

Unit



Introduction to Floriculture

INTRODUCTION

Floriculture is a vast field that includes cultivation and production of all types of ornamentals, viz., croton, cacti, orchids, grasses and bamboos. Besides cultivation, it includes layout and designing of gardens, study of various styles and features of garden and landscaping. The various field of revenue generation in floriculture includes cut flower production, loose flower production, nursery plants, potted plants, seed industry and extraction of essential oils. It has the potential for generating employment opportunities round the year and earning livelihood and valuable foreign exchange. India exports many floricultural products such as cut flowers, potted plants, etc., to many countries of the world. Export of floricultural items is important for our country's economy. About 30 per cent of the economy of a small country, like Holland, is based on the export of cut flowers.



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FLORICULTURE

Floriculture is a branch of horticulture that deals with the cultivation, processing and marketing of ornamental plants, vis-a-vis landscaping and maintenance of gardens so that surroundings may appear aesthetically pleasant.

Floriculture in the Indian economy

- According to the National Horticultural Board Database, (2016–17) the leading flowers producing States in the country are — Tamil Nadu (19%) followed by Karnataka (13%) and West Bengal (12%).
- Maharashtra, Karnataka, Andhra Pradesh, Haryana, Tamil Nadu, Rajasthan, West Bengal have emerged as major floriculture centres (APEDA, 2016–17).
- The share of floricultural products in total horticultural produce is 1.1% (NHB Database, 2015–16).
- About 2184.0 ('000 MT) flower production was estimated with the area of 278.0 ('000 ha) (NHB Database, 2015–16).
- Loose and cut flowers share in the total flower production is 1656.0 ('000 MT) and 528.0 ('000 MT), respectively (NHB Database, 2015–16).
- The highest production of flowers was recorded in Tamil Nadu (416.63 thousand tonnes), followed by Karnataka (280.92 thousand tonnes) (NHB Database, 2015–16).
- The annual growth trend of area and production of horticulture crops are 11.6% and 1.9%, respectively (NHB Database, 2016–17).
- At present, the share of the Indian floriculture products in the international market is about 0.6% (APEDA, 2015–16).
- India's total export is 22,000 metric tonnes of floriculture products with the worth of 548.74 crore in 2016–17. Major export destinations are the United States, Germany, the United Kingdom, the Netherlands and the United Arab Emirates (APEDA, 2016–17).
- There are more than 300 flower export-oriented units in India and more than 50% of the floriculture units are based in Karnataka, Andhra Pradesh and Tamil Nadu (APEDA).



- As per the ITC Trade Map, International Trade Statistics, 2014, India stands 14th in the world in exporting floricultural products, while the Netherlands and Columbia rank first and second, respectively.

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Importance of floriculture

Floriculture is one of the most potential components of the horticulture industry, being important from aesthetic, social and economic points of view. The importance of commercial floriculture are as follows:

(a) Production of cut flower

Cut flowers are harvested with stalk, especially for arrangement in vases. These are long-lasting and constitute a major share of the total world trade in floricultural products. Important cut flower crops are—rose, carnation, chrysanthemum, orchid, gerbera, lily, gladiolus, tulip, narcissus, bird of paradise, heliconia, anemone, ranunculus, tulip, calla lily, etc. Cut flowers are used in bouquet preparation or floral baskets, as corsages, in landscape gardening, flower arrangement and for decoration.

(b) Production of loose flower

Loose flowers are plucked from plants just below the calyx. These do not have attached stalks. Loose flowers are in great demand, especially in Asian countries for making *veni*, *rangoli*, bracelets, hair adornments for women and garlands, religious offerings and decorative purposes at various social functions. Loose flowers comprise rose, chrysanthemum, marigold, jasmine, tuberose, gaillardia, crossandra, barleria, *chandni*, *kaner*, hibiscus, spider lily, eranthemum, etc.

