Conditioning Flowers After Holding at 32°F

by

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When cut flowers are removed from 31°F, they probably have to be conditioned by the grower before packaging and shipping to market or they will arrive in poor condition. Flowers would probably keep better if they were conditioned by the consignee but our present handling methods will not permit this. To insure results, cut the stems and place them in water at a temperature of 100°F, then place the container of hot water at 40°F for 6 to 12 hours that the stems may absorb water. Water temperature of 100°F and air temperature of 40°F during the hardening period provide conditions for rapid water uptake and retention. Cutting stems is of less importance than the warm water treatment.

Why Condition Flowers?

Conditioning flowers after dry packing is necessary because some water is lost from the plant tissues during the holding period regardless of the method of packaging. When flowers are cut from the plant, they are often slightly wilted; particularly if cut in the afternoon. The recommended procedure for holding cut flowers (essential for Better Times roses) is to package directly after cutting without a hardening treatment.

The following information was obtained for Better Times roses, the same factors have been found effective with all other stored cut flowers. In these experiments, Better Times roses were wrapped in Cellophane and held dry for 15 to 18 days at 31°F. At the end of this period, the flowers were placed in tap water of different temperatures and either placed in a 40°F refrigerator or at room temperature to determine the proper conditions for hardening.

Water and Air Temperatures

The warmer the water used in hardening roses within 32°-122°F, the greater is the amount of water absorbed. An air temperature of 40°F caused flowers to retain more water than higher temperatures. Cutting the base of the stems caused additional water to be absorbed. Cutting was not as important as the high water temperature and low air temperature during the hardening process.

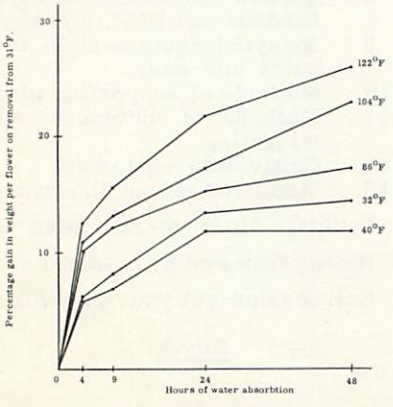

Figure 2. Original water temperature and percentage increase in weight because of water absorbed. Flowers and water placed at 40°F air temperature. Roses held 21 days at 31°F before treatment.

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The results for Better Times roses held for 24 days at 31°F are presented in Figure 1. Water at a temperature of 90°F resulted in a greater percentage increase in weight than water at 32°F and more water was absorbed at the low air temperature of 40°F than at room temperature. Cutting the base of the stems increased the uptake of 90°F water, but was more important at room temperature than at an air temperature of 40°F.

Different water temperatures from 32°F to 122°F at an air temperature of 40°F were compared for hardening roses as indicated in Figure 2. Although the percentage increase in weight for this group of roses was not as great as those in Figure 1, the higher the temperature of the water, the greater the increase in weight of the stored roses over their original weight after holding. Fresh cut roses were also found to respond to water temperatures in a similar manner to held roses.

After Effect of High Water Temperature

During the second 24 hours of water uptake at room temperature, the flowers originally placed in water at the higher temperature continued to gain weight, while the flowers placed in water at 32°F and 40°F gained little or no weight during the second 24 hour period. This continuous gain in weight during the second 24 hours indicates that the physiology of the flowers is affected by the water originally at higher temperatures and the effect continues for periods beyond the time when the water temperature is high.

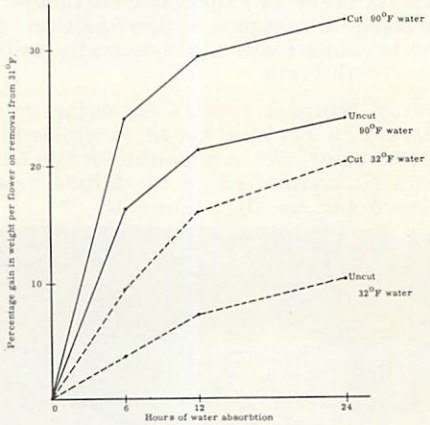

Figure 1. Percentage gain in weight of roses as influenced by water temperature and cutting the base of the stems.

Water at 122°F may be considered extremely warm for hardening roses or other cut flowers. However, one must consider that this water cools immediately after placing the flowers in the container and the effective temperature is considerably lower. In addition, the limiting water temperature was not found as no decrease in water uptake was found at the highest temperature tested.

Results of these experiments show that flowers placed in water at a temperature of 100°F or higher and the container of flowers placed at 40°F increases the amount of water absorbed and retained by roses held or fresh cut more rapid than lower water temperature or higher air temperature.

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