A Study on the Viability of Orchid Cultivation for Ornamental Use in North India

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Abstract

The Indian floriculture business has seen a surge in cut flower exports in recent years. The output of crops including gerberas, gladioli, tuberoses, roses, carnations, and others has increased as a consequence of the use of new and advanced technology in production, post-harvest, and marketing approaches. Similar to this, orchids have untapped potential as a decorative crop. Cut flowers are imported from international markets like Bangkok to meet the very high demand for orchids in the North Indian market. It is urgently necessary to develop technology for mass production, scientific cultivation, post-harvest methods, and marketing strategies. The potential of orchids in floriculture commerce and production methods in the climatic zone of North India are highlighted in the article.

Keywords: Floriculture, North India, Orchids

INTRODUCTION

One of nature's most exquisite creations, orchids are symbolic of nobility and monarchy in floriculture (NRCO, 2015). With 20,000–30,000 species, they are one of the most developed plant families (Dressler, 1993; Tremblay et al., 2005). The most valuable decorative plants are orchids. An estimated 10% of the world's fresh cut flower commerce is made up of orchids, which also make up a significant portion of the worldwide floriculture trade in potted plants and cut flowers (De et al., 2014).

They are a source of great aesthetic value because to their distinctive form, stunning hues, and remarkably extended shelf life. Because of these characteristics, the orchid business is becoming a very lucrative one worldwide. Worldwide, there are around one million hybrids that are grown (NRCO, 2015). Orchids make beautiful cut flowers and are a great addition to pots and baskets. Asia is the primary source of orchids, with Dendrobium species accounting for 85% of the global orchid cut flower trade and Phalaenopsis and Cymbidium species for 15% (De et al., 2014).

There are over 1300 distinct species of orchids in India, most of which are located in the Western Ghats and the Himalayan area. Like alien species, a number of Indian plants have economic potential and should be fully used in the floral business. It is necessary to develop agro-technology for its large-scale production throughout the nation's many climate zones. Although the market for orchids has expanded many times in recent years nationwide, the north-eastern and southern states remain inactive for orchid cultivation. The choice of gorgeous but warm-growing orchids is crucial for establishing the orchid business in Central India and the warmer Indo-Gangetic regions. The region's

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need to import cut flowers from Southeast Asian nations will be lessened with the development of scientific and reasonably priced orchid growing technologies.



Figure 1. Some of the potential Orchids recommended for cultivation in North India: A. Dendrobium 'Sonia', B. Dendrobium 'Burana Stripe', C. Dendrobium 'Emma White', D. Dendrobium 'Pink Stripe' (Photos: Heji Alan), E. Oncidium sphacelatum (Photo: Alan Merrow).

Orchids in Floriculture Trade

The most popular flower in India's cut flower market is the orchid. They are most often used as potted plants and cut flowers for both indoor and outdoor décor.

The primary import cities for orchids in Indian flower marketplaces are Mumbai, Delhi, Bangalore, and Kolkata. The most common types are Dendrobium, Phalaenopsis, Oncidium, and Cymbidium because of their stunning, distinctive, vibrant, and long-lasting blooms. They are available in a variety of vivid hues, including pink, white, violet, red, purple, and vellow.

In Northern India, there is a great demand for flowers because of the growing tourist sector and changing lifestyles. The market has two different kinds of orchid demand. Cut flowers for workplaces, special occasions, or festivals, and potted plants for homes and gardens' aesthetic appeal. To accommodate this demand, flowers valued at crores are imported each year from Thailand and the

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Netherlands. The importance of flowers grows severalfold during joyful seasons. From Rs. 299.09 in 2008–09 to Rs. 3402.36 lakhs in 2014–15, the import of orchid cut flowers has grown (NRCO, 2015). Many orchids are still imported, despite India's potential to grow a thriving orchid economy. The primary obstacles to the commercial growth of high-quality orchids in India, particularly in Northern India, are a lack of knowledge, appropriate plant material, and growing procedures among farmers and nurseries. Orchids are cultivated in accordance with their specific needs for light, humidity, and a comfortable temperature. In India, you may cultivate any tropical orchid.

Shade nets are an easy way to develop warming growing orchids. Dendrobiums of vibrant colors and economic significance, such "Sonia," "Emma White," and "Thongchai Yellow," thrive in the climes of Northern India. In the market, a single cut bloom of the imported Dendrobium "Sonia" costs Rs. 50, while a single plant might cost anywhere between Rs. 500 and Rs. 1000.

Orchid Production in North IndiaOne of the most climatically varied areas in the world is North India, where summer temperatures often surpass 35°C and winter temperatures fall below 5°C. For many months, the Indo-Gangetic plains—one of India's most productive plains—remain hot and dry. By using contemporary technology, it will be possible to create healthy orchid plants that use less water and resources while producing a great volume of blooms.

