KANSAS WHEAT
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Despite drought and disease, Kansas' 2015 yields higher than average.

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In 2014, total Kansas wheat production was 246.4 x 10^6 bushels, down 26% from the 2013 crop and the lowest in 25 years (1989). Yield was 28 bu/acre, 10 bushels below 2013 and the lowest since 1995.

After the record low 2014 wheat harvest, the 2015 crop was not shaping up much better. Autumn planting started with persistent dry conditions across the state. A delayed, autumn crop harvest set planting back even further. Then, over Veterans Day weekend in November, Kansas' state climatologist Mary Knapp explained that temperatures sank into the teens, causing some of the wheat crop to enter dormancy without sufficient root development. Jim Shroyer, K-State Research and Extension crop production specialist (retired), explained in November that the cold weather affected both wheat with excessive topgrowth and wheat that showed drought-stressed symptoms.

Winter brought a roller coaster of warm and cold spells, according to Knapp, and dry soil continued to limit development in many areas. The USDA National Agricultural Statistics Service (NASS) reported on 5 January that the winter wheat condition was rated 2% very poor, 7% poor, 42% fair, 45% good, and 4% excellent.

In late April, freezing temperatures hit the state, particular in south-central Kansas. Knapp explained that although these freezes were not particularly cold, the wheat crop was flowering and particularly vulnerable. By 27 April, the condition of winter wheat condition rated 11% very poor, 20% poor, 43% fair, 24% good, and 2% excellent. Winter wheat jointed was at 78%, ahead of 54% in 2014, and the five-year average of 68%. Headed wheat was at 18%, ahead of 4% in 2014, but near the 16% average.

Then the rain started to fall. The annual Hard Winter Wheat Tour was joined by rain as it moved across the state 47 May, 2015, taking measurements and making predictions. The official tour projection for total production numbers of hard red winter wheat to be harvested in Kansas was 288.5 x 10^6 bushels.

In May, just as the grain was filling, farmers across the state saw heavy rains. Knapp attributed the rains, in part, to moisture from the Gulf of Mexico mixing with cold fronts moving across the state that "opened a fire hose pointed north." According to the Kansas Weather Data Library, Kansas received 188% more moisture than normal in May, averaging 7.73 inches statewide.

By the end of May, the U.S. Drought Monitor listed just 6% of Kansas in moderate drought and 67% of the state as drought-free. However, wet soil, Knapp explained, helped create the right climatic conditions for thunderstorms to build and stay over a small geographic area. She added that these types of weather patterns also are conducive to creating hail, which severely damaged wheat in western Kansas, particularly in Kearney, Finney, and Haskell counties.

Rain also brought disease, stripe rust, leaf rust, and Fusarium head blight. On the annual Hard Red Winter Wheat Tour, Aaron Harries, Kansas Wheat vice president for operations and research, reported seeing stripe rust "in nearly every field we visited." In addition to stripe rust, head blight, and wheat streak mosaic, wheat head smut was found in the state for the first time in decades, initially detected in a field demonstration plot in Rooks County and confirmed by laboratory result during regular and on-going disease survey work. Additional survey teams scouted for the disease, locating it in several other locations. Wheat flag smut has potential yield and trade implications, but presents no human or animal health concerns, and has no impact on grain quality.

Despite the weather and its related effects, the wheat continued to fill and the combines started to roll; later and slower than normal but with better end results than in previous years for many farmers. Kansas farmer Chris Tanner's wheat near Norton did not have a good year, damaged by spring freeze, resurrected with May rainfall, and stricken with stripe rust. "The wheat was about two days from dying of drought when we hit the wet spell," Tanner said. "Then the rust came in bad when the flag leaf was fully emerged."

Luckily, Tanner made the decision to apply fungicide to his crop. His wheat yielded between 30 and 50 bu/acre with test weights of 59 to 62 pounds/bu, in contrast to producers who did not spray and ended the harvest season with yields ranging from 15 to 20 bu/acre with test weights of 46 to 55 pounds/bu.

In its June report, the USDA–NASS upped their forecast to 314.5 x 10^6 bushels in production; a 28% increase from the last year's drought-plagued crop. By 12 August, the USDA–NASS increased that projection, forecasting Kansas wheat production at 334 x 10^6 bushels, up 36% from last year's crop. Yield is forecast at 38 bu/acre, 10 bushels above 2014.

As planting season approaches, Kansas wheat farmers are being encouraged to select wheat cultivars with high resistance to fungal diseases as well as to apply fungicides to seed before drilling wheat this season. According to Jeff Vogel, the Plant Protection and Weed Control program manager for the Kansas Department of Agriculture, "Research has shown that the use of certified seed combined with fungicide seed treatments, is highly effective in preventing the spread of disease." He noted that producers and seedsmen should follow proper protocols to ensure that a thorough and even application of fungicide is made to the seed to ensure a high level of product effectiveness.

After years of drought conditions, farmers can reasonably expect more of that moisture to continue, thanks to the official El Niño pattern declared in April, according to Knapp, who also said if the El Niño pattern persists, most of Kansas will continue to receive more moisture throughout the rest of summer and into the winter, which would be good news for the 2016 Kansas wheat crop.

MINNESOTA

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Wheat rusts in the United States in 2014.

Small grain development and spring fieldwork in the Great Plains and to the east was generally delayed due to the unusually cool late winter and early spring weather. Ongoing drought conditions in many areas of the central and southern Plains were a significant constraint to small grain production and greatly limited development of rust diseases. Drought and freeze damage in early spring in the southern U.S. may have delayed rust development and spread in the spring. Significant rainfall occurred in many areas to the east in mid-June to early July. The widespread rain hampered winter wheat harvest in the South and limited fieldwork in other areas. In the Pacific Northwest, small grain development was somewhat ahead of the 10-year averages. Hot, dry weather dominated California and the Pacific Northwest areas.

Wheat stem rust (caused by *Puccinia graminis* f. sp. *tritici*). Wheat stem rust was not widespread or severe in the U.S. in 2014. It only was reported in nursery locations this season in Texas, Louisiana, Arkansas, Nebraska, Kansas, South Dakota, Minnesota, and Wisconsin. Wheat stem rust was first reported on 7 April at Weslaco in extreme southern Texas. Race QFCSC was the most commonly identified wheat stem rust race in 2014 and in recent years.

Rio Grande Valley, Texas. Wheat stem rust was found in sentinel plots of Morocco, Panola, Siouxland, and Line E at Weslaco in extreme southern Texas on 7 April 7. Severities ranged from <1% on Siouxland (stem rust pustules were found only on leaves) to 5% on Morocco with incidences from 10% on Siouxland to 90% on Morocco. Line E and Morocco were fully headed, whereas Panola and Siouxland did not completely vernalize. In previous years, barley, emmer, and triticale were used more commonly in windbreaks for watermelon, currently more sorghum or sorghum–Sudangrass is used. This was the first report of wheat stem rust in the U.S. in 2014.