«« 2021 ANNUAL REPORT »»

Leading Through the **COVID-19 CRISIS**

Kansas State University | College of Agriculture

K-State Research and Extension

DEAR FRIENDS:

I'm excited to welcome in a new year confident that as science begins to prevail over COVID-19, taxpayer support and our careful planning will make it possible for us to continue to provide Kansans with all that we offer: top agricultural education, research and extension as well as a clear path to economic development.

The challenges brought by the pandemic are enormous for Kansas State University and most other higher-education institutions. Our response includes an aggressive planning process to explore options for strategic growth by increasing our research contracts, protecting our foundational strengths, and finding new efficiencies throughout the system.

During 2020, I was often reminded to never underestimate the power of the land-grant system and what it means to our citizens. Our country faced tremendous struggles – wildfires, business and industry shutdowns, farmers struggling to hold onto their land and livelihoods, disruptions in our food supply, school closures, inequality, and limited access to nutritious food for millions – and our faculty, community leaders and staff rose to each challenge. They found solutions and stepped up to bring change.

Over the last 150 years, the College of Agriculture has become one of the greatest ag programs in the nation. We've never been afraid of change or difficult decisions. Regardless of the situation, we will maintain our high standards, guard our reputation, and ensure our ability to serve Kansas and its citizens.

I hope you enjoy reading just a few examples of the work that began in 2020 within the college and K-State Research and Extension to advance agriculture and the lives of the citizens of our great state and country. We thank you for your support in making this work possible.

J. ERNEST MINTON, PH.D.

Dean and Director, College of Agriculture and K-State Research and Extension

STORIES OF PERSEVERANCE AND DETERMINED SPIRITS

ADVANCING AGRICULTURE

Researchers map genomes of 15 wheat varieties: 'Like finding the missing pieces for your favorite puzzle'

In November, K-State researchers and several international partners announced that they have completed genome sequencing of 15 wheat varieties from breeding programs around the world.

The study, they said, represents the start of a larger effort to generate thousands of genome sequences of wheat, including genetic material brought in from wheat's wild relatives.

"It's like finding the missing pieces for your favorite puzzle that you have been working on for decades," said project leader Curtiz Pozniak, wheat breeder and director of the University of Saskatchewan (Canada) Crop Development Centre.

"By having many complete gene assemblies available, we can now help solve the huge puzzle that is the massive wheat pan-genome, and usher in a new era for wheat discovery and breeding," Pozniak said.

K-State associate professor Jesse Poland, director of the Feed the Future Innovation Lab for Applied Wheat Genomics and

the Wheat Genetics Resource Center, said the Kansas team was responsible for sequencing and analyzing the hard red winter wheat variety Jagger, which was released in 1994.

Jagger is a landmark wheat variety in the Great Plains and covered millions of acres for many years. It was selected for the project because of its relevance as a breeding parent; the variety is found in the pedigrees of many current varieties across the United States.

Funding partners for this work include: the National Science Foundation, Kansas Wheat, the U.S. Agency for International Development, and the National Institute of Food and Agriculture.

IMPROVING FOOD ACCESS

Rural Grocery Initiative to host ‘Keeping Groceries Alive’ webinar

When a grocery store closes, the local community suffers. The Rural Grocery Initiative is addressing this problem and added a free webinar series aimed at preventing such closures in the first place.

The eight-part series, “Keeping Groceries Alive: Successful Ownership Transitions for Rural Grocery Stores,” kicked off in late January to help grocers plan ahead so their stores remain open, even after the owners retire or exit the industry.

Rial Carver, program manager with the Rural Grocery Initiative, said the online series will explore various community-supported grocery models.

“Communities across Kansas recognize that grocery stores are critical assets, both for the economy and quality of life,” she said. “When communities are involved in the transition plan for a grocery store, innovative ideas arise. We’ve seen several rural communities have success with public-private partnerships, cooperatives, and even school-based grocery stores.”

David Procter, co-founder of the Rural Grocery Initiative and professor of communication studies, said that without transition plans in place, grocery stores often close abruptly, leaving local communities with limited access to healthy food.

