RAMA UNIVERSITY, KANPUR, UTTAR PRADESH

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Course: Production Technology of Ornamental Crops, MAPs, & Landscaping (HOR-221)

Lecture 8
Orchid

Introduction: Orchids are perennial, terrestrial, epiphytic, saprophytic or inter-mediate herbs with rhizomes or pseudobulbs or tuberous or aerial roots. Orchid is the most diverse flowering plant utilized for cut flower production and as potted plant. Orchids are excellent for garden and can be grown in beds, pots, baskets, split hollows of bamboo pieces or even ion tree bark. The leaves of Vanda roxburghii is used against rheumatism. Habenaria, a terrestrial genus of orchid also possess medicinal properties. Vanillin produced from Vanilla planifolia is used in flavouring industries. Pseudobulbs of Cymbidium madidum and Dendrobium speciosum are used as food. Orchids are available in abundance in tropics and temperate regions. It belongs to family Orchidaceae and is originated from Indo Malayan and Tropical America.

Classification

Monopodials: Main axis continues to grow year after year and bears flowers on lateral branches. Following genus belong to thisgroup-

Arachnis: Arachnis is generally known as scorpion orchid or spider orchid. Flowers appear almost all the year round. They prefer bright sunlight and high humidity for growth and development.

Renanthera: This is also a sun loving orchid, having good commercial value. It is grown in the southern districts of Kerala, especially in the coastal belt**.**

Phalaenopsis: Phalaenopsis grow best a low temperature, light intensity and lesser humidity.

Flowers are flat with three lobed lips. They are borne long sprays in large number. Vanda: Based on the shape of leaves, there are two types of Vandas; the strap leaved and the terete (pencil like) leaved.

Sympodials: Main axis comprises of annual portions of successive axis each of bears scale leaves and terminal flowers. Following genus belong to this group- Cattleya: These are also of two types based on the leaf types, the unifoliate which produces single leaf from each pseudo bulb and bifoliate which produces two or even three leaves. The pseudobulbs and the flowers are usually larger in size. They require partial shading under tropical conditions. There are more than 50 species.

Dendrobium: Dendrobium is the second largest genus of orchids consisting around 1340 species. They produce pseudobulbs or slender canes out of the underground rhizomes. They prefer partial shade and high humidity. Several commercial varieties are found to perform extremely well under tropical conditions.

Varieties: NewPink,HiengBeauty,EmmaWhite,KasemWhite,Sonia-28,Sonia- 17, White Nern, Boonchoo Gold, Kanchana Green, Jacquline Thomas, Madam Vipor, Pink Tips, Banyat Pink, Sakura Pink and Sabine**.**

Climate: Irrespective of the genera, all orchids need the morning sunlight. Arachnis, Vanda, etc. can tolerate very high light intensities of the tropics, whereas, the light requirement of Cattleya is lower. It is still lower in the case of Dendrobium and very low in Phalaenoposis.

Although various species vary in their individual requirement of optimum temperature, most of the cultivated orchids thrive in a day temperature varying from 15.5 to 21^{o}C and night temperature of 10 to 15.5^{o}C. Orchids in general prefer high humidity. Monopodials require high humidity (upto 70%), while sympodials

require comparatively less humidity (40-50%).

Soil: Areas with very high slope are not desirable. Though the soil quality is not a problem for epiphytic orchids, saline soils may be avoided. In the case of sympodial hybrids that are easily killed by excess moisture, resulting from deep burial of the plants, the media serve to conserve moisture, which on evaporation favours the plants. In general, the media support the plants and supply moisture rather than providing nourishment as is the case with most of the other plants**.**

Propagation

Propagation of monopodial orchids: Stem cuttings, Flower stalk cuttings, and Layering and Micropropagation.

Propagation of sympodial orchids: Division, Off-shoots or keikis, Backbulbs and Micropropagation

Potting and repotting: Repotting with porous compost containing barks, cocochips, cocopeats, leaf mould, sawdust, chopped leaf ferns or brick pieces. Repotting every after 2-4 years as indicated by the bulbs filling the pot, breaking down of potting mixture and if a plant is not able to produce 1-2 bulbs each year from each bulb that grew the previous year. Fresh air and good circulation. Leaves should move gently in a light breezes. Training with bamboo sticks or yoyo to keep the spikes upright position.

