



# Antirrhinum

## Cut Flower varieties 2009

Available in Plugs & Seed unless otherwise listed

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Highsun Express

### Antirrhinum majus - Cultural Notes

#### Transplanting & Growing On:

Snapdragons are commonly grown in soil or soilless medium, directly in the ground or in raised beds or benches. Snapdragons grow best in a growing medium, which allows adequate aeration to the roots yet holds a steady supply of moisture. The greater the aeration of the medium the more forgiving the medium is to over watering. Media with high aeration will require frequent irrigations.

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, decomposed manure, etc.

Whether using soil or a soilless medium, it must be free of disease causing organisms. Some media, such as those composed of perlite, vermiculite, peat moss and/or composted bark, are naturally free of disease organisms, and may be used without treatment. However, they must be treated or replaced if diseases develop. Most growers disinfect their growing media before they plant. Pasteurisation of the medium with high temperatures [71 oC (160 oF) of aerated steam for 30 minutes] is most common, but chemical treatments such as methyl bromide and chloropicrin is possible as well. Follow all applicable federal, state and local regulations when handling or applying any pesticide protect the environment!

Test the growing medium prior to planting. Fertility should be moderate, EC between 1.0 and 1.75 mS/cm with less than 10 ppm ammonium based nitrogen. Medium pH should be between 5.5 and 6.5. The more soil included in the mix, the higher the optimum pH. Organic media should have a pH at the lower end of this range. Amend the soil to adjust the pH several weeks prior to planting. Water the medium and retest before planting to determine if the desired changes have occurred.

Snapdragons are often described as "light feeders," yet no crop can grow well with inadequate nutrition. Many growers have found success with moderate to high applications of fertiliser for snapdragon production. Phosphorus and calcium are usually incorporated into the growing medium prior to planting and the other nutrients are supplied with a soluble fertiliser during growth. Superphosphate fertiliser incorporated at 250 grams per square metre (5 pounds per 100 square feet) should supply sufficient phosphorous for the entire crop, except in very porous media. If medium tests show calcium is low, incorporate limestone (if the pH is too low), or gypsum (if pH is acceptable),

both at 250 grams per square metre (5 pounds per 100 square feet). If phosphoric acid is used to modify water alkalinity, superphosphate application may not be needed.

Transplant Snapdragon plugs on a spacing of 100 130 plants per net m<sup>2</sup> (10 12 plants per net foot<sup>2</sup>) decreasing to 85 90 plants per net m<sup>2</sup> (8 plants per net foot<sup>2</sup>) in seasons with low light. When buying in plugs, allow 24 hours to acclimatise to greenhouse conditions, then transplant promptly. Delayed flowering and loss of final product quality occurs when seedlings are kept too long in plug trays. If delays in transplanting are unavoidable, store plugs at 2-4 oC (36 39 oF) under fluorescent lights at 250 foot candles (2,700 lux) 14 hours per day. Treat with fungicide prior to storage to prevent botrytis.

Irrigate seedlings with clear water after transplanting. Begin fertilising at the next irrigation, using a well balanced, low ammonium (<40%) fertiliser at a rate of 150 200 ppm N.

Constant fertilisation, with occasional clear water leaching, can be used until the flower buds begin to swell. Once the flower buds show colour and swell, use clear water only.

Excessive side shoots are an indication of high moisture or fertility levels, or improper variety selection. Maintain a moderate to low medium EC (less than 2.5 mS/cm) to avoid excessive side shoots. Irrigate with clear water if necessary to lower the medium EC. Light and porous media are less prone to excessive nutrient and moisture levels, resulting in fewer side shoots. It is also important to choose snapdragon varieties from the correct response group. Subjected to long days and high temperatures, Group 1 and 2 varieties tend to increase their side branching. If side shoots persist on edge rows, it is best to trim them off to increase light and air circulation in the centre of the bed.

Snapdragons need support netting during production. Two support nets are minimum, but three are preferred. Mesh sizes of 10 x 10 cm to 15 x 15 cm (4" x4" to 6" X 6") are most commonly used and provide adequate support for the stems. Place the first level at 10 15 cm (4 6") above the soil and the second level at 15.5cm (6") above the first level. Raise upper level of the support nets as the stems lengthen.

