

Manurial value Assessment of Coir Pith through Field Study

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Abstract— *Pot culture studies with coir pith compost indicated that this material in combination with soil and sand can be a suitable for farm yard manure in potting mixtures. When used alone also, coir pith compost was found to be a good medium for the container cultivation. The only practical problem is the use of coir pith alone appears to be the anchorage. A part of this study with nutrient supplementation had indicated that the only major plant nutrient element among N, P, and K that is deficient in composted coir pith is nitrogen.*

Keywords— *Coirpith, potting mixture, NPK.*

I. INTRODUCTION

Use of composted coir pith for agricultural use as a substitute for common organic manures had been tried experimentally decomposed coir pith has very high moisture retention capacity and its wetability is much better than peat (Evans and Stamps, 1996). The decomposition of lignin present in coir pith results in the formation of humic fractions (Kndalli et al., 2001) It had been often suggested that this product may also be used as a component of potting mixtures for container cultivation and even as an exclusive medium for soilless cultivation of indoor ornamental plants. Being a plant product, coirpith is expected to contain all plant nutrient elements and have release all of these on decomposition. However, the level of nutrient availability in this organic manure requires to be assessed. The present study was taken up to assess these aspects and the specific objectives are listed below.

- 1) Assess the suitability of coir pith compost as a component of potting mixture for the container cultivation
- 2) Test of use of coirpith compost as on exclusive medium for soil less cultivation of plants.

Evaluate the nutrient status of this product when used alone and also in combination with sand and soil.

II. MATERIALS AND METHODS

This pot trial had factorial combinations of four different types of potting mixture and four types of nutrient supplementation. Statistical design was CRD with four replications. There were a total number of 80 plants. The test crop selected Tomato var: Vellayani Vijay and the crop period were from August to December. The treatments were the following.

- Media
- Coir pith compost alone
- Soil:Sand in 1:1 ratio
- Soil:Sand:FYM (Farm Yard Mannure) in 1:1:1 ratio

- Soil:Sand:CPC (Coirpith Compost) in 1:1:1 ratio

2.1 NPK treatments

These include supply of three fertilizer nutrients N, P and K. There was one treatment that was received all the three nutrients and another that had none. The levels of nutrients were as per recommendations and calculated on per plant basis. One set of four bags were considered as control in which no fertilizer element was added. In addition to soil application as above, foliar spray of 0.1% nutrient carriers – urea, sodium dihydrogen orthophosphate, Murite of potash were given at weekly intervals as per treatments starting from 14 days after planting in order to ensure the growth was not affected for the need of respective nutrients at any stage. Observations on growth, yield and yield components were taken using standard procedures at periodical intervals and data processed by analysis of variance technique.

TABLE 1
GROWTH, YIELD AND YIELD COMPONENTS OF TOMATO

Types of Media	Plant Height at first harvest (cm)	Spread of leaves (Cm)	Days to first flowering	Days to first harvest	Total No of Fruits	Total weight of fruits
Coir pith compost alone (B1)	58.60	28.95	16.10	43.35	28.0	747.27
Soil:Sand in 1:1 ratio (B2)	50.25	21.95	20.30	45.70	21.0	466.68
Soil:Sand:FYM in 1:1:1 ratio (B3)	56.90	24.43	18.65	43.40	27.9	754.26
Soil:Sand:CPC (B4)	63.30	22.58	16.30	42.80	28.95	702.53
CD(0.005)		20.26	2.259		3.031	55.27
Fertilizers						
No Fertilizers	54.63	19.50		46.19	17.25	46.13
Nitrogen	56.75	25.56		43.44	34.56	863.57
Phosphorous	59.63	29.75		43.56	21.85	600.48
Potassium	56.06	20.06		43.81	21.38	550.67
NPK	59.25	27.50		42.06	37.31	901.15
CD (0.05)		2.262		2.45	3.39	61.794

III. RESULT AND DISCUSSION

Data on the growth, yield and yield components were subject to statistical analysis and it was found that the interaction between the two sets of factors, media composition and nutrient supplementation was not statistical significant. As such, mean values only are presented and discussed (Table 1). The differences between individual factors was statistical significant and on mean values relating to the four media indicate an inferiority on the medium with soil and sand only, which received no organic supplement. Those with coir pith compost were at par with the standard medium of farm yard manure, soil and sand. The proportion of CPC in the mixture did not appear to be very critical and interestingly the one having CPC alone was as good as any other medium including the traditional soil: sand:FYM in equal proportions. The possibility of substituting

FYM in potting mixture is clearly indicated. Another important indication is the possibility of using CPC as the sole medium for container cultivations and there for using it for soilless cultivation of plants. The only practical problem with the use of CPC alone was the poor anchorage at the later stage of the growth of the crop and necessity for the staking the plants when required. The pH of coco peat is closer to the optimum for the growth of most plants than that of sphagnum peat, which is highly acidic. So, replacing sphagnum peat with coco peat can also result in considerable saving, as lot of lime is required for bringing down pH of sphagnum peat (Cresswell, 1997). The importance of identifying porous organic substrates a substitute of Sphagnum moss had been reported (Bonita Kristine Lowry, 2015) and coir pith compost appears to be one possibility.

Among the nutrients supplemented viz: Nitrogen, Potassium and Phosphorous the only having a significant deficiency in coir pith appears to be nitrogen. Advantage of supplementation of this nutrient element is clear both in growth and yield. The factors not much affected by the medium composition are plant height and days to flowering and fruiting.

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