to the districts in which the problems arise. Moreover, extreme variations in soil and climate make it imperative that the findings of the research worker shall be investigated over a wide range of conditions. In carrying out such investigations the Fields Division services the Plant Research Bureau and the Wheat Research Institute, thereby acting as a connecting-link between fundamental research and farm practice. Many of the experiments detailed hereunder are carried out by Instructors in collaboration with specialist officers of the above organizations with this object in view.

DESCRIPTION AND PROGRESS OF EXPERIMENTS.

1. *Grassland.*

(*a*) *Mowing Trials.*—At Marton Experimental Area seven experiments are being conducted in which the yield of herbage throughout the season is measured by the alternate mowing and grassing technique. On the pasture-manuring section the long-term investigations relative to different kinds of phosphate, different methods of applying lime, and varying degrees of fineness of carbonate of lime are being continued. During the year a further experiment has been laid down to investigate the effect of Heskett slag on grass-production. On the herbage-strains section the trials with pedigree lines of rye-grass, red clover, and white clover are being continued. The experiment on pasture harrowing is being carried out until the end of the present season, when the results will be published.

At Ruakura Experimental Farm the three mowing and grazing trials on major soil types are being continued. A comprehensive experiment designed to test the validity of the mowing and grazing technique, with special reference to the " transference of fertility " from one plot to another, has been laid down. A further trial is designed to investigate the use of drastic harrowing on a paspalum sward.

Included among the many projects in connection with facial eczema at Ruakura is an experiment to measure growth of pasture at bi-weekly intervals. By the use of movable frames small plots on which grass has been allowed to grow for a fortnight can be mown and the rate of growth recorded. Data concerning the speed of growth at various seasons will be helpful not only in regard to facial eczema, but in connection with pasture-management problems generally. A similar series of frames for measuring rate of growth is located at Gore's farm in the Waikato.

On one of the irrigation demonstrations area at Levels pasture-production on irrigated and non-irrigated pasture respectively is being measured by means of movable frames similar to those referred to above.

(*b*) *Observational Top-dressing Experiments.*—About four hundred observational trials are being carried out on pasture to investigate the effects of phosphate, lime, and potash on various soil types, and a large number have recently been laid down in Hawke's Bay following the soil survey of that district. Most of these trials now also contain a comparison of different forms of phosphate, and some recently laid down include the new " Heskett " slag. The appearance of several new phosphatic fertilizers on the market necessitates further trials being established, particularly on hill country, for which some of these products are specifically designed. Attention is being paid to the problem of " fixation " of phosphate on certain soils, and preliminary investigations are planned to study phosphatic manuring on such soil types.

(*c*) *Demonstrations of Grass and Clover Strains.*—Plots are established to serve both as experiments and demonstrations of new herbage strains in nearly all districts. They include the desirable and undesirable strains of the main herbage species, and serve to introduce to farmers the new pedigree lines which are brought out periodically by the Grasslands Division of the Plant Research Bureau. The outstanding features of these demonstration areas are generally the white-clover plots. Plots sown without white clover or with inferior strains are often very conspicuous because of the harsh unthrifty nature of the grass. Two strain trials on high-country tussock land have been established in collaboration with the Grasslands Division, Plant Research Bureau, one being located in South Canterbury and the other in the Wellington Province.

(*d*) *Grazing Trials.*—Two grazing trials which investigated the use of potash in Taranaki have been finalized during the year and the results have been published in the *Journal of Agriculture*. Four others are still being continued, and these are in connection with strains of grasses and clovers. One of these, situated on the Winton Demonstration Farm, compares certified rye-grass with uncertified Southland rye-grass harvested from old pastures. Production of wool and lamb from the two areas is being evaluated as well as the stock carried. Two years' production figures have now been obtained, and in both seasons the certified paddocks have carried more stock. In 1937–38 the revenue from the latter was 33 per cent. more than that from the fields sown with Southland rye-grass. Final production figures for last season are not yet to hand.

(*e*) *Clover-inoculation Trials.*—A large number of experiments have been established in recent years in collaboration with the Plant Diseases Division, Plant Research Bureau, to investigate the value of inoculating white clover and to test out different strains of culture in various parts of the Dominion. These experiments have all been finalized. About 20 per cent. of them gave definite results in favour of inoculation, but, although in a few cases the improvement in clover establishment was outstanding, it is not possible to make general recommendations regarding the use of white-clover culture as is done with the lucerne crop.

(*f*) *Subterranean-clover Trials.*—The ecological trials with subterranean-clover strains are being continued, and many additional plots have been established to determine the role of subterranean clover on hill country. The establishment of this species appears to be so bound up with seasonal effects that it is difficult at this stage to make any definite statement regarding its use on existing pastures.