(c) Production of cut greens

Cut greens or cut foliage (leaves and stems) are attractive in form, colour and freshness. These are long-lasting and in great demand in floriculture trade. These are used as filler with cut flowers in flower arrangement,



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and elsewhere for increasing aesthetic value. They have various uses in fresh and dried floral designs and floral ornaments, such as bouquets, wreaths, interior decoration, etc. Some of the cut foliages in demand are asparagus, ferns, thuja, cupressus (goldcrest), eucalyptus, etc.

(d) Potted plants

These are of considerable commercial importance for instant gardening and for indoor, as well as, outdoor decoration. Potted plants can be carried wherever needed. These may be either of ornamental foliage or flowering. They are used for indoor decoration at homes, offices, commercial complexes, corporate offices, hotels, malls, and for decoration of sites during various functions or occasions. The importance of these plants is increasing because with the growing population and lack of open spaces, one has to largely depend on potted plants for decorating their surroundings. Examples of potted plants are—aglaonema, aralia, azalea, calathea, chlorophytum, croton, diffenbachia, dracaena, ferns, ficus, kalanchoe, maranta, money plant, senecio, syngonium, etc.

(e) Flower seeds and planting materials

There is a lot of demand for good quality flower seeds, especially annual ornamentals and ornamental planting materials. Availability of a great variety of soil and climatic conditions enables seed production of practically all types of flowers. Flower seeds of annuals are produced in large numbers for sale. A large number of bulbous plants, such as gladiolus, tuberose, amaryllis, dahlia, lilies, freesia, tulip, calla lily, etc., are multiplied and marketed.

(f) Nursery

Nurseries are meant for multiplying and supplying plants and planting materials. Ornamental plant nursery is a lucrative retail or wholesale business for supplying various types of plants and planting materials. Planting materials include nursery seedlings or prepared plants of trees, shrubs, climbers, annual



seedlings, perennials, foliage plants, bulbous plants, cacti and other succulents, palms, plants for indoor decoration, grasses, seeds, bulbs, etc.

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(g) Lawn

It is a well-mown turf made in the field, in front of a house, open space or in a garden. Lawn is made for various purposes and for providing clean air and elegant environment. A lawn is an integral part of garden, providing a beautiful environment for onlookers and emitting fresh oxygen to the environment as a lung does for the body. It has aesthetic and recreational value. It is believed that lawns improve the value of property by 15 to 20 per cent. It improves curb appeal. Various kinds of grass can be used according to the purpose of lawn use, like golf, hockey, badminton, tennis, etc.

(h) Production of perfumes

The demand for natural floral extracts, like perfumes, from flowers, is increasing by the day. Some flowers, such as rose, jasmine, screw pine and tuberose are used for the extraction of essential oils, which are a base for the preparation of perfumes, scents or attar. These flowers are produced for the extraction of high-grade floral perfumes.

(i) Dried flowers

Since fresh cut flowers and cut foliage are comparatively short-lived and have limited availability period, dry flower technique is used, wherein flowers can be easily dried, preserved and processed to retain its beauty, as well as, value for a longer period of time. The common examples of air-dried and mostly used as dry flowers include acroclium, dahlias, larkspur, helichrysum, lotus pods, etc. In floricultural exports from India, these products constitute 60–70 per cent.

(j) Extraction of colour pigments

Flowers are used to extract natural pigments. Carotenoids, extracted from flowers, are used



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commercially in pharmaceuticals, food supplements, and animal feed additives and as food colourant. In poultry industry, for intensifying the yellow colour of egg yolk, petals of marigold are used as a feed additive. It is also used to prevent diseases of the eye in humans. From chrysanthemum flower, a yellow-coloured dye is extracted for use in food products and cosmetics. The arils of Achiote (*Bixa orellana*) is used in cosmetics and medicines for coating having orange red colour dye.

(k) Pollution-free environment

The role of open spaces like parks and plants in checking air pollution is a well-known fact. Parks are considered as the lungs of cities. Ornamental plants help improve the environment aesthetically and health-wise. Some trees have been found to be useful in preventing air and noise pollution in urban areas. Trees provide shade and create better microclimate. Parks or gardens also serve as recreation spots and are known to have positive effect on physical and mental health apart from providing a peaceful atmosphere for meditation.

