deuhin tui pek tur a ni a, a bal (tuber) in siam hun lai hi tui an mamawh zual lai ber a ni. Ni 10 dan zel ah tui pek ngai ngei a ngai bawk. Khaw awm dan a zir in tui pek hi hmun hrang hrang ah a dang lam thei bawk.

Eichhetu rannung enkawl dan: Thlai hip chhe tu (sucking pests) viz., white fly, mealy bug, mites, scale insects (rannung te reuh te te) te enkawlna atan a hnuaia tarlan ang hian kalpui tur a ni

- A chi a tann a hman te chu natna kai lo leh hrisel tha tak an ni tur a ni.
- Rannung man na ban deuh (yellow sticky trap) kha huan ah khan khai tur a ni a, he thil ban hian rannujng te reuh te te (whilefly) te kha zing dar 4 atanga dar 6 inkar ah a lo man chat chat thin a ni.
- Parasitoid (an mahni ti chhe thei) te kha eichhe tu rannung chi hrang hrang control nan hman tur.
- Predator (eichhe tu rannung te hmelma) kha a hman theih bawk.
- ICAR-CTCRI siam bioformulation 'Nanma' (7ml l-1) pawh a hman theih bawk.
- Neem hriak 15 ml hi tui litre l ah chawhpawlh in hman thin tur.
- Insecticide viz., Imidacloprid 17.8 SL (1ml hi tui litre 3 ah) leh Chlorpyriphos 20 EC (4ml l-1) te leh
- Spiromesifen 240 SC (1.5-2 ml l) leh Dicofol 18.5 EC (2.5 ml l -1) te pawwh rannung ven nan hian a hman theih vek a ni.
- Natna enkawl dan: Pangbal a natna tlanglawn ber chu hetiang hian a pumpelh theih a-
- Thlai chi hrisel hman
- Meristem atanga chhuak thlai hman
- CMD do thei chi chi hrang hrang chin (Sree Padmanabha, Sree Reksha, Sree Sakthi leh Sree Suvarna te)
- Huan kha fai taka siam tur.
- Natna pu darh tu rannung te control - Imidacloprid 0.03% spray hmang in a lo invent theih.
- Natna do thei thlai chi tha siam chhuah (Natna pu darh tu rannung te reuh te te awm loh na hmun ah)

A lak/seng hun: Phun atanga thla 9-10 hnu ah a lak theih tawh a. A thar hma variety ho chu phun atanga thla 6 tanga thla 7 inkar ah an cho thin a. A lak hun a pelh nasat viau chuan a bal ah khan fibre (hrui chi khat) a lo awm teuh thin bak ah taksa tan a tha starch kha lo a tla hniam thin a ni. A chi tha variety ah chuan thla 9-10 chhungin a vaiin hectare khat hmun ah 35-40 tonne an thar chhuak thin a,a thar hma chi ah chuan thla 6-7 chhung in hactre khat hmunn ah 28-30 tonne a thar chhuah theih bawk.

A kuang (stem) vawnthat dan: A kuang la thar lam tak hi phun atan chuan duhthusam a ni a, mahse, hun rei tak ruahtui tlak tawh loh na hmun emaw ruahtui tlak tamna hmnunn ah chuan vawnthat ngei ngein a ngai thin a. Hun rei tak daththat hian a maha hnawng (moisture) awm kha atla hniam thin a, chubak ah rannung chhi hrang hrang ten a lo ei chhe hman thin a ni. Pangbal thar chhuah hlim kung (stem) hi ventilation awm that na leh daihlim ah chuan thla 2 atanga thla 3 chhung chu a vawn that theih ani.

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Agro Techniques in Cassava

By

R. Muthuraj, C. Mohan, P. S. Sivakumar and Lalmingsanga

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(भारतीय कृषि अनुसंधान परिषद्)
श्रीकार्यम, तिरूवनन्तपुरम 695 017, केरल, भारत
ICAR-Central Tuber Crops Research Institute
(Indian Council of Agricultural Research)
Sreekariyam, Thiruvananthapuram 695 017, Kerala, India
Tel. No. : 91 (471)-2598551 to 2598554; E-mail: director.ctcri@icar.gov.in, Website: https://www.ctcri.org

Agro Techniques in Cassava

Cassava (Pângbal) chin dan

Khawlum a chin theih bâl (tuber) zawng zawng zing ah pângbal (Cassava -*Manihot esculenta* Crantz) hi a lar ber pawl a ni a. Brazil (Latin America) ram ah an ching hmasa ber a, kum zabi 17-na ah Portuguese sumdawngte chuan India ram Kerala-ah an rawn la lut a ni. Cassava hian unit area khat ah calorie tam zawk a siam thei a, ruahtui tlak tam lohna hmun ah pawh an tha duh em em a ni.

