

Production of Quality Planting Material in Pomegranate

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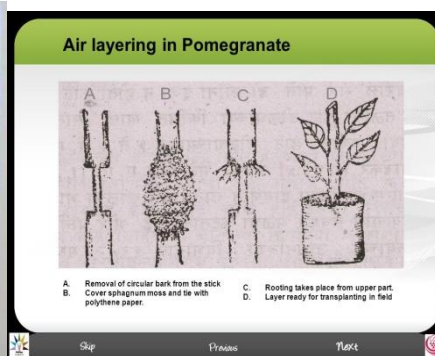
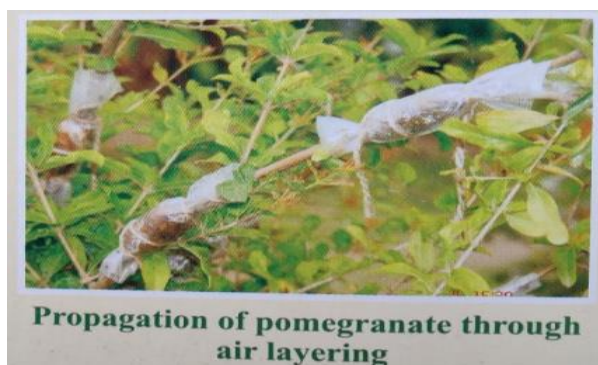
Introduction

Pomegranate (*Punica granatum* L.) is commercially propagated through stem cutting, Air layering and recently by *in vitro* raised plants. Air layering is commonly used for propagation of pomegranate in the Deccan Plateau and hardwood cutting in rest parts of India. Few Indian firms have come up with tissue culture raised pomegranate planting material but endeavor is still on to produce biohardened and better field performing pomegranate plants using tissue culture technique in an economic manner. Recently, systematic efforts for standardization of grafting technique and identification of suitable rootstocks to overcome problems of biotic and abiotic stresses have been initiated.

Air layering

In major pomegranate – growing areas of the Deccan Plateau of India, air – layered plants are used for establishing pomegranate orchards.

1. The upright branches of 0.8-1.5 cm diameter are girdled (2-3 cm) and in length and rooting hormone 2000-3000 ppm IBA is applied on upper part of the cut.
2. The girdled stem is wrapped with sphagnum moss and covered with small polythene strip. Coir/Jute thread or string is used for tying.
3. Well rooted layers are detached from the mother plants from the lower girdle within 75-90 days and planted in nursery or kept in polythene bags for planting in orchard. The optimum time for air-layering is June – August.



Stem cutting

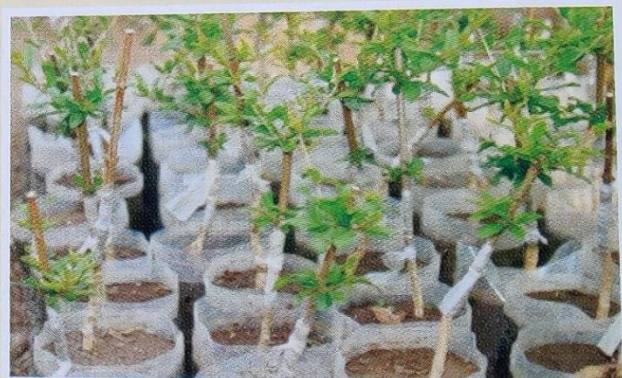
Multiplication of pomegranate by hardwood cuttings is a common practice in major parts of the world. Cuttings can be propagated round the year using pruned wood under polyhouses. These cuttings can be treated with Streptocycline (Streptomycin acid sulphate 90% + Tetracycline 10%) @ 500mg / l and Carbendazim @ 1.0 g / l before planting to ensure production of healthy planting material.

1. Optimum age of shoots for the hardwood cuttings ranges from 6-18 months. Lateral shoots, which usually flower and fruit heavily.
2. Suitable length and diameter of stem cuttings range from 20-25 cm long and 0.6-1.2 cm thick, respectively.
3. Quick dip of stem cuttings for 30 seconds 5 minutes in solution of Indole – 3 – butyric acid (IBA) at 2500-5000 ppm (2.5-5.0 g / l) found suitable for inducing roots in stem cuttings.
4. River silt medium, cocopeat and sand (1:1), soil and FYM (2:1:1) are suitable medium for planting cuttings.



Grafting

Presently, wilt is an emerging threat to the pomegranate industry in its major growing areas. Non-availability of wilt tolerant rootstocks and standard grafting technique are major impediments for its mitigation. Standard grafting technique and suitable rootstocks are required to mitigate the challenges of climate resilient horticulture with special reference to increased soil salinity, drought and other insects pests and diseases for commercial cultivation of pomegranate.



Propagation of pomegranate through grafting



Grafted plants of pomegranate

1. NRC Pomegranate, Solapur has standardized wedge grafting technique. 'Bhagwa' scion on different wild rootstocks gave more than 90 per cent graft success at 45 days after grafting during January – February.
2. Rootstocks of 1 – 1½ years old are decapitated (headed back) at 25 – 30 cm above the ground level. Beheaded rootstock is split to about 5cm deep through centre of the stem

with a sharp knife. Six to twelve months old scion of 15-20 cm length having 0.7-1.0 cm diameter is taken from a terminal shoot, base is made wedge shape and inserted in the vertical split of the beheaded rootstock.

3. Grafts are tied with polythene strips and covered with 20-25 cm long polythene tube tied with thread at its base.

In vitro propagation (Tissue culture)

There is a growing demand of pomegranate planting material in the country which may not be fulfilled only by conventional methods of propagation, thus, mass multiplication of pomegranate through tissue culture is the need of hour.

Farmers are under misconception that these tissue culture raised plants are disease resistant but actually these plants are more susceptible to diseases if not properly hardened/bio-hardened. However, these *in vitro* raised plants are initially free from any kind of infection.

Strengths

1. Availability of elite, disease free planting material in bulk.
2. Synchronized flowering and fruiting of *in vitro* raised pomegranate plants make them more suitable for mechanized cultivation.
3. Precocity, higher uniformity, better quality and yield.
4. Disease free planting material for extension of pomegranate to non – conventional areas.
5. *In vitro* propagation is highly successful in most of the high value crops and has vast scope in pomegranate.

Weakness

1. Intense monoculturing can lead to the threat of wiping out entire pomegranate
2. plantation by a single race of pathogen.
3. Cost intensive and high skill requiring technology.
4. Intensive care is required by *in vitro* raised plants to realize its full potential in terms of yield and quality.
5. Needs proper standardization for commercial cultivation.

Conclusion

The propagation in pomegranate involves hard wood cuttings, air layering, grafting and tissue culture. Now a days, tissue culture method of propagation is being followed to produce healthy, disease-free planting material along with synchronized flowering.