Snapdragon growth and flowering response depends on the interaction of light quality, light quantity, light duration, temperature, CO<sub>2</sub> levels, humidity, soil type, as well as other environmental factors. Snapdragons may be grown under various light intensities, provided appropriate varieties are utilised. The best

quality is usually achieved with highest light levels. Some shading may be necessary in some climates for temperature control. While temperature affects overall growth rate, day-light and quantity of light are the most important factors influencing flower initiation. Flower initiation in young plants occurs when they have 5 10 pairs of leaves, depending on the response group and individual variety. Unusual environmental conditions during this critical stage (i.e., a long period of overcast weather) can greatly affect crop time. Once flower initiation has occurred, night temperature has the greatest influence on flowering time and final quality. The ideal night time growing temperature depends on the group transplanted. For the highest quality snapdragons, optimum night temperatures are as follows:

- Group 1 7 10 °C (45 50 °F)
- Group 2 10 13 °C (50 55 °F)
- Group 3 13 16 °C (55 60 °F)
- Group 4 above 16 °C (60 °F)

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.

High quality snapdragons can be grown using supplemental HID lights. In this production method, Group 3 and Group 4 snapdragons can be grown year round by lighting the plants when natural daylengths are less than 12 hours. Groups 1 and 2 are not recommended for HID culture because they initiate flowers too quickly, which causes a short, weak stem. Use 400 800 foot candles (4,300 8,600 lux), and optimise conditions by increasing fertiliser to 300 to 500 ppm N, by increasing night time temperatures to 16 17 oC (60 62 oF), and by adding CO<sub>2</sub> at 800 1,200 ppm.

#### Insects And Disease:

Snapdragons are relatively pest free in comparison to many crops, but are not immune. Aphids, mites and thrips are the most common pests on mature plants, while seedlings are damaged by fungus gnat and shorefly larvae. Control of these pests can often be done by excluding the insects from the growing area. Frequent scouting of the growing area to find infestations before they become severe is essential. Some of the many pesticides available to control pests are listed in Table 1. Rotate between classes of insecticides after three consecutive applications. Always read the label and check local regulations regarding use of a pesticide before application. Nicotine

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sulphate, vaponal and malathion have been reported to cause phytotoxicity of snapdragons and should be avoided. Chlorpyrifos and some other insecticides can damage budded spikes. If the crop is free of insects going into flowering, then insecticides can usually be avoided when buds show colour.

**Fungal diseases** that can affect snapdragons include downy mildew, pythium, botrytis, rust, phyllosticta blight and anthracnose.

**Downy mildew** affects snapdragons as seedlings with stunting, chlorosis and downward curling of leaves. On more mature plants, the undersurface of the leaf is covered with grey fuzzy growth. The infection checks terminal growth, resulting in a cluster of stunted flower buds. The best environment for the development of this disease is cool and moist conditions. Sterilised media, careful watering, heat, and ventilation help prevent downy mildew.

**Powdery mildew** affects seedlings as well as mature plants. White powdery growth occurs on both leaf surfaces, but usually starts on lower leaves. Left untreated, the fungus destroys the lower leaves and spreads to the upper plant parts, eventually causing a white circular blemish on the flower petals.

**Pythium** is best known as one of the fungi that can cause damping off in seedling trays. This soil fungus can also exist in snapdragon beds, especially where media is unsterilised or kept overly moist. At low levels, pythium does not kill snapdragon plants, but decreases their vigour, resulting in uneven stem lengths, weaker flower stems and poor quality shorter flower spikes.

**Botrytis** affects mainly stems and flower parts of snapdragons. Tan coloured stem lesions can encircle stems, causing wilting of upper plant parts. With severe infections, older blossoms and infected areas show grey or light brown spore masses. Botrytis infections can lead to significant loss of product quality and decreased vase life, causing light grey or brown spots within the centre of the flower or along petal edges. Sanitation is essential in controlling botrytis since the fungus persists in plant debris.

**Snapdragon rust** is primarily a disease of field produced snapdragons. Faint yellow spots on upper leaf surfaces correspond to rusty brown circular pustules on lower surfaces. Keep water off foliage as much as possible to limit infection.

**Phyllosticta** is generally a problem only on snapdragons grown in hot, humid areas. The

disease begins as brown or black foliar spots that enlarge to form well defined light brown lesions dotted with small black fungal fruiting bodies. Lesions can also occur on stems, cracking or girdling the stem, which may cause the plant or branch to wilt.

