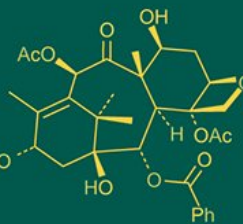


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Effect of different pot mixture on growth and flower yield of tuberose (*Polianthes tuberosa* linn.)

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Abstract

The present research entitled “Effect of Different Pot Mixture on Growth and Flower Yield of Tuberose (*Polianthes tuberosa* Linn.)” was carried out at the Horticultural Research cum Instructional Farm, College of Agriculture, IGKV, Raipur, and the experiment used a Completely Randomized Design (CRD) with 12 treatments and three replications comprising of pot mixture. All the pot mixture treatments studied recorded superior vegetative and flower yield attributes over control. The observations showed that maximum plant height (74.82 cm), plant spread (N-S) 46.00 cm, plant spread (E-W) 47.75 cm, number of tillers plant⁻¹ (6.23) and number of leaves plant⁻¹ (56.50) was recorded in T₆ Soil + Sand + FYM + VC (1:1:1:1). The minimum day to opening of first florets (147.67 days) was recorded T₁₀ Soil + Sand + FYM + VC + GM (1:1:1:1:1). The maximum spike length (67.40 cm), number of florets spike⁻¹ (29.33), weight of 100 florets (88.67 g), loose flower yield per pot (43.63 g) and number of spike per pot (1.76) was noted in T₆ Soil + Sand + FYM + VC (1:1:1:1).

Keywords: Tuberose, pot mixture, growth, flower yield, paddy straw compost, goat manure, Vermicompost, farm yard manure

Introduction

Flowers are an important element of human life because of their diversity in terms of beauty, structure, texture, colour, and scent. Tuberose (*Polianthes tuberosa* Linn.) is a popular Asperagaceae bulbous ornamental plant. This flower is known as Rajanigandha and is used as a cut flower, loose flower, and in perfumery and aromatherapy. Tuberose is a popular bedding and container plant. Arka Sugandhi, a dwarf variety of tuberose developed by ICAR-Indian Institute of Horticultural Research, Hesaraghatta, Bengaluru, is suitable for landscaping and pot mixing. The flower tube is straight, the peduncle is heavily pigmented, and the leaf length is medium (40- 50 cm). Tuberose florets are used to make creative garlands, ornaments, and button holes, while the long spikes are utilized for vase decoration and bouquet preparation. Tuberose has a unique place among flowers because of its lovely, elegant, and fragrant white blossoms. Flowers keep for a long time, can with stand long distance transit, and have a useful place in the flower market (Patil *et al.*, 1999)^[20]. The stage an important role in germination rate, and a lot of additional physiological parameters include plant height, number of leaves, leaf length, spike length, number of florets per spike, diameter of spike and yield etc (Vendrame *et al.*, 2005)^[31]. For cut flower production, the best bulb diameter and planting depth are 2.5-3.5 cm and 6.0 cm, respectively (Hussain, 1999)^[8]. Different manures provide superior nutrition to plants when applied in combination with soilless substrates; a best growing mixture should have proper aeration, water holding capacity, and adequate nutrition (Khobragade *et al.*, 1997)^[12].

Material and Methods

The present research entitled, “Effect of Different Pot Mixture on Growth and Flower Yield of Tuberose (*Polianthes tuberosa* Linn.)” executed in Horticultural nursery, College of Agriculture, IGKV, Raipur (C.G.). The experiment was laid out in Completely Randomized Design with three replications having 12 treatment combinations of different as source of nutrients where, organic manure was used to meet the nutritional needs of the crop. Cleaning of the pot constituents was done by removing the stones, pebbles and unwanted materials

