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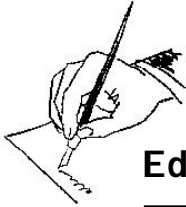
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Editorial

Agriculture a\anga Horticulture Department a indan kum 22-na chu kan lo thleng ve ta reng mai. He kum 22 kal ta chung a \hahnemngai tak chung a Department lo kaihruai a, hlawhtlinna min thlenpuitute an fakawmin an thawhrimna te theihngihl phal rual a ni lo ang.

Chutih rualin District hrang hranga field officer leh staff te \hahnemngai taka kut hnathawktute zirtir a, kaihruai a, hlawhtlinna tlanga chhawpchuaktute hi theihngihl rual an ni lo baw. Tun kum 22 chung hian kan thawhpuite pension-a chhuak leh chatuan ram pantute eng emaw zat an awm ta. | hahnemngai taka tha leh zung an lo thawh \hinnaah an zavaia chungah lawmthu kan sawiin theihngihl an har dawn mang e.

Mizoram-a huan/lo neia eizawngtute ham\hatna tam zawk leh hlawk zawka thlai leh thei an thar chhuah a, sum tam zawk an lak luh zel theih nan Horticulture Department-a thawktu zawng zawngte mahni mawhpurhna \heuhah \hahnemngai taka thawk zel turin kan insawmin kan inngen a ni e.

MIZORAM ECONOMY SIAM | HAT NAN HORTICULTURE

B. Lalzarzova HDO,
 Planning Section
 Directorate of Horticulture

1. Horticulture-a India ram dinhmun tlangpui (Base year 2013-14)

Horticulture thlai hmun hian India ramah 24.3 Million Hectere-a zau a awh a, Horticulture thar chhuah zawng zawng belkhawm chu 280.70 million metric tone a ni. Khawvela thei thar chhuak tam ber chu China a ni a, India chu pahnihna a ni. India ramah hian kan thei chin lar zualte chu Balhla, Ser chi hrang hrang, Apple, Grape, Kawlthei, Theihai, Litchi, Thingfanghma, Lakhuihthei, Thei buhfai, Custard Apple (Sapota) etc. te niin thei chinna hian 7.136 million hectare luahin thei chi hrang hrang 84.411 million metric tone a thar chhuak a ni.

Vegetable-ah India-in khawvela thar chhuak tam ber China dawtin pahnihna a hauh a, thei chinna hmun aiin vegetable chinna hi a zau zawk a, a tharchhuah pawh a tam zawk bawk. India ramah hian vegetable lamah Tomato, Purun, Alu, Bawkbawn, Zikhlum, parbawr, Bawrhaisiabe, Be, Kawlbahra, pangbal etc. te chin tlanglawn a ni.

Plantation corps lam tharchhuahah India ramin ber a hauh a, Cashew nut, kuhva, cocoa, coconut etc. te a ni tlangpui.

Spices leh thingpuiife tharchhuahah India hian a ber dinhmun a hauh mek bawk. Kum 2013-14-ah India-in ram danga a thil thawnchhuah zawng zawng 10.30% chu agriculture kaihhnawih thar chhuah te a ni a, India hi chaw leh thlai thawnchhuah lamah khawvelah pasarihna a ni phak a, Buhfai thawn chhuak tam ber a nih bakah Wheat thawn chhuak hnem ber pahnihna a ni. India ram economy-ah Agriculture leh a kaihhnawih sector te thawhchhuah GDP (kum 2013-14) chu 13.90% niin India ram pum huap Agricultural commodities export hlutzawngah Horticulture Item-in 4% chauh a la luah pha tih hre bawk ila, chung Horticulture Items thawnchhuah zingah chuan thlai malkhaiah Purunsen thawnchhuah tam ber niin 40% a luah pha a ni.

2. Horticulture-a Mizoram dinhmun tlangpui :-

A chung a kan hmuh tak ang khian kum 2013-14 chhunga India ram pumpuia Agriculture and Allied sectors a\anga ram pawn lama bungraw thawnchhuah hlutzawng zawng za zela pali (4%) chauh Horticulture items niin, Thei & vegetable tharlam te a ni a. Amaherawhchu, Mizoramah chuan chhawhchhi tih loh chu horticulture item ni lo, agriculture item, India ram pawn emaw State pawn lama thawnchhuah kan thar sawi tur a vang hle rih mai!

Kum 2012-13 chungang Agriculture Items, Sorkar Check gate hmun li kaltlanga Mizoram pawna kan thawn chhuahte hi chhawhchhi tih loh chu Horticulture Items vek a ni.

Table 1: Exported Agriculture/Horticulture Items of Mizoram

Sl. No.	Items	Unit	2012 - 2013		
			Qty	Rs/Unit	Value (Rs)
1.	Squash (Iskut)	Qtls	29,063	1,000	29,063,000
2.	Hatkora	Qtls	43,313	3,000	43,313,000
3.	Serthlum	Qtls	7,689	7,000	53,823,000
4.	Sawhthing	Qtls	90,721	15-18	149,689,650
5.	Aieng	Qtls	67,870	8-10	61,080,000
6.	Hmarcha	Qtls	12,475	80-150	143,462,500
7.	Chhawhchhi	Qtls	3,547	40-60	17,735,000
	TOTAL				498,169,150

Kum 2013-14 chungang Horticulture thlai chin zinga hmun luah zau ber chu Thei kung niin 57,551 Ha-a zau a luah a, Horticulture thlai hmun za zelah 42.86-a zau a aw h a ni. Chung thlai zingah chuan malkhaiah Mandarin Orange-in hmun a luah zau ber a, 13,508 Ha. niin Horticulture crop area zawng zawng 10.06% a luah pha a ni. Balhlain a dawt a, 10,840Ha a luah baw k a, Balhla hmun hi Horticulture crop area 8.07% a ni. Thei tih lovah chuan vegetable-in hmun luah zau berin 29.35% a aw h a, Spices-in dawt lehin 17.13% niin a bak zawng 10.66% chu pangpar huan te, Medicinal & Aromatic crops te, plantation leh Roots and Tuber crops te a ni.

Thei lamah hian Balhla, Serthlum, Ser chi hrang hrang, Grape, Sapthei, Lakhuihthei, Thingfanghma, Theihai, Kiwi, Dragon fruits, Strawberry, Tengtere, Kawlthei etc. te hi kan chin lar zual te a ni a, heng zingah hian thlai malkhaiah Balhla thar chhuah tam ber a ni a, 1,46,090 Metric tone thar chhuakin Balhla bika kan productivity chu 13.04 matric tone per Ha. niin National level productivity (2013-14) chu 34.64 matric tone/Ha. a ni thung. Mizoram District pariata Horticulture thlai chin tam dan indawtin hetiang hi a ni.

1. Aizawl
2. Serchhip
3. Mamit
4. Champhai
5. Kolasib
6. Lunglei
7. Saiha
8. Lawngtlai

(source: Area & Production Report of Horticulture Department 2012-2013)

Vegetable lamah hian Iskut, Zikhlum, Anlam, Bean, Tomato, Changkha, bawrhaisiabe, Mai, Berul, Behlawi, Purun, Fanghma, Capsicum, Broccoli etc. te kan chin lar zual niin Open field-ah leh Protective Structure chungah te chin a ni. Vegetable-ah hian heng CSS schemes - MIDH, RKVY leh OFWM te avangin nasa takin kan production a pung a, Protected Cultivation leh Drip/spinkler irrigation system bakah, Water Tank chi hrang hrang hmanga huan siamtuten tui daihzai zawka hman tur an neih chhoh zel vang a tih loh theih loh ang.

Spices-te hi Horticulture thlai zinga sum hlawm la lut \ha ber pawl a ni. Mahse, Spices items kan ngah lo hle. Heng Sawhthing, Hmarcha leh Aieng bakah hian Thingmarcha, Coriander leh Purunvar tlem azawng kan thar ve bawk.

Thlai dang zingah sum hlawm la lut tam kan neih zingah Kuhva leh Anthurium pangpar te an langsar fal bawk.

Kan thlai chin lar zual chauh, chinna hmun zau zawng, thar chhuah zat leh thar hlawk dan kum 4 liam ta leh kum kal taa kan dinhmun khaihinna lo tarlang ila. 2014-15 report awm tho mah se constant figure kan la neih loh avangin 2013-2014 hi tehfungah hmang ila.

Table 2 : Comparative Statement of Area, Production & Productivity of 10 major crops

Sl No	Thlai hming	2010-2011			2013 - 2014					
		Area (Ha)	Production (Mt)	Productivity (Mt/Ha)	Area (Ha)	Punna (Ha)	Production (Mt/Ha)	Punna (Mt)	Production (Mt/Ha)	Punna (Mt)
1	M. Orange	6515	19700	3.02	13,508	66993	40,430	30,300	2.99	-8.03
2	Banana	10040	118600	11.81	10840	800	140920	27490	13.00	1.23
3	Pineapple	1532	13590	8.87	4091	2559	30140	23280	7.37	-1.50
4	Grape	1575	20400	12.95	2450	875	23870	3470	9.74	3.21
5	Lime/Lemon	4823	24150	5.00	8000	3177	25600	1450	3.20	-1.80
6	Areca nut	4800	12200	2.54	10138	5338	6050	6150	0.60	-1.94
7	Ginger	6500	31950	4.92	7480	980	29920	2030	4.00	-0.92
8	Turmeric	4780	23970	5.01	6250	1470	24700	730	3.95	-1.06
9	Chayaote	3500	56849	16.24	4660	1160	80020	23171	17.17	0.93
10	Cabbage	2600	33569	12.91	3230	6304	43280	9711	13.40	0.49

Heng thlai tarlante hi Mizoram tan chuan GSDP vawrh sang ber bertu an nih avangin **“Ten valuable Horticulture Economic Crops”** ka ti mai. Chutih mek laiin khaihinna figure-in a tarlan chian em em chu a chinna hmun kan zauh zel laiin thlai \henkhat, entir nan, Kuhva leh Sawhthingah kum 4 chhungin kan thar chhuah nasa takin a tlahniam a, Serthlum, Lakhuihthei, Grape, Lemon/Lime leh Aiengah te productivity a tlahniam hle bawk. A chhan awm thei hrang hrang zingah NLUP programme hnuai a Area kan zauh, mahse thar chhuah la awm si loh vang a ni tlangpui a, mahse, Sawhthing, Aieng leh Lemon te hi NLUP crop an nih loh avangin a chhan awm thei leh a siam\hatna kan dap chhuah vat a ngai niin a lang.

Kan thar chhuah hian a rama chengte mamawh a puhru zo em i han en leh teh ang.

Table 3 : sufficiency index for production of selected Food items in Mizoram

Mizorama mihring cheng zat (population 2011)	Based on 2012 - 2013 Statistic Record					Remarks
	Food Item	Tharchhuah zat (MT)	Mi Pakhat Kum 1 chanai (kg)	Kum 1 chhunga mi pakhat mamawh zat (Approx) (kg)	Mizoram mipui mamawh puhruk tura tharchhuah belh ngai zat (MT)	
10,97,206	Buhfai	57,700	52	164	1,62,226	@450gm/day/head
	Thei	3,43,905	313	183	-	@500gm/day/head
	Vegetable	2,39,807	218	183	-	@500gm/day/head

Hei hi kan dinhmun dik tak ni mah se kan thlaite sumah kan chantir em tih leh thlai pakhat thar tam vangin thlai \henkhat tharchhuah sawi tham loh te a inhliakhuh mawi ve mai a ni tih hria ila, entir nan, Thei zingah Serthlum leh Balhla kan thar \hat deuh laini Kiwi leh Dragonfruit chu tih tham kan la thar lo. Vegetables phei chu State pawn a\angin Tomato, parbawr, Fanghma, Buluih etc. a la rawn lut reng a nih hi.

