

Uses of trees, shrubs, climbers, house plants and seasonal flowers in the gardens

Landscape Plants

- Landscape plants are those plants which are grown with the objective to beautify our surroundings.
- In addition to this these plants must serve certain functional, architectural and engineering uses.

Functional uses of plants

- Visual and physical barriers
- To control solar radiation, wind, humidity and noise
- To control air pollution
- To control soil erosion
- Potential use in comfort of human civilization
- Wild life habitat

Architectural uses of plants

- Screening to prevent direct sunlight, glares of setting sun
- To serve as background
- To create ceiling, walls and floor of outdoor room
- To provide shelter in pavilion, gazebo, glorietas, etc.

Gazebo and Glorietas



Engineering uses of plants

- To direct traffic
- To provide comfort to drivers and riders from sun glares

Different types of landscape plants

- **Trees**
- **Shrubs**
- **Climbers**
- Herbaceous perennials
- **Annuals**
- Biennials
- Bulbous plants
- **Indoor/ live plants**
- Cacti and succulents
- Palms and cycads
- Lawn grasses
- Other ornamental grasses
- Bamboos
- Water plants
- Ferns
- Sellaginellas
- Mosses
- Lichens

Important characteristics of landscape plants

- Proper identification: Botanical name, common name and family
- Habitat
- Habit
- Form
- Height
- Spread
- Trunk height
- Texture- Fine, medium and coarse
- Growth rate- slow, medium and fast
- Leaf retention period- Deciduous, Semi-deciduous and Evergreen
- Foliage colour- Emerging, mature and fall colour
- Flowering season and peak flowering duration
- Flower- Colour, shape, size, fragrance
- Inflorescence- Size, type and number of flowers in it
- Fruits- Colour, shape, size, season and duration
- Associated flora
- Susceptibility or resistance to natural hazards, drought, wind, flood, insect pests and diseases
- Ease of transplanting
- Other peculiar characteristics

How healthy, attractive landscape is maintained?

- Inter-culture and hoeing
- Pruning
- Fertilizing
- Watering
- Plant protection

Ornamental Trees

Tree is a woody perennial plant having distinct trunk and crown at the top.

Logical meaning of each letter of TREE

- T- Temperature and microclimate moderation
- R- Removal of air pollutants
- E- Erosion control
- E- Energy conservation
- Trees are grown on this planet since 50 million years

Three main groups of trees

- Broad leaved
- Narrow leaved or conifers
- Palms and cycads

Selection of Trees in Landscaping

- Habitat
- Habit
- Form
- Height
- Spread
- Trunk height
- Texture- Fine, medium and coarse
- Growth rate- slow, medium and fast
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Different landscape uses of trees

- Specimen plant
- Shade tree
- Flowering tree
- Ornamental fruit tree
- Avenue tree
- Screening
- Wind break
- Checking air pollution

Characteristics of any tree for planting in avenues

- Good ornamental value through out year
- Medium size (10-15m)
- Straight trunk up to 5m
- Fast growing
- Branches non-drooping and unbreakable
- Non-thorny

Cultivation of ornamental trees

- **Deciduous:** December-January
- **Evergreen:** July-September and February-March (if irrigation facility available)

Optimum pit size for planting a tree

- 2 x 2 x 2 feet

Different ways for guarding young tree sapling:

- Fencing of thorny bushes
- Fencing of bricks
- Wire netting
- Perforated drums

Control of white ants:

- Chloropyrifos (0.05 per cent)
- Fenvelarate (5 per cent dust)
- Aldrin (5 per cent dust)

Description of ornamental tree

Photograph

Acacia auriculiformis (Australian Acacia)

Family: *Mimosaceae*

Dwarf to medium sized, evergreen tree with light yellow fragrant flowers year round.



Acrocarpus fraxinifolius (Pink cedar)

Family: *Caesalpiniaceae*

Semi-deciduous, medium to tall tree with orange-red emerging foliage and greenish yellow flowers.



Aesculus indica (Horse chestnut tree)

Family: *Sapindaceae*

Deciduous, medium to tall tree having exfoliating bark on trunk and branches. Good for planting in hills.



Ailanthus excelsa (Tree of heaven)

Family: *Simaroubaceae*

Deciduous, medium sized foliage tree. Good for planting plains and low hill areas.



Anthocephalus indicus (Kadamb)

Family: *Naucleaceae*

Deciduous, coarse texture foliage tree and globosely yellow flowers during July to September.



Azadirachta indica (Neem)

Family: *Meliaceae*

Evergreen, medium sized foliage tree with white flowers during April to June.



Araucaria columnaris (Monkey puzzle)

Family: *Araucariaceae*

Tall straight growing tree with beautiful formal branching pattern and ornamental foliage.



Bauhinia purpurea (Mountain Ebony)

Family: *Caesalpiniaceae*

Semi-deciduous quick growing medium height tree having bi-lobed leaves and lilac to red purple flowers with fragrance during autumn to winter season.



Bauhinia variegata (Kachnar)

Family: *Caesalpiniaceae*

Deciduous quick growing medium height tree having bi-lobed leaves and white with red purple markings flowers during spring to summer season.



