

Cultural Information for:	Antirrhinum	Annual
	Admiral and Calima	
Common Name:	Snapdragon	
Botanical Name:	Antirrhinum majus	
Seed Count:	198,000-255,000/oz.	7,000-9,000/gram
Optimum Germination Temperature:	65°F / 18°C	
Optimum Growing Temperature:	45-60°F / 7-15°C	
Optimum pH:	5.8 – 6.2	
EC – Plug:	0.26 – 0.75 mmhos/cm (1:2) / 0.76 – 2.0 (SME)	
EC – Finishing:	0.76 – 1.25 mmhos/cm (1:2) / 2.1 – 3.5 (SME)	

Seedling Culture 4 weeks (405 / 15 x 27 tray)

Stage 1 - Sowing to Radicle Emergence (days 1 – 7)

Select a well-drained media with little or no starter charge. Maintain a soil temperature of 65°F/18°C. Maintain even moisture in the seedling flats without over saturating it. Either sow uncovered (chamber) or with a light coating of coarse vermiculite (greenhouse). Antirrhinum seedlings are very sensitive to soluble salts so maintain a low EC and keep ammonium levels at less than 5 ppm.

Stage 2 - Stem and Cotyledon Emergence (days 8-14)

Maintain soil temperature between 60-65°F/15-18°C and sufficient moisture levels once radicle emergence occurs. Maintain even moisture but not saturated for best rooting. Provide bright light up to 1,500 foot-candles /16,000 lux. Once the cotyledons are fully expanded, begin fertilizing with 50-75 ppm N using a balanced calcium and potassium nitrate-based fertilizer. Antirrhinum seedlings are very sensitive to high salt and ammonium levels. If the media contains a starter charge additional liquid fertilization may not be necessary at this stage. Watering early in the day will help to prevent disease.

Stage 3 – Growth and Development of True Leaves (days 15-28)

To produce the best root growth, keep soil temperature between 55-60°F/13-15°C and allow the soil to dry thoroughly between irrigations, (do not allow seedlings to wilt). Increase fertilizer to 100-150 ppm N from a balanced calcium and potassium nitrate-based fertilizer. The use of Cal/Mag Specials, like 15-5-15, are ideal as Antirrhinum seedlings require adequate levels of magnesium. Attempt to maintain approximately 4 potassium: 2 calcium: 1 magnesium in the fertilizer for the best growth. Avoid ammonium-based fertilizers. If necessary, or as a preventative, apply fungicides to control pythium and or rhizoctonia.

Stage 4 – Plants Ready for Transplanting or Shipping (day 30)

Seedlings have two pairs of leaves and are now ready for transplanting into cut flower beds. **Do not delay transplanting!** If absolutely necessary, plugs can be stored at 36-39°F/2-4°C under fluorescent lights at 250 foot-candles/2,700 lux for 14 hours per day. In order to prevent botrytis, treat with a fungicide.

Transplanting

Bed Preparation: Plant into raised ground beds containing a soil that is high in organic matter with good aeration and drainage. Ideally, the soil should be free of disease-causing organisms with a pH between 5.8 and 6.2.

Planting: Spacing ranges from 8-10 plants per square foot /85-110 per square meter depending on light levels. Irrigate the seedling with clear water after transplanting and then commence liquid feeding as needed to maintain EC levels at less than 2.5 mmhos/cm (2:1 dilution). Using 150 – 200 ppm N from a balanced calcium and potassium nitrate-based fertilizer is recommended. Avoid formulations that are high in ammonium. Excess fertilizer levels will promote excessive side shoots. A minimum of two levels of support is needed but three is ideal.

Scheduling: Flower initiation occurs after young plants have more than 5-10 pairs of leaves. Photoperiod and light quality are the most important factors influencing flower initiation. In general, crop times range from 16 – 20 weeks from sowing to harvesting. Environmental factors, like long periods of cloudy weather or abnormal temperatures can adversely affect crop time. Once Flower initiation occurs, the night temperature has the greatest influence on flowering time and flower quality.

Group Selection: Antirrhinum grow and flower in response to a combination of day length, light intensity and temperature. Four Groups are available to enable a steady supply of high-quality cut flowers year-round. Many factors, like latitude, play a role in selecting when to sow each group. Below is a general guideline.

Group 1: Late autumn, winter and early spring flowering / low light, short days / optimum night temperature 45-55°F /7-13 °C.

Group 2: Spring Flowering / short days (not as short as Group 1) to medium long days, moderate light / optimum night temperature 50-55°F / 10-13°C.

Group 3: Late Spring, Summer Flowering / medium to long days, moderate to high light / optimum night temperature 55-60°F/13-16°C.

Group 4: Summer, early Autumn Flowering / long days and high light / optimum night temperature 60°F/16°C.

Temperature: In general, the lower range of recommended night temperatures yields the highest quality cuts at the expense of longer crop time. During extended periods of low light maintain temperatures at the lower range. Optimum day temperature is 5-10 degrees higher than the night temperature.

Supplemental Lighting: Many growers wish to simplify their growing methods by working with Group 3 and 4 only. Growers may substitute Group 3 for Groups 1 and 2 by supplementing with HID lights when the day length is less than 12 hours long. It is necessary to provide 12-14 hours of light per day and supplement with 350-400 foot-candles/3,800 to 4,300 lux of HID light. In addition, one should raise the night temperature to 60-62°F/16-17°C and feed heavier (300-350 ppm N). Adding supplemental CO2 at 1,000 ppm is also recommended.

Insects and Disease: Major pests include aphids, mites and thrips. Fungus gnats and shore flies can be a concern in plug production. Since Antirrhinum are grown during periods of low light and cool temperature conditions, be on guard against botrytis, downy mildew, powdery mildew and pythium.

Post-Harvest Handling: Cut stems when 5-7 florets* are open. Remove lower foliage and place immediately in warm water (70-75°F/21-25°C) containing floral preservatives and keep at 45-50°F/7-10°C overnight. To avoid shattering on ethylene sensitive varieties treat with Ethyl Bloc. Place cut stems in a vertical position as soon as possible after cutting to avoid stem bending and store in an upright position. Antirrhinum stems can be stored at 40°F/ 4°C for 3-4 days either dry or in water. Rehydrate stored dry stems as above before shipping.

Note: Premature harvesting can decrease both flower size and color development on the remaining unopened flowers. This is most apparent on darker colored varieties like rose and purple.

Series	Group	Colors
Admiral	1	All
Calima	2.5	Yellow, Pure White
Calima	3	Ivory White
Calima	3.5	Pink
Calima	4	Deep Rose

“All information given is intended for general guidance only and may have to be adjusted to meet individual needs. Cultural details are based on North American conditions and Sakata cannot be held responsible for any crop damage related to the information given herein. Application of recommended growth regulators and chemicals are subject to local and state regulations. Always follow manufacturer's label instructions. Testing a few plants prior to treating the entire crop is best.”