

Protect Coconut Small Holdings from Drought

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A well distributed rainfall is necessary for healthy growth of coconut palms and to ensure a satisfactory yield. Unlike in the previous decades, apparent changes in the rainfall patterns and prolonged dry spells are now being experienced in the major coconut growing areas. These intermittent periods of drought have caused a significant decline in coconut yield, while some plantations showed a retardation in growth, in others palms succumbed to death. The gross effect falls direct on the small holder with his returns diminishing rapidly.

But such losses attributable to drought could be minimised with better management practices so as to obtain a satisfactory yield. More than 75% of the coconut holdings in Sri Lanka belong to the category of Small Holdings. As such it is essential to seek possibilities in minimising drought effects in such lands.

Although establishment of cover crops, and burial of husks are more suited in large plantations, which conserve soil moisture, and thereby withstand drought, the small holders with their low income find it difficult to practise such measures. Therefore what is more important for the small holder is to adopt suitable low costing measures to minimise the drought effects.

Improvement of soil to suit coconut could be achieved by mixing high quantities of organic matter into the soil. This enables the soil to absorb large quantities of water and nutrients and thus enriching itself. Especially sandy and clayey soils, could thus be improved so as to reduce drought effects considerably. The presence of considerable

quantities of organic matter in the soil is necessary to yield maximum benefits from inorganic fertilizer applications. The organic matter helps to retain the soil moisture and plant nutrients, and make them available to the palm gradually.

Organic matter also encourages releasing of fixed plant nutrients in the soil and make them available to palms. Further, the addition of organic matter increases the microbial population in the soil which enrich the soil by their activities. There are various methods of adding organic matter into the soil. When artificial fertilizer is applied in small holdings, it should be placed in the round trenches, and should be well mixed with the soil. Subsequently all available organic matter such as weeds, grasses, old coconut fronds, sheaths, and green leaves like *glicicidia*, *ipil ipil* should be used to fill the trench before topping it with soil.

Apart from these procedures, the nutrient status of the soil could still be improved appreciably with the addition of cattle dung, goat dung, poultry manure, kitchen ash or green manure. These organic matters, are deficient in some essential plant nutrients and should be supplemented with sufficient quantities of inorganic fertilizers. This enables the palm to receive a balance mixture of manure, comprising of all essential nutrients.

Approximate essential nutrient requirements per bearing palm per year, are as follows:—

Nitrogen from 0.3 kg to 0.5 kg
Phosphorus from 0.2 kg to 0.3 kg
Potash from 0.7 kg to 1.0 kg



Organic manure application to a palm

The quantities of organic and the inorganic fertilizer that combine to derive the above nutrient requirements are :—

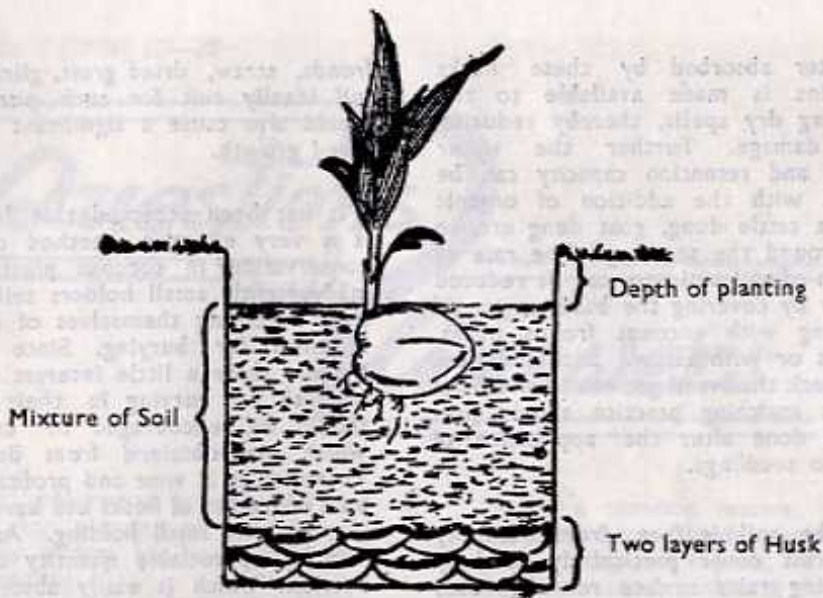
Source	Per palm per Year
1. Cattle dung (Fresh)	55 kg
Saphos phosphate	$\frac{1}{4}$ kg
Muriate of Potash	$1\frac{1}{4}$ kg
2. Cattle dung (dry)	32 kg
Saphos phosphate	$\frac{1}{4}$ kg
Muriate of Potash	$1\frac{1}{2}$ kg
3. Goat dung	14 kg
Saphos phosphate	$\frac{1}{2}$ kg
Muriate of Potash	$1\frac{1}{2}$ kg
4. Poultry Manure	28 kg
Muriate of Potash	$1\frac{1}{4}$ kg
5. Farm yard manure	30 kg
Saphos phosphate	$\frac{1}{4}$ kg
Muriate of Potash	1 kg
6. Compost	55 kg
Muriate of Potash	$1\frac{1}{4}$ kg

The gradual decomposition of organic manure, increases the soil water holding capacity around the trench thus lowering the water stress.