present in it. Seven potting mixture combinations were prepared as per treatment details after thoroughly mixing of various ingredients on used in same quantities and required ratios basis viz., T1-Soil + Sand + FYM (1:1:1) Control, T2-Soil + Sand + VC (1:1:1), T3-Soil + Sand + GM (1:1:1), T4-Soil + Sand + LM (1:1:1), T5- Soil + Sand + PSC (1:1:1), T6-Soil + Sand + FYM+VC (1:1:1:1), T7-Soil + Sand + FYM + GM (1:1:1:1), T8-Soil + Sand + FYM + LM (1:1:1:1), T9-Soil + Sand + FYM + PSC (1:1:1:1), T10-Soil + Sand + FYM + VC + GM (1:1:1:1:1), T11-Soil + Sand + FYM + LM + PSC (1:1:1:1:1) and T12-Soil + Sand + FYM + GM + PSC (1:1:1:1:1). Fertilizer (19:19:19 of NPK) at the rate of 5 g per pot was applied to the substrate at quarterly intervals. Prepared media combinations were filled in 8-inch pot by leaving 2-inch place for, irrigation & intercultural operations while transplanting. Notes - FYM = Farm Yard Manure, VC = Vermicompost, GM = Goat Manure, LM = Leaf Manure, PSC = Paddy Straw Compost.

Results and discussion

Effect of different pot mixture on growth parameters.

Perusal of data (Table 1) showed that all vegetative growth parameters was found to be significantly affected by application of different pot mixture. Plant height (cm) The maximum plant height (74.82) was observed with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) at 120 DAP, which was showed significantly different with all other treatment, except treatment T7, T10 and T12. Whereas the treatment T7, T10 and T12 was found at par with treatment T6. The minimum plant height (60.08) at 120 DAP, was noted with treatment T8 Soil + Sand + FYM + LM (1:1:1:1). The increase in plant height may be due to supply of organic sources nutrients as they are rich in micronutrient besides having plant growth promoting substances viz., hormones, enzymes and humus forming beneficial microbes. Organic sources, on application to the soil, improve the physical properties of the soil such as aggregation, aeration, permeability and water holding capacity and proper drainage of media containing which may promote growth and development of plants. Similar findings were also reported by Treder (2008) [29] in oriental lily, Kumar (2015) [15] and Singh *et al.* (2015) [28] in Tuberose.

Plant spread (N-S) (cm)

Data related to plant spread was represented in table-1. The application of different pot mixtures. At 120 DAP, the longest plant spread (N-S) (46.00) was recorded with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) and it was found at par with treatment T9, T10, T11 and T12 whereas it was found significantly different with rest of the other treatment. The shortest plant spread (33.17 cm) was recorded in treatment T8 Soil + Sand + FYM + LM (1:1:1:1), at 120 DAP. The maximum plant spread (N-S) in tuberose might be due to the reason that during the initial stage, treatment T6 Soil + Sand + FYM + VC (1:1:1:1) supplemented with inorganic fertilizers provided with the slow-release nutrient for long time that may have supported the luxuriant growth of foliage for the better growth of plant spread. Likely, same observations were also reported by Sarodoei *et al.* (2011) in Zinnia and Nair and Bharathi (2019) [18] in Tuberose.

Plant spread (E-W) (cm): At 120 DAP, the highest plant spread (E-W) (47.75 cm) was observed with treatment T6

Soil + Sand + FYM + VC (1:1:1:1) which was showed at par with treatment T7, T10 and T11 whereas it was found significantly different with the rest of other treatment. The shortest plant spread (E-W) (31.87 cm) were recorded in treatment T8 Soil + Sand + FYM + LM (1:1:1:1). The maximum plant spread (E-W) might be due to the reason that potting mixture is slow releasing manure, which continuously supplies nutrient to the plant for long time so that plant shows luxuriant growth of foliage, which in turn showed maximum plant spread of the plant. Similar result was obtained by Sandeep *et al.* (2011) [24] in Cosmos, Sarodoei *et al.* (2011) in Zinnia and Nair and Bharathi (2019) [18] in Tuberose.

