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A comparative study on edible vertical garden established in plastic and geotextile pots

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Abstract

The present experiment was carried out during December, 2020 to April, 2021 in Research Field, Department of Horticulture, SHUATS, Prayagraj. The experiment was conducted in Factorial randomized Block Design (FRBD), with ten treatments, replicated thrice with growing media (Coco peat + sand+ soil + Vermicompost) (1:1:1:1). Total no of plants are 150, there are two factors each factor has five verities and each verity has five plants in three replications. From the present experimental Growth parameters find that (p1) recorded higher no of leaves followed by (P5) recorded significantly taller plant in cm. In (P1) recorded significantly highest number of branches (P4) recorded significantly higher plant spread in cm. Minimum vegetative growth has seen in plastic pots. Maximum growth were seen in geotextile pots.

Keywords: FRBD, vertical garden, factors, growing media

Introduction

Vertical gardening is a special kind of urban gardening suitable to small spaces, particularly for decorating the walls and roofs in various styles. This is an alternative method for gardening by expanding the scope of growing plants in a vertical space. Intensive urbanization has left hardly any horizontal space for outdoor gardens. Green walls are not only spectacularly beautiful, but also helpful in elevating the ambiance. Green walls can absorb heated gas in the air, lower both indoor and outdoor temperature, providing a healthier indoor air quality as well as a more beautiful space. Planting an herb garden is a wonderful way to enjoy the sights, smells and tastes of a wide variety of plants. Fresh herbs are often easy to cultivate. Herbs have many values but a few of the most common uses include aromatherapy, medicinal, as seasonings and flavorings in foods and beverages, and in salads. Many herbs are chockfull of cancer-fighting antioxidants, valuable nutrients, fat-free flavor and more. Vertical garden has aesthetic, physiological, economic and environmental benefits. It also saves place, low maintenance, insulates the building, and gives you privacy and stress reliever. The benefits of growing fresh versatile and capable of lending great flavor to foods, and as natural remedies that benefit personal health and beauty, but the specific act of growing a herbal garden itself helps in many ways. A wonderful way to enjoy the sights, smells and tastes of a wide variety of plants. It has been proved that visual and physical contact with plants can result in direct health benefits. Now this plants are grown in plastic and geotextile pots to see the Effect of different growing material.

Materials and Methods

A field experiment entitle “A comparative study on edible vertical garden established in plastic and geotextile pots” the experiment was laid out in FRBD with 10 treatments replicated thrice time. I was established vertical garden with two factor, one is Potting material (Geotextile pots and Plastic pots) and second one is plants with five crops Periwinkle, Chrysanthemum, Basle, Indian Coleus, Nasturtium in Department of Horticulture, SHUATS, Prayagraj. In vertical garden, I was filled geotextile and plastic pots with growing media of Sand, Soil, Vermicompost, cocopeat in the ratio of 1:1:1:1. Total no. of plant is 150 was planted in pots on 22/12/2020 with young plants with the height of 6 inches.

Results and Discussions

Present investigation entitled “A comparative study on edible vertical garden established in plastic and geotextile pots” was carried out at the department of horticulture, Sam Higgin Bottom University of agriculture, technology and sciences, Prayagraj during the winter season

2020-2021. The objective is to find the best growth in plastic pots or geotextile pots for edible vertical garden have been presented in tables and graphically represented. The result of the experiment has been presented under the following headings.

Number of leaves per plant in plastic pot and geotextile pots

In plastic pots periwinkle (P1) recorded significantly highest number of leaves (126.867) whereas lowest number of leaves (26.067) were observed in nasturtium (P5). In geotextile pots periwinkle (P1) recorded significantly highest number of leaves (161.933) whereas lowest number of leaves (56.867) were observed in nasturtium (P5). Number of branches per plant in plastic

Pot and geotextile pots

In plastic pots periwinkle (P1) recorded significantly highest number of branches (14.4) whereas lowest number of branches (3.367) were observed in basil (P3).

In geotextile pots periwinkle (P1) recorded significantly highest number of branches (17.333) whereas lowest number of branches (7.867) were observed in chrysanthemum (P2).

Root length (cm) in plastic pot and geotextile pots

Root length of periwinkle (P1) in plastic pot is 29.73cm and in geotextile pot is 19.06cm. Root length of chrysanthemum (P2) in plastic pot is 31.06cm and in geotextile pot is 15cm.

Root length of basil (P3) in plastic pot is 24.2cm and in geotextile pot is 17.2cm. Root length of Indian coleus (P4) in plastic pot is 20.86cm and in geotextile pot is 16.23cm.

Root length of nasturtium (P5) in plastic pot is 11.13cm and in geotextile pot is 7.86cm. Total Vegetative fresh and dry weight (gm) in plastic pot and geotextile pots.

Plastic pot fresh and dry weight

Fresh weight of Periwinkle (P1) is 26.73g and dry weight is 4.81g.

Fresh weight of Chrysanthemum (P2) is 13.26g and dry weight is 2.38g.

