LOWERING ROSE GREENHOUSE TEMPERATURES MAY BE FALSE ECONOMY

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Many greenhouse growers have been attempting to deal with rising fuel costs by reducing consumption through the use of insulation, properly maintained equipment, and other conserving measures. At best, such steps have only served to slow somewhat the rapid upward trend in heating costs, as is illustrated by figure 1. The graph shows the amount of gas burned at the University of California field station greenhouses in San Jose during the winters of 1971-72, 1975-76, and 1979-80, and its cost. The data are for similar eight-week billing periods, mid-December - mid-February. The large decrease in the number of therms used at San Jose between 1971-72 and 1979-80 was not sufficient to keep gas costs from rising by 80 percent over the eight-year period. The large amount of gas consumed during the winter of 1971-72 is attributed to abnormally cold weather in central California, combined with little in the way of conservation. The greatly reduced consumption during the winter of 1979-80, on the other hand, reflects not only a mild winter but also the closing of one greenhouse and the use of a number of heat-conserving measures. Had gas consumption at San Jose been as great in 1979-80 as it was in 1971-72, its cost in 1979-80 would have been $1,770.00 rather than $360.00.

Faced with similar cost squeezes in spite of heat-conserving measures, many growers have reduced night minimum temperatures a few degrees below their usual setting. The results of an experiment conducted at San Jose during the winter of 1979-80 demonstrate that such a practice can, indeed, reduce gas bills significantly. However, such a practice — at least in the case of

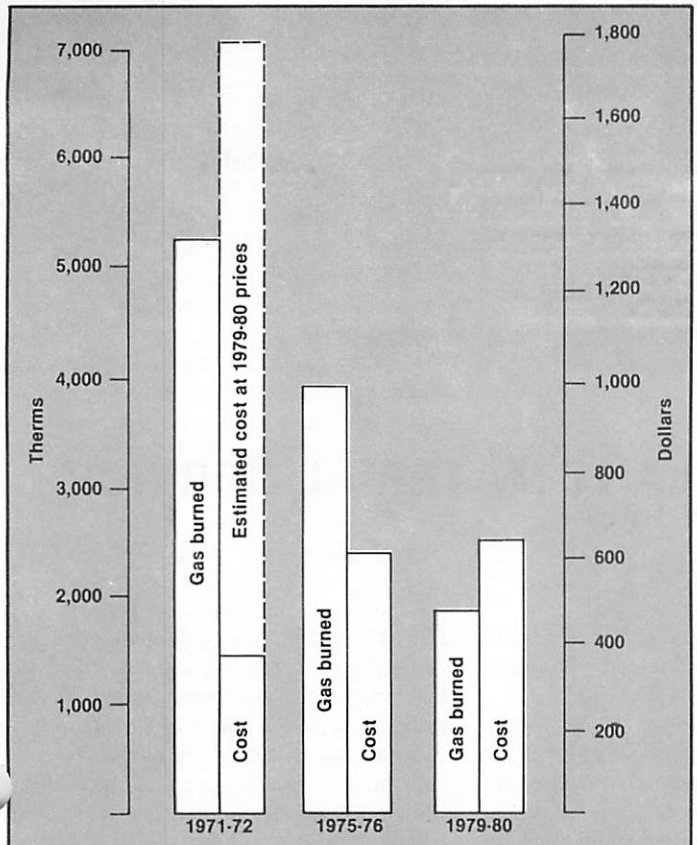

Fig. 1. Gas consumption (therms) and cost (dollars) for eight-week period, mid-December to mid-February, for three selected years, floriculture greenhouses, U.C. field station, San Jose.