Number of tillers plant-1

Observations recorded on the impact of different pot mixture on number of tillers plant-1 of tuberose are given in table-1 that non significantly affected by application of pot mixture. At 120 DAP, the highest number tillers plant-1 (6.23) was observed with T6 Soil + Sand + FYM + VC (1:1:1:1) and it was significantly greater to rest of the all treatment, except treatment T7 and T10, treatment T7 and T10 was exhibited at par with treatment T6. At 120 DAP, the shortest number of tillers plant -1 (3.03) was noted in T5 Soil + Sand + PSC (1:1:1). The highest number of tillers plant-1 was observed in treatment T6 Soil + Sand + FYM + VC (1:1:1:1) that may be due to the potting mixture is a slow releasing manure, with tends to provide nutrient continuously for longer time that, may be favorable for growth of foliage. Similarly, vermicompost contains water soluble nutrients, whereas sand has optimum porosity and aeration, which provide favorable condition for increasing number of tillers plant-1. These results in accordance with the finding reported by previous investigator Kiran *et al.* (2017) [13] in Dahlia, and Nair and Bharathi (2019) [18] in Tuberose.

Number of leaves plant -1\

It was found significantly influenced by application of different pot mixture on number of leaves plant-1 of tuberose are presented in table-1. As for as at 120 DAP, the higher number of leaves plant-1 (56.50) was noted with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) which was significantly superior than all other treatment, except treatment T10. The lowest number of leaves plant-1 at 120 DAP (15.50 and 28.17 cm) was seen in T5 Soil + Sand + PSC (1:1:1). Addition of vermicompost as a source of organic nutrients augmented the vegetative growth. Increased number of leaves of plants can also be due to adequate availability of nitrogen contain in media amended with vermicompost has also been reported by Benito *et al.* (2005) [3], Moghadam *et al.* (2012) [16] in Lilium and Arunesh *et al.* (2020) [1] in Gerbera.

Leaf length (cm)

The data observed and presented in table-1 showed that the leaf length (cm) was found to be significantly affected by application of pot mixture. At 120 DAP, the higher leaf length (49.50 cm) was observed with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) which was showed at par with treatment T3, T7, T9, T10, T11 and T12. Whereas it was found significantly different with rest of the other treatment. The shortest leaf length (41.52 cm) was noted with treatment T5 Soil + Sand + PSC (1:1:1) at 120 DAP. The

maximum leaf length may be due to the fact that Concerning the interaction, using composted leaves medium or its mixture with sand and applying the potting mixture is slow-release manure that provides continuous nutrients to the plant for a long period, allowing for plant growth and luxuriant foliage growth, which may result in the increasing the leaf length. The current result is consistent with the findings of Naggar and Nasharty (2009) in *Hippeastrum*, Sardoei *et al.* (2014)^[26] and Nair and Bharathi (2019)^[18] in *Tuberose*.

Effect of different pot mixture on flower

Parameters of tuberose

The data recorded and depicted in (Table 2 and 3) that all flower parameters was significantly influenced by application of pot mixture.

Day to spike emergence

The potting mixture application of treatment T10 Soil + Sand + FYM + VC + GM (1:1:1:1:1) showed earliest (132.66 days) to spike emergence which was at par with T4, T5, T7, T8, T9, T11 and T12. However, it was found significantly earliest than rest of the other treatment. While the treatment T5 Soil + Sand + PSC (1:1:1) showed higher (162.33 days) to spike emergence. The early emergence of spike in tuberose might be due to the application of organic substance, which slowly releases nutrient continuously for long time, that improved the physico- chemical properties of the soil, and ultimately plant get favorable condition for better growth that may have enhance the early emergence of spike. These finding can be conformity with the finding of Grassotti *et al.* (2003)^[7] in *Lilium*, Parmar (2006)^[19], Chauhan *et al.* (2014)^[5] in *Gerbera* and Nair and Bharathi (2019)^[18] in *Tuberose*.

Day to opening of first florets

The different potting mixture, treatment T10 Soil + Sand + FYM + VC + GM (1:1:1:1:1) showed earliest (147.67 days) to opening of first florets which was found significantly earlier with treatment T6, T7 and T10. However, it was showed at par with remaining of the other treatment. The treatment T5 Soil + Sand + PSC (1:1:1) and the treatment T5 Soil + Sand + PSC (1:1:1) showed maximum (171.33 days) to opening of first florets. The earlier days to opening of first florets might be due to the organic potting mixture, which show vigorous growth of the plant also improved the water holding capacity that has a pronounce effect on early production. This is also attributed to accumulation of more photosynthates in growing media that may have induced early flowering. These results were in accordance with the finding of Khayyat *et al.* (2007)^[11], Chauhan *et al.* (2014)^[5] in *Gerbera* and Karthikeyan and Jawaharlal (2015)^[10] in *Carnation*.

