2024 ISSUE

KANSAS STATE UNIVERSITY

College of Agriculture

AgReport

LOOKING TO THE *Future* OF AGRICULTURE

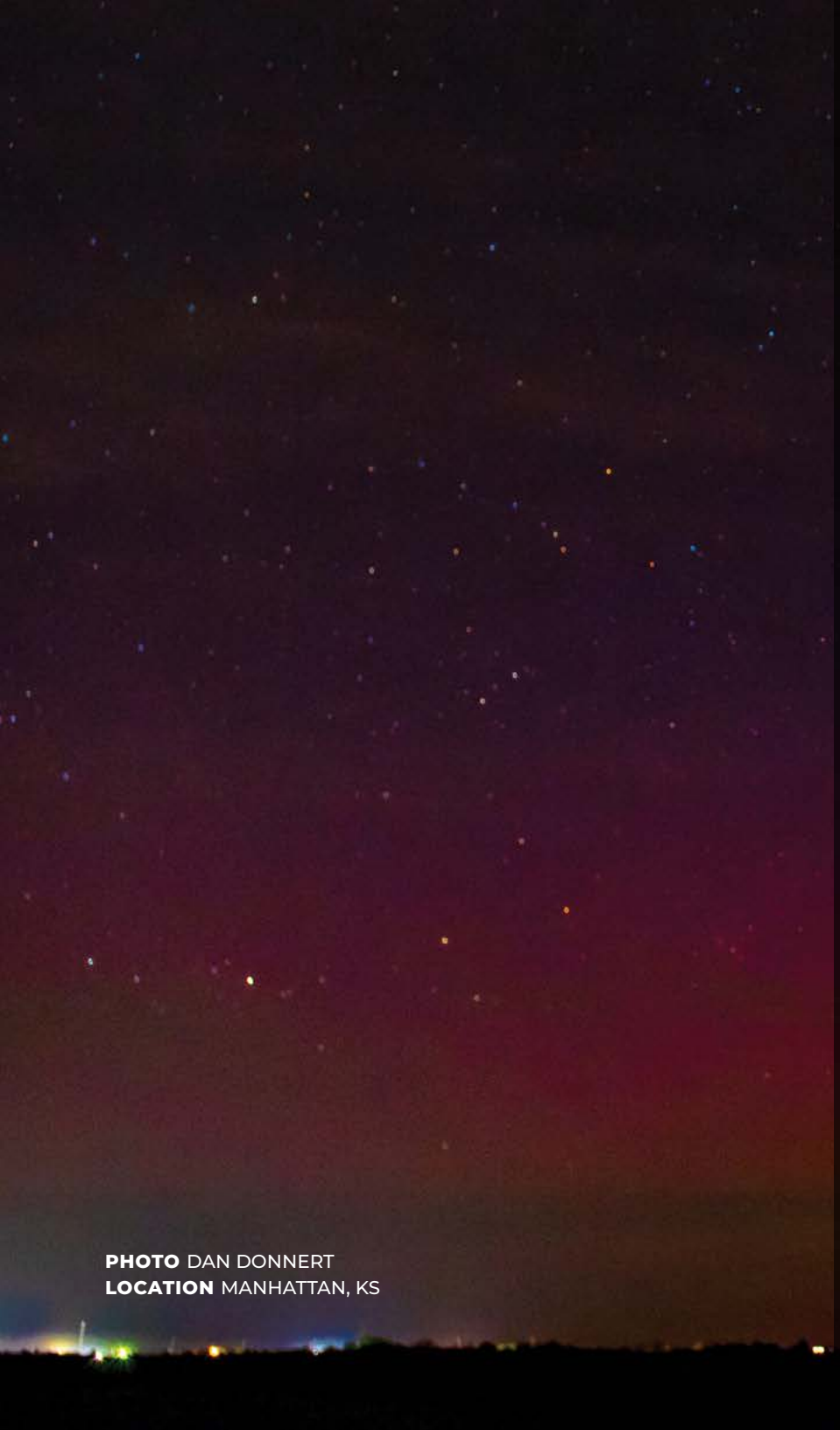

PHOTO DAN DONNERT
LOCATION MANHATTAN, KS

AgReport

2024 ISSUE

College of Agriculture and K-State Research and Extension

AgReport is a publication created and produced by the
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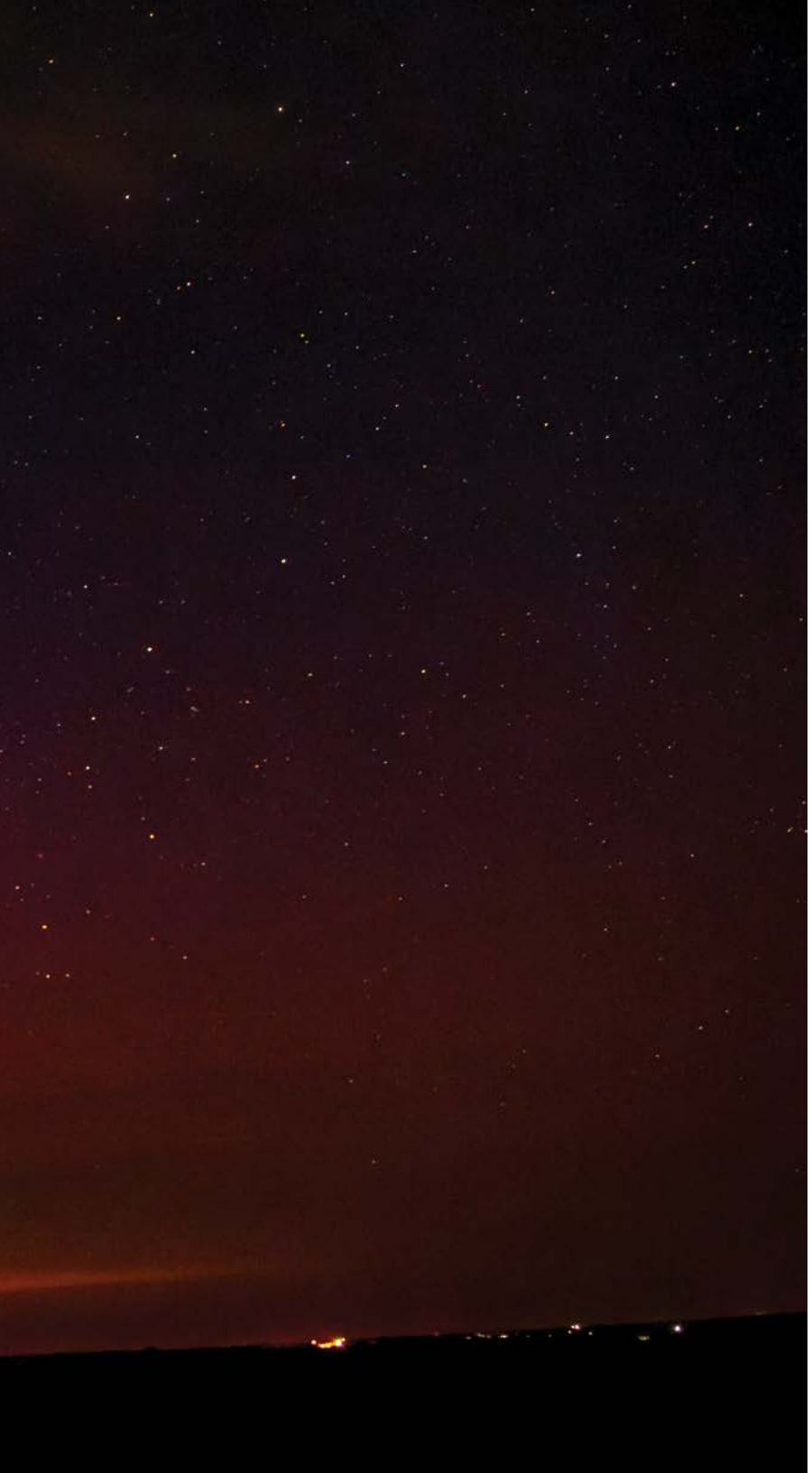

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COURTESY KANSAS STATE UNIVERSITY DEPARTMENT OF AGRONOMY

Dear Friends,

DISCOVERING, INNOVATING AND EDUCATING AGRICULTURE'S FUTURE

In today's world, it seems everything changes rapidly, whether that's society and culture or technology and research. Much of this has us hyper-focused on the here-and-now, and as one of the leading colleges of agriculture in the nation, it is our responsibility to continue to help farmers and ranchers tackle today's problems, educate the future workforce of Kansas – while simultaneously leading the industry forward.

