Cinderella™, Twinkle™

EUSTOMA GRANDIFLORUM (LISIANTHUS) CUTFLOWER

Minimum Germination Rate: 85%

Seed Product Form: Pelleted, raw

FLOWERING

Time frame when plants are receptive to flower initiation: 6 – 8 sets of true leaves are present.

Flowering Type: Facultative long-day plant – long days enhance flowering.

Specific Flowering Mechanism: A combination of long days and high light trigger flowering.

PLUG CULTURE

Germination: Optimum conditions for seedling development that begins the day the crop is sown until cotyledon expansion. Expect radicle emergence in 10 – 14 days. Lisianthus prefers large, deep plug cells, which will promote a better root system.

Cover: Do not cover.

Media: • pH: 6.8 – 7. Amend media with additional lime to adjust for a neutral pH. Lower pH levels may stunt plant growth.

• EC: 0.5 – 0.75

Light: Light is necessary for germination. If utilizing a chamber, providing a light source of 10 – 100 foot candles (100 – 1,000 lux) will improve germination and reduce stretch.

Temperature: 70° – 75°F (20° – 21°C). Throughout the germination process, Lisianthus seeds are sensitive to temperatures in excess of 75°F (24°C). If not utilizing a germination chamber, place plug trays in a cool environment to prevent rosetting.

Average Daily Temperature (ADT): 67°F (19°C). ADT in excess of 78°F (25°C) can trigger rosetting in the young plant stage.

Moisture: Saturated (5) for days 10 – 14 until radicle emergence. Afterward, begin alternating between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4).

Humidity: 100% for days 1 – 14 or until radicle emergence then reduce to 40 – 70%.

Dehumidify: Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Plug Bulking: Optimum conditions during the vegetative period, beginning at cotyledon expansion, needed for the root to reach the edge of the plug cell.

Lisianthus has a sensitive root system that needs to keep actively growing. Development of a good root system is critical for the success of a Lisianthus crop. Seedlings are slow to grow. Do not over-water.

Media: pH: 6.8 – 7. EC: 0.75 – 1

Light: Under low light conditions, supplemental lighting at 300 – 400 foot candles (3,000 – 4,000 lux) for a 16-hour day will promote earlier flowering.

Temperature: 60° – 65°F (15° – 18°C) nights; 70° – 75°F (21° – 24°C) days. Days should not exceed 75°F (24°C) and nights should not drop below 60°F (15°C) to avoid inducing rosetting.

Average Daily Temperature (ADT): 67°F (19°C). ADT in excess of 78°F (25°C) can trigger rosetting in the young plant stage.

Moisture: Alternate between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4). Do not over-water. Algae is indicative of a too-wet environment. Provide airflow over the trays to encourage evapotranspiration to pull excessive water from the media.

Dehumidify: Lisianthus is native to arid regions. Excessive humidity will encourage disease. Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Fertilizers: Lisianthus are light to moderate feeders during the early plug stages. Fertilize at 50 – 150 ppm nitrogen twice a week with a calcium-based fertilizer (13-2-13 or 14-4-14) to promote strong shoot and root growth.

GROWING ON

Twinkle and Cinderella are considered early season varieties and will flower under short days. Cut flower Eustoma is typically transplanted directly into the ground. Raised beds are preferred. Provide support to the growing stems to produce high-quality stems. Good ventilation is necessary to create strong plants and reduce the incidence of disease.

Transplant Ready: 8 – 10 weeks from sow in a '288' tray. Transplant into beds when at least 2 – 3 pairs of true leaves are visible and before plugs become root bound. The plug surface should be planted slightly above the soil surface to prevent Rhizoctonia infection. NOTE: Seedlings held too long in the plug tray will form twisted root balls that will result in delayed flowering on shorter stems. Take precautions to minimize root damage to the seedling during transplant. Stress of any kind will delay active root and stem growth and may promote rosetting.

Spacing: Space on 4"-x-6" squares or 64 – 80 plants per square meter.

Finish Bulking/Flower Initiation: Optimum conditions during the vegetative period, beginning at transplant, needed for the root to reach the edge of the container AND to make the plant receptive to flower initiation.

The key to growing a successful Lisianthus crop is the development of a well established root system. Good ventilation is necessary to create strong plants and reduce the incidence of disease.

Media: pH: 6.5 – 7 Lisianthus prefers a neutral media. EC: 0.5 – 1. Pasteurize the beds on a regular basis between crops. Eustoma are not tolerant of non-disinfected soils. Amend soils as needed to provide good drainage and air porosity. This is particularly important during the cool season when temperatures and light levels are low, and media is slow to dry.

Light: Twinkle can bloom under short days and supplemental lighting may not be necessary. Under low light conditions, supplemental lighting will promote stronger flowering. Lisianthus need 14 – 16-hour days to promote early flowering and active growth. High light levels (5,000+ foot candles, 50,000 lux) during the standard day will help to intensify flower color. Extreme light levels may lead to leaf edge burning on young leaves.

Temperature: Soil temperatures should not drop below 60°F (15°C). Provide soil surface heating if necessary. Finish the crop at 60° – 65°F (15° – 18°C) nights; 70° – 75°F (21° – 24°C) days. Low temperatures will produce stronger stems, but will increase crop time.

Average Daily Temperature (ADT): 67°F (19°C). ADT in excess of 78°F (25°C) can trigger rosetting in the young plant stage.

Moisture: Drip irrigation is the preferred method of irrigation. Immediately after transplant, keep the media moist (3) to the touch until bud set. Once flowers have initiated, begin alternating between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4). It is important to water early in the day and provide good ventilation to produce a strong, healthy crop. Rapid drying of the foliage will discourage disease outbreaks. Do not let plants wilt. Drought stress can promote premature flowering.

Humidity: High daytime humidity, low nighttime humidity is necessary the first 10 – 14 days after transplant. Maintain low humidity conditions after transplants are established to prevent disease outbreaks. High humidity and overwatering will promote disease outbreaks. Drought stress in combination with low humidity levels may promote marginal leaf burn. Stem breakage can be attributed to sudden fluctuations in temperature and humidity.

Dehumidify: Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Fertilizers: Initially start fertilization with a nitrogen:potassium (N:K) ratio of 1:1 at 100 – 150 ppm nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14). Once flower buds are visible, change the N:K ratio to 1:2 at 100 – 150 ppm nitrogen with a near neutral ammonium-based fertilizer (15-10-30) to keep plant compact.

Common Diseases: Botrytis, Fusarium, Rhizoctonia and Peronospora, Powdery Mildew, Thielaviopsis, Pythium, Phytophthora,Tomato Spotted Wilt Virus, Impatiens Necrotic Spot Virus,Tobacco Mosaic Virus. Viruses are commonly transmitted by Thrips.

Common Pests: Aphids,Thrips and Leafminer. Fungus gnats are a major pest of young seedlings. The larvae feed on roots causing many problems from delayed stem growth, flowering and stunted stems.

PRODUCT USE

Commercial cut flower; vase life: 9 – 13 days

EUSTOMA SCHEDULING IN WEEKS

	Cinderella, Twinkle
Total crop time	22 – 26
'288' plug crop time	8 – 10
Transplant to finish crop time	Low light conditions: 14 – 16 High light conditions: 12 – 14

Note: These suggestions are only guidelines and may have to be altered to meet individual grower's needs. Check all chemical labels to verify registration for use in your region.