



Sustainable Production of Coconut Through Biomass Recycling

Every part of coconut is useful for its biomass recycling which is a conducive method for sustainable production of coconut. Recycling of coconut biomass linked with enhanced level of nutrients especially in the form of coirpith compost will replenish the nutrients exhausted by the palms internally without depending on the external source of nutrients. Husk burial carried out at CPCRI showed an increase in yield from 30 nuts to 72 nuts per palm per year from 3rd year onwards. The authors Sherin A. Salam, Dr. D. Geetha and Poornima Yadav of KAU reveal that biomass recycling will also enable to create wealth out of waste by the production of mushrooms which further enhance the dietary status of the common man.

In coconut farming, residue management is not given much importance. Other than the dead root tissues, no other component of the tree biomass usually becomes available for incorporation into soil. The frond find its use as thatching and fencing material; other parts such as husk and shell are used as household fuel. These materials find very limited industrial application mainly at off-farm sites. Thus residue management via recycling of biomass can achieve sustainable production.

Husk is an important organic material derived from coconut. Coconut husk is a good source of plant nutrient. It contains 0.23 per cent N, 0.04 per cent P_2O_5 , 0.78 per cent K_2O , 0.08 per cent CaO and 0.05 per cent MgO on dry weight basis. In many coconut growing countries, this is not systematically recycled in the farming system. The recycling of husk in the farming system has been found to cause significant increase in productivity of the palm. This is not only due to the nutrient present in the material, but also of its positive effect on soil structure and moisture retention capacity. The husk when incorporated into soil, due to its spongy nature absorbs and retain moisture, which will gradually become available to palm roots. A fully soaked husk will retain moisture of six to eight times its weight. Recycling can be done either by burial

in the inter and intra row spaces or mulching in the tree basins. This practice will conserve enough moisture during lean periods.

The trials on husk burial carried out at CPCRI, Kasaragod showed that the process was effective in creating overall improvement in the health of palm as well as in the yield. The beneficial effect become evident from 3rd year onwards and lasted till 8th year after burial. The increase in yield was from 30 nuts to 72 nuts per palm per year. Similar findings were reported from Srilanka also, which brought to light the usefulness of the practice in the semi arid and arid zones of the country. The yield increase recorded was 15-20 per cent in nut production and 15 per cent in copra production.

After extraction of coir, coirpith will accumulate in the premises that form 70 per cent of weight of husk. This is an excellent alternative for recycling in the farming system. **By incorporating, coirpith improves the structure and physical properties of soil. It absorbs water in the range of 400-600 per cent of its weight and releases it to soil very slowly. The coirpith is also rich in various macro and micronutrient. This is also useful for incorporation in sandy as well as clayey soil. It is reported that application of 10 tonnes of coirpith per hectare is an effective ameliorative measure against saline and alkaline reactions of soil.**

Coirpith is comparatively rich in potash but low in nitrogen and phosphorus. We cannot apply raw coirpith as such to the standing crop because of its high lignocellulosic content, wider C: N ratio (60 to 112:1) and high phenols and tannin content as it creates problems to crop while decomposing. It pollutes the water bodies especially during rainy season by means of its washings. The disadvantages with

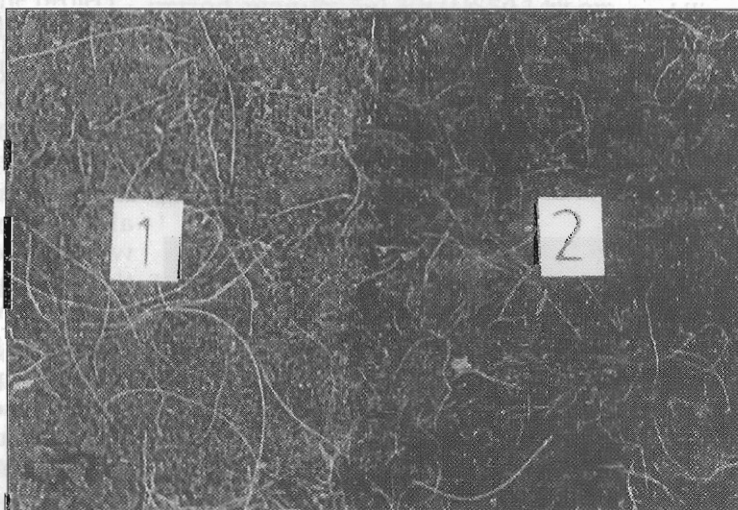


Fig. 1 Uncomposted coirpith in comparison with composted coirpith



direct application can be solved by composting the material with the aid of bio-degraders such as *Pleurotus sajor-caju*, *Trichoderma* sp. etc. While composting, addition of N through urea or biogas slurry and P through rock phosphate will speed up the

112:1 to 24:1 with substantial increase in total N and other nutrients. This makes it feasible to use as organic manure in place of farmyard manure (Fig. 1). The average nutrient composition of coirpith compost in comparison with other manures is

So also the recycling of coconut leaves, bunch stalks, spathe and other organic waste can be done by burying it in the inter space of the palm. This is a dependable agronomic practice to conserve soil moisture, also contribute to higher levels of coconut production.

