti i e`envi gwli msh<sup>1</sup> i AebwZ NtU hv`Re mvi c<sup>0</sup>qvM mst<sup>1</sup>kvab Kiv m<sup>0</sup>e| `Re c`v`<sup>0</sup>tM<sup>1</sup>ei, Kt<sup>0</sup>úv` l

meĖ mvtii gvaġg cġqM Kiv thġZ cġti | tMiei AvRKĵj Rĵj vb I Abġvbġ KġR eġvcKfġte eġenvġii dtĵ RġġZ mvi ġntġte eġenvġii Rbġ cvlqv LġB KġVb | eZġvġb Rĵj vbi Afve cġKU nġlqvġZ MġQi cvZv ev dġtĵi cġiZġ<sup>3</sup> AskI Mġxe tĵvKRb Rĵj vb ġntġte eġenvi Kġtġ | ZvB ġeKġ ġntġte Kġġvġv - I meĖ mvtii gvaġgB ġRe cġv\_ġmġġZ thġM Kġi gġmġi DeġZv eġx Kivi Dci tRvi teġk ġġZ nġe |

**3. kmġ chġġ Aej ġb**

GKB fġġU chġġġg ġbġ ħ mġġi eġeavġb ġeġfġbġdġtĵi Pġl KġvġK kmġ chġġġ eġĵ |

GKB fġġU chġġġg ġbġ ħ mġġi eġeavġb ġeġfġbġdġtĵi Pġl KġvġK kmġ chġġġ eġĵ | kmġ chġġġ Aej ġb Kġtĵ ġbġeġvġZ Dcġġ gġmġi DeġZv kġ<sup>3</sup> eġx I mġiġġZ nġ | kmġ chġġġ chġġġġg Mġfġġġx (cġU, Zĵv) I AMġfġġġx (avb, Mg) dġmĵ, Wĵj -KĵvB, Zġĵ dġmĵ (avb, Mg, fġġv, Pġxv, KġDb), cġiġ "QbġeKġġ dġmĵ (ZĵġvK, Avĵ), gġmġ AvġQvġ bKġvġx dġmĵ (tġmġvġx, gġmġKĵvB, gġmĵ), kġvKġeġR, meĖ mvi dġmĵ (ġAv, kbcġU) BZġġġ Aġġfġġ vKġi Rbġ Rġġi me ġġi ġvġġvġ vb mġfġte cġiġkġmġZ nġ | cġiġ "QbġeKġġ dġmĵ vKġv RġġZ AvġMġQv RbġġZ cġti bġ Ges GKB mġġ fġġim evġġFeb cġġġvġq bġ bġ nġġ RġġZ tġġK ġvġ ġv dġtĵi KġR ĵvġM | GKġRġZġġ dġmĵ evġevi bġ Kġvġ D<sup>3</sup> dġtĵi AvġZġi<sup>3</sup> Pġvġvi ġvġġvġ vb thġb- ġeġR dġtĵi Rbġ bġBġġġRb, ġvġv ev exR dġtĵi Rbġ dġmġim, Avġ ev ġĵ- RġZġġ dġtĵi Rbġ cġUġmġvġq BZġġġ Aġ ġġbġ ġġġġ tġkġ neġi mġġbġ vġġK bġ | Wĵj RġZġġ dġmĵ Pġġi dtĵ RġġZ ġġġvġġe ġvġBġġeġvġq eġvġġmġ qv KZġġ evZġġmġ bġBġġġRb Ges meĖ mvi dġmĵ KZġġ.cġġġ cġiġġvġY ġRe cġv\_ġmġġZ Rġv neġi dtĵ gġmġi DeġZv eġx cġv, tġġZ Aeġvi DġvġZ nġ, gġmġġZ evġġPĵvġPĵ, cġmġ avġY ġġġZv eġx cġvġ Ges DġKġvġx AYġġġei esk eġx I Kġvġġġvġc eġx cġvġ |

**4. AvġMġQv ġb**

AvġMġQv (AvġKġvġLZfġte Rbġġbġ MġQ) dġtĵi cġmġ, ġvġġvġvġ vb I Avġĵv evZġġm fġmġ eġmġġ dġtĵi dĵb Kġġġġ tġq Ges gġmġi DeġZv kġ<sup>3</sup> bġ Kġi tġq | KġġRB AvġMġQv Rbġġbġ ġvġġB Rġġ tġġK mġiġġ tġġġZ nġe | AvġMġQv AekġB dġĵ-dĵ avġi AvġMġ nġġZ tġġb, ġbġo ev tġvġ ġġġġ mġvġthġ Dġġo tġġġ ġġZ nġe | DVġġb AvġMġQv Rġġi I cġti ġeġQġġ ġġġ RġġZ MġQi ġvġġvġvġmġ ġKQġRe cġv\_ġġ thġM Kġte ġv DeġZv ġġġi mġvġKġ | Zġe ĵ ġġġ ġvġv DġPZ, AvġMġQv ġvġZ cġġiġvġ ġkġKo MġRġġ RbġġZ bġ cġti |

**5. cġmġ eġġvġbġ**

RġġZ ġeġġvġ MġQi ġvġġvġvġ ġġ\_ġ cġiġġvġY vKġġ I tġġġv MġQi MġYġthġM Avġvġi Avġmġi Rbġ gġmġġZ chġġ cġiġġvġY ġmġvKġ cġġvRb |

RġġZ ġeġġvġ MġQi ġvġġvġvġ ġġ\_ġ cġiġġvġY vKġġ I tġġġġv MġQi MġYġthġM Avġvġi Avġmġi Rbġ gġmġġZ chġġ cġiġġvġY ġmġvKġ cġġvRb | fġġġġmġi Dġm eġġ ev fġMġ<sup>ġ</sup> cġmġ bġ cvlqv tġġġ tġġġPġi gvaġġ RġġZ cġmġ ġieġvġn Kiv thġZ cġti | AbġvġġK Rġġ teġk ġġb Rĵvex Aeġvġ vKġġ ġKQġMġQġġvġġvġvġ (thġb- MġK, ġġġ) MġQi AMġYġthġM Aeġvġ Pġġ ġvġ | G Aeġvġ AvġZġi<sup>3</sup> cġmġ ġbġġkġbġi gvaġġ Rġġ tġġK ġei Kġi ġġZ nġe | ZvB DeġZv ġġġi ġġġġRġġZ cġġvRbġġ cġmġ ġieġvġġni Ges AvġZġi<sup>3</sup> cġmġ ġbġġkġbġi eġġvġ ġvġv Acġiġvġhġ<sup>ġ</sup>

**6. gġmġi ġeġġvġ (p<sup>H</sup> ġvġ) ġbġġġ**

gġmġi ġeġġvġ (AġġZġ ev ġġviZġ) ġbġġcġbġi ġvġKġmġZ (p<sup>H</sup> ġġġvi) 0-14 chġġġ ġvġ vKġġ I evġġe 3.5 tġġK 10.5 Gi teġk ev Kg AġġZġi ev ġġvġZġi gġmġ cvlqv ġvġ bġ | gġmġi p<sup>H</sup> ġvġ ġLb 7 nġ Zġġ Zġġġ ġbġġcġġ gġmġ eġv nġ Aġġ Gġmġ Aġġġġġ bġ, ġġviġġġ bġ | p<sup>H</sup> ġvġ 7 Gi I cġti tġġġ nġ ġġviġġ gġmġ Avġi Gi ġbġP bġġġ nġ Aġġġ gġmġ |

AwaKvsk dmj ubi`tc` ev  
nij Kv A`uq t`K nij Kv  
`vi xq gnu (p<sup>H</sup> 6.5-7.5)  
cO` Kti |

AwaKvsk dmj ubi`tc` ev nij Kv A`uq t`K nij Kv `vi xq gnu (p<sup>H</sup> 6.5-7.5) cO` Kti |  
Gi e`uZugl gvtS gta` tPtL cto| Pv MvO uKQy A`uq gnu cO` Kti Avevi tjeMvtQi  
cO` uKQy `vi gnu| ZvB Pv evMvtb A`uZveaR Gtgmbqvg mijtdU mvi e`envi Kiv  
hv`h, uKs` tj eMvtQi Avkcvk c`qvRbterta uKQycvi gvY Pz c`qvM KitZ nq| GfvteB  
gnu u`uqvri ubi`tc`Zv eRvq ivLv hvq|

### 7. jeYv<sup>3</sup>Zv`iKiY

ubi`tc` (A` p<sup>H</sup> gvb 7 Gi KvQvKvO) jeY mgx gnu`K jeYv<sup>3</sup> gnu ejv nq| GLvtb  
gnu u`uqvri gvb c`q t`Tb 7 Gi Lv KvQvKvO| AwZi<sup>3</sup> jeYv<sup>3</sup>Zv MvO mn` KitZ cvti  
bv| ZvB gnu jeYv<sup>3</sup>Zv`iKfZ Kti DePZv msi`Y KitZ nq| creY tm`Pi (Flood  
irrigation) gva`tg RvgTz cwb mieivn Kiv ntj cwbTz jeY`exfZ nq Ges u`vktbi  
gva`tg jeYv<sup>3</sup> cwb AcvviY Kti RvgTK jeYv<sup>3</sup>Zv t`K gY Kiv nq| jeYv<sup>3</sup>Zv`iKiY  
ivmrvqbk`e`I e`euZ ntq`vK|

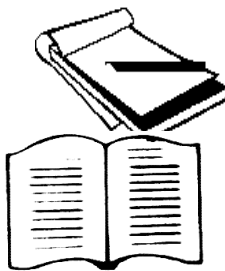
### 8. fig`lq tiva/fig msi`Y

gnu GK`vb t`K tKvb GfRtbi (cwb, evqBZ`v) gva`tg Ab`v`Ptj hievi c`uqvTz  
fig`lq (Soil erosion) etj | fig`lq u`fba`i`bi ntZ cvti | gnu I cti i cvZjv GK`li  
Ab`T Ptj tMj ZvtK Oku fig`lq (Sheet erosion) etj | Avevi cwb Mvotg hievi mgq  
gnu tKtU ubtq Av`tj i Qvtci gZ Mfvi `Tzi mvo ntj ZvtK Omj fig`lq (Reel  
erosion) etj | cwb c`vtni c`U tmTz gnu tKtU hLb Lv` ev biv v mvo nq ZLb ZvtK etj  
Omj fig`lq (Gulley erosion) | fig`lq th ai`biB tnvK tKvbiUB gnu Rb` fij bq|

fig`lq th ai`biB tnvK  
tKvbiUB gnu Rb` fij  
bq|

th`nZzgu I cti `li meTptq tew DeP Ges me ai`bi fig`lq c`uqvTz I cti gnuB  
meri AvtM Ptj hvq, ZvB Gi i`Yvte`Y AwZ , iazc`y gnuTz memgq dmj `vktj , fig  
Av`Qv`bKvix dmj thgb- tLmvi x, gvmKj vB, gmy BZ`v i Pvl Kiv ntj , c`z cvi gvtY `Re  
c`v`c`v`q`Mi gva`tg gnu eU`b `p Kitj kvU fig`lq tiva Kiv thTz cvti | w`tj gta`  
AveRv`tdtj w`j gnu`lq eU Kiv thTz cvti | Mvj fig`lq tivtai Rb` Aek` Mvj i g`L  
eva w`tq cwb i tmTz AvUmktq w`tZ nte| ZvQvovl D`bPzgu Rb` itqtQ KtUvi Pvl  
(Contour cultivation), tmvcv Pvl (Terrace cultivation) Ges RvgTz uKQy`i`cici  
evZvtmi MvZteM tivaK j`v`MvtQi mvi i mvo|

**Ablyj b (Activity):** Avcbvi GjvKvq gnu msi`Y mPivPi Kx Kx e`e`v tbqv nq  
Avtj vPbv Kiab|



**mvi gg<sup>©</sup>**  
evsj v`tki gnu DePZv msi`Y I e`xi c`Pov tbi qv GKvS/c`qvRb| tKvb GKvU c`uZi  
tPtq GKvK c`uZi mgS`q AwaKZi dj c`h` gnu DePZv msi`Y i Rb` u`fba`KvL ZvE`K  
c`uZ KtR j`vMvtbv thTz cvti thgb: mlyg e`envi, `Re mvi c`qvM, km` ch`q Ae j`b,  
AvMvQv`gb, cwb e`e`vcbv, gnu p<sup>H</sup> gvb ubqS`y, jeYv<sup>3</sup>Zv`iKiY, fig`lq tiva c`f`Z|



### cuVhEi gj'iqb 4.5

mWVK DEti i cuKqUK wPy (v) w b

1| ejsj vt`tk tj vKmsL'v ewxi P'fc Ges dmj Drcv`tb Riq e'vcKf'ite e'euZ nevi dtj w`b w`b gmlU Kx Ktg Avm'Q?

- K) cumb avi Y 'lgZv
- M) De'PZv

- L) gmlU Zvcgv'v
- N) gmlU we'p'qv 'lgZv

2| m'yg mvi e'envi Kti AwZ A' mg'q I Kg Li'P Riqi tKvb ,Y msi 'Y I ewx Kiv m'q?

- K) Drcv`b 'lgZv
- M) cumb avi Y 'lgZv

- L) De'PZv
- N) w'Dgvm Drcv`b 'lgZv

3| tKvb RvZxq mvi e'env'ti i dtj gmlU mshy' i AebwZ N'u?

- K) i vmiqubK mvi
- M) R'evYmvi

- L) 'Re mvi
- N) K'x'u'v' mvi

4| dmj Dv'q' i m'z L'v , cumb, Av'tj v I evZv'm f'vM eum'q dm'tj i dj b I gmlU De'PZv kw' tK b' Kti?

- K) t'cvKv gvKo
- M) Av'MQv

- L) ti vMe'j vB
- N) e'v't'wi qv



### Persigj`iqb

#### msu`B I iPbvj-K c`koe

- 1| gnu`i DePZvi msAv`ij Lb|
- 2| gnu`i DePZv I Drcv`b`f`gZvi gta` cv`R`ij Lb|
- 3| `Dgnu`i DeP`ntj I Drcv`b`f`g bv-I ntZ cvti`0 - e`vL`v Ki ab|
- 4| Rvgi DePZvi c`fveKmg`fni bvg`ij Lb|
- 5| Rj evqy` MvQciv`v gnu`i DePZvi Dci Kxfvte` c`fve`ve`li Kti Avtj`vPbv Ki ab|
- 6| `Re c`v`f`K gnu`i c`Y`ej`v`nq`tkb?
- 7| gnu`i DePZvi Dci Pvl`ver`c`v`Zi c`fve`Avtj`vPbv Ki ab|
- 8| gnu`tZ`Re c`v`f`P`Drm`m`u`f`K`Avtj`vPbv Ki ab|
- 9| `Re c`v`f`P`Kvi`fY`Kxfvte`gnu`i`Yvej`xi`Zvi`Zg`nq`Dtj`L`Ki ab|
- 10| ersj vt`tki gnu`tZ`Re c`v`K`g`v`Kvi`Kvi`Y`Dtj`L`Ki ab|
- 11| gnu`tZ`Re c`v`e`v`x`i`Rb`Kx`c`f`c`tbqv`hvq`Dtj`L`Ki ab|
- 12| gnu`tZ`Re c`v`e`v`x`i`c`iZe`U`K`Zv`mgt`U`mst`f`tc`Avtj`vPbv Ki ab|
- 13| c`v`b`tkvb`dmj`f`K`ev`bv`v`f`q`Kxfvte`RvgtZ`Re c`v`e`v`x`Kiv`thtZ`cvti`ij`Lb|
- 14| fvg`f`tqi`gva`tg`gnu`i`DePZv`Kxfvte`bo`nq`ij`Lb|
- 15| m`yg`mvi`Kv`K`etj`?`ev`stq`ej`b|
- 16| `Re`mvi`Kv`K`etj`?`gnu`tZ`Re`m`f`i`i`Kv`R`Kx`e`Y`v`Ki ab|
- 17| km`ch`q`Aej`f`bi`m`glj`e`Y`v`Ki ab|
- 18| Rj`ex`Zv`gnu`tZ`Kx`Am`v`avi`m`v`Kti`e`Y`v`Ki ab|
- 19| fvg`f`q`Kv`K`etj`?`Kxfvte`fvg`f`q`ti`va`Kiv`hvq`ij`Lb|



## DËigjv

### cW 4.1:

1| L 2| K 3| M 4| N

### cW 4.2:

1| L 2| M 3| K 4| M 5| L 6| K

### cW 4.3:

1| N 2| L 3| M 4| N

### cW 4.4:

1| M 2| M 3| M 4| N

### cW 4.5:

1| M 2| L 3| K 4| M

## BDibU 5 `Re mvi

### BDibU 5 `Re mvi

AveRθv cPr mvi gmljZ  
`Re c`vt\_P cwi gvY epx  
I Rigi DePZv msi ¶tY  
Ae`vb ivLjZ cvti |

DwMc RvZ Ges cθYRvZ AθK wRwbm cθZwqZ AcθqvRbxq ev AveRθv wntmte tdtj t`qv  
nq| Gme wRwbm AZ`šf vj KvRRI e`enri Kiv thZ cvti | Gt`i gta` GKwU ntjv %Re  
Drθmi AveRθv cwpTq mvi cθZKiY| GtZ AveRθv cwi<sup>o</sup>vi nq Ges mvi gmljZ cθqwm Kti  
Rigi DePZv msi ¶tY nq| evsjvt`tki gmlj Lg DeP G K\_wU AvengvbKvj t`tK tkvbr  
tMj I RbmsL`v wētūvi tYi Prtc Aver`x Rigi cwi gvY I fvgi DePZv w`b w`b Ktg AvmtQ|  
Rigi DePZv Ktg hvevi cθvb KviY gmljZ `Re c`vt\_P Afve| AveRθv cPr mvi gmljZ  
`Re c`vt\_P cwi gvY epx I Rigi DePZv msi ¶tY Ae`vb ivLjZ cvti |

Avgt`i t`tk bvbri Ktgi DwMc AvtQ th`tj vtk `Re mvi Drcv`tbi KvR e`enri Kiv thZ  
cvti | Zte Gme DwMc`i cwi wPwZ I `ewkó`vej x AθbθKB Rvθbb bv| wkg RvZxq tek wKQy  
DwMc AvtQ th`tj vtk meR mvi wntmte e`enri Kiv thZ cvti | ZvQvov hI ZI Rθbθ\_vKv  
AvMvQv ev Nvm cwpTq Ktθúv÷ ev AveRθv cPr mvi `Zwi i KvR jvMvθbv thZ cvti hv  
tMveθi i cwi etZ RigtZ e`enri Kiv thZ cvti |

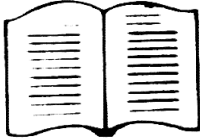
G BDibθU `θUv ZÉxq cvtV `Re mvi mθúθK<sup>o</sup>avi Yv Ges `Re mvi Drcv`bKvi x DwMc mgθni  
cwi wPwZi wētq wē`hwi Z Avtj vPbv Kiv ntqtQ| G Qvovl `θUv e`enmi K cvtV meR mvi I  
Ktθúv÷ `Zwi i wētq Avtj vPbv Kiv ntqtQ|

### cw 5.1 Re mvi m<sup>u</sup>tK<sup>o</sup>avi Yv I msAv



G cvV tkfI Avciob

- ◆ Re m<sup>i</sup>ti i msAv ej tZ cvi teb|
- ◆ Re mvi m<sup>u</sup>tK<sup>o</sup>e <sup>h</sup>wi Z eY<sup>o</sup>v Ki tZ cvi teb|



Avgt<sup>i</sup> i Avkcv<sup>i</sup>ki D<sup>w</sup> RvZ I c<sup>o</sup>YRvZ A<sup>t</sup>bK e<sup>-</sup>tKB mi v<sup>m</sup>vi A<sup>\_</sup>ev c<sup>o</sup>quvRvZ K<sup>t</sup>i RvgtZ mvi w<sup>t</sup>mt<sup>e</sup> e<sup>o</sup>envi Kiv t<sup>t</sup>Z cv<sup>i</sup>|

**msAv:** %Re D<sup>r</sup>m t<sup>\_</sup>tK c<sup>o</sup>KuZK<sup>f</sup>v<sup>t</sup>e c<sup>o</sup>B A<sup>\_</sup>ev c<sup>o</sup>ZKZ.mvi tK Re mvi etj |

#### Re mvi m<sup>u</sup>tK<sup>o</sup>avi Yv

##### %Re mvi

evsj v<sup>t</sup> tk e<sup>o</sup>uZ Re m<sup>i</sup>ti i g<sup>t</sup>a<sup>o</sup> i t<sup>t</sup>q<sup>o</sup> t<sup>m</sup>vei, K<sup>t</sup>u<sup>v</sup>÷, me<sup>r</sup> mvi, we<sup>r</sup>fba<sup>i</sup>t<sup>b</sup>i L<sup>j</sup>, n<sup>i</sup>foi <sup>o</sup>av, g<sup>v</sup>t<sup>o</sup>i <sup>o</sup>av BZ<sup>w</sup> | Ab<sup>v</sup>b<sup>o</sup> t<sup>\_</sup>tK g<sup>v</sup>b<sup>t</sup>j<sup>i</sup> g<sup>j</sup>g<sup>f</sup>, n<sup>i</sup>ra-g<sup>j</sup>m<sup>i</sup> we<sup>o</sup>v, L<sup>u</sup>g<sup>v</sup>i RvZ mvi, c<sup>i</sup>c<sup>w</sup>Li i<sup>3</sup> BZ<sup>w</sup> Re mvi w<sup>t</sup>mt<sup>e</sup> e<sup>o</sup>uZ n<sup>q</sup>| Z<sup>v</sup>Q<sup>v</sup>or Avgt<sup>i</sup> i t<sup>\_</sup>tK Ges we<sup>t</sup> tk c<sup>o</sup>YR mvi (Remvi) w<sup>t</sup>mt<sup>e</sup> A<sup>v</sup>th<sup>v</sup>j<sup>v</sup> (Azolla), b<sup>i</sup>j me<sup>r</sup> t<sup>k</sup>l<sup>j</sup>v (Blue Green algae) I R<sup>x</sup>evY<sup>m</sup>vi (Biofertilizers) e<sup>o</sup>uZ n<sup>t</sup>q<sup>\_</sup>v<sup>t</sup>K|

evsj v<sup>t</sup> tk e<sup>o</sup>uZ Re m<sup>i</sup>ti i g<sup>t</sup>a<sup>o</sup> i t<sup>t</sup>q<sup>o</sup> t<sup>m</sup>vei, K<sup>t</sup>u<sup>v</sup>÷, me<sup>r</sup> mvi, we<sup>r</sup>fba<sup>i</sup>t<sup>b</sup>i L<sup>j</sup>, n<sup>i</sup>foi <sup>o</sup>av, g<sup>v</sup>t<sup>o</sup>i <sup>o</sup>av BZ<sup>w</sup> | Ab<sup>v</sup>b<sup>o</sup> t<sup>\_</sup>tK g<sup>v</sup>b<sup>t</sup>j<sup>i</sup> g<sup>j</sup>g<sup>f</sup>, n<sup>i</sup>ra-g<sup>j</sup>m<sup>i</sup> we<sup>o</sup>v, L<sup>u</sup>g<sup>v</sup>i RvZ mvi, c<sup>i</sup>c<sup>w</sup>Li i<sup>3</sup> BZ<sup>w</sup> Re mvi w<sup>t</sup>mt<sup>e</sup> e<sup>o</sup>uZ n<sup>q</sup>| Z<sup>v</sup>Q<sup>v</sup>or Avgt<sup>i</sup> i t<sup>\_</sup>tK Ges we<sup>t</sup> tk c<sup>o</sup>YR mvi (Remvi) w<sup>t</sup>mt<sup>e</sup> A<sup>v</sup>th<sup>v</sup>j<sup>v</sup> (Azolla), b<sup>i</sup>j me<sup>r</sup> t<sup>k</sup>l<sup>j</sup>v (Blue Green algae) I R<sup>x</sup>evY<sup>m</sup>vi (Biofertilizers) e<sup>o</sup>uZ n<sup>t</sup>q<sup>\_</sup>v<sup>t</sup>K|

##### t<sup>m</sup>vei

Mi<sup>a</sup> g<sup>w</sup>l, Q<sup>v</sup>Mj, t<sup>f</sup>ov BZ<sup>w</sup> i g<sup>j</sup> tK t<sup>m</sup>vei etj | t<sup>m</sup>vei mvi w<sup>t</sup>mt<sup>e</sup> e<sup>o</sup>uZ n<sup>q</sup>| ev<sup>-</sup>te t<sup>m</sup>vei me<sup>U</sup>K<sup>B</sup> t<sup>m</sup>vei <sup>v</sup>tK b<sup>v</sup> Gi g<sup>t</sup>a<sup>o</sup> LoK<sup>l</sup>v, P<sup>b</sup>v BZ<sup>w</sup> I w<sup>g</sup>u<sup>k</sup>Z <sup>v</sup>tK| c<sup>o</sup>Z<sup>w</sup>b t<sup>f</sup>v<sup>t</sup>i Mi<sup>a</sup> t<sup>m</sup>vq<sup>j</sup> Ni c<sup>w</sup><sup>o</sup>vi K<sup>t</sup>i t<sup>m</sup>vei GK<sup>u</sup> P<sup>j</sup>vi w<sup>b</sup>tP M<sup>t</sup>Z<sup>o</sup>t<sup>d</sup>tj c<sup>P</sup>tZ n<sup>q</sup>| c<sup>P</sup>t<sup>b</sup>v<sup>t</sup>Z 2/3 g<sup>m</sup> ch<sup>s</sup>l mgq t<sup>j</sup> t<sup>m</sup> hv<sup>q</sup>| Gmgq t<sup>m</sup>vei AY<sup>r</sup>x<sup>t</sup>e<sup>i</sup> K<sup>u</sup>h<sup>R</sup>j<sup>v</sup>c N<sup>t</sup>U I we<sup>l</sup>v<sup>3</sup> M<sup>v</sup>m t<sup>e</sup>w<sup>i</sup>tq hv<sup>q</sup>| Av<sup>m</sup>Q<sup>v</sup>i ex<sup>R</sup> <sup>v</sup>K<sup>t</sup>j Z<sup>v</sup>l A<sup>v</sup>z<sup>i</sup> Z n<sup>q</sup> A<sup>\_</sup>ev g<sup>t</sup>i hv<sup>q</sup>| Avgt<sup>i</sup> i t<sup>\_</sup>tK GK<sup>u</sup> Mi<sup>a</sup> <sup>w</sup>bK 12-15 t<sup>k</sup>u<sup>r</sup> Ges GK<sup>u</sup> g<sup>w</sup>l 20-25 t<sup>k</sup>u<sup>r</sup> t<sup>m</sup>vei t<sup>\_</sup>q|

##### K<sup>t</sup>u<sup>v</sup>÷ ev AveR<sup>o</sup>v c<sup>P</sup>v mvi

LoK<sup>l</sup>v, Av<sup>m</sup>Q<sup>v</sup>, d<sup>m</sup>t<sup>j</sup> i c<sup>w</sup>i Z<sup>3</sup> Ask, K<sup>P</sup>i c<sup>u</sup>b<sup>v</sup> BZ<sup>w</sup> AveR<sup>o</sup>v <sup>e</sup>tK w<sup>b</sup> <sup>o</sup>c<sup>o</sup>qu<sup>v</sup>i g<sup>v</sup>a<sup>t</sup>g w<sup>K</sup>Q<sup>y</sup> t<sup>m</sup>vei mn c<sup>P</sup>tq c<sup>o</sup>ZKZ. m<sup>v</sup>i tK K<sup>t</sup>u<sup>v</sup>÷ ev AveR<sup>o</sup>v c<sup>P</sup>v mvi etj |

LoK<sup>l</sup>v, Av<sup>m</sup>Q<sup>v</sup>, d<sup>m</sup>t<sup>j</sup> i c<sup>w</sup>i Z<sup>3</sup> Ask, K<sup>P</sup>i c<sup>u</sup>b<sup>v</sup> BZ<sup>w</sup> AveR<sup>o</sup>v <sup>e</sup>tK w<sup>b</sup> <sup>o</sup>c<sup>o</sup>qu<sup>v</sup>i g<sup>v</sup>a<sup>t</sup>g w<sup>K</sup>Q<sup>y</sup> t<sup>m</sup>vei mn c<sup>P</sup>tq c<sup>o</sup>ZKZ. m<sup>v</sup>i tK K<sup>t</sup>u<sup>v</sup>÷ ev AveR<sup>o</sup>v c<sup>P</sup>v mvi etj | G mvi <sup>z</sup>wi tZ 3-4 g<sup>m</sup> mgq j<sup>v</sup>tM| G m<sup>i</sup>ti i <sup>o</sup>YMZ g<sup>v</sup>b t<sup>m</sup>vei m<sup>i</sup>ti i Ab<sup>i</sup>j<sup>f</sup>c|

##### L<sup>u</sup>g<sup>v</sup>i RvZ mvi

k<sup>x</sup>Z c<sup>o</sup>v<sup>b</sup> t<sup>\_</sup>tK Mi<sup>a</sup> ev<sup>o</sup>y<sup>t</sup>K e<sup>o</sup>t<sup>i</sup> i A<sup>w</sup>aK<sup>v</sup>s<sup>k</sup> mgq N<sup>t</sup>i i t<sup>f</sup>Z<sup>t</sup>i i<sup>v</sup>L<sup>t</sup>Z n<sup>q</sup>| Z<sup>L</sup>b Mi<sup>a</sup> ev<sup>o</sup>t<sup>j</sup>i i we<sup>o</sup>v<sup>b</sup>v w<sup>t</sup>mt<sup>e</sup> LoK<sup>l</sup>v, N<sup>v</sup>m BZ<sup>w</sup> we<sup>o</sup>tq t<sup>\_</sup>q<sup>v</sup> n<sup>q</sup>| w<sup>K</sup>Q<sup>y</sup> b c<sup>i</sup>c<sup>i</sup> we<sup>o</sup>v<sup>b</sup>v e<sup>-</sup>j K<sup>t</sup>i w<sup>\_</sup>tZ n<sup>q</sup>| we<sup>o</sup>v<sup>b</sup>v w<sup>t</sup>mt<sup>e</sup> e<sup>o</sup>uZ t<sup>m</sup>vei, P<sup>b</sup>v<sup>m</sup>g<sup>x</sup> LoK<sup>l</sup>v L<sup>u</sup>g<sup>v</sup>i A<sup>v</sup>t<sup>b</sup> GK R<sup>v</sup>q<sup>m</sup>v<sup>q</sup> R<sup>g</sup>v K<sup>t</sup>i i<sup>v</sup>L<sup>v</sup> n<sup>q</sup>| w<sup>K</sup>Q<sup>y</sup> b c<sup>i</sup> G<sup>\_</sup>t<sup>j</sup>v c<sup>t</sup>P m<sup>i</sup>ti c<sup>w</sup>i YZ n<sup>q</sup>| G m<sup>v</sup>i tK L<sup>u</sup>g<sup>v</sup>i RvZ mvi (Farm yard manure) etj |

##### me<sup>r</sup> mvi

RvgtZ <sup>a</sup>Av, k<sup>b</sup>c<sup>v</sup>U, e<sup>i</sup>e<sup>w</sup> BZ<sup>w</sup> d<sup>m</sup>j M<sup>o</sup> R<sup>u</sup>b<sup>t</sup>q b<sup>i</sup>g I me<sup>r</sup> Ae<sup>-</sup>iq RvgtZ w<sup>g</sup>u<sup>k</sup>tq c<sup>o</sup>ZKZ.mvi tK me<sup>r</sup> mvi etj |

RvgtZ <sup>a</sup>Av, k<sup>b</sup>c<sup>v</sup>U, e<sup>i</sup>e<sup>w</sup> BZ<sup>w</sup> d<sup>m</sup>j M<sup>o</sup> R<sup>u</sup>b<sup>t</sup>q b<sup>i</sup>g I me<sup>r</sup> Ae<sup>-</sup>iq RvgtZ w<sup>g</sup>u<sup>k</sup>tq c<sup>o</sup>ZKZ.mvi tK me<sup>r</sup> mvi etj | me<sup>r</sup> mvi RvgtZ Re c<sup>-</sup>v<sup>o</sup>ro<sup>v</sup>l tek w<sup>K</sup>Q<sup>y</sup> b<sup>t</sup>U<sup>t</sup>R<sup>b</sup> th<sup>w</sup>l K<sup>t</sup>i | GK<sup>u</sup> me<sup>r</sup> mvi d<sup>m</sup>j t<sup>\_</sup>tK t<sup>n</sup>±i c<sup>o</sup>Z 10-50 Ub Re c<sup>-</sup>v<sup>o</sup>(m<sup>g</sup>R) Ges 50-150 t<sup>k</sup>u<sup>r</sup> b<sup>v</sup>t<sup>u</sup>t<sup>r</sup>b<sup>t</sup> c<sup>v</sup>l q<sup>v</sup> hv<sup>q</sup>|

**^Lj**

mvaviYZ ^Zj Drcv`bKvix dmtji exR t\_#K ^Lj ^Zwi nq| Nmb ev G· tcvjti  
(Expeller) gva`tg exR t\_#K tZj tei Kti vbtj evKx AskUv ^Lj vntmte A\_ev mvi vntmte  
RvgtZ c`qM Kiv hvq| %j vevfbvbi tbi ntZ cvti, thgb - mvi lv, vZj, vZim, Zjyv, mh@jx  
cFvZi ^Lj | Gme mvti i c`vb Dcv`vb bvBtUtRb|

**nvtoi ,ov**

ci cvLi nvo t\_#K Pve`RvZxq c`v`ev` w`tq nvo ,ov Kti th mvi ^Zwi Kiv nq Zv#K  
nvtoi ,ov mvi (Bone meal) etj | nvo tmx Kti ,ov Kiv ntj mvti dmdivtmi cvigvY  
evx cvq|

**gv#Qi ,ov**

gv#Qi cvi Z`3 Ask Ges evRvi RvZ Kiv gv#K ,ov Kti mvi vntmte e`envi Kiv nq| gv#Qi  
,ov nva-gjvMi Lvevi vntmteI tek mgv`Z| gv#Qi ,ovI gj-Z bvBtUtRb mgx mvi |

**iKbv i3**

cv`exi vevfbvbi`tk Miæ evQjv hT`ZT` RevB bv Kti GK RvqMvq (kbbi nvDtm) RevB Kti  
Gf`i i3 msi`Y Kiv nq Ges i`Ktq ,ov Kti mvi ^Zwi Kiv nq| iKbv i3 bvBtUtRb  
mgx|

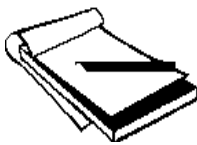
**QvB**

c`Zw`b ivvbevbi jvKvo cvotq th QvB Drcvbenq Zv cUvqvq mgx mvi vntmte RvgtZ  
c`qM Kiv nq|

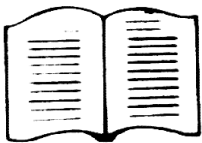
wbP wefbae`Re mvti bvtUtrb (N), dmdim (P<sub>2</sub>O<sub>5</sub>) I cUvk (K<sub>2</sub>O) Dcv`vtbi Zvvi Kv t`qv nj t

QK 1: wefbae`Re mvti bvtUtrb (N), dmdim (P<sub>2</sub>O<sub>5</sub>) I cUvki (K<sub>2</sub>O) cwi giY

mvti bug	N%	P <sub>2</sub> O <sub>5</sub> %	K <sub>2</sub> O%
nvtoi ,av (teivigj)	3.0-4.0	20.0-25.0	-
vmx nvtoi ,av (vmx teivigj)	1.0-2.0	25.0-30.0	-
gvfQi ,av (vdm igj)	4.5-10.0	3.9-9.0	0.3-1.5
iKbvi <sup>3</sup>	10.0	1.5	1.0
Zjvi `Lj	5.0-7.0	2.0-3.0	1.0-2.0
mvi lvi `Lj	5.2	1.8	1.2
vZj `Lj	6.2	2.0	1.2
vZvm `Lj	5.5	1.4	1.3
Kmg dZ (tLvm mn)	4.9	1.4	1.2
Kmg dZ (tLvm Qiov)	7.9	2.2	1.9
KvVi QvB	-	1.5	2.3-12.0
tMvei	0.3-0.4	0.2	0.1
Kt`uv÷	0.4-0.8	0.3-0.6	0.7-1.0
meR mvi	0.5-0.7	0.1-0.2	0.5-0.8
gibyl i gj	1.2-1.3	0.8-1.0	0.4-0.5
Lvgvi RvZ mvi	0.4-1.5	0.4-0.8	0.5-1.9



**Ablyj b (Activity):** %Re mvi ej tZ Kx tevtSb? Avcbvi Gj vKvq mPi vPi e`euZ `Re mvi m`fU GKvU msu`B i Pbv wj Lj|



**mvi gg<sup>©</sup>**

`Re Drm t`K cUkZKfvte cUv A\_ev cU`ZKZ.mvi tK `Re mvi etj | tMvei, Kt`uv÷ meR mvi, wefbae`vti `Lj, nvtoi ,av, gvfQi ,av BZ`w `Re mvti i A`sf |



### cuVhEi gj`iqb 5.1

mivK DEti i cuKqUK wPy` (v) w` b

1/ ubtPi tKvbU cNYR mvi?

- K) Kt`uv÷
- M) meR mvi

- L) Lvgvi RvZ mvi
- N) A`vthuj v

2/ ersj vt`k GKw Mi æ`wbK KZUKzMvei t`q?

- K) 7-8 tKwR
- M) 12-15 tKwR

- L) 10-12 tKwR
- N) 16-18 tKwR

3/ Kt`uv÷ mvi `Zwi ntZ KZ gvm mgq j vtM?

- K) 1-3 gvm
- M) 3-4 gvm

- L) 2-3 gvm
- N) 4-6 gvm

4/ GKw meR mvi dmj tn±i cWZ KZUKzRe c`v` (meR) DrcbaKi tZ cvti?

- K) 10-20 Ub
- M) 10-40 Ub

- L) 10-30 Ub
- N) 10-50 Ub

5/ nvo tm× Kti , av Ki tj Ktmi cwi gvY ep× cvq?

- K) bvBtUtRb
- M) g`vMt`bwkqvq

- L) dmdi vm
- N) cUwkvq

6/ i`Kbr i t`3 tKvb&Lvt`vcv`vb tewk \_vtK?

- K) Aw` tRb
- M) bvBtUtRb

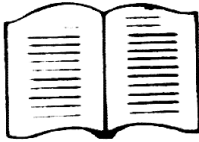
- L) nvBtWtRb
- N) teri b

**cW 5.2 ʿRe mvi Drcv`bKvix DvM`mgm**



G cvV tkfI Avciwb

- ◆ ʿRe mvi Drcv`bKvix DvM`mgmni bvg ej tZ cvi teb|
- ◆ Gme DvM`m`i ʿenkóvej x eYbV Ki tZ cvi teb|
- ◆ Gf`i tK KvR j vMvrbri e`e`v vb tZ cvi teb|



Ggb AfbK DvM`m`i i tqtQ hviv ʿRe mvi Drcv`tb cZ`q| ev ctiv q| fite e`eüZ ntq AvmtQ| ʿRe Dr`mi ʿe`w` t`\_tK mivmvi cÜB A`ev cÜZKZ.mvi tK ʿRe mvi ejv nq| Avi thme DvM`m`i ʿRe mvi Drcv`tb e`eüZ nq tm, tjtK ʿRe mvi Drcv`bKvix DvM`m`i etj | MiæevQyi i tMvei GKvU ʿRe mvi | tMveti th KZ aitbi Rvbn ARvbn DvM`m`i ev AvMvQv i tqtQ Zv ejv KvWb| tZgubfite Kt`xuv` ev AveRbV cPr mvi ʿZvitZI vewfbæaitbi DvM`m`i e`eüZ ntq \_vtK| GQvovl meR mvi Drcv`tb th me DvM`m`i tK KvR j vMvrbv n`Q Gf`i gta` ʿaAv, AvndKvb ʿaAv, kbcvU, tMvgUi ev eievU BZ`w` cäv| gvmKj vB I tLmvi xKj vB tK I gvtS gta` meR mvi Drcv`tb e`envi Kiv ntq \_vtK|

Gme Qvovl tek vKQvnb`gvtbi DvM`m`i i tqtQ, hvf`i tK vb:mfb`tn ʿRe mvi Drcv`bKvix DvM`m`i vntmte MY` Kiv tMjt I Gf`i tK cÜYR mvi Drcv`bKvix DvM`m`i ejv ntq \_vtK| Gf`i gta` i tqtQ bxj meR tkI j v, A`vthj v BZ`w` | RxeYymvi ev BtbrKj v g etj L`vZ mvi ntj v gj-Z cvU gmv tZ vgvkZ vewfbæRvtZi i vBtRveqg e`vt`w` qv| Wlj RvZiq dmtji exR ectbi cfe`RxeYymviti m t½ vgvkZ Kti ecb Kij dmtji dj b 30-150 kZisk chS`e`x` tctZ cvti | Ges dmtji , YMZ gvtbi I DbwZ nq| vb tP ʿRe mvi Drcv`bKvix cävB KtqKvU DvM`m`i veei Y Dc`vcb Kiv ntj v|

Wlj RvZiq dmtji exR ectbi cfe`RxeYymviti m t½ vgvkZ Kti ecb Kij dmtji dj b 30-150 kZisk chS`e`x` tctZ cvti |

ʿaAv (Sesbania aculeata), vkg (Legume) RvZiq Mvp meR c`eüj , փ eabKj el Rme DvM`m`i | Gf`i KvÜ big Ges cÜZ Wlj cvj v h փ Ges 3-4 vgvUv j`x` nq| Gf`i vKkto b vBtU tRb Ave`x`Kvix i vBtRveqg e`vt`w` qvi Ktj vbx ev , vU \_vtK hvi gra`tg Giv evZv tmi g փ b vBtU tRb gmv tZ thvM Kti Mv tQi c`v` thvMvq I cÜZ cvv g vY ʿRe c`v`\_`mi eivn Kti | Giv փ cPbkj |

B`vbx AvndKv gnv`k t`\_tK msvMpxZ AvndKvb ʿaAv (Sesbania rostrata) bvgK c`RvZvU DrKó.gvtbi meR mvi Drcv`bKvix DvM`m`i | Gf`i D`PZv 3-5 vgvUv, KvÜ AvakZi big I c`eüj , KvÜi I cvZvi is Mvp meR| G MvQ AvZ փ cPbkj | vKktoi b`vq Gf`i mvi v KvÜ Rjo 5-6 mvi tZ b vBtU tRb Ave`x`Kvix , vU Drcbæng Ges Giv Avak cvv gvtY ʿRe c`v`\_`I b vBtU tRb gmv tZ mieivn KtZ m`q| ZvQvov AvndKvb ʿaAv exR Ges KvÜ Dftqi `jiv esk v`li KtZ cvti | tFRv gmv tZ ev cvb tZ KvÜi LÜ (Cutting) v`tq Gf`i tK Rb`v tbr L`g mnR|

f`kx ʿaAv Ges AvndKvb ʿaAv GK tn±i RvgtZ h`v`µtg 20-25 I 30-35 Ub ʿRe c`v`\_`Ges 100 I 250 tKvR b vBtU tRb mieivn KtZ cvti |

c`q 8 mBvN eqtm f`kx ʿaAv Ges AvndKvb ʿaAv GK tn±i RvgtZ h`v`µtg 20-25 I 30-35 Ub ʿRe c`v`\_`Ges 100 I 250 tKvR b vBtU tRb mieivn KtZ cvti |

**kbcvU**

kbcvU 7-8 mBvN eqtm tn±i cÜZ 15-16 Ub ʿRe c`v`\_`Ges 60-65 tKvR b vBtU tRb thvM KtZ cvti |

GvU I GKvU vkg RvZiq el Rme big KvÜi c`eüj DvM`m`i | Gi D`PZv 2-3 vgvUv | KvÜ Wlj cvj v tZgb \_vtK bv| AvakZi D`PZv RvgtZ f vj R t b փ Ges AvZ A`i cvb tZ mntR c tP| kbcvU 7-8 mBvN eqtm tn±i cÜZ 15-16 Ub ʿRe c`v`\_`Ges 60-65 tKvR b vBtU tRb thvM KtZ cvti |

Re mvi Drcv`bKvix Ab`vb` dmtj i gta` tMigUi ev ei euU, tLmvi x Ges gvmKj vB Avgrv` i f`tk AwZ cwi uPZ | Gme MvQ ukg RvZxq etj Gt`i ukKto cPz cwi grvY uU v`K I RvgtZ bvBtUtRb thvM Ki tZ cvti | Gme MvQ j Zv RvZxq Ges MtQi D`PZv tZgb nq bv etj RvgtZ Re c`v`Kg thvM nq | gnuUz Ai cwb vKtj I Gme MvQ mntR ctP hvq | Giv cZ tn±i RvgtZ 3-8 Ub Re c`v`Ges 12-25 tKwR bvBtUtRb thvM Ki tZ cvti |

**A`vthj v (Azolla)**

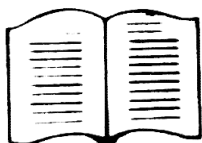
A`vthj v GK cKvi Rj R dvY(tXukKvK) RvZxq fimgvb Dw`c | newfbæAAtj A`vthj v qjz` cvbv, Kvj cvbv, tZZj qv cvbv, myZ cvbv BZ`w` bvtg cwi uPZ | A`vthj v „QvKvfi Rbvtq | vltKvYvKvi cZvU „Q``N`10-15 ugug. Ges c0` 10-12 ugug. nta v`K | A`vthj v thSb (Sexual) I A`R (Vegetative) Dcvta` f` cwb tZB (5-10 tmig) esk we`li Kti | Kv`v gnuUz I A`vthj v ev tZ cvti | mavi YZ 25-30` tm: Zvcgvvq` A`R eske` Kti | tn±i cZ 8-10 tKwR uGmuc c0qvM Kiti eske` AwZ` nq | cZKj- Avenl qiq cvZvi ub`v`k t`vri (Spore) Zvi Kti Ges Dch` cwi t`k thSb c0qvq esk we`li Kti |

c0`vKfite cZ eMgUti 100-200 Mtg Nm (A`vthj v) exR vntmte Ai cwbh` RvgtZ Qvotq v`tj 10-12 v`tb Rvgt I cti GKvU` tii mjo Kite | Rvgt t`K cwb mvi t`q v`tq` li uU gnuU m`/2 v`v`k nq | Gfite GKvU avb dmtj 2/3 evi A`vthj v c0qvM Ki tZ nq | GK` li A`vthj v tn±i cZ 10-15 Ub meR mvi Drcv`b Ki tZ cvti | A`vthj v th RvgtZ Rbvtbv nq tm RvgtZB A`v Ab` RvgtZ I gnuU m`/2 v`v`k t`qv hvq | avb t`q 2-3 tm.ug. Rgv cwb vKtj avb ecb ev t`v`Yi ci tmLv`b mivmvi A`vthj v Rbvtbv hvq | A`vthj v tn±i cZ 30-40 tKwR bvBtUtRb thvM Ki tZ cvti |

**bj meR tklj v (Blue Green Algae)**

G tklj v Pzj i gZ mi` j` I w`v`Qj, t`L tZ bj v f` meR etY` nq | G tklj v ex cwb tZ, bj v, tWiev ev avb ev cvU` tZ RbvtZ t`Lv hvq | BtUi cvt`v t`q` ev m`v`m`Z t`S`Z I G tklj v Rbvt`v`K | tklj v Drcv` tbi Rb` 1 x 2 x 0.2 Nvgtvri AvKvfi t`v`v` cvtZi GKvU cvt` 10 tKwR gnuU fiv`Kti 10 tm.ug. D`PZvq cwb v`Z nte | GtZ 70 Mtg uGmuc v`v`k c0q 200 Mtg i Kt`v tklj v uUv`q v`tj GK msvn ci GKvU cje` tii mjo nte | cvt`i cwb i`v`k i`Kt`v tklj v mvi vntmte e`v`v`i i Rb` t`L v`Z nte |

avb t`v`Yi 7 v`b ci RvgtZ 5-10 tm.ug. D`PZvi cwb tZ tn±i cZ 15 tKwR tklj v uUv`q c0qvM Ki tZ nq | GtZ cZ tn±i 20-25 tKwR bvBtUtRb thvM nq |



**mvigg®**  
t`kx` aAv, AvdKvb` aAv, kbcvU, ei euU, tLmvi x, gvmKj vB, A`vthj v, bj meR tklj v BZ`w` n`Q` Re mvi Drcv`bKvix Dw`c | t`kx` I AvdKvb` aAv tn±i cZ h`v`v`g 100 I 250 tKwR, bvBtUtRb thvM Kti | kbcvU, A`vthj v I bj meR tklj v h`v`v`g tn±i cZ 10-15 tKwR, 30-40 tKwR Ges 20-25 tKwR bvBtUtRb thvM Kti | G Qvovl ukg RvZxq newfbædmj | gnuUz newfbæcwi grv`b bvBtUtRb mi ei vn Kti |



### cuVhEi gj'iqb 5.2

mWk DEti i cuKqUK wPy (v) w b

1/ Re Drm t\_tK cS mvi tK Kx ej v nq?

- K) cKZ.mvi
- M) Re mvi

- L) i vmiqubK mvi
- N) A%Re mvi

2/ AvndKvb aAv MtQi KvU Kq mmi Kti bvBtUtRb AveXKvix uU vtK?

- K) 2-3
- M) 5-6

- L) 4-5
- N) 6-7

3/ kbcvU meR mvi wtmte Pvl Kitj gvUtZ tn+i cZ KZUKzvBtUtRb thvM Kti?

- K) 40-50 tKwR
- M) 60-65 tKwR

- L) 50-60 tKwR
- N) 65-70 tKwR

4/ Avthvj v KZ wMtm. ZvcgvIiq eskeKv Ki tZ cti?

- K) 10-15<sup>0</sup> tm.
- M) 20-25<sup>0</sup> tm.

- L) 15-20<sup>0</sup> tm.
- N) 25-30<sup>0</sup> tm.

5/ tn+i cZ KZ tKwR bxj meR tkIj v avb tqtZ cqvM Ki tZ nq?

- K) 10 tKwR
- M) 20 tKwR

- L) 15 tKwR
- N) 25 tKwR

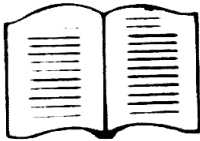
### e`enwiK

#### cw 5.3 meR mvi `Zwi



G cvV tkfI Avciub

- ◆ meR mvi i msAv, cwi i PwZ I `enkóvej x ej tZ cvi teb|
- ◆ meR mvi `Zwi Ki tZ cvi teb|
- ◆ meR mvi i Dckwi Zv eYbv Ki tZ cvi teb|



meR mvi dmj i gta` aAv, kbcvU, eieU BZ`w` Dtg-LthvM`| Avgv`i t`tk euj cwi i PZ `aAv ev t`kx `aAv (Sesbania aculeata) QvovI B`vbx AvvdKv gnv`k t`tk AvvdKvb `aAv (Sesbania rostrata) bvgK GKvU cRvWZ Gf`tk cEzB Kiv ntqtQ, hvi ukKto igt`vRme (Symbiotic) ivBtRmeqvg e`vt`wi qvi uU QvovI mivv`tn (KvU) 5-6 mvi tZ AmsL` uU RbVq| G cRvWZvU exR I KvU`i mivv`th` esk me`vi Ki tZ m`lg| tFRv I i Ktbr Dfq gvUtZB th tKvb mgq KvU`i mivv`th` GB MvQ RbVtbr m`e|

t`kx Ges AvvdKvb `aAv GKK dmj vntmte ev mvi dmj (Relay crop) vntmte Pvl Kiv hvq| thgb AvDK ev tev`iv avb KvUvi 10/12 w`b AvtM aB`Avi exR ecb A`ev KvUJs (Cutting) j vMv`bvi ci avb tKtU vbtj `aAv mxi fvt`e evx` cvq|

#### meR mvi i msAv

me`kl ai`bi ukQyDw`c`tk RvgtZ Rvb`q meR I big Ae`vq gvUtZ vgvktq Ges cvPtq th mvi c`Z Kiv nq Zv`K meR mvi (Green manure) etj |

me`kl ai`bi ukQyDw`c`tk RvgtZ Rvb`q meR I big Ae`vq gvUtZ vgvktq Ges cvPtq th mvi c`Z Kiv nq Zv`K meR mvi (Green manure) etj | G cRvWZvU exR I KvU`i mivv`th` evq`vU`j i g`v bvtU`Rb gvUtZ hv`v Ki tZ cvi |

#### meR mvi dmj i `enkóvej x

meR mvi dmj `z eaBkij ntZ nte, KvU big I imv`jv nte| ZvQvov G MvQ ukv ev uU RvZvq (Legume) ntj fij nq| GtZ Mv`Qi tKktoi e`vKtUvi qv uU (ivBtRmeqvg e`vt`wi qvi Ktj vbx) mivv`th` evq`vU`j i g`v bvtU`Rb gvUtZ hv`v Ki tZ cvi |

#### meR mvi i Dckwi Zv

meR mvi gvUtZ `Re c`v`thvM Kti gvUtK DeP Kti I gvUti tF`SZ vYejxi DbwZ mivab Kti | gvUtZ uU mivv`th` bvtU`Rb thvM Kti | `aAv meR mvi vntmte c`Z tn`ti 20 Ub `Re c`v`Ges 60-70 tKvR bvtU`Rb thvM Kti | kb cvtUi tejvq `Re c`v`P cwi gvY nq 20 Ub Ges bvtU`Rb 40 tKvR | `Re c`v`thvMi gva`tg meR mvi gvUtZ Dckvi x e`vt`wi qvi msL`v, esk I KvhRjvc evx` Kti | Nbvt`e MvQ RbVtbrv Rb` AvMvQv `gb nq Ges fvg`lq ti va nq|

**c0Z c0vj x**

**Riq ubePb**

th tKvb ai#bi Riq#Z `aAv ev kbcvU Rb#q, Zte `aAv DEzibPzme Riq#ZB Ges kb Av#c#qvKZ.DPzRiq#Z fvj Rb#q|

**ecb tgSmg**

`aAv I kbcvU Lwi c Ges iwe Dfq tgSmgB Pvl Kiv hivq|

`aAv I kbcvU Lwi c Ges iwe Dfq tgSmgB Pvl Kiv hivq| Zte cP#bi Rb` iwe tgSmg h#\_o cwb cvl qv bv tM#j Lwi c tgSmgB Aver` Kiv DvPZ| cP#bvi gZ cwb cvl qv tM#j iwe tgSmgI Aver` Kiv th#Z cv#i | gv#PP gvSvgnS t\_#K Gvc#j ch#l `aAv ev kbcvU ecb Kiv hivq| Lwi c tgSmg `aAv ev kbcvU meR mvi wnt#te Pvl Kitj tm Riq#Z A#bK mgq AvDk avb ev cvU Aver` Kiv m#e nq bv| G#qv#I tivcv Avgb avb tivcY KitZ nq|

**Drcv` b c#vZ**

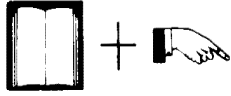
meR mvi dmtji Rb` 2 evi Pvl I gB w`#q Riq `Zwi Kiab| mvariYZ `aAv P#l tKvb m#i i c0qvRb nq bv, Zte wKko I wU ep#i Rb` tn#ic0Z 5-10 tKwR wUGmnc mvi e`envi KitZ cv#i b| aB#v tn#ic0Z 40-45 tKwR Ges kbcvU tn#ic0Z 45-50 tKwR exR Riq#Z wUw#q ecb Kiab| exR ectbi Av#M c0Z tKwR ex#R 20-30 M#g R#evYmvi wgvkZ K#i e#tj dj bl L# fvj nq Ges wKkto wU msL`vl e#j v#tk ep# cvq|

exR ectbi ci Riqi tZgb tKvb cwi Ph# c0qvRb nq bv| Zte Riqi i m tenk cwi gv#Y K#g tM#j G#evi nvj Kv tmP w` b|

exR ectbi 50-55 w` b ci MvQ, #j v#K `v ev KwP w`#q G#j vcv\_wi fv#te tK#U 2/3 w`#bi e`ear#b j v#j w`#q 2/3 wU AvovAwio Pvl w`#q MvQ, #j v#K fvj fv#te gvU#Z wgvk#q w` b| tm mg#q Riq#Z 3-5 tmwUngUvi `wv#bv cwb\_vK#j 10-15 w`#bi g#` MvQ c#P m#i cwi YZ n#e| Zvcgv#v Kg\_vK#j ev gvU#Z cwb i cwi gvY Kg ntj cP#b 5-7 w` b tenk mgq j v#M| meR mvi th Riq#Z Rb#q nq mvariYZ tm Riq#ZB MvQ, #j v#K gvU#Z wgvk#q t`qv nq, Zte GK Riq#Z MvQ Rib#q Ab` Riq#Z I meR mvi c0qvM KitZ cv#i b|

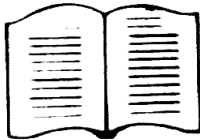
## e`enwiK

### civ 5.4 Kt`xuv÷ `Zwi



G civ tk`l Avciub

- ◆ Kt`xuv÷ -Gi ms`Av ej tZ cvi`teb|
- ◆ Kt`xuv÷ `Zwi i bwiZgvj v I c`lqvRbxq DcKi`Yi brg ej tZ cvi`teb|
- ◆ Kt`xuv÷ `Zwi Ki`Z cvi`teb|



Kt`xuv÷ (Compost) k`aiU j`wUb fvivi Ges Gi A\_`KQyRiubtmi msugkY| `Re Drtmi wewfb`AveR`v I civ Z`3 e`tk me`kl c`lqv gifa`tg civ`tg c`ZKZ.mvi`K Kt`xuv÷ ev AveR`v cPr mri etj |

### DcKiY

civ Z`3 LoK`v, Av`Li civZv, Mv`Qi SivcvZv, dmtji Ges Zwi ZiKwi i civ Z`3 Ask, Mi`ævQ`ji i Lver`ti i Dir`Oó, tMvqj N`ti i AveR`v, Kv`v tMvej, KP`v civv, AvMv`Qv BZ`w` Kt`xuv÷ mvi `Zwi i DcKiY| civb t`tk m` DVv`v KP`v civv`K 2/3 w`b tiv` i`Ktq civbi civ giv` KQyKig`tg tbqv Fij | Aci c`q Av`Li i`Kt`v civZv ev Mtgi i`Kt`v Lo w`KQ`Y w`vR`tg w`bj cPb KvR Zj w`SZ nq|

### bwiZgvj v

Kt`xuv÷ `Zwi i wewfb`c`wZ itq`Q| Gt`i gta` GW`Kv, GKw`f`f`UW I ev`v`j`vi c`wZ D`j`L`thvM`| Gme c`wZi c`Z`Kw`i gj-bwZ GKB| Zte Gt`i gta` ,YMZ gvb ew`xi c`vm wntmte w`KQy` Zvi Zg` j`qYxq| GW`Kv c`wZ`Z Kt`xuv÷ c`Z`Kvix ev`t`w`qv ev Q`v`K eaR` GW`Kv civDw`i c`fveK wntmte thvM Kiv nq| Abj`c`fite GKw`f`f`UW c`wZ`Z kn`ti b`@vi civb, Kv`v Ges ev`v`j`vi c`wZ`Z gvb`j`i gj`g`f` c`fveK wntmte e`eüZ nq| evsj vt`k Aek` Kv`v tMvej I g`w`U`K c`fveK wntmte e`envi Kiv nq| Kt`xuv÷ mvi `Zwi i t`q`T` Avi GKw`U cv`R` civj w`qZ nq| tKv`v tKv`v Gj`v`Kv Kt`xuv÷ DcKiY`K g`w`U`i I c`ti `c ev Mv`v K`ti cPr`v`v nq Avevi tKv`v tKv`v `v`b g`w`U`Z MZ`K`ti cPr`v`v nq| evsj vt`k tk`tlv`3 c`wZ`Z Kt`xuv÷ `Zwi Kiv nq|

### `vb wbePb

Lvgv`ti i D`v`Z mgZj GKw`U `vb tet`Q w`b thLv`v`b eb`vi civb D`v`v ev ew`pi civb R`tg `v`K bv| `vbw`U Mv`Qi Qvqv Ges c`k`z ev tMvqj N`ti i Kv`Q ntj fij nq| Zv`Z Kt`xuv÷ DcKiY tiv` i`Ktq hvte bv Ges c`k`zi i civb A\_`ev tMvqj tarqv civb w`tg Kt`xuv÷ Mv`v`K w`vR`tg ivLv hvte|

### c`Z c`vj x

Kt`xuv÷ `c KZ eo nte Zv w`f`P` K`ti DcKi`Yi civ giv`Yi Dci | DcKiY te`k ntj `tci civk w`K ti`L %N`e`wotq w`b A\_`ev te`kmsL`K tQvU tQvU `c `Zwi Ki`ab| c`vY mivB`Ri GKw`U `tci `N`c`v`I D`PZv nq h`v`m`tg 3 w`Uvi × 1.5 w`Uvi × 1 w`Uvi |

7ci Rb" w b" 8 vbiUi Pri tKvYvq 1 wguvii wKQytenk j 4w evtki LjLj cZ LjLj tji gv\_vq w w 7q teta w b; Gi dtj GuU7K GKwU AvqZvKvi ev7 i gZ t Lvte| Gevi LoKlv BZ" w DcKiY AvqZvKvi t7t7i tgtStZ mgfite Qwotq nvj Kv Pvc c0qM Kti c0q 25 tmvUngUvi DBeGKwU 7i 7Zwi Kiab|

DcKiY, tji tenk i K7bv ntj cmb w 7q wfuR7q wbb| D3 77ii Ici cmb wgnkZ big KuBv tMve7ii 2-3 tmvUngUvi cjae GKwU c0jc w 7q Zvi Ici Aí wKQy, av gnuU nvj Kv fite wQuU7q w b| K77v77i i Yv, Y epxi Rb" GLv7b wKQy7v7oi, av (100 Mg/eMgUvi) c0qvM Ki7Z cv7ib| (Ab"v" c7wZi tejvq tMvei I gnuU cmi e7Z"GLv7b Gw7Kv cvDwvi, b" 7vi gqjv ev gvb7i i gj g7 e"eüZ nq)|

Abijc fite GKwU Dci GKwU Kti me7guU 4w 7li 7Zwi Kiab| 7li, tji mvguMK D"pZv n7e 1 wguvi | c0Z"K evi 25 tmvUngUvi cjae AveR7vi 7ci Ici 2-3 tmvUngUvi cjae Kti tMvei I gnuU w 7j I Gi f7ti AveR7vi 77ii D"pZv wKQy K7g wM7q 4wU 77ii tgvU D"pZv 1 wguvii i tenk n7e bv|

tkl 77ii Ictii Zj 777K GKU7v7y i vL7y thb ewoi cmb tFZ7i bv X7K cvk w 7q ev7ti i w 7K M7otq c7o| Gfite 7cuU7K ti7L w b| 7cuU thb i wK7q bv hvq tm w 7K tLqvj i vL7y| c0qvR7b wKQy b ci ci 7ci Ictii w 7K K7qKwU wQ"7K7i Aí cmb X7K7q w b; G7Z cPb Zj wS7Z nq| K77v77i 7ci cPb m77v77Z 70-120 w 7bi gZ mgq j v7M| DcKiY i m77v Ges Zvcgv7v tenk ntj Kg mg7q c7P, kv7Zi w 7b i K7bv DcKiY c77b mgq tenk j v7M|

cPbKvR m77v77j  
K77v77i is n7e nvj Kv  
L7qix ev ami |

m7aiYZ t Lv hvq w77Pi 77ii AveR7v Ictii 77ii AveR7vi 777q Av7M c7P| ZvB mgfite c77bi Rb" 45-60 w b ci K77v77i 7cuU7K t777 7j Ucvj U K7i w b| 7j Ucvj 77i mgq c77vZb 7cuU7i Kv7Q Abijc GKwU RvqMvq bZ7y GKwU 7c 7Zwi Kiab hvi w77Pi 7li n7e c77vZb 7ci Ictii 7liU Ges GKbfite c77vZb 7ci me77v77i 7liU n7e bZ7y 7ci mevi Ictii 7li| Gfite wKQy b vK7j Ictii Ges w77Pi 7li GKb777 Ges mgfite c77e|cPbKvR m77v77j K77v77i is n7e nvj Kv L7qix ev ami | ZLb Aí cmi gvY K77v77i n77Z w77q Pvc w 7j mn7RB t7777, av n7q hv7e| Z7e AveR7v, tji v t L7Z g7b n7e thb Av7Mi gZB Av7i7q tM7Q| tKej islvB cmi77q7Q| Ggb Ae7vq K77v77i Rv77Z c0qvM Kivi Dch7 etj me77pZ nq|



