Original Research Article

Determining the Effect of Growing Media on Growth and Flowering of Rose

ABSTRACT

The present study aimed to determinethe effect of Growing Media on Growth and Flowering of Rose. The study investigation was carried out in the Experimental Farm, Dept. of Horticulture, Assam Agricultural University, Jorhat for the year 2022-2023 with a view to assess the effect of growing media on growth and flowering of rose (Variety Revival). The experiment was carried out in Completely Randomized Design consisting of 9 treatment combination *viz*., T_1 {Sandy loam + Sand + FYM @ 1:1:1 (w/w)}, T_2 {Loam soil + Sand + FYM @ 1:1:1 (w/w)}, T_3 {Clay loam + Sand + FYM @ 1:1:1 (w/w)}, T_4 {Sandy loam + Sand + Vermicompost @ 1:1:1 (w/w)}, T_5 {Loam soil + Sand + Vermicompost @ 1:1:1 (w/w)}, T_6 {Clay loam + Sand + Vermicompost @ 1:1:1 (w/w)}, T_7 {Sandy loam + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)}, T_8 {Loam soil + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)}, T_9 {Clay loam + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)}, which were replicated three times.

The test crop positively responded to the growing media and the highest performance was observed for the treatment T_8. Stem girth, number of nodes, intermodal length, leaf area and leaf area index, days taken to bud visibility, bud sprouting, half bloom and full bloom, length of stalk and diameter of bud, number of flowers, number of petals per flower and flowering duration (self-life) and diameter of flower were significantly enhanced by the treatment T_8.

Keywords: Rose, vermicompost, cocopeat, loam, Sand, FYM

1. INTRODUCTION

The Rose, scientifically known as *Rosa indica*, is widely recognized as the "Queen of Flowers" due to its unique shape, varying sizes, alluring colours, delightful fragrance and has many practical applications [1]. Genus Rose comprises of more than 200 species and 18,000 cultivars that has since been used as vibrant plant in floriculture industry [2]. Nowadays, the potted production of rose plants is gaining popularity as potted plants are a good source for decreasing air pollution provide freshness in indoor premises. Important growing substrates that are ideally employed for the container production of both annual and perennial ornamental plants include garden soil, sand, vermicompost, cocopeat, FYM, and coir husk [3]. These materials help to boost the microbial activity of the soil which is necessary to improve and meet the nutritional needs and also decrease the nitrogen losses of the crop[7].

A good growing media is very important for the plant to be adequately anchored so that the supply of nutrients and water, as well as gas exchange between the roots and the atmosphere outside the growing medium is not hampered. A highly sought-after horticultural by-product utilized as a substrate for the growth of numerous floricultural crops is coco peat, which is made after the fibre from coconut husk is extracted because of its pH, electrical conductivity and other chemical properties [4].

It is necessary to amend cocopeat with sufficient organic composts in order to maintain the ideal level of nutrients in growing media for the successful growth of plants. Vermicomposting is a technique for obtaining organic matter that is well known for producing highly stable, non-thermophilic products with a lot of potential as soil amendments (Manono, 2016). Large levels of humic substances found in vermicomposts have some effects on plant growth that are comparable to those of soil-applied with plant growth regulators (Manono, 2016). It is with this background that this study aimed to assess the effect of growing media on these aspects by analyzing some growth and flowering parameters in the rose plant.

2. MATERIAL AND METHODS

A field experiment on Effect of growing media on growth and flowering of rose was conducted during 2022-23 at the Experimental Farm, Department of Horticulture, Assam Agricultural University, Jorhat.

For this experiment, three different types of soil were utilized *viz.*, sandy loam, loam and clay loam. The textural class of the soil samples were estimated by feel method for determining soil texture. Soil texture refers to the ratio of sand, silt, and clay present in the soil. In the experiment, Sand, Farmyard Manure, Vermicompost and Cocopeat were used.

