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## ORCHIDS AND FLORICULTURE

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### GLOBAL FLORICULTURE SCENARIO

Floriculture today is a multibillion dollar industry. It is a potential money spinner. According to a report of the International Labour Organisation (ILO) - 'The world cut flower industry: Trends and prospects' by Gijsbert van Liemt, China and India dominate in terms of area under cultivation, but their yield per hectare is low. "In India and China, purchasing power is too low for sizeable imports to take place and quality is too low for sizeable exports to develop". Germany is the typical example of a second group of countries, with sizeable markets where imports satisfy most demands (up to 70 per cent). Roses are the main traded products and Germany is the largest import market, followed by the United States. A third group, which includes Columbia and Kenya, has a small home market, but a large volume of exports of Flowers. Lastly, The Netherlands is a member of a group with a large home market combined with a large export share. It is the world's leading exporter. The developed countries have a competitive advantage in their being close to the market and to quality research and extension services. They have room for innovation and boast of high quality physical infrastructure. However, high labour costs are a competitive disadvantage. Though developing countries like India benefit from low cost of manual labour, but skilled labour and technicians can be expensive. They also have abundant light, good climatic conditions and low land costs. However, airfreight adds significantly to the total cost of exports.

Quality is the catchword as far as exports are concerned. Quality benchmarking of flowers has many aspects. For instance, flowers should be free from diseases and they should be undamaged – elements, which can be judged on visual inspection. Other quality aspects, however, are more difficult to judge. For instance, once cut, it is hard to see whether flowers have been correctly handled. Yet, this is an important determinant

of vase life and whether or not the bud will open. This is why reputation is so important and why growers who have consistently delivered high quality flowers fetch higher prices than little-known or irregular suppliers.

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## FLORICULTURE IN INDIA

After an initial bloom in floriculture in India, a decline seems to have set in. Many of the ambitious floriculture ventures have not lived up to the expectations. It is essential that an evaluation be carried out to find out as to what ails the Indian floriculture industry.

There was a rapid growth of floricultural projects during 1970 to 1980, with most of these producing roses for export. This led to near saturation of the market and a decline in prices of the floricultural produce. Most of the producers in the flower business concentrated on the production, without having any link to the market needs. Shipments were dumped at the auction markets, without paying any regard to the appropriate time, volume or quality ratio of the different flower varieties. No promotional efforts were made to make the sale of flowers popular in competition with other comparable goods available in the market for the same end, especially the gift and decoration segments.

A majority of Indian flowers blooming in the fields are certainly at par in quality, to the ones grown in Europe. However, the problem begins the moment they are cut and commence their journey to the market. Improper handling after harvest, unavailability of optimum temperature and moisture conditions during storage and transportation and under or over-packaging leading to damage and wilting of flowers, are a few factors which have an adverse impact on the quality of Indian flowers reaching the consumer—both at domestic and international markets.

Though Indian flower industry suffers from logistical bottlenecks and inadequate post-harvest infrastructure, government support is focused mostly on the growers. Delhi is India's apex flower market and it is the silent hub of the nation's enormous flower traffic. The flowers moving in and out of Delhi, in all directions of the globe are as diverse as the various stages of handling them pass through. However, roses from Pune decorate coffee tables in a plush German café, the perennial struggle of flower growers, suppliers and distributors never makes it to the desktops. The space around the Coffee Home near Hanuman Mandir in Connaught Place in Delhi, hosts what is arguably the largest flower market in Asia, with 99 per cent cut flowers and one per cent marigolds travelling up from

exports. Of the approximately US \$370 million flowers grown last year, Chrysanthemum and gladiolus claimed the lion's share with 30 million and eight million flowers each, being shipped overseas. Other major exports include *Anthurium*, *Oncidium*, Golden Spider, Lily, Calla, Tuberoses, and Butterfly orchid. Due to convenient transportation between Taiwan and Japan, which not only reduces costs and delivery time, but also guarantees the quality of flowers, Japan has become the island's largest cut-flower export market, followed by South Korea and the United States. In 1994, Taiwan exported a total of US \$27.2 million worth of floral products, while importing US \$13.4 million worth.

