

ROSE

Botany

- "Queen of flowers". * Considered as symbol of beauty & conveys message of love. [[Rose = Rosa x hybrida]]
- Family :- Rosaceae (2n = 14) * Over 120 spp.
- Rose is most popular garden flower.
- Woody perennial. * Origin = India (Rosa indica)
- Form a group of erect shrubs & climbing or trailing plants, with stems that are often armed with sharp prickles.
- Large flowers with a large varieties of colours.
- Most species are native to asia. Rest to Europe, N. America, NW Africa.
- Leaves = alternately on stem, pinnate, with leaflets & basal stipules. leaflets usually have a serrated margin.
- Most roses are deciduous.
- Good source of vit. - C. • Fruit = Hip
- Floral biology :- complete & perfect flower
 - * Radial symmetry
 - * Calyx (K) : 5
 - * Androecium : Distinct
 - * Placentation : Axial
 - * Perianth : Differentiated
 - * Corolla (C) : 5
 - * Ovary : Inferior
 - * Fruit :- Achene (hips)

• Area and production :- Area = 27,900 ha (Haryana = 246 ha)
 Bangalore, Pune, Nasik, Mumbai, Gt, Ajmer, Panipat, Sonapat, Gt, kaithal
 Chandigarh.
 State → (Karnataka, TN, MH, Bihar, GJ, PB, JK)

Production → loose flower prodⁿ = 75000kg (75t)
 Cut flower = 20 million sticks.

Climate :-

Temp.

Light

- | | |
|---|--|
| <ul style="list-style-type: none"> • Affected by quality & quantity. • 15°C - 28°C → Best growth • Lower temp → flower with short neck. • Higher temp → long neck. • Very low temp. → Bud malformation. | <ul style="list-style-type: none"> • Most imp factor influencing growth & flowering. • Plants grown under shade produced thinner leaves with low chlorophyll content. • Blind to shoots may form due to low light intensity. |
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• Classification :- Main classes :-

(1) Hybrid tea ; (2) Floribunda ; (3) Polyantha ; (4) Miniatures ; (5) C & R.

1) Hybrid tea :-

- Tall, vigorous with big flowers well shaped, borne singly with varying shades of colour & fragrance.
- Blooming takes place on long stems.
- Slow opening of flowers & flowers have good keeping quality.
- Varieties :- Arjun, Bhim, Jawahar, Mrinalini, Christian, Dior, Confidence, Pusa Bahadur, Pusa Garima, Pusa Gorima, Pusa Priya.
- First prize, double delight, crimson glory.

2) Floribunda :-

- Produces flowers in cluster like Polyantha but of better shape and bigger size than the flowers of polyantha.
- Flowers are smaller than Hybrid tea roses.
- Flowers are produced in profusion.
- Varieties :- Jantar Mantar, All gold, Queen Elizabeth, Iceberg, Bangoran, Pusa Pitambar, Pusa Virangana, Rosa red rose, marlena.

3) Polyantha :- Also called Pompon or dwarf polyantha.

- Produces abundant flowers singly as well as in cluster throughout the year.
- Small flowers & lack the shape and form.
- Plants are hardy and resistant to insect pest & diseases.
- Varieties :- Echo, China Doll, Orange, Triumph, Ideal.

4) Miniature roses :- Known as baby or fairy roses.

- Plants are compact and dwarf possessing small leaves & flowers.
- Long blooming period and are least affected by cold weather and diseases.
- Origin → China
- By hybridisation, single and double flowers have been

developed in various colours.

- Ideally suited to edging, pots, rockeries, window garden.
- Varieties :- Ori-Ori, Cinderella, Twinkle, Pixie, green ice, red devil, yellow devil.

5) Climbing and Rambling Roses :-

Produce long arching canes & some support to keep them upright.

- Climbing rose will repeat
- Flowers almost all summer.
- Less vigorous
- Some are natural bud spots of Hybrid tea.

Have climbing habit.

Produced by crossing perpetual with Rosa wichuriana & Rosa multiflora.

- Rambling rose usually flower only once, \approx June.
- More vigorous
- Varieties :- American Pillar, Sander's white.

