GrowerFacts

Snapdragon Early Potomac™

(*Antirrhinum majus*)

Germination

- Time of radicle emergence (6-8 days)
- Soil temperature 65-75°F (18-24°C).
- Keep media evenly moist but not saturated.
- Do not cover or bury the seed.
- Light is not necessary for germination until radicle emergence.
- Soil pH 5.5-5.8 and soluble salts (EC) less than 0.75 mmhos/cm (2:1 extraction).
- Cut snapdragon is very sensitive to high salts, particularly high ammonium, during germination.
- Keep ammonium levels less than 5 ppm.

Plug Production

STAGE 1 Time of radicle emergence (6-8 days)

- Soil temperature 65-75°F (18-24°C).
- Keep media evenly moist but not saturated.
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- Light is not necessary for germination until radicle emergence.
- Soil pH 5.5-5.8 and soluble salts (EC) less than 0.75 mmhos/cm (2:1 extraction).
- Cut snapdragon is very sensitive to high salts, particularly high ammonium, during germination.
- Keep ammonium levels less than 5 ppm.

STAGE 2 Stem and cotyledon emergence (7 days)

- Soil temperature 65-70°F (18-21°C).
- Reduce moisture levels once radicle emergence occurs.
- Keep soil evenly moist but not saturated for best rooting.
- Keep soil pH 5.5-5.8 and EC less than 0.75 mmhos/cm.
- Maintain water alkalinity at 60-100 ppm.
- Begin fertilizing with 50 75 ppm N from calcium nitrate and potassium nitrate based fertilizer once cotyledons are fully expanded.
- Snapdragons are very sensitive to high salts and high ammonium levels
- Liquid fertilization may not be necessary at this stage if sufficient nutrition was incorporated in the growing medium before planting.
- 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 (14-21 days)

- Soil temperature 62-65°F (17-18°C).
- Allow the soil to dry thoroughly between irrigations but avoid wilting to promote root growth and control shoot growth.
- Maintain soil pH 5.5-5.8 and EC less than 1.0 mmhos/cm.
- Increase feed to 100 150 ppm N from 20 10 20 alternating with 14 0 14 or other calcium/ potassium nitrate fertilizer.
- Fertilize every 2 3 irrigations.
- 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!
- Occasional leaching with clear water is helpful to reduce soluble salts.
- Attempt to maintain a ratio of approximately 3 potassium: 2 calcium: 1 magnesium in the medium.
- Avoid ammonium-based fertilizer if growing below 65? F (18? C).
- Apply fungicides at the lowest recommended rate to control pythium, rhizoctonia and thielaviopsis.
- Use DIF whenever possible, especially the first 2 hours after sunrise, to control plant height.
- Plant growth regulators are usually not needed for cut snapdragon production.

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

- Soil temperature 60-62°F (16-17°C).
- Allow soil to dry thoroughly between irrigations.
- Maintain soil pH 5.5-5.8.
- Maintain EC less than 0.75 mmhos/cm for shipping, less than 1.0 mmhos/cm for transplanting..
- Fertilize with 14 0 14 or calcium/potassium nitrate feed at 100 150 ppm N as needed.
- Do not use ammonium-based fertilizer.

Growing On to Finish

TRANSPLANTING

- Transplant when the second true leaves unfold.
- When buying in seedlings or plugs, allow seedlings 24 hours to acclimate to the greenhouse conditions, then transplant promptly.
- Delayed flowering and loss of final product quality occurs when seedlings are kept too long in plug trays.
- If holding is unavoidable, store plugs at 36-39°F (2-4°C) under fluorescent lights at 250 foot-candles 14 hours per day.

- Treat with a fungicide prior to storage to prevent botrytis.
- Space plugs at 10-12 plants per ft2 (100-130 per m2).
- Decrease to 8 plants per ft2 (85-90 per m2) during seasons of low light intensity.

SUPPORT

- Two support nets are the minimum, but three are preferred.
- Mesh sizes of 4” x 4” to 6” x 6” (10 x 10 cm to 15 x 15 cm) are most commonly used.
- Place the first level at 4-6 inches (10-15 cm.) above the soil level.
- Place the second level at 6 inches (15 cm.) above the first level.
- Raise the upper level of the support nets as the stems lengthen.

TEMPERATURE

Group 1: Night - 45-50°F (7-10°C), Day - 50-55°F (10-13°C)

Group 2: Night - 50-55°F (10-13°C), Day - 55-60°F (13-16°C)

Group 3: Night - 55-60°F (13-16°C), Day - 60-65°F (16-18°C)

Group 4: Night - > 60°F (> 16°C), Day - > 65°F (> 18° C)

Generally, the lower temperatures in the ranges give the best quality, but at the expense of a longer crop time.

The lower temperature is advisable during extended periods of low light.