Brownea coccinea (Rose of Venenzula)

Family: *Caesalpiniaceae*

Evergreen, medium height tree with large compound leaves, drooping scarlet-red flowers in clusters during March to April.



Callistemon lanceolatus (Bottle brush)

Family: *Myrtaceae*

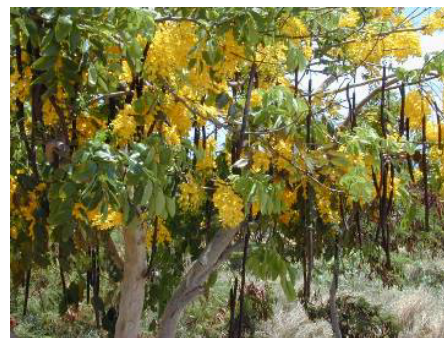
Evergreen, slow growing dwarf-medium height tree, with drooping branching pattern and thick dark green leaves and bottle- brush shaped bright red flowers throughout the year.



Cassia fistula (Indian Laburnum/ Amaltas)

Family: *Caesalpiniaceae*

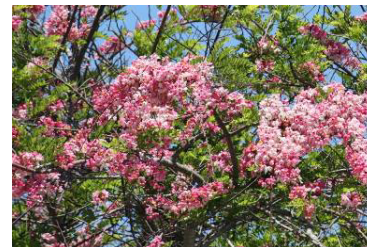
Deciduous slow growing medium height tree suited for dry localities with dull green large compound leaves, bright yellow flowers in drooping racemes during April- June and brown- black pods throughout year.



Cassia fjavanica (Java Cassia)

Family: *Caesalpiniaceae*

Deciduous quick growing medium- tall height with large compound leaves having small leaflets and pink flowers borne in clusters in leaf axis during May- June.



Chorisia speciosa (Mexican silk cotton tree)

Family: *Bombacaceae*

Deciduous, medium-large tree with almost green prickly stem and branches, pink with yellow centre flowers during October- November.



Colvillea racemosa (Colville's glory)

Family: *Caesalpinaceae*

Deciduous, medium- tall tree, dark green, compound and fine texture leaves with orange-red flowers in drooping racemes during July- October.



Cupressus sempervirens (Italian Saru)

Family: *Cupressaceae*

Evergreen, dwarf- medium height tree with columnar shape canopy and fine texture dark green foliage.



Delonix regia (Red Gulmohar)

Family: *Caesalpinaceae*

Deciduous quick growing tree, with umbrella shaped canopy, fine texture compound dark green leaves and scarlet-orange flowers borne in panicles during April-June.



Erythrina indica var. *variegata* (Coral tree)

Family: *Papilionaceae*

Deciduous medium sized tree with large yellow variegated leaves and crimson-red flowers during April to June.



Ficus infectorea (Pilkhan)

Family: *Moraceae*

Semi-deciduous, medium to large tree with spreading canopy.



Grevillea robusta (Silver oak)

Family: *Proteaceae*

Evergreen medium to tall tree with almost conical canopy, fine texture dark green foliage (above), grayish (beneath) and yellow orange fragrant flowers during April to June.



Jacaranda mimosifolia (Blue gulmohar)

Family: *Bignoniaceae*

Deciduous, medium sized tree with spreading canopy, fine texture light green foliage and mauve-blue flowers during March-May.



Kigelia pinnata (Sausage tree)

Family: *Bignoniaceae*

Semi-deciduous medium sized tree with wide oval canopy, coarse texture pinnate leaves and maroon-red flowers during April-July and October-November and drooping cucumber like brown fruits throughout the year.



Koelreuteria paniculata (Golden rain tree)

Family: *Sapindaceae*

Deciduous, dwarf tree with umbrella shaped canopy and compound leaves. Yellow –orange flowers appear during August to October and orange-red tri-fid fruits during October-December.



Lagerstroemia speciosa (Pride of India)

Family: *Lythraceae*

Deciduous, medium sized tree with informal to umbrella canopy, pink-red to purple-pink flowers appear during April to August.



Magnolia grandiflora (Him Champa)

Family: *Magnoliaceae*

Evergreen, medium sized tree with almost cylindrical canopy with glossy green leaves on upper side and bronze beneath and white large fragrant flowers appear during March to May.



Peltophorum ferrugineum (Yellow gulmohar)

Family: *Caesalpiaceae*

Evergreen, medium sized quick growing tree with umbrella shaped. Bright yellow flowers are borne in terminal racemes during April-June and again during September-November.



Platanus orientalis (Chenar)

Family: *Platanaceae*

Deciduous, large sized tree with informal canopy and leaves turning yellow during autumn looks very ornamental.



Plumeria acuminata (Temple tree)

Family: *Apocynaceae*

Deciduous, dwarf tree with umbrella to globular canopy and coarse texture light green leaves and cream with yellow centre flowers appearing throughout the year.



Polyalthia longifolia var. *pendula* (Ashok tree)

Family: *Annonaceae*

Evergreen medium sized columnar shaped canopy with glossy green foliage borne in drooping branches.



