ROSE

Botanical Name: (*Rosa hybrida*)

Family: *Rosaceae*

About the Rose

- Rose is much older than man.
- History of man and rose is linked over 5000 years.
- Fossil remains of rose were found in Oregon and Colorado and are estimated 30 million years old.
- There are about 120 species under *Rosa* genus
- Rose reached Rome before Christ.
- Rose cultivation in India developed with the distillation of roses as mentioned by Charaka in Ayurveda around 100 A.D.

Uses of Rose

- Loose flower
- Cut flower
- Shrub or bush
- Standard
- Climber
- Hedge/ Edge
- Rock plant
- Pot plant
- Hanging basket plant
- Perfume and allied products
- Source of vitamins
- Potpourris and dry flowers

Important categories of roses

- ✓Hybrid Teas (Hybrid perpetual x Tea rose) 1st variety- La France in 1867
- ✓Floribundas (Hybrid Teas x Perpetual polyanthas) 1st variety- Rodhatte in 1924
- ✓Hybrid perpetual (Off-springs of *Rosa chinensis, R. gallica* and *R. centifolia*)
- ✓Teas or Tea scented China roses (Origin from *Rosa chinensis* and *R. gigantea*)
- ✓Grnadifloras (Hybrid Teas x Floribundas)
- ✓Polyanthas (Ancestry of crosses of *R. multiflora, R. wichuriana* and *R. chinensis*) 1st variety- La Paquerette in 1875
- ✓China roses (*Rosa chinensis*)
- ✓Miniatures
- ✓Damask rose (*Rosa damascena*)

Important categories of roses

- ✓ Bourbon rose (*Rosa bourboniana*)
- ✓ Cabbage rose (*Rosa centifolia*)
- ✓ French rose (*Rosa gallica*)
- ✓ Albas
- ✓ Musk rose (*Rosa moschata*)
- ✓ Rugosas (*Rosa rugosa*)
- ✓ Australian briars (*Rosa foetida/ lutea*)
- ✓ Moss roses (modified bristles looking like moss)
- ✓ Ramblers (*Rosa wichuriana, R. multiflora*)
- ✓ Noisette roses (*Rosa chinensis* x *R. moschata*)

Genetically Engineered Rose in Japan released on 1st July, 2004

Way to Blue Rose

- The very first truly blue roses have gone on display in Japan and will be on sale to the public next year.
- After 13 years of research the Japanese Suntory company have finally perfected the mythical flower.
- Working with the Australian company Florigene the researchers took the delphinidin gene, which creates the blue colour, from a petunia. They then inserted it into a mauve rose called the Cardinal de Richelieu.
- The resultant flower was a dark burgundy colour due to an excess of the blue pigment cyanidin.
- After using RNAi technology to reduce this the final blue rose was today unveiled at the annual Flower Expo held at Makuhari Messe in Chiba, Japan.
- Source: Mail On Line: 1st November, 2008

Important characters of cut-rose

- More number of petals
- Petals open slowly
- More longevity
- Attractive colour
- Long and strong stem

Important cultivars of cut-roses for export

Cora, Corvetti, Diplomat, Femma, First Red, Grand gala, Kiss, Konfetti, Lambada, Laser, Nicole, Noblesse, Osiana, Papillon, Parea, Pavrotte, Rodeo, Rossini, Sacha, Samura, Sandy, Sangaria, Soledo, Susanne, Texas, Tineke, Vivaldi.

Indian Rose Varieties

- About 600 cultivars of roses have been developed in India. Some of important are given below:

IARI, New Delhi:

- Hybrid Tea:- Abhisarika, Anurag, Arjun, Bhim, Charugandha, Chitwan, Dr. B.P. Pal, Dr. Bharat Ram, Ganga, Jawahar, Mother Teressa, Mridula, Mrinalini, Nurjahan, Priyadarshini, Pusa Sonia, Pusa Gaurav, Pusa Bahadur, Pusa Priya, Pusa Garima, Raj Kumari, Raktagandha, Rangasala, Surabhi, Vasant. New varieties from IARI are Pusa Ajay, Pusa Arun, Pusa Mansij, Pusa Mohit, Pusa Abhisek, Pusa Komal, Pusa Manhar, Pusa Muskan, Pusa Sharbati, Pusa Urmil, Pusa Priya and Pusa Ranjan.

- Floribunda:- Arunima, Chandrama, Deepshikha, Himangini, Mohini, Nav Sadabahar, Neelambri, Prema, Pusa Barahmasi, Pusa Pitamber, Pusa Virangana, Sadabahar, Saratoga, Shabnam, Sindhoor, Suchitra and Suryodaya.
- Miniature:- Delhi Scarlet.
- Polyanthas:- Swati.

Important factors affecting growth and flowering of cut-roses

- Environmental factors
- Management factors
- Harvest and post harvest factors

Environmental factors

- **Temperature** (Day: 18-28 and night: 15-18^{o} C)
- **Light** (Photoperiod over 12 hours and intensity: 6000-8000 foot candles)
- **Relative humidity** (50-60 %)
- **Aeration** (Good in air and soil)
- **Carbon dioxide** (1000-3000 ppm)

Management factors

- Soil or medium condition
- Nutrition
- Pruning
- Pinching
- Disbudding
- De-shooting
- Defoliation
- Removal of faded flowers
- Bending of shoots (about 25 %)

Ideal Soil or Growing media

- Light, well drained
- pH 6.5
- EC less than 1.0
- Humus 10-12%
- Important constituents of soilless growing medium are:
  - sand
  - coco-peat and
  - rock-wool.

