



**ROHINI**  
**COLLEGE OF ENGINEERING & TECHNOLOGY**  
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## **Department of Agricultural Engineering**

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Course Name : **Protected Cultivation**  
Course Code : **AI3015**  
Regulation : **R2021**  
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Faculty : **Mr. ARUNPANDIAN N ( Asst. Professor)**

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### **UNIT - III**

## **PROTECTED CULTIVATION OF FLOWER CROPS**

## PART 2 : HI-TECH CULTIVATION OF MAJOR CUT FLOWERS

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### 2.1 Cut Roses (*Rosa* spp.)

#### Cultivation Methods:

- Soilless Culture: Raised beds with cocopeat, rockwool, or peat-perlite mixes
- Hydroponic Systems: DFT (Deep Flow Technique) or NFT (Nutrient Film Technique)
- Planting Density: 6-8 plants/m<sup>2</sup> with V-system or 10-12 plants/m<sup>2</sup> with table system

#### Varietal Classification:

Type	Stem Length	Examples	Market
Hybrid Tea	60-100 cm	First Red, Avalanche, Gold Strike	Export
Spray Roses	40-60 cm	Mirabel, Lovely Lidia	Domestic
Garden Roses	40-80 cm	Abraham Darby, Graham Thomas	Premium niche

#### Critical Management Practices:

- Pinching: Removal of terminal bud for lateral branching
- Bending: Horizontal training of branches to break apical dominance
- Harvesting: Stage 1-2 petals reflexed, early morning harvest
- Yield: 200-350 stems/m<sup>2</sup>/year under optimal conditions

## **2.2 Cut Chrysanthemum (*Chrysanthemum morifolium*)**

### ***Classification by Response Group:***

- Short Day (SD) Types: Flower initiation at <13.5 hours daylight
- Intermediate Day (ID) Types: 13.5-15 hours
- Long Day (LD) Types: >15 hours for vegetative growth

### ***Photoperiod Management:***

- Black Cloth Technique: 14-16 hours darkness for SD types
- Night Break Lighting: 2-3 hours light during night for LD response
- Lighting Sources: Incandescent (10 lux), fluorescent (30 lux), LED (specific spectra)

### ***Production Systems:***

1. Standard Disbudded: Single large flower per stem
2. Spray Type: Multiple smaller flowers per stem
3. Pompon: Small, fully double flowers

### ***Important Varieties:***

- Standards: Reagan, Puma, Baltica series
- Sprays: Anastasia, Charm, Davis
- Spiders: Reagan Spider, Yanma

## **2.3 Carnation (*Dianthus caryophyllus*)**

### ***Production Technology:***

- Propagation: Terminal cuttings (3-4 nodes) treated with IBA (2000 ppm)
- Planting: 20-25 plants/m<sup>2</sup> on raised beds
- Support Systems: 2-3 layer netting at 15 cm intervals

### ***Types Based on Flower Form:***

- Standard Carnations: Single large flower per stem
- Spray Carnations (Mini): Multiple smaller flowers
- Dwarf Types: Pot carnations

### ***Temperature Management:***

- Day: 18-22°C
- Night: 10-15°C
- Critical: Below 10°C causes calyx splitting

## **2.4 Gerbera (*Gerbera jamesonii*)**

### ***Advanced Cultivation Practices:***

- Hydroponic Systems: NFT or substrate culture (cocopeat, perlite)
- Planting: 4-6 plants/m<sup>2</sup> in double rows
- Crown Management: Planted with crown above media to prevent rot

### ***Harvest Indices:***

- Local Market: 2-3 rows of disc florets opened
- Export Market: 1-2 rows opened

### ***Major Varietal Groups:***

Type Flower Form Examples Stem Length

Single Flat with visible disc Savana, Rosalin 45-60 cm

Double Fully doubled, disc hidden Winter Queen, Balance 50-65 cm

Spider Narrow, quilled petals Spider, Jaguar 40-55 cm

## **2.5 Asiatic Lilies (*Lilium* spp.)**

### ***Forcing Technology:***

- Bulb Treatment: Pre-cooling (2-4°C for 6-8 weeks) for dormancy breaking
- Planting: 50-60 bulbs/m<sup>2</sup>, depth 8-10 cm
- Temperature Regimes:
  - Rooting: 12-14°C for 2-3 weeks
  - Sprouting: 14-16°C
  - Flowering: 16-18°C

### ***Classification of Hybrid Groups:***

- Asiatic Hybrids: Bright colors, upward facing, no fragrance
- Oriental Hybrids: Large, fragrant, pastel colors
- LA Hybrids: Larger flowers, good keeping quality

Harvest Stage: Buds colored but not opened

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