



Propagation Strategies of Succulents and cacti for Commercial Nursery Production

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INTRODUCTION

Succulents and cacti are important ornamental plants valued for their unique appearance. adaptability to arid conditions. And low maintenance requirements. Their ability to store water in specialized tissues allows them to survive under limited water availability. due to increasing demand for indoor plants. landscaping materials. And nursery production, effective propagation strategies for succulents and cacti have gained significant importance in horticulture and ornamental plant industries.

OBJECTIVES:

- **To multiply succulents and cacti using efficient and reliable propagation methods:**

Succulents and cacti are efficiently multiplied using reliable propagation methods such as leaf and stem cuttings, offsets, divisions and seed propagation. vegetative methods are most preferred in nurseries as they are quick, economical and produce true-to-type plants with high success rate. seeds and tissue culture are used for large-scale production, breeding, and conservation under controlled conditions.

- **To produce healthy, uniform and true-to-type planting material for nursery production:**

Production healthy, uniform and true -to-type planting material is essential for successful nursery production. This is achieved by selecting healthy mother plants, using appropriate propagation methods, and maintaining proper nursery management practices. controlled growing conditions, good-quality growing media, and regular monitoring help ensure vigorous growth, genetic uniformity and help survival of planting material.

• **To enhance the quality and market value of succulents and cacti produced in nursery:**

Enhancing the quality and market value of succulents and cacti in a nursery involves producing healthy, uniform, and pest-free plants with attractive shape and color. Proper propagation methods balanced nutrition, controlled irrigation and good light management improve plant appearance and vigor, Effective pest and disease management along with clean pots and attractive presentation, further increases consumer appeal and market value.

• **To reduce the cost of plant production through vegetative propagation methods:**

Reducing the cost of production in nurseries is effective achieved through vegetative propagation such as cuttings, offsets, and division. These methods are faster, require fewer inputs and ensure high success rates while producing true-to-type plants. As a

result, labor, time and production costs are minimized, improving overall nursery.

• **To promote sustainable horticulture practices through low -water – requirements:**

Promoting sustainable horticulture is achieved by growing succulents and cacti, as they require minimal water and are well adapted to dry conditions, their low irrigation needs help conserve water resources, reduce input costs and support environmentally friendly nursery and landscape practices.

What are Succulents?

Succulents are plants that possess thick, fleshy leaves, stems, or root adapted for water storage, this adaptation helps them withstand drought conditions, Succulents belong to various plants families such as Crassulaceae, Aizoaceae and Euphorbiaceous. Common examples include Aloe, **Echeveria**, **Hawortia** and **Sedum**. Succulents are widely used as indoor plants, pot plants, and in landscaping.



Echeveria elegans



Crassula tetragona l



Echeveria elegans sps



Kalanchoe marnieriana



Dracaena trifasciata hahnii



Aloe juvenna



Aloe barbadensis miller



Mesembryanthemum cordifolium



Echeveria sps



Gasteria batesiana



Crassula ovata



Kalanchoe pinnata

What are cacti?

Cacti are a distinct group of succulents belonging to the family **Cactaceae**. They are characterized by the presence of spines instead of leaves, thick green stems that perform photosynthesis, and specialized structures called

areoles. Cacti are highly adapted to desert environments and are popular ornamental plants due to their unusual forms and colorful flowers. Examples include **Opuntia**, Mammillaria, and **Gymnocalycium**.



Opuntia microdasys



Opuntia ficus indica



Opuntia ficus indica sps

IMPORTANCE OF SUCCULENTS AND CACTI:

Role in Air Purification:

Succulent's and cacti contribute to improving indoor air quality by absorbing Carbon dioxide and releasing oxygen. Certain succulents, such as **Aloe vera** and **Sansevieria**, follow Crassulacean Acid Metabolism (**CAM**),

these plants help in reducing indoor air pollutants and improve overall air freshness. Which allows them to release oxygen during the night. this property makes them suitable for indoor environments and bedrooms. Their low maintenance nature makes them ideal air-purifying plants for homes, offices, and public spaces.



