

Field-Crop Experiments.

A considerable extension of field experiments has been made in the past season. In the North Island the main extension has been along the lines of grazing trials on dairy farms. In the South Island a large number of pasture observation trials have been laid down and a considerable increase in the investigations on manuring of wheat, potatoes, turnips and swedes, and lucerne has taken place.

PASTURE INVESTIGATIONS.

(1) *Grazing Trials.*—About eighty dairy-farms were selected in the North Island with a view to determining the effect of intensive utilization of grass under phosphate in comparison with phosphate plus nitrogen. On each farm a uniform paddock was selected and divided into two equal parts. The treatments mentioned above were used, the nitrogen being applied in three, and sometimes four applications, at 1 cwt. per acre each time of application. Co-operating farmers are keeping records of grazing-days and a very good idea of the relative merits of the treatments is being gained. In some cases nitrogen had been an unqualified success, while in others no apparent difference in grazing-capacity can be determined. The results cannot be finalized for the year until the autumn grazing results are completed.

One very outstanding feature of the trials is the large carrying-capacity of paddocks intensively grazed. Some of the paddocks have already produced over 300 lb. of butterfat per acre. It appears that this figure is likely to be on the high side, on account of the fact that where the pastures are well managed there is a tendency to keep stock on paddocks longer than would be profitable under ordinary farming practice. No appreciable drop in production occurs under the system of having only two paddocks on a farm under such treatment, because the cows usually go back to good grass. It is likely that such high production could not be maintained over a whole grazing portion of a farm, as the effect of too frequent over-grazing and under-feeding would be reflected in the butterfat yield.

(2) *Farm under Intensive System.*—The intensive system of pasture management was commenced on Mr. J. Ward's farm at Manawatu in the 1927-28 season, and is being continued, with certain extensions and modifications, in the present season. Half the paddocks of the farm are under phosphate treatment, and half under phosphate and nitrogen. In spite of a heavy flood over the farm in September, the yield of butterfat will be higher than in the previous season.

(3) *Sheep-grazing Trial, Marton.*—A grazing trial with sheep has been started on the Marton Experimental Farm. The trial aims at a demonstration of the stock-carrying capacity at various seasons of the year when immediate and full utilization of grass by stock is observed. Two treatments are under trial, but nothing conclusive regarding their relative merits is likely to be available for at least another year.

(4) *Mowing Trial.*—This aims at the measurement of growth throughout the year from applications of super and slag applied at quarterly intervals. Valuable information is being gained regarding growth-rate of grass, response-rate of phosphates, and incidence of growth relative to time of application of manures. It is highly desirable that dry matter produced and chemical considerations should be investigated as soon as possible on this trial.

(5) *Haying Trials.*—Five investigations into the effect of fertilizers have been conducted in the North Island, four in Canterbury, and fifty in Otago and Southland. Most of these trials show a marked increase as a result of using phosphatic fertilizers—super as a general rule, especially in the South Island, proving a very satisfactory form.

(6) *Observation Trials.*—About twenty observation and demonstration plots have been laid down or are being continued from previous season in the North Island. In Canterbury about 180 small experiments have been distributed over as many soil-types as possible. Lime, phosphate, potash, and nitrogen are being used alone and in varying combinations. The object in laying down these trials was to get a rapid survey of as much land as possible, with the idea of determining what factors are mainly limiting production. The results more than justify the work at the present time, and, carried on for a few years, should be of great value. The striking feature of the trials is the comparatively widespread effect from lime. Phosphate response is often limited by the requirement of lime, and when used in conjunction with it is usually highly beneficial. Potash does not appear to be of any consequence except in one or two isolated cases. Nitrogen has almost invariably increased grass-growth, and where lime, phosphate, and nitrogen are used together the most marked improvement has taken place. Results indicate that nitrogen is highly important in the establishment and maintenance of rye and cocksfoot, which grasses almost always show a marked response. Grazing trials to test the economic value of response in a few places are being started this season. The arrangement of the plots is such as to demonstrate the effect of controlled grazing. Only a small percentage of farmers are carrying out good-management utilization of the grass produced, and in these cases improvement of the grass-sward, apart from applied manure, is greatly evident. In Otago about twelve areas are being used solely for observation. In the vicinity of Edendale good response to potash is occurring.

(7) *Cereals.*—A considerable extension of experiments in the manuring of wheat took place in the past season. This was rendered possible by the better threshing facilities provided by the up-to-date thresher mounted on a motor-lorry. In all, thirty-two trials were laid down, of which twenty-six were harvested. The remainder, in North Otago, were destroyed by hail. Superphosphate has established a definite superiority over slower-acting phosphates. The spring dressing with soluble nitrogen again proved to be highly beneficial in the main, the use of 1 cwt. of nitrate of soda causing an average increase of about 4½ bushels per acre. About two hundred small plots were laid down on roadside paddocks to focus farmers' attention on nitrogen and to get more general information regarding it. About sixty of these were harvested, and the general result was more or less in agreement with the results from the more carefully conducted trials mentioned above. Potash has not displayed any general advantageous results from its use.