### Pəšigj`iqb

#### msıŋB I iPbvj-K cəkə

- 1| `Re mvi ej tZ ıK tevSıq?
- 2| `Re mvti i GKıU Zıvj Kv cÖZ Ki ab|
- 3| Ktúv÷ `Zıı ntZ KZı`b mgq j vtM Ges Gi , YMZ gıv Kxtmi mgZj`?
- 4| `Re mvi Drcv`bKvix Dıw`ı i GKıU Zıvj Kv cÖZ Ki ab|
- 5| AvıdKıv `aÁvi `eıko`vej x eYÖv Ki ab|
- 6| A`thj vi e`envi weıa eYÖv Ki ab|
- 7| RıevYıvı Kx Ges Kxfıte e`eüZ nq ıj Lı|
- 8| ıkg RıZıq MvtQi ıkKto thme , ıJ t`Lv hvq I , tıv Kx Ges Kx KvR Kti?
- 9| eıeıU, tLmıx ev gıvKjıB meR mvi dmj ıntmte PıI Kiv ntı gıvıtZ KZUKz`Re c`v\_ı bıBtUıRb thıM Ki tZ cıti?
- 10| bıj meR tkıj v Kxfıte Drcv`b Kiv nq ıj Lı|



### DËi gvj v

#### cıW 5.1

- 1| N    2| M    3| M    4| N    5| L    6| M

#### cıW 5.2

- 1| M    2| M    3| M    4| N    5| L

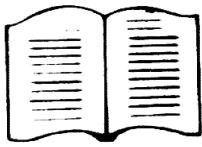


**cw 6.1 RiqTZ mvi c0qM t mti i gvIv, c0qM mgq I c0qM cxwZ**



G crV tkfI AvciB

- ◆ Dirm` i Avcii nvh`Lv` `vcr`vb m`utK`avi Yv w` tZ cvi`teb|
- ◆ mvi Kx Zv ej tZ cvi`teb|
- ◆ mti i cKvi `bt` R Ki tZ cvi`teb|
- ◆ wefbaadm`j i mti i gvIv `bifcY Ki tZ cvi`teb|
- ◆ mvi c0qM Mi mgqm Px wj LtZ I ej tZ cvi`teb|
- ◆ mvi c0qM Mi cxwZ e`vL`v Ki tZ cvi`teb|
- ◆ c`avb c`avb mti i KvR kbr<sup>3</sup> Ki tZ cvi`teb|



weAvbxt` i gtZ 16wU  
Dcr`vb Dirm` i Rb`  
Acwi nvh`

Rxe gvIB tetP `vKvi Rb` A`f Zvt` i epx, meKvk, esk epx I Ab`vb` KvhRjvc  
cwi Pij bvi Rb` c0z kwr<sup>3</sup> i c0qvRb nq Ges tm kwr<sup>3</sup> i Dm ntjv cyb ev Lv` | thnZzdmj  
Rxe RMtZi Ašf` ZvB Zvt` i Lvt` i c0qvRb nq| gvbyl i Lv` Zvwj Kvq thgb itqtQ  
Avngl, kKp, t`m, LwYRc`v`<sup>c</sup>cvb I wUvngb, tZgub Dirm` i tejvqI itqtQ tek KtqKuU  
i vniqubK cyb tgsj ev cyb Dcr`vb| Dirm` t`n mekdY Kti G chšI 30wU gtZv tgsj  
Dcr`vbi mUvb cvlqv tMtQ| Gt` i gta` weAvbxt` i gtZ 16wU Dcr`vb Dirm` i Rb`  
Acwi nvh` Aek` tKvtbv tKvtbv `eAvbxtKi gtZ Acwi nvh` tgsj Dcr`vbi msLv` 20 ev Zvi I  
tewk|

Dirm` i Acwi nvh`  
Lv` `vcr`vb ej tZ tmme  
cyb tgsj tK ešvq hvi th  
tKvtbv GKwU Absw`wZ  
ev Afie Dirm` i `rfweK  
KvhRjvc e`vZ Kti,  
GgbwK Dirm` i gZzchšI  
NUvZ cti |

Dirm` i Acwi nvh`Lv` `vcr`vb ej tZ tmme cyb tgsj tK tevSvq hvi th tKvtbv GKwU  
Absw`wZ ev Afie Dirm` i `rfweK KvhRjvc e`vZ Kti, GgbwK Dirm` i gZzchšI NUvZ  
cti | Gt` i th tKvtbv GKwU Afie ev Absw`wZ Ab` tKvtbvUj `f ev Avak gvIvq e`envi  
w` tQ ciY Kiv m`e bq|

Gme cyb Dcr`vb th AvKvti MvQ MhY Kti tm AvKvti MtQ ev gmltZ c0qM Kiv m`e nq  
bv, tKvtbv bv tKvtbv thšwK `e` (mvi) wntmte c0qM Ki tZ nq| Gme `e` gwEKv` cvb tZ  
`exfZ ntq K`vUvqb (+) I A`vbrqb (-) wntmte c`vZ Dirm` i g`-tvtgi mrvth` t`tn  
c0ek Kti MtQi epx I meKvk NUvZ mrvth` Kti | wKQyKQycyD Dcr`vb Dirm` Zvi cvZv I  
KvtUi gva`tg Avqb ifc MhY Ki tZ cti | Gt` i gta` itqtQ bvBtUtRb, Avqib (tj šn),  
Kcvi (Zvqv), wR¼ ( `v) cFvZ|

Dirm` i Acwi nvh` cyb Dcr`vb t`jvi bvg, Gt` i Dm I cwi tklvY thvM` AvKvi mn `btPi  
Zvwj Kvq t`Lv`bv nj t

cyb Dcr`vb	Drm	cwi tklvY thvM` AvKvi
bvBtUtRb (N)	gml Ges evqy	NO <sub>2</sub> <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , NH <sub>4</sub> <sup>+</sup> , CO(NH <sub>2</sub> ) <sub>2</sub> `eY
dmdim (P)	gml	H <sub>2</sub> PO <sub>4</sub> <sup>-</sup> , HPO <sub>4</sub> <sup>=</sup> , PO <sub>4</sub> <sup>=</sup>
cUvmqvg (K)	gml	K <sup>+</sup>
KveB (C)	evqyGes cvb	CO <sub>2</sub>
nvBtWtRb (H)	evqyGes cvb	H <sup>+</sup> , H <sub>2</sub> O

A# Rb (O)	evqyGes cmb	O <sup>-</sup> , OH <sup>-</sup> , CO <sub>2</sub> , SO <sub>4</sub> , CO <sub>3</sub> <sup>=</sup>
K'ij imqvg (Ca)	gvU	Ca <sup>++</sup>
g'vMtbmqvg (Mg)	gvU	Mg <sup>++</sup>
mij divi (MÜK) (S)	gvU	SO <sub>3</sub> <sup>=</sup> , SO <sub>4</sub> <sup>=</sup>
WR¼ ( ̂ ) (Zn)	gvU	Zn <sup>++</sup>
Kcvi (C)	gvU	Cu <sup>++</sup>
gvj e#Wbvg (Mo)	gvU	MoO <sub>4</sub> <sup>=</sup>
tevi Y (B)	gvU	H <sub>2</sub> BO <sub>3</sub> <sup>-</sup> , HBO <sub>3</sub> <sup>=</sup> , BO <sub>3</sub> <sup>=</sup> , B <sub>4</sub> O <sub>7</sub> <sup>=</sup>
Avqib (tj Šn) (Fe)	gvU	Fe <sup>++</sup> , Fe <sup>+++</sup>
g'v½vbR (Mn)	gvU	Mn <sup>++</sup>
tKvib (Cl)	gvU	Cl <sup>-</sup>

Kvativ Kvativ gtZ vb#Pi , tj vl Acvii nvh@Lv ̂ ̂ vcr ̂ vb

tmvWqvg (Na)	gvU	Na <sup>+</sup>
tKvevë (Co)	gvU	Co <sup>++</sup>
tfbvWqvg (V)	gvU	VO <sub>3</sub> <sup>-</sup>
vmij Kb (Si)	gvU	SiO <sub>3</sub> <sup>-</sup>

̂ xKZ.16vU c# Dcv ̂ vbi gta ̂ c#g 9 vU#K (N, P, K, C, H, O, Ca, Mg, S) Dv ̂ tevk cwi gv#Y cwi tkvly Kti etj G# i#K ejv nq g# ̂ Dcv ̂ vb (Major element) | Avi evnk 7 vU#K (Zn, Cu, Mo, B, Fe, Mn, Cl) ejv nq tMSY Dcv ̂ vb (Minor element), Kvi Y G# i#K Dv ̂ L# A# cwi gv#Y tkvly Kti | tkvly#Yi cwi gv#YZ v#K t#K g# ̂ I tMSY vnt#te MY ̂ ntj | , i#Zj v#K t#K G# i gta ̂ tKvb Zvi Zg ̂ tbB; me , tj vb mgvb , i#Zc#

g# ̂ c# Dcv ̂ vb , tj vi gta ̂ N, P, Ges K Dv ̂ i mePvBtZ tevk cwi gv#Y c#qvRb nq Ges G# i#K c#Bgvix ev c#vgK c# Dcv ̂ vb vnt#te MY ̂ Kiv ntq \_v#K |

g# ̂ c# Dcv ̂ vb , tj vi gta ̂ N, P, Ges K Dv ̂ i mePvBtZ tevk cwi gv#Y c#qvRb nq Ges G# i#K c#Bgvix ev c#vgK c# Dcv ̂ vb vnt#te MY ̂ Kiv ntq \_v#K Ges RvgtZ c#ZvbqZ G# i Afve cwi j#Z ntq \_v#K | Zvb G# i#K h\_v#tg BDvqv, v#j m#v dmt#dU (vUGmnc) Ges vgd#iU Ae clvk (Ggnc) m#i i gra ̂ tg c#Z ̂ K tg#m#B dmj t#Z c#qvM Ki#Z nq | c#v#Šti tMSY Dcv ̂ vb , tj v dmt#i ̂ fveK Pmn ̂ vi Z#bvq gvU#Z h\_ó cwi gv#Y v# ̂ gv# \_v#K etj Avakvsk t#Z G# i Afve cwi j#Z nq v# | Afve t ̂ Lv v# tj Aek ̂ B G# i#K mvi vnt#te c#qvM Ki#Z nq | thgb B ̂ vbs evsj v# ̂ tk t#Pi m#v ev# cvl qv#Z avb Pvlv# ̂ i Rb ̂ erm#i i Avakvsk mgq gvU t#Rv \_vKvq mij divi (MÜK) I WR¼ ( ̂ ) Gi Afve cwi j#Z nt ̂ Q Ges G# i#K h\_v#tg vRcmvg I WR¼ A- vBW ev WR¼ mij #dU bvgK m#i i gra ̂ tg RvgtZ c#qvM Kiv nt ̂ Q |

**RvgtZ mvi c#qvM**

thme ̂ ̂ Dv ̂ i c# mieivn Kti Ges gvU De#Zv msi #Y ev ev# Kti Zv ̂ i#K mvi etj | thgb- BDvqv, vUGmnc, Ggnc BZ ̂ v# |

thme ̂ ̂ Dv ̂ i c# mieivn Kti Ges gvU De#Zv msi #Y ev ev# Kti Zv ̂ i#K mvi etj |

mvi gj-Z`ŷcKvi- A%Re mvi Ges`Re mvi | A%Re Drm t`tK cŰB ev cŰZKZ. mvi tK A%Re mvi etj, thgb- BDwi qv, uJGmuc, BZ`w` | Avi`Re Drm t`tK cŰB ev cŰZKZ. mvi tK`Re mvi etj, thgb- tMvei, Kt<sup>3</sup>uv÷, nvt<sup>3</sup>oi<sup>3</sup>av, mvi lvi`Lj, BZ`w` | weirfbae Lv<sup>3</sup>vcv`vb mie i vnKvix mvti i GKiu Zvij Kv ubtP t`qv nj |

<b>bvBtU<sup>3</sup>Rb mie i vnKvix mvi</b>	<b>N Gi kZKiv nvi</b>	
BDwi qv	CO (NH) <sub>2</sub>	46
Gtgmbqvg mvj tdu	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	20.5
Gtgmbqvg bvBtUU	(NH <sub>4</sub> )NO <sub>3</sub>	33
Gtgmbqvg tKvi vBW	(NH <sub>4</sub> )Cl	25
tmmvllqvg bvBtUU	NaNO <sub>3</sub>	16
K`vj umqvg bvBtUU	Ca (NO <sub>3</sub> ) <sub>2</sub>	15
WvB Gtgmbqvg dmtdu	(NH <sub>4</sub> ) <sub>2</sub> HPO <sub>3</sub>	18
GbnvBWtm Gtgmbqv	NH <sub>3</sub>	83

<b>dmdim mie i vnKvix mvi</b>	<b>P<sub>2</sub>O<sub>5</sub> Gi kZKiv nvi</b>	
iK dmtdu	2Ca <sub>5</sub> (PO <sub>4</sub> ) <sub>2</sub> F	27-40
mzvi dmtdu	Ca(H <sub>2</sub> PO <sub>4</sub> ) <sub>2</sub>	16
uU <sup>3</sup> ej mzvi dmtdu	3Ca(H <sub>2</sub> PO <sub>4</sub> ) <sub>2</sub>	48
e`vnmK u`vM	(CaO) <sub>5</sub> P <sub>2</sub> O <sub>5</sub> SiO <sub>3</sub>	12-20
Gtgmbqvg dmtdu	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	48
WvB Gtgmbqvg dmtdu	(NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub>	54

<b>cUumqvg mie i vnKvix mvi</b>	<b>K<sub>2</sub>O Gi kZKiv nvi</b>	
u <sup>3</sup> gd <sup>3</sup> ti U Ae cUvk	KCl	60
mvj tdu Ae cUvk	K <sub>2</sub> SO <sub>4</sub>	50
cUumkqvg bvBtUU	KNO <sub>3</sub>	46

<b>mvj dvi mie i vnKvix mvi</b>	<b>S Gi kZKiv nvi</b>	
uRcmvg	CaSO <sub>4</sub>	18

<b>1/4 mie i nKvix mvi</b>		<b>Zn Gi kZKiv nvi</b>
1/4 A· vBW	ZnO	78
1/4 mvj tdu	ZnSO <sub>4</sub> , 7H <sub>2</sub> O	36

<b>Aqjib mie i nKvix mvi</b>		<b>Fe Gi kZKiv nvi</b>
tdivm mvj tdu	FeSO <sub>4</sub> , 7H <sub>2</sub> O	20

<b>g'v/2mbR mie i nKvix mvi</b>		<b>Mn Gi kZKiv nvi</b>
g'v/2mbR mvj tdu	MnSO <sub>4</sub> , 4H <sub>2</sub> O	36

<b>Kcvi (Zvgv) mie i nKvix mvi</b>		<b>Cu Gi kZKiv nvi</b>
Kcvi mvj tdu	CuSO <sub>4</sub> , 5H <sub>2</sub> O	25-35

<b>tevib mie i nKvix mvi</b>		<b>B Gi kZKiv nvi</b>
tmmvllqvg tev i U	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> , 10H <sub>2</sub> O	34 - 44

<b>gvj e tWbug mie i nKvix mvi</b>		<b>Mo Gi kZKiv nvi</b>
tmmvllqvg gvj e tWU	Na <sub>2</sub> MoO <sub>4</sub>	37

**dm t j i Pw n ` v**

GKK Rigi (thgb- GKi ev tn±i) GKwU dmj newfbæLv t ` vcr` vb Kx cwi gv tY I Absv tZ cwi t kv lY Kti, Dv t ` i t` n we t k- IY Kti Zvi GKUv avi Yv cv l qv hv q| newfbædm t j i Lv t ` vcr` v t bi Pw n ` v G t ` i a i b, Rv Z, Drcv ` b K j v t K S k j B Z ` w ` i Dci w b f P K ti | Pw n ` v i GKwU Ask Av t m gv l t Z m w A Z Lv t ` vcr` vb t ` t K, Avi ew k Uv m t i i gva ` t g R i g t Z m i e i v n K i t Z n q |

**m t i i g v l v**

gv l U i D e P Z v, A v e n l q v, D r c v ` b t g S m g, d m t j i a i b I R v Z, d m j e ` v c r b v B Z ` w ` i D c i w b f P K ti m t i i g v l v w b a t i Z n q | D t j L, t h ` j l v w R u b t m i w b i f c Y Q v o v m t i i g v l v w K K i v h v q b v Z v i G K w U n t j v d m t j i P w n ` v G e s w Z x q u U n t j v G K K R i g t Z w e ` g v b c w i t k v l Y t h w M ` A e ` v q M v t Q i L v t ` v c r ` v t b i c w i g v Y | h w G K K R i g t Z m w A Z L v t ` v c r ` v t b i c w i g v Y G K K R i g i R b ` c t q v R b x m s L ` K M v t Q i P w n ` v i m g v b e v t e n k n q Z v n t j t m R i g t Z m v i c t q v M K i v i t K v b c t q v R b n q b v | A v i h w ` K g \_ v t K Z t e t m R i g t Z A e k ` B m v i c t q v M K i t Z n t e | Z L b m t i i c w i g v Y n t e M v t Q i P w n ` v G e s g v l t Z m w A Z L v t ` v c r ` v t b i c w i g v Y i e ` e a v t b i m g v b | A \_ P M v t Q i P w n ` v h w ` n q 30 t K w R b v B t U t R t b i A v i R i g t Z \_ v t K 22 t K w R, Z v n t j m v i w t m t e c t q v M K i t Z n t e 30-22 = 8 t K w R b v B t U t R b, h v

th ` j l v w R u b t m i w b i f c Y Q v o v m t i i g v l v w K K i v h v q b v Z v i G K w U n t j v d m t j i P w n ` v G e s w Z x q u U n t j v G K K R i g t Z w e ` g v b c w i t k v l Y t h w M ` A e ` v q M v t Q i L v t ` v c r ` v t b i c w i g v Y

BDni qvi gva`tg c`qvm Kitj c`qvRb nte 17.391 tKvRi Ges Gtgmbqvg mij tdtUi gva`tg  
 v`ij j vMte 39.024 tKvR/ Abjycfvtte Ab`vb` mti i gv`vI ubifcY Kiv hvte/thnZnevfbae  
 GjvKvi gmi DePZv nevfbaeKtgi ntq \_vtK/ GgbwK GKB Rigi nevfbaeAstK DePZv  
 wfbz`i ntZ cvti | tmRb` th tKvb GjvKvi Rb` mti i vLz gv`v msvwi k Kiv m`e nq bv |  
 Zey AtbK cix`v-ubix`v, GjvKvi km` neb`im, AvenvI qv I mvariY AwfAZvi Dci wbfP  
 Kti tKvb GjvKvi Rb` mti i gv`v vba`i Z ntq \_vtK/ Gi c`vb D`i k` ntjv gmi DePZv  
 eRvq ti`L Ges mti i AcPq bv NuUtg jvFRbK I mvdj`RbKfvtte dmtji dj b ewx` Kiv/  
 wbtP evsjv`tki c`vb KtqKv dmtji mti i gv`v D`j`L Kiv ntjv/ `vbxq Ae`vi  
 cvitc`v`Z Gi wKQyKg`emk (AvZ DeP gmi Rb` wKQy Kg Ges AbyP gmi Rb` wKQy  
 temk) ntZ cvti |

**nevfbaedmtj mti i gv`v (tKvR/tn±i)**

<b>dmtji bvg</b>	<b>BDniqv</b>	<b>vJGmic</b>	<b>Ggic</b>	<b>vRcmig</b>	<b>vR¼ A· vBv</b>
AvDk avb (Ddkx)	135	90	70	60	10
ti vcv Avgb avb (Ddkx)	135	90	70	60	10
tevtiv avb (Ddkx)	180	130	70	60	10
avb (Dbz` t` kvRvZ)	90	75	60	60	10
Mg (tmP Qrov)	100-130	100-130	40-50	110	5
Mg (2/1 vU tmP)	140-170	100-130	40-50	110	5
Mg (3 ev temk tmP)	180-200	120-140	60-80	125	10
f`v	220	110	50	125	10
Pxbv/KvDb	100	70	35		
cvU/tg`v	100	25	45	45	10
Zjv	200	150	100	100	
ZivvK	110	110	90	(cUwvqvg mij tdtU)	
AvL	275-370	185-275	275-370	185	
tLmvi x	22	42			
gmj	60-70	90	50	-	10
tQj v	66	82	35		
gvm/gM	45	60	35	30	3
gUi	20-30	50-75			
mvi I v	200-300	150-180	70-100	120-180	5
ev`vg	70-90	180-220	80-100	100-120	5
vZj	100-125	130-150	40-50	100-120	
vZim	75	120	50	100	5

mqvexb	50	120	65		
mh@yx	150-180	150-180	70-100	100-110	
MRB wZj	75	120	45		
Kyng dz	50				
Avj	320	200	250		

mvi c0qvM Mi tejvq AfaR cwi gvY BDwi qv l emK me,tjv mvi c0\_wgK gvT v (Basal dose) wntmte exR ecb ev P riv tivctYi AvtM Rwg c0\_wZi tkl cte c0qvM Kti gmlJi mt1/2 fiv fivte wgwktq w tZ nq| BDwi qv mvtii emK AfaR dmj Abynti 30-35 w b ci GK wkw tZ A\_er 20-25 w b Ges 40-45 w b ci mgvb B wkw tZ Dcwi c0qvM (Top dressing) Kiv thtZ cvti | AvtLi tejvq BDwi qv mvi mgvb wZb wkw tZ- tivctYi mgq, 40-45 w b l 60-70 w b ci cvk;c0qvM i gva tg mieivn Kiv thtZ cvti | BDwi qv mvtii Dcwi c0qvM ev cvk;c0qvM i AvtM Rwg t\_tK AvMvOv cwi v i Kti wbtj mvtii Kg gZv ew cvq|

mvi c0qvM Mi tejvq AfaR cwi gvY BDwi qv l emK me,tjv mvi c0\_wgK gvT v (Basal dose) wntmte exR ecb ev P riv tivctYi AvtM Rwg c0\_wZi tkl cte c0qvM Kti gmlJi mt1/2 fiv fivte wgwktq w tZ nq| BDwi qv mvtii emK AfaR dmj Abynti 30-35 w b ci GK wkw tZ A\_er 20-25 w b Ges 40-45 w b ci mgvb B wkw tZ Dcwi c0qvM (Top dressing) Kiv thtZ cvti | AvtLi tejvq BDwi qv mvi mgvb wZb wkw tZ- tivctYi mgq, 40-45 w b l 60-70 w b ci cvk;c0qvM i gva tg mieivn Kiv thtZ cvti | BDwi qv mvtii Dcwi c0qvM ev cvk;c0qvM i AvtM Rwg t\_tK AvMvOv cwi v i Kti wbtj mvtii Kg gZv ew cvq|

**mvi c0qvM i mgq**

me dmtj mvi c0qvM i mgq GK i Kg bq| ZvOvov me mvi l GKB mgq c0qvM Kiv wK bq| thgb- dmj Drcv tbi c0\_wgK chiq Ges dmj cvKvi mgq bvBtUtRb mvtii c0qvRb nq AfbK Kg| wKŠ mePvBtZ tewk cwi gvY c0qvRb nq Dw t i mteP ewxi chiq| ZvOvov Rwg tZ bvBtUtRb mvi c0qvM Kivi ci Dw t KZR. cwi tkw l Z tnvK ev bv tnvK Af w tbi gta B Zv wewfbv fivte bo ntq hvq| thgb, ewi ci cwb tZ `exfZ ntq wbtPi w tK A\_er c0wnZ cwb i mt1/2 Ptj hvq A\_er c0ZKj cwi tetk D0vqx ntq bo ntq hvq| ZvB bvBtUtRb RvZxq mvi meUkZGKevti c0qvM bv Kti mgvb ev Amgvb B ev wZb wkw tZ c0qvM Kij Dw t tewk cwi gvY cwi tkv l Y Kti | dtj mvtii Kg gZv ewto, AcPq l Kg nq| bvBtUtRb RvZxq mvi cwb tZ Aw mntR `exfZ nq etj c0qvM Kivi ci gml tZ wgwktq bv w tJ l wKko chS l mntR Ptj thtZ cvti | c gZv i, dmdim mvtii `exfZ nevi gZv Kg Ges gml tZ th vtb c0qvM Kiv nq tmLv tB t\_tK hvq| ZvB c0qvM i ci Aek B Zv fiv Kti gml tZ wgwktq bv w tJ wKko 0v iv cwi tkw l Z n tZ cvti bv | cUwmqvg RvZxq mvtii `eYxq Zv gvSmi ai tbi | Zey gml tZ wgwktq bv w tJ G t i Kg gZv AfbKv tK Ktg hvq| ZvB dmdim l cUwmqvg mvtiK ecb/tivctYi cte Rwg c0\_wZi tkl P r t l i mgq c0qvM Kti gml tZ wgwktq t`qv fiv | MUK l `v RvZxq mvtiK l ectbi cte c0qvM Kiv DEg| Gme mvtiK gml AfbK w b chS ai i v l tZ cvti |

AvqZbeuj tMvei, Kt=uv÷, QvB, BZ`w`Re mvi tK gml i mt1/2 fiv fivte wgwktq bv w tJ G t i Kg gZv ev KvhRw i Zv euj vstK nwm cvq|

AvqZbeuj tMvei, Kt=uv÷, QvB, BZ`w`Re mvi tK gml i mt1/2 fiv fivte wgwktq bv w tJ G t i Kg gZv ev KvhRw i Zv euj vstK nwm cvq| ZvB Gme mvtiK c\_lg P r l l gB t`evi ci Rwg tZ c0qvM Kiv ntj ci eZP r l l gB t`evi mgq G,tjv gml tZ wgtk hvev mthvM cvq| RxevYmvi c0qvM i mteP K o. mgq ntjv exR ectbi ce gZv RxevYmvi fiv fivte ex tR i mt1/2 wgwktq 2/1 NsUvi gta B exR ecb Kiv bv ntj mvtii KvhRw i Zv nwm cvq|

**mvi c0qvM c x w Z**

Dch<sup>3</sup> mgq l mlWK c x w Z tZ mvi e`envi bv Kij c g Dcv v tbi AcPq N t U|

mvi c0qvM i c0qvM c x w Z etj | c0qvM c x w Z i Dci mvtii KvhRw i Zv euj vstK w b f P k j | Dch<sup>3</sup> mgq l mlWK c x w Z tZ mvi e`envi bv Kij c g Dcv v tbi AcPq N t U| thgb- AvqZbeuj tMvei, Kt=uv÷ mvi BZ`w` Rwg P r t l i i i a t Z B c0qvM Kij gml tZ fiv fivte wgwktZ cvti Ges c g Dcv v b,tjv mntR B Dw t i M0Y t h v M Ae v q Ptj

Avtm| meUKzbnBtUtRb mvi GKevti c0qum Kitj Dwmc MbY Kivi AvtMB Zv wewfbvite bo ntq hvq| wbtP mvi c0qum cxwZ m=utKAvtj vPbv Kiv ntjv |

**1| w0utq c0qum**

`vbr`vi Ges`iKbv mvi nvZ w`tq ev htšj mrvth` RigtZ mgfite w0utq t`qvK w0utbv c0qum cxwZ etj | Gtjt`i Aí Aí Kti GKeri Rigi GK c0st`tK Aci c0schSI cti Avovwofite w0utq w`tZ nq| exR ectbi cte`h cwi gvY mvi c0qum Kiv nq tm cwi gvYtK e`vmj tWR (Basal dose) ev c0igK gv`v ejv nq|

**2| Uc tWms (Top dressing) ev Dcwi c0qum cxwZ**

RigtZ `w0utbv Ae`vq dmtj i Dci t`tK w0utq mvi c0qumtK Uc tWms ev Dcwi c0qum cxwZ ejv nq| mvari YZ bnBtUtRbRvZxq mvi Gfite c0qum Kiv nq| c0qvRtb cUmkqv mvi l G cxwZtZ c0qum Kiv ntq `vtK| Zte th me mvi mntR gmlj gta` PjvPj KitZ cvti bv, thgb w0c`j mzi dmtDU, tm, tjv G cxwZtZ c0qum Kiv nq bv |

RigtZ `w0utbv Ae`vq dmtj i Dci t`tK w0utq mvi c0qumtK Uc tWms ev Dcwi c0qum cxwZ ejv nq| mvari YZ bnBtUtRbRvZxq mvi Gfite c0qum Kiv nq| c0qvRtb cUmkqv mvi l G cxwZtZ c0qum Kiv ntq `vtK| Zte th me mvi mntR gmlj gta` PjvPj KitZ cvti bv, thgb w0c`j mzi dmtDU, tm, tjv G cxwZtZ c0qum Kiv nq bv |

**3| cvk,c0qum cxwZ**

dmj MtQi tMvoq mwi i GK cvk ev Dfq cvk t`tK w0utq mvi c0qum KivtK cvk,c0qum ejv nq, thgb- Avj yPibver`vg, dzKuc, etavKuci tejvq c0hr`|

**4| `vbxqfite ev AKztj c0qum cxwZ**

dmj MtQi wKttoi KvQvKwQ `vtb gmlj wbtP dwj tZ (Furrow) mvi c0qumtK `vbxqfite ev AKztj c0qum cxwZ etj | mti i AcPq tiva KivB Gi gj- D`t`k`| `vbxqfite c0qum cxwZ wewfbvaitbi ntZ cvti, thgb-

**• c0D tmvj (Plough sole) ev jvzj dwj tZ c0qum**

G cxwZtZ exR ectbi Rb` e`euZ jvzj i mt`h h` wfbwfbwavi K (Container) n0tZ mvi l exR GKB mgtq wfbwfbwQ`f gva`tg RigtZ cto| Gtjt`i exRi wK wbtPi `ti mvi c0qum Kiv nq thgb- avb, cvU, BZ`w` i tejvq c0hr`|

**• e`vU cxwZ**

dmtj i mwi i GKcvtk A`ev Dfq cvtk exR ecb Mfxi Zvi wKQvbtP mi` dwj tZ mvi c0qumtK e`vU cxwZ etj | thgb- dzKuc, etavKuci tjt`i c0hr`|

**• wis ev ej q cxwZ**

AtcjtKZ. `ti `ti jvMvbtv MtQi Pviw`tK cwi wZ `tZj e`vKvi `f Mfxi dwj tZ mvi c0qumtK wis ev ej q cxwZ ejv nq| thgb- bwitKj, tcqviv MtQi tejvq c0hr`|

**5| gv`vq c0qum cxwZ**

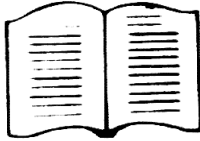
exR ev Pvi v jvMvbtv Rb` `Zwi gv`vq SzSzi gmltZ mvi wgtqtq t`qvK gv`vq c0qum cxwZ etj, thgb- jvD, Kgov, mxg, Avg, Kuvj BZ`w` i tejvq c0hr`|

**6| wAb cxwZ**

Zij mvi A`ev iKbv mvi tK cmbtZ `exfZ Kti t`c0ev wAb htšj mrvth` mvi c0qumtK wAb cxwZ etj | BDwi qv ev Ab`vb` tMSY mvi G cxwZtZ cvZvq c0qum Kiv nq|



**Ablyj b (Activity):** Avcbvi GjuKvq wefbedmtj mPivPi e'eüZ mtii c0qM gvT v I c0qM c×wZ mst99tc wj Lly|



**migg®**

thme `e" DwMf`i cy0 mieivn Kti Ges gwUi DePZv msi99Y ev e9x Kti Zvt`i tK mvi etj | weAvbxt`i gtZ 16wU cy0Dcr`vb DwMf`i Rb" Acwivnh® Gt`i gta" 9wU gly" Dcr`vb Ges 7wU tMSY Dcr`vb | Gme cy0 Dcr`vb tK wefbedmtii gva"tg wefbedc×wZtZ Rwg tZ c0qM Kiv nq|dmtj i Pwv`v Ablyqx dmj t99tZ mwVK mgfq, mwVK gvT vq Ges mwVK c×wZtZ mvi c0qM Kiv ntj mtii AcPq Kg nq, Rwg DePZv e9x cvq Ges dmtj i dj b I 9 YMZ gv tbi DbwZ nq |



**ciVvEi gj`iqb 6.1**

mivK DEti i civk<sup>9</sup>UK wPy (v) w b|

1| Dir<sup>m</sup> i e<sup>3</sup>, nek<sup>3</sup>, eske<sup>3</sup> BZ<sup>3</sup> Kih<sup>3</sup>j vci Rb<sup>3</sup> th kw<sup>3</sup> i c<sup>3</sup>qvRb nq Zvi Drm tKvblU?

- K) gvU                      L) cvb                      M) c<sup>3</sup> ev Lv<sup>3</sup>                      N) Zvcgv<sup>3</sup>v

2| Dir<sup>m</sup> Kx<sup>m</sup> AvKv<sup>3</sup> i c<sup>3</sup> ev Lv<sup>3</sup> `vcr`vb tkv<sup>3</sup>Y K<sup>3</sup>i?

- K) mvi                      L) cvb                      M) pH                      N) Avqb

3| Dir<sup>m</sup> i Ac<sup>3</sup>vi nvh<sup>3</sup>Lv<sup>3</sup> `vcr`v<sup>3</sup>bi msL<sup>3</sup>v KqvU?

- K) 8vU                      L) 12 vU                      M) 16 vU                      N) 20 vU

4| Dir<sup>m</sup> i Ac<sup>3</sup>vi nvh<sup>3</sup>Lv<sup>3</sup> `vcr`v<sup>3</sup>bi g<sup>3</sup>ta<sup>3</sup> g<sup>3</sup> Dcv<sup>3</sup>v<sup>3</sup>bi Zj<sup>3</sup>bvq tM<sup>3</sup>Y Dcv<sup>3</sup>v<sup>3</sup>bi i az<sup>3</sup>j tKgb?

- K) AZ<sup>3</sup>šK<sup>3</sup>g                      L) Kg                      M) GKB i Kg                      N) teuk

5| BD<sup>3</sup>vi qv mvi Dir<sup>m</sup> tKv<sup>3</sup>blv<sup>3</sup> `vcr`vb mi ei vn K<sup>3</sup>i?

- K) bvB<sup>3</sup>U<sup>3</sup>t<sup>3</sup>Rb                      L) Av<sup>3</sup> t<sup>3</sup>Rb                      M) nvB<sup>3</sup>W<sup>3</sup>t<sup>3</sup>Rb                      N) dmd<sup>3</sup>im

6| AvqZbeuj `Re mvi thgb tM<sup>3</sup>ei, K<sup>3</sup>t<sup>3</sup>uv÷ BZ<sup>3</sup> tKv<sup>3</sup> mgq RvgtZ c<sup>3</sup>qvM Ki v DvPZ?

- K) Rvgt P<sup>3</sup>t<sup>3</sup>i c<sup>3</sup>e<sup>3</sup>                      L) RvgtZ t<sup>3</sup>mP<sup>3</sup> t<sup>3</sup> evi mgq  
M) RvgtZ 2/1 vU P<sup>3</sup>t<sup>3</sup>i ci                      N) exR ec<sup>3</sup>bi ci

### cw 6.2 Aš-eZrRvj xb cwi Ph® Pviv cvZj vKiY, AvMvQv`gb, gvj vPs



G cvV tkfI Avciob

- ◆ Aš eZrRvj xb cwi Ph®, tj vi bvg ej tZ cvi teb |
- ◆ Pviv cvZj vKi tYi Kvi Y ej tZ Ki tZ cvi teb |
- ◆ AvMvQvi msÁv Ges`emkó`vej x ej tZ cvi teb |
- ◆ AvMvQv`gtbi bmvZgvj v I c`wZ eYv Kvi tZ cvi teb |
- ◆ gvj vPs Gi msÁv Ges Gi Dckvii Zv eYv Kvi tZ cvi teb |



#### Aš eZrRvj xb cwi Ph®

RigtZ exR ecb ev tivctYi ci t`tK i iæKti dmj msMh Kiv chšI dmj t`tZ thme KivRKg®Kvi tZ nq tm, tj vtK Aš eZrRvj xb cwi Ph® (Intercultural operation) etj | thgb-gvj vPs, AvMvQv`gb, mvti i Dcwi c`qvm, tmP BZ`w` |

RigtZ exR ecb ev tivctYi ci t`tK i iæKti dmj msMh Kiv chšI dmj t`tZ thme KivRKg®Kvi tZ nq tm, tj vtK Aš eZrRvj xb cwi Ph® (Intercultural operation) etj

#### Pviv cvZj vKiY (Thinning)

Rig t`tK c`qvRtbi AvZwi<sup>3</sup> Pviv Dwtq tdj vtK Pviv cvZj vKiY ej v nq | c`Z`K RxeiB tetP`vKvi Rb` wKQvPmn`v`vtK | Pmn`v, tj v Avkvbyfcvte ci-Y Kitj Zvi tFZti j kvvbr` Yvej x (thgb ep`x, weKvk I cYZv) mivKfite cKvk cvq | MvtQi tejvq Ggb GKw Pmn`v n`Q Zvi tefo I vvi Rb` cwiugZ RvqMv (Space) | c`qvRtbi Zjvqv RvqMv Kg ntj thgb mivK ep`x I weKvk NtU bv, tZgvb AvZwi<sup>3</sup> RvqMvi e`e`v Kiv ntj RvqMvUj mgye`envi nq bv |

Rig t`tK c`qvRtbi AvZwi<sup>3</sup> Pviv Dwtq tdj vtK Pviv cvZj vKiY ej v nq |

wevfbaKvi tY exRvvi wKQv tenk t`qv ntq`vtK | Kvi Y, Pvivi msL`v wKQv tenk ntj mnR Zv Dwtq tdj v hvte | wKš` Kg cotj`i b`v`vb ci-Y KivUv ZZ mnR nte bv | c`qvRtbi Zjvqv tKvb`vtbi Pvivi msL`v tenk ntj dj b Ges`YMZ gv`tbi Dci weifc c`Z`w`qv mgy Kti |

cvUj tejvq t`Lv hvq MvtQi NbZi tenk ntj cvUMv wj Kwj tK I nvj Kv nq, Avevi MvtQi NbZi Kg ntj MvQ t`tK Wj cvjv MRvevi c`wE` evto, ZvtZ dj b Kg nq | c`qvRtbi AvZwi<sup>3</sup> MvQ`vKtj c`w MhY, c`mbi Pmn`v ci-Y BZ`w`tZ NvUvZ t`Lv t`evi dtj BwAZ dj b cvl qv hvq bv | Ab`w` tK c`qvRtbi Zjvqv MvtQi msL`v Kg ntj c`Z MvtQi dj b wKQv tenk ntj | Kiv LZ MvtQi msL`v Kg`vKvi Rb` dj tbi NvUvZ KivUvq DVv mæe nq bv | mivgMk dj b Kg nq |

#### AvMvQv`gb (Weed control)

tPvL tgj tj B nvriv i Ktgi MvQ t`Lv hvq hv`i AtbK, tj v c`KwZKfiteB RbWq Avevi KZK, tj vtK RbWtZ nq | Gt`i gta` AtbK, tj vtK AvMvQv Ges AtbK, tj vtK dmj ej v nq |

**msÁv** : tKvb`vtb AewAZfite RbWtbr MvQ tK AvMvQv (Weed) etj |

tKvb`vtb AewAZfite RbWtbr MvQ tK AvMvQv etj |

c`qvš`i thme MvQ tK htZie mvt`Pvivev` Kvi tZ nq Ges hviv gvby Ges Mpcwv Z ci`cvLxi Rxeb avitbi c`qvRbxq mivgMh mieivn Kti Zvt`i tK ej v nq dmj | AvMvQvi D`vniY-

k'vgn, `gP, Pvcov, e\_gv, `UKj m BZ`w` | Avi dmtj i D`vniY ntjv avb, cvU, AvL, mvi Iv BZ`w` |

AvMvQvi mekI `enkó" ntjv AvMvQv mvari YZ AmsL" exR Drcv`b Kti, extRi AvKvi tQvU, IRtb nvj Kv|

AvMvQvi mekI `enkó" ntjv AvMvQv mvari YZ AmsL" exR Drcv`b Kti, extRi AvKvi tQvU, IRtb nvj Kv| mvari YZ AvMvQv I Zv`i exR cAZKj Ae`vq `xNp b tetP \_vKtZ cvfi, AvMvQvi exR me,tjv GKmt½ cwi c° nq bv, GKmt½ me,tjv MRvq bv, Rxebkiv³ `xNp b ati ivLkZ cvfi |

AvMvQv cAvbZ `giti-bi-mvZ`Kvii AvMvQv ev vbiU AvMvQv tmme MvQ hv tKvb `vrb AevAZfvte Rbvk| vDZxqvU AvtcvvK hv Avmtj AvMvQv bq, dmj MvQ| tKvb dmj MvQ hv Ab` tKvb BvAZ dmtj i tvtZ Rbvk ZLb ZvK AvtcvvK AvMvQv etj | thgb- avb tvtZ cvU MvQ AvtcvvK AvMvQv tZgvb cvU tvtZ avb MvQ AvtcvvK AvMvQv |

RxbKvtj i Dci vfiE Kti AvMvQvK vzb fvM fvM Kiv hvq t

**1| eIRxex AvMvQv (Annual weed)**

Gme AvMvQvi AvqyGK ermiþii gfa" mvgvex, thgb- e\_gv, k'vgn| eIRxex AvMvQvK Avevi `B fvM fvM Kiv ntqtQ| h\_v:

**K) iue AvMvQv** - Gf`i RxebKij iue tgSmjg (At±vei-gvP) mvgvex thgb- e\_gv, `UKj m BZ`w` |

**L) Luic AvMvQv** - Gme AvMvQvi AvqyLwi c tgSmjg (Gvcj -tmþP±) mvgvex thgb- k'vgn, MBPv BZ`w` |

**2| vDeIRxex AvMvQv (Biennial weed)**

thme AvMvQvi AvqyGK eQþii tevk vKs` `B eQþii gfa" mvgvex | Gf`i msL`v Lv Kg| eb MvRi, eb imy cvvZ. vDeIRxex AvMvQvi D`vni Y|

**3| eueIRxex AvMvQv (Perennial weed)**

Gme AvMvQvi RxebKij `B eQþii tevk t\_þK iiaKti eu eQi chSntZ cvfi | thgb- `gP, Dj yPvA BZ`w` |

AvMvQv dmj MvQvi mv\_ cvb, mfvjvK, RvqMv vbtq cAZthvMZv Kti, tcvKvgtoi Avkq`j vntmte KvR Kti, dmtj i dj b I , YMZ grb Kvgtq t`q, Drcv`b LiP evovq, Drcv`Z cY`i Ges Rvgi evRvi `i Kvgtq t`q| GK K\_vq AvMvQvK dmtj i kIjev v hvq| AvMvQvi vKQyfvj v KI itqtQ| thgb- MiæevQj AvMvQv tLq evvP, kvK, JIa, Nþii teov, QvDvb, figvq þivta I Rvj vb vntmte AvMvQv KvR Avtm|

AvMvQvK vzbvU bmvZgvj vi gva`tg vbqšY Kiv thkZ cvfi, h\_v t

**cAZþiva (Prevention)**

AvMvQvi ve`vi NUþZ evav cAvb cAvqvtK cAZþiva etj |

AvMvQvi ve`vi NUþZ evav cAvb cAvqvtK cAZþiva etj | thgb- dmj extRi mt½ AvMvQvi exR ecb bv Kiv, tMvei ev Kt±uv÷ fvj fvte bv cvþq RvgtZ cAvqM bv Kiv, Kvi Y fvj fvte bv cvþj tMveti Rxebkiv³ m±vbeAvMvQvi exR t\_þK hvq| GQvov cwi`vi KI v hšcvZi e`enri, Lvj, tmPbvj v cwi`vi ivLv BZ`w` i gva`tg AvMvQv cAZþiva Kiv hvq|



tmP c0qvtMi gva`tg AfbK AvMvQv `gb mæ| thme AvMvQv cvmb mn` Ki tZ cvti bv (thgb-  
gyv, e\_gv, `ÜKj m, `g) tmme AvMvQvi t`ttZ 5/7 w`b cvmb a`i ivLtz Gme AvMvQv gti  
hvq| Ab`w` tK KPm cvbv, cvbv, Kj ug kivK, gvj A BZ`w` thme AvMvQv cvmb c0` Kti Gt`i  
Rug t`tk cvmb w`vkb Kiv ntj Gt`i `gb Kiv hvq|

AvMvQv extRi mivrt` ev A½R Dcv`q esk we`li Kti | mivriYZ el R`xer AvMvQv extRi  
gva`tg Ges eüel R`xer AvMvQv exR Ges A½R Df`q c`xwZ`Z esk we`li Kti `vtK|

AvMvQv `gtbi DËg mgq  
ntjv Gt`i ev`xi c0`ugK  
ch`q A`r dj dj aivi  
AvM ch`S|

AvMvQv `gtbi DËg mgq ntjv Gt`i ev`xi c0`ugK ch`q A`r dj dj aivi AvM ch`S|  
Pj wZ erm`i GKw AvMvQv bó Kiv ntj Zv nte AvMvQv erm`i i nvriv AvMvQv `gtbi  
mgZ`| thme AvMvQv A½R Dcv`q esk we`li Kti tm`tjv `gb Kivi mgq j`l` ivLtz nte  
thb KvÜ ev w`kKo tenk U`kiv bv nq, KvY GtZ c0Z`K U`kiv ev KvÜ t`tk GKw Kti bZy  
AvMvQvi Rb`ntZ cvti | thgb-`g`

**gvj wPs (Mulching)**

Rugi Dcti i`ti big  
GKw Av`liY m`p Kiv`K  
gvj wPs etj | Gi c`vb  
Dt`k` ntjv ev fugim  
msi`Y|

Rugi Dcti i`ti big GKw Av`liY m`p Kiv`K gvj wPs etj | Gi c`vb Dt`k` ntjv ev  
fugim msi`Y| Avgt`i t`tk i`Kbv tg`m`g (tm`P`f-Guc`j) g`w`i Av`Zv Lg Kg `vtK|  
ZLb gvj wPs Lg Dckvix l dj ch`y RugtZ exR ectbi ci ev`cvZ ntj g`w`i Dcti i`li  
k³ ntq hvq Ges dvUj a`i Ges dvUj i`tfZi w`tq cvmb AwZ`Z ev`urfetbi gva`tg Dto  
hvq| Avevi P`IKZ.SzSzi Rug t`tkI cvmb mntR Dto Ptj hvq GtZ dmtj cvmbi Afie  
t`Lv t`q|

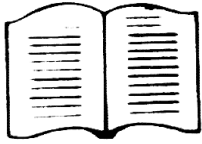
gvj wPs `g`Ktgi nq - `rfweK gvj wPs l Kw`g gvj wPs|

**`rfweK gvj wPs**

k³ g`w`i Dcti tKv`vj, w`bwb ev Av`vov mivrt` g`w`i big Kti g`w`i w`tq nij Kv Avei`Yi  
m`p Kiv`K `rfweK gvj wPs etj | GtZ g`w`i `Kw`K biv`xi (Capillary pore) tLvjv g`y g`w`i  
P`cv cto eÜ ntq hvq, hvi dtj g`w`i cvmb evt`úi AvKv`i mivmvi Dto thtZ cvti bv,  
evavM`ntq g`w`iZB t`tk hvq|

**Kw`g gvj wPs**

dmj ecb ev t`vc`Yi ci Rugi Dci LoK`v w`tq Avj Mv GKw Av`ti i m`p Kiv`K Kw`g  
gvj wPs etj | Avj ygw`P, ev`vg BZ`w` dmtj Kw`g gvj wPs LgB Kvh`Ri | Kw`g gvj wPs g`w`i  
cvmb msi`Y Kiv Qvovl AvMvQv `gtb mivqZv Kti | Avgv`i t`tk Kw`g gvj wPs G LoK`v,  
Nvm, KPm cvbv, BZ`w` e`eüZ nq| G`tjv c`P w`M`g g`w`iZ `Re c`v`thwM Kti | Dbz  
t`tk LoK`vi cwi etZ`KwMR, i veri ev c`w`K kvU gvj wPs wntmte e`eüZ nq| tmme kvU  
Mv`Qi Priv`tei ntq Avmvi Rb` Av`M t`tkB w`Kti t`qv `vtK|



**mvi gg®**

dmj Drcv`tb AšbZiRvj xb cwi Ph® Priv cvZj vKiY, AvMvQv `gb, gvj wPs AvZ cŃqvRbix  
 Ges Avak dj tbi mnvqK/Priivi NbZ; teik nŃj chŃ Avtjv, eiZvm I LvŃ`vcv`vb Ges  
 RvqMvi (Space) Afite MvQ mŃZite teŃ DVtZ cvti bv| AvMvQv dmj MŃQi mŃ\_ cwb,  
 mhŃj vK, LvŃ`vcv`vb, RvqMv cŃvZ. vbtq cŃZthwMzv Kti, tcvKigvKtoi AvkŃ`j vntmte KivR  
 Kti, dmj i dj b I , bMz gvb KigŃq t`q| AvMvQvK cŃvbZ cŃZti va, `gb I DŃ`Q` - G  
 wZb cŃwZŃZ vbtqšY Kiv nq| gvj wPs -Gi gvaŃg figim msi 7Y Kiv nq| gvj wPs `ŃcKvi -  
 rŃvmeK I Kwlġ gvj wPs|



### civhEi gj`iqb 6.2

mivK DEti i civkqUK iPy (v) w b|

1| RvgtZ exR ecb ev Piv tivctbi ci t`tK iiæKti dmj msMh chSf thme KvRKg©  
Ki tZ nq ZvtK Kx civi PhP etj ?

K) c0`ugK civi PhP

L) AšbZxRij xb civi PhP

M) c0`uqvKi Y civi PhP

N) fvg msi qY civi PhP

2| tKiv `vrb AemAZfvte Rbvtbv MvQtK Kx ej v nq?

K) dmj

L) AvMvQv

M) ci MvQv

N) ci t`fvRx MvQ

3| GKwU AvMvQv Kgc t`q KZ ermti i tenk mgq RweZ `vKtj ZvtK euel Rwe AvMvQv  
etj ?

K) 1 ermi

L) 2 ermi

M) 3 ermi

N) 5 ermi

4| AvMvQvi we`li tiva Kivi c0`uqvK Kx etj ?

K) `gb

L) D t`Q`

M) c0`Z tiva

N) A`%vZK qvZKi chq

5| AvMvQtK hLb tKiv Rxe ev AYRxe w tq b0 Kiv nq ZLb ZvtK tKiv cxwZ etj ?

K) civi PhP cxwZ

L) ivmquvK cxwZ

M) `RweK cxwZ

N) A`RweK cxwZ

6| gjj iPs Gi c0`vb D t`k` tKivwU?

K) AvMvQv `gb

L) gvUv q`q tiva

M) tcvKvqvKo `gb

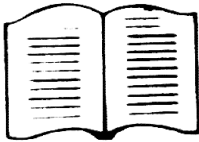
N) fvgi m msi qY

**cw 6.3 tmP I ub@vkb**



G civ tkfI Avcib

- ◆ tmP I ub@vkb i azjeY@v Ki tZ cvi teb |
- ◆ ejsj v`tk gml qvix epocvZi cvi gvY ej tZ cvi teb |
- ◆ wefba@vKvi tmP cxvZ eY@v Ki tZ cvi teb |
- ◆ tmfPi DcKvi Zv eY@v Ki tZ cvi teb |
- ◆ wefba@vP cxvZi mjev I Amjev ej tZ cvi teb |
- ◆ wefba@vKvi tmP hscvZ m@vK@ej tZ cvi teb |
- ◆ ub@vkb cxvZ eY@v Ki tZ cvi teb |
- ◆ ub@vkb cxvZi mjev I Amjev, tje ej tZ I vj LtZ cvi teb |



ej sj v`k bmvZkxZv@vG@v Aew`Z Ges tgsmsx evqj cfrte GLv@v c@v epocvZ nq | GLv@vKvi gwU DeP etj eu dmtji Pvl nq | c@v epocvZ ( eml R 208.66 tm.ug.) mtejl GLv@v tmfPi c@vRbxqZv t`Lv t`evi KviY ntjv epocvZi cvi gvY thgb me RvqMvq GK iKg bq, tZgvb c@vK gvfmI mgcvi gvY bq | ivRkvx tRjvi jvj c@v epocvZi cvi gvY mePvBtZ Kg, eml R gvI 129.67 tm.ug., Ab`v tK vntj tui jvj vLvtj mePvBtZ tevk, eml R 573.43 tm.ug. | ermtii tg t`tK tmfP@v chSf5 gvfmI epocvZi cvi gvY `vovq kZKiv 82 fvfMi tevk, Avi emk 7 gvfm 18 fvfMi Kg | Avi hv` dmj tgsmsx vntmte t`Lv nq, Zvntj Lvi c tgsmsg (Gvcj -tmfP@v) kZKiv 88 fvm Ges iue FZtZ (At@vei-gvP) gvI 12 fvm epocvZ nq | ZvB iue tgsmsg tmfPi Ges Lvi c tgsmsg ub@vkb c@vRb t`Lv t`q | iue tgsmsg cvbi Afvte AtbK Rvq cvZZ `vK | Ab`v tK el@vKvj cvb ub@vkb Afvte dmtji AtbK vjvZ nq | ejsj v`tki gml qvix epocvZi GKvU Zvj Kv vbtP Dc`vcb Kiv ntjv |

c@v epocvZ ( eml R 208.66 tm.ug.) mtejl ejsj v`tki tmfPi c@vRbxqZv t`Lv t`evi KviY ntjv epocvZi cvi gvY thgb me RvqMvq GK iKg bq, tZgvb c@vK gvfmI mgcvi gvY bq |

QK 1 t ejsj v`tki gml qvix Mo epocvZ (tmvUvUv)

gum	epocvZi cvi gvY	gum	epocvZi cvi gvY
Rvbgvi	0.84	RjvB	40.54
tdegvvi	2.54	AvMó	38.23
gvP	4.55	tmfP@v	28.78
Gvcj	10.64	At@vei	14.05
tg	24.13	btf@v	2.62
Rly	40.21	vltm@v	0.53

dmj t@vZ dmtji c@vRtb Kulg Dcvq cvb mieivni c@vqK tmP (Irrigation) etj |

**tmfPi msAv:** dmj t@vZ dmtji c@vRtb Kulg Dcvq cvb mieivni c@vqK tmP (Irrigation) etj |

**tmfPi DcKvix c@ve**

Dv`c gwU t`tK Lv t`vcr`vb cvbtZ `xvZ Ae`vq Avqb vntmte cvitkvI b Kfi | MvQv t`tn i`c`v` (Dry matter) Drcv`tb c@v cvbi c@vRb | c@vKZK c@vq gwU vbtPi

~fii Lv`vcv`vb cwbZ `exfZ nq %KukK bijxi gva`tg gwU l c`ii ~fi D`V Av`m| gwU ZvcgvIv wqstYI cwb c`ve itqQ| cwb gwU `Re c`v`cPtb mrvqZv Kti, AvMvQv `g`b fvgKv ivtL| tmPi cwb gwU jeYv<sup>3</sup>Zv I `QviZj `iKiY mrvh` Kti| exRZjv `ZwiZ, Piv DVtvtZ, gwU Kv`v KiZ cwb i`azj Acwimg| ZvQvov tmPi cwb mrvh` Rvg `Zwi I ecb`tivcY Kv`mgggZ m`ubekiv m`e| c`KuzK wqatg Gme KvRjvc epoi cwb w`tg Kiv nq| wK`epoi Afite tmPB GKgvI meKí|

**tmPi cwb Derm**

tmPi cwb Derm, tjv ntjv b`xbvjv, Lvj wej, ckz, Kc, bj Kc, Mfvi bj Kc I AMfvi bj Kc|

**tmPi cwb Yvejx**

tmPi cwbZ Ggb tKvb wRwv`vKv DvPZ bq hv dm`ji Rb` ev Rvgi Rb` QwzKi, thgb `exfZ jeY ev LvbR c`v,` fimgvb ewj ev cij gwU, AvMvQvi exR, tivMi RxeYyBZ`w`|

tmPi cwb Derm hvB tnvK bv tKb, cwb Yv, Y AwZ i`azcY<sup>9</sup> tmPi cwbZ Ggb tKvb wRwv`vKv DvPZ bq hv dm`ji Rb` ev Rvgi Rb` QwzKi, thgb `exfZ jeY ev LvbR c`v,` fimgvb ewj ev cij gwU, AvMvQvi exR, tivMi RxeYyBZ`w`| Zv Qvov cwb ZvcgvIv thb AwZ Dò ev AwZ kvZj bv nq| cwb pH (wGBP) gv miz A`u ubi`c`nI qv fij|

**tmP c`wZ (Methods of irrigation)**

cw`extZ Pvi c`Kv`ii tmP c`wZ Pvj AvtQ| thgb- fcô`- tmP, fub`e` tmP, el` tmP I tduv tmP c`wZ|

**fcô`-tmP c`wZ (Surface irrigation)**

Drm t`K cwb gwU l ci w`tg c`v`nZ Kti dmj t`tZ tcS`v`vK fcô`- tmP etj| thgb- Lvj KvUv|

**fub`e` tmP c`wZ (Sub-surface irrigation)**

Drm t`K gwU v`p w`tg w`tkl c`uqvq dmj t`tZ cwb mieivn KivK fub`e` tmP etj|

**el` tmP c`wZ (Sprinkler or Overhead irrigation)**

w`tkl c`uqvq exbtj cvt`úi mrvh` Pvc c`qvM epoi gZ w`uvtq cwb mieivn KivK el` tmP etj| el` tmP mevvtZ fij c`wZ|

**tduv tmP c`wZ (Drip irrigation)**

cwb Derm t`K btji w`Zi w`tg dmj MtQ tduvq tduvq cwb mieivntK tduv tmP etj|

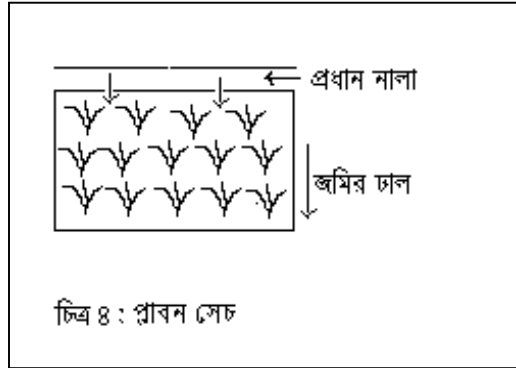
tKvb GjvKvq tKvb tmP c`wZi e`envi AvakZi Dc`thvM Zv w`fP Kti tmLvbKvi cwb Derm l cwi`gvY, fvgi eU`zZv, gwU c`wZ, dmj Drcv`b c`wZ, kvgtKi chwBZv BZ`w`i Dci|

fcô`-tmP c`wZi w`fbac`Kv`if` AvtQ, thgb-

**cwb tmP (Flood irrigation)**

Drm t`K cwb bijvi gva`tg Atc`vKZ.DBz`v`b w`tg dmj t`tZ c`v`nZ Kiv nq| mrv t`tZ cweZ bv nI qv chS`c`v`n eU Kiv nq bv| G t`t` Rvg tgvUv`v`fite mgZj ntZ nq|

Zte byj v tKtU ev AvBj teta cmb ubqšt̃Yi tKvb ẽv ṽt̃K bv| avb, Mg, mwi Iv BZ̃w̃ dmt̃j G c̃x̃w̃Z̃t̃Z̃ tmP t̃`qv nq|



**c̃eb tm̃Pi m̃yav**

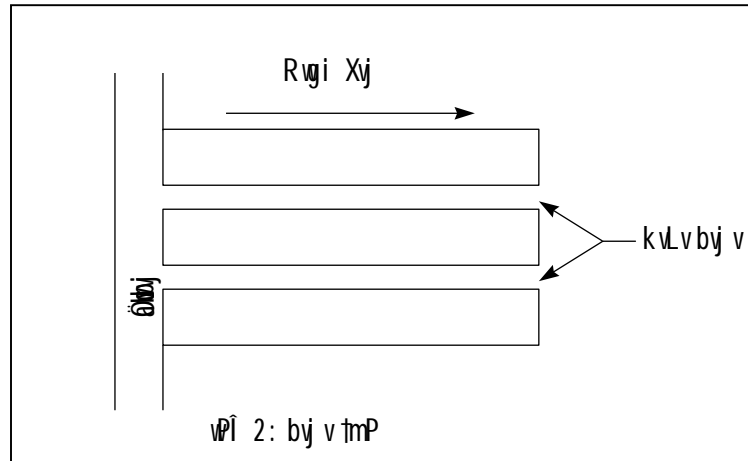
Rug̃Z AvBj teta ev byj v tKtU cmb ubqšt̃Yi Kivi c̃q̃vRb c̃to bv| Rug̃K mgZj Kiv Qvov tZgb tKvb Lĩt̃Pi c̃q̃vRb nq bv| Aí mg̃t̃q̃ tẽwk c̃wi gṽY Rug̃Z̃ tmP t̃`qv hvq| k̃ig̃t̃Ki c̃q̃vRb L̃y Kg nq|

**Am̃yav**

AZ̃w̃aK c̃wi gṽY c̃mbi c̃q̃vRb nq| c̃mbi AcPq tẽwk nq| Rug̃ mgZj bv nt̃j Ãt̃c̃q̃vKZ. ubPz̃ṽtb R̃j vẽx̃Z̃v t̃`Lv t̃`q| c̃mb ubqšt̃Yi i vLv hvq bv| f̃ug̃q̃t̃qi m̃tẽbv tẽwk|

**byj v tmP (Furrow irrigation)**

G̃t̃q̃t̃í Rug̃i Ãt̃c̃q̃vKZ. D̃p̃zc̃ṽt̃ki AvBj ẽivei GK̃u c̃ãvb byj v t̃`t̃K m̃wi c̃x̃w̃Z̃t̃Z̃ j̃ṽM̃ṽt̃bv dmt̃j i ̃B̃ m̃wi i gãẽZ̃P̃ d̃m̃j t̃Z̃ (kvLv byj vq) c̃mb mieivn Kiv nq| c̃mb ax̃t̃i ax̃t̃i m̃wi i GK̃ c̃ãś̃ t̃`t̃K Aci c̃ãś̃ ch̃ś̃ c̃ã̃m̃Z̃ ñt̃q̃ w̃K̃Õyc̃wi gṽY R̃g̃vi ci c̃mbi c̃ã̃ṽn ẽŨ K̃t̃i w̃t̃Z̃ nq| G̃t̃q̃t̃í mẽ, t̃jv m̃wi t̃Z̃ GK̃eṽt̃i tmP t̃`qv nq bv| K̃t̃q̃K̃u m̃wi t̃Z̃ GK̃t̃í tmP t̃`evi ci c̃mb c̃t̃i i K̃t̃q̃K̃u m̃wi t̃Z̃ c̃ã̃m̃Z̃ Kiv nq| GL̃ṽt̃b j̃ q̃ i vL̃t̃Z̃ ñt̃ẽ c̃mb th̃b d̃m̃j i Z̃j t̃`t̃k ṽt̃K, t̃Kvb Aẽ ṽt̃Z̃B Dc̃t̃P bv c̃to| Dc̃t̃P cot̃j g̃m̃U ẽtm̃ w̃M̃t̃q̃ g̃m̃U i M̃Vb b̃o ñt̃q̃ hvq| d̃m̃j i Z̃j t̃`t̃k c̃mb t̃c̃q̃t̃j̃ tmL̃vb t̃`t̃K ̃K̃ũk̃K̃ b̃m̃j i g̃vãt̃g̃ c̃q̃vR̃bx̃q̃ c̃wi gṽY c̃mb d̃m̃j i k̃x̃l̃P̃ k̃ ch̃ś̃ t̃c̃ś̃ t̃c̃ś̃ hvq| G̃t̃Z̃ g̃m̃U i M̃Ṽt̃bi t̃Kvb q̃w̃Z̃ nq bv ẽis̃ M̃ṽt̃Q̃i c̃q̃vR̃bx̃q̃ c̃mbi P̃m̃ñ`ṽ c̃ĩY ñt̃q̃ hvq| AvL, Avj yP̃x̃b̃eṽ`vg, d̃j̃K̃uc, ẽt̃aṽK̃uc BZ̃̃w̃ dmt̃j G̃ c̃x̃w̃Z̃ AZ̃̃ś̃ K̃ṽh̃R̃i| D̃t̃j̃L̃, byj v c̃x̃w̃Z̃i tmP t̃Kej g̃ṽí Z̃L̃b̃B c̃q̃vR̃ h̃L̃b̃ d̃m̃j m̃wi t̃Z̃ ẽcb̃t̃ĩṽc̃Y K̃t̃i t̃M̃ṽõṽq̃ g̃m̃U D̃w̃M̃t̃q̃ w̃K̃uc eṽ t̃f̃ij̃ K̃t̃i t̃`qv nq|