He said 54 rural grocery stores closed between 2008 and 2018.

The webinar series is free and open to the public. Grocers, prospective grocers, and community stakeholders are encouraged to attend. Individuals can register online at **ruralgrocery.org**.

The Rural Grocery Initiative is a program supported by K-State Research and Extension in partnership with NetWork Kansas, the Kansas Rural Center, the Kansas Center for Business Transition, and the Food Co-Op Initiative. It is sponsored by the Ewing Marion Kauffman Foundation through the Heartland Challenge.

PROTECTING HUMAN HEALTH

K-State responds to emergency call for food safety/public health research

A team of faculty and research staff members from the College of Agriculture and the College of Veterinary Medicine are working together to quickly discover new ways to protect the health of workers in meat and poultry plants and prevent the spread of COVID-19 within their communities.

In December, the National Academies of Science estimated livestock-processing facilities were associated with 236,000 to 310,000 COVID-19 cases and 4,300 to 5,200 deaths between March and July, causing many of these plants across the country and around the world to temporarily close because workers were unable or unwilling to report to their jobs. This put a major strain on the food supply by reducing food animal harvesting and processing capacity, temporarily limiting the amount of meat and poultry on grocery store shelves, disrupting food and feed supply chains across the globe, and disrupting our economy.

The research team is working closely with a 10-member meat and poultry industry advisory board, along with various technology companies, to ensure their recommendations are relevant and are rapidly deployable across the food processing sector. Members of the board include senior-level directors of food safety and plant operations who are currently managing COVID-19 response efforts across several large processing facilities in the United States.

Funding for their work comes from a $1 million grant from the United States Department of Agriculture's National Institute of Food and Agriculture and an additional $333,000 from the State of Kansas National Bio and Agro-defense Facility (NBAF) Transition Fund for research conducted at the Biosecurity Research Institute.

RESTORING BUSINESS

Popular farm financial management events continue and expand online

The university is continuing efforts to bolster the resilience of farm families in the state, offering a pair of programs that help them take care of their bottom line.

The Women Managing the Farm conference will provide education and support to women in agriculture. This year's event was scheduled as an online-only event Feb. 10-12. Nearly 300 women attended the in-person conference last year. The group included farmers, rural business leaders and landowners. The project builds on the knowledge that farm women play an active role in all aspects of the financial and risk management of the farm. Organizers said this year's virtual conference will include such topics as agricultural and estate law, crop production, relationships and health, marketing, and management.

In late 2020, the university announced it would also offer a self-paced online course, titled Finances and the Farm. The course is similar to the popular in-person Farm Financial Management classes offered this time last year which drew nearly 700 participants.

"Many of the participants from our classes last winter expressed that they would like to complete this material with their spouse or other shareholders on their farm," said Robin Reid, an extension economist with the Department of Agricultural Economics. "This online course will give them that opportunity."

The six-lesson classes will delve into topics that include balance sheets, income statements and cash flow. Reid said participants will learn to use financial management techniques and set goals for their own operations, plus learn about making changes to avoid financial difficulties. Bonus content includes information on determining the costs of production, grain marketing and family communication.

Both programs are available to producers in Kansas and beyond.

PROMOTING HEALTHY COMMUNITIES

Barber County residents rally to help feed their community

A good-faith effort by a pair of Barber County extension agents to add beef to their school's lunch menu turned into a blessing for two communities during the COVID-19 pandemic.

Agents Robin Eubank-Callis and Justin Goodno helped pave the way for cattle producers in Barber County to donate live cattle to two local school districts for their lunch programs, which resulted in a sharp rise in the number of students participating in school lunch programs and a significant reduction in food waste.

Then came COVID-19. The program came to a screeching halt as state schools were closed, and thousands of pounds of beef, intended for school lunches, were left sitting in the freezer. But it didn't sit there long. Much of it was used for the community's summer meal program, which offers free meals to any child age 18 and younger and to adults for a small charge.

Meanwhile, Eubank-Callis began working with the Kansas Food Bank and members of two local churches. Together they helped increase the number of box meals provided to county residents from 48 to 90.

