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Center for Smart Agriculture

Protected floriculture



Module 3: Production technologies followed for
Protected cultivation of different flowers
Session 16: Protected cultivation of rose



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INTRODUCTION

Common name: Rose

Scientific name: *Rosa sps.*

Family: Rosaceae

Chromosome no: $2n=14$





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IMPORTANCE AND USES

- Cut flowers.
- Aesthetic purpose.
- Perfumes
- Gulkand { 1(petals):1(sugar) }
- Pot pourri.
- Rose water





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POLYHOUSE PRODUCTION

- All year round production
- Quality seedlings
- Perfect growth
- Excellent flowers
- Fetch high prices
- Limited land area
- Minimum fertilizer use





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CULTIVARS OR VARIETIES

- Dutch rose varieties cultivated in green house have high demand in the international markets.

Dutch rose varieties popular in India:

- Top Secret, Gold Strike, Corvette, Noblesse, Bonheur, White Avalanche, Sweet Avalanche, Tropical Amazon, Hot Shot, and Sovereign.



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Gold Strike



Corvette



Sweet Avalanche



Top Secret



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CLIMATIC REQUIREMENT

- Greenhouse temperature

20⁰C or 21⁰C (cloudy days)

24⁰C –28⁰C (sunny days)

- Optimum temperature : 15⁰C to 28⁰C
- Ideal humidity : 60-65%
- CO₂ level :1000-1200 ppm
- Light intensity :40000 to 60000 Lux



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SOIL

- soil pH: 5.5 to 7.
- The soil should be highly porous and well drained.
- 30% of organic matter is required on the growing beds.
- Dutch rose also cultivated on artificial growing mediums like coco peat, rock wool and pumice.





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SOIL STERILIZATION

- Soil sterilization is a process of disinfecting the soil before planting new plants.

Methods of sterilization:

1. Apply formalin @ 10 liters per sq m, cover it with polythene film for 4 days and remove the film and aerate the soil then irrigate to flush out the chemicals.
2. Apply 3-7 ml per liter hydrogen peroxide mixed with 1 liter of water and spread over the soil, let it sit for 4-6 hours then continue planting.



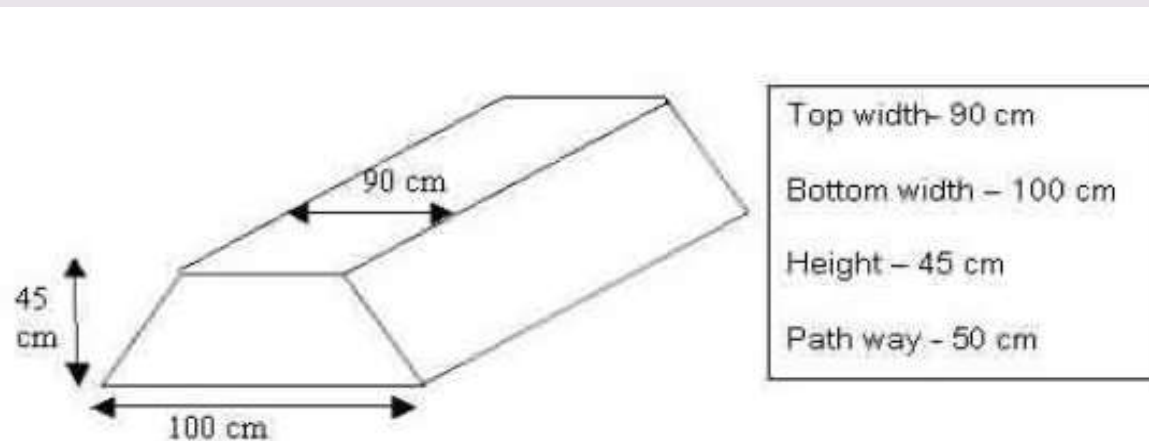
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SOIL BED PREPARATION

➤ Raised beds are used for better drainage & aeration.

dimensions of beds

- Bed height: 45 cm
 - The width of bed at the top: 90 cm
 - The pathway between beds: 50 cm
- For better roots establishment FYM & DAP or SSP (10 to 15 gm /sq.meter)



Bed preparation for roses



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Planting:

two types of planting material:

1. budded plants (5 to 6 weeks old).
2. top grafted plants

Spacing for 2 rows on a single bed

- 18cm (plant to plant)
- 30cm (row to row)

Dutch rose plants is about 8-10 plants/sq. m





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FERTILIZER APPLICATION

- N:P: K:: 20:20:20 @ 2.5 gm/lit every two days for the first three months after planting.
- 2g of calcium nitrate and magnesium nitrate per plant can be applied when needed.
- soil analysis should be done every 2-3 months to decide specific nutrient schedule.

IRRIGATION



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Water quality should be as follows:

- PH: 6.5 – 7.0
- EC : 0.5 – 1 ms/cm.

Drip irrigation specification:

- Use Pressure Compensating Drippers to uniformity in the delivery of water.
- Use two lateral on one bed.
- Dripper discharge capacity 1.2 -4 LPH.



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- The water requirement of Dutch Rose plant can be approximately 800 ml – 1000ml for per plant per day.
- Use micro sprinklers first four weeks for uniform root development gradually change to drip irrigation.





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CULTURAL PRACTICES



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Initial plant development / mother shoot bending

- First flower is pinched after one month from the date of plantation.
- 2 to 3 eyes bud will sprout on main branch to grow as branches which in turn will form buds. Then mother shoot is to be bent towards the direction of path.
- The mother shoot is bent nearer to the bud joint.
- It is done to initiate bottom break ground shoot.



