

was high, belying its appearance. I had an opportunity of seeing samples of this wheat exhibited by different States at the Panama Pacific Exhibition, and also saw it in considerable bulk being made into flour in the Palace of Food Products at the Exhibition by the Sperry Flour Company, who have many flour-mills throughout the States, and had a large mill erected and worked during the Exhibition season within the Palace of Food Products. The sample of Red Turkey wheat they were milling had the same thin shrivelled appearance as that grown in New Zealand, although in weight per bushel it was heavy.

Attached to the Sperry Flour Company's exhibit was a laboratory equipped with the most up-to-date appliances for chemically testing wheats and flours, and also for baking-tests. The company's chief chemist, Mr. B. Ingels, expressed a desire to test the New Zealand wheats on exhibition for comparison with the American wheats in regard to quality of flour for bread-baking. The following is his report and analysis:—

"Attached herewith please find tabulation of the results of our tests on eight New Zealand wheats, which you submitted, as compared with four wheats which we use in our mill here. We have arranged these tests according to our ideas of the value of these wheats for milling purposes. More especially are they arranged as regards their value for breadmaking purposes rather than their value for making high yields. This is on account of it being more difficult and more important to get wheat of high breadmaking characteristics than it is to get wheat of high yielding-value. We also made complete chemical analysis of these samples, and the results as tabulated take into consideration the chemical tests and are arranged accordingly. Trusting that this information may be of value to you, &c."

TABULATION OF TESTS OF NEW ZEALAND WHEATS.

Variety.	Percentage Absorption.	Percentage Wet Gluten.	Colour of Gluten.	Quality of Gluten.	Volume of Loaf.	Colour of Loaf.	Texture of Loaf.
<i>American-grown.</i>							
Kansas Turkey Red ..	61	34.9	Very good ..	Very good ..	2175	Good ..	Very very good.
Idaho Turkey Red ..	60	28.5	Slightly yellow	Slightly soft ..	2125	Very good ..	Fair.
Washington Blue-stem	58	26.7	Good ..	Very good ..	2100	Very good ..	Very very good.
Californian Blue-stem	58	22.5	Slightly yellow	Very good ..	2025	Very good ..	Very very good.
<i>New-Zealand-grown.</i>							
Velvet Ear ..	58	25.0	Good ..	Good ..	1925	Very very good	Very good.
Bob's ..	58	23.5	Good ..	Good ..	2050	Very good ..	Good.
Pearl ..	57	22.0	Good ..	Slightly soft ..	1900	Very very good	Very good.
Marshall's ..	55	21.2	Slightly yellow	Good ..	2000	Good ..	Fair.
Red-chaff ..	52	21.8	Good ..	Good ..	1950	Very good ..	Fair.
Purple-straw ..	55	24.2	Slightly yellow	Good ..	1875	Very good ..	Fair.
White-straw ..	53	23.9	Slightly yellow	Good ..	1850	Good ..	Poor.
Bordier ..	55	21.7	Slightly yellow	Soft and sticky	1800	Good ..	Poor.

With regard to the foregoing tests it is well to know that two of our best New Zealand varieties of wheat—viz., Velvet Chaff and Solid Straw Tuscan—were not represented; also that the New Zealand wheats grown in 1913-14 were not up to the average quality owing to unsuitable weather experienced during the growing and ripening period.

Velvet Ear, which heads the New Zealand varieties in the test, is a variety much grown in Southern Otago, and usually sown as a spring wheat. It somewhat resembles Velvet Chaff, a winter variety, but the heads differ. In Velvet Ear the head tapers towards the point, whereas in Velvet Chaff the head is square or larger at the point.

Most hard wheat in America is produced in regions of less than 35 in. of rainfall and where early summers are subject to drought. When hard wheats are grown under more humid climatic conditions the berry becomes much softer in texture, and this softening tends to develop a large percentage of soft yellow kernels known as "yellow berries." This mixture of hard and soft kernels is difficult to mill properly, hence wheat of this kind never commands a high price. In many of the States soft wheats are grown, and flour produced from these sells at a premium.

From observations it is apparent that if millers and bakers in New Zealand are satisfied with the quality of the wheat now grown and flour produced therefrom, and are not prepared to differentiate sufficiently in price between hard wheats with a higher percentage of protein but low in yield of grain per acre and soft starchy wheats with a high yield of grain per acre, farmers are not likely to alter but will continue to grow the wheats that pay them the best.

No better plan has been devised for discovering the most suitable cereals to grow in any locality than that of the variety test, and no grower of wheat or other cereal should long remain in doubt as to whether he can increase his production or not when he has at hand so simple a method as that of securing a number of varieties considered suitable of each, whether of wheat, oats, or barley, &c., and growing them in small plots of about one-fortieth acre each, a test which should be continued for at least five years. In this way the farmer will discover for himself which variety or strain is best adapted to the soils of his farm, climatic conditions, and environment.

There is ample room and abundance of opportunity for increasing our average yield and production of cereals in the Dominion. More attention should be given to soil-improvement and better cultural methods, the selection and propagation of meritorious types of grain, and breeding for hardiness and increased yield of superior quality by artificial fertilization of individual