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Annals of Biological Research, 2014, 5 (8):13-17  
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## Effect of different levels of sugar in pulsing treatment on post harvest quality of gladiolus cv. American Beauty

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### ABSTRACT

The experiment was conducted at ASPEE, Agricultural Research and Development Foundation Lab, Village Nare, Taluka Wada, District Thane, Maharashtra during Rabi 2013-14. In this study the effects of different levels of sugar in pulsing treatments on post harvest quality of gladiolus cv. American Beauty was carried out. For long-distance transportation, an even earlier harvest stage can be recommended, if it is combined with sugar pulsing (20 % for 20hrs.) to ensure proper opening of the flowers at their destination market. The treatment 20% sugar results in a greater number of opened flowers, marketable condition of spike and longer vase life of spike in days for the gladiolus cv. American Beauty. The parameter of vase life was studied indicated that, the sugar levels increased ultimately increasing the greater number of opened flowers per spike over control.

**Keywords:** Gladiolus, American beauty, Sugar, Vase etc.

### INTRODUCTION

Production of field-grown cut flowers has become quite popular in recent years. The variety of flowers grown has also been increased dramatically. While, production of high-quality flowers is important, it is equally critical to handle the flowers properly after they are harvested from the field. There are reports that improper postharvest handling accounts to 20 to 30% of cut-flower loss during marketing. Still an important commercial cut flower despite a substantial decline in production in recent years, gladiolus responds well to proper postharvest management. The smaller-flowered and 'butterfly' cultivars, as well as modern standards in a variety of colors and forms have helped transform this often stereotypic funeral flower into a contemporary favorite that can be an important accent flower in arrangements.

### MATERIALS AND METHODS

These trails were conducted at ASPEE Agricultural Research and Development Foundation Lab, Village Nare, Tal. Wada, Dist. Thane, Maharashtra during the period of 4<sup>th</sup> January (1<sup>st</sup> and 2<sup>nd</sup> trials) and 8<sup>th</sup> January (3<sup>rd</sup> and 4<sup>th</sup> trials) 2013-14. The aim of this study was to examine the effects of different levels of sugar in pulsing treatment solution that affects envisages on post harvest quality of gladiolus cv. American Beauty. There were 10 treatments consisting

of sugar @ 0, 4, 6, 8, 10, 12, 14, 16, 18 and 20 % along with control- (0 g Sugars) and repeated thrice times as per trial level. The gladiolus cv. American Beauty spikes was collected from ASPEE, Agricultural Research and Development Foundation Farm, Village- Nare, Taluka- Wada, Dist- Thane, Maharashtra during the period of January, 2013-14 (Photo 1).

#### Method of treatments procedure application:

Gladiolus spikes were placed in different levels of sugar solutions overnight (about 20 hrs) as per pulsing treatment wise and then transferred to solutions that do not contain sugar.

The two spikes per replication wise were treated with as per desired concentration of sugars (photo 2). The period of vase solution treatments was 20 hrs. The treated soaked spikes were then transferred to solutions that do not contain sugar on dated 5<sup>th</sup> January (1<sup>st</sup> and 2<sup>nd</sup> trials) and 9<sup>th</sup> January (3<sup>rd</sup> and 4<sup>th</sup> trials) 2014-15 (photo 3). The experiments were replicated thrice times with completely randomized design. Data were compiled and analyzed statistically using appropriate statistical tools.

**Table1 (Figure 1). Effect of different levels of sugar in vase solution affects on post harvest opened flowers per spike, spikes marketable position (Days) and vase life of spike (Days) of gladiolus cv. American Beauty**

