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ORCHIDS: THE KEY CULTIVATION PRACTICES

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Abstract

Orchids are a huge family of flowering plants found in almost every country across the world. A widespread group of blooming plants with brightly coloured and fragrant blossoms. The tropics have the most diverse orchid genera and species. This article deals with the production technology aspects like types of orchids, Propagation techniques, climate, soil, temperature, planting techniques, pest management and disease management, harvesting and Postharvest handling and packing material used for orchids.

Introduction

Orchids are among the most cherished and exquisite plants, admired for their stunning flowers and their ability to last long in bloom. Belonging to the Orchidaceae family, orchids are perennial herbs, with approximately 25,000 species across 730 genera globally. India possesses 7% of the world's biodiversity. The Western Ghats and North-East Himalayan regions have the highest levels of orchids diversity. Furthermore, numerous hybrids are cultivated on a regular basis. Orchids are easily identified from other plants because they share some indistinct derived traits, called synapomorphies. These include: bilateral symmetry of the flower (zygomorphic), multiple resupinate blooms, an almost always significantly modified petal (labellum), fused stamens and carpels, and exceedingly small seeds.

Types of Orchids Based on Growth Environment

Types of Orchids	Growth Environment
Epiphytes	Orchids that anchor themselves to trees.
Terrestrial	Orchids that grow directly in soil
Lithophytes	Orchids that thrive on rocks.
Saprophytes	Orchids that grow on decaying organic material or decomposing logs.
Semi-aquatic Orchids	These orchids grow submerged in water, with only the flower spikes reaching the surface.

Orchid Growth Patterns

Orchids typically display two primary growth patterns, it has three growth patterns

S. No	Growth habit	Description
1	**Monopodial growth**	This type involves a single, upward-growing stem that continues to elongate year after year. Examples include Vanda and Arachis

2	**Sympodial growth**	This pattern features a horizontally growing rhizome that gives rise to new shoots. Sympodial orchids typically form clumps of shoots at various stages of growth. Each shoot axis ceases growth at the end of its flowering cycle. Examples include Dendrobium, Cattleya, Oncidium, and Cymbidium
3	**Pseudomonopodial growth**	Some orchids exhibit both apical and lateral growth

Vanda

Arachis

Dendrobium

Oncidium

Cymbidium

Propagation Techniques

1. **Seed and Tissue Culture:** Best suited for commercial orchid cultivation. It's advisable to source plants from reputable nurseries.
2. **Stem Cuttings:** Cuttings should be 40-50 cm in length and have at least two well-developed aerial roots. Shorter cuttings may take longer to bloom.
3. **Layering:** Ideal for monopodial orchids like Vanda. A 20-30 cm section below the apex is wounded and covered with moist cocopeat or coir until roots develop.
4. **Division:** Large clumps are divided into smaller units, each with at least 4-5 shoots. This method is effective for Dendrobiums and Cattleyas.
5. **Offshoots (Keikis):** These small plants emerge at the nodes of pseudobulbs in orchids like Dendrobiums. Once they mature, they can be separated and potted.
6. **Back Bulbs:** Older, dormant shoots are severed and placed horizontally on a moist medium to stimulate root growth.

Climate Requirements

1. **Air Movement:** Orchids, many of which are air plants, require consistent air circulation to maintain ideal temperature and humidity levels.

2. **Light:** Orchids thrive under diffused sunlight. Too much light can burn the leaves, while too little light can cause them to yellow. Orchids have specific light intensity requirements for Growth phase – 5,000 to 8,000 lux and flowering phase – 8,000 to 15,000

3. **Temperature:** Orchids are categorized into three temperature groups: Cool (for temperature climates), Intermediate (for subtropical regions) and Warm (for tropical climates).

4. **Humidity:** Optimal humidity levels range from 60% to 80%. Watering frequency varies depending on the planting medium moss or bark requires less frequent watering than basket substrates. Water thoroughly in the morning and lightly in the evening to ensure dry leaves overnight.

Planting Techniques

A. **Terrestrial Orchids:** Use a well-draining mix of humus, decomposed compost, sphagnum moss, or coir. Ensure the planting area has good drainage and receives sunlight.
B. **Epiphytic Orchids:** Various substrates can be used, including:

Coconut Husk: Retains moisture effectively.

Tiles/Bricks: Useful for moisture retention and drainage.

Charcoal: Purifies the growing medium and supports healthy growth.

