ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 03, pp. 27206-27208, March, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECT OF TINTING ON FLORETS DROP OF CUT TUBEROSE SPIKES

***Suresh Chougala, B., Hemla Naik, Shivayya Mathapati, Savita K. H. and Shivakumar**

Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere 577 132, Karnataka

ARTICLE INFO

Article History:
Received 15th December, 2015
Received in revised form
24th January, 2016
Accepted 20th February, 2016
Published online 16th March, 2016

Key words:

Tinting, Florets drop and Tuberose spike.

ABSTRACT

The complete research work was carried out with single experiment with factorial concept. The tuberose spikes were treated with different synthetic food dyes used are tomato red, rose pink, lemon yellow, kesar yellow, apple green and blue with two concentrations (6 and 8 %) and three different durations (4, 6 and 8 hrs). Number of florets dropping per day showed the significant difference for different food dyes from fourth to seventh day. Total number of florets were maximum dropped in P_3 (12.02), which was on par with P_2 (11.50) and minimum number of florets dropped in P_6 (4.94). The different concentrations of food dyes treatments showed significant difference for florets dropping on 4th day. However, the maximum florets drop was found in C_2 (0.78) which was on par with P_1 (0.70), whereas minimum found in control and P_6 (0.00). Number of florets dropping has showed significant difference for durations of food dyes treatments on 4th and 5th day.

Citation: Suresh Chougala, B., Hemla Naik, Shivayya Mathapati, Savita K. H. and Shivakumar, 2016. "Effect of tinting on florets drop of cut tuberose spikes", *International Journal of Current Research,* 8, (03), 27206-27208.

INTRODUCTION

Flowers are the wonderful creations of the nature and they are integral part of human life even before humans could find speech and alphabets for the dissemination of their ideas and feelings. Different flowers with their different colours, express different human moods. They symbolize different feelings and also carry a massage with them. But not all colours are available in all flowers so, to have a flower of our choicest colour, they have to be tint artificially. Every breeder gives his new advancement a different name taking into consideration marketing appeal and colour relevancy. Tinting is one of the important value addition technologies for imparting desired shades of colours to flowers. Tinting of flowers with dyes can really enhances the value of these flowers and helps the farmers in earning more from their produce. Only single colour in a flower limits the floral acceptability or reduces the market value.

MATERIALS AND METHODS

The site, where experiment was carried out in the floricultural research laboratory, Department of Floriculture and Landscape Architecture, College of Horticulture Mudigere, University of Agricultural and Horticultural sciences, Shimoga, during 2013-014. The harvested spikes of tuberose cv Prajwal were used for the experiment. Flowers were harvested in the morning between 8.00 and 9.00 am. Immediately after harvest, the cut ends of the flower stalks were immersed in water. After bringing to the laboratory, the flowers were sorted for petal damage, pests and diseases. All the leaves from the spikes were removed and 1.0 to 1.5 cm of the bottom was recut to avoid the blockage of stem at the basal portion before dipping them in to the colour solution. The spike length was kept uniform to 60 cm at the time of dipping. The design adopted for the experiment was complete randomized design with factorial concept and replicated thrice. Three factors food dyes (P), dye concentrations (C) and durations (D). The different food dyes used were Tomato Red (P_1), Rose pink (P_2), Lemon yellow (P_3), Kesar yellow (P_4), Apple green (P_5), Blue (P_6). The food dyes were treated at two different concentrations 6 per cent (C_1) and 8 per cent (C_2) with three durations 4 hrs (D_1), 6 hrs (D_2) and 8 hrs (D_3).

**Corresponding author: Suresh Chougala, B.*
Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere 577 132, Karnataka.

RESULTS

Number of florets drop

The data on number of florets dropped per day and total number of florets dropped are compiled in Table-1 (a).

Table 1. Effect of tinting food dyes treatments on dropping of tuberose florets over different days in vase

Table 1(a). Effect of different food dyes, concentrations and durations of treatments on dropping of tuberose florets after 4th day of treatment