**bjv v tmPĪ mġav**

cnbi ubqšY mnR, cnbi AcPq Kg I Aí cnbtZ tenk cwi gvY Rvg tmP t`qv mæe, Rvgi me AstkB cnb tcšOvq, Rj veXZvi mġo nq bv| gwiLi ebtU ev MVtbi Dci tKvb Lvi vc cfrve cto bv|

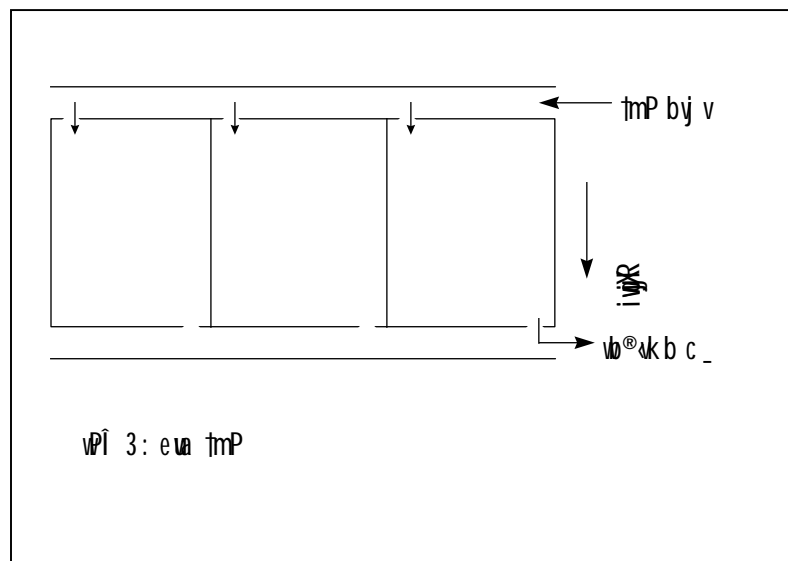
tKej gvĪ mmi exfite j vMrtbv Ges tMvoiq gwiU DVrtbv dmj Qvor Ab` tKvb dmtj bjv v tmP t`qv hvq bv|

**Amġav**

tKej gvĪ mmi exfite j vMrtbv Ges tMvoiq gwiU DVrtbv dmj Qvor Ab` tKvb dmtj bjv v tmP t`qv hvq bv| cšZ`K bjv vq mgcwi gvY cnb mi ei vn mæe nq bv| LiP wKQytenk cto|

**eua tmP (Border or Check irrigation)**

G cxiZwU cnb tmP cxiZi wKQy Dbz ms`i Y| GLvtb Rvgi D`PZv Abymti RvgtZ AvBj teta tQvU tQvU LtŪ fVM Kti tmP t`qv nq| cštg mtePP Rvg LtŪ cnb t`qv nq| Gi ci D`PZv Ablyqx ubtPi w`Kti fvg LtŪ cnbi mi ei vn Ae`vnZ ivLv nq| Gfite me`tj v LtŪ cšqvRbxq cwi gvY cnb Rgv ntj tmP eŪ Kti w`tZ nq|



**ev tmPi mjev**

cmbi ubqšY mnR, cmbi AcPq Kg, Priw tK AvBj vKvq c0qvRbxq cwi gvY cmb tmP t`qv mæ| fvgŋtqi mæbebv Kg| cmb B`Qvbyvqx AtbKw b chšl aŋi ivLv hvq| thme dmj i cmbi Pwv`v teuk Ges RjveXZv mn` KiŋZ cviŋi tmme tŋtŋ G cXWZ wætkl DcŋhvMx thgb- teŋiv I tivcv Avgb avb BZ`w |

**Amjev**

AvBj `ZwiŋZ LiP ewx cvq Ges dmj I Rwgj AcPq nq| fwi eytUi gwU Qvov Ab`T tZgb DcŋhvMx bq| c0qvRtbi mgq Rwg i tKvŋZ AtbK mgq tbq|

**teimb ev \_vj v tmP cXWZ (Basin irrigation)**

eŋŋRvZxq MtQi tMvovi Priw tK AvBj teta cmb mieivn KivŋK teimb ev \_vj v tmP etj | Gtŋtŋ hŋ\_ó `ŋi `ŋi jvMtŋbv eüelRix dj RvZxq etŋŋi `ŋvwi i ga`eZP `vŋb j`ŋj wæfite KvUv GKwU cåvb bvjv t`tK MtQi Priw K tewŋZ teimb chšl cikŋvjv tKtU cmb mieivn Kiv nq| c0qvRb Abyvŋi G teimb cmb w`ŋq cY`Kŋi t`qv nq| bwi tKj , Avg, wj Pzŋcqviv BZ`w` dj MtQ tmPi Rb` G cXWZ tek DcŋhvMx|

**teimb ev \_vj v tmPi mjev**

cmbi ubqšY mnR Ges cmbi AcPq Kg| c0qvRbxq cwi gvŋY Ges Mfxi Zvq tmP t`qv mæ| fvgŋtqi mæbebv `vŋK bv|

**Amjev**

c0wgK LiP wKQYv teuk| AtbK cmbi c0qvRb nq| c0qvRtbi AwZwi<sup>3</sup> mgŋq RjveXZvi Rb` MvQ gŋi thŋZ cviŋi |

**fjbæ' tmP cXWZ**

G cXWZ tZgb cŋvj Z bq| gwUj wbtP `wcz btj i gva`ŋg MtQi tMvovi KvQvKwQ RvqMvq cmb mieivn Kiv nq| `KukK wvj i gva`ŋg cmb lcti DŋV MtQi cmbi Pwv`v ci-Y nq| G cXWZŋZ gwUj wbtP 10-25 tmwUvUvi e`vm wenkó cåvb bvjv `vcb Kiv nq| cåvb bvjvi mŋ½ mgŋKvŋY 5-10 tm.wg. e`vŋmi cŋž msL`K kvLv bj mgvšivj fivte gwUj wbtP emvŋbv `vŋK| kvLv btj i Mtq wKQY t`ci ci wQ`ev tPK fivŋ `vŋK| tPK fivŋ cmbi Pŋŋc tLvŋj Ges eÜ nq| Avi wQ`ŋ RvqMvq KvV Kqv v ev cv`ŋi i UŋKiv w`ŋq tXŋK ivLv nq| Gi dtj btj i wQ`w`ŋq cmb RwgŋZ tewiŋq AvmŋZ cviŋi | wKš` Rwg t`tK gwUj btj i tFZŋi c0ek KiŋZ cviŋi bv|

cåvb I kvLvbj `vctbi `i-Zj I Mfxi Zv gwUj eytU, dmj I Avenl qvi Dci wbfŋkxj , hv I Dfŋq tŋtŋ Mfxi Zv c0q GKB aiŋbi nŋq `vŋK| nvj Kv eytUi gwUŋZ cåvb I kvLvbtj i `i-Zj I Mfxi Zv DfŋqB teuk nq Ges fwi eytUi tejvq Kg nq| Mfxi Zv 50-75 tmwg I `i-Zj cåvb bvjvi tŋtŋ 50-100 wUvi I kvLvbj vi tejvq 10-15 wUvi chšl|

**fjbæ' tmPi mjev**

fvg ev cmbi AcPq nq bv| cmbi ubqšY mnRmva`| Aí cmb w`ŋq teuk RvqMvq tmP t`qv mæ| Lvŋvi hšŋwZ Pj vPŋj ev Kul Kŋg`e`vNvZ mŋp Kŋi bv| fvg ŋtqi mæbebv `vŋK bv|

**Amgav**

c0\_ugK chiq LiP AZ`šiteuk| btji u0`ct\_ ev msthM`-tj MtQi ukKo ev gnu c0ek Kti weNami0 ntZ cvti | tgiugtZi LiP teuk|

**eI/Dcui tmP c×uZ**

G c×uZtZ nij Kv avZe A\_ev cm0K btj ukQy`i-ci ci bRj (imAb hš) hš Kiv\_vtK| btji e`im 5-10 tmUugUvi I`N°8-20 ugUvi nh| bj\_`tjv GKuUi mt½ Ab`uU hš Kiv nq| btji GK gv\_v GKuU cvt`uii mt½ hš vtK I Ab` gv\_v eU\_vtK| cv`u Prjyntj btji tfZti Pic m0 nq Ges bRtji gva`tg cmb mtRvti epi gZ uQuUq cto| bj\_`tjv c0qvRtb GK t`qZ t\_`tK Ab` t`qZ mnR Avbv tbqv Kiv hvq| bRj\_`tjv Nyqgub\_vKvi dtj cmb Pviw`tK mgfite Quotq cto| eI` tmPi Rb` c0qvRbxq DcKiY`vqvriteI emt`bv nq|

**eI` tmPi mgeav**

mgZj I D0bPzDfq cKvii Rigi Rb` Dc`thvMx| Zte cinno D0bPzRigtZ Ges tetj ai`bi RigtZ (hvi cmb aviY` qgZv LyB Kg) AZ`šDc`thvMx| Aí cmb 0vivi teuk RvqMiq tmP t`qv hvq| cmbi AcPq nq bv ev RjvexZvi tKiv m`tebv vtK bv| meP mgfite tmP t`qv hvq| th tKiv dmtji tejvq AwZ Dc`thvMx| tmPi cmbi mt½ mvi I KxUvikk c0qvm Kiv m`e| bj\_`tjv GK RvqMv t\_`tK Ab` RvqMiq mnRB`vivišli Kiv hvq|

mgZj I D0bPzDfq  
cKvii Rigi Rb` eI`  
tmP Dc`thvMx| Zte cinno  
D0bPzRigtZ Ges tetj  
ai`bi RigtZ (hvi cmb  
aviY` qgZv LyB Kg)  
AZ`šDc`thvMx|

**Amgav**

c0\_ugK LiP teuk| c0j evqyc0vni tmPi e`vNvZ m0 KiZ cvti Ges ev`uxfetbi gva`tg cmbi ukQyAcPq nq| cmb cvZvq cto etj cvZvq tivMmi c0`vpe NUvi m`tebv vtK| hšc`vZ cweentY tek LiP cto|

**tdUv tmP**

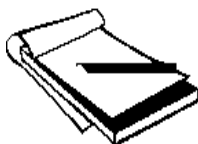
G c×uZtZ cij\_u\_b ev iveri ubugZ c0vb bj\_` kvLvbj Ges evnM0b I cmb mieivn BDvbtUi Rb` t0vivi fvj`fi c0qvRb nq| cmbi Drmi Ae`vb Atc`qvKZ.D0zRvqMiq bv\_vKtj tQvU GKuU cvt`uii`iKvi nq| c0vb I kvLvbj tK MtQi KvQ ubtq mieivn btj msthM`w`-tjB cmb t0vuvq t0vuvq tei ntZ`iiaKti| Atc`qvKZ.`fi`fi Aew`Z MtQ Ges Priv Kjtq tmP t`qvi Rb` G c×uZ AZ`šDc`thvMx| ZvQvov eo e`qvRvZvq dj MtQ G c×uZtZ tmP t`qv hvq|

**tdUv tmPi mgeav**

cmb ev Rigi AcPq nq bv| fig` qitqi m`tebv tbB, Aí cmbtZ teuk`qY tmP t`qv hvq, cmbi ubqšY mnR| tmPi cmbi mt½ mvi ugukZ Kti c0qvm Kiv m`e|

**Amgav**

c0\_ugK LiP AZ`šiteuk, t0vivi dmtji tejvq Abg`thvMx| cmbtZ gqjv\_vKtj ev th tKiv Kvi`Y evnM0gb btji gly`eU ntq tmPi e`vNvZ NUtZ cvti | nij Kv e0vUvi gnuUv Lv`vcr`vb PBtq ukKtoi bvm`tji evBti Ptj thtZ cvti |



**Ablyj b (Activity):** Avcbvi GjvKvq mPivPi Drcb0nq Ggb dmj mgjni biv Ges c0Z`KvUi Rb` Dch` tmP c×uZi biv Kvi bmn m0vivi k Kiab|

**tmP hšcwZ**

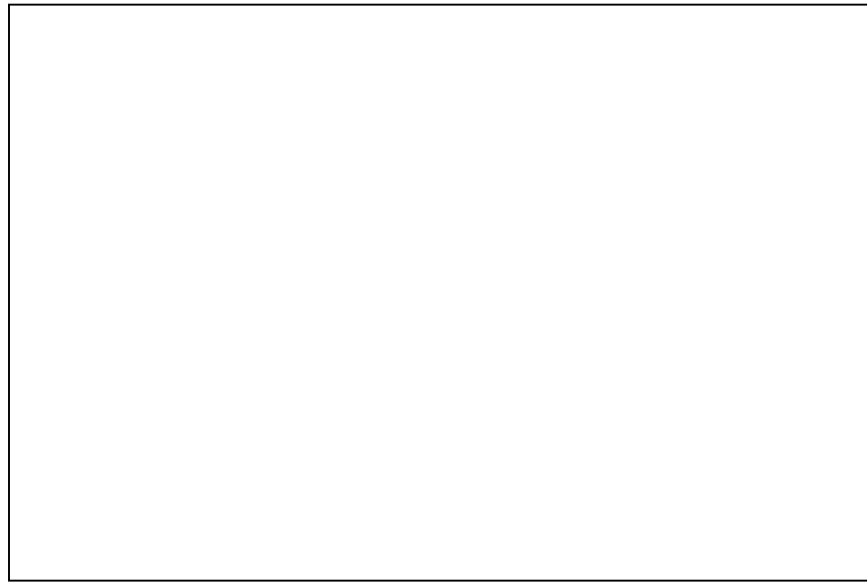
evsj vt̄ tk wKQy w̄ b ce<sup>o</sup>chšI I cāvb tmP hšcwZi gta" uQj t̄ vb, tmDwZ Ges `gKj (cyl qvi c<sup>u</sup>ú) | eZgvtb bj Kc, AMfxi bj Kc I Mfxi bj Ktci e"envi w̄ b w̄ b epx cvt"Q | cvK-fviZ Dcgnvt̄ tk cPwj Z tmP hšcwZi gta" uQj cwmqvb úBj (Persian wheel) BwRcwkqvb ٢٤ (Ezyption screw) tgvU (Mhote) wctKvUv BZ" w̄ | Gt̄ i e"envi I w̄ b w̄ b Ktg Avm̄tQ | wbtP mPivPi e"eüZ tmP hšcwZ, t̄j vi eYb̄v t̄ qv n̄tj v:

**t̄ vb (Swing shovel)**

uUb, KvV ev t̄j v̄vvi cvZ w̄ t̄q w̄bugZ G tbšKvKwZi hšjU j p̄q 2.5 - 5 ugvUvi, cvt̄k Ges Mfxi Zvq h\_v̄m̄t̄g 25-30 Ges 20-25 tmwUngUvi | Gi GK gv\_v tLvj v I Ab" gv\_v eÜ I wKQy evKv I miæ | AvovAmofivte `jt̄v evtki Ljdi I ci w̄ t̄q cvZv j p̄ Ab" GKwU evtki GK gv\_vq t̄ vt̄bi evKv eÜ gv\_wU `wo w̄ t̄q mshȳ \_vt̄K, Ab" gv\_vq GKwU I Rb teťa t̄ I qv nq | GKRB t̄j vK cmbi I cti evtki GKwU gvPvq `wot̄q t̄ vbwU Pij bv Kti b |

t̄ vb 1 NsUvq 2000-3000  
M'vj b cmb 1 ugvUvi chšI  
wbP t̄ t̄K DVt̄Z cvti |  
t̄ vt̄bi cmb avi Y ١٩gZv  
12-16 M'vj b |

t̄ vb 1 NsUvq 2000-3000 M'vj b cmb 1 ugvUvi chšI wbP t̄ t̄K DVt̄Z cvti | t̄ vt̄bi cmb avi Y ١٩gZv 12-16 M'vj b | nvl i/wej GjvKvq Kg D"PZvq cmb tm̄Pi Rb" GwU AwZ Dc̄t̄vMx |



wP̄ 4: t̄ vt̄bi m̄v̄vth" cmb tmP

tmDwZi cmb avi Y ١٩gZv  
1.5-2 M'vj b Ges c̄t̄q 1.5  
ugvUvi wbP t̄ t̄K 1 NsUvq  
1500-2500 M'vj b chšI  
cmb tmP t̄ qv hvq |

**tmDwZ (Swing basket)**

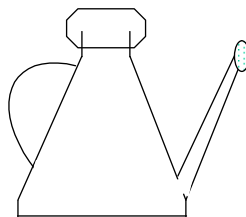
GwU evtki PvUvB ev uUti cvZ ev tet̄zi `Zwi w̄ f̄RvKwZi hšj | hšjU migt̄bi `jt̄KvY `jt̄v Ges w̄cQ̄t̄bi t̄KvY `jt̄v j p̄ `wo etav \_vt̄K | `w̄K t̄ t̄K `Rb t̄j vK c̄Z̄ t̄K `jt̄v `woi gv\_v āti hšjU t̄K t̄ vj bvi gZ `w̄ t̄q cmb I Vvq | tmDwZi cmb avi Y ١٩gZv 1.5-2 M'vj b Ges c̄t̄q 1.5 ugvUvi wbP t̄ t̄K 1 NsUvq 1500-2500 M'vj b chšI cmb tmP t̄ qv hvq | m̄v̄v bZ D̄Bz RvqMvq tmP t̄ evi Rb" tmDwZ e"eüZ nq |



vP7 5: (K) GKwU tmDwZ; (L) tmDwZi mnvth" cwb tmP

**SvSvo**

GwU `f cwi mi evMv7b A\_ev d7Mv7Qi U7e tmP t`qvi Rb" AwZ cwi vPZ Ges e7j e"euZ GKwU h7j GwU evj wZi gZ ev tQvU W77gi gZ, wU7bi cvZ w`7q `Zwi | h7jU i`vm 30-35 tmwUngUvi Ges D"PZvq 40-45 tmwUngUvi | G7Z l c7i i w`7K GKwU nvZj (enb Kivi Rb") Ges cv7ki w`7K GKwU nvZj (cwb tmP t`evi Rb") \_v7K | tmP nvZ7j i weci vZ w`7K SvSvov i Mv7q w7P t`7K j v7 GKwU mi eivn bj \_v7K, b7j i gv\_vq A7bK\_7j v wQ`h7 SvSvov i gva7g cwb ev7i gZ Qwotq c7o | b7j i D7ev cv7k SvSvov l c7i i w`7K cwb f7vZ Kivi Rb" GKUv tLij v g7 \_v7K | Gi av i Y 77gZv 2-3 M7j b |



vP7 6: SvSvo

**uDel t qj ev PrcKj**

uDel t qj i mrvth" gnuji tek ubP t\_ik miæcivBtci gva'tg civt'úi Prc cumb Dtv Avtm/ GtZ Aí cwi gvb RvqMvq t mP t`qv mæe| AvRKvj GKB aitbi weifbrebvtgi Ges cumb DtÉvj b ¶lgZv wekó PrcKj D"weZ ntqtQ| G, t jvi mrvth" nvtZi Prc, nvtZ tUtb A\_ev civtqi Prc cumb DtÉvj b Kiv nq|

**cvi qvi civú ev `gKj**

Giu we`yr ev tKti wmb/wMtrj Pmj Z tQvULvU civú hvi cumb tmtpi ¶lgZv 0.5-1 uKDtmK\* chSnq|

**AMfxi/Mfxi bj Kc**

G`yUv t mP htšj Kvtrí aib GKB iKtgi | Giv we`yr ev wMtrj Pmj Z tgvUtii mrvth" gnuji tek ubP t\_ik fMf' cumb fctó ubtq RvgtZ mieivn Kti | bvg t\_ik thgbuU tevSv hiv AMfxi bj Ktci tPtq Mfxi bj Kc tenk ubP t\_ik cumb I vtz m¶lg Ges tZgub Gt`i Kg¶lgZvtZl Kg tenk AvtQ| AMfxi bj Kc I Mfxi bj Ktci cumb DtÉvj b ¶lgZv tgvUtii kw<sup>3</sup> i Dci wbfP Kti, Zte Gt`i cumb DtÉvj b ¶lgZv mvari YZ h\_vµtg 0.5-1 Ges 2.5-4 uKDtmK Ges Mfxi Zv h\_vµtg 20-70 ugvU Ges 40-150 ugvU ntq\_vtK|

GKuU AMfxi bj Kc w`tq 2-4 tn±i Ges Mfxi bj Kc w`tq 10-25 tn±i RvgtZ t mP t`qv hiv|

AMfxi bj Kc I Mfxi bj Ktci cumb DtÉvj b ¶lgZv mvari YZ h\_vµtg 0.5-1 Ges 2.5-4 uKDtmK Ges Mfxi Zv h\_vµtg 20-70 ugvU Ges 40-150 ugvU ntq\_vtK|

**ub@vkb (Drainage)**

msAv t dmj t¶tZi g<sup>3</sup> ev AwZwi<sup>3</sup> cumb (tMbfUkbyj I qvUvi) Acmvi tYi c@µqvK ub@vkb etj |

gvUtZ th cumb gvUKYvi m½ ugtk\_vtK ZvtK figiml ejv nq| figim wZb cKviti t

**K) tkwl Z cumb (Hygroscopic water)**

gvUKYvi Pvi civt 10,000 t\_ik 31 evqgÚj xq Prc t j tM\_vKv AwZ civZjv t`ii cumb tK tkwl Z cumb etj | G cumb Dw<sup>m</sup> tkvl Y Ki tZ civti b|

**L) %kK cumb (Capillary water)**

tkwl Z cumb t`ii evBti 31 t\_ik  $\frac{1}{3}$  evqgÚj xq Prc gvUKYv t j tM\_vKv t`ii cumb tK

"kK cumb etj | Dw<sup>m</sup> G cumb tkvl Y Ki tZ civti, Zte meUKzbq - cumbi th t`li  $\frac{1}{3}$  t\_ik 15 evqgÚj xq Prci gta" itqtQ tKej gv t mUKzcumb| Kvi Y Gi tPtq tenk tkvl Y ¶lgZv MvtQi tB|

evqgÚj xq Prc  $\frac{1}{3}$  Gi tenk ntj civZvi mtZR five Avt`Avt`lKtg civZv tbwZtq cotZ i iæ Kite| ZLbB tmtpi c@qvRb etj eStZ nte| G Ae`vq cumb t mP w`tj civZv Avevi mtZR ntq DVte| cumb tkvl tYi dtj "kK cumb t`li hZB civZjv nte civZv tbwZtq cov Ae`vi ZZB AebwZ NUte| G Ae`v Pj tZ Pj tZ cumb t`li hLb 15 evqgÚj xq Prc tcvte ZLb

\* 1 uKDtmK = c@Z tmKtU 1 uKDveK dlt (62.4 civDU) cumbi c@v|

tmP w`tj l tbwZtq cov cvZv Avi cteP mžZR Ae`lq wdži Avmte br- MvQ gti hvte| G chiqk ÒDBj ušs tKwdnk:q:UÓ (Wilting co-efficient) etj | KvRB tmP w`tZ ntj Aek`B G Ae`lq tcŠQvi AvtMB w`tZ nte, cti w`tj Zv tKvb KvRB Avmte br| ÒDBj ušs tKwdnk:q:UÓ Bj w=-K e`i ÒBj w=-K tduUšMi Ó (Elastic fatigue) mž½ Zjybrq|

**M) gš/AvZwi<sup>3</sup> cwb (Gravitational/Free/Excess water)**

ˆKukK cwb ˆfi i evBti  $\frac{1}{3}$  evqšUj xq Pvtci wbtP Aew`Z th tKvb gvšci cje ˆfi i cwbkK gš/AvZwi<sup>3</sup> cwb etj | G cwb Dv`i MhYthvM` bq Ges th tKvb w`tK gš fite Pj vPj Ki tZ cvti | w`vktbi gva`tg G cwb Rvq t`tK Acmmi Z nq|

wfbacKwZi GKwU D`vni Y t`tK figi žmi aiY m`utK`GKUr `Q avi Yv cvl qv th tZ cvti | GKwU igvj tK cwb tZ wfmRtq l cti l Vtbr gvB tek wKQyv cwb Sti covi cil tduvq tduvq wKQyv cwb cotZ `vKte hv GKmgq t`tg hvte| G chiq th cwi gvY cwb Sti cotj v Zv tK gš/AvZwi<sup>3</sup> cwb mž½ Zjybr Kiv th tZ cvti | tFRv igvj Ur tiv` Qvotq w`tj igvj t`tK cwb Dto wMtq igvj Ur i wKtq hvte| Gevi th cwi gvY cwb Dto tMj Zv tK ˆKukK cwb mž½ Zjybr Kiv th tZ cvti | iKtbr igvj w`tK Gevi Bw`i Kiv ntj t`Lv hvte Gerš l mgvb` cwi gvY cwb ev`ui AvKv i igvj t`tK tevi tq tMtQ| th cwb UKzer`u ntq igvj t`tK tevi tq tMj Zv tK tkwv Z cwb mž½ Zjybr Kiv th tZ cvti |

AvZwi<sup>3</sup> cwb gwU i UevqšK Acmmi Z Kti Av tRtbi Afie mšp Kti, hvi dtj gš i kjmKvth`e`NvZ NtU, DcKvix gvEKv RievYy Kvhšg l eskepx evvMš nq|

**AvZwi<sup>3</sup> cwb i qvZKi cšie**

AvZwi<sup>3</sup> cwb gwU i UevqšK Acmmi Z Kti Av tRtbi Afie mšp Kti, hvi dtj gš i kjmKvth`e`NvZ NtU, DcKvix gvEKv RievYy Kvhšg l eskepx evvMš nq| AvZwi<sup>3</sup> cwb RvqtZ Rj vevZv mšp Kti, hvi dtj MvQi gš i evx l w`li Ktq hvq, dmtj tMvovPv ti vM t`Lv t`q, gš i evx br nlqv gwU wbtPi ˆfi i Lv`vcr vb MvQ wbtZ cvti br| AvZwi<sup>3</sup> cwb `vKvi Rb` RvqtZ Aew`Z Lv`vcr vb AšbK mgq AMhYthvM` AvKv i i cvššri Z nq, thgb- NO<sub>3</sub> (bvBšU) t`tK NO<sub>2</sub> (bvBUšBU), SO<sub>4</sub> (mij tdu) t`tK SO<sub>2</sub> (mij dvBW) BZ`w` | AšbK t`qš t`vcr v`vbi AfiveRvBZ j qšYI t`Lv t`q| thgb- evsj vt`ki tFRv A`ev m`vZ tmtZ gwU tZ MUK (S) Ges `li (Zn) Afive| ZvQvovl AvZwi<sup>3</sup> cwb Rb` mšp Rj vevZv gwU Zvcgvšv Kvgq evR AsKžv Mšg Ges MvQi evx tZ Amšev mšp Kti, gwU ŐtRv Ae`lq AvmžZ t`ix nq Ges ecb wšj w`Z nq|

**w`vkb c`vZ (Methods of drainage)**

cwb w`vktbi gj-Z `šv c`vZ i tqtQ, thgb -

**Dgš bjj v c`vZ (Open drainage)**

Rvq t`tK gš ev AvZwi<sup>3</sup> cwb tLjv bjj vi gva`tg Acvvi Y Kiv tK Dbkš bjj v c`vZ etj | Dbkš bjj v c`vZ tZ gwU tZ tek wKQyv` cici Ašc`vKZ. Mfxi bjj v (c`v bjj v) Kti Gt`i tK b`x, wšj ev eo cšž mshš Kti w`tZ nq| c`v bjj vi `šcv t`tK wv`š `j tZ tek KZK` tjj v Ašc`vKZ. Kg Mfxi bjj v (kvLv bjj v) c`v bjj vq hš Kiv nq| Rvq t`tK evš cwb ev fMf` AvZwi<sup>3</sup> cwb kvLv bjj v Ges c`v bjj vi gva`tg b`x, wšj ev cšž Acmmi Z nq| Gme bjj vi `j ž; l Mfxi Zv tmLv Kv evš cvšzi cwi gvY, gwU ešU, Avev`KZ. dmj BZ`w` i Dci wšfP Kti | c`v bjj vi `i ž; l Mfxi Zv h`v p tšg 100-300 wšv Ges 1.5-3 wšv l kvLv bjj vi `i ž; l Mfxi Zv h`v p tšg 50-150 Ges 1-2.5 wšv ntq `vK| gwU nvj Kv aišbi (tetj) l wšcvZ Kg ntj bjj vi `i ž; tenk l Mfxi Zv Kg

Ki tZ nq| Avevi fwi ebtUi gmltZ (Gtlj) I epoeuj AA t j bij vi `i-Z; Kg I Mfxi Zv teuk Ki tZ nq|

**ex bij v cxiZ (Closed drainage)**

Rug t tK gmlUi mbP w t q exbij vi gva t g gy ev AwZwi<sup>3</sup> cmb Acmvi YtK exbij v cxiZ etj |

exbij v cxiZ weifbai Ktgi ntZ cfti | thgb- UvBj cxiZ, ivej (byocv\_i) cxiZ| mbtP euj cPij Z UvBj cxiZ m=utK Avtj vPbv Ki v ntj v|

**UvBj cxiZ (Tile or pipe drainage)**

G cxiZ tZi Dbtj bij v cxiZi gZ weifbae` i tZ; cavn I kvLv bij v \_vtK| Zte G t i Mfxi Zv GKUZKg teuk nq| Gme bij v `Zwi Kti bij vi gta` 20-50 tmlUgUvi e v tmi Ges 50-80 tmlUgUvi `i tZ; gmlUi UvBj A \_ev cmok cvBc emv tZ nq| UvBj emv t bvi Av tM bij vi Zj t` tk gmlUi ev im t g tUi u ve emv t q ev gmlU Pmctq gReZ w fZ Kti t b l qv nq hv tZ UvBtj v j vBb GKB mgZtj Ae`vb Kti | Gevi UvBtj i msthvM` j PU, KvMR ev LoKlv w t q tXtK w t q gmlU t dtj me, t j v bij v eU Kti w t Z nq| G t Z Rugi Dcmi f v M Avevi mgZj ntq hvq| wKQy t bi gta` ` B UvBtj i msthvM` t j i PU, KvMR ev LoKlv ctP hvq Ges ZZ w t b bij vi gmlU k<sup>3</sup> ntq etm hvq| G t Z UvBtj i t fZti gmlU Xk t Z cvi te bv Ges msthvM` t j i gmlU i tUi t fZi w t q AwZwi<sup>3</sup> cmb Pbtq Pbtq cU t g kvLv bij v I cti cavn bij vi w fZi w t q w b w m k Z ntq hv t e| D t j L, cavn bij vi tkl c t s i 2-3 w gUvi ch S i Rv q Mv cvKv Kti w t Z nq Ges UvBj bij vi tkl c t s i Z v t i i Rv j w t q g y o t q w t Z nq hv t Z UvBj bij v f v i ev UvBtj i t fZti B u j Rv Z x q t Qv U c O v X z K ev gmlU D w t q bij vi g l y e U K t i t` qvi t Kvb m = t e b v b v \_ v t K |

Dbtj bij v cxiZi gZ UvBj cxiZ tZi bij vi `i-Z; I Mfxi Zv epocvZ, gmlUi cKwZ. I dmtj i Dci w b f P Kti Kgtewk Ki tZ nq| nij Kv ebtUi gmltZ Ges Kg epocv t Z i Gj v Kvq bij vi `i-Z; I Mfxi Zv teuk Ges epoeuj AA t j Ges fwi ebtUi gmltZ bij vi `i-Z; I Mfxi Zv Kg Ki tZ nq| G cxiZ t Z bij vi `i-Z; I Mfxi Zv h \_ v m t g 50-250 w gUvi I 1.0-2.5 w gUvi ntq \_vtK|

**Dbtj bij v cxiZi mjav**

Awak cwi gvY I AwZ `Z cmb w b w m k Z nq, cmb w b w k b q g Z v teuk, epoeuj I Gtlj gmlU mg x AA t j i Rb` AZ` s i Dc t h v M x I Kv h R i | cmb c e v t n i w e N a v U t j Z v m n t R B ` i K i v m = e | bij v c x i Z I i q Y v t e q t Y i L i P A t c q v K Z . K g |

**Amjav**

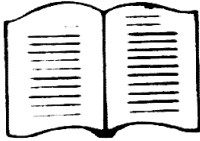
bij v `Zwi t Z c P z cwi gvY dmj x Rug b o nq, wKQy t ci ci bij v \_vKvi Rb` Kw h s c w Z P j v P t j Ges Kv R K t g w e N a m j o n q | Av M v Q v R t b x I gmlU c t o bij v f i v U ntq hvevi m = t e b v \_ v t K | Av M v Q v c w i w i I i q Y v t e q t Y i t e k L i P n q | f u g q t q i m = t e b v t e u k \_ v t K |

**exbij v cxiZi mjav**

w b w k b bij v gmlUi mbtP \_vtK etj dmj x Rugi AcPq nq bv, Kul. h s c w Z P j v P t j ev Kul K t g w e N a m j o n q b v | Av M v Q v R t b x ev t f t 1/2 b o n e v i m = t e b v K g | n i j K v e b t U i g m l U t Z Ges Kg epocvZ AA t j AZ` s i Dc t h v M x I Kv h R i | G K e v i c U Z w o Z n t q t M t j c t i i q Y v t e q t Y i L i P t b B e j t j B P t j |

**Amšav**

cŃ\_igK ũbgŸ LiP AZ`šl tenk | cmb ũb`vk b ŸlgZv AtcŸvKZ.Kg | Gttlj gmltZ ev  
epŃeuj AĀtj i Rb` tZgb DcŃhvlMx bq | cmb ũb`vk b weNæNUtj KviY ũbiŸcY Kiv KũMb  
Ges tgi igZ Kiv e`qma` |



**migg®**

evsj vt`k eml R Mo epŃcvtZi cwi gvb chŸß nlqv mŃEj t`tki weŸfbæGjvKvq Ges  
ermŃi i weŸfbæmgŃq G epŃcvtZi myg eŸUb bv nl qvi evsj vt`ki Rb` tmP I ũb`vk b  
AZ`šl iæZcYŸ tmtPi cmbi cĀvb Drm,tjv ntjv b`xbvjv, Luj nej, cKz, Mfxi I AMfxi  
bj Kz cŸwZ | cĀvbZ Pvi cKvti i tmP c×wZ itqtQ, h\_v: f;cŸ; fŸbæ; eŸ I tdlv  
tmP c×wZ | Gt`tk mPivPi e`eüz tmP htšj gta` itqtQ t`vb, tmDwZ, SvSwo, PvcKj,  
crl qvi cŸú, Mfxi Ges AMfxi bj Kc cŸwZ | ũb`vk b cĀvb `ŸUv c×wZ ntjv Dbš  
bijv c×wZ Ges ex bvjv c×wZ |



### cvVhEi gj'iqb 6.3

mWVK DEti i cvtkqUK wPy (v) w b|

1| esj vt`tk mePvBtZ tenk eppcvZ nq tKvb&`vtb?

- K) j vj vLvj
- M) j vj gmbi nvl

- L) j ij cij
- N) j ij gvB cvnvo

2| tKvb&gvfm metPtq tenk eppcvZ nq?

- K) Rvbgvix
- M) RjvB

- L) GwCj
- N) A±vei

3| cvLextZ KZ i Ktgi tmP cxwZ Pij yAvtQ?

- K) 2 cKvi
- M) 6 cKvi

- L) 4 cKvi
- N) 8 cKvi

4| t`vb KZ Mfxi Zv t`tk cvmb DVvtZ cvti?

- K) 0.5 wgvUvi
- M) 1.5 wgvUvi

- L) 1.0 wgvUvi
- N) 2.0 wgvUvi

5| Dv`c gvU t`tk tKvb&ai tbi cvmb tkvIY Kti?

- K) `KwK cvmb
- M) tkwL Z cvmb

- L) gv` cvmb
- N) eppoi cvmb

6| GKwU Mfxi bj Kc KZ tn±i RvgtZ tmP w`tZ cvti?

- K) 5-15 tn±i
- M) 15-30 tn±i

- L) 10-25 tn±i
- N) 20-40 tn±i

7| Db`y bij v cxwZ tKvb&AAtj i cvmb wv`vktbi Rb` AZ`šI kvhRi?

- K) eppnxb AAj
- M) gavy AAj

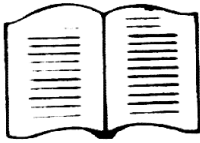
- L) eppéuj AAj
- N) eppéuj Gtlj gvUmgx AAj

### cw 6.4 dmj mSMh, mSMhni mgq, mSMh c`wZ, gvovB, SvovB, iKv`bv I ,`vgRvZKiY



G cvV tk`l AvcmB

- ◆ dmj i cwi c°Zv m`u`tk`ej tZ cvi`teb|
- ◆ wefbaedmj i cwi c°Zvi j`fY ej tZ cvi`teb|
- ◆ dmj mSMhni mgq ej tZ cvi`teb|
- ◆ dmj mSMh c`wZ eY`v Ki tZ cvi`teb|
- ◆ dmj gvovB, SvovB, iKv`bv Ges ,`vgRvZKiY c`wZ eY`v Ki tZ cvi`teb|



me dmj i dj b ev Drcw`Z cY` thgb GKikg bq, tZgub Gf`i cwi c°Zvi aibl wfb` wefbae`enkó` Øviv Gf`i cwi c°Zvi ubi`icZ nq| Mv`Qi wefbaeAsk dj b wntmte MY` ntq ,`v`K thgb- exR, Avk, KvU, cvZv, ifciv`hZ KvU, dj BZ`w`| fij dj b tctZ ntj mgqgZ dmj mSMh Kiv DvPZ| Zv bv Kiv ntj dmj i ,`YMZ gvb Ges dj b DfqB` f`wZM` nq|

dmj i cwi c°Zv`Øi Ktgi ntZ cvi`- t`nZw`EK cwi c°Zv I e`eniv`icthvMx cwi c°Zv| GKwU cvU Mv`Qi dj bv cvKv ch`S`Zvi t`nZw`ZK cwi c°Zv Gtm`Q etj MY` Kiv hvte bv| cvi`Ui Avk thLv`b gly` dj b tm`f`f`T Zvi e`eniv`icthvMx cwi c°Zv A`bK Av`MB - A`\_f` d`z aiv Ae`vqB P`j Av`m| Ab` w`f`K Avj yev w`qvR Mv`Q cwi YZ eqtm i`w`Ktq th`Z i`ia Kij aiv th`Z cvi` Gf`i t`nZw`EK cwi c°Zv Gtm`tM`Q| w`K`hZw` b ch`S`Gme Mv`Q gti c`j`v`v` i`w`Ktq bv hvq ev gv`Ui Av`Zv f`x`Yfite bv Ktq Av`m ZZw` b Gf`i e`eniv`icthvMx cwi c°Zv Gtm`Q etj aiv w`K nte bv| Kv`Y Gf`i`K Av`MB mSMh Kiv ntj Gf`i msi`f`Y ,`Yvej x`A`bKv`st`k Ktq hvq|

#### dmj mSMh (Harvesting)

e`eniv`icthvMx Ae`vq dmj i dj b ev Drcw`Z cY` mSMh Kivi c`u`qv`K dmj mSMh etj |

msAv` : e`eniv`icthvMx Ae`vq dmj i dj b ev Drcw`Z cY` mSMh Kivi c`u`qv`K dmj mSMh etj |

#### dmj mSMhni mgq

th Df`i`k`B dmj Drcv`b Kiv tnvK bv tKb Dch`Ø mg`qi Av`M ev c`ti dmj mSMh Kij wefbae`vte dj b f`wZM` nq| AwZ gv`vq cwi c°Zvi Rb` aiv ev M`gi kvl t`f`t` cto A`\_ev exR S`ti cto| tLmvi x, gmy, tQiv v, mwi lv, wZj, wZwm, BZ`w` i tej vq dj (cw) tdtU hvq Ges exR S`ti cto| ZvQvor AwZcwi c° dmj gv`v tenk w`b`v`Kvi Rb` cvwL Ges tP`ti i Dc`el ew`x` cvq| Ab`w`f`K Kg cwi c° ev Acwi c°Zvi Rb` dmj i dj b Ges ,`YMZ gvb Lvivc nq, dmj i exR c`y` nq bv, Mv`Qi cY`Zv`c`w`B N`tu bv| GQvor exR I R`b` nvj Kv nq, AsK`z`v`Mg` f`lgZv` nwm` cvq, tiv`M` evj`vB` ev tcv`Kv`v`Kto`i Av`m`g`f`Yi` c`Z`ti`va` f`lgZv` Ktq Av`m, ,`vgRvZ` K`ti` i`v`Lv` hvq` bv| Wv`j` Rv`Z`x`q` dmj`i` tej`vq` Av`m`g`f`li` cwi`gv`Y` Kg` nq, tZj` Rv`Z`x`q` dmj` tZ`j`i` cwi`gv`Y` Ktq` hvq|

k`m`i` Df`i`k`f`f`i` A`b`K` t`f`f`i` dmj mSMhni mg`qi Zvi Zg` cwi j`w`f`Z`

k`m`i` Df`i`k`f`f`i` A`b`K` t`f`f`i` dmj mSMhni mg`qi Zvi Zg` cwi j`w`f`Z` nq| thgb Av`MB evj` ntq`Q, Av`tki` Rb`` cvU` Pvl` Kij` d`z` aivi` mgq` dmj mSMh` Kij` nq, Zv` bv` ntj` Av`tki` ,`YMZ` gvb` (pZv, J`3/4`j` ) Lvivc` ntq` hvq| GKB` cvU` h`w` ext`Ri` Rb`` Pvl` Kiv` nq` Zvntj` cY`cwi c°Zv A`\_f` exR` bv` cvKv` ch`S`A`tc`f`lv` Ki tZ` nq| Zv`Z` Av`tki` dj b w`KQv`v` exto` w`K`S` Av`tki` ,`YMZ` gvb` Lvivc` nq|

AþK mgq wfbæcw wZi KviþY cwi c°Zvi mwK mgþqi cþeB dmj mSMh Kiv nq, thgb- eb'vi cwbtZ Wþe hvevi mæbebv \_vKþj AvDk avb Ges Kij `ekvLxi wkjveþ t\_þK i þv tctZ teþiv avb wKQYv Acwi c° \_vKv Ae`vq mSMh KiþZ nq| Avevi KLbl KLbl teþk `vþg wþv i Rb` mwK mgþqi AvþM dmj mSMh Kiv nq thgb- Avj yevavKw, wk g cþwZ|

AvþLi wþj i A\_er AvL gvovB Kþj i cþvBi mþhM-mþeavi Dci AvþLi dmj mSMhni mgþqi tek tniþdi nþZ cþvi | avb, cvU BZ`w` dmþj i teþvq me\_þj v exþRi cwi c°Zv cþq GKB mgþq (~f mgþqi e`eavþb) Avþm etþ Zv` i dmj mSMhni mgq wþvctþY tKvb mgm`v nq bv| wKŠ`mw i v ev Wþj RvZxq dmþj i teþvq me exþRi cwi c°Zv `xN`þbi e`eavþb Avþm, A\_þ MvþQi wþþPi Aþki exR tctK tMþj l Dcti ZLbl dþ t`Lv hvq| Gme tþþþ 70-75% exR cvKvi mgq dmj mSMh KiþZ nq| Avevi wKQYvKQYdmþj i tþþþ dmj mSMhni tKvb wþv` þ mgq bþþB- (thgb WvUv, gþv, cvj skvK, j vj kvK, Avj ymeþ mvi, tMv-Lv` dmj BZ`w`) | G\_þj v `xN`mgq hver e`enþi vctþvMx|

**dmj mSMh cþwZ**

dmþj i cKwZ. Abyvþi wfbæcwþwZþZ dmj mSMh Kiv nq| thgb -

**K) MvþQi tMvov tKþU mSMh**

cwi c°Zvi j þY t`Lv w`þj `v, Kwþ ev tKv`vj w`þq MvþQi tMvov tKþU mSMh Kiv nq| avb, Mg, cvU, AvL BZ`w` dmþj i teþvq G cþwZ DctþvMx| avb, Mg BZ`w` ZÜj dmþj i teþvq tMvov gvU i wKQYv cþi KvUþj l þwZi mæbebv \_vþK bv| Zþe cvU ev AvL dmþj i teþvq A\_þ hþ` i KvÜ dj b mnvqK tm me dmþj i tþþþ KvÜ gvU l Lþ KvQvKwQ KvUv DvþZ| tKbbv gvUþZ t\_þK hv lqv tMvovi w`þki KvþÜi Ask t\_þK cþvUi Avka, cvUKwv A\_er AvþLi i m bv cv l qvq dj b nwm cvq|

**L) MvQ gþj vrcvUþ Kþi/Dcwoþq mSMh**

Wþj RvZxq dmj thgb tLmvi x, gmj, tQvj v BZ`w` Ges `Zj exR dmj thgb- mw i v, wZwm, wZj BZ`w` i MvQ gþj vrcvUþ Kþi dmj mSMh Kiv nq| GLvþb Dþj - h` th, Wþj RvZxq MvþQi gþj bvþþUþþRb AvUKKvi x , wU \_vKvq tm\_þj v Dcwoþq ev gþj vrcvUþ bv Kþi tMvovq tKþU mSMh Kiv DvþZ| Kvi Y ZvþZ bvþþUþþRb AvUKKvi x , wU gvUþZ t\_þK wMþq tmLvþb bvþþUþþRb mi eivn Kþi \_vþK|

**M) gvU Lþo dmj mSMh**

Avj yvqwó Avj yþvþv`vq BZ`w` thme dmj gvU i wþþP nq tm\_þj v j vþj ev tKv`vj ev Ab` þKvb hþw` þq gvU Lþo mSMh Kiv nq|

**N) Pqþ Kþi mSMh**

thme dmj GKmþ½ cwi c° bv nþq wfbæcwþwZþZ cwi c° nq tmme tþþþ G cþwZ AZ`šl DctþvMx, Zþe wKQYv e`qeþj | thgb- ZvgvþKi cvZv me\_þj v GKmþ½ cwi c° bv n l qvq avþc avþc cþZ`K MvQ t\_þK 5/6 wU Kþi cvZv wþþPi w`K t\_þK mSMh Kiv nq ( GþK cþvþgs etþ ) | ZvQvov Zjv, fþv, Pv cvZv , Aoni , gvU i wU, gmKj vB BZ`w` dmþj i teþvq G cþwZ Abyv i KiþZ nq|

**cwi c° Zvi j 9Y**

dmj mSM0ni t9t` th nelqW AZ`sl ,iaZcY°tmU ntjv cwi c° Zvi j 9Y | cwi c° Zvi j 9Y mWKFvte Rvbr bv \_vKtj dmtji ,YMZgvb fxlyfite nwm cvq | ZvB wbtP KtqKuU dmtji cwi c° Zvi j 9Y eY0v Kiv ntjv:

**ZUz RvZxq dmj**

avb, Mg, f4v BZ`w` ZUz dmtj `vbw/exR cy I k3 nIqv Qvovl RvZi wR`^is aviY Ges extR cwi c° Zvi 18-25 kZvstK tbtg Gtj cwi c° ntqtQ etj eStZ nte |

**cW**

f`kx cvtUi tejvq kZKiv 50 fM MrtQ dz Avmtj Ges tZlv cvtU kZKiv 50 fM MrtQ dj aitj Avtki Rb` cwi c° etj avnq |

f`kx cvtUi tejvq kZKiv 50 fM MrtQ dz Avmtj Ges tZlv cvtU kZKiv 50 fM MrtQ dj aitj Avtki Rb` cwi c° etj avnq | extRi tejvq dtji is Kvj ntq extRi wR`^is bv av chS`cwi c° Zv Avtm br |

**Wvj RvZxq dmj, mui lv, vZj, vZwm**

MrtQ kZKiv 70-80 fM dtji exR cy I k3 nIqv Ges wR`^RvZi is aviY Kiv cwi c° Zvi j 9Y | Gi tew mgq RvgtZ \_vKtj dj tdtU exR Sti cto |

**Pxbrev`vg**

wKQyb ci ci MvQ DvWtq hr` f`Lv hvq th, Pxbrev`vg MrtQi dtji (Pxbrev`vtgi) kZKiv 70-80 fvtMi gZ cy ntqtQ Zte cwi c° ntqtQ etj aitZ nte | ZvQvov Pxbrev`vg MrtQ \_vKv Ae`vqB wKQymKQyPxbrev`vg t`tk Priv DVtZ f`Lv hvte | Pxbrev`vtgi exR cy nte, extRi tLmvi evBtii w`tki wKiv-Dcwkiv `uó nte Ges tfZtii w`tk jvj tP ev jvj tP-ev`vqx is aite | Pxbrev`vg extRi AveiYxtZl RvZi wR`^ewktó`i is f`Lv wte | Pxbrev`vg exR 0riv tLmvi tfZtii RvqMv VmrvVwm Kti cY°\_vKte Ges tKvb `uAx Kvj (Spongy tissue) \_vKte br | extR Pvc c0qvM Kijt fft½ wMtg tZtj i Dcw`wZ tevSv hvte |

**AvL**

AvL cwi c° ntjv MrtQi ewx Ktg wMtg cvZvi meR is d`vKvtk ntZ iia Kite | KvU k3 jvW w`tg AvNvZ Kijt avZe ka nte | tgvPo w`tg KvU wMovi (c`teP) gta` mntR fft½ hvte | KvU i wbtPi w`tki wMovi tPvL (Eye) tek eo ntq evBtii w`tk tewotq Avmte Ges wMovi wbtP A`wbK g`tj i ewx iia nte | A`tbK mgq Prgovq dvUj atj i tmi wgoZi (Sweetness) tek evote | KvU i me AstkB (wbtPi, gta`i Ges lctii) wgwó mgvb g`tb nte | ZLb we` wi wMs (Brix reading) Gi gvb 18-22 Gi gta` nq | Brix ntjv cwi c° AvtLi ga`w`Z Kwv c`v\_0

**ZvgvK**

Dtj L` th, ZvgvK i me cvZv GKt` cwi c° nqbr |

cwi c° Ae`vq cvZv ntjv yv f eY°avi Y Kite | cvZvi AMfM wbtPi w`tk wKQyv Stj cote Ges cvZv wKQyv Avvtj v fve f`Lv wte | cvZvi fUR Kijt fft½ hvte | Dtj L` th, ZvgvK i me cvZv GKt` cwi c° nqbr |

**Zjv**

MvQ iKvZ iia Kite Ges cvZv Sti cotZ \_vKte | c0KwZKfiteB Zjvi ej (Boll) tdtU Zjv tewitq Avmte I w`tb w`tb AvKv i ewx c`te | Zjv MvQ I ej Kvj is aviY Kite |

**tMv-Lv dmj**

tMv-Lv dmj i cwi c°Zv tKvb ubw 0 mgq tbB | Zte MtQ d3 aiv ev dj aiv chS (fÆv, tRvqvi) th tKvb Ae-vqB dmj mslMh Kiv hvq | tQvj v RvZxq dmj dj cvKv chS Ges cviv, tbcqv Nvm 30-40 w b ci ci Kvlv hvq | tRvqtii Kiv MtQ (60 w tbi Kg eqtmi) Ww b bvgK GKw MjKvmbW Drcbaeq hv MiævQji i cvK-jxtZ wMtq gviVZK wlv3 nvtWwvqvK GmWw cwi YZ nq | dtj Mew ci gviV hvq | 0gvpmi tenk eqtmi tRvqvi MtQ G wlv bó ntq hvq | ZvB tRvqtii cwi c°Zv 60 w tbi tenk eqtmi MY Kiv DvPZ |

tRvqtii cwi c°Zv 60 w tbi tenk eqtmi MY Kiv DvPZ |

**meB mvi dmj**

Gi tKvb ubw 0 mslMh mgq bvB | th tKvb eqtm Gt i tK gwUtZ wgvktq t`qv tMtj I d3dj aivi cteB cwi c°Zv aiv wK nte | Kvi Y eqm evovi m3/2 m3/2 MvQ k3 ntq hvq Ges cPtb wej 3^NtU |

**gvoVB (Threshing)**

dmj i dj b ev Drcw Z cY dmj MvQ t-tK cK KiYi c0qvvtK gvoVB etj | dmj mslMh Kivi ci hZ kvN^mæ gvoVB Kti dtj v DvPZ | Kvi Y m3/2 m3/2 gvoVB bv Kij wvfbæ fite dj tbi ev ctY i 0wZ nq | dmj tft` 0wZi cwi gvY Kgtenk ntq vtK | Zte AtbK mgq t`Lv hvq GKB dmj I cwi tekMZ Kvi tY 0wZi cwi gvYi Zvi Zg nq | thgb- AvDk aiv mslMhni mgq (RjvB-AvMó) cPz ewócvZ I Mig vKvi Rb Zv 0wB fite gvoVB bv Kij avbexR Ges Lo Dfqb ctP hvq ev extRi Avzi v Mg i iæntq thZ cvti | Ab w tK tevfv aiv ev tivcv Avgb aiv mslMhni tejvq i Kbv Avenvl qv vKvq gvoVB t`ix Kti KivZi tZgb 0wZi Kvi Y nq bv | Zte gvoVB Kivi AvM Kvlv avbMvQtk cvj v Kti 2/4 w b ti tL w tQ A\_ev fij Kti i wKtq wbtj gvoVB c0qv mnRZi nq Ges Aí mgtq AwK cwi gvY aiv gvovbv hvq | Wj vRvZxq km ev mvi lvi tejvq dmj mslMhni ci MvQtk tivt` fij Kti i wKtq bv wbtj gvoVB Kvth^Amæav nq |

Wj vRvZxq km ev mvi lvi tejvq dmj mslMhni ci MvQtk tivt` fij Kti i wKtq bv wbtj gvoVB Kvth^Amæav nq |

dmj gvovbri mgq 0GKw wlv tqi w tK Aek B j 0 i vL tZ nte thb Drcw Z ctY i 0YMZ gvfti tKvb 0wZ bv nq | vbv ev Wj Kj vB ev Zj exR dmj i tejvq gvovbtqi mgq extR AvNvZRwbZ Kvi tY thb tKvb aiv tbi 0tZi mwó bv nq ev dvUj bv atj | 0Z ev dvUj i mwó ntj extRi wei xZv I Avzi v Mg 0gZv fxlY fite 0wZM0 nq | gvovbtLvj vtZ (Threshing floor) thb tKvb i Ktgi MZ ev dvUj bv vtK | Kvi Y MZ ev dvUj Av vB dmj i exR ev AvMvQvi exR vKvi mæebv vtK, hv gvovBKZ. extRi wei xZvi gvB Kvgtq t`q | gvovbtqi Rb v vbuU ntZ nte DpZ mgZj Ges mæ ntj cvKv tqtS | gvovB j wU Qv h3 ntj Avtiv fij nq |

dmj i cKvi tft` gvovB c xwZi wfbawfbaw | Zte ZUj RvZxq A\_ev exR RvZxq dmj i gvovB c xwZ c0q GKB i Ktgi | vbv RvZxq dmj gvovB tj Miæ w tQ gvovbri c xwZ euj cwi wPZ ntj I AvRKij Wtq ev MtQi eo wotZ AvQmotq aiv ev Mg gvovB Kiv ntQ | Wj RvZxq dmj ev cvU ev Zj RvZxq dmj i tejvq Miæ mvi vth gvovbri cvkvvcw k3 tqtSi Dci MvQ Qmotq w tQ j wlv w tQ wcuU tQ gvovbv nq | Aek Aí cwi gvY dmj i tejvq tktlv3 c xwZB euj c0wZ | B v vbx ZUj dmj i tejvq (thgb- avb, Mg) c PwZ tQvU hSj tctWj t`mvti i (Paddle thresher) e`envi w b w b teto Pjt tQ | fÆv gvovB Kivi Rb KY tKj vi (Corn sheller) bvgK GKw wtkl hSj e`envi Kiv nq | Kvi Y nVZ w tQ, Miæ ev tctWj tdmvti i mvi vth wKsev AvQmotq - tKvberbeB fÆv exR gvovB Kiv mæ bq | ZvOvov AvL gvovB Kitz AvL gvovB Kij i c0qvRb nq A\_ev wPvb Kivi Rb wgtj c w tQ w tZ

fÆv gvovB Kivi Rb KY tKj vi (Corn sheller) bvgK GKw wtkl hSj e`envi Kiv nq |



ntj Zvcgvi 3-10<sup>0</sup> tm Gi gta<sup>o</sup> vKv iKvi | exR iKtbr br ntj D<sup>o</sup>P Zvcgvi exRi A<sup>o</sup>zi v Mg i i ante A<sup>o</sup>er Q<sup>o</sup>IK 0v Av<sup>o</sup>sv<sup>o</sup>ntq c<sup>o</sup>P t<sup>o</sup>tZ c<sup>o</sup>ti |

v<sup>o</sup>g Riv c<sup>o</sup>Kv n<sup>o</sup>qv D<sup>o</sup>PZ | c<sup>o</sup>Kv tg<sup>o</sup>tZ K<sup>o</sup>vi ev ev<sup>o</sup>ki gv<sup>o</sup>Pv ev Z<sup>o</sup>IK <sup>o</sup>Z<sup>o</sup> K<sup>o</sup>ti G<sup>o</sup>tZ Q<sup>o</sup>v<sup>o</sup> ev e<sup>o</sup>VM f<sup>o</sup>vZ<sup>o</sup>K<sup>o</sup>ti exR ivLv ntj exRi M<sup>o</sup>tq tg<sup>o</sup>Si ev c<sup>o</sup>K<sup>o</sup>v<sup>o</sup> v<sup>o</sup>bi Av<sup>o</sup> Z<sup>o</sup>v j<sup>o</sup>M<sup>o</sup>tZ c<sup>o</sup>ite br | Z<sup>o</sup>tKi D<sup>o</sup>ci 3/4 Uv e<sup>o</sup>li tenk cvj<sup>o</sup> Kiv m<sup>o</sup>K n<sup>o</sup>te br | N<sup>o</sup>ti tg<sup>o</sup>S ev Av<sup>o</sup>cvk m<sup>o</sup>v<sup>o</sup>t<sup>o</sup>m<sup>o</sup>tZ ntj N<sup>o</sup>ti i gta<sup>o</sup> Mig evZ<sup>o</sup>m c<sup>o</sup>ev<sup>o</sup>nZ K<sup>o</sup>ti Av<sup>o</sup> Z<sup>o</sup>v K<sup>o</sup>g<sup>o</sup>tZ n<sup>o</sup>te |

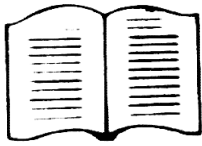
v<sup>o</sup>g Riv c<sup>o</sup>Y<sup>o</sup>i gvb m<sup>o</sup>K ivLv<sup>o</sup> Rb<sup>o</sup> GK<sup>o</sup>U<sup>o</sup> v<sup>o</sup>at<sup>o</sup>j- (Thumb rule) ntj v - Zvcgvi (m<sup>o</sup>VM<sup>o</sup> d<sup>o</sup>ti b<sup>o</sup>BU) Ges Av<sup>o</sup>cv<sup>o</sup>IK Av<sup>o</sup> Z<sup>o</sup>vi th<sup>o</sup>M<sup>o</sup>dj 100 Gi tenk n<sup>o</sup>te br |

exR v<sup>o</sup>g Riv Kivi Av<sup>o</sup>tM K<sup>o</sup>U<sup>o</sup>b<sup>o</sup>vkK Ges ti<sup>o</sup>M<sup>o</sup>b<sup>o</sup>vkK i<sup>o</sup>vm<sup>o</sup>q<sup>o</sup>vbK <sup>o</sup>e<sup>o</sup> w<sup>o</sup>tq tk<sup>o</sup>ab K<sup>o</sup>ti t<sup>o</sup>b<sup>o</sup>q<sup>o</sup> f<sup>o</sup>vj | exR g<sup>o</sup>tS gta<sup>o</sup> ti<sup>o</sup>v<sup>o</sup> w<sup>o</sup>tq i<sup>o</sup>m<sup>o</sup>K<sup>o</sup>tq Av<sup>o</sup>ev<sup>o</sup> e<sup>o</sup>l<sup>o</sup>q f<sup>o</sup>ti v<sup>o</sup>t<sup>o</sup>g ivLv<sup>o</sup>tZ n<sup>o</sup>te |

v<sup>o</sup>g Riv c<sup>o</sup>Y<sup>o</sup>i gvb m<sup>o</sup>K ivLv<sup>o</sup> Rb<sup>o</sup> GK<sup>o</sup>U<sup>o</sup> v<sup>o</sup>at<sup>o</sup>j (Thumb rule) ntj v - Zvcgvi (m<sup>o</sup>VM<sup>o</sup> d<sup>o</sup>ti b<sup>o</sup>BU) Ges Av<sup>o</sup>cv<sup>o</sup>IK Av<sup>o</sup> Z<sup>o</sup>vi th<sup>o</sup>M<sup>o</sup>dj 100 Gi tenk n<sup>o</sup>te br | A<sup>o</sup>er Av<sup>o</sup>cv<sup>o</sup>IK Av<sup>o</sup> Z<sup>o</sup>v h<sup>o</sup>v 60% n<sup>o</sup>q Z<sup>o</sup>vntj Zvcgvi 40<sup>o</sup> dv. Gi tenk b<sup>o</sup>q | A<sup>o</sup>er Gi D<sup>o</sup>ev<sup>o</sup>Uv<sup>o</sup> ntZ c<sup>o</sup>ti - Zvcgvi 60<sup>o</sup> dv. Av<sup>o</sup> Av<sup>o</sup>cv<sup>o</sup>IK Av<sup>o</sup> Z<sup>o</sup>v 40% |



**Ablyj b (Activity):** Z<sup>o</sup>U<sup>o</sup>z<sup>o</sup>RvZ<sup>o</sup>x<sup>o</sup> dmj (Cereal crops) m<sup>o</sup>si <sup>o</sup>IK<sup>o</sup>Y<sup>o</sup> gv<sup>o</sup>ovB, Sv<sup>o</sup>ovB I i K<sup>o</sup>it<sup>o</sup>br<sup>o</sup> (Threshing, Winnowing and Drying) i e<sup>o</sup>Z<sup>o</sup>i Av<sup>o</sup>tj v<sup>o</sup>P<sup>o</sup>br Ki ab (Aby<sup>o</sup> c<sup>o</sup>ov) |



**mvi gg<sup>o</sup>**

Dch<sup>o</sup> mg<sup>o</sup>tqi Av<sup>o</sup>tM ev c<sup>o</sup>ti dmj m<sup>o</sup>SM<sup>o</sup>h Ki<sup>o</sup>tj d<sup>o</sup>m<sup>o</sup>tj i d<sup>o</sup>j b I b<sup>o</sup>MZ gvb D<sup>o</sup>f<sup>o</sup>qB <sup>o</sup>IK<sup>o</sup>Z<sup>o</sup>M<sup>o</sup> n<sup>o</sup>q | w<sup>o</sup>erf<sup>o</sup>b<sup>o</sup>ed<sup>o</sup>m<sup>o</sup>tj i c<sup>o</sup>vi c<sup>o</sup> Z<sup>o</sup>vi mg<sup>o</sup> I j <sup>o</sup>IK<sup>o</sup>Y<sup>o</sup> w<sup>o</sup>erf<sup>o</sup>b<sup>o</sup>erf<sup>o</sup>b<sup>o</sup> Dch<sup>o</sup> c<sup>o</sup>vi c<sup>o</sup> dmj w<sup>o</sup>er<sup>o</sup> c<sup>o</sup>x<sup>o</sup>U<sup>o</sup>Z<sup>o</sup>tZ m<sup>o</sup>SM<sup>o</sup>h K<sup>o</sup>ti w<sup>o</sup>b<sup>o</sup>q<sup>o</sup>Z<sup>o</sup>m<sup>o</sup>S<sup>o</sup>K<sup>o</sup>f<sup>o</sup>ite gv<sup>o</sup>ovB I Sv<sup>o</sup>ovB Kiv n<sup>o</sup>q | Gici d<sup>o</sup>m<sup>o</sup>tj i aib Ably<sup>o</sup>qx DEgi f<sup>o</sup>c ti s<sup>o</sup>t<sup>o</sup> i K<sup>o</sup>it<sup>o</sup>Z n<sup>o</sup>q | D<sup>o</sup>tj<sup>o</sup> th, exRi t<sup>o</sup>IK<sup>o</sup>t<sup>o</sup> exRga<sup>o</sup> w<sup>o</sup>Z Rj<sup>o</sup>x<sup>o</sup> ev<sup>o</sup> u<sup>o</sup>i c<sup>o</sup>vi gvb 10-12 kZvst<sup>o</sup>k t<sup>o</sup>tg br Av<sup>o</sup>mv ch<sup>o</sup>S<sup>o</sup> i K<sup>o</sup>it<sup>o</sup>Z n<sup>o</sup>q | Gici m<sup>o</sup>vb<sup>o</sup>q<sup>o</sup>S<sup>o</sup>Z Av<sup>o</sup> Z<sup>o</sup>v I Zvcgvi w<sup>o</sup>ek<sup>o</sup> c<sup>o</sup>vi t<sup>o</sup>et<sup>o</sup>k dmj m<sup>o</sup>si <sup>o</sup>IK<sup>o</sup>b Kiv n<sup>o</sup>q | m<sup>o</sup>WK mg<sup>o</sup>tq I m<sup>o</sup>WK D<sup>o</sup>cv<sup>o</sup>tq dmj m<sup>o</sup>SM<sup>o</sup>h I c<sup>o</sup>U<sup>o</sup>qvRvZ Ki<sup>o</sup>tj d<sup>o</sup>m<sup>o</sup>tj i d<sup>o</sup>j b e<sup>o</sup>ix<sup>o</sup> cv<sup>o</sup>q, AcPq Kg n<sup>o</sup>q, Y<sup>o</sup>MZ g<sup>o</sup>it<sup>o</sup>bi Db<sup>o</sup>z n<sup>o</sup>q Ges D<sup>o</sup>rc<sup>o</sup>w<sup>o</sup> Z c<sup>o</sup>Y<sup>o</sup> x<sup>o</sup>N<sup>o</sup> b v<sup>o</sup>g Riv K<sup>o</sup>ti ivLv m<sup>o</sup>er n<sup>o</sup>q |



**ci#V#i gj`iqb 6.4**

m#VK D#i i ci#k#UK #P# (v) w` b|

1| Dch# mg#q dmj msM# bv Kiv ntj Kx nq?

