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Nutrient Enrichment of the Coconut Soils of the Humid Kerala Coast through Monsoon Precipitations

ASSESSMENTS of the agricultural value of the mineral nutrient contents of rain water have been made and recorded in several different geographical and climatic zones of the world[1-12]. Some regions appear to receive appreciable replenishments from the precipitations while in others the amounts so added are comparatively small and of doubtful significance for the nutrient economy of the arable soils of the region. In general, in the equatorial regions nitrogen, including both the inorganic and organic forms, is the element reported as received in appreciable quantities[1,11], although Jones[2] reported rather high figures for potassium (32·8 lb./acre) and sodium (53·8 lb./acre) as well, from Nigeria. The information so far available, however, pertains only to comparatively low and medium rainfall regions.

A preliminary investigation of the nutrient content of rain water was made at this Station, which is in the main coconut belt of the country. The nutritional aspects of the coconut palm, which is purely a rain-fed crop, and the soil fertility factors in relation to palm growth form the main subject of different investigations here. The average annual rainfall of this locality is about 3,750 mm., of which about 75 per cent is usually received during the south-west monsoon, which lasts from about the end of May to the beginning of September, and during the north-east monsoon, which begins during late September and continues up to January. Hence this investigation was confined to the maximum rainfall period. Nitrogen, phosphorus and sodium were determined in the rain water throughout the monsoon period of June–November. The estimate of the potassium content is not included in this communication as complete results are not available. The rain water was collected in the open, care being taken to avoid all possible contaminations by terrestrial dust containing plant or animal debris, atmospheric pollen, etc., during sampling. The analysis was carried out every day in a composite sample and when the rain was scarce it was done after sufficient quantity was collected, the sample under such conditions being preserved by the addition of a little toluene. So far as was practicable the rain water was quite fresh for analysis after collection. The different nutrients were estimated by the Association of Official Agricultural Chemists methods. The results are summarized in Table 1.

Table 1. AMOUNTS OF NUTRIENTS IN THE RAIN-WATER AT KASARAGOD. TOTAL QUANTITY OF RAINFALL RECEIVED DURING JUNE 1–NOVEMBER 30, 1961 = 2,919·7 MM.

Nutrients	p.p.m.	kgm./hectare
Nitrogen		
Ammoniacal	0·44	2·130
Nitrite	0·016	0·076
Nitrate	0·03	0·155
Organic	5·90	27·992
Total (Kjeldahl) nitrogen	6·20	29·779
Phosphorus (P)	0·98	4·748
Sodium (Na_2O)	1·70	8·291

These figures show that the rains do bring down some quantities of nitrogen (mostly in the organic form) and sodium to the soils; the phosphorus content is rather insignificant.

These nutrient materials are received through extremely heavy downpour and a portion of this is likely to be lost through leaching and also surface run off. It is, therefore, not possible to say to what extent these nutrients, particularly the nitrogen, are retained in the soil and utilized by the palms. Indeed, the occurrence of conditions like the foliar yellowing usually observed in the palms during the season actually indicate either nitrogen deficiency in the soil and palms or the impaired utilization of the necessary nutrients due to other conditions. However, a further detailed study of these aspects is being undertaken to obtain a definite idea of the part played by rain in the nutrient economy, particularly of nitrogen, of the coconut soils of rather heavy rainfall areas.

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[1] Meyer, J., and Pampfer, E., *Nature*, **184**, 717 (1959).
[2] Jones, E., *Nature*, **188**, 432 (1960).
[3] Gericke, S., and Kurmies, B., *Phosphorsqure*, **17**, 279 (1957).
[4] Krzysch, G., *Pfl. Ernahr. Dung.*, **82**, 138 (1958).
[5] Will, G. M., *Nature*, **176**, 1180 (1955).
[6] Brodis, G., *Tellus*, **8**, 283 (1956).
[7] Eriksson, E., *Tellus*, **4**, 145, 280 (1952).
[8] Larsson, T. E., and Hettick, I., *Tellus*, **8**, 191 (1956).
[9] Denisov, P. V., and Bugaev, A. L., *Dokl. Akad. Nauk*, **108**, 879 (1956).
[10] Hutton, J. T., *Austral. Conf. Soil Sci., Adelaide*, **2**, 4 (1953).
[11] Wilson, A. T., *Nature*, **183**, 318 (1959).
[12] Riehm, H., *Agrochimica*, **5**, 174 (1961).

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