

PROGRESS AT WAITE RESEARCH INSTITUTE

LARGER EXPERIMENTAL AREA

More Plant Diseases Investigated

IMPORTANT CROP ROTATION TESTS

With progress dependent upon the development of rural industries South Australia is fortunate in having the Waite Agricultural Research Institute.

Classification of soils, plant diseases, manurial tests, rotation plots, water required by plants—these are some of the subjects to which attention has been given during the past 12 months by the experts on the staff of the Institute.

A plan of developmental work has been mapped out. An important section is that devoted to field experiments. These should result in valuable information being made available to farmers.

A portion of the estate has been set aside for permanent rotation plots for the study of the most suitable rotation for 20-inch rainfall; manurial experiments on wheat, oats, and barley; time of sowing and rate of seeding experiments; variety tests of wheat, oats, and barley. These experiments provide raw material for laboratory investigations.

The institute is fortunate in having Dr. A. E. V. Richardson as director, who is supported by an enthusiastic and competent staff.

During the absence of Dr. Richardson, Prof. J. A. Prescott has controlled the development of the institute. In spite of his many duties as director, however, he has found time to do much work on the classification of South Australian soils. In this he has been greatly assisted by Mr. C. S. Piper, who has performed all the actual work in connection with the mechanical and chemical analyses.

The control of the majority of the field work, in the absence of Dr. Richardson, has fallen upon the shoulders of Mr. H. C. Trumble (assistant agronomist), and the excellent appearance of the experi-

mental field testifies to the good work he has done in addition to attending to his own sphere of operations on pasture and fodder plants.

The scope of plant disease work, which is in charge of Mr. Geoffrey Samuel, is increasing rapidly. One of the most important developments in this direction is the entrusting of the investigation of tomato wilt to the Waite Institute by the Council of Scientific and Industrial Research. The council has agreed to provide funds to erect a suitable glasshouse at a cost of about £1,500 for this work.

Barley, rate of seeding and time of sowing tests with the same three crops, and investigations to determine the effect of date of fallowing.

One of the most interesting results is the marked beneficial effect shown by nitrogenous fertilisers on crops not sown on fallow. An area of five acres on the Netherby section, which was followed last year, is under oats, and will subsequently be devoted to trials with seed pastures. A further four acres was recently cleared and fallowed with a view to the extension of work on plant breeding. Dr. Richardson has been paying special attention to plant breeding work and there will probably be much development in this direction next year.

In the stud cereal section there are now approximately 300 cereal varieties from all parts of the world, and the progeny from more than 100 crosses made last year. A beginning has also been made with plant breeding methods as applied to pasture plants; and several rows of native and introduced grasses have been sown with a view to artificial selection.

Top-dressing of Pasture

Top-dressing tests on natural pasture are of even more interest than they were last year. One of the most serious drawbacks to the full development of

than 100 species.

Drinks for Plants

The work of Dr. Richardson on the water requirements of plants is being continued, and many improvements in the glasshouse technique have been made during the year. About 250 pots are employed in the tests, and these are kept outside under natural conditions, except when rain necessitates their being run under the shelter of the glasshouse by means of special trucks. The amount of water lost by each crop is measured by accurate weighings made each week.

Tests comprise the determination of the transpiration ratio of 17 agricultural plants, the effect of date of sowing on the transpiration ratio, the intake of mineral nutrients and transpiration loss at different stages of growth in barley, the effect of various fertilisers on growth and transpiration of four species of native grasses.

Two species of saltbush are included in the tests this year, and this will be the first occasion on which exact measurements on the transpiration of growing saltbush have been made.

Much work has been done during the year in the chemical laboratory. Investigations were largely confined at the beginning to the standardisation of various methods of analysis and their adaptation to conditions in South Australia. This especially applies to the mechanical analysis of soils which for many purposes gives more information than the chemical analysis.

A detailed examination of the soils from the small volcanic area round Mount Gambier has been made. Some of these soils have proved to be among the richest in phosphate or any in the world, but these extend for only a few miles round the Mount Gambier, and have been formed by the ash blown out during eruptions.

A large number of samples from typical agricultural areas in other parts of the State has also been examined, but very many more analyses will be necessary before complete classification can be attempted. Several new pieces of chemical apparatus have arrived from Europe during the year, and these will facilitate work.

Facilities were also provided in the laboratory for Mr. M. R. Jacobs, who holds the Lawrie Scholarship at the University, to enable him to make soil analysis. This is being done in conjunction with his survey work, endeavoring to establish a connection between the agri-

causing the dreaded take-all disease of wheat. The soil in the pots is thoroughly inoculated with the disease, and then the pots are planted and placed in the tanks. There are four tanks kept at temperatures of 53 degrees, 54 degrees, 75 degrees, and 86 degrees. It has been found that although in each case the soil is full of disease, it attacks the wheat far more strongly at 64 degrees than at the other temperatures.

