



Coconut Research Institute of Sri Lanka



Advisory Circular No A 6

USE OF ORGANIC MANURE FOR COCONUT

1. Introduction

Continuous organic manure application tends to increase the humus content in the soil, and supply of plant nutrients. High humus content improves the water holding capacity, aeration, structure, microorganism density, microbiological activities and nutrient retention of soils. It also maintains the soil pH and temperature at favorable levels to coconut. Therefore organic manures are important sources of plant nutrients, which help in sustaining soil fertility and productivity especially for perennial crops such as coconut.

Application of organic manure would result in an increase of 15-20% in term of nut yield and 20-25% in terms of copra yield per year. If organic manures that are produced in the estate itself such as dairy/poultry manure and etc are applied, the income will be very much greater as the cost of fertilizer can be reduced.

2. Nutritional value of organic manures

Table 1 gives a list of organic materials and their nutritional values of macronutrients. Table 2 gives the micro nutrient values of those organic materials.

Table 1: Macronutrient content of locally available organic sources (dry weight basis)

Organic source	N(%)	P(%)	K(%)	Mg(%)	Ca(%)
Goat manure	2.2-3.4	0.3-0.7	1.5-2.5	0.4-0.8	1.5-2.4
Cattle manure	1.2-1.9	0.2-0.5	0.5-1.1	0.5-0.6	1.3-1.8
Poultry manure					
Broiler litter	2.0-2.3	0.6-1.0	1.7-2.0	0.5-0.6	1.0-4.9
Layer litter	1.8-2.4	0.6-1.2	0.6-2.0	0.4-0.7	2.7-5.3
Pig dung	1.0-2.0	0.6-0.9	0.4-0.9	0.4-0.6	1.0-1.5
Farm Yard Manure(FYM)	1.2-1.8	0.4-0.6	1.1-1.9	0.5-1.0	0.5-1.1
Compost	1.3-1.7	0.3-0.6	0.4-0.7	0.2-0.5	0.8-2.0
Gliricidia leaves	2.5-3.5	0.1-0.2	1.3-1.7	0.3-0.5	1.0-1.9

Table 2: Micronutrient content of locally available organic sources (dry weight basis)

Organic source	Micronutrients ppm(mg/kg)				
	Fe	Mn	Cu	Zn	B
Goat manure	1449-2174	246-505	20-38	112-184	29-66
Cattle manure	690-1518	167-389	24-40	128-183	13-30
Poultry manure					
Broiler litter	723-1565	213-421	27-40	166-271	15-27
Layer litter	1144-2215	287-450	22-38	182-329	12-23
Pig dung	1020-1990	180-207	45-48	186-575	4-13
Farm Yard Manure(FYM)	1135-3515	229-668	17-29	83-128	12-27
Compost	2090-4064	201-505	11-25	75-169	12-20
Gliricidia leaves	212-450	85-156	4-5	57-70	41-69

3. Rate of application of organic manure

Due to the variability in nutrient contents among sources, some organic manure have to be appropriately supplemented with inorganic fertilizers and applied to coconut palms to meet its total nutrient demand. The required rates of organic manures with inorganic supplementation for young and adult coconut palms are given in Table 3 and 4 respectively.

Table 3: Rates of application of organic manures and inorganic supplementation for young coconut palms

Source	Time after transplanting				
	6 months	1 years	2 years	3 years	4 years upto bearing (every year)
Cattle manure (<i>moisture 20-30%</i>)	5 kg	12 kg	16 kg	20 kg	25 kg
* ERP (<i>Wet and Intermediate zones</i>)	200 g	450 g	600 g	750 g	1000 g
* IRP (<i>Dry Zone</i>)	125 g	300 g	400 g	500 g	625 g
Muriate of potash	30 g	200 g	250 g	325 g	400 g
Dolomite	250 g	250 g	250 g	250 g	250 g
Goat manure (<i>moisture 20-30%</i>)	3 kg	7 kg	9 kg	11 kg	13 kg
* ERP (<i>Wet and Intermediate zones</i>)	200 g	450 g	600 g	750 g	1000 g
* IRP (<i>Dry Zone</i>)	125 g	300 g	400 g	500 g	625 g
Muriate of potash	50 g	120 g	150 g	190 g	225 g
Dolomite	250 g	250 g	250 g	250 g	250 g
Poultry manure (<i>moisture 20-30%</i>)	5 kg	12 kg	16 kg	20 kg	25 kg
Dolomite	250 g	250 g	250 g	250 g	250 g
Gliricidia leaves (<i>moisture 20-30%</i>)	5 kg	12 kg	16 kg	20 kg	25 kg
* ERP (<i>Wet and Intermediate zones</i>)	275 g	650 g	825 g	1100 g	1350 g
* IRP (<i>Dry Zone</i>)	175 g	425 g	550 g	700 g	875 g
Muriate of potash	60 g	150 g	200 g	250 g	300 g
Dolomite	250 g	250 g	250 g	250 g	250 g

*Apply either Eppawela Rock Phosphate (ERP) or Imported Rock Phosphate (IRP) depending on the Agro-ecological Zone.

Table 4: Rate of application of organic manures with inorganic supplementation for adult coconut palms

Organic manure	Quantity (Kg)	Eppawala rock phosphate for wet & intermediate zone/imported rock phosphate for dry zone(g)	Muriate of potash (g)	Dolomite (g)
Cattle manure (Moisture 20-30%)	30	-	1250	-
Goat manure (Moisture 20-30%)	25	-	800	-
Poultry manure (Moisture 20-30%)	30	-	750	-
Gliricidia (Moisture 20-30%)	30	525 (ERP) (Wet and Intermediate zones)	1000	500
		350 (IRP) (Dry zone)		

4. Method of application

Young palms

In the early stages (up to 1-1 1/2 years) organic manures should be broadcast up to a distance of 0.3 meters (about 1feet) from the base and incorporated. As the palm grows older this area should be gradually extended up to about 1.5 meters (about 5 feet) at the time of flowering.



Picture 1: Manure circle



Picture 2: Broadcasting of organic manure

Adult palms

Organic manure and the inorganic supplements should be broadcast in the entire area of the soil surface around the base of the palm up to a distance of 1.75 meters (about 6 feet). The manure and inorganic supplementation should be incorporated into a depth of 4"-6" of the soil. The area on which manure has been applied should be mulched with weed trash, dried fronds, layer of husks etc (Picture 1, 2, 3 & 4).



Picture 3: Incorporation of organic manure to soil



Picture 4: Mulching of manure circle

5. Time of application

Organic manure should be applied preferably with the onset of rain when the soil is moist. On light sandy soils and on lands, which tend to get water logged, manure and inorganic supplementation should be applied after the heavy rains are over.

6. Frequency of application

Organic manure and inorganic supplements should be applied annually for both young and adult coconut palms. However, alternative application of organic manure is also recommended for estates which are applied with inorganic fertilizer mixtures at least once in 3-4 years in order to improve the quality of the soil.