

## Lisianthus Avila

(*Eustoma Grandiflorum*)

### Germination

Maintain soil temperature at 68 to 72°F (20 to 22°C). Keep media evenly moist but not saturated. Do not cover or bury the seed. Light levels of 10 f.c. (100 Lux) or more is required for germination.

### Plug Production

#### Plug Tray Size

Lisianthus can be produced in 392 or 406-cell plug trays.

#### Temperature

Maintain air temperature at 65 to 70°F (18 to 21°C) nights and 70 to 75°F (21 to 24°C) days throughout plug production.

#### Stage 1 (10 to 12 days)

- Maintain soil temperature at 68 to 72°F (20 to 22°C).
- Keep media evenly moist but not saturated.
- Do not cover or bury the seed.
- Light levels of 10 f.c. (100 Lux) or more is required for germination.
- Keep soil pH at 6.2 to 6.5 and EC at less than 0.75 mmhos/cm (1:2 extraction).
- Lisianthus are very sensitive to high salts.
- Keep ammonium levels less than 10 ppm.

#### Stage 2 (14 to 21 days)

- Maintain soil temperature at 68 to 72°F (20 to 22°C).
- Reduce moisture levels once radicals emerge. Allow the soil to dry out slightly before watering to control algae growth. Some growers apply a thin layer of coarse vermiculite to the surface of the plug flat to accomplish this.
- Light levels of 450 to 700 f.c. (4,500 to 7,000 Lux) are optimal.
- Keep soil pH at 6.5 to 6.8 and EC at less than 0.75 mmhos/cm.
- Keep ammonium levels at less than 10 ppm.
- Fertilize once cotyledons are fully expanded.
- Fertilize weekly with 50 to 75 ppm N from 14-0-14.
- Alternate fertilizer applications with clear water.
- Irrigate early in the day so foliage is dry by nightfall.

#### Stage 3 (28 to 35 days)

- Maintain soil temperature at 65 to 68°F (18 to 20°C).
- Allow media to dry thoroughly between irrigations. Avoid extreme wilting, which can induce rosetting.
- Keep soil pH at 6.5 to 6.8 and EC at less than 1.0 mmhos/cm.
- Fertilize with 100 to 150 ppm N every 2 to 3 irrigations from 14-0-14 or other calcium/potassium nitrate fertilizers. Alternate with 20-10-20.
- Irrigate with clear water following fertilizer applications.
- If using 15-0-15, supplement with magnesium 1 to 2 times during Stage 3. Use magnesium sulfate (16 oz. per 100 gal.) or magnesium nitrate (16 oz. per 100 gal). Do not mix magnesium sulfate with calcium nitrate as precipitate will form.
- Use temperature differential (DIF) to control plug height if necessary.
- Do not apply plant growth regulators to cutflower plugs.

#### Stage 4 (7 days)

- Maintain soil temperature at 62 to 65°F (17 to 18°C).
- Allow media to dry thoroughly between irrigations. Avoid permanent wilting, which can induce rosetting.
- Keep soil pH at 6.5 to 6.8 and EC at less than 1.0 mmhos/cm.
- Fertilize at 100 to 150 ppm N from 14-0-14 or calcium/potassium nitrate as needed.
- Do not hold Lisianthus plugs until rootbound as this induces rosetting.

## Growing On to Finish

### Production Location

Optimal-quality Lisianthus are produced in temperate climates in greenhouses for Autumn through Spring. Successful Summer production can be achieved in shadehouse structures.

### Media

Lisianthus should be produced in disease-free soils with a medium initial nutrient charge and a pH of 6.5 to 7.2. Lisianthus prefers a high pH media.

## Planting Density

**Summer:** 8 plants per net sq. ft. (84 plants per net sq. m)

**Winter:** 6 plants per net sq. ft. (64 plants per net sq. m)

## Netting

One to two layers of support netting (4 x 6 in./15 x 20 cm) are recommended.

## Temperature

**Seasonality Number 1-2 day:** 62 to 66°F (17 to 19°C)

**Seasonality Number 1-2 night:** 55 to 60° F (15 to 16° C)

**Seasonality Number 2-3 day:** 66 to 70°F (19 to 21°C)

**Seasonality Number 2-3 night:** 64°F (17°C)

**Seasonality Number 3-4 day:** 68 to 71°F (20 to 22°C)

**Seasonality Number 3-4 night:** 65°F (18°C)

If temperature is higher, keep night temperatures approximately 7°F (4°C) cooler than day temperatures.

Cooler growing temperature will add to stem strength and caliper, but will increase the production time. Higher temperatures (above 82°F/28°C) during the first 4 weeks after transplant can induce rosetting in susceptible varieties.

In regions that require supplemental heating, both space and soil-surface heating is recommended. Hot water should be circulated at a rate to minimize unrecoverable temperature loss.

## Light & Shading

Optimal light levels are 4,000 to 6,000 f.c. (40,000 to 60,000 Lux). Higher light promotes high bud count and good flower development. However, excessive light (over 7,000 f.c./70,000 Lux) could reduce stem length. Shading may be needed to increase stem length.

During Winter when daylength is shorter than 12 hours, supplemental light (incandescent or HID) can be used. Long day (greater than 14 hours) or night interruption from 10 p.m. to 2 a.m. will accelerate flowering. HID light is preferred as it increase flower quality and decrease crop time.

## Irrigation

Begin production with overhead irrigation, then switch to drip irrigation 2 to 3 weeks following transplant. Keep the media moist but not wet; allow drying slightly between waterings. Lisianthus grow slowly at first, and therefore require little water. Do not allow the soil to dry out when plants are in flower.

## Fertilization

Fertilize every other irrigation with calcium nitrate-based fertilizer at 100 to 200 ppm N. Maintain EC at about 1.5 mmhos/cm (using 1:2 extraction). Discontinue fertilizer applications as buds become visible.

High salt levels will delay flowering and can promote rosetting in susceptible varieties.

## Common Problems

**Insects:** Aphids, leaf miners, thrips, whitefly

**Diseases:** Botrytis, Fusarium, Pythium, Rhizoctonia, Tospo Viruses

**Other:** Algae over plug tray surfaces, rosetting

## Crop Scheduling

Sow to transplant in 392-cell trays: 8 to 10 weeks

Crop time is dependant on time of year, temperature, use of supplemental lighting and greenhouse conditions, in coordination with the Seasonality Number being used. As a general guide, the time from transplant to harvest for the ABC series will be 16 weeks for Seasonality Number 1 varieties grown under short days to 13 weeks for Seasonality Number 4 varieties grown under long days. The Laguna series is approximately 10 days earlier than the ABCs per Seasonality Number.

In far northern latitudes where daylength has great variation across the year, the use of HID lighting is common. These regions may experience an even greater degree of variation for crop times. For more information on crop scheduling and lighting, contact our office in Santa Paula, California or our European office in Rijnsenhout, Netherlands.

## Post Production Care

### Post-harvest

Harvest Lisianthus when one or more flowers are open. Harvest in the mornings, when flower and plant



tissues are cool. Remove field heat by transferring harvested bunches to coolers to optimize post-harvest life. Always use clean buckets with fresh cool water for harvested Lisianthus. Do not ship flowers that have not had field heat removed. Pulsing with 3% sucrose for 24 hours after harvest increases vase life.

In Japan and Holland, cut flower Lisianthus are brought to market in 10-stem bunches. In the United States, the market accepts “grower” bunches that are bunched according to stem caliper; 4 to 14 stems may comprise a bunch. Some wholesalers are encouraging growers to market a standard 10-stem bunch in the U.S.

