

CULTIVATION OF LILIES

The genus *Lilium* belongs to Liliaceae family which comprises more than 200 genera.

The plants are perennial, erect, leafy stemmed herbs with underground scaly bulbs.

Flowers are pendulous, inclined, horizontal, or erect, with six separate segments, which are scarcely differentiated as between sepal like and petal like organs, each bearing a nectar groove or furrow at the base.

Stamens are six in number, hygynous or slightly adherent to perianth mostly shorter than the segments. Anthers are versatile, filaments slender, pistil one with long style and three lobed stigma, fruit dry, loculidial and many sided capsule.

BULB:

The lily bulb is composed of firm, fleshy scales that store food for the following season's growth. The bulb consists of a short stem/ axis to which the scales are attached.

The axis is also called as the basal plate which produce roots, scales and buds for new growth. The scales are modified leaves. They provide nourishment to the developing plant until it has enough leaf area and root system to take up this task. The color of the scales is one feature by which a lily species is identified. The color of the scale changes on exposure to light.

Growth of Lily Bulbs: Concentric Stoloniferous Horizontal

Concentric: The axil retains the same shape and position. The bulb remains concentric with its scales arranged around a short vertical stem. The daughter bulb develops within the mother bulb and close to its axis.

Eg: European and Asiatic lilies.

Stoloniferous: Some times the stem travels underground for some distance before emerging bearing bulblets away from the mother bulb.

Eg: *Lilium lankongense*, *Lilium nepalense* and *Lilium wilsonii*.

Rhizomatous: The daughter bulb forms at the end of a horizontal, scaleless branch which pushes out from the mother bulb.

Eg: *Lilium canadense*, *Lilium michiganese* and *Lilium superbum*

STEM:

A mature lily's flowering stem may be few inches (*L. nanum*) to 250 cm as in *L. leucanthum* var *centifolium* or *L. superbum*.

PLANNING LILIES IN THE GARDEN:

- may be planted in mixed borders.
 - may be planted alone.
 - in groups of five
 - do not crowd together in mass with other plants.
 - rarely used in formal beddings.
- Clumps are very good near the house or close to a door.

LILIES IN CONTAINERS

Most lilies can be grown in containers of clay or plastic pots. Large terracotta bowls, Boxes, Whisky barrels, Wooden tubs can be used for growing lilies.

The container should have good drainage holes to allow for free water movement.

Ideal container depth is 45 cm (18"). Short growing lilies can be grown in shallow pots.

Prepare the pot by cleaning it inside and out. Use a hard bristled floor brush. Good drainage is essential and broken crocks placed over the drainage hole will ensure this. These are then covered with a layer of good container soil - acid

Good soil may consist the following ---

2 parts well decayed bark dust + 2 parts short pumice + 2 parts sphagnum peat with macro and micro nutrients added with a pH of 6 - 6.5

The plants require additional feeding later in the growing season which can be given by slow releasing fertilizer like osmocote or liquid feed on monthly basis.

The lily bulbs placed root side down on top of the layer. A rule of thumb is to plant lily bulbs at a depth of two to three times the diameter of the bulb. Thus small bulbs should be covered with about 3-4 inches of soil and larger bulbs should be covered with about 4-6 inches of soil. The exception is *Madonna* lilies (*L. candidum*). These lilies should have no more than one inch of soil over the tops of the bulbs. Expose the pots to cool conditions initially to allow for good root development. In green house the plants needed to be shaded late in the season with 40 to 60% shade cloth.

OUT DOOR CULTIVATION

Soil Preparation:

Lilies prefer slightly acidic, humus-rich soil. If drainage is poor, then plant in raised beds. Turn over the soil to a depth of 12-18 inches. Work humus and Lilies prefer slightly acidic, humus-rich soil. If drainage is poor, then plant in raised beds. Turn over the soil to a depth of 12-18 inches. Work humus and fertilizer into the soil, but avoid the use of fresh manure or other fertilizers high in nitrogen which encourages rot problems.

Add lime which causes the flocculation of soil particles and allows improved air and water management.

Light:

Lilies thrive best in sunny conditions. When the light is restricted they lean towards the light. Very few lilies can survive where the shade is dense.

Planting time:

Most lilies do best when planted in early fall. But *L.candidum* must be replanted in late July or August a few weeks after it flowered.

Planting depth:

Cover the bulbs with soil to a depth equal to 3-4 times of their length.

Stem rooting lilies with large bulbs (trumpet hybrids) may be covered with 25 cm (10") of soil.

Madonna lily can be planted shallow as the roots are produced from the base of the bulb only.

Deeper planting keeps the bulb cool during summer.

FERTILIZERS:

The kind and amount of fertilizer depend on the soil fertility.

A complete well balanced fertilizer with NPK (15 -15 -15) is more suitable. Apply garden lime if the soil is too acidic.

Excessive fertilizer is too harmful to lilies.

Fertilizer is best applied when lily shoots are at the spear stage just before the leaves unfurl.

A suitable six month slow release fertilizer like osmocote (20-20-20) will keep the lilies happy for the entire season.

An old practice is to scrape away a couple of centimeters of soil just as the lilies emerge and replace it with a mulch of well decayed cow/horse manure.

REPLANTING:

Asiatic varieties should be lifted and replanted on a regular basis. Most of them form many bulblets among the underground parts of the stem which results in crowding and subsequently flowering decreases. Lifting and division should be done about every third year with stronger Asiatic varieties.

When the lilies are not growing strongly then move to a new location and fresh soil which will help in regaining lost vigor. This planting is best done 3-4 weeks after flowering. Check the bulbs for diseases (fusarium) and discard severely infected bulbs. Treat the bulbs with fungicides like Benlate or TBZ (Thiabendazole) known as Mertect.

PRUNING:

Undeveloped seed pods should be removed if seed is not desired.

In the fall cut the stems to ground and mark the site of the bulb with a stake.

MULCHING:

Material used for mulching depends on the locally available material like rice husk, saw dust, well rotten cow manure, leaf mold, sphagnum peat, mushroom compost.

WEED CONTROL:

Roundup (Glyphosate) can be used to control weeds. Apply roundup before the lilies emerge.

IRRIGATION:

Don't overhead water. This will cause Botrytis and other fungal diseases

The lily bed should never be too dry or too wet.

DISEASES

DISEASE	ORGANISM	CONTROL
Basal rot	F.oxysporum	Benlate / Mertect
Blue mold	Penicillium	Captan
Botrytis	B.cinera B.elliptica	Kocide/Iprodione/Chlorothalonil
Leaf spot	Cercospora	Mancozeb
Root rots	Pythium Rhizoctonia Cylindrocarpon destructus	Dip the bulbs in Quintozene (Terrachlor,PCNB)
Rust	Uromyces holwayi	
Wilt	Scerotinia delphinii	Quintozene
Soil sterilization		Use formalin/Methyl bromide/ Chloropicrin/Vapam (Dilute Vapam with water and apply with water can.)

PESTS

PEST	CONTROL
Aphids (Vector for viral diseases)	Acephate/Marathon
Bulb mites	Treat bulbs with hot water (45C) for one Hour. Drench the bulbs With Sulpur
Wire worms	Bromophos/Drench with Mocap

	Apply Thimet/Furadon
Lili beetle	Drench with Acephate
Thrips	Malathion/Acephate
Weevils	Acephate
Nematodes	Nemacur/Drench soil with Vapam/ Methyl bromide/Chloropicrin

Stagnant air in humid summer climate favors development of Botrytis blight.
Constant air movement speeds evaporation and drying of foliage.