K) dj b f#j nq

L) dj b L#i#v# nq

M) #, Y#Z g#b f#j nq

N) dj b I #, Y#Z g#b D#q#B #j#ZM#`nq

2| Av#ki dj b I #, Y#Z g#b#i Rb` ci#Ui c#i c° Z# KLb Av#m?

K) d# ai#i Av#M

L) d#dj ai#i mgq

M) exR M#b#i mgq

N) exR c#K#i mgq

3| dmj msM#ni mgq #K#mi Dci #b#P# K#i?

K) dm#j i e#b mg#qi Dci

L) dm#j i D#i#k#i Dci

M) dm#j i R#Z#i Dci

N) exR#i `#i i Dci

4| m#i I# ev W#j R#Z#q dm#j i #j#i# t#K#b#mgq dmj msM# K#i#Z nq?

K) 50% exR c#K#i mgq

L) 70-80% exR c#K#i mgq

M) 90% exR c#K#i mgq

N) 100% exR c#K#i mgq

5| AvL dmj Kx c#W#Z#Z msM# Kiv nq?

K) g#L# L#o

L) g#j #rc#U#b K#i

M) t#M#ov t#K#U

N) P#q# K#i

6| f#v# K#f#v#e g#ov#B Kiv nq?

K) M#ai c`Z#j

L) t#t#W#j t\_#m#i

M) j #W# t#U#v# K#i

N) K#Y#k#j #i

7| exR#K KZ kZ#sk Av`Z#v ch#S#i K#b#v nq?

K) 20-25%

L) 15-20%

M) 12-15%

N) 10-12%



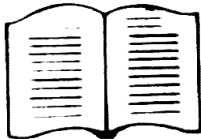
cŭgevi ũbombi mivŭth  
Ges cieZŭRŭtj KŭP ũ`tq  
tKŭU Priv Acmi Y

cŭgevi ũbombi mivŭth Ges cieZŭRŭtj KŭP ũ`tq tKŭU Priv Acmi Y Kiab| eo Priv  
tUtb DVŭtj ũkKŭtoi mŭ½ AŭbK gŭU DŭV Avŭm I Avkcvŭtki Ab`vb` Privi ŭŭZ nq|aib  
tŭŭtZ tiv`ewŭ ev tFRŭ ũksev iKbv th tKŭb Ae`vq ũbomib t`qv hvq ũkS` cvU tŭŭtZ Zŭ  
AŭbK mgq m`e nq bv| cvU tŭŭtZ ũbomib t`qv ev cvZj vKiŭYi mgq Aek`B tLqj i vLj  
thb gŭU m`vZŭtŭZ ev tFRŭ bv`vŭK| tFRŭ gŭU tZ cvŭqi Qvc ev gŭU tZ cv tWŭe tMŭj  
tŭŭtZ cŭek Kiv ũK bq| GŭZ cvŭUi ũkKo ũQto ũMŭq MŭŭQi ewx e`vŭZ nq|

**mvi cŭqŭM**

dvŭjx tZŭv RŭZ Qov Ab`vb` RŭZi tejvq ecŭbi cŭe`tkl Pŭŭl tn±i cŭZ 50 tKŭR  
BDŭi qv, 25 tKŭR ũJGmŭc, 45 tKŭR ũgDŭiU Ae cUŭk, 45 tKŭR ũRcmŭg I 11 tKŭR ũR½  
mŭj tdu mvi fij fŭte ũgŭkZ Kŭi RŭgŭZ ũQŭtq ũ`b| dvŭjx tZŭv cvŭUi Rb` 100 tKŭR  
BDŭi qv, 50 tKŭR ũJGmŭc, 90 tKŭR ũgDŭiU Ae cUŭk, 45 tKŭR ũRcmŭg I 11 tKŭR ũR½  
mŭj tdu GKBfŭte cŭqŭM Kiab| exR ecŭbi 45-50 ũ`b cŭi Ab`vb` RŭZi tejvq 50  
tKŭR BDŭi qv Ges dvŭjx tZŭvi Rb` 100 tKŭR BDŭi qv iKbv emj i mŭ½ ũgŭkŭq ũetKŭj i  
ũ`tK Dcŭi cŭqŭM Kiab|

tMveŭ mvi ev Kŭŭv÷ cvl qv tMŭj dvŭjx tZŭvi RŭgŭZ tn±i cŭZ 9 Ub Ges Ab`vb` RŭZi  
tejvq 4.5 Ub cŭg Pŭŭl i ci mgfŭte Qŭotq ũ`b|



**mvi gg®**

ũewfbŭcŭZKj Zŭ KŭUŭtq DVŭi j`ŭŭ` cŭgZ KŭŭLZ msL`K Privi tPŭq tewk Priv MRŭŭbvi  
Rb` cvU exR ecŭ Kiv nq| cieZŭZ Privi tŭjvi mŭzew`xi Rb` AŭcŭŭKZ.tewk NbŭZj  
Privi tŭjvŭtK ũewfbŭewx chŭŭq Acmi b Kiv nq| G Qovl mŭdj`RbKfŭte cvU Drcv`ŭbi  
j`ŭŭ` RŭgŭZ ũbw`ŭ gvŭvq mvi cŭqŭM Kiv nq| mgqZ cvU tŭŭtZi Privi cvZj vKiY I mvi  
cŭqŭM Kiv nŭj cvŭUi dj b Ges` bMZ gvŭ DfŭqB ewx cvŭq|



### Povšgjqb

#### msw]B I iPbvj-K cKæ

1. DvM` i Acwi nvh`Lv` `vcr` vb ej tZ Kx tevSvq? DvM` i Acwi nvh`Lv` `vcr` v`bi GKU Zvwj Kv cO`Z Kiab|
2. mvi KvK etj ? mvi KZ cKvi I Kx Kx?
3. bvBtU`Rb, dmdim I cUmkqvg mieivKvix cO`Z`K RvZi `tUv Kti mti i big wj Lj|
4. mti i gvT`v Kxfvte wbjcY Kiv nq wj Lj|
5. Piv cvZj vKiY Kivi Kvi Y Kx?
6. exRvni tewk e`envi Kiv nq tKb?
7. cvU MvO GKevti tewk cvZj v Kti w`tj Kx nq?
8. AvMvQvi RxebKvj m`u`KZ fivM, tji vi bvg Kiab| AvMvQv `gtbi bmvZgvj v, tji v eY`v Kiab|
9. gvj wPs KvK etj Ges KZ cKvi eY`v Kiab|
10. evsj v`tk tmP I w`vktbi , iazjeY`v Kiab|
11. tm`Pi cvbi Dm, tji vi bvg wj Lj|
12. t`kxq tmP hšc`wZ, tji vi bvg wj Lj| wewfbocKvi tmP c`wZi eY`v w`b|
13. f`c`p` tmP c`wZ, tji vi bvg D`j L Kiab| cvb w`vktbi UvBj c`wZ eY`v Kiab|
14. w`vktbi exbvj v c`wZi m`eav, tji v eY`v Kiab|
15. dmtj i cwi c`Zv KZ ai`bi I Kx Kx evStq wj Lj|
16. dmj msM`h ej tZ Kx tevSvq? tKvb tKvb cwi w`wZi Kvi tY dmj msM`h m`wK mgtqi AvtM Ki tZ nq?
17. dmj msM`ni c`wZ, tji v wj Lj| Pxbver`v`gi cwi c`Zvi j`Y eY`v Kiab|
18. tRvqvi tMvLv` w`m`vte 60 w`tbi AvtM e`envi Kiv nq bv tKb?



**DĒigjv**

**cW 6.1:**

1| M 2| N 3| M 4| M 5| K 6| M

**cW 6.2:**

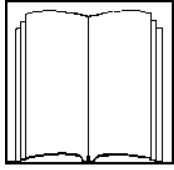
1| L 2| L 3| L 4| M 5| M 6| N

**cW 6.3:**

1| K 2| M 3| L 4| L 5| K 6| L 7| N

**cW 6.4:**

1| N 2| L 3| L 4| L 5| M 6| N 7| N



Z\_mf

Avj g, Gg. Gm; BKeyj , uJ. Gg. uJ; Awgb, Gg. Gm I Mvddvi , Gg. G, 1988| Kwl.ZmEK dm t j i Drcv` b I Dbq b| cKvkK - uJ Gg, RqvBi web BKeyj , mivRMÄ|

BKeyj , uJ. Gg. uJ; Mvddvi , Gg. G; Awj , Gg. GBP; Avj g, Gg. Gm. I Awgb, Gg. Gm, 1992| Kwl.ZtEj tgšj K mel qvej x| cKvkK mÄq Avj g mvg; 392 DEi kvnRvrvbcj, XvKv|

Kšjy, Gg. G. I Zvj š`vi , Gg. Gb. AvB, 1981| gvVkm` Drcv` tbi mewfbækj vtKškj | evsj vt` k Kwl.Mtel Yv KvDwYj , dvq#MU, XvKv-1215|

Kšjy, Gg. G, 1985| evsj vt` tki Lv`km` I A\_Rix dmj | evsj v GKvtWgx, XvKv|

Kšjy, Gg. G. I Zvj š`vi , Gg. Gb. AvB, 1981 | Kwl.ZtEj tgšj b mZ | evsj v GKvtWgx, XvKv|

tNvl , Gm. we. tK, 1983| e`enwv K Kwl. weAvb I tMv-cvj b| fvi Zx ek ÷ j , 6, i gvrv\_gRg`vi ÷ u, Kvj KvZv-700009|

evsj vt` k avb Mtel Yv Bbv÷ uJDU, 1991| AvaybK av tbi Pvl | cKvkK-gnvcvii Pvj K, we.Avi. Avi .AvB, Rqt`ecj, MvRvcj|

fZv, Gg. Gm. BD, 1996| dmj Drcv` tbi tgšj b mZ | evsj vt` k Kvvii Miv uk¶|vteW, XvKv|

Johnson, C.B.; Mannering, J. V. and Moldenhaur, W.C. 1979. Influence of Surface Roughness and Clod Size and Stability on Soil and Water Losses. Journal of American Soil Science Society 43: 772-777.

Mabbayad, B.B. and Obordo, R.A. 1970. Land Preparation. In: Rice Production Manual. IRRI.

Phillips, S.H. and Young, H.M. 1973. No Tillage Farming. Reiman Associates, Milwaukee, Wisconsin. p. 224.

Thakur, C. 1980. Scientific Crop Production. Vol. I and II. Metropolitan Book Co. Pvt. Ltd. New Delhi-11002.

***Lıgvi e¨e ¯ı***

## Lvgvi e'e`v

gnv gbxix i jkx etj tQb, ÔmetPtq eo Ges meK tMSi eguÛZ wkí náj v Kwl. jÓ evsj vt`tki RbMtiYi cãvb RmeKv náj v Kwl. | Kwl. Dbqabi mvt\_ t`tki A\_šawZK I mvgmRK Ae`vi Dbqab NtU| wkí i Kuvgvj Kwl. B thvMvb t`q|

Kwl. ej tZ i aygvWdmj Drcv`b tKB ešvq bv| ci` cij b, ci` i Pvkrmv, grm` Pvl, ebue`v cFvZl Kwl. i Ašifš` i elh| Kwl. AvR GKwU mvsMwZ I mšwZwôZ MwZkxj veÁvb|

evsj vt`tki AwaKisk KIK AvRI mbvZb avivq Kg SvkCv`Kwl. cšvš` e`envi Ki tQb| GtZ Avkvbjfc Drcv`b bv ntq A\_šawZK Dbqab nt`Q axi MwZtZ| dtj KtVi cvi ktgi cti I KItKi Av\_mvgmRK Ae`v Lvivc itq tMtQ| cvi emi K Lv` NvUwZ, cšKwZK eb`v I Liv, Avi Kwl. DcKi tYi EaYšj` I `šcšc`Zv KItKi wechštK ZjwšZ Ki tQ| G cšvqivq šz` KIK Avi I šz`, Avi eMšvix fignxb, fignxb nt`Q MšgQvov Dšv`|

Kwl. I KIK tK i šv Ki tZ náj Km tKi Drcv`b Z\_v Avq evov tZ nte| Gi Rb` KIK tK veÁvbfv`EK cšvš` wk šv w` tš ` šZv emotq Kwl. i Avajb KxKiY Ki tZ nte| Kwl. tZ `ecvK cvi eZš Av tZ nte| Avi ZvB cš tš Avgt`i eš tZ nte evsj vt`tki KIK I Kwl. tK| mvariY `š tZ bq, mešvK veÁvbm`šZ mvgmRK `š tKvY t` tK, hv tK ejv nq ōLvgvi e'e`v|

## BDibU 1 Lvgvi e'e-`vi aviYv

mm̄÷g ev e'e-`v ntjv GKwU wbr`θ mxgvi (Boundary) gta` KZ,tjv Dcv`v̄tbi (Element) m̄÷sj b (Assemblage) h̄t`i gta` ci-`úi Mfxi Kḡm̄úK̄(Interrelationship) w̄`gvb| GB m̄úK̄GKwU e`wZμgx AvPiY (Behaviour) ev w̄μqv̄i m̄ú K̄ti| tm̄U ntjv e'e-`vi tKvb Astk DĪxcbv (Impulse) w̄tj Zv tM̄Uv Astk DĪxcbv Qovq| mnR K-`vq, e'e-`v ntjv hv Gi tKvb Astk evB̄ti i DĪxcbvq m̄ḡw̄MK̄f̄īte (As a whole) c̄ūZw̄μqv̄ (Reacts) t`Lvq ev m̄vov t`q|

Dbq̄tbi D̄t̄i`k` eZḡvb c̄w̄ex `̄̄ c̄w̄i ēwZ̄ nt`Q| Gi m̄v̄\_ Zvj w̄ḡj v̄tZ w̄b̄tR̄t`i K̄w̄l̄t̄Z c̄w̄i eZ̄B̄ NUv̄tZ m̄q̄lg I Dc̄t̄h̄w̄M̄x K̄ti t̄bq̄v c̄ūqv̄Rb| mm̄÷g ev e'e-`vi `̄w̄t̄Z c̄w̄i eZ̄B̄ L̄q̄B R̄w̄Uj c̄ūμqv̄, hv e'e-`v mxgvi (System boundary) w̄f̄Zi ev evB̄ti t\_`t̄K nt̄Z c̄v̄t̄i| c̄w̄i eZ̄B̄bi ḡj- P̄m̄eK̄w̄V nt`Q m̄gm̄v̄ I Ae-`vi mg`K aviYv jv̄f̄ Kiv| m̄gm̄v̄i Āt̄bK Ask\_`v̄K̄t̄Z c̄v̄t̄i| w̄K̄S̄ Av̄jv̄v̄f̄īte w̄ēw̄f̄b̄e Astki m̄ḡv̄av̄b t̄M̄Uv̄ m̄gm̄v̄i m̄ḡv̄av̄b bq|Kiv̄Y Ask,tjv ci-`úi w̄b̄f̄P̄k̄j|

GK\_`v mZ` th, Av̄ḡv̄t`i K̄w̄l̄.Dbq̄b Kīt̄Z nt̄e| Avi Zv̄B c̄ūtḡ Kl̄t̄Ki Ae-`v, c̄w̄i t̄ek I m̄gm̄v̄t̄K eS̄t̄Z nt̄e| t̄et̄P\_`v̄K̄vi Rb` KIK `̄̄ ēu D̄t`w̄M I c̄h̄w̄P̄ evQv̄B Ges M̄h̄Y K̄t̄ib| G Kv̄t̄R Z̄uiv̄ m̄v̄avi Y Ab̄f̄w̄Zi (Common sense) ōv̄iv̄ c̄ix̄q̄v̄ P̄r̄jv̄b, S̄w̄K t̄bb, D̄w̄eb̄ K̄t̄ib Ges ēūḡl̄x̄Zv̄ Av̄t̄bb| w̄bR c̄w̄i t̄ēt̄k Kl̄t̄Ki G Ávb-`q̄Zv̄ c̄w̄i K̄ib̄w̄e`, M̄t̄eI K I Dbq̄b K̄ḡx̄P̄ i ōv̄iv̄ D̄t̄c̄w̄q̄Z nt̄q̄t̄Q| Kl̄t̄Ki m̄gm̄v̄ K̄w̄l̄.Lvḡv̄t̄i i m̄ú, c̄w̄i t̄ek, w̄ec̄w̄E I Av̄K̄v̄q̄v̄i Av̄š̄t̄w̄μqv̄i GK R̄w̄Uj m̄s̄w̄ḡk̄Y| Gi t̄Kvb L̄w̄ŪZ m̄ḡv̄av̄b t̄bB| īt̄q̄t̄Q m̄v̄ḡw̄MK̄ m̄gm̄v̄ m̄ḡv̄av̄t̄bi c̄ūqv̄Rb̄x̄Zv̄| GUVB Av̄R̄t̄Ki h̄t̄M̄ K̄w̄l̄i ev-`eZv̄|

w̄eÁv̄x̄iv̄ ētm̄ t̄bB| q̄l̄z̄a q̄l̄z̄a K̄w̄l̄.Lvḡv̄t̄i i R̄w̄Uj m̄gm̄v̄ m̄ḡv̄av̄t̄b Z̄uiv̄ w̄eM̄Z `̄B `̄k̄K āt̄i mm̄÷g ev e'e-`v w̄f̄w̄ĒK KḡM̄t̄eI Yv̄ (Action research) īīæ K̄t̄īt̄Qb K̄l̄t̄Ki Lvḡv̄t̄i| Z̄uiv̄ Kl̄t̄Ki `̄K̄x̄q̄ Ávb I `̄q̄Zv̄t̄K Kv̄t̄R jv̄M̄t̄b̄vi Rb` KIK̄t̄K M̄t̄eI Yvi Ask̄x̄v̄i (Research partner) K̄t̄īt̄Qb| Avi Gme w̄K̄Q̄B nt̄q̄t̄Q Lvḡv̄i e'e-`vi (Farming systems) I ci w̄f̄w̄Ē K̄t̄i|

G BDib̄t̄U Lvḡv̄i I Lvḡv̄i e'e-`vi m̄s̄Áv̄, Lvḡv̄i e'e-`vi aib, `̄ew̄k̄ó, A½ Ges A½m̄ḡt̄ni w̄ēw̄f̄b̄eAv̄š̄t̄w̄μqv̄i I ci w̄e-`w̄i Z Av̄t̄jv̄P̄bv̄ Kiv̄ nt̄q̄t̄Q|

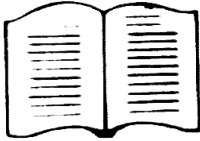


### cw 1.1 Lvgiti i msAv I cKvi

G cvV tkfi Arcub-

- ◆ Lvgvi wK I tKb Zv ej tZ I wj LtZ cvi teb|
- ◆ Kul. I Lvgvi KvtK ej Zv eYBv KitZ cvi teb|
- ◆ Lvgvi KZ cKvi I wK wK e`vL`v KitZ cvi teb|

### Lvgvi wK I tKb



b`xgvZK. I Mgcavb ersj vt`tki gvb`j i cavb RweKv n`Q Kul. | Kul. i ubq`si n`Qb KIK | KIKi emZemo I Zui cwievi, Zui t`qZ, c`kz` er tWvev, Miagunl, QvMj -tfov, nuz-gjvM, Kezi cfwZ GKtI n`Q Zui GKwL Lvgvi | GKRb KIK Zui Lvgiti i cKwL m`u` ev Dcv`vb GKwL AwfbaDti`tk` mjo ev mslMh Kti \_vtKb| tmwL ntjv KIK cwievi i Lv`, e`i; eim`vb, wK`qiv, wPwKrmv cfwZ tgsuj K Pwin`v ci-Y Ges mvgwMK Dbaq|

KIKi emZemo I Zui cwievi, Zui t`qZ, c`kz` er tWvev, Miagunl, QvMj -tfov, nuz-gjvM, Kezi cfwZ GKtI n`Q Zui GKwL Lvgvi |

KIKi Gme m`u` ev Dcv`vb mjo ev mslMh tKej Dcv`vb ubwDZ KitZ cvti bv| GKUZ tft`e t`L`tj B Avgiv eStZ cvi`ter th, KIKi Pwin`v I `qZvi cvkvcwK Lvgiti i cKwZK I Av`mvgwRK cwitek Ges weea m`jvM mjev Zui Dcv`vb Kg`K cfwZ ev ubq`sy KitQ| ZvQrov cKwL wfb`eDcv`vb c`uqv GKwL Ab`wLi Ici wbf`Kxj |thgb`ndmj Dcv`vb KvtR Mi`e`v guntli` Oviv Rvg Pvl Kiv Ges Dv`v`i tMvei gwL`tZ t`qv c`qvRb| Ab`w`tk Mi`aguntli` Lvevi ifc dmtji` Lo, fit, Kez, `Lj cfwZ c`qvRb| mn`tr ejv hvq th, GKwL ubw`e` cwitek wK`Lvgiti dmj, dj-gj-, ci`cwl, grm` I ebR m`u` Dcv`vb c`uqv KZK, tjv Av`st`m`u`K` Oviv mswk` ev msNex ev msthvRZ|

### Kul. I Lvgvi

Lvgvi ntjv KIK cwievi i GKwL mvsMvZ Dcv`vb e`e`vcbv I tft`mi GKK thLv`b dmj, ci`cwl, grm`, dj-gj-, MvQvcjv cfwZ ctY`i mgsZ A`wZK Dcv`vb c`uqv Ptj, hv cKwZK I Av`mvgwRK cwitek Oviv cfwZ ev ubq`sz` nq|

Gevi t`Lv hvK we`Avbwf`wEK AvawbK Kul. I Lvgiti msAv, tjv Kx Kx| Kul. ntjv Ggb KgRvU hv dmj, ci`cwl, grm` cfwZi A`wZK Dcv`vb ubq`tE` OlvbmgwL GKwL ubw`e` GjvKvq mvsMvZ e`e`vcbv gva`tg m`ub`e`KitQ| GLv`b ubw`e` GjvKv n`Q KIKi emZemo, t`qZ, c`kz`-tWvev BZ`w` | GLv`b cKwZK cwitek ubq`sy KitQ| Avi Lv`v n`Q KIK cwievi, hv m`m`iv GKtI emevm I Avvi Kti b| Ges hv GKwL mvsMvZ e`e`vcbv GKK | GLv`b mvgwRK cwitek I m`jvM mjev cfwZ ev iLv`tQ|

Lvgvi ntjv KIK cwievi i GKwL mvsMvZ Dcv`vb e`e`vcbv I tft`mi GKK thLv`b dmj, ci`cwl, grm`, dj-gj-, MvQvcjv cfwZ ctY`i mgsZ A`wZK Dcv`vb c`uqv Ptj, hv cKwZK I Av`mvgwRK cwitek Oviv cfwZ ev ubq`sz` nq|

### Lvgiti i cKvi

Kul. cw`exi c`PxbZg tckv| ZvB weeZ`e` c`uqv h`jM h`jM wefba`e`wP`gq Kul. i mjo ntqtQ| tmB miv` Lvgvi I ntqtQ wefba`e`Kvi | GLv`b Lv` msv`Bfvte Lvgvi-Gi cKvi t`v` AvtjvPbv Kiv ntqtQ|





### cuVhEi gj'iqb 1.1

mWk DEti i cuK, UK Pý (V) w b |

- 1/ KIK Zvi Lvgvii cZuU m=ú` Kx DfI k" mup Ktib ?
  - K) wevFbe
  - L) AvvFbe
  - M) gnr
  - N) cOqvRb
  
- 2/ 7vqfZji wvEzZ Lvgvi KZ cKvi ?
  - K) Pvi
  - L) cuP
  - M) `B
  - N) wZb
  
- 3/ cY'i mL'v wvEzZ Lvgvi KZ cKvi ?
  - K) Pvi
  - L) cuP
  - M) `B
  - N) wZb
  
- 4/ Kwl.KgRvU GKwU wbu`G Gj vKvq m=ubanq, GLvfb wbu`G Gj vKv tKvbuU ?
  - K) emZemo
  - L) t9TZ
  - M) cKz-7Wver
  - N) me, wj GKfT
  
- 5/ Kwl.cwLexi Kx iKg tckv ?
  - K) cuPxbZg
  - L) AvavbKZg
  - M) ga'hlyq
  - N) beZi
  
- 6/ wefkl fite cwi Kwí Z wqk<sup>a</sup>Lvgvi tK Kx etj ?
  - K) eúglyx Lvgvi
  - L) mgwšZ Lvgvi
  - M) eúCY" Lvgvi
  - N) RvUj Lvgvi



**3/ cY (Enterprise) :** cY Qvov Lvgvi eēvi Drcv`b m=ubæntæ bv| Lvgviti i dmj, ci-cvnl, gvrmi, MvQcvjv, hšçvuz, AKul.KvR BZ`vir` meB GK GKul cY| cY Drcv`tbi mgšqB vevfbæLvgvi eēvi mjo Kti \_vtK|

**4/ Avštµqv (Interaction) :** Avštµhv ntjv Lvgvi eēvi cŸ`tfc| GuU vevfbæmgq, cŸµqv I cKviti m=ubæng| vevfbæctY`i gta` Avštµhv, vevfbæcvi evti i Avštµqv, `vbxq ms`uZ. ev RvZZtEji mv\_ Avštµhv, tšZ I `Re cvitætki mv\_ Avštµqv BZ`vir` |

**5/ mvgwMKZj (Holistic) :** Lvgvi eēvi gj`enkó` ntjv Dctii mKj wKQyGKtI mvgwMKfite KvR Kti | GvvtK Drcv`b eēvi (System) GRb`B ejv nq| tšKvib GKul Qvov Ab` me`uj APj nte| Zte `enkó` tji cvigvY ev `YMZ Kg-tæki Rb` Drcv`b ev Avq Kg-tænk ntZ cvti, thU eēvi `enkó`|



**cufVĒi gj`iqb 1.2**

**mivK DĒti i cufkšUK ipý (v) v b |**

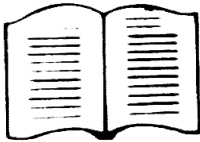
- 1/ t`tki weifbaGj vKvq weifbačKvi Kwl..Drcv`tbi eo Kvi Y tKvbuU ?  
 K) KI.tKi cŮB mæút`i wfbæzv  
 L) KI.tKi D.tI.tk`i weifbačv  
 M) wfbæviRvi e`e`v  
 N) Kwl..ci vgtkP wfbæzv |
  
- 2/ Lvgvti i tšZ mæú`mgn ci`úti gta` Avštupqv i Øivi wK mivó Kti ?  
 K) wepI Ae`vi  
 L) GK Abb` Ae`vi  
 M) eüglx Ae`vi  
 N) Avštupqv e`e`vi |
  
- 3/ tšZ mæút`i Avštupqv mivó Ae`v tKvb mæút`i Kvhfej x cĕimeZ Kti ?  
 K) A%Re mæú`mgtni  
 L) cŮKwZK mæú`mgtni  
 M) `Re mæú`mgtni  
 N) i vnvqubK mæút`i |
  
- 4/ Lvgvi e`e`vi `emkó` KquU ?  
 K) `BvU  
 L) wZbvU  
 M) PivvU  
 N) cvPvU |
  
- 5/ Lvgvi e`e`v eüglx Drcv`tbi Kx i Kg mĒv ?  
 K) LŮ LŮ mĒv  
 L) mivqWĖK mĒv  
 M) `vkŮK mĒv  
 N) AvavbK mĒv |
  
- 6/ tKvbuU Lvgvi e`e`vi cŮY`tjc ?  
 K) Avštupqv  
 L) ein:upqv  
 M) cŮZupqv  
 N) `^upqv |



### cw 1.3 eisj v˘tki Lvgvi e˘e˘vi eZgub ifc

G cvV tk˘l Arcub-

- ◆ eisj v˘tki weifbaLvgvi e˘e˘vi avi Yv w ˘Z cvi˘eb|
- ◆ fiY-˘cviY Lvgv˘ti i weifbaifc D˘tj ˘ Ki˘Z cvi˘eb|
- ◆ eisj v˘tki weifbaewYmR˘K Lvgvi D˘vni Ymn D˘tj ˘ Ki˘Z cvi˘eb|
- ◆ eisj v˘tki weifbaait˘bi ewYmR˘K Lvgv˘ti i Zwj Kv ˘Zwi Ki˘Z cvi˘eb|
- ◆ ugk˘Lvgv˘ti i weifbaifc I Ae˘˘img˘ eY˘v Ki˘Z cvi˘eb|
- ◆ eisj v˘tki Lvgvi e˘e˘vi ifc m˘u˘t˘K˘Av˘tj vPbv Ki˘Z cvi˘eb|



### eisj v˘tki weifbaLvgvi e˘e˘v

eisj v˘tki eZgub Lvgvi e˘e˘v, t˘j v gj-Z: ˘B cKvi˘N (1) fiY-˘cviY ev AvZ˘cviY Lvgvi Ges (2) ewYmR˘K Lvgvi | Gi c˘ZiUB Avevi brbv firM wef˘3 thU wP˘ bs-1 G ˘Lr˘br nt˘j v| Zte ˘tki me˘P we˘Z th Lvgvi e˘e˘˘img˘ Gi me, t˘j vB GKwU ˘ewk˘ enb Ki˘Q, Zv nt˘j v fiY-˘cviY Lvgvi | ˘tki weifbaGj vKvq tQvU tQvU ewYmR˘K Lvgvi, t˘j v Qwot˘q Av˘tQ|

eisj v˘tki eZgub  
Lvgvi e˘e˘v, t˘j v gj-Z:  
˘B cKvi˘N (1) fiY-  
˘cviY ev AvZ˘cviY  
Lvgvi Ges (2)  
ewYmR˘K Lvgvi |

### fiY-˘cviY Lvgvi

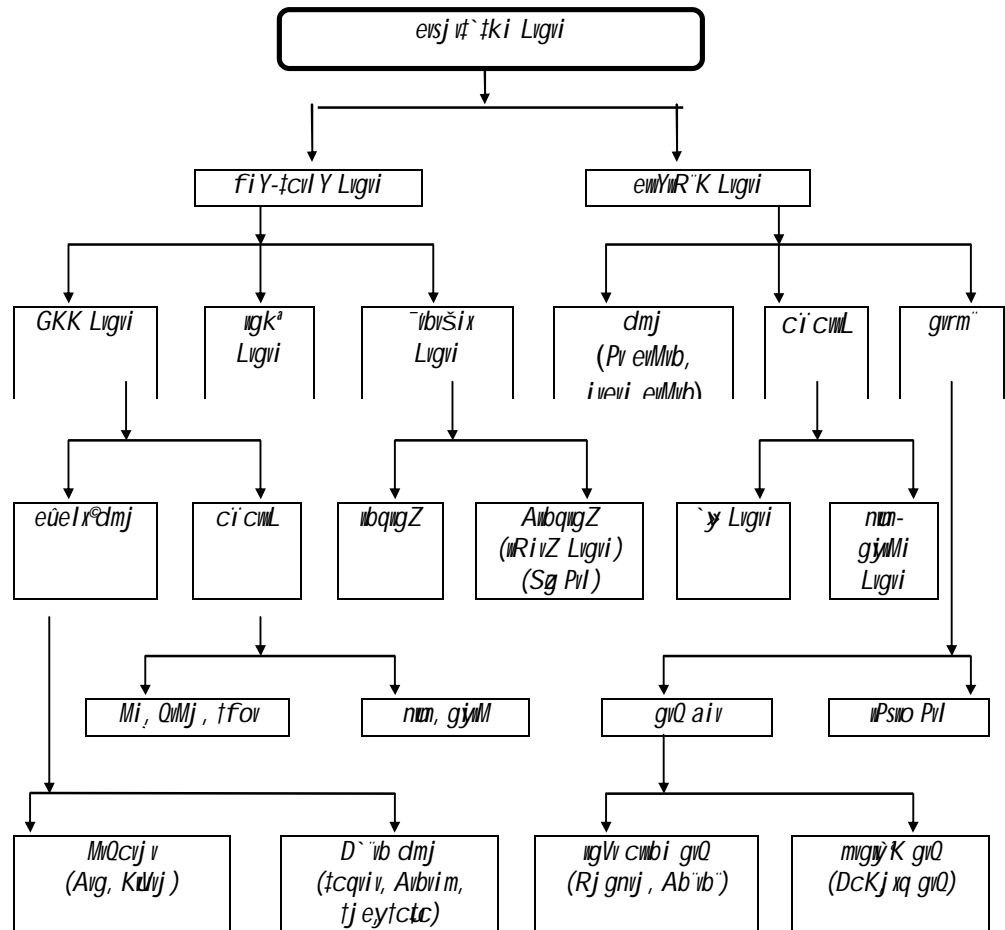
c˘vrbZ: K˘tqKwU Ae˘˘vq GB Lvgvi e˘e˘v ˘tk ˘Lr hvq| thgb˘N

- 1| **GKK Lvgvi** : dmj , dj ev ci˘cwiLi Lvgvi
- 2| **ugk˘Lvgvi** : GK˘˘ A˘t˘K ai˘t˘bi Lvgvi
- 3| **ZY.figi hihvei Lvgvi** : m˘vavi YZ kKi cij b Ki v
- 4| **˘t˘v˘s˘ix Lvgvi** : cirvo A˘A˘t˘j Sg Pvl , nvl o A˘A˘t˘j wRivZ Lvgvi |

### ewYmR˘K Lvgvi

eisj v˘tk thme ewYmR˘K Lvgvi i˘t˘t˘Q tm, wj nt˘Q w˘b˘e˘fc˘N

- 1| **dmj Lvgvi** : thgb˘N P˘EM˘g I wnt˘j ˘Ui Pr evMvb, P˘EM˘t˘gi i˘vevi evMvb|
- 2| **c˘i˘cwiL Lvgvi** : thgb˘N gw˘bKM˘A, m˘rfvi, XivKv, wK˘tkviM˘A, gqgbw˘m˘stn ˘y Lvgvi ; M˘vR˘xc˘j, m˘rfvi, t˘bvqvL˘j x, wK˘tkviM˘A˘ gjwMi Lvgvi |
- 3| **gvr˘m** : K) gvr˘m˘ Pvl : thgb˘N DcKj xq A˘A˘t˘j ewM˘v wPswoi Pvl , fij ˘vq av˘t˘bi c˘ti gvQ Pvl , nvl o aib ˘t˘t˘Z Mj ˘v wPswoi Pvl |  
L) gvQ aiv : thgb˘N Rj gnr˘t˘j wgvv c˘mbi gvQ, e˘t˘v˘cm˘M˘t˘i m˘gvv˘K gvQ|



**ugk²Lvgi e`e`v**

evsj v`tki gml, ewocvZi aib I Av\_® mvgmRK Ae`v igtj meP ugk²Lvgi e`e`v (Mixed farming systems) Mto DtvQ| tQvU tQvU fvgLtU AtbK, tjv Df`vM mgvšZ Kti cwi emi K ktjK e`envi Kti K.I.K Drcv`b I Avq evovZ tPov KiQb|

evsj v`tki gml, ewocvZi aib I Av\_®mvgmRK Ae`v igtj meP ugk²Lvgi e`e`v (Mixed farming systems) Mto DtvQ| tQvU tQvU fvgLtU AtbK, tjv Df`vM mgvšZ Kti cwi emi K ktjK e`envi Kti K.I.K Drcv`b I Avq evovZ tPov KiQb| thgbNGfite Zviv cKvzi meifcZvq Svk tgvKwej v KiZ mtpo|

ugk²Lvgi e`e`vq evsj v`tki mewfbæDrcv`b e`e`vK Kxfite web`im Kiv nq Zv iPI-2 G f`Lj| GmU ev`te AmsL`fite ntZcvti | Zte eSvi mjevavi Rb` GKmU web`im Kiv ntqQ| GtZ f`Lv hvq th, emZemo mKj LvgitiB itqQ Acwivh`emko` wntmte| ubtP Lvgi e`e`vi Dc-e`e`v, tjv (Sub-systems) GtK GtK Avtj vPbv Kiv ntj v|

**emZemo e`e`v (Homestead systems)**

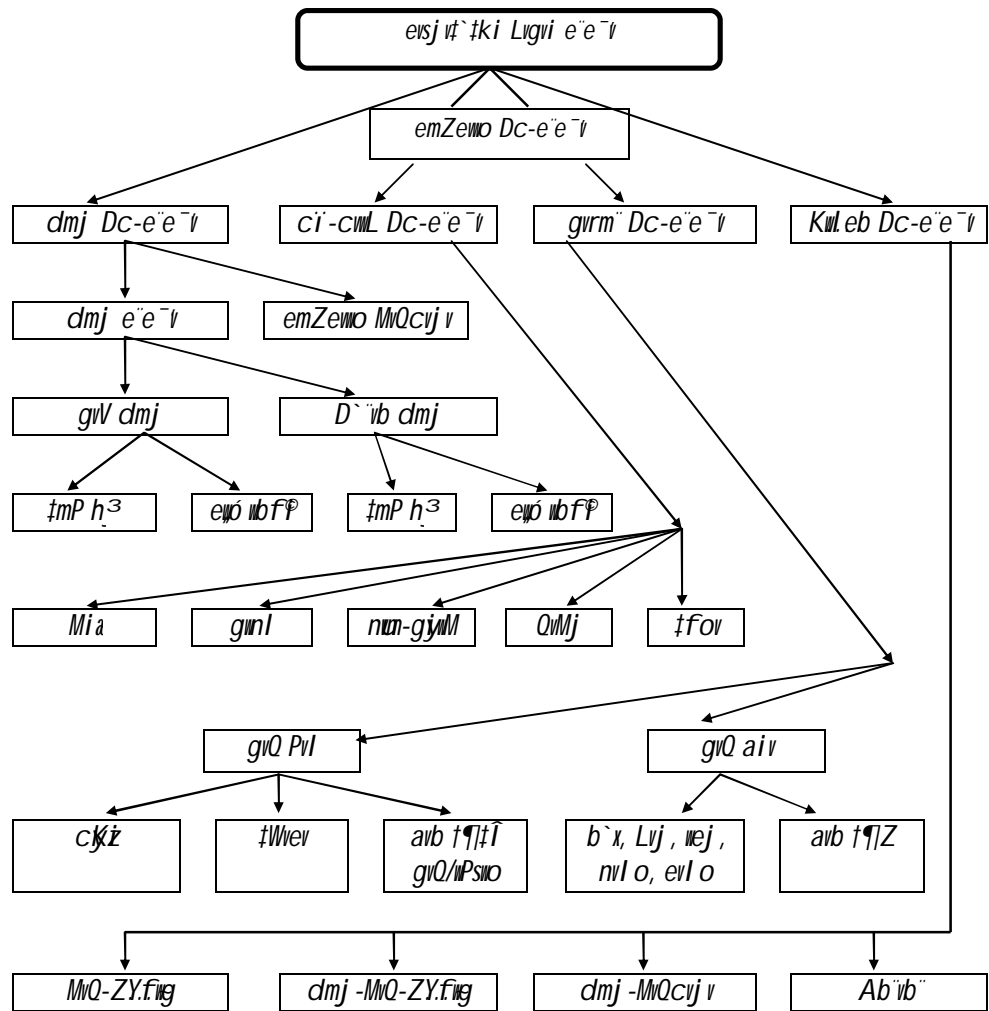
KiKti cwi evi, emovfUv, DVvb, cij vbRig I R½j vbtq emZemo e`e`v Mto Dtv| GLvtb mKj Lvgi KtgP Drcv`b I tfitMi wvšI MpxZ I ev`evqb c`tq|c tbqv nq| GKmU Lvgiti i Av`tzi Rb` emZemo e`e`v Aek` c`qvRbxq|

**dmj e`e`v (Crop systems)**

dmj e`e`v gvV dmj I D`vb dmj GB `B fvtM nef<sup>3</sup> | Gi c`ZuUB Avevi tmPh<sup>3</sup> I ep` ubfP`N GB `B fvtM nef<sup>3</sup> | emZemoi MvQcuj v I kvK-meRi Avi GKuU fVM nrtmte t`Lv hVq |

**ci-cwL e`e`v (Livestock system)**

ci-cwL e`e`v Mia gwnI, QwMj, tfov I nwn-gjwM GB c`B nefvtM nef<sup>3</sup> | nwn-gjwM Avevi tgvI M-gjwM, nwn I Kez`i GB wZb fvtM nef<sup>3</sup> |



wP` 2 : e'isj vt`tki wK`Lvgi e`e`vi nefvbaDc-e`e`v I D`vbMmgn-

**gvrM e`e`v (Fisheries system)**

gvrM e`e`v gj-Z: `B c`KviN gvrM Pvl I gvQ aiv | gvrM Pvl c`Kz`, wQ`bi t`Wver I avb-gvQ ev avb-wPswO GB wZb fvtM nef<sup>3</sup> | gvQ aiv t`QvU-eo Rjvkq (b`x, Lij, wej, nvl o, evl o) Ges avb t`q`t`Z gvQ aiv GB `B fvtM nef<sup>3</sup> |

**Kuleb e`e`v (Agroforestry system)**

Kuleb emZemo, t`qZ I cwiZZ Rwg GB uzB `v`bB Mto D`v`vQ| Gi mvt\_ weifbaedmj I c`Yxi msthr`M Pvi c`Kvi Kuleb n`z cvti |

**evsj v`k Lvgvi e`e`vi ijc**

c`KZct`q t`tki M`gvi`Atj eZ`v`b Kx ai`bi Lvgvi e`e`v Mto D`v`vQ Zvi e`v`bZv Avtj vPbv Kiv hvK| B`zvgta`B Avgiv tR`b`wQ cwi`tekMZ Ae`vb, KI`tki P`mn`v I c`lavb` Ges Z`ur `qZv, Avb I Awf`AZvi ubwi`L m`u` Ab`y`n`ti Lvgvi e`e`v mg`šZ nq| ZvB GKB M`tgi GKB emoi weifbaKIK weifbaLvgvi e`e`v Mto Z`z`z cvti b| Avi wfb`acwi`te`tki M`g n`tj G`uj Avi I wfb`z`i n`te| `w` Kwl.cwi`tek A`A`tji `w` M`tgi mKj KI`tki gta` Kx Kx Lvgvi e`e`v Mto D`v`vQ tm`tjv mvi Yx-1 I 2-G t`L`y|

Ggubfvte t`tki weifba Kwl.cwi`tek A`A`tj weifbaLvgvi e`e`v Mto D`v`vQ| c`z eQi Avevi Lvgvi e`e`v mg`šq ev m`u`t`i w`K t`tk cwi`emZ nq| ZvB ejv P`tj Lvgvi e`e`v cwi`eZ`kxj ev M`vZkxj |

c`g M`gviU gvSmi D`ezGjvKvq eb`v`g`y` A`A`tj Aew`Z etj eQti uzbevi dmj Drcv`b Kiv hvq| G`tjvi gta` dmj, ci`cml I gvr`m` D`v`vM mg`šq Lvgvi e`e`v c`lq mgvb| w`Zix M`gviU L`pB ub`aeGjvKvq, eQti 6 gvm Mfxi eb`v`q W`je `v`tk Ggb A`A`tj Aew`Z etj eQti gv` G`Kevi dmj Drcv`b Kiv hvq| GLv`b Lvgvi e`e`vi tgvU mSL`v 16wU (mvi Yx 2)| G`tjvi gta` ci`cml mg`šq Lvgvi e`e`v dmj mg`šqi tPtq tenk|

Ggubfvte t`tki weifbaKwl.cwi`tek A`A`tj weifbaLvgvi e`e`v Mto D`v`vQ| c`z eQi Avevi Lvgvi e`e`v mg`šq ev m`u`t`i w`K t`tk cwi`emZ nq| ZvB ejv P`tj Lvgvi e`e`v cwi`eZ`kxj ev M`vZkxj |

mvi Yx 1 :gvSwi DBz Gj vKv Kwl. cwi tek AĀtji GKwU Mġgi Lvgvi e'e'vmgr;  
KwRi nkj v, wġ kvj , gqgbwmsn (tnv'mb cġy, 1991) |

μg K bs	Lvgvi e'e'v	tgw Lubvi msL'v					tgw tjvKmsL'v				
		19 86	19 87	19 88	19 89	19 90	19 86	19 87	19 88	19 89	19 90
01.	dmj -Mi a - QvMj -nwn- gyM-gvQ	26	40	24	32	25	20 6	26 4	17 0	19 8	17 9
02.	dmj -Mi a - QvMj -nwn- gyM	11	7	8	9	9	80	39	45	65	7
03.	dmj -Mi a - nwn-gyM- gvQ	48	52	63	35	39	40 2	36 9	45 6	42 9	28 8
04.	dmj -Mi a - nwn-gyM	18	17	18	22	27	12 7	10 8	10 6	13 1	97
05.	dmj -Mi a - QvMj	3	2	N	N	1	17	18	N	N	6
06.	dmj -Mi a - gvQ	2	2	2	5	1	16	8	14	35	6
07.	dmj - QvMj -nwn- gyM-gvQ	3	5	4	3	5	25	31	23	20	27
08.	dmj - QvMj -nwn- gyM	1	2	N	2	2	7	13	N	14	12
09.	dmj - QvMj -gvQ	1	N	N	N	4	8	N	N	N	27
10.	dmj -nwn- gyM-gvQ	18	10	18	13	43	10 8	69	11 7	74	25 7
11.	dmj -tfor- nwn-gyM- gvQ	1	N	N	N	N	4	N	N	N	N
12.	dmj -QvMj	1	N	N	N	N	5	N	N	N	N
13.	dmj -nwn- gyM	15	11	14	9	13	70	66	91	58	74
14.	dmj -gvQ	11	13	12	10	18	50	49	56	52	91
15.	dmj	7	5	6	2	16	27	16	30	10	72
16.	Mi a-QvMj - nwn-gyM- gvQ	1	3	1	1	N	4	8	4	5	N
17.	Mi a-QvMj - nwn-gyM	6	3	3	4	3	30	24	11	30	17
18.	Mi a-QvMj	2	N	N	N	N	15	N	N	N	N
19.	Mi a-nwn- gyM	3	2	2	7	N	20	7	9	35	N
20.	Mi a	1	N	N	1	1	5	N	N	5	5

21.	<i>QvMj -nun-gjM-gvQ</i>	4	5	3	6	3	22	35	16	39	11
22.	<i>QvMj -nun-gjM</i>	1	N	N	N	N	5	N	N	N	N
23.	<i>QvMj -gvQ</i>	2	N	N	N	N	10	N	N	N	N
24.	<i>QvMj</i>	2	2	3	5	N	6	14	12	26	N
25.	<i>nun-gjM-gvQ</i>	3	4	3	7	1	15	23	10	40	3
26.	<i>nun-gjM</i>	2	1	N	5	N	10	2	N	19	N
27.	<i>gvQ</i>	6	2	3	3	2	30	8	14	13	10
28.	<i>AKvl .KvR</i>	N	N	N	N	3	N	N	N	N	11
29.	<i>dmj -Mi a</i>	1	N	1	3	1	9	N	4	14	8
	<b>tgW</b>	<b>20</b>	<b>18</b>	<b>18</b>	<b>21</b>	<b>21</b>	<b>14</b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>12</b>
		<b>0</b>	<b>8</b>	<b>8</b>	<b>4</b>	<b>7</b>	<b>98</b>	<b>71</b>	<b>88</b>	<b>82</b>	<b>58</b>

mvi Yx 2 : AwZ wPzGj vKv Kwl. cwi tek AAjt i GKw Mgtgi Lvgvi e'e'vmgr; tbrqvMu , KwigMA, wKtkvi MA (trvmb cgy, 1991)

μg K bs	Lvgvi e'e'v	tgvU Lvbi msL'v					tgvU tj vKmsL'v				
		19 86	19 87	19 88	19 89	19 90	19 86	19 87	19 88	19 89	19 90
01.	dmj -Miæ gwl -nun- gyM- gvQai v	4	4	2	3	3	46	34	22	27	38
02.	dmj -Miæ QvMj -nun- gyM- gvQai v	12	2	3	7	4	80	15	18	45	38
03.	dmj -Miæ - nun-gyM- gvQai v	93	96	95	60	53	60 8	55 4	54 9	38 1	40 6
04.	dmj -Miæ - QvMj -nun- gyM- gvQai v	4	1	1	3	7	22	5	7	21	42
05.	dmj -Miy gvQai v	13	12	10	8	3	83	68	60	54	15
06.	dmj -nun- gyM- gvQai v	56	48	45	56	87	30 2	22 9	21 3	32 1	52 5
07.	dmj - gvQai v	20	15	19	23	9	12 5	74	98	10 6	53
08.	dmj - QvMj -nun- gyM- gvQai v	1	Ñ	Ñ	5	Ñ	3	Ñ	Ñ	28	Ñ
09.	dmj -nun- gyM- gvQai v	12	1	2	4	3	68	7	8	27	19
10.	dmj -nun- gyM- gvQai v	2	1	1	4	6	9	4	4	20	26
11.	MiægvQai v	9	2	1	6	1	36	7	4	26	7
12.	nun-gyM- gvQai v	93	54	44	37	95	48 8	22 1	18 2	16 0	49 8
13.	gvQai v	13	16	12	81	39	66	79	35	43	20

		1	5	5			9	9	5	2	9
14.	<i>dmj-gwl- nwn-gjM- gvQai v</i>	$\tilde{N}$	$\tilde{N}$	$\tilde{N}$	$\tilde{N}$	1	$\tilde{N}$	$\tilde{N}$	$\tilde{N}$	$\tilde{N}$	6
	<b><i>tgW</i></b>	<b>45</b>	<b>40</b>	<b>34</b>	<b>33</b>	<b>31</b>	<b>23</b>	<b>20</b>	<b>15</b>	<b>16</b>	<b>18</b>
		<b>0</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>39</b>	<b>17</b>	<b>20</b>	<b>88</b>	<b>88</b>



### cuVhEi gj'iqb 1.3

#### mWK DEti i cuKqUK Pý (v) u b |

- 1/ ejsj vt`tki eZgub Lvgvi e`e`r, tjv gj-Z: KZ cKvi ?  
 K) Pvi  
 L) uZb  
 M) `B  
 N) cuP
- 2/ t`tki meP we`Z Lvgvi e`e`rimgR GKwU `enkó` enb Ki tQ, Zv tKvbuU ?  
 K) `wi`^Lvgvi  
 L) fiY-ıcvlY Lvgvi  
 M) ıZ^Lvgvi  
 N) DbZ Lvgvi
- 3/ Pr evMvb tKvb ai tbi Lvgvi ?  
 K) fiY-ıcvlY Lvgvi  
 L) ci-cmLi Lvgvi  
 M) emYmR`K Lvgvi  
 N) dtj i Lvgvi
- 4/ ŐDcKj xq AA t j evM`v uPsmoi Pvl Ő tKvb ai tbi Lvgvi ?  
 K) emYmR`K Lvgvi  
 L) gvtQi Lvgvi  
 M) fiY-ıcvlY Lvgvi  
 N) uGk^Lvgvi
- 5/ ejsj vt`tki gwU, emócvtZi aib I Av\_`mvgmRK Ae`r ugtj meP tKvb Lvgvi e`e`r Mto DıVtQ ?  
 K) GKK cY`gıx Lvgvi e`e`r  
 L) eüGıx Lvgvi e`e`r  
 M) cŐKıZ.K Lvgvi e`e`r  
 N) uGk^Lvgvi e`e`r
- 6/ uGk^Lvgvi e`e`r ejsj vt`tk KZfıte web`ım Ki v th tZ cvti ?  
 K) Pvi  
 L) cuP  
 M) AmsL`  
 N) `k
- 7/ ejsj vt`tk uGk^Lvgvi e`e`r q KquU Dc-e`e`r i tqtQ ?  
 K) cuP  
 L) uZb  
 M) Pvi  
 N) Qq
- 8/ ejsj vt`tki gıSwıi DBzGj vKıq eb`ıhı AĀ t j i MıtG KquU Lvgvi e`e`r Mto DıVtQ ?  
 K) ctbi uU  
 L) Ebuı k uU  
 M) uı k uU  
 N) tPSı uU |

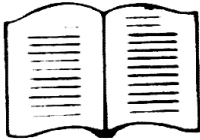
### ciw 1.4 Lvgvi e`e`vi A½mgn Ges cvi`úwi K m`úK©



G cvV tk`l Arcub-

- ◆ Lvgvi e`e`vi A½mgn Kx Kx Zv ej tZ I wj LtZ cvi`teb|
- ◆ Lvgvi e`e`vi A½mgn i weei Y w` tZ cvi`teb|
- ◆ A½mgn i cvi`úwi K m`úK©Ztj ai tZ cvi`teb|

### Lvgvi e`e`vi A½mgn (Components)



GKwU Lvgvi e`e`v H Lvgv`i msNuUZ mKj ctY`i cL`¶ KgrvU wbtq MmVZ| A`bK, tj v GKb ai`bi cY`tK GKt` A½ etj | GB cL`¶ A½mgn c`vzbZ cL` cKvi | h\_vN

- 1| dmj A½ (Crop Component)
- 2| ci`cUL A½ (Livestock Component)
- 3| gvr` A½ (Fisheries Component)
- 4| Kul`eb A½ (Agroforestry Component)
- 5| emZemo A½ (Homestead Component)

GKwU Lvgvi e`e`v H  
Lvgv`i msNuUZ mKj  
ctY`i cL`¶ KgrvU  
wbtq MmVZ| A`bK, tj v  
GKb ai`bi cY`tK  
GKt` A½ etj |

A`btK GB A½mgn`K Dce`e`v (Subsystem) etj \_v`Kb| tKbbv c`ZuU i Aax`b Avevi A`bK, tj v cY` (Enterprise) \_v`K th, tj v GKt` GKwU Drcv` b e`e`v Mto tZvtj | GQrov Avil KZ, wj A½ ctiv`¶ fite Dcti i A½mgn`K Drcv` b mniqZv Kti | thgbN Kul. hws`KxKIY A½ (Agricultural mechanization component), Kul. A\_`mVZ A½ (Agricultural mconomics component), AKwL A½ (Nonfarm component) I Lvgvi e`e`v A½ (Off-farm component) |

### A½mgn i weei Y

#### dmj A½

Lvgv`i wevfb`cKvi I wevfb`mgtq Drcw` Z mKj dmj mgn GKt` dmj A½ MVb Kti | thgbN GKelx` w`elx` e`elx` dmj | Avevi `vbr, Auk, meivR, dj, K`vj, `Zj exR, Wj dmj A\_ev gvV dmj I D`vb dmj | GB meivKQ` GKt` dmj A½ | dmj A`zi Rb` Rvg ev t`¶ tZi c`qvRb nq|

#### ci`cUL A½

Lvgv`i A\_`mVZK D`t`k` jvj b-cj bKZ. mKj cKvi I mKj eqtmi ci` ev cUL mgn`K GKt` ci`cUL A½ etj | thgbN Mi` gmi, tNvor, QvMj, tfov, kKi, nzn, gjvM, ivRnzn, Kezi BZ`w` | Gmtei Rb` Pri Yfng, Avev`j I cKz`/Wvev c`qvRb|

#### gvr` A½

Lvgv`i i PrIKZ.ev Lvgv`i i gvby KZ` az mKj cKvi gvQ, wPsw, wSbj, kvj` cfvZ`K GKt` gvr` A½ etj | gvQ, wPsw, wSbj cfvZ` Prtli Rb` cKz, tWvev, t`¶Z, Rj vfvng cfvZ` c`qvRb| gvQ aivi Rb` Lvgv`i i KvQvKwQ b`x, Lvj, wej, Rj vqk, Rj gnvj, evlo, mg`\_vKv` i Kvi |

**Kuleb A½**

emZewo, dmtji t¶Z, cuZZ Riq, cƒz cvo cƒwZ Lvgvixb GjvKvq Drcbædj, KvV, Rjy vbx I JIwa MwQcij v†K GK†I Kuleb A½ etj | Zte wetkl fite mþ eb GB A½i Avl Zvaxb bq|

emZewo, dmtji t¶Z,  
cuZZ Riq, cƒz cvo  
cƒwZ Lvgvixb GjvKvq  
Drcbædj, KvV, Rjy vbx I  
JIwa MwQcij v†K GK†I  
Kuleb A½ etj |

**emZewo A½**

Lvgviti b˘bZg A½ n†Q emZewo| Ab˘vb˘ A½ bv vKtj I G A½wU mKj Lvgvi e˘e˘vq we˘gvb| GuU Qrov Lvgvi e˘e˘v Mto D†V br| AvevmK Ni, DVvb, R½j, cƒz, cvj vb cƒwZ ug†j emZewo A½ Mto D†V|

**A½mg†ni cvi ˘umi K m˘úK©**

KIK Zvi c¶qvRb Abynti Lvgvi cwi tek I mvg†\_P wfwEtZ Lvgvi e˘e˘v Mto tZvtj b| GB Lvgvi e˘e˘vi wefbaeA½mg†ni cvi ˘umi K m˘úK©KI†Ki D†I†k˘, cwi tekMZ Ae˘v I w˘všI Øviv ubaŋi Z I cwi Pnj Z nq| mst¶†c m˘úK©w†j Pri cKvi | GLv†b G,†jvi e˘vL˘v Kiv ntj v t

1| e˘e˘v ag©(System properties) : c¶ZwU A½ GKKfite wqvkvxj v†K| thgbŊ Dce˘e˘v| Avevi G,†jv GK†I msNex AvPiY K†i v†K| msNex GKK AvPiY†KB e˘e˘v ag©ejv nq| e˘e˘v a†gP Avevi PriwU ,Y Av†Q| tm,†jv ntjv Drcv˘bkxj Zv, ˘wqZ; ˘wN© ˘wqZ;ev tUKmB Ges mvg˘Zv|

2| Lv˘ I c¶ miein (Food and Nutrition) : mKj A½B gj- D†I†k˘ Lv˘ thwMvq| G†¶†I GKwU AciwUj cwi c†K (Complementary)|

3| S†k ubeviY (Risk management) : c¶ZKj c¶KwZK I mvgwRK Ae˘vq A½mgn- Lv˘ ev Ab˘vb˘ mgm˘v mgv†b mrvqK fvgKv iv†L| tKbbv Ggb Ae˘vq me A½ GK†I ¶wZM†I nq bv|

4| Avštm˘úK©(Interaction) : Lvgviti mweR Drcv˘†b ev Avq mwó K†g©A½mgn- ci ˘uti i g†a˘ wefbaecKvi Avštm˘úK©Zwi K†i | mwK w˘všI Øviv ubqŋšZ bv ntj G Avštm˘úK© Lvgviti Rb˘ ¶wZKi n†Z cv†i | Zte Awakvsk t¶††B G,†jv Lvgvi Drcv˘†b mrvqK fvgKv cvj b K†i |

Dc†i Av†j wPZ Lvgvi e˘e˘vi wefbaeA½i cvi ˘umi K m˘úK©3 bs wP†† t˘ Lv†bv ntj v|



1P1 3 : Lvgvi e`e`vi weifbæA½zi cvi`úni K m=úK©



**Ablyj b** (Activity): Lvgviti i weifbæA½mgþni bvg Dþj LceR Gþ i Avštm=úK©Zþj ai ab|



### cuVhEi gj'iqb 1.4

mWk DEti i cutk@UK wPy (v) w b|

- 1/ mWk e'e'vi cZ'q A½mgR KquU ?  
 K) cuPwU  
 L) mwZwU  
 M) PwiwU  
 N) wZbwU
- 2/ Lvgvi e'e'vi cfi vq A½mgR KquU ?  
 K) cuPwU  
 L) mwZwU  
 M) PwiwU  
 N) QquU
- 3/ AfbtK A½mgRtK Dce'e'v etj b Kvi Y cZwUi Aaxb AfbK,tj v Kx\_vtK ?  
 K) e'v  
 L) cY'  
 M) m'ú`  
 N) e'e'v
- 4/ dmjtj i A½i Rb' Kx c@qvRb ?  
 K) cKz  
 L) Rwg  
 M) b`x  
 N) ci'cwl
- 5/ wftkl fiqe m'p eb tKvb A½i Avl Zvaxb bq ?  
 K) Kwl.eb  
 L) dmj  
 M) gvrw  
 N) ci'cwl
- 6/ tKvb A½wU mKj Lvgvi e'e'vq w'e'gvb ?  
 K) dmj  
 L) ci'cwl  
 M) emZemo  
 N) gvrw
- 7/ A½mgRni cvi úwi K m'úK,tj v KZ cKvi ?  
 K) cuP  
 L) Pwi  
 M) Qq  
 N) mwZ
- 8/ A½mgR GKtT msNex AvPi Y Kti GB GKK AvPi YtK Kx etj ?  
 K) c@KwZK ag®  
 L) tfSZ ag®  
 M) i vmvqwbK  
 N) e'e'v ag®

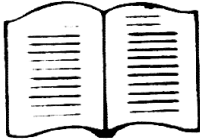


### cw 1.5 dmj -ci'cml Avštμqv

G cvV tkʔI Avciḅ-

- ◆ Avštμqvī msikō nelq, t̄j v Kx Kx Zv eYḅv KiʔZ criʔeb|
- ◆ dmj -ci'cml AstMi Avštμqv Kxfvʔe nq Zv e`il`v KiʔZ criʔeb|

#### Avštμqvī msikō nelq



Lvgri e`e`vi th tKvb `B ev ZʔZmaK AstMi Avštμqv Avtj vPbvi cʔe`msikō KZ, t̄j v nelʔq avi Yv t̄bqv cʔqvrB| G, t̄j v vbt̄`Avtj vPbv Kiv n̄t̄j vN

1| Lvgvʔii mKj Aveim, fvg, k̄g, cʔk̄z/tWvev, ci'cml, MvQcvjv, hšcwmZ, tgav, AvfÁZv BZ`w` meB m`ú` (Resources)|

2| GKwL Lvgvʔi `w̄ cāvb KvR m`ú`b̄nq| GKwL Drcv`b (Production) Ges AcivU t̄f̄vM (Consumption)|

3| Drcv`ʔbi gva`tg cūB Drcv`KmḡʔK Pvi f̄vʔM f̄vM Kiv hvq| G, t̄j v n̄t̄j vN `e` (Product or commodity), DcRvZ (By-product), Dv`Qb̄ (Residue) Ges eR` (Waste)|

4| Avštμqv vbi f̄c̄ʔY cwi gvY (Quantity), A` (Money), c̄w̄ Dcv`vb (Nutrients) I kv̄<sup>3</sup> (Energy)N GB PviU GKK e`envi Kiv hvq|

5| eZḅv c̄ȳʔK Avštμqv tKvb f̄vʔe vbi f̄c̄Z bv Kʔi mvari Yf̄vʔe e`envi Zv (Utility) vbt̄q Avtj vPbv Kiv n̄t̄q̄Q|

#### Avštμqvī v̄eiY

Lvgri e`e`vq dmj I ci'cml AstMi v̄v̄fb̄m̄st̄h̄v̄t̄Mi gva`tg Avštμqv NʔU| G, t̄j v GLvʔb mst̄ʔ̄t̄c Avtj vPbv Kiv n̄t̄j v| vP̄ 4-G dmj -ci'cml Avštμv̄K`eSv̄t̄v n̄t̄j v|

GKwL Lvgvʔi `w̄ cāvb KvR m`ú`b̄nq| GKwL Drcv`b (Production) Ges AcivU t̄f̄vM (Consumption)|

Avštμqv vbi f̄c̄ʔY cwi gvY (Quantity), A` (Money), c̄w̄ Dcv`vb (Nutrients) I kv̄<sup>3</sup> (Energy)N GB PviU GKK e`envi Kiv hvq|



