Wheat-breeding.—Two new varieties bred by the Institute are now being distributed. The first is WRI-Yielder, which in thirty-seven trials conducted over the last seven years gave yields higher than those of Cross 7 by 4½ bushels per acre. The first commercial increase area (of 8 acres) will be sown in South Canterbury this autumn from seed supplied by the Institute. Four areas of the second new variety, Hilgendorf, were grown by farmers, all of whom were well pleased. One of the outstanding features of the new wheat is its early maturity; baking-quality and protein content of trial samples were again better than Cross 7.

New lines under test include 192,01, which so far has outyielded Cross 7 by a substantial margin.

Cereal Chemistry Milling and Baking.—Full-scale commercial milling and baking trials of Hilgendorf flour were made this year, using 25 per cent. of the new flour blended with ordinary flour. The general opinion formed is that the new wheat will make a marked improvement in the palatability and keeping-quality of the country's bread, being particularly valuable for week-end bread. One hundred and seventy sacks will be available for distribution for trails in the coming year.

Chemical and Research Work.—The investigation into the factors responsible for the dark crumb colour of bread from 80 per cent. extraction flour has been continued and widened to include other aspects of flour quality.

Routine testing of wheat and flour for millers and bakers has increased, due to difficulties associated with 80 per cent. extraction flour.

The Institute has assisted the Wheat Committee in its control of flour quality.

Two short courses for bakers were held during the year.

CAWTHRON INSTITUTE

The following reports relate to land-utilization, chemical work, and tomato investigations carried out by the Institute. Other work is published under the headings "Tobacco Research" (see p. 16) and "Fruit Research" (see p. 11), while entomological work is included in the report of the Entomology Division (see p. 30).

Land-utilization.—Mechanical and chemical analyses of soil samples from the Tapawera locality have now been completed, enabling soil maps to be drawn. Soil mapping of the Stanley Brook locality has been commenced, this being the last tobacco area in the Waimea County which remains to be completed. Tobacco soil maps of these areas should be available shortly.

The reconnaissance soil map of the Waimea County has been revised and will shortly be published with an account of the major soil types.

Plant-food Status of Tomato Soils.—Detailed studies have been continued on the effect of steam, chloropicrin, and D.D. on the nitrogen and base status of tomato soil subject to these treatments. It would appear that the three treatments produce conditions in the soil favouring an ammonia nutrition of the tomato plants, as compared with nitrate nutrition on the unsterilized soil.

Tests with Steam and Soil Disinfectants on Yield of Tomatoes.—Results of previous years were largely confirmed. D.D., formalin, and Gammexane gave poorer results than steam and chloropicrin.

Effect of Compost and other Materials on Tomato Yield.—Compost again gave outstanding results. Cocoa-bean husks were also beneficial.

Tomato "Cloud."—Studies on the incidence of "cloud" in Nelson tomato-houses have been continued, and some new varieties obtained from Cheshunt Tomato Station in England were tested for susceptibility to "cloud." Much valuable information has been accumulated concerning the soil moisture and air temperatures favouring "cloud," but further work is necessary before a full answer can be given.