



ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY
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CROP PRODUCTION TECHNOLOGY

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UNIT 5

Production Practices of Horticulture crops

Manuring should be done immediately after pruning.

Training and pruning

The main branches should be allowed to appear at a height of 0.75-1 m above the ground level.

Plants should be trained to modified central leader system.

During March–April, prune and thin the crowded branches to provide maximum fruit bearing area in the tree.

Yield

The crop yields about 100 kg/tree annually.

FLOWER PRODUCTION

Floriculture is the art and knowledge of growing flowers to perfection. It deals with the cultivation of flowers and ornamental crops from the time of planting to the time of harvesting. It also includes production of planting materials through seeds, cuttings, budding, grafting and marketing of flowers and flower produces It includes cultivation of flowering and ornamental plants for sales or for use as raw materials in cosmetics, Perfume industry and also Pharmaceutical sector.

Important flower production statistics in Tamil Nadu

Sl No	Flower	Area(ha)	Production (Tonnes)	Productivity (t/ha)
1	Rose	1949	14130	7.25
2	Jasmine	10623	92951	8.75
3	Mullai	2769	23537	8.50
4	Jadhimali	841	7569	9.00
5	Crossandra	1317	2634	2.00
6	Chrysanthimum	2240	20160	9.00
7	Marigold	1502	22530	15.00
8	Arali	1195	9261	7.75
9	Tuberose	1529	15290	10.00
10	Others	3174	34343	10.82
TOTAL		25610	227115	8.87

Flowers are commercially classified as

Cut flowers and loose flowers.

Cut flowers in Tamil Nadu are:

- Cut rose, cut chrysanthymum, carnation, anthurium, dendrobium orchid, liliun, gladious, gerbera, china aster. Golden rod,

Loose flowers

- Rose, malligai, mullai, jathimali, crossandra, chrysanthemum, marigold, tube rose, neruim

1. JASMINE - *Jasminum officinale* - (MALLIGAI)

Varieties

- Single Mogra, Double Mogra, Iruvatchi, Ramanathapuram local and ArkaAradhana etc. are presently cultivated.

Soil and climate

- Well drained loamy or red loamy fertile soil. Warm summer, mild winter, moderate rainfall and sunny days.

Propagation:

- Semi hard wood cuttings (15-20 cm long)

Preparation and planting

- Layers or rooted cuttings are planted in pits 30 x 30 x 30 cm with a spacing of 1.25 m either way to accommodate 6400 plants per ha during June to November. 20 kg FYM/pit is applied before planting

Irrigation

- Irrigation should be given immediately after planting followed by weekly irrigation depending upon weather conditions

Manuring

- FYM @ 10 kg/pit is applied before planting. NPK @ 60:120:120 g/plant/year is applied in 2 equal splits during November (after pruning) and June-July along with 10 kg FYM per plant

Micronutrients

- Foliar spray of ZnSO₄ 0.25 % + MgSO₄ 0.5% + FeSO₄ 0.5%.

Pruning

- The bushes are pruned to 50 cm height from the ground level during last week of November



Season of flowering and harvest

- Flowering commences in March - April. Fully developed unopened flower buds should be picked in the morning hours. For concrete extraction, fully opened flowers are harvested.

Yield

- Flowers : 8-9 t / ha ;
- Concrete recovery : 0.14-0.19%

2. ROSE (*Rosa sp*)**Varieties**

- Edward Rose and Andra Red Rose and Button rose are found mainly under cultivation

Soil and climate

- Well-drained sandy loam with pH of 6-7 is suitable.
- Bright sunshine for minimum of 6 hours is essential for the cultivation of roses.

Propagation and planting

- Cuttings with 2-3 buds are dipped in IBA or IAA @ 500 ppm. Pits of 45cm x 45 cm x 45 cm are dug at 2.0 x 1.0 m spacing and 10 kg FYM is added to each pit before plant

Irrigation

- Irrigation is done once in 2 days until plants establish and once a week there after. Avoid salt water for irrigation purpose

Manuring

- After pruning in October and again in July the plants are manured with FYM 10 kg and 6:12:12 g of NPK per plant.

