

THE SOILS OF WESTERN SAMOA.

By L. I. GRANGE.

The writer in July–August, 1936, spent a month in Western Samoa examining the soils, chiefly in the Reparation Estates. He was accompanied by Mr. W. M. Hamilton, who reported on the agricultural aspects. The investigations were made on behalf of the Department of External Affairs.

The soils of the estates are derived from basalt, the depth of soil lying on rotten rock being about 5 ft. Soil development has proceeded under a high rainfall, from 88 in. to about 140 in. in the plantations; outside the plantations a soil profile was collected where the rainfall is as high as 200 in. In general, the soil is a dark brown-yellow or dark-brown drab. Crumb-structure is usually well developed in the topsoil, and the subsoil is free and powdery to a depth of at least 16 in.

It was extremely difficult to obtain constant profile characteristics which would serve to divide the soils into series. In the main, the classification depends chiefly on chemical analyses. Analyses show that silica is the main constituent that is lost; iron oxide and alumina remain behind. In the most leached soils practically only iron oxide, alumina, and titania remain. The soils are thus undergoing the laterite process of development. This being so, it was thought that total silica in the soil would give a quick lead to classification. It was found that silica ranged from 23.6 per cent. down to 3.0 per cent. within the plantations and that the fertility as observed by growth and yield of tropical crops varied directly with the percentage of this constituent—the least fertile soils were those containing the smallest amounts of silica. This clue shows that certain general characteristics of the soil profile used in the field were correct.

The soil types recognized are—
 Saleimoa stony sandy loam.
 Falepuna stony silt loam.
 Vaitele stony clay loam.
 Vaipapa stony clay loam.
 Malatula stony clay loam.
 Tuasivi clay loam.
 Tiavi clay loam.

The soils of the first five types are located in the plantations. The complete list is thought to represent order of fertility, the best being Saleimoa.

Saleimoa stony sandy loam is obviously derived from a young lava flow. It extends from near Saleimoa back to the new Government settlement block. It is the most fertile volcanic soil in Upolu.

Falepuna stony silt loam, located on the western end of Upolu, is another young soil, a fact that is obvious from the great number of angular boulders which lie on its surface. The fertility of this soil is moderate.

The remaining types are of low fertility compared with the above soils.

The Vaitele soil is fairly widespread, occurring at Vaitele, Mulifanua, Central Group, and Fagalie. It has in general a darker yellow-brown compact layer at a depth of 18 in.

Vaipapa soils occur at Vaipapa, near Mulifanua, and at some of the private plantations. A common characteristic of this type is a loose dark-brown drab soil to a depth of about 3 ft.

Malatula soils on the south of Vailele in many places show a dark brown-yellow compact layer at 16 in. below the surface. Tuasivi and Tiavi types in high rainfall areas are still in forest and need not be considered here.

The Vaitele, Vaipapa, and Malatula soils are low in readily available phosphate, but as there is about 1 per cent. of phosphorous pentoxide in fusion analyses there is no doubt a big store of difficultly available phosphate in the form of basic iron phosphate. Potash tends to be low, whereas nitrogen in all the soils is in good supply. Leaf analysis showed potash deficiency, and this is thought to be due largely to the fact that plants are not obtaining sufficient phosphate.

Mr. Hamilton and the writer considered that for coconuts and cocoa the manures which should be used on soil types other than Saleimoa and Falepuna, pending the results of manurial trials, are 2 cwt. to 3 cwt. of basic slag and potash manure at the rate of 50 lb. of K_2O per acre. The most payable results will probably be obtained from the manuring of the Vaitele soil type.

REPORT ON SURVEY OF TUNG GROVES IN NORTH AUCKLAND.

By M. M. BURNS and N. H. TAYLOR.

During December, 1936, and again during February and March, 1937, visits were paid to all the company-owned and privately-owned tung groves in North Auckland. The object of the survey was to analyse and evaluate the factors which have helped to bring about the present condition of the trees and to put forward suggestions as to lines along which an improvement may be brought about.

LOCATION OF THE GROVES.

All the established areas of tung trees are confined to North Auckland, though occasional trees are scattered over the Bay of Plenty and round Auckland City. The major plantings extend from Te Arai, on the east coast near Wellsford, to the extreme northerly point of Parengarenga, with the most extensive acreage near Kaikohe. Although the rate of expansion of the plantings has fallen off considerably in the past year or two the total area planted with tung trees is approximately 5,000 acres, more than nine-tenths of which is company-owned.