

healthy leaves have been collected and are being analysed for zinc content. Already there are indications that chlorotic leaves from the Tauranga District are significantly lower in zinc than healthy leaves, but the work is still in the preliminary stages.

Samples of cocoa leaves from trees affected with "die-back" collected by the Director of the Soil Survey Division of the Department of Scientific and Industrial Research during his recent visit to Samoa, were also analysed for zinc. No deficiency of this element was apparent, the leaves ranging from 50 to 80 parts of zinc per million dry weight.

SOILS.

Napier Harbour Reclamation.—Early in 1936 the area of raised mudflat to the south of the main dewatering channel was permanently drained through the operation of the pumps installed by the Public Works Department. During April a representative series of samples of soil were collected from this dewatered area and analysed for water-soluble constituents. In August, after a fairly heavy winter rainfall, a second complete series of samples was collected from the same locations. It was found that a very considerable reduction of salt content had taken place, those soils with the coarsest texture naturally showing the greatest reductions. Ploughing, which in a number of cases had been done between the first and second samplings, was shown to have no influence on the amount of salt leached from the soil (ploughing was necessary in many instances owing to the rapid spread of tall fescue). Much of the area had dropped in content of sodium chloride to the vicinity of 0.1 per cent. Calculated on a 9 in. depth of soil, in certain cases as much as 9 tons of salt per acre had been removed from the soil in four months. Certain selected samples were submitted to detailed chemical and mechanical analyses.

A series of soils from the Napier airport were analysed in connection with the grassing of this reclaimed area, only a small portion of which was found to have a high salt content.

Lyttelton Harbour.—Soil from some reclaimed land which it was proposed to grass contained 4.1 per cent. of sodium chloride and 0.6 per cent. of magnesium sulphate and had a pH of 8.2. It was considered advisable to defer sowing grass until drainage had reduced the salt content.

General.—A white incrustation in a tomato greenhouse at Greenmeadows, which had given rise to some concern, was found to be chiefly carbonate of lime. This was probably due to long continued use of lime and superphosphate under conditions of low leaching and high evaporation.

In connection with wheat and barley manurial trials conducted by the Crop Experimentalist a number of nitrate determinations were made on the soils.

A number of samples of soil from field trials for pasture response to liming have been collected by Fields Division officers. Determinations are being made of pH, lime requirement, and percentage base and lime saturation. These figures and the graphs drawn therefrom will be compared with the field responses in an endeavour to select or evolve a simple laboratory method enabling the behaviour of soils on liming to be predicted with a reasonable degree of accuracy.

About a dozen soils from various parts of New Zealand previously analysed and found to have a clay content of over 44 per cent. were sent to Mr. R. L. James, of Lincoln College, for experiments on methods of mechanical analysis of soils.

FERTILIZERS.

Besides routine analysis of fertilizers (see report of Inspector of Fertilizers) the following samples of a special nature may be noted:—

Samples of reverted phosphate and borated reverted superphosphate were examined in connection with seed-germination injury. Some free carbonate of lime and free acid were present in both cases. The borated basic superphosphate contained 0.81 per cent. of free boric acid, equivalent to half the borax which had been added and which had doubtless been liberated by displacement with phosphoric acid either free or as unreverted mono-calcium phosphate.

A blast furnace slag from New South Wales was found to consist principally of silicates of lime, iron, and alumina, with only a trace of phosphoric acid.

Waste from a flock-mill had a composition similar to that of English shoddy and doubtless could be similarly used as a nitrogenous fertilizer.

Samples of a synthetic basic slag made by a fusion process have been analysed and found to contain about 15 per cent. of phosphoric acid, almost wholly soluble in 2-per-cent. citric acid.

An expensive proprietary mixture claimed to have remarkable powers of promoting plant-growth was found to consist of a very dilute solution of sodium phosphate and ammonia, together with some soluble organic matter resembling rubber latex.

Limestones.

The routine testing of commercial ground limestones has been continued and is being extended to cover the majority of sources of supply to the farmer.

Difficulty has been experienced by some companies operating in districts where supplies of high-grade limestone are not readily available in maintaining a satisfactory quality in their output. Constant analytical checking and departmental representations have usually resulted in improvement.