

SOIL SURVEY.—SEVENTH ANNUAL REPORT.

Land Utilization Committee.—Messrs. T. Rigg (Chairman), A. H. Cockayne, E. J. Fawcett, R. B. Tennent, R. P. Connell, W. Robertson, Professor W. Riddet, Dr. L. I. Grange, Messrs. F. R. Callaghan, and F. J. A. Brogan (Secretary).

The land utilization survey programme under the general direction of the Land Utilization Committee comprises soil, pasture, and farm management surveys by the Soil Survey Division, the Grasslands Division of the Plant Research Bureau, and the Fields Division of the Department of Agriculture respectively. The Cawthron Institute and the Dominion Laboratory co-operate in carrying out the chemical analyses required in connection with the soil surveys.

In Hawke's Bay, which was selected as the starting-point for a comprehensive land utilization survey, substantial progress has been made. In North Auckland an extensive soil survey is in progress which will provide a sound basis for subsequent land utilization investigations.

In addition to the major activities in Hawke's Bay and North Auckland, special soil surveys have been conducted in connection with tung and citrus growing, and irrigation projects. The Director of the Soil Survey Division also visited Samoa to study the soils and their relation to agricultural practice.

REPORT BY DIRECTOR (DR. L. I. GRANGE).

The soil surveys of Hawke's Bay Province (under the charge of Messrs. I. J. Pohlen and C. S. Harris) and North Auckland (under Messrs. N. H. Taylor and C. F. Sutherland) continued during the year. In North Auckland area a total of 1,900 square miles and in Hawke's Bay about 3,000 square miles have been mapped. Other activities included :—

- (1) Mapping by Mr. Sutherland of 200 square miles of the district surrounding Kaitia.
- (2) A complete survey by Dr. M. M. Burns and Mr. N. H. Taylor of tung groves of North Auckland, including soils and all operations connected with the growing of the tung-tree.
- (3) A detailed soil survey by Mr. H. A. Hughes of Heretaunga Plains.
- (4) A soil and agricultural survey of Western Samoa by Mr. W. M. Hamilton and the Director.
- (5) A survey of the Tauranga and Gisborne districts for possible areas to extend citrus planting by Mr. N. H. Taylor in co-operation with Mr. L. Paynter (Department of Agriculture) and Mr. W. M. Hamilton.
- (6) Completion of the survey of Redcliff irrigation area by Dr. J. K. Dixon and Mr. K. S. Birrell.
- (7) Chemical work by Dr. J. K. Dixon and Mr. A. C. Harris on some of the saline soils of New Zealand.
- (8) Moisture and chemical analyses of soils in irrigation districts by Mr. K. S. Birrell (seconded to Mr. T. G. Beck, Public Works Department).

The Hawke's Bay and North Auckland areas are strongly contrasted as regards their present land utilization. In the former area practically all the soils are growing pasture, but in the latter pasture accounts for a relatively small area. Hawke's Bay soils in general have a high natural fertility, except for phosphate. The brown loams are among the poorer soils, but their amelioration involves no problems. A detailed knowledge of the Hawke's Bay soils is being sought to provide a basis for improved land utilization.

Most North Auckland soils are well leached, and pans impeding drainage are not uncommon; some of the brown loams are problem soils, and a percentage of the country is too steep for agriculture. From data obtained in land utilization surveys, advice can be given in regard to selection of land for future settlement and methods to be followed in utilizing such land to the greatest advantage.

The experience to date shows that aerial photography is a necessary part of land utilization surveys. Soil types and land utilization depend to a large extent on topography, and from air maps flat, rolling, and steep country may readily be delimited. Further, each kind of parent rock seems to have its individual topography. To obtain such data air photomosaics may be used. If the pedologist has also the topographic maps compiled from air photos he can map his soil boundaries much more accurately and rapidly than by other methods. Aerial mosaics of a part of the Hawke's Bay area are now being made from photos taken by the Defence Department.

As in the previous year full advantage has been taken of chemical analyses made at the Dominion Laboratory and Cawthron Institute. Fusion analyses of the soil, when compared with the composition of the rock from which it is formed, show to what extent percolating waters have washed out chemical constituents. Analyses of the clay portion are useful, for the colloids play an important part in soil fertility. Analyses which give the amount of exchangeable lime, &c., are of value in indicating order of fertility. Finally, the acidity of the soil (pH) is a useful guide in all soils, except the brown loams, as to whether lime is required.

HAWKE'S BAY SOIL SURVEY : PROGRESS REPORT.

By I. J. POHLEN and C. S. HARRIS

INTRODUCTION.

During the 1936-37 season the mapping of genetic soil types in Hawke's Bay was continued in slightly more detail than previously. Approximately 2,000 square miles were mapped this season, bringing the total area completed to about 3,000 square miles, or just over half the land district. The area includes the country south of the Napier-Taihape Road, except for small areas west of Tikokino, at Woodville, and a larger block between Weber and the coast.