

Standardisation of Optimum Stage of Harvest for Enhancing Vase Life in Ornamental Sunflower (*Helianthus annuus* L.)

Kirtimala B. Naik, Nataraj S. K.*, Shadakshari Y. G., Kumar D. P. and Seetharamu G. K.

College of Horticulture, GKVK campus, UHS, Bagalkot-587104

*Corresponding Author E-mail: natflori@gmail.com

Received: 1.05.2018 | Revised: 28.06.2018 | Accepted: 4.07.2018

ABSTRACT

This experiment was conducted in the year 2012-2013 at GKVK, campus, UHS, Bagalkot, to know the optimum stage of harvest to prolong the vase life of ornamental sunflower. Post harvest parameters indicated highest cumulative water uptake was in the flowers harvested at 50 per cent of ray florets open stage (S_3 stage) recording 51.28 g followed by one row of ray florets open (S_2 stage) recording 50.50 g and fully open flowers (S_4 stage) recording 49.53 g. Flowers harvested at tight bud (S_1 stage) and one row of ray florets open (S_2 stage) showed minimum cumulative water loss (46.39 and 48.13 g respectively). The flowers harvested at one row of ray florets open (S_2 stage) followed by flowers harvest at 50 per cent of ray florets open (S_3 stage) recorded highest vase life recording 5.63 and 5.37 days. The above results revealed flowers harvested at 50 per cent of ray florets open (S_3 stage) followed by flowers harvested when one row of ray florets (S_2 stage) can be considered as ideal stage for harvesting ornamental sunflower.

Key words: Sunflower, Stems, Weather condition,

INTRODUCTION

Sunflower (*Helianthus annuus* L.) is native to North America and belongs to the family *Compositae*. It has been used as an ornamental plant in gardens for many years but it has only recently regained popularity as a specialty cut flower. The final quality and post harvest longevity of cut flower is known to be influenced by correct stage of harvest and post harvest handling. The right stage of harvesting determines the vase life and post harvest

quality of any cut flower. Stage of harvesting varies with variety, grower, weather condition and distance from the market. Sunflower stems should be harvested in the cup stage, when ray flowers begin to unfold from the centre of the inflorescence and the flower head viewed from the side looks like a cup⁸. If the stems are to be sold directly from the field at a farmer's market or local grocery store, they should be harvested with a completely open flower⁶.

Cite this article: Kirtimala, B. Naik, Nataraj, S.K., Shadakshari, Y.G., Kumar, D.P. and Seetharamu, G.K., Standardisation of optimum stage of harvest for enhancing vase life in ornamental sunflower (*Helianthus annuus* L.), *Int. J. Pure App. Biosci.* 6(4): 733-735 (2018). doi: <http://dx.doi.org/10.18782/2320-7051.6453>

Consumer demand for sunflowers has increased in recent years but there is little information about the postharvest management of this cut flower². Studies on this aspect are meagre. Hence an attempt was made to study the different stages of harvest in ornamental sunflower in order to attain the best post harvest quality with longevity.

MATERIAL AND METHODS

This experiment was conducted in the year 2012-2013 at GKVK, campus, UHS, Bagalkot, to know the optimum stage of harvest to prolong the vase life of ornamental sunflower by harvesting the flower heads at various stages of growth as given below. For each treatment 25 flowers were harvested to make up five replications and their vase life was studied in plain tap water. The statistical design followed was randomized complete block design adopting Fisher's method of analysis of variance technique as given by Panse and Sukhatamane³ by using SAS package V9-3 available at statistical cell, IIHR with four treatments and five replications. Different stages of harvest were as follows: S₁: Tight bud stage, S₂: When one row of ray florets open, S₃: 50% of ray florets open, S₄: Fully opened flowers.

