GrowerFacts

Heliotrope Fragrant Delight

(*Heliotropium arborescens*)

Propagation

STAGE 1 - Harvesting of cuttings to sticking

- Harvest uniform diameter cuttings to ensure uniform rooting.
- Make multiple passes over the stock to collect uniform diameter cuttings.
- Harvest cuttings at the correct stage of maturity- be certain stem cuttings are not woody.
- Harvest cuttings in the early morning or late afternoon when ambient temperatures are below 90°F (32°C).
- Place cuttings in carriers either base up or base down.
- Avoid crushing the cuttings when harvesting to decrease botrytis problems.
- Cover the carrier with a damp towel to prevent desiccation of the cuttings.
- Store the cuttings for at least 2 hours at 48°F (9°C) to reduce cutting temperature.
- Maintain 75-90% RH in the cooler to prevent desiccation of the cuttings.
- If planting is going to be delayed, store the cuttings at 50-60°F (10-16°C) for 24 hours maximum.
- Stick in sand or perlite mixture. Air space and dry media is important for root formation. A callus will prevent rooting.

STAGE 2 - Root initiation-and callus formation

- Soil temperature 70-72°F (21-22°C).
- To guarantee uniform rooting, the media should be sufficiently moist so that water is easily squeezed out of rooting media.
- Keep RH 75-90% at the base of the cutting.
- Use tempered water, 70°F (21°C), in the mist lines since cold water will lower the soil temperature during the day.
- Maintain high relative humidity in the air surrounding the cutting, 75-90%, to minimize evapotranspiration.
- Prevent leaf wilting by applying overhead mist or fog.
- The mist frequency should increase and decrease as the light and ambient temperatures change during the course of the day.
- During the first 3-5 days frequent night misting may be required.
- Each wilting episode during stage 2 adds at least one day to the rooting program.
- Light intensity should be 500-1000 foot-candles.
- Light intensity above 1000 will increase plant stress due to plant warming.
- Use retractable shade so that the light intensity can be increased as the cuttings mature.
- Begin foliar feeding with 50-75 ppm of 20-10-20 as soon as there is any loss in foliage color.
- Soil pH should be 5.5-5.8 with an EC < 0.5.
- Maintain pH of media leachate at 5.5-5.8.
- If growth regulators were used during stock plant growth, no growth regulators are used during stage 2.
- If growth regulators were not used during stock plant growth then start applying Cycocel as soon as cuttings are turgid.
- Once 50% of the cuttings begin differentiating root initials, the cuttings are ready to transfer to stage 3.

STAGE 3 - Root development (7-14 days)

- Soil temperature 70-72°F (21-22°C).
- Once the cuttings begin to form root initials, it is critical to begin drying out the soil.
- Avoid drying out the air since this will increase evapotranspiration which will reduce root zone temperature.
- To reduce soil moisture:
- Reduce the mist application during the dark period.
- Reduce the duration and frequency of the mist.
- Reduce the amount of water applied per day by delaying the start of the mist period until 9:30 to 11:00 AM and end the mist period earlier than 4:00-5:00 PM.
- Begin increasing light intensity to 1000-2000 ftc as the cuttings begin to root out.
- Apply growth regulators as needed.
- Foliar feed at 100 ppm nitrogen from 15-0-15 alternating with 20-10-20 then increase rapidly to 200 ppm. Increase the frequency and rate at each application to prevent salt problems.
- The majority of fertilizer should be in the nitrate form (15-0-15).
- The soil pH should be 5.5-5.8.
- Soil EC should be below 0.5.
- Monitor the pH and EC of the leachate on a daily basis. The pH should be 6.0 and the EC should stay between 0.5-1.0.

STAGE 4 - Plants ready for transplanting or shipping (7 days)

- Air temperatures 65-68°F (18-20°C) nights, 70-80° F (21-26°C) days.
- Move the liners from the mist area into an area of lower RH, lower temperatures, and higher light intensity.
- A zero DIF is desired.
- Use growth regulators if DIF is positive.

- Increase the light intensity to 2000-4000 ftc.
- Provide shade during the mid point of the day to reduce temperature stress on the crop.
- Maintain soil pH 5.5-5.8 and EC less than 1.0 mmhos/cm.
- Fertilize at 150-200 ppm nitrogen from 15-0-15 alternating with 20-10-20 once per week.

Growing On to Finish

TEMPERATURE

Night: 65-68°F (18-20°C)

Day: 70-80°F (21-26°C)

LIGHT

- Keep light intensities at 4000-7000 ftc. while maintaining moderate temperatures.
- Heliotrope is a long day plants and will flower earlier under long days. Flowering is accelerated by increasing the intensity. During the winter when sunlight is reduced, crops take longer to finish.
- When photoperiod is less than 10 hours, flowering is inhibited.
- Low light levels promote stem stretch.

WATER

Avoid over watering or water stress as this will cause leaf edge damage.

MEDIA

- Use a well-drained, disease-free soil-less medium with a high initial nutrient charge and a pH 5.5-5.8.
- Heliotrope can decrease the soil pH therefore additional limestone is sometimes required to control pH.
- If leaves roll, increase the pH.
- Combinations of peat, bark, or perlite are best.

FERTILIZATION

- Heliotrope has a moderate fertilizer requirement.
- Constant fertilization 15-0-15 alternating with 20-10-20 is best.
- As the plants mature the rate can be increased to 200-300 ppm.
- Water with clear water every third watering if high soluble salts problems occur.
- Maintain medium electrical conductivity around 0.5 mmhos/cm (using 1:2 extraction).
- Do not add iron to fertilizer solution.
- Excessive ammonia fertilizers (20-20-20) may drop pH and promote iron uptake.

PINCHING

- Once liners are established, pinch plants back.
- Pinch plants above the 5th-6th leaves about 1-1.5 “above the soil.
- With the new varieties pinching is not as necessary, but produces a more compact, rounded plant.

CONTROLLING HEIGHT

- Height can be controlled by withholding fertilizer, especially phosphorous and ammonium-form nitrogen.
- Heliotrope respond well to Cycocel. Two to three applications of 500-1000 ppm Cycocel will also result in compact plants.

POST PRODUCTION CARE

TEMPERATURE

Night: 65-68°F (18-21°C)

Day: 70-80°F (21-26°C)

LIGHT

- Heliotrope does best in full sun.
- Optimum light levels are 4500+ ftc.

WATER

Avoid water stress.

COMMON PROBLEMS:

Insects: Aphids, Thrips, Whitefly, Spider mites

Diseases: Botrytis, Rhizoctonia, Pythium, Powdery Mildew

Problem: Plants collapse

Causes: Wet media for an extended period; Botrytis; Iron toxicity due to low pH

Problem: Excessive vegetative growth

Causes: High ammonia concentration in the soil; Over fertilization under low light; Low light and over watering, wet media

Problem: Poor branching

Causes: Low fertilization during early stages

Problem: Foliage Necrosis

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Causes: Drying out the plant between irrigations; High soluble salts in the soil; Iron toxicity; Low soil pH

Problem: Leaf Curl

Causes: Low soil pH; Iron toxicity

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