Propagation of roses

- Seeds (Developing new cutivars)
- Cuttings (Propagation of rootstocks- 15 to 20 cm long stem cuttings of pencil thickness having at least three buds)
- Shield or T-Budding (Commercial method)
- Grafting (Cleft, bench and inarching)
- Layering (ground and air)
- Stenting method (Budding done on cuttings, which are planted for rooting in mist chamber)
- Micro-propagation

Characteristics of rootstocks

- Should produce fibrous root system.
- Propagated easily by cuttings.
- Vigorous growth habit and healthy.
- Resistant or tolerant to biotic and abiotic stresses.
- Uniform plant growth.
- Free from suckers.
- Thick bark to hold firmly the bud.
- Support the bud for long time.
- Able to grow in varied soil and agro-climatic conditions.

Important rootstocks of rose

- ✓ *Rosa bourboniana*
- ✓ *Rosa indica* var. Odorata
- ✓ *Rosa laxa*
- ✓ *Rosa multiflora*
- ✓ *Rosa noisettiana*
- ✓ *Rosa rugosa*
- ✓ *Rosa chinensis*
- ✓ *Rosa moschata*
- ✓ IXL
- ✓ Dr. Huey

Budding Time in Rose

- N.I. plains: Nov.-Dec.
- Low hills: Dec.-Feb.
- Mid hills: Jan.-Mar.
- High hills: Feb.-April.
- Pruning in roses should also be done during this period.

Optimum Planting Density in Rose

- Purpose of growing roses determines the planting density and spacing.
- In open 60 x 60 cm (Row-Row and Plant-Plant) or 60 x 30 cm.
- Closer spacing of 30 x 30 cm is now very common.
- In greenhouse single, double or four row planting system in bed is being followed and spacing of 30 x 25 cm is kept.
- Optimum plating density in greenhouse is 60-70 thousand per hectare.

Optimum dose of nutrients (ppm) to be given as fertigation in roses

- pH: 6.2-6.8
- EC: 0.7
- Nitrate: 180
- Phosphate: 4
- Potassium: 45
- Sodium: 25
- Chloride: 35
- Sulphate: 105
- Bi-carbonate: 30
- Calcium: 55
- Magnesium: 20
- Ammonium: 2
- Iron: 0.39
- Manganese: 0.04
- Zinc: 0.07
- Boron: 0.08
- Copper: 0.05

Factors determining the amount of pruning in roses

- Cultivar
- Class or category of rose
- Health and vigour of plant
- Spacing
- Soil fertility
- Desired quality

Pinching in roses

- In pinching 2-5 unfolded leaves are removed.
- Reduces plant height
- Promote lateral branching
- Regulate flowering
- Early pinching result in increased diameter of cane, with more height.

How rose plants are to be prepared for the next season?

- Stop watering and nutrition after harvesting flowers, for about 4-8 weeks until most of the leaves drop.
- Do pruning up to 30-60 cm from ground level.
- Start slowly watering and nutrition.

Wintering of roses

- The base of the plant is exposed to sun and air by removing 10-15 cm deep soil layer in 20-30 cm plant periphery.
- After about a fortnight fill this with a mixture of well decomposed manure and do watering.
- Wintering of roses is very common in western part of India.

Important insect-pests of roses

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

Important diseases of roses

- 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*) are important disease of roses.

Disorders in roses

- Bull head
- Bent neck
- Limp neck
- Blind shoot
- Vascular plugging
- Deficiencies of Zn and B.

Optimum stage of harvesting cut roses

- For local market: When outer one/two petals start unfurling.
- For distant market: Fully coloured tight buds
- Loose flowers: Fully open flowers.
- White, pink and yellow cultivars are harvested earlier to red as red may not open if harvested at tight bud stage

Qualities of Rose cut flowers

- Strong straight stem capable of holding the flower in upright position.
- Uniform stem length.
- Shape and size of flower representative of the cultivar.
- Uniform stage of development.
- Flowers should be free from injuries of any kind or discolouration.
- Foliage should be healthy and of good quality.

Popular grades of cut roses

- Large flower cultivars: Stem length 60-90 cm and bud size 3-3.5 cm.
- Small flower cultivars: Stem length 40-50 cm and bud size 2-2.5 cm.

Packaging of cut roses

- In bundles of 10, 12, 20 or 25.
- In corrugated card board boxes of 100 x 32.5 x 20 cm (L x W x H) accommodates about 80-100 cut roses of 60-65 cm length.
- Wrap flower bunches in cellophane sleeves.
- Inline the boxes with tissue paper or news paper.

Optimum yield of cut roses

- Open field: 25-50 stems/m^2/ year.
- Indian greenhouse: 150-200 stems/m^2/year.
- European greenhouse: 350-400 stems/m^2/year.
- Loose flowers: 3-5 ton/ ha/ year.