IPĀ 4 : dmj -ci cml Avšġuqv

**1| `Re-cwi tekMZ msthM (Ecological linkage)**

G tġġġġ GKġU cġj b (ubqg) Abġ GKġU KġRġK cġmeZ Kġi | cġZZ Rġg ev mġgġqK cġZZ Rġg Ges dmj DVġġvi ci tġġZ ci ev cml Nvm, Lo, kmġ cġġZ Lġq | GB ci cml Liv tmLġġbB weġv ev gġ ZġM Kġi | Gfġġe Rġg Z\_v gġUġi DeġZġ evġ cvq |

**2| weġgq msthM (Exchange linkage)**

`ġ Lġgġġi ev ewġi gġaġ dmj wġ I ci cml Li `ġ ev eġenvi (KġR) weġgq Ųvi v GġU NġU \_vġK | thgbġ wġg wġġb PġDj /avb tġqv, nvj -PġI Kġi avb tġqv BZġ wġ |

**3| cġZthM Zv msthM (Competition linkage)**

G tġġġġ GKB mġuġ (Fġg) dmj Drcġ b Ges ci PġiġYi DcġthMġ nġq \_vġK | thgbġ DEġev gġSġi DEġRġg | Gme tġġġġ AMġġKġi wġġġZ fġg eġenvi wġK Kġv nq, hv Lġgġi weġġġ wġġġZ cvġi |

**4| weġġqM msthM (Investment linkage)**

GKġU Lġgġi ci cml mġuġ \_vKġi cġġcġmġ dmġġi tġġZ \_vKġġ GB msthM mġġ nq | G tġġġġ weġġqM, SġK eġeġcbv I dmj evġġZ Drcġġni msthM \_vġK | Abġġcġġe dmj ci cml cvj b I Drcġ b weġġqM evġġZ Drcġġ tġq |

**5| Lv` msthM (Food linkage)**

weib tqvM msthM tK mrvqZv Kti Lv` msthM| KIK cwi evi Lv` ktm`i m`u`i-K i f`c gvsm, `g, wlg BZ`w` ev G, t j vi Drcw`Z `e` tL tZ cvti |

**6| `Re mvi msthM (Manure linkage)**

ci`cwlLi weov, gF, Dw`Qo Lv` I eR` dmtji RvgtZ `Re mvi thvMvb t`q| Awak RbmsL`vi P`tc wbeo Pvl ver` Gj vKvq GB msthv`Mi , i az; A t b K teuk |

ci`cwlLi weov, gF,  
Dw`Qo Lv` I eR`  
dmtji RvgtZ `Re mvi  
thvMvb t`q| Awak  
RbmsL`vi P`tc wbeo  
Pvl ver` Gj vKvq GB  
msthv`Mi , i az; A t b K  
teuk |

**7| ci`kw<sup>3</sup> msthM (Draft linkage)**

Kwl .Kv`R nij Pvl , gB I Av`ov t`qv Ges Nvb Uvbrq, B`zgvovB`q ev Mmo Uvbrq I w, ej ` , GgbwK A t b K t`f`I B Mv`xl fvi evnx ci`i f`c e`e`u`Z n t`Q |

**8| ci`Lv` msthM (Fodder linkage)**

dmtji Lo, Aewkóvsk, DcRvZ (`Lj , fwt, Kzv) ev wef`bakm` BZ`w` ci` ev cwlLi wef`bae Lv` mie ivn Kti |

**9| Rvj vbx msthM (Fuel linkage)**

wbeo dmj Avev`Kvix Gj vKvq dmtji tMvov, Aewkóvsk, tMvei, i`Kbv cvZv, i`Kbv Nvm c`f`vZ meB KIK cwi ev`i Rvj vbx i Dm | Ab`\_vq G, t j v ci`cwlLi Lv` I Rvgti `Re mvi i f`c e`envi Kiv thZ |



### cuVvEi gj'iqb 1.5

#### mWk DEti i cuK, UK Pý (v) i b |

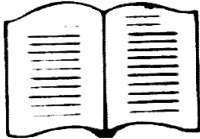
- 1/ Lvgvti i Aveim, fig, kg, cKZ, ci'cviL, MvQcij v, hšcviZ, tgav, AvfÁZv BZ'w`  
meBÑ  
K) mæú`  
L) e`  
M) Df`vM  
N) gj'evb
- 2/ Lvgvti cãvbZ` vj KvR mæúbæq | GKvU Drcv` b, Ab'vU Kx ?  
K) vevvU  
L) f'vM  
M) cwi eZB  
N) msi vY
- 3/ Lvgvti Drcv` tbi gva'tg cãB Drcv` KmgæK KZfvM f'vM Kiv hvq ?  
K) cuB  
L) vZb  
M) Qq  
N) Pvi
- 4/ Avštµqv vbi fctY KqvU GKK e'enri Kiv hvq ?  
K) Pvi vU  
L) QqvU  
M) cuBvU  
N) mvZvU
- 5/ dmj -ci'cviL Avštµqv KqvU ?  
K) `kvU  
L) GMvi vU  
M) bqivU  
N) AvUvU |



### cw 1.6 dmj-gvrm` m`u` Avstijuvq

G cvV tkfI Avciub-

- ♦ dmj gvrm` m`u` Avstijuvq KquU I uK uK Zv DttL Ki tZ cvi teb|
- ♦ Kxfite dmj gvrm` m`u` Avstijuvq m`ubanq Zv e`vL`v Ki tZ cvi teb|



### Avstijuvqi cikvi

dmj -gvrm` m`u` Avstijuvq c`avbZ QquU| G Avstijuvqvmgr` m`u` i ga`Kvi msthtMi dtj m`u` nq| vbt`aG, uij i msv`fjB weei Ymn big t` qv ntj v|

### Avstijuvqi weeiY

fugi dmj Drcv`tb  
e`envi cieZ`fZ gvQ  
Pv`fI mnvqK nq|  
tg`stjg cmeZ aib t`fZ,  
vej, tWiev cf`fZ `v`b  
dmtj i Aekovsk c`fP  
gv`fQi Lv` nq Ges c`fI  
Gme `v`b gvQ PvI Kiv  
nq|

#### 1| Re-cvitekMZ msthM (Ecological linkage)

G t`f`fI fugi dmj Drcv`tb e`envi cieZ`fZ gvQ Pv`fI mnvqK nq| tg`stjg cmeZ aib t`fZ, vej, tWiev cf`fZ `v`b dmtj i Aekovsk c`fP gv`fQi Lv` nq Ges c`fI Gme `v`b gvQ PvI Kiv nq|

#### 2| vebgq msthM (Exchange linkage)

GKRb PvIx I GKRb tRtj A\_ev`fjB PvIx g`a` dmj I gvrm` `fe`i Av`vb-c`v`b ntj GB vebgq msthM nq|

#### 3| c`v`thwMZv msthM (Competition linkage)

GKB Rvq GKB mg`tq gvQ I dmj `fjvB Drcv`tbi Dc`thwMx ntj c`v`thwMZv msthM nq| thgbN AMfxi vej, tWiev, eI`fKv`fj cmeZ v`bPzRvq BZ`v` |

#### 4| veb`qvM msthM (Investment linkage)

GKvU Drcv`tb c`vB A\_`Ab`vU`fZ LvUv`bv ntj veb`qvM msthM NtU| thgbN Lv`v`fI Drcv`Z gv`fQi Avq ntj aib ev Ab` dmtj veb`qv`fMi mjev nq| Avevi Gi D`e`vU I ntZ cv`fI |

dmtj i DcRvZ K`av,  
f`v` I `Lj gv`fQi  
Lv` `i`fc e`e`vZ nq|  
Avevi gv`fQi `av, gv`fQi  
Dir`O`o, gv`fQi AvBk  
cf`fZ tKv`b tKv`b t`f`fI  
Rvq De`fZv evov`fZ  
e`e`vZ nq|

#### 5| Lv` msthM (Food linkage)

KIK cvi ev`fI i Lv` Zvuj Kvq fiv`fI c`fI B gv`fQi `v`b| G t`f`fI gvQ Lv` m`u`-K fugKv i vL`fQ|

#### 6| gvQ Lv` msthM (Feed linkage)

dmtj i DcRvZ K`av, f`v` I `Lj gv`fQi Lv` `i`fc e`e`vZ nq| Avevi gv`fQi `av, gv`fQi Dir`O`o, gv`fQi AvBk cf`fZ tKv`b tKv`b t`f`fI Rvq De`fZv evov`fZ e`e`vZ nq|



WPI 5 : dmj -gvr m m u` Avstmuq



**Ablyj b** (Activity): WPI i mvr h dmj Ngvr m m u` Avstmuq c k ce R Gi i azj  
e v L v Ki ab |



### cuVhEi gj`iqb 1.6

mivK DEti i cutk, QUK iPy (v) i b |

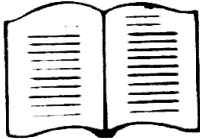
- 1/ dmj -gurm` m`u` Avštμqv Kqiu ?  
 K) cuPiu  
 L) Qqiu  
 M) Pviu  
 N) miZiu
  
- 2/ `Rb Pvi xi gta` dmj I gurm` `te`i Av`vb-cūvbtk tkvb msthvM ej v nq ?  
 K) cūZthvMZv  
 L) webtqvM  
 M) webgq  
 N) Lv`
  
- 3/ GKiu Drcv`tb cūB A\_`Ab` Drcv`tb LvUvtrv nřj Kx msthvM NřU ?  
 K) webtqvM  
 L) webgq  
 M) Lv`  
 N) cūZthvMZv
  
- 4/ GKB Riq GKB mgřq gvQ I dmj `šlvB Drcv`tbi DcřhvMx nřj Kx msthvM nq ?  
 K) webgq  
 L) cūZthvMZv  
 M) webtqvM  
 N) Lv`



### cw 1.7 ci'cwl-gvrm"-Kuleb Avstiqv

G cvl tkfi Avcib-

- ◆ ci'cwl-gvrm"-Kuleb Avstiqv KqW Zv Dfj L Kitz criteb|
- ◆ ci'cwl-gvrm"-Kuleb Avstiqv Kxfite nq Zv eYv Kitz criteb|



### Avstiqvi cKvi

ci'cwl, gvrm" I Kuleb GB wZbu Afi Avstiqv G,tjvi weifbæmsthvMi dtj msMwZ nq| GB Avstiqv çävZ mvZ cKvi | h\_vN`Re-cwi tekMZ, cözthwMzv, weibgq, Lv`, cÖYx Lv`, Re mvi I weibiqvM msthvM|

### Avstiqvi weiy

GKB fig mæut`i Dci weifbængtq ci'cwl  
 cij b Kitz gvtQi Lv`  
 `Zwi nq| çti gvQ Pvl  
 Kitz Lv` Kg jvtM|  
 Avevi GB cwi tek k wKQy  
 RjgMwQcvi vl fij  
 Rtb#| Gijc çhæµngK  
 fite ci'cwl, gvQ I  
 Kulebi Drcv`b cæwZ  
 `Re-cwi tekMZ msthvM  
 ifc t`Lv hvq|

#### 1| `Re-cwi tekMZ msthvM (Ecological linkage)

GKB fig mæut`i Dci weifbængtq ci'cwl cij b Kitz gvtQi Lv` `Zwi nq| çti gvQ Pvl Kitz Lv` Kg jvtM| Avevi GB cwi tek k wKQy RjgMe MwQcvi vl fij Rtb#| Gijc çhæµngK fite ci'cwl, gvQ I Kulebi Drcv`b cæwZ `Re-cwi tekMZ msthvM ifc t`Lv hvq|

#### 2| cözthwMzv msthvM (Competition linkage)

GKB fig tMv-Pri Y, gvQ Pvl I MwQcvi v jvMvbtvi DcthwMx ntj cözthwMzv msthvM nq| tMv-Pri Y figtZ GKB mgtq MwQcvi v jvMvbtv tMj I gvQ Pvl Kiv hvte bv| ZvB AMwaKvi wFwEtZ Drcv`b tetQ wbtZ nte|

#### 3| weibgq msthvM (Exchange linkage)

`w KIK cwi evti i gta` ci'cwl, gvrm" I Kuleb GB mæu` ,tjvi Drcw`Z `e`, DcRvZ ev th tKvb wKQy weibgtq G,tjvi th tKvbw MhY çµqvB weibgq msthvM|

#### 4| Lv` msthvM (Food linkage)

kmRvZ Lv`i ci KIK cwi evti gvsm, wlg, `g, gvQ, iUKx I weifbædj cözw Lv`i Aek` çöqvRbxq Ask| ZvB Gme gby` Lv` cwi ci-K figKv ivLq| GUV Lv` msthvM|

#### 5| cÖYx Lv` msthvM (Feed and Fodder linkage)

tMvi, nwn-gjvMi wev gvtQi Lv`, dtji DwQó gvtQi I ci'cwl Lv`, gvtQi çv ci'cwl Lv`, MvtQi cvZv ci Lv`N Gfite GKw AcivUi cÖYx Lv`ifc msthvM mjo Kti|

#### 6| `Re mvi msthvM (Manure linkage)

ci'cwl Gj-gf I t`nvetkl Ges gvtQi Auk I DwQó G,tjvi meB `Re mvi ifc Kuleb Afi e`eüz nq| Avevi Kulebi cvZv, KWP Wwv, wKko, j Zvbtv MwQ BZ`w` çP Ktæuv÷

ntj Zv cKz ev tWvev DePZv ewx Kti gvQ Drcv`tb mnvqK nq| GfiteB`Re mvi msthvM Mto Dtv|

**7| weibtvM msthvM (Investment linkage)**

ci cvL, girm` I Kul eb A½i Drcv`Z`è, DcRvZ, cY` BZ`w` wep Kti Gt`i th tKvb A½i cjtweibtvM Kivi mtebv mjo Kti | Gfite A½i msL`v evovi mvt\_ mvt\_ weibtvM msthvMi mtebv tefo hvq| GtZ Svk e`e`vcbv mnR nq|

ci cvL-girm`-Kul eb Avštupqv iPT 6-G t`Lvfbv ntj v|



iPT 6 : ci cvL-girm`-Kul eb Avštupqv



**Abyj b (Activity):** Avcvb wK gtb Ktib dmj I girm` mæú` Avštupqvi PvbZ ci cvL, girm` I Kul eb Avštupqv figi Kvq` e`envi wboDZ nq? Avcbvi DEt`ii`c`f` hvq` Dc`vcb Kib|



**cwVhEi gj`iqb 1.7**

**mWk DEti i cwtk, QUK wPy (v) w b |**

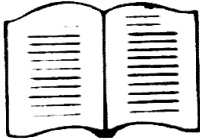
- 1/ ci cwl-gvrm`-Kwl eb Avst`u, qv KqvU ?
  - K) AvUwU
  - L) mvZwU
  - M) bqUwU
  - N) QqvUwU
  
- 2/ GKB Fig tMvPvi Y, gvQ Pvi I MvQcvj v j vMv`bvi Dc`thvMx n`j Kx mst`hvM nq ?
  - K) wwbvgq
  - L) wwb`tqvM
  - M) c`Z`thvMzv
  - N) Lv`
  
- 3/ `y KIK cwi evti i g`a` ci cwl, gvrm` I Kwl.R eb G, t j v Drcw`Z `e`, DcRvZ ev Ab` wKQj Av` vb-c`vb`K Kx mst`hvM etj ?
  - K) wwbvgq
  - L) wwb`tqvM
  - M) c`Z`thvMzv
  - N) Lv`
  
- 4/ ci cwl, gvrm` I Kwl eb n`Z Drcw`Z `e` ev DcRvZ wv`u Kti G, t j v`Z c`y`vq e`envi`K Kx mst`hvM etj ?
  - K) wwbvgq
  - L) wwb`tqvM
  - M) c`Z`thvMzv
  - N) Lv`|



### cvW 1.8 dmj -ci`cvL-gvm`-Kuleb Avštjμqv

G cvW tkłI Avcub-

- ◆ dmj -ci`cvL-gvm`-Kuleb Avštjμqv cKvi Dštj K i t Z cv i t e b |
- ◆ dmj -ci`cvL-gvm`-Kuleb Avštjμqv Kxfite nq Zv eYbV K i t Z cv i t e b |



#### Avštjμqv cKvi

evsj vt`ki GKU mvari Y Mōtg AwZ mvari Y Lvgi nt`Q dmj , ci`cvL, gvm` I KulebN GB PriuW Aštzi msthvRZ mgnvi | Avi GB PriuW Aštzi Dcv`wZtZ Mto DVv Lvgi e`e`v nq mteP mtebvqg, Drcv`tb w`wZkxj Ges cwi t e t k t UKmB | Gi j c Lvgti Drcv`b cōq mvi v eQiB ntq \_vtK | ZvB GLvtb cwi emi K ev gRyx kō `ŋZvi mvt\_ e`envi Kiv hvq | GB PriuW Aštzi ga`Kvi wef b e msthvM ntZ cvti AštK | Zte G\_ t j vtK tgvUvgv fite bquW cKvti e`vL`v Kiv hvq | G\_ w j nt`QŃ `Re-cwi t e k M Z, weibgg, cōZthvM Zv, webtqvM, Lv` , `Re mvi , ci`kw³, ci`Lv` Ges Ryj vbx msthvM |

#### Avštjμqv weiy

##### 1| `Re-cwi t e k M Z msthvM (Ecological linkage)

th tKvb GKUW Aštzi cPj b (wbgg) hv` Ab` GKUW AštK cFweZ Kti Zvntj `Re-cwi t e k M Z msthvM nq | thgbN cūZZ RvgtZ ci` Nvm tLtq gj -gĤ Z`vM gvW DeP ntj tmLvtb cti dmj Pvl Kiv | avb tŋtZ avtbi tMvov ev AvMvQv cĤP tMtj I cmtZ fti tMtj tmLvtb gvQ i Pvl Kiv nq | wef b e msthvM Qvqg ci` Nvm tLtq mektg tbq, Qvqv hŋ `v t b me t k I dmj Drcv`b nq |

##### 2| weibgg msthvM (Exchange linkage)

th tKvb `w Lvgti i gta` dmj , ci`cvL, gvm` I Kuleb Aštzi Drcv`Z `ē, cY, DcRvZ cFwZi Av`vb-cōvb ntj weibgg msthvM nq | thgbN avb ev Pštj i weibgtq gjvM ev wWg mSMh | gvQ i weibgtq Pij mSMh | dj ev Kv t Vi weibgtq avb, `ŋ ev gvQ mSMh | Gi j c AštK ntZ cvti |

##### 3| cōZthvM Zv msthvM (Competition linkage)

GKB m`u` (fvg, UvKv) dmj , ci`cvL, gvm` I Kuleb Aštzi Rb` Dc thvMx ntj cōZthvM Zv msthvM nq | G t ŋ t Ĩ K I K t K A M Ń a K v i w f ũ t Z ev m g ũ s Z Drcv` t b i t K Š k t j i Avkō w b t Z nq | thgbN dmj -gvQ, gvQ -ci`cvL, dmj -Kuleb, ci`cvL -Kuleb cFwZ m g ũ s Z Drcv`b t K Š k j |

##### 4| webtqvM msthvM (Investment linkage)

GKB Aštzi Dcv`wZ Ab` GKUW Aštzi mō ev Drcv`b epx ev Aw`Zj wUkv t b t Z mrvqZv K i t j we b t q v M m s t h v M n q | d m j , c i ` c v L , g v m ` I K u l e b A Ń , t j v G K t Ĩ \_ v K t j G \_ w j c i ` ũ i t K we b t q v M m s t h v M m Ń Ń t Z m r v q Z v K t i |

**5/ Lv` msthM (Food linkage)**

gubtj i Lv` AtbK cKvi | ZvB GKB Lvgvti eü A½i mæsj tb GKU KIK cwiertii cåvb  
Lv` fvZmn gvQ, gism, wlg, ˘g, weifbædj Drcv Z nq| GLvfb GKU A½ Lv` i Øvi v Ab`  
A½, tj vi mæúit-K fngKv cyj b Ki¼Q| GB eüglx Lv` KIK cwiertii Lv` ˘qsmæúYzv  
ARfb , iæZcYfngKv i vL| GtZ Gme A½ weibqvm DrmvinZ nq|

**6/ ˘Re mvi msthM (Manure linkage)**

dmtj i Aewkóisk I wkKo, ci cvLi gj -gÊ, gvQi Dv'Qóvsk Gme dmj , gvQ I MvQciv v  
Drcv tb ˘Re mvi i fç e'ëüZ nq ˘Re mvi msthM mæp Kti | GtZ Lvgvi Z\_v mvgwMk  
cwi tek ˘LY nqZ i ¶v civq|

**7/ ci kw³ msthM (Draft linkage)**

dmj Drcv` tbi PvI , gB I AvBov t` qvq, weifbæKwl. cY` Drcv` tbi Nvb Uvbvq, B¶zgvovB  
KvR, cY` cwi entb, Mõtq Mno Uvbvq ci e'ëüZ nh| GfiteB fvi evnx ci Ab`vb` A½i  
msthM NUvq| GtZ Mægy Kwl. I A\_æwZK KvR mæúbant`Q|

**8/ ci Lv` msthM (Feed and Fodder linkage)**

weifbædmjtj i Lo, AvMvQv, DcRvZ I Dv'Qó, dtj i Pvgov ev Dv'Qó, gvQi , av, nvtoi , av,  
km BZ`w` Mæcwj Z ci (Miæ gwI, QvMj , tfoi) ev cvLi (nwn, gjwM, Kezi) Lv` i fç  
e'ëüZ nq ci Lv` msthM mæp Kti | GtZ Lvgvti Aew`Z weifbæA½i Drcv` b LiP Ktg  
hvq| Gfite weifbæA½i mgšq Lvgvi e'ë`vK j v fRbK chq wbtq thqZ cvti |

**9/ Ryj vbx msthM (Fuel linkage)**

wbæo dmj Drcv` bKvix GjvKvq (NbemwZcYf) dmtj i Dv'Qó, Lo, Miai weöi, MvQciv v,  
Rj R AvMvQv BZ`w` KIK cwiertii i vbi Ryj vbx i fç e'ëüZ nq| GfiteB Ryj vbx msthM  
nq \_vK| Ab`\_vq G, tj vi AtbK wkQb ˘Re mvi msthM e'ëüZ nqZv|

dmj -ci cvLi -gvrm` -Kwleb GB A½, tj vi Avštµqv wPÎ 7-G t` Lvfbv ntj v|



wPĪ 7 : dmj -ci`cml-gvrm"-Kwleb AvŠtġuqv



**Abkzj b** (Activity): `Re cwi`tekMZ mšthvM, `Re mvi mšthvM Ges Rjy vbx mšthvMi  
ga`Kvi AvŠtm=úK`eYDv Ki ab|



**cǎVǎi gj ǎq b 1.8**

**mǎK Dǎi i cǎk ǎUK ǎPǎ (ǎ) ǎ b |**

- 1/ dmj -ci cǎL-gvrǎ -Kwl eb Avštǎ qv Kqǎ ?  
 K) ǎkǎ  
 L) Avǎǎ  
 M) Gmǎǎ  
 N) bqǎ
  
- 2/ dmj , ci cǎL, gvrǎ | Kwl eb GB Priǎ Aǎ½i DcǎǎZǎ Mǎ DVǎ Lvgǎ e ǎǎ  
 Kx aiǎbi ?  
 K) jvǎRbK  
 L) mǎǎebvgq  
 M) mgmǎ v mǎǎj  
 N) cǎRgq
  
- 3/ dmj , ci cǎL, gvrǎ | Kwl eb GB Priǎ Aǎ½i DcǎǎZǎ Mǎ DVǎ Lvgǎ e ǎǎ  
 Drcǎ ǎ tKgb nq ?  
 K) ǎǎZkǎj  
 L) AvǎǎZkǎj  
 M) cǎǎZkǎj  
 N) mǎǎebvgq
  
- 4/ dmj , ci cǎL, gvrǎ | Kwl eb GB Priǎ Aǎ½i DcǎǎZǎ Mǎ DVǎ Lvgǎ e ǎǎ  
 cǎi tǎk ǎǎZǎ nq tKgb ?  
 K) ǎǎǎǎ  
 L) mǎǎebvgq  
 M) ǎǎǎǎ  
 N) AvǎǎZkǎj
  
- 5/ dmj , ci cǎL, gvrǎ | Kwl eb GB Priǎ Aǎ½i mgštǎ Mǎ DVǎ Lvgǎ cǎi eǎi K  
 ev gRǎ kǎ ǎKfǎ e ǎǎ Kiv hvq ?  
 K) ǎǎZǎ mǎǎ  
 L) A ǎǎZǎ mǎǎ  
 M) B ǎǎZ  
 N) Acǎi Kǎ Zfǎ



## Persigj`iqb

mWK DEti i ctk`UK wPý (v) w b |

- 1/ A\_ wZK `wótkvY t\_ tK Lvgvi KZ cKvi ?  
 K) `B  
 L) wZb  
 M) Pvi  
 N) Qq
  
- 2/ th Lvgviti i Drcv`b ev Avq`i ayKwL.cwi evti i tgšij K Pwn`v ugUvq ZvK Kx Lvgvi etj ?  
 K) ugk²  
 L) fiY-tcvlY  
 M) `wi`²  
 N) tgšij K
  
- 3/ wKtmi th tKvb Ask evBti i Dİxcvq mvgwMK fite cšZwqv t` Lvg ?  
 K) Dc-e`e`vi  
 L) mvgvex wqvvi  
 M) e`e`vi  
 N) DİxcKti
  
- 4/ tK Zui Ávb, `qZv, AvfÁZv I kw³i Øvi v Lvgviti i tšZ I `Re mæú`mgr I Dnv`i cšwqv, tj v wPqYZvi mv`\_ KvR j vMvqN  
 K) wÁvbx  
 L) KIK  
 M) cšvi YKgx®  
 N) mi Kvi
  
- 5/ Lvgvi e`e`vi `enkó` ,tjvi cwi gvY ev ,YMZ Kg-tenk i Rb` Drcv`b ev Avq Kx nšZ cvti ?  
 K) Kg-tenk  
 L) kb`  
 M) tenk  
 N) Kg
  
- 6/ Rj -gnvtj Kx RvZxq gvO ai v nq ?  
 K) mvgwK  
 L) wgvvcmbi  
 M) tj vbcmbi  
 N) wvfbæ
  
- 7/ Sg Pvl Kx aišbi Lvgvi ?  
 K) ZY.fwg  
 L) `vqx  
 M) `vbršlix  
 N) ugk²

- 8/ Lvgvi e'e-v mgšq ev m=út` i w`K t\_#K cŹ eQi cwi ewZŹ nq| ZvB GUv#K Kx ej v Ptj ?  
K) A`vqx  
L) MwZKxj  
M) `vqx  
N) NYŹqgvb
- 9/ Lvgv#i wK D#t`k` j vj b-cvj bKZ.ci'cml.mgn#K GK#t` ci'cml A½ etj ?  
K) A\_ŹwZK  
L) cwi ewi K  
M) tLj vajv  
N) mvgmRK
- 10/ Lvgv#i P#KZ.ev Rj vk#q aZ mKj gv0, wPsw0, kvgk, wSbky c#Z#K GK#t` Kx A½ etj ?  
K) cŹYxR  
L) gvrw`  
M) Rj R  
N) ci'cml
- 11/ Lvgv#i i mKj A½B Kx thwMvq ?  
K) dj -gj  
L) U#Kv-cqmv  
M) Lv`  
N) ci'Lv`
- 12/ mwK wmxvšŹvi v wqwsž bv n#j tKvbU Lvgv#i i Rb` q#wZKi n#Z c#i ?  
K) A½  
L) e'e-v  
M) cY`  
N) Avštm=úK®



**mswB i Pbvj-K cke**

- 1| wmt÷g ev e`v ej tZ Kx eSvq ?
- 2| evsj v`tki emYwR`K Lvgvi ,tj vi bvg I Ae`vb wj Lly|
- 3| evsj v`tki wkg<sup>3</sup>Lvgviti Dc-e`e`vi cY` ,tj v wj Lly|
- 4| Lvgvi e`e`vi emZemo A½ e`vL`v Kiab|
- 5| Avštupqv i msukó wclq ,tj v Avtj vPbv Kiab|
- 6| dmj -ci`cml-gvrm`-Kuletbi Ryj vbx msthvM e`vL`v Kiab|
- 7| Lvgvi KvK etj ?
- 8| Kul.ej tZ Kx eSvq ?
- 9| Kx DfI`tk` GKRb KIK Lvgviti i Dcv`vb msMh Kti b ?
- 10| Lvgvi e`e`v ej tZ Kx eSvq ?
- 11| Lvgvi e`e`vi `ewkó` KquU I Kx Kx ?
- 12| evsj v`tki wvfbvLvgvi e`e`vi tkYweb`vm Kiab|
- 13| evsj v`tki wkg<sup>3</sup>Lvgvi e`e`vi Dc-e`e`v ,tj v wj Lly|
- 14| emZemo Dc-e`e`vi eYv wj Lly|
- 15| Lvgvi e`e`vi cZ`q I ctiv`q A½mgfni bvg wj Lly|
- 16| dmj A½i eYv wj Lly|
- 17| Avštupqv i tZ Kx eSvq wj Lly|
- 18| e`e`v ag`ej tZ Kx eSvq wj Lly|
- 19| Lvgviti i Drcv`tbi gva`tg cB Drcv`KmgfK KZfvte fivM Kiv hvq? H, wj Kx Kx ?
- 20| Avštupqv wbi fctYi GKK ,tj v Kx Kx ?
- 21| dmj -ci`cml Avštupqv i th tKvb PviU eYv Kiab|
- 22| dmj -gvrm` m`ut` i `Re-cwi`tekMZ msthvM e`vL`v Kiab|
- 23| dmj -gvrm` m`ut` i gvQ Lv` msthvM e`vL`v Kiab|
- 24| ci`cml-gvrm`-Kuleb Avštupqv i `Re mvi msthvM e`vL`v Kiab|
- 25| ci`cml-gvrm`-Kuleb Avštupqv i `Re-cwi`tekMZ msthvM eYv Kiab|
- 26| dmj -ci`cml-gvrm`-Kuletbi `Re-cwi`tekMZ mshvM eYv Kiab|
- 27| dmj -ci`cml-gvrm`-Kuletbi Lv` msthvM e`vL`v Kiab|
- 28| dmj -ci`cml-gvrm`-Kuletbi ci`Lv` msthvM eSvq wj Lly|



**DĚi gvj v**

**cW 1**

1| L    2| N    3| M    4| N    5| K    6| L

**cW 2**

1| K    2| L    3| M    4| N    5| L    6| K

**cW 3**

1| M    2| L    3| M    4| L    5| N    6| M    7| K    8| L

Kw.L.1 c j n Dbq b ě

**cW 4**

1| K    2| M    3| L    4| L    5| K    6| M    7| L    8| N

**cW 5**

1| K    2| L    3| N    4| K    5| M

**cW 6**

1| L    2| M    3| K    4| L

**cW 7**

1| L    2| M    3| K    4| L

**cW 8**

1| N    2| L    3| K    4| M    5| L

**Peršigj-qtbi DĚi**

1| K    2| L    3| M    4| L    5| K    6| L    7| M    8| L

9| K    10| L    11| M    12| N

## BDibU 2 Lvgvi emYur`KxKiY I Df`v³v Dbq̄b

evsj t`tki Kul.cãvb A\_ØmZi wfiE mÿp Kiv cØqvRb| t`tk Kul.KtgP Dbq̄tbi gva`tg Drcv`b evortbv mæ| Gfite eüglx Lv` Pmrv`v ci-Y Kti Kul.RvZ cY` Avg`mb eÜ Kiv thZ cvti| ZvQvov kvKmevR, dj-gj-, gvQ, gvsm, wlg, wPsw BZ`w`i Drcv`b emotq idZmbi mÿhm mÿp Kiv hvq| Dbz Kul.chy³i gva`tg Kul.cwi tek AÄj Abviti Lvgvi emYur`KxKiY mÿwi Kwí Zfite iia Kiv cØqvRb| GRb` chy³, cök¶¶Y I e`vcbv Dbq̄b tRvi`vi Kiv DvPZ|

ukw¶¶Z I AvMhx e`v³/cØZovtbi Df`v³M emYur`K Lvgvi mÿpí cvkvcnk `¶, Drmrvx I D`v³ebx ¶gZv mæúbæKl.KtKI G cØqvRb Rvov Kiv cØqvRb| Aí wKQyeo Lvgviti tPq nrvvi nrvvi ¶z³ Lvgvi emYur`Kfite Mto ZjzZ cvitj mæut`i mÿzeEb I `¶ e`envi ZjvšZ nte| GRb` Kul.tZ Df`v³v Dbq̄b cØqvRb iia Kiv cØqvRb| evr Lvgvi Mto tZvj vi AvtM ¶z³ Lvgviti chy³ e`envi Kti Df`v³vMY fij-g` hvPvB Kti `¶Zv evx i mÿhm jvf Kiteb| GKB mæ\_ mgvšZ Kul.Lvgvi `Zvi i cØqvRb Avl jvf Kitz cviteb|

Kul.R ukí mekvk cØqvR Z e`v³K FY e`v³v chy³, cök¶¶Y I e`vcbv Ašf³ cØqvRb| cKí cØqvR I ev`evqtb `¶ mekIÁ/meÁvxi cKí cwi`k I civgk cØvb eva`Zvgj-K Kiv DvPZ| Ftyi Urvv mæwK cKí mebtqvM Kitz FY Av`vq Kiv mnR Ges wvØZ nq|

t`tki ukw¶¶Z teKvi hy mgvRtK ev`eglx chy³i Dci cök¶¶Y I e`vcbv cØvb ci Df`v³v Dbq̄b cØqvRb Rvov Kitz emYur`K Lvgvi Mto tZvj mæ nte| GfZ `³ Kgfs`vb mÿhm mÿpí cvkvcnk Kul.RvZ `te`i Pmrv`v ci-Y Kiv hvq| h\_vh\_ Kwí Mvi I e`vcbv Ávb e`ZxZ emYur`K Lvgvi iia Kiv eo SvkY¶ G e`vcbv mZKZv Aej æb Kiv Riãx|

GB BDibU Lvgvi emYur`KxKiY I Df`v³v Dbq̄tbi msÁv, Df`v³vi `enkó` I cKvi, Df`v³v Dbq̄tbi mgm`v, mævbev, w`K vbt`Rbv BZ`w`i I ci me`wv Z Avtj vPbv Kiv nq̄tQ|

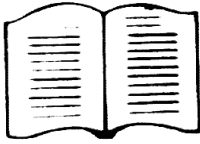
### cw 2.1 Lvgvi emYur`KxKiY



G cvV tk̄tI Avcib-

- ◆ Lvgvi emYur`KxKiY Kx I tk̄bv Zv ej tZ I wj LtZ cviteb|
- ◆ fiY-ıcvlY I emYur`K Lvgviti cv`R` wbfcy Kitz cviteb|
- ◆ Lvgvi emYur`KxKiYi AšfıvqmgR Dtz L Kitz cviteb|
- ◆ Lvgvi emYur`KxKiYi DcvqmgR Ztz aitZ cviteb|
- ◆ Lvgvi emYur`KxKiY MtelYi fvgKv Dtz L Kitz cviteb|

**Lvgvi emYiR`KxKiY iK I tKb**



Lvgvi emYiR`KxKiY  
A`Kwl. Lvgvi tK  
emYiR`Kfite jvFRbK  
Kiv|

Lvgvi emYiR`KxKiYi  
c`uqv t`tki tgaim`ube  
AwfA KIKMYtK `qZv  
I neib`qVM ewx Kti  
j vMmB ch`yB e`envi  
Kti Drcv`b tK jvFRbK  
ch`q Dbaz Kiv eS`vq|

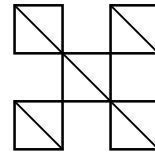
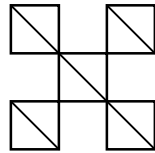


evsjv`tki GKK epEg tckv Kwl. | bvbv cwi`tek c`ZKj Zv I c`KwZK Kvity Gt`qj`T  
Avkvbjfc Dbaq nqub| Kwl. tckvtK uWk`tg ivL`tZ ntj M`gxy Kwl. Lvgvi ,tj vtZ Dbaq`bi  
tOqv j vM`tZ nte| Kwl. Lvgvi tK emYiR`KxKiY Ki`Z nte| Lvgvi emYiR`KxKiY A`Kwl.  
Lvgvi tK emYiR`Kfite jvFRbK Kiv| t`tki Kwl. Lvgvi tK eZ`qyb fiY-`tclY ch`q t`tk  
emYiR`K ch`q Dbaz Ki`Z nte| GuU GKwU KwVb c`uqv, Zte `ifn bq| Lvgvi e`e`icbvq  
`qZv ewx I Kwl. tZ j vMmB ch`yB MZ cwi eZ`B Gt`b Zv Kiv m`e|

Lvgvi emYiR`KxKiY I emYiR`K Lvgvi mgv`R gtb ntj I `yji c`uqv wfb`b emYiR`K Lvgvi  
th tKvb e`i`B, c`Z`oib ev ms`v, c`yR, m`u` I ch`yB msM`b Kti Mto Z`tZ c`ti| Lvgvi  
emYiR`KxKiYi c`uqv t`tki tgaim`ube AwfA KIKMYtK `qZv I neib`qVM ewx Kti  
j vMmB ch`yB e`envi Kti Drcv`b tK jvFRbK ch`q Dbaz Kiv eS`vq (wP` 8)|

**e`i`B/Dt`v`v`v/c`Z`oib**

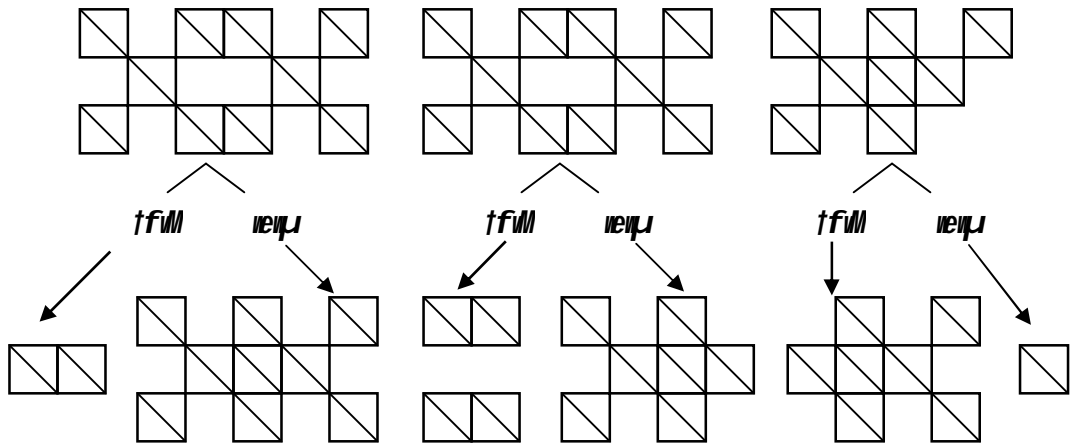
**KIK**



**ch`yB i mte`Eg e`envi  
I Drcv`b**

**ch`yB i `q e`envi  
I Drcv`b**

**ch`yB i Kg e`envi  
I Drcv`b**



**(K) emYiR`K Lvgvi**

**(L) Lvgvi emYiR`KiY**

**fiY-`tclY Lvgvi**

wP` 8 : emYiR`K Lvgvi

**fiY-`tclY I emYiR`K Lvgvi**

evsjv`tki M`tgi Kwl. Lvgvi tK mvari Yfite fiY-`tclY Lvgvi ejv nq| Gi `enk`o` ntjv  
Lvgvi Drcv`Z `e`, cY` ev DcRvZ c`q meB cwi ev`ti i fiY-`tclY e`e`uZ nq| eQi

tfj` Kg-teik D0E cY` ev`e` wepμ Kti KIK Ab`vb` Pnin`v tgUvq| G cKvi Lvgti ntZ AvZni<sup>3</sup> Avq Kti mvgvRK Dbz m`e nq br| A\_`bWZK`w0Z Gme Lvgti eQti th LiP nq Drcv`tbi Avw`R gj` Zvi mvgvb` teik ev mgvb ev Kg nq| cKwZK`jhm ntj Drcv`b ktb`i tKvVq tbtg thZ cvti |

GKwU Kul.Lvgti eQti th kg, cμR, DcKiY cFwZ e`q nq, Drcw`Z mKj cY`, `e` ev DcRvZ BZ`w`i evRvi gj` GKtI Dnvi tPtq Kgctq kZKiv 80 fVM teik ntj tmUvtK emYwR`K Lvgti ejv nq|

Acic`q, GKwU Kul.Lvgti eQti th kg, cμR, DcKiY cFwZ e`q nq, Drcw`Z mKj cY`, `e` ev DcRvZ BZ`w`i evRvi gj` GKtI Dnvi tPtq Kgctq kZKiv 80 fVM teik ntj tmUvtK emYwR`K Lvgti ejv nq|

GLv`b fiY-`tcvY I emYwR`K Lvgti i Zj`bvqj-K AvtjvPbv Kiv nt`Q| G t`tK`b cKvi Lvgti i cv`R` , tjv eSv hite (mvi Yx-3)|

**mvi Yx 3 : fiY-`tcvY I emYwR`K Lvgti i cv`R`**

<b>welq</b>	<b>fiY-`tcvY Lvgti</b>	<b>emYwR`K Lvgti</b>
1  weib`qvm	wbR`^m`u`, kg, cμR	wbR`^I FY Kiv m`u`, cμR, kg
2  chj <sup>3</sup>	me ai`tbi Kul.chj <sup>3</sup>	emYwR`K fite jvFRbK chj <sup>3</sup>
3  Drcv`b	Kg ntZ gvSwi, mvgvb` teik	A`bK teik
4  cY`/`e` e`envi	cwi emi K tfVM teik, wepμ Kg	wepμB teik, tfVM Kg
5  evRvi/gj`	evRvi RvZ mgm`v bvB, gj`i cFve Kg	evRvi RvZKiY Ri`aix, gj`i cFve A`bK teik
6  Ae`rb	t`tki mKj Mtg	evRvi-mjear m`ubae`rb, kn`ii Av`kcv`k

**Lvgti emYwR`KxKi`yi Ašivq**

evsj v`tki t`c`v`c`U Kul.Lvgti emYwR`KxKi`yi Ašivqmg` w`e`j`c`N

- 1| m`u` I Avw`R mvgv`xZv
- 2| jvMmB chj<sup>3</sup> I`qZvi Afve
- 3| chj<sup>3</sup> Abjvqx DcKi`yi Afve
- 4| cwi`tetki c`ZKj Zv
- 5| S`k Mh`y mvgv`xZv
- 6| gj` I evRvi wel`q`f` avi Yv|

**Lvgti emYwR`KxKi`yi Dcvq**

Lvgti emYwR`KxKiY cμqv weifb`fite m`ub`entZ cvti | Zte Gt`q`I Dc`ti emY`Z Gi Ašivqmg` `i Kivi e`e`v`vKv Ri`aix| tmB m`t`z KI`Ki ZYgj- ch`q msthvM`vcb Kti c`P`v`w`ntZ nte| th me Dcv`q Lvgti emYwR`KxKiY ntZ cvti tm`w`j` ntj vN

- 1| tKv`u`vbx (Company) mμo
- 2| U`÷ ev dvD`f`Ukb (Trust or Foundation) Mvb
- 3| temi Kvi`x c`Z`v`b ev Gb`RI (NGO) Kv`p`g
- 4| KIK msMvb (Farmers' association) c`Z`v`
- 5| KIK/e`w`/D`v`v` Dbq`b (Farmer/Individual/Entrepreneurship development)

GLvrb mst`qtc Lvgvi ewYwR`KxKiYi Dc`ti ewY`Z Dcvq, tji vi fvgKv Avtj vPbv Kiv ntjv :

tKv`ubx `xNp b Awak  
Drcv`tb m`qg Kul.c`hny`  
KIKtK t`te Ges  
Drcw`Z cY` μq Kti  
evRviRvZ Ki`te| g`bvdvi  
civkvcnk KIK tmerl  
ntZ nte tKv`ubxi  
D`i`k`|

1] tKv`ubx m`p : Kul. cY` ev DcKiY evRviRvZKiY GK ev GKwaK e`emvqK  
tKv`ubx ntZ cvti | tKv`ubx `xNp b Awak Drcv`tb m`qg Kul.c`hny` KIKtK t`te  
Ges Drcw`Z cY` μq Kti evRviRvZ Ki`te| g`bvdvi civkvcnk KIK tmerl ntZ nte  
tKv`ubxi D`i`k`|

2] Uv`- ev dvD`Ukb MVb : i`agv`i Kul.c`hny` D`m`eb, Kul.c`Y`i Drcv`b evovt`b I  
Hme `e` evRviRvZKiY KIKtK mnvqZv c`v`b`i D`i`k` msuk` w`tkl`A mgstq Guv  
MVb Kiv nte| c`v`q`R`b GLvb ntZ KIKtK Drcv`b FY I c`y`R I mieivn Kiv hute|

3] GbwRI Kvh`p`g : evsjv`tki c`Z`s`i`A`A`j `w`i`a` w`tg`v`Pb, w`k`q`v, `r`^`^`, Kul.c`f`w`Z  
Kvh`p`g A`b`K GbwRI RiwZ AvtQ| Zv`i Kvh`p`g cwi`tek w`f`w`EK c`hny` D`m`eb I  
tmUvi ewYwR`K e`envti mnvqZv c`v`b`GKwU, j`az`c`y`Dbq b tK`S`kj ntZ cvti |

4] KIK m`m`Vb : w`b`R`i`i` f`i`M` w`b`R`iv Mo`z` m`y`S`M`W`Z, m`k`c`L`j I m`j`h`w`M` KIK m`m`Vb  
Mto tZjv ntjv Lvgvi ewYwR`KxKiYi D`E`g c`S`i` G m`m`Vb RvZxq, Av`A`w`j`K I  
`v`b`x`q miKvix ev temiKvix Awd`tm m`st`h`w`M` Kti Dch`y` c`hny` w`el`t`q c`k`q`j`Y w`b`t`q G  
Kv`R` mdj Zv j`v`f` Ki`z` cvti | c`hny` e`envti F`Y`i Rb` e`v`st`Ki m`v`\_`t`h`w`M` Kiv  
mnR nte| O`ng`e` w`f`U`v`O` evRviRvZKvix m`m`Vb Gi`f`c` GKwU ms`v`|

w`b`R`i`i` f`i`M` w`b`R`iv  
Mo`z` m`y`S`M`W`Z, m`k`c`L`j  
I m`j`h`w`M` KIK m`m`Vb  
Mto tZjv ntjv Lvgvi  
ewYwR`KxKiYi D`E`g  
c`S`i`| O`ng`e` w`f`U`v`O`  
evRviRvZKvix m`m`Vb  
Gi`f`c` GKwU ms`v`|

5] KIK/e`w`b`/D`i`v`^` Dbq b : w`el`P`t`q` mnR I `z`Z`i` e`e`v` ntjv Av`M`h`x` e`w`b`, Av`f`A` I  
`q` KIK ev th tKv`b` teKvi h`g`K`N` G`i` c`hny` c`k`q`j`Y w`t`q Lvgvi ewYwR`KxKiYi  
DrmwvZ Kiv| G`z` c`Z`t`k` `^`^`^`c`Q`g`z`v Lvgvi m`p`i` m`j`h`w`M` cv`te`b`| w`b`R` `q`Z`v I  
c`y`R w`el`t`q`v`t`Mi t`q`i` cv`te`b`| G`i`q`i`t` msuk`- o` w`e`A`v`x` ev w`el`k`l`A`t`i` m`v`\_`m`st`h`w`M` i`q`v`  
Kti Gw`M`t`q` th`z` nte|



**Ablyj b (Activity):** evsjv`tki Lvgvi ewYwR`KxKiYi eZ`v`b Ae`v` Z`j` ai`ab`| eZ`v`b  
Ae`vi Dbq`b` Kx`Kx` c`^`q`c` M`h`Y` Av`i` c`v`q`R`b` Zv` h`y`^`mn` Dc`v`cb` Ki`ab`|

**Lvgvi ewYwR`KxKiYi MtelYvi fvgKv**

evsjv`tki Kul. Dbq`b` ewYwR`K Lvgvi `v`c`b` Drmwv, m`R`b`k`j` I Aa`emvq`x` e`w`b`MY`t`K  
Kwi`Mwi I Dch`y` c`hny` mnvqZv c`v`b` c`v`q`R`b`| civkvcnk t`tki j`q` j`q` fi`Y`-t`c`i`Y`  
Lvgvi `t`j`v`tki Lvgvi ewYwR`KxKiYi c`v`q`v`q` j`v`f`R`b`K` Kiv c`v`q`R`b`| B`z`v`c`t`e`^`Avtj` w`P`Z  
mgm`v, tji vi mgv`v`b`K`i` ZY`g`j`- ch`q`q` MtelYv`i`Kvi`|

evsjv`tk 30wU Kul. cwi`et`k` A`A`j` w`e`f`^`| Gme A`A`j`i` m`e`P` mgm`v` I m`v`e`b`v` GK i`Kg  
bq`| Kul. MtelYv`i` c`v`z`v`t`b`i` c`hny` m`e`P` mgv`b`f`ite` j`v`M`m`B` nq`bv`| Ziv Av`k`i` `k`t`K` G`t`k`  
i`i`a`n`q` Lvgvi e`e`v` I cwi`tek MtelYv`i`| Gi` j`q`i` w`Q`j` KIKtK m`t`z` w`b`t`q` w`e`f`b`e`Kul. cwi`et`k`  
`v`b`x`q` DcKiY I m`v`u`t`i` w`f`w`E`t`Z` KIKtK`i` tgav` I `q`Z`v` Kv`R` j`v`M`t`q` evRvi`-P`v`v`v` m`v`u`b`e`  
j`v`M`m`B` c`hny` D`m`eb` Kiv`| eZ`v`b` G` ai`t`b`i` A`b`K` Kul.c`hny` i`t`q`q`|

cieZ`x`c`w`v` tji v`t`Z` evsjv`tki t`c`q`i`t`Z` MtelYv`i` ä` dj`v`d`t`j`i` w`f`w`E`t`Z` Lvgvi ewYwR`KxKiYi  
D`i`v`^` Dbq`b` c`v`q`v` Avtj` v`Pbv` Kiv` nte`|



## cvVĖi gj`iqb 2.1

mĭK DĖti i cvkĭUK Pŷ (√) ū b|

- 1/ evsj v`tki epĖg tckv Kx ?
  - K) gvQai v
  - L) PĭKžx
  - M) Kŭl.
  - N) kĭRĭex
  
- 2/ t`tki Kŭl.Lvgvi tK eZĭvb fiY-tcvlY chĭq t\_tK tKvb chĭq DbŷZ Ki tZ nte ?
  - K) emYŭR`K
  - L) AvabK
  - M) ŭgk<sup>a</sup>
  - N) mgŭSŽ
  
- 3/ Lvgvi emYŭR`KxKiY I emYŭR`K Lvgvi mgŭ\_R gtb ntj I `ŷli ŭfbžv Kx ?
  - K) c×ŭZ
  - L) cĭLqv
  - M) Dĭt`k`
  - N) Dbqtb
  
- 4/ fiY-tcvlY I emYŭR`K Lvgvti i Zžbvq KqŭU ŭel q AvtQ ?
  - K) AvUŭU
  - L) cvPŭU
  - M) QqŭU
  - N) bqŭU
  
- 5/ Lvgvi emYŭR`KxKiY KqŭU Dcvtq Kiv hĭq ?
  - K) QqŭU
  - L) cvPŭU
  - M) mvZŭU
  - N) bqŭU
  
- 6/ Lvgvi emYŭR`KxKiY mgm`v mgvavbKĭf tKvb chĭq Mtel Yv`i Kvi ?
  - K) D`PZi
  - L) ga`g
  - M) ZYgj-
  - N) ŭef`k
  
- 7/ evsj v`k KqŭU Kŭl.cŭi tĕk AĀtj ŭef<sup>3</sup> ?
  - K) ŭĭ kŭU
  - L) cŭP kŭU
  - M) Pĭj kŭU
  - N) ŭekŭU

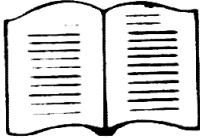


### cW 2.2 D`v<sup>3</sup>vi msAv I aib

G cvW tkfi Avcib-

- ◆ D`v<sup>3</sup>v WK ev KvK etj Zv ej tZ I wj LtZ cvi teb|
- ◆ D`v<sup>3</sup>vi `enkó` WK Zv D`j L Ki tZ cvi teb|
- ◆ D`v<sup>3</sup>vi cKvif` Ztj aitZ cvi teb|
- ◆ D`v<sup>3</sup>vi WK Zvi eYv Ki tZ cvi teb|

### D`v<sup>3</sup>v (Entrepreneur)



D`v<sup>3</sup>v kãUi gj- A\_@ntjv D`v<sup>3</sup>v ev cKí MhY| Bsti RxtZ GtK e`emvqx (Merchant), AwfhrTx (Adventurer) ev wbtqMKZP(Employer) BZ`w` ejv nq|

A\_@mZi mfi D`v<sup>3</sup>v nt`Q tmB e`w<sup>3</sup>, whub wínea Z\_` A\_@ evRvi Ae`v, e`e`vcbr I wmxvšlMhY-Gi mgštq tKvb j vFRbK D`v<sup>3</sup>v MhY Kti b|

mgšclvfi gtZ, D`v<sup>3</sup>v ntjv A\_@mZi AMhY Pwj KvKw<sup>3</sup>| hvi KvR nt`Q bZb WKQyD`mteb (Innovation) Kti A\_@wZK Dbqb mvab|

wj teb÷Btbi gtZ, D`v<sup>3</sup>v nt`Q e`wZµg`¶ I mdj e`w<sup>3</sup>Zj| whub tKvb Dbqb KvR e`\_ nteb br| ev`bZv ntjv e`\_ZvB wbgg, mvdj `B e`wZµg|

A\_@mZi mfi D`v<sup>3</sup>v nt`Q tmB e`w<sup>3</sup>, whub wínea Z\_` A\_@ evRvi Ae`v, e`e`vcbr I wmxvšlMhY-Gi mgštq tKvb j vFRbK D`v<sup>3</sup>v MhY Kti b|

### D`v<sup>3</sup>vi `enkó` (Characteristics of entrepreneur)

D`v<sup>3</sup>vi msAv, tjv ntZ Gi `enkó` A`bKvB e`v hrvq| D`v<sup>3</sup>vi `enkó`, tjv w`w`cN

- 1| D`mteb ¶gZv m`úba(Innovativeness)
- 2| c`j B`Qvkw<sup>3</sup> m`úba(Strong will power)
- 3| S`K MhY AvMhX (Risk-taking attitude)
- 4| m`w` j ¶g` (Purposeful goal)
- 5| m`Lj I wbggvZv( Disciplined and scheduled)

### D`v<sup>3</sup>vi cKvi (Types of entrepreneur)

gj-Z w`fbaD`mtebxi cKvif`i Rb`B D`v<sup>3</sup>vi w`fbZv nq| D`v<sup>3</sup>v mvaviYZ cW cKvi | G, tjv ntjv)N

- 1| bZb t`m`cY` cPj b/cjvZb cY` Dbqb (beifcraqb)
- 2| Drcv`tbi Awfba tKškj (c`hY) cPj b
- 3| bZb Gj vKvq bZb evRvi m`w` Kiv
- 4| be Drtmi K`vgyj /Avavc`Z cY` mi eivn
- 5| bZb wkí `vcbr /U`÷ MVb/ GKK evRvi mRb

### D`v<sup>3</sup>vi MhY (Entrepreneurship)

D`v<sup>3</sup>v KZ` th tKvb D`v<sup>3</sup>v MhYi Abktj Zvi gvbmK, Kwi Mvi I A\_@wZK g`brfve-mRtb (Motivation) Kg`Kškj ev c`µqv nt`Q D`v<sup>3</sup>vi MhY| GB c`µqv D`v<sup>3</sup>vi gtb GKw gnub Mšte` (D`v<sup>3</sup>v) t`v`i `c`el B`QvK RvMZ Kiv nq| dtj m`w` Avb` I wRtqi AvKv`¶vq Zvi Aš` `kw<sup>3</sup> e`v tctq j t`¶` tK` `fZ nq| Bv`KB D`v<sup>3</sup>vi MhY ejv nq|



**Abktj b (Activity):** aib, Avcvri e`ZRbie ingvb GKw t`w`Lvvi Kivi D`v<sup>3</sup>v MhY Ki tZ AvMhX| Gt`¶t` mdj D`v<sup>3</sup>v Zvi Kx Kx, Yvejx `vKv ev`Abxq etj Avcib gtb Kti b, hY` mnKvfi D`j - L Ki ab| Rbie ingvb tKvb a`tbi D`v<sup>3</sup>v wntmte w`ewPZ nteb?



