

SOILS OF GISBORNE-EAST CAPE DISTRICT

and rushes and fern the flatter portions. The pumice is for the most part very free draining. Where waterlogging occurs areas can be drained successfully with open drains or manuka fascines. Mole drainage is not satisfactory as nowhere in the profile is there a band of clay to hold moles successfully.

The low natural fertility is accounted for by the extreme lack of phosphate, but when the country is cleared and sown down with Certified seed and an initial dressing of 4cwt. per acre of superphosphate followed by annual dressings of 2cwt. an excellent transformation takes place. It then becomes good fat-lamb country. The trace element cobalt is lacking and to prevent bush sickness cobalt is applied in the form of cobaltised superphosphate. Dressings of $\frac{1}{2}$ ton and 1 ton of lime per acre give a moderate response, but in most cases the cost is too high.

4. Recent soils from alluvium: These are the soils of the river flats and aggregate 110,000 acres. The biggest single area is the Gisborne flats, built up by the Waipaoa River and covering 52,000 acres. Other important areas are the Tolaga Bay and Ruatoria flats, built up by the Uawa and Waipuu Rivers respectively.

The soils of the Gisborne flats are of high fertility and free draining and in places the alluvial soil is 25ft. deep. The flats have almost unlimited cropping power and crops of maize have been grown for 20 years on the same ground without fertiliser of any kind and in the final year have given yields above the Dominion average for the crop. The ground, except the heavily silted land, which pugs if attempts are made to work it while wet, is easy to cultivate.

The portion of the flats liable to flooding (in 1948 most of them were flooded) does not require lime, as the silt from the Waipaoa River is rich in lime and is in fact equivalent to a dressing of a poor-grade limestone. The potash content of the soil is par-



Erosion on the Whatatutu hills with silt-covered land in the foreground. Over a considerable area of the Gisborne-East Cape district erosion is a serious problem.

ticularly high and the phosphate content high; thus for grassland farming there is no need to topdress.

The area stretching from Makaraka through Gisborne to Wainui has been formed through the interaction of river silt and raised beaches and pumice from the Gisborne ash shower. The soil is of a very free-draining structure and ideal for winter gardening provided green manuring is practised.

The terrace soils at Puha and Whatatutu are much lighter than the river flats and have only limited cropping power. They dry out quickly in summer, but remain in a good friable condition throughout winter. Responses are obtained by the use of superphosphate or lime.

The Tolaga Bay flats have a black loam over a clay subsoil; generally, deep ploughing reveals the clay subsoil. Much of the land is low lying and not free draining and is waterlogged or partially so during winter and spring. Lime used in conjunction with drainage brings about a marked improvement.

The Ruatoria flats and the flats around Te Ararua are built up of shale and greywacke from the surrounding and inland hills. Gravel and larger stones are apparent and the soil has little organic matter and little depth of fine material. It is not of high fertility, dries out rapidly, and can be used only for very intermittent cropping. The soil is deficient in both lime and phosphate and when both are used in conjunction reasonably good responses are obtained.

Land Utilisation

Of the occupied area of 1,760,000 acres 83 per cent, or 1,470,000 acres are in grass. This area and some in scrub and second growth are utilised mainly as grazing for the district's 2,000,000 sheep and 319,000 cattle. Supplement-

ary fodder crops are not grown extensively, but on the flat areas, particularly around Gisborne, maize is an important crop and 50 per cent. of the Dominion's acreage in maize for threshing is grown in this area. Around Gisborne increasingly large areas are being devoted to market garden crops and in 1948 the area had reached 439 acres compared with 60 acres in 1920.

Trends in Production

Though sheep numbers for the whole district decreased from 2,118,000 in 1920 to 2,069,000 in 1948, the position is masked by the improvement which has taken place on the flats and by the increase in the number of cattle carried. In Cook County, for instance, total sheep increased from 636,000 to 696,000 in the period, this being due largely to the expansion of fat-lamb production on the Poverty Bay flats.

The position generally is one of declining sheep numbers on the hill country and increasing numbers on the flat areas.

Cattle numbers, excluding dairy cows in milk, have shown a considerable increase—from 175,900 to 299,200 in the 1920-48 period. In 1925 in the northern part of the district the number of beef cattle per 100 sheep shorn was between 8 and 9 and in the southern part between 10 and 11; in 1948 the ratio for the whole district was between 14 and 17.5 head of cattle to 100 sheep.

The total of dairy cows in milk rose from 10,000 in 1920 to 30,200 in 1935, but has since fallen, the most rapid decline occurring since 1940, when there were 26,300 cows in milk against 19,900 in 1948.

Some idea of the importance of the livestock industry in the district can be obtained from the killings at the freezing works. (See Table 3.)

