Lisianthus Cut Flower Pot Culture

Cultural Information for: Lisianthus Cut Flower (Pot) Annual
Common Name: Texas Bluebell
Botanical Name: Eustoma grandiflorum F1
Seed Count: 23,000 /ounce 800 /gram
Optimum Germination Temperature: 68-70ºF / 20-21ºC
Optimum Growing Temperature: 65-70ºF / 18-21ºC

Plug Culture – 8 weeks (288 / 12 x 24 tray)

Stage One - (days 1-14) Single sow pelleted seeds carefully in deep plug trays filled with a well-drained media. Do not cover the seed and never allow it to dry out during germination. **Sufficient moisture must be provided to melt the pellet.** Maintain a soil temperature of 68-70°F/20-21°C and keep the media moist throughout the entire germination period by using a mist system. A pH between 6.5 and 7.0 is essential to provide sufficient calcium levels and avoid zinc toxicity. Placing the seed flats on capillary mats or plastic helps to keep the media moist and encourages a very uniform emergence**. Note:** 100 to 300 foot candles/1,000 to 3,200 of light is needed for germination.

Stage Two - (days 14 - 21) After seedlings emerge, remove the seedling flats from the germination area and place them in a location with good air circulation. Lower the night temperature to 60-65°F/16-18°C and provide a light feed between 70 - 100 ppm of Nitrogen from a well-balanced calcium nitrate-based fertilizer. Be careful not to allow the day temperature to exceed 77°F/25°C or the night temperature to drop below 54°F/12°C to avoid rosette problems, (induced resting stage), which is difficult to cure.

Stage Three - (days 21 - 56) The young seedlings are very slow in growth and require extra care to avoid high or low temperatures to prevent rosetting. Other factors to avoid are low light levels and excessive humidity, which will invite both disease and overgrowth of the seedlings. Since Lisianthus is native to the alkaline soils of West Texas, Arizona, and Southern Colorado, calcium based feeds help to maintain stronger and healthier seedlings. Fertilize the seedlings with 200 ppm of N or as needed and maintain the media EC levels between 1.0 to 1.3 mmhos (1 to 2 slurry).

Stage Four - (day 57 - 60) The seedlings should have 4 true pair leaves at this stage and are now ready to transplant into pots. Lisianthus has a sensitive root system and one must be careful to avoid checking the plugs. Timely transplanting will ensure that the root system stays active and takes hold in the final container. Older plugs with more than one internode take longer to establish with less than optimal performance.

Transplant to flowering (90 – 120 days)

Transplanting: Transplant the seedlings when they are young and actively growing, (around 2 pairs of true leaves). To avoid stem rot, take care not to bury the plants too deep. Setting the plugs a little "high" in the container will guard against Rhizoctonia. To ensure a healthy start, maintain high relative humidity for 10 days after transplanting and do not let the soil dry out. Target the media pH at 6.5 to 7.0 for best results. A pH lower than 6.5 increases the risk of micronutrient toxicity and uneven growth.

Plants per Pot: In general, place 2 plugs per 5 inch/12 cm. pot and 3 plugs per 6 inch/15 cm. pot. Overcrowding of plants can promote disease; especially botrytis.

Temperature: Maintain a temperature of 60-65ºF/16-18ºC at night and 68-77ºF/20-25ºC during the day.

Irrigation: Since Lisianthus is native to low humidity areas, botrytis is a major disease problem. The use of drip irrigation is best to reduce free moisture on the plants. Watering early in the allows sufficient drying; especially if watering overhead.

Fertilization: Lisianthus does well with high rates of fertilizer as long as the pH is 6.5. Maintain a soil EC level around 1.5 to 1.8 mhos, (1 to 2 slurry). The use of Calcium Nitrate based fertilizers is recommended to build strong stems and reduce soft growth. Lisianthus requires higher moisture levels in the early stage of development. As the plants begin to mature and show flower buds, watering should be reduced to tone the plants.

Methodology	Recommendation
Controlled release fertilizers 14-14-14 or 19-6-12	8 to 10 lbs. / cubic yard 2.75 to 3.5 kg. / cubic meter
Constant Liquid Feed (CLF) 15-5-15, 20-10-20, 17-5-17	150 -200 ppm Nitrogen N:K ratio 1:1.5
Slow release and CLF combination	5 lbs./cubic yard – 1.75 kg./cubic meter Plus 250 ppm Nitrogen

Flowering: Lisianthus development is influenced by temperature, light intensity and photoperiod. Media temperature has the greatest influence followed by light intensity and photoperiod. Being a facultative long day plant, Lisianthus develops flowers quicker when the days are greater than 14 hours. Higher light levels and warmer temperatures will also accelerate flowering response. The use of mum lighting at the 6th true leaf stage, from 10 PM to 2 AM, during the short days of winter will reduce the time to flower. Be sure to maintain at least 55ºF/13ºC soil temperature.