Chi tha zawk (Improved varieties): ICAR-CTCRI chuan ei tur leh industry atana hman tur quality hrang hrang nei variety 19 lai a siam chhuak tawh a, pângbal (cassava) chi hrang hrang te chipchiar takin a hnuaia mi ang hian tarlan a ni.

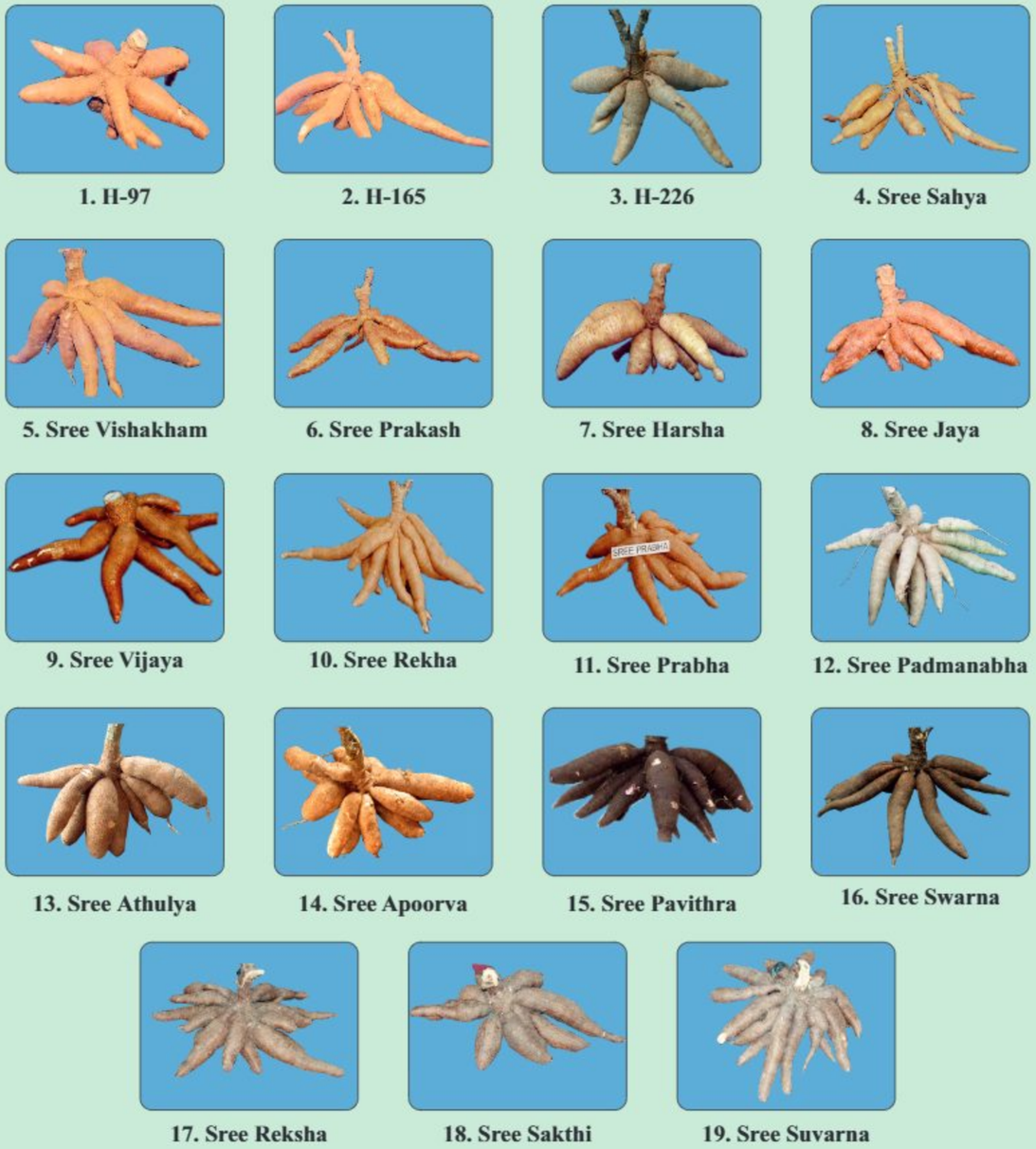
Lei leh boruak mamawh dan (Soil and climate): Pângbal hi lei chi hrang hrang ah a thang tha duh hle a, mahse lei al lutuk leh tui luan ralna tha awm lohna hmun ah chuan an thangtha vak theilo . Hmun lum leh vawt, ruahtui a tawk chauh a tlak na hmun pawh an ngeih hle bawk.

