Evaluation of Efficiency of Organic Compost on Growth of Some Vegetables in Soil less Culture at Roof Top

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Abstract:

Green revolution technologies supported by policies and fuelled by agrochemicals, machinery and irrigation are known to have enhanced agricultural production and productivity.Conventional crop growing practices leads to high degree of crop specialization while organic cultivation leads to diversity of crop. In this paper an attempt has been made to evaluate the effect of cocopeat in various combination of vermicompost and cowdung compost on growth of different types of vegetables.The tallest plants of 66 cm ,92cm, and 43cm height of brinjal, tomato and chilli respectively were observed when treated with 1:3 ratio of vermicompost and cowdung i.e. 5 kg and 15 kg respectively. Highest no of fruits calculated per plant were 63, 61, 46 in chilli, Brinjal and tomato respectively in the cocopeat medium supplemented with higher cowdung compost.

Keywords: Cocopeat, cow dung, vermicompost, Organic cultivation, Conventional.

Introduction:

Green revolution technologies, supported by policies and fuelled by agrochemicals, machinery and irrigation are known to have enhanced agricultural production and productivity (Reddy 2010) modern agricultural farming practices, along with irrational use of chemical inputs over the past four decades have resulted in loss of natural habitat balance, soil erosion, decreased ground water level, soil Salinization, pollution due to chemical fertilizers and pesticides, genetic erosion, ill effect on environment, reduced food quality and increase in the cost of cultivation, rendering the farmer poorer year by year. (Ram 2003).Vegetable crop growers are now looking forward to the alternative techniques and strategies for growing crops. The principle of organic cultivation is attracting crop growers all over the world because of its various advantages over modern agricultural practices. Organic farming supports and strengthens biological processes without use of inorganic remedies such as chemicals fertilizers and pesticides. Organic culture is productive and sustainable (Reganold et.al.,1993, Letourneau and Goldstein, 2001; Mader et al, 2002).Conventional crop growing practices leads to high degree of crop specialization while organic cultivation leads to diversity of crop.In conventional crop cultivation at roof top is strongly influenced by the type of soil, density of soil, its properties along with soil borne harmful microorganisms, water drainage system and soil aeration.This consideration led to the outcome that it would be preferable to standardize the soils used for determining soil contents, chemicals and composition (P Mangala et al 2009, Gawlik 2001). In the artificial soil (OECD, 1984; 2004; ISO 2012 a,), sphagnum peat represents soil organic matter. However, the cost of sphagnum peat is increasing (Meerow 1994) and also it is mined from endangered sphagnum plant ecosystems which are declining rapidly due to environmental constraints (Barkham 1993, Robert son 1993, Frolking et al 2001) and due to this, sphagnum peat become scarce and completely

unavailable in many regions including the tropics (Garcia 2011, Romboke et al 2007). This has created a need to find other similar alternatives to be used as soil media for roof top vegetable farming.Cocopeat, also known a coir pith, coir dust etc. is made from coconut husks, a by product of coir industries and readily available in tropical countries.Coir pith has many beneficial characteristics, making it a potentially productive resource for use in agriculture in proper combination of vermicompost and cowdung compost (2Prabhu 2002) In this paper an attempt has been made to evaluate the effect of cocopeat in various combination of vermicompost and cowdung compost on growth of different types of vegetables.

Material and Methods:

Cocopeat, vermicompost and cowdung manure purchased from local organic agency and suppliers , used in 3 different combinations for the experiment.The experiments were performed in 3 large containers in 3 different combination of cocopeat + vermiconpost and cow dung compost in open condition covered with agronet at roof top. The experiment was conducted in 3 diff. combinations, the combinations were A1 – cocopeat 45 kg + 5 kg vermicompost and 10 kg.Cowdung, A2 – cocopeat 45 kg + 5 kg vermicompost and 15 kg cowdung manure, A3 – cocopeat 45 kg + 15 kg vermicompost and 5 kg cowdung.These 3 experiments were performed in 3 different containers with dome shaped Agronet at roof top. Size of the containers were 1 x 1 m (2m2). Saplings of tomato, Chili and Brinjal were obtained by sowing seeds in sapling tray. Later saplings were transferred to the container at the distance of 25 cm and 40 cm. Plant height and no of fruits were taken after 14 weeks.

Result and Discussion:

Effect of different combinations of cowdung and vermicompost on plant height and no. of fruits per plant varied significantly with fluctuation in the amount of cowdung compost.Higher percentage of cowdung i.e.15 kg. per container along with other mannure produced greater height whereas other combinations took 50% more days to attain that height.The tallest plants of 66 cm, 92cm, and 43cm height of brinjal, tomato and chilli respectively were observed when treated with 1:3 ratio of vermicompost and cowdung i.e. 5 kg and 15 kg respectively. Similar result with cowdung manure was observed in past by some workers (9). The effect of cowdung compost on plant height was very significant as compared to other combinations. Highest no of fruits calculated per plant were 63, 61, 46 in chili, Brinjal and tomato respectively in the cocopeat medium supplemented with higher cowdung compost. Low conc. i.e. 5 kg cowdung with high conc.i.e.10 kg vermicompost produced lesser no. of fruits as shown in **Table1**.

Earlier observation by Moyin Jesh (2007a) shows that cowdung compost increased uptake of N, P,K, Ca and Mg by the vegetable seedlings under observation. Moah and M Bagwa (2006) also found that the cowdung manure increases soil organic Matter, N and cation exchange significantly. The increase in growth and yield parameters by higher cowdung compost is consistent due to increased uptake of N, K, P, Ca and Mg.When the amount of cowdung increased beyond 15 kg/45 kg of cocopeat early yellowing of fruit and leaf drop was observed

which may be due the excess organic matter and N which might have caused dilution effect on K, Ca and Mg concentration in the medium (Brady and Weil 1999).

Thus the appropriate amount of cowdung ensures optimum growth and yield due to more availability of nutrients in medium which can be absorbed by the crop easily. Thus, gives healthy and chemical free crop.

Table 1: Effect of cowdung compost on height and **yield of vegetable crops**

Substrate combination V + C + Cocopeat	Brinjal		Tomato		Green chili	
	H(cm)	F/P(No.)	H (cm)	F/P(No.)	H(cm)	F/P(No.)
5 + 10 kg + 45 kg.	48.8	43	67	32	40	55
5 + 15 kg + 45 kg.	66.8	61	92	46	43	63
10 + 5 kg + 45 kg.	28.8	17	37	9	35	37

Conclusion:

Application of different concentrations of cowdung manure to vegetable crop led to significant increase in growth and yield. Thus the use of cowdung can be recommended for organic farming for better yield. It is also because of its easy availability, environmental and cost effectiveness.

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