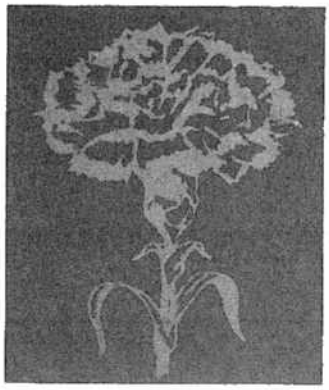

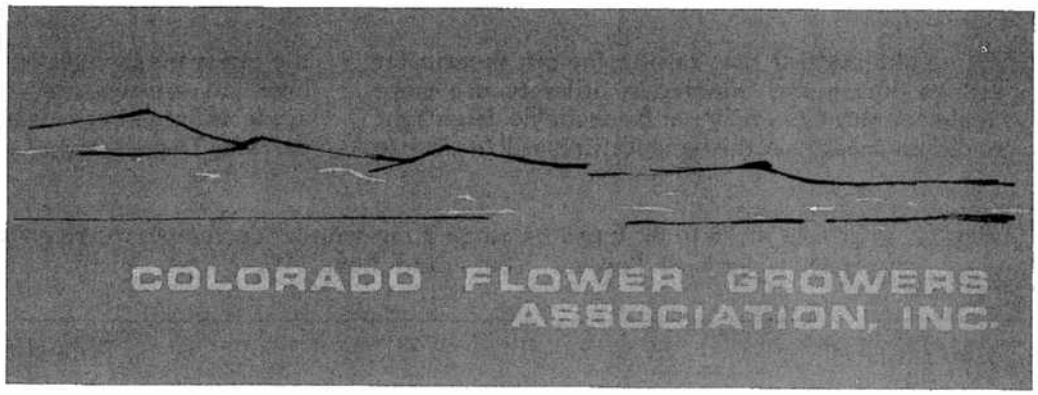

IN COOPERATION WITH COLORADO STATE UNIVERSITY
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The Effect of High Day Temperatures on New Plantings of Forever Yours, Love Affair, and Cara Mia Roses

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A short-term study of the effects of high day temperatures on new plantings of Forever Yours, Love Affair, and Cara Mia roses was conducted this summer at CSU. Total yields at temperatures of 85 to 90 F were 49.6% higher than yields of roses grown at a day temperature range of 78 to 80 F. However, the number of marketable flowers increased only 20.8%. Stem length, fresh weight, and flower size were reduced at the higher temperatures resulting in lower quality flowers.

A total of 96 plants of each variety was planted in four 14' x 18' fiberglass houses. One ground bed each of Forever Yours and Love Affair was planted in each house with Cara Mia grown as buffer plants at the ends of the beds. Two of the houses were set up with the first stage of cooling starting at 78 F and the last stage at 82 F. The other two houses were set with 84 to 88 F cooling temperatures. Carbon dioxide was added to each house at the rate of approximately 500 ppm.

Yield, stem length, and stem fresh weight were recorded for each variety beginning August 10, 1972 when the first flowers were cut. Records were terminated September 25 when temperatures were reset. The term "marketable flowers," as used in Tables 1 and 2, includes all flowers that were salable.

Table 1 compares Forever Yours and Love Affair and Table 2 shows the same statistics for Cara Mia. Total yields were much higher for each variety grown at high temperatures. However, the percentage of these flowers that were marketable was much lower than from plants grown at the lower temperature. Forever Yours and Cara Mia showed an increase in the number of marketable flowers per square foot. Forever Yours showed no change in stem length, but the fresh stem weight was much lower at the higher temperature. Cara Mia at the high temperature showed a substantial decrease in both stem length and weight. Love Affair gave results similar to Cara Mia except the number of marketable flowers for each treatment was the same. Love Affair had lower yields, indicating that perhaps the cultural requirements for this variety are different, or the variety is unsuitable for greenhouse production.

In addition to the effects on yield, length, and weight, each variety showed different damages from high temperatures. Cara Mia under the high temperature produced a large number of stems with two or more burned leaves. Small flower size was evident under both treatments. Forever Yours grown at high temperatures initially showed a large number of bullheads, but cabbage heads (Table 1) and very small flowers showed up in large numbers during the last 3 weeks of the study. Love Affair produced a large number of bullheads and some cabbage heads at high temperatures.

Figure 1 compares the grade distribution of each variety under high and low temperatures. High temperature affected Forever Yours by producing a greater number of flowers in the middle grades. Love Affair and Cara Mia produced more flowers in the lower and middle grades and less in the higher grades.

The results suggest that raising the fan thermostat settings during the summer in order to use more supplementary CO_2 may not be desirable. High light conditions mean that the temperatures will be close to the fan settings most of the day. During the winter, high fan settings may not be as serious since the available light never sustains the temperature for long periods. These settings will be repeated this winter.

Table 1. Effects of 78 to 82 F and 84 to 88 F fan ventilation temperatures on yield, stem length, and stem fresh weight of Forever Yours and Love Affair roses planted May 25, 1972.

	Temperatures			
	Forever Yours		Love Affair	
	78-82	84-88	78-82	84-88
Total Yield	412	583	238	317
Marketable Flowers	377	433	181	180
Percent Marketable Flowers	91.5	74.3	76.0	56.8
Marketable Flowers per square foot[a]	6.7	7.7	3.2	3.2
Mean stem length (inches)	18.3	18.2	18.2	17.0
Mean stem fresh weight (ounces)	0.805	0.643	0.760	0.575
Percent burned leaves	—	3.1	—	—
Percent bullheads	7.5	13.9	20.0	38.0
Percent cabbage heads[b]	—	8.5	2.9	4.7
Percent small flowers[c]	—	11.0	—	—

aFlowers cut beginning August 10 and ending September 25, 1972.
bInner petals short, underdeveloped, or missing resulting in hollow flowers and/or short flat buds.
cThese flowers were included in the number of marketable flowers.

Table 2. Effects of 78 to 82 F and 84 to 88 F fan ventilation temperatures on yield, stem length, and stem fresh weight of Cara Mia roses planted May 25, 1972.

	Temperatures	
	78-82	84-88
Total Yield	424	697
Marketable Flowers	402	547
Percent Marketable Flowers	94.8	78.5
Marketable Flowers per square foot[a]	7.2	9.8
Mean stem length (inches)	20.0	17.9
Mean stem fresh weight (ounces)	0.96	0.66
Percent burned leaves	4.7	20.6

aFlowers cut beginning August 10 and ending September 25, 1972.

Figure 1. Grade distribution of three varieties of roses grown under 78 to 82 F and 84 to 88 F fan ventilation temperatures.