

Wheat farming in Kansas: a variety of ways to succeed

BY MIKE COURSON
Farming: bury a seed in the ground, add water and sunlight and watch it grow. If only it were that simple. Wheat farming in the 21st century is a highly complex business. Beyond all the complications that can wipe out a wheat crop - disease, drought, hail, fire to name a few - choosing the right variety can also determine a crop's success.

"Farming is very independent," said Alicia Boor, agriculture and natural resources agent with the Barton County K-State Research and Extension Office. "Every decision a farmer makes can affect him later on. They have a lot of choice in what they decide to plant, what they decide to buy or hold back. There is a lot of decision making in farming."

Crops then and now
Wheat farming is an ever-changing industry. A report from the United States Department of Agriculture (USDA) and National Agricultural Statistics Service (NASS) suggests wheat may have been planted in the area as early as 1839.

The Kansas State Board of Agriculture (KSBA) was created in 1872 and compiled extensive statistics on wheat farming in the state. With two entities doubling up on work and sometimes creating conflicting statistics, the KSBA merged its

functions with the USDA to create the NASS.

Records indicate the original farms in Kansas were small and inefficient. In 1866, the first year on record, some 68,000 acres were harvested with an average yield of 19 bushels per acre. Though the number of acres greatly expanded over the next several decades, peaking at 6,880,000 acres in 1907, yields were even lower, often in the range of 12-15 bushels per acre.

The harvest was hit hard in 1951. Of 14,773,000 acres planted, only 9,701,000 were harvested, the lowest figure in 11 years. The next year proved to be one of the best with 14,649,000 acres harvested at a yield of 21.0 bushels per acre, a record at the time.

Yields again fell off for the most of the 1950s but picked back up in 1958 with yields of 28.5 bushels per acre. For the most part, yields have trended upwards since, hitting 34.5 in 1971, 41.5 in 1983, and 49 in 1998.

Today, yields continue to increase. With rain coming at just the right time over the past several months, many farmers around Kansas are reporting yields of 60-65 bushels per acre.

Science makes the seed

Not all wheat is created equal. The original crops likely have very low yields. "Wild wheat

looks completely different than domesticated wheat," Boor said. "It's from the Southwest Asia area and humans, as we migrated, brought it with us."

Farmers and scientists began to produce a better crop. By breeding different strains of wheat, yields have increased. Susceptibilities to disease have decreased.

Even the manner in which new varieties are created has improved. It used to take farmers and scientists more than a decade to develop a new variety and produce enough seed to plant. Now, with the use of double-haploid breeding, the process can be cut down to about six years.

"Instead of having to plant and harvest, plant and harvest, plant and harvest, you're able to get offspring to closely resemble the mother plant in about 11 months instead of four years," said Marsha Boswell, director of communications for Kansas Wheat.

"The huge benefit of the double-haploid is it takes time out of the wheat-breeding process. The typical process is maybe 10-12 years. With the double-haploid process, they can get it done in about half the time. It gets those new genetics out to farmers that much more quickly."

Inside the Kansas Wheat Innovation Center in Manhattan is a business



called Heartland Plant Innovations. They do the double-haploid work that essentially involves emasculating the wheat from a desired line to prevent cross-pollination. The plants are then tricked into believing they have been fertilized. The resulting embryo will contain genetic information only from its mother plant.

"In order to that in the field, they have to back cross it with the mother plant for a number of years," Boswell said. "With the double-haploid process, they're able to do it in less than a year."

The double-haploid process produces just a small number of seeds. Those seeds are sent back to a wheat breeder who may or may not further the process of developing the line. Though HPI successfully crosses a line about 98 percent of the time, not all of those lines will be deemed desirable and make it into the fields. More desirable lines continue on to the increasing

process: the small number of seeds are planted and harvested. The process is repeated several times with each seed creating more seeds with each harvest. Certified seed growers ensure the line stays pure.

An ongoing process

There is always room for improvement in science. Around the state, farmers and scientists continue to work on improving the wheat crop. This year, Boor worked two experimental varieties in Barton County - one near Galatia in the northern half, and one on Radium Road in the southwestern corner.

"It's not quite as technical as what Dr. Erick De Wolf with the Kansas State Plant Pathology Department would do," she said. "We watch how they grow. When we were really dry, I went out and took photos to show how each one was varying in the drought conditions we had, to see if they would die out or if we would be able to harvest it."

"We went out and took photos of which ones were being affected by any kind of rust. I think both farmers sprayed their fields because they wanted the rest of their fields protected. After they sprayed the rust issue was no longer an issue we could

look at. During harvest we will take each variety individually and weigh it out to determine which one produces the most."

Choosing a variety

Farmers are able to take advantage of the science. Each year, the "Wheat Varieties for Kansas and the Great Plains" publication highlights the advantages and disadvantages of each variety available to farmers.

"A farmer would see what he wants out of the wheat crop," Boor explained. "Is he looking for a wheat crop that tillers a lot in the fall and spring so he can graze cattle on it? We've had stripe rust and leaf rust issues over the past several years. Does he want something with a high tolerance to that where he would not have to worry about spraying a fungicide as much as one with (a variety) that's more susceptible?"

The publication rates more than 40 varieties on 11 common diseases and 18 other factors, including acid soil tolerance, protein content, maturity date, milling quality, test weight, and overall yield record.

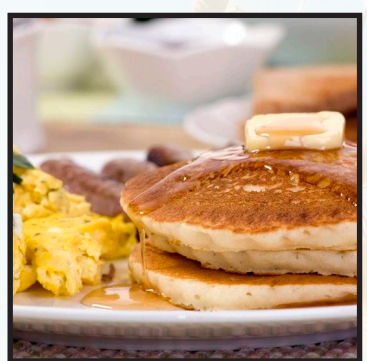
Everest remains one of the most popular varieties in Kansas. It is relatively resistant to many diseases but is susceptible to stripe rust and moderately susceptible to wheat streak mosaic.

"It remains one of the 'go-to' varieties for Eastern and Central Kansas," the publication says. "Everest will need to be sprayed for either stripe rust or tan spot if those diseases are a problem. In the absence of those diseases, it has very few other weaknesses in Central

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