

The Influence of Different Media on Rooting of Litchi Plant through Air Layering

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Abstract

The investigations were carried out in Jabban Dargai, Malakand Agency in collaboration with Department of Agriculture Extension during 2010. “An effect of different media on rooting of litchi plant through air layering” were studied & the data were collected on number of roots plant⁻¹, number of shoots plant⁻¹, number of leaves plant⁻¹, root weight plant⁻¹ & percent plant survival. One-year-old erect, vigor & healthy pencil thickness branches of litchi were selected for practices of air layering using different media i.e. silt, (silt + sawdust), & sawdust in month of July. The maximum root weight plant⁻¹, shoot numbers plant⁻¹, roots numbers plant⁻¹, leaves number plant⁻¹ & percent plant survival was noted in case of silt use as a medium and the minimum root weight plant⁻¹, shoot number plant⁻¹, root number plant⁻¹, leaves number plant⁻¹ and percent plant survival was noted in case of sawdust using as a medium.

Keywords: Different Media, Air Layering in Litchi, Silt

INTRODUCTION

Litchi (*litchi chinenses* som) belongs to the family sapindaceae and sub family Nephroleae and is a sub-tropical, delicious, juicy fruit of excellent quality. It is used as a fresh fruit throughout the world.

Litchi is mostly use as a fresh fruit, but various other products such as pickles, preserves and wines are also made from litchi in china. Dried litchi commonly known as litchi nuts are very popular among Chinese. A highly flavored squashes is also prepared from litchi fruit. The nutritive value of litchi mainly depends on its sugar content. Sugar content in different varieties ranges from 6.74 to 18.86 in India (Singh and Singh, 1964). In addition to sugar content litchi also contains 0.7% minerals particularly calcium and phosphorous and 64mg vitamins C per 100 gm of pulp.

Litchi has about 125 genera and more than 1000 species. It is a moderately vigorous evergreen tree, which may attain the height of up to 7m and spread of 10m. It has broad round topped crown with profuse glossy light green foliage. The leaves are pinnately compound consisting of 3-9 leaflets about 7-10 cm length. The young leaves are orange or coppery reds colored. The inflorescence is a compound raceme developing both from terminal and auxiliary buds. The flowers are small and inconspicuous, born on leafless branches terminal panicles about 30 cm length. They are bisexual, unisexual or intermediate. In china, Pakistan and India flowering opening start in 2nd or 3rd week of March, while in Florida it may appear flowering in the late January or early February after chilling period. Flowering period ranges from 26-35 days in different varieties. The crop matures in four months but the time of maturity varies or different varieties. it can be grown on wide range of soils. It, however best grown in deep, well-drained soil, rich in organic matter. the climatic requirement for successful cultivation includes hot summer (Up to 40 oC) and mild winter with no frost.

Since the litchi has been propagated vegetative from ancient times, it is natural that many horticulture varieties should be grown in different countries. Different varieties of litchi are shahi, Rose scented, Purbi, China, Bedana, Bengali, Gee Kee, Tai so, Wai chee, Bombai, Deshi, Elachi, Kasba, Meclean and Muzafar Pur. The variety lohmaichi is said to be one of the best in world (Imran, 1997).

Root initiation in litchi is affected by many factor i.e. media, time, propagation practice, growth regulator, suitable temperature and growth condition of the fruits plants. Among these media, time factor and propagation practice play an important role in root initiation. Time is very important factor in root initiation, mainly due to temperature and humidity. The best time for roots initiation in litchi ranges from May to July, preferably before the onset of second flush.

Propagation of litchi by seed is not usually recommended, since litchi seedling is genetically diverse and most are characterized by a long juvenile period. Air layering or pot layering is, and will probably continue to be most widely used commercial method of propagation of litchi.

Upright branches from well-developed trees, free from pest and disease are selected for layering. Roots developed faster on branches with mature vegetative growth compared with recently flushed wood. A branch of pencil thickness is selected and 2.5cm is wounded or girdled and moist compost in pot or wrapped in polythene are tied round the injured portion. When a good ball of root has formed, the branch is cut off from mother plant below the ball and placed in larger box or tube or pot avoid the cracking of all during opening from plastic or pot. Then it is transfer to plastic bags and keeps in shady place for 1-2 months until they have become established

and renewed their growth.

This project was carried out with the following objectives

1. To study the effect of different media on rooting in litchi through air layering.
2. To find out the successful media for propagation of litchi through air layering.
3. To find out the easiest method for propagation of litchi through air layering.
4. To find out the most economic and best media for rooting.
5. To find out the successful media in month of July.

MATERIALS AND METHODS

The experiment was conducted at Fruit Nursery Farm Jabban Agricultural Extension Department Dargai Malakand. “An effect of different media on rooting of litchi plant through air layering” was studied. Layering was done in the month of July. The experiment was conducted in RCBD design with the following treatments.

1. Silt
2. Silt (66.7%) + Sawdust (33.3%)
3. Sawdust

The treatment here replicated five times. In order to initiate rooting in litchi the following procedure was followed.