Treatment	4 days after opening florets per spike		Pool	8 days after opening florets per spike		Pool	Spikes marketable position (Days)		Pool	Vase life of spike (Days)		Pool
Trials	Trial-1 <sup>st</sup>	Trial-2 <sup>nd</sup>		Trial-1 <sup>st</sup>	Trial-2 <sup>nd</sup>		Trial-1 <sup>st</sup>	Trial-2 <sup>nd</sup>		Trial-1 <sup>st</sup>	Trial-2 <sup>nd</sup>	
T <sub>1</sub>	0.67	0.00	0.33	5.33	5.00	5.17	7.00	8.50	7.75	9.33	10.33	9.83
T <sub>2</sub>	1.33	0.67	1.00	6.00	6.33	6.17	8.00	8.67	8.33	11.67	11.00	11.33
T <sub>3</sub>	1.67	1.33	1.50	6.33	7.00	6.67	9.33	9.00	9.17	12.00	12.00	12.00
T <sub>4</sub>	2.33	2.33	2.33	6.67	7.67	7.17	9.67	9.33	9.50	12.00	12.33	12.17
T <sub>5</sub>	2.67	3.00	2.83	7.00	8.33	7.67	10.00	9.40	9.70	12.67	13.33	13.00
T <sub>6</sub>	3.67	3.33	3.50	8.00	8.67	8.33	10.33	9.83	10.08	12.67	14.00	13.33
T <sub>7</sub>	4.00	3.67	3.83	8.33	9.00	8.67	10.67	10.17	10.42	13.33	14.00	13.67
T <sub>8</sub>	4.33	4.00	4.17	8.67	9.67	9.17	11.00	10.57	10.78	14.33	14.33	14.33
T <sub>9</sub>	5.00	4.67	4.83	10.67	10.33	10.50	14.33	12.00	13.17	15.33	14.67	15.00
T <sub>10</sub>	6.67	5.33	6.00	11.33	11.33	11.33	15.67	14.23	14.95	16.00	15.67	15.83
SEm±	1.22	1.10	0.83	1.07	1.02	0.8	1.00	1.03	0.80	0.97	1.02	0.81
C.D.@ 0.05	3.60	3.25	2.45	3.16	3.01	2.5	3.0	3.04	2.37	3	3.01	2.39

**Table 2 (Figure 2). Effect of different levels of sugar in vase solution affects on post harvest opened flowers per spike, spikes marketable position (Days) and vase life of spike (Days) of gladiolus cv. American Beauty**

Treatment	4 days after opening florets per spike		Pool	8 days after opening florets per spike		Pool	Spikes marketable position (Days )		Pool	Vase life of spike (Days)		Pool
Trials	Trial-3 <sup>rd</sup>	Trial-4 <sup>th</sup>		Trial-3 <sup>rd</sup>	Trial-4 <sup>th</sup>		Trial-3 <sup>rd</sup>	Trial-4 <sup>th</sup>		Trial-3 <sup>rd</sup>	Trial-4 <sup>th</sup>	
T <sub>1</sub>	0.67	1.00	0.83	5.33	5.67	5.50	7.83	7.17	7.50	10.33	10.17	10.25
T <sub>2</sub>	1.33	1.50	1.42	6.33	6.67	6.50	9.00	8.67	8.83	11.67	11.00	11.33
T <sub>3</sub>	1.67	1.67	1.67	6.67	7.00	6.83	9.33	9.00	9.17	12.00	12.00	12.00
T <sub>4</sub>	2.00	1.83	1.92	7.00	7.00	7.00	9.67	9.07	9.37	12.33	12.33	12.33
T <sub>5</sub>	2.67	2.60	2.63	7.33	7.33	7.33	10.00	9.40	9.70	12.67	13.17	12.92
T <sub>6</sub>	3.67	3.73	3.70	8.67	8.00	8.33	10.33	9.83	10.08	12.67	13.67	13.17
T <sub>7</sub>	4.00	3.83	3.92	9.00	8.67	8.83	10.67	10.33	10.50	13.33	13.83	13.58
T <sub>8</sub>	4.33	5.33	4.83	9.00	9.67	9.33	11.00	10.40	10.70	13.33	14.33	13.83
T <sub>9</sub>	5.33	6.37	5.85	10.17	10.00	10.08	12.00	11.33	11.67	15.33	14.50	14.92
T <sub>10</sub>	5.67	6.50	6.08	10.50	11.67	11.08	13.00	12.23	12.62	16.00	15.50	15.75
SEm±	1.03	0.99	0.88	0.92	1.05	0.68	0.71	0.66	0.68	1.09	1.03	0.89
C.D.@ 0.05	3.03	2.92	2.60	2.72	3.09	1.99	2.1	1.95	2.01	3.22	3.03	2.61

## RESULTS

The present study envisaged that the effects of different levels of sugar in pulsing treatment on post harvest quality of gladiolus cv. American Beauty gave significantly better results than over control treatment.