But the very nature of Taiwan's floriculture industry means that a number of changes will be necessary in order to remain competitive. The industry is largely composed of individual farmers operating on a relatively small scale. Rapid price changes and complicated laws regarding land use and ownership are viewed as barriers to further increases in exports. Possible solutions to the present bottleneck are the establishments of special flower growing zones for export purposes, and the establishment of an information system capable of providing information to local growers about access to foreign markets. The successful production and marketing of *butterfly orchids*, by the state-owned Taiwan Sugar Corporation (TSC), is an example of a successful government enterprise. Bolstered by cheap land costs, rich human resources, and abundant financial support, the TSC moved into floriculture in 1987 and later it initiated the mass propagation of *butterfly orchids*. These orchids sold primarily to Japan, the U.S., and European countries, have won worldwide acclaim.

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### Floriculture in the Netherlands

The floriculture sector is gaining importance throughout the world. Flower production is burgeoning in many countries like India. There has also been broad expansion in international trade. Sales are largely centred on markets like Europe, the USA and Japan with strong purchasing power. The Netherlands is a major player in this sector, both in production and distribution. Dutch flower auctions play an intermediary role between the Dutch growers and the wholesale trade, foreign flowers and plants are increasingly sold at auctions in the Netherlands.

The cultivation of flowers and plants accounts for only around 4% of horticultural land use in the Netherlands. However, floriculture under glass is extremely intensive. Thus the floriculture sector generates over EUR 3000,000,000 - half of the total production value of Dutch horticulture.

The rapid expansion in the market for flowers and plants has induced many vegetable growers to switch to floriculture. In fact, they often opt to grow flowers for the cut flower market. Cut flower growers in turn are moving into the production of pot plants. This trend has led to a further increase in the share of the Dutch floriculture sector in the total production value of Dutch horticulture.

At least 70% of Dutch production is exported. The Netherlands dominates the market in the cultivation of starting material. Dutch cuttings and young plants are finding their way into all the flower-growing countries in the world. Dutch producers of starting material, and cut flower growers have often contributed to the development of the sector in these countries. A substantial proportion of world horticultural production finds its way to the customer through auctions in the Netherlands. Tons of Asiatic, African, and South American flowers, and other plants are flown into Amsterdam airport every day, vast majority of which are destined for auctions. In this way, the Dutch flower auctions serve as a hub for around half of the world's production of flowers and plants. Prices set here are often adopted as guide prices for international trade. The Dutch wholesalers who re-export the imported flowers and plants often provide added value. They have bouquets made up to the specifications of the customers and provide the flowers with labels. The supply of foreign flowers and plants is extremely important for Dutch wholesalers and exporters. They are well aware that customers want to make a selection from a complete range. However, there are certain periods when Dutch growers cannot supply particular products, but foreign growers often can.

The main centres of production are situated in the west of the Netherlands, in the area around the airport and in the greenhouse district, Westland, between the cities of The Hague and Rotterdam. Flowers and plants are largely produced by family firms, in which the owner plays an active role. As a rule, the growers do not sell their products themselves, but are affiliated to one of the flower auctions. The auctions concentrate supply and demand in the same location to ensure problem free sales. This leaves the growers entirely free to concentrate on production. This has led to far-reaching specialisation in the nurseries, themselves. This specialisation relates largely to the selection of crops. By growing only one crop, or sometimes even just one variety or cultivar, growers can optimise their production.

The production of cut flowers under glass is the largest sector in floriculture. The major cut flower crops are roses, tulips, chrysanthemums, freesias and gerberas.

In flowering plants, the shape and colour of the flowers determine ornamental value. Among the important flowering pot plants are *Kalanchoë*, *Phalaenopsis*, *Dendranthema* (potted chrysanthemum), *Spatyphillum*, Gerberas, Roses *Begonia*, *Cyclamen*, *Saint-Paulia*, *Primula*, and *Hortensia*. These are all largely cultivated on growing tables. Taller flowering plants, such as *Hortensia* and larger-sized *Euphorbia pulcherima*, are grown on concrete floors or anti-rooting cloth. A proportion of pot plants are grown hydroponically, particularly for interior plants in offices and similar uses. The plants stand in pots of fired clay granules, which can absorb a lot of water. One great advantage of this system is that the plants get a large water buffer, which need only be topped up once a month. Young plants for hydroponic cultivation are raised on phenol foam or rooted directly into the clay granules. Some are raised in potting compost. Before the plants are transplanted, the roots of these plants are rinsed clean of any compost which could be transferred to the clay granules.

