NURSERY MANAGEMENT AND PRODUCTION OF QUALITY PLANTING MATERIALS IN CITRUS

Issued by Department of Horticulture
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(Technical Publication)

August, 2010
1000 copies

Published by:
Department of Horticulature
Govt. of Mizoram

Printed at:
Zo-Awm Offset Press

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Ser hian khawvel a Fruit Industry ah hmun chungnungber a chang mek a,Khawvel a thei thar chhuah 20% hi ser hian a luah mek bawk a ni. India ramah chuan ser hian thei thar chhuah tam pathumna hauh mekin Mango leh Banana dawtah a awm a,India hian khawvel Fruit Industry ah hian parukna a hauh mek in 5% vel a thawh ve bawk.Kan chinna hmun area ngaihtuah chuan kan thar tlem hle a,hei hi Ser phuntur tha kan neih loh a vangte leh enkawl that tawkloh vangte niin mithiamte chuan an ngai .

Ser phuntur tha nei tur hian a chi atangte,Tissue culture hmangte leh Budding hmangte hian kan nei thei a,Tunlai khawvel a an hman lar ber leh thaber a an ngaih chu Budding hmang a buatsaih hi a ni.Budding chu thlaikung pakhat atang a amit lak a thlaikung dang a bel hi a ni.

Ser phuntur tha neih theih nan a hriatur pawimawh leh tul te

1. GREEN HOUSE :

Ser phun tur tha leh hrisel tak nei tur hian hmunzawl (terrace) atangte leh Shade house chhung a tangtein a kuitiahin a tharchhuah theih tho laiin Green House phui tha tak,ruahtui leh boruak bal, rannung leh natna dang luh mai mai theih lohna hmun, sik leh sa control theihna a kuitiah leh enkawl ni theise duhthusam a ni a,Tin green house chhungah chuan tui tling theilo se, a tlin theih loh nan 1% slop a siam nise,a theih phei chuan thlai leh lei a insik loh nan chhuat phah emaw concrete flooring emaw nei theise,hei hian lei a tang a natna then khat (soil borne disease) a kai mai tur lak atangin a veng bik,Bed kang a nih theih phei chuan duhthusam a ni, a chhan chu Pot a thlai ten lei atangin hnawnna (moisture) anla thei lova, an zung pot ah a awm khawm a, thlai phunsawn dawnah a zung hliam lovin a neih theih phah thin a ni.

High Tech Nursery

Inside nursery

2.CLIMATE MANAGEMENT:

Ser phuntur tha neih theihna tur a thil pawimawh dang pakhat chu Nursery chhung climate hi a ni. Thlai tiah that nan leh than that nan hian boruak lum tha tak a mamawh a,nisa lutuk erawh a haw hle thung a ni.Nursery chhung ni a sa lutuk a nih chuan Shade net hmang a ceiling siam mai tur ani bawk.Temperature 10oC-32oC hi duhthusam a nih lain Temperature 40 oC thleng pawhin a tha thei a,enkawl uluk erawh a ngai thung , Temperature 10 oC hnuai lamah hi chuan thlai a thang meuh tawhlo thin a ni.Tin,Green house chhung temperature control nan hian Fante,Side opente leh Ventilationte hmanin awmzia a nei hle bawk ani. Tin boruak ro lutuk emaw hnawng lutuk hi a tha chuang lova Humidity 60-80 % vel hi duhthusam a ni a,Humidity 80 % chung lamah hi chuan natna a kai duhin a pung chak thin hle bawk ,Tin humidity 50 % hnuai lam anih chuan Nursery chhuat kha springler hmangin emaw,Foger hmangin emaw ,bucket a tui dahin emaw boruak hnawng siam sak thin hi a tha hle.

Air circulation Fan

Side rolling for climate control

2. SOIL:

Nursery a ser chi kan kui tiahna tur a tan chuan lei dur tha leh lei banlo tui luan ral zung zung theihna ni theise ,A lei (potting media) atan Sand Cocopeat Cowdung leh Soil (3:1:1:1 Ratio) hman a, uluk tak a chawhpawlh hman hi duhthusam a ni.

