

## Yield and quality of gerbera influenced by nitrogen and phosphorus levels under polyhouse conditions

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### ABSTRACT

An experiment entitled "Yield and Quality of gerbera as influenced by nitrogen and phosphorus levels was carried out from February, 2004 to August, 2004 at Floriculture Unit, University Department of Horticulture, Dr. Panjabrao Deshmukh krishi Vidyapeeth. The results indicated that, significantly maximum flowers per plant and per sq.m, flower stalk length, flower stalk thickness and number of flowers of grade I were recorded under the higher levels of nitrogen and phosphorus (10 N + 15 g P<sub>2</sub>O<sub>5</sub> /m<sup>2</sup>). Maximum flower diameter was obtained under the application of 10 g N/ m<sup>2</sup> along with 12.5 P<sub>2</sub>O<sub>5</sub>/m<sup>2</sup>. Whereas, maximum flowers of grade II and more vase life were reported under lower level of nitrogen and higher level of phosphorus (5 g N + 15 g P<sub>2</sub>O<sub>5</sub>/m<sup>2</sup>).

**Key words:** Gerbera, Nitrogen, Phosphorus, Polyhouse.

### INTRODUCTION

Now a days, Gerbera (*Gerbera jamesonii* H. Bolus) has come up as a new potential flower crop for protected cultivation. It is one of the most popular cut flowers in the world and according to the global trends in floriculture, it occupies fourth place among cut flowers (Sujatha *et al.* 2002). In Maharashtra total area under protected cultivation of gerbera was 29.12 ha with the production of 360 lakh flower. The success of gerbera crop grown under the controlled conditions, depends upon many factors and optimum fertilization is one of the most important factor need to be considered for obtaining quality produce. In this regard, preferably nitrogen and phosphorus has been found very effective in gerbera. Hence, to decide suitable dose of nitrogen and phosphorus present investigation was carried out.

Akola, on yield and quality of gerbera as influenced by nitrogen and phosphorus levels during February to August, 2004. The experiment was laid out in Factorial Complete Randomized Design (FRD) with three replications. The treatments consist of four levels of nitrogen (0, 5, 7.5 and 10 g N/m<sup>2</sup>) and four levels of phosphorus (0, 5, 10 and 15 g P<sub>2</sub>O<sub>5</sub> / m<sup>2</sup>). Red soil, well rotten FYM and sand (2:1:1) were mixed thoroughly. The whole mixture was then sterilized with formalin (0.2%) by covering with polythene sheet for 48 hrs. Raised beds of 3 m length, 1 m breadth and 0.40 m height were prepared. Two months hardened tissue culture gerbera plants of variety Estoril were planted on beds at a distance of 30x30 cm on 26<sup>th</sup> February, 2004. The observations were recorded on yield and quality attributes and presented in Table 1.

### MATERIALS AND METHODS

An experiment was carried out at Floriculture Unit, University Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth

### RESULTS AND DISCUSSION

#### Yield

The data presented in Table 1 indicated that, significantly

Table 1: Yield and quality of gerbera as influenced by nitrogen and phosphorus levels

