

FIELD EXPERIMENTAL WORK.

Mr. J. W. Woodcock, Crop Experimentalist, supplies the following sub-report:—

The total number of experiments being carried out by officers of the Fields Division is 771, compared with 557 for the corresponding date in 1934. The large increase is mainly due to the establishment of a number of trials on the inoculation of clover, an extension of the strain trials, and also to a large number of observational trials being laid down during the year.

DESCRIPTION AND PROGRESS OF EXPERIMENTS.

Research into Fundamental Grassland Problems.

Experimental Farm, Marton.—Eleven trials are now being carried out under the “alternate mowing and grazing technique.” Four investigate the relative merits of different kinds and methods of applying phosphatic or nitrogenous fertilizers. One of these, which has served its purpose, is shortly to be discontinued. Two experiments are concerned with an investigation into the liming of grassland, one being a trial of different methods of applying ground limestone, while the other, which has only recently been established, aims at a determination of the relative merits of the coarse and fine fractions respectively of ground limestones from two sources. A further trial is designed to investigate the effect of pasture cultivation with a penetrating harrow. The remainder of these trials are being carried out in collaboration with the Agrostologist to compare the production of various strains of grasses and clovers.

Ruukura Farm of Instruction.—An experiment is being carried out here under the “mowing and grazing” technique which has for its object a comparison of no-manure, with super, and with super plus lime, the latter being applied by two different methods. Lime is giving quite a marked response.

Grassland Investigations and Demonstrations.

Observational Top-dressing Experiments.—There are at present in existence throughout New Zealand 430 observational top-dressing experiments with the object of surveying grasslands from point of view of their response to lime, phosphate, and potash.

Responses to phosphate occur on most of the soil-types on which trials have been laid down. Nevertheless, in some districts it has become evident that the effect from phosphate is only slight unless either lime or potash is applied in addition. In parts of Westland, Canterbury, and Southland, the marked effect of lime has been recognized for many years. Trials in North Auckland now indicate that lime is a major limiting factor on the clay and the ironstone soils in that region. There are also some of the volcanic soils of South Auckland which respond quite well to lime.

Potash has been effective in experiments laid down in North Taranaki and in parts of South Taranaki. In the former region about a hundred small plots were laid down last spring to define, if possible, the limits of the potash responsive areas. Unfortunately, the subsequent abnormal dry summer conditions mitigated against securing on these the same marked results from potash as have occurred in previous experiments. In the Waihi district of the Auckland Province a number of trials recently laid down have indicated that good results from potash might be expected in that region. Various forms of phosphate are being compared in many trials. Slag is generally quite effective, but is not superior to super or to super and lime except in isolated cases. Rock phosphates have been invariably less beneficial than the superphosphate and basic slag.

Demonstrations and Trials of Grass and Clover Strains (in collaboration with the Agrostologist).—There has been an increase in the number of these demonstrations during the year. They are proving of great value not only for purposes of testing strains of grasses and clovers in different localities, but also for demonstrating to the farming community the importance of sowing approved strains and grass-seed mixtures. Such areas are almost ideal for field days, and in that respect are of great help to the instructional staff in furthering knowledge gained at research centres and in emphasizing the importance of sowing better strains of herbage plants. Alongside these demonstrational areas top-dressing experiments have been laid down.

Grazing Trials.—There are nine experiments in which the production as measured in grazing-days of one field is compared with that of another differently treated. Four trials investigate the relative production of good rye-grass strains and poor rye-grass strains respectively, one trial in Canterbury compares fields treated with lime with an unlimed field, while two experiments in Taranaki are designed to further investigate the use of potash. At Marton Experimental Area, records are being kept from fields under different methods of management.

Legume Inoculation Trials (in Collaboration with the Mycologist).—About a hundred simple experiments are being carried out to determine the effect of inoculating red and white clover, lupins, and field peas. Positive results from inoculation in a small number of the earlier trials resulted in an extension of the experiments during the past season, particularly those including clover. In a few trials on peas outstanding responses have been secured, although in others no differences have been observed. The evidence available so far, however, does not warrant any general recommendation regarding the inoculation of any of the crops mentioned.

Cereal Experiments.

Wheat Manuring.—Only one experiment was laid down during the past season. During the coming year a large programme of work has been planned to investigate the use of nitrogenous fertilizers on wheat crops sown after a previous stubble crop. Experimental results in the past have indicated that under the latter conditions nitrogen applications are most likely to be effective, but that results vary considerably according to the season. Results from trials in Australia have indicated that response to nitrogen is largely bound up with the nitrogen-content of the soil, and this aspect will be investigated in the trials to be carried out by this Department during the coming season.

Wheat Variety Trials.—Trials were carried out in collaboration with and on behalf of the Wheat Research Institute on twenty-five farms in the South Island, but seven of these experiments could not be harvested owing to lodging. In the majority of these the new variety, Cross 7, was compared with Solid Straw Tuscan.

In seven trials, including three in Marlborough, Cross 7 was superior to Tuscan, while in nine experiments it was lower in yield than Tuscan. The average difference was in favour of Solid Straw Tuscan to the extent of a $\frac{1}{4}$ bushel per acre.

Seven trials included a comparison of a selection (13/28) of Solid Straw Tuscan, brought out by the Agronomist, with ordinary commercial Solid Straw Tuscan. Although there was no difference between the two when the average of all trials are taken into account, the superiority of the selection in a trial at the Pure Seed Station, Lincoln, suggests that it may be superior on certain soil-types. Further trials in selected localities are to be laid down during the coming season.