This year's AgReport focuses on the future of agriculture across the state of Kansas and on campus. You will find stories addressing how our Manhattan-based Agriculture Innovation Initiative will enhance and impact our educational and research experiences, ranging from what's on our plates and in our pets' bowls.

Kansas State University continues to positively move the needle on the ever-challenging topics of water and drought – while in another story we address digital agriculture – which will be extremely helpful in managing our use of this precious resource. The issue also includes an agricultural economics roundtable discussion about what trends farmers and ranchers may have to address in the future as demographics and consumer preferences change over the next two decades.

The takeaways from this year's AgReport are exciting for the future of Kansas State University and the College of Agriculture. As is always the case in this complex, ever-changing industry, our faculty and staff continue to discover, educate, innovate and counsel so that the state of Kansas continues to expand its influence as a global leader in all areas of agriculture, in both the short and long term, to feed a hungry world.

J. ERNEST MINTON,

J. Ernest Minton

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

PHOTO DAN DONNERT
IN THE PHOTO ELDON GIDEON DEAN MINTON STANDS IN FRONT OF WEBER ARENA AS IT IS DEMOLISHED TO MAKE WAY FOR THE NEW GLOBAL CENTER FOR GRAIN AND FOOD INNOVATION
LOCATION KANSAS STATE UNIVERSITY


Kansas State

LAYING A *Foundation*

K-State's commitment to becoming a next-generation, land-grant university

In late 2022, just months after assuming the university's top post, K-State President Richard Linton announced a $210 million capital campaign to boost the agricultural infrastructure on the Manhattan campus.

For Ernie Minton, the Eldon Gideon Dean of the College of Agriculture, the announcement was validation for work that he had begun not long before.

STORY JANAE MCKINNEY

Minton has long been a leader in the Association of Public and Land-Grant Universities (APLU) and remembers championing a 2015 national study conducted to estimate the deferred maintenance costs affecting land-grant campuses across the U.S. The study was updated in 2020 and released in 2021, and concluded that, nationwide, the cost of deferred maintenance totaled $11.5 billion, with a total building replacement cost of $38.1 billion across the country.

As a result of the study's findings, Minton started working with an architectural firm to create a plan for what is now known as the Agriculture Innovation Initiative, a project involving multiple buildings that is currently underway on the north end of the Manhattan campus.

The groundwork that Minton had laid was valuable in helping Linton embark on what he has called "the single largest building project in the history of our university."

"It paid off to have engaged the architects early when President Linton arrived as we had a solid platform and opportunity to raise funding," Minton said.

Agriculture: 'An undeniable pillar'

Casey Lauer, the university's associate vice president for facilities, understands the importance of the College of Agriculture and how much it means to the university.

"Agriculture is an undeniable pillar for the reputation of K-State and one that has been placed on the backburner for a very long time," Lauer said. "At one time, conditions dating back to the mid-50s were acceptable. Outdated facilities are incongruent with the first-class education and opportunities the university is known for."

Lauer said the evolution of the campus footprint is evidence of the university's growth since the mid-1950s. An example includes Weber Arena, which hosted an annual rodeo and was a key events facility for the Department of Animal Sciences and Industry.

“[Students and visitors] are going to be able to visualize what's going on in food and feed research and look at the science as it's unfolding”

— JANE SCHUH, ASSOCIATE DEAN FOR RESEARCH AND GRADUATE STUDIES

The arena’s initial position on the north edge of campus originally made sense, but as the K-State campus evolved, Weber Arena was in the middle of campus. From a safety and logistical standpoint, it’s difficult today for livestock, people, stoplights and traffic to seamlessly interact. A new facility – the Bilbrey Family Event Center north of campus – addresses those issues.

“The new center will have one of the taller viewpoints in the entire area and overlook the National Bio and Agro-Defense Facility and Bill Snyder Family Stadium,” Lauer said. “The arena will have a site that is accessible, offers amenities, be fully functional, code compliant and air conditioned. It’s pretty cool.”

Transparent and flexible learning spaces

The Global Center for Grain and Food Innovation is being designed with flexible laboratories to be shared, rather than single use.

“We have buildings that were built for chemistry and that’s it,” Lauer said. “It’s a closed loop. The paradigm shift is an open loop with peers that can challenge each other to solve real world issues with colleagues and industry partners.”

Lauer said 30% of space in the facility will foster interdisciplinary collaboration between public, private and intercollegiate groups, which he says could be a model going forward for the college and university.

In addition to better using research spaces, plans for the Global Center for Grain and Food Innovation allow opportunities for visitors to see what is happening in laboratories.

“Students and visitors coming into the Global Center will be able to look through glass walls into active research areas,” said Jane Schuh, the College of Agriculture associate dean for research and graduate studies. “They are going to be able to visualize what’s going on in food and feed research and look at the science as it’s unfolding.”

Dan Moser, the associate dean of academic programs, said flexible learning spaces may be a common feature of future agricultural facilities.

“It’s definitely a trend throughout education to have more interactive sorts of experiences in the classroom,” he said.

Classrooms going forward will not only have changeable setups with tables and chairs to move into smaller breakout groups, but also focus on modern technologies. A post-pandemic education includes in-person and remote learning experiences; the classrooms for the College of Agriculture will focus on both.

Moser said the livestock and agronomy units north of Kimball Avenue will continue to be a main priority for education. He said other colleges have similar facilities much farther away from campus, making it difficult or impossible to hold classes at those units.

"Our leadership is committed to our use of the land north of Kimball, which is a huge competitive advantage for student recruitment, student lab experience, undergraduate research and part-time student employment," Moser said.

RENDERINGS UPPER LEFT: FIRST FLOOR CORRIDOR ALLOWS VISITORS TO SEE ACTIVE LABS IN THE GLOBAL CENTER FOR GRAIN AND FOOD INNOVATION **ABOVE:** ENTRANCE AND THE NEW DAIRY BAR OF THE GLOBAL CENTER FOR GRAIN AND FOOD INNOVATION **COURTESY** CLARK & ENERSEN

He adds: "Infrastructure is symbolic of an institution's and state's commitment to a program. The students want to go where the state and alumni are making investments, and where the university prioritizes the programs they are interested in."

'Incredible moment' for agriculture

Marty Vanier, a project donor whose family's generosity to K-State has spanned decades, calls the Agriculture Innovation Initiative "a terrific way to launch K-State into the future."

"While we have many talented faculty members and wonderful programs here, they've been operating in their separate sandboxes," she said. "The Ag Innovation Initiative is a terrific way to bring everyone together, synergize their talents and experiences, and establish K-State as a leader in agriculture innovation."

Schuh called this "an incredible moment" for the College of Agriculture.

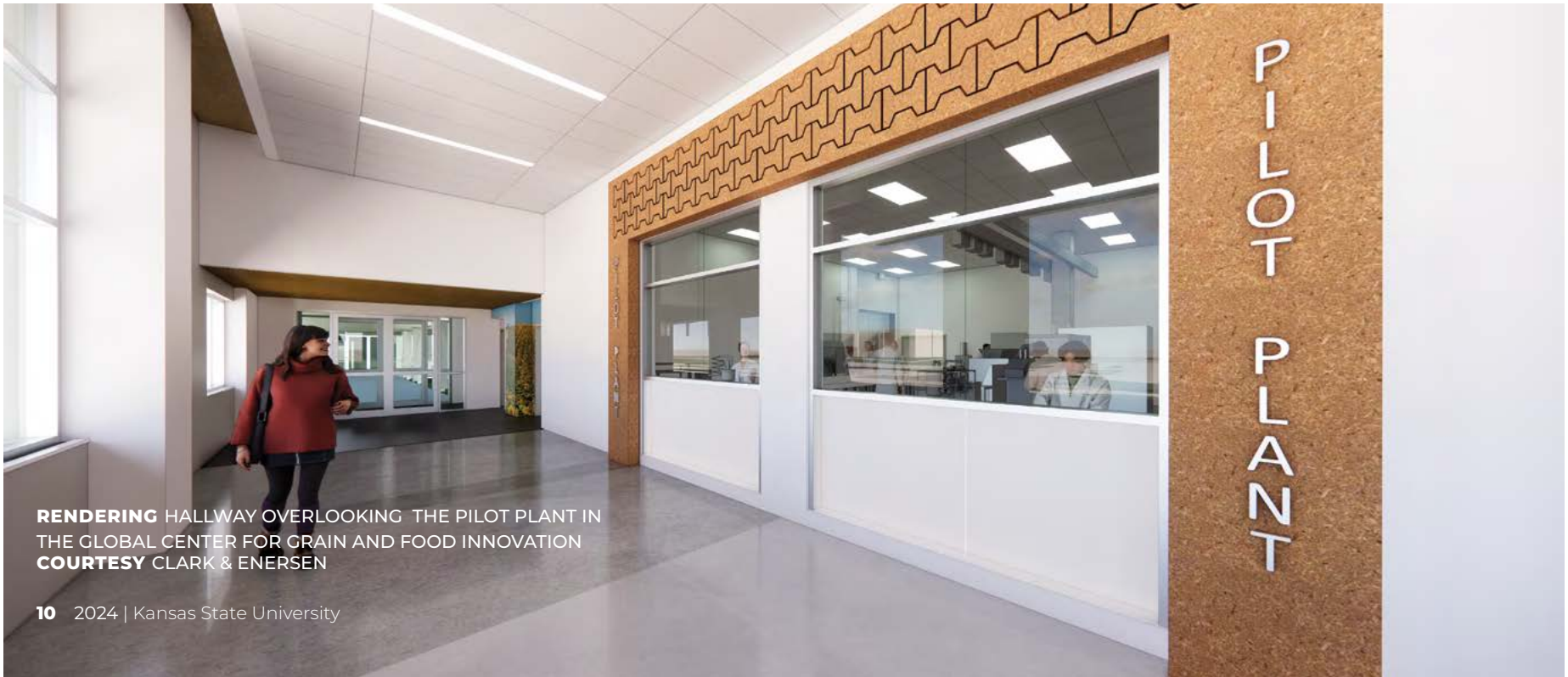
"If we are doing incredible work in the buildings we have now, imagine what we can do with cutting edge technology and facilities that reflect the level of expertise we have," she said. "It's a great time to be at K-State."