Treatments	Flower yield		Flower stalk length (cm)	Flower diameter (cm)	Flower stalk thickness (cm)	Grades			Vase life (days)
	Per plant	Per sq.m.				*Grade I	*Grade II	*Grade III	
T <sub>1</sub> – N <sub>0</sub> P <sub>0</sub> (0 g N + 0 g P <sub>2</sub> O <sub>5</sub> /sq.m)	3.68	33.12	43.37	5.81	0.37	0.41	0.53	2.74	5.54
T <sub>2</sub> – N <sub>0</sub> P <sub>1</sub> (0 g N + 5 g P <sub>2</sub> O <sub>5</sub> /sq.m)	4.08	36.72	45.16	6.64	0.49	1.02	0.57	2.49	6.23
T <sub>3</sub> – N <sub>0</sub> P <sub>2</sub> (0 g N + 10 g P <sub>2</sub> O <sub>5</sub> /sq.m)	4.42	39.78	45.86	6.81	0.53	1.59	0.72	2.11	6.77
T <sub>4</sub> – N <sub>0</sub> P <sub>3</sub> (0 g N + 15 g P <sub>2</sub> O <sub>5</sub> /sq.m)	4.86	43.78	49.63	7.31	0.58	1.93	0.91	2.02	7.42
T <sub>5</sub> – N <sub>1</sub> P <sub>0</sub> (5 g N + 0 g P <sub>2</sub> O <sub>5</sub> /sq.m)	5.14	46.26	52.17	6.92	0.43	2.29	0.94	1.91	6.59
T <sub>6</sub> – N <sub>1</sub> P <sub>1</sub> (5 g N + 5 g P <sub>2</sub> O <sub>5</sub> /sq.m)	5.39	48.51	53.27	7.44	0.54	2.43	1.29	1.67	10.47
T <sub>7</sub> – N <sub>1</sub> P <sub>2</sub> (5 g N + 10 g P <sub>2</sub> O <sub>5</sub> /sq.m)	5.92	53.28	52.65	7.74	0.61	3.17	1.62	1.13	11.15
T <sub>8</sub> – N <sub>1</sub> P <sub>3</sub> (5 g N + 15 g P <sub>2</sub> O <sub>5</sub> /sq.m)	6.28	56.52	55.26	8.09	0.67	4.46	0.91	0.91	11.83
T <sub>9</sub> – N <sub>2</sub> P <sub>0</sub> (10 g N + 0 g P <sub>2</sub> O <sub>5</sub> /sq.m)	6.75	60.75	57.14	8.42	0.62	4.82	0.59	1.41	7.37
T <sub>10</sub> – N <sub>2</sub> P <sub>1</sub> (10 g N + 5 g P <sub>2</sub> O <sub>5</sub> /sq.m)	6.92	62.28	57.43	9.50	0.71	5.10	0.84	1.34	9.31
T <sub>11</sub> – N <sub>2</sub> P <sub>2</sub> (10 g N + 10 g P <sub>2</sub> O <sub>5</sub> /sq.m)	7.21	64.89	59.82	9.79	0.74	5.91	0.62	0.97	10.27
T <sub>12</sub> – N <sub>2</sub> P <sub>3</sub> (10 g N + 15 g P <sub>2</sub> O <sub>5</sub> /sq.m)	7.54	67.89	58.11	9.19	0.77	6.33	0.65	0.68	10.62
T <sub>13</sub> – N <sub>3</sub> P <sub>0</sub> (15 g N + 0 g P <sub>2</sub> O <sub>5</sub> /sq.m)	7.13	64.17	61.72	8.30	0.68	5.51	0.55	0.63	8.37
T <sub>14</sub> – N <sub>3</sub> P <sub>1</sub> (15 g N + 5 g P <sub>2</sub> O <sub>5</sub> /sq.m)	7.86	70.74	62.58	10.10	0.76	6.67	0.59	1.07	8.65
T <sub>15</sub> – N <sub>3</sub> P <sub>2</sub> (15 g N + 10 g P <sub>2</sub> O <sub>5</sub> /sq.m)	8.36	75.24	64.28	11.87	0.81	6.81	0.92	0.70	9.13
T <sub>16</sub> – N <sub>3</sub> P <sub>3</sub> (15 g N + 15 g P <sub>2</sub> O <sub>5</sub> /sq.m)	8.91	80.19	62.21	10.28	0.89	7.03	1.47	0.56	9.68
'F' test	Sig.	Sig.	Sig.	Sig.	NS	Sig.	Sig.	Sig.	Sig.
SE (m) ±	0.087	0.785	0.0127	0.0178	0.030	0.080	0.054	0.065	0.031
CD at 5% level	0.250	2.210	0.0367	0.0513	--	0.230	0.160	0.185	0.088

Grade I : Stalk length > 50 cm, diameter of flower 10 cm and above

Grade II : Stalk length 30-49.9 cm, diameter of flower 8-9.9 cm

Grade III : Stalk length < 30 cm, diameter of flower < 8.0 cm

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highest number of flowers per plant (8.91) and per square meter (80.19) were obtained from the plants fertilized with 10 g nitrogen along with 15 g phosphorus per sq.m, while, it was lowest in control i.e. without application of nitrogen and phosphorus (3.68 flowers/plant and 33.12 flowers/sq.m). Thus, with the increase in nitrogen and phosphorus levels, the number of flowers per plant went on increasing. The higher levels of nitrogen and phosphorus increased the growth and metabolic transport which leads to proper vegetative growth and ultimately increased the flower yield. Similar results were also recorded by Ambad *et al.* (2002) and Gurav *et al.* (2002) in gerbera.

#### Quality

The data revealed that, significantly maximum flower stalk length (64.28 cm), and flower diameter (11.87 cm) were recorded in the application of 10 g nitrogen along with 12.5 g P<sub>2</sub>O<sub>5</sub> per sq.m. Whereas, it was recorded minimum in control treatment (43.37 cm and 5.81 cm respectively). The effect of nitrogen and phosphorus on flower stalk thickness was non-significant. Gerbera plants fertilized with 10 g nitrogen combined with 15 g P<sub>2</sub>O<sub>5</sub> per sq.m produced maximum flowers of grade I (7.03). However, flowers of grade II were maximum under application of 5 g nitrogen combined with 10 g phosphorus per sq. m. While, these were produced minimum in control treatment (0.41 and 0.53 respectively). Control treatment were produced maximum number of Grade III flowers (2.74) and minimum (0.56) were produced by application 15 g nitrogen along with 15 g phosphorus per sq.m. The data clearly indicated that, higher levels of nitrogen and phosphorus were produced more number of quality flowers. This might be due to more production of food material which subsequently increased in the quality parameters like flower stalk length, flower diameter and graded flowers. Similar results were also obtained by Salunkhe *et al.* (2000) and Ambad *et al.* (2002) in gerbera.

#### Vase life

Significantly highest vase life period of gerbera flower (11.83 days) was recorded in application 5 g nitrogen along with 15 g phosphorus per sq.m. While, it was recorded minimum (5.54 days) in control treatment. This prolonged vase life of cut flowers in low nitrogen and high phosphorus levels might be due to the accumulation of high amount of food material in flower stalk which might have prolonged the vase life of cut flowers. The findings are in line with the findings of Maulinter and Montarone (1978) in gerbera.

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