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Goat Manure and Coconut By-products as Organic Fertilizers for Coconuts

TECHNOLOGY DESCRIPTION

Alternative sources of fertilizers for coconut such as organic fertilizers are now being used by farmers in combination with chlorine nutrient sources as KCl (44% Cl) and NaCl or common salt (50% Cl) inorganic fertilizers. Several farm wastes e.g. animal manures specifically goat manure and coconut farm by-products are usually produced right in the farmer's backyard. Aside from their nutritional value, they have high organic matter content, which improve soil physical and chemical conditions thus providing better water retention and soil aeration.

SOURCES OF ORGANIC FERTILIZERS

- Goat Manure
- Coconut Husk
- Coconut Coir Dust
- Coconut dry leaves, stipules, branches

FERTILIZER COLLECTION AND APPLICATION

Goat Manure

- Collect from farms with abundant supply of this waste material.
- Spread and air dry collected goat manure in raised platforms under shade for 2-3 months to protect them from rain and direct sunlight.
- Manures are spread 5 inches thick, turned 3 times with intervals of 2 days after spreading.
- Apply the air dried manures to coconut with the following rates at different stages of growth in combination with Cl-fertilizer.

Year	FP	0.5	1	2	3	4	5-10	>10
Goat Manure (kg/tree)	1	2	3	4	6	8	10	12

Coconut Husk and Coir Dust

- Husk – spread within 1.5 radius, each husk separated in 4-5 pieces
- Coir Dust – either broadcast and fork-in within the top-soil (4-6 inches) or by hole method (in 8-10 holes)
- General recommendation for coastal and inland coconut areas under post-rehabilitation period (at least in 2-3 years)

Material	Area	Amount/ Tree	Frequency and Timing
Husk	Coastal Inland	50 pcs 75 pcs	Anytime of the year, every six mos., best at start and end of rainy season (in dry and intermediate growing zones
Coir Dust	Coastal Inland	10 kg 15 kg	Anytime of the year, every six mos., best at start and end of rainy season (in dry and intermediate growing zones

Coconut dry leaves, stipules, branches and other parts – collect from the field and place or mulch at the base of coconut trees (about 1.5 m radius) together with other organic and inorganic fertilizers.

Approximate Composition of Some Organic Fertilizers

Material	% N	% P	% K	% Cl
Goat Manure	1.68	2.50	1.33	-
Coco Husk	0.30	0.02	1.80	0.95
Coir Dust	.25-.50*	44-60*	680-1080*	600-800*

- no available data * in ppm

Organic Matter and Moisture Content of Coconut Husk and Coir Dust

Property/ Material	Time from Application		
	2 mos.	5 mos.	10 mos.
% OM/Husk	76.5	83.1	52.3
% OM/Coir Dust	59.3	74.1	51.0
% MC/Husk	7.2	9.1	14.1
% MC/Coir Dust	22.7	13.1	14.5

OM – Organic Matter MC – Moisture Content

ADVANTAGES OF USING ORGANIC FERTILIZERS

- Reduce inorganic fertilizer inputs
- Improve soil properties
- Balance nutrient source
- Maximize utilization of farm residues and waste products

DISADVANTAGES OF USING ORGANIC FERTILIZERS

- Presence of toxic substances
- Variable fertilizer quality
- Slow release of mineralized-nutrients
- Bulky and difficult to transport
- Should be combined with Cl-containing fertilizer to be more effective in case of animal manures or with nitrogen fertilizers for coconut wastes residues
- Goat manure may not always readily and sufficiently available

Cost and Return Analysis

Treatment	Average Copra (kg/tree)	Gross Income*	Total Cost*	Net Income*
No Fertilizer	8.3	23,572.00	6,500.00	17,072.00
By-Product +NaCl	25.5	72,420.00	10,450.00	61,970.00
Inorganic Fertlizer	28.5	80,940.00	32,210.00	48,730.00
Goat manure	16.5	46,860.00	18,250.00	28,610.00

SOCIO-ECONOMIC ANALYSIS

Table 1 shows the Cost and Return Analysis for using different fertilizers and with goat manure for coconuts.