Pterospermum acerifolium (Kanak Champa)

Family: *Sterculiaceae*

Evergreen, medium sized tree with informal canopy and coarse texture large leaves. Flowers are white with mild fragrance.



Rhododendron arboreum
(Rhododendron)

Family: *Ericaceae*

Evergreen, dwarf tree with glossy green foliage makes contrast with red flowers during March-May in hilly areas.



Roystonea regia (Royal palm)

Family: *Palmaceae*

Evergreen, tall tree with bottle shaped trunk and pinnate shaped large leaves.



Spathodea campanulata (Tulip tree)

Family: *Bignoniaceae*

Evergreen, medium-tall tree with bright green foliage makes contrast with crimson-red flowers throughout the year.



Thespesia populnea (Portia tree)

Family: *Malvaceae*

Evergreen, medium-tall tree with light green heart shaped leaves and yellow flowers with red marks throughout the year.



Note: For more detail refer to Annexure on Ornamental Trees in the book, “Floriculture at Glance”

Ornamental Shrubs

- A shrub is a woody or semi-woody perennial plant with little or no trunk and grows up to a height from 50 cm to less than four meters.



Purposes of planting shrubs

- To enhance the beauty of surroundings
- To provide fragrance in the garden
- To act as boundary of property line
- To secure privacy for the family
- To divide different areas or features in the garden
- Softening harsh building lines
- To screen off unwanted sites/ features
- To reduce winds
- To control traffic
- To provide background for growing annual flowers
- To reduce soil erosion
- To conserve moisture
- To discourage weed growth
- To provide natural habitat for wildlife especially birds

Criterion for selection of shrubs

- Habitat
- Amount of sunlight received
- Habit
- Form
- Height
- Spread
- Texture- Fine, medium and coarse
- Leaf retention period- Deciduous, Semi-deciduous and Evergreen
- Foliage colour- Emerging, mature and fall colour
- Flowering season and peak flowering duration
- Flower- Colour, shape, size, fragrance
- Inflorescence- Size, type and number of flowers in it
- Fruits- Colour, shape, size, season and duration
- Susceptibility or resistance to natural hazards, drought, wind, flood, insect pests and diseases
- Ease of transplanting
- Other peculiar characteristics

Classification on the basis of landscape value

- Flowering shrubs
- Foliage shrubs
- Flowering and foliage shrubs
- Shrubs valued for fruits
- Shrubs with fragrant flowers
- Shrubs with ornamental bracts
- Other peculiar characters

Landscape uses of shrubs

- Specimen plant
- Standard
- Half standard
- Shrubbery border
- Avenue planting
- Hedge
- Edge
- Under-planting
- Rockeries
- Cut flowers
- Cut foliage
- Moonlit gardening
- Shrubs for pots

Shrubbery border

- Area of the garden devoted exclusively for growing shrubs planted in a row or rectangular fashion is known as a shrubbery border.

Basis of shrubs for arranging in the shrubbery border:

- Height
- Flower colour
- Flowering season
- Foliage colour
- Leaf retention time

Types of shrubbery borders

- Single faced: Tall- Medium- Dwarf. Created on the corner of the garden.
- Double faced: Dwarf- Medium-Tall- Medium-Dwarf. Created in the middle of the garden.

Ideal site to grow shrubbery

- Grow shrubbery in front of a tree
- Avoid shade of trees
- Plant in South-east direction
- If more height is desired in a shrubbery, keep more width.

Shrubs valued for ornamental fruits

- *Ochna squamosa*
- *Duranta plumieri*
- *Solanum pseudocapsicum*
- *Euonymous japonicus*
- *Citrus japonica*

Shrubs valued for ornamental coloured foliage

- *Acalypha hispida*
- *Codiaeum variegatum*
- *Excoecaria bicolor*
- *Euphorbia cotinifolia*
- *Gynura bicolor*

Shrubs valued for ornamental flowers and foliage

- *Camellia japonica*
- *Hamelia patens*
- *Hibiscus rosa-sinensis*
- *Gardenia jasminoides*
- *Nerium indicum*

Shrubs valued for fragrant flowers

- *Jasminum species*
- *Gardenia jasminoides*
- *Cestrum nocturnum*
- *Camellia japonica*
- *Murraya exotica*

Shrubs valued for ornamental bracts

- *Euphorbia pulcherrima*
- *Mussaenda frondosa*
- *Mussaenda philipica*
- *Bougainvillea species*
- *Flemingia fruticulosa*

Shrubs flowering almost through out year

- *Beloperone amherstiae*
- *Cassia laevigata*
- *Euphorbia milli*
- *Justicia magnifica*
- *Vinca rosea*

Shrubs good for hilly areas

- *Aucuba japonica*
- *Camellia japonica*
- *Fuchsia hybrida*
- *Hypericum ovalifolium*
- *Weigela florida*

Shrubs suitable for growing in moonlit gardens

- *Jasminum auriculatum*
- *J. sambac*
- *Gardenia jasminoides*
- *Murraya exotica*
- *Nyctanthes arbortristis*

Description of ornamental shrub

Acacia auriculiformis (Australian Acacia)

Family: *Mimosaceae*

Dwarf to medium sized, evergreen tree with light yellow fragrant flowers year round. Good for planting in hills.