The opening of florets per spike, marketable spikes position and vase life of spike [Table 1(Figure 1) and 2 (Figure 2)] were considered being an important factors to judge the post harvest quality of gladiolus cv. American Beauty.

On 4<sup>th</sup> days (6.67, 5.33) and 8<sup>th</sup> days (11.33, 11.33), the number of opening of florets per spike in treatment T<sub>10</sub> was significantly observed maximum and then followed by T<sub>9</sub> treatment in first and second trail, respectively. Likewise the number of opening of florets per spike on 4<sup>th</sup> days and 8<sup>th</sup> days was significantly recorded higher i.e. 5.67, 6.50 and 10.50, 11.67 in third and fourth trail, respectively in treatment T<sub>10</sub>. The Treatment T<sub>1</sub> was produced lowest opening of florets per spike.

Marketable spikes position on 15.67 days, 14.23 days, 13.00 days and 12.23 days was recorded significantly maximum in treatment T<sub>10</sub> and remained statically at par with T<sub>9</sub> in 1<sup>st</sup> trial and 2<sup>nd</sup> trial as well as T<sub>9</sub>, T<sub>8</sub>, T<sub>7</sub> and T<sub>6</sub> in 3<sup>rd</sup> trial and T<sub>9</sub>, T<sub>8</sub>, T<sub>7</sub> T<sub>6</sub> T<sub>5</sub> in 4<sup>th</sup> trail, respectively for local markets. The treatment T<sub>1</sub> was produced the lowest marketable spike position.

The vase life of spike was recorded statistically highest in the treatment T<sub>10</sub> i.e. 16, 15.67 16 and 15.15 days in 1<sup>st</sup> trial, 2<sup>nd</sup> trial, 3<sup>rd</sup> trial and 4<sup>th</sup> trial, respectively. This was also followed by treatment T<sub>9</sub>, T<sub>8</sub> and T<sub>7</sub> in first trail and third trail as well as T<sub>9</sub>, T<sub>8</sub>, T<sub>7</sub>, T<sub>6</sub> and T<sub>5</sub> in second trail and fourth trail, respectively. The treatment T<sub>1</sub> was produced the lowest vase life.

