TECHNOLOGY DESCRIPTION

- Coconut coir dust (also known as cocopeat, coir waste or fiber dust) consists of short spongy fibers and dust which are by-product in the processing of husk to coir fiber.
- Coir dust retains water firmly, holding it 8-9 times its weight and slowly releases water to the plant through its feeding roots.
- A coconut farm producing 10,000 nuts/year has the potential of 3,600 kg of husks and 2,300 kg of coir dust, with a storage capacity of about 18,000 liters of water if incorporated in the soil. These conditions could help minimize the crop water deficit during El Nino period.

ADVANTAGES

- Makes the crop tolerant to drought because of its high water - holding capacity, thus, minimizing the depressive effect of drought on crop physiology and yield
- Creates favorable soil structure when applied as mulch
- Supplies some nutrients i.e. macronutrients (N, P, K, Ca, Mg, Cl, Na) and micronutrients (Zn, B, Fe, Mn, Cu) necessary for plant growth
- Provides for good medium for nursery seednuts and seedlings
- Generates rural jobs and gives additional income to coconut farmers

PROCEDURE

1. Evenly distribute coir dust within 1.5 m radius of the coconut palm.

2. Incorporate within topsoil (0-6 in.) the following amount of coir dust/palm/year:
   a) 10 kg (in coastal areas)
   b) 15 kg (in inland areas)

3. Apply also recommended mineral fertilizer (ammonium sulfate) once a year at the start of rainy season following the broadcast and soil incorporation method within the 1.5 m radius of rootzone of each palm.

TABLE 1. NUTRIENTS SUPPLIED BY COCO PEAT (UNDER OPEN FIELD STORAGE)

Nutrient	New - 1 mo*	2-3 mos*.	4-6 mos*	12 mos**	Ave.
Macro		percent	(%)		
N	.373	.398	.463	.605	.459
P	.072	.031	.055	.011	.042
K	2.724	1.283	1.746	1.548	1.83
Ca	.156	.377	.690	.260	.371
Mg	.126	.124	.133	.167	.138
Cl	1.536	.182	.383	.113	.554
S	.048	.050	.052	.104	.064
Na	.094	.318	.400	.215	.257
Micro		parts /	million	-ppm	
B	23.7	23.8	29.5	21.3	24.57
Zn	17.0	19.2	20.8	13.7	17.67
Mn	9.4	45.5	56.6	24.4	33.97
Cu	5.1	7.5	9.2	6.7	7.13
Fe	532.2	1,253	1,450	281.2	879.1

* At Davao City (inland) ** At Mauban, Quezon (coastal)

Source: Magat, S.S., R.M. Ebuna and M.I. Secretaria. 2002. Mid-term yield response (1996-2001) of coconut to the application of coconut coir dust or coco peat in coastal area (Mindanao, Phil.). Paper presented in the World Food Day Celebration, Lecture Series on Soil Conservation & Water ResourcesManagement Technologies. Seminar for Future Soil Scientists. Oct.15, 2002. DA-BSWM, Diliman, Quezon City.

ECONOMICS OF PRODUCTION

- In terms of average net income per hectare (1997-2001), the application of 10 kg coir dust + 100% recommended inorganic fert./palm/yr resulted in the highest benefits of PhP34,183/ha/yr followed by 20 kg coir dust + 50% inorg. fert. /palm/yr (PhP33,509).

- Overall, the maximum economic benefit was achieved when coconuts were applied with the combination of cocopeat (10-20 kg/palm/yr) plus inorganic fertilizer (ammonium sulfate).

Table 2. Cost & return analysis (PhP/ha) of coir dust & inorganic fertilization in monocrop coconut at PCA-Zamboanga Research Center, Zamboanga City. (Average of five years: 1997-2001)

Treat-ment [a]	Gross Income	Total Cost[b]	Net Income
T1	36,144	9,432	26,712
T2	40,215	12,159	28,056
T3	46,659	12,476	34,183
T4	46,011	12,502	33,509

[a] T1 – Unfertilized (Control)
T2 – 20 kg Coir dust/palm/yr
T3 – 10 kg Coir dust + 100% Inorganic fertilizer (1.6 kg ammonium sulfate) / palm/tree
T4 – 20 kg Coir dust + 50% Inorg. Fert (0.8 kg ammonium sulfate)/palm/yr

[b] Includes: Material Inputs: AS- P3.90/kg, Coir dust – P10/20kg sack; Labor inputs: Ring-weeding (13 min/tree) – P125/m-day
Fert. application (15 min/tree) –125/m-day
Harvesting & hauling-P0.10/nut
Dehusking & copra making – P0.50/nut

Likewise, the financial benefit based on Net Present Value (at 18% discount factor) and benefit-cost ratio is maximized over the years if cocopeat application (10-20 kg/tree/yr) is combined with the annual recommended inorganic fertilizer at 50-100% (ammonium sulfate) on coconut trees grown in a sandy loam coast soil.

Table 3. Sensitivity analysis using profitability index of coir dust (with & without inorganic fertilizer application) based on net present value (NPV @ 18%) and benefit-cost ratio (BCR), 1997-2001

Price/kg Copra Treatment	NPV (PhP)	BCR
A. P8*/kg copra		
T1	43,858	2.48
T2	50,209	2.35
T3	63,049	2.65
T4	67,644	2.80
B.P10*/kg copra		
T1	62,222	3.10
T2	72,086	2.93
T3	88,346	3.32
T4	93,846	3.51
C.P12*/kg copra		
T1	80,586	3.72
T2	93,964	3.52
T3	113,644	3.98
T4	119,843	4.21

* fixed for all years of observation

Source: Magat, S.S., R.M. Ebuna and M.I. Secretaria. 2002. Mid-term yield response (1996-2001) of coconut to the application of coconut coir dust or cocopeat in coastal area (Mindanao, Philippines)

For further information, call, write or visit:
Agricultural Research Management Dept.
Phil. Coconut Authority, Diliman, Quezon City.
Tel No. (02)426-1398; 920-0415
Email: sevmagat@mozcom.com
Agronomy & Soils Division, PCA-Davao Research Center
Bago Oshiro, Davao City. Tel. No. (082)293-0161
Email:pca-drc@interasia.com.ph/
milsecretaria@yahoo.com

Techno Guide Sheet No. 10
Series of 2003

Utilization of COCOPEAT in Coconut Production

Department of Agriculture
PHILIPPINE COCONUT AUTHORITY
Research, Development & Extension Branch
Zamboanga Research Center
Davao Research Center