3. Mizoram economy dinhmun tlangpui :

Phek hmasa lamah Agriculture & allied sectors bikin kum 2013 - 2014 chhungin India economy-ah 13.90% a thawh ve tih kan tar lang tawh a, ramchung sum dehchhuah dan hriltu ber chu Gross Domestic Product (GDP) a nih avangin kum hnih chhunga Mizoram GSPD atana sector hrang hrang thawhchhuah lo khaikhin ila.

Table 4: Sector wise GSDP at Factor cost by Industry of origin (2004-05 series at current price)

Sl No	Sector	2011-2012			2012-2013		
		- in crore	%	Economy \hanna%	- in crore	%	Economy \hanna%
1	Primary sector	1393.28	19.35		1403.10	17.42	
	1) Agriculture & Allied	1011.11	(14.04)		1094.04	(13.58)	
	2) Forestry	310.40			228.03		
	3) Fishing	48.51			50.99		
	4) Mining & Querying	23.23			30.05		
2	Secondary (Industry) Sector	1198.06	16.64		1323.91	16.44	
3	Testiary (Service) sector	4606.48	64.01		5326.07	66.14	
	TOTAL	7197.82	100	9.79	8053.09	100	9.07

(Remarks : Record-a awm lo, Economics & Statistics Department of Mizorama thawkte \hahnem ngaihnaa min chhut chhuahsak danin Horticulture items-in GSDP-a thawhchhuah ve chu; 2011-12-ah 9.3%, 2012-13-ah 8.5% a ni).

A chunga kan hmuh angin thlan tui tla chunga dehchhuah (Primary leh Secondary sector) khi pung mah se thla hlawh neia hnathawkho Service Sector hlawh a pun nasat avangin sector dang dehchhuah punna a lan vek a, kan State sum bawm 64-66% chu Sawrkar/Kohhran/Company/pawl leh mimal rawih hnathawk hlawh tling khawm mai a ni e. Cencus of Government Employee 2008 tarlan danin 1.4.2008-ah sorkat hnathawk 55,665 awmin chung zinga 48,453 te chu a ngheta thawk an ni.

Khitiang dinhmuna kan awm mekna chhan langsar \henkhatte chu :

1. Thar chhuah theih zat (Productivity) tla hniam zelin Agriculture tharchhuah a\anga sum lak luh a tihlem vang.

2. Agriculture sector hnuai eizawng \hinten Industry leh service sector-ah an chhuahsan nasa.
3. Agriculture hmasawna ruh rel (Agriculture infrastructure) dinna leh Research and Development atan sum dah tlem lutukin Agriculture Technology changkang hman kawngah min ti\huanawp a, tharchhuah a pun theih loh bakah tharchhuahsa pawh man man takin a hralh theih loh.
4. | halai lehkhia thiam tam berin Agriculture & allied sector-ah hna thawk lovin Service sector-ah hna an zawng zel a, hei hi Mizoram Economy \han mawh bawk pakhat a ni bawk.

Mizorama cheng mi pakhat Per Capita Income chu (Base year 2004-05 at current price) 2012-13 ah Rs. 60,836/- a ni. National level per capita income chu Rs. 74,920/- (Kum 2013-14). Per capita income hi Bihar State-ah a hniam ber a, Jammu & Kashmir, Assam, Manipur leh Nagaland ten an dawt a, a chhe ber group-ah kan la lang lo hi vannei tak kan ni.

4. Harsatna : Horticulture hi Mizoram Economy chawi kang tur hian mi thiam eng emaw zatin scope nei \ha ber pawlah min dah ve \hin. Mahse, a tak ram thlen chu la har tak a ni. Heng harsatnate avang hian kan tum ram kan thleng thei meuh ang em?

1. State sum dinhmun chhe lutuk.
2. Thawktu indaih lohna.
3. Thawktu inpekna (efficiency) a thuk tawk lo.
4. Farming aiin Gardening kan tuipei a, kan eizawna hmun aiin khawchhungah kan cheng tam zawk.
5. Tharchhuah sa hralh chhuah kawnga \anpuitu Agency an awm lo.

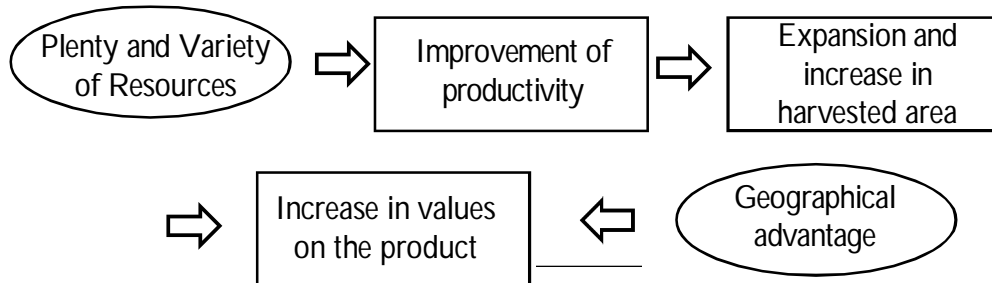
Japan International Cooperation Agency (JICA) ten min comment dan \henkhat hetiang hi a ni:

1. Extension officer ten tun lai thiamna technology hi an hman thiam tawk lo.
2. A hmuna viltu field staff ten chetchhuah an harsat.
3. Lo/Huan neitute leh anmahni kaihruaitu tur Service Provider ten hman thlir an nei mumal lo.
4. Sawrkar hmalakna tihmasawn thei state mil tawk inkaihhuaina a awm lo.
- 5. Mizoram thlai tharchhuah tlemna chhan lian deuh deuh :**
 - a) Lei chunglang luan ral avanga lei \hatna kiam zel.
 - b) Thlai chi \ha leh a chinna hmanraw \ha tlakchham vang.
 - c) A tihdan hriat loh vanga mahni lo enkawl \hat loh leh a tihdan dang hmuh tur awm loh vang.
 - d) Lo neitute an phur tawk lo.
 - e) Huan/Lo enkawl dan \ha tawk lo.
 - f) Tui lak tur tlem vang.

- g) Sum a harsa lutuk.
- h) Thlai tharchhuahna hmun pawhtu kawng (Road) awm mumal loh vang.

5. | an lak \ulnnate :

1. Kan Department thawhchhuah GDP 8.5% (2012-13) hre rengin hemi tipung tura ruahmanna mumal tak siam a, thapui thawha kan beih a ngai.
2. Field functionaries te tan refresher training course tam zawk buatsaih ni se.
3. | halai lehkha thiamte hi Horticulture Marketing Agency a tam thei ang bera indin tura hmalakpui ni se. Hemi atan hian Department hian section hran hial din thei se.
4. Thlai tharchhuah ringawt hi suma kan chantir loh emaw, kan vawm khawm \awih mai mai a nih chuan a enkawl nana tha leh hun kan sen ral kha suma chantirin sum kan khawh ral tihna a ni a, kan ram sum bawm kan rawk tihna a ni. Thlai chingtuten hei hi an hre reng tur a ni.
5. Huan neitu tinte hi a bial neitu ten Plan fel tak duanpui thlap se. Sawrkar sum harsatna hre reng chungin Centrally Sponsored Scheme pawn lama ruahmanna tihhlawhtlin hau tak deuh deuh buaipui pumpelh nise. A ngaihna hre lo leh efficiency lantir thei lo officer-te chu CHO post luah tir loh ni se. Tin, he post hi siam danglam a nih hma chuan emaw, siam danglam pawh lo ni ta teh reng se inhremna hmunah hmang lo bawk ila.
6. A hnaivai berah hma lam kum sawmpanga a\anga kum sawmhnih (15-20) thleng tal thlir lawk phain ruahmanna siam ila, Look East Policy hmalaknate Trans-Asia Highway kan hma lawka sial turte Sairang thlenga rel kawng lo kal tur hmang \angkai thei ngei turin ruahmanna \ha leh tlo i siam ang u.
7. Kum 2008-09-ah North east state panga - Assam, Manipur, Tripura, Mizoram te Crop area khaikhinnaah chuan Mizoram pum crop area 50.52% luah pha Horticulture & Plantation Crops-a sang ber a ni. Hei hi kan tihpun belh zel a \ul hle.
8. Hetih lai hian Agriculture Department chuan 2005-06 a\angin 2013-14 thleng (kum 9 chungin) Red Oil Palm Mizoramah 17,588 Ha. a zau an chintir tawh a ni. Hei hi Mizoramah chuan thlai mal (Single Crop) chin tam ber a ni ta reng mai. Hei hian thlai mal area luah zau ber \hin Serthlum 13,508 Ha. (2013-14) chu 4080 Ha. zetin a rawn lehpel dawrh mai a. Kum tin Serthlum chinna hmun kan zauh bel dan @3063 Ha. per year (2009-10 to 2014-15) anga chhutin umpha tur emaw lehpel tur emaw chuan kum hnih tal kan mamawh a ni. Tin, kan area khuh zau ber serthlum dawttu Balhla hian Mizoram khawi lai hmun pawh a ngeih a, kan GSDP tana thawhhlawk em em Cultivation Technique sang bawk si lo, ram pawn thlenpui hmaa hralh zawh nghal zel theih hi a chi thianghlim nen bul kan \an thar leh a ngai hle a ni.
9. Japan International Cooperation Agency (JICA) chuan kum 2 chung (2013 & 2014) a zir chian hnuah Mizoram Agriculture hmasawna tur Master Plan a siamah hetiangin Strategy \ha leh ril tak a duang a.



Heta \anga kan zir atana \ha tak mai chu kan chenna ram, kan Zoram zim te, 21,081 Sq.Km (21,08,100Ha.) lek, mihring pung zel bawk siah hian Horticulture Potential land 11,56,000Ha. lai kan nei ve a, chuta 1,09,000Ha. chu kan hman \angkai mek a ni a. Mahse, mihring pun chak dan chhutin kan ram hi a awl rei dawn loh bakah potential anga kan chhal hi kum sawm bi a vei tam hmain a potential lo \euh dawn a ni. Kan ram zauzawng lah inchi khat pawhin kan zauh hmel bawk si lova, chuvangin, Japan-ho ruahman ang hian a thar hlawk dan (productivity per unit area) tipung tura hma kan lak nasat a ngai a ni. Tin, thlai chinna area hi zauh satliah ni lo, thlai rah sengna hmun ngei zauzawng tihpun hi kan tum ngei tur a ni. Chu chuan awmze hrang daih a nei a, rah seng mumal awm mang si lova huan siam ve zelzul lam a kawk lova, kuangbang awm lova seng fai vekna tur thlai chinna hmun kan zauh zel tur tihna zawk a ni. Tin, kan thlai thar hlutna tipung tur hian a ngaihna hria thlai thar chhuah tihral lam concerned minister te, chutiang lam khawih thiam tak concerned department officer te an la rawn chhuak ve zel turah ngai ila, chutih hunah chuan Railway Transport, Highway Transport to ASEANs etc. kan la chhawr \angkai ngei turah ngai ang.

