**Effect of different organic media on Cost Economics of Strawberry (*Fragaria x ananassa* Duch.) propagated through runners raised on beds under protected condition**


## Abstract

Impact of Various Organic Media on Strawberry (*Fragaria* x *ananassa* Duch.) Cost Economics at the Precision Farming Development Centre (PFDC), Department of Fruit Science, College of Agriculture, IGKV, Raipur (C.G.), using runners raised on beds under protected conditions. Eight treatments and three replications made up the completely randomised design (CRD) used for the experiment's layout. The combination of cocopeat, rice husk, and vermicompost (1:1:1) was found to be the most efficient among the different treatments in terms of economy. In terms of economical aspects maximum gross return (7844165 Rs./ha), maximum net return (5983079 Rs./ha) and highest Benefit: Cost ratio recorded (3.22:1).



**Keywords:** Organic media, Vermicompost, FYM, Cocopeat, Rice husk and Strawberry.


## Introduction

Originating in France, the strawberry (*Fragaria* x *ananassa* Duch.) is one of the most significant temperate fruit crops, though it can also be grown in sub-tropical climates. It is a member of the family Rosaceae. Strawberries farmed for commercial purposes (*Fragaria* x *ananassa* Duch.) is monoecious octaploid (2n=56) hybrid of two dioecious octaploid species, namely, *Fragaria chiloensis* Duch. and *Fragaria virginiana* Duch. (Bowling 2000) with a basic chromosome number (x) = 7. It is a short-day herbaceous perennial plant that thrives in temperatures ranging from 22°C to 25°C during the day and 7°C to 13°C night (De and Bhattacharjee, 2012). Strawberry is a non-climacteric plant, with fruits that mature only on the plant. Strawberry cultivation has only recently gained traction in Himachal Pradesh, despite the fact that it is still in its infancy. Normal intake of its fruits has been shown to reduce the risk of cancer and asthma (Wange and Kzlogoz, 1998). Based on a higher concentration of particularly potent phenolic compounds, primarily anthocyanin, flavonols, hydrobenzoic acid, and ellagitannins, a large number of scientific studies confirm the nutritional and health-promoting values of strawberry fruits (Milosavljevic *et al*., 2021; Fotiric Aksic *et al*., 2019; Manganaris *et al*., 2014; Milivojevic

*et al*., 2013; Giampieri *et al*., 2012; Panico *et al*., 2009). Their evaluation is crucial for identifying novel sources of plant-based antioxidants, and because they are associated with numerous health benefits, cultivars that contain high concentrations of phenolic compounds ought to be encouraged and ingested more regularly. Strawberry plant produces runners, runners are long thin horizontal stem that run above the ground and produces roots and shoots at widely spaced nodes. The Inflorescence develops terminally. Botanically, strawberry is an aggregate fruit with having seeds on the surface of a red fleshy receptacle (Darnel, 2003). Since plants grown from seeds are not true forms, commercial strawberry transplants are vegetatively propagated (Bish *et al*., 2000). Strawberry transplants are primarily produced by vegetative propagation using runner plants (Hartmann *et al*., 1997). It is the most effective and cost-effective method of obtaining new strawberry plants. Excellent organic media used are farm yard manure, cocopeat, rice husk, and vermicompost. Farm yard manure increases vegetative growth and improves quality of strawberry, Cocopeat have high water holding capacity and cation exchange capacity, Rice husk being easily available cheap organic substrate its decomposition rate is slow due to silica content rice husk results in best quality fruit production. Vermicompost contains lot of readily available NPK and micronutrients, growth regulators and microbial and enzyme activities (Chaoui *et al*., 2003).

**Materials and Methods**

The present investigation was carried out at PFDC (Precision Farming Development Centre) Department of Fruit Science, College ofAgriculture, IGKV, Raipur (C.G.) during the year 2020-21. Sweet charlie is an important cultivar of strawberry, which performs well in the climate of Chhattisgarh. From PFDC (Precision Farming Development Centre), Department of Fruit Science, shade net, healthy grown strawberry mother plant was selected, then cut off the runners with the help of secateur right at the base of the mother plant that had root nodules which have more chance to survive and ready to support themselves. Vigorous and healthy cutted runners were collected and planted firmly directly in the raised beds of size 2.6 $m^2$ (2.6m x 1m) without keeping in the polybag, grow more bag and plug tray etc and along with without mulcing. It saves time, labour and expense. Per plot, 20 runners were accommodated at a spacing of 45 cm (row to row) 25 cm (plant to plant) in paired row on raised beds. Irrigation was provided by a tube well, which supplied water to the experimental plants

through a drip irrigation system.

