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## Standardization of growing media on growth and yield of cucumber (*Cucumis sativus* L.) in containers

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### Abstract

The entitled research work "Standardization of growing media for organic cucumber (*Cucumis sativus* L.) Production in containers" was conducted during the *rabi* season of the year 2020-21 in the Department of Horticulture, College of Agriculture, Indore (M.P.). The research material under research comprised of 8 treatment G1-soil + sawdust + FYM (2:1:1), G2-soil + cocopeat + FYM (2:1:1), G3-soil + sawdust + vermicompost (2:1:1), G4-soil + cocopeat + vermicompost (2:1:1), G5-soil + cocopeat + vermiculite + perlite (2:1:1:1), G6-soil + cocopeat + vermiculite + FYM (2:1:1:2), G7-sawdust + vermiculite + FYM + perlite + coco coir (1:1:2:1:1), and G8-soil alone (Control) which were tested in RBD with three replications with the objectives *viz.*

1. To find out the effect of different growing media on growth and yield of cucumber in containers.
2. To find out the suitable growing media for rooftop and terrace gardening of cucumber.
3. To know the economics of different growing media in containers.

It can be concluded that the applied of different treatment combinations, treatment G5-soil + cocopeat + vermiculite + perlite (2:1:1:1), was best at all the stages of growth, quality and yield parameters like vine length (cm), number of primary branches per vine, number of leaves per vine, number of nodes per vine, days to first flower initiation, fruit length (cm), fruit girth (cm), total number of picking, no. of fruit per vine, average fruit weight per vine, fruits yield per vine, total fruit yield per container and fruit TSS parameters showed better performance from other treatment levels. B:C ratio was obtained under different treatments ranged from -0.07 to 1.50. It was found to be highest (1.50) under the G1-Soil +sawdust +FYM and the lowest (-0.07) under the G7-sawdust +vermiculite +FYM +perlite +Cococoir, no doubt this is due to more input cost of media in the treatment.

**Keywords:** Sawdust, cocopeat, perlite, vermicompost, FYM, cucumber in containers gardening

### Introduction

Cucumber (*Cucumis sativus* L.) is commonly known by its vernacular name as "Khira" is an important vegetable crops belongs to the Cucurbitaceous family having chromosome number  $2n = 14$ . It is originated in Southern Asia probably in India (Gangadhara *et al.* 2019) <sup>[5]</sup>. From India, it seems to have spread to other parts of Asia, Africa and then to Europe. It is almost grown throughout India in open as well as in protected conditions. It is a short duration crop and most important in kitchen gardens, therefore, cultivated broadly throughout the world round the year The leading states in India growing cucumber are Punjab, Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh, West Bengal, Assam, Meghalaya, Andhra Pradesh, Tamil Nadu and Gujarat. The major growing districts in Madhya Pradesh are Barwani, Indore, Shahdol, Satna, Jabalpur, Khargone, Sagar, Rewa, Dhar and Ujjain. The China is the world leader in cucumber area and production, However, India ranks 25<sup>th</sup> with area under cultivation 82,000 ha. And annual production 12,60,000 MT. In Madhya Pradesh and district Indore the area under cultivation and av annual production of cucumber is 9,460 ha. And 154,520 MT. and 1,000 ha. And 20,000 MT. respectively.

### Materials and Methods

A field experiment was conducted during 'Kharif' season of the year 2016a. A field experiment was conducted during 'Kharif' season of the year 2016a. A field experiment was conducted during the rabi season of 2021-22. Department of Horticulture, College of Agriculture, Indore (MP). At a latitude of 22o 43 "N and a longitude of 75o 66 "E with an altitude of 555.5 meters above mean sea level. The experiments was laid out in randomized block design (RBD) with three replication. The experiment compared 24 treatment combinations 8G1-soil + sawdust + FYM (2:1:1), G2-soil + cocopeat + FYM (2:1:1), G3-soil

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+ sawdust + vermicompost (2:1:1), G4-soil + cocopeat + vermicompost (2:1:1), G5-soil + cocopeat + vermiculite + perlite (2:1:1:1), G6-soil + cocopeat + vermiculite + FYM (2:1:1:2), G7-sawdust + vermiculite + FYM + perlite + coco coir (1:1:2:1:1), and G8-soil alone (Control) Observations were recorded for the replications in each treatment for the different characters. Various yield traits were observed and recorded to fulfill the objective and purpose of the study. vine length, No. of primary branches per vine, No. of leaves per vine, No. of nodes per vine, Days to first flower appearance, Fruit length, Fruit girth, Total number of pickings, No. of fruit per vine, Average fruit weight, Fruit yield per vine, Total fruit yield per container.

