Crop	Antirrhinum
Series	Admiral, Calima and Snapstar
Botanical name	*Antirrhinum majus*
Plant type	Annual
Seed type	Raw
Seed count	6,000-9,000 seeds / gr
Germination	20°C - 5-7 days light favored
Growing	7-15ºC
Optimum pH	5.8-6.2

Plug Culture: 4 weeks (406 cell tray)

Stage 1 (days 1-7) Select a well-drained media with little or no fertilizer. Maintain a soil temperature of 18-20ºC. Maintain even moisture in the plug trays 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 (days 8-14) Maintain soil temperature between15-18ºC and sufficient moisture levels once radicle emergence occurs. Maintain even moisture but not saturated for best rooting. Provide bright light. Once the cotyledons are fully expanded, begin fertilizing with 50-75 ppm nitrogen 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 fertilizer additional liquid fertilization may not be necessary at this stage. Watering early in the day will help to prevent disease.

Stage 3 (days 15-29) To produce the best root growth, keep soil temperature between 13-15ºC and allow the soil to dry thoroughly between irrigations, (do not allow seedlings to wilt). Increase fertilizer to 100-150 ppm nitrogen from a balanced calcium and potassium nitrate-based fertilizer. The use of calsium / magnisium 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 (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, seedlings can be stored at 2-4ºC under fluorescent lights for 14 hours per day. In order to prevent botrytis, treat with a fungicide.

Transplanting to finish: 12-16 weeks

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.

Transplanting: Spacing ranges from 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 mS/cm (2:1 slurry). Using 150–200 ppm nitrogen 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 7-13ºC.

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

Group 3: Late Spring, Summer Flowering / medium to long days, moderate to high light / optimum night temperature 13-16ºC.

Group 4: Summer, early Autumn Flowering / long days and high light / optimum night temperature 16 ºC.

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 ºC higher than the night temperature.

Light: 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. In addition, one should raise the night temperature to 16-17ºC and feed heavier (300-350 ppm nitrogen). Adding supplemental CO2 at 1,000 ppm is also recommended.

Pests: aphids, mites and thrips
Fungus gnats and shore flies can be a concern in seedling production

Disease: 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 (21-25ºC) containing floral preservatives and keep at 7- 10ºC overnight. 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 4 ºC 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.

All information given is intended for general guidance only and may have to be adjusted to meet individual needs. Cultural details are based on Asian conditions such as in Japan and Sakata cannot be held responsible for any crop damage related to the information given herein. Always follow manufacturer's label instructions. Testing a few plants prior to treating the entire crop is best.