

20 per cent., except after the September application, when 40 per cent. to 50 per cent. recoveries were obtained from some treatments. The experimental data does not show what happened to the rest of the nitrogen.

*Microbiological Research.*—A temporary microbiological laboratory has been set up and a start made with the equipment to hand. To date, rhizobium organisms have been isolated from clovers growing on the Rukuhia peat, and comparisons of these strains with those from clovers on the Hamilton clay loam will be made with the object of evaluating the efficiency of the strains growing on peat with the object of isolating a strain that may increase the fixation of nitrogen on peat soil in the district.

*Laboratory and Pot Culture Studies.*—The assessing of available phosphate and potash in soils through Mitscherlich pot cultures commenced in 1945 has been continued on a larger scale in the season 1946–47. Results serve as a standard of comparison for the more rapid laboratory methods under investigation. Accumulated data of this nature from the plant growth and laboratory studies form a sound basis on which to build a Dominion-wide advisory service for farmers—a project regarded as of prime importance. With such a service in view, attention has been directed especially to quick-test methods, as these can be handled by field officers able to relate findings to their personal knowledge of the farms under investigation. Advice, too, can be given more expeditiously than from a central laboratory. The Purdue soil and plant test kit has been used tentatively on a fairly wide scale. The need of much experience for confident interpretation of results has become obvious. Samples of soil from observational top-dressing trials will be analysed by those laboratory methods showing to best advantage, the comparison with field pointings forming an additional check. At the Soil Fertility Research Station a replicated trial on the effect of molybdenum and lime dressings on cauliflower-production is in progress. Some marked deficiency symptoms have appeared, but these are not associated with any particular treatment. No whiptail, a malformation which has been attributed to molybdenum shortage, is in evidence. The Research Station is also associated with small trials with molybdenum in Wellington and near Dunedin. In one instance an initial advantage in colour and growth shown by the molybdenum-treated plants was later lost, the control outgrowing them. In 1946 a pot experiment was conducted in which rape was grown on selected soils which had received a wide range of fertilizer treatments during vegetable-production in the preceding war years. Each pot was provided with an adequacy of all major nutrients other than phosphate. The correlations of the yields, which varied greatly, with the contents of available phosphate indicated by a variety of laboratory methods were noted. No laboratory method gave results closely following yield data, but all clearly indicated the most deficient soils.

Analysis of soil samples representative of each of the differently fertilized blocks at the Station have been completed. There is little connection between the levels of the major plant nutrients and the recorded fertilizer applications. A lack of uniformity prior to the S.V.P. work may account for the discrepancy. A study of the heavy crop removals might also throw some light on the subject.

*Plant-tissue Testing.*—The concentrated work on sap analysis occasioned by vegetable-production work during the war and the investigations into the sap composition of white-clover petioles from variously manured plots has been followed up to determine whether such methods will materially assist research on soil-fertility problems. As sap extracts lend themselves to quick tests, it was considered worth while investigating the possibility of providing advisory officers with a simple and reliable kit for use in the field. In