Auctioning of flowers in The Netherlands is a well known activity in the world. **The auction clock** is still the primary means of trade at the auctions. The flowers and plants are displayed in front of the auction clock. This system has recently been linked to computer sales, where the buyer sees the product for sale on the screen. The auction clock works on the price reduction principle, whereby the price goes downwards and the product is sold to the first buyer to respond. Despite the advent of other sales methods, the price set by the auction clock is the determining factor for the pricing of flowers and plants at home and abroad. The auctioneers also act as intermediaries between wholesalers and growers for immediately available lots. Advance sales of floriculture products by this method are also growing in importance. Electronic sales have recently been introduced, in which the cultivated product no longer passes physically through the auction; instead the auction just offers the electronic infrastructure of the sale. This system enables growers and wholesalers to respond to product supply and demand.

The Netherlands' central role in the distribution of flowers and plants is also manifest in the fact that many foreign producers choose to sell their products through the Dutch flower auctions and wholesale trade, despite the high transport costs. All the major imported flowers are supplied all year-round. The supply only drops off in the summer months when there is a larger demand.

The main imports in these auctions are roses, carnations, *Solidago*, *Hypericum* and orchids. Orchids are mainly imported from Taiwan and to

this qualification. The programme is not only concerned with environmental considerations, but social factors such as safety, health and working conditions which also play an important role. Wholesalers and retailers also participate in the programme.

Since 2001, applied plant research in the Netherlands has been brought together under the Practical Plant Research Organisation (PPO). The glasshouse horticulture strand of this organisation works for the cut flower, pot plant and glasshouse vegetable sectors. The PPO has research establishments in Aalsmeer, Naaldwijk, Horst and Klazienaveen, where work is carried out in modern, well-equipped glasshouse complexes. In addition, the PPO has laboratories, cold stores and climatic test chambers, and different areas of expertise to support research and facilities for light measurement, substrate and nutrient research. The PPO's clients are the Ministry of Agriculture, Nature Management and Fisheries, and the Commodity Board for Horticulture, which represent the private sector.

Dutch floriculture is a very good example for a very well developed organization of controlled and regulated trade of agricultural products. More than anybody India, being an agriculture based country, should learn a lot from the system followed by Holland.

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## ROLE OF ORCHIDS IN INDIAN FLORICULTURE

Man's wish to surround himself with ornamental plants, even in his indoor habitat, dates from earliest times. But it is in the modern times, that an enthusiasm for new ornamental plants began to develop on the part of botanists, flower growers, missionaries and traders. England played a prominent role in the commercialisation of exotic plants. George III and his mother founded the celebrated Kew Botanical Gardens (Prasad and Kumar, 1998).

In 1800 itself, the trade of exotic plants was a competitive business. Thus, over the years, a fascination for ornamental plants sustained the practice of floriculture and horticulture, at large. The term horticulture is derived from two Latin words, *hortus*, meaning a garden and *cultura*, meaning cultivation. Initially, horticulture referred to the culture of crops grown in gardens. At present, fruits, vegetables, flowers, and other ornamentals are grown not only in home gardens, but also on a commercial scale. Floriculture is a branch of horticulture dealing exclusively with the cultivation of flowering plants. It has been the endeavour of scientists all over the world to develop better varieties of plants in terms of quality and to improve

the procedures for production. To this endeavour, the application of biotechnology has actually given an edge. Thus, the present day floriculture may be defined as the science and technology involved in the production, processing and merchandising of flowers and flowering plants.