2.1 Experimental details

The details of the experiment with respect to treatment, design, plot size are given below:

list 1 :Details of the experiment with respect to treatment, design, plot size

Period of Experiment	: 2022-2023
Crop Variety	: Revival
Design of the experiment	: CRD (Completely Randomized Design)
Number of replications	: 3
Number of treatments	: 9
Number of pots per treatment	: 5
Pot size	: 30 cm diameter and 28 cm height
Total number of pots	: 135
Total area	: 500 m^2

2.2 Treatment details

The experiment consisted of 9 (nine) treatment combinations comprised of 3 (three) different types of soil incorporated with sand, FYM, vermicompost and cocopeat. The details of the treatment combinations are given below:

2.2.1 Treatments

List 2 :Details of the treatment combinations

Notation	**Treatment**
Treatment 1 (T_1)	Sandy loam + Sand + FYM @ 1:1:1 (w/w)
Treatment 2 (T_2)	Loam soil + Sand + FYM @ 1:1:1 (w/w)
Treatment 3 (T_3)	Clay loam + Sand + FYM @ 1:1:1 (w/w)
Treatment 4 (T_4)	Sandy loam + Sand + Vermicompost @ 1:1:1 (w/w)
Treatment 5 (T_5)	Loam soil + Sand + Vermicompost @ 1:1:1 (w/w)
Treatment 6 (T_6)	Clay loam + Sand + Vermicompost @ 1:1:1 (w/w)
Treatment 7 (T_7)	Sandy loam + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1(w/w)
Treatment 8 (T_8)	Loam soil + Sand + Vermicompost (10% substituted with Cocopeat)

	@ 1:1:1 (w/w)
Treatment 9 (T_9)	Clay loam + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)

The soils used for the pot experiment were collected from three different locations of the Experimental Farm, Department of Horticulture, Assam Agricultural University, Jorhat. Each soil was mixed thoroughly and stones and debris were removed and mixed homogeneously with sand. Each soil sample was mixed with FYM, vermicompost and cocopeat in different ratios respectively.

2.3 Filling up of pot

For the pot experiment, 5 kg capacity pots were used. The pots were properly cleaned and sun-dried. Holes were made and a few broken pieces of bricks were placed at the bottom of the pots. Then the pots were filled with soil mixture and proper labelling of each pot was done.

2.4 Collection of planting material and planting

35 days old grafted planting material were collected from a Government accredited nursery and were planted in individual pots on 19th August, 2022. Watering was done immediately after the completion of planting.

2.5 Crop protection

Saaf @ 1.5gm/l and Blitox @ 2gm/l was sprayed alternately as a prophylactic measure against dieback at an interval of 15 days. 2-3 spray of Blitox @ 2gm/l and Imidacloprid @ 0.5 ml/l was sprayed at an interval of 10 days for insect attacks. 21

2.6 Observations recorded

Growth characters

- Plant height (cm)
- Number of leaves per plant
- Leaf area per plant (cm^2) was measured with a Laser area Meter Model No: C1-203, C1-203A (Make-CID, Inc., USA). Leaf area index (LAI)
- The leaf area index was calculated according to Evans (1972) as follows:
  LAI = Total leaf area of the plant Total ground area covered by the plant
- Stem girth (cm)
- Intermodal length (cm)
- Plant spread (cm)

Flower characters

- Days taken to bud visibility from planting
- Days taken to bud sprouting
- Days taken to half bloom
- Days taken to full bloom
- Bud length (cm)
- Bud diameter (cm)
- Stalk length (cm)

- Stalk diameter (cm)
- Flower diameter (cm)
- Number of flowers per plant
- Number of petals per flower
- Self-life (duration of the flowering) (days)

3. RESULTS AND DISCUSSION

3.1 Effect of growing media on soil physico-chemical properties (after mixing)

Results on soil analysis after mixing showed a significant variation between the treatments in respect of soil pH, organic carbon and available N, P and K in the growing media.

It was found that the treatment T_1 {Sandy loam + Sand + FYM @ 1:1:1 (w/w)} exhibited the highest soil pH of 5.91 (Table 1). The probable reason for this may be because of the application of FYM in sandy loam soil which is responsible for the moderately acidic pH as pH of FYM is higher than that of any other organic inputs amended in the growing media treatments. Similar finding was reported by [5]. However, highest organic carbon of 23.20 g kg^{-1} (Table 1), available Phosphorus of 23.15 kg ha^{-1} and Potassium of 152.54 kg ha^{-1} (Table 2) was recorded in treatment T_9. This might be because of the presence of cocopeat in the media containing clay loam soil as cocopeat has organic matter of 85-90 % and as soil carbon is a component of soil organic matter leading to higher organic carbon in the growing media. Similar findings were reported by [6]. Organic amendments can significantly enhance soil organic C and provide considerable effects on soil microbes, nutrient availability, and uptake for plant [7]. The probable reason for higher P and K content might be because of the presence of vermicompost and cocopeat in the media both containing adequate quantities of N, P, K and several micronutrients essential for plant growth [8]. The probable reason for the increase in the available potassium content might be due to the release of potassium from the organic inputs and also release of potassium [9]. The increase in available phosphorus in soil might be due to the incorporation of compost which is enriched with PSB and other microorganism helping in phosphate solubilizing and mineralization process thus increases the soluble form of Phosphorus [10].