Cultural operations

Weed control: Hand weeding must be done very carefully. A combination of direx 4L (1.5 kg a.i./ha) and ronstar WP (2.2 g/l) applied either as a potting component or as a spray application can provide a wider spectrum of weed control than either chemical alone.

Replanting/repotting: The plant is gently shaked out of pot. If the roots are clinging to the inside of the pots tightly, a sharp knife is run around the inside wall of the pot to loosen the roots. If the plants have sufficient number of shoots, they are divided and repotted separately. Before planting, the dead bulbs and dried roots should also be

removed.

Regulation of light: Providing optimum shade is an important aspect of cultivation of orchids. Maximum spike production occurs in 25% double level shading. Fifty per cent single level shading is distinctly superior to all other treatments with respect to the number of flowers per spike. Vase life also increases in 25% and 50% double levels of shade.

Ventilation: Air movement helps to evaporate stagnant water trapped during watering, where fungi and bacteria breed**.**

Damping: To imitate these conditions, damping is done by spraying the floors, walls and staging of the house. Damping in winter should be done with a rising temperature.

Spraying: Spraying is done in morning and afternoon during warm weather. Plants like Cymbidium delight in heavy spraying in hot weather.

MANURE AND FERTILIZERS: A fertilizer complex containing nitrogen, phosphorus and potash in equal proportion (like 17:17:17 complex) is ideal for general application. Instead of a readymade mix or complex fertilizer, a mixture can be readily prepared using laboratory chemicals. Ammonium nitrate, orthophosphoric acid and potassium nitrate (to supply N, P and K respectively) can be used for this. During vegetative phase a 30:10:10 combination of N, P and K should be used which may be changed to 10:20:20 formulation during flowering stage. A concentration of 0.2% should be sprayed twice a week.

Diseases

Fungal: Leaf spot, Pythium black rot and flower blight. Bacterial:
Bacterial soft rot

Viral: Blossom brown necrotic streak, Mosaic flower break, Cymbidium mosaic, black streak or Cattleya leaf necrosis and Odontoglossum ring spot. Insect pests: Aphids, Orchid weevil, Orchid bulb borer, Orchid fly, Orchid mealybug, Cattleya midge, Cattleya weevil, Dendrobium borer, Scales, Thrips, Mites, Slugs and

Nematodes.

Harvesting: Correct stage of harvesting is essential as it not only influence keeping quality, but also add to the beauty of the spike. Cattleya should be harvested 3 to 5 days after the bud split or dehisce. Dendrobium is harvested when two or three buds are still unopened. The weather conditions prevailing at the time of harvesting influence the exact stage of picking. During the warm weather, the blooms can be harvested at an earlier stage of development. Tagging the buds each day facilitate cutting process. Cymbidium can be cut with the help of sharp blade when they are fully open. Individual flower or the entire spike is harvested at one time. Flowers are harvested twice a week during peak production period and once a week during low periods. Harvesting is done when 30 to 40% of the flowers are open. Harvesting should preferably be done in evening. The knife used for harvesting should be dipped in antibiotic mixture to prevent diseasestransmission.

Grading and packaging: Grading is done on the basis of number of flower/buds, uniformity of flowers colour, maturity and the number of open flowers compared with number of buds, flower blemishes, stem length, stem curvature, missing floral parts, presence of twisted or deformed flowers. After grading, hydrating, grouping and sleeving take place. To keep flowers hydrated, a small piece of moist cotton is kept at the base of each stem, covered with small piece of plastic film (6 x 6 cm). Packing can be carried out in single spray or in bunches with stem base aligned. Five or ten sprays in a bunch are standard. Bunches are placed in a clear plastic sleeves. After sleeving, the flowers packed in fibre board trays are then packed in master cartons. The cartons should have sufficient number of holes to facilitate aeration. Flowers are shipped either as intact spray or individual flower.

Yield: In general orchid has a long gestation period and it produces flowers after 3-4

years of plantation. Yield of orchid flowers varies according to genus. Dendrobium gives a yield of 1-2 spikes/plant. The genus Oncidium bears 5-6 stems/plant, producing 30-50 flowers/stem. Genus Vanda has an average yield of approximately 4 sprays/plantbearing10-15flowersperspray.Generally,genus Cymbidiummaygivea yield of upto 2500 spikes from fourth year onward, reaching upto 5000 to 7500spikes per 500 m^2 area in the fifth and sixth year, respectively.