COLORADO FLOWER GROWERS ASSOCIATION, INC.

IN COOPERATION WITH COLORADO STATE UNIVERSITY
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Snapdragon--A Crop for Colorado

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Why have snapdragons and crops other than carnations been less popular with the Colorado grower? The answer is simple. The grower's net return has not been as high as that from carnations. Why? In many cases, it boils down to a better marketing job on carnations.

Why should we consider the snapdragon as a potential crop at this time? Better varieties, variety classification into response groups, and cultural shortcuts could make this crop more profitable than carnations. Combining these technical advances with closer spacing to produce the grades retailers want and will pay for can make this a most interesting crop.

Among the most important advances in snap culture are improved varieties and their classification into light-temperature groups. Firm-stemmed, clean-growing hybrid varieties are now available for flowering year round. Most varieties are relatively non-shattering, and breeders are improving the "holding" characteristics of snapdragons each year.

Snapdragon varieties have been classified into light-temperature groups for flowering at specific times of the year (see schedule). This classification is based on the reaction of the variety to temperature, daylength, and light intensity. Class I snaps should be flowered Dec. 10 to Feb. 15. Due to higher winter light intensity in Colorado, Class II snaps are also satisfactory for this period. Class II snaps should be selected for flowering in late fall and early spring, Class III in early fall and late spring, and Class IV in summer. If varieties are flowered in their proper season, there is much less trouble from soft growth and grassiness. They also flower on time.

Culture

Tremendous quantities of good seedlings are needed on an exact time basis. This means a reliable method for germinating and growing. From 20 to 30 days should be adequate to produce seedlings of optimum size for planting in the producing bench.

The medium for germination should be one you can duplicate week after week. Failures cannot be tolerated. We prefer one part each of coarse sand, sphagnum peat, and soil. The mixture should have medium to low total fertility. Mixture and flats should always be steamed since fungus infection in the seed flat leads to plant losses in the producing bench. Intermittent mist on the seed flats, similar to that used in rooting carnation or mum cuttings, will give near perfect germination. Seed need not be covered. When seed leaves are well developed, mist can be cut off and surface watering started, or the misting turned on manually to water the plants as needed. Tops of plants should be dry at night to reduce possible damp-off. Germinate and grow seedlings in full sun.

A germination temperature of 65-70° F. is preferred. This should be reduced to 55-60° F. after they are well germinated. The foregoing information on germination is merely a guide. Every grower finds ways of improving germination for his operation.

Planting

Four crops per year and from 6 to 12 seedlings per square foot must be planted. The planting operation offers one of the best opportunities for labor-saving in this relatively low-labor requiring crop.

While there are no planting machines to my knowledge, this problem has been approached at Colorado State University. In four plantings, made during the 1964-65 season, planting labor was minimized by the following method.

Soil was tilled, leveled, and steamed. Before planting, the soil was evenly sprinkled so the surface was moist but not wet. Furrows, approximately 1/2-inch deep and 4 inches apart, were made lengthwise to the bed with pot labels. Seedlings were dropped approximately 4 or 5 inches apart, depending on the spacing desired. Each seedling was dropped in the furrow so that the roots were in the furrow and the top was up or leaning on the edge of the furrow.

The first irrigation with a gentle stream of water completed the planting by covering the roots. Plants straightened and resumed growth almost immediately. One of the slowest parts of this operation is the watering-in, but this is also a slow and careful operation following conventional planting.

A simple device can be constructed to make furrows which can be pulled along a bench. It can be as simple as a modified marking board. When seedlings are not overgrown, dropping them in the furrow is a tedious but rapid operation, especially for women.

Irrigation

Snapdragons produce quality flowers under watering regimes similar to those used for carnations. Much of the soft growth on snapdragons in the past was due to poor adaptation of the variety to the time of year and was not due to overwatering. Since snapdragons retain heavy foliage to the soil line, an irrigation system must cover the surface of the bench thoroughly in spite of the dense foliage. A Gates system with narrow angle nozzles spaced 8 to 12 inches apart should accomplish this. Some growers use a soaker hose effectively if their soils have good capillary water movement. Overhead sprinkler irrigation is useful on a large scale before flowering begins.

Timing

A snapdragon planting and flowering schedule should be planned with the seed supplier. A guide for seeding, benching, and flowering dates for Colorado is included with this article. This schedule has been calculated by interpolating between certain key flowering trials and should be used as a guide only. Because of more winter sunshine, the crops flowered from December to April require less bench time than comparable latitudes in other parts of the country. Summer crops in cooled greenhouses may be a bit slower.