Photograph

Acalypha hispida (Acalypha)

Family: *Euphorbiaceae*

Dwarf medium sized shrub with multi-colour foliage and drooping red catkins during March-June. Good for planting in tropical areas.



Achania malvaviscus (Chinese lantern)

Family: *Malvaceae*

Medium sized semi-deciduous shrub with dark green foliage and orange-red flowers throughout the year.



Allamanda cathartica (Allamanda)

Family: *Apocynaceae*

Climbing evergreen shrub with green glossy foliage and bright yellow flowers appearing throughout the year. Good for planting in tropical areas.



Azalea species (Azalea)

Family: *Ericaceae*

Dwarf to medium sized, evergreen shrub with pink, red, white and purple flowers appearing during February-July. Good for planting in hills.



Bougainvillea species (Bougainvillea)

Family: *Nyctaginaceae*

Climbing type thorny evergreen shrub valued for ornamental bracts with almost every colour throughout the year. Good for planting in tropical to sub-tropical areas.



Buddleja linleyana (Buddleia)

Family: *Buddlejaceae*

Evergreen, grayish- green foliage and mauve-blue fragrant flowers during March-October. Good for planting in hills.



Caesalpinia pulcherrima (Peacock flower)

Family: *Caesalpiniaceae*

Deciduous, medium-large shrub with red-yellow flowers throughout the year and good for planting in sub-tropical areas.



Camellia japonica (Camellia)

Family: *Theaceae*

Evergreen, medium sized shrub with shining dark green foliage with pink, red and white flowers during February to May and is good for planting in acidic soils in hills.



Cestrum norcturnum (Rat kee rani)

Family: *Solanaceae*

Evergreen, large shrub with greenish-yellow fragrant flowers throughout the year and good for planting in subtropical and sub-temperate areas.



Codiaeum variegatum (Croton)

Family: *Euphorbiaceae*

Dwarf, evergreen shrub with multi-colour foliage and good for planting in tropical areas.



Crossandra infundibuliformis
(Crossandra)

Family: *Acanthaceae*

Dwarf, evergreen shrub with orange-yellow flowers throughout the year and good for planting in sub-humid tropical areas.



Dombeya spectabilis (Dombeya)

Family: *Sterculiaceae*

Large deciduous shrub with coarse texture foliage and white fragrant flowers during March-November and good for planting in tropical to temperate areas.



Euphorbia pulcherrima (Poinsettia)

Family: *Euphorbiaceae*

Medium- large deciduous shrub grown for coloured red, orange, cream or yellow bracts mainly during January to March. Good for growing sub-temperate to tropical areas.



Forsythia viridissima (Forsythia)

Family: *Oleaceae*

Dwarf deciduous shrub grown for bright yellow flowers borne on leafless branches during February-April and good for growing in hills.



Gardenia jasminoides (Cape jasmine)

Family: *Rubiaceae*

Evergreen, medium sized shrub with glossy light green leaves and white highly fragrant flowers during March-July. Good for growing temperate to sub-tropical areas.



Hibiscus rosa-sinensis (Shoe flower/ China rose) Family: *Malvaceae*

Evergreen, large shrub with glossy green leaves and red, cream, saffron, yellow or white flowers almost throughout the year and it is good for planting in subtropical to sub-temperate areas.



Hiptage benghalensis (Madhavi lota)

Family: *Malpigiaceae*

Large deciduous rambling shrub with orange-light red emerging foliage and turning reddish in autumn and creamy white fragrant flowers are borne during February- June. It is good for planting in subtropical to sub-temperate areas.



Holmskioldia sanguinea (Cup and saucer)

Family: *Verbenaceae*

Large, deciduous rambling shrub, grown for red or yellow cup and saucer shaped flowers appearing during October to February. Good for growing temperate to sub-tropical areas.



Hydrangea macrophylla (Hydrangea)

Family: *Hydrangeaceae*

Dwarf deciduous shrub grown for coarse texture green leaves and large blue, pink, red or white flowers borne in globose shaped corymbs during April to September and good for growing in hills.



Ixora coccinea (Rukmani)

Family: *Euphorbiaceae*

Evergreen medium sized shrub with dark green foliage and orange-red flowers appearing during April to September. It is good for planting in subtropical to tropical areas.



Jasminum primulinum (Primrose jasmine) Family: *Oleaceae*

Large deciduous rambling shrub with green drooping branches bearing yellow star shaped semi-double flowers before appearing leaves during March-May. It is good for planting in subtropical to sub-temperate areas.



Mussaenda frondosa (Mussaenda)

Family: *Rubiaceae*

Evergreen medium sized shrub with light green foliage and white, cream, orange or red bracts appearing during March-September. It is good for planting in subtropical to tropical areas.



Nerium indicum (Red kaner)

Family: *Apocynaceae*

Evergreen, large shrub with dark green shining thick leaves and white, pink or red flowers borne in bunches almost throughout the year. It is good for planting in subtropical to sub-temperate areas.