Micronutrients

- Foliar application of 0.2% micro nutrient mixture containing 20 g MnSO_4 + 15 g MgSO_4 + 10 g FeSO_4 + 5g B (2g of the mixture is dissolved in one litre of water) can produce bright coloured flowers.

Bio fertilizers

- Soil application of 2 kg each of Azospirillum and Phosphobacteria per ha at the time of planting. It is to be mixed with 100kg of FYM and applied in pits

**After cultivation****Pruning**

- The best time of pruning is the period when the activity of rose plant is least and the plant is dormant to near dormant stage.

- Pruning time will depend on climatic conditions of the particular region.
- All the weak, diseased, criss-crossing and unproductive shoots are removed.

Growth regulators

- Spray 250 ppm of GA3 (30days after pruning) during early vegetative stage to increase the flower production

Crop duration

- The plants will start flowering in the first year and will give economic yield from the second year onwards.

Season of flowering and harvesting

- Flowering will commence from 45 days after pruning. Fully opened flowers are picked early in the morning.

Yield

- About 10 lakh flowers /ha / year can be obtained.

3. CROSSANDRA (*Crossandra fundibuliformis* L.)

Acanthaceae

Varieties

Tetraploidtypes -Orange, Lutea Yellow, Sebaculis Red, Triploid types - Delhi Crossandra

Climate:

- It requires a temperature of 30 - 35°C for growth. It is shade tolerant to some extent but susceptible to low temperature and frost.

Soil:

- Well drained sandy loam and red soils with pH of 6 -7.5 are ideal. Soil is to be tested for nematodes before planting.

Propagation:

- Tetraploids: Propagated through seeds.Seed rate is 5 kg/ha. 60day old seedlings are transplanted in the main field.
- Triploids:Propagated through terminal cuttings of 10-15 cm length (41,700 cuttings/ha)

Seeds and sowing

- Fresh seeds are sown during July - October in raised beds at 15 cm apart in lines. Watering should be done daily. The seedlings will be ready for transplanting in 60 days.

Seed rate

- The required seed rate is 5 kg/ha for optimum plant population. For Delhi Crossandra, rooted cuttings have to be used for planting.

Preparation of field

- Land is ploughed thrice and FYM at 25 t/ha is incorporated. Ridges are formed 60 cm apart. Dip the roots of seedlings in Carbendazim (1 g/l of water) and plant on one side of the ridge at 30 cm spacing. For seed production the spacing may be 60 x 60 cm.For Delhi Crossandraa spacing of 60 x 40 cm is to be followed.

After cultivation

- Spray Diuron (pre-emergence) 2.5 kg a.i/ ha for controlling the weeds.

Manuring

- **Tetraploids:** Apply FYM 25t /ha as basal and NPK at 75, 50 and 125 kg/ha as top dressing three months after planting.
- **Delhi Crossandra:** Apply FYM 25 t/ha, Gypsum 100 kg/ha and P & K at 50 and 100 kg/ha respectively as basal dose.

Bio fertilizers:

- Soil application of 2 kg each of *Azospirillum* and *Phosphobacteria* per ha at the time of planting. It is to be mixed with 100 kg of FYM and applied.

Growth regulators:

- Spray Ascorbic acid 1000 ppm (1 g/ lit of water) before flowering.

Irrigation

- Irrigation is done once in a week.

Crop duration

- 3 years including ratoon crop.

**Harvest**

- Flowering will start a month after transplanting. Fully opened flowers are picked once in two days.

Yield

- An average yield of 2000 kg of flowers per ha/year can be obtained. In Delhi Crossandra, 2800 kg of flowers per ha per year can be obtained.

4. MARIGOLD - *Tagetes***Varieties**

- Local types (orange & yellow), Pusa Narangi Gaiinda, Pusa Basanthi Gaiinda (IARI varieties) and MDU 1 can be cultivated

Soil

- Well drained loamy soil is found suitable. The soil pH should be 7.0 to 7.5. Saline and acidic soils are not suitable for cultivation.

Seeds and sowing

- The seeds are sown through out the year.
- Nursery is raised with 1.5 kg seeds/ha and the seedlings are transplanted after four weeks on one side of the ridge at 45 x 35 cm spacing.
- Treat the seeds with *Azospirillum* (200 g in 50 ml of rice gruel) before sowing.

