



Effect of Rooting Media and Different Polythene Wrappers on Air Layering of Grape Fruit (*Citrus paradisi*)

(*Kumar Saket, Saket Mishra, Annjoe V Joseph and Shashi Kant Ekka)

Department of Horticulture, SHUATS, Naini, Prayagraj, Uttar Pradesh

*Corresponding Author's email: saketv97@gmail.com

Grapefruit (*Grape Fruit paradisi*), also called pomelo, is a Grape Fruit tree of the Rutaceae family. It became well-established as a fruit for home consumption in the lands of the West Indies before its culture spread to the American mainland. World production of grapefruit (combined with pomelos) was 9.3 million tonnes, of which 53% was in China. Other significant producers include Vietnam, the United States and Mexico. It has become popular as breakfast fruit in various parts of the world, and production has expanded to most Grape Fruit-growing countries. The grapefruit tree grows to be as large and vigorous as an orange tree; a mature tree may be from 4.5 to 6 metres (15 to 20 feet) high. The foliage is very dense, with leaves dark and shiny green. Most varieties are yellow when ripe. Fruit is usually ready to harvest from October and may continue to bear until May. The fruit ranges from 100 to 150 mm (4 to 6 inches) in diameter, its size depending upon the variety and upon growing conditions. Its pulp is usually light yellowish, tender, and full of juice, with a distinctive mildly acid flavour. Grapefruit juice contains about half the citric acid of lime or lemon juice and about 50% more citric acid than orange juice. Grapefruit is a tropical Grape Fruit fruit known for its sweet and sour taste. It's rich in nutrients, antioxidants and fibre, making it one of the healthiest Grape Fruit fruits. Grapefruit can be propagated through sexual and asexual methods but the sexual method is usually not recommended because seedlings are not true to type and the juvenile period is too long to bear fruit. Asexual propagation methods include budding, grafting and air-layering. Asexual propagation methods can probably be the most widely used commercial method of propagation in grapefruit. Some plants which are difficult to root, air layering has been proven as an effective method in a wide range of species as a means of increasing their kind. Air layering is a method of producing plants from aerial branches which remain in position while rooting.

Air-Layering

Air-layering is a well-known oldest method for the vegetative propagation of economically important woody plants. It is a reliable and easy means of propagation, especially in species that are difficult to root on cuttings. The retention of desirable characteristics, the creation of uniform rootstock and the ability to mass produce identical plants quickly and efficiently are all advantages of asexual propagation (Adriance and Brison, 1955) and these can be fulfilled through air-layering. It has a two-fold benefit for growing healthy mother plants. Seaweed is a biostimulant and stimulates cell division of root cells, resulting in more lateral root growth and root mass. More lateral roots mean stockier plants with more candidates for healthy clones.

Air-layering is a commercial method in practice for the propagation of Grape Fruit. The most ideal time for air layering in Grape Fruit is between April and July in the warm and humid climate, when the average temperature varies between 29.3 and 30.5°C and relative

humidity between 69.0 and 80.0 per cent. A shoot from the previous year's growth of 1cm in diameter is selected for air-layering. A ring of bark about 3cm long is removed. This area is covered with wet sphagnum moss, and cocopeat and tied with a different type of polyethylene film. The rooting takes place in about 30-40 days. Veneer grafting, T-budding, and Forkert budding are some of the other methods of propagating Grape Fruit.

Effect of Auxins on Air Layering

Auxin particularly IBA, NAA and IAA have been reported to induce rooting in many of the species with varied success. Auxin-induced acceleration of cell elongation in individual root cell, Elongation of cell is caused by stimulation of the first phase. The second phase of cell elongation can only be retarded by auxin. If its concentration is so low that the acceleration of the first phase of growth is not completely marked by retardation of the second phase.

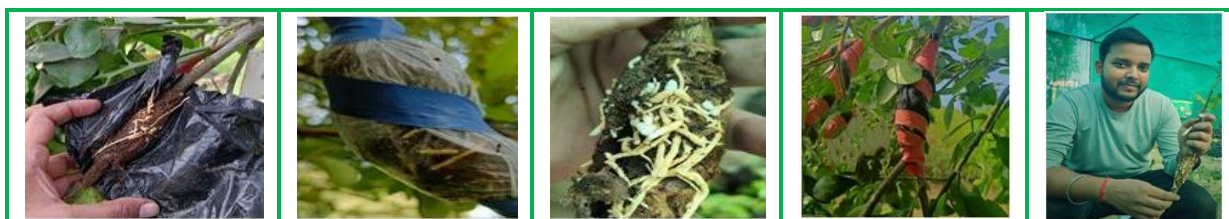
Air layering with the help of growth substances stimulating root primordial in air layers of fruit plants. IBA at higher concentration might be due to the activity of auxin at cambial may be adequate for callus formation and initiation of root primordia.

Effect of rooting Media on air layering

Better absorption of nutrients and moisture from the growing media created a more favourable environment for root and shoot growth resulting in a higher survival percentage of air layering in Grape Fruit. The maximum survival percentage of air layers might be due to better water-holding capacity of media as well as more number of primary and secondary roots, number of leaves etc. The increase in yield is attributed mainly to an improvement in root development, an increase in the rate of water and mineral uptake by roots. While maximum number of leaves might be due to the availability of more mineral nutrients and water due to efficient absorption by a vigorous root system. The rooting media such as sand, soil, sawdust, cocopeat, sphagnum moss, vermicompost and FYM.

Effect of different Polythene wrappers

As regard the wrappers, black polythene significantly increased the rooting of air layers as compared to white polythene. Rooting percentage, callus formation ,the number of roots,length of roots,diameter of primary roots and dry weight of roots was also found significantly superior with the use of black polythene wrappers.This beneficial effect of black polythene wrappers in air-layering was probably due to “Negative Phototropic” atmosphere.



Conclusion

- In all the results observed under the present research , it was notice that black polythene was definitely superior then white polythene.
- For all the route and growth characters, treatment (Sphagnum moss + black polythene wrappers +IBA1000ppm) was found to be significantly superior for the character such as number of primary and secondary roots, diameter of primary roots,length of primary roots and number of leaves for sprout.
- overall it can be concluded that for the very successful Air Layering of Grape fruit one should use IBA 1000 as a plant growth substance along with Sphagnum moss,Sawdust covered with black polythene.

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