Aesthetic value of flowers

‘Aesthetic’ is the perception of beauty and study of its appreciation. Aesthetic value may be defined as the theory of the level of beauty of certain natural resources. It is the value or pleasure that anything beautiful gives to humans. Flowers symbolise passion, purity, beauty, innocence, peace, love, adoration, etc., and are well-proofed for their aesthetic value. Some common aesthetic values of flowers are as follow:

(a) Psychological

Flowers bring feelings of peace and comfort when given to an ailing member at home or in hospital or rehabilitation centres, and to family members or friends in general. They help in achieving higher level of personal development and satisfaction.

(b) Landscaping

Landscaping is the treatment of waste or otherwise free land with a goal to make it attractive and beautiful.



Landscaping is becoming common as it improves the environment of an area, brings in calmness, freshness and increases aesthetic value. This is important for offices, residences, supermarkets, etc., as the first look of a building's exterior is expected to give a pleasant overall appearance. Parks and gardens provide an opportunity for a large number of people to relax and enjoy the beauty of nature. A lawn is an integral part of a garden and is primarily for aesthetic purpose.

(c) Indoor gardening

Growing plants inside a house is known as indoor gardening. It not only makes the appearance of indoors beautiful, pleasant and attractive but also improves the air quality and adds freshness to an area.

(d) Flower arrangement

Flower arrangement is the aesthetic and artistic form of flower display, which refreshes the mind. It provides a means of livelihood to the arranger. Cut and loose flowers are used for various flower arrangements and can be presented on various occasions, such as weddings, birthdays, etc. They add beauty to the table when used as a centrepiece.

Prospects and present status of floriculture in India

- Due to the changing lifestyles and increase in the per capita income, the demand for floriculture has also gone up substantially. At present, it has become one of the profit making trades, owing to constant rise in the demand of flowers and its products.
- Floriculture exports from India are primarily dominated by fresh cut flowers and dried flowers.
- The various fields of revenue generation in floriculture include cut flower production, loose flower production, nursery, potted plants, seed industry, extraction of essential oils and value-added products.
- The production of loose flowers is the highest in Tamil Nadu, followed by Karnataka and Madhya



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Pradesh, whereas, the production of cut flowers is the highest in West Bengal, followed by Karnataka, Odisha and Uttar Pradesh.

- Several seed companies have established production units in major flower growing states to meet the demand of flower seeds.
- Seasonal flower seed production is a established business in Punjab, Karnataka and Maharashtra.
- Some of the agri-export zones for floriculture set up by the Government of India are in Maharashtra, Sikkim, Tamil Nadu, Uttarakhand and Karnataka (APEDA).
- In terms of floricultural production and export units, south India dominates, having more than half of the total units.
- The United States, Germany, the United Kingdom, the Netherlands and the United Arab Emirates are perhaps some of the major countries, which import floricultural produce from India.

Prospects of Indian floriculture

Since time immemorial, India has a tradition of growing flowers. It is considered as a high growth industry. The export-oriented flower production has increased due to the government's liberal policies.

The scope of floriculture in India are as follows:

- Opportunities for floriculture are increasing due to various uses of flowers — for aesthetics, prayers, festivals and other occasions, and perhaps due to the increasing purchasing power of people.
- The demand for floricultural plants and their produce, such as bouquet, garland, *veni* and value-added products, like dry flowers, pot-pourie, is increasing day-by-day in various functions and celebrations.
- Strategically and geographically, our country is well located between major flower markets — Europe and East Asia.
- Export is likely to get a boost due to the development of model floricultural centres and agri-export zones created by the government.