RESULTS AND DISCUSSION

Highest cumulative water uptake was in the flowers harvested at 50 per cent of ray florets open stage (S₃ stage) recording 51.28 g followed by one row of ray florets open (S₂ stage) recording 50.50 g and fully open flowers (S₄ stage) recording 49.53 g. Fully

open flowers (S₄ stage) followed by 50 per cent of ray florets open (S₃ stage) increased the cumulative water loss (60.91 and 54.65 g respectively) whereas flowers harvested at tight bud (S₁ stage) and one row of ray florets open (S₂ stage) showed minimum cumulative water loss (46.39 and 48.13 g respectively). Parmeshwar⁴ also recorded maximum water uptake and water loss in 50 per cent harvest stage in sunflower followed by harvested flowers at 1 row of ray florets open stage. Data pertaining to results on optimum stage of harvest is furnished in **Table 1**.

The flowers harvested at one row of ray florets open (S₂ stage) followed by flowers harvest at 50 per cent of ray florets open (S₃ stage) recorded highest vase life recording 5.63 and 5.37 days respectively while fully opened flowers (S₄ stage) and tight bud stage (S₁ stage) flowers recorded shortest vase life of 3.73 and 3.80 days respectively. This may be attributed to the cell turgidity and membrane integrity at the S₂ and S₃ development stages of flower development leading to maximum water uptake hence increasing vase life. Similar results were reported by Rajagopalan and Khader⁵ in chrysanthemum, Singh and Arora⁷ and Kumar *et al.*¹ in tuberose and Parmeshwar⁴ in sunflower. Data pertaining to results on optimum stage of harvest is furnished in **Table 1**.

Following the above results flowers harvested at 50 per cent of ray florets open (S₃ stage) followed by flowers harvested when one row of ray florets (S₂ stage) can be considered as ideal stages for harvesting ornamental sunflower.

Table 1. Post harvest parameters as influenced by different stages of harvest in ornamental sunflower genotype M-17R

Stages of harvest	CWU (g)	CWL (g)	Vase life (days)
Tight bud stage (S ₁)	38.11	46.39	3.80
When one row of ray florets open (S ₂)	50.50	48.13	5.63
50% of ray florets open (S ₃)	51.28	54.65	5.37
Fully opened flowers (S ₄)	49.53	60.91	3.73
SEm	1.26	1.31	0.07
CD @ 1%	3.79	3.92	0.22
F-Test	*	*	*

*- Significant at $P = 0.01$

NS-Non significant at $P = 0.01$

Where:

CWU - Cumulative water uptake, CWL - Cumulative water loss

REFERENCES

1. Kumar, J., Sambyal, S. and Rana, P., Effect of GA₃, NAA and Citric acid on the post harvest life of cut tuberose (*Polyanthus tuberosa* L.) spikes cv. Double. *J. Orn. Hort.*, **7 (3-4)**: 386-389 (2004).
2. Mensuali-Sodi, A. and Ferrante, A., Physiological changes during postharvest life of cut sunflowers. *Acta Hort.*, **669**: 219-224 (2005).
3. Panse, V.S and Sukhatamane, P.V., Statistical methods for Agriculture workers, ICAR, New Delhi, pp: 152- 155 (2002).
4. Parmeshwar, A. S., Evaluation of sunflower (*Helianthus annuus* L.) germplasm for ornamental cut flower production. *MSc. Thesis* Univ. Agri. Sci., Bengaluru (2010).
5. Rajgopalan, A. and Khader, M. A., Effects of pulsing treatments on the vase life of chrysanthemum cut flowers. *South Ind. Hort.*, **41 (1)**: 61-63 (1993).
6. Schoellhorn, R., Emino, E. and Alvarez, E., Specialty Cut Flower Production Guides for Florida: Sunflower. Environ. Hort. Department, FL. Coop. Ext. Serv.. *Inst. of Food and Agril. Sci, Univ of Florida*. ENH885. pp 1-3 (2003).
7. Singh, K. and Arora, J. S., Effect of harvesting stages, sucrose, BAP and GA₃ on bud opening and vase life of tuberose. *J. Orn. Hort., New series* **3 (2)**: 111-113. *Can. J. Bot.* **53**: 2650-2659 (2000).
8. Young, J., Field Grown Cut Flower Production in Southern Louisiana. *M.Sc. Thesis. Louisiana State University. Baton Rouge, LA* (2002)