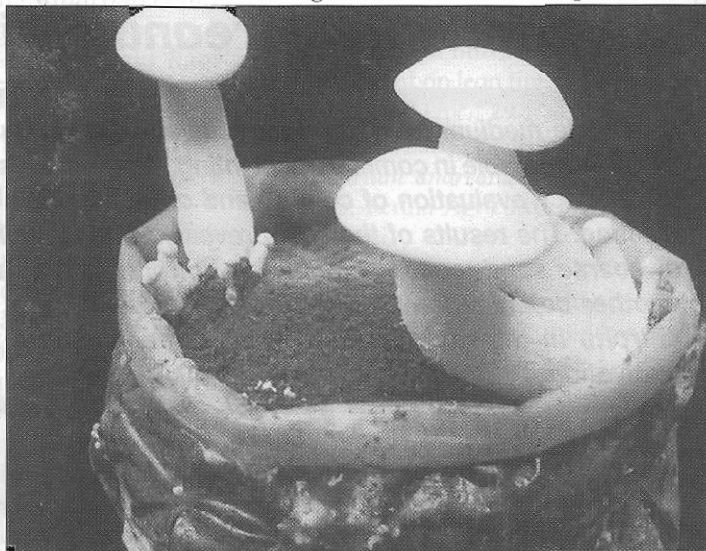
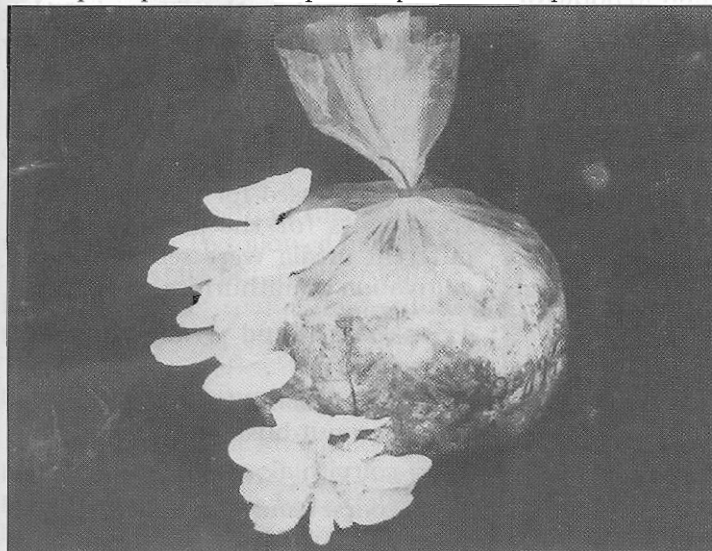


Fig. 2 Cultivation of oyster and milky mushroom on coirpith in combination with paddy straw

process and enhance the nutrient status of the final product. The composting is usually done in heaps by arranging the raw material in layers and regulating the moisture content at around 70 per cent. The microbial inoculum and additives are added in-between the layers.

shown in table. Recent studies on mushroom production strategies proved coirpith (both retted and non-retted) to be an efficient substrate for realizing comparatively good yield for oyster and milky mushroom in various combinations with paddy straw

Thus recycling of coconut biomass linked with enhanced levels of nutrients especially in the form of coirpith compost, will replenish the nutrients exhausted by the palms internally without depending on the external source of nutrients. Moreover, it also enables to create wealth out of waste by production of mushrooms that further enhances the dietary status of the common man. In short, every part of coconut finds its use in recycling of biomass, which is a conducive method for sustainable coconut production without damaging the ecological base of farming.

Comparative nutrient content of various organic manures

Item	Average nutrient content (%)		
	N	P ₂ O ₅	K ₂ O
Coirpith compost	1.06	0.06	1.20
Farm yard manure	0.78	0.72	0.65
Vermicompost	1.60	2.20	0.67
Poultry manure	2.87	2.93	2.35
Fish manure	2.63	0.26	0.09

Composting reduces the volume of raw coirpith by 40 per cent and narrows down the C:N ratio from

(Fig. 2). Thus a protein rich food can be obtained from a waste dumped in the premises at relatively cheaper cost.

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-Editor