

Effect of Different Growing Media and Biocapsules on Seed Germination, Seedlings Growth and Survival Percentage of Phalsa (*Grewia subinaeaulis*)

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Since the discovery of auxin, there has been spectacular progress in the area of chemical regulation of plant growth and development. At present there are five groups of PGRs viz., auxins, gibberellins, cytokinins, ethylene and abscisic acid. However, some others like brassinosteroids, jasmonic acid, oligosaccharides and fusicoccin are found useful in one or other ways for growth and development of horticultural crops. These plant growth regulators are organic compounds other than nutrients, which in small amounts promote, inhibit or otherwise modify any physiological process in plants. These growth regulators can be natural or synthetic. Phalsa (*Grewia subinaeaulis* D.C.) a member of family Tiliaceae, is one of the oldest fruits known to Indian. Phalsa has been mentioned in Vedic literature as having certain medicinal properties. It is capable of growing under neglected and water scarcity conditions where only a few other crops could survive. Besides, it is an important catch crop in commercial orcharding. The mildly acidic fruits are rich in Vitamin A, C and minerals. Flowering in phalsa starts from February-March and continues till May. After 40-45 days of flowering, the fruits start ripening. Fruits are small-sized and ripen over a period of about a month. Gradual but steady ripening of few fruits in a cluster during summer necessitates frequent harvesting. Therefore a number of pickings are required at 2-3 days intervals which are very expensive. Phalsa fruits have short shelf life; therefore, its fruits are suitable for local market or need to be processed immediately after harvesting. Problems in phalsa whether related to the propagation or production may be tackled with the use PGRs are presented here.



Botany of Phalsa

Phalsa belongs to genus *Grewia*. It is deciduous bush in North India. It can be trained both as a bush and single stemmed small tree. In South India it is evergreen. It performs better in areas with district winters. The stem is hard and brittle. The bark has mucilaginous juice, which is used to purifying to sugar or jaggery. Leaves are broad rough and light green in colour, with hairs on both sides. Flowers small, yellow in colour, appear in clusters on peduncles in leaf axis. Flowers appear in April in north India. Fruit ripens in June and is drupe with one or two hard seeds.

Growing Media

Growing media, also known as growing substrates or growing mediums, are materials used in horticulture and agriculture to support the growth of plants. They provide physical support, aeration, and nutrient retention for plant roots. Common growing media include soil, peat

moss, coco coir, perlite, vermiculite, and various soilless mixes. The choice of growing media depends on the type of plants being cultivated and specific environmental conditions. Different media offer various characteristics, such as water retention, drainage, and aeration, to ensure optimal plant growth.

Effect of Biofertilizer (Bio-Capsule)

Biofertilizers are microbial in origin, offer themselves as a viable alternative for their ability to enrich the soil with beneficial microorganisms, mobilize the nutritionally important elements from non-usable to usable form through biological processes resulting in enhanced production of various fruit crops. They are less expensive, ecofriendly and sustainable and do not require non-renewable source of energy during their production. They improve plant growth and fruit quality by producing plant hormones. They increase the fertility of the soil and make it more productive and it is a way of achieving sustainability.

Biocapsule, a bio-fertilizer technology developed by the IISR (Indian institute of spices Research). It uses a select combination of beneficial microorganisms such as *Trichoderma*, *Pseudomonas* and *Bacillus*. They form a mutually beneficial microorganism in a gletin capsule for its delivery to the crops for the enhanced soil nutrient solubilization, enhanced growth, and yield. Increase in number of fruit's per plant, fruit breadth (cm), fruit length (cm) and fruit weight (g) may be attributed to the presence of biofertilizers (biocapsule).

Propogation of Phalsa

Seeds: Phalsa seeds can be collected from ripe fruit and sown in well-prepared soil. Ensure that the seeds are fresh and not dried out. They usually germinate within a few weeks. This method, however, may result in variation in the quality of fruit produced.

Bold seeds give 90 percent germination during July. Sow seeds on raised beds 2cm deep in lines 10cm apart. Seed to seed distance should be 2cm. Cover the seeds with mixture of sand + F.Y.M 50: 50 ratio.

Apply water with sprinkler, immediately after sowing. Avoid flooding of seed beds, failing which root rot fungus *Pythium* may appear. Apply 1% Bavistin solution after the seed germinate. Apply the solution Dursban 20EC (chlorophyriphos) @ 10ml/L of water after 30days of seed sowing to check the attack of white ants. Seeding become ready for transplanting in January.

Conclusion

In phalsa growing media plays a very vital and crucial role in propogation and establishment of nursery in phalsa. A good growing media and it's combination give arise a good seedlings and influence the growth and development of seeds to plumule and radicle . Once seeds germinated it also provides nutrients,minerals and all other basics needs for good germination and healthy seedlings. Before planting of phalsa tress the selection of healthy seedlings is very important which can be get by the growing media.

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