**Anthracnose** causes leaf or stem spots on snapdragons, which are greyish, white, sunken, and form oblong areas with dark narrow borders. Usually infected leaves die and drop. This is another fungal disease, which is favoured by high humidity, and is more common in the autumn when the day/night temperature differences cause condensation on the foliage.

**Tomato spotted wilt virus (TSWV L)** and impatiens necrotic spot virus (INSV, previously called TSWV I) also affect snapdragons and can be especially devastating. In young plants, it is expressed as tan leaf spots. Often there are dark bull's eye patterns within larger spots. However, it is not unusual for snapdragons infected with these viruses to remain symptomless until just before bloom. These viral diseases are characterised by brown or black lesions along the length of the stem, followed by collapse of the stem in this region. The best method of prevention is to monitor and control western flower thrips, which transmit this virus, especially during seedling, and young plant stages. The best protection against insects and diseases is prevention. Immediately discard dead or diseased plant material because it harbours insects and diseases. It is also important to keep the area surrounding and including your growing area weed free.

### Postharvest Handling:

The best quality flowers for the consumer are those harvested with a minimum of 5-7 open florets. Harvesting immature stems leads to poor flower colour development and reduced flower size. This is especially critical on dark colours such as rose and royal purple.

For maximum vase life, place snapdragon stems in water as soon as possible after harvest. 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 21-25 °C (70-75 °F) containing floral preservatives and hold at 7-10 °C (45-50 °F) for at least 6 to 8 hours or overnight. Select a preservative that contains sucrose as well as 8-HQC (8-hydroxyquinoline citrate) or other bactericide to facilitate water uptake and inhibit stem plugging. Colour development is enhanced by holding the stems in the light (200 foot candles/2,100 lux).

Shattering in response to ethylene exposure can be a problem with some snapdragons. Many shatter tolerant varieties exist, and the

problem can be avoided with careful variety selection. Refer to the variety description guide for the list of shatter tolerant varieties. Shattering of sensitive varieties can be controlled with STS (silver thiosulfate). Pulse harvested stems for one hour in a solution containing water 3.75 grams/litre (0.5 oz. STS/gallon of) or add 0.75 grams/litre (0.1 oz./gallon) to your floral preservative solution for overnight conditioning. Avoid natural sources of ethylene such as senescing flowers, ripening fruit or bacterial growth in coolers and containers. Ventilate and reduce temperatures to slow ethylene build up.

Snapdragons should be stored and shipped upright at all times. Place cut stems vertically as soon as possible after harvest; snapdragons placed horizontally may begin to curve upwards, a physiological response known as negative-geotropism. 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 4 °C (40 °F). If stored dry, rehydrate and condition in the same manner as for freshly cut snapdragons. 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 preservative at air temperatures of 0-4 °C (32-40 °F).

### Variety Selection:

Snapdragons can be produced year round in most climates. Varieties are categorised into groups based on their optimum growing conditions.

- Group 1: short days, low light, night temperatures 7-10 °C (45-50 °F)
- Group 2: short days (but not as short as Group 1) moderate light, night temperatures 10-13 °C (50-55 °F)
- Group 3: medium to long days, moderate to high light, night temperatures 13-16 °C (55-60 °F)
- Group 4: high light, long days, night temperatures higher than 16 °C (60 °F)

Generally, lower temperatures in these ranges produce the best quality, but at the expense of longer crop time. The lower temperature is advisable during extended periods of low light.

There is some overlapping of groups and varieties. Group 1, 2 varieties perform well throughout autumn Group 2, winter Group 1 and spring Group 2 conditions. Similarly,

Group 3, 4 varieties are useful for spring Group 3, summer Group 4 and autumn Group 3 harvest. Group 2, 3 varieties are essentially Group 2 with extended use into Group 3 conditions, i.e., spring and autumn harvest.

These recommendations are general guidelines and should be modified to fit particular conditions.

For instance, in the South, with fans and pad cooling Group 3 snapdragons might be used throughout the summer. South growers in high light areas in winter may produce better quality snapdragons by staying with Group 2 varieties throughout the winter.

