

## SOIL FERTILITY RESEARCH STATION

The Soil Fertility Research Station at Hamilton officially came into existence on the 1st January, 1946. The objectives of the Station are to carry out research work in connection with the many phases of soil fertility and to pass on to Instructors and other officers of the Department any information which may be of use to them in their advisory service to farmers.

The Station itself is situated some three miles south-west from Hamilton on the main road to Te Awamutu. It is approximately 60 acres in area, is easy rolling country, and the soil principally Hamilton clay loam—one of the major soil types in the Waikato. Previously the area was used for the production of vegetables for war purposes, and the residual value of fertilizers applied during that period is being studied.

At the present time the laboratory staff, who are part of the Station personnel are located at the Galloway ex-ammunition factory, but it is anticipated that laboratory facilities will be provided on the Station itself so that a closer relationship between field and laboratory research workers will then be possible.

The principle activities of the Station may be dealt with under the following headings :—

*Field Research.*—This is designed to deal specifically with soil problems in the field, and work planned in the immediate future is intended to give data on the various techniques of the measurement of pasture growth, on the response to various fertilizers of the Hamilton clay loam and peat soils of the Waikato basin, on the effect on pasture production of various forms of added nitrogen, and the relative efficiency of certain fused phosphates both from overseas and locally manufactured. Provision has also been made for the laying-down of variety trials on feed barleys and subterranean clover.

*Weed Control.*—Although this forms part of field research, its importance warrants separate treatment. Work is proceeding on the relative efficiency of various weed-killers, including the new hormone types. Attention is being largely concentrated on ragwort and blackberry. The programme for this work will be greatly expanded during the ensuing year to give information on the control of such other important weeds as nassella tussock and Californian thistle. A herbarium of weeds and pasture plants is being formed as a background and aid to this work.

*Quick Soil and Plant-tissue Testing.*—Using as a basis work done overseas, a start has been made in the use of quick-test methods for diagnosing deficiencies of the major elements in plants and soils. Experimental kits are being provided to selected Instructors in Agriculture for extensive tryouts under field conditions. It is the aim of the Fields Division to build up as soon as possible a comprehensive service to farmers. An attempt to induce and study the effect of mineral deficiencies in plants of both major and minor elements is being made at the Station.

*Laboratory and Pot Culture Studies.*—The principal aim of the soil laboratory is to select or devise methods for determining available plant foods which will give results closely correlated with actual crop yields as measured in field experiments. For this purpose a variety of methods, including pot cultures, is being applied to the same areas as are used for field trials. This work and that of the general chemical laboratory are dealt with more fully under separate headings.

*Miscellaneous.*—Two phases of soil investigation which it is planned to develop in the near future are lysimetry and microbiology :—

- (a) Lysimeters or soil-drainage gauges will be installed to give data on relative utilization and losses of soil nutrients, including water, under both pasture and arable crops.
- (b) In regard to microbiology there are many problems of plant-food utilization which can be adequately studied only with a knowledge of the part played by soil organisms, including bacteria, fungi, protozoa, and worms. As facilities become available a commencement will be made with a study of such problems as the efficiency of nitrogen fixation and utilization as influenced by liming, cultivation, and organic manuring, and the defining of factors influencing the numbers and activity of the worm population, especially in relation to special soils such as peat.