Irrigation

- Irrigation is done once in a week or a sand when necessary. Water stagnation should be avoided.

Manuring

- During last ploughing, incorporate 25 t /ha of FYM. Apply 45 : 90 : 75 kg NPK/ha as basal and 45 kg N/ha as top dressing 45 days after planting.

After cultivation

- Weeding should be done as and when necessary.
- Irrigation should be given immediately after planting and life irrigation on third day after planting. Water stagnation should be avoided.
- Based on the soil moisture condition, irrigation should be done.

Nipping/ tipping

- Thirty days after planting terminal portion should be tipped / removed to encourage the branching.

Crop duration

- The crop duration is about 130-150 days.



Harvest

- Flowers are picked once in 3 days beginning from 60 days after planting.

Yield

- The average yield is about 18 t / ha.

5. CHRYSANTHEMUM - *Ismelia carinata*

Varieties

- CO 1 (yellow coloured flowers), CO 2 (purple coloured flowers), MDU 1 (yellow coloured flowers) Indira and Red Gold.

Climate:

- Tropical and subtropical climatic conditions are ideal. However, the best temperature for growing chrysanthemum is 20-28 C for day and 15-20C for night.

Soil:

- Well drained red loamy soil with pH of 6 to 7.

Propagation and planting:

- Commercial propagation is through terminal cuttings (5-7 cm long) or suckers. Planting during June - July at 30 x 30 cm spacing on one side of ridges (1,11,000 plants/ha).

Irrigation

- Irrigation is done twice a week in the first month and subsequently at weekly intervals.

Manuring

- **Recommended dose:-** 25 t FYM and 125: 120: 25 kg NPK/ha.
- **Basal application** –half of N +entire P and K; topdressing- half of N applied 30 days after planting.

Desuckering:

- Remove the side suckers periodically.

Micronutrients:

- Foliar spray of ZnSO₄ 0.25% + MgSO₄ 0.5%.

Bio fertilizers:

- Soil application of 2 kg each of *Azospirillum* and *Phosphobacteria* per ha at the time of planting. It is to be mixed with 100kg of FYM and applied.

Growth regulators:

- Spray GA₃ @ 50 ppm on 30, 45 and 60 days after planting.

Duration

- The duration is 6-8 months for plant crop and 4 months for ratoon crops.



Harvest

- Harvesting of the flowers starts from 3rd month onwards at 4 days intervals. Harvesting is done at 3/4 to full open stage for nearby markets and 1/2 open stage for distant markets.

Yield

- An average yield of 20t/ha from plant crop and 10t/ha from ratoon crop can be obtained

6. TUBEROSE (*Polianthes tuberosa* L.)

Varieties

Single –Calcutta Single, Mexican Single, Phule Rajani, Prajwal, Rajat Rekha, Shringar, Khahikuchi Single, Hyderabad Single, Pune Singl, Arka Nirantra

Double–Calcutta Double, Hyderabad Double, Pearl Double, Suvasini, Vaibhav.Swarna Rekha,

Climate: Tropical conditions with a temperature range of 28 to 30C

Soil

Well drained loamy soil having a pH of 6.5-7.5 is ideal for cultivation.

Propagation and planting

Bulbs are used for commercial propagation. Bulbs (25 to 30 g) are planted (1,12,000 corms/ha) on the sides of ridges at 45 x 20 cm spacing at 2.5 cm depth during June-July. Bulbs are planted after 30 days of harvest. Dip the corms in 5000 ppm CCC (5 g/lit) before planting to increase the yield.

Manuring and after cultivation

Manuring can be done with FYM 25 t/ha and NPK 200:200:200 kg/ha (IIHR Recommendation).

Micronutrients:

- Foliar spray of ZnSO₄ 0.25%+MgSO₄ 0.5%.

Growth regulators:

Foliar application of GA₃ at 50 to 100 ppm thrice at 40, 55 and 60 days after planting.

Crop duration

It extends upto 2 years. The crop can be maintained for one more year with good management practices.

Harvest:

For Loose flower and concrete extraction: Individual florets are plucked during early morning hours before 8 am daily, when they start to open.

For cut flower: Whole spike is cut leaving 4 to 6 cm from the base.

