Colorado Flower Growers Association, Inc.

IN COOPERATION WITH COLORADO STATE UNIVERSITY

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Spacing Patterns for Carnations

by

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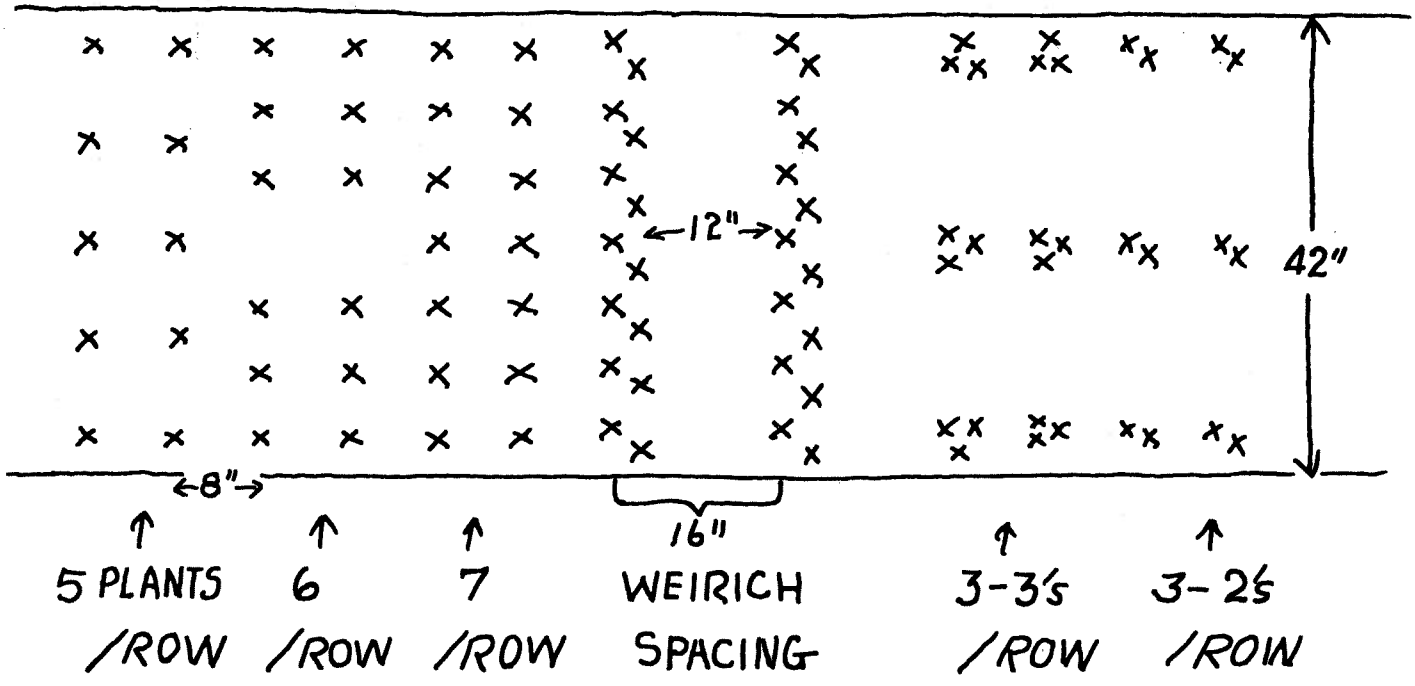
There is no doubt an optimum plant density for most cut flower crops. This optimum usually varies with light available to the plants. The objectives of the grower would also have a bearing on whether he sets his plants close together, or allows them more space. If he wants a heavy first crop to hit a particular market, he may justify two or three times the normal number of plants. If he is more interested in a steady crop of better than average flowers, he may set fewer than normal.

Within the past two or three years the Weirich spacing pattern has been widely adopted for carnations. The same number of plants are set in a bench with closely spaced rows alternating with 12-inch openings. Several advantages are apparent from this arrangement of plants. Cutting the flowers and caging the growths are facilitated. Sprinkler irrigation is more easily accomplished. Air flow through the plants is accomplished especially where fans pull the air across the benches. Certain winter light advan-



tages have been claimed for houses oriented in an east-west direction. These may or may not be valid. Without doubt some labor is saved by the foregoing advantages.

The normal spacing used on carnations in Colorado for the past decade has been 6 by 8 inches, or three plants per square foot. As summer cooling of greenhouses developed, plants made more summer growth and filled with lateral shoots for the following winter's crop. A count of laterals on carnation plants during the early fall far exceeds the number of flowers which are cut the succeeding six months. This heavy increase in plant density may have contributed to the increase in percentage of design grade flowers since summer air conditioning has been adopted.

To investigate possible influences of plant density and spacing patterns on yield and grade of carnations, six different treatments were set up as follows:

1. Three groups of three plants per row,
2. Six plants per row,
3. Three groups of two plants per row,
4. Five plants per row,
5. Seven plants per row, and
6. Weirich spacing with 7 plants per row and alternating 4- and 12-inch spacing between rows.

Three benches 42 inches wide were planted with rooted cuttings of White Sim on June 5, 1959. The 6 spacing treatments were randomized within each bench, each plot occupying 14 square feet with buffer plants of a color sport on either side at the same spacing.

Table 1. Effects of spacing patterns on yield and grade of Sim carnations.

Spacing pattern	Grade						
	Design	Short	Stand.	Fancy	Total	Mean grade	Fls. sq. ft.
3 -- 3's/row	192	184	525	450	1351	3.91	32.2
6 plants/row	218	208	547	403	1376	3.82	32.8
3 -- 2's/row	132	177	507	489	1305	4.04	31.1
5 plants/row	145	199	516	387	1247	3.92	29.7
7 plants/row	192	213	492	450	1347	3.89	32.1
Weirich	195	193	458	408	1254	3.86	29.9

Flowers were cut from October 4, 1959 to May 28, 1960, and graded by a combination of weight, stem length and strength, and flower size. The yield and grade for the three plots of each treatment (42 square feet) is included in table 1. When analyzed statistically none of the differences were significant. A distinct trend toward fewer designs and more fancy grade flowers was noted where three groups of two plants were set per row. This spacing pattern throughout a bench gives an advantage from better air flow through the plants when the flow is linear with the bench. Labor saving due to easier cutting and caging is less apparent with this arrangement, however.

In conclusion, there was little effect on yield or grade of carnations spaced in these six patterns. This indicates strongly that a grower is rather free to space and arrange his plants for improved air flow through his plants without fear of reducing yield and grade. Better winter temperature control (See CFGA Bul. 128) can accomplish more reduction in design grade flowers than can reducing the plant density in the benches.