

SOIL SURVEY OF THE REDCLIFF IRRIGATION AREA, SOUTH CANTERBURY.

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INTRODUCTION.

The irrigation project is situated on the north bank of the Waitaki River, about fifteen miles from Waimate and twelve miles from Glenavy. The area is located on an old terrace level of the Waitaki River on which has been deposited alluvium not only from the Waitaki River, but also from wet-weather streams draining the neighbouring hillsides. In Glinka's classification the soils would be classed as skeletal, although in some cases mild podsolization may be present. The rainfall is of the order of 20 in. per annum.

Rainfall data for 1934-35 are as follows :—

	In.		In.
December, 1934	1.55	July, 1935	1.09
January, 1935	1.73	August, 1935	0.41
February, 1935	1.85	September, 1935	0.55
March, 1935	3.02	October, 1935	1.62
April, 1935	1.35	November, 1935	3.39
May, 1935	0.58		
June, 1935	1.55	Total	18.29

Regular soil-moisture observations by the Public Works Department made over the last two years show that during the summer months considerable soil-moisture deficiencies occur, particularly on some types of the Waikakahi Series and on the stony silt loams of the Waitaki Series. Observations show that these soils may easily reach wilting-point.

SOIL CLASSIFICATION.

(1) *Pike's Point Series.*

In this series four soil types are recognized :—

Type.	Description.	Origin.
1	Deep silt loam	Waitaki River.
2	Deep sandy loam*	Waitaki River.
3	Deep silt loam, meadow soil	Waitaki River.
4	Deep silt loam	Elephant Hill Stream and Waitaki River.

* Type 1 grades into Type 2 occasionally (*e.f.* 1595).

This series is well exemplified along the Pike's Point Road. The parent material is alluvium derived from greywacke and deposited on a high terrace level of the Waitaki River.

Since the soil material has been deposited by stream action it is to be expected that there will be local variations in texture.

Type 1 has the largest distribution, and a typical profile is—

10 in. grey silt loam ;
On 3 ft. + yellow silt loam, occasionally mottled with iron staining.

In certain cases wet-weather streams from the adjacent hills have deposited material on the Waitaki alluvium, so that the resultant soil must be regarded as a composite. At some locations the soils are sufficiently changed to be recognized as a separate type, and these have been picked out and included with the soils of the Waikakahi Series, which are younger than the Pike's Point soils. At the eastern end of the area the subsoil sometimes shows mottling, suggestive of a high water table during parts of the year.

Farther west towards the intake (*e.g.*, 1593) there is a definite meadow type carrying rushes. The centre of the irrigation area is saucer-shaped and the ground-water level is thus much nearer the surface in this locality. The project includes the irrigation of adjoining areas, and it would appear that some increase in drainage may be necessary to obtain optimum results.

An area of silt loam (Type 4) on the western side of the Waihuna Stream (1587, 1821) is very similar to the silt loam occurring eastward along Pike's Point Road (Type 1), but the field evidence indicates that much of the material is derived from the Elephant Stream. This type has therefore been separated from Type 1 to emphasize its different origin, but as far as texture and agricultural development are concerned it can be regarded at present as identical with Type 1.

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