Theme B - Spice production technology

Effect of seed rhizome storage and priming on performance of ginger (*Zingiber officinale* Rosc.) transplants in growbags

*Dharini Chittaragi and **Jalaja S. Menon

* Research Scholar, Department of Spices and Plantation crops, Tamil Nadu Agricultural University, Coimbatore

** Assistant Professor (Hort.) and Head, Cashew Research Station, Kerala Agricultural University, Thrissur

Introduction

Ginger is grown as rainfed crop in Kerala by planting during April-May and harvesting by Dec - Jan.

Zero energy cool chamber (ZECC) are ideal method for storings ginger seed rhizome.

Ginger transplanting technology with rhizomes sprouts of 3-5 g reduces seed rate -from1500 to 1800 kg/ha – 500-700 kg/ha (Prashath *et al*., 2014).

Biopriming ginger rhizome before transplanting was found to be beneficial in increasing the yield of green ginger (Menon *et al.,* 2016)

Materials and methods

Experiment -1

Design : CRD
Treatments : 4 - Immediately after harvesting
One month after storage
Two months after storage
Three months after storage
Replications : 5

Zero Energy Cool Chamber (ZECC)

Experiment -2

Exp. design	:CRD
No. of treatments	:13
	T_0- Absolute control T_1 -Humigration (Soaking seed rhizome –water 0.5 hrs and storing in air tight bag for 8 days before planting) T_2 -Hydropriming -(Soaking seed rhizome - water for 24 hours before 10 days of planting) T_3 - *Trichoderma viride* (4 gm /lit. of water 0.5 hrs) T_4 - *Pseudomonas fluorescens* (10 gm/lit. of water 0.5 hrs) T_5 - *Trichoderma viride*+ *Pseudomonas fluorescens* T_6 - Soaking in water (0.5 hr) T_7 - PGPR 5% (1 hr) T_8 - Gibberellic acid (100ppm for 1 hr.) T_9 - Gibberellic acid (200ppm for 1 hr.) T_{10} - Ethephon (100ppm for 1 hr) T_{11} - Ethephon (200ppm for 1 hr) T_{12} -Soaking in water (1 hr)
Replications	: 3
Sowing time	: Feb, March, April, May

Seed priming

Media preparation

Sowing in portrays

Seedlings in nursery

Experiment -3

Exp. Design	:CRD
No. of treatments	:11 treatments from nursery were included
Replications	: 3
Planting time	: March, April, May, June

Transplants in growbag

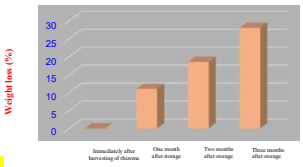
Results

Experiment -1

Length and breadth of the bud at different stages of development

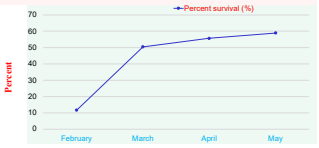
Treatments	Length (µm)	Breadth (µm)
Immediately after harvesting of rhizome	0.847	1.19
One month after storage	0.790	0.781
Two months after storage	1.82	0.764
Three months after storage	2.19	0.703

Weight loss in storage as influenced by storage period

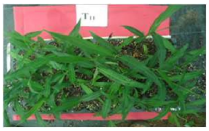


Experiment -2

Percent survival of sprouts over various seasons



Ginger transplants treated with Ethepon (200 ppm)



Experiment -3

Effect of priming treatments on fresh rhizome yield over seasons

Treatments	March	April	May	June	Treatment means
T_0	279.89^{fg}	516.54^{a}	304.07^{e}	100.75	300.32^{c}
T_1	459.67^{cde}	369.39^{d}	341.89^{cde}	102.67	318.40^{bc}
T_2	335.5^{efg}	517.36^{a}	404.82^{bcde}	103.17	340.21^{abc}
T_3	462^{cde}	441.12^{bcd}	360.42^{bcde}	112.04	343.89^{abc}
T_4	493.11^{ab}	490.70^{abc}	320.16^{de}	136.63	340.21^{abc}
T_5	348.44^{bcd}	511.20^{ab}	377.13^{bcd}	107	335.94^{abc}
T_6	381.56^{abcd}	419.08^{cd}	352.41^{bcde}	106.53	314.89^{bc}
T_7	338.33^{cd}	381.17^{d}	421.17^{ab}	108.95	312.41^{bc}
T_8	347.11^{bcd}	414.65^{cd}	416.93^{ab}	102.5	320.29^{bc}
T_9	527.11^{a}	474.70^{abc}	388.82^{abcd}	98.67	372.33^{a}
T_{10}	416.89^{abcd}	434.15^{a}	457.59^{a}	113.83	355.62^{ab}
Season means	399.06^{B}	451.83^{A}	376.85^{B}	108.43^{C}	

Fresh rhizome after harvest (Ethepon 200 ppm)

Conclusion

- Storing of seed rhizomes under ZECC up to two months will be beneficial for further planting with minimum weight loss.
- Priming seed rhizomes for four planting season showed high survival rate of transplants and helps in early sprouting during May.
- Among different treatments T_{11} (Ethepon-200 ppm) showed high rate of survival irrespective of the seasons.
- . Irrespective of the priming treatments, the fresh rhizome yield of transplants, planted in the month April (451.83g/p) was significantly high.
- Irrespective of the planting seasons, the fresh rhizome yield from seed rhizome primed with Ethephon 200ppm (372.33g/p) was superior

Literature cited

Prasath, D., Kandiannan, K., Srinivasan, V., and Ananadraj, M. 2014. Standardization, of single–sprout transplanting technique in ginger [abstract]. In: Abstracts, Sixth *Indian Horticulture Ccong.* TNAU, Coimbatore,Tamilnadu, 6-9 Nov. 2014 Abstract No.10.13140/2.1.3227.8726

Menon, J. S., Karippai, R. S., and Shaji, J. 2016. Biopriming seed materials to enhance yield in offseason green ginger cultivation. *Proceedings of national seminar on planting material production of Spices,* Directorate of Arecanut and Spices development.21-24 Apr.2016. Calicut pp.182-184.

Acknowldegemet

Department of Plantation crops and Spices, College of Horticulture, Kerala Agricultural University, Vellanikkara, Thrissur