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## Effect of different soil media on growth, flowering and yield of gerbera (*Gerbera jamesonii*) under naturally ventilated polyhouse condition

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**Abstract**

An experiment entitled Effect of Different Soil Media on Growth, Flowering and Yield of Gerbera (*Gerbera jamesonii* Bolus) under naturally ventilated polyhouse conditions was conducted at Horticulture Research Field, Department of Horticulture, during the year 2019-2020. The experiment was laid out in Factorial Randomized Block Design having 10 treatments T<sub>0</sub>(Normal soil), T<sub>1</sub>(Cocopeat), T<sub>2</sub>(Vermicompost), T<sub>3</sub>(Neemcake), T<sub>4</sub>(Cocopeat 50% + Vermicompost 50%), T<sub>5</sub>(Cocopeat 25% + Vermicompost 75%), T<sub>6</sub>(Cocopeat 75% + Vermicompost 25%), T<sub>7</sub>(Cocopeat 75% + Neemcake 25%), T<sub>8</sub>(Cocopeat 25% + Neemcake 75%), T<sub>9</sub>(Cocopeat 50% + Neemcake 50%) with three replications. The result revealed that treatment T<sub>1</sub> (Cocopeat) is the most promising treatment with respect to plant height (40.75cm), plant spread (34.27cm), number of leaves (15.45cm), days taken for bud initiation (77.18), Flowering diameter (9.70cm), Flower stalk length (43.69cm), flower stalk girth (2.07cm), vase life (10days), flower yield per plant (11.02), flower yield/200m<sup>2</sup> (139.09), maximum gross return (556,360), maximum net return (387,660) and benefit cost ratio is 3.29. Thus, among the different treatments soil media cocopeat is the most suitable soil media under naturally ventilated polyhouse in Prayagraj agro climatic conditions.

**Keywords:** different soil media, gerbera, polyhouse

**Introduction**

Gerbera (*Gerbera Jamesonii*) comes from a daisy family Asteraceae. It was named after german naturalist Traugott Gerber. It is native of tropical regions of South America, Africa and asia. It is a south African species also known as Transvaal daisy or Barberton daisy. Gerbera is commonly known as the African daisy. It stands among the top 10 cut flower of the world. On average 241 million blooms are produced every year. There are currently more than 40 species of gerbera plant worldwide. Gerbera is ideal for beds, borders, pots and rock gardens. It is widely used as decorative garden plant or as cut flower. It is commercially produced widely in the flower industry due to its floral flowers, attractive colour, good keeping quality and suitable for long distance travelling as they have a high market price. It grows well within tropical and sub tropical altitudes of 13,00 to 3,200 meters.

Gerbera are usually 30-40 cm tall. It produces attractive flowers known as 'head' or capitulum. Leaves are patioled, lanceolate and deeply lobed and are arranged at the base. Flowers are like daisy in many wide range of colours like white, yellow, red, orange, peach, pink, maroon, scarlet, and various other shades.

Gerbers cultivation can be done under wide range of conditions but the flowering and performance is greatly enhanced when grown in protected or semi-protected conditions. In tropical climate gerbera flowers are grown in the open but in subtropical and temperate climate they are protected from frost and cultivated in greenhouse/shade net house. Day temperature of 22-25 °C and night temperature of 12 °C to 16 °C is ideal for cultivation. Temperature that is below 7 °C will hinder the growth and result in inferior growth.

**Materials and Methods**

A field experiment entitled 'Effect of different soil media on growth, flowering and yield of gerbera (*Gerbera jamesonii*) under naturally ventilated polyhouse conditions' was carried out at Research Field of Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences during 2019-2020. The area is situated on the south of prayagraj on the right bank of Yamuna at rewa road 6km distance from prayagraj city. It is situated at a latitude of 60°3" East and altitude of 98 meters above mean sea level (MSL).

The area of Prayagraj district comes under subtropical belt in the South east of Uttar Pradesh, which experience extremely hot summer and fairly cold winter.

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The maximum temperature of the location reaches up to 46 °C – 48 °C and seldom falls as low as 4 °C – 5 °C. The relative humidity ranges between 20 to 94 per cent. The average rainfalls in this area are around 1013.4 mm annually.

Ten treatment combinations is done with Randomized Block Design (RBD) with three replications. The soil media used were cocopeat, vermicompost, neemcake and untreated control normal soil were used in which plant overall improvements were taken at 30,60 and 90 days.

### Results and Discussion

The present investigation entitled 'Effect of different soil media on growth, flowering and yield of gerbera (*Gerbera jamesonii*) under naturally ventilated polyhouse condition' was carried out in the Research Field of Department of Horticulture, Naini Agriculture Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, during December, 2019 to April, 2020.

#### Plant height (cm) of gerbera

Maximum height was recorded in cocopeat (40.75 cm) followed by vermicompost (39.19 cm) which was on par with neemcake (41.09 cm) and cocopeat 75% + vermicompost 25% (39.29 cm). Normal soil recorded minimum height (25.5 cm).

#### Plant spread (cm) of gerbera

Maximum spread was recorded in cocopeat (34.27 cm) followed by vermicompost (32.34cm) which was on par with neemcake (32.14 cm) and cocopeat 75% + vermicompost 25% (34.04 cm). Normal soil recorded minimum height (25.56 cm) and Coco 25% + Neemcake 75% (24.44 cm).

#### Number of leaves per plant of gerbera

Among the different soil media used, maximum number of leaves per plant was recorded in the soil media of cocopeat (15.45), vermicompost (16.07) which was at par with Neemcake (15.30), and cocopeat 75% + vermicompost 25% (14.53). Normal soil recorded minimum height (13.50) and Coco 25% + Neemcake 75% (12.30).

