Wheat-breeding

The full scope of operations has been resumed and much of the accumulated material has been sown. A large amount of hybrid material from compound crosses is now under test. Of the more advanced lines, one resulting from a cross Tuscan × Tainui (78, 01) shows good promise. It has yielded more than Cross 7 in all but one of the eleven trials conducted during the last six years; it ripens distinctly earlier than Cross 7, it equals Cross 7 in baking quality, it has equally tight chaff, it is more resistant to Hessian fly and stem weevil, but it is not as resistant to lodging as Cross 7.

Genetic studies of the inheritance of grain size and other economic characters, and genetic and cytological studies, of a number of variants in wheat have been carried forward and are approaching conclusion.

Laboratory Work

Moisture Testing.—The same seven stations for moisture testing have been available to the wheat industry as during the harvest of 1943. Favourable harvest conditions in most districts were reflected by relatively small numbers of samples submitted and satisfactory moisture contents, the only major exception being South Canterbury, where humid conditions delayed harvesting and caused a certain amount of sprouting.

Milling and Baking Tests.—Milling and baking tests and routine chemical work were carried out as in previous years.

Work for Armed Forces.—The Institute's travelling baker has visited a number of camps and Air Force stations to give guidance in breadmaking, and several bakers from the United States Forces spent a week at the laboratory having instruction in the Institute's methods for using dried yeast. Routine examination of Service biscuit meals and oatmeals have been continued.

Research Work in Progress.—While the main lines of previous baking-quality investigation are still interrupted because of absence or partial absence of staff, a considerable amount of chemical work in this connection has been done.

At the request of the Nutrition Committee of the Health Department, a commercial experiment in the production of high-extraction flour is being undertaken. Preliminary work for this has included analyses for vitamin B_1, fibre, &c., to determine by what changes in milling practice the vitamin B_1 content can be increased with the minimum increase of fibre. In addition, vitamin B_1 determinations have been made on all bread flours in New Zealand. Further work is in progress.

RESEARCH WORK AT AGRICULTURAL COLLEGES

Grants were made by the Department during the year to Canterbury Agricultural College and Massey Agricultural College for a number of projects, which are reported on below.

CANTERBURY AGRICULTURAL COLLEGE

Subterranean Clover Investigation

Mr. J. W. Calder

The fifth grazing season, completed at the end of March, 1944, will mark the end of a period during which the main objective was to measure the production of subterranean-clover pastures on the light, stony land of the Canterbury Plains under four different fertilizer treatments. Production was measured in terms of sheep returns in the form of carrying-capacity, live-weight increase, wool weights, and fat-lamb weights.

The carrying-capacity during the five years is as follows:—

	Ewes per Acre.				
	First Year.	Second Year.	Third Year.	Fourth Year.	Fifth Year.
A treatment: 1 cwt. super. alternating with 5 cwt. lime ..	1·0	1·3	1·6	2·1	1·8
B treatment: 2 cwt. super. annually	1·3	1·2	1·2	1·4	1·5
C treatment: 1 ton lime initial, 2 cwt. super. annually ..	1·6	1·7	1·8	2·0	1·9
D treatment: 1 ton lime initial, 2 cwt. super. annually, ½ cwt. potash annually	1·6	2·1	2·3	2·3	2·0

The detailed results of live-weight increase, wool weight, and fat-lamb production for the current season are not yet available.

In the fifth season the number of stock carried was less than in the fourth season following a dry spring and summer. No hay was cut, the ewes being wintered on hay which was left over from the previous season. This was not of high quality, and though the ewes fared reasonably well it was considered advisable to graze the hoggets off the plots for one month.

The investigation has produced valuable information during the five years, and it is considered that a continuation of the work on the same plan would not add much to our knowledge of the differential production of the four fertilizer treatments. A full report covering the costs and returns of each treatment over the five-year period, as well as a detailed report on the management and technical problems encountered, will be presented at an early date.

Consideration is now being given to modification of the scheme to investigate further problems of management and technique.