Handbook on Floristry

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Contributors
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Floriculture has gradually and significantly emerged as an economically viable option in the agriculture sector with the steady increase in flower demand in the country. In our country, flowers are grown in around 3,28,000 ha land, with the production of loose flowers around 16,95,000 MT and that of cut flowers 582,000 tons (2016-17). India is paving its way towards significant growth in the flower sector as Indian flowers are now been accepted while dry flowers contribute noticeably in the international market. Floriculture which was merely restricted to growing of traditional flowers in our country has emerged to a modern hi-tech agro-based industry. The popularity and commercialization of flowers is rapidly increasing as depicted from the magnificent floral decorations. Further, value added floral products like fresh flower craft and dry flowers craft are in much demand in both national and international market.

I am happy to know that skill development training on “Floristry” is being organised at Navsari Agricultural University, Navsari in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs and Directorate of Arecanut and Spices Development (DASD), Ministry of Agriculture & Farmers Welfare, from 8 January 2018 to 30 January 2018.

The skill oriented technique of Floristry has a good scope for employment generation for unemployed youth of the country and specially women with a potential to come up with some business start ups on a small scale. I appreciate the efforts of the team of floriculture scientists at NAU, Navsari for organizing this training and also publishing a Handbook on Floristry for the trainees for the ease of understanding various aspects on floristry.

My best wishes for the success of the training program.
Floriculture has emerged into a potential money spinner, an economical viable agri-business in the last decade. Success stories emanating from Bangalore, Pune and south Gujarat have singled the potential and scope of floriculture as an industry in India. A budding hub of floriculture is emerging in recent years with the pace of floriculture growth and development in the state. Further, to resolve the problem of postharvest flower losses and sustain the growth of floriculture as an industry, firm and consistent technology backup and its dissemination is required, which has hitherto been inadequate.

The initiative taken by the faculty of ASPEE College of Horticulture and Forestry is organizing training for skill development on “Floristry” in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs and Directorate of Areca nut and Spices Development (DASD) Ministry of Agriculture & Farmers Welfare, from 8 January 2018 to 30 January 2018 deserves appreciation. It is befitting the occasion that a handbook on Floristry is being published and released. I am sure that it would go a long way to help the young trainees in generating novel ideas for income generation through value addition in flowers in form of floristry.
I am happy to know that Navsari Agricultural University in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs. and Directorate of Areca nut and Spices Development (DASD) Ministry of Agriculture & Farmers Welfare, is organizing training for skill development on “Floristry” from January 8th 2018 to January 30th 2018.

Floriculture has emerged into an economical viable agri-business in the last decade owing to technology inputs, scientific back up and interest of the farming community. The immense potential of flower industry for employment generation and earning of foreign exchange has been recognized. The national flower market is growing at 10% annum. The industry is, however facing the problems of price fluctuation due to market gluts in view of lack of awareness and knowledge on scientific postharvest handling technology and value addition of flowers. Floristry has an immense potential and scope for self employment generation on small as well as bigger scale. Thus, identifying these aspects and organizing a training program with the basic theme to develop and upgrade skills on floristry will be a step ahead to empower the unemployed youth specially the women sector who can initiate some business. I appreciate the initiation taken by Dr. Alka Singh and her team in organizing this training program and for compilation of handbook on Floristry for the benefit of the trainees. I am sure the trainees will gain some momentum with a ray of hope towards income generation and explore new opportunities in flower trade.

I wish the training a good success.
Floriculture is an emerging area in horticulture for providing livelihood option owing to the increasing demand and expectable income of people. Cultivation of flowers provides opportunity to farmers to earn a better livelihood, harvest more profit per unit area. Looking to the floriculture sector, the area under flower cultivation in India has increased in the last decade by almost 2.5 times from 129000 ha in 2005-6 to 328000 ha in 2016-17 as per NHB estimates with a production of 2277000 MT (Loose flowers 1695000 MT and Cut flowers 582000 MT).

Flowers are high value commodities used in various ways in domestic and social activities. Besides the main product like cut flowers, loose flowers, potted plants, bulbs and tubers; value added products in form of bouquets, ikebana, flower arrangement etc with the skills of floristry are highly popular and their demand is on rise at national level.

The art and technique of Floristry has a great scope for employment generation but requires well developed and upgraded skills. I appreciate the initiatives taken by the faculty of ASPEE College of Horticulture and Forestry in organizing training for skill development on "Floristry" in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs and Directorate of Arecanut and Spices Development (DASD), Ministry of Agriculture& Farmers Welfare, from 8 January 2018 to 30 January 2018. It is befitting the occasion that a handbook on Floristry is being published and released.

I convey my good wishes for the success of the training wherein the trainees will gain confidence and skills with entrepreneurship mindset.
Message

Horticulture holds significant role in nutritional security, poverty alleviation and employment generation and has rightly been emerged in form of horticulture industry and as one of the most significant sectors in the world. Over the years, horticulture has evolved as one of the potential agricultural enterprise in accelerating the growth of economy in India as well. It offers not only a wide range of options to the farmers for crop diversification, but also provides ample scope for sustaining large number of Agro-industries which generate huge employment opportunities. Recently, Floriculture has also emerged an economically viable option wherein value addition based flower industry specially floristry i.e the technique of flower designing holds great scope for good income generation.

It is a great pleasure that Navsari Agricultural University in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs and Directorate of Arecanut and Spices Development, Ministry of Agriculture & Farmers Welfare, is organizing training for skill development on “Floristry” from January 8\textsuperscript{th} 2018 to January 30\textsuperscript{th} 2018.

I appreciate the initiatives taken by Dr. B.N. Patel, Dean, ACHF and Dr. Alka Singh, Associate Professor and Head to organize this training program as well as publishing a handbook on Floristry. I wish the training program to be successful and hope that the trainees will be encouraged for some new initiatives with the upgraded and developed skills on floristry.
Floriculture is an emerging blooming area in horticulture for providing livelihood option. Floriculture as cut flowers, loose flowers or nursery business provides opportunity to farmers as well as entrepreneurs to earn a better livelihood, harvest more profit per unit area. Flowers are high value commodities used in various ways in domestic and social activities. Further, value added products from flowers through floristry have high demand in national and international market for interior decoration as well as for a variety of other aesthetic and commercial uses and thus has better scope for income generation.

The skill development training on “Floristry” has been organized at Navsari Agricultural University in association with Agriculture Skill Council of India (ASCI) under the aegis of the Ministry of Corporate Affairs and Directorate of Arecanut and Spices Development (DASD), Ministry of Agriculture& Farmers Welfare with the basic aim to create awareness about the potential, upgrading the skills on the floristry and developing confidence in the unemployed youth to generate good income option.

