GROWING ALSTROEMERIA IN THE FOOT HILLS OF HIMALAYA

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Alstroemeria(Alstroemeria *hybrids*) is an exotic perennial and rhizomatous plant. Recently, it is introduced in the country as a new cut flower crop. It is also known as the Inca and Peruvian lily. It is gaining popularity in Indian flower markets due to its long stem flowers, prolonged vase life and various colour and shades of petals, generally having lavender, maroon, white, orange, yellow, pink, red and purple colours. Agro-techniques for production of its cut flower and planting material (under polyhouse) have been standardized for Himachal Pradesh and other hill states. Flowering period of Alstroemeria is February to August, depending upon the crop cycle, planting time and variety. The cut flowers remain fresh for 10 to 12 days at room temperature.

LOCATION

Alstroemeria prefers locations having cool temperature, free from water logging and strong winds. It does not prefer direct sunlight and can be grown successfully in cool places under polyhouse and shading nets. Cooling system is required in the places having high temperature.

SOIL

Alstroemeria prefers sandy loam soil. The most suitable range of soil pH is 5.5 to 7.0. It can also be grown in other soils rich in organic matters (2-3%), having porous structure and well drainage system. In case of clay soils, it is advised to mix sand and well decomposed farm yard manure (FYM) to make it porous.

TEMPERATURE

For better plant growth and quality flower production, the optimum day and night temperature during growth period should be maintained between 18-22°C and 12-16°C respectively. Prolonged high air temperature above 24°C during growing period may reduce the production and quality of flowering shoots. High temperature may increase the production of blind shoots and it can be reduced by spreading 25 % shading net on the roof of the polyhouse and light watering in dry beds and paths.

LIGHT

It is basically a long day plant. Sufficient light (5000 ft candles) is important to prevent bud abortion and improve the quality of flowering shoots. Light below 4000 ft candles can cause buds abortion, lanky shoots production, delay in bud initiation and harvesting of flowers. To reduce the high light intensities, plants can be grown under polyhouse condition or under 50 % shading net.

RELATIVE HUMIDITY

Humidity is one of the most important factors for quality flower production. The most suited relative humidity is between 65 to 85% for successful growing of the crop. High relative humidity above 90% can cause fungal infection.

CARBON DIOXIDE

Quality flowers and early production in the plants can be achieved by Carbon dioxide enrichment in growing conditions. Best quality flowers of Alstroemeria produced when CO_2 concentration in the polyhouse maintained at 900 ppm.

CULTIVARS SELECTION

Selection of Alstroemeria cultivars should be made on the basis of its colour demand in the markets, large florets, long stems, good in keeping quality, resistance to diseases and high cut flower production.

SOIL DISINFECTION

Sterilization of soil before planting of rhizomes is beneficial for quality flower production. The soil should be drenched with 2% Formaldehyde solution and immediately covered with polythene sheet for at least 2-3 days. After the removal of polythene cover, it should be aerated for 6 to 8 days. The planting beds should be thoroughly irrigated before a week of planting to reduce the residual toxic effects of chemicals.

BED PREPARATION

Beds should be made in well pulverized soil. Soil should be dug to a depth of 30-40 cm deep to allow the roots to grow properly during two years production cycle. Before planting, incorporate judicial quantity of organic and inorganic fertilizers and mix up to 30-40 cm depth of the soil. Bed should be prepared long and 1 m wide along with the 50-60 cm wide paths between the beds. Shallow irrigation should be given to the beds before a week of planting so that the soil may have sufficient moisture at the time of planting.

PROPAGATION

Alstroemeria is propagated by division of rhizomes. About 10-15 days prior to division, plant should be cut 15-20 cm above the ground level, leaving only the youngest shoots. Roots of the rhizomes grow 30-40 cm deep thus dig the roots properly to get the feeding roots along with growing points for making divisions. From one year old plant 10-15 and from a two year old plant 20-25 planting size rhizomes can be

obtained. The rhizomes with small or weak roots should be planted separately.

PLANTING TIME

In the cool climatic regions, it can be planted throughout the year. The best time for planting in the mid hills is July to November.

PLANTING DENSITY

It can be planted in 1 meter wide beds in two rows at 50 cm spacing. The plant to plant distance within the row should be 30-50 cm.

