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Effect of time of air-layering on the success of layers in litchi cv. Deharadun

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Abstract

The best time for air-layering in litchi was observed to be March-April having success rate of 78.3 and 81.0 per cent during the two years study. Root development in terms of number of main roots and its length, was found to be maximum in layering done during July-August, while the number of side roots in the layering between March to August, were statistically at par with each other.

Introduction

Litchi is an important subtropical fruit which can be grown successfully up to an elevation of 950 amsl. Bihar is the major litchi growing state in India besides Uttar Pradesh, Punjab, Haryana and West Bengal. It is becoming a favourite fruit with the orchardists of Himachal Pradesh also. Air-layering is the most common and successful method for propagation of litchi, done during monsoons (Anonymous 1998). However, there is no report available about the influence of layering operation carried out during the entire period of the year, which could be helpful in raising the nursery production and manipulating the other nursery operations, especially during monsoons, when the nurseryman is busy in sale of plants and other field operations. Therefore, the present studies were undertaken to work out the most suitable time for air-layering and its impact on the rooting of layers in litchi.

Material and Methods

The present studies were carried out at Litchi and Mango Research Station, Nagrota Bagwan, Distt. Kangra, H.P. during the years 1998 and1999 on 15 year old plants of litchi cv. Dehradun. Air-layering was done on one year old shoots, by removing a bark ring of 2-3 cm from the base, applying the rooting media comprising of soil and FYM (1:1), covering it with moist sphagnum moss(20g) and then tying with polythene sheet. Layering operation was carried out throughout the year dividing the entire period into six treatments, each comprising of two successive months. 200 layers prepared on a tree in each period, formed a treatment, replicated four times under RBD. Data pertaining to development of roots i.e. number of main roots, number of side roots and root length were recorded at the time of detachment of rooted layers from mother plants and their shifting to the nursery beds during the first week of July in the following year. Success of layers in the nursery beds was recorded later after two months.

Results and Discussion

Data pertaining to the effect of time of air-layering on the root development and success of layers in the litchi nursery, for the years of 1998 and 1999 are presented in table 1.

A. Root development

Main roots: Formation of main roots was lower in the layers made during winters and it increased during the warmer periods. It was noticed to be maximum in layering performed during July-August and the results were significantly superior to all other treatments, during both the years under study.

Side roots: As in case of main roots, the formation of side roots was also found to be highest in layers of July-August and the results were at par with those done earlier during May-June and March-April, during both the years. The number of side roots was observed to be lower during the colder months and was minimum in layering performed during November-December.

Roots length: It was found to be maximum (9.20 cm)

Table 1. Effect of time of air-layering on the rooting of layers and their success in litchi nursery

Time of Layering	Root Development							
	Main Roots (No.)		Side Roots (No.)		Root Length (cm)		Success of Layers (%)	
	1998	1999	1998	1999	1998	1999	1998	1999
Jan-Feb	19.0	21.7	85	98	7.20	8.10	72.5 (58.43)*	68.9 (56.11)
Mar-Apr	20.5	23.6	104	116	8.10	8.20	78.3 (62.39)	81.0 (64.29)
May-Jun	21.5	24.1	115	121	8.40	9.10	75.2 (60.54)	77.5 (61.78)
Jul-Aug	30.3	27.4	140	130	9.20	9.50	66.2 (54.50)	65.1 (53.84)
Sep-Oct	22.2	24.4	78	110	8.50	8.90	68.0 (55.5)	63.4 (52.79)
Nov-Dec	16.5	18.1	67	72	8.30	8.10	63.0 (53.05)	60.2 (50.89)
CD (P=0.05)	3.7	3.2	46	41	0.95	1.02	5.24	4.43

*Figures in parentheses are the angular transformations

in the layers of July-August, though the results did not differ significantly between the layering done during May onwards up to December during the first year of study and May to October during the second year. It was minimum in layers of January-February.

Kumar and Kumar (2000) studied the role of season in multiplication of litchi cultivar Sahi under sub-humid conditions of Bihar from February to October and reported root development in terms of number of roots and root length to be the best, in layering done during June and July, and no rooting observed in those done during February and March. Kanwar and Kohlon (1986) observed that layering in litchi under Punjab conditions was successful when carried out during mid July to early October and different cultivars differed in their response to rooting and survival, after transplanting in the nursery.

B. Success of layers

Survival of the layers in the nursery beds was found to be maximum (78.3 and 81.0%) during the two year study in the layers of March-April followed closely by those of May-June. It was significantly lower in the layering done during monsoons and thereafter up to December. Higher percentage of success in layering done during March-April is possible due to favourable weather conditions and longer time available for root development and hardening. Dhillon and Mahajan (2000) reports 5 August to be the best date for conducting air-layering in Dehradun and seedless Early cultivars of litchi, and 12 August for Calcattia under sub-montaneous region of Punjab (India).

The study revealed that layering in litchi can be done throughout the year with success varying between 60.2 to 80.0 percent. Common practice of undertaking this propagation technique during monsoons is also not of much advantage as the best time was found to be March-April, though it was statistically at par with that of May-June. The added advantage of March-April layering is that rooted layers can be shifted earlier to nursery beds for better and early establishment. The present study also indicates that though the root development was better when layering done during July-August, it did not matter much as the final success was observed to be the best in March-April layering. It seems that the number of main roots and the root length developed in March-April layers was sufficient for their establishment in the nursery beds. Number of side roots which is more important for uptake of water and nutrients, developed with these layers was at par with those of July-August where it was maximum.

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