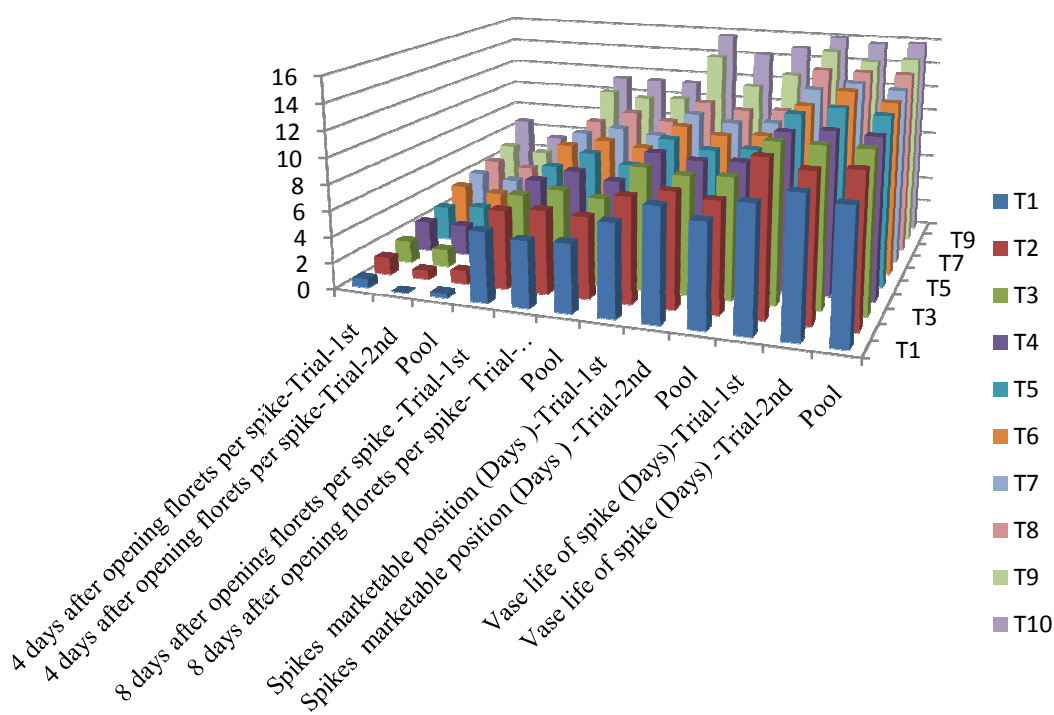


Figure 1. Effect of different levels of sugar in vase solution affects on post harvest opened flowers per spike, spikes marketable position (Days) and vase life of spike (Days) of gladiolus cv. American Beauty.

The pooled experimentation study, the number of opening florets per spike at 4<sup>th</sup> and 8<sup>th</sup> days after pulsing treatment was observed statistically significant in all trails in same treatment i.e. treatment T<sub>10</sub>. Likewise, similar results also found in spikes marketable position (local markets). The vase life of spikes cut stem in all trails in treatment T<sub>10</sub> was found maximum and remained statistically at par with T<sub>9</sub>, T<sub>8</sub>, T<sub>7</sub> and T<sub>6</sub> treatments. The treatment T<sub>1</sub> was produced the lowest marketable spikes position, opening of florets per spike and vase life at the end of experimentation in first and second trials as well as third and fourth trials and also pooled study, respectively.

## DISCUSSION

Our data support the suggestions of a number of previous workers that the postharvest life of gladiolus is greatly improved by providing sugars in the vase solution [1]. Although we obtained some benefit from the pulsing treatment suggested by researchers [2], we found that the opening of florets per spike, marketable spikes position and vase life of spike was improved by pulsing treatment.

The treatment of cut flowers with sucrose is found to be beneficial in delaying senescence processes [3 and 4]. Thus, results due to treatment presumably allow accumulation of adequate sugar in the leaves and stem during that time period to aid the development of flowers. When Gladioli are pulsed overnight that results on flower opening faster and the stem has a longer vase life [5 and 6].

The experiment clearly stood that providing a pulse solution with at least 20 % sugar had a very significant effect on vase life of florets per spike and marketable position of spike.