Encouraged by their success, the agents applied for and were awarded a grant from the Kansas Health Foundation to further address food security issues in the county.

With the project involving the local meat locker, producers, schools, churches and the food bank, the extension agents truly pulled together a community-wide effort.

SUPPORTING ECONOMIC DEVELOPMENT

Researchers look for ways to combine natural resources to benefit rural towns

Scientists have embarked on a five-year study that capitalizes on one of the Central Plains' most abundant natural resources – wind – to store energy in ammonia. Their work, which is funded by the National Science Foundation, could help stunt the population drain that is common in many rural communities by tying together crop production, energy production and water use.

Vincent Amanor-Boadu, professor of agribusiness economics and management, said the project combines expertise of researchers at Kansas State University, the University of Kansas, Washington State University and Western New England University. Together, they form a project known as FEWtures focusing on food, energy and water needs for rural communities. The group includes experts in engineering, hydrology, agricultural economics, business, political science, sociology and education.

"It is a multi-disciplinary study," Amanor-Boadu said. "That was intentionally done because of the complexity of bringing the implications of food production, rural communities, water needs and energy requirements together."

Many parts of Kansas and surrounding states have benefited from wind energy to power their communities. "The problem with wind is that you can generate electricity, but if you don't use that electricity right away, you lose it," Amanor-Boadu said.

Amanor-Boadu said this project will capitalize on nitrogen taken from the air; use the energy from wind; combine it with hydrogen from water; and use all that to make ammonia, a compound made of nitrogen and hydrogen.

"When you do that, you are actually putting energy into the bonds between the nitrogen and hydrogen," Amanor-Boadu said. "Then, when you want that energy back, you just split the nitrogen from the hydrogen. So, basically, you can think of ammonia as batteries."

According to Amanor-Boadu, when the energy stored in the ammonia is not needed, it will become available as fertilizer in food production. The team is also working on methods to optimize production of wind captured at the local level to treat wastewater to use for irrigation and reduce the draw of water from the aquifer.

PROVIDING ACADEMIC EXCELLENCE

College ranked among the nation's best

The College of Agriculture is consistently ranked among the top agriculture schools in the nation and world. What makes the school's exceptional rankings particularly impressive is the university's size.

Ranked in the top 10 of the nation's best 140 ag schools by Niche.com, K-State is smaller than its top 10, even top 20, peers. Those schools average more than 36,000 students. K-State has just over half that, with 18,658 students.

Generally speaking, the smaller the school, the more difficult it is to advance in the rankings. These complex, multi-factor

rankings are affected by the revenue generated from tuition, research and state appropriations, ease in recruiting top faculty and students, academic reputation, number of faculty publications and affordability.

Being ranked one of the world's best agriculture programs is not a simple bragging right: It's a serious responsibility. The Kansas agriculture economy is dependent on the college's leadership and capability to provide a strong ag workforce and the innovation and research in agriculture that will move Kansans to continued prosperity.

