

WHEAT RESEARCH INSTITUTE.

The programme of research under the ægis of the Wheat Research Institute showed steady and continued progress during the year. In all departments the amount of work covered was greater than in previous years, and has reached a stage when the maximum efforts of staff and facilities are being put forth.

In connection with the wheat breeding and selection work, over nine thousand individual plots were sown and subjected to detailed investigation during the year. These plots cover a wide range of crossbred wheats, bred by the Institute, which are undergoing the process of selection and elimination with a view to securing types of wheat better suited to New Zealand conditions than those at present in use. A large number of introduced varieties was grown for trial, almost every wheat-growing country in the world contributing samples of its wheats. The field-work has revealed important practical information, which is being immediately made available to farmers, regarding the optimum amount of seed and manures to be used, the winter hardiness of the main varieties of wheat, the tillering-capacity and ripening-capacity of different strains, and other matters which have a very considerable effect upon yield and quality.

In the laboratory, baking, milling, and chemical tests, totalling well over ten thousand in number, were completed. The laboratory worked in the closest association with bakers and millers, and the results of the work undertaken have been conveyed speedily to representatives of these two industries, with the result that improved practices are gradually being adopted.

The services of the laboratory have also been available to farmers, especially at harvest-time. These were particularly acceptable this year, when the difficulties at harvest-time were very pronounced. The wheat in the North Canterbury area for the most part shrivelled considerably as the result of drought, while in South Canterbury, under very wet weather conditions, considerable spoilage occurred through sprouting. As the result of tests carried out by the laboratory it was possible to save for milling purposes some 150,000 bushels of wheat which had suffered from the damp weather.

The Wheat Research Institute was also instrumental in providing information enabling the proper blending of wheats harvested in what was probably one of the most difficult years of wheat-growing in Canterbury to be gristed in such a manner as to maintain as far as was possible the good quality of the flour.

KAURI-GUM.

Striking advance has been made in regard to methods of refining kauri gum and resin. Methods were worked out in the Laboratory by Dr. J. R. Hosking for (1) solvent extraction of low-grade kauri-gum, and refining to a product preserving, unaltered, the valuable properties of the gum; (2) solvent extraction of resin from fossil kauri timber, and hill timber, to produce a kauri-resin of good colour and low acid value. These methods were tried out on a pilot plant, towards the cost of which the Unemployment Board contributed, and hopeful reports on the products have been received from overseas.

Following the experience with the pilot plant, arrangements were made to modify a solvent extraction plant for kauri-gum refining at Henderson, and it is hoped that this plant will soon be in operation. In addition, plans and specifications have been drawn up with a view to inviting tenders for alterations of a resin-extraction plant near Dargaville.

PLANT RESEARCH STATION.

The work at the Plant Research Station is of the utmost importance to the primary industries of the Dominion, because, as it deals with grasses and pastures, with insect and fungous diseases of farm crops, with plant breeding, selection, and certification, with fundamental botanical studies of all farm crops, and with all forms of field trials, it ensures that the basic problems of this industry are receiving due attention. The full utilization of our resources of soils and pastures is dependent upon the progress of knowledge in all divisions of agricultural science, and it is imperative that continued study be devoted to the class of problems outlined above. Marked progress has been made, particularly in regard to the value of strain influences in grasses and clovers, and in the control of several serious diseases of farm crops, all of which may speedily result in marked improvements in the financial returns from farming.

DAIRY RESEARCH.

Ranking of first importance in our primary industries, dairying and its problems have claimed closest attention from research workers during the past year. It has been found necessary to undertake a considerable amount of fundamental work in order that it may be possible to make more progress on the more practical difficulties affecting butter and cheese production. As a result of continued attention to the original wide problems of cheese openness, it is now apparent that this defect could not be attributed to any one specific factor. Both laboratory experiments and factory-scale tests have indicated that there are at least some seven influences which are conducive towards this trouble. The search for the causes of the trouble of openness have led investigators to explore completely the whole range of processes involved in cheese-manufacture, from farm to the market. The result has been the tracing of defective processes, so that the Dairy Research Institute is now in a position to refer specifically to features in cheese manufacture and transport which when given due attention will be a means of improving in a large measure the quality of our produce.