During the May 2024 groundbreaking for the Global Center for Grain and Food Innovation, Linton told a standing-room-only gathering that "the new facilities will support cutting-edge research and learning. We will have interdisciplinary lab spaces and areas dedicated to helping foster partnerships with industry. This is an achievement that we should all take pride in.

"With each facility that we build, renovate or demolish, we are one step closer to creating unparalleled opportunities for our faculty, staff and students to achieve their highest potential and make transformational impacts in agriculture," he said. ■

AGRICULTURE INNOVATION INITIATIVE

KEEP UP WITH THE AGRICULTURE INNOVATION INITIATIVE PROJECTS AT **kstate.ag/innovation**



RENDERING HALLWAY OVERLOOKING THE PILOT PLANT IN THE GLOBAL CENTER FOR GRAIN AND FOOD INNOVATION
COURTESY CLARK & ENERSEN

RENDERINGS INTERDISCIPLINARY LAB (LARGE) AND CLASSROOM (SMALL) INSIDE THE GLOBAL CENTER FOR GRAIN AND FOOD INNOVATION
COURTESY CLARK & ENERSEN

A BIG ID3A?

K-State's Institute for Digital Agriculture and Advanced Analytics will help lead farmers into the future

In past days, the tools of agriculture included such staples as a tractor, three-wheeler, combine and feed bunk. If you really want to go way back, a trusty steed was a farmer's best friend.

STORY PAT MELGARES

“The goal isn’t to replace the human on the farm, but rather to help those who want to stay on the farm.”

— SHAWN HUTCHINSON, DIRECTOR OF K-STATE'S GEOGRAPHIC INFORMATION SYSTEM SPATIAL ANALYSIS LABORATORY

While much of that equipment still has a place on today’s farms, there is one industry-altering addition: satellites.

From a computer keyboard, or by using voice-recognition technology to ask a question on a cell phone or tablet, satellites in outer space assure that farmers have access to up-to-the-minute information that will help them adjust the way they grow crops, raise livestock or manage their financial statements.

Access to information has become so efficient that using digital technology may no longer be just optional for farmers in an industry that is being asked to feed a global population that will approach 10 billion people in the next 25 years.

At K-State, faculty and staff have formed an interdisciplinary team to make sure farmers understand the vast potential at their fingertips.

The next generation of farming

The Institute for Digital Agriculture and Advanced Analytics, or pronounced I-D-THREE-A, was formed in Fall, 2023 from funds provided through K-State’s Next-Generation Strategic Plan, which outlines President Richard Linton’s vision to position the university as a leading, next-generation, land-grant university by the year 2030.

ID3A will study ways to pair existing technologies – sensors, robotics, GPS, maps and more – with newer technologies – artificial intelligence, satellite images, virtual reality and others – so that farmers can make more rapid and informed business decisions.

“I suspect that the future of farming will feature significant machine automation; the collection, transfer and analyses of massive volumes of on- and off-farm data; increased energy self-sufficiency and

resource reuse; and realize a benefit from real-time, predictive analyses that combine to promote the well-being of farm households and rural places," said Shawn Hutchinson, director of the Geographic Information System Spatial Analysis Laboratory at K-State.

Hutchinson is one of seven co-directors of ID3A, including Ignacio Ciampitti (agronomy), Trevor Hefley (statistics), Pascal Hitzler (computer science), Brian McCornack (entomology), Susan Metzger (Office of the President) and Ajay Sharda (biological and agricultural engineering).

"In the future, farmers will be seeking even more efficiency and looking at ways in which technology can help them farm more acres," said Ciampitti, noting current trends indicating larger farms owned by a shrinking number of U.S. farmers. "The only way we can become sustainable in the future is by having more technology."

A 'holistic' way of farming

Digital agriculture is a move toward collecting large volumes of data to make decisions on the farm, aiding in production and reducing the farm's environmental footprint. It differs from precision agriculture, which is focused on the farming processes. Precision agriculture is considered a subset of digital agriculture.

"For more than two decades, precision agriculture has focused on putting the right amount of product in the right place at the right time…engaging available technology, such as GPS systems or tractors with sensors," Sharda said.

"But digital agriculture is different. Digital agriculture is taking all the data and utilizing it to extract more fundamental and advanced knowledge about what is in that field, beyond soil and variability. As a farmer, once I know all of the parameters of what is happening in my field, I can also begin to minimize my risk."

Sharda foresees a day when volumes of data – whether gathered by research, artificial intelligence (AI), pictures from outer space or other means – can be accessed in seconds or minutes so that a farmer knows exactly what time of year each portion of their field is most likely to be productive, or what challenges might exist at any given time.

"Digital agriculture," he says, "gives you a more holistic approach to farming operations because you have instant and direct access to information to make decisions."

Hutchinson adds: "The purpose of a digital culture, depending on what the problem is that it's being applied to, is to collect and analyze a lot of data – more than we've ever done before – and quickly turn that data into usable, actionable information. It's that translation or interpretation of the data that is key. For farmers, they can then make more informed decisions about what they're doing."

Leading in innovation

Automated processes likely will become more common on U.S. farms, but the K-State experts said digital agriculture is not a move to replace humans. Instead, it's one answer to the challenge of shrinking populations in rural communities, and a shrinking labor force.

"The goal isn't to replace the human on the farm," Hutchinson added, "but rather to help those who want to stay on the farm."

"I feel like there is always concern when a new technology comes out; it changes our comfort zone," Ciampitti said. "We are in this moment of movement in farming. But, as an example, if we start thinking about ways we can use artificial intelligence for a benefit, those concerns go away. Because if I'm asking AI to just give me some ideas for different types of incentives for my farm, I can get that information in seconds, rather than doing research that takes hours."

"In all these cases, it's still up to the farmer to check sources, make an interpretation of the information and execute the plan."

According to Hutchinson, "we want to make producers as economically viable and sustainable as possible because when you do that, there are many additional benefits that occur, including healthier and more prosperous communities and improved environmental conditions. The type of infrastructure that it will take to pull off a future with digital agriculture means rural schools will have access to high speed Internet."

Which technologies are best? Or equally important, which are safe? Farmers will have those questions, Ciampitti says, and it's a founding principle of why ID3A was formed.

"We (K-State) want to be a leader in innovation, to make sure we are ready to answer farmers' questions," Ciampitti said. "We want to make sure that we are an unbiased source of information for them." ■

LEARN MORE ABOUT ID3A AT
kstate.ag/digital-ag

PHOTO DAN DONNERT
IN THE PHOTO IGNACIO CIAMPITTI LEADS A TEAM OF STUDENTS IN COLLECTING SPECTRAL DATA FROM LEAVES TO BETTER UNDERSTAND PLANT HEALTH AND IMPACT OF STRESSORS
LOCATION AGRONOMY NORTH FARM, KANSAS STATE UNIVERSITY

TRENDS AND *Outlooks*

K-State agricultural economists discuss trends, future of industry

Agricultural economists are an important part of the success of the U.S. agricultural and food industries.

"A lot of what we end up doing is looking at how people make decisions about food, whether or not that be purchasing or production or other factors," said Allen Featherstone, head of K-State's Department of Agricultural Economics. "But essentially we look at market signals and determine how people will react to economic situations."