10. Horticulture Minister, Pu H. Lalthanliana'n a sawi fo \hin, Ram tua\o thlai nekral (dominate) thei thlai, ram pawn a\anga lak luh fo ai chuan kan neihsa tihpun a, a hlutna belhchhah zawnga hma kan lak a \ul em em tawh a ni.
11. A tawp berah chuan Service Sector thawhchhuah (GSDP) tipung tur ringawtin Horticulture Department-ah hian thawk lo ila, Primary Sector (Agri & Allied) thawhchhuah a tam thei ang bera tipung turin \an i la ang u.

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PESTICIDE CHI HRANG HRANG LEH A HMAN DAN

Dr. H. Vanlaldiki
Horticulture Extension officer (PP)
Directorate of Horticulture

SI No	Pesticides	Mode of action leh thil pawimawh hriat tur	Dose	Hmanna tur rannung/natna
1.	Phosphomidon 40% SL	*systemic and acaricide with stomach and slight contact action *Absorbed actively by the leaves and roots	1.5/lit	Sucking pest -aphids, thrips, jassids, fruits flies leh boring insects ho kah nan a \ha
2.	Malathion 50% EC	*Non systemic insecticide and acaricide with contact, stomach and respiratory actions *Low mamalian toxicity	2-2.5ml/lit	Malathion hi low mammalian toxicity a nih avangin tho, thosi leh mihring seh chi rannung hrang hrang ven nan a \angkai a, buh leh be lam chi dah \hat ven nan pawh a \angkai. Rannung \angkai hoin an huat nep avangin damdawi him pawla ngaih a ni.
3.	Acetamiprid 20%SP	*Neo-nicotinoid group, systemic insecticide with contact and stomach action	0.2-0.5g/lit	Sucking pests ho thah nana damdawi \ha a ni a, a bikin whitefly rannung thah har tak thah nan a \ha hle.
4.	Emmamectin benzoate 5% SG	New molecules and systemic insecticide	0.4-0.75g/lit	Mites ven nana damdawi \ha bik a ni a, chutih rualin pangang ang chi rannung tam tak thah nan pawh a \ha hle. Bawrhaibe eichhetu pangang borer ven nan pawh \angkai tak a ni.
5.	Dichlorvos 76%EC	*Systemic insecticide and acaricide with stomach, contact and strong vapour action. *Excellent knock-down effect and fast degradation within 24 hours.	1ml/lit	*In leh a chhehvela rannung kah nan a \ha a *Aphid, whiteflies leh thrips, jassids ven nan a \angkai hle. *A residue hi a cham rei lo a, darkar 24 chhunga a reh avangin hmanhmawha thlai seng leh vat ngaih eg. bawrhaibe kah nan te a \ha hle. Fumigant action a neih bawk avangin thil nget ur nan a \ha
6.	Methyl Parathion 50%EC	*Non-systemic insecticide and acaricide with contact, stomach and some respiratory actions	2-3ml/lit	Chewing pest leh sucking pests eg. beetle chi hrang hrang keltelaimawm leh thlangdar (bugs) ang chi ho ven nan a \ha.
7.	Imidacloprid 17.8%SL	*Neo-nicotinoid insecticides with systemic insecticide *It has long residual activity *Can be used for termite control	0.2-0.5ml/lit	A formulation a zirin seed treatment atan te, leia rannung thah nan leh a hnah eichhetu thah nana hman theih damdawi a ni. 17.8 SL hi chu foliar application-a hman tur a ni. Sucking pests (aphids, plant hoppers, leaf hoppers, whiteflies leh thrips) ho thah nan a \ha a, leaf miner thah nan phei chuan duhtusam a ni. Termite ven nan pawh a \ha

8.	Profenofos 50% SL	*Non-systemic insecticide and acaricide with ovicidal contact and stomach action	2ml/lit - sucking pest 3ml/lit - borer leth thlangdar etc. ho tan	Rannung pangang ang chi ho (lepidopteran) ho thah nan a \ha a, Mites ven nan pawh damdawi \ha tak a ni.
9	Chlorpyrifos 20% EC	*Non-systemic insecticide with stomach, contact and vapour actions *It is termiticide/insecticide	2-3ml/lit - rannung thah nan 5ml/kg seed-a chi dah \hat nan 5ml/lit - tlumpi ven nan	Beetles leth bugs (thlangdar) chi ho ven nan te, chukchu leth thosi ven nan te a \ha a. Buh leth bal dah \hah (store grain) tur ven nan pawh damdawi \ha tak a ni. Fanghmir leth tlumpi thah nan a \ha bik. Leiah a cham rei a, thla 2-4 thleng a turin hna a thawk thei.
10	Carbufuran 3% WG	*Systemic insecticide and nematicid with contact and stomach actions	5g/tree	Vual leth thlai zung eichhetu ho venna damdawi \angkai tak a ni a, chubakah sucking pest, weevils leth flea beetles ho kah nan pawh a \ha. Systemic a nih avangin leia kan kah/leth khan thlai zungin a hip lut a, chu chuan a zung eichhetu laka a ven bakah a kung hrim hrim pawh rannung lakah a venghim Nematode thah nan pawh damdawi \ha tak a ni.
11	Monocrotophos 36% SL	*Systimic insecticide and acariced with contact and stomach actions	1.5-2ml/lit	Broad spectrum insecticide a nih avangin rannung chi hrang sucking, chewing and boring insects ven nan a hman theih a ni.
12	Neemazal-F Azadirachtin 5% Wp		3ml/lit	Aphids, thrips, jassids, whiteflies leth lepidopteran (pangang) ang chi ho ven nan a \ha.
13	Lambda-cyhalothrin 5%Ec	*systemic pyrethroid insecticide with contact and stomach actions and repellent properties. *Gives rapid knock-down effect and long residual activity. * Satisfactory control of insect-borne plant viruses	0.75-2ml/lit	Rannung chi hrang hrang sucking (a tuihnang zuk chi), lepidopteran (pangang a pui phengphehlep), coleopeteran (beetles) ang chi ho ven nan a hman theih.
14	Acephate 75%SP	*Broad spectrum systematic insecticide with ovicidal, contact and stomach actions	2-3g/lit	Sucking pests te, pangang ang chi leth cutworms , borer leth red hairy caterpillar ven nan a \angkai.
15	Virogold (SAS 103)	*Anti-virus, anti-fungal leth anti-bacterial a ni a, tlumpi lakah pawh thlai a veng thei.	4ml/lit Bur khat 900ml hi tui 200lit nena pawhlin, acre khat atan a tawk	Thlai natna chi hrang hrang leth rannung laka vengtu a ni a, natna do theihna a siam avangin thlaiin natna an vei har bik. Natna kai hmaa kah hi duhtusam a ni Thla khat vela upa an niha kah \an tur, tichuan natna an kai chuan kah nawn leth tur a ni.

16	NPAC F-7		3-4ml/lit in ni 7-10 danah kah nawn tur	Hmuar natna chi hrang hrang venna damdawi a ni eg. leaf spot, hnah val, a rah natna te pawh
17	NPAC F-8 (White special)		4-5ml/lit at 7-10 days interval	Whitefly venna bik a ni.
18	NPAC MITICON		4ml/lit at 10-12 days interval	Mites ven nan a \ha

FUNGICIDES

1.	Captaf (captaf 50% WP)	*Broad spectrum fungicide with protective and curative actions	2g/lit 3-5g/kg seed	Hmuar natna chi hrang hrang ven nan a \ha a, seed treatment tih nan pawha damdawi \ha tak a ni
2.	Hexaconazole 5%EC	*Systemic fungicide	1.0-2.5ml/lit	Hmuar natna chi hrang hrang ven nan a \angkai, a bikin cercospora vanga leaf spot natna awmte leh powdery mildew ven nan a \ha lehzuai
3.	Metalaxyl 35% WP	*Systemic and highly effective fungicides for sepcific use as a seed dressing against fungal diseases	1.0-2.5g/lit - a hnah kah nan 3g/lit - a chi chiah nan leh lei kah/leih (drench) nan	Hmuar chi hrang hrang - damping off, downy mildew, late blight leh powdery mildew ven nana damdawi \ha tak a ni. Thlai chi chiah nana duhtusam damdawi a ni.
4.	Carbendazim 50% Wp	*Systemic fungicide with protective and curative actions *Absorbed through roots and green tissues	1-2g/lit - a hnah kah nan 3g/lit - a chi chiah nan leh lei kah/leih (drench) nan	Hmuar natna chi hrang hrang ven nana damdawi hman lar ber pakhat a ni a, mahse a ngai reng hmang lo a, a chungam mi nen te pawh khian hman kar thlak \hin a \ha. Powdery mildew - grape, theihai leh vegetables ven nan a \ha bik bawk.
5.	Mancozeb 75%WP	Contact fungicide	3.5g/lit	Hmuar natna chi hrang hrang ven nan a \ha a, a chungam mi nen te pawh khian hman karthlak \hin a \ha. A bikin downy mildew , late blight leh early blight leh leaf spot chi hrang hrang ven nan a \angkai hle. Natna a tiham bakah hian manganese leh zinc a pai tel a, chu chuan thlai a tihriselin a \han a ti \ha.
6.	Ridomil Gold (Metalaxyl 4%+Mancozeb 64%WP)	*Systemic fungicide with protective and curative actions *Absorbed through leaves, stem and roots *Longer persistence and so required less no. of application	1.25-2.0g/lit hi a hnah kah nan 3g/lit in nursery- a lei kah/leih (drench) nan	Hmuar natna chi hrang hrang ven nan a \ha a, a bikin downy mildew damping off leh late blight (tomato leh alu) ven nan a \ha Sawthing lawih (rhizome rot) ven nan pawh duhtusam a ni.
7.	Copper sulphate	* Aquatic algicide and foliar fungicide with protective actions * Very effective as a wood preservative	1:1:100 as Bordeaux mixture 1:1:10 as Bordeaux paste	Hmuar natna ven nana tinreng damdawi a ni, chinai nena pawlhin Bordeaux mixture leh Bordeaux paste siam nana hman a ni a, hmuar natna chi tinreng atan a \ha Damdawi a nihna bakah Bordeaux mixture hi thlai tana chaw \ha (copper, sulphur leh calcium) a pai tel

				avangin thlain an ngeihin an hriseh phah duh bawk. Chinai nena pawlh loh chuan thlai a kang (phytotoxicity) duh a, chuvangin fimkhur a \ul hle.
8	Streptomycin 90% +Tetracyclin 10%	Antibiotic	0.5-1.0g/lit at 15 days interval	Bacterial disease ho ven nana damdawi \ha tak a ni eg. serthlum natna canker leh scab, tomato-bacterial blight.
HERBICIDES				
1	Paraquat dichloride 24%SL	*Damdawi kah a'anga darkar 24 hnuah a thawk \an *Eng thlai huan atan pawh a hman theih vek eg. orchard leh thlai (vegetables) *Leilung buatsaih lai pawhin a kah theih a, lei tan engmah pawina a nei lo.	5-10ml/lit	Non selective herbicide a nih avangin hnah bial leh grass ho thah nan a hman theih ve ve.
2	Glyphosate 41% SL	A hnahin a hip a, thlai zawng zawngah a sem darh \hin.	5ml/lit a chawr no thah nan 10ml/lit hnim lian leh sang ho kah nan	Non-selective a ni nachungin hnah sin/ di ang chi hoin an haw bik. Hnim lian tawh thah nan a \hat em em rualin chawr tantirin an haw ber.
3	2, 4-D Sodium salt 80% WP	Selective systemic, post-emergence herbicides a ni.	5g/lit	Hnah bial leh hnah hlai hlo bik a ni. Diin an haw ve lo. Hnim \o chhuah \antirh a de \an tihah kah tur.
PLANT SUPPLEMENTS AND NUTRIENTS				
1	CAN (Calcium Ammonium nitrate)	Mixture of calcium carbonate leh ammonium nitrate	Leiah pek tur, a hnahah kah loh tur	20-25% Nitrogen leh Calcium a pai a, thlai chaw \ha a ni.
2	WIN-A-CROP		A bawmah hian packet pahnih No 1 leh No 2 inziak a awm a, 1 zawk hi ni 15-30 vela upa an nihin 0.5g/lit-in a hnaha kah tur a ni, a zung bul vela leih pawh a pawi lo. No 2-na chu a parhma deuhin emaw a hmasa kan kah a'angin ni 15-30 hnuah kah leh tur a ni.	
3	Multiplex for vegetables	Micro-nutrients chi hrang hrang a pai	2.5g/lit-in ni 20 danah vawi 3 tal kah tur. Rannung thahna damdawi dang nena chawh-pawlh a pawi lo.	Thlai (vegetables) tan a \ha bik

