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Some Effects of Timing and Cooling on Carnation Quality

by W. D. Holley

During the past two years the cooling of greenhouses has come into general commercial practice. The fan and evaporative pad method (1) has been used most in carnation culture. The improved quality of summer and fall flowers grown with cooling has been outstanding. It was the purpose of this investigation to study some of the effects of summer cooling on the growth of the plants and the quality of flowers during the winter following cooling. The effect of cooling on the timing of these plants was reported in Bulletin 89.

Large cuttings of Sim varieties of carnation were planted at 10-day intervals from May 25 to July 15, and a final planting was made August 5, 1956. The greenhouse was cooled by fans and evaporative pads according to formulas presently in use. The cuttings were pinched above the sixth to eighth pair of leaves 10 to 20 days following planting, or as lateral growths appeared. Each planting occupied 21 square feet of bench area, or a total of 147 square feet.

Night temperatures during the summer and fall varied from 55 to around 65°F. From October through the winter and spring, they were controlled at 50 to 52°F. Day temperatures during the summer varied with the weather from a low around 65° to a high of 84°. During the heating season these day temperatures varied from 60° on cloudy days to 75° on sunny days.

For comparison, rooted cuttings of the variety Red Gayety were planted in boxes June 25 (near the average planting date for the cooling treatments) and grown out of doors until October 3, then moved into a greenhouse which was not cooled. The spacing (6 by 8 inches), fertilization, watering, and other cultural methods were the same for this lot of plants as was described for the plants in a cooled greenhouse. However, the planting time was not identical. The uncooled plants were started at the average starting time for the 7 cooled plantings.

The total yield for the seven cooling treatments, the number of flowers in each grade and the mean grade are compared to the yield from the same area (147 sq. ft.) of uncooled plants in Table 1. Cooling increased the yield to May 11, 1957, by 38

	Split and design	Short	Standard	Fancy	Total	Mean Grade
Cooled during Summer	365	416	2041	1445	4267	4.07
Not cooled	44	56	1288	1692	3080	4.50

Table 1. The effects of greenhouse cooling on yield and grade of Sim carnation.

per cent, or 1187 flowers. Over half of this increase (681) came in the design and short grades. Cooling increased the yield in the standard grade by 58 per cent and decreased fancy flowers by 14 per cent.

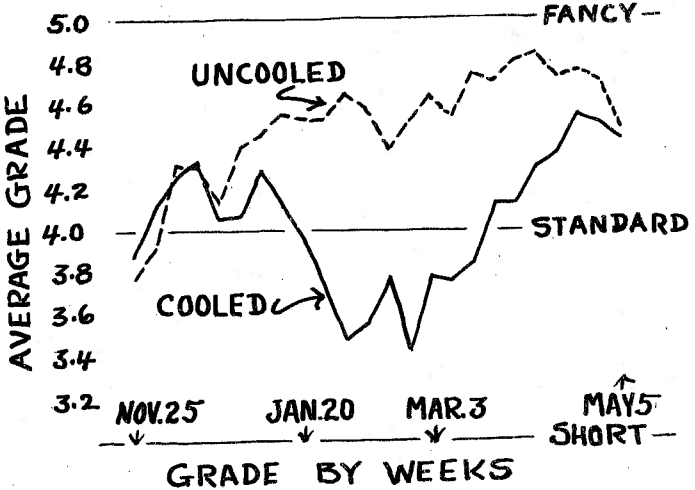

Fig. 1. The average grade of cooled and uncooled Sim carnations, 1956-57

Summer cooling most adversely affected the mean grade from December 30 to March 23, Fig. 1, however, the grade of flowers produced by the cooled plants did not equal that from uncooled plants until early May. The yield from the cooled plants was at an exceptionally high rate from December 30 to February 10 (Fig.2),

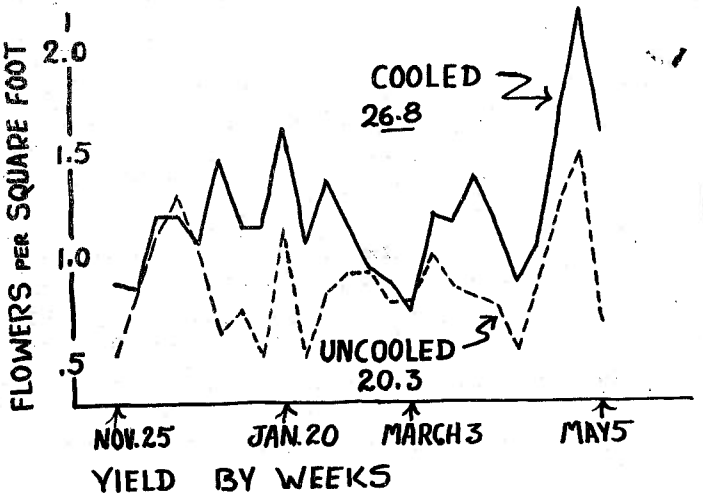

Fig. 2. The yield of cooled and uncooled Sim carnations, 1956-57.

a time when light is at its lowest. This high yield came on lateral branches produced in August, September, and October, when greenhouse cooling was most effective in promoting this lateral growth, both in size and numbers. The adverse effects on mean grade were no doubt due to the heavy yield of flowers at a time when light and carbohydrates were limited. The higher light intensities of March and April were required to finally nullify these ill effects.