Containers for orchids cultivation:

Clay pots with holes, plastic containers and wooden baskets are ideal for orchid cultivation, and also offering proper drainage and airflow should be there.

Nutrient Management

Nutrient may vary by orchid species, potting medium, seasonal growth conditions and also for growth.

Stage of orchids	Nutrients	Dosage
Early Growth Stage	Apply a balanced NPK fertilizer (1:1:1) every two weeks.	2 grams per liter of water
Pre-Flowering Stage	Apply an NPK fertilizer with a 3:1:1 ratio	5 grams per liter of water
Flowering Stage	Use an NPK ratio of 1:2:2.	5 grams per liter of water

Organic fertilizers such as diluted oil cakes, composted manure, and sea weed extracts are also beneficial.

Watering Guidelines

Orchids, typically grown on porous substrates, require watering at the crown using sprinklers. The amount of water needed depends on the climate, substrate and plant age. Adequate drainage is essential to prevent root rot.

Repotting

Orchids need repotting often, because usually every 2 to 3 years.

- When the plant outgrows its container due to its huge size.
- When the soil becomes degraded.
- When dividing or splitting the plant is necessary.
- It is preferable to report epiphytes annually.

Pest Management

Pest	Symptoms	Control Strategies
Slugs and Snails		Apply slug pellets around pots or on the ground.
Mites	Cause silvery discoloration	Spray miticides like Abamectin @0.06ml, Bifenazate @0.25 ml/lit
Caterpillars	Damage young leaves and flowers	Use insecticides such as Spinosad @0.5-1ml/lit, Pyrethyrin1-2 ml/lit of water
Aphids	Cluster on leaves and flowers,leaving sticky residue	Rake around plants, Spray Imidacloprid @0.5-1 ml/lit, neemoil@5 ml/lit
Sciaridae	Attack roots	Use yellow sticky traps and Spray Imidacloprid @0.5-1 ml/lit, neemoil@5 ml/liter,chloropyrifos@0.5-1 ml/lit of water

Disease Management

Disease	Symptoms	Control Measures
Pseudomonas cattleyae	Brown patches with oily spots on leaves	Use healthy plant material, reduce nitrogen levels, spray with Streptocyclin
Erwinia carotovora	Foul-smelling wet spots on leaves	Use healthy plant material, spray with hydrogen peroxide or streptomycin
Botrytis	Brown spots on flowers	Avoid excess humidity, apply Quintal spray
Fusarium	Black triangular spots at the leaf base	Prevent overwatering, treat with Topsin or Roko
Rhizoctonia spp	Affects the roots and substrate	Improve air circulation and drainage, apply Bavistin or Benomyl drench
Sclerotium rolfsii	White fungal threads and mustard-like sclerotia	Drench with Quintal or Rovral.
Moulds	Moisture and EC fluctuations that damage roots	Maintain low EC, ensure high pot temperature, keep the substrate drier briefly
Viral Diseases	Stunted growth, discoloured flowers, chlorotic spots	Use healthy plant material and remove infected plants regularly

Harvesting and Yield:

Orchid flower spikes should be harvested when the last flower is still in the bud stage. Typically, a plant yields 6 to 7 flower stems annually.

Post-Harvest Handling and Packaging:

After harvesting, orchid stems should be kept in water at temperatures between 7°C and 10°C. Depending on the variety and environmental conditions, the vase life of orchid flowers ranges from 5 days to 6 weeks. 12-hour pulsing: 8-HQC 500ppm +5% sucrose. AgNo3 25ppm +8-HQC 400 ppm + 5% sucrose as the holding solution. 50-gauge polythene with the spike base soaked in 8-HQC 25ppm is used as the wrapping material. Shredded wax paper can be used to keep the mix in the pot and to wrap spikes in buds or blossoms. Orchids are often shipped in cardboard boxes.

Conclusion:

In conclusion, orchid cultivation is a complex endeavour that requires a deep understanding of various factors including growth environments, propagation techniques, and specific climate and nutrient needs. By effectively managing these aspects from selecting the right type of orchid to retaining suitable pest and disease management strategies growers can optimize yields and enhance flower quality. Furthermore, proper harvesting and post-harvest handling techniques are essential for maintaining the longevity and marketability of orchid blooms. As the global demand for orchids continues to rise, implementation of advanced cultivation methods and sustainability practices will be crucial for both commercial success and environmental change in this exciting sector of horticulture.