Table 1. pH and organic carbon content of different media (24 hours after mixing)

Treatment	pH	Organic carbon (g kg^{-1})
Treatment 1	5.91	15.63
Treatment 2	5.72	16.33
Treatment 3	5.68	16.53
Treatment 4	5.23	11.27
Treatment 5	5.20	12.03
Treatment 6	5.12	15.27
Treatment 7	5.12	20.20
Treatment 8	5.11	20.40
Treatment 9	5.05	23.20
S.Ed. (±)	0.12	2.09
$C.D._{P=0.05}$	0.25	4.39

The available nitrogen of 309.42 kg ha^{-1} (Table 2) was recorded highest in treatment T_6 {Clay loam + Sand + Vermicompost @ 1:1:1 (w/w)}. This might be because of the presence of vermicompost in clay loam soil which is rich in nitrogen leading to higher nitrogen availability of the growing media. Vermicompost is an organic amendment that is rich in nutrients and microorganisms and is produced as a result of the interactions between

earthworms and microorganisms during the decomposition of organic materials. It is a stabilized, finely divided peat-like substance that has a low C:N ratio, high porosity and water-holding capacity. The majority of the nutrients are present in forms that plants may easily absorb as reported by [11]. These results are in close conformity with the findings of [12].

Table 2. Available nutrient content of different media (24 hours after mixing)

Treatment	Available nutrients (kg ha^{-1})		
	N	P	K
Treatment 1	269.83	15.68	112.34
Treatment 2	271.79	16.05	132.53
Treatment 3	275.97	16.43	142.50
Treatment 4	292.69	17.92	118.57
Treatment 5	301.05	18.67	133.69
Treatment 6	309.42	19.79	148.51
Treatment 7	280.15	21.65	135.15
Treatment 8	284.33	22.03	141.23
Treatment 9	288.51	23.15	152.54
S.Ed. (±)	12.52	1.19	3.92
C.D.$_{P=0.05}$	NS	2.50	8.23

3.2 Effect of growing media on growth

Data showing the plant height (cm) and no. of leaves in different growth stages of rose i.e., at 30 days, 60 days, and 90 days of planting are presented in Table 3. From the investigation it was found that there were significant differences among the treatments and also noticed that there was gradual increase in height of the plants of different treatments with the growth advancement. The treatment containing loam soil, sand, vermicompost and cocopeat have been found to increase the plant height, leaf number, and leaf area at vegetative stage and also decrease in the number of days required for flowering. After 30, 60 and 90 days of planting, the tallest plant height were recorded in $T_8$with 29.50, 34.33 and 42.10 cm, respectively (Table 3).

Table 3. Plant height (cm) and number of leaves in different growth stages

Treatment	Plant height (cm)			No. of leaves		
	30 DAP	60 DAP	90 DAP	30 DAP	60 DAP	90 DAP
Treatment 1	15.00	15.16	24.33	7.67	12.33	26.47
Treatment 2	23.33	21.50	32.70	9.67	20.67	35.03
Treatment 3	24.16	26.50	35.53	10.37	23.03	36.07
Treatment 4	19.66	20.83	32.07	8.00	16.07	29.67
Treatment 5	21.33	23.16	32.17	9.00	19.77	32.73
Treatment 6	28.16	31.00	40.67	13.07	25.04	38.37
Treatment 7	27.83	29.00	41.73	12.00	22.07	38.00
Treatment 8	29.50	34.33	42.10	14.40	26.83	39.10
Treatment 9	24.66	28.50	39.43	10.97	23.67	36.40
S.Ed. (±)	2.05	2.75	3.18	1.19	2.05	3.04
C.D.$_{P=0.05}$	4.31	5.79	6.68	2.50	4.30	6.38

Similarly, after 30, 60 and 90 days of planting, the maximum number of leaves (14.40, 26.83 and 39.10) were recorded in T_8 and minimum number of leaves were recorded in T_1. This indicates that the response of rose was positive to the growing media inputs used for this pot mixture. Similar results have been reported by [13] and [14] in rose. The possible reason for

better growth characters might be due to the presence of vermicompost which significantly augmented soil enzymatic activities and beneficial microbes which ultimately led to an increase in a number of growth and flowering indices, including plant height, number of leaves, leaf area, plant spread, stem diameter and early flowering. These findings are in conformity with [15] in rose.

