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Comparison of different methods of drying in rose cv. GLADIATOR

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ABSTRACT

An investigation to compare the different methods of drying was carried out in the Department of Floriculture and Landscaping K.R.C.College of Horticulture, Arabhavi in 2002-03. The rose cultivator used for the experiment was Gladiator. The half opened rose flowers were treated with appropriate concentration of (1:5) for 12 hours and 8 treatments were followed in the experiment under average room temperature and relative humidity. The data recorded were analyzed by following factorial CRD. With respect to drying methods shade drying was best for quality parameters scoring *viz.*, colors (3.41), shape (3.45), appearance (4.05) and texture (4.10). Sun dried flowers showed the least acceptable quality. Silica gel was the most promising desiccant. The interaction effect showed that shade drying by embedding in silica gel would yield the best quality dried flowers as it scored best for all the quality parameters and was at par with oven drying with silica gel as embedding material.

Key words : Drying, Rose, Flower, Quality

INTRODUCTION

Rose is an ornamental shrub with upright as climbing stems generally with thorns. Rose flowers are beautiful having exquisite shape, size, diverse colours with delightful fragrance. Rose is the best cut flowers and as such is in great demand in both domestic as well as in international markets. Dry flowers are an important product of the floral industry which is picking up at a faster rate in the international trade. Dried flowers are long lasting and therefore, economical and can be reused several times. The life of dried flowers varies with different flowers according to the species, texture of their petals and consistency of flowers. Existing technologies are not advanced enough to support future expansion of the dry flowers industry. Hence, the present study was undertaken for comparison of different methods of drying to determine the mask effective method for drying.

MATERIALS AND METHODS

An investigation was carried out during 2002-03 in the Department of Floriculture and landscape gardening, K.R.C. College of Horticulture, Arabhavi, Dharwad using popular rose cultivar Gladiator, the flowers were harvested at half opened stage and sheared with appropriate concentration of glycerol in the ration (1:5) for 12 hours and 8 treatments were imposed. Different drying methods *viz.*, solar drying, shade drying, oven drying, microwave oven drying were carried out alone and in combination with the desire silica gel. Drying average room temperature recorded ranged from 24^0 C to 34^0 C and 68 per cent relative humidity. Factorial Complete Randomized Design was followed for the experiment with 3 replications. Five flowers were used per replication and were treated with 8 different treatments *viz.*, sun drying, shade drying, oven drying, microwave drying, embedding in silica gel to sun drying, embedding in silica gel oven drying and embedding in silica gel + micro oven. At the end of drying the petals of the flowers were pressed with fingers to check the presence of moisture. Statistical analysis was carried outby following CRD given by Sundarraj *et al*. (1972).

RESULTS AND DISCUSSION

Parameters like dry weight, moisture time taken for drying, colour shape, appearance and texture of dry flowers as influenced by different drying methods are presented in Table 1 and 2. The significant difference was seen by all the treatments with respected to dry weight and moisture loss.

Flowers which were dried by silica gel took 65 hrs as compared to the flowers dried with embedding which took only 51.84 hrs, shade drying took maximum time of 131.50 hours whereas microwave oven drying took only 0.031 hours. Interaction effects showed that maximum time of 143 hours was taken by the rose flowers without embedding in shade, while microwave oven took minimum

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Table 1 : Dry weight, moisture loss and time taken for drying of rose flowers as influenced by desiccants and stage of harvest

Sr. No.	Treatments	Dry weight (g/flower)	Moisture loss (%)	Time taken to dry (hours)
	Desiccant (D)			
1.	Sand	3.39	61.51	10.16
2.	Silica gel	3.24	60.18	6.08
	S. E. ±	0.05	1.05	0.14
	C.D. (P=0.01)	NS	NS	0.56
	Stages of harvest (S)			
1	Tight bud stage	3.22	58.47	10.37
2	Half opened stage	3.45	62.50	8.25
3	Fully opened stage	3.28	61.55	5.75
	S. E. ±	0.06	1. 28	0.17
	C.D. (P=0.01)	NS.	NS	0.69
	Interaction effect (D x S)			
1	Sand + tight bud stage	3.16	58.49	12.12
2	Sand + half opened stage	3.62	63.23	11.00
3	Sand + fully opened stage	3.41	62.79	7.37
4	Silica gel + tight bud stage	3.28	58.44	8.62
5	Silica gel + half opened	3.29	61.78	5.50
6	Silica gel + fully opened stage	3.16	60.31	4.12
	S. E. ±	0.09	1. 82	0.24
	C.D. (P=0.01)	NS	NS	1.00

