Marlborough Soils.

In connection with the establishment of lime and fertilizer tests by the Department of Agriculture in Marlborough, a series of soil samples from the Wairau, Kaituna, and Rai valleys was examined. The soil samples were representative of the hill country at Hillersden in the upper Wairau, of the Vernon hills near Blenheim, and of the alluvial flats in the Kaituna and Rai valleys.

In striking contrast to many soils of the lower Wairau plain, the analyses show low pH values for all samples. Base exchange data as well as the pH values suggest that lime treatment will be required for these soils. The content of phosphoric acid tends to be low in all samples, particularly in those from the Rai Valley and the Vernon hills. The supply of available potash is satisfactory with the exception of some of the soils from the Rai and Kaituna valleys.

Soils of Mossy Creek, Ikamatua.

At the request of the Lands Department, a report was prepared on the possibility of developing portions of the Crown lands at Ikamatua in the Grey-Reefton valley. The land in question comprises Sections Nos. 54 and 13, Block 12, situated on the south side, and section No. 22, Block 12, on the north side of Mossy Creek. With the exception of approximately 30 acres located on a lower terrace overlooking the Grey River, the sections are situated on terraces 120 ft. to 150 ft. above Mossy Creek. The land has been in forest, but in recent years this has been felled and burnt.

Field examination of the soils showed much evidence of leaching under the high rainfall prevailing at Ikamatua. Although no "pan" formation was observed the soils are poorly drained. Over extensive areas surface drainage is far from satisfactory, resulting in wet peaty areas of considerable extent. The presence of umbrella fern and rushes indicates that soil conditions resemble those of the mature pakihi soils at Westport. Samples of soil analysed in the laboratory confirm the general conclusions drawn as a result of the field examinations, and show high soil acidity, a poor base content, and rather poor reserves of both potash and phosphoric acid. In addition, the cobalt content of all samples of soil analysed is low, indicating that cobalt supplements would be required for stock if the land is developed for pasture purposes.

The soil on the lower terrace facing the Grey River, although leached and showing a low base content, is well drained. The experience of farmers located on similar land on this lower terrace shows good prospects of developing it for stock purposes at a reasonable cost.

The use of adequate amounts of lime and phosphates would be essential to satisfactory pasture developments on the Mossy Creek sections.

Soil Survey of Tobacco Lands.

At the request of the Tobacco Research Committee a detailed soil survey of the alluvial soils in the Riwaka and Motueka district is being made with a view to the expansion of tobacco-culture on soils texturally suited to the crop. Owing to great local variation in soil texture, the mapping of the soils has proved a most laborious work involving repeated soil inspections on almost every acre of the Riwaka and Motueka flats. Good progress, however, has been made, and some 10,000 acres have been mapped. The soils have been classified and their extent marked on 20-chain-to-the-inch maps. An aerial survey of the district which was completed during the past summer should facilitate greatly soil mapping of the Motueka, Dovedale, and Moutere valleys which remain to be done.

Soil Colour.

In North Auckland different shades of brown and red are characteristic colours of some of the well-defined soil types. The colour of these soils appears to be dependent on the presence of different oxides of iron—*e.g.*, limonite and hæmatite. If the colour of these soils could be accurately defined, their classification would be facilitated. The Lovibond tintometer has been used for recording colour in such soils with marked success.

It has been found that a high yellow/red ratios for the brown loams differentiates them from the red loams. On ignition the yellow/red ratio for both brown and red loams are similar, suggesting that the brown colour is influenced greatly by the amount of hydrated iron oxide present in the soil. This conclusion is in keeping with the fact that the ratio of combined water to clay is greater for brown than for red loams.

Estimation of Magnesium in Soils.

The usual gravemetric method for estimating magnesium in soils after the removal of iron and alumina and the precipitation of calcium, tends to throw all errors into the magnesium determination. Where only small amounts of magnesium are present as in the estimation of exchangeable magnesium the error in the magnesium determination tends to be large. On this account, the 8-hydroxyquinoline method for magnesium (Berg (1927): *Z. Anal. Chem.*, *71*) has been tested for the determination of magnesium in soils. As a result of a large number of tests on prepared solutions of magnesium salts and on soil extracts, a technique has been elaborated whereby amounts of magnesium as small as 0·2 mg. to 0·5 mg. can be estimated with confidence.

The method would prove particularly useful for the determination of magnesium in soils associated with "sand-drown" of tobacco and "premature defoliation" of apples, disorders which are known to be caused by magnesium deficiency.