

Effect of Different Potting Media on Propagation of Ivy Gourd through Stem Cuttings

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ABSTRACT

A study was carried out to explore the effect of different potting media on sprouting per cent and ivy gourd cutting growth with respect to vine, root characteristics were studied at Krishi Vigyan Kendra, Dr. Y.S.R. Horticultural University, West Godavari district, Andhra Pradesh, India. Three types of media with different combinations were tried. The experiment was laid out in Completely Randomized Design, with eight treatment combinations, and replicated thrice. Results showed that the medium, Red soil: Cocopeat: Vermicompost in 2:1:2 proportion gave highest sprouting per cent (69.00 %), less days to sprouting (9 days), more number of vines per node (4.67), more vine length (34.50cm), maximum vine fresh weight (0.53g) and dry weight (0.22g), more number of primary roots (8.00) and more average root length (15.67cm), highest root fresh weight (2.36g) and root dry weight (0.34g). The least values were recorded in treatment T7- Red soil:Cocopeat:Vermicompost - 4:1:0.

Key words: Coco peat, Growth media, Red soil, Sprouting (%) and Vermicompost,

INTRODUCTION

Ivy gourd (*Coccinia grandis*) is one of the important under exploited dioecious cucurbitaceous vegetable, grown for its tender immature fruits for vegetable throughout the Asian countries. It is a semi perennial crop and highly accepted by the people due to its availability for nine months (February - October) in a year. In South east Asia, ivy gourd is grown for its edible young shoots and fruits⁸. Being very rich in protein and vitamin

A, it has unique medicinal properties viz. controlling diabetes, bronchitis, skin disorders, seeks fever possess cell-stabilizing, anti-anaphylactic and anti-histaminic potential¹². The survival of plant in nature is due to seed⁷, but, propagation through seed is avoided for commercial cultivation due to poor seed viability and establishment of plants, resulting more than 50 per cent non-fruiting i.e. male plants¹¹.

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Vegetative propagation through stem cuttings offers an excellent mean for commercial cultivation of this crop⁴. It is also grown in tribal areas and in some plain areas of west Godavari district of Andhra Pradesh. The demand for ivy gourd rooted cuttings is at increasing trend in these areas because of more profitable crop to farmer. Success of vine or stem cuttings in terms of rooting, growth and development varies with the different potting media³. Hence the present investigation was undertaken to study the effect of growth media on Propagation of Ivy gourd through Stem Cuttings at Krishi vigyan Kendra, Venkataramannagudem for standardizing best growth media for multiplication.

MATERIAL AND METHODS

An experiment was conducted at Krishi vigyan Kendra model nursery, Dr. Y. S. R. Horticultural University, Venkata ramannagudem, West Godavari district (India) during summer, 2016-17. The nursery was raised under 30 per cent shade net. The experiment was laid out in Completely Randomized Design with three replications. The media comprised of red soil, Cocopeat and Vermicompost with eight treatment combinations and replicated thrice. One year old pencil thickness stem cuttings were used for rooting purpose. thirty cuttings planted in each replication. Five cuttings were selected randomly for recording observations in each treatment and data were recorded on sprouting percent, shoot and root parameters of cuttings at 20 days after planting.

RESULTS AND DISCUSSION

Stem cutting sprouting parameter as influenced by different potting media mixture and are presented in Table 1. Among different potting media, sprouting commenced at an average of 9.00 days after sowing in Red soil: Cocopeat: Vermicompost (2:1:2) (T5) which was statically at par with T3 (Red soil:Cocopeat:Vermicompost -1:1:3) (9.33). The highest days to sprouting was noticed in treatment T7 (Red soil:Cocopeat: Vermicompost - 4:1:0) (11.67). Among

different treatments significantly the highest sprouting per cent was recorded in T5 (69.00%) which was statically at par with T3 (68.00%). The minimum sprouting per cent was noticed in Red T7- soil:Cocopeat: Vermicompost - 4:1:0 (54.00%). More number of vines per node was observed in T5-Red soil:Cocopeat: Vermicompost (2:1:2) (4.67) which was statically at par with T3 (4.33) and T1 (4.00) and T6 (4.00), whereas less number of vines per node was noticed in T7 (2.33). More vine length was noticed in treatment T5 (34.50cm) which was statically at par with T3 (32.73cm) and T6 (31.00cm), whereas minimum vine length was observed in T7 (22.07cm). The maximum vine fresh weight (0.53g) and dry weight (0.22g) was noticed in Treatment T5, whereas minimum fresh (0.20g) and dry weight (0.09g) was observed in T7. In case of root parameters more number of primary roots (8.00) and more average root length (15.67cm) was recorded in treatment T5 and less number of primary roots (4.67) and less average root length (7.67cm) was recorded in T7. With respect to root fresh and dry weight, the highest root fresh weight (2.36g) and dry weight (0.34g) was noticed in T5, whereas minimum root fresh weight (0.34g) and dry weight (0.05g) was noticed in T7 (Red soil: Cocopeat:Vermicompost - 4:1:0). In case of leaf characteristics there was no significant difference with regard to no of leaves per rooted cutting, leaf fresh weight and leaf dry weight. In all treatments, minimum number of days to sprout (9.00), highest sprouting per cent (69.00%), more number of vines per node (4.67), More vine length (34.50cm), vine fresh weight (0.53g) and dry weight (0.22g), more number of primary roots (8.00), average root length (15.67cm), more root fresh weight (2.36g) and dry weight (0.34g) were obtained in T5-Red soil:Cocopeat:Vermicompost (2:1:2). Red soil: Cocopeat:Vermicompost - 4:1:0 (T7) without vermicompost showed least values for all the parameters compared to other treatments. This could be due to the fact that vermicompost rich in organic matter with high water and nutrient holding capacity of the medium for supply to

