PRECONDITIONING OF PREMATURELY CUT GLADIOLUS SPIKES

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In California, gladiolus cut flowers are harvested when one to three of the lower buds on the spikes show petal color at the tips. If spikes are harvested "green," i.e., with no floret color showing, the buds may not open when they reach the consumer. This is particularly true of certain cultivars, such as 'Captain Busch.'

A. Halevy, Shimon Mayak, and others in Israel, and A.M. Kofranek at University of California, Davis, have demonstrated that using high sugar solutions to precondition green gladiolus spikes after harvest can overcome the problem of buds not opening properly.

76

BESEMER

An experiment was conducted to determine a practical commercial procedure at the producer level for conditioning and shipping gladioli to market. A standard conditioning solution was used, containing distilled water, 20 percent sucrose, 200 ppm 8-hydroxy-quinoline citrate, 50 ppm silver nitrate, and 50 ppm aluminum from aluminum sulfate.

A total of 300 spikes of 'Captain Busch' were cut in a green condition on January 23, 1974. They would normally be harvested two to three days later at that time of year. The spikes were tied into bunches of ten stems each, and the cut ends trimmed.

The experiment consisted of six treatments with five bunches of ten stems in each treatment. Four treatments were held for 18 hours in the complete sugar solution at 40°F or 80°F. After this preconditioning, the treatments were removed from the solution, wrapped in paper, and held dry for 24 hours at either 40°F or 80°F. to simulate shipping conditions. The fifth treatment was held at 40°F for 18 hours in plain distilled water and "shipped" at 80°F for 24 hours. The sixth treatment was kept in the complete sugar solution at 80°F for the entire time of the experiment.

The first five treatments that were preconditioned and "shipped" were placed in plain distilled water after simulated shipping to determine how the florets opened in comparison with the sixth treatment. The opening room was well ventilated at a constant 80°F temperature and had 100 foot-candles from fluorescent lights 24 hours a day.

Each bunch of 10 spikes was placed in a separate vase for floret opening evaluation. The average number of florets that opened per spike (see table) was determined by counting daily those florets that were at least half open on each bunch. Spikes were discarded when the two lowest florets had wilted or senesced. Each day the total number of open florets was divided by the remaining spikes in the treatment. An overall average was then determined for the treatment. No florets opened before the third day in the opening room. All treatments were discarded before or on the tenth day.

RESULTS AND CONCLUSIONS

If gladiolus spikes were harvested in a green condition, the florets opened poorly or not at all. This was demonstrated by treatment E, where the spikes were conditioned in distilled water at 40°F and shipped at 80°F. An average of only 1.87 florets opened per spike in seven days.

Treatments A through D show the effects of preconditioning in a sugar solution. The complete sugar solution helped promote floret opening of green-harvested gladioli. The 18-hour preconditioning in solution at 80°F (C and D) gave the best results. Preconditioning at 40°F apparently did not allow for sufficient absorption of the sugar solution (A and B).

Holding the green-harvested spikes continuously in the sugar solution (treatment at 80°F) achieved the maximum floret opening. In fact, so much sugar was absorbed by the stems that syrup dripped from the florets. Treatment F florets were the largest and had the greatest longevity.

For a commercial procedure, treatment C appears to offer an opportunity for growers and shippers to pretreat green-harvested gladioli or cultivars known to have difficulty in floret opening after harvest. The results of this test indicate that preconditioning gladioli in a 20 percent sugar solution for about 18 hours at 80°F and shipping at 40°F in refrigerated trucks would greatly improve product performance. Although it was not tested, this preconditioning might also improve the ultimate floret opening and quality of normally harvested spikes.

FLORETS OPENED UNDER VARIOUS PRECONDITIONING AND SHIPPING TREATMENTS OF GREEN-HARVESTED GLADIOLI, 'CAPTAIN BUSCH'

Preconditioning treatments and subsequent handling	Avg. no. florets open per spike	Comments on florets
A 40°F solution, 80°F shipping	4.25	Small
B 40°F solution, 40°F shipping	3.85	Small
C 80°F solution, 40°F shipping	5.73	Medium
D 80°F solution, 80°F shipping	5.57	Medium
E 40°F dist. H_2O, 80°F shipping	1.87	Poor opening
F 80°F solution, entire experiment	6.40	Large