Filling of Media into Poly bag

Filled Media

4.SOWING OF SEEDS :

Kan thlai chi (Rootstock seeds) te hi Primary Nurseryah Germination tray-in

emaw,Secondary Nursery-ah Polythene bag-ah direct-in a kui thei a,Germination tray-ah kan kui anih chuan a tray size a zirin a chi dah tur a ni,Primary Nursery a kui tiah a a hnu a transplant leh hi hna a hautak deuh nain natna then khat laka a fihlim theih nan a tha hle. Polythene bag-ah kan kui dawn a nih chuan a chi pathum vel centimeter khat vel a thukah phum tur a ni.Polythen bag 30cm X24 cm Size a kui nghal hi a thanthu lova a awm theih avangin duhthusam zawk a ngaih a ni.Tin,ser chi te hi a kawr a chan avang hian a tiak har hle a,hemi anih avang hian a kawr hi Pin hmangin hawng ila a tiak hma bik.,A chi hi Green house chhungah chuan duh duh hunah a kui theih a, chutih rual chuan a budding tih hun leh budwood awm hun thlir chung a kui ni theise,June thla a kui hian February leh March thla veleh a bud theih a,hei hi Mizoram bik a tan chuan duhthusam a ngaih a ni bawk.Tin,Seed Borne diseases lak a ven nan Bavistin a seed treatment tih ni theise a tha hle .

Seed sowing into Polythene bag

Seed sowing

5.VARIETY OF ROOTSTOCK SEED

Khawvel ah hian rootstock a tan a hman thin variety thahnem tak a awm a,kan china hmun leilung leh boruak mil a thlan thiam a pawimawh rualin,rootstock hian a rah size,a kung size leh a thlum leh thur dan pawh a ken tel avangin thlan uluk a ngai hle.India ram a kan hman variety langsar zualte chu 1.Trifoliate 2.Troyer citrange 3.Rangpur Lime 4.Sour orange 5.Rough Lemon 6.Volkamariana te hi a ni.

6.IRRIGATION MANAGEMENT:

Kan tui hmante a thianghlim tha tawk tur a nia,sahbawn thlite phei chu hman loh hram tur a ni. Ser hian than nan leh hrisel nan hian tui a mamawh hnem hle a,a than dan a zirte,a upat dan a zirte,boruak lum leh hnawn dan a zirte a pek thin tur a ni.a tlangpuiin a tiah tawh hnu ni 60 vel atang chuan tui 80ml-100ml hi thlai kung pakhat atan leh nikhat a tan a tawk hle a ngaih ani.Tui pek nan hian Watering Cane te,Pipe te,Springler te leh Dripper te a hman theih a,Dripper hmang a tui pek hi duhthusam a ni thung.Tin tui pek pah hian a hnah leh a kung balte silfai thei thin ila a tha hle bawk a ni.

7.NUTRIENT MANAGEMENT:

Nursery a thlai kuitiah na hmunah Bawngek leithate,Ramleithate thahnem tak hmang thin mah ila,thlai hrisel zawk nan leh a than that theih nan leithaLeichi pek belh thin tur a ni.Leitha NPK 20:20:20/19:19:19 leh Micro elements Ca,Mg,Zinc,Boron leh Mb etc.te 60:40 Ratio hmang a chawhpawlh a ,kan thlaite thla

nga (five month) a upa anih hnuah leh 10-20 cm vel a sang anih hnuah a kung leh a hnah silovin thlai pakhat tan 5gms vel thlatin thlali tal pek hi duhthusam a ni a,Budding tih lai erawh chuan leitha hi pek loh tur a ni.Leitha kan pek hian a dipin emaw tui a tihtuiin emaw a pek theih a,a dip a kan pe dawn anih chuan leichhungah dah a lei a chhilh leh nghal a tha hle,Tin lei tha kan pek tawh hnuah chuan tui hnawng tawk chauh,luangrallo tur a pek ni theise a tha hle bawk a ni.

8.INTER CULTURE OPERATION

(a) Weeding;Kan thlai kuina hmun Nursery chhung leh a pawnte chu hnim hman lo tur a ven uluk a tha hle,hnim kan thlofai anih pawhin kan ser tiak zung leh a kung a tih chhiat loh nan hnim tet lai a pawhfai zung zung hi duhthusam a ni.Green House chhung a kan enkawl a nih chuan karhnih danah thlawh a ngai thin bawk.