The next most severe effect is found at 75 degrees, and plants grown at 53 degrees and 86 degrees are not badly affected. The effect of the amount of moisture in the soil is also being investigated, and later other factors will have to be taken into consideration.

REG-6-10-26

DR. RICHARDSON IN AMERICA.

WASHINGTON, October 3. Dr. A. E. V. Richardson, Director of the Waite Research Institute, Adelaide, has arrived at Washington (U.S.A.). Following upon his agricultural research in South Africa, England, and the Continent, he will visit American colleges of agriculture, and will then attend the Pan-Pacific Science Congress at Tokio in November.

Dr. Richardson said that the South African Government devoted much attention to the development of agricultural education and research, the improvement of merino wool production by the importation of high-class merinos from Australia, and the providing of skilled instructors and investigators. The veterinary research station at Pretoria was the finest organization of its kind in the world, and its discoveries had enabled the pastoral industry to be placed on a sound and profitable basis. A great development had occurred in agricultural research and education in the United Kingdom since the war as the result of material encouragement from the Imperial Government. In the United States one outcome of the war was the speeding up of agricultural production and the application of improved labour-saving machinery, leading to a great surplus of production over consumption, which had not yet been adjusted. The prices of wheat, maize, cotton, and meat had fallen materially, and farmers were not yet enjoying the same prosperous conditions as those engaged in industry. A new emphasis had therefore been placed on the study of economic and marketing problems. One development in wheat culture in America that was of interest to Australians was the growing popularity of the combined harvester and tractor, the use of which had been confined to the Pacific coast, but which was now being employed in Kansas, Oklahoma, and Texas, where great developments were occurring as the result. Another interesting feature was the extended use of Australian varieties of wheat on the Pacific coast. The Federation and Bunyip wheats were very popular. Insect and fungus pests were causing immense losses in American agriculture, nullifying the work of a million men and destroying 10 to 20 per cent. of the crops.

REG. 4-10-26

A social gathering was held at the Elder Conservatorium on Wednesday evening, when the students welcomed Mr. Frederick Bevan on his return from a journey to the old world. Mr. I. G. Reimann, who presided, expressed the pleasure of all connected with the Conservatorium at the return of Mr. Bevan. The guest of the evening, in responding, touched briefly on his experiences during his holiday. Later in the evening a presentation was made by Professor E. Harold Davies, Mus. Doc., to Mrs. Smedley Palmer, on behalf of Mr. Bevan's students whom she had taught during his absence, and the students of Miss Gill, whom Mrs. Palmer had taught during her illness. Dr. Davies said Mrs. Palmer was much beloved by the students and they felt deeply how much she had done for them. Mrs. Palmer acknowledged the gift. Songs and competitions were followed by supper.

REG. 8-10-26

Dr. R. S. Rogers and Mr. B. S. Roach have been reappointed members of the Board of Governors of the Public Library, Museum, and Art Gallery. Mr. E. T. Cornish has been appointed a member of the board of management of the Port Pirie Hospital.

REG. 8-10-26

Dr. E. F. West has been appointed honorary anaesthetist, and Dr. G. Hardy honorary dental surgeon at the Adelaide Hospital.



CORNER OF EXPERIMENTAL FIELD AT WAITE RESEARCH INSTITUTE

Grass and clover variety garden with pollination screens over lucerne

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Effect of Fertilisers

The experimental area has been extended by bringing under cultivation an additional 14 acres, part of which is already under crop. Field experiments now include permanent rotation tests, fertilizer tests with wheat, oats, and barley, variety trials with wheat, oats, and

this side of the work, however, is that the effect of the various treatments cannot yet be effectively measured under natural grazing conditions. This is because funds have so far not permitted the erection of the necessary subdivisional fences. The measurement is at present made by estimation of the total yield of each plot, and detailed botanical analysis which brings out clearly the effect of the various fertilizers on the clovers, grasses and other plants.

The grass and clover variety garden has recently been extended by the addition of 50 plots, some of which have already been sown. One of the most essential needs of pioneer investigations on pasture plants is the comprehensive collection of all available species followed by the selection of those forms which are likely to be of value under natural conditions. The collection at Urbis will soon be one of the best in the Commonwealth. It comprises more

cultural possibilities of the different soil types and the natural vegetation on different parts of the area.

Obscure Oat Disease

Interesting results have been achieved during the year from the work on plant diseases. The investigation of an obscure oat disease near Mount Gambier and Penola led on to the discovery of a mycorrhizal fungus living in the roots of nearly all crop and fodder plants, as well as weeds and native plants. The fungus lives in the roots without harming them, and may even do good perhaps by furnishing the plant with nitrogen assimilated from the air, somewhat as the nodule bacteria of the leguminose are known to do. This is a question which merits further investigation.

Special electrically controlled soil tanks have been installed and are yielding interesting results with the fungus