Flowering duration (days)

The different of potting mixture, the treatment T5 Soil + Sand + PSC (1:1:1) showed higher (24.33 days) to flowering duration, which was significantly superior than treatment T10 and T11. However, it was found at par with T1, T2, T3, T4, T5, T6, T7, T8, T9 and T12. The treatment T10 Soil + Sand + FYM + VC + GM (1:1:1:1:1) showed shorted (14.33 days) for flowering duration. The maximum flower retention in plants could be due to better growing conditions and good

physico-chemical properties of media containing vermicompost, as well as abundant oxygen supply to the plants. These results collaborated with the previous finding of Chaudhary *et al.* (2018)^[4] in *Lilium* and Arunesh *et al.* (2020)^[1] in *Gerbera*.

Spike length (cm)

The potting mixture at 165 DAP, the highest Spike length (67.4 cm) was observed in treatment T6 Soil + Sand + FYM + VC (1:1:1:1). Which was significantly superior than all other treatment, except treatment T10 and T12, which was showed at par with treatment T6. The lowest spike length (51.60 cm) was recorded in T5 Soil + Sand + PSC (1:1:1) at 165 DAP. The increase in spike length might be due to the application of organic sources to soil, which supplies micronutrients growth promoting substances hormones, enzymes and humus) but also improves physico-chemical properties of soil such as aggregation, aeration, permeability and water holding capacity which promotes spike length of plants. Similar findings were also reported by Awang *et al.* (2009)^[2] in *Celosia cristata*, Kumar (2015)^[15] and Singh *et al.* (2015)^[28] in *Tuberose*, Chaudhary *et al.* (2018)^[4] in *Lilium*.

Rachis length (cm)

The higher rachis length (41.50) was observed with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) at 165 DAP and which was showed at par with treatment T7, T10 and T12, whereas it was found significantly different with rest of the all-other treatment. The shortest rachis length (29.56 cm) was noted in treatment T5 Soil + Sand + PSC (1:1:1) at 165 DAP. The rachis must have increase in length due to potting mixture as it is a slow -release manure which ensures the supply of hormones like auxins & gibberellins, enzymes and humus for a longer time to the plant. This in turn, improved the physical properties of soil. Similar findings were also previous investigator Kale *et al.* (2009) in *gerbera*, Naggar and Nasharty (2009) in *Hippeastrum vittatum* Kumar (2015)^[15], Singh *et al.* (2015)^[28] and Preetham *et al.* (2019)^[21] in *Tuberose*.

Number of florets spike -1

The highest number of florets spike-1 (29.33) was noted with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) at 165 DAP and it was showed at par with treatment T4, T7, T8, T9, T10, T11 and. T12. However, it was showed significantly greater than rest of the other treatment. At 165 DAP, the lowest number of florets spike -1 (21.00) was noted in T5 Soil + Sand + PSC (1:1:1). The better results may be due to slow – release manure played an important role in plant growth as well as in conversion of vegetative phase in reproductive phase of plant. The differences in cut flower quality parameters, applying of vermicompost which is high amount of humus and plant growth substances hormones might be due to presence of more organic matter percentage in media that facilitated availability of essential nutrients, which resulted in cell division, elongation and cell size that may have increase number of florets spike-1. These results were collaborated with the previous findings of Parmar (2006)^[19], Naggar and Nasharty (2009) in *Hippeastrum vittatum* and Chauhan *et al.* (2014)^[5] in *Gerbera*, Nair and Bharathi (2019)^[18] in *Tuberose*.

