Himachal Journal of Agricultural Research 33 (2):193-194, 2007

Effect of planting time of detached air layers of litchi on the success and growth of plants

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Abstract

Air layering was performed on litchi cv Dehradun plants during monsoon season and the rooted layers were detached from the mother plants and shifted to the nursery beds at different timings during the following year. The best time for transplanting rooted layers was observed to be May-June which was better than any other period including the rainy season when the layers are generally planted. Success of plants as well as their growth was observed maximum in layers shifted during May-June.

Introduction

Litchi is an important sub-tropical fruit of India, grown successfully in Bihar, Uttar Pradesh, Punjab, Haryana and West Bengal. It is becoming a favourite fruit with the orchardists of the lower hills and valley areas of Himachal Pradesh also. Air layering is the most common and successful method practiced for propagation of litchi (Anonymous, 1998). Generally, air layering is done during monsoon season, rooted layers are detached from the mother plants and shifted to the nursery beds during the next monsoon season and allowed to grow and establish for about a year before plantation in the orchards. Practically, it takes about two years for raising litchi plants in the nursery. Therefore, studies were undertaken to work out most appropriate time for detachment of rooted layers from mother plants and their shifting to the nursery beds for better and early establishment.

Material and Methods

The present studies were carried out at Litchi and Mango Research Station, Nagrota Bagwan, Distt. Kangra, H.P. during 1997-98 and 1998-99, on 15 year old plants of litchi cv Dehradun. Air layering was done during monsoon on one year old shoots by removing bark ring 2-3 cm from the base, covered by applying the rooting media comprising of soil and FYM (1:1) and again covering it with moist sphagnum moss (20 g) and then tying with polythene sheet. Well rooted layers were detached from the mother plants and shifted to the nursery beds in the following year at six different times, each of two successive months i.e. January-February, March-April, May-June, July-August, September-October & November-December. The rooted layers (400) planted in the nursery periodically, formed a treatment, replicated four times under RBD. Data pertaining to success of rooted layers, plant height, fresh growth and plant girth were recorded after 4 months of their establishment in the nursery.

Results and Discussion

Data pertaining to the effect of time of shifting of rooted layers from mother plants to the nursery on the success and growth of litchi plants are presented in Table-1.

Table 1. Effect of time of shifting of rooted layers from mother plants to the nursery beds on the success and growth of litchi plants

Time of shifting	Success (%)			Plant height (cm)			Fresh growth (cm)			Plant girth (cm)		
	A	B	Mean	A	B	Mean	A	B	Mean	A	B	Mean
Jan-Feb	67.4(55.2)*	68.6(56.4)	68.0	54.4	52.4	53.4	10.6	11.6	11.1	0.98	0.96	0.97
Mar-Apr	72.5(58.4)	74.5(60.1)	74.9	57.2	60.1	58.7	14.2	12.6	13.4	1.03	1.01	1.02
May-Jun	92.5(74.6)	95.0(74.4)	93.8	70.2	74.4	72.3	16.8	15.7	16.3	1.08	1.06	1.07
Jul-Aug	80.2(63.7)	76.0(65.6)	78.1	62.4	65.6	64.0	15.2	14.4	14.8	1.06	1.04	1.05
Sep-Oct	75.3(60.2)	71.5(61.4)	73.4	60.2	61.4	60.8	14.8	14.8	14.8	1.05	1.03	1.04
Nov-Dec	50.4(45.2)	64.0(50.2)	57.2	46.2	50.2	48.2	9.2	9.0	9.1	0.96	0.95	0.96
CD (P=0.05)	3.6	4.1	-	6.7	6.6	-	2.0	1.7	-	0.04	0.06	-

*:Figures in the parenthesis are the angular transformations
A: Year 1997-98 B Year 1998-99

Success of plants

The percentage of success, in general was recorded to be poor in layers shifted to the nursery beds during winter, which increased thereafter during summer. The lowest percentage of success was recorded in layers removed from the mother plants during November-December (50.4,64.0), which increased with coming warmer months and was recorded maximum with those of May-June (92.5%, 95.0%) which was significantly superior to all other shifting timings during the two years of study. However, layers shifted during January-February and March-April, remained statically at par with each other in this aspect. Kumar and Kumar (2000) found higher survival of 72.7 per cent in litchi cv. China in comparison to 64.2 per cent in Shahi, when layers were removed from the mother plant and transplanted to nursery after 45 days of layering done between February to October at monthly intervals.

Plant height

As in case of success of plants, plant height was low when layers were detached and planted in nursery during winter and it increased as the summer season advanced. Maximum plant height (70.2 cm, 74.4 cm) recorded from layers detached in May-June, during the two years of observation which was found significantly better than all other treatments, though, those shifted between January-February or March-April remained at par. Hartmann & Kester (1986) explains that plants of good size can be produced particularly by air layering with minimum propagation facilities.

Fresh growth

Fresh growth was also noticed to be low when layers were detached during winter and higher when shifted to nursery beds during summer. It was recorded to be the highest (16.8 cm, 15.7 cm) in rooted layers detached from the mother trees during the months of May-June and lowest in those of November-December during both the years of study. Hartmann & Kester (1986) suggested that when the layers are planted during fall, a sufficiently large root system develops by spring to permit better growth.

Plant girth

Plant girth was recorded to be maximum(1.08 cm, 1.06 cm) during the two year study when the layers were removed during May-June which declined slightly thereafter in those shifted to the beds in the coming months up to September-October. Lowest plant girth was recorded in layers planted during November-December, which was at par with those of January-February. Improved plant girth in the layers shifted to nursery beds during May-June might be due to favourable weather conditions for establishment and growth. Bose *et al.*(1986) opined that rooted layers planted in the nursery beds would show renewed growth after establishment.

The study reveal that the time of detachment of rooted layers from mother plants for shifting in the nursery beds plays an important role on the success as well as growth of the plants. The best time for shifting of layers was observed to be May-June which was found better than any other period including the monsoon when the layers are generally transplanted. The added advantage with May-June shifting is that plants can establish better in nursery and would be ready for disposal and plantation in the orchards during September-October. Sharma and Grewal (1989) transplanted layers prepared in July after two months to the nursery and reported a success of 89.4 per cent after another couple of months in litchi cv Dehradun. Kanwar and Kahlon (1986) observed that rooted layers of various cultivars of litchi responded differently after shifting to the nursery.

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