He adds: "Kansas products go all over the world, whether it be wheat, beef, pork or many other products. And so it's not only important to understand the preferences of consumers in the U.S., but consumers globally in relation to their interest in Kansas products."

K-State Research and Extension's news team recently sat down with Featherstone and fellow K-State agricultural economists Robin Reid, Jenny Ifft and Glynn Tonsor to talk about their work and trends in agriculture.

Allen, you've been working in this field for nearly four decades. How have agricultural economics principles changed during your career?

Featherstone: The principles don't change, but the problems and issues and people's preferences change. One of the things that makes economics so interesting is that a study that was done 10 years ago may come up with a totally different conclusion today, simply because the way that people think about issues changes.

Robin, one of those areas that you've been talking about recently is the trend in land ownership. What are you learning, and what does that potentially mean for the future of farming, say, 10, 20 years from now?

Reid: I've been doing research since 2015 and comparing it to recent years on just who the landowners are in Kansas and where they are located throughout the United States. What I found in 2015 is that about 84.5% of our agricultural acres in Kansas were owned by people living in the state.

As we fast-forward to 2022, that seven-year difference has made a small shift into more out-of-state ownership. And two things are driving that most likely. One, the baby boomer generation of farmers is currently retiring and will be for years to come. And as we see the ownership of that land change hands to heirs, a lot of them are not on the farm anymore. They might still be involved as a landowner at that point, but may not live in Kansas.

The other thing that's surfaced in recent years is Kansas farm ground is being purchased by out-of-state investors, or for hunting opportunities.

So there's a different demographic bidding on farm and ranch land that has not been in the pool previous to the last 5-10 years. I think as we have more landowners geographically and generationally removed from the farm, we're going to see more of a need for education for these landowners in working with tenants on the farm.

Jenny, you were appointed K-State's Flinchbaugh Agricultural Policy Chair, which recognizes an icon in U.S. farm policy. In that role, you have your hand in a lot of topics, but one that recently garnered a lot of attention is a report in which you and your colleagues found that farmers could face as much as a 66% loss in income due to rising temperatures in Kansas.

Ifft: Risk is a big part of agriculture in Kansas. If you look over the past 20 years, total farm income from the state is in a range of $2-10 billion. For those in farming, it's a major farm management challenge to

balance cattle and crop markets, agricultural policy, weather and more. Farm income numbers affect rural economies and local businesses.

Specific to weather issues, crop insurance payments play a large role in farm income. You have other farm bill programs or disaster programs that also play a role in markets. (In the future), it is critical for producers in Kansas and the U.S. to understand what those safety net policies look like.

Jenny, what exactly did your research on changing temperatures find?

Ifft: A one degree Celsius increase (about 1.8 degree Fahrenheit) in temperature leads to a 60% decline in farm income, which is a large number. You can look at state-level farm income statistics and it makes sense – the impact is consistent and large. In terms of lenders, they're modeling risk, so we hope this information can be used to quantify and manage risk in agriculture. Lenders play a role in keeping producers in business and providing capital for adaptation to weather and market challenges.

Tonsor: I can give an example specific to cattle. If we do see warmer temperatures going forward, agricultural producers will adapt in different ways. If we face a warmer world, the economics to invest in shade for Kansas feedlots goes up, right? And we don't need to get into the details of that here, but you know, there are large cattle producers in South Dakota that now calve in barns to mitigate cold winters.

That's the opposite direction of weather change. But it's the same economics signal that if you have a baby calf at risk at some point, it makes sense to mitigate that risk. Well, here you potentially have large animals that are more exposed to heat. We'll make shade or other types of investments to protect them. I have full faith Kansas producers will evaluate and make those investments going forward.

Glynn, we learned a lot during the COVID pandemic about the delicate nature of the meat supply chain, which is something that you've studied for nearly two decades. Help us understand the factors that impact the beef and pork industries in particular, and the challenges that these industries may face in the next 10 to 20 years in order to remain strong.

Tonsor: At the time of the pandemic, there was a lot of discussion about resiliency. The U.S. consumed more meat in 2020 than they did in 2019. So one could look at that as a testament that the meat industry was resilient because it found a way to get more pounds in front of the average American than it did the year before, despite the pandemic.

So we can learn from that. The U.S. consumer wants meat; more than 85% of the public is a regular meat consumer. Globally, U.S. beef, pork and poultry are desired. And then when you bring it back to Kansas, Kansas has a role in each of those industries as well.

I don't envision that changing in the next 10 to 20 years. There are actually some estimates that the rates of vegan or vegetarian demand rates have declined in the last three years. But I'm interjecting that because desire for meat is strong and I don't think that's going to disappear in the next 10 to 20 years.

Allen, Kansas and many other regions are experiencing labor shortages in agriculture, as well as population shifts. From your viewpoint, what impact will these trends have over the next 20 years?

Featherstone: I think farm labor is going to be a huge issue. It's one of the things that I think our university can invest more resources in to understand immigration policy, and helping Kansas producers understand what is and what is not legal.

Technology is going to be extremely important because there is a need for more Internet accessibility at a speed that is world class. It allows more individuals to locate in rural areas, whereas before there may have been a demand in rural areas, but people were constrained by technology.

I think much of production agriculture is going to be driven by satellites and Internet connectivity. As we move to drones and precision farming on a large-scale basis, Internet connectivity becomes very important.

Ifft: Part of the demographic shift took place before the COVID pandemic. Local businesses and state governments are adapting. The Kansas Department of Agriculture has programs. K-State has programs, such as collaborating to increase childcare throughout the state. It's a multi-faceted challenge.

Demographics aren't going to change. There's the immigration aspect, which politically can be tricky. But, you know, a lot of producers in Kansas use guest workers from other countries, and they'll say they don't love everything about the program, but they couldn't do business without it. So that's going to be an ongoing policy issue moving forward.

So, looking at this from a broad view, what do think will be key to the success of agriculture in Kansas and the United States 20 years from now?

Featherstone: I think efficiency is going to be key. In terms of looking at the global population, we'll be looking at between 9-10 billion people on Earth, and we need to have the ability to produce enough food to feed that population.

The big issue I think that we will face is there's going to be a mismatch between where production will be and where population will be. There's two ways governments can solve this: one is through trade, one is through immigration, and both of those currently are distasteful from a politician's eyes. There is no popular political answer at this point for that.

Ifft: Twenty years ago, we were worried about labor shortages in a very different setting. Twenty years before that, we were looking at resource problems.

So I think a lot of the problems you work on (today) are going to be problems in the future. And hopefully some of the tools we have now will still be useful, even though the context of the problems will be different. There's definitely going to be surprises.

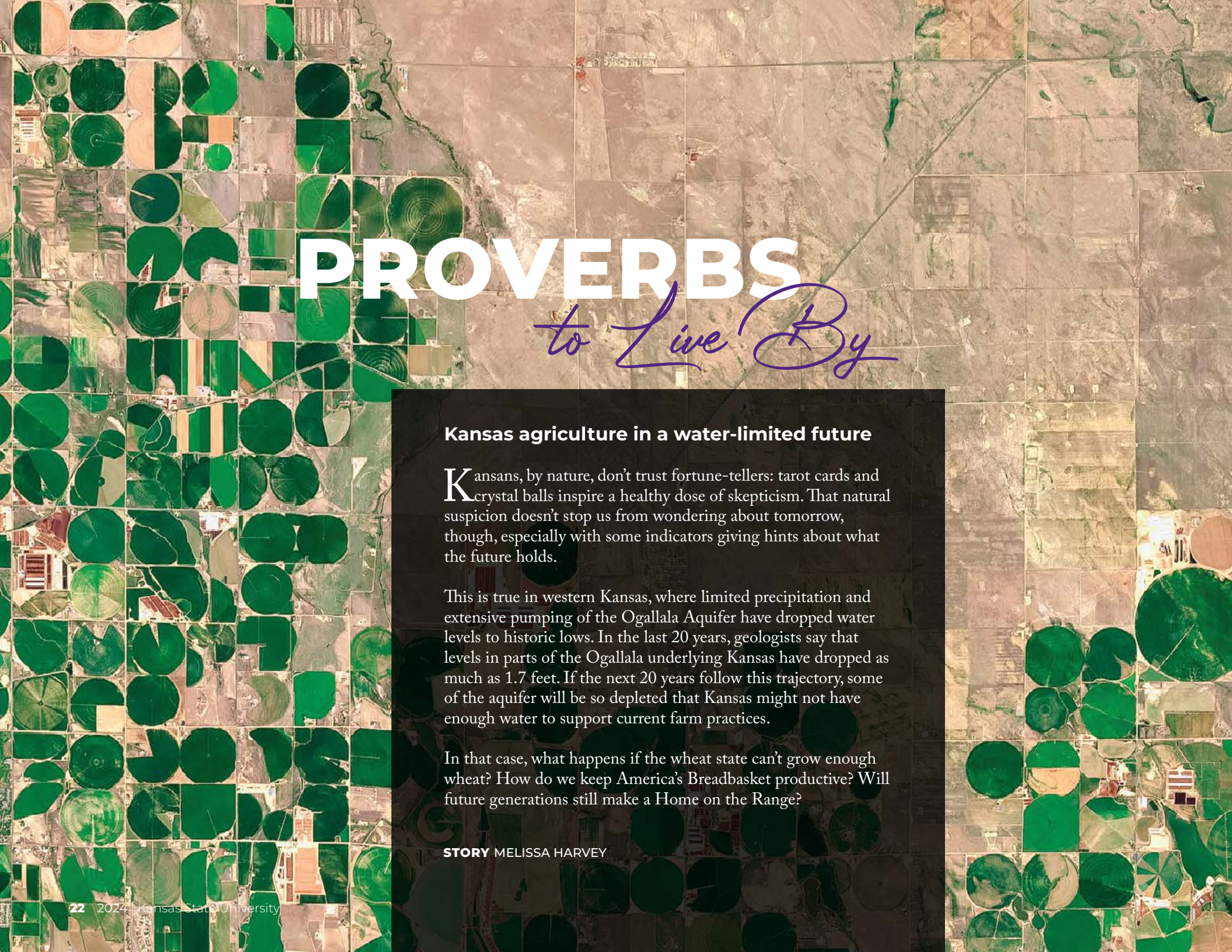
Reid: One of the trends that was very evident in the 2022 census is we continue to have fewer and larger farms in Kansas and the United States. I think technology has a role in this, enabling us to farm more acres with less labor, but that labor has to be more skilled.