Food dyes (P)	Number of florets drop/spike				
	Days				
	4	5	6	7	Total
Control	0.00	0.00	1.00	5.00	6.00
P_1 -Tomato red	0.70 (1.04)	1.54	3.61	4.74	10.48
P_2 -Rose pink	0.65 (1.02)	2.39	4.93	3.54	11.50
P_3 -Lemon yellow	0.68 (1.03)	2.26	4.83	4.24	12.02
P_4 -Kesar yellow	0.56 (0.99)	1.54	4.43	4.33	10.85
P_5 -Apple green	0.72 (1.05)	2.54	4.39	3.52	11.17
P_6 -Blue	0.00 (0.71)	1.39	2.09	1.46	4.94
S.Em±	0.05 (0.02)	0.12	0.18	0.17	0.24
C.D. @ 1%	0.07	0.46	0.66	0.65	0.89
Concentrations (C)					
Control	0.00	0.00	1.00	5.00	6.00
C_1 -6 %	0.32 (0.87)	1.51	4.05	3.71	9.55
C_2 -8 %	0.78 (1.08)	2.38	4.04	3.57	10.77
S.Em±	0.03 (0.01)	0.07	0.10	0.10	0.14
C.D. @ 1%	0.04	NS	NS	NS	NS
Durations (D)					
Control	0.00	0.00	1.00	5.00	6.00
D_1 -4 hrs	0.00 (0.71)	1.42	3.60	3.44	8.40
D_2 -6 hrs	0.53 (0.96)	1.99	4.29	3.58	10.39
D_3 -8 hrs	1.13 (1.25)	2.42	4.25	3.90	11.69
S.Em±	0.04 (0.01)	0.09	0.12	0.12	0.17
C.D. @ 1%	0.05	0.33	NS	NS	0.63

The values in the parenthesis are square root transformed values and outside are real values.

Table 1(b). Interaction effect of different food dyes and concentrations of treatments on dropping of tuberose florets after 4th day of treatment

Food dyes X Concentrations (P x C)	Number of florets drop/spike				
	Days				
	4	5	6	7	Total
Control	0.00	0.00	1.00	5.00	6.00
$P_1 C_1$ -Tomato red at 6 %	0.37 (0.89)	1.30	3.78	5.07	10.29
$P_1 C_2$ -Tomato red at 8 %	1.04 (1.18)	1.78	3.44	4.41	10.67
$P_2 C_1$ -Rose pink at 6 %	0.44 (0.92)	2.15	4.85	3.78	11.22
$P_2 C_2$ -Rose pink at 8 %	0.85 (1.12)	2.63	5.00	3.30	11.78
$P_3 C_1$ -Lemon yellow at 6 %	0.37 (0.89)	1.33	4.89	4.15	10.74
$P_3 C_2$ -Lemon yellow at 8 %	1.00 (1.17)	3.19	4.78	4.33	13.30
$P_4 C_1$ -Kesar yellow at 6 %	0.37 (0.89)	1.52	4.22	3.78	9.89
$P_4 C_2$ -Kesar yellow at 8 %	0.74 (1.08)	1.56	4.63	4.89	11.81
$P_5 C_1$ -Apple green at 6 %	0.37 (0.89)	1.44	4.59	3.89	10.30
$P_5 C_2$ -Apple green at 8 %	1.07 (1.20)	3.63	4.18	3.15	12.04
$P_6 C_1$ -Blue at 6 %	0.00 (0.71)	1.30	1.96	1.59	4.85
$P_6 C_2$ -Blue at 8 %	0.00 (0.71)	1.48	2.22	1.33	5.04
S.Em±	0.07 (0.02)	0.17	0.25	0.25	0.33
C.D. @ 1%	0.09	0.65	0.93	NS	NS

The values in the parenthesis are square root transformed values and outside are real values.

Number of florets dropping per day showed the significant difference for different food dyes from fourth to seventh day [Table 1(a)], where the maximum number of florets were dropped in P_5 (0.72), P_5 (2.54), P_2 (4.93) and P_1 (4.74), which were on par with P_1 (0.70), P_2 (2.39), P_3 (4.83) and P_1 (4.33), whereas minimum dropped in control (0.00), control (0.00), control (1.00) and P_6 (1.46), respectively. Total number of florets were maximum dropped in P_3 (12.02), which was on par with P_2 (11.50) and minimum number of florets dropped in P_6 (4.94). The different concentrations of food dyes treatments showed significant difference for florets dropping on 4th day [Table 1(a)]. However, the maximum florets drop was found in C_2 (0.78) which was on par with P_1 (0.70), whereas minimum found in control and P_6 (0.00). Florets dropping was did not exhibit any significant difference from fifth to seventh day. The maximum number of florets was dropped in C_2 (2.38), C_1 (4.05) and C_1 (3.71) and minimum number of florets dropped in control (0.00), (1.00) and (3.57), respectively from fifth to seventh day. The total number of maximum florets dropped in C_2 (10.77) and minimum observed in control (6.00).

