

**Short Communication**

**Evaluation of ornamental sunflower for value addition**

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**ABSTRACT**

An experiment was conducted at College of Horticulture, GKVK, campus, Bengaluru, UHS, Bagalkot during 2012-13 to study the suitability of ornamental sunflower for dry flower production. Highest flower weight loss was with corn meal and silica gel (90.75 and 88.45 per cent). Silica gel followed by borax powder took least number of days for drying of flower heads (9.40 and 12.60 days respectively). Colour retention in dried ornamental sunflower was highest with control treatment and silica gel with a score of 4.63 and 4.44. Flower appearance was best with silica gel (4.44) which was at par with control with a score of 3.81. Best texture score of (4.31) was highest with silica gel followed by control (shade), corn meal and alum powder which recorded 3.63, 3.31 and 3.25 respectively. Best flower shape after drying period as with silica gel (4.38). The results reveal silica gel and corn meal as best drying agents in ornamental sunflower.

**Key words:** Drying, desiccants, embedding, sensory, appearance

**INTRODUCTION**

Floriculture is fast emerging industry in the world. In recent years, there has been a revival of interest in producing field-grown cut flowers. As fresh flowers are short-lived and are available only during a particular season and wastage of huge number of fresh flowers due to lack of proper marketing channel and some unavoidable circumstances during blooming season, some flowers were identified which could be easily dried, preserved and processed in nature. Standardisation of drying techniques is important to determine the exact method of drying for extending the post harvest dry flower quality in sunflower. Therefore research on different desiccants of drying to retain the flowers original colour and form for a longer period is important. Flower drying is one of the alternative techniques that could be used to preserve flowers for a longer period. There are several methods of preservation available and in many cases their results last for years and may be used for many occasions. It can be made into permanent or semi-permanent decorations. Dried flowers do not have to be used in arrangements immediately. They can be stored for several months without deteriorating. By investing in this industry the country is still able to

increase its export earnings. Information on preserving flowers to retain quality standards such as colour, lack of shrivelling are limited. As very meagre work has been done in this regard that too in a flower like ornamental sunflower, an attempt was made to know the exact method of drying ornamental sunflower. Dana and Lerner (2002) reported that the most satisfactory desiccants used are sand, borax and silica gel.

An experiment was conducted at College of Horticulture, GKVK, campus, Bengaluru, UHS, Bagalkot during 2012-13 to study the suitability of ornamental sunflower for dry flower production. The flowers were harvested at fully opened stage with bursting of not more than 50% pollen and dried separately in sun and shade for a period of 7 days. On the basis of visual appearance of colour, shape of petals and texture shade drying was considered a suitable method to dry sunflower flowers. This was followed by drying the flowers in different embedding materials. Observations *viz.* visual colour, shape of petals, texture and overall appearance were recorded and finally the sensory evaluation of these dried flowers was conducted by a panel of judges. The design followed in this experiment was simple CRD adopting Fisher's

method of analysis of variance technique as given by Panse and Sukhatamane (2002) by using SAS package V9-3 available at statistical cell, IIHR with six treatments and four replications. The drying treatments followed were as follows 1) Silica gel, 2) Sand, 3) Borax, 4) Corn meal, 5) Alum, 6) Control (without embedding).

Flower weight after drying duration decreased significantly with Corn meal and silica gel (1.75 and 2.16 g respectively) followed by alum powder (2.43 g). Weight loss was significantly more with corn meal and silica gel (90.75 and 88.45 per cent) followed by alum powder (87 per cent). Silica gel, a drying agent has the capacity to absorb large quantities of moisture (upto 40 per cent) and could quickly dehydrate cut flowers Robberts (1997). Major drawback of air drying method is that it is weather dependant and the quality of the product is not good (Datta, 2004). Silica gel followed by borax powder took least number of days for drying of flower heads (9.40 and 12.60 days respectively (**Table 1**). Drying time varies depending on the flower thickness and the drying agent used

Musgrove (1998). Similar results were recorded by Rengaswamy *et al.* (1999); Dahiya *et al.* (2004); Sangama (2004); Safeena *et al.* (2006) and Salma (2010).

Sensory evaluation by a panel of judges mean highest score for colour retention in dried ornamental sunflower was scored by flowers dried in control treatment and silica gel with a score of 4.63 and 4.44 (**Table 2**). Shade drying since olden times is known to retain colour. The flowers embedded in silica gel were found to produce good quality dry flowers as this desiccant prevents the direct removal of moisture from flowers by acting as an intermediate. This prevents shrinkage of the flower and degradation of colouring pigments Safeena *et al.* (2006).

Mean highest score for appealing appearance was registered by flowers dried in silica gel (4.44) which was at par with control with a score of 3.81. Similar results were reported by Barnett (1996) and Datta (2004) in drying experiment in different flowers.

**Table 1. Dry flower attributes of ornamental sunflower genotype M-17R dried in various embedding material**

Embedding treatment	Fresh weight of flower head (g)	Dry weight of flower head (g)	Weight loss (%)	Days taken for drying
Borax powder (T1)	18.05	3.34	81.48	12.60
Sand (T2)	18.46	3.10	83.21	14.87
Silica gel (T3)	18.69	2.16	88.45	9.40
Alum powder (T4)	18.73	2.43	87.00	17.40
Corn meal (T5)	18.94	1.75	90.75	19.20
Control (Shade) (T6)	17.94	3.20	82.10	14.73
SEm	0.34	0.19	1.09	0.34
CD at 1%	1.00	0.55	3.18	0.99
F-test	NS	*	*	*
CV %	4.16	15.00	2.85	5.15

\*- Significant @  $P=0.01$  NS - Non significant @  $P=0.01$

Flowers dried in silica gel maintained best texture of flower heads with highest score (4.31) followed by control (shade), corn meal and alum powder which recorded 3.63, 3.31 and 3.25 respectively. Mean highest score for retaining best flower shape after drying period was with silica gel (4.38). The phenomenon of embedded drying is that during desiccation, the water content of the flower is completely absorbed by the

surrounding desiccant material. Silica gel in powder form is the quickest acting desiccant. Silica gel keeps the flower colour well and could be used to dry the flowers, which are difficult to preserve (Peggy, 1978). Similar results were also by Keisarlourdusamy *et al.* (2003) in gomphrena, Dahiya *et al.* (2004) in annual chrysanthemum, Safeena (2006) in rose and Salma (2010) in dendrobium.

**Table 2. Mean scores of sensory evaluation of dried sunflower flower genotype M-17R**

Embedding Treatments	Colour retention	Appearance	Texture	Shape
Borax powder (T <sub>1</sub> )	2.88	3.06	2.94	2.81
Sand (T <sub>2</sub> )	3.00	2.69	2.94	2.75
Silica gel (T <sub>3</sub> )	4.44	4.44	4.31	4.38
Alum powder (T <sub>4</sub> )	3.44	3.13	3.25	3.19
Corn meal (T <sub>5</sub> )	3.31	2.81	3.31	3.31
Shade (T <sub>6</sub> )	4.63	3.81	3.63	3.22
Sem	0.27	0.32	0.20	0.22
CD @ 1%	0.80	0.94	0.58	0.65
F-test	*	*	*	*
CV %	14.96	14.00	11.51	13.39

Score: 5=very good, 4=good, 3=average, 2=poor, 1=not acceptable\*- Significant @  $P=0.01$

NS - Non significant @  $P=0.01$

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