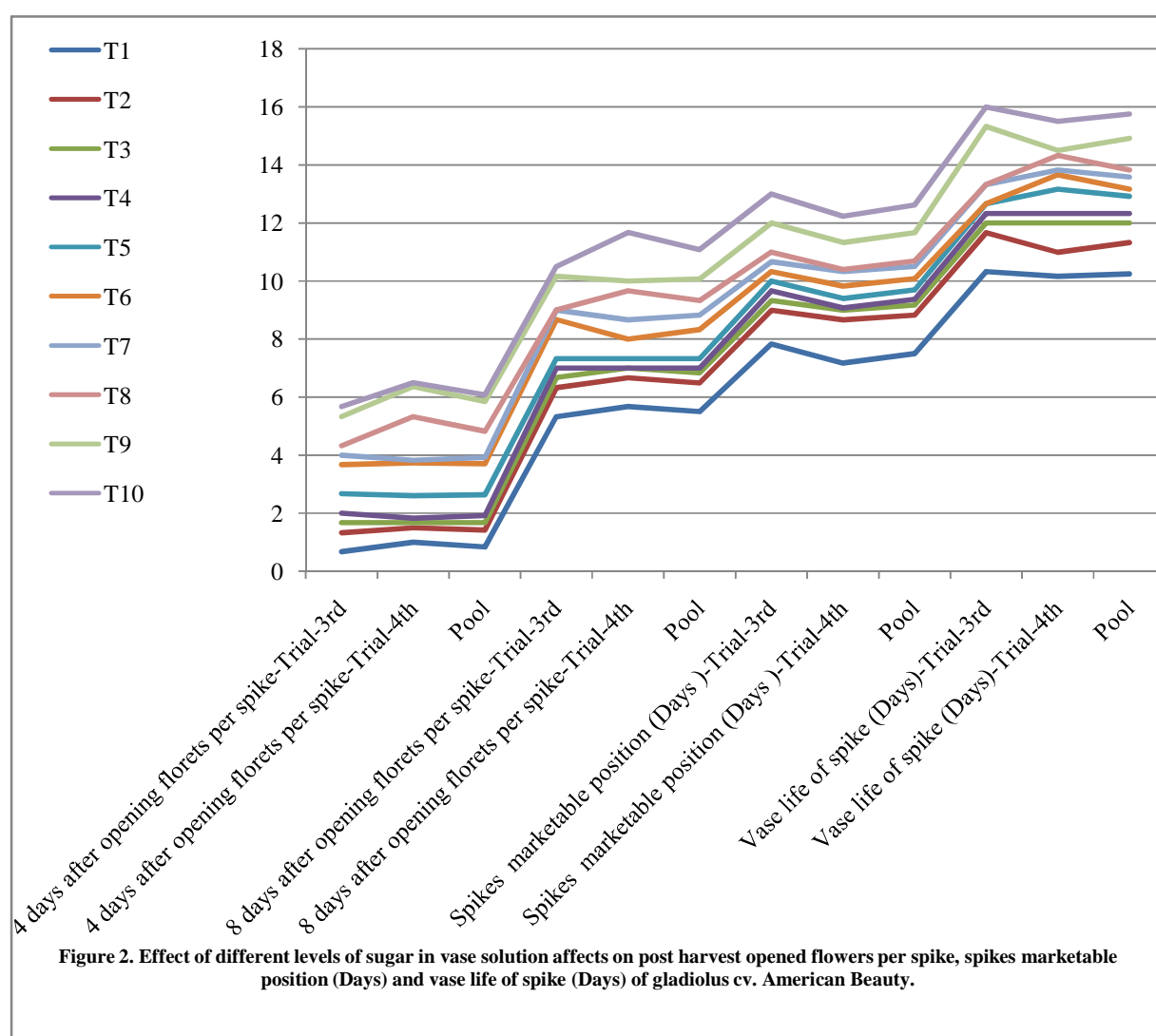




Photo 1. Selection of Spikes



Photo 2. Treated Spikes per treatment



Photo 3. Opened florets per spike

### CONCLUSION

The immersing cut spikes stem in pulsing treatment of high sugar concentration @ 20% for 20 hours at 20°C that improved the opening of the florets per spike, increased longevity of the flowers spikes and then followed by 18 % sugar concentration than control treatment.

### Acknowledgement

We thank to The Directors, ASPEE, Agricultural Research and Development Foundation for the generous donation of flowers.

### REFERENCES

- [1] K. Ichimura, and T. Hiraya, *J. Japan Soc. Hort. Sci.*, **1999**, 68: 23-27.
- [2] A.H. Halevy, and A.M. Kofranek, *Hort Sci*, **1984**. 19:845-847.
- [3] B.C. Chung, S.Y. Lee, S.A. Oh, T.H. Rhew, H.G. Nam, and C.H. Lee. **1997**. *J. Plant Physio*, 151: 339-345.
- [4] E. Yakimova, T.V. Kapchina, V. Alexieva, I. Sergiev, and E. Karanov, *Bulgarian J. Plant Physiol*, **1996**, 22: 74-87.
- [5] Anonymous, International flower bulb center, *Post Harvest treatment Forcing Guide*, **2014**, pp-5.
- [6] S. Mayak, B. Bravdo, A. Gvilli, and A.H. Halevy, **1973**. *Scientia Hort*, 1:357-365.