Russelia juncea (Coral bush)

Family: *Scrophulariaceae*

Evergreen medium sized shrub with drooping green branches bearing red tubular flowers almost throughout the year. It is good for planting in subtropical to sub-temperate areas under partially shady areas.



Spiraea japonica (Spiraea)

Family: *Rosaceae*

Dwarf deciduous shrub with drooping brown branches bearing white and fragrant flowers on leafless branches during February to April. It is good for planting in hills.



Tabernaemontana divaricata (Double chandani)

Family: *Apocynaceae*

Evergreen, medium sized shrub with light green leaves and double white flowers almost throughout the year. Good for growing sub-temperate to sub-tropical areas.



Tecoma stans (Yellow bells)

Family: *Bignoniaceae*

Medium sized deciduous shrub valued for yellow, bell shaped flowers appearing throughout the year. Good for growing sub-temperate to sub-tropical areas.



Note: For more detail refer to Annexure on Ornamental Shrubs in the book, “Floriculture at Glance”

Ornamental Climbers

- Climbers are the group of plants which have weak stems and ability to climb up the support with the help of modified organs viz:
 - Clingers
 - Tendrils,
 - Thorns,
 - Roots,
 - Rootlets,
 - Prickles,
 - Linear,
 - Weavers,
 - Latex, etc.
- These climb over walls, arches, pergolas, trellis, pillars, cascade, gates and topiary.

Twiners and Ramblers

Twiners:

- It does not have such modified organs to climb, but twin around the support by spiraling or coiling.
 - *Ipomoea species*
 - *Lonicera japonica*
 - *Quoamoclit pinnata*
- Ramblers:
 - It has neither any modified organ for climbing nor it coils around the support, but climb on its own.
 - *Bauhinia vahlii*
 - *Hiptage benghalensis*

Criterion for selection of climbers

- Habitat
- Amount of sunlight received
- Habit
- Spread
- Texture- Fine, medium and coarse
- Leaf retention period- Deciduous, Semi-deciduous and Evergreen
- Foliage colour- Emerging, mature and fall colour
- Flowering season and peak flowering duration
- Flower- Colour, shape, size, fragrance
- Inflorescence- Size, type and number of flowers in it
- Fruits- Colour, shape, size, season and duration
- Susceptibility or resistance to natural hazards, drought, wind, flood, insect pests and diseases
- Ease of transplanting
- Other peculiar characteristics

Classification on the basis of landscape value

- Flowering climbers
- Foliage climbers
- Flowering and foliage climbers
- Climbers valued for fruits
- Climbers with fragrant flowers
- Climbers with ornamental bracts
- Other peculiar characters

Climbers climb up with tendrils

- *Antigonon leptopus*
- *Pyrostegia venusta*

Climbers climb up with thorns

- *Bougainvillea species*
- *Euphorbia milii*
- *Persea equileata*

Climbers climb up with prickles

- *Rosa species*

Climb with roots and rootlets

- *Ficus pumila*
- *Hedera helix*
- *Hedera nepalensis*
- *Hoya carnosa*
- *Vanilla crenulata*
- *Vanilla carnosa*

Climbs with latex or stickers

- *Ficus pumila*

Climbs with hookers

- *Gvilandrina cristata*
- *Combretum comosum*

Climbs with clingers

- *Passiflora caerulea*
- *Passiflora quadrangularis*
- *Hydrangea petiolaris*

Landscape uses of climbers

- Create privacy
- Create natural, thick screens
- Covering ugly objects
- Covering slopes as ground cover
- Shading after training over pergolas
- Avenue planting
- Topiary
- Integrating house with the garden
- Softening harsh masonry walls
- To change line of building and architecture
- To divide different features in the garden
- To supplement and filling bare spots in the garden
- To give added interest by training on trees
- To cover up patio

Light climbers

- *Aristolochia elegans*
- *Bignonia unguiscati*
- *Ipomoea species*
- *Lonicera japonica*
- *Tecoma jasminoides*

Heavy climbers

- *Antigonon leptopus*
- *Bauhinia vahlii*
- *Beaumontia grandiflora*
- *Pyrostegia venusta*
- *Thunbergia grandiflora*
- *Wisteria sinensis*

Climbers planted in sunny situations

- *Antigonon leptopus*
- *Bougainvillea species*
- *Campsis grandiflora*
- *Pyrostegia venusta*
- *Quisqualis indica*
- *Wisteria sinensis*

Climbers planted in partially shady situations

- *Clerodendrum splendens*
- *Lonicera japonica*
- *Trachaelospermum jasminoides*

Climbers for screening walls

- *Bignonia unguiscati*
- *Ficus pumila*
- *Vernonia elaeagnifolia*

Climbers planted for making topiary

- *Bignonia unguiscati*
- *Clerodendrum inerme*

Climbers planted for covering slopes

- *Lonicera japonica*
- *Passiflora caerulea*
- *Thunbergia grandiflora*

Important indoor climbers

- *Asparagus*
- *Hedera*
- *Monstera*
- *Philodendron*
- *Senecio*
- *Scindapsus*
- *Syngonium*

Climbers having fragrant flowers

- *Clematis paniculata*
- *Hiptage benghalensis*
- *Jasminum grandiflorum*
- *Solanum jasminoides*
- *Tecoma jasminoides*
- *Trachaelospermum jasminoides*

Climbers having ornamental fruits

- *Dioscorea deltoides*
- *Hedera nepalensis*
- *Rosa species*

Description of ornamental climber

Allamanda cathartica (Allamanda)

Family: *Apocynaceae*

Quick growing climber with shining foliage and bell shaped bright yellow flowers.



