COIR PITH COMPOSTING- AN ALTERNATE SOURCE OF ORGANIC MANURE FOR RAINFED MAIZE

K. Kannan, V. Selvi, D.V. Singh, O.P.S. Khola, R. Mohanraj and A. Murugesan

CENTRAL SOIL & WATER CONSERVATION RESEARCH & TRAINING INSTITUTE, RESEARCH CENTRE
(Indian Council of Agricultural Research)
Udhagamandalam- 643 004

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With the introduction of the farm machinery and commercial fertilizers the reliance of the animal power as cultural tool has substantially reduced in the recent past and has thus reduced the availability of farm yard manure availability in the farm. Environmental degradation is a major threat and the rampant use of chemical fertilizers contributes largely to the deterioration of the environment through depletion of fossil fuels. Coir pith compost is a good source of organic manure for dry land agriculture as it can absorb water five times its weight and thereby when applied to soil increase the water holding capacity of soil. Coir industry in Tamil Nadu generates nearly 4.5 lakh tonnes of organic waste (coir pith) every day which

Coir pith waste

needs safe disposal. Coir pith contains constituents like lignin (30%) and cellulose (26%), which do not degrade quickly but can be decomposed by employing the fungus *Pleurotus sojar-caju* with urea supplementation. At the end of the composting period, the coir pith is changed in to a well-decomposed black mass. The C : N ratio is reduced to nearly 24:1 with the N content enhanced from 0.26 to 1.06%. The advantages of coir pith compost over other compost materials are it adds micronutrient to the soil enhances microbial activity and reduces soil erosion. In addition to the higher moisture content, coir pith compost is known to supply micro and secondary nutrients such as magnesium, sulphur, calcium besides nitrogen, phosphorous and potassium.

Preparation of coir pith compost

One tonne of coir pith, 5 kg of urea and 5 bottles of, *Pleurotus* spawn is required to prepare one ton of coir pith compost. First 100 kg of coir pith waste should be spread over a shady place. Then one bottle of *Pleurotus* spawn should be applied over this layer uniformly. Now 100 kg of coir pith waste should be applied over this first layer and one kg of urea spread over the second layer of coir pith. This procedure of alternate application of *Pleurotus* and urea should be done for the whole one tonne of coir pith waste. Sufficient moisture should be ensured for speedy decomposition in this composting process. It takes nearly one month for complete decomposition of coir pith indicated when its colour changes to black.

Case study in Ayalur watershed

Demonstrations were carried out successfully by the Central Soil and Water Conservation Research & Training Institute (CSWCRTI), Research Centre, Udhagamandalam, on preparation of compost from coir pith and its application in *rainfed* maize, for improving soil quality and increasing the crop productivity, in

Ayalur Model Watershed, Erode District, Tamil Nadu developed under Macro-Management of Agriculture (MMA-NWDPRA), programme of the Ministry of Agriculture, Govt. of India

The watershed is characterized by red lateritic soils, poor in soil organic matter, soil texture and structure. The soils of the watershed have low nutrient content, low water holding capacity and poor soil depth. Next to groundnut, maize is grown as the important crop with an average yield of 4.5 t ha^{-1} in the watershed. The maize area under this watershed is increasing as it is being used for industrial purpose. Since the soil physical and chemical properties are not conducive for getting good yield in maize; it is suggested to ameliorate the soil with the application of farm yard manure. But the availability of farm

Demo on coir pith composting

yard manure is the limitation in the watershed. Hence it is important to look for alternate composting using locally available materials. Coconut is the important plantation crop cultivated in substantial area in and around watershed. Coir pith, a buy product of coir industry which is available in plenty can be used for making compost.

With the technical guidance from CSWCRTI, RC, Udhagamandlam, Mr. Arun Kumar and Mr. Rajamani in Ayalur watershed have set up two coir pith composting unit in their

Coir pith compost applied field (top) and control (below)

respective fields to produce 16 tonnes of compost. Coir pith waste was decomposed within two months and this well decomposed coir pith compost was applied to the maize crop (variety COH (M) 4) @ 5t ha^{-1} for improving soil condition and soil moisture. Plant height, length of the cob and stover yield of maize was higher under coir pith compost applied field compared to control plot. Higher yield of maize grain (17%) was achieved with the application of coir pith compost compared to normal practice due to the higher soil moisture content with the application of coir pith compost in *rainfed* maize (table 1).

Table 1: Effect of coir pith compost on maize growth, yield and RWUE

Treatment	Plant height (cm)	Cob length (cm))	Number of grains/ear
Control	158	17.4	530
Coir pith	184	21.2	610
Treatment	**Grain yield (kg ha^{-1})**	**Stover yield (kg ha^{-1}**	**WUE (kg ha^{-1} mm)**
Control	4210	5473	4.95
Coir pith	4925	6382	5.79

Number of grains per maize cob was 15 per cent higher than the control. Higher (5.79 kg ha^{-1} mm) Rain Water Use Efficiency (RWUE) was also achieved with the application of coir pith compost. There was an average increase of net income to the tune of Rs 5350/- due to coir pith compost application in *rainfed* maize.

For further details please contact:
The Head,
Central Soil & Water Conservation Research & Training Institute, Research Centre,
Udhagamandalam - 643 004, Tamil Nadu.
Phone: 0423-2444038, 2443992; Fax: 0423-446757