

MICHIKOFF WHEAT.

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The application of science to the creation of new types and varieties of plants has been a fruitful field of service to agriculture. Developments along this line have been of far-reaching economic importance. Many millions of dollars annually have been added to the income of farmers by the use of varieties of crop plants adapted to particular conditions by scientific methods of breeding. The plant breeder is no longer looked upon as a wizard. He is simply one of many who have learned to apply science in their particular line of effort. Plant breeding is now a practical science. By segregation and recombination of genetic factors in plants, the scientific plant breeder can produce, almost at will, any desired form. He is limited only by the bewildering mass of material at hand and the intricate relations of plant characters to environmental factors.

A noteworthy contribution to the list of valuable varieties of wheat has been made recently by the Purdue University Agricultural Experiment Station in the production of Michikoff, a new hard red winter wheat adapted to the climate of Indiana and capable of producing a grain equal to the hard wheats of Kansas and the Northwest.

Millers and bakers who have given Michikoff a thorough trial say that it is fully equal to the standard hard red winter and spring wheats in both milling and baking qualities. Several mills are now regularly supplying a large number of bakeries with Michikoff flour. The advantage of this wheat to millers, bakers and the consumers of bread lies in the saving of heavy freight charges on hard wheats or hard wheat flours from distant parts of the country. Indiana people are more and more demanding bread made from hard wheat flour. Heretofore, Indiana has not been able to produce hard wheats of the required quality. Consequently a heavy expense has been incurred in transporting hard wheat or hard wheat flour into the state and a corresponding expense in shipping out that much soft wheat that is not wanted. Of course, the consumer pays the bill.

Michikoff wheat (Purdue No. 14C-5-3-5) came from a third generation selection out of one of several crosses between Michigan Amber and Malakoff, the latter being the male parent. The cross was made in 1912 and the final selection in 1915. The name Michikoff was derived by combining the first five letters of the name of the female parent with the last four letters of the name of the male parent. Michikoff does not resemble either of its parents. The mature plant has a rather short stiff white stem and a short fairly compact smooth white-chaff beardless head which droops slightly when ripe. The kernel is short and plump, red in color, and quite hard and glutinous. It is excellent in winter hardiness and is especially well adapted to the loose black soils but does well also on the heavier dark colored soils.

The thing that makes Michikoff wheat of special scientific interest is its ability to maintain its original hardness and high quality of gluten in this part of the country. Heretofore it has not been possible in Indiana, or in fact anywhere east of the semi-arid belt, to grow hard winter wheats that would yield a flour satisfactory for bread making. Ever since the establishment of hard red winter wheats in the United States efforts have been made to grow them outside of the semi-arid portions of the country to which they are especially adapted. Their winter hardi-



Michigan Amber
(Female parent)

Michikoff

Malakoff
(Male parent)

Fig. 1. Typical heads and kernels of Michikoff wheat and its parents.

ness particularly attracted the attention of farmers in the central portion of the corn belt, especially on the prairies, where the common winter wheats were not found to be sufficiently winter hardy. So far as winter hardiness and general yielding ability are concerned they have met the requirements remarkably well but the quality of the grain has not been maintained. In Kansas and neighboring semi-arid country, these hard red winter wheats produce a quality of grain almost equal to the hard spring wheats of the Northwest for bread making purposes. In the corn belt, however, the more humid climate seems to be unfavorable to the

quality of hardness in these wheats. The kernel produced is much softer in texture and both the quantity and quality of the gluten are inferior. As a result it has been generally believed that hardness in these wheats is a function of climate and that the humid portions of the country never could produce a good quality hard wheat. The Michikoff wheat has upset this theory. It originated as a hard wheat, adapted to this climate at the beginning, and now at 12 years of age is as hard as ever. Furthermore, it meets the requirements in winter hardness for which the Kansas hard wheats have been introduced.

Michikoff was first distributed to a few farmers in 1920 when about 100 bushels of seed was available. The resulting crop was practically all used for seed in 1921 and again in 1922. Last year considerable quantities of this wheat became available to millers and commercial milling and baking tests were made with such satisfactory results that several millers began paying premiums for all the Michikoff available. This year there were some 40,000 acres of this wheat harvested and another large increase in acreage was seeded this fall.

The following table shows how Michikoff compares with the standard hard and soft wheats in milling and baking tests made on wheats of the 1923 crop. Comparison samples of Michikoff and some common wheats were secured from each of nine different sections of the State so that the tests might be fairly representative. The averages only are shown in the table, along with the accepted standards for soft winter, hard winter and spring wheats.

TABLE 1. COMPARISON OF MICHIKOFF WITH STANDARD HARD AND SOFT WHEATS IN MILLING AND BAKING QUALITIES.

KIND OF WHEAT	Absorption %	Loaf volume, cc.	Texture	Color	Dry gluten %
Michikoff, av. 9 samples.....	61.3	2173	98.3	cr. white	11.4
Common wheats, av. 9 samples.....	57.5	2021	97.0	cr. white	9.3
Soft winter, standard.....	55.9	2050	98.0	cr. white	9.3
Hard winter, standard.....	59.1	2160	99.0	cr. white	10.7
Spring wheat, standard.....	60.0	2200	99.0	cr. white	11.2