Antigonon leptopus (Coral vine)

Family: *Polygonaceae*

Deciduous, quick growing climber with rose-pink flowers and is good for cascading effect.



Aristolochia elegans (Duck flower)

Family: *Aristolochiaceae*

Deciduous quick growing climber, good for trellis and cascading.



Asparagus plumosus (Asparagus)

Family: *Liliaceae*

Evergreen light climber good for shady areas and as cut green.



Bauhinia vahlii (Climbing bauhinia)

Family: *Caesalpiniaceae*

Large, evergreen climber/ rambler, good for growing in foot hills in drought prone areas.



Bignonia unguis-cati (Cat's claw)

Family: *Bignoniaceae*

Evergreen light climber ability to climb up ware walls and pillars with emerging foliage purple-red. Good for making topiary.



Bougainvillea species (Bougainvillea)

Family: *Nyctaginaceae*

Evergreen climber, valued for bracts and foliage.



Campsis grandiflora (Trumpet flower)

Family: *Bignoniaceae*

Deciduous climber ability to climb ware walls, with glossy dark green foliage.



Clematis paniculata (Trumpet flower)

Family: *Ranunculaceae*

Deciduous heavy climber with dark green foliage and fragrant white flowers.



Clerodendrum splendens (Clerodendron)

Family: *Verbenaceae*

Large evergreen climber with coarse textured dark green foliage making contrast with red flowers.



Ficus pumila (Indian Ivy)

Family: *Moraceae*

Light climber ability to climb on ware walls, pillars in shady areas.



Hedera helix (Ivy)

Family: *Araliaceae*

Evergreen, light climber with variegated foliage. Good for semi-shady areas.



Hiptage benghalensis (Madhavi lota)

Family: *Malpighiaceae*

Heavy woody semi-deciduous climber with shining foliage, emerging orange-red and red-purple in autumn and fragrant flowers.



Ipomoea quamoclit (Cypress vine)
Family: *Convolvulaceae*
Fine textured dark green foliage like ferns and crimson red flowers.



Lonicera japonica (Honey suckle)
Family: *Caprifoliaceae*
Evergreen heavy quick growing creeping plant with fragrant flowers



Passiflora caerulea (Passion flower)
Family: *Passifloriaceae*
Flowers looking like watch with various colour combinations, good for trellis and cascading.



Pyrostegia venusta (Golden shower)
Family: *Bignoniaceae*
Large deciduous climber with lush green foliage and makes evergreen combination when planted with Trumpet flower over pergolas and cascading.



Quisqualis indica (Rangoon creeper)
Family: *Combrataceae*
Large quick growing climber requires no support to climb and has wide ranging flower colours.



Note: For more detail refer to Annexure on Ornamental Climbers in the book, “Floriculture at Glance”

House/ Indoor Plants

- The art of growing and arranging plants indoor or in the house for its best use for function and/ or beauty is called as Indoor gardening.

Why indoor gardening

- The pleasure and thrill of growing house plants/ indoor plants are immense
- Indoor gardening brings an intimate and natural association of the man and the plants
- Indoor gardening is never out of season
- It is a matter of over-joy to many especially those living in cities where they don't have open space for gardens and gardening and for them a well maintained single ornamental plant itself makes a garden

Why indoor gardening.....cont...

- Indoor plants add charm to the architectural beauty of the house and complement the interior setting
- Modern architectural designing of the homes having larger windows and well lighted rooms, has made indoor gardening a popular, useful and absorbing hobby
- It is now common to find living plants inside the homes, offices, shops, banks, hotels, restaurants, clubs, hospitals, universities, colleges and schools.

Purposes of indoor plants

- Exceptional value in interior decoration
- Primitive ways to cultivate ornamentals
- Cultivation for desired satisfaction
- Sense of interest for recreation
- Source of exercising gardening adventures
- To reduce expenditure on wide open areas outside the houses, since population density is increasing at alarming rate in urban areas
- Plants used to divide indoor living areas
- Brings permanence in the house.

Qualities of indoor plants

- Robust (ability to tolerate hot, cold or dryer conditions indoor)
- Evergreen
- Attractiveness.

Potting media

- Good drainage
- Proper salinity level
- Adequate nutrients
- Good water holding capacity

Constituents of potting media

- Bagasse, Bark, Cinders, Clay, Garbage, Moss, Peat moss, Perlite, Rice hulls, Sand, Saw dust, Vermiculite and Wood shavings.