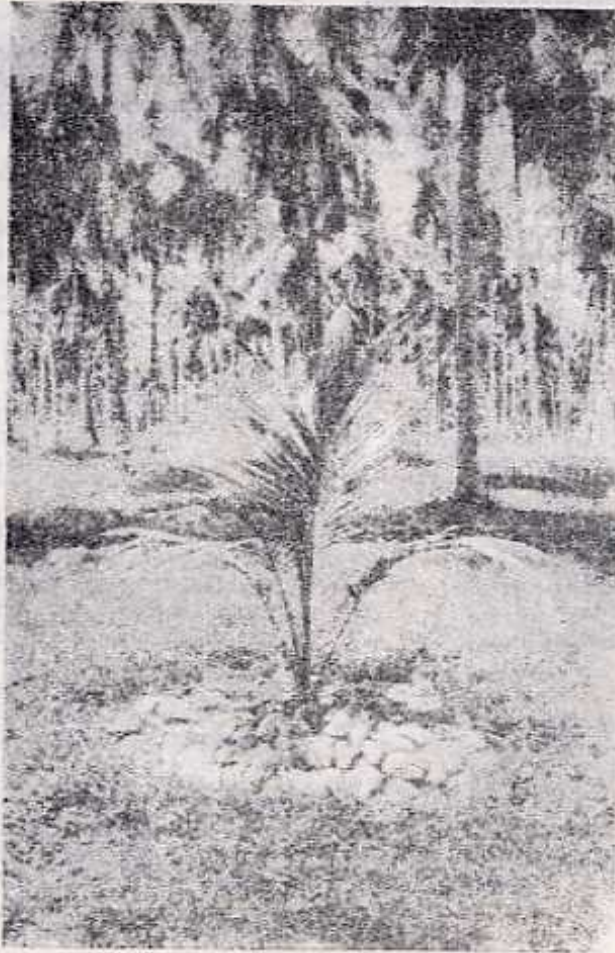
Burial of organic matter such as kitchen refuse, leaves and coconut fronds in the coconut lands are also beneficial. Collecting daily kitchen refuse, sweepings, cattle or goat dung in a pit would successfully lead to the formation of compost manure. Once sufficient quantities are collected, this compost manure could be buried in a trench cut around the palm, and covered with soil for better results.

The adverse effects of drought are mostly high in newly planted seedlings and young palms up to about 5 years of age. Therefore it is very essential that two layers of coconut husks be placed at the bottom of each planting hole as advised by the Coconut Research Institute.

The following diagram illustrates the correct method of planting a seedling in the field.



The correct way of planting a seedling in the field



Basal region of a seedling covered with husk

The water absorbed by these husks during rains is made available to the roots during dry spells, thereby reducing drought damage. Further the water absorption and retention capacity can be accelerated with the addition of organic matter like cattle dung, goat dung etc. to the soil around the seedling. The rate of evaporation of soil moisture can be reduced appreciably by covering the basal region of the seedling with coconut fronds, husks, dried grass or with straw. Such practices tend to check the weed growth in the basal area. This mulching practice should preferably be done after the application of fertilizer to seedlings.

When the soil is free from naturally existing grass cover particularly in slopy lands, during rains surface run-off causes removal of sub-soil which contains a high proportion of organic matter and thereby degrading the nutritional status of the soil. Therefore, the natural growth of grass should never be totally disturbed in slopy areas. The loss of soil moisture during dry spells could be arrested by covering the soil with mats of organic matter. Dried coconut

fronds, straw, dried grass, gliricidia or ipil ipil ideally suit for such purposes. This would also cause a significant set back in weed growth.

It has been accepted that husk burying is a very effective method of moisture conservation in coconut plantations. But, inadvertently small holders sell green nuts thus devoiding themselves of useful husks required for burying. Since the small holders show a little interest on purchase of husk for burying in their lands, they should be encouraged to collect husks which are obtained from domestic use. Therefore it is wise and profitable to build up a collection of husks and have this buried in your own small holding. As husks contain an appreciable quantity of potassium nutrient which is easily absorbed by the roots, burying of husks can also apply additional nutritional requirements to palm as well.

If small holders can manage their lands as described and detailed above, the adverse effects to coconut from intermittent droughts could be minimised.