

SOILS.

Maritime Soils Reclamation.—Regular sampling at six-monthly intervals of the reclaimed harbour muds and sands at Napier has been carried out and data supplied to the Lands and Survey and Public Works Departments, as well as officers of this Department, concerning changes in content of soluble salts. This data has been correlated with vegetation changes, cultivation practices, and results of cropping and grassing. In addition, mechanical and chemical analyses are being made on a number of representative samples, and changes in replaceable bases will be followed up from time to time.

Samples of soil were collected from reclaimed mud-flats of the Kaipara Harbour which were under consideration for sowing down to pasture. It was found that good ten-year-old pasture adjacent to the mud-flat had a content of 0.09 per cent. salt (NaCl) in the topsoil and 0.18 per cent. in the subsoil. Poor pasture had 0.19 per cent. in the topsoil and 0.27 per cent. in the subsoil. Experimental strips of the mud-flat that had been sown near to the drains with rye-grass and white clover had 0.10 per cent. salt in the topsoil and 0.38 per cent. in the subsoil, where both grass and clover were growing well, but where rye-grass alone was growing the figures for salt were 0.27 per cent. and 0.83 per cent. respectively for top and subsoil. Main areas of the reclamation growing only salicornia and other salt weeds had from 0.78 per cent. to 1.10 per cent. salt in the topsoil and 1.32 per cent. to 2 per cent. in the subsoil. It was recommended that no further sowing of grass be made except experimentally until the salt content of the main areas was reduced to the vicinity of 0.25 per cent. in the topsoil.

Soils from the bed of Lake Tuakitoto are under examination in connection with a proposal to drain the lake.

In connection with a proposal of the Fields Division to establish an experimental area on Mount Pisa Flats, Central Otago, analyses of the soil were carried out. The soils were found to be sandy loams or loams, low in water-soluble salts, slightly acid, with low lime requirements and well supplied with plant materials. Citric-soluble phosphate varied from 0.060 per cent. to 0.083 per cent. and total from 0.16 per cent. to 0.26 per cent.

A number of soils were analysed for officers of the Fields Division, acidity (pH), lime requirement, soluble salts, plant foods, &c., being determined. In addition, a detailed study is being made of the degree of correlation between the indications of various chemical methods of estimating available phosphate and potash and of observational pasture top-dressing trials. Lime-requirement methods are under similar investigation. The Crop Experimentalist and District Field Superintendents have selected certain mowing and grazing trials, and L.P.K. plots for these purposes and soil samples collected from the control strips are under analysis. Dr. E. B. Davies is carrying out these studies from the chemical side and is devoting some attention to improvement of the methods.

Two interesting soil samples were submitted by Dr. D. Cook, of the Health Department, who had been making an investigation of the health of the inhabitants of Pitcairn Island for the Imperial authorities. These soils were of lateritic type, red clays of volcanic origin, one from ground that had been continuously cultivated by the Islanders for a hundred and fifty years, the other from a virgin area. The analyses of the two soils were as follows:—

					Virgin.	Cultivated.
pH	..	..	..	..	7.3 (alkaline)	6.4 (acid)
Carbonate of lime	..	..	..	..	1.9	Nil
Nitrogen	..	..	..	..	0.420	0.257

Mineral Plant Food.				HCl Extract "Total."	Citric Extract "Available."	HCl Extract "Total."	Citric Extract "Available."
Lime	..	..	..	1.47	0.302	0.38	0.134
Magnesia	..	..	..	0.96	0.338	0.61	0.146
Potash	..	..	..	0.81	0.420	0.11	0.033
Phosphoric acid	..	..	..	1.85	1.010	0.05	0.031

The outstanding richness of the virgin soil would go far to explain why continuous cultivation without manuring has been possible for so long with little deterioration in the health of the inhabitants, if it could be assumed that the cultivated soil was originally of the same nature. Some further samples may be collected as opportunity offers to investigate this point.

In order that the greatest degree of co-ordination may be secured in planning soil investigations a Soil Committee has been set up consisting of representatives of the Cawthron Institute, Dominion Laboratory, Soil Survey, and of this Section.

FERTILIZERS AND LIMESTONES.

The usual routine testing of fertilizers has been continued and consultation maintained as required with the Registrar and Inspector of Fertilizers. Experiments are being conducted with a view to making the boron in borated superphosphate more slowly soluble so as to reduce seed injury.