2021 KANSAS STATE UNIVERSITY COLLEGE OF AGRICULTURE RANKINGS

#8

AGRICULTURAL PROGRAM

Niche.com

Comparing 140 U.S. agriculture programs

#46

QS STARS WORLD UNIVERSITY RANKING

Comparing 401 agriculture schools across the globe

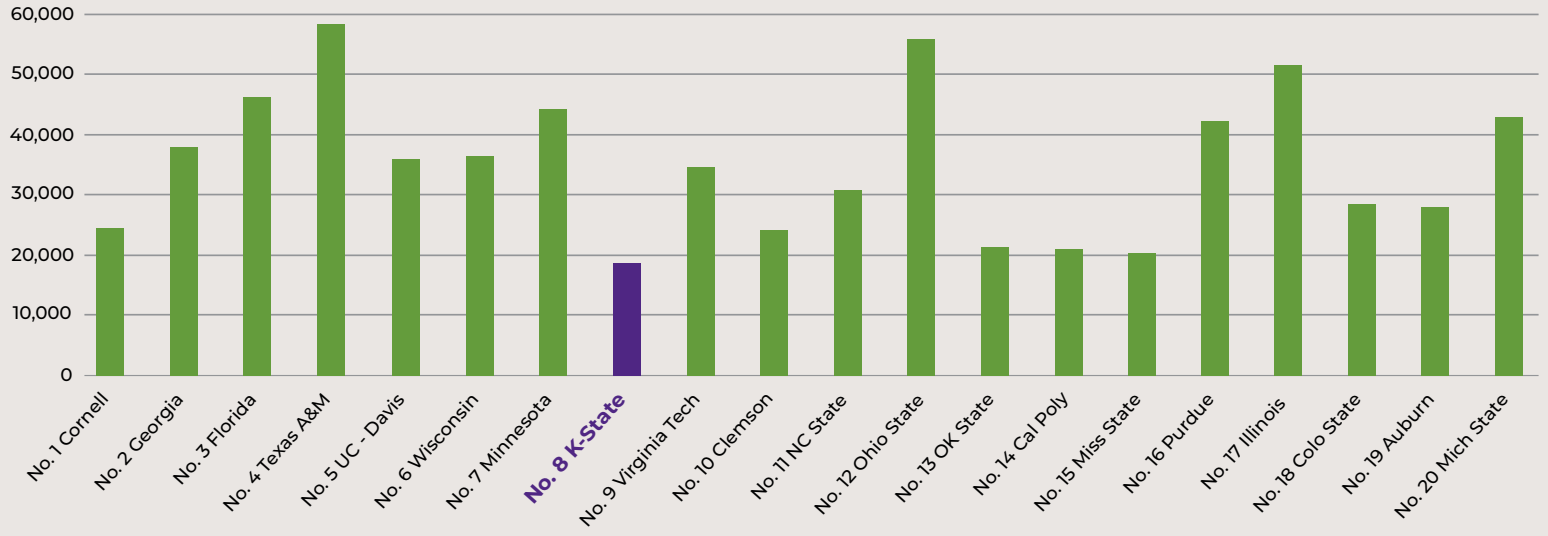
#1

- **AGRICULTURE AND AGRICULTURAL OPERATIONS PROGRAM**
- **COLLEGE OFFERING ONLINE DEGREES IN AGRICULTURE**
- **COLLEGE OFFERING AGRICULTURE DEGREES FOR VETERANS**

College Factual

Comparing 98 U.S. agriculture schools

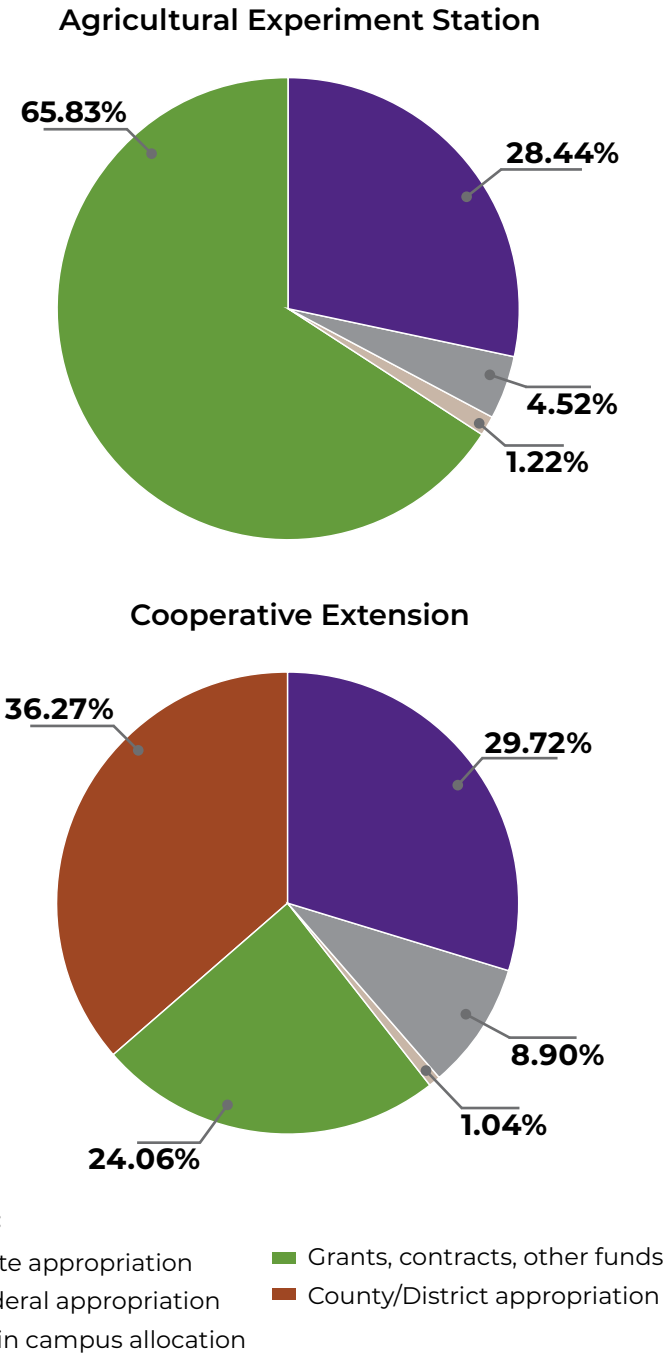
Niche.com 2021
Top 20 Agriculture Schools
Enrollment of full time undergraduate and graduate students