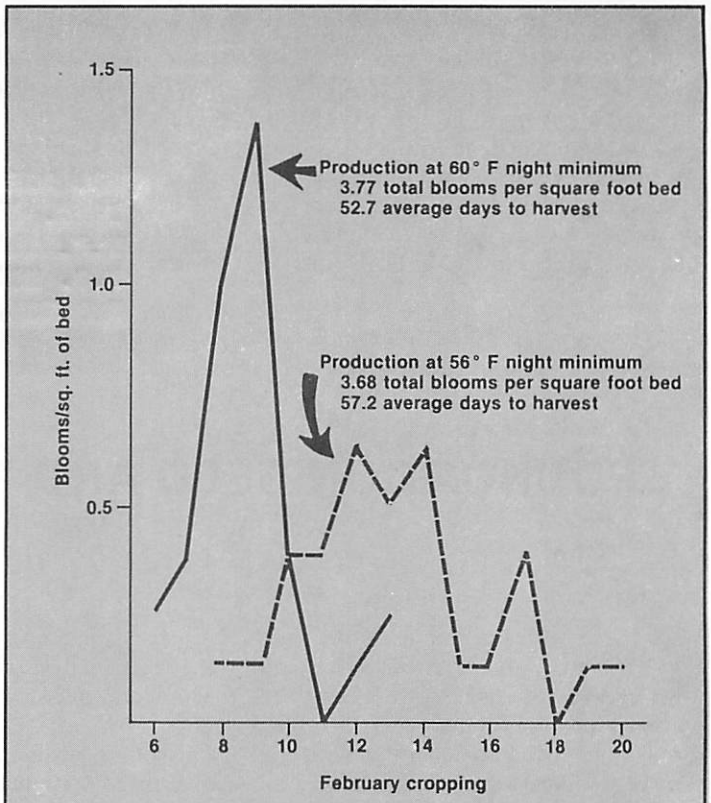

Fig. 2. Return crop production from December 18 harvest cut of 'Cara Mia' roses grown at 60° or 56° F night minimum temperature, San Jose, 1979-80.

roses — may also reduce net income appreciably by delaying the harvest past a peak market period.

The time of harvest and number of blooms cut per day for a Valentine's Day crop of 'Cara Mia' roses grown at 60° F minimum night temperature compared with that of a similar crop grown at 56° F minimum is shown in figure 2. Both treatments (N = 16; one plant per square foot) had been grown in 5-gallon containers in the same greenhouse at 62° F minimum until the previous December 18. The stages of shoot maturity at that time had ranged from full open buds (about three days beyond normal harvest stage) to those showing color but with sepals not yet reflexed. The plants grown at 56° F minimum thereafter produced a return crop total of 3.68 blooms per square foot of bed compared with 3.77 per square foot for those grown at 60° F minimum — a difference that is not statistically significant. Also, the average number of days to harvest was only about 8 percent more (4½ days) for the cooler-grown crop.

These appear to be small differences when the savings in heat are considered: 21.4¢ per square foot of bed for the 60° F planting, but only 12.8¢ per square foot for the 56° F planting. However, it should be noted that 90 percent of the 60° F crop was harvested by February 10 — the planned market cut-off date — but less than 20 percent of the cooler-grown crop was harvested by this date. In addition, the normal spring cropping schedule was delayed appreciably in the cooler planting (although no harvest data were recorded after February 20).

Cost of Heating Two Similar Greenhouses Maintained at 60° F and 56° F Minimum Night Temperatures from mid-December, 1979, to mid-February, 1980. San Jose U.C. Floriculture Facility

	Cost per sq. ft. greenhouse		Cost per sq. ft. rose bed		Cost per acre greenhouse	
Heating period	60° F	56° F	60° F	56° F	60° F	56° F
	¢	¢	¢	¢	$	$
12/17 to 12/30	3.13	1.55	4.81	2.39	1,362	676
12/31 to 1/13	3.84	2.70	5.91	4.16	1,674	1,177
1/14 to 1/27	3.99	2.22	6.14	3.42	1,738	968
1/28 to 2/10	2.92	0.93	4.49	1.43	1,272	405
Total	13.88	7.40	21.35	11.40*	6,046	3,226

*Actual fuel cost for 56° F crop was 12.8¢ when harvest was completed on February 20, 1980.

It should be borne in mind that the winter of 1979-80 was unusually mild in most California flower-producing areas. A cold winter would be expected to magnify the differences observed in this experiment, because minimum temperatures would be reached earlier in the night. It therefore appears that lowering rose greenhouse temperatures a few degrees to save on heating bills could easily prove to be false economy, even discounting some of the other problems that could occur under cooler conditions (such as higher incidence of Botrytis flower blight or downy mildew). It also appears that the apparently favorable 1979-80 production comparisons made with the previous winter's crop by some "cool" California growers may not be completely valid because of the confounding effects of the two seasons. In other words, last winter may have been a relatively favorable winter in which to "shave" night temperatures. In any case, the practice ought to be evaluated carefully in light of total season scheduling requirements if production and net income losses are to be minimized.

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