Table 1: Average nutrient content of potting mixture used for the experiment

S. no.	Name of potting mixture	Nutrient content			
		Nitrogen	Phosphorus	Potassium	Unit
1.	Soil	112.89	5:00	204:00	Kg ha ⁻¹
2.	Sand	25.08	3:00	5.82	Kg ha ⁻¹
3.	Farm yard manure	0.52	0.60	0.55	%
4.	Vermicompost	1.82	0.61	0.83	%
5.	Goat manure	1.91	0.56	1.06	%
6.	Leaf compost	0.98	0.07	0.04	%
7.	Paddy straw compost	0.80	0.17	0.48	%

**Fig 1:** A view of effect of different pot mixture on vegetative growth and flower in tuberose

Table 2: Effect of different pot mixture on vegetative growth parameters of tuberose

Tr. No.	Treatment	Plant height (cm)	Plant spread (N-S) (cm)	Plant spread (E-W) (cm)	Number of tillers plant ⁻¹	Number of leaves plant ⁻¹	Leaf length (cm)
T1	Soil + Sand + FYM (1:1:1) Control	67.37	36.40	39.50	3.27	35.83	43.98
T2	Soil + Sand + VC (1:1:1)	63.83	35.08	38.65	4.00	32.67	42.22
T3	Soil + Sand + GM (1:1:1)	65.83	36.60	34.92	3.37	34.50	45.90
T4	Soil + Sand + LM (1:1:1)	65.73	35.12	37.28	4.30	31.00	43.70
T5	Soil + Sand + PSC (1:1:1)	66.87	37.43	36.63	3.03	28.17	41.52
T6	Soil + Sand + FYM + VC (1:1:1:1)	74.82	46.00	47.75	6.23	56.50	49.50
T7	Soil + Sand + FYM + GM (1:1:1:1)	68.18	38.23	40.60	5.10	38.50	46.12
T8	Soil + Sand + FYM + LM (1:1:1:1)	60.83	33.17	31.87	3.50	38.17	43.30
T9	Soil + Sand + FYM + PSC (1:1:1:1)	62.87	40.17	38.50	4.03	38.33	45.30
T10	Soil + Sand + FYM + VC + GM (1:1:1:1:1)	71.00	44.42	43.77	6.00	38.50	47.73
T11	Soil + Sand + FYM + LM + PSC (1:1:1:1:1)	67.10	39.95	41.98	3.50	40.00	45.92
T12	Soil + Sand + FYM + GM + PSC (1:1:1:1:1)	68.85	40.93	38.57	4.10	36.00	46.42
	SEm ±	2.4	2.42	2.74	0.55	4.97	1.53
	C.D @ 5%	7.03	7.07	8.00	NS	14.52	4.48
	C.V.	6.23	10.93	12.13	23.05	21.23	5.90

Length of florets (cm)

The longest length of florets (6.10 cm) was noted with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) at 165 DAP and which was found at par with treatment T7, T9, T10, T11 and T12. However, it was showed significantly superior than all other treatment. At 165 DAP, The shorter length of florets (5.80 cm) was noted in treatment T5 Soil + Sand + PSC (1:1:1). The increase in florets length could be attributed to the application of organic sources to soil, which provides micronutrients and growth stimulating compound but also enhances the soil physical properties, aggregation, aeration and water holding capacity of the soil that may be promoted length of florets in tuberose. Similar results were also reported by Kumar (2015) [15], Singh *et al.* (2015) [28] and Preetham *et al.* (2019) [21] in Tuberose.

Diameter of florets (cm)

The maximum diameter of florets (4.05 cm) was recorded in treatment T6 Soil + Sand + FYM + VC (1:1:1:1), which was showed at par with treatment T2, T3, T4, T7, T8, T9, T10, T11 and T12. However, it was showed significantly greater to treatment T1 and T5. While the lowest diameter of florets (3.24 cm) was recorded with treatment T5 Soil + Sand + PSC (1:1:1). The increasing in diameter of florets might be due to the application of vermicompost & goat manure to the soil. As they are slow-release manure tends to provide nutrients for longer times. The differences in cut flower quality parameters might be due to more organic matter percentage in media which facilitates availability of essential nutrients resulted increase in cell division, elongation and cell size. Luxuriant growth with greener biomass of plant has more availability of primary and secondary metabolites, higher the source to sink response, more is diameter of flower. The increased flower head diameter may be related to the optimum growing conditions of the medium i.e., lower bulk density, high porosity, high water holding capacity as well better nutrient uptake. This result was also in collaboration with findings of Parmar (2006) [19], Chauhan *et al.* (2014) [5] in Gerbera & Nair and bharathi (2019) [18] in tuberose.

