

Yield, Quality and Economics of Potted Gerbera (*Gerbera jamesonii* H. Bolus) cv Savanaha Grown under Shade House as Influenced by Integrated Nutrient Management

NAVEEN M. PUTTASWAMY AND G. GOPINATH

*Division of Horticulture, University of Agriculture Sciences
 Bangalore 560065, India*

Abstract

The present investigation on INM on potted gerbera cv Savanaha reveals that application of vermicompost at 100 g/plant of pressmud at 50 g/plant along with PSF at 250 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients resulted in better quality cut flowers and higher yield and more benefit cost ratio. However, it also shows that the quality and yield are more in winter season.

Key words : Gerbera, Yield, Quality, Economics, Nutrient management.

Gerbera is an ornamental flowering plant, cultivated on commercial basis for its attractive color and quality cut flowers with longer stalks and comparatively longer shelf life. It is cultivated in cities like Poona, Ooty and parts of Kashmir, Sikkim, West Bengal and Karnataka. Even though fertilizer recommendations are available for this crop, information on integrated nutrient management is lacking. Due to rising cost of fertilizers. It has become imperative to arrive at an INM schedule for this crop to achieve better growth and flowering at economized use of plant nutrients under shade house as it is a shade loving plant. Hence an attempt was made using vermicompost, pressmud, phosphorus solubilizing fungi, phytozeal along with recommended nutrient dosage alone and in combination under the shade house.

Methods

The experiment was conducted on June 2002 to March 2003 at the Division of Horticulture, University of Agriculture Sciences, Bangalore. The variety chosen was Savanaha. Study comprised seven experiments laid out in a complete block design with three replications. The treatments included inorganic from of N, P₂O₅ and K₂O at 10:15:20 g/sq m alone and in combination with vermicompost, pressmud, phosphorus solubilizing fungi and phytozeal. Application of FYM at 10 t/ha and recommended nutrient dosage was constant for all treatments. The plants were grown in pots under 50% shade house condition. The

yield and quality observation was recorded for every plant in each replication at seasonally interval and also the economics was worked out.

Results and Discussion

Diameter of Cut Flower (cm)

Cut flowers with higher diameter (13.65 cm) was obtained during December 2002 by treating the plants with vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml liter + recommended dosage of nutrients compared to control (10.60 cm) (Table 1). This might be due to availability of micronutrients in vermicompost increased uptake of phosphorus and phyto-hormonal effect produced by phytozeal. The results are in conformity with the finding of Nethra (1) and Kale et al. (2) who reported greater diameter of flowers when vermicompost were used as substrates.

Length of Ray Florets (cm)

Longer length of ray florets (6.03 cm) was found in flowers of the treatments involving vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients compared to control (4.60 cm) (Table 1) as observed during December 2002.

Length of Cut Flower Stalk (cm)

Significantly greater length of cut flowers stalk was obtained during December 2002 (51.85 and 51.80

Table 1. Influence of INM on diameter of cut flower and length of the ray florets of potted gerbera cv Savanaha grown under shade house.

Treatments	Diameter of cut flower (cm)					Length of ray florets (cm)				
	Rainy		Winter		Summer	Rainy		Winter		Summer
	Aug 02	Sep 02	Dec 02	Jan 03	Mar 03	Aug 02	Sep 02	Dec 02	Jan 03	Mar 03
T1 : Control (recommended dosage of nutrients)	9.55	9.75	10.60	10.70	9.50	4.12	4.27	4.60	4.68	4.07
T2 : Recommended dosage of nutrients + vermicompost 100 g/plant	10.40	10.45	11.40	11.45	10.97	4.47	4.47	4.85	5.17	4.92
T3 : Recommended dosage of nutrients + pressmud 50 g/plant	9.60	9.75	10.85	10.95	10.85	4.20	4.25	4.62	4.87	4.78
T4 : Recommended dosage of nutrients + PSF (<i>Aspergillus awamorii</i>) 25 g/plant	9.85	10.30	10.50	10.75	10.80	4.20	4.37	4.41	4.63	4.68
T5 : Recommended dosage of nutrients + Phytozeal 30 ml/l	10.20	10.00	11.15	11.20	10.60	4.33	4.17	4.90	5.00	4.63
T6 : Recommended dosage of nutrients + vermicompost 100 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	12.50	12.75	13.65	13.25	12.90	5.60	5.75	6.03	5.90	5.75
T7 : Recommended dosage of nutrients + pressmud 50 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	11.50	12.00	12.87	12.60	12.40	5.02	5.18	5.68	5.62	5.40
SE \pm	0.23	0.22	0.22	0.20	0.19	0.17	0.08	0.11	0.14	0.11
CD at 5%	0.72	0.68	0.68	0.62	0.58	0.51	0.25	0.36	0.43	0.35