*Handbook on Floristry* is a step forward to popularize flowers and floristry with technical support. I compliment Dr. Alka Singh and her team for their sincere efforts in bringing out this useful publication. I hope the trainees and the young entrepreneurs will surely benefit from this handbook.
Preface

Flowers, the essence of beauty, vitality and serenity, act as stress buster and evoke a positive response in form of happiness in us by a way of influencing human psyche. The freshness and beauty of flowers, is further enhanced and refined for beautiful presentation through the art and technique of Floristry.

Floristry is a beautiful art of flower display and sale. It is an art of designing and arranging flowers aesthetically in a vase or bowl retaining their freshness for a longer time and thus enhancing the consumer appeal and income. It endows with a magic touch to the cut flowers and adds more than 50% value to flowers. Fusion of creativity and science of post harvest handling is needed for development of the skills of floristry. Flower designing is an important part of the ambience on any occasion like weddings, birthdays, parties, or any other events in life as well as beautify homes and offices alike. Apart from adding to aesthetics, floristry is a lucrative income generating hobby with business potential for women entrepreneurs and unemployed youth.

This Hand book on Floristry deals with the introduction to different flowers with the basic aspects of flower designing, focusing on floristry as an income generating technique, plant material as source for flower designing, containers, tools and accessories, different styles of arranging flowers in detail and is well supported with illustrations and photographs for better clarity and easy understanding. It has been compiled especially for the trainees who would be the upcoming entrepreneurs in future. It would also be useful to the established florists, hobbyists, students as well as nature lovers.
Acknowledgements

The support of the following is highly acknowledged

- Honourable Vice Chancellor for instigating us with his global inspirational vision and keen interest in publication of literature for teaching, research and education in all the fields.

- The dean and Principal, ACHF, NAU, Navsari, for his affirmative approach and provision of the facilities to accomplish the training program.

- Agriculture Skill Council of India (ASCI) Ministry of Corporate Affairs

- Directorate of Arecanut and Spices Development (DASD), Ministry of Agriculture& Farmers Welfare
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Chapter 1

Flowers and Floristry

Flowers depict nature's true charisma, representing live beauty, focusing on aesthetic and positive side of life. Flowers have been associated with progress and prosperity from ancient time. Flowers either in form of garlands or bouquets denote freshness, acceptance, a positive outlook and a newly blessed beginning of any important social function.

Flowers impact on human life

Flowers influence human psyche in different manner and act as stress buster and evoke a positive response either as joy, pleasure or happiness. Flowers with sweet fragrance, colour and soft texture stimulate and awaken all the five senses and thus significantly influence psychology to greater extent that serve as mood enhancer and stress buster. Flower also influences positive outlook, work culture and performance. Happiness and health are well associated with flowers and plants as people involved in landscape designing as profession or having hobbies of flower arranging, bonsai making, home gardening and kitchen gardening are healthier and happy. The freshness and beauty can be further enhanced and made more presentable through the skills of floristry.

Floristry

Floristry is a skill of beautifully displaying of flowers and flower products for sale. It is an art of designing and arranging flowers aesthetically in a vase or bowl retaining their freshness for a longer time and increasing consumers appeal. Flower arrangements endow with a magic touch to the cut flowers and add more to more than 50% value to the cut flowers. Fusion of creativity and science of post harvest handling is needed for development of the floristry skills. Flower designing are an important part of the ambience on any occasion like weddings, birthdays, parties, or any other events in life as well as beautify homes and offices alike.

Value addition through floristry increases the economic value and consumer appeal of floricultural commodities and serving as a linkage between growers and consumers, it directly emphasizes the utility of flowers and a necessity for marketing of flowers.

Unemployed youth and small-scale farmers can set up small enterprises where value addition in the form of bouquets, garlands, venis, flower arrangements in containers, dry flower making etc can be taken up.
**Floral Arts and Technique**

The popularity and commercialization of floral craft i.e based on flower arrangement art is rapidly increasing in our country as depicted from the magnificent floral decorations costing from Rs 10,000 to 20 lakhs in wedding and religious ceremonies. There is around 20 to 200% monetary value addition through flower arrangements in different forms. The growing popularity of special day celebrations like Valentines' day, women's day and mother's day has also contributed to the growth of this art cum industry. This sector is rapidly expanding with the growing rate of flower consumption. Floral bouquet factories flourishing in Thailand, China, UK, etc., are offering sale of bouquets on many websites. Websites like www.theflowerfactory.com, www.flowerfactory.co.nz, www.flowerfactory.ca, www.theflowerfactoryusa.com etc are found on the internet, which offers floral décor for all occasions ranging from weddings, reception, spring, anniversary celebrations, etc., at your door step to make your celebration a memorable one. The bouquets and floral arrangements cost from US$ 8 to US $300 by these floral factories. The concept of floral designing has great application in modern bouquets and decorations on stage, walls, ceilings, curtains for various ceremonies including wedding. Although, this floral live art has become an integral part of ceremonies, it is yet to enter our homes and offices on regular basis. This global aesthetic live art needs to be explored at industrial level in India.

There are basically three style of arranging flowers viz., western style (Oriental), Ikebana (Eastern style) and Contemporary free style which are generally composed of cut flowers, foliage, twigs, stems with some accessories. Besides, in Indian tradition loose flowers are also used for designing flower arrangements in form of rangoli, garlands, flower ornaments and hair decoration. Loose flower craft in form of garlands, String, veni, bridal crown, Jadai (Hair adornment), Thoduthamaalai (garland of 1 to 12 feet length made up of banana pseudostemfibres) corsage for hand wrist etc, have great demand specially during festivals and South Indian weddings.
Chapter 2
Introduction to cut flower

Cut flowers: The term cut flower is used to define the flower which is harvested along with the portion of the stem. It is usually removed from the plant for decorative use.

Examples: Rose, gerbera, carnation, chrysanthemum, gladiolus, tuberose, goldenrod, daisy, gypsophila, lilium, anthurium, orchid, heliconia, bird of paradise, alstroemeria etc.

Uses: Mainly cut flowers are used for
- Vase display
- Preparation of bouquets
- Making floral arrangements
- Decoration of stage, car etc.
- Preparation of wreaths
Chapter 3
Introduction to cut greens

Cut greens: It refers to the leaves or part of leaves along with stems, branches with or without decorative fruits or other parts of the plant.

- This can be fresh or dried and are intended for decoration on its own or in association with flowers in bouquets.
- The cut greens are also referred to as cut foliage in several countries.