A chin hun (Season of planting): Pângbal hi tui tha tak a pek chuan kumtluan in a chin theih a. A phun hun tha ber chu ruahtui tlak tan tirh lai April-May inkar hi a ni a; August-September inkar ah pawh a phun theih bawk.

Leilung buatsaih dan (Land preparation): Tractor emaw bawngtuthlawh hmangin lei chu 20-25 cm vel a thuk in laih phut tur a ni a, Lei thawl (light textured soils)-ah chuan flat method hmanga ram buatsaih a, lei sakhat (heavy textured soils) -ah chuan lei chhun vum (mound method) leh tui pek na hnuai (irrigated condition) ah ridge leh furrow method hmanga ram buatsaih a tha.

Variety	Duration (months)	Yield (t ha^{-1})	Year of release	Important features
1. H-97	10	25-35	1971	Semi branching, starch awmzat 27-31%
2. H-165	8-9	33-38	1971	Non-branching, starch awmzat 23-25%
3. H-226	10	30-35	1971	Semi branching, starch awmzat 28-30%, susceptible to CMD
4. Sree Sahya	10-11	35-40	1977	Semi branching, starch awmzat 29-31%
5. Sree Vishakham	10	35-38	1977	Semi branching, starch awmzat 25-27%, a tak eng, β carotene tam na
6. Sree Prakash	7	30-35	1987	Semi branching, starch awmzat 29-31%, hmun hniam lai ah a tha duh a, a puitling hma bawk
7. Sree Harsha	10	35-40	1996	Erect branching, starch awmzat 38-41%, susceptible to CMD, good cooking quality, drought tolerant
8. Sree Jaya	6-7	26-30	1998	Erect branching, excellent cooking quality, suitable for lowland as a rotation crop, susceptible to CMD, early maturing, starch content 24-27%
9. Sree Vijaya	6-7	25-28	1998	Erect branching, excellent cooking quality, suitable for lowland as a rotation crop, susceptible to spider mites and scale insects, starch content 27-30%
10. Sree Rekha	8-10	45-48	2000	Erect branching, good table variety, suitable for both upland and lowland conditions, starch content 28-30%
11. Sree Prabha	8-10	40-45	2000	Semi branching, good table variety, suitable for both upland and lowland conditions, starch content 26-29%
12. Sree Padmanabha	9-10	38	2006	Resistant to CMD with normal yield, starch content 25-26%
13. Sree Athulya	10	35-40	2014	Variety with stable and high extractable starch (30.2%) with higher yield, ideal for cultivation in industrial areas in Tamil Nadu
14. Sree Apoorva	10	35-40	2014	Variety with extractable starch of 29.9% and higher yield, ideal for cassava based industries
15. Sree Pavithra	9-10	35-40	2015	Medium starch (24.4%) content, high K efficiency (243.65 kg tuber/kg K absorbed), suitable for soils which are inherently low to marginal in soil exchangeable K.
16. Sree Swarna	7-8	35-40	2015	Field tolerant to CMD, starch content 25.2%, suitable for both upland and lowland conditions
17. Sree Reksha	8-9	40-50	2017	Non-branching, CMD resistant, starch content 27-31 %, tolerant to post-harvest physiological deterioration

18. Sree Sakthi	9-10	45-50	2018	Non-branching, CMD resistant, medium starch content 25-27%, industrial use
19. Sree Suvarna	7-8	45-50	2018	Non-branching, CMD resistant, high yielding, high starch content 27-32%, tolerant to post-harvest physiological deterioration
20. Sree Kaveri	9-10	40-50	2023	Resistant to CMD,highnutrient efficiency and drought tolerance and starch content 27-28%



Thlai chi tha thlan dan (Selection of quality planting material): Pangbal hi a tang tan chum (cutting) hmanga tihpun a ni a. Thlai puitling, natna leh rannung ei chhiat loh 2-3cm a chhah chu a tang chunglam leh a laihawl chu tan chum tur a ni a, a tang chunglam a tanga hmun thum a then a hmun khat chu paih thin tur a ni. A zung tha tak a chhuah theih nan a bial zawng in mam tak in tan (cut) tur a ni