Horticulture has emerged as a major venture in the world scene, by the propagation of ornamental by tissue culture. Over the past few decades, the flower business in the world has taken root and blossomed into a US \$20 billion industry (Chopra, 1995). Flowers are fast emerging as potential money spinners for many third world countries. The annual consumption of cut flowers in the world is worth US \$13 billion (Prasad and Kumar, 1998). The main importers of cut flowers are USA, Germany, France, UK, Switzerland, Sweden, Norway, the Netherlands, Denmark, Belgium, Italy, Austria and Japan. Germany is the largest importer, followed by the USA, France and UK. Among the exporters of cut flowers, the Netherlands dominates. It accounts for 70% of the world's cut flower trade. Columbia accounts for 12%, Israel's share is 6% in the world cut flower trade and India accounts for just 0.1% (Koshoo, 1995). Thailand which is the world's sixth largest exporter of cut flowers, earns US \$30 million a year from orchid exports, and Singapore earns US \$16 million a year. Out of the production of tropical orchids through tissue culture in Asian countries, Thailand accounts for 33% (Gavinlertvatana and Prutpongse, 1994). In the Netherlands, floriculture has expanded so much that practically no more land is available for expansion (Prasad and Kumar, 1998). It supplies more than 17,000 tons of flowers per year to Germany alone. There are 11,000 growers, 2500 wholesalers, 10,000 propagation companies and nine flower auction centres in the Netherlands. They control the world's export and auctioning of flowers. As the global market is expanding rapidly, the Dutch companies are looking for other countries like India for procuring floricultural products. It is likely that Singapore may become an official auction centre for flowers in Asia. Various aspects of commercialisation of orchids are discussed by Pemphishey (1997).

The world trade in flowers was expected to touch US \$38 billion by the end of the year 2000. The demand for flowers in West European countries has risen from US \$12 billion in 1991 to US \$18 billion 2000. The consumption of cut flowers in the USA was expected to rise from US \$5 billion in 1991 to US \$11 billion in 2000 (Prasad and Kumar, 1998). Though 75% of the area in Israel is desert, a daily Rose flight takes off from Tel Aviv to the Netherlands, carrying flowers worth US \$135 million per year. Kenya, the youngest member of floriculture business, has the world's

largest carnation plantation. Columbia, the second largest exporter of flowers meet 60% of the demands of the USA. A small country like Thailand has monopolised the world orchid trade (Chopra, 1995).

A majority of the cultivated orchids in India are native of tropical climates and are found in abundance in India in the states of Assam, Meghalaya, West Bengal, Karnataka and Kerala. Kalimpong, Shillong, Trivandrum, Bangalore, Yercaud and almost all the coastal areas of India, which are the places most suitable for the cultivation of orchids.

In this context, one should strengthen the fields of agriculture and horticulture to achieve healthy economic growth, through a number of efforts have been put, there is not much of a success in the Indian Floriculture. Floriculture has the potential for generating employment within the country and earning valuable foreign exchange.

According to an estimate, the area under floriculture in India was around 34,000 hectares in 1989 including 24,000 hectares under traditional cultivation (Chopra, 1995). It is now estimated that about 70,000 hectares of land is covered under floriculture. Climatically controlled greenhouses are available in about 500 hectares for growing flowers of export quality, more than two-thirds of the area is occupied by traditional flowers, while in the remaining area modern cut flowers are grown (Ghosh, 1998). Floriculture has by far a great annual growth potential of 25-30% which is 25 to 30 times more than that of cereals or any other agricultural produce (Prasad and Kumar, 1998). Since most of the flowers in the international cut flower industry are being grown in our country, we are at an advantageous position. India is well placed to meet the international demand of cut flowers which, peaks during the winter months. Being a tropical country, we are a treasure house of ornamental plants, especially orchids, as there are about 1200 orchid species growing wild in India. However, the country is yet to reach the full potential of production and commercial exploitation in this area. There was a target to achieve an export of flowers worth Rs.200 crores by 2000 (Khoshoo, 1995). But unfortunately it could not be achieved due to various reasons.

