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EFFECT OF NITROGEN, PHOSPHORUS AND THEIR INTERACTION ON FLOWER QUIALITY AND VASE LIFE OF SNAPDRAGON

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Abstract

A field experiment was carried out to study the effect of nitrogen, phosphorus and their interaction on snapdragon at the Main Experiment Station, Department of Floriculture & Landscape, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during winter season in the year 2016-2017. The experiment was conducted in Randomized Block Design (Factorial) with 12 treatment combinations and three replications to assess the effect of nitrogen, phosphorus and their interaction on flower quality and vase life of snapdragon. Results reveal that the application of nitrogen 60 kg per hectare (N_2) proved maximum duration of flowering (50.27cm days), length of spike (45.35 cm), number of spike/plant and per hectare (4.48 & 7.57 lack) and vase life (14.33 days) number of florets per spike (45.16), however number of florets per spike (36.10) was obtained by application of nitrogen 90 kg/ha. Application of nitrogen delayed the spike initiation. Application of phosphorus had also responses well on flower quality and vase life of snapdragon. Phosphorus at 60 kg per hectare resulted maximum duration of flowering (48.57cm days), maximum length of spike (40.82 cm), number of florets per spike (33.51), number of spike/plant and per hectare (4.48 & 7.54 lack), and vase life of spike (13.78 days).The interaction effect of nitrogen and phosphorus left significant response on duration of flowering, number of floret per spike.

Key Word- Nitrogen, Phosphorus, Snapdragon, Spike, Floret, Vase life

Introduction

Snapdragon is an important annual grown in the winter season for garden decoration and production of flowers. It is popularly called as snapdragon, dog flower, bunny rabbit or bunny mouth because of its curious shape of flowers, which resemble a dog, rabbit or dragon. It is ideally suited for beds, pots, edging, window boxes, rockery and mixed borders or with herbaceous plants. Snapdragon flowers are used as cut flower, floral arrangements and in bouquets. Snapdragons thrive in cold weather when many flowering plants are still dormant or just emerging. Snapdragons bloom not according to the calendar but according to the temperature. Expect these plants to be happiest when temperatures are between 20 and 80^0F. The flowers come in a wide range of colors from reds, orange, yellow, and maroon. Plants with dark colored flowers have dark green or reddish stems and those with white or pale flowers have pale green stems.

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Nitrogen is one of the very important major plant nutrients which directly affect the quality and vase life of flower. It is constituent of nucleic acid, protoplasm and might have increased carbohydrates synthesis, amino acid etc. from which the phyto-harmones like auxins, gibberellins and cytokinins have been synthesizes resulting flower quality and vase life of spike. Very little work has been done on nitrogen requirements of snapdragon. Proper manuring and fertilization is very important for better flowering and vase life. Application of appropriate amount of nitrogen is important as its deficiency causes several abnormalities like over growth and less flowering.

Phosphorus is one of the important elements for plant growth and metabolism. It plays key roles in many plant processes such as energy metabolism, the synthesis of nucleic acid and membranes, photosynthesis, respiration, nitrogen fixation and enzyme regulation. Adequate phosphorus nutrition enhances many aspects of plant development including flowering and vase life. Keeping in view the importance of nitrogen and phosphorus on the plant present experiment was conducted to assess the effect of nitrogen, phosphorus and their interaction on snapdragon.

Materials and Methods

The present study was under taken at Main Experimental Station, Horticulture, N.D.U.A. & T., Kumarganj, Faizabad (U.P.) India during winter season of 2016- 17. Geographically, it is situated in typical saline alkali belt of Indo-gangetic plains of eastern U.P. at 26.47-0 N latitude, 88.120 E longitudes and at an altitude of 113 meter from mean sea level. The region enjoys sub humid and subtropical climate receiving a mean annual rainfall of about 1215 mm out of which about 85% is concentrated from mid June to end of September. The winter months are cold and dry and occasional frost occurs during this period. The experiment was laid out in Randomized Block Design (factorial) with three replications and twelve treatment combinations either alone or in combination of nitrogen and phosphorus to evaluate the effect of nitrogen and phosphorus on snapdragon. 30 days old seedlings of snapdragon, African mix variety were transplanted at 30 × 20 cm in well prepared seed bed in the month of November. The FYM were mixed with soil at final field preparation. Nitrogen and phosphorus were applied in the form of urea and single superphosphate. Urea was applied in two split doses as first dose applied at the time of transplanting and second dose after 30 days of transplanting, while phosphorus was used in single dose as basal application. Murat of potash (MOP) was applied as recommended dose at the time of final field preparation. Observations were recorded on five tagged plants and mean were calculated. The obtained data had statistically analyzed adopting procedure as given by Panse and Sukhatme (1985).