Potting media

- Soil (Loam/ sandy loam): Sand: Leaf mould (one part each)
- Soil (Clay/ Silt): Sand: Leaf mould:: 1: 2: 1
- Soil (Clay/ Silt): Sand: Leaf mould: FYM:: 1: 1: 1: 1
- Peat moss: Perlite: Vermiculite (one part each)
- Peat moss: Sand:: 3: 1
- Peat moss: Bark: Wood shavings (one part each)
- Peat moss: Perlite:: 3: 1

Containers to grow indoor plants

- These may be pots, bowls, dishes baskets or troughs
- These may be of Earthen, Glazed clay, China clay, Brass, Copper, Glass, Plastic, Cement, Concrete, Cane, Wooden planters and barrels
- These may be round, oval, elliptical, cone, rectangular, square, oblong, heart, hexagonal, octagonal or any other shape desired by consumers
- These may be plain or ornamental design, depending upon the interior setting, as it must harmonizes with respect to its colour and texture
- There should be one drainage hole at the bottom
- It is necessary to place the containers on platters or saucers in the rooms
- Earthen containers provide better aeration
- Plastic containers are good for cacti and succulents or for drier conditions

Environmental factors

- Light (Quality, Intensity and Duration)
- Temperature
- Relative humidity
- Aeration

Light

- Sunny plants: Direct sun in winter is required for over 5 hours and no direct sun in summer i.e. Flowering and coloured foliage plants
- Semi sunny plants: Direct sun in winter for 2 to 5 hours and no direct sun in summer i.e. Alocacia, Aphelandera, Araucaria, Asparagus, Rex begonia and variegated foliage plants
- Semi shady plants: Bright light but no direct sun i.e. Adiantum, Aglaonema, Chlorophytum and light green foliage plants
- Shady plants: Dim light i.e. Aglaonema, Asparagus, Aspidistra, Monstera, Philodendron, Scindapsus and dark green to blue green foliage plants

Ideal temperature

- A difference of 2-5°C between day and night temperature is ideal for indoor plants
- Optimum temperature range in air for indoor plants is 21-32°C
- Optimum soil/ growing medium temperature is 18-21°C
- Restrict watering at lower temperature, when it is less than 7°C.

Relative Humidity

- Relative humidity of around 50-60 per cent is most ideal for indoor plants
- For ferns and orchids relative humidity of 80-100 per cent is required

Fertilizers

- Optimum level of major nutrients is N: 150-200 ppm, P: 50-70 ppm and K: 100-150 ppm
- Slow release fertilizers like **Osmocote** and **Agroben** are very useful for indoor plants
- Fertigation is also very useful for indoor plants.

Watering

- Watering in winter once in a week and in summer alternate day or everyday is done depending upon type of plant, weather or situation

Key hints for watering/ maintaining relative humidity

- Use of pebble trays
- Cover pots with polythene bags
- Use of double pots
- Spraying water with fine mist
- Fogging
- Use of humidifiers
- Grouping of plants together for cumulative transpiration, so as to create microclimate with high relative humidity.

Pruning/ Management

- Maintain shape and height
- Remove all faded flowers and dried leaves from time to time
- Mostly indoor plants are pruned during December-January in plains and March-April or August-October in hills.

Insect pests

- Aphids
- Mealy bugs
- Red spider mites
- Scales
- Slugs and snails
- Tarsonemid mites
- Thrips
- Nematodes: Root knot, Cactus cyst, Root lesion, Burrowing and Foliage and bud nematodes.

Important fungi

- *Alternaria*
- *Botrytis*
- *Cercospora*
- *Colletotrichum*
- *Fusarium*
- *Phytophthora*
- *Pythium*
- *Sclerotium*
- *Rhizoctonia*

Important bacteria

- *Erwinia*
- *Pseudomonas*
- *Xanthomonas*

Note: For more detail refer to Annexure on Indoor Plants in the book, “Floriculture at Glance”

Ornamental Annuals

- Annuals or seasonal are the group of plants which complete their life cycle (germination, vegetative growth, flowering, seeding and finally death of the plants) under a given site within one season or a year.



Important features of annuals

- Easily grown plants
- Varied growth habit, form, flower- colour, size, shape and season of flowering
- Profuse flowering
- Cover a place with in a short span of time
- Beautify places of interest at low cost with less labour
- Bring change in the outlook of the garden with the changing season
- Grown for various situations with varied uses
- Production of large number of seeds
- Provide mass effect in the garden
- Hence, annuals are indispensable in any garden.

Important uses of annuals

- **Specimen plant:** Almost every annual can be grown for this purpose.
- **Fragrant flowers:** Sweet alyssum, sweet William, carnation, stock, viola, sweet pea, sweet sultan and marigold.
- **Pot plant:** Almost every annual except annual climbers.
- **Hanging basket plant:** Annuals with compact growth, low growing and drooping like daisy, verbena, portulaca, nasturtium, ice plant and sweet alyssum.
- **Screening:** Kochia, hollyhock, sweet pea, quamoclit, moon flower, cobabaea and ipomoea.
- **Bedding plant:** Almost every annual can be grown for this purpose.
- **Border plant:** Almost every annual can be grown for this purpose.
- **For shady areas:** Salvia, cineraria, clarkia and verbena.
- **Edging:** Ageratum, marigold, portulaca, lobelia, pansy, phlox, petunia, viola and candytuft.

Important uses of annuals....cont...