## Results and Discussions

- **Vine length:** Varied from 228.90cm to 293.57cm. The maximum vine length was recorded (293.57cm) in treatment G5-Soil + Cocopeat + Vermiculite + Perlite, which was significantly superior over other treatment but was at par with treatments G4-Soil + Cocopeat + Vermicompost (281.22cm). Whereas, the minimum value of vine length (228.90 cm) was recorded in treatment G8-Soil alone (Control)
- **No. of primary branches per vine:** Varied from 9.60 to 12.67. The maximum number of primary branches per vine plant was recorded (12.67) in treatment G5-soil + cocopeat + vermiculite + perlite which was significantly superior over other treatments but at par with treatment G4-soil + cocopeat + vermicompost (12.39), G6-soil + cocopeat + vermiculite + FYM (12.14). The minimum value of the number of primary branches per vine (9.60) was recorded in treatment G8-Soil alone (Control).
- **No. of leaves per vine:** Varied from 60.57 to 85.64. The maximum number of leaves per vine was recorded (85.64) in treatment G5-soil + cocopeat + vermiculite + perlite which was significantly superior over other treatments but, at par with treatment G4-soil + cocopeat + vermicompost (82.22) and G6-soil + cocopeat + vermiculite + FYM (79.80). The minimum value of the number of leaves per vine was (60.57) recorded in the G8-Soil alone (Control) treatment.
- **No. of nodes per vine:** Varied from 27.54 to 35.23. The maximum number of nodes per vine was recorded (35.23) in treatment G5-soil + cocopeat + vermiculite + perlite which was significantly superior over other treatment but at par to treatment G4-soil + cocopeat + vermicompost (34.50), G6-soil + cocopeat + vermiculite + FYM (33.94). The minimum value of the number of nodes per vine was (27.54) recorded in treatment G8-Soil alone.
- **Days to first flower appearance** were influenced significantly by growing media. Cucumber crops sown with G5-soil + cocopeat + vermiculite + perlite was used had fewer days to first flower appearance (32.66) than treatments G4 (33.39), G6 (34.04), G2 (34.86), G3 (35.23), G1 (35.89), G7 (36.42) and G8 (37.22).
- **Fruit length of cucumber** was significantly influenced by different treatments. Significantly maximum fruit length (17.78 cm) was recorded in treatment G5-soil + cocopeat + vermiculite + perlite which was at par with all the treatments except treatments G2 (16.27 cm), G3 (15.80 cm), G1 (15.29 cm), G7 (14.81 cm) and G8 (13.98 cm). The minimum fruit length (13.98 cm) was recorded in treatment G8 (Control).
- **Fruit girth (cm)** that treatment G5-soil + cocopeat + vermiculite + perlite produced the highest fruit girth (14.64 cm) which was at par with treatment G4 (13.89 cm). The lowest value of fruit girth (9.39 cm) was noted in G8 (control).
- **Total numbers of pickings** were significantly influenced by growing media. The maximum total numbers of pickings (17.92) were noted in treatment G5 (soil + cocopeat + vermiculite + perlite). Treatment G5 was found to be significantly superior to other treatments but at par with treatments G4-soil + cocopeat + vermicompost (17.16) and G6-soil + cocopeat + vermiculite + FYM (16.54). The minimum total number of pickings were (12.51) recorded in G8
- **No. of fruit per vine:** Observed that a significantly higher number of fruits per vine (46.77) was recorded under the treatment G5 (soil + cocopeat + vermiculite + perlite) which was found at par with treatments G4 (41.95). The lowest number of fruits per vine (24.91) was obtained with treatment G8
- **Average fruit weight (g):** That treatment G5 (soil + cocopeat + vermiculite + perlite) recorded a significantly higher fruit weight (184.08 g) as compared to treatments G1, G2, G3, G6, G7 and G8. However, treatment G5 was at par with treatment G4 (178.85 g). Whereas, it was the lowest (140.89 g) in treatment G8
- **Fruit yield per vine (kg):** The growing media G5 (soil + cocopeat + vermiculite + perlite) produced the significantly maximum organic fruit yield per vine (8.63kg) as compared to the treatments G1, G2, G3, G7, G6 and G8. However, the yield value of G4- Soil + Cocopeat + Vermiculite + Perlite, treatment (7.47 kg). was found at par with G5. On the other hand the minimum fruit yield per vine (3.61 kg) was registered in treatment
- **Total fruit yield per container (kg):** The maximum fruit yield per container was recorded (25.68 kg) in treatment G5-soil + cocopeat + vermiculite + perlite which was significantly superior over other treatments but, at par to treatment G4-soil + cocopeat + vermicompost (22.21 kg). While, it was the minimum (10.45 kg), recorded in treatment G8.