Propagation

Orchids, like the majority of plants, may reproduce asexually by vegetative propagation and sexually through seed. One of the simplest and most popular techniques is vegetative propagation. There are five methods for vegetative propagation: tissue culture, aerial cuttings, keikis, rear bulbs, and division. Plants are propagated by division when they are divided into two or more sections, each of which has at least one new shoot. One of the easiest ways to produce new plants of the same species or variety is via this approach. Plants that are split are more likely to generate more shoots with greater vigor and quality. There should be a minimum of one new growth and three back bulbs each division. Early spring, when new growth is just beginning, is the ideal time to divide plants since it gives each division a complete growing season to establish itself and blossom the next season. The process of creating a new plant from previously bloomed or unflowered back pseudobulbs—which are often leafless—is known as back bulb propagation. Plants cultivated in this manner may take two to three years or more to achieve blooming size. During the reporting procedure, older back bulbs are taken out and put in growth conditions to encourage rooted. When removing back bulbs, it's crucial to bear in mind that the parent plant or any divisions should still have at least two healthy back bulbs and a growth in order to maintain the plant at blooming size. Dendrobiums and Phalaenopsis are two examples of orchids that produce offshoots along the stem that resemble and are miniature, independent plants. After they reach maturity, they may be gently removed from the parent plant. Like a back bulb, the juvenile branch, or "keiki" as it is sometimes known, may be potted up. Several Dendrobiums often have aerial cuttings. When exposed to harsh growth circumstances, some Dendrobiums will create little plants in their place of flower buds. Since the plant is almost completely developed before being separated from the parent plant, aerial cuttings are relatively simple to take. High-end, professional farmers may turn to production using cuttingedge technology like tissue culture propagation, which allows for year-round output, reduced labor

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costs, and effective post-harvest processing.

Growing

Given the hot and dry climate, growing orchids in the area calls for specialized knowledge, care, and abilities. For both personal and commercial orchid growth, choosing the right species, growing media, pots, cultivation methods, and shade house or polyhouse type is crucial. Dendrobium and Phalaenopsis species are the most suitable for the area. They will need a shade situation with high humidity (60–80%), however. The best growth media are rice hulls or husks, charcoal, and tree bark. Although charcoal and bark are often utilized, adding rice husks or hulls to the growth media can lessen the risk of mold or fungus infestation. Rice husks reduce water retention and permit drainage. In addition, rice hulls are more readily accessible and less expensive than coconut husks. Orchids are grown in six- and eight-inch perforated clay pots. In addition to aiding in aeration, one-inch side holes or perforations will allow aerial roots to dangle and absorb moisture from the atmosphere. Shade houses with flat roofs or doom-shaped roofs may be employed. The doom house should be at least nine meters high, and its breadth will depend on how many seats are built to hold the orchid plants. The seats, which may be constructed of wood, bamboo, or iron, should be three feet from the ground. A shade home with a flat roof is simpler to construct and requires less upkeep. To provide proper ventilation, a net (75%) with a width of 4 meters is used, with two levels of roofing, one taller (1-2 feet) than the other. The net is dispersed using wire strings attached to concrete poles. Mist or above sprinklers should be installed in the homes to provide water and keep the air damp.

Fertilizers

Orchids scavenge nutrients from whatever happens to be around in their natural environment, such as decaying leaves, animal or bird droppings, or minerals carried by precipitation.

To develop more quickly and blossom earlier, orchids grown in shade nets or green houses need frequent feeding and the proper nutrients. In addition to trace minerals like iron, fertilizers for orchids should include nitrogen (N), phosphorus (P), and potassium (K).

The primary regulator of floral and fruit growth is potassium (K).

Nitrogen (N) for robust vegetative development and phosphorus (P) for floral formation. The kind of plant, the season, and the overall health of the plant all affect how much food is needed. NPK 30:10:10 is the best fertilizer for orchid development, while NPK 10:30:30 is best for blooming. Traces of iron, magnesium, manganese, copper, zinc, boron, and molybdenum should also be used. Every seven to ten days, fertilizer should be sprinkled in the morning. Fertilizer should not be used when there is a lot of rainfall. Additionally, it must never be used with fungicides or insecticides.

Pests & Diseases Control

The main issue that damages plant components and sometimes results in plant death is pests. Scales, mealybugs, thrips, spider mites, aphids, cockroaches, and grasshoppers are a few of the significant pests. Insecticides are an easy way to manage these insects. Plants may be protected from these pests by applying pesticides once every seven to ten days between 4 and 5 p.m. on a bright day.

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Numerous diseases, including botrytis, mildew, and leaf rot, may affect orchids. One such condition is bacterial soft and brown rot, which causes tiny, water-soaked patches on the leaves that are often encircled by yellow haloes. If left untreated, the infection will quickly destroy the roots and leaves before more slowly moving into the pseudobulbs or rhizomes. This wet rot may smell bad and look like it's saturated in water.