The experiment was laid out in Completely Randomized Design (CRD), comprised of eight treatments and three replications. FYM : Soil : Sand (1:1:1) were applied as per recommendation in all the eight treatment combinations involving different organic media viz., $T_0$ : Control (FYM : Soil : Sand ) (1:1:1), $T_1$: Cocopeat + FYM (1:1), $T_2$: FYM : Soil : Sand (2:1:1), $T_3$: Rice husk + FYM (1:1), $T_4$: Vermicompost + Soil (1:1), $T_5$: Cocopeat + FYM : Soil : Sand (1:2:1:1), $T_6$: Cocopeat + Rice husk + Vermicompost (1:1:1), $T_7$: Cocopeat + Vermicompost (1: 1). As per respective treatments fym, soil and sand mixed with the appropriate proportion of organic media vermicompost, farm yard manure, cocopeat, and rice husk applied after planting of runners on raised beds in the experimental field. The data recorded on Yield attributes and Benefit: Cost were analyzed by using MS-Excel in Completely Randomized Design (CRD). All the observed parameters are described below briefly.

**Benefit: Cost ratio**

Production cost in all the treatments was calculated on the basis of the prevalent input and market price of the produce. The net realization was worked out by deducting the cost of production per hectare from the gross realization per rupee invested was worked out treatment wise to evaluate the economic impact of the treatment by dividing the net realization per hectare by the production cost per hectare.

**Results and Discussion**

**Benefit: Cost ratio**

The highest Benefit: Cost ratio (3.22:1) was recorded under the treatment $T_6$ Cocopeat + Rice husk + Vermicompost (1:1:1) followed by $T_7$ (3.19:1). Moreover the lowest Benefit: Cost ratio (2.62:1) was registered under Control $T_0$ (FYM : Soil : Sand ) (1:1:1) which was at par with treatment $T_2$ & $T_3$ having respective B: C ratio of 2.65:1 & 2.71:1 under the present investigation. Similar observations have been reported by Kumar *et al*. (2018) in strawberry cv. Sweet charlie. All the details presented in the table.

**Conclusion:**

Treatment $T_6$ Cocopeat + Rice husk + Vermicompost (1:1:1) combination was found best and obtained highest B:C ratio among the different treatment combinations.

**Table: Effect of different organic media on Economics of Strawberry (*Fragaria x ananassa* Duch.) propagated through runners raised on beds under protected condition**

| **Treatments** | **Cost of organic media (Rs./ha)** | **Total cost cultivation (Rs./ha)** | **Gross return (Rs./ha.)** | **Net return (Rs./ha)** | **B: C ratio (Rs./ha)** |
|---|---|---|---|---|---|
| $T_0$ Control (FYM : Soil : Sand ) (1:1:1) | 000.00 | 794430 | 2874830 | 2080400 | 2.62:1 |
| $T_1$ Cocopeat + FYM (1:1) | 711104 | 1505534 | 5741330 | 4235796 | 2.81:1 |
| $T_2$ FYM : Soil : Sand (2:1:1) | 533328 | 1327758 | 4859330 | 3531572 | 2.65:1 |
| $T_3$ Rice husk + FYM (1:1) | 666660 | 1461090 | 5433855 | 3972765 | 2.71:1 |
| $T_4$ Vermicompost + Soil (1:1) | 799992 | 1594422 | 6206830 | 4612408 | 2.89:1 |
| $T_5$ Cocopeat + FYM : Soil : Sand (1:2:1:1) | 888880 | 1683310 | 6778415 | 5095105 | 3.02:1 |
| $T_6$ Cocopeat + Rice husk + Vermicompost (1:1:1) | 1066656 | 1861086 | 7844165 | 5983079 | 3.22:1 |
| $T_7$ Cocopeat + Vermicompost (1: 1) | 977768 | 1772198 | 7431830 | 5659632 | 3.19:1 |



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