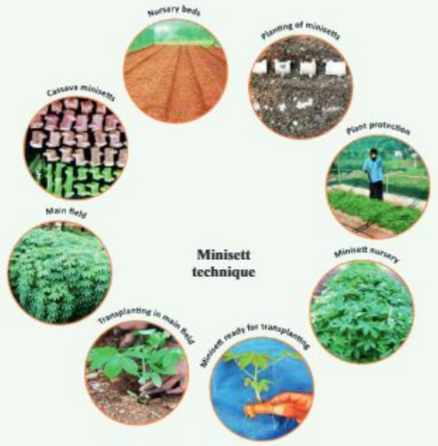
A tang (stake) sei zawng leh phun dan: Stake sei zawng chu 15-20 cm a hman theih a, stake hi 5 cm thlenga thuk in phun tur a ni.

Minisett technique: He technique hi bâl (tuber) chi hrang hrang rang taka tihpunna atana hmanraw tangkai ber leh hmantlak ber nia ngaih a ni a. Step hrang hrangte chu

- Natna nei lo nia lang thlai te kha select tur a ni
- Tissue culture method a hman theih a
- Plantlets index te in vitro mother plant anga hman
- Thlai lo tiak te kha green house/ net house chhung ah dah leh phawt tur
- Minisett te chu nursery ah tihpun tur
- Thlai lo tiak te chu huan ah phun mai tur
- A kalphung zawng zawng kha tih nawn zel a, tih pun a, sem chhuah theih a hmalak

Minisett technique mamawhna chhan

- Tuber (bâl) thlai hi a tam zawk chu a chi (seed) hmang lo a tih pun vek an ni a
- Bê leh dâl ho nena khaikhin chuan a tih pun zat (multiplication ratio) a hniam
- Clone hmanga tihpun hian natna an kai awlsam bik a



Protocol for quality planting material production in cassava

Variety siam chhuah thar te hian loneitute hnen a thlen nan hun a duh rei bawk

- Cassava-a quality planting material siamchhuahna tur protocol
- Released varieties take a long time to reach farmers

Quality tha pangbal thar chhuah dan

Stake phun dan: Stake phun dan hrang hrang te chu: vertical (a tung chho zawng a phun), slanted (a awn deuh a phun)leh horizontal (a khamphei zawng a phun). A tung chho zawnga phun hian an to rual ber zawk a ni.

A phun inkar hlat zawng (Spacing): Non-branching type - 75 x75 cm, semi-branching leh branching type ah chuan 90 x 90 cm in an phun tlangpui a ni. Thar chhuak hnem tur chuan a tlangpuiin stake (a tang) pakhat zel an phun thin a ni.

Phun tur mamawhzat : Hectare khata phun tur mamawh zat -75 x 75 cm inkar ah a tang (stake) 3600 leh 90 x 90 cm inkar ah a tang 2500 vel a phun theih.

A chung lam atanga lo chawr chhuak te hi a stake hnuai lam atanga lo chawr chhuak te aiin an thang chak zawk a. A hnah tam lutuk paih then hian a bal (tuber) a in siam tha thei zawk a ni.

A tang phun belh (gap filling): Field-a a tang phun lai hian a tang 5% (600 nos.) chu square meter khata zau nursery-ah 4 x 4 cm inkar ah a hranin phun tur a ni a, ni 20 atanga 25 in kar a upa thlai te chu phawi chhuah a, a tang kan phun dam zo lo ho kha replace mai tur a ni.

Interculture leh earthing up (lei rih vur): A bik takin a tir lam ah hnim hi pawhfai/tihfai a pawimawh hle a, phun atanga ni 45-60 hnuah interculture hmasa ber chu tih tur a ni a, chumi hnu a tang a thla khat hnuah earthing up (lei rih vur) ngei ngei tur a ni.

Leitha pek dan (Manure leh fertilizer): Ram buatsaih lai hian leitha (Bawng ek, ar ek etc) 12.5 tons bakah fertilizer dose 50 kg Urea, 50 kg SSP leh 50 kg MOP chawhpawlh hman a tha. Thlai phun atanga ni 45-60 hnu ah leitha pek te, hnim pawh fait e leh a tul ang ang kha tih thin tur a ni a, 50 kg Urea leh 50 kg MOP te chu hectare khat zel ah kah (spray) thin tur a ni. A thar hma chi leh local variety chi hrang hrangte tan chuan fertilizer dose 50:25:50 kg Urea, SSP, MOP hectare khat zel ah hman thin tur.

Tui pek dan: Phun atanga ni 20 chhung tal chu uluk