→ Can be grown on walls of buildings along sunny sides or on arches of gates.

→ Varieties :- Golden shower, Delhi white Pearl, Joseph's coat American pillar, iceberg, aleck's red, royal gold.

• Rootstocks :- Commonly used rootstocks in rose are :- Rosa bourboniana, Rosa multiflora, Rosa indica.

1) Rosa bourboniana :- Most popular rootstock used extensively in India for budding standard roses. (Edward rose \rightarrow R. B. 1)

2) Rosa indica (var. odorata) :- Large climbing shrub used for greenhouse roses which is easily propagated from cuttings.

→ Well adapted to dry or wet soil condⁿ, can withstand high soil pH and is resistant to powdery mildew and many insect pests. In India, it has been recommended for Northern plains.

3) Rosa multiflora :- Native to China & Japan (introduced in India = 1872).

→ Widely used rootstock for outdoor roses which can be easily propagated by cuttings.

→ Adaptable to wide range of soil and climatic conditions.
→ Recommended for Bihar, Bengal & hilly areas.

• Varieties :- 580 cultivars - dev. in India
(IARI) :- 1) Hybrid teas → Abisarika, Anurag, Arjun, Bhim, Chaugandha,
Dr. B. P. Pal, Ganga, Jawahar, Mother Theresa, Mridula, Mrinalini,
Noorjahan, Pusa Sonia, Pusa Caurav, Pusa Garima, Raktagandha,
Surabi, Vasanth, Pusa Priya.

2) Floribunda :- Arumina, Pink Montezuma, Summer Holiday, Winter
Holiday (mutant).

3) Miniature :- Delhi Scarlet

4) Polyantha :- Swati

[NBRI, Lucknow] :- 1) Hybrid tree → Mrinalini Strip, Pink Montezuma,
Summer holiday (mutant).

2) Floribunda → Angara, Avis, Sahara, Twinkle

3) Miniature → Windy City (mutant)

4) Climber → Climbing ou ou

[IHR, Bangalore] → Arka Parimala (selection), Dr. G. S. Randhawa
(Hybrid), Kiran, Nishkant (Root stock, Mutation - Isolation).

[IHBST (CSIR) Palampur] → Jwala and Himroz.

Promising cultivars :- First red, grand gala, avalanche, Tweeta,
Gladiator, Gold Strike, Poison, Charisma.

Important varieties for export :- Coza, corvetti, first red, grand gala

→ Kiss, Lambada, Laser, Nicole, Noblesse, Osiana.

→ Papillion, Parua, Parrotte, Rodeo, Rossini, Sacha, Samura.

→ Sandy, Sangaria, Solido, Susanne, Texas, Tineke, Vivaldi.

Leading exotic varieties :- Grand gala, first red, Ravel, Hollywood, Frisco, Proplyta, Jazz

• Protected rose cultivation :- → Mild climatic condⁿ - Naturally ventilated polyhouse
(Bangalore & Pune)

↳ Under warm & T temp - forced ventilation system (cool-cell pad) - quality flowers
(Hyderabad & Delhi)

• Climatic condⁿ :- Sun loving plant - requires high light intensity

Opt. day temp = 24-26°C ; Opt. night temp. = 15-17°C.

RH = 75% ; CO₂ = 1000 ppm - 3000 ppm

Classification of cut flower roses → floribunda rose

↳ HT rose

- Bed preparation → Ploughing, appⁿ of FYM, Soil sterilization, irrigation, Path, L, W, H.
- Planting material → Rootstocks, method of propagation, age of plant, quality/assmate
- Method of planting → Time of planting, spacing, depth of planting