All the leaves were removed from the portion meant for air layering. Then branches of pencil-sized diameter were wounded by complete removal of ring of bark just below the buds in the month of July. After the bark removal, a nail was hammered in the injured portion. The nail not only delays the healing process but also keeps the media tight in the place to and prevents it from being disturbed. A ball was made weighing 400-

600grams from different wet media (silt, silt + sawdust, sawdust). The soil ball was wrapped around the injured portion. Then the soil media was wrapped with a white sheath of polythene bag. Both the ends of the white sheath were tied with a plastic strip.

When the ball became dry approximately after 30 days then water was applied to the ball through a syringe. After 60 days when the roots became visible in plastic sheath then the rooted plants were cut just below the soil ball. The plastic sheath was removed after cutting rooted plant. Soil ball was removed and cleaned with water to study the number of roots & root weight per plant.

The data was recorded on the following parameters.

1. Number of roots plant⁻¹

Soil from sample of each of the five randomly selected layered branches were removed gently through water soaking and washing. The number of roots per layer was conducted through visual observation and their averages were worked out.

2. Roots weight plant⁻¹ (gm)

The roots weight of each of the five randomly selected plants were recorded with electrical balance and their averages were calculated.

3. Number of shoots plant⁻¹ (cm)

Shoot growth of each of the five randomly selected plants were measured with the help of measuring tape in centimeter for statistical analysis from base to top.

4. Number of leaves plant⁻¹

Number of leaves of each of the five randomly selected per plants were counted and was recorded.

5. Percent plant survival

At the end of experiment, all the plants were counted and their percentages were recorded by the following formula:

$$\text{Percent plant survival} = \frac{\text{Total number of survival plants}}{\text{Total number of plants}} \times 100$$

6. Economics

The economics of both the practices including labor, media, equipment's etc. were recorded.

RESULTS AND DISCUSSION

Effect of different media on rooting of litchi (*litchi chinensis som*) was studied and data were recorded on number of roots per plant, number of shoots per plant, number of leaves per plant, root weight and percent survival are presented.

Table-1

Media	No. of Roots	No. of shoots	No. of leaves	Root weight (gm)
Silt	54.2a	4.6a	71.4a	5.4a
Silt (66.7%) + Sawdust (33.3%)	31.4b	3.4ab	49.2b	4.26b
Sawdust	6.4c	2.4b	12.8c	2.98c

1. Number of roots plant⁻¹

The mean values of number of roots as affected by different media on layering in litchi is given in table-1 and the analysis of variance is given in table-1a. According to the statistical analysis of variance all the media have significant effect on number of roots.

Data in table-1 show that maximum number of roots (54.2) was recorded in silt media while minimum number of roots (6.4) was observed in sawdust. In case of (silt + sawdust) using as medium no of root was (3.14). So silt media have more nutrients & provide ideal condition for the growth of roots.

2. Number of shoots plant⁻¹

The mean values of number of shoots as affected by different media on layering in litchi is given in table-1 and the analysis of variance is given in table-1b. Data in table-1 indicate that maximum number of shoots per plant (4.6) was recorded in silt media, while minimum number of shoots (2.4) in sawdust. In case of using (silt + sawdust) as medium number of shoot was (3.4).

3. Number of leaves plant⁻¹

The mean values of number of leaves affected by different media on layering in litchis are given in table-1 and the analysis of variance is given in table-1c. Data in table-1 show that maximum number of leaves (71.4) was recorded in silt media, while the minimum number of leaves (12.8) in sawdust. In case of using (silt + sawdust) using as medium number of leaves was (49.2).

4. Root weight plant⁻¹ (gm)

The mean values of root weight affected by different media on layering in litchi are given in table-1 and the analysis of variance is given in table-1d. Data in table-1 show that maximum root weight (5.4gm) was recorded in silt media, while the minimum root weight (2.98gm) was recorded in sawdust. In case of (silt + sawdust) using as a medium root weight was 4.26.

5. Percent plant survival (%)

The mean values of percent plant survival affected by different media on layering in litchi are in the table-2. Data in table-2 show that maximum percent plant survival (92.30%) was recorded in silt media while the minimum percent plant survival (89.66%) was recorded in sawdust medium. In (silt + sawdust) medium the percent plant survival was (91.40%).

Table 2. Percent survival (%) Effected by different layering

Treatments	Percent survival
Silt	92.30%
Silt (66.7%) + Sawdust (33.3%)	91.40
Sawdust	89.66

6. Economic

The silt using as a media is 96% economic because of low labor cost, time saving and easy available for propagation as compared to silt + sawdust & sawdust using as a medium for layering. And it is also noted that in litchi the air layering is the easiest, non-laborious and time saving method of propagation.

CONCLUSION AND RECOMMENDATIONS

It is concluded from the experiment that air layering is the easiest and economic method of propagation in litchi. The silt media is best in all media almost in all respect i.e., root weight plant⁻¹, shoot number plant⁻¹, root number plant⁻¹, leaves number plant⁻¹ & percent plant survival as compared to medium (silt + sawdust) & sawdust. Beside this silt is easy available, inexpensive & successful medium as compared to (Silt + sawdust) and sawdust. Litchi propagation is successful and its survival is best in month of July.

RECOMMENDATION.

Air layering in litchi is recommended in silt media for the vegetative propagation of litchi.

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