The reason behind the increase in the plant height may be due to the presence of cocopeat and vermicompost in the media, which considerably improved the aeration, water holding capacity and nutrients uptake by the root system. Similar results were recorded by [16] in rose.

Likewise, the reason behind the increased leaves number might be attributed to the increased availability of N in the media. High nitrogen concentration in the media will cause the plant to produce a lot of leaves because nourishment is a key factor in growing more leaves. The increase in number of leaves as a result of vermicompost application are in accordance with the findings of [17] and [18] in rose. Likewise, the maximum stem girth of 0.93 cm was recorded in the treatment T_8 (Table 4). The reason behind the increase in stem girth might be due to the cocopeat application which increased the readily available nitrogen in the media, which enhanced plant metabolic activities and thus increased various stem girth. The rise in organic carbon content can enhance the activity of helpful soil microorganisms and improve soil fertility by increasing the accessibility of nutrients for plant growth [19]. It also might be due to the increase in humic materials and plant growth promoting substances by application of vermicompost that ultimately promoted the plant growth. These results are in harmony with the findings of [20] and [14] in rose. The maximum number of nodes was recorded in T_8(36.37). This might be because of the increased plant spread and the overall growth of different parameters. Vermicompost gives plants the right amount of nutrients, which results in more carbohydrates absorption and results in better utilisation of nutrients. These results are in close conformity with the findings of [15] in rose.

Table 4. Stem girth (cm) and number of nodes in different growth stages

Treatment	Stem girth (cm)			No. of nodes		
	30 DAP	60 DAP	90 DAP	30 DAP	60 DAP	90 DAP
Treatment 1	0.43	0.43	0.50	5.43	17.00	22.47
Treatment 2	0.50	0.56	0.60	6.40	23.37	27.33
Treatment 3	0.53	0.60	0.66	8.00	24.13	28.37
Treatment 4	0.46	0.50	0.56	10.67	18.70	24.17
Treatment 5	0.50	0.53	0.56	7.70	21.40	26.10
Treatment 6	0.66	0.70	0.73	13.33	24.67	29.73
Treatment 7	0.73	0.83	0.86	9.00	30.10	33.43
Treatment 8	0.86	0.90	0.93	11.67	31.70	36.37
Treatment 9	0.63	0.66	0.73	10.03	24.07	29.00
S.Ed. (±)	0.05	0.06	0.05	2.19	2.73	2.18
$C.D._{P=0.05}$	0.12	0.13	0.12	4.60	5.78	4.58

The maximum inter-nodal length of 4.83 cm was recorded in the treatment T_8 (Table 5). This might be because of the increased plant height. The use of vermicompost and cocopeat together had a significant impact on plant growth parameters. This is likely because the combination of both factors improved the physical conditions of the media and provided better nutrition. Scientists [21] and [22] suggested that when mixed with vermicompost, coir dust may offer a superior growth medium for establishing plants despite being low in nutrients. Similar results were recorded by [16] in rose.

Table 5. Inter-nodal length (cm) and plant spread (cm) in different growth stages

Treatment	Inter-nodal length (cm)			Plant spread (cm)		
	30 DAP	60 DAP	90 DAP	30 DAP	60 DAP	90 DAP
Treatment 1	1.63	1.60	2.86	11.37	15.23	22.70
Treatment 2	2.50	3.20	4.10	15.40	21.33	35.17
Treatment 3	2.60	4.03	4.20	17.83	22.43	37.47
Treatment 4	2.06	2.76	3.50	19.50	20.44	29.73
Treatment 5	2.16	2.83	4.03	13.17	20.37	34.80
Treatment 6	3.80	3.80	4.40	24.07	30.33	41.40
Treatment 7	3.03	4.16	4.70	22.01	27.43	38.44
Treatment 8	4.40	4.20	4.83	27.37	32.47	41.73
Treatment 9	2.83	3.86	4.36	20.00	25.40	38.70
S.Ed. (±)	0.41	0.32	0.29	4.50	2.92	1.87
$C.D._{P=0.05}$	0.86	0.68	0.63	9.45	6.13	3.92

The plant spread records furnished was found to increase at all the growth stages. The maximum plant spread of 41.73 cm was recorded in the treatment T_8. The plant spread may have been boosted by improved physiochemical properties of the growing media, such as lower bulk density, higher total porosity, increased water retention, and greater nitrogen availability. Another contributing factor may be the enhanced air circulation in the soil resulting from the incorporation of cocopeat into the media. The above results are in line with the findings of [23] in petunia.