Weight of 100 florets (g)

The different potting mixture, the highest weight of 100 florets (88.67 g) was noted in treatment T6 Soil + Sand + FYM + VC (1:1:1:1) which was at par with treatment T9,

T10, T11 and T12 and it was showed significantly superior than all other treatment. The lowest weight of 100 florets (75.66 g) was noted in treatment T5 Soil + Sand + PSC (1:1:1). The maximum weight of 100 florets (g) might be due to the vermicompost and goat manure, which are rich source of nutrients, and it with provided continuously slow release nutrient for long times and also rich in humus plant growth promoting hormones like (auxins & gibberellins) and growing media possess high physico-chemical properties for increase in flower size and more accumulation of starch from leaves of flowers as well as the improved growth and development of plant and hence increased the weight of florets. Similar result was obtained by Koley and Pal (2011) [14] and Kumar *et al.* (2015) [15] in Tuberose, Chauhan *et al.* (2014) [5], Vamanrao (2015) [30] and Arunesh *et al.* (2020) [1] in Gerbera.

Number of spike per pot / Number of spike Per clump

The potting mixture, the higher number of spike per pot and number of spike per clump (1.76) was observed with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) which was significantly greater than rest of the other treatment, except treatment T7, T8, T9, T10, T11 and T12. It was showed at par with treatment T6. The minimum number of spike per pot and number of spike per clump (1.33) was recorded with treatment T5 Soil + Sand + PSC (1:1:1). The increased in number of spike per pot and number of spike per clump may be goat manure available of high amount of nitrogen and potassium of the soil. As they are slow-release manure tends to provide nutrients for longer times. As measured by either by improved nutrient uptake or reduced nutrient losses to the environment, or both or its acts as a soil amendment to help improve soil structure or function and Optimum growing conditions provided by the medium amended with vermicompost and paddy straw compost helped to optimize the plant health resulting in the production of more number of flowers/spike. As well as the vermicompost is a sustainable source of macro and micro nutrients and has a considerable potential for improving plant growth thus enhance yield. Similar observations were reported by Patil (1999) [20], Sahni *et al.* (2008) [23], Moghadam *et al.* (2012) [16] in Asiatic hybrid lily Navona, Rajera and Sharma (2017) [22] in hybrid Lily and Karim *et al.* (2017) [9] in Tuberose.

Loose flower yield per pot (g)

Among the potting mixture, the highest loose flower yield per pot (43.63 g) was noted with treatment T6 Soil + Sand + FYM + VC (1:1:1:1) which was showed at pat with treatment T7, T10, T11 and T12. However, it was observed significant difference with rest of the other treatments. The lowest loose flower yield per pot (25.91 g) was noted in treatment T5 Soil + Sand + PSC (1:1:1). The maximum loose flower yield per pot may be due to the application of vermicompost, which is rich in humus-promoting hormones like auxins and gibberellins, to the improved growth of plant

and the better physical properties of the substrate media which influences the absorption of nutrients by the plants. As the vegetative growth was better, reduced nutrient losses to the environment, or both or it acts as a soil amendment to help improve soil structure or functions and thus may be influenced positively on flower production. These findings are in agreement with those of Dutt *et al.* (2002)^[6], Naggar and Nasharty (2009) in *Hippeastrum*, Chauhan *et al.* (2014)^[5] in *Gerbera*, Sankari *et al.* (2015)^[25] and Karim *et al.* (2017)^[9] in *Tuberose*.