Uses:

- Mainly cut foliages are used as a filler, lining and background material in various flower arrangements.
- Used for creating a contract and bringing life to the bouquets, wreaths and garlands.

*Asparagus meyeri*, *Calathea*, *Areca palm leaf*, *Leafy leather fern*, *Alpiniazerumbate*
Codiaeum

Cycas revolute

Dracaena massangena

Monstera

Dracaena reflexa

Dracaena florida beauty

Cordyline leaf

Ruscus leaf

Asparagus plumosa

Murraya exotica
Chapter 4
Introduction to loose flowers

The flowers which are usually harvested without stalk and used for Gajara, Veni and Garland. For example marigold, jasmine, crossandra, spider lily, chrysanthemum, country rose, hibiscus, periwinkle, gaillardia, tuberose and china aster etc.

It can be used for making flower ornaments, hair ornaments like gajara, veni and making of garlands for marriage ceremony and for shops opening, offering to gods.

Fragrant loose flowers: rose, jasmine, spider lily, tuberose

Marigold
Jasmine
Chrysanthemum
Garland
Veni
Hair decoration
Garland in market
Spider lily
Floral rangoli

Loose flowers in local market
Chapter 5
Harvest indices of different flowers

Harvesting of cut flowers should be done in proper way considering the optimum stage of harvest. Harvest stage is dependent upon market distance. Flowers may be selected at some advanced stage for local market while for distant markets specially for export; flowers at early stage should be selected.

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<thead>
<tr>
<th>Flower</th>
<th>Harvest stage</th>
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<tr>
<td>Roses</td>
<td>Tight bud but developed stage.</td>
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<tr>
<td>Gladiolus</td>
<td>Basal two buds show the colour</td>
</tr>
<tr>
<td>Carnation</td>
<td>Fully developed bud at paint brush stage</td>
</tr>
<tr>
<td>Gerbera</td>
<td>Ray florets are fully expanded, two whorls of disc floret become mature i.e open and perpendicular to the stalk</td>
</tr>
<tr>
<td>Chrysanthemum (Std)</td>
<td>Fully open before the central disc is fully mature</td>
</tr>
<tr>
<td>(Spray)</td>
<td>When four flowers are fully open before the pollens shed</td>
</tr>
<tr>
<td>(decorative)</td>
<td>Centre of the oldest flower fully open</td>
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<tr>
<td>Gypsophilla</td>
<td>25-30% flowers are fully open in the inflorescence</td>
</tr>
<tr>
<td>Tuberose</td>
<td>Single: Buds are fully developed but yet not open</td>
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<td></td>
<td>Double: Basal 3-4 buds start to open</td>
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<tr>
<td>Orchids</td>
<td>Most species: 90% to fully open flowers. Dendrobium 75% inflorescence is open</td>
</tr>
<tr>
<td>Anthurium</td>
<td>When one third to one half of the spadix shows change in Colour (mature).</td>
</tr>
<tr>
<td>Bird of Paradise</td>
<td>When first flower is fully open</td>
</tr>
<tr>
<td>Lilium</td>
<td>When all buds are mature and show colour</td>
</tr>
<tr>
<td>Heliconia</td>
<td>2-3 Bracts open</td>
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Chapter 6
Post harvest handling of cut flowers

Importance of post harvest handling
- The flowers are highly perishable and need extreme care. When flowers are detached from the plant, they are deprived of food, water, minerals and hormones.
- It is estimated that about 30% of flowers perish during handling.
- The quality of flowers, which reaches the final consumer, depends on the pre-harvest and post-harvest handling.
- For customer satisfaction and creating value, quality is the foundation.
- Therefore it is important to study post-harvest handling of flowers to keep flowers in good quality.

Factors affecting post harvest life of flowers:

a) Pre harvest factors
- Selection of the variety
- Environmental factors like light, temperature, relative humidity
- Nutrition, irrigation, diseases and pests, pollution, etc.

b) Post harvest factors
- Handling
- Water quality and preservatives
- Plugging of xylem vessels of cut flower.
- Ethylene production
- Carbohydrate reserves
- Pressure potential of petal cells
- Susceptibility to disease and insects

Method and time for harvesting
Proper time and method at optimum stage of harvesting influence the vase life of flowers.
- Harvest early in morning or in the late evening when temperatures are mild to avoid faster respiration rate to excessive water loss.
- Flowers are fully turgid due to low transpiration at night (rose, chrysanthemum, gerbera).
• Immediately after harvest the flowers should be put in water or preservative solutions.
• Right method of harvest includes cutting flower stem with sharp knives or secateurs;
• Avoid crushing of stem, giving slanting cut to hard wood stems so as to expose maximum surface area to ensure rapid water absorption.
• Cutting stem length at specific lengths depending on crop market, purpose, etc.
• Harvesting at an optimum maturity stage is important and stage of harvest varies from crop to crop and varieties.

**Conditioning of cut flowers**
• Conditioning refers to placing of stem cut ends in water immediately after harvest to avoid water stress.
• Generally conditioning is done by placing stem ends immersed in warm water at room temperature for short duration and overnight in the cold room.
• Flowers are treated with de-mineralized water supplemented with germicides and acidified with citric acid to pH 4.0 to 5.0. Some chemicals like 8-HQ, 8-HQC, 8-HQS, sucrose etc can also be used for conditioning.

**Pre-cooling of cut flowers**
• Pre-cooling refers to keeping flowers under cold storage conditions immediately after harvest to bring down the respiration rate and field heat and ultimately to enhance the vase life and quality of cut flowers.
• The pre-cooling temperature varies with the species and cultivars. E.g. Alstroemeria 4°C, Anthurium 13°C, Gerbera 5 -7°C, Dendrobium 5-7°C, Carnation 1°C, Gladiolus 4°C, Rose 1-3°C, Chrysanthemum and Cymbidium (0.5-4°C).
• Pre-cooling reduces respiration rate and decreases breakdown of nutritional and other stored material in the stems, leaves and petals, delays bud opening and flower senescence. It also delays rapid water loss and decreases flower sensitivity to ethylene.
Impregnation
- It refers to permeation or infusing of the stem ends for a short time with chemicals. It protects the blockage of the water vessel in stem by microbial growth and decay.
- Chemicals like CoCl₂ or NiCl₂ are used at high concentration for a period of 10-15 minutes.

Pulsing
- Pulsing, is a short duration treatment given to cut flowers in form of high concentration of sucrose.
- Fresh cut flowers are pulsed by placing lower portion of flower stems in solutions containing sugar and germicides for a period ranging from few hours to 2 days, depending upon the flower species.
- The antimicrobial agents viz. 8-HQ, 8-HQS, 8-HQC, silver salts, citric acid etc should also be incorporated to enhance better solution uptake that would suffice maximum effects of the supplied sugar.
- The concentration of pulse solution varies in different flowers. Generally for rose and carnation, 5-8% sucrose solution is sufficient while for multi-floret spikes like gladiolus and tuberose, high concentration of 10-20% is needed.