the cutting. Vermicompost is reported to have bioactive principles considered to be beneficial for root growth, root initiation, sprouting and growth of the plant², as also having a balanced composition of nutrients¹³. Vermicompost, mixed with cocopeat and red soil, affects physical, chemical and biological properties of the soil as the organic matter acts as a glue for soil aggregation and is a source of soil nutrients. Soil aggregation improves permeability and airflow in the poly bags. Organic matter may also improve nutrient availability and improve phosphorus absorption⁶. All these factors are favourable for sprouting and ultimately, increase sprouting per cent, all root parameters and other growth parameters. Combined application of vermicompost and Cocopeat

and red soil in treatment T₅ showed significant positive effect on sprouting, rooted cutting growth and plant biomass, probably owing to a synergistic combination of both these factors in improving physical condition of the media and providing nutritional factors¹⁰. Vermicompost provides adequate nutrients and enhances both physical properties and waterholding capacity. Combined application of vermicompost and cocopeat have showed significant effect on sprouting and plant biomass, perhaps due to the synergistic effect of both these factors. This result is in line with the findings of Campos Mota *et al* and Abirami *et al*¹, who suggested that since coir dust was low in nutrients when mixed with vermicompost it provides a better growth medium for plant establishment.

Table 1: Effect of different potting media on sprouting (%), vine parameters and root parameters of ivy gourd cuttings

Treatments	Days to first sprouting	Sprouting (%)	No of vines per node	Vine length (cm)	Vine fresh weight (g)	Vine dry weight (g)	No of primary roots	Avg Root length (cm)	Root fresh weight (g)	Root dry weight (g)	No of leaves per cutting	Leaf fresh weight (g)	Leaf dry weight (g)
T1	10.67	65.00	4.00	29.67	0.34	0.14	6.67	12.33	1.40	0.31	6.0	0.27	0.06
T2	10.33	59.67	2.67	25.33	0.28	0.12	5.00	11.00	0.77	0.11	6.0	0.24	0.03
T3	9.33	68.00	4.33	32.73	0.45	0.19	7.00	15.67	1.76	0.31	7.0	0.28	0.06
T4	10.33	60.00	3.00	27.00	0.30	0.13	6.00	11.67	1.19	0.25	6.0	0.26	0.04
T5	9.00	69.00	4.67	34.50	0.53	0.22	8.00	15.67	2.36	0.34	8.0	0.30	0.06
T6	10.67	65.67	4.00	31.00	0.43	0.18	7.00	14.33	1.53	0.31	7.0	0.28	0.06
T7	11.67	54.00	2.33	22.07	0.20	0.09	4.67	7.67	0.34	0.05	6.0	0.22	0.03
T8	11.33	63.00	3.67	28.17	0.33	0.14	6.33	12.00	1.31	0.25	6.0	0.26	0.06
SEm (±)	0.37	0.60	0.44	1.24	0.03	0.02	0.58	0.82	0.04	0.01	0.7	0.03	0.01
CD (5%)	1.13	1.82	1.33	3.76	0.09	0.05	1.75	2.47	0.12	0.04	N/A	N/A	N/A

T1-Red soil:Cocopeat:Vermicompost (3:1:1); T2-Red soil:Cocopeat:Vermicompost (1:3:1); T3-Red soil:Cocopeat:Vermicompost (1:1:3); T4-Red soil:Cocopeat:Vermicompost (2:2:1); T5-Red soil:Cocopeat:Vermicompost (2:1:2); T6-Red soil:Cocopeat:Vermicompost (1:2:2); T7-Red soil:Cocopeat:Vermicompost (4:1:0); T8-Red soil:Cocopeat:Vermicompost (4:0:1)

CONCLUSION

On the basis of results obtained in this study, it is concluded that growth media significantly influence the sprouting per cent and growth in ivy gourd cuttings. Potting media with Redsoil:Cocopeat:Vermicompost (2:1:2) was the best since more sprouting and rooted cutting growth and development parameters, were higher in this than on other media. Overall results revealed that media supplemented with vermicompost and cocopeat resulted in higher rate of sprouting and better growth and development of ivy gourd rooted cuttings, compared to other

combinations. Therefore, it is suggested that vermicompost, red soil and cocopeat may be used as growth media for achieving higher sprouting rate and faster growth in ivy gourd cuttings.

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