Insects and Disease: Fungus gnats (plug stage), leaf miner and thrips are the major pests. Botrytis, Fusarium, Pythium and Rhizoctonia are the principal diseases.

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Variety Selection: Similar to forcing Snapdragons (Antirrhinum) Lisianthus cut flower varieties are grouped according to their response to temperature, light quality/intensity and photoperiod. Winter and spring flowering groups (Group 0 and 1 respectively) produce less numbers of nodes prior to flowering so the y require less aggressive height control and ideal for spring sales. Group 2 varieties are ideal for late spring and summer sales. Below is a general guide.

Group 0 (9-10 nodes)

Winter November-March*	Borealis (standard double flower)

Group 1 (12 nodes)

Spring March-June*	Piccolo 1 (spray single flower) Doublini (spray micro double flower) Rosita® 1 (spray double flower) Wonderous (standard single flower) Echo (standard double flower)

Group 2 (15 nodes)

Mid Summer June-August*	Piccolo 2 (spray single flower) Rosita® 2 (spray double flower) Excalibur (standard double flower) Mariachi® (quadruple flower) Flamenco (standard single flower)

*Northern Hemisphere flowering periods

Mechanical Height Control: To control plant height without using chemicals, apply a soft pinch 5-6 weeks after transplanting when the plants are established in the pot and the plants begin to bolt. Target the pinch in order to leave 6 – 7 true pairs of leaves. Then, again pinch the side shoots before flower buds appear to leave 3-4 true pairs of leaves. Pinched plants require a longer crop time than non-pinched plants.

Grower Tip: Studies show that seed sown under short days and flowered under long days enhances basal branching.

Chemical Growth Regulation: Chemical growth retardant applications are necessary when tall cultivars are used for potted plant production. B-Nine (daminozide), Bonzi (paclobutrazol) and A-Rest (ancymidol) are effective. The time of year, series being used and specific cultivar within the series will determine which chemical is selected and how many applications are required. Below is a guide. Additional applications may be necessary.

B-Nine / Alar	PPM Spray	When to apply
1st treatment	3,200 – 4,000 0.32 - 0.4%	1 week after transplanting
2nd treatment	3,200 – 4,000 0.32 - 0.4%	3 weeks after 1st treatment (2 weeks in summer)
3rd treatment	3,200 – 4,000 0.32 - 0.4%	3 weeks after 2nd treatment (2 weeks in summer)

A-Rest	PPM Drench	When to apply
1st treatment	10 ppm 30 ml. per 4 in./10 cm. 50 ml. per 6 in./15 cm.	When the shoots on the pinched or non-pinched plant are 2 in./5 cm. long.
2nd treatment	10 ppm 30 ml. per 4 in./10 cm. 50 ml. per 6 in./15 cm.	10 – 20 days following the first treatment.
3rd treatment*	5 ppm 30 ml. per 4 in./10 cm. 50 ml. per 6 in./15 cm.	If needed apply at time of visible bud.

*Blue cultivars usually need 2 treatments and white flowered cultivars 3 treatments.

Bonzi	PPM Drench	When to apply
1st treatment	10 ppm 30 ml. per 4 in./10 cm. 50 ml. per 6 in./15 cm.	When the shoots on the pinched or non-pinched plant are 2 in./5 cm. long.
2nd treatment	10 ppm 30 ml. per 4 in./10 cm. 50 ml. per 6 in./15 cm.	10 – 20 days following the first treatment.
3rd treatment		Not recommended.

Note: Blue cultivars treated with chemical growth retardants flower about a week earlier than non-treated plants. This flowering acceleration, however, is not observed in white and pink flower cultivars.

Crop Schedule (from transplant):

Plug Size	Spring	Summer	Fall	Winter
288	14-15	11-12	13-14	16
128	13-14	10-11	12-13	15

Culture Watch Points: Ultraviolet light intensifies flower color. High night temperature (>73 °F/23 °C), excess fertilizer/nitrogen, or keeping the media too moist will reduce intensity. Strong light intensity (>5,000 f.c./54,000 lux) combined with warm temperatures will cause flower scorch.

Disclaimer: Please note that the above information is given as a suggestion only. Many factors, including temperature, light quality, latitude and photoperiod, greatly impact crop time and height. Growers should first do trials before committing to large scale productions.

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