Table 6 depicted that the maximum leaf area of 34.10 cm^2 was recorded in the treatment T_8 {Loam soil + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)}. One reason for the increase in leaf area may be due to an increase in the number of leaves. This increase helps maintain a high source-sink relationship, as there is an enhanced photosynthetic area. These findings agree with the findings of [24] in rose and [17] in rose. The maximum LAI of 4.77 was recorded in the treatment T_8. The increase in leaf area index may be attributed to a sufficient supply of nitrogen and other nutrients that play a vital role in plant metabolism, the synthesis of carbohydrates, and the activity of phytohormones. The above results are in line with the findings of [25] in pistachio seedlings.

Table 6. Leaf area and Leaf Area Index

Treatment	Leaf area (cm^2)	Leaf Area Index
Treatment 1	18.76	2.63
Treatment 2	24.20	3.41
Treatment 3	25.73	3.47
Treatment 4	23.36	2.77
Treatment 5	23.43	2.80
Treatment 6	29.20	3.86
Treatment 7	31.60	4.37
Treatment 8	34.10	4.77
Treatment 9	29.16	3.79
S.Ed. (±)	2.33	0.22
$C.D._{P=0.05}$	4.89	0.48

3.3 Effect of growing media on flowering

The minimum days taken to bud visibility and to bud sprouting of 39.10 and 9.40 respectively (Table 7) was recorded in the treatment T_8. It is possible that the plant's rapid growth in the media, coupled with its quick absorption of nutrients and water, contributes to its early production. This may be attributed to an increase in protein formation from carbohydrate deposits in its vegetative part, as well as in protoplast formation. Similar result was also found by [26].The possible reason for early bud sprouting maybe attributed to the accumulation of more photosynthates in the plants resulting in early bud sprouting. Similar result was also found by [20].

Table 7. Days taken to bud visibility and days taken to bud sprouting

Treatment	Days taken to bud visibility	Days taken to bud sprouting
Treatment 1	74.43	16.01
Treatment 2	59.03	14.70
Treatment 3	57.77	12.37
Treatment 4	69.04	16.47
Treatment 5	62.73	16.40
Treatment 6	65.00	16.70
Treatment 7	47.67	10.40
Treatment 8	39.10	9.40
Treatment 9	50.40	12.10
S.Ed. (±)	3.83	1.06
$C.D._{P=0.05}$	8.04	2.24

Likewise, the minimum days taken to half bloom of 12.33 and days taken to full bloom from bud sprouting of 19.60 was recorded in the treatment T_8 (Table 8). This observation has similarity with the findings of [27] who reported early flowering in lilies and pelargonium, when these were grown in media containing cocopeat.

Table 8. Days taken to half bloom and days taken to full bloom

Treatment	Days taken to half bloom	Days taken to full bloom
Treatment 1	21.47	30.81
Treatment 2	17.17	25.57
Treatment 3	15.73	24.50
Treatment 4	20.67	29.93
Treatment 5	18.43	27.00
Treatment 6	19.80	28.14
Treatment 7	13.73	21.03
Treatment 8	12.33	19.60
Treatment 9	14.00	22.37
S.Ed. (±)	1.07	1.87
$C.D._{P=0.05}$	2.24	3.97

It was observed that the treatment T_7 {Sandy loam + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)} showed the highest length of bud (3.53 cm) (Table 9). The reason for this is may be the use of vermicompost, which can enhance the presence of growth-promoting chemicals and nutrients in the soil-plant system. This can lead to better absorption of nutrients and an increase in the accumulation of photosynthates within the plant. Similar findings were reported by [13] in rose cv. Gladiator.

Table 9. Bud length (cm) and bud diameter (cm)

Treatment	Bud length (cm)	Bud diameter (cm)
Treatment 1	1.60	0.90
Treatment 2	2.57	1.30
Treatment 3	2.80	1.37
Treatment 4	1.63	1.17
Treatment 5	2.50	1.27
Treatment 6	2.10	1.20
Treatment 7	3.53	1.63
Treatment 8	3.47	1.77
Treatment 9	3.30	1.57
S.Ed. (±)	0.19	0.07
$C.D._{P=0.05}$	0.40	0.16

Likewise, the bud diameter and highest length of stalk value (1.77 and 27.27) was exhibited by treatment T_8 (Table 10). Superior bud diameter might be due to better growing conditions and good physico-chemical properties of media containing cocopeat with loam soil. These finding are in agreement with the results obtained by [6] in *Celosia cristata* and [28] in gerbera.

