

# HYPOBARIC STORAGE OF CUT FLOWERS

Raymond F. Hasek, Extension Environmental Horticulturist, Davis

Recent uncertain market conditions have triggered a great deal of interest in postharvest handling of cut flowers. In an attempt to achieve more orderly marketing, long-term storage of cut flowers was begun in 1971 at Michigan State University, where hypobaric or low-pressure storage came under investigation.

Fresh-cut flowers are placed in vacuum chambers and the air pressure within reduced to approximately  $\frac{1}{2}$  atmosphere. During storage the temperature is maintained at 32° F, and humidified ethylene-free air is drawn through the chamber continuously. The purging action of the humidified air prevents flowers from drying and also eliminates possible ethylene buildup within the plant tissue or surrounding air. By reducing total pressure to which the flowers are subjected, the researchers reasoned any ethylene produced within the plant tissue would escape more rapidly.

To date, cut carnations, which are notoriously sensitive to small amounts of ethylene in the environment, have shown little or no sleepiness when subjected to hypobaric storage.

Results with roses and snapdragons were not as successful. The bluing problem was not eliminated in 'Forever Yours' roses under hypobaric storage conditions. In addition, an unacceptable amount of decay occurred.

Snapdragons harvested with only one or two florets opened stored well for up to 8 weeks. However, when one-third to one-half of the florets were open on each spike at harvest, a great deal of decay developed during storage.

For the time being, carnation storage at either the bud stage or commercial degree of openness appears to be the most promising. Since the test chambers used in the experiments were only 1' x 2' x 2' vacuum-tight containers, application of the technique on a feasible commercial scale will be costly.

At present-day prices the carnation grower must consider investment costs compared to eventual results of long-term storage. Those who use hypobaric storage first will probably gain a short-term advantage. As the practice comes into general use, the initial advantage will be lost. Growers will then be faced with the possibility of prolonging glut periods if they use this storage method to withhold flowers from the market during times of overproduction. Should the storage of large amounts of flowers become even more prevalent for holiday periods, the resulting ample quantities or oversupply could eliminate the so-called "hot holiday" markets. Only time will tell whether hypobaric storage will be a boon to the carnation industry or just another added cost of production.