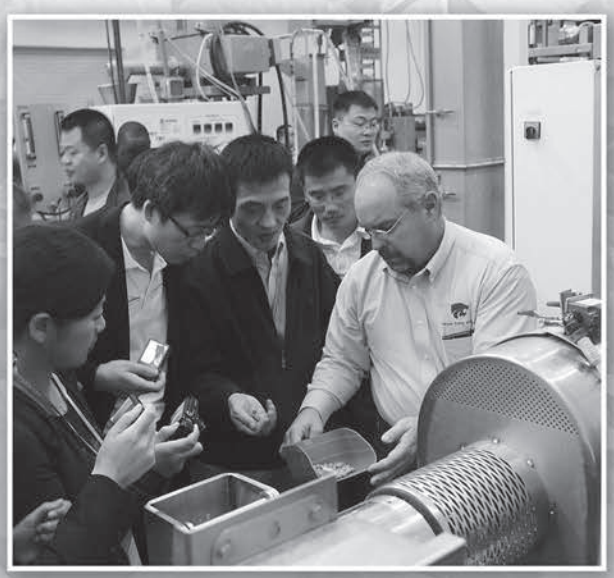

K-STATE
Research and Extension

Making a Difference for All Kansans

2013 Report to the Legislature

K-STATE
Research and Extension

Making a Difference for All Kansans

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Our Commitment

K-State Research and Extension is committed to Kansas citizens. We are here to expand the human capacity and enhance the quality of life by conducting practical research and delivering educational programs and technical information that address issues important to Kansas citizens.

www.ksre.ksu.edu

Dan Donnert

John Floros (left), director of K-State Research and Extension and dean of the College of Agriculture, talks with David Rock, a member of the dean and director's advisory council that meets with administrators twice a year to review goals and progress.

The Role of K-State Research and Extension

K-State Research and Extension is a short name for the Kansas State University Agricultural Experiment Station and Cooperative Extension Service, a partner in the nationwide land-grant system of universities created in the 1860s to educate people from all walks of life and to generate and distribute useful public knowledge. K-State scientists and extension faculty can draw on the expertise and accumulated studies and discoveries of the land-grant system, other universities, state and federal agencies, and industry.

A Message from the Director

Since accepting the position of dean and director in August, I have visited many of our statewide facilities and met with various stakeholders to see how K-State Research and Extension is making a difference. I'm pleased to report that we are responding to the needs of Kansans by providing research-based information to meet those needs.

I've also been meeting with faculty, staff, and students asking about their concerns and goals. Input from external and internal groups will be used in the next few months to develop a strategic plan for the College of Agriculture and K-State Research and Extension. The plan will provide direction for the next 12 years and closely align with the university's plan to be a Top 50 research institution by 2025.

The articles in this publication emphasize how we are working for the future of agriculture and industry in Kansas and the Great Plains; providing food, nutrition, and health programs for Kansans of all ages; adapting irrigation practices and developing new crop varieties to deal with drought and weather extremes; helping communities to remain strong and viable; and encouraging youth to be tomorrow's leaders through science, math, and engineering.

The College of Agriculture is experiencing a tremendous increase in student numbers. Our graduates are finding good, well-paying jobs in a variety of occupations. Our science-based curricula prepare them to meet the challenge of feeding a projected population of nine billion people, which will require doubling the food production through more efficient production, handling, and distribution systems.

Severe drought has affected nearly everyone — from the Kansas City area plant nurseries to the northwest Kansas corn farmer, from the southwest Kansas feedlot manager to the Flint Hills rancher. Faculty and staff provide important drought-related information — in a variety of formats — on how to deal with current conditions, as well as how to plan for future water quality and quantity issues.

Obesity, diabetes, and health-related expenses are growing in Kansas and across the nation. Educating people about living a more healthful lifestyle through exercise and better food choices will benefit people of all ages.

We continually evaluate and adjust our programs to ensure we are making the best use of our resources and reaching out to Kansas' citizens. Our faculty on campus and around the state also leverage resources by competing for grants to fund important programs.

Our programs impact society, improve the standard of living, and elevate the quality of life. We are providing Knowledge for Life.

John D. Floros

John D. Floros
Dean, College of Agriculture, and
Director, K-State Research and Extension

Dan Donnert

Dale Huncovsky (shown above) and his wife, Laverna, own and operate the Cuba Cash Store in Cuba, Kan. The small store anchors the community and is known for its fresh meats and customer service. They also supply a local restaurant called Two Doors Down and run a catering business to strengthen the base for the community's grocery store.

Grocery stores are vital to small communities. The Pottawatomie County economic development director reported that the city of Onaga lost $20,000 per year in sales tax revenue when its grocery stored burned.

K-State Helps Communities Improve Access to Food

Kansas is a top crop and livestock producer, yet many in the state have difficulty accessing food.