4	Jagromin 99	A hnaha kah chi a ni	2.5ml/lt ni 30-35 an nihin kah a, chumi hnu ni 20-25 velah kah nawn leh tur	Micro-nutrients-thlai chaw \ha chi hrang hrang a pai a, thlai engah pawh a kah theih, a bikin micro-nutrient tlachhama kan hriat thlaiah kah leh zual tur.
5	NPK 19:19:19	A hnaha kah chi a ni	4-5g/lt	Macro-nutrients pathum- nitrogen, phosphorus leh potassium a pai
6	Gibberalic acid	*Broad spectrum plant growth regulator, effects in extremely low concentrations *Influence growth and development of plant, flowers, fruits, berries and branches etc	1-2g/lt	Chi hrang hrangin a hman theih a ; 1. A rah insiam \hat nan (fruit setting) 2. Grape-ah a rah len nan 3. Ser lemon ang chi ho-ah a rah hmin tur tihtlai nan (a hring rei a, a eng har) 4. A lu-ah dormancy break a, tih chaw hma nan

Note :

1. Damdawi reng rengte hi a ngai reng hmang loin hman chhawk (rotate) reng tur a ni a, a \hat dan inang leh thawh dan inang \heuh \heuh pawh rotate kual a \ha ber. Entir nan acetamiprid leh imidacloprid te hi systemic insecticide ve ve an ni a (Neo-nicotinoids-ah pawh group khat Chloronicotinyl compounds ve ve an ni a), a pakhat zawk pawh khian vawi eng emaw chen chu kap char char ila, a \ha viau mai thei a, amaherawhchu, pest resurgence (rannung puang) leh resistance (damdawi do theihna) a awm theih avangin hman chhawk tur a ni, chu chu kan thlai leh rannung ven nan mai bakah beneficial insects humhalh nan a pawimawh em em a ni.
2. A chung a damdawite hi a siamtu company-ten hming dang dang an pek avangin a composition ang zel zawka ziah a ni. Damdawi kan chawhin ngun taka en \hin a \ul hle.

FINANCIAL ASSISTANCE AVAILABLE FOR PROMOTION OF HORTICULTURE

T. Liankunga
ADHO, Kolasib

Horticulture promotion atan sorkar-in Scheme/Programme/Mission hrang hrang a siam a, chumi tihlawhtling tur chuan Department hrang hrang bakah Board hrang hrang a siam bawk a, chuti chung chuan kan State (Mizoram) hian kan tawng sang lutuk lovin, heng scheme hrang hrangte pawh hi kan chhawr \angkai tawh lovin a hriat a, chuvangin ngaihtuahna thar leh thinlung thar pua theihtawp chhuaha \anlak a pawimawh hle a ni.

Horticulture-a hmasawwna thlen tur hian thiamna, finna, taimakna, thawhrimna a pawimawh rualin sum leh pai tel lovin bul \an a har \hin. Sum leh pai kan mamawhte dap chhuak turin Sorkarin Scheme/Programme/Loan kan hman \angkai theih tur a duante tarlan kan tum ang a, chipchiar taka tarlan erawh tun atan chuan a theih loh mai thei, mahse a kalphung tlangpui kan tarlang ang a, chumi a\ang chuan a bawhzui dan tur chu kan hre chhawm mai turah ngai ila a \ha ang e.

1. Mission for Integrated Development of Horticulture (MIDH)

He Mission a\ang hian farmers-te hnenah \anpuina kan pe thei a, a tlangpui thuin a chanve (50% of the estimated cost) sorkar-in a tum a, 50% dang leh chu farmers ten an tum tura ngaih a ni. He mission a\ang hian programme tam tak ruahman a ni a, chung a\anga \anpuina pek theih dan chu hetiang hi a ni.

MIDH HNUAIA | ANPUI AWM THEITE

S/n	Particulars	Cost Norms	Pattern of Assistance
A	Production of planting materials		
	1. Hi-Tech Nursery (4 ha)	Rs. 100 lakhs	Rs. 40 lakhs (40%) credit linked back ended subsidy
	2. Small Nursery (1 ha)	Rs. 15 lakhs	Rs. 7.5 lakhs (50%) credit linked back ended subsidy
	3. Upgrading Nursery Infrastructure to meet accreditation norms (4 ha)	Rs. 10 lakhs	Rs. 5 lakhs (50%)
	4. Setting up of new Tissue Culture Units	Rs. 250 lakhs	Rs. 100 lakhs (40%) credit linked back ended subsidy
	5. Seed production for vegetables and spices		
	a) Open pollinated	Rs. 35,000/ha	50% limited to 5ha (Rs. 87,500)
b) Hybrid seeds	Rs. 1.50 lakhs/ha	50% limited to 5ha (Rs. 3.75 lakhs)	
6. Seed Infrastructure (handling processing, packing storage of seeds etc. of seeds meant for use	Rs. 200 lakhs	Rs. 100 lakhs (50%) credit linked back ended subsidy	

	as seed material for cultivation of horticultural crops) Area expansion of fruit crops (max 4ha per beneficiary)		
B	a) Integrated package with drip irrigation	Rs. 1 lakh to 5.5 lakhs/ha based on crops	50% for 2-3 yrs for the cost of planting materials, drip material, INM/IPM Rs. 50,000 - 2,75,000
	b) Without Integration	Rs. 60,000 to Rs. 1,25,000/ha based on crops	50% for 2-3 yrs for the cost of planting materials, INM/IPM Rs. 30,000 - 62,500
C	Area expansion of vegetables (max 2 ha per beneficiary)	Rs. 50,000 per ha for hybrid only	50% Rs. 25,000
	a) Production Unit	Rs. 20 lakhs per unit	40% credit-linked back ended subsidy (Rs. 10 lakhs)
	b) Spawn making unit	Rs. 15 lakhs per unit	40% credit-linked back ended subsidy (Rs. 7.5 lakhs)
	c) Compost making unit	Rs. 20 lakhs per unit	40% credit-linked back ended subsidy (Rs. 10 lakhs)
D	Area expansion of flowers (max 2 ha per beneficiary)		
	a) Cut flowers	Rs. 1.0 lakh/ha	50% (Rs. 50,000)
	b) Bulbous flowers	Rs. 1.5 lakh/ha	50% (Rs. 75,000)
	c) Loose flowers	Rs. 0.4 lakh/ha	50% (Rs. 20,000)
E	Area expansion of loose flowers		
	a) Seed & Rhizomartic Spices	Rs. 0.3 lakh/ha	50% (Rs. 15,000)
	b) Perennial Spices	Rs. 0.5 lakh/ha	50% (Rs. 25,000)
F	Area expansion of Cashew on Cocoa (max 4 ha per beneficiary)		
	a) Integrated with drip irrigation	Rs. 1.0 lakh/ha	50% for 3yrs for the cost of planting material, drip and INM/IPM (Rs. 50,000)
	b) Without Integration	Rs. 0.5 lakh/ha	50% for 3yrs for the cost of planting material and INM/IPM (Rs. 25,000)
G	Creation of Water Sources		
	a) Community water Tank	Rs. 25lakh/unit	100% for group of farmers
	b) Individual Water Tank	Rs. 1.80 lakh per unit	50 % (Rs. 90,000)
H	Protected cultivation (max 4,000 Sqm per beneficiary)		

	a) Fou & pad system Greenhouse	Rs. 1610 to Rs. 1898 per Sqm based on size of area (500-4000)	50% (Rs. 805 - Rs. 949)
	b) Tubular structure greenhouse	Rs. 970 to Rs. 1219 per Sqm based on size of area	50% (Rs. 485 - Rs. 609)
	c) Wooden structure greenhouse	Rs. 621/Sqm	50% (Rs. 310)
	d) Bamboo structure greenhouse	Rs. 518/Sqm	50% (Rs. 259)
	e) Tubular structure shadenet house	Rs. 816/Sqm	50% (Rs. 408)
I	Cost of planting materials and cultivation in polyhouses		
	a) High value vegetables (Tomato/Capsicum etc)	Rs. 140/sqm	50% (Rs. 70)
	b) Orchid and Anthurium	Rs. 700/Sqm	50% (Rs. 350)
	c) Carnation & Gerbera	Rs. 610/Sqm	50% (Rs. 305)
	d) Rose and Lilium	Rs. 426/Sqm	50% (Rs. 213)
J	Horticulture Mechanisation		
	a) Tractor (upto 20hp)	Rs. 3 lakh/unit	Rs. 1.00lakh (Max)
	b) Power tiller (below 8BHP)	Rs. 1 lakh/unit	Rs. 0.5 lakh (50%)
	c) Power tiller (above 8BHP)	Rs. 1.5 lakh/unit	Rs. 0.75 lakh (50%)
	d) Self-propelled horticulture machinery	Rs. 2.5 lakh/unit	Rs. 1.25 lakh (50%)
	e) Plant protection equipments	Rs. 1200 to Rs. 20,000 based on equipments	50% (Rs. 600 - 10,000)

MIDH hnuai programme/scheme hrang hrang hmang hian Horticulture lama tui \halai/farmer ten eizawna bul kan \an theih ngei ka beisei.

2. Rastrya Krishi Vygian Yajona (RKVY)

He scheme hi chu State Sorkar-in Agriculture/Horticulture programme tana budget a dah do letna leh a tlakchham lai puhruksak tumna a nih avangin a kal reng thei dawn em sawi theih a ni lo a, \anpuina pek theih dan pawh MIDH norms zulzuia kalpui a ni.

3. OFWM under NMSA

He mission hnuai hian thlai tui pekna lam kalpui a ni a, \angkai taka hman dan ngaihtuah a pawimawh hle a ni. State Matching Share ngai a ni a, hetiangin -

Gov't of India - 50%
Farmer - 40%
State - 10%

4. Board hrang hrangte :

- a) Coconut Board
- b) Cashew Board
- c) Tea Board
- d) Spices Board
- e) National Horticulture Board etc.

Heng Board hrang hrangte hian programme kalpui dan leh financial assistance pek dan hrang vheuh an nei a, chipchiarin sawi lo mai ila, chutih rual erawh chuan NHB Scheme/Programme kalpui dan leh kan hlawkpui theih dan tur tlangpui tarlan tum ila, kan Vangkaipui ngei ka beisei.

Cost Norms leh Pattern of Assistance chu a hnuai tarlan ang hi a ni e.

