

## Borage Herb

(*Borago officinalis*)

### Germination

- Time of radicle emergence (3-5 days)
- Soil temperature 68-70°F (20-21°C).
- Keep media very moist, near saturation.
- Cover the seed lightly with vermiculite.
- Light at 100-400 foot-candles may be beneficial for germination.
- Soil pH 5.5-5.8 and soluble salts (EC) to less than 0.50 mmhos/cm (2:1 extraction).
- Borage is very sensitive to high salts, particularly high ammonium, during germination.
- Keep ammonium levels to less than 10 ppm.

### Plug Production

#### STAGE 1 - Time of radicle emergence (3-5 days)

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#### STAGE 2 - Stem and cotyledon emergence (7-10 days)

- Soil temperature 65-70°F (18-21°C).
- Reduce moisture levels once radicle emergence occurs! Allow the soil to dry out slightly before watering for best germination and rooting.
- Keep soil pH 5.5-5.8 and EC to less than 0.50 mmhos/cm.
- Keep ammonium levels to less than 10 ppm.
- Begin fertilizing with 50 75 ppm N from 14 0 14, 15-5-15 or a calcium/potassium nitrate feed once cotyledons are fully expanded.
- Alternate feed with clear water.
- Irrigate early in the day so foliage is dry by nightfall to prevent diseases.

#### STAGE 3 - Growth and development of true leaves (7 days)

- Soil temperature 62-65°F (17-18°C).
- Allow the soil to dry thoroughly between irrigations but avoid permanent wilting to promote root growth and control shoot growth.
- Maintain soil pH 5.5-5.8 and EC to less than 0.75 mmhos/cm.

- Increase feed to 100 150 ppm N from 20 10 20 alternating with 14 0 14, 15-5-15 or other calcium/potassium nitrate fertilizer.
- Fertilize every 2nd – 3rd irrigation.
- If using 15-0-15 supplement with magnesium 1 2x during this stage, using magnesium sulfate (16 oz/100 gal) or magnesium nitrate. Do not mix magnesium sulfate with calcium nitrate as precipitate will form!
- Use DIF whenever possible, especially the first 2 hours after sunrise, to control plant height.
- Growth regulators cannot be used on Borage.

#### STAGE 4 - Plants ready for transplanting or shipping (5-7 days)

- Soil temperature 60-62°F (16-17°C).
- Allow soil to dry thoroughly between irrigations.
- Maintain soil pH 5.5-5.8 and EC to less than 0.75 mmhos/cm.
- Fertilize with 14 0 14 or calcium/potassium nitrate feed at 100 150 ppm N as needed.

## Growing On to Finish

### TEMPERATURE

**Night:** 55-60°F (13-16°C)

**Day:** 65-70°F (18-21°C)

### LIGHT

Maintain light levels as high as possible while maintaining moderate temperatures

### MEDIA

Use a well-drained, disease-free soil-less medium with a medium initial nutrient charge and a pH 5.5-6.2.

### FERTILIZATION

- Fertilize every other irrigation with 15-0-15 alternating with 20-10-20 at 150-200 ppm nitrogen.
- Maintain medium electrical conductivity around 1.0 mmhos/cm (using 1:2 extraction).

### CONTROLLING HEIGHT

- Once plants are rooted to the sides of the containers they can be allowed to wilt prior to irrigation to provide some height control.
- Height can also be controlled by withholding

fertilizer, especially phosphorous and ammonium-form nitrogen.

- Borage is responsive to day/night temperature differential (DIF), and is shorter with a negative DIF.
- Chemical PGR's can not be used on vegetables and herbs.

## COMMON PROBLEMS

**Insects:** Aphids

**Diseases:** Botrytis, Pythium, Rhizoctonia

## Post Production Care

### TEMPERATURE

Optimum temperatures for Borage:

- **Night:** 50-55°F (10-13°C)
- **Day:** 55-58°F (13-14°C)
- Optimum conditions may be difficult to maintain, especially if plants are displayed outside.

### LIGHT

Borage best in full sun; however partial shading may be beneficial during retail display.