## cuVhEi gj`iqb 2.2

miWK DEti i cuK, UK Pý (√) i b|

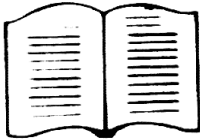
- 1/ Dž`ir<sup>3</sup>v kãuLi gj- A\_ Kx ?
  - K) Dž`iMx
  - L) Dž`iM MhY
  - M) cKí`Zix
  - N) cwi KíbvKvíx
  
- 2/ Dž`ir<sup>3</sup>vi`enkó` KquU ?
  - K) cuPiuU
  - L) PviuU
  - M) QquU
  - N) miZiuU
  
- 3/ Dž`ir<sup>3</sup>v KZ cKvi ?
  - K) Qq
  - L) cuP
  - M) Pvi
  - N) miZ
  
- 4/ Dž`ir<sup>3</sup>v wínea Zt\_`i mgštq jvFRbK Dž`iM MhY Kti b| Gi` nšj v evRvi Ae`r I e`e`rcbv, ZZxquU wK ?
  - K) cuR
  - L) Dž`iM
  - M) m×vš- MhY
  - N) cwi ešk
  
- 5/ Dž`ir<sup>3</sup>v e`iZμgx`¶ I mdj e`ir<sup>3</sup>Zij wZib tKvb KvtR wK nte bv ?
  - K) mdj
  - L) e`\_`
  - M) wCQcv
  - N) fixZz

### cw 2.3 Kwl tZ Df`v<sup>3</sup>v Dbq b, mgm`v I m<sup>a</sup>tebv



G cvW tkfI Arcub-

- ◆ Kwl tZ Df`v<sup>3</sup>v Dbq b KtK etj Zv eY<sup>0</sup>v KtZ cvi teb|
- ◆ Df`v<sup>3</sup>v Dbq b c<sup>0</sup>uqvU e`vL`v KtZ cvi teb|
- ◆ Df`v<sup>3</sup>v Dbq b mgm`vmgr-<sup>0</sup>PyZ KtZ cvi teb|
- ◆ Df`v<sup>3</sup>v Dbq b m<sup>a</sup>tebv m<sup>a</sup>utK<sup>0</sup>eY<sup>0</sup>v KtZ cvi teb|



### Kwl tZ Df`v<sup>3</sup>v Dbq b (Agricultural entrepreneurship development)

Kwl. Dbq b i gj- K\_v ntj v weAvbwf<sup>0</sup>EK j vMmB Kwl. ch<sup>0</sup>y<sup>0</sup> e`envi | Df`v<sup>3</sup>v Dbq b GKwU c<sup>0</sup>uqv hvi gra`tg Kwl. t<sup>0</sup>q<sup>0</sup>t<sup>0</sup> emYwR`K m<sup>a</sup>tebv<sup>0</sup>gq c<sup>0</sup>Zk<sup>0</sup>z<sup>0</sup>k<sup>0</sup>j ch<sup>0</sup>y<sup>0</sup> i cY<sup>0</sup>c<sup>0</sup>uqvM I euj e`envi w<sup>0</sup>oZ KtZ D`gx KIK ev Ab`tK ch<sup>0</sup>y<sup>0</sup> e`e`rcbvq `q<sup>0</sup> Kti Lvgvi m<sup>0</sup>otZ Dc<sup>0</sup>thvMx Kti Mto tZvj v hvq|

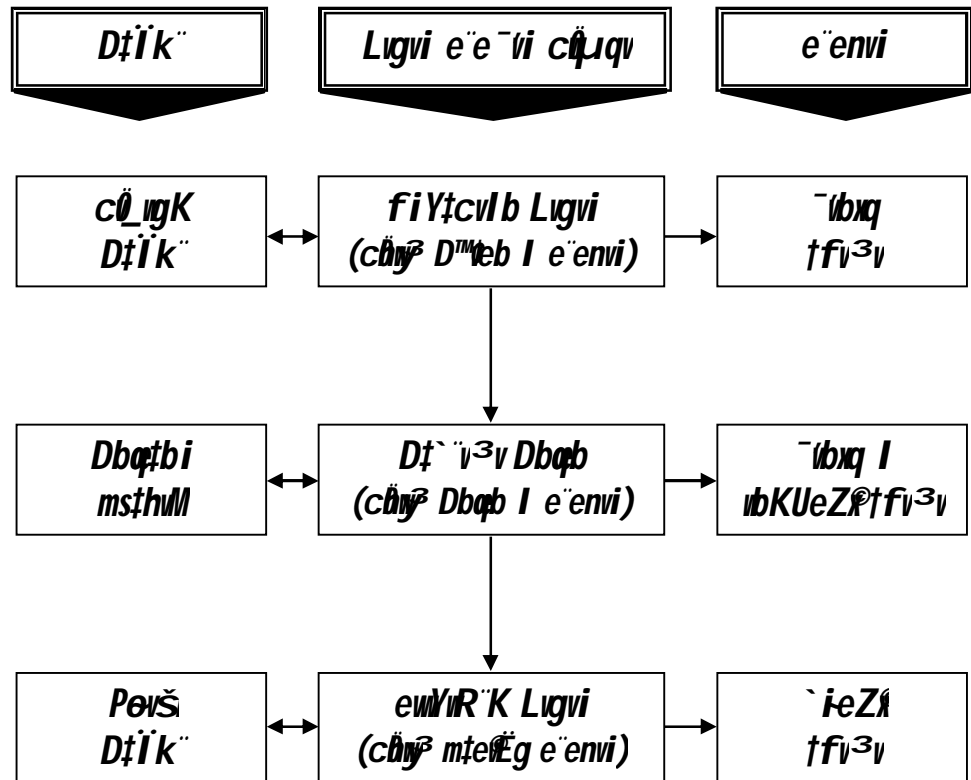
Df`v <sup>3</sup> v Dbq b GKwU
c <sup>0</sup> uqv hvi gra`tg Kwl.
t <sup>0</sup> q <sup>0</sup> t <sup>0</sup> emYwR`K
m <sup>a</sup> tebv <sup>0</sup> gq c <sup>0</sup> Zk <sup>0</sup> z <sup>0</sup> k <sup>0</sup> j
ch <sup>0</sup> y <sup>0</sup> i cY <sup>0</sup> c <sup>0</sup> uqvM I
euj e`envi w <sup>0</sup> oZ
KtZ D`gx KIK ev
Ab`tK ch <sup>0</sup> y <sup>0</sup>
e`e`rcbvq `q <sup>0</sup> Kti
Lvgvi m <sup>0</sup> otZ Dc <sup>0</sup> thvMx
Kti Mto tZvj v hvq

Lvgvi e`e`v I cvi tek Mtel Yv weAvbwf<sup>0</sup>Kwl. cvi tek j vMmB ch<sup>0</sup>y<sup>0</sup> D<sup>0</sup>teb Kti fiY-<sup>0</sup>tcvY Lvgv<sup>0</sup>i Drcv`b evot`Q| Mtel Yvi Gwv c<sup>0</sup>uqK Df`k`| Avi Pevs`Df`k` n<sup>0</sup>Q fiY-<sup>0</sup>tcvY Lvgvi tK Dbz Kti j vRbK emYwR`K Lvgv<sup>0</sup>i cvi YZ Kiv ev Lvgvi emYwR`K i Y| Df`v<sup>3</sup>v Dbq b n<sup>0</sup>Q c<sup>0</sup>uqK I Pevs`Df`k` i ga`eZ<sup>0</sup>ch<sup>0</sup>q ev m<sup>0</sup>thvM| m<sup>0</sup>t<sup>0</sup>q<sup>0</sup>tc e`vL`v Ktj Gwv n<sup>0</sup>te w<sup>0</sup>oZ<sup>0</sup>cN

fiY-<sup>0</sup>tcvY Lvgvi → Df`v<sup>3</sup>v Dbq b → emYwR`K Lvgvi |

**Dt`v<sup>3</sup>v Dbqj cūiqv (Process of entrepreneurship development)**

Dt`v<sup>3</sup>v GKU Kul.cwi tek cūtg tQv AvKvti Kul.Lvgvi Kti tmLvtb Kul.cūy<sup>3</sup> e`envi, e`e`vcbv I evRvi mjev hPvB cūvZtZ ev`e Avb jvf, AwfAZv I `qZv ARB KitZ \_vtKb| GUvtK Lvgvi emYvR`KvKiY cūkqY ejv thZ cvti| Gfite cūy<sup>3</sup>MZ `qZv ev Amjev vbxqY Kti cwieZB/cwieaB θvin cūy<sup>3</sup>IK emYvR`Kfite DcthvMx Kiv hvq| cieZtZ Dt`v<sup>3</sup>MY `qZv I AvZvekftm ejxqv ntq vbtōs/ vbtRivB Kul.Lvgvi mRtb GvMtq thZ cvtib| Drcv`b evovi dtj cY` ev`te`i MthK cwiwal mtg teto hvq| GB Dt`v<sup>3</sup>v Dbqj cūiqv uPĪ 9-G t`Lvtbv ntjv|



uPĪ 9 : fiY-tcvlY Lvgvi ntZ emYvR`K Lvgvi mvoj ga`eZtDt`v<sup>3</sup>v Dbqj cūiqv

t`tki Kul.cwi tek,  
Av\_ qmgnRK Ae`v Ges  
msthvM-mjev vefbzvi  
Rb` Dt`v<sup>3</sup> Dbqj  
vibvea mgn`v ve`gvb|

**Dt`v<sup>3</sup>v Dbqj mgn`v**

t`tki Kul.cwi tek, Av\_ qmgnRK Ae`v Ges msthvM-mjev vefbzvi Rb` Dt`v<sup>3</sup> Dbqj bibvea mgn`v ve`gvb| G, tjvtK vzb vvtM fvM Kiv hvq| thgbN (1) Kvii Mii mgn`v (Technical problems), (2) cwi tekMZ mgn`v (Environmental problems) Ges (3) A\_ qvZK mgn`v (Economic problems) | cūZvU mgn`vtK msvqYB AvKvti e`vL`v Kiv ntjv|

1/ **Kwi Mui mgm`v**

we`gvb Kwi Mui mgm`v ub`e:fcN

- 1.1 cÅZuU Df`vMB mdj nq jvMmB Kwl. chny`i e`enit`iN G K\_uU m`u`K© Df`v`v`i AmfPZbZv|
- 1.2 Kwl. chny`i e`enit`i ev`e AwfAZv I `qZv cÅqvRbN Guv MhY KitZ Df`v`v`i Abxrv|
- 1.3 jvMmB chny`i Drm Ges Df`v`v`i gfa` KvhRi msthvMi Afve
- 1.4 chny`i kZ`qgvZiteK KvR Kivi `q kigtKi Afve|
- 1.5 Lvgvi cwi Kí bvq we`kI Z chny`i cwi Kí bvq we`kI Áf`i gZvgZ MhY bv Kiv|
- 1.6 mguS Z Kwl. chny`i m`eav m`u`K©AmfPZbZv|

2/ **cwi tekMZ mgm`v**

i`azcY`cwi tekMZ mgm`v ub`e:fcN

- 2.1 Kwl. Drcv`b `RueK chny`i (Biological process) m`ub`enq, ZvB cwi tek ub`fP G K\_vi i`az;bv`t`qv|
- 2.2 tKib cwi tek tKib Lvgvi jvFRbK, cwi tekMZ S`uk AvfQ uKbvN Df`v`v`i G we`l`q uP`S`i bv Kiv|
- 2.3 Drcv`tbi iia` n`Z tkl ch`S`i/Abk`j cÅKuzK cwi tek bv`vKtj Zvi mgvartb we`Kí uP`S`i bv Kiv|
- 2.4 Drcv`tbi DcKiY cÅKuzKfite KZUKzAvi m`m`h, Drcv`b ev`µq Kti KZUKzLvgvi cwi tek cvl`qv hiteN Zvi mg`S`q bv Kiv|
- 2.5 mgv`m`RK ubivcEvi Afve, DEg thvMthvMi cwi tekMZ mgm`v|
- 2.6 cY` we`cY`b evRvi cwi te`ki cfve uP`S`i bv Kiv|
- 2.7 AbvKI`Y`xq I AmsMvZ Kwl. evRvi cwi tek|

3/ **A\_`u`v`ZK mgm`v**

weivRgvb A\_`u`v`ZK mgm`v ub`e:fcN

- 3.1 Df`v`v`i Avu`R m`u`Z m`u`gZ|
- 3.2 cÅZõmbK FY e`e`v AcL`z Ges q`l`z`Df`v`v`i Abk`j bq|
- 3.3 cKí ev`RU cwi Kí bv I chny`i t`q`i ev`eZv m`ub`ebv n`q Avb`g`mbK nI`qv|
- 3.4 A\_`M`e`cÅZõvb KZR Kwi Mui I cwi`k`b m`thvMzv c`vb bv Kiv|
- 3.5 u`kí Df`v`v`i b`vq Kwl. Df`v`v`i M`AvZ `z` g`v`d`v AR`bi g`v`b`m`KZv|
- 3.6 Kwl. u`kí FY Ab`vb` LvZ LvU`v`b|

<p>t`tki we`fbaGj vKvq we`q`B ev`msNe`fite eU mdj Kwl. Lvgvi Df`v`v`i we`gvb </p>
---

**Df`v`v`i Dbaq b`m`e`bv (Potentials of entrepreneurship development)**

Df`v`v`i Dbaq`b`i we`fba`mgm`v Ges t`tki cÅKuzK cÅZKj Zv (eb`v, Liv, Niv`So, u`kj`ve`v) t`g`b`ub`tj I Kwl. Df`v`v`i Dbaq`b`i c`P`z m`e`bv i`q`i`Q| t`tki we`fba`Gj vKvq we`q`B ev`msNe`fite eU mdj Kwl. Lvgvi Df`v`v`i we`gvb| GKul msv`q`B Zv`ij Kv ub`e`e`v`qv n`tj vN

- 1| **dmj RvZ Lvgvi** : Pr, i veri, Avg, wj Pz Kwlj, Avbri m, tctc, tcqiv, tj eybimfx ev Priv, km` I kvKmeRxi exR, bwi tKj, Kjv, tRg, tRjx, kieZ|
- 2| **ci`cwlRvZ Lvgvi** : `y, MiætgvUvZvRvKiY, nwn, gjMx, etjvi, nwn-gjMxi ev`Pr|
- 3| **gurm`RvZ Lvgvi** : wPsw Lvgvi, Rjgnvj, grm` n`vPvix, gvQ Pvl i cKz-`wN, wPsw c`uqvRvZKiY, gvQ wngvqZKiY|

G Qvovl f`iel` tZ m`tebvqg Kul.Dt` v`Mi t`T, tjv n`QÑ

- 2| **dmj** : `Zj exR, Wvj, B`z tcqR, imly, Av`v, gwi P, Avbri m c`uqvRvZKiY, tctcu tcqiv, tj eywefbKv`Vi eb|
- 2| **ci`cwl** : QvMj, gwnl, tfov, msKi RvZ Miæ Dbz RvZi nwn-gjMx, wN, gvLb, cwbi |
- 3| **gurm`** : mKj cKzi w`k`gvQ, avb t`T gvQ, avb t`T wPsw Pvl, eo AvKv`i i tcvbri Pvl, cPr tWverq gv, i Pvl |
- 4| **mgvSZ Lvgvi** : dmj, ci`cwl I gurm` GB wZbuUi th tKvb mgvSZ Dt``vM me`c`j jvfRbK nq|

Dt``v`v Dbq b t`tk Kul.RvZ cY` Avg`wb Kvgtg i Bvbx evovtZ m`g| GtZ bZb Kgm`v`v m`v nte Ges`wv`a w`gvPtb mrvqZv Ki te|



**Ablyj b (Activity):** Avcub Rvbg`Z Dt`L`thvM` GKw Kul.Lvgvi Dt``v`v bvg Dt`L` Kiab| Avcbri Dvj wLZ Kul.Lvgv`i Kwi Mix, cui t`kMZ I A\_`wZK mgm`vmg` Kx Kx Zv eY`v Kiab|



### cuVvEi gj`iqb 2.3

#### mWk DEti i cuVvEi Py (v) v b |

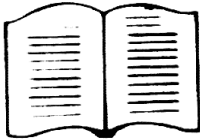
- 1/ j vMmB Kwl. chv e`envti i c0\_wgK DfIk` Drcv`b evovtbv, Avi PevsI DfIk`  
Lvgvi emYvR`KxKiY | Df`v<sup>3</sup> Dbqtb n`Q G `tjvi tKvb chq ?  
K) chq  
L) cieZx`chq  
M) ga`eZx`chq  
N) tKvbUvB bq
- 2/ Df`v<sup>3</sup>v DbqtbK Kx c0k`Y ej v thZ cti ?  
K) Lvgvi emYvR`KxKiY  
L) Lvgvi Dbq b  
M) Lvgvi `vcb  
N) Lvgvi gj`iqb
- 3/ Df`v<sup>3</sup>v Dbqtb i bvbvwa mgm`vK KZ fvM fvM Kiv hvq ?  
K) Pvi  
L) wZb  
M) `B  
N) cuV
- 4/ t`tki wvfbvGj vKvi mdj Kwl. Lvgvi , tj v c0vbZ KZfvM fvM Kiv hvq ?  
K) wZb  
L) cuV  
M) Pvi  
N) Qq
- 5/ fvcl `tZ m`tebvq Kwl. Df`v`Mi gta` me#c`v j vFRbK n`Z cti tKvb Df`vM?  
K) ci`cwl  
L) dmj  
M) gvrM`  
N) wZbUv mgšq

### cW 2.4 Dt`v<sup>3</sup>v Dbqtbi c\_ I wft`Rbv : GKK cY`glyx I eu cY`glyx Lvgvi



G cvW tkfI Arcub-

- ◆ Dt`v<sup>3</sup>v Dbqtbi thSw<sup>3</sup>KZv Kx Zv eY<sup>3</sup>v Ki tZ cvi teb|
- ◆ Dt`v<sup>3</sup>v Dbqtbi c\_ I tKSkj m<sup>u</sup>tK<sup>e</sup>vL<sup>v</sup> Ki tZ cvi teb|
- ◆ Dt`v<sup>3</sup>v Dbqtbi wft`Rbv w` tZ cvi teb|
- ◆ GKK cY`glyx Lvgvti i wft`Rbv w` tZ cvi teb|
- ◆ eu cY`glyx Lvgvti i wft`Rbv w` tZ cvi teb|



#### Dt`v<sup>3</sup>v Dbqtbi thSw<sup>3</sup>KZv (Rationale of entrepreneurship development)

KIKMtYi ga` n tZ Dt`v<sup>3</sup> Dbqtbi thSw<sup>3</sup>KZv gj-Z MtelYv AwfAZv cNz| weMZ GK`kK ati Lvgvi e`e<sup>v</sup> I cwitek MtelYmn Ab`vb` MtelYv cNzOvtb G ai tbi KI tKi Askx`wi tZj Zv` i cwitek KvR Pj tQ| Mtel Yj ex AwfAZv mst`jt c w<sup>u</sup>bcN

- 1| KI tKi Lvgvti i Drcv`b e`e<sup>v</sup> w<sup>u</sup>fb<sup>u</sup>Avst<sup>u</sup>uqv<sup>i</sup> gva`tg mgu<sup>s</sup>Z|
- 2| mKj KIK mKj Kul.c<sup>h</sup>y<sup>3</sup> m<sup>u</sup>Y<sup>u</sup>ite MhY Ki tZ cvi tQ bv|
- 3| AtbK KIKB c<sup>h</sup>y<sup>3</sup> e`envti hZkxj, `q I Awak Drcv`tb m`tg| G tZ c<sup>h</sup>y<sup>3</sup> i cY<sup>3</sup> Drcv`bkj Zv cKvk cvq|
- 4| AtbK KI tKi B D<sup>u</sup>ebx q`gZv, Mtel Yv c<sup>h</sup>YzV Ges`vbxq c<sup>h</sup>y<sup>3</sup> Avb i tqtQ|
- 5| mgu<sup>s</sup>Z Kul.c<sup>h</sup>y<sup>3</sup> `vbxq m<sup>u</sup>, `Re eR<sup>3</sup> I cKwZi `q e`envti i gva`tg LiP Kgvq, Drcv`b evovq|

AtbK KIKB c<sup>h</sup>y<sup>3</sup>  
e`envti hZkxj, `q I  
Awak Drcv`tb m`tg|  
G tZ c<sup>h</sup>y<sup>3</sup> i cY<sup>3</sup>  
Drcv`bkj Zv cKvk  
cvq|

wk<sup>u</sup>qZ teKvi RbtMoxi ga` n tZ Dt`v<sup>3</sup>v Dbqtbi thSw<sup>3</sup>KZv gj-Z Gt`i `Kgn<sup>s</sup>vtbi mshvM m<sup>u</sup>otZ wbnZ| G ai tbi AvMox I `q Rbk<sup>u</sup> Drcv`b e<sup>u</sup>x i gva`tg Kul.wk<sup>i</sup> meKik I Avi I A`q kigK wbtqvM Ae`vb i vL tZ mnvqZv Ki te|

#### Dt`v<sup>3</sup>v Dbqtbi tKSkj MZ c\_ (Strategic ways of entrepreneurship development)

Dt`v<sup>3</sup>v Dbqtbi c\_ I tKSkj w<sup>u</sup>fP Kti Gi Dt`i k, mgm<sup>v</sup> I m<sup>u</sup>ebv Ges Dt`v<sup>3</sup>vi m<sup>u</sup> I `vbxq cwitek i Dci| t`tki w<sup>u</sup>fb<sup>u</sup>vtb GB c\_ I tKSkj n tZ cvti w<sup>u</sup>fb<sup>u</sup> wK<sup>s</sup> tKSkj MZ b<sup>u</sup>WZg<sup>v</sup>vi (Strategic policies) w<sup>u</sup>fb<sup>u</sup> tKSkj MZ c\_ `Zwi n tZ cvti | mst`jt c GB b<sup>u</sup>WZ, t<sup>j</sup>v Avtj vPbv Kiv n tZ v|

##### 1| AveiZ c<sup>h</sup>y<sup>3</sup> D<sup>u</sup>eb I e`envi

t`tk mefkl Z`w<sup>u</sup>fb<sup>u</sup> Kul.c<sup>h</sup>y<sup>3</sup> cwitek I m<sup>u</sup> w<sup>u</sup>fb<sup>u</sup> D<sup>u</sup>eb GKw Pj g<sup>u</sup>b c<sup>u</sup>qv n te| Dt`v<sup>3</sup>v MY t<sup>u</sup>, t<sup>j</sup>v tRtb I wktL e`envi Ki teb|

##### 2| AveiZ c<sup>h</sup>y<sup>3</sup> c<sup>u</sup>qv I `qZv Dbqt

mefkl D<sup>u</sup>eb c<sup>h</sup>y<sup>3</sup> mdj c<sup>u</sup>qvMi Rb` Dt`v<sup>3</sup>vt`i c<sup>h</sup>y<sup>3</sup> Ges Lvgvi e`e<sup>v</sup> vcbvq `qZv e<sup>u</sup>x tZ c<sup>u</sup>qv GKw Pj g<sup>u</sup>b c<sup>u</sup>qv n te|

mefkl D<sup>u</sup>eb c<sup>h</sup>y<sup>3</sup>  
mdj c<sup>u</sup>qvMi Rb`  
Dt`v<sup>3</sup>vt`i c<sup>h</sup>y<sup>3</sup> Ges  
Lvgvi e`e<sup>v</sup> vcbvq `qZv  
e<sup>u</sup>x tZ c<sup>u</sup>qv GKw  
Pj g<sup>u</sup>b c<sup>u</sup>qv n te|

3/ cY` necYb gubUis

`q Df`v3v Dbaqtb cY`i erRvi gj` I necYtb `xN@gqv`x Zf`i c@qvRb/ iBmbthvM` cY`i Z`I Rvbr c@qvRb/

4/ cigk@ cwi`k@ muf@

Df`vM cwi Kí bv I ev`evqb Ges cY` necYtb wekIÁ/weÁvbx`i cigk@eva`Zvgj-KKiY/ Gf`qf` A\_@M@e c@Zóv/GbuRI, m@c@vvi Ywe` I wekIÁ/weÁvbx`i wíglyx msthvM m@óKiY/

5/ f`kR cY` Puv`vi c@ab` c@vb

f`ki Kul.DcKiY I Lv` cY` Drcv`b Df`vMfK c@ab` c@vbKiY/ Gf`te Kul.RvZ cY` Avg`vbx nvm cvte/ wekI f`qf` iBmb cY` Drcv`bKiY/

6/ ve`gub c@KuzK m@úf` i m@ze`envi

f`ki weifbaGj vKiq Kul.cwi tek Abyv`ti weifbaDrcv``bi c@KuzMZ msthvM itqtQ/ Gme Gj vKvi m@úf` i m@ze`envi Kti Drcv`b evov`bv I cwi tek msi qY c@qvRb/

Df`v3v Dbaq`bi ubf`Rbv (Guidelines of entrepreneurship development)

Df`v3v Dbaq`bi c@g Kvr n`Q c@qvRbxq `eukó` m@úb@AvM@x e`v3 ube@PZ Kiv/ Gf`te ube@PZ Df`v3v ub@j uLZ c`f`c M@Y Ki`eb/

Df`v3v Dbaq`bi c@g Kvr n`Q c@qvRbxq `eukó` m@úb@AvM@x e`v3 ube@PZ Kiv/

- 1/ c@f`i AvI Zvf@ chv@ (mga)-i Dci c@kqY M@Y/ chv@i S@k`\_vKtj Zv tRtb tbqv/
- 2/ c@f`i `v`bi cwi tekMZ I Kwii Mii Dch@Zv wefPbv Kiv/ cwi tek `f`Yi m@f@bv Kgv`bv/
- 3/ Df`v3vi ubR`m@ú` (Drcv``b e`envi thvM)-Gi Zvj KvKiY/
- 4/ chv@ Abyv`ti c@qvRbxq hšcuvZ, DcKiY, cwi Pj bv I Ab`vb` e`fqi c@\_vgK c@`j b `Zvi (AvBfUg I LvZ wfvEK)/
- 5/ `q I A`q kg e`enit`i c@`j bKiY/ Gifc kg c@v@ ubv@ZKiY/
- 6/ DcKiY, hšcuvZ c@f`vZ c@v@i ubv`@ `vb I c@Zóv`bi Z`\_ msM@/
- 7/ c@f`i ev`-evqtb mKj Kvr m@úv``bi mgq I `vqZi Abyv`ti QK `Zvi KiY/
- 8/ mKj Drcv``bi (cY`, `e`, DcRvZ, eR@) c@`j b `Zix/
- 9/ Dc`i Kvr mg@ (1 n`Z 8 bs) m@úv``b wekIÁ/weÁvbx`i mn`thvM Zv M@Y/
- 10/ FY M@f`Yi c@qvR`b A\_@M@e c@Zóv`b (e`vsK/GbuRI) thvMv`thvM `vcb/
- 11/ %@b@`b mKj LiP, Drcv``b I erRvi RvZKi`Yi ti KW@msi qY/ necYb m@óKiY/
- 12/ c@f`i ev`evqbKv`j Am@av`\_tjv wj wce`xKiY I c@qvR`b wekIÁ/weÁvbx`i cigk@ M@Y/

ubf`Rbv : GKK cY`glyx Lvgi

GKK cY`glyx Lvgi Dc`i evY@ ubf`Rbvi c`i I ub@j uLZ c`f`c`\_tjv ubf`Z nte/

Drcv``Z eR@hv`Z Lvgi I `vbxq cwi tek `f`Y er`qZM@Kif`Z bv c`f`i Zvi e`e`v M@Y/

- 1/ cY` necY`bi mgq I `vb uba`f`f`Y mZK`v Ae`j`b/
- 2/ Drcv``Z DcRvZ weq`v bv n`j tm`\_tjvi e`envi ubv@ZKiY/
- 3/ Drcv``Z eR@hv`Z Lvgi I `vbxq cwi tek `f`Y er`qZM@Kif`Z bv c`f`i Zvi e`e`v M@Y/





### cuVhEi gj`iqb 2.4

#### muk DEti i cutk, UK vPy (v) i b j

- 1/ KIKMti ga` nZ Df`v<sup>3</sup> Dbq tbi thSw<sup>3</sup>KZv tKvb AwfAZv chZ ?  
 K) MtelYv  
 L) Amvdj`  
 M) e`isK  
 N) GbuRI
- 2/ ukvqZ teKvi RbtMvxi ga` nZ Df`v<sup>3</sup> Dbq tbi thSw<sup>3</sup>KZv tKvb mshuM mpoZ ubuuz ?  
 K) PvKzx  
 L) we`k Mgb  
 M) `Kgfis`vb  
 N) ukqKZv
- 3/ Df`v<sup>3</sup> Dbq tbi tKSkj MZ c\_ tKvb bnuZgvj vi wfiEtZ nZ cuti ?  
 K) Drcv`b  
 L) emYR`  
 M) Kwii Mui  
 N) tKSkj MZ
- 4/ Df`v<sup>3</sup> Dbq tbi KquU tKSkj MZ bnuZ Avtj vPbv Kiv nqtq ?  
 K) cutuU  
 L) QquU  
 M) mvZuU  
 N) PviuU
- 5/ Df`v<sup>3</sup> Dbq tbi cUg KivR cUqivRbxq `eukó` m`ubamKifc e`v<sup>3</sup> ubePb Kiv ?  
 K) AvMhx  
 L) mvg\_@vb  
 M) mdj  
 N) Pij vK
- 6/ Df`v<sup>3</sup> Dbq tbi KquU ubt`Rbv Avtj vPZ nqtq ?  
 K) tPSi uU  
 L) wekuU  
 M) evi uU  
 N) `kuU
- 7/ GKK cY`glyx Lvgti KquU AvZwi<sup>3</sup> ubt`Rbv Avtj vPbv Kiv nqtq ?  
 K) cutuU  
 L) QquU  
 M) mvZuU  
 N) uzbuU/



### Peršigj`iqb

mWK DEti i ctk, UK Pý (√) w b |

- 1/ KwL.tckvtK wUktq ivLtz ntj tKvb KwL.Lvgvi , tj vtZ Dbq̄tbi tQqv j vMvtZ nte?
  - K) kn̄ti i
  - L) M̄gxy
  - M) ewYwR`K
  - N) A`vqx
  
- 2/ Lvgvi ewYwR`KxKiY GKwU KwWb c̄m̄qv, Zte Kx bq ?
  - K) m̄e
  - L) msw̄q̄β
  - M) `ifn
  - N) Avkvc̄ō
  
- 3/ Lvgvi e`e`vcbrq `q̄Zv ewx Ges KwLtz wK aītbi c̄h̄ȳMZ cwieZB Gtb Lvgvi ewYwR`KxKiY m̄e ?
  - K) j vMmB
  - L) mnR
  - M) msw̄q̄β
  - N) mv`vqvUv
  
- 4/ GKwU KwL.Lvgvti eQti meq̄vU th e`q nq, Drcw`Z cY, `e` ev DcRvZ BZ`w` i gj` GKt̄ Kgc̄t̄q̄ kZKiv KZfvM tenk ntj ZvtK ewYwR`K Lvgvi ej v hq ?
  - K) 100
  - L) 80
  - M) 120
  - N) 90
  
- 5/ Df`v̄3v ntjv A\_Šwzi AM̄x Pw̄j Kvk̄3 | wZwb Kx KvR Kti A\_ŠwzK Dbq̄b mvab Ktib?
  - K) c̄h̄ȳ M̄h̄Y
  - L) e`isK `vcb
  - M) bZb wKQyD`eb
  - N) c̄tk̄q̄Y M̄h̄Y
  
- 6/ wbtai tKvbU Df`v̄3vi GKwU `enkó ?
  - K) mvrnx
  - L) S̄tk̄ M̄h̄t̄Y AvM̄h̄x
  - M) weEevb
  - N) Ávbx
  
- 7/ j vMmB c̄h̄ȳi Dm Ges Df`v̄3vt`i gta` Kvhr̄i mst̄hv̄t̄Mi AfveÑ Guv tKvb aītbi mgm̄v ?
  - K) A\_ŠwzK
  - L) cwit̄ekMZ
  - M) Kw̄i M̄w̄i
  - N) Ab`vb`

Kwl.1 c j n Dbqb t`z

8/ Df`v<sup>3v</sup> Dbqb t`zk Kwl.RvZ cY` Avg`mb Kvgtq wK evovtZ mflg ?

- K) iBmb
- L) evRvi
- M) tfr<sup>3v</sup>
- N) cyp

9/ eU cY`gla Lvgvfi Kqul AwZwi<sup>3</sup> wbt`Rbv Avtj vPbv Kiv ntqtQ ?

- K) cuPwU
- L) PviwU
- M) wZbwU
- N) QquU

10/ Lvgvi emYwR`KxKiYi Rb` tKv<sup>3v</sup>vbv Kiv ntj gbydvi cvkvcwK tKv<sup>3v</sup>vbvi Avi Kx Df`k`\_vKtZ nte ?

- K) ch<sup>3v</sup> MhY
- L) thwMthvM
- M) KI.K tmer
- N) FY`vb



**mswB i Pbvj-K cke**

- 1/ Lvgvi emYmR`KxKi Y ej tZ Kx ešSb wj Lšy|
- 2/ Lvgvi emYmR`KxKi tYi Ašli vq KqmU I Kx Kx ?
- 3/ emYmR`K Lvgvi KvK etj wj Lšy|
- 4/ Df`v`vi msAv wj Lšy|
- 5/ Df`v`vi `ewkó` , t j v eYšv Ki ab|
- 6/ D`m`ebxi cKvi t f t` Df`v`vi newfbzv nqN GUv eštq wj Lšy|
- 7/ Df`v`v Dbqeb ej tZ Kx ešSb ?
- 8/ Df`v`v Dbqeb cšqumU e`vL`v Ki ab|
- 9/ D`v`v Dbqfbi Kwii Mwi mgm`v , t j v Kx Kx ?
- 10/ D`v`v Dbqfbi QqmU wbt` Rbv wj Lšy|
- 11/ Df`v`v Dbqfbi tKškj MZ bmxZ , t j v wj Lšy|
- 12/ Df`v`v Dbqfbi thšv`KZvq Mtel Yvj ä cšmU AwfÁZv wj Lšy|
- 13/ fiY-tcvlY I emYmR`K Lvgvti i cšmU cv`R` wj Lšy|
- 14/ Lvgvi emYmR`KxKi tY Gb. wR. I Kx Ki tZ cvti ?
- 15/ Df`v`v MxKi Y ej tZ Kx ešvq ?
- 16/ Df`v`v Dbqfbi A`šowZK mgm`v , t j v wj Lšy|
- 17/ Df`v`v Dbqfbi wZbvU tKškj MZ bmxZ Avtj vPbv Ki ab|



**DĚi gvj v**

**cW 1**

- 1/ M    2/ K    3/ L    4/ M    5/ L    6/ M    7/ K

**cW 2**

- 1/ L    2/ K    3/ L    4/ M    5/ L

**cW 3**

- 1/ M    2/ K    3/ L    4/ K    5/ N

**cW 4**

- 1/ K    2/ M    3/ N    4/ L    5/ K    6/ M    7/ N

**Peršigj`wqfbi DĚi**

- 1/ L    2/ M    3/ K    4/ L    5/ M    6/ L    7/ M    8/ K  
 9/ L    10/ M



**mgusZ Lvgvi e`e`v**

BtZigta`B Avgiv Lvgvi Ges Lvgvi e`e`v Kx tRtbuQ| Avi Guv tRtbuQ th, mekl fite cwi Kwir Z wgaLvgvi tK mgusZ Lvgvi etj | Gevi mgusZ Lvgvi e`e`v ma`utK`Avtj vPbv Kiv ntjv|



mgusZ Lvgvi e`e`v  
ntjv Lvgvii mguMk  
cwi tek DcthmMx  
tKSkj /chyp e`e`v hv  
Lvgvii wefbaA`i  
(Dw`c I cOY) cwi Kwir Z  
mgstqi gva`tg  
Drcv`tb cOqvRbxq  
DcKiY/ Dcr`vb/ Lv`  
mieivn ubu`DZ Kti |

mgusZ Lvgvi e`e`v ntjv Lvgvii mguMk cwi tek DcthmMx tKSkj /chyp e`e`v hv Lvgvii wefbaA`i (Dw`c I cOY) cwi Kwir Z mgstqi gva`tg Drcv`tb cOqvRbxq DcKiY/Dcr`vb/ Lv` mieivn ubu`DZ Kti | e`e`vi ag`Abymti Lvgvii A`mgn Avst`m`u`K` nq Ges Avst`m`u`qv Kti \_v`K| Abj`cfite Lvgvii emZemo, cKz, ci`cml, Kwleb, cyjvb I Ab`vb` Rvg/t`qZ ubtq Lvgvi cwi tetki mgv uba`i Z nq |

GLv`b chyp K\_vuI e`vLv Kiv ntjv | chyp (Technology) ntjv Dcrv`b ev e`e`vcbv hv GKK ev th`fite dmj, ci`cml, gurm` ev MvQcijvi Drcv`b cOqv ma`u`b I ubu`DZ Kitz m`q |

**mgusZ Lvgvi e`e`vi cKvit`f`**

BtZigta`B Avgiv Lvgvi e`e`vi c`u`u A` ma`utK` tRtbuQ | emZemo A` th`nZzmKj Lvgvii B Dcr`Z, tm`nZzPvi u` A`i wefba`mgstq Nuvbv ma`e | A`i gva`tg AmsL` mgstq ma`e ntj I ev`te Gi mgstq AZ`s`i Kwib cOqv | tKbbv G`\_tjvi gta` Avst`m`u`K`\_v`KZ nte I Avst`m`u`qv Nuvz nte | Z`gvi cwi tek, ma`u` I KIK`i Pw`v Ges wefba`m`h`v`Mi weq\_s`\_tjv | Gt`q`i` we`epbv Kitz nq |

ev`te t`Lv hvq th, KIK cO`tg Zu` m`eavRbK GKv A` m`g`Lj I Drcv`bkj Kti Mto tZtj b | Gici ch`m`tg Ab`vb` A` ev A`i D``vM m`p Kitzb | GB c`i A` ev A`i D``vM gj-Z: cO`g A`v`u`i cwi ci`Kfite mRb Kiv nq | tKbbv Lvgvii tgvU Drcv`b ev Avtqi weivU Ask thvMv t`q tmB cO`g A`v`u` | A`\_p cO`g A`v`u` n`Q Lvgvii w`vE, hv`K tK`^`Kti cieZ`A` ev D``vM\_s`\_tjv Mto D`v | cO`g ev c`vb A`i w`vE`Z mgusZ Lvgvi e`e`v c`vbZ c`p c`vi | h`v`

- 1| dmj w`vE`K mgusZ Lvgvi e`e`v (Crop based integrated farming systems)
- 2| tWqix ev `g`j Mvfx w`vE`K mgusZ Lvgvi e`e`v (Dairy based integrated farming systems)
- 3| t`cwe`^` ev nungj`M w`vE`K mgusZ Lvgvi e`e`v (Poultry based integrated farming systems)
- 4| gurm` w`vE`K mgusZ Lvgvi e`e`v (Fisheries based integrated farming systems)
- 5| emZemo w`vE`K mgusZ Lvgvi e`e`v (Homestead based integrated farming systems)

Dcti eivZ wefba`A`w`vE`K mgusZ Lvgvi e`e`v\_s`\_tjvi cO`Zu` Avevi eu` c`vi ntZ cvti | thgb`N dmj w`vE`K mgusZ Lvgvi e`e`v`K avb w`vE`K mgusZ Lvgvi e`e`v, B`q`z`w`vE`K mgusZ Lvgvi e`e`v, Kjv w`vE`K mgusZ Lvgvi e`e`v BZ`w` fr`M wef`^` Kiv hvq |

**cwi tek**

cwi tetki avi Yv L`gB e`v`cK | Zte GLv`b Avgiv Zv ersj t`tki t`c`q`Z Avtj vPbv Kitev |

gubly Ges Pri crtki RmeZ MvQcij v, cOYx I AYRxe Ges weifbæcOwZK mæu` thgbN gwU, cwmb, evqy mhaj vK Ges Av\_@mvgwRK mjhm-mjeav Ges mg`l wKQj AvštmæuKB ntj v cwi tek| eSvi mjeavi Rb` ZvB cwi tek tK weifbæfšMij K, mvgwRK ev Kul. mxgubvq eYDv Kti Avtj vPbv Kiv nq|

gubly Ges Pri crtki RmeZ MvQcij v, cOYx I AYRxe Ges weifbæcOwZK mæu` thgbN gwU, cwmb, evqy mhaj vK Ges Av\_@mvgwRK mjhm-mjeav Ges mg`l wKQj AvštmæuKB ntj v cwi tek| eSvi mjeavi Rb` ZvB cwi tek tK weifbæfšMij K, mvgwRK ev Kul. mxgubvq eYDv Kti Avtj vPbv Kiv nq|

**cwi tekki A½**

cwi tekki tek wKQyA½i AvštmæuK@Mto DfV| cwi tekki A½ cævbZ: wZbuU| G,tj v ntj vN

- 1| Re A½ (Biotic components)
- 2| A%Re A½ (Abiotic components)
- 3| Av\_@mvgwRK A½ (Socio-economic components)

**1| Re A½**

gublymn AwZ qjz`AYRxe ntZ i iæKti epr nuz chšl cOYx, weifbæRj R cOYx, KxU-cZ½, Nvm, j Zv-cvZv, eŋl cŋwZ meB cwi tekki `Re A½|

`Re A½ tK Pvi wU fvM fvM Kiv hq| thgbN

- 1.1 **gubly** : RbmsL`v, Gi , Yv, Y, cOZovb/ cŋyP, fvM, Drcv`b BZ`w` mæu` I cwi tek tK cOZubqZ cPÜ Pvc w` t`Q|
- 1.2 **Dw`Kj** : weifbæDw`c RvZ/ cRvuz, tgšmgx, `f`vqx, `xN`vqx cŋwZ| G,tj vi msL`v I , YMZ cwi wa cKwZ I cwi tek tK cŋwZ KitiQ|
- 1.3 **cOwKj** : weifbæcOYx (`j R/Rj R), gvsmvKx, ZYt`fvRx, KxUcZ½, Mpcwv Z, cŋwZ gubly i fvM, Kul, e`emv BZ`w` tZ fvqKv i vL, fi Y-tcv tY mrvqZv Kti |
- 1.4 **AYRxe** : gwU, cwmb I evZvM we` gvb AmsL` qjz`AYRxe, gubly, cOYx ev Dw`K` i weifbamjeav ev Amjeav mjo Kti |

**2| A%Re A½**

gwU, cwmb, evZvm, mhaj vK, kwP, epocvZ, ZvcgvTv, LubR cŋwZ cOwZK mæu` wF`Ei cwi gvY I , YMZ we`wZ i tqtQ|

**3| Av\_@mvgwRK A½**

gubly i cWR, Ni-ewo, iv`vNvU, mjhm-mjeav, i wZbmZ, AvPri-AvPi Y, ivRbmZ, agx@ Ae`v cŋwZi cwi gvY, , YMZ I Ava`wZK we`wZ i tqtQ|

gubly i mo` fšMij K Gj vKvq weifbamgtq Dctiv` A½mgtni AvštmæuK@MlvbKvi cwi tek eSvq| cwi tekki weifbæA½i `ewP` I gubly i AvštmæuK@mRb cOvov cwi tek tK cŋwZ Kti \_vtK| Zte Rie-cwi tekki `wqZ; wbfP Kti cwi tekki `Re `ewP`Zii (Biodiversity) Dci |

**Kul. cwi tek**

cwi tek I Kul. KivR wbeofvte AvštmæuKZ| Kul. KivR Argiv thgbN cOwZK cwi tekki gwU, cwmb, mhaj vK, epocvZ I weifbæcOYx/Dw`K`i Dci wbfPkj nB, tZgub Avevi

Kwl. cwi tek nt`Q  
cwi tek ki weifbæA½i  
Avštm=úK® hv Kwl.  
Drcv`bK cfwēZ  
Ki tQ| mživs Kwl.  
cwi tek l wZbu A½  
thgbN`Re, A%Re l  
Av\_řvgwRKŃ G\_ tji  
Avštm=úK® dtj mō|

G\_ tji vi mSL`v, cwi gvY ev\_ YMZ cwi eZŃl mivab Kwi | weifbæKwl.Drcv`b l Dbqib KivRi  
gva`tg Avgiv Kwl.i mžhvM mjo Kwi, Ab`v`tk Avevi tRtb ev bv tRtb Kwl.tZ mgm`vi mjo  
Kwi | Liv, eb`v, jeYv³Zv, giagqZv, gwU ¶q, wkv v ep, NiYSo BZ`w` Kwl.KivR meNzv  
NUbvq|

Kwl.cwi tek nt`Q cwi tek ki weifbæA½i Avštm=úK®hv Kwl.Drcv`bK cfwēZ Ki tQ|  
mživs Kwl.cwi tek l wZbu A½ thgbN`Re, A%Re l Av\_řvgwRKŃ G\_ tji vi Avštm=úK®  
dtj mō| weifbæfšMij K Gji vKvq cwi tek A½i Ae`v`bi wfbævi Rb` weifbæKwl.cwi tek  
Mto Dtv`tQ|

**eZgub Kwl.cwi tek**

Avgiv eštZ tctiw th, Avštmuqvi ōviv Kwl.cwi tek ki weifbæA½ Avštm=úKZ| mjbw`Ń  
Kwl.KtgP ōviv ersj v`tki Kwl.cwi tek ki Dci cfwē Avtj vPbvi cte`ewaZ RbmsL`vi dtj  
mō Kw l cwi tek ki Dci miguwK cfwē Avtj vPbv Kiv ntj v|

**`wi t` ai` ěřin Pµ (Vicious cycle of poverty)**

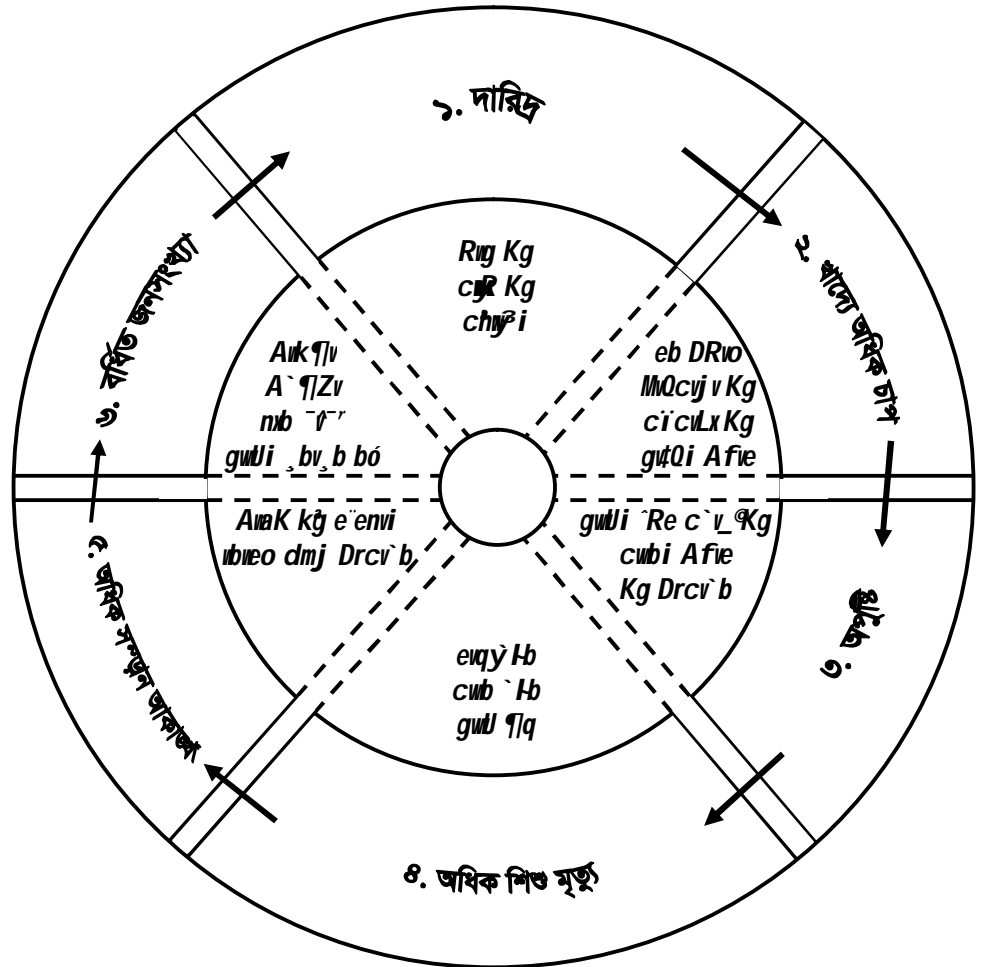
ersj v`tki Kwl.cwi tek ki eZgub Ae`vb w`æfcN`

- Kg RvgtZ Awak RbmsL`vi Pvc,
- DRvoKZ.ebfwg,
- ¶qcŃB gwU,
- wej Ń cŃq Rvj vbx Dm,
- ¶wqòzRie m=ú` ,
- eb`v-Liv-jeYv³Zv Ges
- weifc cwi tek k`wi`KIK|

G Ae`v Kxfvte mjo nq Zv wbtP Avtj vPbv Kiv ntj v t

RbmsL`v ep× tctj `řvneKfiteB gwU, cwib, ebR l RjR m=út`i gZ cŃKwZK m=ú`  
e`envi teŃo hvq| GtZ gwU, eb-R½j l RjR m=ú` ¶wqòzntZ\_`vK| eb DRvo l  
MvOcvj v wbiePřti tKtU Awak Lv` l ivwvi Rvj vbx ms`vb Kiv nq| dtj gwU i`Re c`v`P  
Dm Ktg hvq, gwU cwib aŃi ivLtZ cvři bv, gwU i ¶q i`iæ nq| gwU i\_ Yv\_ Y/DeřZv Ktg  
hvq| Pvlver`, cvbxq l Mv`jx KivR cwibi Afve t`Lv t`q| cwi tek `Y i`iæ nq| Gi  
cfvte Kwl.Drcv`b Ktg hvq| gvby i Lv`, Avkq l ivwvi cŃqvRtb`i Kvi nq Awak cŃR,  
cŃhvř l kq e`envi i i | wKš`wi`at`tk cŃR l cŃhvřN` Ńvvi B Afve\_`vK| G Afve cŃv`tq  
wbZ gvby tK Awak kq w`tZ nq| GtZ Awak gvby Rtbř| Giv eo nq AcŃp, Awk¶v l  
A`¶Zvq| cŃhvř tkLvi-Rivvi tZgb mžhvM cvq bv| ZvB Giv cŃv`vq cwi tek tK ¶wZMŃ  
Kti | dtj Giv Avi l `wi`anq| GfvteB NYřqgvfvte Pj tZ\_`vK`wi t` ai` GB `řin Pµ|

Awak RbmsL`v, Lv`vřve, AcŃp, Awak wki gZž l Awak mšib AvKiv¶vi gta` Avštm=úK®  
Ges Gi dtj Kwl.cwi tek ki ¶wqòzAe`vi Avštmuqv mtgZ `wi t` ai` ěřin Pµ wPŃ 10  
Gi gva`tg e`vL`v Kiv ntj v| t`tki kZKiv cŃq 85 Rb KIK Gtñb AwfKb `wi`Pµ  
e`x|



पT 10 : `wi t`i `ye m Pp I Kwl.cwi tek



**civVēi gj`iqb 3.1**

**mivK Dēti i civk, UK Pj (v) v b |**

- 1/ Kvl tZ meR necē K Lb i i antqij ?  
 K) cĀvki `k tK  
 L) IvUi `k tK  
 M) Pij tki `k tK  
 N) mĒti i `k tK
  
- 2/ mgvšZ Lvgvi e`e`v Lvgviti i Drcv`bkxj Zv Kx Kti ?  
 K) Kgvq  
 L) evovq  
 M) vKQb bv  
 N) vVZ Kti
  
- 3/ mgvšZ Lvgvi e`e`v civi Kvī Z mgštqi gva`tg Drcv`tbi DcKiY/Dcv`vb/ Lv`miei v n Kx Kti ?  
 K) Avb vōZ  
 L) Am`úY<sup>©</sup>  
 M) m`úY<sup>©</sup>  
 N) v b vōZ
  
- 4/ cĥv<sup>3</sup> ntj v e`e`v vcbv/Dcvq hv vevfbv A t 1/2 i Drcv`b v b vōZ Ki t Z N  
 K) A v g  
 L) m v g  
 M) m v q Z v K v i x  
 N) c v q v M K v i x
  
- 5/ mgvšZ Lvgvi e`e`v cĀvbZ KZ cĀvi ?  
 K) Oq  
 L) mvZ  
 M) cvP  
 N) Pvi
  
- 6/ civi tēk tK vevfbv fšMij K, mvgvRK ev Kvl. vK t m eY v Kti Avtj v Pbv Kiv nq ?  
 K) Gj v K v q  
 L) `v t b  
 M) m v g v b v q  
 N) AĀ t j
  
- 7/ civi tēk i A 1/2 cĀvbZ K q v U ?  
 K) `B v U  
 L) P v i v U  
 M) c v P v U  
 N) v Z b v U



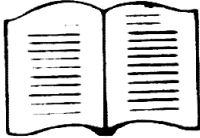


### cw 3.2 cwi tek `HY I qiqòzkul.cwi tek

G cvl tk`l Arcub-

- ◆ `HY I cwi tek `HY m`utK`ej tZ I wj LtZ cvi teb|
- ◆ Kul.cwi tekki qiqòzAe`v e`vL`v Ki tZ cvi teb|
- ◆ qiqòzkul.cwi tekki 17w Kvi tYi cfve eY`v Ki tZ cvi teb|

#### `HY (Pollution)



mnR K\_vq gwU, cwib I evZv`m qiwZKi `e`w` msthM/ wgt`Yi dtj cwi tekki c`KwZK  
\_Yvej x bó nI qv`K `HY etj | thgb`N gwU tZ m`itii AwZwi<sup>3</sup> msthM, cwib tZ KxUv`kK  
wgt`Y I evZv`m `M` Qov`bv|

mnR K\_vq gwU, cwib I  
evZv`m qiwZKi `e`w`  
msthM/ wgt`Yi dtj  
cwi tekki c`KwZK  
\_Yvej x bó nI qv`K  
`HY etj |

#### cwi tek `HY (Environmental pollution)

cwi tek `HY ntj v Avgv` i Pvi cv`tki cwi tek qiwZKi cwi eZ` NUv`bv| G\_vj vi AwKv`skB  
gvb`j i Ggb me KgR`vU hv`Z Rxemg`fni mL`v, kw<sup>3</sup> I wv`KiY fvi mv`g, i v`vqv`bK I A`%Re  
MVb BZ`w` qiwZM`- nq|

#### Kul.cwi tekki qiqòzAe`v (Degradation of agricultural environment)

gvbly Zvi tg`šj K Pwv`v I Ab`v`v` Kj `v`Y cwi tekki wv`fbw`A`z`K e`envi Ki t`eN GUvB  
`v`f`v`eK| wK`Š` GKv`R gvby hLb th`šv`K mxgv j`Nb K`ti ZLbB cwi tek `w`Z nq, wv`  
m`j`z nq| m`w` nq cwi tekki fvi mv`g`nxbZv| GUvB cwi tekki qiqòzAe`v| Kul.cwi tekki  
qiqòzAe`v Kx Zv Av`tj vPbv Kiv hv`K|

Òfv`Z-gv`Q ev`w`j Ó GKwU cv`t`b`c`v` | Avv`kK`f`v`teB avb Drcv`b evsj v`tki Kul i me`  
epr c`l`v`q| wv`MZ wZb`kK a`ti ewaZ Lv` Pwv`vi tgv`w`ej vq Awv`Z avb Pvi Kiv nt`q`Q|  
Db`Z Rv`Zi av`bi Avv`v` m`tgB te`to`Q| ZvB te`to`Q i v`vqv`bK mvi, KxUv`kK I tmP  
cwibi e`envi| D`t`e`w``t`K K`gt`Q `Re mvi e`envi Avi tm`Pi cwibi Drm| G`t`Z gwU  
\_Yv` Y bó nt`q`Q| Rv`j vbx, Kv` I Ab`v` c`l`v`R`tb m`tg eb-R`j`j DRvo nt`q`Q|

eb, Rv`g, cv`v`o I emZem`o nt`Z m`gw`MZ f`v`g q`l`q nt`q`Q| wv`v`f`v`g, wv`j, Lv`j, b`x, Rj v`f`v`g  
fivU nt`q`Q| i`v`v`v` tg`š`j`g Rj vavi i`w`K`tg Af`š`li`v`Y gv`Q Drcv`b K`gt`Q| gv`Q`i c`l`v`w`Z wv`j`  
nt`q`Q| gv`Q`i Zv`e`v` Af`v`e Ab`v`Z nt`Q|

eb`v, Liv, Nw`v`So I jeYv`<sup>3</sup>Zvi c`l`K`v`c m`tg ev`o`Q| wv`fbw`Acwi Kw`i Z Db`q`bI Kul.cwi tek  
wv`bó K`ti`Q| m`v`v`e`R`f`v`te Kul.cwi tek GLb b`v`v`v` `HY I wv`j`c Ae`v`i dtj qiqòzAe`v`q  
DcbxZ|

evsj v`tk Kul.cwi tekki  
`HY, q`l`q, wv`j`cZv I  
Av`j`v`v` b`k`j` Zv Kg`-t`e`w`k  
Gi c`l`q m`Kj A`t`z`B  
N`t`U`Q|

#### qiqòzkul.cwi tek (Degraded agricultural environmental)

evsj v`tk Kul.cwi tekki `HY, q`l`q, wv`j`cZv I Av`j`v`v` b`k`j` Zv Kg`-t`e`w`k Gi c`l`q m`Kj  
A`t`z`B N`t`U`Q| Gi wv`k`v` wv`e`i`Y Gi`j`c cwi m`ti Kiv m`v`e` bq| ZvB \_j`a`z`c`Y`<sup>17</sup>wU Kul.c`l`v`q`v`/  
c`h`v`v`<sup>3</sup>/ Ae`v`m`g`f`ni `v`v`v`v` Kul.cwi tekki qiwZKi/wv`j`c cfve msv`q`v`f`v`te wv`t`e Av`tj vPbv Kiv  
ntj v|

**1| AveiZ GKK dmj (avb) Pvl**

eisj v`tki Awakusk Gj vKvq GKB RvgtZ eQti ž ev wZberi ci ci avb Pvl Kiv nt`Q| Gi dtj N

- RvgtZ `Re c`v\_ Q Ktg hv`Q
- gmltZ Dv`i cyp Dcv`v`bi Afve t`Lv w` t`Q
- cŁZ eQi dmj tcvKv I ti vMi cŁ žve nt`Q
- gmlj Mvb cwi ewZŽ nt`Q, cmb avi Y ųgZv KgtQ
- `f Kvj xb tMv-Pvi Y Gj vKv Ktg hv`Q|

**2| tmPhy teiv avbi Avev` Rvq**

gvSwi DpZgvSwi wbpZl wbpZGj vKvq tmPhy Dbz teiv avb PrtI i Avev` cŁZ eQi evotQ| dj `wotqtQ w`e/cN

- i` tgsmjg i we dmj wtklZ: Wj I `Zj exR Avev` Gj vKv Ktg wMtqtQ
- MgxY gubj i Lv` tclw I t`m RvZxq Dcv`vb Ktg hv`Q
- f-Mf` cmbi `li tbtg wMtq cixq Rj I tmPi cmbi Afve nt`Q
- gvQi cRbb I Pvi Y tųI Ktg wMtqtQ (wbpZj vkq, wej Gj vKv)
- f-cp` cmbi Avavi i wKtg hv`Q
- i vqvubK mri I KxUbvK e`envi teto wMtqtQ
- A`bK `vbxq teiv avbi RvZ wej ž ntqtQ
- i` tgsmjg tųtZ `wv`bv cmb gkvi esk epx I DrcvZ ewotqtQ|

**3| Wj I `Zj exR Avev` Ktg hvl qv**

Avgb avb KvUvi ci ci Rvq i wKtg hvl qv Ges cŁq mKj RvgtZ Mg ev teiv avb Pvl epx cvl qvtZ i we tgsmjg wvfbwWj I `Zj exR dmj Avev` Ktg wMtqtQ| Gi dtj N

- t`tki Wj I `Zj exR Drcv`b KtgQ, Avg`wmb tetoQ
- ci-cwL I gvQi Lv` Drcv`b KtgQ
- gmlj `Re c`v\_ QKtgQ I gmlj cmb avi Y ųgZv Ktg hv`Q
- gmlj DcKvi x AYRxei msL`v nwm cv`Q
- gmlj tFŠZ, i vqvubK I `Re atgP , YMZ cwi eZB NUQ|

**4| cvU Pvl Ktg hvl qv**

cvU evRvi gj` Drcv`b LiPi tPtq A`bK Kg \_vKvq Ges wKf Kwl`g ZŠf e`envi evovq wMZ `kK cvU Pvl Dtj - LthvM` nvi KtgQ| GtZ hv nt`Q Zv ntj vN

- `Re Rvj vbx I Mv`vj x Dcv`v`bi Zxe`Afve
- gmlj `Re c`v\_ Q DePZv Ktg hvl qv
- tMvei, Nvm, cvZv BZ`w` i Rvj vbx f`c e`envi
- Mv`vj x Ni -evoxi KvR evk e`envi epx
- Kwl.RvgtZ AvMvvi DrcvZ epx cvl qv

cvU evRvi gj`
Drcv`b LiPi tPtq
A`bK Kg _vKvq Ges
wKf Kwl`g ZŠf e`envi
evovq wMZ `kK cvU
Pvl Dtj - LthvM` nvi
KtgQ

**5| GKB RvgtZ μgMZ Kj vBųjZvl**

eisj v`tki DpZl gvSwi DpZGj vKvq tKv\_vl Kj v ev tKv\_vl Bųj vFRbK dmj i f`c GKB RvgtZ `xNf`b Pvl Kiv nt`Q| Gi dtj N

- gmlj `Re c`v\_ QKtg hv`Q

- gmlJi cjo Dcv`v`bi Afve NUtQ
- gmlJ nZ cmb tkvIY teik nt`Q
- mvi I KxUvktKi e`envi ep` tctqQ
- gmlJi , YMZ cwi eZB NtU cti Ab` dmj Aver` SdkcY`nt`Q (dj b Ktg hv`Q)

**6| Avak BDwi qv (bvBtUtRb) mvi e`envi**

AweiZ avb Pvl, tmPKZ.tertiv avb Pvl, Kj v I Bqjz Pvl, Dbz Avj yI Ab`vb` kivKmeWR Pvl Zzbvgj-Kfite AtbK teik BDwi qv mvi (bvBtUtRb c`vb) e`euZ nt`Q| Gi c`fiteN

- Rvg ntZ Avak bvBtUU (tej I tej t`uAvk gmlJZ) vbPz`v`bi Rvg I cmbtZ RgtQ
- gvby I c`Yxi `r` Sdk evotQ
- gmlJi , YMZ cwi eZB NUtQ
- gmlJZ Ab`vb` cjo Dcv`v`bi Afve NUtQ
- Gtgvbqv I vgt`b M`vm D`Mxi Y evotQ|

**7| Avak imqvbK mvi (Ab`vb`) e`envi**

eZv`tb cPz` u.Gm.uc (Triple super phosphate), cUvk (Muriate of potash), uRcmvg Ges tKv`vI `~v I tevib mvi RvgZ e`envi Kiv nt`Q| uKs`Re mvi AtbKkg ev uKQ` t` qv nt`Q bv| Gi c`fiteN

- gmlJi `Re c`v`Ktg hv`Q
- gmlJi cjo Dcv`v`bi Afve mtgB evotQ
- Ae`euZ mvi vbPz`v`bi Rvg I cmbtZ Rtg`IY evotQ
- Rj R cwi tek Dv`c I c`Yxi nec` mpo nt`Q
- gmlJZ DcKvix Rxe I AYRxei msL`v nvm cvt`Q
- dmtj i dj b mtg KgtQ
- gvQ I Rj R c`Yxi msL`v nvm cvt`Q|

**8| Avak KxUvktK e`envi**

AvbqgZmsKfite vevfbredmtj eu KxUvktK e`euZ nt`Q| vevfbekm` I i`UKx msi qj`yI G`tjv e`envi Kiv nt`Q| Gi dtj N

- gmlJ, cmb I evqy`IY nt`Q
- dmtj KxUvktKi Aemko`w`wZ (Residue) evotQ
- gvby I c`Yxi `r` Sdk evotQ
- gv`Qi RvZ vej`v` NUtQ, Rj R cwi tek`IY nt`Q
- gmlJi DcKvix Rxe I AYRxe KgtQ

AvbqgZmsKfite vevfbredmtj eu KxUvktK e`euZ nt`Q| vevfbekm` I i`UKx msi qj`yI G`tjv e`envi Kiv nt`Q| Gi dtj N

- gmlJ, cmb I evqy`IY nt`Q

**9| Rjx Avgb avb Pvl nvm**

vevfbredmtj vKvq thLv`tb cfe`Rj x Avgb avb Pvl Kiv ntZv Zv mtg KgtQ I terativ avb Pvl evotQ| Gi c`fiteN

- Wj I `Zj exR dmj Aver` (H`v`tb) KgtQ
- MoxY Lv`t` t`c`Uvbi Afve nt`Q
- gv`Qi c`KuzK Lv` Avktq`vb Ktg gv`Qi Drcv`b KgtQ|

**10| dmj Pti AwK AwbK Riv e'envi**

avb QrovI AtbK km, Wj, `Zj exR I kiv-meiR Aveit` mgristq AwbK Riv/nvBieW e'euZ nt"Q| Gi dtj N

- KI#Ki evBti i DcKi tY (exR, Priv, Kj g) wbfPkj Zv evotQ
- Drcv`b LiP (exR-mvi-KxUvbkK-tmP) evotQ
- m#tebigq `vbxq dmj I Riv wej s nt"Q
- ci cmlLi Lv` I Rjy vbxI Afve t`Lv w` t"Q
- gmlU ntZ AwK Lv` Dcv`vb `z Pti hv t"Q
- gmlU DePZv KgtQ
- Kwl.cwi tek`Re`ewP T Zv KgtQ|

**11| eb DRvKiY**

ebvAtj I MgrY eb-Rzj ntZ wbePti e` wbatbi dtj t`tki eb I ebR m#u` `z nwm tctqtQ| Gi dtj N

- fmg q q tetotQ; b`x-bvj v, Lij -wej fi vU ntqtQ
- gmlU `Re c`v`P Dm I cwb avi Y qgZv KgtQ
- eb` ci cml I MvQciv vi Rxe cwi tek fvi mg`Zv nwi tqtQ
- eb` ci cml I MvQciv v nwm tctqtQ
- %Re Rjy vbxI Dm I KvW KgtQ
- f-Mf` cwb` tY I j eYv`Zv tetotQ
- evqykrab c`uqv nwm tctqtQ|

**12| giagZv**

t`tki DEivAtj MvQciv w bab, `xN# b Liv Ges b`x, tj vtZ cmbi `f Zvq c`q giakIY i ia nevi ct\_| G Ae`v c`fmeZ Ki tQ N

t`tki DEivAtj  
MvQciv w bab, `xN# b  
Liv Ges b`x, tj vtZ  
cmbi `f Zvq c`q  
giakIY i ia nevi ct\_|

- Dci S`gmlU DeP`li q q
- gmlU `Re c`v`Ktg DePZv webó
- f-Mf` cmbi`li AtbK w bP tbtg hvI qv
- gmlU w bP i`ti j eYv`Zv m`ó
- Rxe-cwi tekki`ewP T Zv nwm|

**13| tcSi I wki`eR**

t`tki mKj tcSi GjvKvi mKj eR` Ges wki` Kvi Lvbi, BtiU fiUv, avtbi wj c`fwiZi bivmea eR` memR#bi tKvb e`e`v tbB| G, tj v h T T t dj v nt"Q| ZvQrov wki` Kvi Lvbi fatqv evZv m w gktQ| Gmtei dtj N

- gmlU, cwb I evZim`w`Z nt"Q
- `tYg` `v tbi th tKvb Drcw`Z Lv` `t`"i Rb` q wZKi
- RjvKq, b`x, Lij I wej i gvtQi c`Rbb I ew` e`vnZ nt"Q; gvtQi c`RwZ wej s nt"Q
- gvbY I ci cmlLi`v` u`guk m`ó nt"Q|

14| DcKj xq iPsiD Pvl ue`iZ

t`tki`wYvAtj  
DcKj eZi`vrb μgvištq  
emYvR`K em`v iPsioi  
Pvl evotQ| GiU t`tk  
`ef`nkK gYi j vfi  
civkvcmk Kul.cwi tekK  
wevNz Ki tQ|

t`tki`wYvAtj DcKj eZi`vrb μgvištq emYvR`K em`v iPsioi Pvl evotQ| GiU t`tk  
`ef`nkK gYi j vfi civkvcmk Kul.cwi tekK wevNz Ki tQ| thgbN

- RvgtZ μgviMZ tj vrb cwb Xkvvrbvi dtj gmltZ j eYv<sup>3</sup>Zv tefo avb Drcv`b nwm  
civ`Q
- DcKj xq RbMtYi Ab`T `vrbšli`i iæntqtQ
- DRvrbvi b`xi cwb cævn KgtQ, ZvB DcKj-xq j eYv<sup>3</sup>Zv μtg t`tki Af`šti  
cæek Ki tQ|

15| tmP I eb`vrbqšY eva

t`tk dmj Drcv`b evotZ wevfbætmP cKf GjvKvq Ges eb`vi nvZ ntZ Rvg i`vrbq eb`v  
cæY GjvKvq eva t`qv ntqtQ| ZQvov iv`vNvU vbgYI Dæætai b`vq KvVtgv Mto Dtv`Q|  
Kul.cwi tekK Gme evai mæve` cifve cwi Kf vrb vrb cvl qvq G<sub>3</sub> tj vi dtj N

- evai vFZi GjvKvq `vqx Rj ve×Zv mwo ntqtQ, dmj Drcv`b nwm ev eU ntqtQ
- gY Rj vktqi gvQ cævb eU ntqtQ, gvQ Pvl I Kiv hv`Q bv, gvQI cævMZ j š nt`Q
- gml vrbq ntq fivU nt`Q tmP Lvj , bvj v
- cwi tekK Rxe`evP`Zv nwm tctqtQ, fvi mvg`nrbZv mwo ntqtQ|

MögvAtj `Re Rvj vbi  
cPvj Z Dm civKvM,  
wevfbæMvQciv v I etk|  
mvæcæZKKvtj Gmtei  
Afite tMvei, j Zv-  
civZv, Nvm, `aAv,  
dmjtj i Dv`Qó, Lo  
cævZ Rvj vbi fæc  
e`eüZ nt`Q|

16| AcPvj Z Rvj vb e`envi

MögvAtj `Re Rvj vbi cPvj Z Dm civKvM, wevfbæMvQciv v I etk| mvæcæZKKvtj Gmtei  
Afite tMvei, j Zv-civZv, Nvm, `aAv, dmjtj i Dv`Qó, Lo cævZ Rvj vbi fæc e`eüZ nt`Q| Gi  
dtj N

- RvgtZ `Re mvi ev `Re c`vt`P Dm I e`envi gvivZKfite KgtQ; Rvg AbvP  
nt`Q
- civmLi Lv`i Afve t`Lv v`qtQ
- gvQ Pvl DcKivYi Afve nt`Q
- meR mvi ifæc `aAvi cæqM KgtQ|

17| fvg vrbq

dmjtj i Rvg, emZemo, vrfUv, Dææfvg, b`xKj , civno cævZ `vb ntZ wevfbæKvi tY fvg vrbq  
nt`Q| Gi dtj N

- gml i DePZv nwm I dmj Dc`hvMvZv vebó nq
- gvby emZvrfUv, dmjtj i t`vZ BZ`v i vevj vrbq ntj `vrbšli nq
- KvUcZ½ I civmLi Avev`j vebó nq
- b`x-bvj v, Lvj -vej , Rj vkb fivU ntq bvb Kul.mgm`v NUvq|



**Ablyj b (Activity):** evsj it`k Kul.cwi tek vrb vrb vrbq hveri cævb KviY<sub>3</sub> tj v vrbvZ  
Kvab| Gt`i cævb KviY<sub>3</sub> tj v eYv Kvab (AbaY<sup>200</sup> kã)|



### civēi gj'iqb 3.2

mWK Dēti i civēi (✓) ū b |

- 1/ civētki cōKūZK , Yrej x bó nI qvK Kx etj ?  
 K) `tY  
 L) ūgkY  
 M) ¶q  
 N) cxob
- 2/ civētk `tY nŕjv Avgv`i Pricvki civētk Kx aiŕbi civēZŦ NUŕbv ?  
 K) DbžZi  
 L) ¶ŕZKi  
 M) mŕgŕMĀ  
 N) AvsŕK
- 3/ civētki ūefbæA½ e`enŕti gvby tKŕb&mŕgv j •Nb Kiŕj civētk `ŕZ nq ?  
 K) AŕhŕŕK  
 L) Awŕŕ  
 M) thŕŕK  
 N) ūbŕŕ
- 4/ Kwl. civētki `tY, ¶q, ūeŕcZv I Abŕcv`bkŕj Zv Kg-tenk tKŕb A½ NŕUŕQ ?  
 K) mKj  
 L) cŕcŕL  
 M) dmj  
 N) gŕrm
- 5/ ūZcŕKZŕU Kwl. cōŕqv/cōŕŕ/Ae`ŕmgŕni Őviv Kwl. civētk ¶ŕZKi cŕŕve  
 Avŕj ŕPZ nŕqŕQ ?  
 K) cŕbiŕU  
 L) tŕj ŕU  
 M) mŕZiŕU  
 N) ūekŕU
- 6/ GKB RŕgŕZ ci ci `ŕ/ŕZb evi avb PŕI KiŕŕZ gŕŕŕi `Re c`ŕ\_ŕKiŕc civēZŦ  
 nŕ"Q?  
 K) ŕWKB AvŕQ  
 L) Kŕg hvŕ"Q  
 M) teŕo hvŕ"Q  
 N) ŕKQŕnŕ"Q bv
- 7/ tmP hŕŕ teŕŕiv avŕbi Aveŕ` cōZ eQi tKgb civēZŦ nŕ"Q ?  
 K) evŕŕQ  
 L) GKB AvŕQ  
 M) KgŕQ  
 N) ŕKQŕnŕ"Q bv

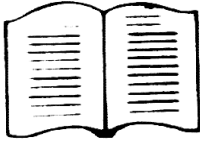


### cw 3.3 cwi tek Kul. I Lugvi e`e`vi Drcv` bKxj Zv msi qiy



G cvV tk tI Avci b-

- ◆ cwi tek Kul. m`u`K`ej tZ I wj LtZ cwi teb |
- ◆ cwi tek Kul. i bmxZgvj v D t j L Ki tZ cwi teb |
- ◆ cwi tek Kul. i c`u`qvRbxqZv e`vL`v Ki tZ cwi teb |
- ◆ weifbac`kvi cwi tek Kul. m`u`K`eY`v Ki tZ cwi teb |
- ◆ Lugvi e`e`vi Drcv` bKxj Zv msi qiy Gi fmgKv e`vL`v Ki tZ cwi teb |



Drcv` bKxj Zv I mivgvl`k  
 cwi tek tK i qiv K ti  
 Kul. Drcv` b tKSkj  
 MhY ntj v cwi tek Kul. |

#### cwi tek Kul. (Environmental agriculture)

Kul. KgRvU GKwU ubw` e` cwi tek msNwUZ nq | cwi tek Kul. nt`Q Rxe cwi tek, t fS`Z cwi tek, gvby I c`Yxi `r` Ges Drcv` bKxj Zv msi qiy K ti (ev Kg qiwZ K ti) Kul. Drcv` tbi c`hy` / tKSkj / c`u`qv MhY I Drcv` tbi DcKiY (Lv` Drcv` b, cwb, `Re c`v` ) msMhKiY | A`f Drcv` bKxj Zv I mivgvl`k cwi tek tK i qiv K ti Kul. Drcv` b tKSkj MhY ntj v cwi tek Kul. |

#### cwi tek Kul. i bmxZgvj v

cwi tek Kul. i t`q` t Drcv` b c`u`qvq KZ` t j v bmxZgvj v MhY Ki v ntq `v`K | G` t j v nt`Q`N`

- 1 | cwi tek `tY kb` ev Kg c`f`ve
- 2 | kb` ev L`y Kg i vmiqubK `e` (mvi / KxUv`kK / JI a) e`envi
- 3 | Kg em: m`u` e`envi: mKj `vbxq m`u` (Dw`c, `j R I Rj R c`Yxi) e`envi
- 4 | weifb`e`Re I me`R mvi Ges eR`c`y: e`envi |

#### cwi tek Kul. i c`u`qvRbxqZv (Rationale of environmental agriculture)

eisj vt` tki Awakisk KIK ewp` wbf`P Pvlver` K ti b hv Awbu`DZ | Rigi nvmgvb De`PZv I Avenl qvi c`u`Kj Zv Kul. Drcv` tbi S`uk evovq | K t`Ki c`u`R I L`y Kg | Kul. i dj b I Avkvbj`c nt`Q bv | KIK I Kul. i G cwi tek tK GK K`vq c`u`SK cwi tek (Marginal environment) ej v hvq | Z`gwi Awak i vmiqubK `e` (mvi / KxUv`kK) e`envi Kivi d t j Rvcvb I Avtqwi Kvi Lv` `e` KxUv`k tK i Aew`wZ (Residue) mvi Y NUbv ntq `wot`q`Q | G tZ gvby I c`Yxi `r` S`uk evot`Q | G t` tki Lv` Drcv` b I msi qiy i c`u`qvq i vmiqubK `e` Aew`wZ we`gvb |

`vii` a ntZ gy` j v f,  
 Kul. i Drcv` bKxj Zv  
 Ges gvby I c`Yxi  
 `r` msi qiy i Rb`  
 cwi tek Kul. Aek`  
 c`u`qvRbxq |

c`u`SK cwi tek Nb emwZcy` tK KIK `vii` a i `w`m P tmu Ave`x | `vii` a ntZ gy` j v f,  
 Kul. i Drcv` bKxj Zv Ges gvby I c`Yxi `r` msi qiy i Rb` cwi tek Kul. Aek` c`u`qvRbxq |  
 Kvi Y GKgvI G tKSkj Mh`tYB Avgi v Kul. cwi tek tK I msi qiy Ki tZ cwi tev |

#### weifbac`kvi cwi tek Kul.

Kul. cwi tek i Kg qiwZ K ti I Kul. i Drcv` bKxj Zv eRvq ti tL weMZ `y` k tK cw` exi weifb`e` t` tK A`bK M`teYv c`Pov` tbqv ntq`Q | Gi dj k`y` tZ bZb bZb Kul. tKSkj D`weZ ntq`Q | G` t j v nt`Q`N`

- `Re Kul. (Organic farming)
- Rxe cwi tek K Kul. (Ecological agriculture)

- `xN`vqx Kul. (Sustainable agriculture)
- cly:Drcv`bkxj Kul. (Regenerative agriculture)
- meKf Kul. (Alternative agriculture)

1| `Re Kul.