A. COST NORMS FOR OPEN FIELD UNDER NATIONAL HORTICULTURE BOARD SCHEMES

S/n	Crops	Plant Spacing (Metre)	No of Plants per Acre (Nos)	Cost of Planting Materials/acre (Rs.)	Overall Ceiling in Project Mode with Add-on Components/acre (Rs.)
1	2	3	4	5	6
1	Aonla	6x6 3x3	112 444	4,003 15,984	1,25,000.00 1,70,000.00
2	Banana (Sucker)	2x2	1000	10,000	1,25,000.00
3	Banana (TC)	1.8x1.8	1234	20,984	1,50,000.00
4	Lime/Lemon	3x3 4x4	444 222	15,998 7,992	2,00,000.00 1,75,000.00
5	Mandarin/Orange	6x6 4x5	112 200	4,003 7,200	1,75,000.00 1,75,000.00
6	Sweet Orange	6x6	112	4,003	1,75,000.00
7	Custard Apple	2.5x2.5	640	25,600	1,50,000.00
8	Grapes	4x4 1.8x1.8	250 110	3,750 16,662	3,20,000.00 3,55,000.00
9	Guava	6x6 1x2	112 2,000	3,336 60,000	1,25,000.00 1,75,000.00
10	Kiwi	6x6 4x4	112 250	2,780 6,250	1,75,000.00 2,20,000.00
11	Lichi	10x10 4.5x4.5	40 197	2,000 6,580	1,50,000.00 1,65,000.00

12	Mango	10x10 2.5x2.5	40 640	1,800 28,800	1,50,000.00 2,00,000.00
13	Papya	1.8x1.8 1.5x1.5	1,110 1,777	16,662 26,664	1,25,000.00 1,50,000.00
14	Passionfruit	4x4 3x2	250 666	5,000 13,328	2,50,000.00 2,70,000.00
15	Peach	3x2.5 2.5x2.5	533 640	18,662 22,400	1,50,000.00 1,50,000.00
16	Pear	5x5 3x3	200 444	6,000 13,332	1,25,000.00 1,50,000.00
17	Pineapple (sucker)	0.6x0.30	18,000	54,000	2,00,000.00
18	Pineapple (TC)	0.6x0.3 0.225x0.6x0.9	18,000 21,200	72,000 84,800	2,25,000.00 22,000.00
19	Plum	3.5x3.5 2.5x2.5	326 640	13,056 25,600	1,25,000.00 1,50,000.00
20	Strawberry	0.9x0.45 0.5x1.00	9,876 8,000	49,382 40,000	2,00,000.00 1,75,000.00
21	Cashewnut	8x6	85	5,740	2,00,000.00
22	Coconut	7x6	95	6,650	1,50,000.00
23	Tamarind	10x10	40	2,000	1,25,000.00
24	Pomegranate	5x5 4x3	160 266	6,400 10,656	1,85,000.00 1,85,000.00

- NB : 1) Minimum area of the project is 2 ha (5 acres)
2) Maximum limit of assistance per project is Rs. 37.50 lakh in NE & Hilly Areas

B. COST NORMS FOR PROTECTED CULTIVATION UNDER NHB SCHEMES

S/n	Crops	Cost of Poly house with drip & fogger system/acre	Cost of cultivation/acre (Rs. in lakh)	Cost ceiling per acre with add-on components in project mode (Rs. in lakh)
1	2	3	4	5
1	Anthurium and Orchid	33.76	28.00	70.00
2	Rose, Lilium and Chrysanthemum	33.76	17.04	60.00
3	Carnation and Gerbera	33.76	24.40	66.00
4	Hi-Value Vegetables under Poly houses	33.76	5.60	47.00
5	Hi-Value Vegetables under Shade Net	28.40	5.60	40.00

- NB : 1. Cost of Tubular Structure Poly House will be 15% more in hilly areas.
 2. Minimum area of project is 2,500 Sqm.
 3. Maximum limit of assistance is Rs. 56.00 lakhs.

C. Norms of Technology Add-on Components and other essential components of Integrated Commercial Horticulture Projects

S/n	Items	Description	Admissible Cost
1	2	3	4
1	Cost of Land	Admissible only if newly but not before one year from date of sanction of loan	Actual or 10% of eligible project cost subject to maximum of Rs. 50,000 per acre
2	Land Development	Includes cost of land leveling, digging of pits, fencing, gates etc.	Actual or 10% of eligible project cost subject to maximum of Rs. 50,000 per acre
3	Cultivation	Includes costs of planting materials, cost of inputs	As per MIDH Cost Norms
4	Drip System with internal pipelines	Includes mainlines, valve, regulator, filter etc.	i) Rs. 20,000 to Rs. 25,000 based on plant density ii) Sprinkler Rs. 15,000 per acre

TOMATO PEST / DISEASES

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Cutworm (Katua) Horn Worm	October - March	Neem Seed Kernel 5ml/1	Chlorpyripos 3ml + 1 ltr. Water + spray	After 25-30 days 1 st spray 2 nd spray after 15 days 3 rd Spray after 30 days
Aphids (Mahu)	Whole Year	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	
Fruit worm	May - August	Neem Seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	
Nematode	May - August	Neem Seed Kernel 5ml/1	Carbofuran 4kg/ha + 1ltr Water + Spray	After 10 - 12 days interval

Leaf Curl Virus	October - March	Neem Seed Kernel 5ml/1	Methyl demeton 1.5ml + 1ltr. Water + Spray	After 10 -15 days Interval
Bacterial Disease	February - March		Bleaching Powder 2kg + 1ltr. Water + Spray	After 10 - 15 days Interval

BROCCOLI PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Aphids (mahu)	Whole year	Neem Seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	After 25 - 30 days 1 st spray 2 nd spray after
Cabbage worm	October - March	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr. Water + Spray	15 days 3 rd spray after 30 days
Downey Mildew	May - August	Neem Seed Kernel 5ml/1	Rodomil 2gg + 1ltr Water + Spray	

CAULIFLOWER PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Aphids (mahu)	Whole year	Neem Seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	After 25 - 30 days 1 st spray 2 nd spray after
Diamond moth	September - March			
Worm	October - March	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	15 days 3 rd spray after 30 days
Whitefly	October - March	Neem Oil 5ml/1	Chlorpyriphos 3ml + 1ltr Water + spray	
Black Rot Disease	August - March	Neem Oil 5ml/1	Copper Oxy Chloride 3 gm + 1ltr. Water + spray	After 1 month

CABBAGE PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Aphids (mahu) Diamond back moth	Whole year September - March	Neem Seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	After 25 - 30 days 1 st spray 2 nd spray after 15 days 3 rd spray after 30 days
Cabbage Worm	October - March	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	
Cabbage looper	October - March	Neem Oil 5ml/1	Chlorpyriphos 3ml + 1ltr Water + spray	

BRINJAL PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Fruit & Shoot borer	May - August	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	After 25 - 30 days 1 st spray 2 nd spray after 15 days 3 rd spray after 30 days
Aphids (mahu)	Whole year	Neem Oil 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	
Whitefly	October - March	Neem Oil 5ml/1	Imidacloprid 2ml + 1ltr Water + spray	
Beetle	October - March	Neem Oil 5ml/1	Triazophos 2.5ml + 1ltr Water + spray	
Nematode	May - August	Neem seed kernel 5ml	Triazophos 2.5ml + 1ltr Water + spray	

OKRA (BHINDI) PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Aphids (mahu)	Whole year	Neem Seed	Endosulfan	After 25 - 30 days 1 st spray 2 nd spray after 15 days 3 rd spray after 30 days
Worm	October-March	Kernel 5ml/1	2ml + 1ltr Water + Spray	
Moth	October-March			
Whitefly	October-March	Neem Oil 5ml/1	Triazophos 2.5ml+1ltr Water + Spray	
Nematode	October-March	Neem Seed Kernel 5ml/1	Triazophos 2.5ml + 1ltr Water + spray	After 10 - 12 days interval
Virus Disease	October-March	Neem Seed Kernel 5ml/1	Methyl Demeton 1.5ml + 1ltr Water + spray	After 10 -12 days interval

POTATO PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Aphids (mahu)	Whole year	Neem Seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + Spray	After 10 - 12 days Interval
Whitefly Grub	October-March	Neem Oil 5ml/1	Chlorpyriphos 2ml + 1ltr	After 25-30 days 1 st spray 2 nd spray after 15 days 3 rd spray after 30 days
Potato Tuber	September - March	Neem seed Kernel 5ml/1	Water + Spray Endosulfan 2ml + 1ltr Water + Spray	
Moth				
Late Blight	October-March	Neem Seed Kernel 5ml/1	Mencozeb 2.5gm + Carbendazim 1gm/1 + 1ltr Water + spray	After 10 - 12 days interval

CAPSICUM/CHILLI PEST / DISEASE

Insect name	Causing period	Control measures		Spraying
		Botanical	Chemical	
Weevil grub	May - August	Neem Oil 5ml/1	Chlorpyripos 3ml + 1ltr Water + Spray	After 25 - 30 days 1 st spray 2 nd spray after 15 days 3 rd spray after 30 days
Antracnose/ Trips	October-March	Neem Oil 5ml/1	Borex 3gm + 1ltr Water + spray	After 10 - 12 days interval
Aphids (Mahu)	Whole year	Neem seed Kernel 5ml/1	Endosulfan 2ml + 1ltr Water + spray	After 10 -12 days interval
Leaf curl virus (Viral Disease)	October - March	Neem seed Kernel 5ml/1	Methyl demeton 1.5ml + 1ltr Water + Spray	After 10 - 12 days interval

CANOPY MANAGEMENT AND REJUVINATION OF SENILE PLANTATION

M. Vanlalzami
HDO (Ft)
Department of Horticulture

Introduction

Canopy management hi khawvel mihringte ei bar mamawh pung zel hmachhawn thei tura thei kung enkawl dan kawngah tihdan pawimawh berte zinga mi a ni. Canopy management chu thei kung rah \ha leh thar tam tura a kung enkawl nuam bawk sia siam rem dan tiin a sawifiah theih awm e.

Rejuvenation chu thei kung a nihna ang tak tura a \han theih nana enkawl emaw thei kung upa tawhte tuai thar lehna a ni.

Canopy management-a tih tur leh hriat tur pawimawhte :

- **Thei kung zar tin leh \ang tinin ni eng hmu vek tura siam.**

Thei hnah tinin ni eng an mamawh ang an hmuh theih nan a kung tet lai a\angin training emaw pruning emaw tih nghal tur a ni. Ni eng hian thei kung leh rah a ti\hang \ha a, thlai hnahten eng an lo dawn \hat hian carbohydrates leh sugar a lo insiam \hin a, chungte chu a mamawh hun leh mamawhna apiangah eg. a chawr tharah te, a parah te leh a rahah te an hmang \angkai \hin a ni. Thei kung zar tinten ni eng an hmuh rual \hat chuan a \han a \hat phah a, a rah a titamin a rah quality a \hat phah \hin.

- **A kung buk ei chhetu tur rannung leh natna awm theih loh dan tur.**

Thei kung a buk lutuk chuan rannung leh natna tam tak an awm phah \hin a, a rah pawh a tlem phah \hin. Chuvangin buk leh lutuka dah loh tur.

- **Awlsam zawka enkawl theih tura a kung siam.**

Thei kung tam tak chu a kung a san lutuk avang leh a buk lutuk avangin pesticides emaw nutrients-in kah a harsat phah \hin. Chuvangin a kung sang chite chu a hniam tura prune leh a hnah zawng zawng kap kim thei turin a buk dan pawh control a \ha.