Knowing the relationship between flowering times of varieties allows you to fine tune your crop scheduling. This is especially important in two situations - targeting a key holiday, and scheduling a smooth transition between groups. If a white variety scheduled for Christmas harvest consistently blooms too short or too early, try a late blooming white variety or

transplant the early white variety slightly later than recommended for that group, assuming all other factors are constant. Transplant and harvest dates presented in these guidelines are purposely given in a range to account for varietal differences and regional environmental differences.

Normal weather variations from year to year can still complicate the most well planned schedule. The fewer environmental controls available (heat, fans, etc.) the more buffers must be added to guarantee a successfully timed crop, i.e., using more than one variety, or two or more transplanting dates of a favourite variety.

Growers often cite the autumn transition from Group 3 to Group 2 as the most difficult time to schedule a continuous succession of quality snapdragons. Excessively warm temperatures and high light at the young plant stage (late summer) can make Group 2 snapdragons bloom too early and too short. On the other

hand, unusually cool nights, even after flowers have initiated, can drastically lengthen the crop time of Group 3 varieties. Intermediate varieties (G2, 3) are excellent choices for harvest during this period. Alternatively, use the variety descriptions to choose varieties, which help connect Group 2 to Group 3. The logical progression as daylight decreases is: Group 3, early Group 3, late Group 2, Group 2.

## Antirrhinum majus - Colour Selections

### Bronze/Orange

*Bronze has golden yellow or orange petals with pink or rose tube.*

Overture Light Bronze – Group 2

gold-centered bronzy-orange

Overture Orange – Gp 2

Opus Early Bronze – Gp 3, 4

Chantilly Bronze – Gp 2, 3

Chantilly Deep Orange – Gp 2, 3

### Lavender

Opus Lavender – Group 3,4

attractive light lavender

### Pink

Opus Pink – Group 3,4

clear, mid-pink

Overture Pink – Group 2

clear, medium pink

Overture Light Pink – Group 2

clear, pastel pink

Opus Appleblossom – Group 3,4

a contrasting combination of  
pure white and bright rose

Chantilly Light Pink – Gp 2, 3

Chantilly Pink with Throat – Gp 2, 3

Opus Early Pink – Gp 3, 4

Chantilly Light Salmon – Gp 2, 3

### Purple

Opus Plumblossom – Group 3,4

a contrasting combination of  
royal burgundy on white

Overture Plumblossom – Group 2

a contrasting combination of  
rich burgundy on white

### Red

Overture Magenta – Group 2

an attractive burgundy magenta

Overture Red – Group 2

Opus Red – Group 3,4

### Rose

Opus Rose – Group 3,4

bright ros

Overture Rose – Group 2

### White

Opus Ivory – Group 3,4

a pleasing shade of creamy  
white

Overture Ivory – Group 2

soft creamy white

Opus White – Group 3,4

pure white

Overture White – Group 2

pure white

Opus Early White – Group 3,4

Opus Fresh White – Group 3,4

Chantilly White – Group 2, 3

### Yellow

Opus Yellow – Group 3,4

bright, golden-yellow

Overture Yellow – Group 2

rich, bright yellow

Chantilly Cream Yellow – Group 2, 3

# Greenhouse Forcing Snaps 2009

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## Group & Planting Times for Greenhouse Forcing Snaps

Forcing snaps are classified into groups, based on flowering response to a combination of day length, light intensity and temperature.

### Group 2

Overtures are Group 2, bred for short days, lower light, cooler temperature blooming. Overtures have excellent stem length and calibre, very consistent flower spike and overall uniformity, all blend to produce a top quality finished product. Height 100-130cm.

### Group 2,3

Chantilly - Autumn, Winter & Spring flowering. The new, delicate seven colour, butterfly type snapdragons offer beauty to any arrangement. They will bloom early when grown under low temperatures. Days from sow to flower are 110 - 120 days. Chantilly grows like a traditional snapdragon. Height is 90 - 115cm.

### Group 3,4

Opus series are a long day variety fitting into the Group 3 & 4 growing requirements and are bred for blooming during spring, summer and early autumn, with higher light and longer day periods. Opus have excellent stem length and

calibre, very consistent flower spike and overall uniformity, all blend to produce a top quality finished product.