Table 1(c). Interaction effect of different food dyes and durations of treatments on dropping of tuberose florets after 4th day of treatment

Food dyes X Durations (P x D)	Number of florets drop/spike				
	days				
	4	5	6	7	Total
Control	0.00	0.00	1.00	5.00	6.00
$P_1 D_1$ .Tomato red for 4 hrs	0.00 (0.71)	1.06	1.56	4.72	7.00
$P_1 D_2$ -Tomato red for 6 hrs	0.56 (0.99)	2.28	4.72	4.33	11.89
$P_1 D_3$ -Tomato red for 8 hrs	1.56 (1.42)	1.28	4.56	5.17	12.55
$P_2 D_1$ -Rose pink for 4 hrs	0.00 (0.71)	1.72	4.56	3.06	9.33
$P_2 D_2$ -Rose pink for 6 hrs	0.61 (1.01)	2.00	5.17	4.05	11.84
$P_2 D_3$ -Rose pink for 8 hrs	1.33 (1.35)	3.45	5.06	3.50	13.33
$P_3 D_1$ -Lemon yellow for 4 hrs	0.00 (0.71)	1.56	4.28	4.39	10.22
$P_3 D_2$ -Lemon yellow for 6 hrs	0.56 (0.99)	1.84	5.39	4.28	12.06
$P_3 D_3$ -Lemon yellow for 8 hrs	1.50 (1.40)	3.39	4.83	4.05	13.78
$P_4 D_1$ -Kesar yellow for 4 hrs	0.00 (0.71)	1.33	4.61	3.61	9.56
$P_4 D_2$ -Kesar yellow for 6 hrs	0.56 (0.99)	1.61	4.39	4.28	10.83
$P_4 D_3$ -Kesar yellow for 8 hrs	1.11 (1.27)	1.67	4.28	5.11	12.17
$P_5 D_1$ -Apple green for 4 hrs	0.00 (0.71)	1.39	4.56	3.33	9.28
$P_5 D_2$ -Apple green for 6 hrs	0.89 (1.11)	3.06	4.17	3.33	11.45
$P_5 D_3$ -Apple green for 8 hrs	1.28 (1.33)	3.17	4.45	3.89	12.78
$P_6 D_1$ -Blue for 4 hrs	0.00 (0.71)	1.44	2.06	1.50	5.00
$P_6 D_2$ -Blue for 6 hrs	0.00 (0.71)	1.17	1.89	1.22	4.28
$P_6 D_3$ -Blue for 8 hrs	0.00 (0.71)	1.56	2.33	1.67	5.56
S.Em±	0.09 (0.03)	0.21	0.31	0.30	0.41
C.D. @ 1%	0.11	0.80	NS	NS	1.54

The values in the parenthesis are square root transformed values and outside are real values.

Table 1(d). Interaction effect of different concentrations and durations of treatments on dropping of tuberose florets after 4th day of treatment

Concentrations X Durations (C x D)	Number of florets drop/spike				
	Days				
	4	5	6	7	Total
Control	0.00	0.00	1.00	5.00	6.00
$C_1 D_1$ -6 % for 4 hrs	0.00 (0.71)	1.35	3.39	3.37	8.00
$C_1 D_2$ -6 % for 6 hrs	0.00 (0.71)	1.61	4.35	3.78	9.74
$C_1 D_3$ -6 % for 8 hrs	0.96 (1.19)	1.56	4.41	3.98	10.91
$C_2 D_1$ -6 % for 4 hrs	0.00 (0.71)	1.48	3.81	3.50	8.80
$C_2 D_2$ -8 % for 6 hrs	1.05 (1.22)	2.37	4.22	3.39	11.04
$C_2 D_3$ -8 % for 8 hrs	1.30 (1.30)	3.28	4.09	3.81	12.48
S.Em±	0.05 (0.02)	0.12	0.18	0.17	0.24
C.D. @ 1%	0.07	0.46	NS	NS	NS

The values in the parenthesis are square root transformed values and outside are real values.

Cost of spike: Rs. 10/spike.
Cost of Food dyes:

- Tomato red- Rs. 5/10 g.
- Rose pink -Rs. 5/10 g.
- Lemon yellow - Rs. 5/10 g.