GK ai#bi Kul. Drcv`b c`wZ thLvtb `v`c0 gwU I dmj msi`Y DrmwvZ Kiv nq| GRb` `Re c`v`P Lv` Dcv`v b cly:Pµvqb, dmj AveZB, mivK Pvlver` MhY Ges imvqubK mvi I KxUvkk e`envi cwi nvi Kiv nq|

2| Rie-cwi`tekK Kul.

Kul. Drcv`b e`e`v hv Kul. cwi`tekK Dbqb Kfi ev` QmZM0fKfi bv| thLvtb imvqubK mvi, KxUvkk e`envi LpB Kg nte, Zte eU nte bv|

3| `xN`vqx Kul.

`vbxq DcKiY wfvEK Rie-cwi`tekK Kul. thLvtb dj bkxj Zv msi`Y meZK cPov vbtqvM Kiv nq|

4| cly:Drcv`bkxj Kul.

Kul. Drcv`b tKSkj hvZ `vbxq cly:Drcv`bkxj DcKiY e`envi I cwi`tek msi`Y`K i azj f`qv nq|

5| meKf Kul.

gj-Z: `Re Kul i Abjfc| Zte OmefR wecæ Kul i 0 (Green revolution agriculture) cwi etZ`MpxZ etj B GuLi G biv ntqtQ|

Dcti Avtj vPZ wvfbecKvi cwi`tek Kul i gj- Df`k`mgr- tgvUvgv GKB i Kg| tm, tj v ntj vN

- Kul. cwi`teki fS, `Re I Av`wvRK Ae`vi DcthvMx fvg e`envi ev Lvgi e`e`v D`v`eb|
- `vbxq c0B m`ut`i mgye`envi, emnti i DcKiY wfvPkvj Zv Kgv`bv (mvi, KxUvkk, JIa)|
- Kul. tZ `xN`vqx Drcv`bkxj Zv i`vKiY|

Lvgi Drcv`bkxj Zv msi`Y

Kul. i `enk0`

mnR K\_vq Lvgi Drcv`bkxj Zv msi`Y A\_`n`Q Lvgiti `xN`b Drcv`bkxj Zv eRvq i vLv| BtZvgta`B G K\_vu cwi`tek Kul. i Avtj vPbvq GKvU Df`k` i`fc GtmtQ| G c0t`1/2 weAvbMY etj b, 0Kul. Dbqb c`v`e `xN`vqx nte hv` Kul. tZ vbw`0 KtqKvU ev me, tj v `enk0` eZgvb \_v`K|0 vbw`0 QqvU `enk0` n`Q wv`v`cN

weAvbMY etj b, 0Kul. Dbqb c`v`e `xN`vqx nte hv` Kul. tZ vbw`0 KtqKvU ev me, tj v `enk0` eZgvb \_v`K|0

- Kg LiP (Inexpensive)
- weCYb thvM` (Marketable)
- `vqx (Permanent)
- MhY`thvM` (Acceptable)
- msi`Y c`v`e (Conservation effect)
- c`v`v` DcthvMx (Technology response)

Dctii `enkó` tji BstiiR cōZ ktāi cōZiUi cōg Aŋi w`tq IMPACT kāuU cvl qv hviq/ hvi A\_P `xN`vqx cFie/

**Kul. chny`i `enkó`**

Dchy` chny` MhY Qvov hMj Dc`thvMx Kul. Dblab m`e bq/ ZvB `xN`vqx Kul. Dbq`b `xN`vqx chny` (Sustainable technology) MhY Aek` c`qRbxq/ Kul. chny` tZ w`b`w`j wLZ QquU , Yvej x\_vKtj Zv `xN`vqx chny` nte/ G\_tj v n`j vN`

- S`K mnbkxj (Buffered against risks)
- mg`qj t`c`ŋ`ŋ`Z `vqx (Stabilized against time)
- Rj evq`z mgj q (Synchronized with climate)
- cwi t`ek `^Q` (Harmonized with environment)
- f`w`g ŋ`w`q`ō`Zvq mst`e` b`kxj (Sensitive to soil degradation)
- cwi e`Z`f`b Dc`thvMx (Responsive to change)

GLb e`ŋv hv`Q` th, `xN`vqx Kul. chny` e`envi I Ab`vb` c`q`v`v`i gva`tg `xN`vqx Kul. Dbq`b A\_ŋ` Lvgvi Drcv` b`kxj Zv e`Rvq i vLv m`e/ Avi cwi t`ek Kul i D`f`i`k` Lvgvi Drcv` b`kxj Zv e`Rvq i vLvmn Lvgvi cwi t`ek i mKj A`1/2` Dcv` vb msi ŋ`Y/

**c`qRbxq e`e`v`cbv**

Gevi mst`ŋ`ŋ`c Kx Kx e`e`v`v`c`q`v`v`i/chny` e`envi K`i Lvgvi Drcv` b`kxj Zv Ges Lvgvi cwi t`ek msi ŋ`Y Kiv hvq Zv Av`j vPbv Kiv n`j v/

**1/ gwU e`e`v`cbv**

Kul tZ gub`j i c`i`B gwU i `vb/ G gwU i m`w`K e`e`v`cbvi gva`tg gwU i ŋ`q, `tY I Ab`ŋ` c`q`v`v`i eU Ki tZ nte/ G D`f`i`k` w`b`w`j wLZ c`f`ŋ`c MhY Kiv th`z cv`i /

- gwU i Dci Dchy` Nvm, MvQ, dmj ev e`ŋ`ŋ`i Av`Qv` b i ŋ`Y/
- A`th`ŋ`v`K gwU KIŋ, dmj Dv`Q`ó tcvov`bv, AZ`wa`K tM`P`v`i`Y, eb DR`v`o`K`i`Y I Acwi Kur Z gwU Kiv v cwi nvi Ki Y/
- Xij ygwU tZ ev cvn`to`i Xv`j i Avov`v`v`o` e`ŋ, dmj , MvQ BZ`w` j vM`v`bv/
- nvl o ev Avz w`b`w`j`A`j emZ`v`v`o`i f`w`g ŋ`q ti va chny` MhY/
- dmj x Rvq n`z gwU ŋ`q ti va Ki tY gvj w`Ps I `Re c`v`\_`c`q`v`v`i w`ŋ`K`i`Y/

**2/ cwb e`e`v`cbv**

cwb Qvov tKvb Dv`m`c ev c`ŋ`xi t`e`P`\_v`Kv I e`ŋ` Am`e/ ZvB c`K`w`Z. n`z c`ŋ` c`w`bi w`e`P`ŋ`Y e`envi I `tY ti v`ta e`e`v` MhY Ki tZ nte/ G Rb` w`b`w`j wLZ c`f`ŋ`c t`b`q`v` th`z cv`i N`

- f`-c`ŋ`o`i c`w`bi Avav`ti m`L`v, Avq`Zb I M`f`xi`Zv e`ŋ` K`i c`ŋ`z e`ŋ`o`i c`w`b msi ŋ`Y/ GRb` m`v`g`w`R`K`f`v`te (M`ŋ`g`/G`j`v`Kv w`f`w`E`K) f`i`v`U c`ŋ` R`j`v`k`q, w`ej , L`v`j , t`Q`v`U b`x` c`ŋ`:L`b`b` Kiv Dv`P`Z/
- f`-M`f`o`i c`w`bi `li w`b`P` t`b`tg i`o`i t`g`ŋ`m`tg c`w`bi Z`x`e`A` f`i`v`e` n`t`Q`/ G mg`q` h`\_v`m`e` Kg c`w`b j`v`M`te G`i`f`c` dmj Av`v` K`i`Y/ Zv`Q`v`ov` gwU`t`Z` c`w`b Av`v`K` w`b` a`ti i`v`L`t`Z i`w`e` km` e`cb I Av`Qv` b dmj Rb`v`bv/

cwb Qvov tKvb Dv`m`c ev c`ŋ`xi t`e`P`\_v`Kv I e`ŋ` Am`e/ ZvB c`K`w`Z. n`z c`ŋ` c`w`bi w`e`P`ŋ`Y e`envi I `tY ti v`ta e`e`v` MhY Ki tZ nte/

- KxUvbkK I i vmiqubK mvi e`envi i mWK c`uZ, gvIv, mgq BZ`w` Ktvi fite tgb Pjv| t`f`zi cmb AvUtK mvi ev KxUvbkK c`qM|
- cmbtZ gj -gf- I eR`memR` eUKiY|

**3| A`Re mvi e`icbv**

mvi e`envi gvIv myg I ths<sup>3</sup> ntZ nte thb Zv Ae`eüZ t`tK ev PBtq ev M`vm ntq cwi tek `tY Ki tZ bv c`ti | GRb`N

- BDwi qv mvi GK mvt\_ tenk e`envi bv Kti KtqK evti gmlUj wbtP c`qM Ki tZ nte|
- tetj ev tetj t`v-Atk gmlUtZ ugDtiU Ae clvk (Gguc) mvi I BDwi qvi b`vq c`qM Ki tZ nte| dmtUmn Ab`vb` mvi Pti I mgq gmlUtZ wgnktq w`tZ nte|
- gmlUtZ mvi c`qMti AšZ mVz w`b ci dmj /exR/Pvi v ecb/tivcY Ki tZ nte|
- mvi c`qMti ci t`f`zi cmb AšZ 10 w`b AvUtK ivLtZ nte|

**4| KxUvbkK e`icbv**

KxUvbkK e`envi h`vm`e mwgZ ivLtZ nte| Gi e`envi Ggbfite m`ubdKi tZ nte hvZ Gi dtj AcKvi Kvi x KxUcZ½ Qvov gubj, Lv`, gvQ, ci-cvL I DcKvi x KxUcZ½ BZ`w` i Dci t`wZKi c`fve bv tdtj | GRb`N

KxUvbkK e`envi h`vm`e mwgZ ivLtZ nte| Gi e`envi Ggbfite m`ubdKi tZ nte hvZ Gi dtj AcKvi Kvi x KxUcZ½ Qvov gubj, Lv`, gvQ, ci-cvL I DcKvi x KxUcZ½ BZ`w` i Dci t`wZKi c`fve bv tdtj |

- mgwšZ evj vB e`icbv (IPM) e`icKfite Pj Kiy|
- Dv`c RvZ t`kxq KxUvbkK e`envi RbwcqKiy|
- tKvb&tcvKvi tKvb&KxUvbkK Ges Zvi h`vh\_ gvIv I c`qM c`uZ mWKfite tRtb e`envi Kiy| gtb ivLtZ nte KxUvbkK gvi vZ`K mel|
- evZv`mi c`ZKtj, e`oi mgq, Lwj Mvtq Ges cvbiZ ev Lv`ve`vq Gme e`envi b`Kiy|

**5| dmj e`icbv**

t`tki Kul. KvRi epR AskB ntjv bvbmea dmj Drcv`b| ZvB dmj wbePb, Drcv`b I msi t`Y KvR mtpZb nI qv c`qvRb hvZ cwi tek I Drcv`bkxj Zv msi t`wZ nq| GRb`N

- i`ayvb Drcv`b tK clvb` bv w`tq Ab` c`qvRbxq dmj wbePb Kti dmj `emP`Zv AvbqbKiy| GRb` w`k`dmj, Avštdmj, w`tj dmj, m`x dmj Pvl c`wZ tKškj MšY|
- gmlUj t`wZDePZv msi t`Yi Rb` el`dmj mtg avtbi cvkvcnk cvU, Wvj, `Zj exR, mxg dmj Ašf`Kiy|
- tev`iv avb Avev` AvZwi<sup>3</sup> `wv`bv cmb bv titL w`civQtc cmb ivLv DvPZ| GtZ cmb msi t`Y Kti gkK ev` nvm Kiv hvte|
- dmtj meR mvi Ges avb, Wvj I `Zj exR dmtj RievYmvi (Biofertilizer) e`envi ev`Kiy|
- i` tgsmtg RvgtZ Avak w`b cmb ati ivLvi tKškj (gvj wPs, Av`Qv`b dmj, mmi ex dmj, w`k`dmj, tev dmj) Aej`bKiy|
- Kg cmb w`tq dmj Pvl tKškj wbtZ nte|
- `f I `w`gqv`x dj Avev`i mvt\_ w`k`dmj I `aAv Avev` Kti gmlUj cmb I DePZv msi t`Y|
- `vbxq RvtZi w`f`b`dmj Avev` ati ivLv|

6/ cŵxe e ʻicbv

cwiʼetki msi ʻŶY I Drcv ʼbkj Zv epxi Rb ʼ Dm ʼ I cŵxi (Mpcwj Z) ʼewP ʼZv i ʻŶv KiʼZ nte| Kul. ʼ iaZm ʼubæ cŵxi jvj b-cvj b I msi ʻŶY ubæ ʼwLZ e ʼe ʼv MŵY Kiv cŵqvRb|

cwiʼetki msi ʻŶY I Drcv ʼbkj Zv epxi Rb ʼ Dm ʼ I cŵxi (Mpcwj Z) ʼewP ʼZv i ʻŶv KiʼZ nte| Kul. ʼ iaZm ʼubæ cŵxi jvj b-cvj b I msi ʻŶY ubæ ʼwLZ e ʼe ʼv MŵY Kiv cŵqvRb|

- f ʼkix ci-cwLi Drcv ʼbkj Zv epxi Rb ʼ Gʼ i cŵKi Lv ʼ, mŵPwKrmv I gnvgvix (Epidemic) ti wM cŵZti va (Vaccination) e ʼe ʼv MŵY|
- f ʼkix DcKi Y mnʼhuʼM mʼet ʼEg Lv ʼ ti kb cŵZ I Zv ci cwLi K Lv qvʼbv|
- aib ʼŶʼZ gvQ/wPsw Pvl (GKB mʼ½ Ges chʼqµtg) Rbucŵ Kti gvQ Drcv ʼb evovʼbv|
- cPv Avex Rj vktq f ʼkix wks, gv, i, ʼK RvZix gvʼQi Pvl Kiv| GʼZ cwiʼek Dbqb I gvQ Drcv ʼb epx cʼte|
- iaB, KvZj v, gʼMj cŵwZ Kiv ʼRvZix gvQ Dbz Dcvtq cʼkzi Pvl Ki Y|
- wewfbaAcŵj Z ʼj R I Rj R Nvm, j ZvciZv, cʼbv cŵwZ evQvB Kti ci, nwn-gjwM I gvʼQi Lv ʼ iʼc e ʼenvi Kiv| cŵqvRʼb G, ʼj v cʼyivq Drcv ʼb ubwŵZKi Y|

7/ ʼRe e ʼicbv

ʼRe eR ʼh ʼZ ʼI tdʼj cwiʼek ʼ ʼY Kiv nʼQ| G, ʼj vi cwi Kw ʼZ mslMŵ, msi ʻŶY I cPb Kul. Drcv ʼbi wewfba ʼŶʼI wecæ etq Avbʼte| GRb ʼN

ʼRe eR ʼh ʼZ ʼI tdʼj cwiʼek ʼ ʼY Kiv nʼQ| G, ʼj vi cwi Kw ʼZ mslMŵ, msi ʻŶY I cPb Kul. Drcv ʼbi wewfba ʼŶʼI wecæ etq Avbʼte| GRb ʼN

- mKj eR ʼwAvbm ʼZ ubqʼg msi ʻŶY Kti Kʼuv ʼ Drcv ʼb I e ʼenvi Ki Y| tMvei, QwMj I nwn-gjwMi weŵv msi ʻŶY Kti ʼRe mvi iʼc e ʼenvi |
- AʼbK eR ʼmivmwi ci cwL ev gvʼQi Lv ʼ iʼc e ʼenvi ubwŵZKi Y|
- dmtj i Aewkŵvsk ʼŶʼZ ti ʼL tmLvʼbB gvwʼZ wgvʼbv| Rj vmbi Rb ʼ wewfba ʼZ eaŵkij e ʼŶ ev ʼaAv ev cvU Pvl Kiv DvPZ| dmtj i ʼŶʼZi Pvi cʼk ev gvʼS gvʼS G, ʼj v j vMʼbv nq|
- mgwʼSZ Kul. Drcv ʼb cŵw ʼ MŵY Kij AʼbK eR ʼmivmwi Drcv ʼb e ʼeüZ nq| thgb ʼN nwn-gjwM I gvQ Pvl, nwn-gvQ-aiB Pvl BZ ʼw |
- wewfbaPvDj Kʼj cŵZ QvB cvl qv hʼq| G, ʼj v wewfbaKpZ Av ʼv, nj ʼy, tcqvr, i mly, gwi P Avevʼ ʼ h\_vh\_ e ʼenvi Drcv ʼb epx cvq|
- tcŵi Gj vKv I wki Gj vKvi KwB eR ʼ, ʼj v weʼkl e ʼe ʼvq cʼPʼq cʼyivq dmtj i RvʼgʼZ e ʼenvi Ki Y c ʼŶʼc MŵY|
- evʼqm ʼvm cwU ʼicʼbi gva ʼtg Rj vmb I ʼRe mvi ʼ ʼvB GKmv ʼ\_ j vʼf Kiv mæ|



**Ablyj b (Activity):** Avcub wK gʼb Kti b th, Lvgti i Drcv ʼbkj Zv msi ʻŶY Avek ʼK? Zvntj Lvgti i Drcv ʼbkj Zv epx ʼZ Kx Kx c ʼŶʼc MŵY Kiv DvPZ etj Avcub gʼb Kti b?



### civēi gj`iqb 3.3

mivK Dēti i civk, UK vP (v) v b |

- 1/ Drcv`bkxj Zv I mvgvMvK civi tektk i vlv Kti Kul. Drcv`b tkškj MhY ntj vN
  - K) Dbz Kul.
  - L) civi tek Kul.
  - M) `Re Kul.
  - N) A%Re Kul.
- 2/ civi tek Kul i KqvU bmvZgij v Avtj vPbv Kiv ntqtQ ?
  - K) vZbvU
  - L) cvPvU
  - M) Pvi vU
  - N) QqvU
- 3/ ersj vt`tki Avakvsk KI.K Kx vbfP Pvl ver` Kti b ?
  - K) tmP vbfP
  - L) mvi vbfP
  - M) KxUvbkK vbfP
  - N) evó vbfP
- 4/ Rvgi nvmgyb DePZv, Avenl qvi cūZKj Zv I Kg cvR mevkó Kul. I KItki civi tektk G K\_vq vK ej v nq?
  - K) cūšK civi tek
  - L) veifc civi tek
  - M) Amnbxq civi tek
  - N) `vi`^civi tek
- 5/ KZ cKvi civi tek Kul. Avtj vPbv Kiv ntqtQ ?
  - K) Pvi
  - L) Qq
  - M) vZb
  - N) cvP
- 6/ i vmvqubK mvi I KxUvbkK e`envi civi nvi Kvix Kul i bigN
  - K) A%Re Kul.
  - L) `xN°vqx Kul.
  - M) `Re Kul.
  - N) Rxe-civi tekK Kul.
- 7/ meR wece Kul i civi etZMpxZ Kul i bvg Kx ?
  - K) meKí Kul.
  - L) civi evZŽ Kul.
  - M) civi tek Kul.
  - N) `Re Kul.

Kwl.1 c j Dbaq b ĩž

8/ ĩvbxq DcKiY wfiĒK Rxe-cwi ĩekK Kwl. thLiĩb dj bkij Zv msi ĩĩY meZK cĀPón tbqv nq ZvĩK wK etj ?

- K) cwi ĩek Kwl.
- L) ĩNĀvqx Kwl.
- M) Rxe-cwi ĩekK Kwl.
- N) A%Re Kwl.

9/ wewfbacĩvi cwi ĩek Kwl.i Kqiu gj- Dĩĩk" Avĩj wPZ ntqĩ0 ?

- K) Piuu
- L) cuĩu
- M) ĩu
- N) wZbu

10/ Kwl.ĩZ KĩqKiu wbuĩ ĩ "ewkó" \_vKĩj Dbaq b cĩve ĩNĀvqx nte| GB wbuĩ ĩ "ewkó" Kqiu?

- K) Qqiu
- L) Piuu
- M) cuĩu
- N) wZbu

11/ Kwl.cĩnyĩZ Kqiu , Yvej x \_vKĩj Zv ĩNĀvqx cĩnyĩ nte ?

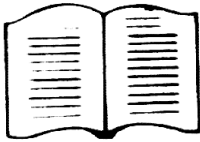
- K) Qqiu
- L) Piuu
- M) cuĩu
- N) wZbu|

### cw 3.4 mgušZ Lvgvii kZfej x I j 9



G cvl tkil Avciab-

- ◆ mgušZ Lvgvii kZfej x Džl Kitz cvi teb|
- ◆ evsj v`tki Klžki weifbæAe`v eYbvi Kitz cvi teb|
- ◆ mgušZ Lvgvi mvi j 9 ej ž I vj LžZ cvi teb|
- ◆ Dž`v`v`i mgušZ Lvgvi cžžovi mætebv eYbvi Kitz cvi teb|



### mgušZ Lvgvii kZfej x

Kul.cvi tek Abkj \_vktj I mgušZ Lvgvi Mto ZžžZ ntj weifbæmæu` I cžžvi cžžvRb nq| mæu` I cžžvi GB cžžvRbxqZvžK mgušZ Lvgvii kZfej x evj nq| mgušZ Lvgvii cvlvi kZfej x vbej/cN

- fig (Land)
- cvR (Capital)
- kžžK (Labour)
- cžžv/e`e`vcbv (Technology/Management)
- Drcv`b mgq (Production time)

G kZfej x weifbæcKvi mgušZ Lvgvii vfbžzi ntq \_vžK| GB kZfej xi cžžvRbxq Ae`v mst`žžc mvi vY 4-G t`Lvžv ntj v| weifbæmgušZ Lvgvii cžžžv Zv Avžv vPbv Kiv ntj v|

### tcvæivfiEK mgušZ Lvgvi

Giv Ly Aí fig I Ly Kg cvR v`žq iia Kiv hvq| Žte GLvžv AžbK kžžK I vbeo cžžv/e`e`vcbv cžžvRb nq| Drcv`b tčž mgq Aí j vžM|

### tWBi vfiEK mgušZ Lvgvi

Giv tevk fig I AZ`vvaK cvR vbtq iia Kiv cžžvRb| kžžK Zžžvžj-Kfivte Kg j vžM| cžžv/e`e`vcbv Avavbeo ntj Pž | vKš`Drcv`b tčž AvvaK mgq cžžvRb|

mvi v 4 : mgušZ Lvgvi e`e`vi kZfej x I G, žjvi cžžvRbxq Ae`v

mgušZ Lvgvi e`e`vi cKvi	fig	cvR	kžžK	cžžv/e`e`vcbv	Drcv`b mgq
tcvæivfiEK	Ly Aí	Ly Kg	AžbK	vbeo	Aí
tWBi vfiEK	tevk	AZ`vvaK	Kg	Avavbeo	AvvaK
gvrm`vfiEK	Aí	Kg	Ly Kg	Kg vbeo	AvvaK ev Aí
dmj vfiEK	Ly tevk	AvvaK	AžbK	AvvaK vbeo	Aí ev AvvaK

### gvrm`vfiEK mgušZ Lvgvi

Giv Aí Rvž I Kg cvR v`žq iia Kiv hvq| kžžK I Kg j vžM| cžžv/e`e`vcbv tWBi xi tPž Kg vbeo| Žte Drcv`žbi mgq AvvaK j vžM| vKš`avb t`žžž žv ev vPsvv Pvl Ki ž mgq Kg j vžM, Gžž fig tevk j vžM|

**dmj wfiEK mguSZ Lvgvi**

G Lvgvi dmtji cKviti Dci wfpkij | thgbN kvKmeiRwfiEK mguSZ Lvgvi Kg fig I Kg cyRtZ iiaKiv hvq | GK ev udei dmi (dj) wfiEK mguSZ Lvgviti Avi I teik fig I teik cyRi cQvRb nq | Ab`vb` euei dmi (dj) I gvV dmj wfiEK mguSZ Lvgviti Lg teik fig I Awak cyRi cQvRb nq | mKj cKvi dmj wfiEK Lvgviti B AtbK kigK I Awak ubneo chv`/e`e`vcbr cQvRb | Drcv`tbi mgq kvKmeiR I gvV dmtj Kg Ges dj PrtI Awak jvM |

mi Kwii cwii msL`vb gtZ (1995) evsj v`tk GK tKwUi Dci KIK cwii evi itqtQb | Zt`i gta` fignxb nt`Qb cQq A`aR (kZKiv 49 Rb) | Gi ctib itqtQb q`za KIKMY, huiv kZKiv 32 Rb | t`tk gvSvix KIK kZKiv 15 Rb Ges eo KIK kZKiv 4 Rb | Aciv`tk Kwl. figi gvij Kivb Gi weciZ | thgbN fignxb I q`za KIKMY wgtj t`tki Kwl. figi kZKiv 29 fvMi gvij K | gvSvix KIKMY tgvU Kwl. figi kZKiv 45 fvM I eo KIKMY kZKiv 26 fvMi gvij K |

**evsj v`tki KI`Ki Ae`v**

mi Kwii cwii msL`vb gtZ (1995) evsj v`tk GK tKwUi Dci KIK cwii evi itqtQb | Zt`i gta` fignxb nt`Qb cQq A`aR (kZKiv 49 Rb) | Gi ctib itqtQb q`za KIKMY, huiv kZKiv 32 Rb | t`tk gvSvix KIK kZKiv 15 Rb Ges eo KIK kZKiv 4 Rb | Aciv`tk Kwl. figi gvij Kivb Gi weciZ | thgbN fignxb I q`za KIKMY wgtj t`tki Kwl. figi kZKiv 29 fvMi gvij K | gvSvix KIKMY tgvU Kwl. figi kZKiv 45 fvM I eo KIKMY kZKiv 26 fvMi gvij K |

GLb Avgiv mvari Yfite evsj v`tk KIKM`Yi weivRgvb m`u`, Drcv`b I tfvM e`e`v Ges chv` m`ear wbtq Avtj vPbv Ki uQ | G, tjv wP` 11-tZ t`Lv`bv ntjv |

**(K) m`u` wfiE`**

wefbecKvi KI`Ki fig, cKz, Mpcwv Z ci I cvL, kigK Ges cyRi weivRgvb Ae`v eSvi Rb` wP` 11 (K) t`Lb |

wbR`^fig, cKz, Mpcwv Z ci I cyR fignxb`i metPtq Kg itqtQ | G, tjv cwii gvY q`za KIK ntZ mgu`stq ew` tctq eo KI`Ki t`q`T metPtq teik itqtQ | wbR`^Mpcwv Z cvL (nwn-gjvM) I kigK mieivn fignxb`i teik | GKBfite eM`tbqv fig I Mpcwv Z ci cvL fignxb`i metPtq teik Ges eo KIKM`Yi Zv`tb |

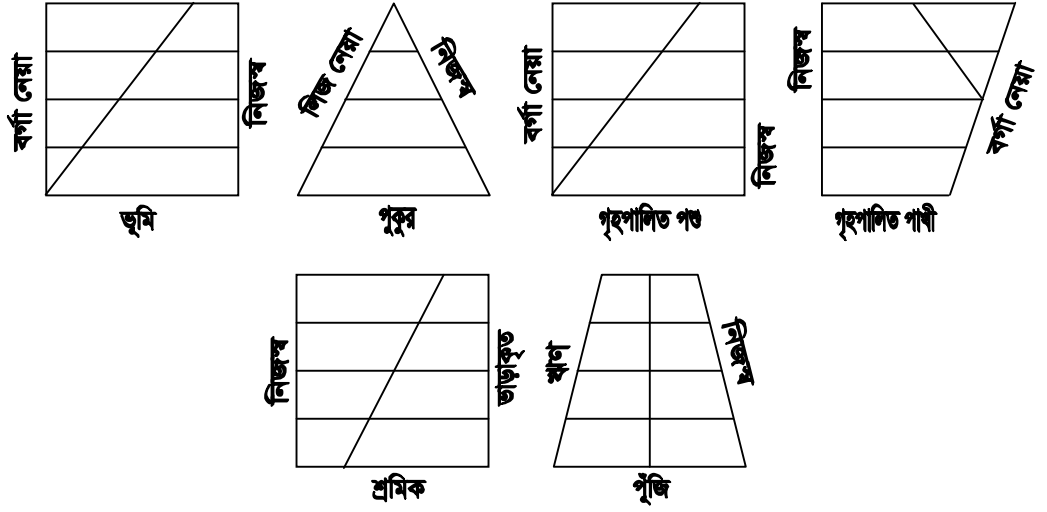
wj R`tbqv cKz I FY Kiv cyR m`ear eo KIKt`i metPtq teik | G, tjv gvSvix KIK ntZ mgu`stq Ktg fignxb`i metPtq Kg AvtQ |

**(L) Drcv`b I tfvM e`e`v**

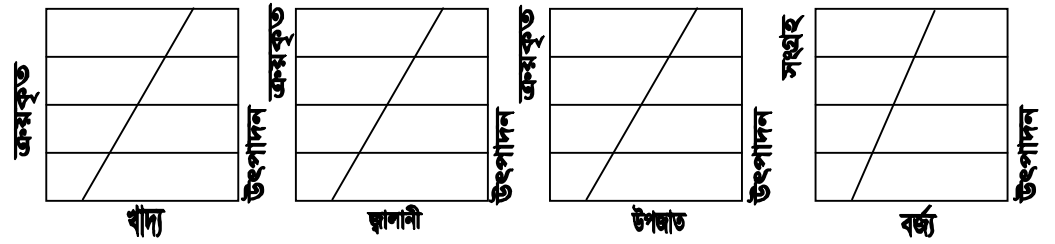
wefbelv`, Rvj wv I DcRvZ fignxbiv metPtq Kg Drcv`b KitZ cvtib | ZvB teik mq Kti tfvM Ktib | q`za KIK ntZ Drcv`b mtg evotQ, Avi mq KgtQ | eo KIK G, tjv teik Drcv`b I Kg mq Kti tfvM KitQb |



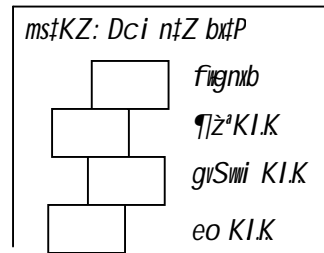
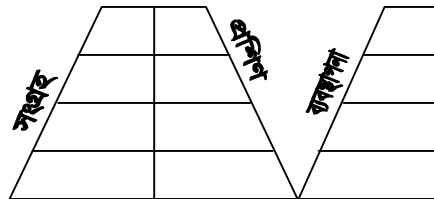
(K) mɔú` wfiE



(L) tfwM e'e`v



(M) chnyʒ myeav



ıPı 11 : K.I.Ki mɔú` wfiE, tfwM e'e`v | chnyʒ myeav

eR©msMh tenk Ktib fignxbiv Avi Drcv`b tenk Ktib eo KIK [iP1 11 (L)]| Drcv`b I tFvM e`e`v t`tk GUv myúó n`Q th, µq ubFpkj Zv KgvZ fignxb I 9z`a KIKMti Yi wefbaL`v` , Rjj vbx I Ab`vb` Drcv`b Avi I evortbri c0qvRbxqZv we`gvb|

**(M) chny` mjev**

ubR`^D`weZ`vbxq chny`/e`e`vcbri cirkvcmk KIKMY AvaybK Kul.chny` I e`envi Kti` \_vtKb| chny` mSMh I e`e`vcbri mjev fignxbti i LyB Kg| G mjev µgvstq ewx tctq eo KIKti` i tejvq metPtq tenk itqtQ [iP1 11 (M)]| tKbbv, wefbaemi Kwi ev temi Kwi Avdftm hvZvqvZ mjev I c0vi gva`gMZ mjev eo I gvSvix KIKti` i tenk itqtQ| Gme mjev 9z`a KIKti` i Kg, fignxbti` i tbB ej tj B Ptj | c0k`9Y MhY mjev eo KIKti` tenk|

**mgvSZ Lvgi e`e`vi j 9j`**

Dctiv` AvtjvPbv I Ae`vi t09j`z` t`tk mgvSZ Lvgi e`e`v mjo` c0µqvq wKQymjov` 9 j 9j` \_vKv c0qvRb| G`\_tjv n`Q ub`e`fcN`

- fignxb I 9z`a KIKti` i Rb` cyR mieivn Kti` c0B ktjK Drcv`tb j vMtbvi e`e`vKiY|
- fignxb I 9z`a KIKti` i Rb` chny` mSMh I e`e`vcbri mjev evortbri I c0k`9Y e`e`v mjo`KiY c0qvRb|
- gvSvix I eo KIKti` itK mgvSZ Lvgi Mto tZvjvi DctivMx j vMmB chny`/e`e`vcbri c0k`9Y c0v`bi m`thvM mjo`KiY|
- KIK I Dti`v`v`vi nvtZi KvQ DcKiY, FY, chny` I c0k`9Y t0v`v`bri c0Pov` MhY|

**Dti`v`v`vi m`tebv**

wkiv9Z teKvi h9K, 9z`a ev eo e`emvqx Ges th tKvb Dti`v`v`vi ubR` fig, cyR I kigK e`envti i mvg`\_© Abjv`ti Dch9` c0k`9Y MhY Kti` th tKvb aitbi mgvSZ Lvgi c0Zov` Kitz cvtib| Gt`9j`i Dti`v`v`v`ti Dch9` Kul.cwi`tek Ges Drcv`Z` `te`i wecyb mjevaw` we`tePbvq ubtq GvMtg thZ nte|



**cuVhEi gj`iqb 3.4**

**mivK DEti i cutk`UK wpy (v) w b|**

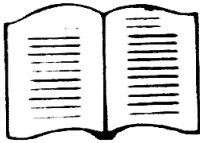
- 1/ mguSZ Lvgvi i kZej x KquU ?  
 K) PiuU  
 L) QquU  
 M) mivZuU  
 N) cuPuU
  
- 2/ Ly Aí fig I Ly Kg cyR w`tq`i iæKiv hvq tKvb aiþbi mguSZ Lvgvi ?  
 K) tWqi xwFvEK  
 L) tcwëitFvEK  
 M) gvrw`wFvEK  
 N) tKvbUvB bv
  
- 3/ tenk fig I AZ`waK cyR wbtq`i iæKiv hvq tKvb aiþbi mguSZ Lvgvi ?  
 K) tWqi xwFvEK  
 L) tcwëitFvEK  
 M) gvrw`wFvEK  
 N) tKvbUvB bv
  
- 4/ Aí fig I Aí cyR w`tq`i iæKiv hvq tKvb aiþbi mguSZ Lvgvi ?  
 K) tWqi xwFvEK  
 L) tcwëitFvEK  
 M) gvrw`wFvEK  
 N) tKvbUvB bv
  
- 5/ evsj v`k fignxb KI`Ki msL`v kZKiv KZ fivM ?  
 K) 60  
 L) 49  
 M) 35  
 N) 45
  
- 6/ gvSwi KI.KMY tgvU Kul.`figi kZKiv KZ fivMi gvij K ?  
 K) 60  
 L) 49  
 M) 35  
 N) 45
  
- 7/ KI`Ki eZ`vb Ae`vi Avtj`vK mguSZ Lvgvi e`e`v cu`quvi KquU mybw`ð j`q`  
 \_vKv`iKvi ?  
 K) 5uU  
 L) 4uU  
 M) 6uU  
 N) 7uU

**cw 3.5 tcwëñfiĒK mgušZ Lvgvi (gjm/nun, dmj, gvQ)**



G cvV tkʿl Avciḅ-

- ◆ tcwëñfiĒK mgušZ Lvgvʿi i mʿtebr, tʿj v eYḅv KiʿZ cvi ʿeb|
- ◆ tcwëñfiĒK mgušZ Lvgvʿi i Ki Yxq weI q, tʿj v ej ʿZ I wj LtZ cvi ʿeb|
- ◆ tcwëñfiĒK mgušZ Lvgvʿi i mgšq avcmgn eYḅv KiʿZ cvi ʿeb|
- ◆ tcwëñfiĒK mgušZ Lvgvʿi i GKw D`vni Y I Avq-e`q mʿuʿKʿavi Yv cvi ʿeb|



**tcwëñfiĒK mgušZ Lvgvi**

**1| mʿtebr**

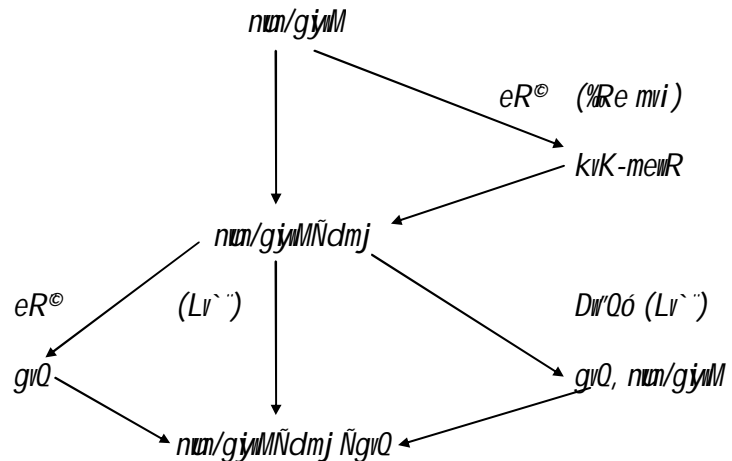
- LəB Kg RiqʿZ I Kg cvRʿZ ʿZ Drcv`b I Avq jvʿfi Rb` fignxb KIKMY G aiʿbi mgušZ Lvgvi Mto ZʿʿZ cvi ʿeb|
- nun-gjmMi eRʿ ev weōv cvPʿq Zv `Re mvi iʿc e`envi Kʿi ʿf RvqMvq weifbē tgšmgn kvK-mewR Aver` KiʿZ cvi ʿeb|
- tʿOvU cʿkʿz `vKʿj cʿkʿzi i Dcʿi nun-gjm I gvQ Pvl GKʿĪ Kiv hvq|
- kvK-mewRi Dir`Qó nun-gjmʿK Lvl qvʿbv hvq, gvQʿKI Lvl qvʿbv hvq|

**2| Ki Yxq**

- tcwëñfiĒK mgušZ Lvgvʿi ubweo cḅvʿ/e`e`vcbv cḅqvRb| ZvB cāK`ŋY MāY Kiv DvPZ|
- nun-gjmMi tʿi vM cāZʿi vaK UxKv ev BbʿRkKb h`vmgʿq wbgggwcdK t`qv DvPZ|
- nun-gjmMi weōv bv cvPʿq RiqʿZ e`envi Kiv DvPZ bq|
- cʿkʿzi i Dcʿi nun-gjm cvj b I cʿkʿzi gvQ Pvl GKʿĪ Kiʿj cāZ wZb eQi ci cʿkʿzi cwb i`vKʿq gwU tkvab Kʿi bZb cwb w`ʿq Averi gvQ I nun-gjm Pvl Kiv DvPZ|

**3| mgšq avcmgn**

GKwU tcwëñfiĒK mgušZ Lvgvi, thLvʿb nun-gjm, dmj I gvQ `vKʿe, tmwU Kxʿvʿe avʿc avʿc mgšq Kiv hvq Zv ubʿP t`Lvʿbv ntʿj v|



#### 4/ D`niY

GKwU tcmw`f`EK mgwšZ Lvgv`i i msv`f`B weeiY I Avq-e`q GLv`b D`niY`f`c t`Lv`bv ntjv|

- Lvgvi e`e`v : nun/gj`M Ń dmj Ń gvQ
- m`u` mgr : cwi ev`i i tjvKmsL`v Ń cjad 2, gwnj v 3  
Rwg Ń emZemo 0.04 tn.; t`f`Z 0.10 tn.  
c`ž 0.06 tn.; tgvU 0.20 tn±i |

Dbž Rv`Zi tgv`M 4uU, gj`M 20uU, nunv 1uU, nunx 5uU

- Kl`Ki cKvi : fignxb
- Lvgv`i nun-gj`M cvj`bi Avq-e`q (evrmi K)

e`tqi weeiY	UvKv	Av`qi weeiY	UvKv
1/ μq gj`Ń gj`M (24uU x 90 UvKv) nun (6uU x 70 UvKv)	2160 420	1/ wWg Drcv`b gj`M (4186 x 2.50 UvKv) nun (980 x 2.50 UvKv)	10465 2450
2/ Lv`Ń gj`M nun	2133 1092	2/ Drcv`b tk`l gj`Mi gj` (24uU x 60 UvKv) n`mi gj` (6uU x 50 UvKv)	1440 300
3/ JI a/f`vKwmb	250	3/ nun-gj`Mi we`vi `Re mvi gj` (50 tKwR x 0.40 UvKv)	216
4/ klgK (cwi ewi K)	Ń		
5/ Ab`vb`	560		
<b>tgvU LiP</b>	<b>6615</b>	<b>tgvU Avq</b>	<b>14871</b>
		<b>bxU g`v`v</b>	<b>8256</b>

- kvK-mewR Piv`I i Avq-e`q (evrmi K)

e`tqi weeiY	UvKv	Av`qi weeiY	UvKv
1/ Rwg `Zwi	220	1/ kvK-mewR Drcv`b WvUv (318 tKwR x 3 UvKv) c`kvK (574 tKwR x 3 UvKv) tXam (280 tKwR x 5 UvKv) U`gtUv (434 tKwR x 5 UvKv) cvj skvK (380 tKwR x 3 UvKv) evavKwC (380uU x 3 UvKv)	954 1722 1400 2170 1140 1140
2/ tMve i μq	150		
3/ nun-gj`Mi we`v (wbR`)	Ń		
4/ A`Re mvi	380		
5/ exR/Pv`v	400		
6/ klgK (cwi ewi K)	Ń		
7/ Ab`vb` LiP	570		
<b>tgvU LiP</b>	<b>1720</b>	<b>tgvU Avq</b>	<b>8526</b>
		<b>bxU g`v`v</b>	<b>6806</b>

Kv.1 cji Dbq b`z

- tgšmšx cšzi gvQ Pvl i Avq-e`q (evrmi K)

e`tqi meiy	UvKv	Avtqi meiy	UvKv
1  cšz cwi`vi	150	1  gvQ Drcv`b	
2  Pz cšqM (8 tKvR x 5 evi x 5 UvKv)	200	mj fri Kvc` (50 tKvR x 30 UvKv)	1500
3  n-m-gjMi eov`Re mvi i f c cšqM (vbR`)	N	_vB mi cšqM (35 tKvR x 50 UvKv)	1750
4  A%Re mvi cšqM (3 tKvR x 8 evi x 6 UvKv)	144	ngi i Kvc` (45 tKvR x 40 UvKv)	1800
5  gvQ i tcvb`m q (700m)	350	Kv m cD	
6  gvQ i Lv` cšqM (10 tKvR x 8 evi x 7 UvKv)	560	(40 tKvR x 40 UvKv)	1600
7  kvK	350		
<b>tgW LiP</b>	<b>1754</b>	<b>tgW Avq</b>	<b>6650</b>
		<b>bW glydv</b>	<b>4896</b>

- tcvb`m EK mgvšZ Lvgv i i Avq-e`q (evrmi K)

mešW LiP 10089 UvKv  
 mešW Avq 30047 UvKv  
 mešW bW glydv 19958 UvKv



**cuVhEi gj`iqb 3.5**

**mivK DEti i cutk, QUK wpy (v) w b |**

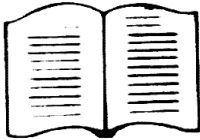
- 1/ Kg cURtZ I LqB Kg RigtZ `y Drcr`b I Avq jvtfi Rb` tKib ai tbi mguSZ Lvgvi Mto tZvj v hvq ?  
 K) dmj wfiEK  
 L) tcwvfrfiEK  
 M) givm`wfiEK  
 N) GKwJ bv
- 2/ tcwvfrfiEK mguSZ Lvgviti i KquU mtebv Avtj vPbv Kiv ntqtQ ?  
 K) PivU  
 L) cutPwU  
 M) wZbvU  
 N) QquU
- 3/ tcwvfrfiEK mguSZ Lvgviti i KquU Ki Yiq Avtj wPZ ntqtQ ?  
 K) QquU  
 L) cutPwU  
 M) PivU  
 N) wZbvU
- 4/ tcwvfrfiEK mguSZ Lvgviti i KquU avc t` Lvfbv ntqtQ ?  
 K) PivU  
 L) cutPwU  
 M) QquU  
 N) wZbvU
- 5/ tcwvfrfiEK mguSZ Lvgviti wKifc cbw? / e`e`vcbv cquRb ?  
 K) wbieo  
 L) Avawbieo  
 M) Awak wbieo  
 N) Kg wbieo |

### cw 3.6 tWqixwfiEK mgušZ Lvgvi (Miægnl, dmj, gvQ, gjm-nm, QmJ)



G cvl tkłl Arcnb-

- ♦ tWqixwfiEK mgušZ Lvgviti mæbebv, tjv Zžj aižZ cvižeb|
- ♦ tWqixwfiEK mgušZ Lvgviti KiYxq melqmgr-Džl KižZ cvižeb|
- ♦ tWqixwfiEK mgušZ Lvgviti mgšq avc, tjv vbt`R KižZ cvižeb|
- ♦ tWqixwfiEK mgušZ Lvgviti GKwD`vniY l Avq-e`q mæútkæYb KižZ cvižeb|



#### 1/ mæbebv

tWqixwfiEK mgušZ Lvgvi cžZóvi mæbebv, tjv vbt`æ/cN

- tek fig, AZ`mak cjr l Zžbjg-Kfiž Kg klgK e`eniti gvSwi ev eo KIKMY G aižbi mgušZ Lvgvi Mto ZžžZ cvižeb|
- Awak Rvg PriYfig Ges Nvm ev ci`Lv` Drcv`žbi Rb` cžqvRb nq| PriYfig eo ntj GKB `vžb QmJ cvj b Kiv mæ|
- žmvei l žmPbv msi`Y Kži G, žjvi mř\_ ci`i Dv`Qó Lvevi vgvktq Kžúv÷`Zwi Kiv hvq| Kžúv÷ kvK-meiR tžžZ ev `fžgv`x dj evMřb (Kjv, tctc) DEg`Re mvi ižc e`envi Kiv hvq|
- cžž`vKžj cPv žmvei gvřQi Lv` `Zwi i Rb` cžž cžqm Kži gvQ Pvl Kiv mæ|
- cžž i Dci nm-gjm cvj b Kiv ntj G, žjvi vevn gvřQi Lv` nq|
- kvK-meiR ev dtj i Dv`Qó ci` ev gvřQi Lv` nmvte e`envi Kiv hvq|
- PriYfigi Pricvřk dtj i MvQ jvMřj Hme MřQi cvZv Miægnl-Qmžj i Lv` ižc f`qv hvq|
- Gižc Lvgvi ntž Drcv`b tctž ntj Awak mgq jvřM|

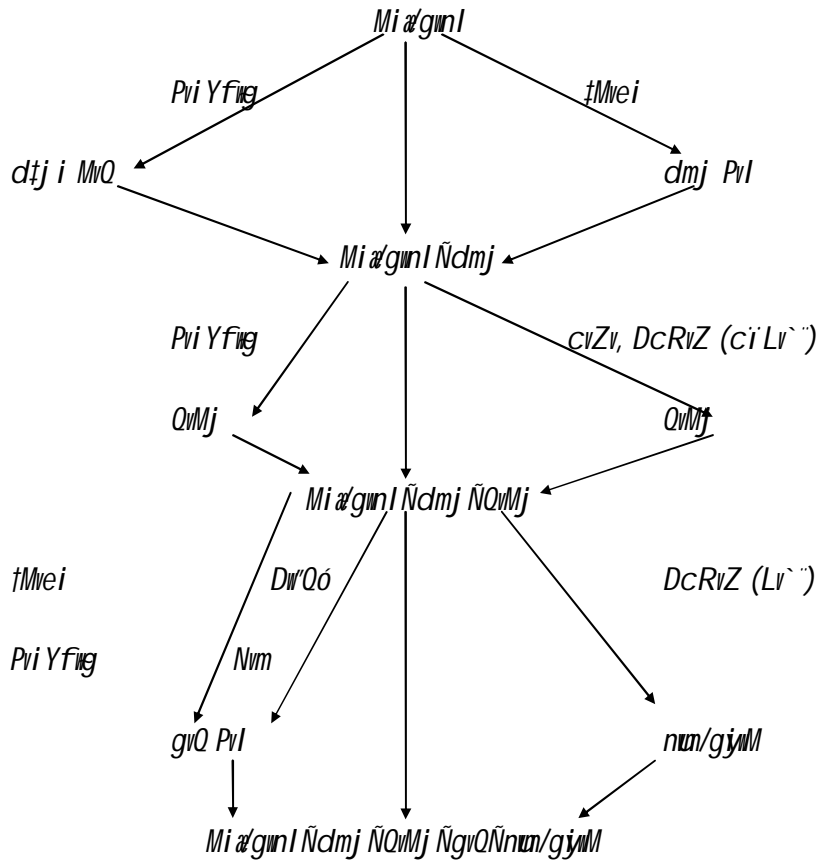
#### 2/ KiYxq

tWqixwfiEK mgušZ Lvgviti KiYxq, tjv vbt`æ/cN

- tWqix Lvgviti Avambeo cžv`e`e`vcbv cžqvRb etj cžk`Y MžY Rižix|
- ci-cvLi mgqgžZv tiVm cžžživaK UxKv ev BbžRkKb f`qv Ges KvgbvkK Lvl qvřbv DvřZ|
- Nvm ev ci`Lv` Drcv`b KvřR BDviqv mvi cžqm Kži žmLvbKvi Nvm/ci`Lv` Ašž 10 v`b ci`ci`K Lvl qvřZ nte|
- ci-cvLi Avem`j mvi eQi i Kbv i vLv DvřZ|
- ci-cvLřK me`v bj Kžci cvnb Lvl qvřbv DvřZ|

### 3| mgšq avcmgn

GKwU tWqiwfwiEK mgwšZ Lvgvi thLvtb MiagwI, QvMj, dmj, gvQ I gjwM-nun\_vKte, tmiU Kxfvte avtc avtc mgšq Kiv hvq Zv vbtP t`Lvtbr ntj vñ



### 4| D`vniY

GKwU tWqiwfwiEK mgwšZ Lvgviti mswfjB weeiY I Avq-e`q D`vniY`tfc GLvtb t`Lvtbr ntj v|

- Lvgvi e`e`v : MiÑdmj ÑQvMj ÑgvQÑnun
- m`u`mgR : civ evti i tj vKmsL`v Ñ cjał 10, gwvj v 6  
Rig Ñ emZemo 0.50 tn.; t`fjZ 2.60 tn., cKž 0.24 tn.;  
Nvm Rig 0.20 tn.; kvK-menR 0.36 tn.; tgvU Rig 3.90 tn±i |

Mvfx (Dbž) 8uU, t`kx 2uU, Iw (Dbž) 2uU, ej` (t`kx) 2uU, evQy (Dbž) 12uU, QvMj (t`kx) 5uU, nun (Dbž) 100uU

- KIžKi cKvi : eo KIK

Kwl.1 cji Dbq b`z

- Mia l QvMfj i we`wi Z weeiY :

cKvi	RvZ	msL`v	μq gj` (UvKv)	eZgub gj` (UvKv)	gbydv (UvKv)
Mvfx	Rvnxμm	2	43,000	60,000	17,000
Mvfx	kvnxl qij	2	34,000	50,000	16,000
Mvfx	wdwRqvb μm	3	25,000	60,000	35,000
Mvfx	vmUx	1	10,000	20,000	10,000
Mvfx	t`kx	2	wbR`	20,000	20,000
Iw	Rvnxμm	2	9,000	18,000	9,000
ej`	t`kx	2	16,000	18,000	2,000
evQiy	μm	12	wbR`	48,000	48,000
eKix	t`kx	2	1,500	2,000	500
Lvmx	t`kx	3	wbR`	3,300	3,300
<b>tgw</b>	<b>Mia 26w, QvMj 5w</b>		<b>1,38,500</b>	<b>2,99,300</b>	<b>1,60,800</b>

- Dbz` yeZx Mvfx cij tbi Avq-e`q (eivmwi K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1/ Lv`N Lo (19.5 Ub x 500 UvKv) meR Nvm (49 Ub x 50 UvKv) wPv_o (975 tKwR x 4 UvKv) Lj (2920 tKwR x 5 UvKv) Pvtj i Kgv (9700 tKwR x 2 UvKv) Mtgi fwt (4900 tKwR x 7 UvKv) jeY (245 tKwR x 7 UvKv)	9750 2450 3900 14600 19400 34300 1715	1/ `y Drcv`b (18250 wj : x 14 UvKv)	255500
2/ JIa/FvKwmb	3500	2/ tMvei Drcv`b (52 Ub x 500 UvKv)	26000
<b>tgw LiP</b>	<b>89615</b>	<b>tgw Avq</b>	<b>281500</b>
		<b>bw gbydv</b>	<b>191885</b>

- ej` cij b l Iw tgvUvZvRv Ki tYi Avq-e`q (eivmwi K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1/ Lv`N Lo (10 Ub x 500 UvKv) meR Nvm (20 Ub x 50 UvKv) wPv_o (450 tKwR x 5 UvKv) Lj (1500 tKwR x 5 UvKv) Pvtj i Kgv (4000 tKwR x 2 UvKv) Mtgi fwt (2500 tKwR x 7 UvKv) jeY (150 tKwR x 7 UvKv)	5000 1000 2250 7500 8000 17500 1050	1/ Iw wevμ (1w) 2/ nvj Pvl (400 w`b x 50 UvKv) 3/ tMvei Drcv`b (24 Ub x 500 UvKv)	28000 20000 12000
2/ JIa/FvKwmb	1500		
<b>tgw LiP</b>	<b>43800</b>	<b>tgw Avq</b>	<b>60000</b>
		<b>bw gbydv</b>	<b>16200</b>

- Aver`KZ.el`dmj μtgi meeiY :
  - 1/ tivcv AvDk (Dbz) N̄ tivcv Avgb (t`kx) N̄ mmi Iv (t`kx) 1,30 tn:
  - 2/ cWZZ N̄ tivcv Avgb (Dbz) N̄ tevʼiv (Dbz) 0.45 tn:
  - 3/ tivcv AvDk (Dbz) N̄ tivcv Avgb (t`kx) N̄ Mg (Dbz) 0.45 tn:
  - 4/ tevʼv AvDk (t`kx) N̄ tivcv Avgb (Dbz) N̄ gyyj (t`kx) 0.40 tn:
- Aver`KZ.dmtj i Avq-e`q (evrmmi K)

e`tqi meeiY	UvKv	Avtqi meeiY	UvKv
1/ Rwg Pvl I`Zwi	3600	1/ dmj Drcv`b	
2/ tMvei c0vb (26 Ub, ubR`)	N̄	AvDk aib	
3/ A%Re mvi c0qvM		(8.6 Ub x 5000 UvKv)	43000
BDwi qv (1140 tKwR x 6 UvKv)	6840	Avgb aib	
WUGmwc (830 tKwR x 7 UvKv)	5810	(12.5 Ub x 5500 UvKv)	68750
Ggwc (430 tKwR x 5 UvKv)	2150	tevʼiv aib	
WRcmvg (740 tKwRx 3 UvKv)	2220	(2.7 Ub x 5500 UvKv)	14850
4/ exR/Pvi v μq (ubR`^evt`)	4500	Mg (0.90 Ub x 12000 UvKv)	10800
5/ ecb/ tivcY	3500	mmi Iv	
6/ tmP I KxUvbkK c0vb	13838	(1.38 Ub x 15000 UvKv)	20700
7/ klgK (ubR`^evt`)	9500	gyyj (380 tKwR x 30 UvKv)	11400
8/ Ab`vb` LiP	5580	2/ DcRvZ	
		Lo (28 Ub x 1000 UvKv)	28000
		Kzv/fi# (3 Ub x 4000 UvKv)	12000
<b>tgW LiP</b>	<b>57538</b>	<b>tgW Avq</b>	<b>209500</b>
		<b>bxW glycdv</b>	<b>151962</b>

- kiv-mewR I Nvm Drcv`tbi Avq-e`q (evrmmi K)

e`tqi meeiY	UvKv	Avtqi meeiY	UvKv
1/ Rwg Pvl I`Zwi	2200	1/ Nvm Drcv`b	
2/ tMvei c0vb (5 Ub, ubR`)	N̄	1g Wkwi`i (40 Ub x 50 UvKv)	2000
3/ A%Re mvi c0qvM		2q Wkwi`i (20 Ub x 50 UvKv)	1000
BDwi qv (177 tKwR x 6 UvKv)	1062	3q Wkwi`i (10 Ub x 50 UvKv)	500
WUGmwc (142 tKwR x 7 UvKv)	994	2/ kiv-mewR Drcv`b	
Ggwc (80 tKwR x 5 UvKv)	400	Kijv (gvSvi x AvKwZ)	
WRcmvg (70 tKwR x 3 UvKv)	210	(1856 tKwR x 5 UvKv)	9325
4/ exR/Pvi v μq	4700	WpP%v (1656 tKwR x 5 UvKv)	8280
5/ tmP c0vb	3400	kmv (3380 tKwR x 4 UvKv)	13520
6/ KxUvbkK c0vb	900	evavKwc (3824 tKwRx3 UvKv)	11472
7/ klgK (ubR`^evt`)		UtgtUv (2170 tKwR x 5 UvKv)	10850
(235 Rb x 40 UvKv)	9400	Kijv (Df`Q)	
8/ Ab`vb` LiP	2800	(1275 tKwR x 5 UvKv)	6375
<b>tgW LiP</b>	<b>26066</b>	<b>tgW Avq</b>	<b>63322</b>
		<b>bxW glycdv</b>	<b>37256</b>

Kwl.1 cji Dbqb ž

- QvMj j vj b-cvj žbi Avq-e“q (evrmii K)

e“tqi weeiY	UvKv	Avtqi weeiY	UvKv
1  ev“Pmn QvMj μq (2uU x 900 UvKv)	1800	1  eQi tkłl cŲYxi gj“ QvMj (2uU x 2000 UvKv)	4000
2  Lvmx μq (3uU x 500 UvKv)	1500	ev“Pvi gj“ (4uU x 500 UvKv)	2000
3  Pfo Lvl qv  (“ ūbK 5-6 NÈv, ūbR Pvi YFŲg)	Ñ	Lvmxi gj“ (3uU x 1500 UvKv)	4500
4  Lv“ -gvmKj vB FŲ QvMj (72 tKŲR x 10 UvKv)	720	2  “Ų Drcv`b (32 Ųj Uvi x 12 UvKv)	384
Lvmx (75 tKŲR x 10 UvKv)	750	3  QvMj i weo“ (1260 tKŲR x 0.50 UvKv)	630
5  JIa/ FvKŲmb	150		
6  kŲgK (cvi ewi K)	Ñ		
7  Ab“vb“ LiP	250		
<b>tguU LiP</b>	<b>5170</b>	<b>tguU Avq</b>	<b>11514</b>
		<b>bŲU gŲvcdv</b>	<b>6344</b>

