Agro-technology and Post harvest handling of *Lilium Cut Spikes and Bulbs.*

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Botanical name	*Lilium* ssp.
Local name	Lilies
Cultivation	Recommended under open and shade net conditions under Valley conditions
Varieties	Broadly classified into two categories: i) **Asiatic lilies:** Enchantment, Dreamland, Novona, Connecticut king, Alaska, Sterling silver, ii) **Oriental lilies:-** Stargazer, Siberia, Casablanca, white Mountain, cascade, Marcopolo, Olympic star.
Time of planting	- Planting of pre-cooled bulbs should be done in the month of March- April for early flowering under open conditions - May to June under 50% shade conditions
Planting material	- Bulbs, bulb size (12 cm and upwards produce taller and stronger stems, and more uniform flowering and shorter cultivation - A bulbs 14-16 cm will flower 2-3 weeks earlier than 8-10 cm bulbs
Planting distance	➢ Lilies are grown on raised beds about 20-30 cm high ➢ The planting density is critical ➢ At high density spike length will be reduced and flower quality impaired The following are bulb size/density guide lines **Bulb size (cm)** — **Number of bulbs (m^{-2})** 10-12 (Asiatic) — 50-60 14-10 — 30-40 14-16 (Oriental) — 30-35 16-18 — 24-30
Soil requirement	Lilies can be grown in all types of soil but well drained ones having a minimum depth of 40 cm with pH ranging from 6.0-7.0 are ideal.
Fertilizer application	• Farm Yard manure (FYM) @ 2.0 kg m^{-2} should be thoroughly with soil before painting • N, P and K @ 20:20:15 g m^{-2} should be applied before planting

	• Avoid super phosphate fertilizer as fluoride in them is toxic to lilies
Irrigation	- Lilium require a fair amount of water - During dry spells irrigation is needed on alternate days as soon as top layer of the soil dries out
Harvesting	Flowers:- Harvesting is done when the first bud of a five bud spike shows colour. - Stem having 5-10 buds should be harvested when two show colour. - Harvest in the morning hours. - Cut spike at least 15-20 cm above ground Bulbs: - Bulbs are harvested after yellowing of leaves. - Bulbs can also be retained in soil for a maximum of three years.
Yield	Flower:- Average yield is upto 4000 spike in case of Asiatic hybrids and 3000 spike in oriental hybrids per 100 sq.m area. While as bulb yield varies 42-4500 bulbs in Asiatic and 3200-3500 in Oriental hybrids per 100 sq m. Area.
Post harvest management	After harvest place the cut spike in buckets containing 15 cm of clean water. Pre-transport treatment (pulsing) for 5-8 hrs in a solution of 5% sucrose + 1000 citric acid to increase vase life Bulbs: - Lily bulbs are naked or non-tunicated structures. Hence protection against loss of moisture is essential. - Lily bulbs can be left in the ground if proper storage facilities are not available - Lily bulbs treated with 0.1% carbendizim are best stores in crates filled with moist Cocopeat, vermicompost and sawdust for a period of 5-6 months at 2-4 □ - Another low cost method of storage of various bulbs like Lilium, Gladiolus, Tulip etc is the *pit method*. The technique is more suitable to temperate climatic conditions with partial suitability in subtropical conditions during winter months of December, January and February - Precaution for the pit method of storage are, to avoid swampy, dumpy area, avoid harsh scorching direct sunlight, the media should be porous and airy.

Diseases	i) Bulb and scale rot, (*Fusarim oxysporum*) Control:- Sterilize the soil using heat or chemical disinfectants. Give dip treatment to bulbs in the fungicide Captan (0.2%) before planting ii) Rhizoctonia rot, (rhizoctonia Solani) Control:- Soil drenching with suitable fungicides such Monceren (0.2%) iii) Foot rot, (*Phytophythora caetorum*) Control:- Sterilize the soil before planting the bulbs The fungicide mancozeb (0.25) or metalazyl + mancozeb (0.2%) may be applied as soil drench iv) Root rot, (*Pythium ultimum*) Control:- Drench the soil/rooting medium with fungicides as fosetyl –A1, Captan or metalaxyl + mancozeb (0.25%) v) Gray mold: (*Botorytis elliptica*) Control:- Improve circulation of air in the polyhouse area Apply sprays of the fungicide chlorothalonil (0.2%) at 10-14 days intervals.
Insects	i. Aphids:- Control, Spray dimethoate 30 EC @ 2.0 ml/l ii. Lily bulb mites:- Control:- Steam sterilization of bulbs at 60□ for 30 min. Fortnightly spray with dicofol 18.5 EC or monocrotophos 36 SL @ 0.5 ml/l.

Figure 1 Pictorial representation of bulb storage