Preservative –Solution
- Preservative or vase solution refers to a holding solution consisting of sucrose (2-3%), anti-microbial agent (200-300 mg/l)) and or growth regulator (optional) in which cut flowers stems can be continuously placed.
- Basically, the concentration is much lower than pulse solution. The anti-microbial agents like 8-HQC, 8-HQC, Aluminiumsulphate, anti-ethylene agents like STS, AgNO₃, and acidifying agents like Citric acid are widely used as vase solution.
- Ethylene inhibitors like Amino Ethoxy Vinyl Glycine (AVG), Methoxy Vinyl Glycine (MVG) and Amino Oxyacetic Acid (AOA) are beneficial in ethylene sensitive flowers.
- Chemicals (anti-oxidants and mineral salts) like α-Lipoic acid, Sodium Benzoate, Calcium Nitrate, can also be used for prolonging life and quality.
Grading

- Grading means grouping of flowers based on quality prior to marketing.
- Grading is done on the basis of appearance, stage of maturity, blemishes or injuries due to diseases, insect infestation, colour, size of the bud, straightness and stem length.
- Flowers should look fresh, turgid and spot-less along with proper bud size and stalk length as per the requirement.
- Grading is done manually scale fixed on stand on a platform.
- Recently, new techniques like machine vision system, image processing techniques, neutral network analysis, Bayes decision theory etc are being developed for flower grading.

Packaging

- Packaging plays a major role in flower quality, appearance and opening ability.
- Proper packaging of the cut flowers is must for ensuring good quality at the retailer or customer end even after long transportation or storage duration.
- Internal and external are the two important packing to be followed for flowers.
- The internal packaging consists of direct packaging of the cut flowers with a single or double layer film.
- Internal packing is done either with cellophane, polyfilm or butter paper or corrugated paper.
- External packaging is done for protecting the cut flowers from physical injuries or bruises during the transport system.
- The Corrugated Fiber Board (CFB) boxes of different sizes (100x40, 80x50, 120x50 cm) with or without vents are found to be highly beneficial for the external packaging of the cut flowers.
- The CFB boxes posses good physical strength depending upon the number of layers used in the CFB sheet.
- The box should be strong enough to support the weight of at least 8 full boxes placed on the top under high humidity. The minimum length of the boxes should be about twice the width and its width about twice the height. The boxes are tested at 0°C and 100 per cent RH for drop test, compression test and vibration test.

- Total vent should be equal to 4.5 per cent of the area of the end walls and should be avoided near the corners. Shredded papers or paper pillows can also be placed inside the box to avoid bruising injury to the flowers.

Precooling in rose

Grading

Bunching and packaging in rose

Rehydration and packaging in gerbera and anthurium

Graded Orchids
Tinted orchids
Orchid Packaging

Postharvest handling of cut flowers
Chapter 7
Florist Shop

Components of Floral Shop
The flower shop consists of different components, viz. sale counter, display area, working area and storage area.

Sale counter
It is the place where customer will get the product after making the payment. It should have appealing and neat look.

Display area
It is an area used to showcase or display the beautiful unique finished products to attract customer's attention.

Working area
It is most important area where all the flower decorative arrangements are prepared. It should be full of light and having provision of proper ventilation and cooling and should be neat and clean. It should have necessary and sufficient tools, equipments and furniture to facilitatworking on flower design.

Storage area
The storage storescut flowers and cut greens as well as material and accessories needed for making of flower arrangements.

Design of floral shop
The design of the floral shop should be appealing with transparent and artistic windows under cool environment.

- It should be across from the front door.
- There should be shelves along the walls and in the centre of the display room at eye-level display space.
- The entrance and inside walk of the shop should be filled up with fresh cut flowers and fresh flower arrangements creating pleasing and fragrant environment for customers.
- A seating place in the lobby area with attached table with flower décor can be added. Sample books can also kept handy with nearby shelf.
- The decorations should be changed regularly to reflect holidays, seasons and wedding and birthday themes.
- The display area can be accentuated with flowering and foliage trailing potted plants, vases, baskets, cards and soft toys.
- Some small gift items like pen, pad, vase, cards, and small teddy bear toy can also added.

**Infrastructure required to establish the flower shop:**
Infrastructure of floral shop comprises of wooden furniture, window display, tables, chairs, air conditioner, refrigerator, refrigerated display shelves, exhaust fan, ceiling fan, table fan, humidifiers, water storage tank etc.

**Materials for floral shop**
For setting up a florist shop there is need of flowers (cutflowers, cut greens, fillers), tools and materials, accessories, flower preservatives (pulsing and vase solutions), etc.
Chapter 8
Containers

Container is an integral part of the floral composition and foundation or the base of a design. The major consideration for selection of container for flower bouquets/baskets/arrangements are given below:

- **Function**
  The container must be capable of holding water, be suitable enough to support the weight of the flowers and be deep enough to hold an adequate supply of water. However, if the container cannot hold water, another container, which can hold water can be placed inside.

- **Material**
  Materials used in construction of floral design container are glass, metal, plastic, porcelain or glazed pottery. Metallic finishes require protection from the tarnishing that accompanies the use of floral preservative chemicals in the container water. When pottery containers are to be used, the glazed should extend across the bottom surface on the outside of the piece.

- **Style**
  The shape and size of a container often suggests the type of design to be created within it. A large, heavy container requires a taller arrangement to balance the mass of the container. A beautiful curved style of arrangement calls for a dainty stemmed compote to provide balance. A horizontal dinner table arrangement is most attractive when constructed in a low, flat rectangular container. The lines of the container are repeated or accentuated to provide unity and harmony within a design.

- **Color**
  The color pattern found in the container appears best when it either repeats those found in color scheme of the design or when neutral colors are present in the container. The most utilitarian colors used in floral containers are green, white, gray, brown, tan, or black. Green-colored floral vases are often selected, since nearly all flower stems and foliage repeat this color. Brown containers appear best when this color is duplicated in dried flowers, wood, or autumn-colored leaves. Metallic containers having a finish of silver, brass, bronze and gold leaf usually suggest a formal design.
Common container types based on shape

- **VASE**
  The height of container is greater than its width. It is not pedestal but is used for vertical designs.

- **BOWL**
  The width of the container is greater than the height. It is often used for table arrangements.