LIGHT

Group 1: low light - 1000-1500 foot-candles

Group 2: moderate light - 1500-3000 foot-candles

Group 3: moderate to high light - 2500-4500 foot-candles

Group 4: high light - 3000-5000 foot-candles

MEDIA

- The growing medium should allow adequate aeration to the roots yet hold a steady supply of moisture.
- The greater the aeration of the medium, the more forgiving the medium is to over watering.
- Growing media in benches must be better aerated than media used to grow snapdragons directly in the ground, because the bench bottom creates a “perched water table” which limits water drainage.
- Ground beds in locations with sandy loam soils may be suitable for growing snapdragons without any amendments.
- Heavy soils should be improved prior to planting by tilling in organic material such as peat moss, rice hulls, compost, or decomposed manure.
- Growing medium for raised benches should consist of less than 50 percent field soil, with the remaining percentage consisting of a mixture of more than one of the following: vermiculite, perlite, peat moss, composted bark, or rice hulls.
- Medium must be free of disease-causing organisms.
- If using soil, it will be necessary to disinfect the media.
- Perform a soil test of the growing medium before planting.
- EC should be between 1.0 - 1.75 mmhos.
- Ammonium-based nitrogen less than 10 ppm.
- pH 5.5-6.5.

FERTILIZATION

- Phosphorus and calcium are usually incorporated into the growing medium prior to planting and the other nutrients are supplied with a soluble fertilizer during growth.
- Super phosphate incorporated at 5 pounds/ 100 ft2 (2 grams/m2) should supply sufficient phosphorus.
- If soil tests show calcium is low, incorporate limestone (if the pH is low), or gypsum (if pH is acceptable), both at 5 pounds/100 ft2 (250 grams/ m2).
- Irrigate with clear water after transplanting.
- Begin fertilizing at the second watering.
- Use a low ammonium fertilizer at 150-200 ppm.
- Use constant fertilization, with an occasional clear water leaching.
- High moisture or fertility levels will cause excessive side shoots.

CONTROLLING HEIGHT

- If height control is necessary, the plants can be allowed to wilt slightly before irrigation.
- Height can also be controlled by withholding fertilizer, especially phosphorous and ammonium-form nitrogen.
- Cut snapdragon are responsive to day/night temperature differential (DIF), and are shorter with a negative DIF.
- Chemical plant growth regulators are not needed for cut snapdragon production.

GROWING SCHEDULE

North and south are separated at the 38th parallel, extending from San Francisco, California in the West,

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through Kansas City, Missouri, to Washington D.C. in the East.

Regional conditions vary. The sowing and harvest dates given are general guidelines only.

NORTH:

Group 1
Sow: Aug. 15-Aug. 31

Flower: Dec. 10-Feb. 15

Group 2

Sow: Sept. 11-Dec. 10

Flower: Feb. 15-May 10

Sow: July 24-Aug. 09

Flower: Oct. 25-Dec. 10

Group 3

Sow: Dec. 10-Mar. 21

Flower: May 10-June 30

Sow: June 18-July 16

Flower: Sept. 10-Oct. 25

Group 4

Sow: Mar. 28-June 10

Flower: July 01-Sept. 10

SOUTH:

Group 2

Sow: Aug. 22-Dec. 20

Flower: Dec. 01-May 01

Group 3

Sow: July 06-Aug. 16

Flower: Oct. 01-Dec. 01

Sow: Jan. 07-Mar. 08

Flower: May 01-June 15

Group 4

Sow: Mar. 15-July 02

Flower: June 15-Oct. 01

Post Production Care

HARVESTING

- The best quality flowers for the consumer are those cut with a minimum of 5-7 open florets.
- Premature harvesting leads to poor color development and reduced flower size as flowers continue to open.

WATER

- For maximum vase life, place snapdragon stems in water as soon as possible after cutting.
- Remove foliage on the lower third of the stems, then grade and bunch.
- To condition for immediate use or shipping, place the flowers in warm water (70-75°F, 21-24°C) containing floral preservatives.
- Select a floral preservative which contains sucrose as well as 8-HQC (8-hydroxyquinoline citrate) or other bactericide to facilitate water uptake and inhibit stem plugging.

TEMPERATURE

Hold at 45-50°F (7-10°C) at least 6 to 8 hours or overnight.

LIGHT

Color development in enhanced by holding the stems in approximately 200 foot-candles light.

STORAGE AND SHIPPING

- Snapdragons should be stored and shipped upright to prevent curvature of the spikes.
- Place cut stems vertically as soon as possible after harvest; stems placed horizontally may begin to bend upwards in as little as 30 minutes.
- To maintain flower quality, it is important to sleeve the upper portion of the snapdragon bunches and use tall, upright hampers for shipping.
- Snapdragons can be stored for 3 to 4 days, dry or in water at 40°F (4°C).
- If stored dry, rehydrate and condition in the same manner as for freshly cut flowers.
- For longer term storage, 5-10 days, select only the highest quality stems, wrap each spike in plastic to prevent desiccation, and hold the stem in a

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preservative at air temperatures of 32-40°F (0-4° C).
- Shattering in response to ethylene can be a problem with some snapdragons. Some shatter tolerant varieties do exist.
- Shattering can be controlled on sensitive varieties with STS (silver thiosulfate).
- Avoid natural sources of ethylene such as ripening fruit and bacterial growth in coolers and containers.
- Ventilate and reduce temperatures to slow ethylene build-up.

COMMON PROBLEMS

Insects: Aphids, Thrips

Diseases: Downy Mildew, Botrytis, Rust, Powdery Mildew

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