Also, there are efficiencies behind what it takes to support a family these days without off-farm income. It's going to take a larger farm than it did 20 years ago, and that will continue to be the trend in the next 20 years. We're going to need more acres and more cattle to support a family farm than we do right now.

Featherstone: Business skills will be much more important simply because if you're running 10,000 cattle as opposed to 1,000 cattle, one little mistake is catastrophic. It's always catastrophic, even with a 1,000 cattle operation, but from a societal perspective, a 10,000 cattle error is much more catastrophic than one with 1,000 cattle. ■

STAY UP-TO-DATE ON THE ASPECTS OF THE AGRICULTURAL ECONOMY WITH DAILY REPORTS AT **agmanager.info**

PHOTO DAN DONNERT
IN THE PHOTO [L-R] ALLEN FEATHERSTONE, ROBIN REID, GLYNN TONSOR AND JENNY IFFT
LOCATION WATERS HALL, KANSAS STATE UNIVERSITY



PROVERBS *to Live By*

Kansas agriculture in a water-limited future

Kansans, by nature, don't trust fortune-tellers: tarot cards and crystal balls inspire a healthy dose of skepticism. That natural suspicion doesn't stop us from wondering about tomorrow, though, especially with some indicators giving hints about what the future holds.

This is true in western Kansas, where limited precipitation and extensive pumping of the Ogallala Aquifer have dropped water levels to historic lows. In the last 20 years, geologists say that levels in parts of the Ogallala underlying Kansas have dropped as much as 1.7 feet. If the next 20 years follow this trajectory, some of the aquifer will be so depleted that Kansas might not have enough water to support current farm practices.

In that case, what happens if the wheat state can't grow enough wheat? How do we keep America's Breadbasket productive? Will future generations still make a Home on the Range?

STORY MELISSA HARVEY

"...western Kansas depends on agriculture, and agriculture depends on water."

— BRIAN OLSON, HEAD OF THE WESTERN KANSAS RESEARCH-EXTENSION CENTERS

Here today, gone tomorrow

Kansas' decades-long policy for the Ogallala was "planned depletion," one factor leading to water levels so diminished that the Kansas Water Authority made a major policy shift in 2023. They publicly acknowledged the elephant in the room: our water is running out.

"We all knew it was true, but nobody wanted to say it out loud," said Kansas Water Authority chair Dawn Buehler, in a recent lecture at K-State. "We took a leap and finally said the policy of planned depletion is no longer in the best interest of the state of Kansas. It was huge."

For those who believe the future isn't set in stone, this first step may ensure viable agriculture for the next 20 years and beyond.

"We have a great opportunity to move in a positive direction, but we need to start making changes now," said Brian Olson, head of the Western Kansas Research-Extension Centers.

Never put off to tomorrow what can be done today

Olson predicts a need for improved plant genetics and producers growing low-water-use forages like millet or triticale. To support the beef industry, he said the most economical plan will be to produce these forages within a 10- to 12-mile radius around feedlots.

PHOTO DAN DONNERT
IN THE PHOTO A GROUP OF PARTICIPANTS LISTEN TO A SPEAKER AT THE MARCH, 2024 OGALLALA AQUIFER SUMMIT
LOCATION LIBERAL, KS

"If farmers only need to reduce water by 10, 15, or 20%, then they can probably stay in alfalfa and corn production systems. But if they have to reduce [water] by 40-50%, that's a total step change in the types of production practices that need to happen and the type of forages that need to be grown. This is determined by managing the Ogallala locally," he said.

This move will benefit growers and beef producers alike, according to industry experts.

"We can change what we grow, and grow as things change," said Clayton Huseman, executive director-feedlot division, Kansas Livestock Association. "The beautiful thing about (feeding) a bovine is that a variety of forages will work."

Where there's a will, there's a way

In Finney County, the agriculture sector drives the economy. When considering the county's agriculture industry as a whole, though, it is beef production employing more than 11 times as many people and generating 11 times as much revenue, according to K-State agricultural economist Bill Golden.

Golden and a multi-university team determined that corn generates about $970 per acre-foot of water while the dairy industry generates more than $93,000 per acre-foot of water. The beef industry comes in at more than $165,000 per acre-foot.

Golden believes that livestock production will be even more important in the next 20 years.

PHOTO DAN DONNERT
IN THE PHOTO SUSAN METZGER HELPS COORDINATE RESEARCH RELATED TO AGRICULTURAL USES OF THE OGALLALA AQUIFER CONSERVATION PROJECT
LOCATION MANHATTAN, KS

"I've asked farmers, who [tell] me that corn production drives the economy, but it's beef that drives the economy of western Kansas," he said.

This is true in Groundwater Management District 1 (GMD1), which covers parts of five counties in western Kansas. The Ogallala supplies more than 98% of that district's water, and the Kansas Geological Survey said aquifer thickness there has declined an average of 63%. As of May 1, the Kansas Mesonet reported most of GMD1 hadn't seen one-half of an inch of rain since mid-December.

What is dry now will likely be more dry in 20 years.

Even so, GMD1 manager Katie Durham believes that farmers are taking positive steps for future generations, such as creating Local Enhanced Management Areas (LEMAs) that conserve a minimum 10% of water, with many farmers saving more. Where producers used to believe that they had to "use it or lose it," Durham said farmers now think about water stability.

"People are looking at their water like they look at a bank account – it creates a different mindset. You notice when you're paying for five streaming services when you only wanted Netflix," she explained. "Farmers realize what water they can spend, and what they can save."

The future belongs to those who prepare today

Despite current water struggles, most say that western Kansas agriculture will grow for decades.

"The future is bright, but [it's] going to be most certainly different," said Daran Rudnik, K-State director of sustainable irrigation. "There's an energy here in Kansas unlike any other. I believe we're going to have to be adaptable. We need coordination and cooperation. We're going to have to lean on each other."