- **PEDESTAL**
  The container is elevated on a base that may be short or long stemmed. It is useful when a tall arrangement is needed yet the mass of a vase container is not desired. The ‘S’ curve and triangular types look perfect in pedestals.

- **BASKET**
  The baskets of wood or metal or bamboo are available. They are used for both vertical and horizontal designs. The designs are usually informal in style. Round arrangements also look elegant in baskets.

- **NOVELTY:**
  These are limitless in possibilities. Care should be taken to assure that they do not overpower the design. These are perfect specially for free styles

![Images of containers](image-url)

**Figure 4. Different type of containers used in flower arrangement**
Chapter 9
Accessories

Accessories along with flowers and fillers, add the touch of exquisiteness with contemporary look to the arrangements. Accessories like stones, marbles, pebbles, ribbons, feathers, cellophane papers, floral tapes, varnish, paints, sparkles, moss, coloured net cloth, balloons, etc. though not essential but add a pinch of added beauty.

i) Ribbons: Coloured ribbons are available in various attractive colours and are used in bouquets, etc.

ii) Stones, pebbles & marbles: Small pebbles and marbles have long been used to hold the stems of cut flowers.

iii) Lustre gems: Glossy stones or gems are used in place of stones and pebbles. In order to match the colour or to give contrasting effect different coloured lustre gems can be used.

iv) Feathers: Feathers of birds can be used as fillers in flower arrangements.

v) Hearts, crosses and shapes: The hearts, crosses, and different shapes made of plastic are used for giving special touch in making arrangements during various occasions.

vi) Varnish and paints: Transparent lacquered varnish and different spray paints are used to give background colour or shine or to give artistic look by making different patterns.

vii) Sparkles: Shining sparkles of silver and golden colour are used to add value to the floral arrangements.

viii) Mosses: Moss sticks are used in pots for climbing plants like money plant, syngonium, epipremnum, hedera, Ficus procumbens, monstera, etc.

ix) Coloured net cloths: The delicate net clothes are used to make big decorations and arrangements along with flowers.
Chapter 10
Materials and Tools

Different type of hand tools and materials are required for holding and supporting the flowers, preparing them for arranging as per the flower designs.

Material for supporting flower stems

Floral Foam
Various floral foam products are popular stem-supporting aids for both florist and home flower arrangement. These floral foams are available in several shapes and in green colour for fresh arrangements. It may be purchased in either rectangular bricks to be cut to fit individual containers, or they are also available in cylindrical blocks for uses in specialized containers. These products are extremely porous, so they provide water to the inserted flower stems used in the arrangement.

Pin holder/Needlepoint Holders
Needlepoint holders area also called pin holders or frogs. These are popular stem-supporting aids for flower arranging. Needlepoint holders are customarily used for the creation of modernistic and stylized designs by an amateur. Ikebana is exclusively done by using pin holder and not floral foams. Needlepoint holders are available in many sizes and shapes (round, oval, or square) to suit any particular arranging requirements. They may be placed in any location at the base of the container and anchored for temporary or permanent use. These may be of copper, brass or coated iron.

Chicken Wire
The stem support aid used for large floral bouquets usually consists of chicken wire and a filler material. The chicken wire or floral netting having a 1-inch mesh is generally used. The filler material may be of chipped floral foam, vermiculite, or the wire may be used to cover a solid block of foam.

Other material for preparation and after care

- **Buckets**: Plastic buckets are used for holding cut flowers and foliage.
- **Candle holder**: Various types of plastic candle holders are available for inserting in floral foam or placing in pin holders.
- **Cocktail sticks**: Use a cocktail stick or a tooth pick to make holes in florist's foam for a soft stem or to attach a fruit to the foam holding a flower display.
• **Florist’s foam objects**: This is a plastic container which has internal projections designed to hold a block or round of florist foam.

• **Mister/Sprayer**: A hand-held spray bottle to produce a fine mist of water droplets is an aid to keeping an arrangement looking fresh in warm weather.

• **Watering can**: It is used for adding water to flower arrangements, when necessary.

• **Floral Tape**: The stem binding tape made of plastic and waxed paper is 12 mm wide and is used to cover artificial stem made of wire. It is available in assorted colors to blend into the arrangement.

• **Cellophane wrappers**: These are transparent papers used to cover the bouquets.

• **Wires**: Wire is used to support weak flower stems and to hold curved lines in arrangements. It varies according to length and thickness (gauge). The heaviest gauge is number 18 and the finest is number As the weight of flowers of foliage increases, the weight of the wire needed to support them also increases.

• **Bases**: It is an optional object that is placed underneath the container to protect the surface of the support and/or to add to the beauty of the display is called base.

**Basic tools for making of flower arrangements**

• **Knife**: A short blade made of quality steel is for scrapping stem, removing leaves, and stripping away thorns. It is used for trimming stem and pointing the tips of stem so that they can be driven easily into foam or pin holder. It is also required to cut the floral foams.

• **Secateurs**: Secateurs having short blades with serrated edges are used for cutting both herbaceous and woody plant material.

• **Pruning shears**: The best ones have two cutting blades of quality steel. They are used for cutting woody materials.

• **Ribbon Shears**: These are similar to ordinary scissors in appearance.

• **Secateur**: It is sharp cutter and is used for cutting woody stems.

• **Stapler**: It is used for keeping the cellophane sheet intact and for fastening ribbon.

• **Wire cutters**: These are useful for heavy cutting chicken wire, plastic stem of artificial flowers, and thick stub wires.
<table>
<thead>
<tr>
<th>Floral Foam</th>
<th>Pin holder</th>
<th>Water can</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secateur</td>
<td>Scissors</td>
<td>Wire Cutter</td>
</tr>
</tbody>
</table>
Chapter 11
Fresh flowers and foliage for Flower designing

Flowers and foliage required for arrangement in flower design can be categorised indifferent types as per their basic shape and are used accordingly. Some branches and fruits can also be used to add some different effect.

