

ETHYLENE CONCENTRATIONS INSIDE AND OUTSIDE RETAIL ESTABLISHMENTS IN DENVER

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At the request of CFGA, air samples were taken periodically, inside and outside several retail establishments in Denver. Fig. 1 shows the general locations. The majority were retail flower shops, although two supermarkets were included. Samples in the retail shops were usually taken inside the cooler. Due to the distance between locations, and the fact that analysis had to be done in Fort Collins, sampling was not simultaneous; usually beginning before 8:00 a.m. at Location 1 and finishing at Location 6 around noon. It so happened that none of the days on which sampling was conducted (8 days between December, 1976, and April, 1977) could be considered as highly polluted.

Table 1 shows a summary of 99 samples, the trend toward higher concentrations inside buildings was not statistically significant. Most of this was due to extreme variability in ethylene concentration. Fig. 2 is more meaningful, showing that 92% of all inside samples had ethylene concentrations less than 60 ppb. On the other hand, most outside samples (85%) had concentrations less than 40 ppb, with 36% of the samples having concentrations in the range of 0 to 10 ppb. Note that there were three outside samples with ethylene levels in excess of 80 ppb, ranging upward to 150 ppb. This variability did not occur with inside air samples.

The pattern for outside concentrations follows the trend shown by earlier sampling in 1972 (CFGA Bul. 264). It appears that most establishments will have ethylene levels ranging from 10 to 30 ppb. This is a distinct departure from outside, suggesting internal ethylene contribution, and that inside ethylene levels do not, generally, follow outside concentrations. On the basis of previous work (CFGA Bul. 263 and 276), we know that exposure to ethylene at 100 ppb

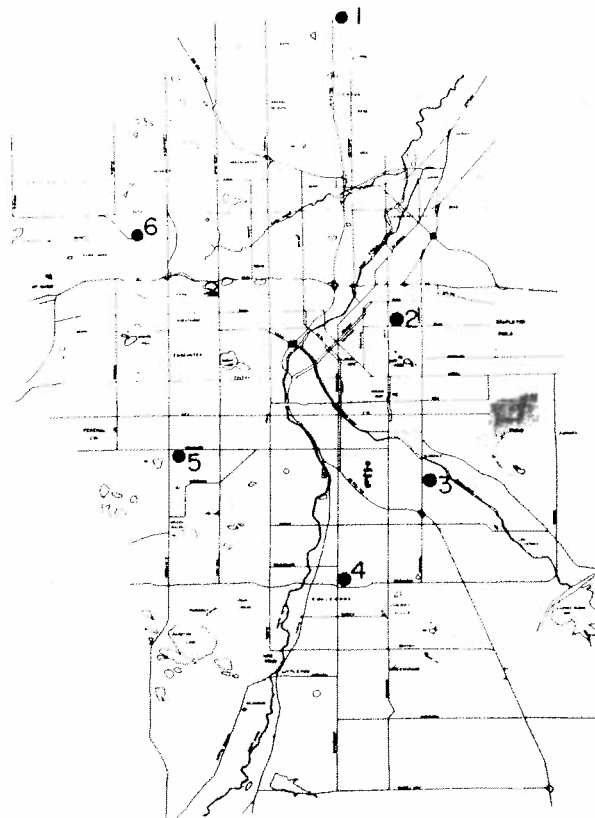


Fig. 1: General location of retail establishments sampled for ethylene in the Denver region.

Table 1: Average ethylene concentrations (ppb) inside and outside several retail establishments in the Denver region.

	Location number (See Fig. 1)						Mean
	1	1	3	4	5	6	
Inside ^a	34	36	31	35	20	29	31
Outside	32	23	37	29	23	10	26

^a Samples usually taken inside refrigerator.

for less than one day will reduce keeping life of carnations 20% if kept at 70°F. At 30 ppb, exposure for more than 2 days, but less than 3 days, will reduce carnation keeping life by 20%.

In general, it seems to be a safe conclusion that carnation keeping life probably suffers wherever they are kept for one or more days at room temperature. Procedures undertaken to maintain carnations at low temperatures, or remove ethylene by air circulation to the outside, would probably improve carnation keeping.

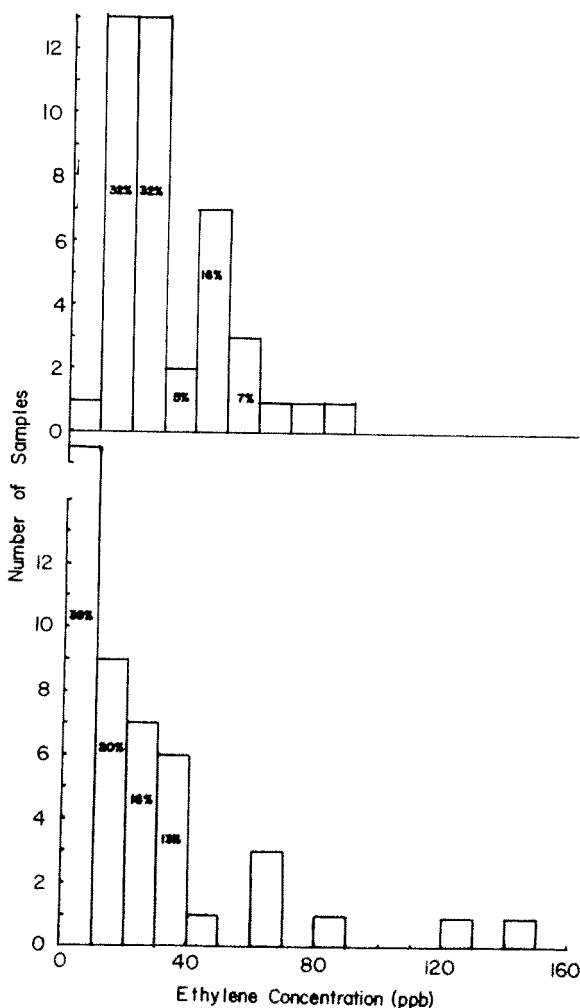


Fig. 2: Ethylene concentration frequency inside and outside several retail establishments in the Denver region. Total of 99 samples between December, 1976, and April, 1977.

Upper — Inside samples

Lower — Outside samples