Fresh weight of Basil (P4) is 11.53g and dry weight is 2.07g.

Fresh weight of Indian coleus (P5) is 69.53g and dry weight is 13.16g.

Fresh weight of Nasturtium (P5) is 10g and dry weight is 1.86g.

Geotextile pot fresh and dry weight

Fresh weight of periwinkle (P1) is 44.33g and dry weight is 7.98g.

Fresh weight of chrysanthemum (P2) is 23.3g and dry weight is 4.06g.

Fresh weight of basil (P3) is 45.26g and dry weight is 8.14g.

Fresh weight of Indian coleus (P4) 154g and dry weight is 27.48g. Fresh weight of nasturtium (P5) is 13.33g and dry weight is 2.5g.

Table 1: Effect of different growing material on the herbal vertical garden on plant height (cm), no. of leaves, no of branches

Treatment No.	Treatment details	Height				Leaves				Branches			
		30	60	90	120	30	60	90	12	30	60	90	12
	Plastic	DA	DA	DA	DA	DA	DA	DA	0	D	D	D	0
		S	S	S	S	S	S	S	DA	AS	AS	AS	D
									S	AS	AS	AS	AS
P1	Periwinkle	16.	17.	19.	21.	34		87	12	7.	10	12	14
		2	93	73	93	.2	57	.8	6.8	2	.2	.0	.4
P2	Chrysanthemu m	5.6	7.3	9.2	9.5	21	30		62.	1.	2.	3.	4.
			67	33	67	.9	.6	43	26	33	33	33	33
P3	Basil	5.6	12.	22.	26.	9.	22	24	35.	1.	2.	3.	3.
		33	73	13	48	33	.2	.5	66	06	06	33	36
P4	Indian coleus	10.	12.	13.	14.	22	48	64		3.	4.		5.
		15	06	93	93	.1		.2	92	53		5	8
P5	Nasturtium	10	14.	23.	24.	8.	11	16	26.				
			2	46	6	66	.7	.0	06				
	Geo textile												
P1	Periwinkle	20.	22.	26.	30.	50	66	10	16	7.	13	14	17
		14	53	73				5.	1.9		.4	.2	.3
		7	3	3	2	.8	.6	66	33	6	67	67	33
P2	Chrysanthemu m	13.	15.	17.	19.	23	57	73	10	2.	4.	4.	7.
		90	1	2	46	.6	.2	.4	3.4	6	2	26	86
P3	Basil	13.	16.	34.	38.	10	27	67	12	2.	4.	10	11
		37	6	13	13	.1	.6	.9	9.9	4	86	.4	.1
P4	Indian coleus	15.	19.	23.	30.	30	59	10	13	3.	4.	6.	10
		95	13	6	06	.1	.3	5.	3.7	26	46	86	.6
P5	Nasturtium	17.	29.	47.	57.	10	27	38	56.	7			
		53	53	66	2		.4	.8	86				

Table 2: Effect of different growing material on herbal vertical garden on plant spread in (I'm), root length in (cm), dry weight and fresh weight in (gm)

Treatment No.	Treatment details	Plant Sprade				Root length	Dry weight	Fresh weight
		30 DAS	60 DAS	90 DAS	120 DAS			
	Plastic							
P1	Periwinkle	8.567	10.56 7	12.3 67	13.5 67	29.73	26.73	4.81
P2	Chrysanthemum	9.813	10.42 7	10.9 47	12.8 33	31.06	13.26	2.38
P3	Basil	8.767	10.56 7	13.0 27	14.0 27	24.2	11.53	2.07
P4	Indian coleus	10.63 3	14.53 3	15.0 67	17.1 67	20.86	69.53	13.16
P5	Nasturtium					11.13	10	1.86
	Geo textile							
P1	Periwinkle	9.567	11.56 7	15.0 67	19.9	19.06	44.33	7.98
P2	Chrysanthemum	10.14 7	15.64 1	20.6 71	22.7 4	15	23.3	4.06
P3	Basil	14.26	23.23 6	26.7 67	27.7 67	17.2	45.26	8.14
P4	Indian coleus	16.5	24.46 7	32.4 67	36.4 67	16.23	154	27.48
P5	Nasturtium					7.86	13.33	2.5

Conclusion

From the present investigation conducted on different plats, it is concluded that the plants grown in the geotextile pots were performed better than the plants grown in plastic pots. In all aspects the plants in a plastic pots for too long we get a few large roots wrapping and circling the edges of the pot over and over and eventually choking itself out. The plants in the geotextile pots expose root tips to relatively dry air, thus stopping their growth. The plant now focuses on creating secondary roots then branch. The overall effect of this growth and a well-developed root system in a relatively short amount of time, all the herbal plants selected were grown well in geotextile pots when compared to plastic pots according to prayagraj conditions and the vegetative growth of edible vertical garden in two different grow pots were recorded and got highly significant difference and I have concluded that plants grown in the geotextile pots were grown better.

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