(b) Removal of unwanted Branches and Plants:Nursery a ser tiakte hi a tiah dan leh a than dante a in anglo thei hle,thenkhat chuan hnah pangngailo bial lam deuhte a rawn pu chhuak nghal thin a,henghi a len deuh hnuah pawh budding tih nan a tlak thin loh avangin a tet laiin paih a tha hle,Tin,thenkhat chu hnahpui arawn chhuah rualin peng (Branches) tam tak a rawn nei nghal bawk thin,heng pawh hi Budding tih na tur chuan a puitlin har deuh avangin paih mai hi duhthusam a ni.

(c) Topping: Thlai kung a ler lam a zikno tel a ,azik lam tan chhum hi toopping a ni. Kan thlaite budding a tih theih dawn hnaih, ni 40-50 Days vel ala awmin a kung bul a tang a 30-40 cm ah topping ni theise,hei hian a kung size a tihlen mai bakah tuipek ,tihfai/thlawfai leh lei tha pek a ti awlsam bik a ni .

(c) Deleafting: Thlai hnah a kung a tang a kan paih then hi Deleafting a ni.Ser budding kan tih dawn hnaih ah lei atang a 15-20cm chin hnuai lam pang zawng a hnah paih vek tur a ni .hei hian budding tih a awlsam a enkawl a tinuam bawk

Topping

Deleafting

9.TIME OF BUDDING

Ser budding hi kumkhat chhung hunbi pathum then a ni a,chung hunbi then te chu hengte hi a ni.

(1) Spring budding- February –March

(2) June Budding –Late May-June

(3) Fall Budding- Mid June-Mid September

Ser buuding tih nan hian hun thaber a sawi theih lova,Bud-wood awm rem chan hunte,rootstock a bud theih hunte, sik leh sa nawm hun laite hi en a ngai a,Khawlum lutuk leh khawvawh lutuk loh lai,kan ramah chuan February kar thumna

atang a March thla kar hnihna thleng hian duhthusam a ni.Tin,rootstock pawh pencil size vel hi ni theise duhthusam a ni.

Seedling are Pencil size

Seedling are ready for Budding

10.COLLECTION OF BUDWOOD

Nursery a thlai kan kuitiah a bul lam a kan hman tur hi Rootstock a ni a,A mit kan bel , kung dang a tang a kan lak hi Bud wood a ni.Mizoramah hian budwood atan variety hrang hrang Michal,New Hall,Satsuma,Washington leh Mandarine Orange te hi hlawhtling takin hman a ni tawh a.Budwood lakna tur Serhmun leh a kungte hi thlan uluk a ngai hle.duhthusamah chuan Ser huan dang atang a 500 meter vel a awm hrang,Ser kung hrisel tha leh rah tha,natna kailo leh rannungten an bawm loh emaw an bawm loh nan a uluk tak a ven,rah pawh kum thum tal lo chhuah tawh,kum nga hmalam atang a uluk tak a lei tha leh tui a chawm ni theise.Budwood tha a awm thei nan bud hun hma thlaruk velah Prunning leh Topping lo tih lawk bawk tur a ni.Tin,Budwood kan lak hi a no lutuk tur a ni lova,a chang lutuk tur a ni lo bawk.chumai bakah kum hmasa lam a rahna tang chu lakloh bawk tur a ni.Bud wood lak hian fimkhur a ngai hle a,kan hmanrua Bakcheh leh Chemte-te Alcohol hmang a tih thianghlim a tha hle,kan kut leh kan kenna bawm te pawh uluk tak a silfai hi duhthusam a bawk.Bud wood kan lak veleh hian tuiah chiah huh a,paper a tuam a Ice box emaw Fridge emawah dah thei ila duthusam a ni a,hmuin hlatak a mi kan la dawn anih phei chuan Vur tlang a tih vawh nan keng tel ila a tha hle a ni.

