

**BULLETIN NO. 23. U. S.
DEPARTMENT OF AGRICULTURE.
DIVISION OF BOTANY. RUSSIAN
CEREALS ADAPTED FOR
CULTIVATION IN THE UNITED STATES**

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MARK ALFRED CARLETON

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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF BOTANY.

RUSSIAN CEREALS

ADAPTED FOR CULTIVATION IN THE
UNITED STATES.

BY

MARK ALFRED CARLETON.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1900.

NOTE.

In securing the importations referred to in the text, Mr. Carleton's itinerary was as follows: He set out from Washington July 4, 1898, his route lying through New York and London. On the European Continent he first visited a number of points in Sweden, Germany, Austria-Hungary, and Roumania. From Constanta, in Roumania, he crossed the Black Sea by steamer to Odessa, first entering Russia at that point August 22. Ten days were spent at this important grain port. After this his visits were as follows: Morčarovka (Kherson Government), September 3; Kief, September 5 to 8; Moscow, September 12; Samara, September 18 to 23; Orenburg, September 24 to 26; Samara, September 27 to October 1; Ufa, October 2 to 4; Moscow, October 8 to 18; St. Petersburg, October 19 to November 2; Moscow, November 3 to 20; St. Petersburg, November 21 to December 1; Moscow, December 2 to 8; Marie Experimental Farm, December 9; Saratof, December 10 to 15; Rostof-on-Don, December 17; Petrovsk, December 20; Tiflis, December 23 to 26; Batum, December 27; Sukhum-Kale, December 28 to January 1, 1899; Novorossisk, January 2; Ekaterinodar, January 3 and 4; Odessa, January 7 to 15; Warsaw, January 17 to 20. Returning by way of Berlin, Bremen, Paris, London, and Liverpool, he arrived at Washington February 18, 1899.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF BOTANY,

Washington, D. C., November 1, 1899.

SIR: In connection with the recent discussion of a prospective shortage in the wheat supply of the world within the next generation, some statistics of immediate concern to this country have been brought out, showing the probable relation of the grain supply of the United States to our domestic consumption at the end of that period. An estimate has been made by Mr. John Hyde, statistician of the Department of Agriculture, that by the year 1931, on the basis of the present per capita consumption of cereals and the present product per acre, with a normal increase in population, the United States will require for home consumption all the cereals and hay we now consume and export, besides all that can be raised on about 150,000,000 acres additional to the present area devoted to these crops. There can be no question that the product per acre in the area now devoted to grain will be increased by the development of superior strains and superior methods of culture; but this method of adding to our grain crop will probably be offset by a demand for a larger area for fruit and vegetables.

It is clear that our domestic needs and the call for export grain will demand an enormous increase in cereal acreage. Where are we to find this land? A small portion of it only is to be found east of the Mississippi River. The remainder must come from the 600,000,000 acres of unimproved land in the arid-land States. The most liberal of reliable estimates places the irrigable lands in this area at about 70,000,000 acres. From the remaining 530,000,000 acres must be drawn most of the land that we require, and this land is too dry or too cold for the cultivation of the ordinary cereal crops.

During the past decade great advance has been made in introducing into the arid region drought-resistant varieties of grain and grass which would mature a crop where ordinary varieties failed. From 1888 to 1893 the Division of Botany maintained an experiment in western Kansas, one of the results of which was to demonstrate the success of Kafir corn as a grain and forage crop in an immense subarid area where Indian corn was either a total failure or a precarious crop. In 1893 the value of the Kansas crop of the different varieties of Kafir

corn was \$653,120; in 1894, \$813,156; in 1895, \$2,079,286; in 1896, \$3,599,646; in 1897, \$4,275,774; in 1898, \$5,842,682. The experiments showed also that Turkey wheat was one of the most drought-resistant varieties known in the West, and in the past few years it has become widely cultivated in the Great Plains. It is clear that one of the greatest possibilities of expansion in our cereal industry lies in the direction of securing new drought-resistant varieties with which to extend the cereal-producing area farther and farther into the arid region.

Mr. Mark Alfred Carleton, who has been engaged for several years, under the direction of the Chief of the Division of Vegetable Physiology and Pathology, in an investigation of wheat varieties with reference to their improvement, was detailed in July, 1898, as an agricultural explorer of the Section of Seed and Plant Introduction. From that time until his return to Washington, in February, 1899, Mr. Carleton was engaged in an investigation of the cereals of Russia suitable for introduction into the United States, especially those adapted to the rigorous conditions of the arid West. It has seemed desirable to publish a detailed account of the cereals thus secured, both as a matter of record and for reference by experimenters. The accompanying report has been prepared with this in view, and its publication as a bulletin of this division is recommended. It is believed that before the end of a decade some of the cereals enumerated in this report will have become established and important factors in the extension of the American grain-producing industry.

Respectfully,

FREDERICK V. COVILLE,

Botanist.

Hon. JAMES WILSON,
Secretary of Agriculture.

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RUSSIAN CEREALS ADAPTED FOR CULTIVATION IN THE UNITED STATES.

INTRODUCTION.

For some time there has been a growing inclination among American agriculturists toward the more general use of Russian economic plants, especially of cereals, forage crops, and fruits. In some instances the cultivation of Russian cereals has gone on many years without any knowledge, apparently, on the part of the growers that they originally came from Russia; as an excellent example, the red winter wheat, commonly called Turkey wheat, may be mentioned. This very hardy sort has been grown in certain portions of the Great Plains for more than twenty-five years. More recently the use of this variety has become very extensive, and fresh importations of seed have been made at different times. At present it is probably the most highly prized variety in the hard winter wheat belt, its value being most apparent in years of extreme drought or cold. It is then often the means of saving certain districts from total failure of crop. The name, however, is misleading, and few people know that it is a native of the Crimean region of Russia. Similarly the evidence is rather strong that the entire group of Fife wheats, upon which is founded the immense wheat and flour production of the Northwest, came originally from Russia, and are not of Scottish origin, as many suppose. Therefore, the Fifes of the Red River region simply compete annually in the English market with their own race, the Ghirkas of the Volga region. So also Ames, Meekins, Grass, Black Sea, Mennonite, Ladoga, etc., are all simply special names of varieties of Russian origin, though usually not known to be such. The same thing is true in regard to some excellent sorts of oats. If a grower finds a variety well suited to his needs, he usually cares little to know its pedigree.

The experimenter, after giving years of study to the subject, learns that the great majority at least of introduced sorts that do best in his own region have uniformly originated in regions having similar soil and climate. In the case of Russian cereals introduced into this country, such parallelism is found to be especially striking. A series of field experiments, beginning with nearly 1,000 varieties of wheat,