- **Rah \ha tak leh hrisel tharchhuah**

Thei kung zar tinin ni a hmuh \hat chuan a rah pawh a hrisel nge nge \hin a, chu mai bakah a thlumin a tui zawk a ni.

- **A kung/buk awmze neia hlawk tawka enkawl**

A buk lutuk chuan a rah leh a kungin a hrisel loh phah thei a, prune nasat lutuk chuan a rah a tlem phah thei bawk.

CANOPY MANAGEMENT TIHDAN TLANGPUITE :

Modified Leader System

- Thei phunin 50-75cm-a sang a thlen hma chuan a peng/\ang paih tur.
- Hemi chung lam a\ang chuan a peng zar zuah chhoh tur.
- A kung ziding 3-3.5-ah tan chhum tur.
- A peng/zarte chu bial deuh maiin a insiam \hin
- A zik ziding tan hi plant density azirin tan hniam emaw tan san emaw tur a ni.

Open Centre System

- Thei kung lei a\anga 30-45cm thleng a peng paihin kung mal din tur a ni.
- Lei a\anga 30-45cm chung lamah chuan a peng/zar zuah tur.
- A kung zidingin 1.5-2.0m-ah tan chhum tur.

Central Leader System

- Thei kung lei a\anga 30-45 cm thleng a peng paihin kung mal din tur a ni.
- Lei a\anga 30-45 cm chung lamah chuan a peng/zar zuah tur. Hetiang hian V-shape canopy an siam \hin.

Head Back (Topping)

- Thei kung upa leh rah \ha tawh lo siam nulat (rejuvanate) nan December - January-ah lei a\anga 2.5-3.0 M a kung/peng tan tur.
- A tanna lai hi copper oxichloride emaw bawng ek diakin emaw hnawih tur.
- A chawr thar a\angin a zar puitling tur duh zat zuah tur.
- | ang/zar 4-6 vel zuahin a zar khamphei/pharh tura siam.
- May-June-ah a \ang/zar zuahte chu a zatve (50%) vel sih tawi leh tur.

THEI KUNG | HENKHat A CANOPY SIAM DAN TUR:

- **Banana**

- A hnah tam lutuk chuan a hnah hlui paih \hen.
- A sucker paih \hen \hin.
- A hnah hrisel lote natna a inkai darh loh nana paih.

- **Mandarin Orange**

- A tet laia 70-80cm a sang vela tan.
- A zar \ha 2/3 thlan a, a kung atana zuah.
- A zar lo chhuak thar kum 1-a upate a chanve vel paih \hin.
- Water shoot paih nghal zel.

- **Kawlthei**
 - A len hmain 60-70cms a sangah tan tur, zuaha a chanve veleh tan leh tur.
 - A zar tan hi January thlaah leh May thlaah tih a \ha.
- **Litchi**
 - Phun hlimin 50cms vela sangah tan tur.
 - A tanna hnuai chiaha a chawrte chauh zuaha a bul\hut lama chawr zawng chu paih tur
 - A lo \han len laiin a buk lutuk tur ven a \ha.
 - A rah \ha lo zarte tan.

PRUNING-A HRAT TUR PAWIMAWHTE

- A kung/buk \han \hat nan.
- A thar tam leh a rah \hat nan.
- A kung leh a zung inbuk tawk turin.
- A zar derdep awm lo turin.
- A zar leh a \ang peng zat bithliah fel takin.
- A zar inkawkalh leh innawt lo turin.
- Water sprouts paih zelin.
- A kung/buk pharh \ha turin.
- A rah hun bi chiaha lo pawha rahtir thei turin.
- A kung lian lova kung tam zawk phun thei turin.
- Ni eng \ha tak hmu turin.
- Rah lian turin.
- Huan enkawl nawmna turin
- Thei kung dam rei nan.
- Thei kung upa tuaithar leh nan.
- Natna leh rannung eichhetu ven nan.
- Kan duh ang taka thei kung siam turin.

NORTH EAST STATES-A SER TAM/THIHNA CHHANTE

- Tlang ram a nih avangin leilung luang ral a tam.
- Ser hrisel \ha tawk lote kan phun avangin.
- Ser hmuna thlai dang chin pawlh nasat lutuk vang.
- Ser huan enkawl \hat loh lutuk avangin.
- Trunk borer leh phytophthora natna avangin.
- | hal laia tui a mamawh pek loh avangin
- Lei\ha pek \hin loh avangin.

A ENKAWL DAN

- Half-moon terrace siam leh a kung bulte tihfai
- Water shoots, a \ang ro leh bawngghar te, plant parasites te a awm chuan paih \hin.
- FYM 30Kg, Urea 1.30Kg, SSP 3Kg, MOP 1.2kg te hi hmun thumah \hen ila, March-April, June-July leh September-October-ah te pek tur. Dolomite emaw chinai thi 3Kg kung khat atan kum thum danah pek tur.
- Multiplex hi tui 1lit-ah 2.5ml zel pawlhin kah \hin tur. A chawrno laia kah a \ha.
- Trunk borer hian a tichhe nasa ve hle \hin a, chuvangin trunk borer puitling tawhte thah nan a zarte kha wawi 2/3, ni 10 danah May thla chungin sawi \hin tur.
- Trunk borer-in a kung a kher kuakah khan petrol/khawntartui/Monocrotophos emaw Syringe-in chiu lut ila, lei banin char hnan leh ila a \ha.
- Bordeaux paste-in a kung zut \hin tur.
A hnah zawng zawng Bordeaux Mixture-in kum khatah wawi 2 tal kah \hin a \ha.

LEI | HA PEK

- Lei\ha pek reng rengin a zung tamna lai ber chaw la lut theiho awmna kan ngai pawimawh tur a ni. A buk hmawr a\anga a kung lam ½ft huam chungah lei\ha kha pek tur a ni.
- Lei\ha pekna lai tur kha tlema laih khuara lei\ha pek hnuah vur leh tur a ni.
- Lei\ha pek zawh veleh tui pek a \ha.

TUI PEK

- | hal laiin kar khat danah tal tui pek a \ha.
- Tui pek pawh a zung tamna laia pek tur a ni.

GUMMOSIS OR ROOTROT

- A kung bulah tui tlintir loh tur.
- A hnai/gum te kha chema ziah faia Bordeaux paste hnawih tur.
- Rootrot atan a bul vela lei then fai a, Potassium Permanganate solution 1% leih a, a hnuah Bordeaux Mixture 1% leih leh tur.

SCAB

- Bavistin emaw Blitox-in April-June-ah leh September thlaah kah tur.



**Hon'ble Chief Minister, Mizoram Pu Lal Thanhawla'n
'HORTI FAIR 2015' Ribbon chep chatin Dt. 26.5.2015 khan a hawng**





Mizoram Governor thar Lt. General NIBHAY SHARMA in 27.5.2015 khan 'HORTI FAIR 2015' a tlawh a, Mizoram Florist Association-in pangpar an hlan



Mega sale - 2012 - Rs. 17,39,306/-
Horti Fair - 2013 - Rs. 22,90,367/-
Horti Fair - 2014 - Rs. 12,47,142/-
Horti Fair - 2015 - Rs. 17,10,030/-

CULTIVATION OF KIWIFRUIT IN MIZORAM

K. Zonunsanga
Horticulture Extension Officer
Sub-Divisional; Horticulture Office
Champhai, Mizoram

Botanical Name : *Actinidia chinensis*
Family : Actinidiaceae
Common Name : Chinese gooseberry Kiwifruit
Origin : China

Kiwifruit hi China ramhnuai thei chi khat a ni a, James McGregor an china ram a'anga a chi a lak thlak chu Alexander Allison chuan New Zealand-a; Wanganui-ah ching pungin a hmingah pawh New Zealand ram sava hming chawiin Kiwifruit tih a lo ni ta a. Kum 1910 vel lai khan hlawhtling taka rah chhuahtir \an a lo ni a. Chuta \ang chuan zir Chiang zelin variety tam tak an lo chhuahtir ta a, a variety pakhat hmingah pawh a ching chhuahtir Alexander Allison-a hming chawiin Allison tih te a lo ni ta a ni. Kum 1930 vel a'ang khan commercial fruit crop-ah an lo ching ta hial a ni. He thei hi hmun vawta chin chi niin hnah tla kawlh chi leh hrui zam chi a niin Species 50 chuang lai awmin a zam duang \ha duh tak 30ft lai mai pawha sang te a zam thei \hin. He thei khawvela thei tui ber leh hrisel bera sawi hian Vitamin 'C' a content a \ha hle a, nutritive value pawh thei dang zawng aini a sanga sawi a ni bawh. Kiwi theiah hian a nu leh a pa kung a awm hrang a, a pa kung hi polination \ha tak awm thei tur chuan 9:1 ratio (a nu kung kua (9)-ah a pa kung khat (1) a tawka ngaih a ni). Fertilization awm \ha chu a mu a tamin a thlum \ha bik em em a ni. A nu leh a pa kungte hi an parah chauh lo chuan a pa kung hriat hran mai theih a ni lo a; a pa parah chuan style chhul dawta nei ve loin a pollengrains awmna stigma hlirin a awm mai \hin. A rah hi artui lian pawl ang tiat vel niin 75gms to 120gms laite pawh fertilization a \hat chuan a ni thei a ni. A sen laiin leh a hmin hma chuan a thur thiang em avangin a hel pawh hi thei thur duh chuan an ei fo \hin bawh.

India ramah pawh hmun vawt zawk Solan, Himachal Pradesh leh Bomdilla, Arunachal Pradesh-ah te hlawhtling taka chin a ni a, chumi chu hriain Mizoram, a bik takin khawchhak ram hmun sang zawk leh ram vawt lam Tuichang (Khawzawl Division) chhak lamah te hian thlai chin \ha duh leh chin chi a tam loh em avangin khawvelin an thei ngaihsan Kiwifruit hi Khawchhak ram vawt deuh lam hmunah a \hat ve theih beiseiin Mizoram Horticulture Department chuan Khanpui Horticulture Farm, Chalfilh tlang pang, Samthang Horticulture Farm leh Champhai Horticulture Farm-ah te kum 1997-ah trial neihtir a ni a, Samthang Horticulture Farm-ah hian hlawhtling dawn viaua hriat a nih laiin a enkawltu Farm Manager-a awm chu sorkar sum indaih lohna avangin Department lam hotuten ruahmanna siamin Samthang Horticulture Farm Manager chu Champhai Horticulture Farm-ah hma chak zawka lak a nih theih nan tiin kum 1988 November thla tawp lamah khan sawn phei

a ni a. Samthang Farm-a enchhinna chu enkawl mumal lohin a awm ta a. Kum 1994 April thlaah Kiwifruit chu Champhai Horticulture Farm-ah trial neih zawmtir lehin a chi/Planting materials chu 4th April, 1999 khan Champhaia Horticulture Farm-ah kung 98Nos. chu phun lehin kum 2010-ah khan Mizoin a khawchhin an tih angin a rah \an ta. Kum 2005 kum vel kha chuan hlawhtlinna hmuh theihin kung khatah pawh a rah pum 647Nos. vel lai a lo thar thei ta mai a, heta a rahte chu a rih zawng 75gms to 120gms, Artui lian pawl tiat vel a\anga a aia liante an lo ni ta mai a. Mizoramah Kiwi thei (Kiwifruit) chin theih a ni tih hmuh chhuah/prove a lo ni ta a ni. Vanduaithlak takin kum 2006 khan he trail neihna ram hi a mual chawpin a tawlh bo zo hlah mai.

