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Evaluating potting media for production of quality planting materials of Litchi (*Litchi chinensis* Sonn)

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ABSTRACT

An experiment was conducted during 2008-09 with ten different potting mixtures prepared from locally available materials *viz.*, FYM, vermi-compost, vermiculite, perlite, riverbed soil etc. Need based plant protection measures were adopted to raise healthy and vigorous planting material of litchi in all the treatments. The results revealed that maximum survival (82%) was recorded with potting mixture prepared by mixing Riverbed soil + Vermi-compost (2:1) + DAP (5g) followed by in Riverbed soil+ Vermi-compost (2:1)+ Vermiculite (50g) and Soil : Sand : Vermi-compost (1:1:1) + DAP (5g) with respective 76% and 70% survival rates. Maximum number of secondary roots and tertiary roots were recorded in the Riverbed soil+ Vermi-compost (2:1) + DAP (5g). The maximum height (72.6 cm), stem girth (4.16 cm), number of leaves (17) and number of leaflets (58.4) were recorded in the mixture containing, Soil: Sand : Vermi-compost (1:1:1) + DAP (5g).

Keywords : Litchi, propagation, potting mixtures, rooting media, vermicompost.

Amongst a number of factors affecting productivity and production unavailability of quality planting material of selected variety in time is one of them. Litchi is commercially propagated by vegetative means through air-layering. This propagation techniques lead to mortality of large no. of saplings in the nursery and thus final establishment is also very less. The planting medium should be high in organic matter with good drainage. Zee, *et al.*, (1999) found that the young lychee roots are very brittle, and careful handling is critical during planting. A potting medium of equal parts soil, compost, and black cinder is good for lychee air-layers having high in organic matter with good drainage. Conventionally litchi saplings are raised in nursery in seedbed and uprooted during the next monsoon. In general the nursery bed soil/ poly bags mixture have poor nutrient content and transplanted saplings become weak in few months of its transplanting. Saplings loose their vigor and luster due to improper potting mixture. Weak air-layers failed to establish in the main field. Production of quality vigorous seedling is the first step in achieving production and productivity in litchi. Their advantages in planting programme is beneficial in producing saplings and also get higher recovery due to the fact that potting mixtures not only hold more moistures but also provides better nutrition to saplings. Raisings of seedling in poly-bags was introduced in 1969 in Ivory-coast. It was reported from Sri Lanka that riverbed sand could be a successful alternatives to the more expansive potting media currently used in poly-bags. Therefore choosing the right potting mixtures is very important. Research work particularly use of potting mixtures combination and dipping in solutions are lacking in litchi saplings propagation and has immense scope to increase the quality plant propagation production by reducing the plant mortality in nursery and final establishment in the field. Thus the present investigation was undertaken using different potting mixture to enhance vigour of litchi saplings in the nursery.

MATERIALS AND METHODS

The experiment in the net house was conducted to study the effect of different potting mixtures during 2008 and 2009 at National Research Centre for Litchi, Muzaffarpur, Bihar. Sufficient no. of air-layers were propagated following the standard procedure in the mother block. The air-layered saplings were detached in the 1st week of October from the mother plants in the morning hour and kept in the net house. The potting mixtures were prepared thorough mixing of the treatment materials alongwith coco-pit separately. Detached air-layers were dipped in the thick solution of vermi-compost to fill cracks before putting them in

Table 1: Effects of different potting mixtures in growth and vigour of air-layers

Treatments	Girth (cm)	Height (cm)	No. of leaf	No. of leaflets
T1: Soil: Sand: FYM (1:1:1)	2.80	46.00	6.00	28.00
T2 : T 1 + DAP(5 g)	3.48	62.00	12.40	41.00
T3 : Soil:Sand:Vermi-compost (1:1:1)	3.40	63.20	13.80	42.40
T4: T 3 + DAP(5g each)	3.44	50.80	9.40	37.60
T5: Riverbed soil: FYM (2:1)	3.04	42.00	9.20	27.20
T6 T 4+ DAP (5g)	3.10	47.40	6.60	30.40
T7: Riverbed soil: Vermi-compost(2:1)	3.20	46.00	11.80	34.20
T8: T 7 + DAP (5g)	4.16	72.60	17.00	58.40
T9: T 7+ Vermiculite (50g/kg)	3.32	65.60	13.20	48.80
T10:T 7 + Perlite (50g/kg)	3.12	49.60	5.80	27.40
CD at 5%	NS	6.11	NS	7.65

