

RP-100

Reprint from Coconut Bulletin, Vol. XX, No. 1
April, 1966. Pages 3 — 6.

Coir dust and river silt as fillers in the reclamation of marshy lands ('Kaipad' lands)

By SANKARANARAYANAN, C. K. BALAKRISHNAN NAMBIAR
AND K. M. PANDALAI
Central Coconut Research Station, Kasaragod

M. T. M. Press, Ernakulam

Coir dust and river silt as fillers in the reclamation of marshy lands ('Kaipad' lands)

By SANKARANARAYANAN, C. K. BALAKRISHNAN NAMBIAR
AND K. M. PANDALAI
Central Coconut Research Station, Kasaragod

The dearth of suitable arable land for expansion of coconut cultivation in Kerala State and the very encouraging price of this produce have prompted many growers to reclaim the waste, lowlying marshy areas, locally called 'kaipad' lands for planting coconut.

LAND FEATURES

They are situated by the side of backwaters, lagoons and rivers and are partially submerged, inundated and subject to tidal action, owing to the flat to concave relief. There is a fairly large extent of such lands spread over the former Malabar and Travancore-Cochin areas of Kerala State. Under the

prevailing condition direct planting of coconut is not possible without their reclamation.

PROCESS AND PROBLEMS OF RECLAMATION OF MARSHES

Being partially submerged or swampy, the ground level has to be raised well above the water table and drains have to be provided to avoid water stagnation, prior to planting. Besides the anaerobic condition of the environment, the underlain soil is of very clayey type, sticky, highly compact when dry, poorly permeable and strongly acidic. As such, this material alone cannot be made use of as a filler for raising the ground level. Usually sea sand and

organic wastes are also added to this in bulk quantities as soil amendments to overcome the abovementioned defects. The composition and nutrient contents

of the 'in situ' clayey soil and sea sand commonly used as fillers for the reclamation of marshes ('kaipad' lands) are furnished below:

| Constituents | <i>in situ</i> soil | Sea sand |
|--|---------------------|---------------|
| Clay + silt | 78.8 per cent | 3.1 per cent |
| Sand fractions | 7.6 „ | 97.0 „ |
| Organic matter and acid solubles | 6.2 „ | — |
| Moisture | 8.4 „ | 0.8 „ |
| Nitrogen (N) | 0.22 „ | 0.02 „ |
| Available Phosphoric acid (P ₂ O ₅) | 0.005 „ | 0.003 „ |
| Available Potash (K ₂ O) | 0.004 „ | Traces |
| Organic carbon (C) | 2.60 „ | 0.11 per cent |
| pH | 4.6 | 5.6 |

The usual process of reclamation consists of initial earthing up with the 'in situ' soil to form a base on which are heaped up sea sand, the under ground clayey soil, organic wastes, etc., in alternate layers and mounds or ridges are formed to a height of about two to three feet above the water table and seedlings are subsequently planted on them. After they are established, the gaps in between are also filled up and levelled with the same materials providing linear trenches in between rows to serve as drainage channels. Periodical earthing up and spreading of sea sand in thin layers to cover up the exposed roots are also done.

Collection and transport of sea sand to the reclamation site form an expensive item of the process and it will be beyond the means of ordinary cultivators who may not have fair financial resources. It may be possible to take up the reclamation on a large scale with

considerable reduction in expenditure if alternative suitable materials could be secured from nearby, cheaper and easily available sources. With this objective, the suitability of coir dust and river silt as fillers was examined from the point of economy, their availability, composition and characteristics.

SOURCES

In the coastal and backwater areas of this State, coir making is one of the important cottage industries and is the means of livelihood for a large section of the people living there. Coir dust (coir waste), a refuse in the extraction of fibre has not been put to any large-scale industrial or agricultural use in those parts and it is often found heaped up in bulk quantities in many places adjacent to the marshy regions that could be reclaimed for cultivation. Silt (sedimented deposit of rivers and backwaters) can also be obtained in bulk

from the rivers and lagoons close to the marshes.

In order to assess their suitability as fillers, samples of coir dust and river silt were collected from Cherukunnu, Kannapuram, Mattool and Pappinisseri villages of Cannanore District, Kerala State and composite sample of each material was examined for composition and mineral constituents. It is also interesting to note that there is scope for further expansion of coconut area in the above mentioned places on reclamation of the waste marshy areas ('kaipad' lands) there.

COMPOSITION AND CONSTITUENTS

OF COIR DUST AND RIVER SILT

Coir dust (coir waste) is a fluffy cellulosic material consisting of a

mixture of cork pith, fibre shorts and epicarp left over after the extraction of the useful fibre and is often admixed with sand and soil particles in the process of crushing and beating of retted husks. This waste product constitutes about sixty to seventy per cent of the weight of the husk. It is porous and spongy and has a very high moisture absorbing capacity as much as six to eight times its weight. River silt is the sedimented deposit constituted of 58 per cent sand, 28 per cent clay and silt fractions and the rest organic matter and acid soluble materials. The figures for important plant food elements contained in them are given below:-

| Constituents | Coir dust (Coir waste) | River silt (Sediment) |
|--|------------------------|-----------------------|
| Moisture | 25.0 per cent | 7.6 per cent |
| (expressed on dry basis) | | |
| Total Nitrogen (N) | 0.26 per cent | 0.14 per cent |
| Acid soluble (Hcl)— | | |
| Phosphoric acid (P_2O_5) | 0.12 „ | 0.17 „ |
| Acid soluble (Hcl) Potash (K_2O) | 0.36 „ | 0.37 „ |
| „ Lime (CaO) | 0.19 „ | 0.37 „ |
| „ Magnesia (MgO) | 0.19 „ | 0.89 „ |
| Available Phosphoric acid (P_2O_5) | — „ | 0.08 „ |
| Available Potash (K_2O) | — „ | 0.02 „ |
| pH | — | 5.2 |

From the foregoing data it may be seen that both coir dust and silt have soil amending and enriching properties capable of improving the physical and chemical characteristics of the soil medium, though they cannot be classified

as manures. Compared to sea sand they have better nutrient status too.

THEIR BENEFICIAL ROLE AS FILLERS

Coir dust (coir waste) with its fluffy and porous nature, on admixture with

the clayey soil of the marshes, reduces the compactness of the latter, promotes easy penetration of roots and facilitates aeration and permeability. Besides improving the physical condition it adds to the nutrient reserve of the reclaimed soil. Where sand is also used as one of the ingredients for reclamation, addition of coir dust increases the water holding capacity of the soil medium and acts as an excellent mulching agent conserving moisture during the period of severe drought. By virtue of its easy availability from nearby sources and its very light weight the expenditure on collection and transport can be reduced to the minimum unlike in the case of sea sand.

The silt with its medium texture (sandy loam) when applied as a filler with the clayey soil of the marshes

eliminates the unfavourable effects of the latter on the crop improving the physical condition of the soil such as texture, structure, aeration, permeability and drainage. Further the soil medium gets enriched in nutrient reserve. Addition of lime as a soil ameliorant will be beneficial to bring down the acidity of the reclaimed soil.

Both coir dust and river silt, therefore, appear to be quite suitable as fillers in the reclamation of marshes ('kaipad' lands) from the point of view of economy, easy availability and their composition and characteristics. Although the reclamation process is somewhat expensive to start with, the investment, according to the reports of the coconut growers, is paying and profitable with proper management of the gardens.