



Heartland Science



Ohio's Legacy of Discovery & Innovation



Agriculture & Food

From Aquaculture to Hot Dogs

The Durham Wheat Industry

Mark A. Carleton, a native of Jerusalem, Ohio, in the late 1800s brought back to the United States seed from hardy varieties of disease-resistant "durham" wheat growing in harsh climates in Russia. Carleton's work started the United States durum wheat industry, allowing farmers to grow wheat on vast expanses of land in the Great Plains that were too cold and dry for traditional varieties.



Carleton worked for the U.S. Department of Agriculture (USDA) in the 1890s, when scientists were concerned that population growth would outstrip wheat production. Some believed that widespread food shortages would occur by the 1930s unless researchers found ways of increasing wheat production. So in 1898, the USDA sent Carleton on expeditions to Russia to search for new varieties of wheat that yielded more bushels per acre, produced good crops despite drought, and resisted damaging diseases.



In 1899, he brought back seeds of Kubanca, spring wheat that started the United States durum wheat industry. "Durham" comes from a Latin word meaning "hard" and the new wheat had a very hard grain. A year later Carleton returned to Russia, coming home this time with a hard winter wheat called Kharkov that also became popular. Farmers plant "spring" wheat in the spring and harvest it in autumn. "Winter" wheat goes into the ground in the autumn, and is ready for harvest the following spring. USDA appointed Carleton chief of its Office of Cereal Investigation, where he was responsible for other innovations in grain cultivation. He helped make the Sixty-Day oat the most popular variety grown in the U.S., for instance, and introduced winter barley cultivation to the Midwest.

Mark Carleton was not the first person to bring those new wheat seeds to the United States. In the 1870s, for instance, Mennonite immigrants came to the United States with seeds of hard winter wheat. However, almost nobody knew about it, or the benefits of switching to the new wheat. Carleton, in contrast, followed up with a relentless campaign to convince farmers, millers, and consumers that his new wheat was superior.



Wheat Factoids

Wheat comes in 2 major types, winter wheat and spring wheat.

- Winter wheat is planted in the fall, goes dormant during the winter, starts growing again in the spring, and is harvested in the summer.
- Spring wheat is planted in the spring, grows throughout the summer, and is harvested in the fall.

The United States produces 5 main classes of wheat, named according to the color of its kernels. Each needs a specific set of growing conditions, is grown in a specific region, and has its own special uses.

- Soft red winter wheat grows in the eastern third of the United States and is used in cakes, cookies, crackers, snack foods, and pastries.
- Hard red winter wheat grows in the southern and central plains and accounts for most of the wheat produced in the United States. Its flour is used mainly in bread.
- Hard red spring wheat and Durham wheat are both grown in the northern plains. Flour from hard red spring wheat makes bread, while Durham wheat flour makes spaghetti, macaroni, and other pasta products.
- White wheat grows mainly in the Pacific Northwest, and is used much like soft red winter wheat.