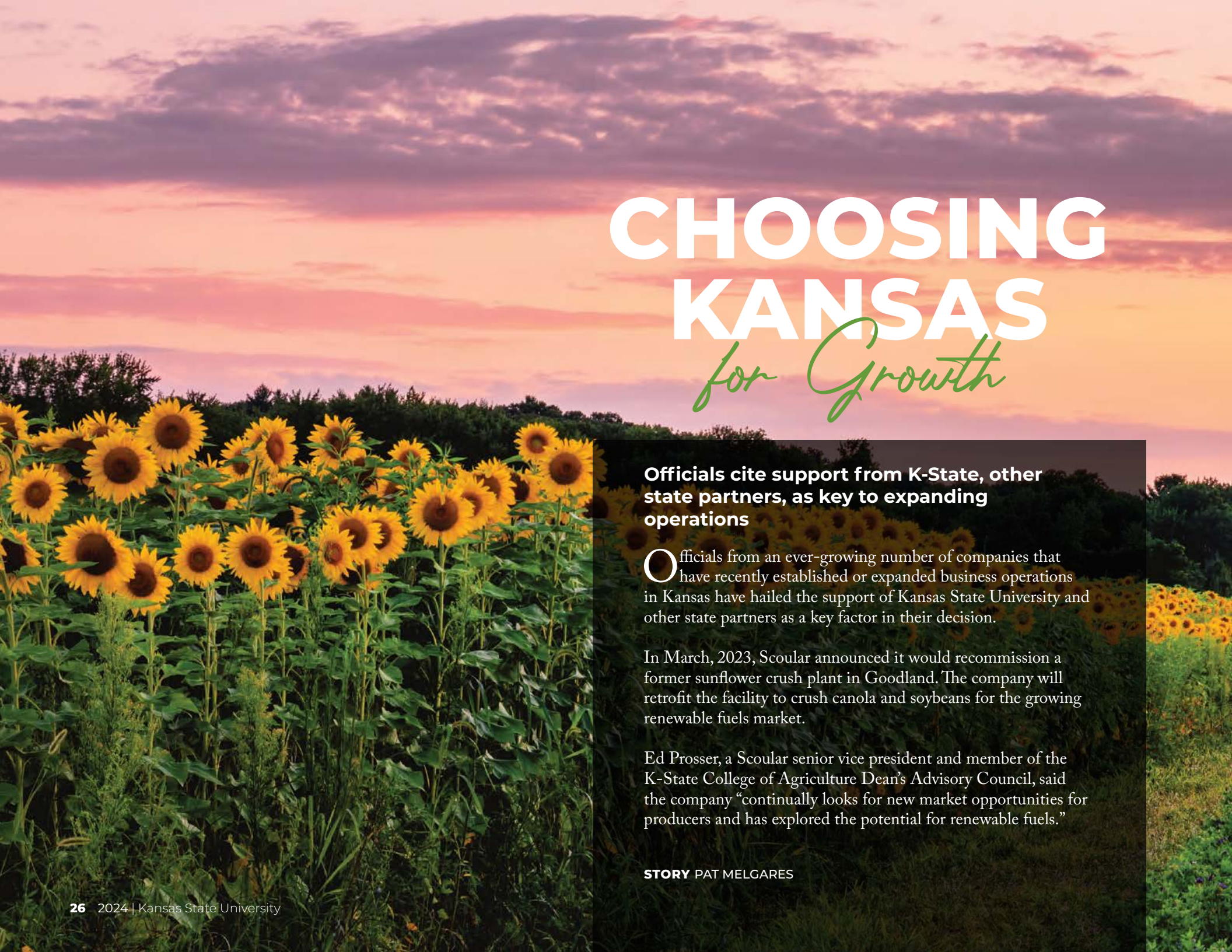
K-State's support for agricultural growth takes many shapes, whether developing better seed genetics or leveraging K-State's land-grant mission to work alongside producers making management decisions, according to Kansas Water Institute director Susan Metzger.

"The communities and economy of western Kansas represent the heart of what stands to be gained – or lost – based on how resilient our agricultural industries, infrastructure and supply chains can be to climate and water-related risks," Metzger said.

Olson said K-State must improve its understanding of the Ogallala and associated management factors for successful future generations of livestock and forage producers. He said the plan is to take a systems approach to the problem of a limited water future, including irrigation engineering, forage production, feeding trials and breeding programs.

"There's some great momentum here, and we need to keep moving forward. I want to see all these small towns grow [and] thrive," he said. "Because western Kansas depends on agriculture, and agriculture depends on water." ■

LEARN MORE ABOUT THE KANSAS WATER INSTITUTE AT **kstate.ag/kansas-water-institute**



CHOOSING KANSAS *for Growth*

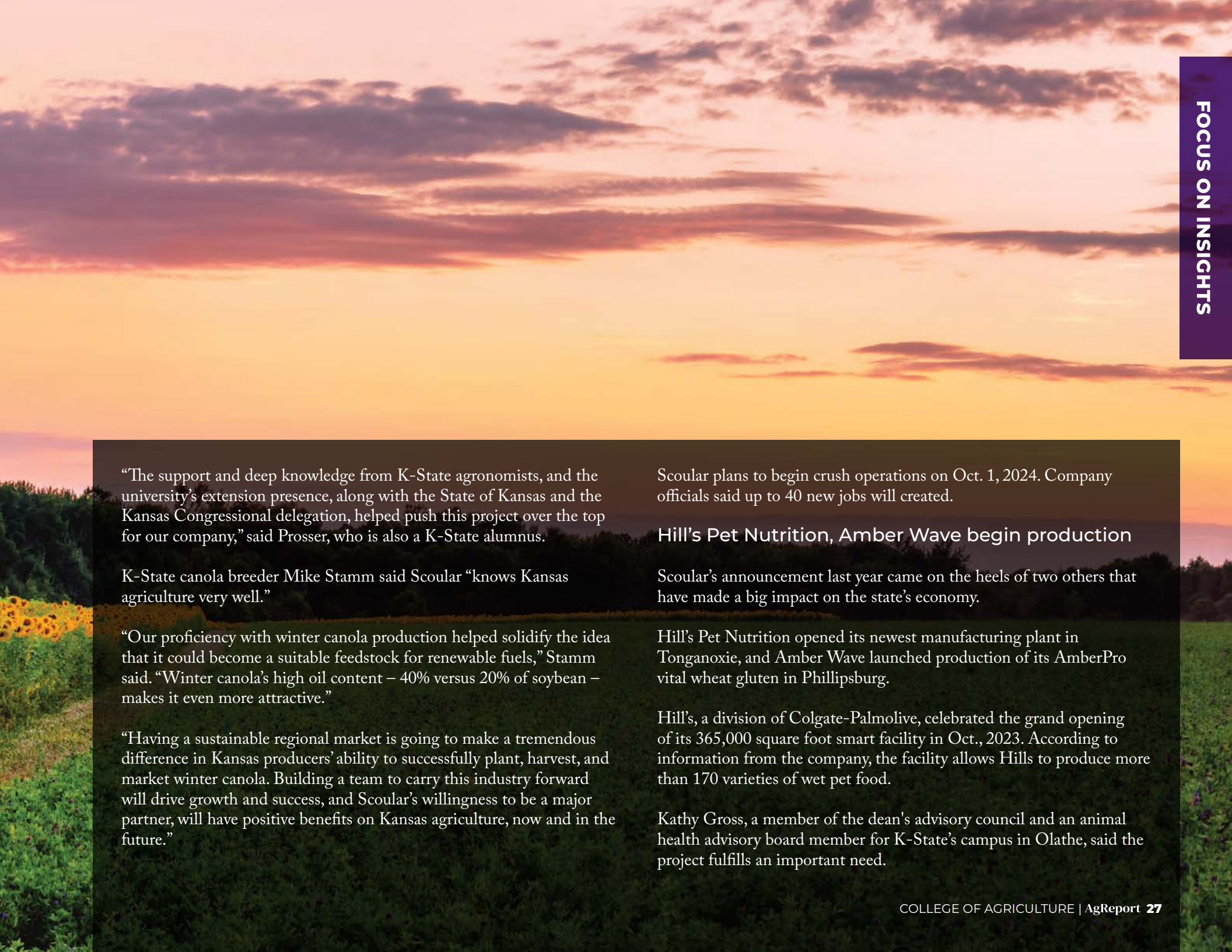
Officials cite support from K-State, other state partners, as key to expanding operations

Officials from an ever-growing number of companies that have recently established or expanded business operations in Kansas have hailed the support of Kansas State University and other state partners as a key factor in their decision.

In March, 2023, Scoular announced it would recommission a former sunflower crush plant in Goodland. The company will retrofit the facility to crush canola and soybeans for the growing renewable fuels market.

Ed Prosser, a Scoular senior vice president and member of the K-State College of Agriculture Dean's Advisory Council, said the company "continually looks for new market opportunities for producers and has explored the potential for renewable fuels."

STORY PAT MELGARES



"The support and deep knowledge from K-State agronomists, and the university's extension presence, along with the State of Kansas and the Kansas Congressional delegation, helped push this project over the top for our company," said Prosser, who is also a K-State alumnus.

K-State canola breeder Mike Stamm said Scoular "knows Kansas agriculture very well."

"Our proficiency with winter canola production helped solidify the idea that it could become a suitable feedstock for renewable fuels," Stamm said. "Winter canola's high oil content – 40% versus 20% of soybean – makes it even more attractive."

"Having a sustainable regional market is going to make a tremendous difference in Kansas producers' ability to successfully plant, harvest, and market winter canola. Building a team to carry this industry forward will drive growth and success, and Scoular's willingness to be a major partner, will have positive benefits on Kansas agriculture, now and in the future."