cm) when treated with pressmud at 50 g/plant or vermicompost at 100 g/plant along with PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients respectively compared to control

(Table 2). This could be due to effect of phytozeal in addition to PSF coupled with nutrient sources such as vermicompost or pressmud. The results are in conformity with findings of Seetha (3) in gerbera with

Table 2. Influence of INM on length and girth of flower stalk in potted gerbera cv Savanaha grown under shade house.

Treatments	Length of cut flower stalk (cm)					Girth of cut flower stalk (mm)				
	Rainy		Winter		Summer	Rainy		Winter		Summer
	Aug 02	Sep 02	Dec 02	Jan 03	Mar 03	Aug 02	Sep 02	Dec 02	Jan 03	Mar 03
T1 : Control (recommended dosage of nutrients)	42.45	42.95	42.20	42.60	42.05	4.80	4.80	5.40	5.30	5.00
T2 : Recommended dosage of nutrients + vermicompost 100 g/plant	42.85	45.00	46.30	45.80	44.25	5.40	5.40	5.90	5.70	6.10
T3 : Recommended dosage of nutrients + pressmud 50 g/plant	43.85	43.60	44.20	44.50	44.00	6.20	5.90	6.10	6.40	6.40
T4 : Recommended dosage of nutrients + PSF (<i>Aspergillus awamorii</i>) 25 g/plant	42.40	42.75	43.60	42.60	42.17	5.90	6.00	6.50	6.30	7.00
T5 : Recommended dosage of nutrients + Phytozeal 30 ml/l	44.00	45.00	43.70	42.17	44.75	4.80	4.70	5.40	5.30	5.70
T6 : Recommended dosage of nutrients + vermicompost 100 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	48.00	49.85	51.80	49.25	48.25	6.30	6.50	6.50	6.80	7.20
T7 : Recommended dosage of nutrients + pressmud 50 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	54.65	52.45	51.85	51.35	50.05	6.30	6.80	7.20	7.00	7.30
SE \pm	1.73	1.88	1.63	1.88	1.04	0.28	0.23	0.20	0.23	0.21
CD at 5%	5.25	5.71	4.96	5.71	3.18	0.86	0.72	0.62	0.70	0.64

Table 3. Influence of INM on yield of cut flowers per 100 m², per cent marketable and unmarketable and vase life in potted gerbera cv Savanaha grown under shade house.

Treatments	Yield of cut flowers per 100 m ²					Marke- table flowers (%)	Unmarke- table flowers (%)	Vase life (days)
	Aug 02	Rainy Sep 02	Winter Dec 02	Jan 03	Summar Mar 03			
T1 : Control (recommended dosage of nutrients)	1587.67	1833.33	2445.67	2203.67	1708.67	78.22	21.78	8.22
T2 : Recommended dosage of nutrients + vermicompost 100 g/plant	1708.67	2079.00	3421.00	3054.33	2570.33	82.50	17.50	9.11
T3 : Recommended dosage of nutrients + pressmud 50 g/plant	1587.67	1958.00	3179.00	2808.67	2321.00	81.50	18.50	9.56
T4 : Recommended dosage of nutrients + PSF (<i>Aspergillus awamorii</i>) 25 g/plant	1342.00	1833.33	2933.33	2687.67	2079.00	80.77	19.23	9.11
T5 : Recommended dosage of nutrients + phytozeal 30 ml/l	1591.33	1833.33	2687.67	2442.00	1837.00	78.53	21.50	9.22
T6 : Recommended dosage of nutrients + vermicompost 100 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	1712.33	2445.67	4521.00	4033.33	3666.67	84.55	15.45	11.44
T7 : Recommended dosage of nutrients + pressmud 50 g/plant + PSF 25 g/plant + phytozeal 30 ml/l	1587.67	2079.00	3912.33	3666.67	3175.33	83.48	16.52	10.89
SE ±	231.72	244.10	239.52	257.75	213.17	0.34	0.35	0.29
CD at 5%	NS	NS	726.57	781.88	701.24	1.05	1.05	0.89

application of vermicompost at 15 t/ha and 75% recommended dosage of NPK.

increase in stalk length, which in turn resulted in increased girth of cut flowers.

