



# COLORADO FLOWER GROWERS ASSOCIATION

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## Effect of CO<sub>2</sub> Concentrations on Roses: II Yield

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Yield, length and weight records were obtained from roses grown at 500, 1000, 1500 and 2500 ppm CO<sub>2</sub> under clear-day conditions. Yield increased between 500 and 1000 ppm CO<sub>2</sub>, but higher levels did not result in significant differences. Length and weight were not significantly affected, although higher levels seemed to hasten peak cycling, and hasten flower development. It appeared that 1500 ppm CO<sub>2</sub> was an optimum level.

### Methods

'Forever Yours' and 'Love Affair' roses were grown in four individual houses maintained at 500, 1000, 1500 and 2500 ppm CO<sub>2</sub> under clear-days. Otherwise, conditions were the same in all houses as outlined in Part I of this report. Yield, length and weight records were kept for a period beginning November 3, 1974, and terminated May 3, 1975.

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### Results

There was a marked increase in total yield between 500 and 1000 ppm CO<sub>2</sub> (Fig. 1). 'Love Affair' was not as responsive. For 'Forever Yours', the difference was 24% (593 to 779 cut roses). There was not a statistically significant response for either cultivar with 1500 and 2500 ppm CO<sub>2</sub>.

Fig. 2 shows typical response patterns for roses grown at 1000 and 1500 ppm. Increasing CO<sub>2</sub> concentration appeared to hasten peak production by about one week, reduce the peaks, and increase the off-crop production. As noted in Fig. 3, higher CO<sub>2</sub> levels hastened bud development by about 1 to 2 days. There were no significant effects on weight and stem length.

Under commercial conditions, it is doubtful that 2500 ppm CO<sub>2</sub> can be maintained consistently, and any increase in growth probably does not warrant the expense. It appears that levels of 1500 ppm under cloudless conditions represents the best compromise. Levels will be much higher during early morning and late evening hours, or if skies are cloudy.

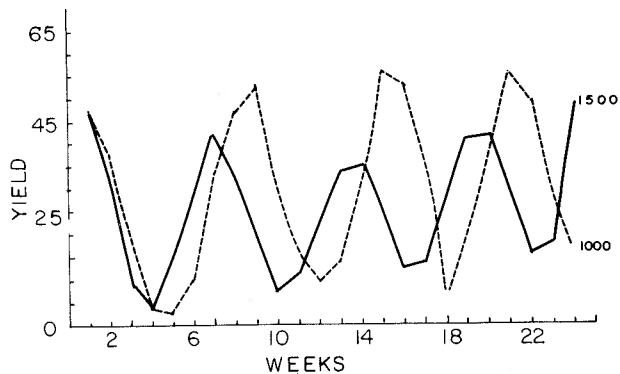
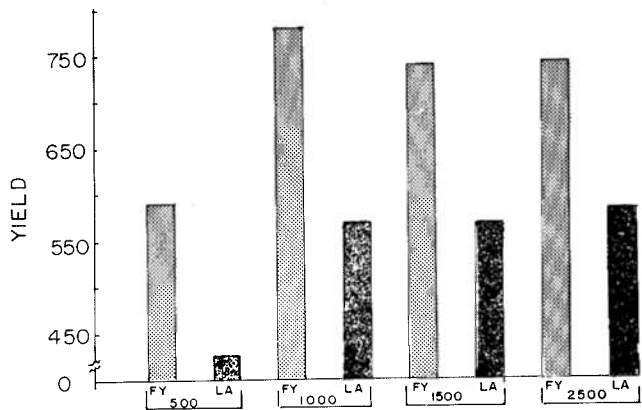


Fig. 1: *Upper*: Effect of CO<sub>2</sub> concentration on total yield of 'Forever Yours' (FY) and 'Love Affair' (LA) roses between November 3, 1974, and May 3, 1975.

*Lower*: Smoothed weekly yield of 'Forever Yours' roses grown at 1000 and 1500 ppm CO<sub>2</sub>.

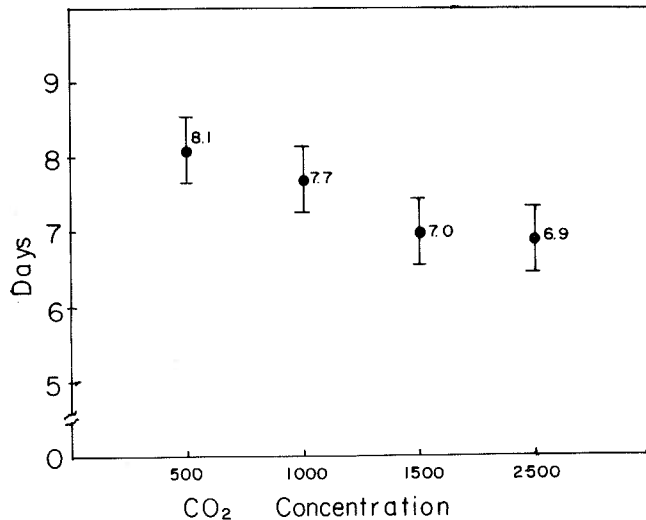


Fig. 2: Number of days required from sepal separation to cutting of 'Forever Yours' roses grown at 4 different CO<sub>2</sub> concentrations. Vertical bars which do not overlap are significantly different from each other.