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- Planting - Bed size = ^(80-100m) L, ^(1-1.6m) W, ^(15-20cm) H ; Distance b/w beds = 0.5-0.7 m
- Spacing - 30-40 x 15-20 cm. No. of plants = 6-9 plants/m².
- Growing media :- Both soil & soil less substrates (Rockwool, peat, sphagnum moss, vermiculites, perlite, leaf mould, coco peat, rice husk)
Opt. pH = 5.5-6.8 ; EC < 1 ; Humus = 10-12% ; Soil: well drained, porous, rich in OM
→ Pasturize with steam at 70-100°C for 30 min or use methyl Bromide @ 25-30 g/m² or formalin.
- Propagation :- (1) Shield / T-budding [Commercial method]
(2) Seeds (Developing new cultivars)
(3) Cutting prop. of rootstocks :- R. indica (North I) ; R. multiflora (Central) ; R. bourboniana (South India)
(4) Grafting (cleft, bench & inarching) (6) Micro-propagation
(5) Layering (ground & air) (7) Stenting method (Budding done on cuttings which are planted for rootstocks in mist chamber)
- Fertilizers :- FYM = 100t/ha ; 1 : 0.2 : 1.2 : 0.3 (Mg)
- Irrigation :- 1 ltr./plant/day ; Drip irri. = 3-4 weeks after planting for uniform watering.
- Special horticultural practices :-

- 1) Bud capping - Flower buds are inserted with nylon cap for tight bud size, avoids damage in transportation & maintains microclimate in package.
- 2) Staking - Post is placed at intervals of 3m on both sides of bed.
→ Galvanised wires or plastic string are fastened at the posts at 30-40cm intervals to support the plant.
- 3) Pruning - Root suckers should be removed whenever they appear.
- 4) Disbudding - Removing side buds to allow top buds to grow larger.
- 5) Mother shoot bending - Mother shoot is bend on 2nd leaf nearer to crown region.
The first bottom break or ground shoot will start coming from base

- Harvesting :- Harvest the flower buds at tight bud stage for distant market. (show full colour but petals not unfolding).
→ often cut back to first 5-leaf stage. small & sprays = 250-350 stems/m²
- Yield :- Large hybrid tea = 100-150 stems/m² ; Medium type = 200-225 stems/m² ;
- Imp. characteristics of cut rose :-
 - * More no. of petals
 - * Attractive colour
 - * More longevity
 - * Long & short stem.
- For loose flowers, harvesting is done when flowers are fully open.
- Harvesting is done in morning & the sticks are immediately placed in water, which prevents entry of air & blockage of xylem vessels.

- Loose flowers → packed in bamboo baskets, cut flowers → corrugated carton
- Roses are packed in bundles of 20 each. 20 roses or four bundles of 100 cm stem length can be accommodated in such box.

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Insect Pests :-

1) Red scale :- (*Aspidiotella aurantii*)

- Serious pest, Attacks mostly in August & September.
- Insect sucks juice of plant & plant get dry under severe attack
- Control → Malathion / monocrotophos @ 0.2% in October.

2) Aphids :- (*Macrosiphum rosaeformis*) Attack tender shoots, leaves & buds

- Suck cell & cause twisting of petals & failure to open buds.
- Control → Monocrotophos / Rogor spray

3) Chaffer beetle :- feed on growing points & leaves, and make regular holes in leaves during nights, at adult stage.

- Control → Handpicking during night or endosulfan spray @ 0.05%.

4) Jassids :- Suck juice & cause yellowing. Control → Monocrotophos @ 0.05%

5) Thrips :- Cause mottling & malformation of affected parts.

- Control → Metasystox spray @ 0.1%

Diseases :-

1) Die back :- Appear after pruning. Drying up & blackening of pruned shoots (from top to down). Control → Apply bavistin paste on cut ends after pruning.

2) Black spot :- leaves become chlorotic, dry up & pre maturely fall.

- Severe in cool & humid climate. Control → Bavistin spray @ 0.2%.

3) Powdery mildew :- Serious disease in warm, humid & cool weather.

- Young growing shoots & leaves covered with white powdery growth
- Infected leaves drop & bud fails to open. Control → Karathane spray @ 0.1%

4) Botrytis blight :- Produces brown specks on flowers. Buds becomes brown & decay. Cool & humid weather = Greenish grey flower.

- Control → Bavistin spray @ 0.1%

5) Wilt :- Stunting growth with chlorotic leaves & ultimately results in defoliation. In nursery, this disease hampers the rooting of cutting & their establishment.

6) Mosaic :- Viral, development of chlorotic areas near the midvein & near the base of leaf.

- Control → Propagation by use of disease free buds during propagation.