Table 3: Effect of different pot mixture on flower and flower yield parameters of tuberose

Tr. No.	Treatment	Day to spike emergence	Days to opening of first florets	Flowering duration	Spike length (cm)	Rachis length (cm)	Number of florets spike ⁻¹
T1	Soil + Sand + FYM (1:1:1) Control	144.66	171.34	20.67	52.33	34.46	21.33
T2	Soil + Sand + VC (1:1:1)	144.33	166.00	21.00	51.66	31.66	23.66
T3	Soil + Sand + GM (1:1:1)	144.00	168.67	19.67	53.06	32.00	22.66
T4	Soil + Sand + LM (1:1:1)	151.33	166.00	22.33	58.00	32.00	24.66
T5	Soil + Sand + PSC (1:1:1)	162.33	171.33	24.33	51.60	29.56	21.00
T6	Soil + Sand + FYM+VC (1:1:1:1)	143.33	149.33	19.33	67.40	41.50	29.33
T7	Soil + Sand + FYM + GM (1:1:1:1)	148.00	162.33	21.67	54.00	37.73	25.33
T8	Soil + Sand + FYM + LM (1:1:1:1)	148.66	165.67	19.67	52.33	34.33	25.66
T9	Soil + Sand + FYM + PSC (1:1:1:1)	145.66	169.00	23.67	54.66	32.80	25.66
T10	Soil + Sand + FYM + VC + GM (1:1:1:1:1)	132.66	147.67	14.33	59.03	38.26	28.33
T11	Soil + Sand + FYM + LM + PSC (1:1:1:1:1)	145.33	164.00	16.33	55.43	34.20	27.00
T12	Soil + Sand + FYM + GM + PSC (1:1:1:1:1)	145.00	162.67	24.00	58.66	39.86	28.00
	SEm ±	4.24	5.06	1.88	3.00	2.10	1.74
	C.D @ 5%	12.40	14.78	5.48	8.78	6.15	5.07
	C. V.	5.03	5.36	15.82	9.36	10.47	11.94

Table 4: Effect of different pot mixture on flower and flower yield parameters of tuberose

Tr. No.	Treatment	Length of florets (cm)	Diameter of florets (cm)	Weight of 100 Florets (g)	No. of spike per pot/ Number of spike per clump	Loose flower yield per pot (g)
T1	Soil + Sand + FYM (1:1:1) Control	5.90	3.31	80.00	1.33	29.51
T2	Soil + Sand + VC (1:1:1)	5.83	3.83	81.00	1.40	30.68
T3	Soil + Sand + GM (1:1:1)	5.83	3.57	79.00	1.40	28.47
T4	Soil + Sand + LM (1:1:1)	5.90	3.69	78.66	1.40	27.43
T5	Soil + Sand + PSC (1:1:1)	5.80	3.24	75.66	1.33	25.91
T6	Soil + Sand + FYM + VC (1:1:1:1)	6.10	4.05	88.67	1.76	43.63
T7	Soil + Sand + FYM + GM (1:1:1:1)	5.97	3.67	81.00	1.46	34.66
T8	Soil + Sand + FYM + LM (1:1:1:1)	5.87	3.88	80.00	1.46	31.48
T9	Soil + Sand + FYM + PSC (1:1:1:1)	5.97	3.95	81.66	1.46	31.54
T10	Soil + Sand + FYM + VC + GM (1:1:1:1:1)	6.07	4.00	86.66	1.75	41.96
T11	Soil + Sand + FYM + LM + PSC (1:1:1:1:1)	6.00	4.03	82.00	1.70	35.12
T12	Soil + Sand + FYM + GM + PSC (1:1:1:1:1)	6.03	4.04	85.66	1.70	39.54
	SEm ±	0.08	0.26	2.46	0.11	3.86
	C.D @ 5%	0.18	0.54	7.19	0.32	11.28
	C. V.	1.84	8.56	5.23	12.81	20.08

Conclusion: On the basis of present investigation, it can be concluded effect of different pot mixture on growth and

flower yield of tuberose (*Polianthes tuberosa* Linn.). However, Treatment T6 Soil + Sand + FYM + VC (1:1:1:1)

showed better growth and more advantageous than all treatments. The increase in plant growth and flowers because the organic sources be due to supply of nutrients as they are rich in micronutrients beside having plant growth promoting substances viz., hormones, enzymes and humus forming beneficial microbes. Organic sources, on application to the soil, improve the physical properties of the soil such as aggregation, aeration, permeability and water holding capacity which promote growth and development of plants

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