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PLANT STRUCTURE DEVELOPMENT

- After planting ground shoot will start growing from crown of plant.
- The weak ground shoots should be bent at ground level, for forming a basic and strong frame work.
- strong ground shoots should be cut at 5th five pair of leaves after four and half months from the date of plantation.
- The medium ground shoots should be cut at 2nd or 3rd five of leaves.



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BENDING

- Bending helps in maintaining enough leaf area on the plants to build up a strong root system.
- Only weak and blind shoots are selected for bending.
- Growing suckers should be removed .
- Bending is done on 1st or 2nd five pair of leaves.
- Buds should be removed from the bended stem to avoid thrips incidence.
- Stem should not break and leaves should not touch the ground.



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DISBUDDING

- The removal of these buds is known as disbudding.
- When bud attain pea-size and shows slight colour then it is right time to do disbudding.
- For most spray varieties, the center crown bud is to be removed.
- It is generally done on weak stem.
- Thick stem produce strong sprouts whereas thin stem gives out weak sprouts.





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PINCHING

- Removal of unwanted vegetative growth from the axil of leaf below the terminal bud is called pinching.
- It leads to apical dominance.





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WILD SHOOT (ROOT STOCK) REMOVAL

- Removal wild shoots which are the unwanted growth that takes place at the union on the root stock.
- They should not be cut but removed from its union by pressing it with thumb in order to check its further sprouting.





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SUPPORT OF THE PLANTS

- The support system consists of bamboo / GI pipes / 'L' angles.
- They are inserted on both sides of bed at the start and end of the bed.
- Poles are placed at intervals of 3m on both sides of the bed.
- Along the sides of bed, fastened at the poles are 14 gauge GI wires or plastic string at 30 cm – 40 cm intervals to support the plant.





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MAINTENANCE OF BEDS

- It is done by adding fresh soil to bed or by shifting fertile soil from path to bed.

PRUNING

- Stems are cut back leaving 4-5 nodes on the basic stock frame, removing all weak shoots and redirecting the wayward ones.
- Generally, flowering takes place 45 days after pruning.





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WEEDING AND LOOSENING OF THE SOIL

- It is helpful for removal of weeds, breaking the top layer of algae and to facilitate better air circulation in soil.

APPLICATION OF BUD CAPS

- Placed on pea sized buds to increase the size and shape to meet customer demand.

REMOVAL OF DIEBACK

- When cut portion is infected stem starts drying from place of cut towards bottom of the plant.



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HARVESTING

- First harvest should be taken on 2nd or 3rd five pair of the leaves above the first cut.
- The regular harvesting is done on 2nd five pair of leaves.
- Low green house temperature only early morning harvest.
- High day temperature – second harvest late afternoon.



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Cut stages of roses

- Stage 0 & 1 for export.
- Stage 2 & 3 for domestic market.

YIELD

- 230 flowers per sq. m
- To improve vase life for 10-12 days use 10 litres of clean, chlorinated water or water mixed with preservatives like Florissant and RVB chrysal as vase solution.





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POST HARVEST MANAGEMENT



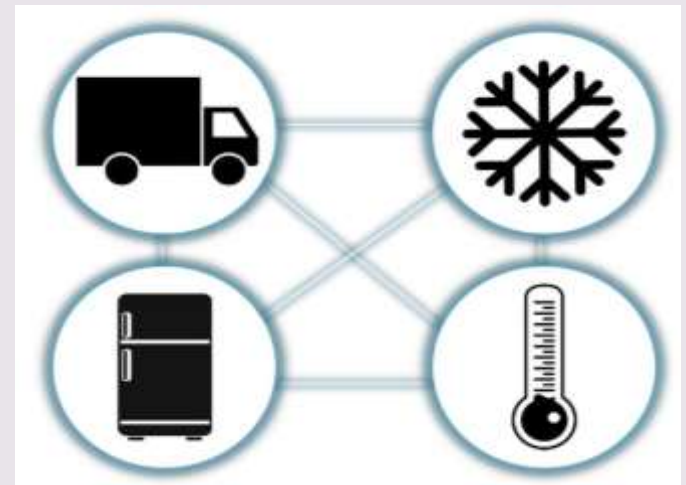
Pre cooling chamber



De leafing



Grading and bunching



Cold chain



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Packing



Transport



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PACKGING OF DUTCH ROSES IN CORRUGATED BOXES

Sl no <small>www</small>	Corrugated Box Size	Stem length		
		40 cm	50 cm	60 cm
1	100×40×20 cm	600 stem	500 stem	400 stem
2	100×40×20 cm	600 stem	500 stem	400 stem



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PRODUCT SPECIFICATION

- Flowers with more than 35 cm are sold at local market.

Quality parameters of dutch roses for export market

S. No	Stem length(cm)	Bud size(cm)	Bud diameter
1	40	3.2	2.2-2.5
2	50	3.5	2.5-2.7
3	60	3.5-4	2.7
4	70	4	2.7

DISEASES



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- Die back (*Diplodia rosarum*, *Colletotrichum sp.*)
- Black spot (*Diplocarpon rosae*)
- Powdery mildew (*Spaerotheca pannosa*)
- Downey mildew (*Peronospora sparsa*)
- Gray mould (*Botrytis cinerea*)
- Rust (*Phragmidium sp.*)
- Crown ball (*Agrobacterium tumefaciens*)
- Wilt (*Marmor flaccumfasciens*)

INSECT-PESTS



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- Red scales
- Red spider mites
- White ants
- Aphids
- Thrips
- Jassids
- Chafer beetles
- Mealy bugs
- Stem girdler
- Sawflies



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PHYSIOLOGICAL DISORDERS

- Bull head
- Bent neck
- Limp neck
- Blind shoot
- Vascular plugging



Blind shoot



Bent neck



Bull head



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Thank you