- The availability of diverse agro-climatic conditions in the country enables to grow all flowers in one season or the other.
- The winter season is mild in India as compared to other flower producing temperate countries. This provides us with an opportunity to grow and produce flowers and seeds for export during the season when the demand is high because of Christmas, New Year, Easter, Mother's Day, Father's Day and Valentine's Day.
- Floriculture offers employment for skilled, as well as, unskilled human resources, including rural youth and women.
- Landscaping has become an integral component of urban horticulture, which apart from its aesthetic value, protects the environment, reduces air and noise pollution and promotes eco-tourism.
- Lawn establishment and maintenance have become an integral part of landscaping, which require skilled, as well as, unskilled human resources. This has become a lucrative enterprise.
- In the light of climate change, the scope of turf or lawn grasses, vertical gardening, roof gardening, etc., is on the rise.
- Increasing industrialisation and depleting agricultural land has opened avenues for the production and marketing of potted plants. It has also opened avenues for plant rentals for interior decoration in hotels, corporate houses, etc.
- Nursery industry is coming up as a flourishing enterprise, giving high returns. There is a demand for high quality flower seeds, including F1 hybrids.
- Protected and hi-tech cultivation of cut flowers has a great future. One can increase the area under intensive flower production to increase floricultural exports.
- The extraction of essential oils, natural dyes, pharmaceuticals and nutraceutical compounds from flower plants is also an important activity and is coming up as a lucrative business.

Classification of ornamental plants

Based on life span

Annuals

Plants, which complete their life cycle from seed germination to seed production in one growing season, are 'annuals'. They complete the process of life, such as seed germination, growth, flowering, seed formation and die in one growing season or year. They require replanting in every season. They are mostly grown through seeds and are commonly called 'seasonal'. Examples are China aster, coreopsis, gomphrena, marigold, petunia, tithonia, verbena, zinnia, etc.

Biennials

These are the plants that complete their seed-to- seed life cycle in two seasons or two years. Usually, most of the temperate season plants are biennial in nature as they complete vegetative growth in one season or year and flowering to seed formation in another season or year, such as amaranthus, celosia, hollyhock, pansy, snapdragon, etc. These require replanting.

Perennials

Plants that have a life cycle that is more than two years are called 'perennials'. They produce seeds or flowers every year once the bearing starts. They do not require replanting. Once planted, they flower every year. Perennials are, usually, categorised into two groups.

Woody perennials

These mostly comprise trees, shrubs and vines, which have woody stems and branches, such as *Cassia siamea*, *C. fistula*, *Peltophorum*, *Cassia biflora*, *Lawsonia alba*, *Hibiscus rosa-sinensis*, *Petrea volubilis*, *Quisquallis indica*, *Vernonia eleagniaefolia*, etc.

Herbaceous perennials

These comprise plants with soft and herbaceous (non-woody) main stalk, such as anthurium, bird of paradise, geranium, gerbera, heliconia, pelargonium, periwinkle, portulaca, perennial balsam, sweet violet, viola, etc.



Based on season of growth

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Winter season annuals

Winter season annuals are hard to grow during the rigours of winter, withstanding low temperature. The seeds of annuals are sown in September–October and the seedlings are transplanted in October–November, for example, candytuft, antirrhinum, larkspur, nasturtium, pansy, petunia, phlox, sweetsultan, verbena, etc.

Summer season annuals

These are grown in the summer season and can tolerate high temperature to produce flowers. The seeds are sown in the end of February or beginning of March and seedlings are transplanted in the end of March–April, for example, cosmos, gaillardia, gomphrena, kochia, portulaca, sunflower, tithonia, zinnia, etc.

Rainy season annuals

Rainy season annuals are grown during the rainy season and can produce flowers under high humidity and rainfall as compared to other annuals. Seeds are sown in June and seedlings are transplanted in July. The example are amaranthus, balsam, celosia, cock's comb, gaillardia, etc.

Based on market value

Loose flower

Loose flowers are harvested without stalk. Examples of loose flowers are — barleria, bedding dahlia, calotropis, chrysanthemum (spray type), *chandni*, crossandra, eranthemum, gaillardia, jasmine, *kamini*, *kaner* (yellow and red), lotus, marigold, rose (fragrant *desi* type), shoe flower (hibiscus), sunflower, tuberose, water lily, etc. They are used for making *rangoli*, *gajra*, *veni*, garland, and offered for worships at home, as well as, in religious places.

