

In view of the importance of the world food situation, further consideration is being given to this aspect of the Department's activities and scientific guidance is being sought in this matter from the United Kingdom authorities.

Recognition of the pre-eminent importance of our soil resources has resulted in the completion of the general soil surveys of both the North and the South Island, which are providing the basic information for detailed surveys relating to specific problems such as those connected with closer land-settlement in the Taupo and Southern Wairarapa districts, soil erosion, and the areas in which mineral deficiencies occur.

Intensive work on the improvement in the quality of pasture for all types of country has shown results in improved strains of rye-grass and cocksfoot which have been proved this year. In rye-grasses, cocksfoot, and clovers, prolonged tests have shown that our research work has produced lines which provide under New Zealand conditions marked increases in food values in comparison with the best selections from overseas, a factor which must have a considerable potential influence in the economy of production from New Zealand's pastoral lands.

Considerable progress is being made in the understanding of pasture response to top-dressing with phosphates, nitrogen, and potash. Attention focused on the nitrogen problem has shown that an entirely new view of nitrogen intake by the grazed pasture plant and its use in the leaf has to be adopted. Advances are being made also in the knowledge of methods for improving pastures in the hill country of both Islands. This progress is important in a country so dependent upon grass for its economic welfare.

Improvements in the quality of stock fodder crops, such as swedes, kale and lupins, which have resulted from plant breeding work, will also be helpful towards supplies for sheep and cattle.

An intensive programme of research on insect pests and fungus, bacterial and virus diseases of all farm crops, is being maintained, and a number of useful results were secured during the year. The heavy toll exacted annually by plant pests and diseases is seldom recognized, and work in this field continues to pay handsome dividends.

Three new apple varieties of English origin and five varieties of peaches from Australia, after exhaustive tests, have been selected for issue to New Zealand growers. The importance of helping the fruit industry in its difficult problem of frost-fighting has necessitated the continuance of a comprehensive series of investigations.

The value of research to a primary industry is well exemplified in the case of tobacco research, where, as the result of close collaboration between the Departments of Scientific and Industrial Research, Industries and Commerce, and Agriculture, the Cawthron Institute, growers, and manufacturers, a steady flow of information of great value to the industry as a whole emerges each year. The recently established Hop Research Station shows similar promise and already much useful preliminary work has been done on varietal, disease, and curing problems, despite serious handicaps.

Plant-breeding work at the Wheat Research Institute gives promise of varieties even better in quality than Hilgendorf, which is being rapidly multiplied now for extended commercial use.

In view of the very extensive field covered by agricultural research, grants are being made each year to Cawthron Institute, Massey College, and Lincoln College to enable a better coverage to be achieved in this sphere. Very valuable results have been secured and the policy does much to promote co-ordination of effort and exchange of ideas between the workers of these institutions and the Department.

A marked increase in the activities of the Geological Survey took place during the year as a consequence of additional staff becoming available to deal with coal survey and hydro-electrical dam site surveys. In both spheres, geophysical methods and equipment are being extensively used, and the application of these to New Zealand's problems is likely to both expedite and improve the quality of the results. Studies in volcanology and the use of geothermal power have been inaugurated.