NUTRITION

Before planting soil analysis should be done to ascertain the fertility level of the soil. It requires fertile soil with high nutrient levels once the plants are established. Regular fertilization with 450 mg N and 300-450 mg K per plant per week is required for good growth and development of plants. Nitrogen should be provided in the form of nitrates under cool growing conditions.

IRRIGATION

It requires quality water for irrigation for better growth, being sensitive to fluoride and salt. The salt content in the irrigation water should not be higher than 10 micro mol per litre. Top 30 cm of soil should be continuously kept moist because the development of root takes place up to this depth. If sufficient water is not given to the crop, the flower production declines. Newly planted crop should not be over irrigated.

THINNING

Thinning of undesirable shoots promotes the production of new shoots and improves the quality of flowers. It is advisable to thin weak and blind shoots on a monthly basis from the production plot. At one time, 30% of the shoots should be removed.

STAKING

Plants grow 50 to 150 cm tall depending upon the cultivar. Staking is required to hold the plants. It also keeps the flowering stem erect. Two to three layers of holding nets should be spread in the beds as soon as the rhizomes start sprouting. The height of the supporting nets should be raised as the shoots grow in height. The lower most net should be 30 cm above the ground level.

HARVESTING

Flowering shoot emerge after 5 to 6 months of planting, depending upon the cultivar and it takes further 25-35 days to flower. The stage of flower harvesting mainly depends upon the distance of flower market. For long distance market, flowers should be harvested when the first florets are swollen and showing some colour. For nearby markets, flowers should be harvested when primary florets are fully developed colour and majority of them are showing colour. Harvesting should preferably be done by pulling the flowering shoots in the morning hours. Flower should be kept immediately in the fresh water after cutting the lower portion of shoots.

YIELD

Yield of flowering shoots mainly depends upon the cultivars, plant spacing, growing conditions, and cultural practices. Alstroemeria plant can produce 50-75 flowering shoots per plant per year under polyhouse.

DISEASES

The plants are affected by a number of fungal diseases which attack the plants and flowers. The most destructive diseases are described below:

Botrytis

In a *botrytis* infected plant, brown colour spots are

developed and visible on the flower petals during the period of high humidity. It can be controlled by providing adequate ventilation and keeping the crop dry during rainy season. Fortnightly spray of Mancozeb @ 2 to 2.5 g per litre is helpful to control the disease.

Root rot

Root rot is caused by the fungus *Pythium* and it prefers moist conditions. *Pythium* infected plants lose the root parts and suffer heavy loss to the flower production. It generally attacks the plants grown in heavy and compact soil. It can be controlled by sterilization of soil before planting, better air circulation and decreasing the moisture content of growing media.

Foot rot

Rhizoctonia is the main cause for this disease, where infected plant stems show rotting just above the soil level and after some time, crop growth gives a retarded appearance. Avoid more fluctuation in temperature and during warm weather watering in mid-day to control *Rhizoctonia*.

INSECT-PESTS

Aphids

The aphids are usually found on young leaves and flower buds. It sucks the sap of foliage and bud and causes retarded growth of the plant with poor quality flowers. Regular spray of Endosulfan or Rogor @ 1.0 to 1.5 ml per litre of water at every 15-20 days can control it.

Green Caterpillar

The caterpillars are particularly active in summer. It rolls the leaf and lays eggs. It can be controlled by regular spraying of Endosulfan, Rogor or Malathian @1.0 - 1.5 ml per litre of water.

PHYSIOLOGICAL DISORDER

Alstroemeria is sensitive to fluoride which can cause leaf and bud scorch. It could be due to the use of super phosphate or other fluoride containing amendments as well as excessive fluctuation of temperature and humidity in polyhouse during the growing period. Small brownish bumps appear on flower buds and shoot tips. Affected flower buds do not open properly and fall prematurely. It may occur due to the prolonged period of low light conditions, use of excessive salt and watering.

INCOME

After third year of cultivation, net income of Rs. 300 - 600 per year/per sq m can be earned continuously.

VARIETIES

Some of the varieties have been found to grow well under sub- temperate conditions of Himachal Pradesh viz., Aladdin, Amor, Capri, Cinderella, Pluto, Rosita, Serena, No. 14 and Tiara.

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