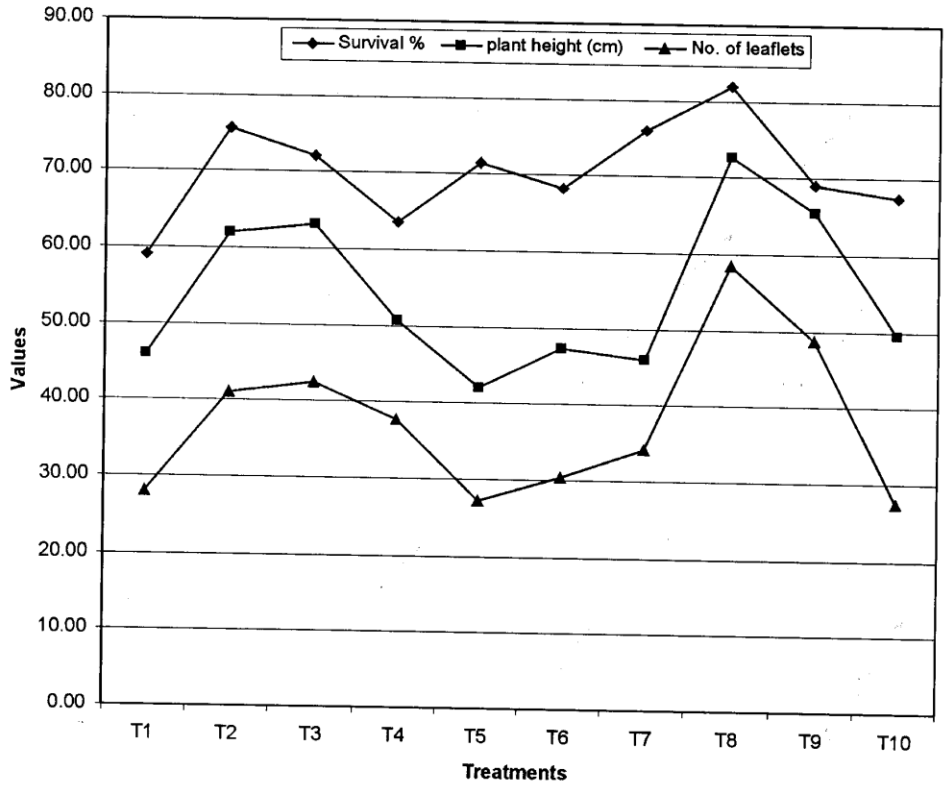

Fig.: 1. Effect of different potting mixtures on survival, plant height and no. of leaflets

the polybags. Altogether ten different treatments were made viz. T1-Soil:Sand:FYM(1:1:1);T2-T1+DAP(5g); T3- Soil: Sand: Vermi- compost(1:1:1); T4-T3+DAP(5g); T5- Riverbed soil: FYM(2:1); T6- T5+DAP(5g); T7- Riverbed soil: Vermi-compost(2:1); T8- T7+DAP(5g); T9- T7+ Vermi-culite (50g/bag) and T10- T 7+Perlite (50g/kg). Each treatment was replicated four times containing 100 no. of rooted air-layers. Filled polybags were kept in the net house with the facility of misting system. Need based plant protection measures and good horticultural practices were taken to raise healthy and vigorous saplings.

RESULTS AND DISCUSSION

Results indicated that maximum survival 82% was recorded with potting mixture prepared by mixing Riverbed soil+ Vermi-compost (2:1)+ DAP(5g) followed by 76% and 70% in Riverbed soil+ Vermi-compost (2:1)+Vermiculite (50g) and Soil: Sand: Vermi-compost (1:1:1) + DAP(5g)respectively. Maximum no. of secondary roots (6) and tertiary roots (22) were recorded in the Riverbed soil+ Vermi-compost (2:1)+ DAP(5g)followed by Soil: Sand: Vermi-compost (1:1:1)+ 5g DAP with 4 and 16 no. secondary and tertiary roots respectively. Maximum height (72.6cm), stem girth (4.16cm), no. of leaves (17) and no. of leaflets (58.4) were recorded in the mixture combination of Soil: Sand: Vermi-compost (1:1:1)+ DAP(5g) followed by (63.2cm), (3.44cm), 13.8 and 42.4 respectively in Riverbed soil+ Vermi-compost (2:1) + DAP(5g). Treatments like riverbed soil+ vermi-compost (2:1) provided favorable condition for the growth of secondary and tertiary roots and uptake of nutrients from the mixtures. A balanced mixture of ingredients gives excellent moisture retention, whilst allowing optimum aeration and good drainage. The physical properties of the media or media mix determine the availability of air and water, the two most important factors for plant growth. However, as the media ages in pots during plant production these physical characteristics are assume to change and water absorption rates, wettability, water holding capacity, water retention efficiency and bulk density of a number of key growing media currently being utilized by Australian production nurseries (Poulter and Eberhard, 2008). Kishore, et al. (2004) in case of papaya var. Surya seedlings reported that maximum survivability and with highest growth rate, number of leaves per plant, leaf area and better shoot/root ratio were recorded under treatment with soil + FYM (1:1). The soil mixture analysis showed very high organic carbon and subsequently very high organic matter (4.89%) in the mixture containing soil and FYM. Similarly, Barman, *et al.* (2004) also found influence of growing media and system of planting on growth and flowering of *Cymbidium tracyanum*. Kumar, *et al.* (2007) positive response of different organic materials on the grafting success and scion growth of apple (*Malus goestica borkh*). With the available data and discussion it is concluded that from the experiment that use of proper potting mixture (Riverbed soil+ Vermi-compost in 2: 1 ratio + DAP 5g) is useful for the better survival, growth of saplings and establishment in the field.

REFERENCES

1. Barman, D.; Rajni, K.; Naik, S.K. and Upadhayay, R.C.2004. Influence of growing media and system of planting on growth and flowering of *Cymbidium tracyanum*. Abstact 1st Indian Horticulture Congress (6-9 Nov. 04) pp.127.
2. Kumar, G.; Dimiri, D.C. and Bhatt, B.B.2007. Response of different organic materials on the grafting success and scion growth of apple (*Malus goestica borkh*). Abstract. 2nd Indian Horticulture Congress (18-21 April. 2007) pp.123.
3. Poulter, R. and Eberhard, J. 2008. Determining Physical Properties of Nursery Growing Media. Australian Standard. Potting mixes AS 3743-1993 Standards Association of Australia ISBN 0 7262 83517.
4. Zee, F.; Nagao M.; Nishina, M; and Kawabata, A. 1999.Growing Lychee in Hawaii. Fruits and Nuts June. Published by the College of Tropical Agriculture and Human Resources (CTAHR) and issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture.

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