Results and Discussion

The statistical analysis of data (table-1) revealed that

Table 1: Effect of nitrogen, phosphorus and their interaction on flower quality and vase life of snapdragon

Treatments	Days taken to first spike initiation	Duration of flowering (days)	Length of spike (cm)	No. of spikes per plant	No. of florets per spike	No. of spikes/ ha.(lack)	Vase life of flower (days)
N_0	107.36	39.22	27.78	3.53	23.16	6.01	11.11
N_1	109.47	43.03	37.84	4.20	29.09	7.01	13.52
N_2	116.33	50.27	45.35	4.48	35.91	7.57	14.33
N_3	111.89	47.20	42.06	4.18	36.10	6.97	13.80
S.Em±	0.57	0.72	0.66	0.15	0.68	0.23	0.35
CD at 5%	1.69	2.12	1.95	0.44	2.00	0.69	1.03
P_0	108.42	41.77	34.98	3.67	28.83	6.12	12.53
P_1	110.73	44.46	38.97	4.15	30.83	7.01	13.35
P_2	114.63	48.57	40.82	4.48	33.51	7.54	13.78
S.Em±	0.49	0.62	0.57	0.13	0.59	0.69	0.30
CD at 5%	1.46	1.84	1.69	0.38	1.74	0.60	0.89
N_0P_0	104.73	38.27	24.69	3.27	20.33	5.45	10.33
N_0P_1	106.74	39.40	29.53	3.33	24.00	5.90	11.33
N_0P_2	110.87	40.00	29.11	4.00	25.13	6.67	12.00
N_1P_0	107.73	39.40	33.84	3.27	24.93	5.45	13.00
N_1P_1	108.93	42.50	37.95	4.47	27.53	7.45	13.67
N_1P_2	111.73	47.20	41.73	4.87	34.80	8.12	13.90
N_2P_0	112.07	45.33	43.73	4.07	34.20	6.79	13.80
N_2P_1	116.43	48.93	44.43	4.60	36.13	7.68	14.33
N_2P_2	120.47	56.53	47.88	4.77	37.40	8.23	14.87
N_3P_0	109.13	44.07	37.67	4.07	35.87	6.79	13.00
N_3P_1	111.07	47.00	43.97	4.20	35.73	7.01	14.07
N_3P_2	115.47	50.53	44.54	4.27	36.71	7.12	14.33
S.Em±		1.25			1.18		
CD at 5%	NS	3.68	NS	NS	3.48	NS	NS

N=Nitrogen, N_0= 0 kg/ha, N_1=30 kg/ha, N_2=60 kg/ha, N_3=90 kg/ha, P=Phosphorus, P_0=0 kg/ha, P_1=30 kg/ha, P_2=60 kg/ha quality and vase life of flower influenced with different treatments. Application of higher doses of nitrogen delayed the spike initiation and opening of first floret. However maximum duration of flowering (50.27 days), length of spike (45.35 cm), maximum number of spike per plant and per hectare (4.48 & 7.57 lack) and longest vase life (14.33 days) were obtained with application of nitrogen at 60 kg/ha. However nitrogen delayed spike initiation. Maximum number of florets per spike (36.10) was obtained with application of nitrogen at 60 kg/ha. Flower quality and vase life of flower enhanced with nitrogen application because nitrogen is a very important constituent of nucleic acid, protoplasm and its might have increased carbohydrate synthesis, amino acids etc. from which the phyto- hormones like auxins, gibberellins, cytokines have been synthesized resulting in increased flower quality. These results are in close conformity with those of Sonawane *et al.* (2008), Kishor *et al.* (2010) and Lehri *et al*. (2011) in gladiolus, Kaur and Sharma (2012) in tuberose and Dhaked *et al.,* (2013) in calendula.

The flower quality and vase life increased significantly influenced with different level of phosphorus. Phosphors at 60 kg/ha exhibited significantly maximum duration of flowering (48.57 days), length of spike (40.82 cm), number of florets per spike (33.51), number of spike per plant and per hectare (4.48 & 7.54 lack) and vase life of flowers (13.78 days). Application of higher doses of phosphorus delayed the spike initiation. Phosphorus governs the root growth and constituent of nuclic acid phytin ATP which plays a vital role in plant for proper growth and developments, ultimately higher and quality flower production and enhanced vase life. These results are in close conformity with those of Chauhan and Kumar (2007) and Kumar and Singh (2011) in calendula, Khan *et al.* (2012) and Verma *et al.* (2015) in gladiolus.

The interaction effect between nitrogen and phosphorus was found significant in duration of flowering (days) and number of florets per spike. Results are in conformity with Baboo and Singh (2003) and Acharya and Dashora (2004) in marigold.

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