- Kesar yellow- Rs. 5/10 g.
- Apple green- Rs. 5/10 g.
- Blue- Rs. 20/100

Number of florets dropping has showed significant difference for durations of food dyes treatments on 4th and 5th day [Table 1(a)], where the maximum florets drop found in D_3 (1.13) and D_3 (2.42) which were followed by D_2 (0.53) and D_2 (1.99), respectively. Minimum number of florets dropping found D_1 and control (0.00) on 4th day and minimum flower drop found in control (0.00) on 5th day. Number of florets dropping did not notice any significant difference on sixth and seventh day, the maximum number of florets was drop in D_2 (4.29) and D_3 (3.90), whereas minimum observed in control (1.00) and D_1 (3.44). The total number of maximum florets dropped in D_3 (11.69) and minimum observed in control (6.00). The interaction effect for different food dyes and colour concentrations were showed the significant difference found for 4th, 5th and 6th day [Table 1(b)], where the maximum number of florets dropped in P_5 C_2 (1.07), P_5 C_2 (3.63) and P_2 C_2 (5.00), which were on par with P_1 C_2 (1.04), P_3 C_2 (3.19) and P_3 C_1 (4.89), whereas minimum number of florets were dropped in P_6 C_1 (0.00), control (1.30) and control (1.96), respectively. Florets dropping did not exhibit any significant difference on seventh day and for total number of florets, where the maximum number of florets was dropped in P_1 C_1 (5.07) and P_3 C_2 (13.30), whereas minimum observed in P_6 C_2 (1.33) and P_6 C_2 (4.85). The number of florets dropped also showed significant difference for the interaction of food dyes and durations of treatments on 4th and 5th day [Table 1(c)], where the maximum florets dropped were found in P_1 D_3 (1.56) and control, P_1 D_2, P_2 D_1, P_2 D_1 (0.00), which were on par with P_3 D_3 (1.50) and P_3 D_3 (3.39), respectively, whereas minimum dropping of florets found in lesser durations of treatments. Florets dropping did not exhibit any significant difference on sixth day, seventh day and for total number of florets, where the maximum number of florets was dropped in P_3 D_2 (5.39), P_1 D_3 (5.17) and P_3 D_3 (13.78), whereas minimum observed in control (1.00), P_6 D_2 (1.22) and P_6 D_2 (4.28), respectively. The combined effect of concentrations and durations of food dyes showed the significant difference only on 4th and 5th day [Table 1(d)], where the maximum number of florets dropped in C_2 D_3 (1.30) and C_2 D_3 (3.28) followed by C_2 D_2 (1.05) and C_2 D_2 (2.37), where as minimum number of florets dropping was found in C_1 D_1 (0.00) and control (0.00), respectively. Florets dropping did not exhibit any significant difference on sixth day, seventh day and for total number of florets, where the maximum number of florets was dropped in C_1 D_3 (4.41), C_1 D_3 (3.98) and C_2 D_3 (12.48), whereas minimum observed in control (1.00), C_1 D_1 (3.37) and control (4.28), respectively.

DISCUSSION

Number of florets drop

Number of florets dropping per day showed the significant difference for different food dyes from fourth to seventh day, where the maximum number of florets was dropped in apple green, rose pink and tomato red treated spikes, whereas minimum dropped in control and blue food dye treated spikes. The toal number of florets was dropped in tomato red treated spikes and minimum number of florets dropped in blue dye treated spikes. Florets dropping were found on fourth day onwards where spikes which were treated with blue edible dye were did dropped any florets. The florets in blue edible dye treated spikes wilted but not dropped might be toxic for cell metabolism in the applied treatments, and affected the osmotic pressure of the cells thus altering the cell turgidity. Also this blue edible dye might have created blockage during translocation in vascular vessels of the spikes. The different concentrations of food dyes treatments showed significance difference for florets dropping on fourth day and which was showed no significant difference for remaining days. Maximum florets dropping found in 8 per cent concentration and minimum found in control. The Maximum florets dropping might be due to toxic effect on the cell metabolism when kept in the edible dye solution 8 per cent concentration. Flower dropping was more found in higher concentration. Number of florets dropping has showed significant difference for durations of food dyes treatments on fourth and fifth day, where the maximum florets dropped found in 8 hr duration of treatment, while minimum number of florets dropping found 4 hr of dye treatment and control The Maximum florets dropping might be due to toxic effect on the cell metabolism when kept in the edible dye solution for 8 hr of immersion. Flower dropping was more found in higher duration of 8 hr where the spikes were losing their weight and decreased the vase life. The interaction effect for different food dyes and colour concentrations were showed the significant difference found from fourth to sixth day, where the maximum number of florets dropped in apple green and rose pink at 8 per cent of concentration treated spikes, whereas minimum number of florets was dropped in blue food dye at 6 per cent and control respectively.

REFERENCES

Amin, K. A., Abdel, H., Hameid, A. H. and Elstar, A. 2010. Effect of food and azo dyes tetrazine and carminozine on biochemical parameters related to renal hepatic function and oxidative stress, biomarkers in young male rats. *Food and Chemical Toxicity,* 48:2994-2995.

****