

in the farmer's field became unfit even for feed purposes. Most of the ventilated line was entirely fit for feed, and a portion of it which was mouldy was expected to be usable after machine cleaning. Even better drying effects could be achieved by a rearrangement of ducts which was suggested by the results obtained.

This experience demonstrated the feasibility of saving wheat endangered by accidents such as flooding and that the equipment can be quickly and cheaply improvised.

This trial was the outcome of experiments made in 1938 with wheat containing 18 per cent. of moisture, and in view of the success achieved this year it is intended to proceed further, but more especially in the treatment of lines of wheat with from 18 per cent. to 20 per cent. of moisture, a number of which are encountered in many seasons.

Wheat Storage in Southland.—Wheat-drying in Southland presents special problems owing to the lateness of the harvest season and the high air humidity. Observations on stacked lines and on wheat in open trays showed that the rate of drying in stacks on the farm is very low. Where the wheat cannot be brought into dry condition before the winter, it seems doubtful whether it is worth while attempting to decrease the moisture content by keeping wheat in stacks over the winter and early spring. It was found that drying-conditions were much more favourable in the Dipton-Winton area than in Invercargill.

NUTRITIONAL WORK

Vitamin Content of New Zealand Wheat and Flour.—Samples of the wheat used and the flour manufactured from many flourmills have been analysed for thiamin (Vitamin B₁). A series of samples from twenty mills received in the second half of 1944 showed that average thiamin content of the wheats was 4.5 micrograms per gram, while that of the flours was 1.5 micrograms per gram. In 1944, therefore, New Zealand flour had 50 per cent. more thiamin than British pre-war flour and half that of the present British national flour. Investigations aimed at raising the thiamin content of New Zealand flour are in progress.

Milling of High-vitamin Flour. It was previously reported that, at the request of the Department of Health through the Nutrition Research Committee of the Medical Research Council, the milling of high-vitamin flour on a commercial scale was to be attempted and that preliminary studies and analyses of mill products were in progress for that purpose. This work revealed, however, a much easier mode of approach to the problem and made inadvisable an immediate large-scale experiment. It was found that certain mill streams at present going to pollard contained a relatively large proportion of the total thiamin in the wheat, and that the thiamin was present not on the branny part of the pollard streams, but in products which could possibly be added to flour and which could be separated mechanically. The work was therefore centred upon the method of treatment of the pollard streams to facilitate the separation of the valuable portions.

A new milling-machine has been designed and its prototype used in a commercial mill for some weeks. Another improved model is now to be made with sufficient capacity to permit a full-scale trial.

Small-scale experiments have shown that the new method should enable the thiamin content of New Zealand flour to be raised to about double its present value. The yield of flour would be raised by 2 per cent. or 3 per cent. The effect of the additions on the breadmaking quality of the flour and on the crumb colour of the bread has been slight.

Part of the expense of the commercial trials will be borne by the Department of Health.

EXTENSION WORK

As in previous years, the Institute has continued to collaborate with the Wheat Committee, with the organizations of farmers, millers, and bakers, with the Armed Forces, and with many individuals and firms in the industry. A number of addresses were given to various organizations. In the awkward harvest season of 1945 the advisory and testing activities—especially on behalf of flour-millers and bakers—have been called upon to a greater extent than ever before. The travelling baker continued to visit numerous bakers throughout the Dominion.

CAWTHRON INSTITUTE

Director: Sir T. Rice

Assisted by grants from the Department of Scientific and Industrial Research, the Cawthron Institute has carried out investigational work connected with soil survey, mineral-deficiency problems, and fruit and tomato research. In addition, the Institute has co-operated in the work of the Entomology Division of the Plant Research Bureau (see p. 28) which is located at the Cawthron Institute, and in collaboration with the Tobacco Research Station has been responsible for the conduct of work relating to the tobacco industry (see p. 36).

Other research work conducted by the Cawthron Institute is reported below under the headings Soil Survey, Tomato Investigations, Fruit Research, Cobalt Investigations, and Magnesium Investigations.

SOIL SURVEY

Soil-survey work has been curtailed owing to the absence of several members of the staff with the Armed Forces.

Land Utilization.—A land-utilization map covering the Brightwater-Spring Grove sector of the Waimea Plains has been prepared. Much of the land is devoted to arable farming with small acreages of tomatoes, hops, orchards, and tobacco.

Chemical Work.—The routine examination of soil samples collected in connection with the soil surveys of the Waimea Plains has proceeded steadily.

Further work has been done on the effect of steam sterilization and formalin treatment on the nitrogen status of Nelson tomato soil under glasshouse conditions. Both steam and formalin treatments resulted in a rapid increase in ammonia nitrogen. Nitrate nitrogen, on the other hand, was at a lower level than in the untreated soil. On the 11th August the figures for ammonia nitrogen were: formalin, 29.8 p.p.m.; steam sterilized, 35.1 p.p.m.; and for untreated, 18 p.p.m. On the