

REPORT OF THE PLANT RESEARCH STATION, PALMERSTON NORTH.

The activities of the Plant Research Station have been well maintained during the past year, 1935–36. The appended reports of the several sectional heads outline the main features of the work, and afford a good indication of its wide scope.

As previously, the Department of Agriculture has had the co-operation of the Department of Scientific and Industrial Research in certain parts of the work.

A. H. COCKAYNE, Director.

AGROSTOLOGY SECTION.

E. BRUCE LEVY, Agrostologist.

The work of the Agrostology Section throughout the year has progressed steadily and the staff has been kept exceedingly busy, much good work being accomplished. Strain testing of ecotypes and for certification purposes has been a major feature, and additional grass and clover species are now being studied. Plant-breeding and other work in connection with strain building to pedigree standard has been steadily continued, and it is obvious that this work will gradually raise the standard of ordinary certified seed and, in addition, will afford progressive farmers an opportunity to adopt pedigree seeds for the betterment of their grazing areas. The Section has as its objective in building to pedigree standard the production under certification of such quantities of pedigree seeds and at a price that these seeds ultimately will be within reach of every farmer.

Strain-testing, strain-building, and field trials, thanks to the close and energetic co-operation of the field staff of the Fields Division, have been maintained as a continuous process, and too much emphasis cannot be laid on the value of this close inter-relation between research and field extension. At the time of writing changes are contemplated, and the wisdom of those changes in no small measure will lie on the amount of co-ordination retained between research and extension.

A pleasing feature of the year's work has been the close co-operation of workers in the matter of the investigation into feed flavours in cream. Farmers, dairy factories, cream graders of the Dairy Division, the Dairy Research Institute, the Fields Division, and the Plant Research Station have all linked up in the prosecution of this research. The work at Palmerston North and in the Waikato is well forward, and will be presented for publication in the near future.

The ecological field-work of the Section has been extended and for the time being is being concentrated on a mapping of pasture types survey in the Hawke's Bay District in conjunction with a farm-management survey by the Fields Division, Department of Agriculture, and a soil survey by the Soil Survey Division, Department of Scientific and Industrial Research. This further example of collaborative field-work is to be commended.

During the year negotiations with the New Zealand Golf Council were successfully finalized whereby green-keeping research was placed on a sound footing. A field advisory officer and a permanent hand for the research area have been appointed by the New Zealand Golf Council. This will enable research and extension to be fully co-ordinated.

The work of the year in detail is as follows:—

GRASSES.

PERENNIAL RYE-GRASS.

Certification and other Plot Trials.—Eight hundred and twenty-two plots were sown for study or report for certification purposes, all the latter of which have been finalized. Included in the study trials were a number of overseas lots which were studied particularly to co-ordinate ultra-violet-light test and type test as determined by plot trial. As a result of these trials it can be definitely laid down that the ultra-violet-light test may not be used as an international test for type determination, and that it is reliable only when taken in conjunction with type as determined by plot trial. Thus it serves admirably as a test for contamination in the Hawke's Bay and Poverty Bay strain, but it does not serve to differentiate between types of true perennial themselves. This is an important finding, and it should have a bearing on the class of certified perennial rye-grass, known as the "commercial class," which has been established on the ultra-violet-light test alone. None of the overseas strains under trial proved superior to the New Zealand certified rye-grass, and most were distinctly inferior. Some few Australian, some British indigenous, and two Hungarian lines were much superior to the ordinary run of lines.

Elite Strain Work.—The 1-acre block of selected pedigree rye-grass has been retained and was again harvested for seed. A yield of 403 lb. of dressed seed was secured, and from this an additional 12 acres have been sown for seed-production on a contract basis. This makes 32 acres now sown out on contract from the nucleus area. A crop was secured from the 20 acres sown on contract in 1935, and a yield of 800 bushels was secured. This has now gone into commercial seed-production channels.

The breeding programme in perennial rye-grass includes a study of 6,700 single plants, the seed for the planting of which was secured as a result of crosses and selfings made in the 1934–35 season. Notes have been taken periodically on these and will continue for another season before selection of the most promising material is made. Further selfings and diallel crosses were made of other promising plants, and studies were initiated to determine the degree of vigour that may be regained in crossing unrelated inbred plants.

Low Germination of Perennial Rye-grass.—The trial of 200 lines conducted at Palmerston North and at Winton in connection with the investigation into the low-germination capacity of certified perennial rye-grass when harvested in a wet season yielded no data as a result of good seed setting and development under comparatively dry seasonal conditions, which are unfavourable for the causal fungus to develop. A preliminary examination of the crop at Palmerston North revealed that there was no fungus present, and consequently it was considered unnecessary to proceed further with the investigation. The crop at Winton was harvested and the samples were forwarded to Palmerston North for threshing and testing. Representative lines were tested but germination in all cases was high, indicating that the season in the South also was favourable to good seed setting and development. The experiment is to be continued at both places.