

MARKET-GARDEN SOILS OF LOWER HUTT.

A soil survey was made of the soils in the market-garden district of the Lower Hutt, extending from Waterloo Road to the northern end of Taita. The soil types recognized were Taita sandy loam, Cottle sandy loam, Hutt silt loam, Nae Nae heavy silt loam, and Waiwhetu complex with sandy loam to clay textures. All are derived from alluvial beds deposited by the Hutt River. The last three types are meadow soils, but are now well drained.

The soil types are similar in their plant-food content—namely, high available phosphate, satisfactory to low potash, and moderate acidity. This general level of high fertility extends down into the subsoil. The effects of continuous cropping on the fertility is mentioned in the Soil Survey Laboratory (Wellington) section of this report.

MARKET-GARDEN SOILS, MANAWATU.

In association with the Horticulture Division of the Department of Agriculture, a report is being compiled on the market-garden soils in the Manawatu from Waikanae north to Palmerston North. All types of soils were mapped, but below are described only those on which market gardening is already established to some extent. Comments as to the suitability of any of these soils for an extension of market gardening or whether other types can also be utilized can obviously be made only after all classes of survey have been completed.

RECENT ALLUVIAL SOILS.

Recent alluvial, well drained, deep silt loams and sandy loams border the larger streams and rivers throughout the district between Waikanae and Palmerston North. In most of these soils there is little or no development of profile apart from a small amount of humus accumulation in the topsoil. Greywacke gravels lie at 2 ft. 6 in. to 5 ft. from the surface, and the water-table is generally to be found at 5 ft. to 6 ft. Fertility is high and crumb-structure is fairly good, though addition of humus would assist in improving texture. The lighter soils are the more rapidly exhausted and are usually cropped for two seasons and then put down in grass for a few years. Exhaustion of the land for gardening appears to be chiefly due to depletion of humus, with consequent loss of crumb-structure.

OLDER ALLUVIAL.

The Levin silt loam—a composite type—is the main type of old alluvial soil. There is a considerable variation in soil texture over short distances, but roughly half of the area has a profile of 6 in. to 8 in. of dark brown to light chocolate-brown silt loam topsoil, resting on lighter brown to brownish yellow heavy silt loam subsoil. Drainage is good in those parts which have the above profile and the water table is about 5 ft. from the surface. Heavier soils in this composite have a clay loam subsoil and drainage is not good.

The recent alluvial and old alluvial soils, which are of high fertility, occupy an area of several thousand acres. The recent alluvial soils are found at Otaki, Ohau, Shannon, Moutoa, Opiki, and on the north bank of the Manawatu River from Hamilton's Line to Te Matai district. The areas of these blocks range from 300 acres to 2,000 acres, the largest one being located at Te Matai. Old alluvial soils are extensively developed to the north and south of Levin, but, as stated above, they have been mapped as a composite type in which there is a fairly wide range of soil quality.

MARKET-GARDEN SOILS AT OHAKUNE.

A survey was made of the market-garden soils in the Ohakune, Raetihi, Karioi, and Horopito West districts. In these districts a total of 1,500 acres is utilized for the growing of cabbages and potatoes, and the object of the survey was to obtain information on the distribution of soil types used for gardening and on the nature of the soils. As in the Manawatu, the Division is co-operating with the Horticulture Division of the Department of Agriculture.

SOILS.

Ohakune Silt Loam.

The Ohakune silt loam, derived from andesitic volcanic ash, occurs on the flat to gently rolling country, north of Karioi. The usual profile is:—

- 8 in. silt loam; brownish black or chocolate black, free.
- 12 in. heavy sandy loam; chocolate brown, excellent crumb-structure.
- On heavy sandy loam; light chocolate brown, slightly compact.

The most striking features of the profile are the extreme fluffiness of the topsoil and the very good crumb and nut structure of the subsoil. Over most of the type, drainage is good and the water-table is more than 3 ft. from the surface, but there are some wet areas.

Ohakune Silt Loam (rolling to moderately steep phase).

The rolling parts of the rolling to moderately steep phase give a profile similar to that obtained on the Ohakune silt loam. The moderately steep parts also give a similar profile except that below 30 in. from the surface is a yellowish-brown clay loam derived from the underlying mudstone.

All these types of soils on which market gardening is carried on at various places total about 30,000 acres. They differ from the alluvial soils used for gardening in other districts, in that the