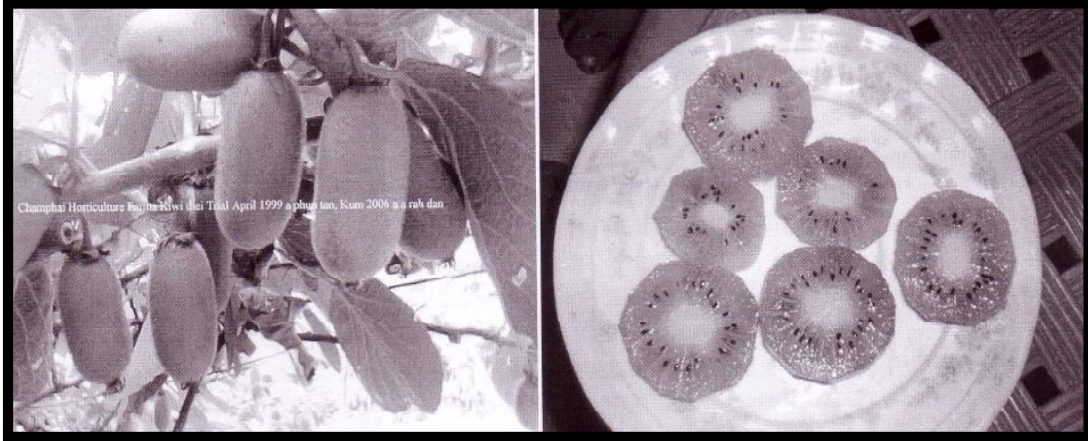
Heta \ang hian Department lam pawhin Champhai leh a chhehvel mipuiah chintir \anin tunah pheh chuan Division dang Saiha, Serchhip leh Aizawl te a ram vawt leh sang lai deuh hmunah te chintir \an a lo ni ta a ni. Mi taima leh tumruh ho chuan eng emaw zah a rah an lo seng ve ta a ni.



Male Flowers of Kiwifruit (Kiwifruit a pa par)



Female Flowers of Kiwifruit (Kiwifruit a nu par)



Kiwifruit rah

Crossection of Kiwifruit

Kum 2010 kum pheih kha chuan Pu Chalbawia, Champhai Vengthlang pawhin kung 15 vel lek a langin kum khatah Rs. 18,000/- vel lai mai a lo lei chhuak thei ta reng mai.

Hawh u, Zoram khaw vawt thlai nazawng \hat theih lohna leh thlai phun tur \ha vanna hmunah hian tuna Grape chingtuten hlawhtlinna an hmuh mek ram Economic sawi nghing lawih thei tur khawpa Zoram tihming \hatu ni tur leh khawthlangpa (Western Mizoram) ram luma chengte Serthlum awt bik hauh loin kan awm thei tih i han pholang leh dawn teh ang aw! Hma i han la ang u hmiang. Tichuan, mi taima leh tum ruh mi chuan a thawh rah an seng leh ngei dawn si a.

Climate (Sik leh sa) : Temperature 5.5°C to 24°C leh boruak hnawng 50-70% vel leh chilling period 400-600 hrs chung 7°C awm theihna hmun hi duthusam a ni.

Soil leh Site selection : Ram leilung duhzawng chu hmar chhak hawi, ram dam lam leh lei \hatna hmun, ruah tui luan ral zung zung theihna leh lei dur \ha Fertile Soil-ah te hian a \ha duh bik hle.

Pit : Khur zau zawng 1cum (1m x 1m x 1m) hi a \ha tawk hle a, khur hi FYM 5tin leh lei chung lang hang \ha uluk taka chawhpawlha chhilh tur a ni a, khur kan vur hian lei/soil level aiin 1ft vel tala sang/pawng a, tui tlin theih loh nan vur tur a ni. Hetianga kan hnawh chuan kan lei chawhpawlh khur hnawhna chu a lo tlak muk hnawh pawh tui tling thei loin a awm thei \hin a, chu chuan Damping off leh Rootrotten lakah a veng.

Spacing : Kiwi thei hi inkar hlat zawng chu 15ft (4m) - 18ft (5m)-a hla (Plant to Plant Row to Row ni se a \ha).

No. of Plant planting material requirement : Dan naranin Kiwifruit hi 400nos - 500 nos of seedling/Hactare khat atan a phun theih, phun inkar hlat dan a zirin.

Interculture Operation : Kiwi thei hi hruizam chi ni mah sela Grape te angin (tendril) khang a nei ve loh avangin a zamna pargola system-a siam a ngai a; a zamna a thlen hma pheii chuan a kung ngil tak a awm theih nan hrui emaw thingtuai emaw hmanga ven ngun a ngai em em \hin. A kung invet turte chu invet lo tura ven an ngaih avangin a kung ngil leh nalh tak mawi nei tur chuan Grape chin ang mai maia inthlahdah ve theih a ni lo. A zamna a thlen hnuah pawh a kung vial emaw invet let loa awm te leh a kung dawng van lam hawi zawnga \hang duang tak chu paih/cut \hin tur a ni.

Weeding/Thlawhfai : Kiwi thei hi thlawh fai fo tur a ni a, thlawh fai hian lei tidur leh hnim hnah kan thlawhna te chu a kung bul thlang lamah soil erosion veng zawng turin a kung a\anga ½ft - 1ft tala hlaah chang kham ang deuha tih \hin hi a \ha hle. Ngun taka enkawl a lo puitlin hnuah chuan a hnuai hnim pawh an lo nemin thlawh a hautak lo tial tial \hin a ni. Tui \hal laiin pek \hin a \ha hle bawk.

Kiwi thei hi a ritin kung khatah pawh a rah a tam theih em avangin a zamna hi uluk tak leh rinawm taka siam a ngai.

Cutting : Kiwi thei hi kum tinin Grape te ang deuh bawka mit li nga neia cut \hin tur a ni a, kan cut-na hmawr a\anga chhiara mit hnih thum vel a\angin a chawr thar dang a rawn insiam \hin.

Kiwi thei chu a kung leh zarte inzam kawkalh lo zawnga pharh \ha thei ang berin siam/enkawli \hin tur a ni.

A rah seng hun : Kiwi thei hi March thla tawp lam a\anga April thla chhungin an lo chawr \an a, a chawrna mit bul a\angin grape ang bawka par insiamin mit khatah rah khat zel a chhuah \hin a vangin a mit/chang zing apiang a \hain a thar hlawk. April thla chawhnu lamah a sen \an nghal \hin a, October to January thla chhungin seng a hun \hin. A seng/lawh hun dik tak hriat theih nan chuan hmul thiap mai chu dim tea i nuai zawnga a \ilh theih hun emaw a rah kha kuta na vak loa han hum zawnga a dup lam deuh em aw tih ang a awm chuan chu chu lawh hun a ni tih hriat mai tur a ni. A kung puitling \ha taka enkawlah chuan kung khatah pawh 1000 - 2000 thlengin a rah thei.

Thar theih zat : Kiwi thei hi dan naranin 350qtls - 800qtls/Ha thlengin ngun taka enkawl a nih chuan a thar theih a ni.

NB : Heng thlalak (photo) te hi Champhai hmuna adaptability trial (Enchhinna) neih ami vek an ni. Hun a chep a, duh ang leh kimchangin ka la ziak hman lo a, a photo nen kimchangin a bua la siam ka tum a, kan la chhiar zel dawn nia.

INTEGRATED NUTRIENT MANAGEMENTLalremruata
HEO (F)

Awmzia : Thlai chaw mamawh hrang hrang uar bik awm loa thiam tak leh \angkai thei ang bera pek dan hi Integrated Nutrient Management (INM) an ti a.

Fertilizer chauh hmang loin Organic Manure te, Compost, FYM, Green Manure, Biofertilizer-te hmangin lei \hatna vawng nung reng chungin thlai tam zawk thar turin INM hi hmang uar tura inzirtir a ngai hle a ni.

A \hatnate :

- Chemical fertilizer (lei chi) mal chauh hman chuan lei \hatna a pui lo a, chaw \ha chu pe mah se nakin zel atan a daih reng thei lo a, hun reiah chuan thlaiten \hatpui aiin an chhiat phah thei a, tui, leilung leh boruak thlengin a tibawlhhlawh thei a, Ecosystem a tibuai bawk. INM-ah chuan thlai chaw atan thil chi hrang hrang rual taka hman a nih avangin lei \hatna a belhchhah a, lei a tidur \hain thlai hlawk taka thar chungin Ecosystem pawh a tibuai lo a ni.
- Chemical fertilizer chauh hman a nih chuan Pathian siam sa thlai chaw pe theitu rannung te reuh te te (microbes) te a lo bo a, tin, chemical bang nawu (residues) te mihring tana hlauhawm khawp a awm thei \hin a, INM-ah chuan thlai chaw atan thil chi hrang hrang hman a nih avangin Microbes te an thi bo ve lo a, \angkai takin an awm ho zawk \hin a, thlai thar a thianghlimin a hrisel bik a, chemical fertilizer te hman ni bawk mah se a tam tham loh avangin a bang nawu pawh sawi tham leh mihring tana hlauhawm tham a awm lo a ni.
- Chemical fertilizer hman chuan thlai tan chaw \ha rang taka pein puhru mah se a daih rei lo a, kum tina chhunzawm a ngai ta \hin a, hman chhunzawm tur a awm reng loh phei chuan kan buai phah viau thei a, INM erawh chu a tirah lang nghal mai lo mah se a rei hnuah a \hatzia a lang chhuak dawn chauh a, huan kumhlun enkawltu tan phei chuan tih makmawh a ni zawk a ni.

INM atana thil \ulte :

1. Chemical Fertilizer
2. Organic manure
3. Farm yard manure & Compose
4. Green manuring
5. Legume intercropping
6. Bio fertilizers

1. Chemical Fertilizer : Thlai chaw kim (essential nutrient elements) chi 17 thlain a puitlin nan a mamawh a, chungte chu :

Carbon (C)	Hydrogen (H)	Oxygen (O)	Nitrogen (N)
Phosphorus (P)	Potassium (K)	Calcium (Ca)	Magnesium (Mg)
Sulphur (S)	Iron (Fe)	Manganese (Mn)	Zinc (Zn)
Copper (Cu)	Boron (B)	Molybdenum (Mo)	Chlorine (Cl)
Nickel (Ni)			

C, H, N, P, K, Ca, Mg leh S te hi Macro nutrients an ti a. A dang zawngte hi Micro nutrients an ti a.

NPK te hi Primary nutrients an ti bik a, thlain an mamawhna a nasa bik a, an mamawh zat pawh a tam bik a ni. Ca, Mg leh S te hi Secondary nutrients an ti a, hengho hi chu an mamawh zat a tlem deuh a, mahse a tlem avang hian a tel lo chuan an awm thei chuang lo a ni.

Lei \ha (fertilizer) kan hman larte :

Lei \ha	A chakna (%)
1. Urea (Nitrogenous fertilizer)	46%
2. SSP (Phosphatic fertilizer)	18%
3. Rock phosphate (phosphatic fertilizer)	20-38%
4. MOP (potassic fertilizer)	60%
5. DAP	18% N + 46% P
6. NPK (WSF)	
7. Slaked lime	80-95% CaCo ₃
8. Dolomite	20-45% CaO, 5-20% MgO

Liming - Chinai thi hman

Mizoram leilung hi lei thur (Acidic Soil) a ni a, lei thur tih reh nan leh \ul dang avangten Chinai thi hi hman a ni a, hei hi 'Liming' an ti.