- **Rockery:** Annuals which thrive well and flower profusely in poor soil with less water like verbena, ice plant, nasturtium, phlox, nemesia, stock and venidium.
- **Long lasting flowers:** Clitoria, calendula, paper flower, amaranthus, nasturtium and gomphrena.
- **Dry flowers:** Paper flower, straw flower, gomphrena, daisy, carnation, marigold and ageratum.
- **Natural landscape:** Almost every annual can be grown for this purpose.
- **Cut flowers:** Antirrhinum, carnation, stock, gypsophila, coreopsis, sweet sultan and sweet pea.
- **Loose flowers:** Marigold, annual chrysanthemum, gomphrena, zinnia, gaillardia, straw flower, paper flower, dahlia and arctosis.
- **Cut greens:** Kochia, amaranthus, coleus, quamoclit, cineraria and celosia.

Classification of annuals

- According to flowering season
- According to hardiness
- According to photoperiod

According to flowering season

- Summer season
- Rainy season
- Winter season

Summer season annuals

- These annuals grow luxuriantly and produce flowers under high temperature. In north Indian plains these are sown in February-March, whereas in hills in March-April.
- Cosmos
- Gaillardia
- Gomphrena
- Kochia
- Marigold (Few cultivars)
- Portulaca
- Sunflower
- Tithonia
- Zinnia

Rainy season annuals

- These annuals can withstand heavy rains and high humidity coupled with high temperature. These are sown during May-June.
- Amaranthus
- Balsam
- Celosia
- China aster
- Cleome
- Cock's comb
- Gaillardia
- Marigold (Few cultivars)
- Salvia
- Rudbeckia
- Zinnia

Winter season annuals

- These annuals are able to tolerate low temperature and there are about 100 winter season annuals. These are sown in September-December in the plains and during September-November or February-April in hills.

Note: For more detail refer to Annexure on Ornamental Annuals in the book, "Floriculture at Glance"

According to photoperiod

- **Short day:** Amaranthus, Chrysanthemum, Cosmos, Salvia.
- **Long day:** Antirrhinum, Carnation, Petunia, Rudbeckia
- **Day neutral:** Gomphrena, Impatiens
- **Intermediate day:** Coleus
- **Long short day:** Aloe
- **Short long day:** Campanula, White clover

Ideal medium for nursery raising?

- One part each of Sand, Garden soil, well rotten farm yard manure (FYM) and leaf mould.

Ideal nursery bed size

- Length: 3 meters
- Width: 1.2 meters
- Height: 15-20 cm

Ideal depth and row spacing of seed sowing in nursery

- 0.5 cm deep or
- 2.5 times than diameter of seed
- Row-row distance: 5 cm
- The small seed annuals like petunia and antirrhinum are sown by mixing in well received FYM or sand.

When the nursery of annuals become ready for transplanting?

- At four leaf stage
- Summer and Rainy season annuals after 4-5 weeks
- Winter season annuals after 6-8 weeks
- Summer and rainy season annuals are transplanted during evening hours so as to avoid heat stroke
- Winter annuals are transplanted in the morning hours so as to avoid chilling injury during night.

Herbaceous border

- The planting of annuals in the border of a plot in a definite pattern. The border may be:
 - Single faced or
 - Double faced
- In single faced border is made in front of a background and annuals are arranged on the basis of height i.e. Tall-Medium-Dwarf.
- In double faced border Tall annuals are planted in the centre, Medium annuals on both sides of Tall annuals followed by Dwarf annuals. i.e. Dwarf-Medium-Tall-Medium-Dwarf. This border is created in the centre of the property area of garden and can be viewed from all sides, whereas single faced border is viewed from the front side only.

Ideal site for making herbaceous border

- Sunny
- South or South-east direction
- Suitable background
- Good foreground

Factors must be considered for planting annuals in border

- Growth habit
- Height
- Flower colour
- Flowering time and duration
- Annuals must synchronize in flowering

Directly sown in beds

- Balsam
- Hollyhock
- Nasturtium
- Sweet pea
- Zinnia

Salient features of colour scheme

- Red, yellow and blue are primary colours
- Orange, green and violet are secondary colours
- White, grey and black are neutral colours
- Cream, pink and shades of colours are tertiary colours
- Green being colour of foliage dominate through out year in the garden
- Red being warm colour dominates during winter and yellow during spring season.
- Red, yellow and orange are warm colours
- Green and blue are cool colours.

Optimum spacing for planting different ornamental annuals

- **Dwarf annuals:** 15-20 (Row to row) x 10-15 cm (Plant to plant)
- **Medium annuals:** 25-30 x 15-20 cm
- **Tall annuals:** 40-50 x 20-30 cm

Management hints

- Do gap filling for a fortnight
- Irrigate at 10-12 days interval in winter and 4-5 days interval in summer
- Before flowering broadcast urea @ 20g / m² area
- Deficient nitrogen cause premature flowering in clarkia, candytuft and salvia
- High dose of nitrogen cause premature flowering in Lupine, sunflower and nicotiana
- Pinching regulate quality, number of blooms and flowering
- Shade up to two hours a day delays flowering up to six weeks.