The subject of drainage has been ably described in the *Malayan Agricultural Journal* by Messrs. Wardlaw and Mason[3] in which they state, *inter alia*—

> In the case of coco-nut cultivation the writers would consider a well-drained soil one in which there is a constant soil water movement, but this movement should be very slow, in fact, a bare seepage, and by no means of such a nature as to result in washing the soil, as this might prove to be harmful.
>
> If no movement takes place, then steps should be taken either by additional drains, or the planting of suitable covers to rectify matters. A badly-drained soil will be one in which soil water movement was non-existent, thus giving a "still" or stagnant water table near the surface, conditions under which coco-nuts will not thrive for long.

Taking into consideration the requirements of this variety of coco-nut palm, and noting to what extent they can be satisfied by conditions in New Guinea, there is really no reason why the successful cultivation of this "dwarf" could not be undertaken, and careful research and experiment by the Department of Agriculture or the large planting interests are well warranted, as good coco-nut land in New Guinea, although not scarce, is becoming more difficult to obtain, and the planter is now, more than ever, desirous of obtaining the maximum return from his available land.

LITERATURE CITED.

(1) Duncan—*Pacific Islands Monthly*, 21st December, 1936.
(2) E. B. Copeland—*The Coco-nut*. H. C. Sampson—*The Coco-nut Palm*.
(3) H. H. Wardlaw and F. R. Mason—*Malayan Agricultural Journal*, September, 1936.

REPORT ON SOME DUST AND MUD DEPOSITS RESULTING FROM THE RECENT VOLCANIC ERUPTIONS AT RABAUL, ISLAND OF NEW BRITAIN, NEW GUINEA.

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Seven samples representing dust, mud and ash deposits derived from the recent volcanic eruptions at Rabaul have been examined.

The deposits vary in texture from sandy loams to loams bordering on clay loams. The dust deposits from the Vulcan Island Crater, and the rain-washed and sorted material, fall within the former class, and the hardened mud and compacted ash from Matupi Crater, fall within the latter class; the mud layer from Matupi is intermediate in texture. The deposits have an extremely floury consistency, being composed mainly of fine sand and silt; the ratio of fine sand to silt varying from 2:1 to 3:2. The washed and sorted material is the only sample showing any appreciable concentration of coarse pumiceous sand. All materials are highly abrasive.

No free acid is present in the deposits which vary in reaction from slightly acid (pH 5.0) in the Matupi mud layers to slightly alkaline (pH 7.7) in the underlying Vulcan Crater dust layers. The washed and sorted deposit from Vanalea is the most alkaline with a pH of 7.9.

The deposits were examined for soluble salts, 200 gms. of each being extracted with 1 litre of distilled water. The total salt content varied from about 3 per cent. in the more acid deposits from Vulcan Crater to about 1 per cent. in the alkaline Matupi mud layers. The washing of the Vanalea deposit has resulted in marked leaching of this material, less than 0.1 per cent. of salt being present.

Calcium sulphate (gypsum) and sodium chloride constitute the bulk of the soluble salts, although potassium and magnesium salts are also present. The total content of calcium sulphate in the deposits is, undoubtedly, higher than the figures given, since the water extract for those soils showing the greater concentrations have reached approximate saturation. An examination of the figures for loss on acid treatment indicates, however (by subtracting the remaining soluble salts), an upper limit to the content.

While the content of calcium sulphate is a natural result of volcanic activity the high content of sodium chloride is probably due to contamination with sea water.

The effect of heavy rains in the rapid removal of salts is evident when the content for the deposit from Vanalea Village is compared with the remaining samples.

Analytic details for the seven samples are given in the Table.

MECHANICAL ANALYSES OF, AND WATER SOLUBLE SALTS IN, THE VOLCANIC DEPOSITS FROM RABAUL, NEW BRITAIN, NEW GUINEA.

Field Sample Number.	1.	2.	3.	4.	5.	6.	7.*
Waite Institute Number.	5202.	5203.	5204.	5205.	5206.	5207.	5208.
Nature of Deposit.	Dust (protected from rain).	Mud Layer overlying No. 3.	Dust Layer underlying No. 2.	Composite Sample of Nos. 2 and 3.	Hardened Mud.	Compacted Ash.	Deposit washed and sorted by Thunder Storms.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Coarse Sand	7.4	4.5	13.3	6.4	3.0	13.4	32.5
Fine Sand	58.7	47.9	52.0	49.1	37.6	30.3	36.4
Silt	28.1	29.5	29.0	30.7	30.8	23.5	26.1
Clay	4.7	9.6	4.6	8.5	21.0	16.5	4.8
Loss on acid treatment	2.2	6.4	1.8	5.0	6.7	7.8	0.7
Moisture	0.8	2.7	0.7	2.2	2.3	3.0	0.4
Loss on Ignition ..	1.9	3.1	1.7	2.4	2.9	4.5	1.5
Reaction pH	7.3	5.0	7.7	5.1	7.1	5.8	7.9
Soluble Salts†—							
Chloride .. ion Cl' ..	0.46	0.69	0.34	0.49	0.13	0.49	0.035
Sulphate .. ion SO_4 ..	0.37	1.08	0.30	1.01	0.89	1.33	0.020
Calcium .. ion Ca'' ..	0.20	0.50	0.13	0.50	0.46	0.46	0.009
Magnesium ion Mg''..	0.03	0.09	0.03	0.07	0.04	0.15	0.001
Sodium .. ion Na' ..	0.22	0.32	0.17	0.25	0.08	0.28	0.018
Potassium ion K' ..	0.02	0.04	0.02	0.03	0.03	0.05	0.006
Manganese ion Mn''..	0.001	0.006	0.002	0.005	0.004	0.013	0.000
Carbonate ion Co_3 ..	0.001	0.000	0.000	0.000	0.001	0.000	0.001
Total	1.30	2.73	0.99	2.36	1.63	2.77	0.090
Salts expressed as—							
Gypsum $CaSO_4,2H_2O$ ..	0.66	1.93	0.54	1.81	1.59	1.97	0.036
Sodium Chloride NaCl	0.56	0.81	0.43	0.64	1.26	0.71	0.046

* This sample contained 8 per cent. pumiceous stone. † 200 gms. of deposit extracted with 1 litre of distilled water.

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