The most prevalent and serious illness that damages leaves is called bacterial brown spot, and it manifests as a tiny, tender blister that is soaked in water. The diseased area, which starts off filthy green, grows, clumps together, and finally becomes brown or black, dried up, and sunken. It exudes a liquid that is packed with germs, especially when the sickness has spread to the leaf tip. In warmer climates, it is most common. By removing contaminated tissue and using bactericides, both illnesses may be cured.

Harvest

Because high temperatures promote quick respiration rates and considerable water loss, orchid flowers should be plucked in moderate weather (De, 2015). The best times to collect flowers are early in the morning or late at night. Because of the elevated sugar levels and nighttime evaporation, the blooms remained turgid in the early morning. In a similar vein, blooming stems that are cut in the afternoon maintain more of their stored carbs and have a longer vase life. The flowers' stems were always separated from the mother plant using sharp instruments like secateurs. Particularly for hard wood stems, the cut angle was slanted, and the stem was not crushed during harvesting.

As soon as the spikes were harvested, they were dunked in a pail of water.

Post harvest

The diameter and length of the florets, flower opening, fresh weight variations, stem or pedicel diameter or length, senescence pattern, petal color, overall lifespan, and leaf burning all affect a cut flower's vase life or longevity (De & Singh, 2015; De et al., 2014). An orchid cut flower of high quality should have at least eight standard blooms per stem, be clean, uniformly colored, and free of physiological disorders, have flowers that are evenly spaced around the stem, cover two thirds of the stem, and have a firm texture and a luminescent sheen. According to De et al. (2014), stems must have a minimum base diameter of 10 mm and be solid when held upright.

Improving longevity of cut flowers

Transporting and managing cut flowers after harvest are crucial procedures that need extra attention. After being harvested, cut flowers are pre-cooled by being kept in open boxes or cold storage without packaging until they reach the proper temperature (Bhattacharjee, 1997). The flowers were allowed to stand freely in a large container during the next stage of hardening so that air could circulate around the stems. Restoring the turgidity of cut flowers under water stress during storage and transit was the aim of the treatment. The following step involves impregnating the cut bases of flowers with a high concentration (1000 ppm–1500 ppm) of silver nitrate, nickel chloride, or cobalt chloride for ten to fifteen minutes. This protects the water vessels in the stem against microbial development and stem degradation. This made a number of blossoms last longer. Orchid farmers,

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distributors, and retail florists use a process called pulsing, in which solutions containing sugars and germicides are absorbed via the lower cut bases of flower stems, to prolong the cut flowers' vase life in water after they are cut. Occasionally, the buds are removed from the plant and the blooms are plucked at a period earlier than is often thought of as the cutting stage. By making cut flowers less susceptible to ethylene, low humidity, and harsh temperatures, opening the buds prolongs their usable storage life and saves space during shipping. Bud cut flowers may be opened using preservatives such sugars, biocide, and growth regulators (De & Singh, 2015).

CONCLUSION

The floriculture business is seeing a sharp rise in orchid demand. Northern India is reliant on imports, particularly cut flowers, because of a lack of expertise and equipment to produce them there. Technology advancements for post-harvesting and mass manufacturing will assist regional growers, nurseries, and business owners in cultivating orchids, lowering the need for imports from outside. Expert farmers using contemporary technological techniques will be crucial in boosting productivity and output of various orchid varieties to satisfy local demand while reducing imports and profits in home markets.

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REFERENCES

- Bhattacharjee, S.K. 1997. Packaging fresh cut flowers. Indian Horticulture, 41:23-27. 1.
- 2. De, L.C. and Bhattacharjee, S.K. 2000. Methods for prolonging vase life of cut flowers-a review. Orissa Journal of Horticulture, 28(1): 73-78.
- De, L.C., Vij, S.P. and Medhi, R.P. 2014. Post-Harvest Physiology and Technology in Orchids. 3. Journal of Horticulture, 1: 102. doi:10.4172/2376-0354.1000102
- De, L.C., Pathak, P., Rao, A.N. and Rajeevan. P.K. 2014. Commercial Orchids. Walter de Gruyter 4. GmbH & Co KG., Germany
- De, L.C. and Singh, D.R. 2015. Post-Harvest management and value addition in Orchids. 5. International Journal of Biological Sciences, 3(1): 14-35.
- Dressler, R.L. 1993. Phylogeny and Classification of the Orchid Family. Dioscorides Press, 6. Portland, OR
- 7. NCRO, 2015. Vision 2015. Indian Council of Agricultural Research, New Delhi
- Tremblay, R.L., J.D. Ackerman, J.K. Zimmerman and R.N. Calvo. 2005. Variation in sexual 8. reproduction in orchids and its evolutionary consequences: A spasmodic journey to diversification. Biological Journal of the Linnean Society, 84:1–54.

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