<table>
<thead>
<tr>
<th>No</th>
<th>Type</th>
<th>Shape</th>
<th>Flowers</th>
<th>Foliage/branch/fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Line</td>
<td>Thin, vertical, tapering</td>
<td>Tuberose, gladiolus, Iris, Amaryllis, Heliconia, golden rod</td>
<td>Twigs and branches of Bottle brush, Murraya exotica, etc. Foliage of Sansieveria, Asparagus, cycus, Areca palm, Fishtail palm etc</td>
</tr>
<tr>
<td>2</td>
<td>Mass</td>
<td>Round, used at center of arrangement</td>
<td>Rose, gerbera, Amaryllis, carnation, Anthurium, liliums, alstroaemeria, tulip, lisianthus</td>
<td>Syngonium, Money plant, Fruits: Pomegranate, apple, Oranges,</td>
</tr>
<tr>
<td>3</td>
<td>Form</td>
<td>Uncommon, unusual shape</td>
<td>Bird of paradise, Heliconia</td>
<td>Driftwood, Irregular and unique shaped branches Fruits: Cashew fruit, Grapes, Banana etc</td>
</tr>
<tr>
<td>4</td>
<td>Filler</td>
<td>Tiny, thin and spreading</td>
<td>Golden-rod, statice, daisy, gypsophilla, Candytuft, Ladyslace</td>
<td>Asparagus, thuja, casuarinas, bottle brush, ferns, Murraya exotica</td>
</tr>
</tbody>
</table>
From Different type of flowers for flower arrangements
Chapter 12
Principles of Flower Designing

The major principles of western style of Flower Arrangement are as mentioned below:

Design
It is the structural pattern of the floral arrangement. It is a visualized plan about the size and overall shape and pattern of the floral arrangement. The design is determined by the location, occasion and the materials available.

Balance
An arrangement should have both mechanical and visual balance. Balance is of two types viz. symmetrical and asymmetrical balance.

Scale
It deals with the proportions of different components of the floral arrangement. It emphasizes on the use of material to be used to that of the size of the container, holding the floral arrangement. The scale of a design is dictated by the size of arrangement and its relationship to its surroundings.

Rhythm
Rhythm is the apparent flow of lines, textures, or colors that express a feeling of motion rather than confusion in an arrangement. Rhythm may be achieved in several ways through opposition, repetition, radiation, or transition.

Harmony and Unity
Harmony in flower arrangement indicate a pleasant composition of flower shapes, colors, textures and size. Unity is created when all of the design parts blend together without a noticeable separation. Unity is best achieved by repeating related flower types, colors, and textures throughout the design.

Emphasis (Focal Point)
The central portion of the floral arrangement from where the flowers and foliage of the arrangement appear to be emerging is known as the focal point of the arrangement. Larger and dark colored flowers are usually used in the focal point of the floral arrangement.
Figure  Balance in flower arrangements
(Symmetrical and asymmetrical)
Chapter 13
Classification of Flower Design

Basically three style of arranging flowers have been developed viz., western style, Eastern style (Ikebana) and Contemporary (free style).

Western style of flower arrangement
The emphasis is on the use of ‘many flowers as a mass’ in the western style of flower arrangement. This style follows geometrical forms and consists of more number of flowers and depicts a complete and full effect emphasizing color, shape and beauty. Western style of flower designing consists of various traditional designs in standard patterns, corsage and buttonaires and wreaths.

Ikebana

Ikebana symbolizes Living flower. It is a Japanese word, meaning: Ike (To set in/To live) + bana (flower). Ikebana is an expression of liveliness and has spiritual significance, depicting life and freshness. Japanese ikebana is a creative and meditative art, which brings indoors the charm and beauty of landscapes, the seashore or lakeside. Ikebana consists of three basic lines viz., i) Shin(symbolizing heaven, strongest, firm and tallest among all), ii) Soe (Symbolizing man, medium length) and iii) Hikae/Tai (Symbolizing Earth and shortest). Rikka, Nagiere, Shoka, Moribana, Morimono and Jiyukaare the important styles of ikebana. It follows strict rules about lines and even the use of support material.
Free style of flower arrangement
The contemporary (free) style of flower arrangement neither follows rules of geometrical shape of western style neither does it follow strict rules of eastern style. The aim of the free style is the beauty and expression. This style is highly creative and expresses the aesthetic sense of the arranger. The whole of the arrangement should be in harmony, pleasing to the viewer’s eye. There are no standard patterns of free style. Also, there is no fixed rules for the container type, form and plant material and stem supporting material. The free style can imitate natural landscapes with modern outlook in a stylish way.
Chapter 14

Western Style of Flower Arrangement and Standard Patterns

Use of ‘many flowers as a mass’ with proper selection of the design are the focus of western style flower arrangement. The geometrical forms of the western style are thus reflected in various types of bouquets and stage decoration. Balance and Depth and rhythm are very important to be maintained. Traditional designs in standard patterns are basic types in western style of flower arrangement. These are the basic formal flower arrangements in geometrical shapes like triangular, round, S curve and crescent shape.

Traditional Designs in Western Style

Traditional Line Design
The line predominates which is strongly influenced by Asian design. Line designs are simple and clean cut, resulting in a sharp open silhouette.

Traditional Line Mass Arrangement
A line mass arrangement is similar to a line arrangement, but there is more massing of the material, creating a greater depth—the third dimension that is practically not much emphasized in line designs.

Traditional Mass Arrangement
A traditional mass arrangement is a bold, bountiful arrangement with a range of flowers in many forms, colors and textures typically arranged in a round, oval, triangular or fan-shaped design.

Standard patterns of western Style
Triangular either symmetrical or asymmetrical, Round or spherical, Oval, Hogarth curve, ‘L’ shape and Crescent are the standard patterns and their techniques are described below:

Triangular
Triangular arrangement can be designed in symmetrical and asymmetrical look. The symmetrical triangular design is more traditional with line mass effect. The triangular arrangements have an added benefit of displaying in large sizes on any occasion. Basic steps involved are:

1) Arrange three basic lines of the triangle in the container,
2) Arrange the mass flowers in the geometrical design,
3) Fill the gaps in the designing by properly arranging and fixing the filler flowers.
4) A complete look is given by covering the basal and sides with green foliage.

**Round or spherical**
The round arrangements are designed on dining tables or central tables having lower heights. It can also be designed around candle stand or candles. It has benefit of viewing from all sides. The major steps in arranging round design are:
1) arrange the mass flowers of required length equally or horizontally more as per the requirement of the shape. Care should be taken to maintain the desired shape.
2) Properly arrange the fillers flowers evenly
3) The whole of arrangement should look radiating like sun.

**L Shape**
‘L’ shape arrangement is a form having similarity with asymmetrical triangle and basically traditional line arrangement. The steps involved include:
1) arrange the two basic lines forming ‘L’ shape in the container,
2) arrange the mass flowers within the geometrical design
3) fill the gaps in the designing by properly arranging and fixing the filler flowers.

**The typical Hogarth curve**
The ‘S’ curve arrangement, typically also called Hogarth curve, is named after the English painter William Hogarth. It gives an elegant and exclusive look. The lines for ‘S’ shape can be prepared by wiring the flower or foliage twig or stem and it looks elegant when designed in pedestal. The steps involved in arranging it are:
1) Arrange the curved ‘S’ basic lines using two twigs of flower or stem as per requirement,
2) Arrange the mass flowers within the geometrical design
3) fill the gaps in the designing by properly arranging and fixing the filler flowers.