In the recent past, a number of Export Oriented Floriculture Units (EOU) have been established in India. By December 1996, more than 200 EOUs were approved including 157 units having foreign collaboration and direct foreign investment. The total investment in this sector was approximately Rs. 1000 millions (Ghosh, 1998). At present, there are 230 EOUs in India with an average unit size between 3-4 hectares. Of the 230 units only 52

are under production, 44 are under implantation and 134 units have been officially approved. More than 50% of the EOUs are in the South Zone, including Bangalore, Hyderabad and Chennai. The total area of units under production and implementation is 323 hectares (Apte and Bhargava, 1998). At least 30 biotech companies in India are engaged in micropropagation of orchids and other commercial crops (Ravishankar and Venkataraman, 1997).

Apart from the need to meet international demands, there is a strong local market for flowers in India. The use of flowers has a central place in Indian culture. There is no reliable study of the turnover of floriculture trade in India. However, some empirical estimates exist at the local level. For instance, in Delhi during the peak season the sale of cut flowers touches Rs. 80,000 per day in the winters and Rs. 50,000 in the summers. Roughly 10% of the sales are accounted for consumption in hotels, 20% in the offices and embassies and the remaining 70% through retail shops (Khoshoo, 1995). The annual sales in Delhi, on a cumulative basis, amount to a total of Rs. 100 crores (Deshpande, 1992).

In India growing of orchids commercially is not organised and it is still in the hands of hobbyist and a few dealers who mainly depend on wild collections from forests to meet a large part of their foreign and local demands. As a result, some of the orchid-growing areas are without any knowledge about orchids and very rare species are facing the danger of depletion now. Deforestation through burning of forests and felling of trees for timber, has been the major cause for the depletion of Indian orchid wealth. A large number of orchid species which were present in plenty in Indian forests are now on the verge of extinction and some of them have become so rare that a large number of botanical teams are unable to trace them. To cite an example, *Paphiopedilum druryi* which was once found in plenty in Agastaya Hills in South India is now difficult to locate. Steps should therefore be taken to conserve this natural wealth.

Floriculture is a highly specialised and remunerative venture, which has tremendous potential for export besides local consumption. Indian floriculture industry is definitely poised to bloom (Thomas, 1996). According to Govil and Gupta (1994), the total annual production of ornamental plants by tissue culture is 67,00,000, as compared to all other plants produced by tissue culture, which is estimated to be 37,60,000. According to Agricultural and Processed Food Products Export Development Authority (APEDA). The industry has grown at an annual rate of 10-15 percent during the last two decades. However, commercially

it is still developing in India. Due to the availability of area and the natural advantages of harvesting rich solar energy, India is in a favorite position. Moreover, it has the advantages of a diverse climate and soil, unlike the Westren countries which have severe climatic condition. Israel, where desert conditions prevail in 75% of the area, is the third largest exporter of horticultural products, next only to Columbia and the Netherlands (Bezalel, 1995).

India's trade of cut flowers is negligible, when compared even to some smaller countries like Asia like Singapore, Japan, and Taiwan, etc. Efforts are being made to improve the floriculture industry in India through the establishment of infrastructure, congenial Government policies and strengthening international collaborations. An Indo-Dutch co-operation started around 1992 with the implementation of the Eight Five Year Plan (1992-1997) in India. This plan has played a crucial role in the development of an export floriculture industry. The Government allocated an amount of Rs. 1000 crores in the eighth plan, as against Rs. 24 crores in the seventh plan, an unprecedented boost to floriculture. With the implementation of economic reforms and new seed development policies in India, the Government of the Netherlands, together with the Financial Bank for Developing Countries at Hague, ordered a study by a commercial company in 1992, which published the report entitled, "Opportunities for Floriculture in India". This lead to a series of dialogues resulting in the building up of an export floriculture industry in India. The Government of India kept short term goals enthusiastically high, to be achieved within a period of 5 years (1992-1997). The Government's target for export was Rs. 100 crores by 1996-97 and Rs. 200 crores by 2000. At present, there are mainly three Zones of importance in the high tech floriculture sector in India, North Zone with Gurgaon and areas around New Delhi, South zone with Karnataka, Tamilnadu and Andhra Pradesh, and West Zone including Pune and some areas of Maharastra.

Since orchids account for 2.7% of the global cut flower production, India with its vast orchid germplasm has a lot to gain by the use of tissue culture technology in the area of orchid cultivation (Singh, 1993).