11.BUDDING

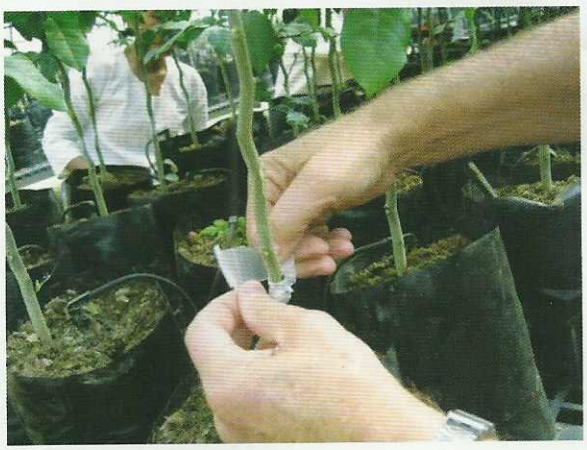
Budding dan hi chi hrang hrang a awm a,chung te chu

(1).T-Budding
(2).Inverted T-Budding
(3).Patch Budding
(4).Ring Budding
(5).Chip budding

Ser budding tih nan a hman lar ber leh awlsam,,hlawhtling si tunlai khawvel a an hman lar ber chu Patch Budding hi a ni.Budding chu lei atang a 10cm chung lam,a kung mam thalai ni theise,hei hian tawnngheh a awl a,natna lakah a veng bik bawk.Budding tuam nan hian 100 guage polythene strips 1.2-1.8 cm wide te Parafilm 2X3 cm vela hlai te hman thin a ni a,Parafilm hman hi duhthusam a ni .Tin,budding tih nan a kan hmanrua Chemte leh Sakawrbakcheh te Alcohol emaw Sodium

Hypochlorid emaw Spirit hmangin emaw tih thiang hlim a,kan kut leh ke, kan taksa mai bakah kan kate pawh tih fai that bawk tur a ni.

Bud wood



Wrapping by Parafilm

Sprouted buddings

Readyf or Transplanting

12.PEST AND DISEASE MANAGEMENT

Ser hian eichhetu leh bawmtu rannung a ngah hle a,ven uluk leh vil ngun pawh a ngai thin a ni,Kan Nursery chhung chu fai tak a enkawl thin tur a ni,natna lak a kan thlaite alo fihlim theih nan Bavistin @1gm/litre of Water a thlahnih danah kah thin tur a ni bawk.Tin Phytopthora spp.leh Viral infection te hmuh a nih chuan kan thlai chu a polythene chawp a paichhuah a phumbo tur a ni a,Nursery chhung a natna langsar zual leh a ven na then khat te.

(1) Confidor @ 1gm/litre of Water –Leaf eating caterpillar ven nan
(2) Dicofol @1.5 ml /litre of water-Mites ven nan
(3) Quinalphose @1.5 ml /Litre of water-aphids ven nan
(4) Nuvan @1.5ml/litre of water-leaf miner ven nan
(5) Malathian @2ml/litre of water white fly ven nan
(6) Sulphur/Bavistin @1gm/litre of Water –Powdery Mildew ven nan
(7) Blitox 1.5 gm/litre of Water-Pink disease ven nan

.ADVANTAGES AND DIS-ADVANTAGES

Advantages of budding

1.A rah hma bik,phun chhuah atang a kum khat chhungin a rah thei
2.Chi neilo (seedless variety) tih pun nan a thaber leh hmanlar ber a ni.
3.Bud wood kan lak ang chiahin a rah chhuak .
4.Ser kung khatah chi tam tak a rah tir thei
5.A than a rualin,a thang chak bik a,a rah pawh a rual khai a,a rah quality pawh a tha bik
6.Rootstock a tan variety thenkhat hmanin Nematodes resistant thei ser kung a siam chhuah theih a ni.
7.Rootstock a tan variety thenkhat hman in Viral disease indicator atan a hman theih bawk.

Dis-advantages of Budding

1.A dam reilo
2.Variety thar a siam chhuah theih loh.
3.Phun chhuah turin hun a duh rei bik

THLAITIAK THA NEI TUR A HRIATRENG TURTE

1. Nursery hnaihah Serhuan a awm tur a ni lo.
2. Rootstock seed kan lakna kung a hrisel tha tur a ni.
3. Seedling polypot a kan sawn in,a zung kawilo leh thleplo chauh phun tur a ni
4. A zung sei lutuk tan chum thin tur a ni
5. Budwood laknatur Mother plant a hrisel tha tur a ni a,a bik a enkawl a tha hle bawk.
6. Nursery chhungah tul bikna thil a nih loh chuan hnathawktu bak lut thinlo se.