**Crescent shape**
The crescent shaped flower arrangement looks delicate and can be prepared by wiring the flower or foliage twig or stem. This arrangement looks beautiful when designed in pedestal and bows also. The steps in designing crescent are
1) arrange the crescent shape curve as basic lines using two twigs of flower or stem as desired,
2) arrange the mass flowers within the geometrical design (crescent shape)
3) fill the gaps in the designing by properly arranging and fixing the filler flowers.

Figure : Standard patterns of western style
Triangular arrangement (Symmetrical)

Triangular arrangement (Asymmetrical)

Round arrangement

L Shape arrangement

Hogarth Curve (S shape) arrangement

Crescent
Chapter 15
Corsage and Boutonniere

These are small floral designs to be worn on dress.

Corsage A Corsage is a small floral arrangement designed beautifully to be attached to the dress or worn on wrist. Corsages are also sold extensively during the Christmas, Easter, and Mother's Day holidays in western countries.

The basic principle
The size and form of the corsage should be proportional with the wearer and the dress and follows the basic principle of retaining focal point with carefully and smoothing tugging of flowers and foliage with wires and pins.

Making of corsage
The corsage must be constructed securely enough to retain its original design. This should be done with minimum of wires and floral tape to avoid large masses of stems at the base. Flowers should be positioned for best effect and firmness in construction. Flower colors should be coordinated with the dress, the complexion and hair color of the wearer, and the lighting available (for day or evening occasions).

Material for corsage
A few flowers of same colour (mass) with some contrasting or complementary fillers are used for making of corsage. Wires and floral tape of green or brown colour replace the flower stems in a well-constructed design to give a clean and neat look with lighter effect. The wiring techniques like the Hook, the insertion, the hairpin, and the wrapped-wire are used for corsage construction. Net and Lace background material along with satin ribbon bow are added to a corsage to create a fullness in a design without adding weight.

Boutonniere
The boutonniere is designed to be worn on the buttonhole of a man's lapel. Most boutonnieres resemble a single-flower corsage in construction. However, since this design is to be worn by a man, it should not be too ornate. There are several types of boutonniere styles, but most consist of only a single flower (mostly a rose bud) placed on an artificial stem.
Chapter 16
Ikebana

Ikebana is the Eastern type of flower arrangement. It is an expression of liveliness and has spiritual significance. Ikebana came to Japan with Buddhism from India via China around the year 600 A. D. In Ikebana nature asymmetry and continuity is important to be depicted using few flowers in which nature and humanity brought together. This art greatly influenced all aspect of life, culture and the arts.

Ikebana symbolizes living flowers. It is a Japanese word, meaning: Ike (To set in/To live)+ Bana (Flower)

Principals of Ikebana:

1. Asymmetry: There is never symmetry in the ikebana types yet the arrangement looks balanced.
2. Few flowers: Few flowers are used to form basic lines of ikebana and does give filling effect. The arrangement depicts space and creativity.
3. Clossness to Nature: Life appears to be associated with nature.
4. Continuity: Ikebana always give a growing and live look. It should not appear but should appear persisting and maintaining continuity.

There are three basic lines of Ikebana arrangements:

1. Shin: The most important basic line which symbolizes Heaven and express the truth. Hence, this should be strongest, firm and tallest among all.
2. Soe: It is the second important line which symbolizes man and expresses body, the human being.
3. Hikae/Tai: This is third line that symbolizes earth and expresses support.
There are few considerations for Ikebana:
1. Not mass but few flowers
2. Face upside and natural curves
3. Originating from one Point.
4. Flowers look evolving and rising.

There are mainly 4 types of Ikebana:

1. Rikka: It is the original form of Ikebana that follows strict rules. Rikka consists of nine basic and well defined lines originating from a single point in the bronze vase.
2. Shoka: There are three basic line and 2 more and total five lines.

3. Nagiere: Nagiere is arranged with three basic lines in a tall vase without using pinholder in stead hana-kubari (cross-twigs) are used for support of the cut flowers and foliage.
4. Moribana: Moribana is arranged in a shallow container (bowl) with three basic lines with the help of a pinholder.
Chapter 17
Loose flower Ornaments

Since the long time, women wears floral ornaments like bangles and floral crowns. Even today, in certain Indian dances, the dancer, especially the female dancer, also wears floral bangles along with garlands. In Maharashtra, the expecting mother, in a ceremony called 'Shrimanth' is honoured like flower queen with flower ornaments like crown, bangles, necklace, earrings etc.

In West Bengal, a floral crown is also made to be used in ceremonies by the central character, especially during Annaprasana, a ceremony when the newborn takes its first cereal food, generally cooked rose, art the age of 6-9 months wearing a floral princess in a drama. The flower most used for this purpose is tuberose. At first a crown shaped strings may be used to make the structure and the flowers may be sewn inside the wires. In the countryside, generally, the frame is made of large leathery leaf, such as jackfruit or Kadamba, on which the flowers are sewn with the help of cotton thread and needle. Ear-rings and Bajubandhs, made of flowers, are also used in ceremonial dances where heroes and heroines such as Rama and Sita wear floral ornaments such as garlands, bangles, and bajubandhs. The tribal women even today, decorate their ears with flowers as earrings and also put on flowers ornaments during festivals and celebrations.

Flowers used for ornaments making
For ornament making, generally, fragrant flowers like jasmine, rose, tuberose are preffered. However, non fragrant type like Marigold and aster are also used. The bangles may be made of either jasmine or tuberose among the fragrant flowers, and Tabernaemontana and marigold among the non-fragrant flowers.
The loose flowers are generally used to make ornaments like as below:

1. Bangles

2. Bajubandh

3. Earing

4. Veni

The veni is single or multiple rows or chain of flowers bunched into one unit or as loose multiple flower strings, which is applied on long open hairs or plaits.
5. **Gajara**

Gajra is wider, circular and firm form of veni. gajra making requires proper skill of flower weaving with needle and thread.