#### First flower bud emergence (days)

Among the different soil media the maximum number of days for first flower bud emergence (85.70) was recorded in normal soil and (83.75) in Cocopeat 25% + Neemcake 75%. And (77.18) Cocopeat, (80.17) Vermicompost, (78.58) Neemcake and (80.29) Cocopeat 75% + Vermicompost 25% was observed best for earliness.

#### Flower diameter (cm) of gerbera

Among the different soil media the maximum flower diameter(9.70cm) was recorded in Cocopeat, (8.75cm) in Vermicompost, (8.90cm) in Neemcake followed by (8.95cm) in Cocopeat 75% + Vermicompost 25% and minimum flower diameter (8.70cm) were observed in Normal soil and (8.50cm) in Cocopeat 25% + Neemcake 75%.

#### Stalk length (cm) of gerbera

Among the different concentration the maximum stalk length(43.69cm) in Cocopeat, (42.29cm) in Vermicompost, (43.17cm) in Neemcake and (41.90cm) in Cocopeat 75% + Vermicompost 25%) and minimum stalk length (34.50cm) Normal soil and (33.77cm) were observed in Cocopeat 25% + Neemcake 75%.

#### Stalk girth (cm) of gerbera

Among the different concentration the maximum stalk girth (2.07cm) was recorded in Cocopeat, (2.02cm) in Vermicompost, (1.75cm) in Neemcake and (1.59cm) in Cocopeat 75% + Vermicompost and minimum stalk girth (1.09 cm) in normal soil and (1.12 cm) in Cocopeat 25% + Neemcake 75%.

#### 4 Vase life (days)

Among the different concentration the maximum vase life (10 days) was recorded in Cocopeat, (10.2 days) in Vermicompost, (9.90 days) in Neemcake and (9.67 days) in Cocopeat 75% + Vermicompost 25% CCC and minimum vase life (7 days) in normal soil and (7.5 days) in Cocopeat 25% + Neem 75%.

#### Flower yield (number) per plant

Among the different concentration the maximum number of flower per plant (11.02) was recorded in Cocopeat, (10.43) in Vermicompost, (10.77) in Neemcake and (11.12) in Cocopeat 75% + Vermicompost 25% and minimum number of flower per plant (7.19) was observed in Normal soil and (7.39) in Cocopeat 25% + Neemcake 75%.

#### Flower yield (1000) per 200 sq m.

Among the different concentration the maximum flower yield per 200 sq m (139.09) was recorded in Cocopeat, (127.13) in Vermicompost, (120.45) in Neemcake and (135.18) in Cocopeat 75% + Vermicompost 25% and minimum flower yield per 200 sq m (87.07) in Normal soil and (88.14) in Cocopeat 25% + Neem 75%.

**Table 1:** Growth parameters, flower yield and vase life of gerbera as influenced by different soil media.

Treatment	Treatment combination	Plant Height (cm)	Plant Spread (cm)	No. of Leaves/plant	1 <sup>st</sup> flower bud emergence (days)	Flower diameter (cm)	Stalk length (cm)	Stalk girth (cm)	Vase life (days)	Flower yield per plant	Flower yield per 200 sq m.
T <sub>0</sub>	Normal soil	25.5	25.56	13.50	85.70	8.77 cm	34.50	1.09	7	7.39	87.07
T <sub>1</sub>	Cocopeat	40.75	34.27	15.45	77.18	9.70 cm	43.69	2.07	10	11.02	139.09
T <sub>2</sub>	Vermicompost	39.19	32.34	16.07	80.17	8.75 cm	42.29	2.02	10.02	10.43	127.13
T <sub>3</sub>	Neemcake	41.09	32.14	15.30	78.58	8.90 cm	43.17	1.75	9.90	10.77	120.45
T <sub>4</sub>	Cocopeat 50% + Vermicompost 50%	35.23	32.05	14.53	79.27	9.25 cm	39.55	1.20	8.33	9.85	119.04
T <sub>5</sub>	Cocopeat 25% + Vermicompost 75%	39.72	31.75	14.49	80.36	9.07 cm	40.09	1.45	9.08	9.62	118.08
T <sub>6</sub>	Cocopeat 75% + Vermicompost 25%	39.29	34.04	14.19	80.29	8.95 cm	41.90	1.59	9.67	11.12	135.18
T <sub>7</sub>	Cocopeat 75% + Neemcake 25%	40.25	28.66	13.75	79.65	8.65 cm	41.15	1.25	7.67	8.86	120.07
T <sub>8</sub>	Cocopeat 25% + Neemcake 75%	37.70	24.44	12.30	83.75	8.50 cm	33.77	1.12	7.5	7.19	88.14
T <sub>9</sub>	Cocopeat 50% + Neemcake 50%	39.15	29.60	12.70	78.75	8.60 cm	41.12	1.18	8.29	8.93	117.12

## Conclusion

Based on the findings of the experiment it is concluded that the treatment T1 (Cocopeat) is the most promising treatment with respect to plant height (40.75cm), plant spread (34.27cm), number of leaves (15.45cm), days taken for bud initiation (77.18), Flowering diameter (9.70cm), Flower stalk length (43.69cm), flower stalk girth (2.07cm), vase life (10days), flower yield per plant (11.02), flower yield/200m<sup>2</sup> (139.09), maximum gross return (556,360), maximum net return (387,660) and benefit cost ratio is 3.29. This soil media is suitable for commercial cultivation under naturally ventilated polyhouse under Prayagraj agro climatic condition.

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