The issue affects urban and rural residents and impacts quality of life, community health, and the local economy, said David Procter, director of Kansas State University's Center for Engagement and Community Development.

The center draws on university resources and K-State Research and Extension to meet the needs of Kansans; for example, it was the primary organizer for a series of grocery conferences. The most recent, "Strengthening Our Stores, Strengthening Our Communities," attracted 175 participants from 14 states.

Conference goals include sharing ideas, identifying resources, and encouraging dialog among communities seeking access to food. Consider these examples:

• After losing its grocery store three years ago, Minneola residents organized a community corporation and sold shares ($50 each) to raise $200,000 to reopen a grocery store. The low share price allowed residents to take pride in ownership, and more than 200 volunteers helped renovate the building before the Home Town Market opened March 7, 2012.

Lonnie Patrick, store manager and butcher, selects fresh meats for the store.

"Sales are averaging $18,000 to $20,000 per month," said Patrick, who noted that the store includes a deli with daily specials. "We've placed chairs by a window so customers can enjoy fresh-cooked foods and catch up on the local news."

• In Wyandotte County, a virtual store is poised to improve access to food for low-income residents without the transportation they need to the nearest grocery store five miles away.

Online services also should improve community health, said Bruce Chladny, director for K-State Research and Extension – Wyandotte County.

Grant funds from the Robert Wood Johnson Foundation and Local Initiative Support Corporation allowed K-State to hire Linda Quinn, a community organizer and advocate. She and Chladny enrolled in a class to learn how to write the business plan for the project, and she pitched the plan to county commissioners to secure $42,000 for the 2013 trial.

Quinn partnered with a local grocer and negotiated discounted fees for online purchase and delivery. The goal of the pilot is to prove to prospective store developers that there is a need for nutritious food in the community.

• Residents in Plains have been without a grocery store for a decade. Now they are moving forward to improve access to food, provide nutrition education, and facilitate aging in place. Inspiration for the idea came from K-State's 2010 grocery conference, when Faye Minium from Morland offered a session on establishing a community foundation to reopen a grocery store.

Plains' representatives followed up by forming the Community Enhancement Foundation of Plains and identifying their first project as an "Access to Food and Nutrition Education Center." They also applied for Internal Revenue Service status as a 501(c)(3) corporation, which was granted in January 2012.

The nonprofit status will allow the foundation to seek donations and apply for grant funding, such as a recent $25,000 grant from State Farm Insurance, to make the new center a reality, said Cheryl Rickers, foundation vice president.

For more information, visit *www.ruralgrocery.org*.

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Resources for TBI

The TBI*options* program is designed to connect those who have experienced a traumatic brain injury (TBI) — as well as their families, friends, and caregivers — with resources in their communities. The program has two components: the original "Connecting to Resources" (*www.tbioptions.ksu.edu*) and "Promoting Knowledge" (*www.tbioptions.ksu.edu/knowledge*), which was introduced in 2012. The new component incorporates interviews with survivors and their families into a presentation that provides more information about TBI for those interested in being caregivers.

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Developing a Plan

A Kansas PRIDE program staff member works with the Kansas Association of Counties to help county personnel plan for the future. For example, she facilitated meetings with Lyon County commissioners, heads of county departments, and other stakeholders to help them define how departments interact and what community resources were available. The county was able to develop a mission statement and a clear vision for its future.

The Kansas Department of Commerce, K-State Research and Extension, and private sector companies and associations, which operate in Kansas, partner together to make the PRIDE program successful.

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Dan Donnert

Wichita County farmer Greg Graff serves as district representative for the Kansas Grain Sorghum Commission and board president of the Western Kansas Groundwater Management District 1. He and Ramasamy Perumal, sorghum breeder at the Agricultural Research Center–Hays, examine a K-State sorghum test plot after an early freeze.

Compared to corn or soybeans, the other major summer row crops in western Kansas, grain sorghum requires less water to make a decent yield and handles stress better. No other crop makes such efficient use of available water and consistently generates income as a cash crop under such a wide range of soil and weather conditions.

Sorghum Research Could Extend Water Resources

The extreme heat and drought of 2011 and 2012 took a heavy toll on summer crops in most of Kansas. Just ask western Kansas producer Greg Graff from Wichita County. The dryland crops produced nothing. Only irrigated sorghum came close to a normal yield.

"Nothing really worked on dryland acres around here in 2012, not even grain sorghum — which can usually withstand dry weather pretty well," Graff said in early fall. "On irrigated ground, the grain sorghum looks relatively good, at least compared to corn."

This is not surprising, Graff said. Compared to corn or soybeans, the other major summer row crops in the region, grain sorghum requires less water to produce a decent yield and handles stress better. No other crop makes such efficient use of available water and consistently generates income as a cash crop under such a wide range of soils and weather conditions, he said.