- cŲzi nŲn I gvtQi AvambŲeo Ųgk“PŲłl i Avq-e“q (evrmii K)

e“tqi weeiY	UvKv	Avtqi weeiY	UvKv
1  nŲmi Ni “Zvi	2100	1  ŲŲg Drcv`b (22998uU x 2.5 UvKv)	57495
2  nŲn μqŲ 16 mBvn eqm (100uU x 70 UvKv)	7000	2  Drcv`b tkłl nŲmi gj“ (100uU x 50 UvKv)	5000
3  nŲmi Lv“ (2200 tKŲR x 12 UvKv)	26400	3  gŲQ Drcv`b i aB (290 tKŲR x 60 UvKv)	17400
4  Pb cŲqvM (180 tKŲR x 5 UvKv)	900	KvZj v (700 tKŲR x 60 UvKv)	42000
5  tMei cŲqvM (500 tKŲR x 6 evi, ūbR“)	Ñ	gŲMj (270 tKŲR x 60 UvKv)	16200
6  AŲRe mvi cŲqvM (150 tKŲR x 6 UvKv)	900	MŲm Kvc“(190 tKŲR x 50 UvKv)	9500
7  nŲmi JIa/FvKŲmb	600	_vB mi cŲŲ (120 tKŲR x 50 UvKv)	6000
8  gvtQi tcvbv μq (2700uU)	1200	Ųgi i Kvc“(40 tKŲR x 40 UvKv)	1600
9  kŲgK (ūbR“^evf“)	1600	Kvi ŲcD (52 tKŲR x 40 UvKv)	2080
10  Ab“vb“ LiP	1200		
<b>tguU LiP</b>	<b>41900</b>	<b>tguU Avq</b>	<b>157275</b>
		<b>bŲU gŲvcdv</b>	<b>115375</b>

- tŲqi ŲFŲEK mgŲŲZ LŲgti i Avq-e“q (evrmii K)

meŲguU LiP 402589 UvKv  
 meŲguU Avq 1082411 UvKv  
 meŲguU bŲU gŲvcdv 679822 UvKv



**cuVhEi gj`iqb 3.6**

**mivK DEti i cutk, QUK iPy (v) i b |**

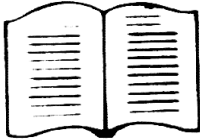
- 1/ tWqi xivfivEK mguSŠZ Lvgiti i Kqiu mtebr Avtj vPZ ntqtQ ?  
 K) AvUuU  
 L) cuPiuU  
 M) QqiuU  
 N) mivZiuU
- 2/ Pvi Yfiig Ges Nvm Drcv`tbi Rb` tKiviuU Avak cwi gvtY cšqvRb nq ?  
 K) emZemmo  
 L) dmtj i Rwig  
 M) Rwig  
 N) me, tj vB
- 3/ tWqi xivfivEK mguSŠZ Lvgiti i Kqiu mveavbZv Avtj vPZ ntqtQ ?  
 K) PviuU  
 L) cuPiuU  
 M) QqiuU  
 N) iZbiuU
- 4/ ci cvLi Aveim`j miv eQi iKifc ivLv DvPZ ?  
 K) tFRv  
 L) müZtmtZ  
 M) iKbv  
 N) Mig
- 5/ ci cvLtk me<sup>©</sup>v iKtmi cvib LvI qvtbv DvPZ ?  
 K) cKž  
 L) vej  
 M) b`x  
 N) bj Kc
- 6/ tWqi xivfivEK mguSŠZ Lvgi miv i Kqiu avc t`Lvibr ntqtQ ?  
 K) iZbiuU  
 L) PviuU  
 M) cuPiuU  
 N) QqiuU |

### cW 3.7 gvrn'wfiEK mgušZ Lvgvi (gvQ, gjM-nu, dmj)



G cvW tkłI Avciub-

- ◆ gvrn'wfiEK mgušZ Lvgvi i m'ebv m'utK'ej tZ cvi teb|
- ◆ gvrn'wfiEK mgušZ Lvgvi i Ki Yxq KvR m'utK'eY'v Ki tZ cvi teb|
- ◆ gvrn'wfiEK mgušZ Lvgvi i mgšq avc , tj v eY'v Ki tZ cvi teb|
- ◆ gvrn'wfiEK mgušZ Lvgvi i GKu D`vni Ymn Avq-e`q m'utK'e`vL`v Ki tZ cvi teb|



#### 1| m'ebv

gvrn'wfiEK mgušZ Lvgvi i m'ebv , tj v ub'ie:fcN

- Kg Rigi cKž, Kg cvR I Lg Kg klgK e`eniti qž`KIKMY mnRB G ai tbi mgušZ Lvgvi Mto Zž tZ cvi b|
- gvrn' PrłI ch'p / e`e`vcbv Zž bvgj-Kfite Kg ub'ieo| Zte ti Yytcvbi Prł ub'ieo e`e`vcbv ub'fP|
- ti Yytcvbi Drcv`b wZb gvtm ntj I gvQ PrłI GK eQi j vM|
- gvtQi cKž nu-gjM GKtI Prł Kiv hvq|
- cKži cPr gWU I gvtQi Dv`Qo cPr kvK-menR I `f tgv`x dj (Kj v, tctc) Prł e`envi Kiv hvq|
- avb t'q tZ gvQ/wPsvio Prł Ki tZ Drcv`b `z nq, GtZ Rig wKQyv tenk j vM|
- Kg cvR m'ubeDt`v`vMY cKž/Rig j xR ub'tq gvrn'wfiEK mgušZ Lvgvi i i` Ki tZ cvi b|

#### 2| KiYxq

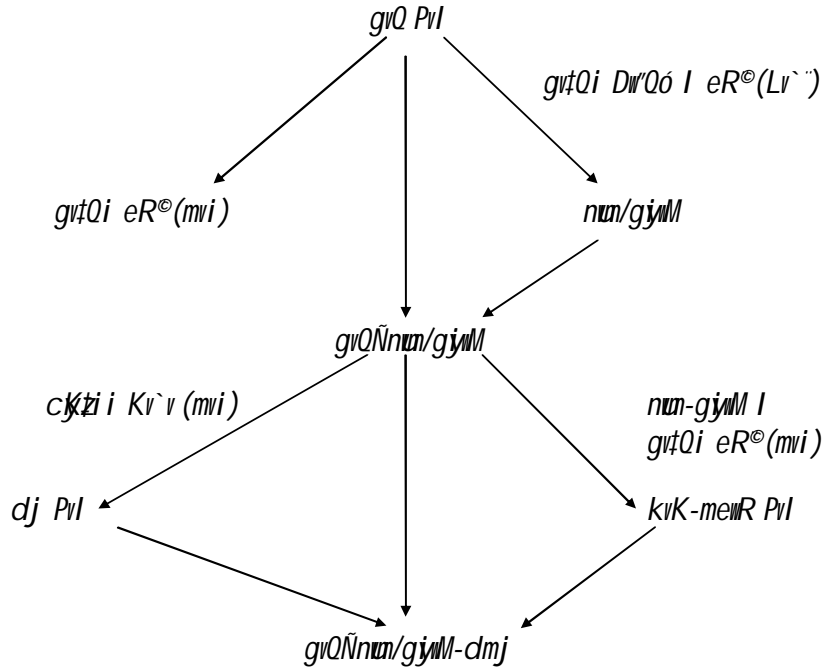
gvrn'wfiEK mgušZ Lvgvi ub'ie:fc c` t'q]c Ae j `b Ri ai xN

cKži i cwb tZ gvtQi ch'p cKwZK Lv` (dvBtUvcasKUb, RycasKUb) `Zvi i Rb` tMvei, Pz I i vmqubK mvi mivK ubqg, mgq I cwi gvtY w` tZ nq|

- cKži i cwb tZ gvtQi ch'p cKwZK Lv` (dvBtUvcasKUb, RycasKUb) `Zvi i Rb` tMvei, Pz I i vmqubK mvi mivK ubqg, mgq I cwi gvtY w` tZ nq| GRb` cK`qY` i Kvi |
- gvtQi RvZ, tcvbi AvKvi I msL`v ubePtb weAvb wfiEK ubqg bv gvtj gvQ Prł Kg j vFRbK nq|
- ti Yytcvbi Prł ch'p mivKfite bv gvtj Drcv`b Ktg, j vFI Ktg th tZ cvi |
- cKži i Prł cvtk Qvqv`vbKvi x I cvZv cZbkxj MvQ j vMv b ev i vLv DvPZ bq|
- KuUvK hš; wuk, embcI cFwZ cKži i cwb tZ tavq hvte bv|
- cKži nu-gjM cvj b Ki tZ wZb eQi ci cKži i gWU tkvab I cwb bZz Kti w` tZ nte|

### 3/ mgšq avcmgn

GKwU gvrn`wfiEK mgwšZ Lvgvi, thLvfb gvQ, nun-gjwM I dmj GKfT`\_vKte, tmuU Krfvte avtc avtc mgšq Ki v hvq Zv wbtP t`Lvfbv ntj vN



### 4/ D`niY

GKwU gvrn`wfiEK mgwšZ Lvgvti i msvfjB weeiY I Avq-e`q D`niY`fjc GLvfb t`Lvfbv ntj v|

- Lvgvi e`e`v : gvQñnwnñdmj
- m`u`mgR : cwi evti i tj vKmsLv`N cjal 3, gwvj v 3  
Rig N emZewo 0.06 tn., 0.16 tn.; t`fjZ 0.08 tn., Kj v evMvb 0.10 tn.; tgvU Rig 0.40 tn±i |

Dbz RvZi N nwm 63wU, nwnv 7wU, gjwM 10wU, tgvM 2wU

- KI`Ki cKvi : f`z`KIK

- cKzi nun I gvtQi Avambieo igk<sup>a</sup>Prtli Avq-e`q (evrmii K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv	
1/ nctmi Ni`Zwi	2100	1/ mWg Drcv`b	38325	
2/ nun μqN 16 mβvn eqm (70uU x 70 UvKv)	4900	2/ Drcv`b tk+l nctmi gj` (70uU x 50 UvKv)		
3/ nctmi Lv` (1400 tKwR x 12 UvKv)	16800	3/ gvQ Drcv`b	11520 28800 12000 6250 4000 960 1400	
4/ Pz cθqvM (120 tKwR x 5 UvKv)	600	iaB (192 tKwR x 60 UvKv)		
5/ gjvMi weθv cθqvM (wbR`)	N	KvZj v (480 tKwR x 60 UvKv)		
6/ A%Re mvi cθqvM (100 tKwR x 6 UvKv)	600	g#Mj (200 tKwR x 60 UvKv)		
7/ gvtQi tcvb μq (1800uU)	600	Mθm Kvc <sup>q</sup> (125 tKwR x 50 UvKv)		
8/ nctmi JIa/FvKwmb	380	_vB mi cW (80 tKwR x 50 UvKv)		
9/ ktgK (cwi ewi K Qvov)	950	igi i Kvc <sup>q</sup> (24 tKwR x 40 UvKv)		
10/ Ab`vb` LiP	700	Kvi wCD (35 tKwR x 40 UvKv)		
<b>tgvU LiP</b>	<b>26830</b>	<b>tgvU Avq</b>		<b>106755</b>
		<b>bvU gbydv</b>		<b>79925</b>

- Dbz RvtZi gjvM cij tbi Avq-e`q (evrmii K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1/ gjvM μqN 12 mβvn eqm (12uU x 90 UvKv)	1080	1/ mWg Drcv`b (2200uU x 2.50 UvKv)	5500
2/ Lv` tikb	1550	2/ Drcv`b tk+l gjvMi gj` (100uU x 50 UvKv)	5000
3/ nctmi JIa/FvKwmb	120	3/ gjvMi weθvi `Re mvi gj` (216 tKwR x 0.40 UvKv)	86
4/ ktgK (cwi ewi K)	N		
5/ Ab`vb` LiP	350		
<b>tgvU LiP</b>	<b>3100</b>	<b>tgvU Avq</b>	<b>10586</b>
		<b>bvU gbydv</b>	<b>7486</b>

• AgZ mivMi Kj v I kvK-memRi AvštPrłI i Avq-e`q (evrmii K)

e`tqi meiy	UvKv	Avtqi meiy	UvKv
1  Rıg`Zıı	500	1  kvK-memR Drcv`b	
2  tMveı cŃqvM (100 tKıR x 0.40 UvKv)	40	j vj kvK (200 tKıR x 3 UvKv)	600
3  gjvMi meŃv cŃqvM (250 tKıR, ıbR`)	Ñ	Kı j v (180 tKıR x 5 UvKv)	900
4  `Lj cŃqvM (50 tKıR x 5 UvKv)	250	gj-v (300 tKıR x 2 UvKv)	600
5  mvi cŃqvM BDıı qv (50 tKıR x 6 UvKv)	300	2  Kj v Drcv`b	
ıUGmıı (60 tKıR x 7 UvKv)	420	1g ıKıv`.	16100
Ggıı (40 tKıR x 5 UvKv)	200	2q ıKıv`.	4900
6  Kj vı Prı v μq (250ıU x 3 UvKv)	750	(700 tKıR x 7 UvKv)	
7  kvK-memR exR μq	200		
8  kıgK (25 Rb x 40 UvKv)	1000		
9  Ab`ıv` LiP (fmPmn)	1570		
<b>ıgvU LiP</b>	<b>5230</b>	<b>ıgvU Avq</b>	<b>23100</b>
		<b>bıU gııııv</b>	<b>17870</b>

• ıııııı kvK-memR PrłI i Avq-e`q (evrmii K)

e`tqi meiy	UvKv	Avtqi meiy	UvKv
1  Rıg`Zıı	180	1  kvK-memR Drcv`b	
2  tMveı μq (325 tKıR x 0.40 UvKv)	130	cŃ kvK (450 tKıR x 3 UvKv)	1350
3  gjvMi meŃv cŃqvM (50 tKıR, ıbR`)	Ñ	tXam (190 tKıR x 5 UvKv)	950
4  A%Re mvi	350	ıııııv (225 tKıR x 3 UvKv)	675
5  exR/Prı v	330	Uıgıııv (335 tKıR x 5 UvKv)	1675
6  kıgK (cıııııı K)	Ñ	dııKııı (250ıU x 4 UvKv)	1000
7  Ab`ıv` LiP (fmPmn)	480		
<b>ıgvU LiP</b>	<b>1470</b>	<b>ıgvU Avq</b>	<b>5650</b>
		<b>bıU gııııv</b>	<b>4180</b>

• gııııııııEK mgııııZ Lıgıııı i Avq-e`q (evrmii K)

meıgvU LiP 36630 UvKv  
 meıgvU Avq 146091 UvKv  
 meıgvU bıU gıııııv 109461 UvKv



### cuVhEi gj'iqb 3.7

#### muk DEti i cutk, UK wPy (N) w b |

- 1/ grm' Pritli chny<sup>2</sup>/e'e'icbv Kg ubneo ntj l ti Yytcubri Prl wKifc e'e'icbv ubfP?

  - K) Kg ubneo
  - L) ubneo
  - M) Avambneo
  - N) Avak ubneo

  
- 2/ ti Yytcubri Drcv`tbi tPtq gvQ Drcv`tbi mgq wKifc j vM ?

  - K) Kg
  - L) mgvb
  - M) teik
  - N) tKvUvB bv

  
- 3/ avb tTtZ gvQ/wPsw Prl Kitj cKzi i tPtq Rwg wKifc j vM ?

  - K) mgvb
  - L) wKQyv teik
  - M) Kg
  - N) AtbK teik

  
- 4/ gvrw'wFwEK mgwSZ Lvgvti i KquU Ki Yxq Avtj vPbv Ki v ntqtQ ?

  - K) QquU
  - L) cuPwU
  - M) PwU
  - N) mwZwU

  
- 5/ gvrw'wFwEK mgwSZ Lvgvi mwptZ KquU avc t`Lvfbv ntqtQ ?

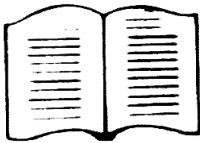
  - K) PwU
  - L) wZbwU
  - M) `BwU
  - N) cuPwU |

### cW 3.8 dmj wfiEK mgušZ Lvgvi (dmj, Miægini, QWj, gjM-nu, gvQ, tgšgwQ)



G cvV tkfI Avciab-

- ◆ dmj wfiEK mgušZ Lvgviti i mætebmgæ e`vL`v Ki tZ cvi teb|
- ◆ dmj wfiEK mgušZ Lvgviti i Ki Yxq KvRmgæ eYðv Ki tZ cvi teb|
- ◆ dmj wfiEK mgušZ Lvgviti i mgšq avgmæ ej tZ I wj LtZ cvi teb|
- ◆ dmj wfiEK mgušZ Lvgviti i GKiu D`vni Y I Avq-e`q e`vL`v Ki tZ cvi teb|



#### 1| mætebv

dmj wfiEK mgušZ Lvgvi mjo i mætebv, tj v ubæfcN

- Ly teik fig, AwaK cyR I A tBk kigK wbfP gvSmi ev eo KIK G ai tbi Lvgvi Mto Z tZ m f g | G, t j v Z j b v g j - K f i t e K g \_ v K t j k i K - m e i R e v ` f t g q v ` x d j P r l w f i E K L v g v i M t o t Z j v h v q |
- dmj wfiEK Lvgviti AwaK ubæeo c h y P / e ` e ` v c b v c Q v R b e t j c h y P c k K Y Y ` i K v i |
- kvK-meiR I gvV dmj Aí mg t q A v i d j P r l g v S m i n t Z ` x N m g t q D r c v ` b K i t Z m f g |
- AwaK cyR m æ ú b æ u b æ o d m j P r t l c k K Y Y c i B I A t B k k i g K L v U r t b v i m v g \_ e i b D t ` v v M Y G a i t b i L v g v i M t o Z t Z c v t i b |
- w e i f b æ d m t j i ` e , D c R v Z I D w Q o c i - c v i L I g v Q t K L v l q r t b v h v q |
- d m t j i D w Q o I e R e c i P t q K t æ ú v ÷ ` Z m i K t i d m t j i R u g t Z c b t e ` e n v i K i v h v q |
- m i i l v , W j I A b ` v b ` d m t j i d j t d v U v i m g q g r t V K i t V i e v t . t g š g w Q c i j b K t i g a y D r c v ` b K i v h v q |
- t W e v - R j v k t q R t b f G g b w K Q y R j R D w M c g v Q I n u n - g j M i L v ` i f c e ` e n v i K i v h v q |
- w e i f b æ c h y P e ` e n v i K t i R u g t Z m e j m v i ` R e I m v i D r c v ` b K t i g u U i D e P Z v e v o r t b v h v q |

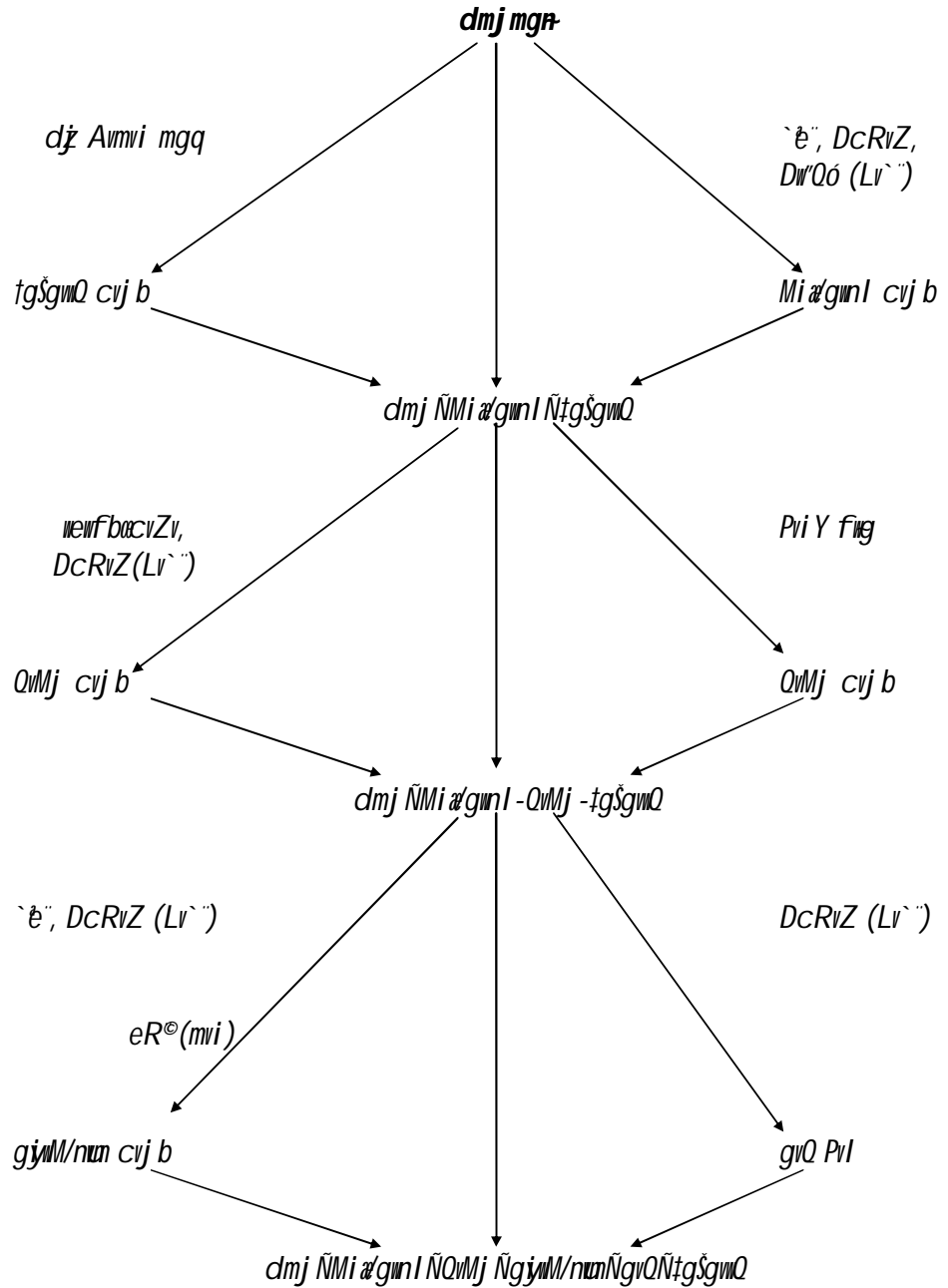
#### 2| KiYxq

dmj wfiEK mgušZ Lvgviti i KiYxq KvR, tj v ubæfcN

- G ai tbi Lvgviti i m v d j ` w b f P K t i g u U i , Y v , Y , D b z e x R , t m P m y e a v I w e i e a m v i e ` e n v i t i ` f j Z v i D c i | Z v B G m e w e l t q c k K Y Y M h Y R i a i x |
- AwaK g b v d v t c t Z A v M v g k v K - m e i R e v d m j P r t l m f g n t Z n t e |
- w e i f b æ d m t j i ` e , D c R v Z , D w Q o I e R e ` e n v i t i ` f b v n t j D r c v ` b L i P t e t o g b v d v K t g t h t Z c v t i |
- ` x N P b AwaK i v m i q u b K m v i I K i U b i k K e ` e n v i K i t j R u g i d m j D r c v ` b k x j Z v K t g t h t Z c v t i |
- R u g t Z m e j m v i , ` R e m v i , R x e v Y m v i c f i u Z c h y P e ` e n v i K t i g u U i D e P Z v i f l v K i v D i P Z | G t Z D r c v ` b L i P K g n q |

### 3| mgššq avcmgn

GKwU dmj wfirEK mgwšZ Lvgi thLvtb dmj, Miægwl, QvMj, gjwM-nwn, gvQ l tgšgwQ GKtĪ \_vKte, tmwU Kxfvte avtc avtc mgššq K i v hvq Zv wbtP t`Lvbtv ntj vŃ



#### 4/ D`niY

GKwU dmj wfiEK mgvSZ Lvgvfi i msvqB weeiY I Avq-e`q D`niY`fC GLvfb t`Lvfbv ntjv|

- Lvgvi e`e`v : dmj NMi aNOMj NgjvMNgvQNTgSgwQ
- m`u`mgv : cwi evfi i tjvKmsL`v N`cjal 5, gvujv 3

Rwg N`emZemo 0.24 tn.; cKz 0.20 tn.; KjvevMb 0.12 tn.; tctc + nj`y evMb 0.12 tn.; dm`j i t`qZ 1.94 tn.; tgvU Rwg 2.62 tn±i |

ci`m`u`N` Mvfx (Dbz` μm) 2uU, evOj 2uU; ej` (t`kx) 2uU, lω (Dbz` μm) 2uU; QvMj 5uU, ev`Pv 8uU, Lvmx 5uU|

cviLm`u`N` gjvM (Dbz`) 15uU, tgvim (5uU); nux (Dbz`) 35uU, nuxv 5uU; Kez`i (t`kx) 5 tRvor|

- KI`Ki cKvi : gvSvi KIK
- emZevotZ gvPvq Dbz` Dcvq mevR P`i i Avq-e`q (evrmi K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1  MZ`g gvPv`Zwi		1  mevR Drcv`b	
(70 gv`v, 8uU gvPv)	1000	Pvj Kzov (210uU x 5 UvKv)	1050
2  tMvei I`Lj c`qM	N	vPvP`v (150 tKvR x 5 UvKv)	750
(1 Ub tMvei, 4 tKvR`Lj, vBR`)	N	Kijv (30 tKvR x 6 UvKv)	180
3  A`Re mvi c`qM (4 tKvR x 6 UvKv)	24	vqo Kzov(250uU x 10 UvKv)	2500
4  exR/Pv v μq	400	mvg (170 tKvR x 3 UvKv)	510
5  tmP c`vb (cvi ewi K kg)	N	jvD (400uU x 6 UvKv)	2400
6  kvK (cvi ewi K)	N	KvK`ij (50 tKvR x 6 UvKv)	300
7  Ab`v`LiP	250	kmv (180 tKvR x 5 UvKv)	900
<b>tgvU LiP</b>	<b>1674</b>	<b>tgvU Avq</b>	<b>8590</b>
		<b>bvU gvvdv</b>	<b>6916</b>

- Aver`KZ.mvfbvael`dmj μg I Rwg

μgK bs	eI`dmj μg	Rvgi cvigv (tn±i)
	t`kx cvU (Dbz`) N`ti vcb Avgb (Dbz`) N`Zi gR (Dbz`)	0.40
	tZiv cvU (Dbz`) N`ti vcv Avgb (Dbz`) N`Avj y(Dbz`)	0.32
	ti vcv AvDk (Dbz`) N`ti vcv Avgb (Dbz`) N`gjv (t`kx)	0.08
	cB kvK (t`kx) N`ti vcv Avgb (Dbz`) N`Utg`Uv (Dbz`)	0.16
	cB kvK (t`kx) N`ti vcv Avgb (Dbz`) N`evavKvc (Dbz`)	0.08
	WUv (t`kx) N`ti vcv Avgb (Dbz`) N`dZKvc (Dbz`)	0.04
	cB kvK (t`kx) N`ti vcv Avgb (t`kx) N`tcqvR (t`kx)	0.06
	WUv (t`kx) N`ti vcv Avgb (t`kx) N`imj (t`kx)	0.04
	cwZZ N`mvi Iv (t`kx) N`te`ti v (Dbz`)	0.40
	cwZZ N`gvmKj vB (t`kx) N`te`ti v	0.20
	gJx KPz(t`kx) N`te`b (t`kx)	0.20
	AgZ mvi Kjvi Pvl	0.12
	tctc I nj`i Avs:Pvl	0.12

Kwl.1 cji Dbaq b`z`

- avb, cvU, mmi Iv I gvmKj vB PrtI i Avq-e`q (evrmmi K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1  Rwg Prt I `Zwi	3500	1  dmj Drcv`b	
2  tMvei c`qvm (10 Ub, ubR`)	N	AvDk avb (0.32 Ub x 5000 UvKv)	1600
3  A%Re mvi c`qvm		Avgb avb (5.90 Ub x 5500 UvKv)	32450
BDwi qv (266 tKwR x 6 UvKv)	1596	tevtiv avb (4.20 Ub x 5500 UvKv)	23100
uUGmuc (200 tKwR x 7 UvKv)	1400	cvU (1.45 Ub x 9000 UvKv)	13050
Gguc (124 tKwR x 5 UvKv)	620	mmi Iv (0.60 Ub x 15000 UvKv)	9000
uRcmvg (150 tKwR x 3 UvKv)	450	gvmKj vB (0.30 Ub x 20000 UvKv)	6000
4  exR/Priv μq (ubR`^evt`)	3000		
5  tmP/KvUvKc c`vb	9500	2  DcRvZ	
6  klgK (ubR`^evt`)	8000	Lo (15 Ub x 1000 UvKv)	15000
7  Ab`vb` LiP	4800	Kzv (0.63 Ub x 3000 UvKv)	1890
		fwt (0.23 Ub x 5000 UvKv)	1150
<b>tgU LiP</b>	<b>32866</b>	<b>tgU Avq</b>	<b>103240</b>
		<b>buU gbydv</b>	<b>70374</b>

- kvK-meiR I Nvm Drcv`tbi Avq-e`q (evrmmi K)

e`tqi weeiY	UvKv	Avtqi weeiY	UvKv
1  Rwg Prt I `Zwi	4000	1  kvK-meiR Drcv`b	
2  tMvei c`qvm (8 Ub, ubR`)	N	cDkK (8.4 Ub x 3000 UvKv)	25200
3  A%Re mvi c`qvm		WUv (0.72 Ub x 2000 UvKv)	1440
BDwi qv (350 tKwR x 6 UvKv)	2100	gKv KPz (5.52 Ub x 4000 UvKv)	22080
uUGmuc (266 tKwR x 7 UvKv)	1862	te`b (4.70 Ub x 3000 UvKv)	14100
Gguc (200 tKwR x 5 UvKv)	1000	Zi gR (13.12 Ub x 3000 UvKv)	39360
uRcmvg (120 tKwR x 3 UvKv)	360	Avj x (8.13 Ub x 2500 UvKv)	20325
4  exR/Priv	16700	gj-v (1.67 Ub x 2500 UvKv)	3340
5  ecb/tivcY	7000	UtgtUv (7.73 Ub x 4000 UvKv)	30920
6  tmP/KvUvKc c`vb	6000	evavKuc (1.76 Ub x 2000 UvKv)	3520
7  klgK (ubR`^evt`)	10000	dZKuc (0.72 Ub x 3000 UvKv)	2160
8  Ab`vb` LiP	5900	tccvR (0.72 Ub x 3500 UvKv)	2520
		imly (0.17 Ub x 7000 UvKv)	1190
		Kjv (3500 tKwR x 7 UvKv)	24500
		tctc (1.5 Ub x 3000 UvKv)	4500
		nj y (1.5 Ub x 3000 UvKv)	4500
<b>tgU LiP</b>	<b>54922</b>	<b>tgU Avq</b>	<b>199655</b>
		<b>buU gbydv</b>	<b>144733</b>

- dmtj i RiqfZ tgšgmQ evf. cij tbi Avq-e`q (evrmi K)

e`tqi meiy	UvKv	Avtqi meiy	UvKv
1/ tgšgmQi ev. μq (5uU x 500 UvKv)	2500	1/ gayDrcv`bN (5 ev. x 12 tKwR x 150 UvKv)	9000
2/ kigK (cwi ewi K)	N		
3/ Ab`vb`	800		
<b>tgU LiP</b>	<b>3300</b>	<b>tgU Avq</b>	<b>9000</b>
		<b>bU glydv</b>	<b>5700</b>

- ej` cij b I lω tgvUvZvRv Ki tYi Avq-e`q (evrmi K)

e`tqi meiy	UvKv	Avtqi meiy	UvKv
1/ Lv`N Lo (11.4 Ub, wBR`)	N	1/ ci i eZgib gj`N Mvfx (2uU x 20000 UvKv)	40000
meR Nvm (28 Ub x 50 UvKv)	2800	lω (2uU x 7000 UvKv)	14000
wPv_o (550 tKwR x 4 UvKv)	2200	ej` (2uU x 12000 UvKv)	24000
`Lj (1750 tKwR x 5 UvKv)	8750	evQj (2uU x 3000)	6000
Prtj i Kgv (5000 tKwR x 2 UvKv)	10000		
Mtgi Fwt (1000 tKwR x 7 UvKv)	7000	2/ `g Drcv`b (3540 wj Uvi x 14 UvKv)	49560
jeY (140 tKwR x 7 UvKv)	980		
2/ Jla/FvKwmb	2100	3/ nvj PrtI e`enwi (400 w`b x 50 UvKv)	20000
3/ kigK (cwi ewi K evf`)	3500		
4/ Ab`vb` LiP	4300	4/ tMveI Drcv`b (38 Ub x 500 UvKv)	19000
5/ ci i μggj`N Mvfx (Dbz μm)	30000		
lω (Dbz μm)	8000		
ej` (t`kx)	17000		
<b>tgU LiP</b>	<b>96630</b>	<b>tgU Avq</b>	<b>172560</b>
		<b>bU glydv</b>	<b>75930</b>

- QvMj I Lvmx j vj b-cij žbi Avq-e“q (evrmi K)

e“qi veeiY	UvKv	Avqi veeiY	UvKv
1/ ev“Pmn QvMj μq (5uU x 800 UvKv)	4000	1/ eQi tkłl cŃYxi gj“ QvMj (5uU x 2000 UvKv) ev“Pvi gj“ (8uU x 600 UvKv) Lvmxi gj“ (5uU x 1600 UvKv)	10000
2/ Lvmx μq (5uU x 500 UvKv)	2500		4800
3/ Pfo Lvl qv (“ubK 5-6 NÈv, ubR Pvi Yfiq)	Ñ	2/ “Drcv`b (70 vj Uvi x 12 UvKv)	840
4/ Lr“ -gvmKj vB fiv QvMj (180 tKwR x 10 UvKv) Lvmx (125 tKwR, ubR“) ev“Pv (80 tKwR, ubR“)	1800 Ñ Ñ		3/ QvMj i veov (2.27 Ub x 500 UvKv)
5/ JIa/ FvKumb	380		
6/ kłgK (cwi ewi K ev“)	500		
7/ Ab`vb“ LiP	400		
<b>tgU LiP</b>	<b>9580</b>	<b>tgU Avq</b>	<b>24775</b>
		<b>bU gbycv</b>	<b>15195</b>

- Kezi cij žbi Avq-e“q (evrmi K)

e“qi veeiY	UvKv	Avqi veeiY	UvKv
1/ Kezi μq (5 tRvov x 70 UvKv)	350	1/ eQi tkłl gj“ Kezi (5 tRvov x 50 UvKv) ev“Pv (60 tRvov x 40 UvKv)	250
2/ Lr“ cŃvb Płj i Ly (36 tKwR, ubR“) mivi Iv (18 tKwR, ubR“) Kj vB (18 tKwR, ubR“)	Ñ Ñ Ñ		2/ veov (72 tKwR x 0.50 UvKv)
3/ kłgK (cwi ewi K)	Ñ		
<b>tgU LiP</b>	<b>350</b>	<b>tgU Avq</b>	<b>2686</b>
		<b>bU gbycv</b>	<b>2336</b>

• **čkzi nun-gjM I gvtQi Avambieo ngk<sup>a</sup>PrtI i Avq-e`q (evrmii K)**

<b>e`tqi neeiY</b>	<b>UvKv</b>	<b>Avtqi neeiY</b>	<b>UvKv</b>
1/ nun-gjM i Ni `Zwi	1250	1/ mWg Drcv`b	
2/ nun μqN 16 mβvn eqm (40uU x 70 UvKv)	2800	nun (8700uU x 2.50 UvKv) gjM (4450uU x 2.50 UvKv)	21750 11125
3/ gjM μqN 14 mβvn eqm (20uU x 90 UvKv)	1800	2/ Drcv`b tkłI gj`	
4/ nčmi Lv` (nbR`Qvov) (800 tKwR x 12 UvKv) gjM i Lv` (nbR`Qvov) (320 tKwR x 12 UvKv)	9600 3840	nčmi gj` (40uU x 50 UvKv) gjM i gj` (20uU x 60 UvKv)	2000 1200
5/ Pβ cłqvM (150 tKwR x 5 UvKv)	750	3/ gvQ Drcv`b	
6/ A%Re mii cłqvM (125 tKwR x 6 UvKv)	750	i aB (245 tKwR x 60 UvKv) KvZj v (590 tKwR x 60 UvKv) gtMj (240 tKwR x 60 UvKv) Młm Kvc (160 tKwR x 50 UvKv) _vB micł (110 tKwR x 50 UvKv)	14700 35400 14400 8000 5500
7/ gvtQi tcvb μq (2250uU)	900	ngi i Kvc (35 tKwR x 40 UvKv) Kvi uCD (48 tKwR x 40 UvKv)	1400 93805
8/ JIa/FvKumb	350		
9/ kłgK (cvii emi K evt`)	900		
10/ Ab`vb` LiP	650		
<b>tgvU LiP</b>	<b>23590</b>	<b>tgvU Avq</b>	<b>117395</b>
		<b>błI gbydv</b>	<b>93805</b>

• **dmj vFvEK mgvšZ Lvgv i i Avq-e`q (evrmii K)**

mešgvU LiP                      222912 UvKv  
 mešgvU Avq                      637901 UvKv  
 mešgvU błI gbydv              414989 UvKv



### cvWĚi gj'iqb 3.8

mWK DĚti i cvk, UK Pý (V) ů b |

- 1/ dmj wfĚK mġšZ Lvgvġi i KqU mġebv Avtj vPZ ntqġO ?  
 K) mvZU  
 L) AvU  
 M) bqU  
 N) `kU
  
- 2/ Ly teik fig, AwK cyR I AġbK kġK ůbfP gvSwi ev eo KIK tKv wfĚK mġšZ Lvgvi Mto ZġġZ cvti b ?  
 K) tcwĚ<sup>a</sup>  
 L) tWqix  
 M) gvr<sup>m</sup>  
 N) dmj
  
- 3/ evġ- tgŠġO cij b I gayDrcv`b dmġj i tKv mgġq Kiv hvq ?  
 K) Piv Ae`vq  
 L) dġ tclUv  
 M) dmj cvKv  
 N) evošAe`vq
  
- 4/ AwK gvġv tġZ tKv mgġq kvK-mewR ev dmj Piv KiġZ nġe ?  
 K) AvMvg  
 L) t`ixġZ  
 M) cPġj Z mgġq  
 N) th tKv mgq
  
- 5/ `xNġ b AwK i vġqubK mvi I KxUvkK e`envi Kitj Rġi dmj Drcv`bkj Zv ůK nġZ cvti ?  
 K) teġo thġZ  
 L) Kġg thġZ  
 M) ůKQġ bv  
 N) ůK \_vKġZ
  
- 6/ dmj wfĚK mġšZ Lvgvġi KqU Ki Yxq Avtj vPbv Kiv ntqġO ?  
 K) PivU  
 L) QqU  
 M) cvPvU  
 N) ůZbvU
  
- 7/ dmj wfĚK mġšZ Lvgvi mġi KqU avc t`Lvġv ntqġO ?  
 K) PivU  
 L) cvPvU  
 M) QqU  
 N) mvZU |

### cw 3.9 Kul.cwi tek msi ʒtY Kul.Rxtei figKv



G cvV tkfI Avciub-

- ◆ Kul.Rxe ej tZ Kx eSvq Zv ej tZ cvi teb|
- ◆ mstʒtc Kul.Rxtei , i azj eYbV Ki tZ cvi teb|
- ◆ Kul.cwi tek msi ʒtY dmj I DwM`i figKv e`vL`v Ki tZ cvi teb|
- ◆ Kul.cwi tek msi ʒtY ci-cvLi figKv eYbV Ki tZ cvi teb|
- ◆ Kul.cwi tek msi ʒtY gv tQi , i azj m`utK`Avtj vPbv Ki tZ cvi teb|
- ◆ Kul.cwi tek msi ʒtY AYRxtei , i azj eYbV Ki tZ cvi teb|
- ◆ Kul.cwi tek msi ʒtY gvbtj i figKv eYbV Ki tZ cvi teb|

#### Kul.Rxe



nevfbaKul.Drcv`tb cZ`ʒ ev ctivʒfvte RvOZ/e`eüZ DwM`, cÖYx AYRxemgn`K GK`I Kul.Rxe ej v nq| GtZ nevfba dmj , DwM` , Mpcvuj Z ci cvLi , gvQ , AYRxie c`fWZ meivKQ`KB eSvq|

#### Kul.Rxtei , i azj

Avgiv Rmb th, Kul.Rxe cwi tekki `Re Dcv`vb/At`i Ašf` | `vfvmeKfvteB ZvB Gt`i Kul.cwi tek msi ʒtY , i azj c`v`figKv i tqtQ| thgbN

- dmj I gvQ Avev` bv ntj Lv`vfvte I cwi tekki DwM` `evP`Zv bó nte|
- DwM` I cÖYxi vej vB NUtj `vbxq `Re-cwi tek meivNz` nq, evqg`Üj DEB nq, gi agqZv `i i anq I cKuzi fvi mvg`Zv mebö nq|
- nevfbaAYRxtei msL`v nvm tctj eR`cPb I nevfba`Re-ivmivqubK cÖµqv meivNz` ntq Drcv`b Ktg|
- RbmsL`v evx` tctj gvbtj i Avk`v, Acvö, A`ʒZv I AbvPvi evto Ges gvby cKuzi ʒWZ Kti |

#### Kul.cwi tekK Kul.Rxtei figKv

Kul.cwi tek msi ʒtY nevfbaKul.Rxtei figKv m`utK`dmj , DwM` , ci-cvLi , gvQ , AYRxie I gvbtjNG QquU mel t`q Avj v`vfvte Avtj vPbv Ki v ntj v|

#### 1| dmj

dmj tgšmgn, GKelx`uöelx` eüelx`ntq `v`K| ZvQvov dmj km`, Atk, gj-, K`j, Wj , `Zj Rxe, meivR, dj BZ`w` RvZxq ntq `v`K| G meivP` RvZi dmj nevfbaemgtq Rtb` cwi tekki Rxe-`evP` MVtb mivqZv Kti | cwi tek msi ʒtY dmj i figKv v`v`cN

- Rxe-`evP` `i gva`tg dmj Kul.cwi tekK Lv` Dcv`vb Pµvqb Ges AvMvQv, KxUcZ½ I tivM` gtb mivqZv Kti |
- dmj i DwQó, DcRvZ I eR`ci cvLi I gv tQi Lv` `i f`c e`eüZ ntq Kul.cwi tekK cÖYxKž` vUvKtq i v`L|
- AtbK dmj x Mv tQi KvÜ ev ukKo Rvj vbi f`c KIK cwi evti i kv`i Drm|
- dmj i evR, Pvi v, Kj g, gj- c`fWZ AtbK mgq GK cwi tek t`tK Ab` cwi tekK tivM` ev KxUcZ½i vWg ev cZ½ enb Kti | ZvB Gme Drcv`b I cwi entb mZK`ntZ nte|

### 2| Dm`c

mi vmi dmi ifc e`euZ nq br Gifc tQvUeo `j R I Rj R Nvm, j ZivcZiv, MvQ, e`j c`fWZ cwi tek me`gvb| G, tj vi Ae`vbMZ Kvi tY cwi tek msi w`fjZ nt`Q| ZvQvov G, tj vi weP`fjY e`envi I g`zj RbK ntZ cvti | thgbN

e`u Dm`c, Nvm I j ZivcZiv KivU, ukKo, dz, dj I cvZv Dm`c Riv KxUvbkK `Zwi tZ e`envi Kti cwi tek i vmiqbK KxUvbkK `fY Kgv`bv hvq|

t`tki w`bA`j, civov AAj I Xvj y`gE`Kv AAj bvbwea Nvm, MvQ I e`j cwi Kw` Zfite Rb`fj f`ig `fj`iva Kti Kwl. cwi tek Dbq b m`e|

- e`u Dm`c, Nvm I j ZivcZiv KivU, ukKo, dz, dj I cvZv Dm`c Riv KxUvbkK `Zwi tZ e`envi Kti cwi tek i vmiqbK KxUvbkK `fY Kgv`bv hvq|
- we`f`bwe`Dm`c (`j R I Rj R) ev j ZivcZiv me`R mvi ev Kt`u`v`v` `Zwi tZ e`envi Kti cwi tek cwi `Qb`v`v`L hvq|
- A`f`bK Dm`c, Nvm I cvbv ci`c`mL I gvtQi Lv` ifc e`envi Kti j Kwl. cwi tek msi `fjY I Drcv` b GK mvt` Pj te|
- we`f`kI RivZiq tQvU Dm`c G`f`Rij v I b`j`v`f` me`R k`v`j`v` evZim ntZ b`v`f`U`f`Rb m`st`h`v`Rb I Zv cti g`m`U`f`Z w`t`q` g`m`U`i De`f`Zv e`w`x` Kti |
- t`tki w`bA`j, civov AAj I Xvj y`gE`Kv AAj bvbwea Nvm, MvQ I e`j cwi Kw` Zfite Rb`fj f`ig `fj`iva Kti Kwl. cwi tek Dbq b m`e|
- e`u Dm`c i ukKo, KivU, cvZv, dz, dj BZ`w` ci`c`mL I gvb`f`j I JIa ifc cwi te`f`ki c`v`Y`K`j msi `fjY Ki`f`Q|
- me`R mvi ifc e`envi Dc`th`v`M`x c`l`q` 50 c`R`v`i`Zi Dm`c i`f`q`f`Q| G, tj v g`m`U`i De`f`Zv evov`f`Z m`f`ig|

### 3| ci`c`mL

Kwl. cwi tek Mpcw`j Z ci`c`mL I eb` ci`c`mLi `e`v`f`Zv msi `fjY c`l`q`v`Rb| ZvB M`f`g emZemotZ I Ab`vb` eb Ges Dm`c `e`v`f`Zv i`f`v`Ki`Y c`l`q`v`Rb| Kwl. i`az`m`u`b`we`f`b`we`c`i` I c`m`Li w`be`f`f`b ZvB cwi tek Dc`th`v`M`Zv we`f`e`P`bv`q` i`v`L`f`Z nte| GRb`N

t`tki `v`b`x` Lv` Drcv`v` I cwi tek tUKmB Dbz n`n`-g`j`v`Mi Riv w`be`f`f`b Kti M`f`g`Y` K`I`K` L`v`g`v`i j`v`j`b`-c`v`j`b` Kiv Dm`PZ| t`Kiv`g`f`Z`B` n`v`B`we`w` n`n`-g`j`v`M` M`f`g`i` L`v`g`v`i we`Zi`Y` Kiv Dm`PZ` b`q`| G`f`Z` b`Z`b` t`i`v`f`Mi m`e`v`e`b`v` t`\_`f`K` hvq|

- Dbz ci`i Riv hr G`f`tki M`f`g`Y cwi tek c`l`B` Lv` `R`x`e`-a`v`i`f`Y` Dc`th`v`M`x` i`a`y`m`i`f`c` RivZB w`be`f`f`b Kti j`v`j`b`-c`v`j`b` I esk e`w`x` Kiv`f`bv` Dm`PZ|
- Nvm Drcv`v` w`b`v`o`Z`v` b`v` Kti Dbz M`f`x`i` L`v`g`v`i `v`c`b` t`tki `v`b`x` Nvm m`e`u` w`b`we`o` e`envi`i` we`j`f` ntZ cvti | G`f`Z `v`b`x` RivZi Mi`e` Q`v`M`j, t`f`ov`i` t`M`P`ri`Y` `v`b`j`f` ntZ cvti |
- t`tki `v`b`x` Lv` Drcv`v` I cwi tek tUKmB Dbz n`n`-g`j`v`Mi Riv w`be`f`f`b Kti M`f`g`Y` K`I`K` L`v`g`v`i j`v`j`b`-c`v`j`b` Kiv Dm`PZ| t`Kiv`g`f`Z`B` n`v`B`we`w` n`n`-g`j`v`M` M`f`g`i` L`v`g`v`i we`Zi`Y` Kiv Dm`PZ` b`q`| G`f`Z` b`Z`b` t`i`v`f`Mi m`e`v`e`b`v` t`\_`f`K` hvq|
- `v`b`x` RivZi ci`c`mL msi `fj`Y` D`E`g` Lv`, w`P`v`K`r`m`v` I U`x`Kiv`v`b` w`b`v`o`Z`v` Kti c`v`Y` `e`v`f`Z`v` i`f`v` Kiv Dm`PZ|

### 3| gvQ

Rxe-`e`v`f`Z`v` msi `fj`Y` Rj R c`v`Y`i` g`ta` gvQ L`g`B` i`az`c`Y` cwi te`f`ki we`f`c`Z`v`q` me`f`P`t`q` te`w`k` `f`j`q`M`O` i`n`f`q`f`Q` t`k`x`q` g`v`f`Qi` c`R`v`i`Z`| GRb` w`b`aj` m`L`Z` w`e`l`q` we`f`e`P`bv` Kiv Dm`PZ`N

- t`k`x`q` g`v`f`Qi` AmsL` c`R`v`i`Z` i`a`y`Lv` `B` mieivn Kti b`v, G, tj v Rj R cwi tek `e`v`f`Z`v` i`f`v` Kti |
- avb t`f`f`Z` gvQ ev w`P`v`o` P`f`f`i` d`f`j` e`u` KivUc`Z` `g`b` nq Ges avb Drcv`v` e`w`x` cvq|
- e`u` c`P`b`k`j` `e` t`L`f`q` gvQ c`v`b`i` cwi tek cwi `Qb`v`v`f`L|
- b`v`f`j` m`U`K`v` Ab` gvQ e`w`x`f`Z` evav` t`q, M`f`m` Kiv`c`D`b`f` `v`f`b` t`M`f`j` avb I Ab`vb` Rj R Nvm t`L`f`q` m`i`e`v`o` Kti, A`v`i`d`Kiv`g`v, i` D`b`f` `v`f`b` t`M`f`j` m`K`j` Rj R c`v`Y` t`L`f`q` m`i`e`v`o` Kti | ZvB G gvQ, tj v m`x`v`e`x` Rj v`k`f`q` P`v`l` Kiv Dm`PZ|

### 5/ AYRxe

gml, cml I evZvfm AtbK AYRxe itqtQ| G, tjv Kwl.cwi tek tK c fmeZ Kti | thgbN

- ArcKvix tivM RxeYygvby, ci cml I DcKvix tcvKvqKo AvugY Kti gZz NUtj cwi tek weNz nq|
- DcKvix gmlI AYRxe `Re eR©cPtb mnvqZv Kti gmlI DeFZv epx Kti | gmlI `Re c`v`epx Kti |
- AtbK AYRxe (thgb- ivBthmeqig cRwZ) RxeYynvi ifc dmj Drcv`b evovq|
- weifbæAYRxe gmltZ t`K `Re-ivmvqbK cLqvg Dv`i Lv` Dcv`vb mieivn ubvDZ Kti I Kwl.cwi tek tK i`qv Kti |

AtbK AYRxe (thgb-  
ivBthmeqig cRwZ)  
RxeYynvi ifc dmj  
Drcv`b evovq|

### 6/ gvby

Kwl.cwi tek i nbqšI nt`Q KIK ev gvby| ZvB Kwl.cwi tek weifbæRxei figKv m`utK© KIKMYtK AewZ KtZ nte| ZvQvor Kwl.Drcv`tbi mv`\_ cwi tek msi`qvYi c`qvRbxqZv RvbtZ nte| GRb`N

- RbmsL`v mvgZ ivLtZ nte| Avak RbmsL`vi dtj Acv, Avk`qv I A`qvZv epx cvq|
- Kwl.cwi tek i dmj, Dv`c, ci cml I gv`Qi eugvZv Avqb Kti `Re-`vP`Zv m`oKiY|
- Kwl.cwi tek tK Kg`qvZM`IKti Ggb c`v` M`tY KIKMYtK Drm`vZKiY|
- Kwl.cwi tek msi`qvY I `vii`v we`qvP`tbi GK Aek` c`qvRbxq kZ,© Zv KIKMYtK e`v`v|



**Ablyj b (Activity):** tKvb `tbi Kwl.cwi tek Dbqtb ci cml I AYRxei figKv eYv Kiab|



### cuVhEi gj'iqb 3.9

#### mWK DEti i cuVhEi i PY (N) i b |

- 1/ Kwl. Drcv`tb cZ`q] ev ctivq]firte RwoZ/e`euZ Dw`c, cOYx I AYRixemgr#K GKtI Kx etj ?  
 K) Rxe-cwi tek  
 L) Rxe-%wP`  
 M) Kwl Rxe  
 N) Rixemgr
- 2/ Kwl Rxe cwi tek i tKvb Atzi Ašf? ?  
 K) A%Re  
 L) `Re  
 M) mKj  
 N) cOYx
- 3/ Kwl Rxei KquU , i azjms`q]tc Avtj vPZ ntqtQ ?  
 K) PivU  
 L) wZbvU  
 M) cuPvU  
 N) `BvU
- 4/ Kwl .cwi tek KquU Kwl Rxei Avtj vPbv Kiv ntqtQ ?  
 K) PivU  
 L) cuPvU  
 M) wZbvU  
 N) QquU
- 5/ Kwl .cwi tek msi q]tY dmtj i KquU fvgKv Avtj vPbv Kiv ntqtQ ?  
 K) cuPvU  
 L) QquU  
 M) PivU  
 N) wZbvU
- 6/ Kwl .cwi tek msi q]tY Dw`c` i KquU fvgKv Avtj vPZ ntqtQ ?  
 K) mvZvU  
 L) QquU  
 M) cuPvU  
 N) AvUvU
- 7/ Kwl .cwi tek msi q]tY gv`Qi KquU fvgKv Avtj vPbv Kiv ntqtQ ?  
 K) cuPvU  
 L) wZbvU  
 M) PivU  
 N) QquU



## Pešigj`iqb

mWK DEti i ctk, UK Pý (√) i b |

- 1/ cj ni fiY-ıcrIY Lıgvi , tj vZ iKı/c Lv`vfıve ne`gıv ?  
 K) fıZ  
 L) GKgıx  
 M) eüglıx  
 N) tçüUb
- 2/ meR nekıei dtj Lv`km` Drcı`b KZ , Y eıx tçtqtQ ?  
 K) 2/3  
 L) 3/4  
 M) 5/6  
 N) 4/5
- 3/ bZb avıbi RıZ mbıZb `ıbxq AıbK RıZ Kı KtııQ ?  
 K) emotqtQ  
 L) nej ş  
 M) D`ıeb  
 N) gj`ıqb
- 4/ Kıl .cıı tekıK Avı Kı Kıv DıPZ nıe bı ?  
 K) ııZMıı  
 L) ııKıZ  
 M) ıe`ıZ  
 N) msKıPZ
- 5/ Kıl .cıı tek msi ıııY mKj ıK Kı nıZ nıe ?  
 K) AıPZb  
 L) çıkıııZ  
 M) mıPZb  
 N) mıKıııZ
- 6/ ev`ıe KIK çüıg mııavRbK Kqu Aı/2 mıı:Lj I Drcı`bkıj Ktı Mıo tZııj ?  
 K) `Bıı  
 L) GKıı  
 M) ııZbıı  
 N) Pıııı
- 7/ mgııSZ Lıgıııı çüıg Aı/2ıı nı`Q Lıgııııı  
 K) ııFııE  
 L) mııı`  
 M) Drcı`ıb  
 N) Dbııb

Kwl.l cj#Dbq b`z

- 8/ aubwfiEK mgwšZ Lvgvi nt"Q tKvb wfiEK Lvgiti i Ašif? ?  
K) ci'cwl  
L) dmj  
M) gvQ  
N) emZewo
- 9/ `Re, A%Re I Av\_@mvgwRK Ažzi wKtmi gva`tg cwi tek Mto tZitj ?  
K) Avš'm=úK©  
L) mgy=úK©  
M) wepμqv  
N) cšZμqv
- 10/ gvwU, cwb, evZim, mh#j vK BZ`w` cwi teški tKvb A½ ?  
K) `Re  
L) A%Re  
M) Av\_@mvgwRK  
N) tKvbUvB bv
- 11/ cwbžZ KxUvkK wgy wKtmi D`vni Y ?  
K) `TY  
L) cwi eZš  
M) wešqvRb  
N) msthvRb
- 12/ cwi tek `TY KgRvŰi AwaKvskB Kti Kti ?  
K) ci'cwl  
L) AYRe  
M) gvby  
N) MŰcvj v
- 13/ avb Drcv`b evsj vž`ški Kwl.i wKifc cšμqv ?  
K) mvgvb`  
L) ,ižcY©  
M) me@pr  
N) tQvU
- 14/ eb, Rwg, cvnio I emZewo nžZ fig μgvMZ Kx nt"Q ?  
K) Űq  
L) wef³  
M) Drcv`b  
N) msthvRb
- 15/ Acwi Kwí Z Dbq b Kwl.cwi tekžK Kx KižQ ?  
K) Dbž  
L) webó  
M) my`i  
N) wewPĪ

- 16/ dmj Pvl Awak AvaybK Riv e`envti i dtj Kl.tKi evBti i DcKi tY Kx evotQ ?  
 K) wbfPkj Zv  
 L) AvZnekjm  
 M) cQ`  
 N) Anekjm
- 17/ AcPvj Z Rvj vbx e`envti i dtj RvgtZ `Re mvti i Dm Kx ntqtQ ?  
 K) tetotQ  
 L) KtgatQ  
 M) GKB AvtQ  
 N) wVK AvtQ
- 18/ OGKgrI GB tKSkj Mh.tYB Avgiv Kul.cwi tek tKI msi qY Ki tZ cvi tevON GLvtb tKSkj ej tZ Kx eSvtbv ntqtQ ?  
 K) `Re Kul.  
 L) A%Re Kul.  
 M) cvi tek Kul.  
 N) Kul.cthv<sup>3</sup>
- 19/ `xN<sup>o</sup>vqx Kul.Dbqb cFvti Rb` Qquw `enkto`i Bsti Rx cZktai clg Aqi vbtq th Bsti Rx kaw nq Zv ntj vN  
 K) INTACT  
 L) IMPACT  
 M) INCREASE  
 N) CONTACT
- 20/ cvi tek Kul.i DfIk` Lvgvi Drcv`bkj Zv eRvq ivLumn Lvgvi cvi tek tKvb&A½ msi qY?  
 K) dmj  
 L) ci`cwl  
 M) mKj  
 N) Kul.eb
- 21/ Kul.cwi tek msi qY ci`cwl i Kquw figKv Avtj vPbv Kiv ntqtQ ?  
 K) Pvi wJ  
 L) wZbwJ  
 M) cvPwJ  
 N) QquwJ
- 22/ Kul.cwi tek msi qY AYRvti Kquw figKv Avtj vPbv Kiv ntqtQ ?  
 K) cvPwJ  
 L) Pvi wJ  
 M) wZbwJ  
 N) QquwJ



**mswʿB i Pbvj-K cʿke**

- 1/ mgušZ Lvgvi e ʿe ʿv Kx eʿStq wj Lj/
- 2/ cwi tek ej tZ Kx eʿSb wj Lj/
- 3/ Kwl. cwi tek KvK etj ?
- 4/ cwi tek ʿtY ej tZ Kx eʿSb wj Lj/
- 5/ Kwl. cwi teʿki ʿʿiqòzAe ʿv mstʿʿtc Avtj vPbv Ki ab/
- 6/ tmPhʿ teʿtiv avb Aver ʿ eʿxi dtj Kwl. cwi teʿk Kx Kx ʿʿiqòzAe ʿv t ʿLv w ʿtqʿQ wj Lj/
- 7/ AnaK KxUbvK e ʿenʿti Kwl. cwi teʿk Kx Kx ʿʿiqòzAe ʿvi mʿwò ntqʿQ eYʿv w ʿb/
- 8/ cwi tek Kwl. KvK etj ?
- 9/ cwi tek Kwl. i bʿwZgvj v ʿtj v wj Lj/
- 10/ weʿfbacʿKvi cwi tek Kwl. i bʿv ʿtj v wj Lj/
- 11/ ʿxN ʿiqx Kwl. cʿhʿi QquU ʿ Yevj x wj Lj/
- 12/ mgušZ Lvgvʿi i kZʿej x KquU I Kx Kx ?
- 13/ evsj v ʿtk KI ʿKi m ʿu ʿ Ae ʿvi mʿavi Y Avtj vPbv Ki ab/
- 14/ mgušZ Lvgvi cʿZòvq Dʿ ʿv ʿvi m ʿtebv wj Lj/
- 15/ tʿwèʿfʿiĒK mgušZ Lvgvʿi i m ʿtebv ʿtj v wj Lj/
- 16/ tʿwèʿfʿiĒK mgušZ Lvgvʿi i Ki Yxq w ʿl qmgn Kx Kx ?
- 17/ tʿwèʿfʿiĒK mgušZ Lvgvʿi i avc ʿtj v wj Lj/
- 18/ tʿwqixʿfʿiĒK mgušZ Lvgvʿi i cʿʿuU m ʿtebv wj Lj/
- 19/ tʿwqixʿfʿiĒK mgušZ Lvgvʿi i Pʿv uU Ki Yxq wj Lj/
- 20/ tʿwqixʿfʿiĒK mgušZ Lvgvi mʿwó avc ʿtj vi weei Y w ʿb/
- 21/ gʿvrm ʿfʿiĒK mgušZ Lvgvʿi i cʿʿuU m ʿtebv wj Lj/
- 22/ gʿvrm ʿfʿiĒK mgušZ Lvgvʿi i Pʿv uU Ki Yxq wj Lj/
- 23/ dmj ʿfʿiĒK mgušZ Lvgvi mʿwó Ki Yxq ʿtj v wj Lj/
- 24/ dmj ʿfʿiĒK mgušZ Lvgvʿi i cʿʿuU m ʿtebv wj Lj/
- 25/ dmj ʿfʿiĒK mgušZ Lvgvi mʿwó avc ʿtj v Dc ʿvcb Ki ab/
- 26/ Kwl. Rxe ej tZ Kx eʿSvq wj Lj/
- 27/ Kwl. cwi tek msi ʿʿtY Kwl. Rxei mswʿB Pʿv uU fʿwgv wj Lj/
- 28/ Kwl. cwi tek msi ʿʿtY dmʿtj i fʿwgv mstʿʿtc wj Lj/
- 29/ Kwl. cwi tek msi ʿʿtY ci cʿmLi fʿwgv mstʿʿtc wj Lj/
- 30/ Kwl. cwi tek msi ʿʿtY gvʿQi fʿwgv mstʿʿtc wj Lj/
- 31/ Kwl. cwi tek msi ʿʿtY Dʿwʿt ʿ i fʿwgv mstʿʿtc wj Lj/
- 32/ ʿxN ʿiqx Kwl. Dbqʿbi wʿv ʿ QquU ʿenkó wj Lj/
- 33/ weʿfbacw ʿi tek Kwl. i gj- Dʿt ʿk ʿ ʿtj v wj Lj/
- 34/ ʿtY Kx D ʿvni Ymn wj Lj/

- 35| Wj I `Zj exR Aver` Ktg hvI qvq KwL.cwi tešk Kx Kx ųıqòzAe`vi mıó ntqıQ  
ıj Lıj|
- 36| Awak bıBtUıRb mvi (BDwi qı) e`envıı dtj KwL.cwi tešk Kx Kx ųıqòzAe`vi mıó  
ntqıQ ıj Lıj|
- 37| cãvb Aııi wıEıZ mgıšZ Lıgvi e`e`v KZ cKvi I Kx Kx ıj Lıj|
- 38| cwi teški KqıU Aıı I Kx Kx ıj Lıj|
- 39| cwi teški `Re Aııi KqıU fıM I Kx Kx ıj Lıj|



**DĒi gıjv**

**cW 3.1**

1| L    2| L    3| N    4| L    5| M    6| M    7| N    8| K  
9| L    10| M

**cW 3.2**

1| K    2| L    3| M    4| K    5| M    6| L    7| K    8| L  
9| N    10| M    11| K

**cW 3.3**

1| L    2| M    3| N    4| K    5| N    6| M    7| K    8| L  
9| N    10| K    11| K

**cW 3.4**

1| N    2| L    3| K    4| M    5| L    6| N    7| L

**cW 3.5**

1| L    2| K    3| M    4| N    5| K

**cW 3.6**

1| K    2| M    3| L    4| M    5| N    6| L

**cW 3.7**

1| L    2| M    3| L    4| K    5| L

KwL.1 c j n Dbq b 7

**cW 3.8**

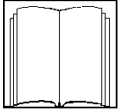
1| M    2| N    3| L    4| K    5| L    6| M    7| K

**cW 3.9**

1| M    2| L    3| K    4| N    5| M    6| K    7| M

**Perš-gj-ıqıbi DEİ**

1| M    2| K    3| L    4| K    5| M    6| L    7| K    8| L  
9| K    10| L    11| K    12| M    3| M    14| K    15| L    16| K  
17| L    18| M    19| L    20| M    21| K    22| L



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