6. **Broach**

Broach is a hair decoration flower arrangement similar to veni. It is rather a combination of veni and gajra in a flexible and stylish form.
7. Crown

8. Garland
Chapter 18
Dry Flower Craft

The flowers whether dried naturally or artificially retaining ornamental look are known as dry flowers. Dry flowers are used to make a number of products like dry flower arrangements, pot pourris, floral gifts, floral greeting cards, book marks, wall hangings, paper weights, table mats, etc. Popular dry flowers: statice, molucella, winged everlasting, paper flower, straw flower, globe amaranth, etc. The dry flowers have many advantages over fresh flower as they are

- Available all the year round
- Available in wide variety of products
- Tolerant to heat and cold
- Have long shelf life
- Easy to transport and store

Products of Dry Flower Craft

Wreath
A wreath is an assortment of flowers, leaves, fruits, twigs or various materials designed and constructed in circular form to resemble a large ring of about 20-90 cm. Wreaths are used typically as wall or door decoration, mainly as a festive decoration or at the arrival of season. It is also used in ceremonial events around the globe. Wreaths are usually made of twigs, roots, leaves, flower, pods, fruits, etc.

Dry flower bouquet
Flower bouquet is a bunch of flowers in a creative arrangement either as free hand or a holder or bowl or basket arrangement.
Posy
Posy is a small bunch of flowers or single cut flower tied with decorative ribbon for giving better appearance. Spikes of golden rod, branches of grass inflorescence can be simply used after proper drying.

Nosegay arrangement
It is a bunch of flowers and foliage well arranged to give a round look and this is tied with a decorative ribbon for giving better appearance. It is like a hand held arrangement. Dry flower branches, grasses as well as dry inflorescences are arranged to form a round bouquet.

Corsage
A delicate arrangement of floral and foliage tied either on ribbon or bracelet or attached with a pin to be worn on dress or tied on the wrist. One or two dried rose or orchid with some dried statice or gypsophilla flowers.

Dry Flower Bouquet
Dry Flower bouquets are free hand bouquets or can be arranged for the decor of homes or public buildings, or may be handheld. Handheld bouquets are often given for special occasions such as birthdays or anniversaries. They are also used extensively in weddings. Bouquets arranged in vases or planters for home decor can be arranged in either traditional or modern styles.

Pot-Pourri
Pot-pourri refers to a fragrant mixture of dried flowers, petals, herbs and
spices in an enclosed transparent packet or in an open container. The flowers, roots, stems or seed products are dried and mixed properly. A few drops of essential oil as per the choice is added to a fixative which is mixed with the mixture of dried plant products. The fixative absorbs the essential oil and releases slowly to last longer. The commonly used fixatives are non-iodized salt, orris root, sweet flag (colomasroot), patchouli and dried hibiscus flowers.

The basic ingredients:

1. Flowers for scent and colour
2. Aromatic leaves, dry leaves whole and crushed
3. Spices and peels of fruits

Fixative, to absorb and hold the scents.

Precautions taken for floral craft preparation

- Since dry flowers are very brittle and fragile, they are to be handled gently and carefully; a slight pressure will detach the petals and dried parts.
- They absorb moisture and lose shape and hence, these materials should be stored in moisture-proof container
- For the storage of dried materials, container like glass desiccators, tin boxes, cartons wrapped with plastic sheets or wax paper are suitable.
- In order to avoid fading of colour, the dry flower articles should be protected from direct sunlight.
- The dry flowers/ materials should be kept away from direct sunlight and wind.
Chapter 19
Safety and Hygiene

In There is utmost need to keep safety and avoid accidents takes while handling and applying chemicals while working in florist shop. Dealing with flowers is not hazardous but while dealing with preparation of chemical solution and using pruning shears and cutters precautions should be taken and first aid kit should always be handy for minor accident. Hygiene should be maintained with frequent washing of hands with soap and keeping clean towel or disposable paper towels.

First aid and treatment
Chemical poisoning may result from continuous contact, absorption through skin, inhalation of toxic vapour or swallowing it directly while handling or applying chemicals. The common symptoms of pesticide poisoning are headache, vomiting, nausea, tremors, convulsion, difficulty in respiration etc. A first-aid kit with necessary antidotes should be available at work site for each type of poisoning.

Safety and protective devices
Protective and safety devices should be used while handling chemicals in the floristry shop. The various kinds of pesticide poisoning and their first-aid treatment are already discussed. The protective and safety equipment essentially consists of gas mask, hand gloves, shoes, eye shields, head gear, protective clothing, respiratory devices, etc.

i. Mask: It is a device to protect the respiratory tract from toxic gases, and aerosols. It gives clean air to the operator by removing contamination from ambient air by using a filter or bed of absorbent material.
ii. **Hand gloves**: The gloves made of leather, cotton or any other fluid-absorbing materials should never be used for handling chemicals. Only rubber gloves should be used.

![Hand-gloves and mask](image)

iii. **Shoes**: Shoes made of rubber or any synthetic materials are used instead of leather or canvas shoes.

iv. **Protective clothing**: Apron should be used while working with chemicals and pruning branches to protect clothing and skin.
General health and safety measures:
Follow these measures for health and safety at the workplace:
- Identify what is unsafe or unhealthy in the workplace.
- Take action to fix the unsafe or unhealthy workplace problems.
- Check that problems are solved and won't happen again.
- Train workers on how to do the work safely.
- Design and supervise safe work procedures.
- Provide a first aid kit and have trained first aid officers available.
- Provide appropriate safety devices (gloves and mask).

Health and safety awareness in the workplace:

- Encourage other employees to support young workers by keeping an eye out for them.
- Demonstrate the commitment to health and safety with your own consistent, safe work practices, and emphasise that unsafe work practices are unacceptable.
- Make health and safety a part of all workplace communications.
- Personally encourage young workers to report health and safety issues that they may encounter, and to share ideas and suggestions.
- Respond to all health and safety concerns and act promptly.
- Use and wear protective equipment and safety gear as required and ensure adequate maintenance.
• Ensure children are supervised at all times and kept away from high risk chemicals.
• Make sure chemicals are correctly labelled (includes safety and risk phrases).

Electricity
• Keep electrical equipments away from water.
• Protect all electrical equipment with a residual current device (safety switch).
• Secure and protect extension leads from damage and ensure they are uncoiled when in use.
• Ensure all equipment is maintained in good working order and all specified electrical equipment tested and tagged where required.
• Identify the location of overhead power lines with ground markers.
• Apply appropriate exclusion zones when working near power lines.

Amenities for safety at work environment
• Provide accessible first aid equipment and train workers in its use.
• Provide hand and face washing facilities.
• Provide access to potable, clean and cool drinking water.
• Ensure workers have access to toilets.
• Promote good personal hygiene practices.

Emergency response
• Develop emergency response procedures for the workplace (e.g. fire, confined space entry, snakebite, working in remote locations, heat stress or chemical spill).
• Ensure workers are aware of emergency response procedures.
• Train workers in administering first aid.
• Maintain emergency response equipment.
About the Authors

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Unknown flower......
just picking
our silence
- Lech Szeglowski