Girth of Cut Flower Stalk (mm)

Application of pressmud at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients resulted in production of thickest flower stalk (7.20) compared to control (4.60) during December 2002 (Table 2). This might be due to

Yield of Cut Flowers (Number of Cut Flowers/100 m²)

Significantly more number of cut flower per 100 m² (4,521) was resultant of application of vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of

Table 4. Economics of potted gerbera cv. Savanaha per 100 m² per year as influenced by INM under shade house. INM : Integrated nutrient management, C : Control, RDN : Recommended dosage of nutrients, VC : Vermicompost, PM : Pressmud, PSE : Phosphorus solubilising fungi, PZ : Phytozeal.

Treatments	Shade house fixed cost 120/m ²	Depreciated cost (Rs) (for a life span of 5 years)	Pots fixed cost (Rs)	Depreciated cost (Rs)	Interest on fixed cost (Rs)	Repairs and maintenance cost (Rs)	Total appariotional cost (Rs)
T1 : C	12000	2400	5000	1000	433.50	200	4033.5
T2 : RDN+VC	12000	2400	5000	1000	433.50	200	4033.5
T3 : RDN+PM	12000	2400	5000	1000	433.50	200	4033.5
T4 : RDN+PSF	12000	2400	5000	1000	433.50	200	4033.5
T5 : RDN+PZ	12000	2400	5000	1000	433.50	200	4033.5
T6 : RDN+VC+PSF+PZ	12000	2400	5000	1000	433.50	200	4033.5
T7 : RDN+PM+PSF+PZ	12000	2400	5000	1000	433.50	200	4033.5

Table 4. Continued.

Treatments	Cost of cultivation (Rs)	Total cost of cultivation (Rs)	Total yield of flowers	Total revenue (Rs) at 2/flr	Net profit (Rs)	B : C
T1 : C	4750	8783.5	7775	15550	6766.5	0.77
T2 : RDN + VC	5000	9033.5	10120	20240	11206.5	1.19
T3 : RDN + PM	6375	10408.5	9380	18760	8351.5	0.80
T4 : RDN + PSF	5500	9533.5	8610	17220	7686.5	0.81
T5 : RDN + PZ	6600	10633.5	8115	16320	5596.5	0.53
T6 : RDN + VC + PCF + PZ	7600	11633.5	13031	26058	14424.5	1.24
T7 : RDN + PM + PSF + PZ	8975	13008.5	11279	22550	9541.5	0.73

nutrients compared to control (2,445.67) (Table 1) during December 2002. This could be attributed of vermicompost plus enhanced phosphorus availability and phytozeal as a source of growth regulating substance. The findings are in conformity of those Seetha (3) in gerbera, Mashaldi (4) in marigold and Sreenivas and Gowda (5) in China aster with use of vermicompost and recommended dosage of nutrients and phosphocompost.

Marketable and Unmarketable Cut Flowers (%)

Application of vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients resulted in higher per cent yield of marketable flowers (84.55%) when compared to control (78.22%) (Table 3). This could be attributed to higher nutrient availability and efficient usage of the available nutrients by the crop.

Vase Life (days)

Significant longer vase life (11.44 days) and shorter (8.22 days) was recorded by the plant treated with vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal at 30 ml/liter + recommended dosage of nutrients and control respectively (Table 3). The results are in agreement with those of Seetha (3) in gerbera and Nethra (1) in China aster.

Economics

The economics worked out revealed that treating the potted gerbera cv Savanaha grown under shade house with vermicompost at 100 g/plant + PSF at 25 g/plant + phytozeal 30 ml/liter + recommended dosage of nutrients resulted in maximum yield (13,029 flowers), revenue (Rs 14, 424.5) and benefit : cost ratio (1.24) (Table 4) compared to other treatments.

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