### Group 2 Varieties – Winter Forcing Snaps

Chantilly Deep Orange  
Chantilly Bronze with Throat  
Chantilly Cream Yellow  
Chantilly Light Pink with Throat  
Chantilly Light Salmon  
Chantilly Pink with Throat  
Chantilly White  
Overture Ivory  
Overture Light Bronze  
Overture Light Pink  
Overture Magenta  
Overture Orange  
Overture Pink  
Overture Plumblossom  
Overture Red  
Overture White  
Overture Yellow

### Group 3 Varieties – Autumn / Spring Forcing Snaps

Chantilly Bronze with Throat  
Chantilly Cream Yellow  
Chantilly Deep Orange  
Chantilly Light Pink with Throat  
Chantilly Light Salmon

Chantilly Pink with Throat  
Chantilly White  
Opus Appleblossom  
Opus Early Bronze  
Opus Early Pink  
Opus Early White  
Opus Fresh White  
Opus Ivory  
Opus Lavender  
Opus Pink  
Opus Plumblossom  
Opus Red  
Opus Rose  
Opus White  
Opus Yellow

### Group 4 Varieties – Summer Forcing Snaps

Opus Appleblossom  
Opus Early Bronze  
Opus Early Pink  
Opus Early White  
Opus Fresh White  
Opus Ivory  
Opus Lavender  
Opus Pink  
Opus Plumblossom  
Opus White  
Opus Yellow

## Group Timings For Queensland

### Group 4 – Summer Forcing Snaps

Seed:	Wk 35 (early Sept)	To	Wk 3 (mid Jan)
Transplant:	Wk 39 (end Sept)	To	Wk 7 (mid Feb)
Harvest:	Wk 46 (mid Nov)	To	Wk 14 (early Apr)

### Group 3 – Autumn Forcing Snaps

Seed:	Wk 4 (end Jan)	To	Wk 11 (mid Mar)
Transplant:	Wk 8 (mid Feb)	To	Wk 15 (mid Apr)
Harvest:	Wk 16 (mid Apr)	To	Wk 23 (early Jun)

### Group 1 & 2 – Winter Forcing Snaps

Seed:	Wk 12 (end Mar)	to	Wk 19 (mid May)
Transplant:	Wk 16 (mid Apr)	to	Wk 23 (early Jun)
Harvest:	Wk 25 (end Jun)	to	Wk 33 (mid Aug)

### Group 3 – Spring Forcing Snaps

Seed:	Wk 20 (mid May)	to	Wk 34 (end Aug)
Transplant:	Wk 24 (mid Jun)	to	Wk 38 (end Sept)
Harvest:	Wk 33 (mid Aug)	to	Wk 45 (early Nov)

## Group Timings For Sydney And South

### Group 4 – Summer Forcing Snaps

Seed:	Wk 37 (mid Sept)	to	Wk 52 (end Dec)
Transplant:	Wk 41 (mid Oct)	to	Wk 4 (end Jan)
Harvest:	Wk 48 (end Nov)	to	Wk 12 (end Mar)

### Group 3 - Autumn Forcing Snaps

Seed:	Wk 1 (early Jan)	to	Wk 6 (early Feb)
Transplant:	Wk 5 (early Feb)	to	Wk 10 (early Mar)
Harvest:	Wk 13 (end Mar)	to	Wk 18 (early May)

### Group 1 & 2 – Winter Forcing Snaps

Seed:	Wk 7 (mid Feb)	to	Wk 26 (end Jun)
Transplant:	Wk 11 (mid Mar)	to	Wk 30 (end Jul)
Harvest:	Wk 20 (mid May)	to	Wk 40 (early Oct)

### Group 3 – Spring Forcing Snaps

Seed:	Wk 27 (early Jul)	to	Wk 36 (early Sept)
Transplant:	Wk 31 (early Aug)	to	Wk 40 (early Oct)
Harvest:	Wk 40 (early Oct)	to	Wk 48 (end Nov)

Disclaimer: "Significant variations in seed, variety and crop performance, in results and in crop outcomes may occur depending upon geographic location, climate, soil type, soil conditions, cultural and management practices and other growth and development factors. Any cultural and descriptive information or other advice, recommendation, information, assistance or service provided by Highsun Express is intended as a general guide only and should not be relied upon and is provided without liability or responsibility (including for negligence) on the part of Highsun Express. It is recommended that in all cases a small scale trial production is undertaken in order to test local conditions and circumstances that may affect the crop."



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