CREDIT: NATIONAL CENTER FOR EDUCATIONAL STATISTICS, 2018

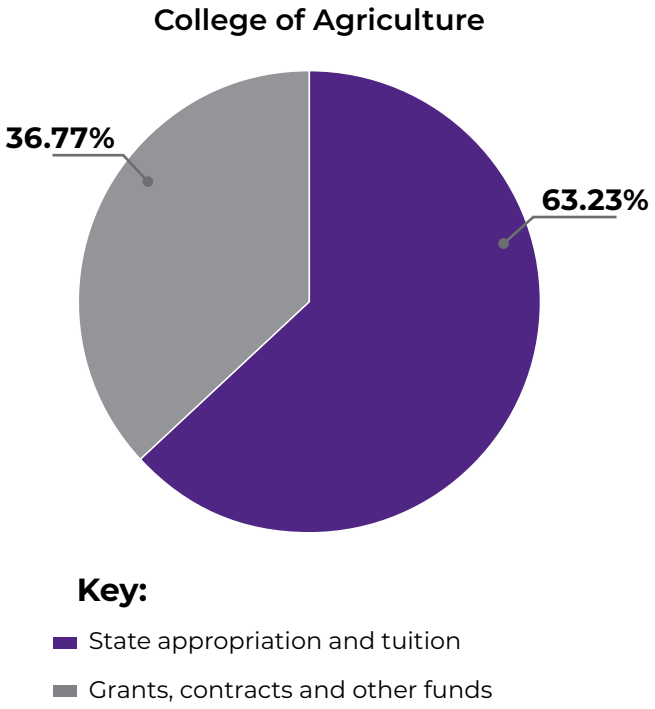
K-STATE RESEARCH AND EXTENSION FUNDING (FY 2021)

Agricultural Experiment Station	Dollars
State appropriation	$28,323,939
Federal appropriation	4,500,000
Main campus allocation	1,211,954
Grants, contracts and other funds	65,558,734
Agricultural Experiment Station	**$99,594,627**
Cooperative Extension	
State appropriation	$18,027,746
Federal appropriation	5,400,000
Main campus allocation	628,088
Grants, contracts and other funds	14,593,421
County/District appropriation	22,000,000
Cooperative Extension	**$60,649,255**
Total K-State Research and Extension	**$160,243,881**



COLLEGE OF AGRICULTURE FUNDING (FY 2021)

College of Agriculture	Dollars
State appropriation and tuition	$10,804,221
Grants, contracts and other funds	6,282,860
Total College of Agriculture	**$17,087,081**



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Kansas State University Agricultural Experiment Station and Cooperative Extension Service

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