A \hatnate :

1. Lei thur a tireh.
2. Leia rannung \angkai chi (beneficial soil bacteria) a tipung.
3. Leia Phosphorus leh Potash awm, thlain a ei mai theih lohte chu thlai ei mai theih turin a siam.
4. Thlai chaw Calcium leh Magnesium a keng tel.
5. Kum tin hman a ngai lo a, kum 2/3 danah pek a tawk.
6. Thlai kung khatah 3kg kum 2/3 danah pek a tawk.

Lei \ha pek dan tur :

- a) **Basin Application** : Hei hi thlai kung bula zung chaw zawngte tamna laiah tlem laih khuara lei \ha kha dah tur a ni a, dah zawhah rih vur leh mai tur a ni.
- b) **Broadcasting** : Lei \ha kan pekte chu ar chaw kan peka kan theh ang khan thlai bulah khan theh mai hi broadcasting chu a ni.
- c) **Fertigation** : Thlaite tui kan pek rualin kan tui pekah khan lei \ha tuia chawh ral theih chi kan thlak a, kan tui pek rual khan lei \ha an hmu nghal mai thei a ni.
- d) **Foliar application** : Hei hi chu lei \ha tuia chawh ral theih chite thlai hnaha kan kahin thlain a hnah a\angin a lo la lut \hin a, chu chu foliar application an ti.

2. Organic manure : Hei hi chu ran zun leh ek mai bakah thil nung thi tawh bang nawi a\angtein siam a ni a, a \hatnate :

1. Lei riral tur a tihpun belh (tam taka telh belh a ngaih \hin avangin).
2. Thlai chaw \ha muang tein a pek belh reng.
3. Soil microbes chenna leh inthlah pun nan a remchang.
4. Tui hnawng a pai rei thei.
5. Tui hu kal ral tur a vengin thlai tan temperature \ha takin a vawng thei.

Concentrated organic manure kan tih zingah hian kan hriat lar tak tak heng Neemkasto, Ozoneem, Super Organic Manure te pawh hi an tel vek a ni.

3. Farm yard manure : Ran ek, ran chet tlatna thli, zun leh an chaw bang nawitea an siam lei \ha hi FYM chu a ni a, FYM hian fertilizer hman tur 25% lai a chhawk thei.**A pek dan :**

1. A la \awih zo lo a nih chuan thlai chin hma kar 3-4-ah pek tur a ni a, a \awih zel theih nan tihhnawn reng tur a ni.
2. A \awih \ha a nih chuan thlai chin hma chiahin pek tur a ni.
3. FYM chu rual taka theh darha lei leh hnan tur a ni.
4. FYM chu a mala hmang loin chemical fertilizer nena hman pawlh a nihin thlai tan a \angkai leh zual.
5. Kum khatah 10-25qts/Ha. tal hman theih ni se.
6. |um khatah huan pum daih kan neih loh chuan a tahtawlin a kum lehah a daih chin bak pek leh zel mai \hin tur a ni.

4. Compost : Hnimhnah leh ran ek te dah \awih a, thlai chaw \ha rang taka ei theih tura siam hi compost chu a ni. Huan leh a chhehvela thil awm chi hrang hrang hnim, hnawmhnawk, ran ek, ran in thli te hi cellulose leh carbohydrate-te an pai tam a, C:N ratio 40:1 aia sangte an ni hial a, heng kan dah \awih hian C:N ratio hi 10:1 emaw 12:1 emaw velah te kan tihnam a, hei hi thlai tan chaw \ha leh ei mai theih a lo ni ta a ni.

Compost siam nana kan hman \angkai theih chu Nature Vel Ag, tuna Horticulture Department-in huan thlai enkawltute hnena a thlawna lak theiha a chhawp chhuah ang te hi a \ha em em a ni. Nature Vel AG hi a chhin 10 tui 20tk-a pawlhin kah tur a ni a, thlai hnah leh a vel leiah ni 10 danah kah tur a ni. Thlaite nursery-a an awm lai a\anga a rah kan lawh hma thla khat thleng hman tur a ni a, tlai ni nem hunah chauh kah tur a ni thung. Tin, chemical nen hman pawlh loh tur a ni. Kan hmanna leiah compost angte a awm hian a \ha lehzual a, thil a ti\awih chak em em a ni. Chemical pesticide hman leh Nature Vel hman inkarah ni 15 tal a awm tur a ni bawk.

5. **Green manuring / Lagume intercropping :**

1. Lei tih \hat nana thlai emaw, hnim emaw a la hrin laia lei leh hnan hi Green manuring in-situ an ti a, hmun dang a\anga lak khawm a nih chuan Green leaf manuring an ti bawk.
2. Thlai \hangduan leh lei chhe ngam bakah lei \hatna belhchhah thei chite hman \hin a ni.
3. Be lam chite hian boruaka Nitrogen awm hi an zung hmangin an man khawm thei a, chu chu thlai tan chaw \ha tak a ni ve leh a. Nitrogen bakah hian thlai chaw dang tam tak thlaiin a ei theih turin a siam thei a ni.
4. Be lam chi thlai ni 45-60-a upate hi leia leh hnanin (biomass 4-6tons a\angin) lei \ha 100kg N/Ha. an pe thei hial a ni.
5. Green manuring atana thlai hman larte chu - Dhaincha, Sunhemp, Berseem etc. te an ni.
6. Legume intercropping-ah chuan Behlawi, Bekang, Bean, Chana etc. te an ni.
7. Green manuring/Legume intercropping te kalpui hian leia nitrogen content a tipung a, leia microbes awmte a chawk phur a, soil structure a siam \ha a, tui a pawm tam theih phah bawk.
8. Thlai thar 20% lain a tisang thei a ni.

6. **Bio-fertilizers :** Bio-fertilizer chu thlai chaw mamawhte pe thei tura rannung te tak te te, mit lawnga hmuh theih loh (micro-organism) te inthlah puntir a, chung hmang \angkaia thlai chi emaw, lei emaw thlai thar tam tura enkawlina hi a ni.

Bio-fertilizers \hatna leh \angkainate :

1. A man a tlawm a, cheng tam tak senga chemical fertilizer lei \euh ngai loin bio-fertilizer hmangin thlaiin chaw a mamawh tam tak kan pe thei dawn a ni.
2. Chemical fertilizer mamawh zat 25-30% a puhruk thei.
3. Lei \hatna a chawk thoin hnim leh hnawmhawk te a ti\awih hma a, lei a ti durin a ti hnawng rei bawk a ni.
4. Thlai \hanna hormones a siam chhuah avangin thlai a \hang duang a, a bikin thlai zungten an \hat phah em em a ni.

5. Thlai zungten an \hat phah avangin thlaite chuan khawkhengte an tuar chak bik a, lei a\anga natna lo awm theite pawh an do chak theih phah a ni.
6. Bio-fertilizer-te hi pek tam lutuk vanga thlain an tawrh phah emaw, chemical fertilizer te ang pek tam luk emaw vanga thlain a thih phah angte hi a awm ve lo a, tin, huan leilung dik lote pawh a awm ve lo bawk.
7. Bio-Fertilizer te hi 250 gm packet tea siam a nih avangin huan leh loah te ken a awlsam a, \in khat hmun daih tur pawh ipte puiah awlsam takin a ah chhuah mai theih a ni.

7. Vermicompost (Changpat ek lei \ha) : Changpat hmanga thlai leh hnim, ran ek leh thil ningnawi hrang hrang \awih ral thei te, lei \haa chantir hi vermicompost a ni. Changpat sen Eisenia foetida hi hman lar ber a ni a, anmahni rih zawng zat ni khatah ei ralin lei \haah an siam thei a ni.

Vermicompost-in nutrient a pai dan :

N-1.68%, P-0.23%, K-1.26% leh Cu, Mn, Zn te hi a awm vek a ni.

Vermiwash - Changpat tui thli hian thlai chaw \ha tak a pai a, bacteria natna bakah rannung leh natna dangte a veng thei a, vermiwash hi tui 5 ltr-ah (1:5)-ah pawlhin eng thlaiah pawh a kah theih a ni.

Tetra Vermi bed - Hei hi \helret puan \ha chia siam (ready made) a ni a, a tlangpuiin ft 12-a sei, ft 4-a hlai, ft 2-a thuk a ni a, hmun zawlah kawih pharh mai theih a ni. Vawi khatah lei \ha 5-10 qtls a thar theih a ni.

KEIMAHNI

I. Mizoram Horticulture Service Association chuan kum 2015-2016-a hruaitu turte date 23/4/2015 khan Berawtlang, Art & Culture Department Conference Hall-ah an thlang.

President : Pu Rosanglura Ralte, DHO, Aizawl
 Vice President : Pu Vanlalruata Chenkual, Dy. Director (Veg), Directorate
 General Secretary : Pu F. Lalthlamuana, HDO (FI), Directorate
 Asst. Secretary : Pu B. Lalzarzova, HDO (Veg), Directorate
 Financial Secretary : Pu Robert Lalrinsanga, HEO (Veg), Directorate
 Treasurer : Ni. Lalrinchhani, HEO (FI), Directorate

II. Date 22/4/2015 hian Mizoram Horticulture Service Association te chuan Seminar an nei a. An thupui atan "Ram hmasawwna atan | halaite Horticulture hmalaknaa hruai luh" tih chu lungual takin an pass a ni.

III. "HORTI FAIR - 2015" date 26th - 29th May, 2015 khan Mizoram Horticulture Department chuan a buatsaih a. Horti Fair - 2015 chung hian Thlai/Thei/Pangpar \iak leh thil dang hralh chhuah a\angin Rs. 17,10,030.00 zet hmuh a ni. Mipuiten an hlut hle a, Department lam pawhin hlawhtling an tiin Horti Fair hi kum dangah pawh chhonzawm zel ni thei se an ti. Tin, 26th May, 2015 to 29th May, 2015 chung hian Farmers Seminar ni tina neih \hin a ni a. Farmers 10 \heuh Division tin a\angin he seminar-ah hian an training a ni. Farmers ten seminar hi hlawk thlak an ti hle a ni.

IV. PENSION/VOLUNTARY PENSION/BORAL

Sl. No.	Name & Designation	Date of pension	Name of Division
1	Pi Hmingthanzami, Assistant	28.2.2015	DHO, Lunglei
2	Pi C. Lalnunmawii, Peon	28.2.2015	DHO, Kolasib
3	Pu Ngurthankima, HEO	31.1.2015	DHO, Khawzawl
4	Pu C. Thantluanga, Peon	31.1.2015	DHO, Kolasib
5	Pi Natlai, peon	30.4.2015	DHO, Saiha
6	Pu Lalrinmawia, BDO	30.4.2015	DHO, Serchhip
7	Pu F. Lalrinsanga, Peon	31.5.2015	DHO, Lunglei
8	Pu K.L. Zothantluanga, AHEO (Voluntary Pesion)	30.4.2015	DHO, Lawngtlai
9	Pu Khaizapau, Naulak, HEO (Boral)	17.3.2015	DHO, Khawzawl

V. TRANSFER / PROMOTION / DEPUTATION

1. Pu S.H. Lasker, JE, DHO Tuidam to J.E. Directorate
2. Pi R. Lalnunhlimi, LDC, DHO Khawzawl to Directorate
3. Pu Zohmingsanga, Assistant I&PR (LL) to H.A. DHO Lunglei
4. Pu Vanlahmuaka Sailo, JE, DHO Khawzawl to J.E Directorate
5. Pu Saingura Sailo, D/M, DHO Lawngtlai to D/M, Directorate