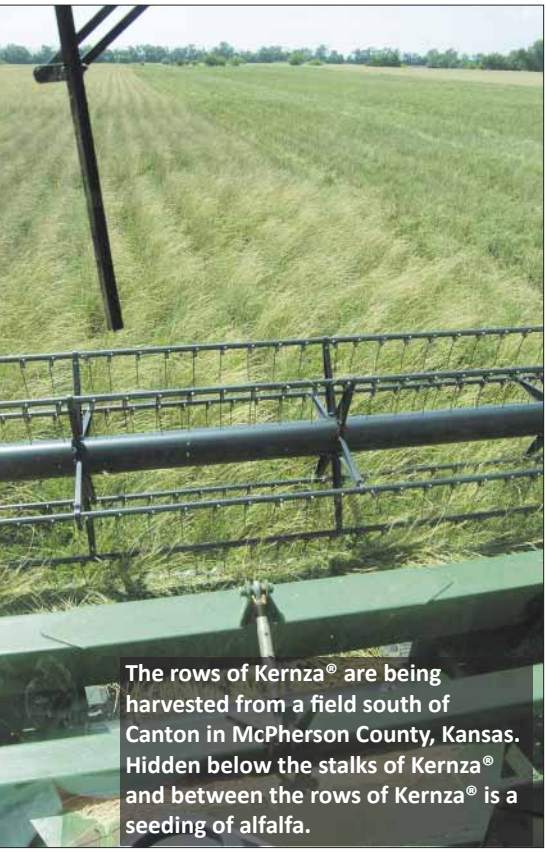
By Douglas Helmke, P.G., Water Rights/Source Water Protection Tech

Kernza® Makes Move to Viable Cover Crop

Heads of Kernza® grain stand tall above the alfalfa growing below. The combine is able to take the grain and leave the alfalfa for another day.



The rows of Kernza® are being harvested from a field south of Canton in McPherson County, Kansas. Hidden below the stalks of Kernza® and between the rows of Kernza® is a seeding of alfalfa.

In the November 2018 issue of *The Kansas Lifeline*, I introduced to the public water supply systems of Kansas a new grain crop that had the potential to impact agriculture by helping to control nutrient loss and soil erosion from farms. See web link: https://krwa.net/Portals/krwa/lifeline/1811/WheatCountyAlternativeCrop.pdf?ver=2018-10-25-231517-623.

While many of our readers have an agricultural background and some of those same people may consider themselves to be farmers, there may be just as many that don't have much knowledge or experience with agricultural systems, even if they consider themselves to be "rural". So for those that aren't familiar with cover crops, we'll start with a brief explanation of their use and the benefits farmers and others hope to achieve with their use, before we focus on the potential of Kernza®.

Cover crops are plants that are planted on fields to grow when the primary annual crops are not present. According to the latest data from the National Agricultural Statistics Service at the United States Department of Agriculture (USDA), there were 6.6 million acres planted to wheat, 6.1 million acres planted to corn, 4.75 million acres planted to soybeans and 3.0 million acres planted to sorghum in Kansas in 2020. Even though some of those acres may be counted twice (think soybeans planted after wheat harvest), that's still a lot of days of soil exposed in a way that didn't occur in the long history of our Kansas soils. Because these primary crops are annual plants that do not grow for 12 months, and because they do not provide much organic residue to protect the soil when there is not a desirable living plant present, there is a significant amount of time that bare

soil is exposed to the forces of nature. Cover crops can be thought of as "living mulch", to reduce the impact of raindrops (really), to slow runoff, to increase infiltration, to increase the organic matter in soil, to improve the biotic activity in the soil, to reduce weeds, to provide plants for grazing or harvesting, and the list continues. Having living roots in the soil more closely mimics the natural world of our original prairies, where all forms of biologic agents live in the soil continuously.

Research has been able to demonstrate the value of cover crops in many different soil types, with a variety of crops, and for different desired beneficial results. Almost all cover cropping practices put into place at this time involve the use of annual cover crops. That may be changing very soon, however. As mentioned earlier, Kernza® is being grown in Kansas, and not just at the Land Institute were plant breeding and research continues to make it an acceptable crop. Kernza® is a perennial Intermediate Wheatgrass that can be planted as a buffer, where grasses do not provide a direct economic return, and can be a viable plant for up to 5 years.

In the previous article, we explained that Kernza® produced a grain, which could be ground into flour and used in any number of bakery items. A quick Google search will reveal that a number of breweries are experimenting with Kernza®, even one in France. At least two breweries in Kansas have made beer with Kernza®.

The heads of Kernza® are not like those of the wheat or barley we know today, but more like those of many wild grasses. The Land Institute and the University of Minnesota hope to close the gap between Kernza® yield and the yield of annual wheat in the future with their plant breeding research.

Now four years later, research is continuing on breeding for desirable traits and the best ways to incorporate this perennial cover crop with primary crops. Additionally, two young men have started a business in Kansas to plant, nurture, harvest and market Kernza® for farmers. Sustain-a-grain, LLC (https://sustainagrain.com) is located in Lindsborg, but in reality, they are operating throughout central Kansas. Farms in Reno, McPherson, Marion, Saline, and Ellsworth counties are growing Kernza® and even some is being grown in Neosho County in southeast Kansas. Brandon Schlautman of Sustain-a-grain estimates that more than 750 acres of Kernza® is being grown commercially in Kansas. Minnesota has the most land growing Kernza® with approximately 1,300 acres. Nationally, only about 4,000 acres is planted to Kernza®.

The Kernza® being grown by Sustain-a-grain at this time is almost always grown in conjunction with either alfalfa or red clover. With more research and experimentation by farmers, new ways to incorporate Kernza® in cropping plans will be found.

Annuals: Plants that have an entire life cycle within a single growing season.

Perennials: Plants that can live through many growing seasons, often withstanding freezing conditions.

The equipment used to harvest Kernza® is not unlike the equipment used to harvest other small grains. The alternating rows of Kernza® and alfalfa are easily seen behind the combine. Sustain-a-grain currently stores the Kernza® they harvest near Hutchinson, Kansas.

Research completed by many different people has shown what was commonly believed about the benefits of the Nitrate efficiency of Kernza®. The living roots of Kernza® can nearly stop the leaching of Nitrate from the fields where it is applied. In Wisconsin, research has found that Kernza® has reduced Nitrate leaching by over 80%, when compared to corn and wheat. Benefits to both the farmer and water systems is that field buffers of Kernza® can continue to provide an economic return to the farmer / landowner while also reducing soil and phosphorus loss from fields. It is believed that recent harmful algal blooms (HABs) are partly the result of phosphorus entering surface water bodies like rivers and reservoirs. The potential of Kernza® as a buffer and cover crop has led the Cheney Lake Watershed, Inc. and the Cottonwood River Watershed Restoration and Protection Strategy (WRAPS) to promote Kernza® to protect water quality in Cheney and Marion Reservoirs.

Kansas Rural Water Association hopes to assist a public water system with the incorporation of Kernza® in their source water protection program. Please let us know if your water system wants to enhance the existing source water protection plan with a partnership with a Kernza® grower. We can also help develop a new source water protection plan for water systems without one. We're excited to become involved with this emerging crop and farming practice.

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