

Sprouted Wheat.—The chief characteristic of New Zealand wheats this year has been the prevalence of sprouted samples. In the baking test all sprouted lines have shown a great doughiness of the crumb of the loaf. The crumb refuses to bake, no matter how well baked the crust is. Very careful blending is necessary to make use of these sprouted wheats.

Starch Tests.—The progress of our research has shown that the baking test is not completely satisfactory as a measure of the quality of a wheat. It is not sufficiently analytical, in that it gives an end result and not the causes of that result. We have therefore spent some time in testing or devising other methods of estimating the qualities of a flour—*e.g.*, the Gottinger test, a straight gassing test in an apparatus devised by Mr. Hullett to give constant pressure to the gas evolved by the yeast during fermentation. Since sprouting injury is due to dextrinization of the starch, the amount of dextrinization is being measured in doughs kept at oven temperatures. A refractometer is being used, but a perfectly suitable instrument has not been available in New Zealand.

Gluten Tests.—These tests were concerned with starch changes, and have diverted our attention from what is usually the more urgent problem—*viz.*, gluten quality. Arrangements have been made, however, to resume work on this matter. There is on order a farinograph costing £400, and a gluten washing machine for the Berliner, and Koopman test. It is hoped that these pieces of apparatus, with the gassing tests, will indicate the directions in which flours are weak and strong, and will therefore be of greater assistance in blending than the straight baking test has been.

Lemon-juice.—The work of Jorgensen in Denmark showed that vitamin C added to doughs has the same effect as bromate, probably in inhibiting the proteolytic enzymes that attack the gluten during fermentation. Since the use of bromate is prohibited in New Zealand this seemed to have an important bearing in our baking practice, and Mr. Hullett tried the effect of vitamin C on our breads, with good results. Since pure vitamin C is an expensive substance, Mr. Hullett then tried natural sources of the vitamin and found that lemon-juice in very small quantities made a marked improvement on the loaf, at a negligible cost. The use of lemon-juice in breadmaking is now adopted by several bakeries.

WHEATGROWING PRACTICE.

Investigations have been continued into wheatgrowing practices with the object of cheapening production.

- (1) The Government Statistician has been good enough to furnish, for the third year in succession, details of yields of wheat by counties and varieties. These details have been analysed, and information is being built up on the most productive varieties for the same districts.
- (2) A questionnaire on wheatgrowing practices was sent out to young farmers' clubs, and useful information was obtained.
- (3) A survey of wheatgrowing practice in the Ashburton County is being made by an honours student of Lincoln College. The survey is being guided by the Institute, and its results will be available for our records.
- (4) For the third year in succession a trial of the effect of feeding-off wheat by sheep was made by Lincoln College and the Institute in conjunction. The results show either no increase or a diminution of yield consequent in feeding-off, so that one is now able to say that wheat should not be fed off except for some definite purpose—*e.g.*, to supply feed urgently required by sheep, or to prevent the wheat from lodging.
- (5) Soil-moisture determinations during the growing season of the wheat have been made for the fourth year in succession with the object of correlating soil-moisture with wheat-yield. The results are promising.
- (6) An experiment on soil-moisture and wheat-yield has been conducted for the third year in succession by growing wheat in plots with controlled soil-moisture. This season's results indicate very clearly that adequate soil-moisture in October is of the greatest importance, in January less important, and in the other months—September, November, December—quite unimportant within the limits to which our soil-moisture is ever likely to fall.

CO-OPERATION WITH THE DEPARTMENT OF AGRICULTURE.

The Department of Agriculture has continued to be of the greatest assistance to the Institute both by making variety trials in all parts of the country and certifying wheat-seed, and also by allowing its officers to act on the Specialists' Committee which discusses the kind of experiments that should be conducted.

PHORMIUM RESEARCH.

(REPORT OF WORK AT THE MASSEY AGRICULTURAL COLLEGE.)

(By Dr. J. S. YEATES.)—

The past year has been an eventful one in this work in that operations have been extended to larger-scale planting. In May and June the planting of some 25 acres in the Easton area near Shannon was completed. The total area of land leased for this work is approximately 70 acres, and it is intended to plant the remainder when plants of the right types are available. The varieties now planted are mainly Ngaro, which covers about 20 acres. The remainder is made up of varieties S.S., No. 22, and No. 37.

The Easton area represents an attempt to overcome the most difficult stage in applying plant-breeding results—namely, the transition stage between the nursery and the commercial plantation.