

During the latter part of the year fresh arrangements were made with the Fields Division of the Department of Agriculture with a view to initiating some more exact detailed work at the Ruakura Farm of Instruction during the coming season.

At Palmerston North, in conjunction with the Dairy Research Institute, work progressed along lines similar to those of the previous season, and cows were fed with herbage consisting of rye-grass pure, rye-grass and white clover, Italian rye-grass, and Italian rye-grass and red clover. The small areas sown down to provide special feeds (subterranean clover, annual white clover, and sweet vernal) were utilized as occasion demanded, but little information of significant value was obtained from these. The results of the year's work have brought about a change in policy, and in future endeavours will be made to feed the various mixtures of herbage at different stages of growth to determine the influence of this on feed-flavour incidence, instead of as in the past, when various proportions of clover to grass were fed for the same periods. The cloverly pastures were definitely more prone to produce an undesirable flavour in cream in both the Waikato and Palmerston North districts. A considerable amount of valuable information regarding pasture management has been secured in connection with the feed-flavour investigation, and great care in the management has been necessary.

Careful attention has been given to the production of the pure feeds required for both the grazing and stall-fed cows. The botanical composition of the pastures and pure swards has been recorded and an endeavour was made to measure the amount and rate of growth of different pastures, but with limited labour and inadequate facilities this was not carried out as fully as was anticipated.

Chemical analyses and dry-matter determinations of the diets of the cows under test have been regularly undertaken.

GREEN-KEEPING RESEARCH.

Very little new investigational work has been undertaken, the activities of research having been concentrated more on weed eradication and the testing of chemicals in connection with turf production and maintenance. The advisory officer engaged by the Golf Council reports having had a very satisfactory year and has covered most of the North and South Islands, learning the problems of the various golf and bowling clubs. He has given advice on most occasions where he has visited a club, and has brought back with him several problems requiring attention on the experimental area.

CHEMISTRY SECTION.

The work of the section has continued along the lines of last year's report, but special attention has been given to some biochemical problems concerning grasses and clovers. The work on herbage and soil samples from the Marton Area has been continued. Special attention has been given to the movement of lime in plots treated with limestone at different rates of application, and much interesting data has been obtained.

A considerable amount of time has been devoted to the analysis of material fed to cows in connection with the feed-flavour investigations in conjunction with the Dairy Research Institute. Endeavours were made to produce artificially feed flavours in cream, from rye-grass and various clovers in the fresh state, and in various stages of digestion *in vitro* with digestive enzymes. Typical "feediness" was not produced in any instance, although flavours were readily produced from various clovers when vacuum distilled. The flavours obtained after digestion with ptyalin were markedly different from those produced from fresh material. Virtually no flavours were produced from rye-grass. Investigation of the nitrogen partition in clovers and grasses and the variation found from day to day was commenced. The results obtained were most interesting and are considered worthy of being followed up next season. Marked differences in the nitrogen partition between grasses and clovers were observed and daily variations were noticed, depending, apparently, on weather conditions.

The usual miscellaneous analyses have been made during the year.

PUBLICATIONS.

- Investigation of Feed Flavour in Cream and Butter. Bulletin No. 52, Dept. S. & I. R.
Behaviour of New Zealand Certified Clovers in New Zealand and Abroad (*N.Z. Journal of Agriculture* (1936), 53, 76.
Strain in Subterranean Clover. *N.Z. Journal of Agriculture* (1937), 54, 82.
Effect of some Phosphatic Fertilizers and Superphosphate-lime Mixtures on Turnip-seed Germination. *N.Z. Journal of Science & Technology* (1937), 18, 739.
Note on an Exudation of Glutamine from Chewing's Fescue. *N.Z. Journal of Science & Technology* (1937), 18, 844.

LECTURES AND DEMONSTRATIONS.

Lectures have been given to various Young Farmers' Clubs and at conferences held both in Palmerston North and at other centres. Visitors to the research plots have been numerous, and a considerable amount of time has been devoted to showing people over the areas. The number of overseas visitors has been considerable, and the number of farmers from different parts of New Zealand who have been shown over the plots indicates that there is an increasing demand for more intimate knowledge of the pasture research work.

EQUIPMENT, IMPLEMENTS, AND APPARATUS.

Further evidence of the value of good implements has been demonstrated during the year. By the use of tractors and cultivators the labour costs have been kept at a minimum and the working efficiency of the staff has been improved.