NS- Non-significant

Table 2: Influence of desiccants and harvest stages on colour, shape, appearance and texture of dried roses as assessed through sensory evaluation

Sr. No.	Treatments	Colour	Shape	Appearance	Texture
	Desiccant (D)				
1.	Sand	2.26	2.02	1.83	2.13
2.	Silica gel	4.03	4.08	3.76	3.82
	S. E ±	0.08	0.07	0.07	0.09
	C.D. (P=0.01)	0.31	0.28	0.27	0.34
	Stages of harvest (S)				
1	Tight bud stage	2.80	2.70	2.42	2.61
2	Half opened stage	3.43	3.16	2.85	3.00
3	Fully opened stage	3.20	3.28	3.12	3.31
	S. E ±	0.09	0.09	0.08	0.10
	C.D. (P=0.01)	0.36	0.37	0.34	0.42
	Interaction effect (D x S)				
1	Sand + tight bud stage	2.15	2.10	1.80	1.99
2	Sand + half opened stage	2.34	1.63	1.45	1.67
3	Sand + fully opened stage	2.30	2.32	2.24	2.74
4	Silica gel + tight bud stage	3.46	3.30	3.05	3.23
5	Silica gel + half opened	4.53	4.70	4.24	4.34
6	Silica gel + fully opened stage	4.12	4.23	3.99	3.89
	S. E ±	0.13	0.12	0.11	0.14
	C.D. (P=0.01)	0.54	0.49	0.48	0.60

NS- Non-significant

hours (0.031 hours) irrespective of made of desiccation.

This might be due low ambient temperature in the drying room. Similar results were also reported by Joy Kumar (1997) for drying rose, marigold and china aster flowers. Significant differences were observed for flowers colour by different methods. Higher score (3.68) was recorded for flowers embedded as compared to flowers dried without embedding in silica gel as known by the quick action of silica gel for dehydration compiled with its smooth texture and light weight that must have prevented loss of pigments. Shade drying with silica gel scored the highest 3.41 points which was at par with hot air oven drying. Similar findings were reported by Bhutani (1990) and Susan (1990).

In the interaction effect embedding in silica gel under shade maintained colour to that of original (4.50) which was at par with flowers dried in hot air oven embedded in silica gel (3.75). This may be due to the rapid drying which generated little amount of heat (White, 2002).

For shape of the flowers embedded drying with superior in retaining shape by scoring 3.72 points. According to Conder (1979) embedded drying method retains good shape and form.

Shade drying was significantly superior (3.45) as compared to all other treatments except oven drying method showing 3.29 score. Sun drying scored least points (2.75) indicating poor shape of dried flowers by this method slow and steady removal of moisture from flowers might have depressed the mode of degradation of flowers structure (Bhutani 1990 and Susan, 1990).

Interaction effect showed that highest acceptability for shape of flowers was achieved under shape with silica gel scoring 4.58 pints against the least score of 2.33 in sun and shade drying without embedding in desiccants. Similar results were reported by Datta (1999).

Data pertaining to flower appearance reflected that irrespective of drying methods and embedding treatments gave better appearance scoring 3.87 points. Shade drying scored 4.05 against 2.78 points scored under sun.

Interaction effects showed that the appearance of flowers was the best when flowers were dried in shade and embedded in silica gel scoring 4.38 points. However, Datta (1999) reported that embedded material may also be dehydrated under microwave oven (1-4 minutes) flowered by 2-5 hours setting time.

Rose flowers dried by embedding in silica gel scored highest (3.90) points for texture compared to flowers dried without embedding (2.80) points. This is in evident to the other quality parameters maintained by silica gel.

Good texture was obtained by shade drying method with higher score of 4.10 points as compared to other methods.

Interaction effects showed that flowers dried in shade embedded in silica recorded the highest score of (4.77). However, was at par with roses dried in oven by silica gel embedding. Texture was poor in flowers dried under sun without any desiccant. The scorching summer sun caused the burning and browning of pigments due to loss of antocyanins.

Summary :

Experiments were undertaken on rose variety Gladiator under various treatments to determine the most suitable and effective method for rose drying. The present study indicated that the methods of drying and the desiccants significantly influence the quality of dried rose flower Silica gel proved to be the best desiccants shade drying was best for quality parameters *viz.*, colour (3.41), shape (3.45), appearance (4.05) and texture (4.10) sun dried flowers were least acceptable for quality parameters. The results of the present study suggest that shade drying by embedding in silica gel would yield the best quality dried rose flowers.

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