Scoular plans to begin crush operations on Oct. 1, 2024. Company officials said up to 40 new jobs will created.

Hill's Pet Nutrition, Amber Wave begin production

Scoular's announcement last year came on the heels of two others that have made a big impact on the state's economy.

Hill's Pet Nutrition opened its newest manufacturing plant in Tonganoxie, and Amber Wave launched production of its AmberPro vital wheat gluten in Phillipsburg.

Hill's, a division of Colgate-Palmolive, celebrated the grand opening of its 365,000 square foot smart facility in Oct., 2023. According to information from the company, the facility allows Hills to produce more than 170 varieties of wet pet food.

Kathy Gross, a member of the dean's advisory council and an animal health advisory board member for K-State's campus in Olathe, said the project fulfills an important need.

"People love their pets, and the pet food industry continues to grow; pet owners' demands for healthy, tasty and nutritious products are at an all-time high," said Gross, who also is retired from a position as worldwide director for research and development at Hill's Pet Nutrition, Inc.

"Hill's is one of the largest global pet food makers and has invested in building a modern, wet food facility in Kansas to meet current and future demands for science-based, alternative pet food forms and packages."

According to a company press release, Hill's invested $450 million in the facility, and created 100 new jobs in Leavenworth County.

Amber Wave, based in Ames, Iowa, began production at its $250 million Phillipsburg facility in Nov., 2023. The company's gluten product is considered a valuable domestic source of gluten for commercial bakeries, food ingredient plants, alternative meat manufacturers, pet food processors and specialty feed companies.

All of the wheat needed for Amber Wave's production is grown within 100 miles of Phillipsburg, according to the company's release.

"With more than 80% of the vital wheat gluten used in the U.S. being imported, we not only add value to the growing region but also serve as a supply chain solution provider for our customer base," said Randy Cimorelli, the company's chief executive officer.

Once it reaches full production, Amber Wave will be North America's largest wheat protein facility. The project has added more than 60 jobs to the Phillipsburg area. ■

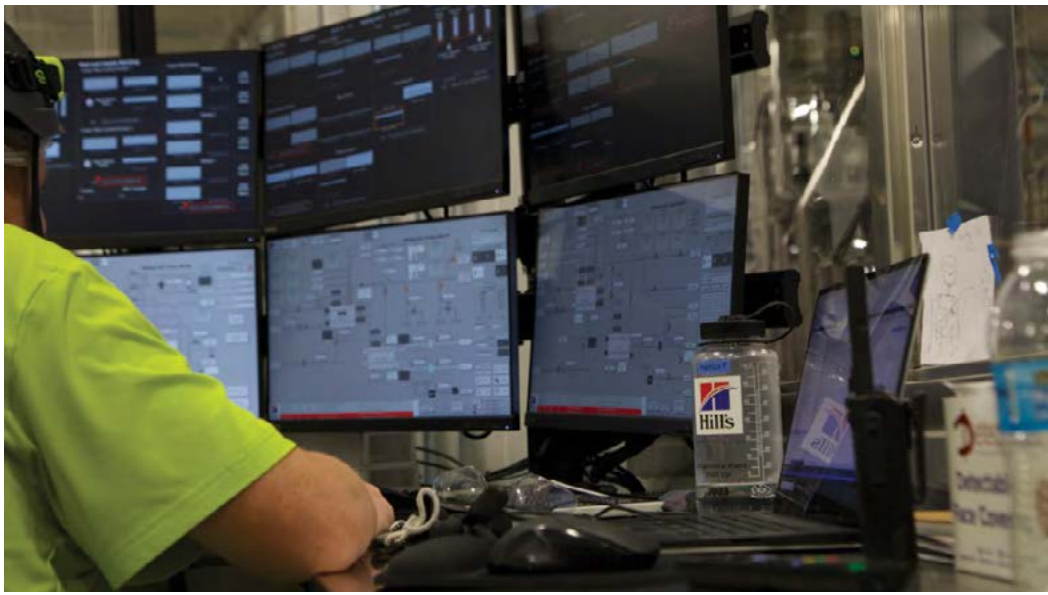
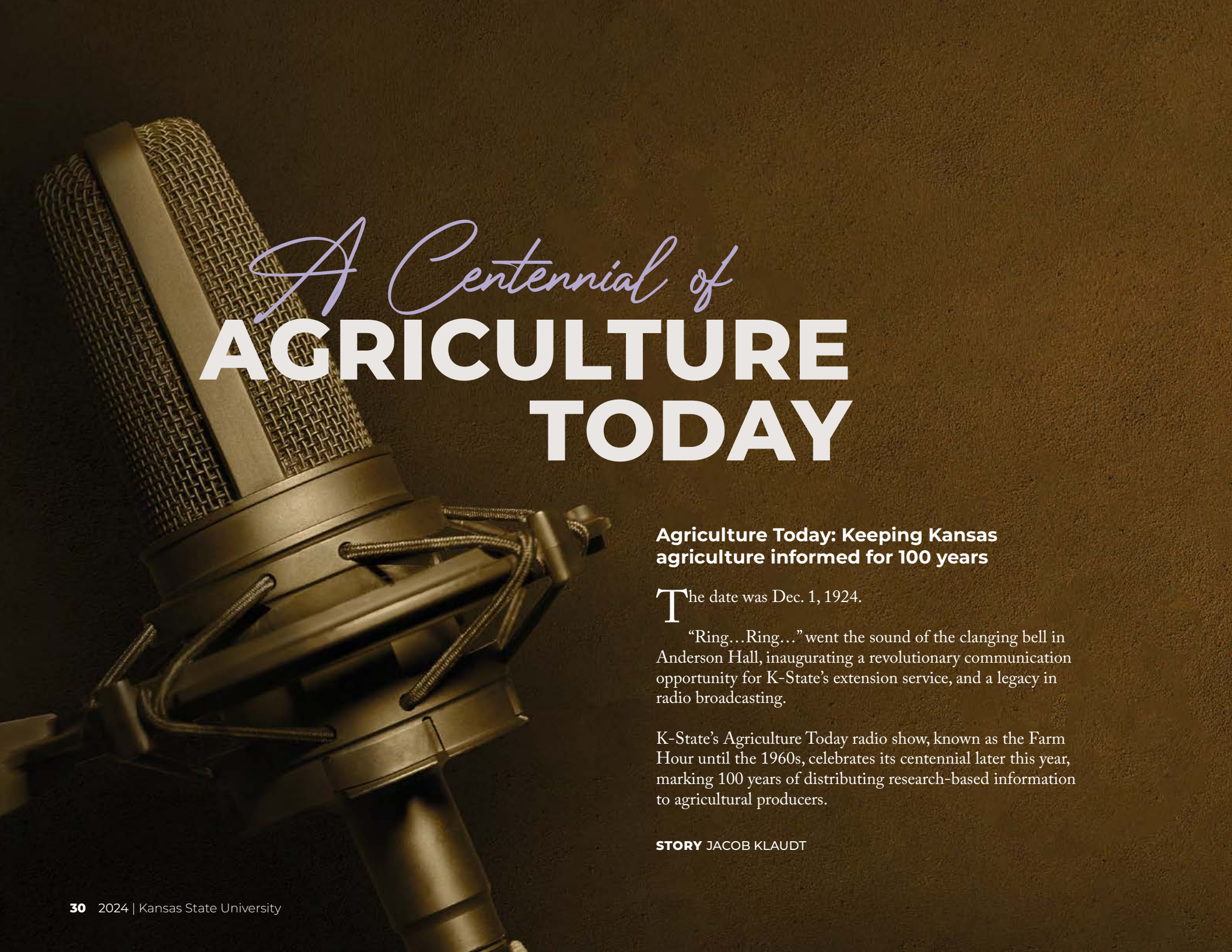


PHOTO HILL'S PET NUTRITION SMART PET FOOD FACILITY IN TONGANOXIE, KS OPENED IN OCT., 2023
COURTESY HILL'S PET NUTRITION

PHOTO SCOULAR'S CRUSH FACILITY IN GOODLAND, KS WILL PROCESS CANOLA AND SOYBEANS
COURTESY SCOULAR

PHOTO DAN DONNERT
IN THE PHOTO MIKE STAMM, K-STATE AGRONOMIST, HOLDS CANOLA SEED
LOCATION KANSAS STATE UNIVERSITY



A Centennial of AGRICULTURE TODAY

Agriculture Today: Keeping Kansas agriculture informed for 100 years

The date was Dec. 1, 1924.

"Ring…Ring…" went the sound of the clanging bell in Anderson Hall, inaugurating a revolutionary communication opportunity for K-State's extension service, and a legacy in radio broadcasting.