Suggested Timing Schedule for Snapdragon in Colorado/a

Seeding date	Benching date	End of crop	Total days bench time
Feb. 15	March 15	June 10	85
March 15	April 10	June 30	80
March 25	April 20	July 5	75
April 10	May 5	July 20	75
April 25	May 15	July 30	75
May 5	May 25	Aug. 10	75
May 20	June 5	Aug. 20	75
June 1	June 15	Aug. 30	75
June 10	June 25	Sept. 10	75
June 20	July 5	Sept. 20	75
July 1	July 15	Sept. 30	75
July 10	July 25	Oct. 10	75
July 20	Aug. 5	Oct. 25	80
Aug. 1	Aug. 15	Nov. 10	85
Aug. 5	Aug. 20	Nov. 20	90
Aug. 8	Aug. 28	Dec. 3	95
Aug. 13	Sept. 3	Dec. 13	100
Aug. 18	Sept. 8	Dec. 22	105
Aug. 23	Sept. 13	Jan. 8	115
Sept. 5	Sept. 25	Jan. 25	120
Sept. 10	Oct. 5	Feb. 5	120
Sept. 20	Oct. 20	Feb. 20	120
Oct. 15	Nov. 10	March 5	115
Oct. 25	Nov. 25	March 20	115
Nov. 5	Dec. 5	March 25	110
Dec. 1	Dec. 30	April 15	105
Jan. 5	Feb. 5	May 10	95
Jan. 20	Feb. 20	May 20	90

/a. Based on single-stem culture, raised benches, and 50° F. night temperature.

Select from the following flowering groups, depending upon the time of year the crop is to flower:

Group I. For flowering Dec. 10--Feb. 15.

Group II. For flowering Feb. 10--May 10 and Oct. 25 --Dec. 10.

Group III. For flowering May 10--June 30 and Sept. 10--Oct. 25.

Group IV. For flowering July 1--Sept. 10.

Spacing

With other factors equal, the grower can regulate the grade of flowers produced by spacing. Normally, spacing should be closer in summer and wider in winter to produce comparable grades. The wider the spacing for any period, the higher the average grade produced. Some markets will not pay for a high percentage of spikes in the top (special) grade. If this is the case, closer spacing will produce more total flowers in the grades desired by the market. There has never been a steady supply of snapdragons to the Denver market so that growers could learn what grades this market requires. If the price is $1.50 per dozen snapdragons, these can be produced by proper spacing.

Table I illustrates the effect of spacing on grades. These data were obtained by the late Dr. Jud Haney at Michigan State University on a planting which flowered in December, 1952. Improved varieties and more light would increase the average grade in Colorado (table II).

Table I.--Effect of spacing on grade of snapdragon Spartan Rose. Flowered Dec. 22 to 31, 1952, at East Lansing, Michigan.

	Dozens per 100 square feet					
Spacing	Special	Fancy	Extra	First	Cull	Total
4 x 8	6.4	15.6	14.6	0.9	---	37.5
4 x 7	7.7	14.3	16.5	4.4	---	42.9
4 x 6	2.9	17.6	23.5	5.9	---	49.9
4 x 5	5.0	10.0	23.3	21.6	---	59.9
4 x 4	4.8	9.4	25.8	30.5	4.8	75.3
4 x 3	0	10.0	32.5	45.0	12.5	100.0

Table II.--Percent of snapdragons by grade produced at 4- by 5-inch spacing

	Special	Fancy	Extra	First
December crop, East Lansing, 1952	8.3	16.7	38.9	36.1
Four crops flowered Jan. to May, 1965 at Fort Collins	40.3	46.8	9.3	3.6

Several factors caused the difference in grade shown in table II, but the major ones were improved light in Colorado and major improvements in varieties. A high percentage of flowers in the special and fancy grades were produced at 4- by 5-inch spacings by four different Class I and II varieties flowered at Fort Collins from Feb. 15 to May 10 (table III).

Table III.--Yield and grade of 4 varieties of snapdragons at Fort Collins, Colorado in 1965. Spacing 4 by 5 inches.

Variety	Flowering date	Grade				
		Special	Fancy	Extra	First	Total
Pan American White	2/15-24	137	99	30	6	272
Debutante	3/11-22	101	115	10	24	250
Snowman	4/10-16	100	164	41	7	312
Treasure Chest	5/1-10	87	116	17	1	221
TOTAL		425	494	98	38	1055

Projection of Profits

In order to make an intelligent estimate on potential profits, one must assign selling prices to the various grades. Prices of 11, 13, 15, and 17 cents per spike are reasonable for the grades first, extra, fancy, and special. Our experience is that retail florists are pleased to have well-graded snapdragons available at these prices.

Projecting these prices on the 1965 yields at Fort Collins gives $1.03 to $1.08 per square foot of bench area per crop. Closer spacing to increase yield and reduce grade can increase gross income per crop. On an average market, the gross income per crop has been increased around 30 percent by changing the spacing from 4 by 5 to 4 by 3 inches. This increases the yield by 40 percent and the gross by approximately 30 percent. This approaches the solution to one of the problems Colorado snapdragon growers have experienced in the past. Generous spacing has produced flowers too large for the demand.

Intelligent planning, better varieties, and close spacing could put snapdragons ahead of carnations as a profitable crop for local markets in Colorado.