Table 10. Stalk length (cm) and stalk diameter (cm)

Treatment	Stalk length (cm)	Stalk diameter (cm)
Treatment 1	9.73	0.37
Treatment 2	19.90	0.67
Treatment 3	19.17	0.70
Treatment 4	15.93	0.50
Treatment 5	18.53	0.63
Treatment 6	18.17	0.60
Treatment 7	23.50	0.80
Treatment 8	27.27	0.77
Treatment 9	22.67	0.73
S.Ed. (±)	1.38	0.05
$C.D._{P=0.05}$	2.91	0.10

The increase in the stalk length of roses grown in cocopeat may be due to a decrease in phenolic compounds or organic acids. Similar finding was reported by Yonis *et al*. (2015) in rose. The highest value of stalk diameter of 0.80 cm (Table 10) was exhibited by treatment T_7. This increase in flower stalk diameter may be attributed to overall good growth of plants in these cocopeat and vermicompost amended medium due to its favourable physical and chemical properties. The results are in line with the findings of [29] and [30] in gerbera.

The largest size of flower (8.10 cm) and highest number of flower (20.04) was exhibited by treatment T_8. (Table11). It is possible that the improved size of flowers grown in cocopeat-amended soil is a result of increased potassium availability in the soil mixture. The larger flower size may be a result of all growth factors working together, including an increase in leaf area. This could be caused by heightened production and accumulation of photosynthates in the leaves, which are then transported to the flowers. The above results are in line with the findings of [17] and [31] in rose.

Table 11. Flower diameter (cm) and number of flowers

Treatment	Flower diameter (cm)	No. of flowers
Treatment 1	5.57	4.74
Treatment 2	7.57	13.07
Treatment 3	7.57	14.02
Treatment 4	6.40	10.41
Treatment 5	7.43	12.47
Treatment 6	7.27	11.33
Treatment 7	7.70	17.74
Treatment 8	8.10	20.04
Treatment 9	7.63	16.48
S.Ed. (±)	0.20	1.49
$C.D._{P=0.05}$	0.42	3.13

The higher number of flowers per plant and nitrogen content were recorded in potting media containing cocopeat as cocopeat adds organic matter to the medium and contains more nitrogen as a source of nutrition for the development of more numbers of flower [32].

The data revealed that the highest number (41.00) of petals per flower and the maximum self-life (19.00 days) was exhibited by treatment T_8 (Table 12). The use of cocopeat in the potting media has been found to contribute to an increase in potassium content and positive physico-chemical properties such as high porosity, good water retention, and improved moisture retention. These factors have been shown to improve the length and width of rose petals, increase the number of petals per flower, and enhance the diameter of the flower. These results are in conformity with [31] in rose and [33] in Carnation. Better flowering duration in cocopeat amended media might be due to higher availability of potassium in media mixture. These results are supported by [18] in rose.

Table 12. Number of petals per flower and self-life

Treatment	No. of petals per flower	Self-life (days)
Treatment 1	20.74	8.07
Treatment 2	36.37	12.72
Treatment 3	36.38	13.71
Treatment 4	30.43	9.67
Treatment 5	35.07	12.37
Treatment 6	32.67	11.67
Treatment 7	40.75	18.33
Treatment 8	41.00	19.00
Treatment 9	36.10	16.77
S.Ed. (±)	1.85	1.06
$C.D._{P=0.05}$	3.88	2.22

4. CONCLUSION

Rose positively responded to the growing media and the highest performance was observed for the treatment T_8 {Loam soil + Sand + Vermicompost (10% substituted with Cocopeat) @ 1:1:1 (w/w)} which was at par with T_6 {Clay loam + Sand + Vermicompost @ 1:1:1 (w/w)}, as regards to plant height, number of leaves and plant spread. Stem girth, number of nodes, intermodal length, leaf area and leaf area index, days taken to bud visibility, bud sprouting, half bloom and full bloom, length of stalk and diameter of bud, number of flowers, number of petals per flower and flowering duration (self-life) and diameter of flower were significantly enhanced by the treatment T_8.

Disclaimer (Artificial intelligence)
Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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