

(10) The wet phase of the grey-brown meadow clays covers about 13,000 acres surrounding and including the drained Lake Tangonge. Water lies on the surface for a great part of the year. The soils for the most part are grey to bluish-grey clays and clay loams. The present surface cover is raupo, willow weed, rush, and manuka. These soils would be fertile if drained and sweetened.

(11) The peaty phase of the grey-brown meadow clays covers 2,600 acres, more than half of which is subject to occasional tidal flooding and the remainder to river flooding. The soil profile is—

6 in. to 12 in. dark peaty loam ;
On grey-brown flocced clay.

Dairying is carried out on this soil type, but although over most of the area the pastures commence growth earlier than on the grey-brown meadow clays, yet generally the annual production is less.

(12) *Peat Soils*.—The peaty loams occupy only 640 acres. The surface is hummocky with stumps close to the surface in many places and much of it is covered with manuka, gorse, blackberry, and bracken. Parts are covered with a fair sward containing a good percentage of clover.

(13) The peat soils, 6,400 acres in area, are mainly dark-brown, fibrous peats supporting a vegetation of rushes and stunted manuka. A narrow belt of sandy peats borders the sandhills to the west. Adjacent to the river on a lower portion of the swamp dark, loamy, fibrous peats support a cover of flax, rush, and manuka. This latter type is probably more suited to pasture than the rest of the area, but the farming of any peat land is at present problematical.

(14) *Red-brown Soils*.—The brown crumbly clays form the soil over only a small part of the district, chiefly in the Victoria Valley and south of the Ahipara Road. They cover low rolling hills formed mainly from basic igneous alluvium. The topsoils are dark grey-brown crumbly clays; the subsoils are compact and sticky rusty-brown clays. Nodules of iron and manganese are common in the Ahipara soils, but are rare in the Victoria Valley. These soils are farmed, but the pastures are low producers and become parched during dry spells.

(15) The red and brown crumbly clays cover the steep hills of the range that borders the southern edge of the district. The country is steep and is for the most part covered with dicotylous-podocarp forest. Parts of the area have been sown to pasture for sheep and cattle grazing, but although the pastures may be classed as fairly good, over much of the area they lack clover. Since the bush has been felled many of the hill-sides have slipped and much of the soil has been removed by erosion.

DRIFTING SANDS.

The grey drifting sand-dunes cover about 4,000 acres bordering the west coast. These sands, which are steadily encroaching on the older weathered dunes, have now been fixed by lupins and marram-grass, but the fixing process is hindered by wandering stock and scrub fires.

CREAM SUPPLIES IN RELATION TO SOIL GROUPS.

The Awanui Dairy Factory operates throughout the year with peak months in December and January, and a very slack period in June and July.

Early in August cream commences to come in from the brown podsolized sands and from the degraded rendzina soils, followed closely by supplies from the brown podsolized clay loams and clays. Early in September cream commences to come in from the brown sandy clays and clays, and from the brown meadow clays. The grey-brown meadow clays are the last to come into production but are always producing well by October.

ANNUAL REPORT ON CHEMICAL WORK AT THE CAWTHRON INSTITUTE FOR THE YEAR ENDING 31st MARCH, 1937.

By T. Rigg, Officer in Charge.

A wide range of work has been covered during the period under review. The progress of the soil surveys in Hawke's Bay, North Auckland, and Samoa has necessitated the examination of a large number of soil samples for texture, exchangeable base status, and plant-food content.

In view of the important part played by soil profiles in the classification of New Zealand soils, special chemical studies have been undertaken on typical profiles from the Waipa County, North Auckland, Hawke's Bay, and the Nelson Province. The examination of profiles representing a range of leached soils has provided much valuable information concerning the chemistry of the leaching process and the maturity of the soils under varying conditions of climate and forest cover.

During the year opportunities were presented for the examination of several soils affected by soluble salts. Samples from Central Otago, Oamaru, and Marlborough were investigated with a view to determining the part played by different salts in lowering the fertility of the soils.

One of the important investigations concluded during the period under review has been the survey of the cobalt status of New Zealand soils by Miss E. B. Kidson, M.Sc. The survey has included all the more important soil types of New Zealand, particular attention being paid to those soils where stock ailment of the bush-sickness type was known to occur.

NORTH AUCKLAND SOILS.

A considerable amount of time has been devoted to profile studies of the red-brown soils described by Messrs. Taylor and Sutherland in previous reports. These soils have been derived from the weathering of basalt under varying conditions of climate and forest cover. The chemical data