Dracaena trifasciata hahhii



Crassula ovata



Aloe barbadensis miller



Zamioculcas

Role in Beautification and landscaping:

These plants are widely used for beautification due to their diverse shape, textures, and colors. Succulents and cacti enhance the aesthetic value of homes, offices, gardens, rockeries, and xeriscapes. Their low water requirement makes them ideal for

sustainable landscaping and urban green spaces. Succulents and cacti are suitable for areas with poor or sandy soils where other plants may not thrive. they contribute to long-lasting landscapes designs with reduced maintenance costs. they are ideal for beginners and busy individuals due to their hardy nature.

**Succulents Dish Garden.****Importance as Pot Plant:**

Succulents and cacti are popular pot plants because they require minimal care, less frequent watering, and adapt well to container growing. They are commonly used for table decorations, balconies, window skills and indoor plants displays. Their long lifespan and slow growth further increase their value as ornamental

pot plants. These plants are available in a wide range of sizes, making them suitable for small pots and compact spaces. They are easy to transport and handle, which adds to their commercial and decorative appeal and They are ideal for beginners and busy individuals due to their hardy nature.

**Succulents Pot Plants**

Propagation Strategies in Succulents and cacti:

Propagation is the process of multiplying plants through sexual or asexual methods. In succulents and cacti, both seed and vegetative methods being more common due to higher success rate.

1. Seed Propagation:

Seed propagation is mainly used for breeding, conservation, production of new varieties.

- Seeds are sown in sterile, well -drained media.

- Requires controlled moisture and temperature.
- Growth is slow and requires careful management.

2. Vegetative Propagation:

A) leaf propagation:

Healthy leaves are detached from the mother plant and allowed to dry to form a callus. The callused leaves are placed on well-drained media, where roots and new shoots develop. This method is common in **Echevaria**, **Crassula** and **Sedum**.



Snake plant leaf Propagation.

Echevaria leaf propagation.

b) Stem Cuttings:

Stem cuttings are prepared from mature a plants and dried planting; this method is widely used

for both succulents and cacti due to its simplicity and high success rate.



Jade plant stem cuttings

Echevaria stem cuttings.

c) offsets and pups:

Offsets or pups are naturally produced at the base of the plant. they are separated carefully and planted individually. This method ensures true-to-type plants and is commonly used in **Aloe**, **Agave** and **Haworthia** .

D) Grafting:

Grafting involves joining a scion of one cactus to the rootstock of another .it is used for rare, slow-growing, or chlorophyll-deficient cacti. Grafting improves growth rate and plant survival.

Growing Media and Environmental Requirements:

A Well-drained growing medium is essential for successful propagation. A mixture of sand, garden soil, cocopeat and perlite is commonly used. And good air circulation are important to prevent fungal diseases and root rot.

Role in Sustainable Horticulture:

Succulents and cacti support sustainable horticulture due to their low water requirement, minimal fertilizer needs and adaptability to harsh conditions. They are suitable for xeriscaping and water-efficient gardening practices, especially in arid and semi regions.

Additional Strategies to increase Profit in Commercial Horticulture Nursery:

- Mass propagation using leaves, cuttings, and offsets to produce more plants at low cost.
- Select fast- growing and high-demand varieties for quicker sale and better returns.

- Maintain healthy mother plants to ensure high survival rate and uniform growth.
- Use low-Cost, well-drained growing media made from locally available materials.
- Plan propagation according to market demand and season to sell plants at higher prices.
- Reduce losses by proper drainage and controlled watering to prevents rotting.
- Add value through attractive pots, combo planting, and labeling to increase selling price.
- Training Labour in Propagation Techniques skilled workers reduce damage and increase success rate of propagation.
- Sell directly through nursery outlets, exhibitions, and social media to avoid middlemen and increase profit.
- Reuse of Pots and Trays, clean and reuse propagation trays and pots to reduce production costs.

CONCLUSION

Succulents and cacti are valuable ornamental plants with significant aesthetic, ecological and commercial importance. Effective propagation strategies such as seed propagation, leaf and stem cuttings, offsets and grafting play a vital role in their multiplication and contribution to air purification, beatification, pot plant use, and sustainable landscaping highlights their growing relevance in modern horticulture.