

representative of different areas are available. Dry weather has impeded field-work and has delayed greatly the collection of representative soil samples. The Wakefield-Belgrove sector, covering some 10,000 acres of alluvial soils, is more suitable for tobacco-culture than the northern part of the Wai-iti Valley. The soils, however, are patchy, and great variation in texture is frequently experienced, even within restricted areas of soil. Air-drying of Burley tobacco is more popular with farmers than the culture of kiln-cured varieties. The acreage of both air-dried and kiln-cured tobacco, however, tends to increase, particularly in Pigeon and other valleys, where the soils are derived mainly from Moutere Hills material.

A commencement has also been made with the mapping of tobacco soils in the Motupiko-Tapawera locality. In this area some soils are high in magnesia, which confers characteristic properties on the tobacco leaf. Soil classification must therefore take into account both chemical and textural qualities of the soils.

*Land Utilization.*—Maps showing the present use of the land in the Brightwater-Spring Grove and Wakefield-Belgrove sectors of the Wai-iti Valley have been prepared. Tobacco, hops, stone fruits, and small fruits are all important crops in this part of the Nelson district.

In view of the great importance of extending the forest cover on the hill country, forming the water-sheds of the Wairoa and Motueka Rivers, an attempt has been made to classify the hill land and establish a boundary between land suitable for agriculture and that which is required for river control.

*Soil Erosion on the Moutere Hills.*—At the request of the Nelson Catchment Board observations have been made concerning soil erosion in orchards established on the Moutere Hills. Owing to the planting of orchards on somewhat steep slopes, a great deal of erosion has taken place in many orchards. This is evidenced by the denudation of topsoil on the higher slopes of the orchards and the accumulation in the valleys of silt which has submerged trees to a depth of 12 in. to 15 in. The displacement of soil has been caused in part by cultivating implements, but heavy rains during the summer when the land is bare and the soil loose have been responsible for the deposition of much silt in the lower part of the orchards. In conjunction with the Orchard Instructor of the Department of Agriculture, an article on soil erosion and methods of control was prepared and reprinted by the Nelson Catchment Board for circulation to fruitgrowers in the Nelson district.

*Chemical Work.*—The mechanical and chemical analyses of soil samples collected in the Waimea and Wai-iti surveys have been continued. Silt loams and sandy loams are the most common textural types, but clay loams and stony loams are also found. Chemical analyses of some eighty-five samples taken throughout the Waimea and Wai-iti Valleys show that the phosphate status is moderately good, especially on the Appleby, Heslington, and Brightwater soils, many of which are used for tomatoes and other garden crops. The potash status, on the other hand, tends to be low, particularly in the case of soils derived mainly from the Moutere Hills. For the most part liming has received attention by farmers, for the average pH value of the soils is over 6.0.

Determinations of ammonia and nitrate nitrogen have been made of tomato and tobacco soils which have been subject to experimental treatment with steam and soil disinfectants. Increase in ammonia nitrogen was again found to be associated with steaming and with the use of formalin and chloropicrin as soil disinfectants.

The use of sawdust in the preparation of tomato soil greatly reduced the amount of soil nitrate nitrogen while the use of compost resulted in a very great increase in nitrate nitrogen. The effect of steaming soils at different steam pressures and for different lengths of time was investigated in regard to the ammonia and nitrate nitrogen status of the soils. Although prolonged steaming (fifteen minutes) was associated with the highest ammonia figures, the results were not sufficiently outstanding to rely on the nitrogen status as an index to efficiency of steam treatment.

*General.*—At the request of the Rehabilitation and State Advances Departments, reports have been prepared on several properties required for ex-servicemen desirous of taking up tobacco-growing. Many requests from Nelson farmers have been received concerning the use of lime and fertilizers on their soils.