K-State's Agriculture Today radio show, known as the Farm Hour until the 1960s, celebrates its centennial later this year, marking 100 years of distributing research-based information to agricultural producers.

STORY JACOB KLAUDT

Interestingly, the history of radio and agricultural broadcasting in the United States has strong ties to what was happening on the Manhattan campus early in the 20th century.

Radio arrived at K-State in 1902 through the physics department. K-State then began broadcasting the first regularly scheduled weather forecasts in the nation to agricultural producers across Kansas, licensed as 9YV in 1912.

"They started out with a telegraphic radio station that was in Morse code. That's how the weather forecasts went out. Farmers and their sons would make a receiver and the operator would tap out code very slowly, so it could be written down," said Mary Ellen Titus, the wife of the late Ralph Titus, a former KSAC station manager and member of the founding committee for National Public Radio.

Eleven years later in Milford, Kansas, J.R. Brinkley – known to history as the "Goat Gland Doctor" – formed a radio station called KFKB (Kansas First Kansas Best) with the ability to transmit audio that reached across middle America.

"If it hadn't been for KFKB and Dr. Brinkley, there may not have been a radio station at K-State or Agriculture Today," Titus said. "It was a very providential moment."

K-State physicist Eric Lyon, horticulture specialist Louis Williams and extension editor Sam Pickard then recognized the unique opportunity that stood before them, potentially capitalizing on KFKB's position as one of the most powerful radio stations in North America.

"Those three men thought since Milford was so close that radio would be a good way to communicate for K-State. They did a show called the 'College of the Air,'" Titus said. "It was classes you could take over the radio and they had lots of professors that would lecture on (topics) like agriculture, engineering, home economics and general science by long-line telephone."

"College of the Air" stood at the cutting edge of broadcasting and in 1923, brought a whole new meaning to extension's mission of taking the university to the people.

According to Titus: "It was very successful. People in Kansas got to take the classes for free. If you lived anyplace else, you were charged 50 cents. By 1924, K-State and those three men had been so good at promoting extension and the station that they got money from the state of Kansas to put KSAC on the air."

KSAC, call letters that stood for Kansas State Agricultural College, pioneered educational broadcasting. The first educational radio station in Kansas started with a five-hour broadcast called the "Voice of the Kansas Aggie" and was the home of Agriculture Today for 78 years.

"When KSAC began, they did have the Farm Hour intact with farmers and agricultural people listening in on a variety of topics from crop production to livestock to agribusiness," said Eric Atkinson, former 39-year host and agriculture director for KSAC/KKSU.

From the onset, Agriculture Today committed itself to delivering information that agriculturists in Kansas and the surrounding areas would find useful. Titus recalled a segment that aired during the 1930s that provided farmers and ranchers with crucial financial advice to help save their operations.

PHOTOS TOP: RADIO ENGINEER FROM EARLY DAYS OF "THE FARM HOUR" **BOTTOM:** RETIRED RADIO HOST ERIC ATKINSON CONDUCTS AN INTERVIEW IN THE FORMER KSAC/KKSU STUDIO
COURTESY MARY ELLEN TITUS AND ERIC ATKINSON

"They had a half-hour show called Farm Business during the Great Depression. It talked about how farmers could make it through the economic depression and how to make budgets and things of that nature," she said.

"If it hadn't been for KFKB and Dr. Brinkley, there may not have been a radio station at K-State."

— MARY ELLEN TITUS

The Farm Hour continued to generate practical content that delighted listeners with unique perspectives. During the 1950s, the show covered a program developed by K-State's Smith County extension office that established a working farm within a single day.

"It was a huge educational effort that had all kinds of experts on from crop production to livestock to agricultural engineering," Atkinson said. "They built things and literally started a farm from scratch."

A decade later, former host and Kansas radio legend, Paul DeWeese, followed a truckload of wheat harvested near Wichita through the exporting process to Europe.

"He wanted to show people what really happened to Kansas wheat. He took the year off, went to all the countries over there that used our wheat and sent back recordings to play over the air," Titus said.

The name of the show changed from the Farm Hour to Agriculture Today in 1961. The show stayed grounded in its roots, however, and continued distributing helpful knowledge from experts on pertinent topics ranging from weekly market reports to industry-changing events like the Farm Crisis of the 1980s.

"We were taking the information our (K-State) people were generating here through their research and through their interactions with peers. It was unbiased, impartial information based on science, based on research, and we were getting that information out to agricultural producers, supporting industries and agribusiness," Atkinson said. "That was an ongoing goal of the show from day one."

Arguably the most influential moment in the show's history occurred when K-State sold the broadcasting rights of the station carrying Ag Today, KKSU (known previously as KSAC), to its air-time partner, WIBW.

"Agriculture Today was still very much intact at the time and doing well with listenership. Then the rights of the station were sold. We were fortunate that a major farm broadcaster, KFRM, out of Clay Center, Kansas, contacted us and inquired as to whether we'd like to air the program on their airwaves as a regular daily weekday program. Surely, we jumped at the chance to do that," Atkinson said.

Agriculture Today broadcasted for the last time on 580-AM with 5,000 watts over KKSU on Nov. 27, 2002. The station aired the "The Final Day" program. Ralph Titus summed up the excellence of its broadcasting with the following sentences:

"All the information programs provided a source of information of consequence. In short, presenting, on a daily basis, the world of ideas. Doing what those three

men set out to do in 1924: taking the university to the people."

A couple of months later, in Jan., 2003, the show resumed. Since that time, Atkinson and other hosts have governed Agriculture Today with strict guiding principles that revolve around improving the life of the Kansas farmer and rancher through connection.

"Ag Today offers us a vehicle to share with the public our new initiatives and research, and the success of our programs and services. A major part of being successful in extension and engagement is making people aware of our efforts and connecting them to the resources they need. Agriculture Today is an important part of that," said Gregg Hadley, K-State assistant vice president and director of extension.

PHOTO DAN DONNERT
IN THE PHOTO CURRENT AGRICULTURE TODAY HOST, SHELBY VARNER, CONDUCTS AN INTERVIEW
LOCATION RADIO STUDIO, KANSAS STATE UNIVERSITY

Despite such incidents as a fire that destroyed all broadcasting equipment in 1968, the show briefly going off radio and other unfortunate events in its history, Agriculture Today has proven to be resilient against forces hindering its ability to deliver information to the public.

"It has just proven itself over and over again to be an extremely effective way of reaching agricultural producers and their allies," Atkinson said. "If you provide good content that's of value to the listener, then they will listen and that's carried the day for us."

Even with audiences possessing more forms of media now than ever before, agricultural broadcasting maintains a loyal listenership. According to surveys conducted by Aimpoint Research for the National

Association of Farm Broadcasting (NAFB) in 2021 and 2022, listeners choose agricultural radio as their daily source of information over other forms of communication.

"More than 75% of our farmers surveyed recently said that they listen at least five days a week. This is true among several different age groups, not just older farmers. Close to 50% of our respondents say that they listen to agriculture radio for more than 60 minutes a day," said DeLoss Jahnke, former Agriculture Today employee and current vice president of the NAFB.

Those statistics speak to K-State's potential to meet its future engagement and outreach goals.

"It will provide us an opportunity to continue to maintain a connection with rural, agricultural communities, in particular, folks that are in those sectors that need the information and benefit from the findings of agricultural research and innovation. I also believe it enables us to reach out to people who may not be traditionally involved with agriculture who hear the stories that come out on broadcast radio," said Marshall Stewart, K-State senior vice president for executive affairs, university engagement and partnerships.

Recently, Agriculture Today started streaming on all major podcast listening platforms, a sign of how readily the show evolves with its audience's listening habits.

"We're really good at catching on quick to how people consume information and that's one of the reasons we're so successful," said Jeff Wichman, K-State Research and Extension communications specialist. "Right now, the podcast works well because we archive all our shows. It's something that they can access either right away in real time, or they can go back and listen to a program when they have the time."

Technology and the way people consume information change constantly. While the distribution of Agriculture Today may change in the future, Atkinson hopes the essence of the show will persist.

"Twenty years ago, podcasts weren't even on the radar at all. Now, podcasts are a mainstay of communication, so who knows what will be the next best thing 20 years from now. I would like to think that whatever shape it takes, it will retain some of the same elements that we look at now in agriculture broadcasting, like good information," he said.

He adds: "I think the public is still going to want to look into something that has some value to it. It's in the preparation; it's in the understanding of the topic. It's in the willingness to convey that information in an understandable way. It's all this basic stuff that has existed back in the early genesis of radio; it's still intact today. I think all that will remain so." ■

LISTEN TO PAST AND CURRENT EPISODES OF AGRICULTURE TODAY AT **kstate.ag/AgToday**

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