**Table 1:** Effect of different growing media for various characters

S.N.	Treatments	Vine length	No. of primary branches/ vine	No. of leaves/ vine	No. of nodes / vine	Days to first flower appearance	Fruit length
	<b>Different Media</b>						
G1	Soil + Sawdust + FYM (2:1:1)	254.71	10.29	66.83	31.71	35.89	15.29
G2	Soil + Cocopeat + FYM (2:1:1)	266.43	11.18	74.02	32.91	34.86	16.27
G3	Soil + Sawdust + Vermicompost (2:1:1)	259.76	10.93	69.51	32.09	35.23	15.80
G4	Soil + Cocopeat + Vermicompost (2:1:1)	281.22	12.39	82.32	34.50	33.39	17.13
G5	Soil + Cocopeat + Vermiculite + Perlite (2:1:1:1)	293.57	12.67	85.64	35.23	32.66	17.78

G6	Soil + Cocopeat + Vermiculite + FYM (2:1:1:2)	275.76	12.14	79.80	33.94	34.04	16.83
G7	Sawdust + Vermiculite + FYM + Perlite + Cococoir (1:1:2:1:1)	243.44	9.88	64.76	29.87	36.42	14.81
G8	Soil alone (Control)	228.90	9.60	60.57	27.54	37.22	13.98
	SEM+	5.69	0.18	2.10	0.74	0.89	0.32
	CD (P = 0.05)	17.26	0.55	6.36	2.26	2.69	0.96

**Table 2:** Effect of different growing media for various characters

S.N.	Treatments	Fruit girth	Total no. of pickings	No. of fruit/ vine	Average fruit weight	Fruit yield/ vine	Total fruit yield/container
	<b>Different media</b>						
G1	Soil + Sawdust + FYM (2:1:1)	11.19	14.84	34.76	156.59	5.37	15.67
G2	Soil + Cocopeat + FYM (2:1:1)	12.33	15.81	37.46	164.24	6.22	18.52
G3	Soil + Sawdust + Vermicompost (2:1:1)	11.78	15.20	36.42	158.75	5.64	16.37
G4	Soil + Cocopeat + Vermicompost (2:1:1)	13.89	17.16	41.95	178.85	7.47	22.21
G5	Soil + Cocopeat + Vermiculite + Perlite (2:1:1:1)	14.64	17.92	46.77	184.08	8.63	25.68
G6	Soil + Cocopeat + Vermiculite + FYM (2:1:1:2)	13.21	16.54	38.89	171.94	6.65	19.90
G7	Sawdust + Vermiculite + FYM + Perlite + Cococoir (1:1:2:1:1)	10.39	14.17	33.29	150.41	4.99	14.88
G8	Soil alone (Control)	9.36	12.51	24.91	140.89	3.61	10.45
	SEM+	0.45	0.57	1.97	1.73	0.46	1.21
	CD (P = 0.05)	1.35	1.72	5.97	5.26	1.40	3.68

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