Cut flower

Cut flowers are fresh flowers, flower buds or spikes harvested along with their stems attached to the flowers, length of stems being as specified to individual flowers. Examples of cut flowers are

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alpinia, anthurium, antirrhinum, bird of paradise, carnation, freesia, gerbera, gladiolus, gypsophila, heliconia, iris (bulbous), lupins, narcissi, orchid, rose (improved varieties), scabiosa, statice, tuberose, watsonia, etc. They are mostly used for bouquets and vase arrangements.

Flower yielding value added product

They are used as raw material in industries for the extraction of essential oils and preparation of edible products, such as *gulkand* and rose water. They are also used for the extraction of pigments as natural colours, and as dry flowers, such as acroclium, jasmine, marigold, rose, etc.

Based on type of plant

Herbaceous

Lilium, verbena, viola, etc.

Shrubs

Bougainvillea, jasmine, lawsonia, hamelia, nyctanthes, rose, tecoma, etc.

Trees

Gulmohar, *palash*, *amaltas*, *kadamb*, pride of India, etc.

Climbers and Creepers

Adenocalymma, *Antigonon*, Rangoon creeper, *madhulata*, *petrea*, *thunbergia*, etc.

Based on mode of propagation

Bulbous plants

Lily, narcissus, tuberose, tulip, etc.

Cormous plants

Crocus, gladiolus, tritonia, watsonia, etc.

Rhizomatous plants

Canna, hedychium, iris, lotus, etc.

Tuberous plants

Begonia, dahlia (root tuber), etc.



Practical Exercises

Activity

Identification of common flowers/ ornamental plants

Material required: Pen, pencil, practical notebook, herbarium file, etc.

Procedure

Visit a nearby flower growing farm, garden or flower market.

1. Collect the specimen of various ornamental plants or flowers.
2. Identify and list the collected flowers.
3. Maintain herbarium record or paste flower images in the practical notebook.
4. Classify flowers on the basis of life cycle, season and growth behaviour.

Check your Progress

Fill in the Blanks

1. Plants comprising soft and non-woody main stalk are known as _____ perennial.
2. Trees, shrubs and vines come under _____ perennial.
3. Those plants that complete their life cycle in one year are known as _____.
4. Plants that complete their life cycle (seed-to-seed) in two seasons or two years are known as _____.
5. India ranks _____ in exporting floriculture products.
6. Plants grown inside a house are known as _____.
7. A _____ is an integral part of garden.
8. Nurseries are meant for multiplying and supplying the _____ materials.
9. Cut greens or green foliage are used as _____ with cut flower in flower arrangement.

Multiple Choice Questions

1. Floriculture is a branch of horticulture that deals with _____.
 - (a) processing of vegetables
 - (b) planting crop
 - (c) production of fruits
 - (d) cultivation of flowers

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2. Cut flowers are harvested _____.
(a) with stalk
(b) with whole plant
(c) without stalk
(d) with leaves
3. The highest loose flower producing State is _____.
(a) Tamil Nadu (b) Haryana
(c) Uttar Pradesh (d) Punjab
4. The perception of beauty and study of its appreciation is _____.
(a) aesthetic value (b) pharmaceuticals
(c) cosmetics (d) cultivation

Subjective Questions

1. Describe the following:
(a) Floriculture
(b) Difference between loose flower and cut flower
(c) Cut green
2. What are the prospects of Indian floriculture in your view?
3. Do you think lawns are important? If so, why?
4. What is indoor gardening?
5. Give any two examples of the following ornamentals:
(a) Ornamental shrubs
(b) Ornamental trees
(c) Ornamental annuals
(d) Herbaceous perennials

Match the Columns

- | A | B |
|-----------------------|---|
| 1. Bulbous plants | (a) Begonia, dahlia |
| 2. Cormous plants | (b) China aster, carnation |
| 3. Rhizomatous plants | (c) Hollyhock, pansy |
| 4. Tuberous plants | (d) C. fistula, hibiscus
rosa-sinensis |
| 5. Annuals | (e) Canna, iris, lotus |
| 6. Biennials | (f) Crocus, gladiolus |
| 7. Perennials | (g) Lily, tuberoses, tulip |