So why has grain sorghum acreage lagged behind corn and soybean acreage under full and limited irrigation in Kansas? Three big reasons, according to Graff: limited top-end yield potential, limited options for controlling summer annual grasses, and a price spread that favors corn over grain sorghum.

A strong K-State Research and Extension program in grain sorghum is vital, Graff said.

"Farmers in Kansas are relying on our K-State sorghum breeders, Ramasamy Perumal in Hays and Tesfaye Tesso in Manhattan, to continue emphasizing higher yields," Graff said. "Right now, we can get maximum sorghum yields of about 170 to 180 bushels per acre on 12 to 14 inches of water. If we could get 220 bushels per acre on that same amount of water, that would make sorghum roughly as profitable as growing corn on 18 to 24 inches of water."

After that, sorghum yields need to increase by 2 to 3 percent a year to keep pace with increases in corn yields, he added.

The goal is not to entirely replace irrigated corn with grain sorghum, but to make grain sorghum more of an equal partner with corn under irrigation.

"As a western Kansas farmer, I'd like to have a cropping system choice of corn, sorghum, and wheat under irrigation instead of just corn and wheat, but wheat and sorghum currently are not as profitable as corn," he explained. "That would allow us to extend the available water in the aquifer, make better use of planting and harvesting equipment through the season, and allow us to reduce our risk of crop failure because of weather extremes and stress."

In addition to efforts to increase yields through plant breeding trials, K-State researchers have made other important contributions recently to grain sorghum profitability, Graff added:

- Herbicide-resistant sorghum technology will help with in-season grass control in sorghum.
- Nitrogen fertilizer management research allows producers to reduce nitrogen use while maintaining yields.
- Improved stalk quality will support the weight of higher yields.
- Greater cold tolerance would allow sorghum producers to plant earlier and use longer season hybrids than they currently grow and increase yields.

Research efforts through K-State's Great Plains Sorghum Improvement and Utilization Center help increase sorghum acreage in Kansas so producers can make better use of water and other valuable resources now and in the future.

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Irrigation Software

These software tools are available at the Mobile Irrigation Lab website *mobileirrigationlab.com*

KanSched is primarily used for daily in-season irrigation scheduling.
Crop Water Allocator helps determine the best crop mix (acreage-based) for a limited water supply.
Crop Yield Predictor considers effects of in-season water application strategies and evaluates the effect of the initial root zone soil water on yield potential.
FuelCost evaluates pumping plant performance to compare energy sources and conduct economic analysis of repairs or upgrades.

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Sorghum Center

As pressure on the Ogallala Aquifer increases and less irrigation is possible, sorghum will become even more important to farmers in the Great Plains and to the High Plains livestock and ethanol industries. The Great Plains Sorghum Improvement and Utilization Center brings together breeders, weed scientists, entomologists, faculty studying new uses for sorghum, plant pathologists, and crop production specialists. The goal is to improve sorghum yield and profitablity.

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1863 Wheat Released

The Kansas Wheat Alliance will introduce a new hard red winter wheat variety in February 2013, with Overley, Karl 92, and Cutter as the parent varieties. It is named 1863 in honor of the year K-State opened as the nation's first operational land-grant university under the Morrill Act.

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Division of Communications and Marketing

K-State food scientist Randy Phebus and graduate students Nick Baumann and Nick Sevart process ground beef inside a biosafety level 3 "Biobubble" at K-State's Biosecurity Research Institute in Pat Roberts Hall. Projects like this led to K-State's inclusion in a multistate $25 million beef safety grant.

There are 500 known Shiga toxin-producing *Escherichia coli* (STEC), 100 of which can cause illness in humans. The multistate grant research will focus on the seven most dangerous strains of *E. coli*, plus a new strain that made its first widespread appearance in an outbreak in Europe in 2011.

Multistate Effort Launched to Improve Beef Safety

A food safety outbreak affects consumers, those who produce and process the food, and the economic stability of the food industry. To improve beef safety and prevent outbreaks, K-State scientists are working with counterparts across the country through a $25 million USDA Agriculture and Food Research Initiative (AFRI) coordinated agricultural program grant.

The project focuses on reducing the occurrence and public health risks from six Shiga toxin-producing *Escherichia coli* (STEC) that result in more than 265,000 infections in the United States each year. The grant was awarded to the University of Nebraska-Lincoln; however, K-State has 20 faculty involved with the grant and receives $8.2 million over its five-year duration.

K-State food scientist Randy Phebus serves on the grant executive team with Harshavardhan Thippareddi and Rodney Moxley, UNL; John Luchansky, the USDA/Agricultural Research Service; and Dan Gallagher, Virginia Polytechnic Institute and State University. More than 50 researchers from 11 institutions and the USDA/ARS will address five interrelated project objectives during the five-year grant. The management team meets twice weekly, often including other collaborators, to assure they are not duplicating but enhancing efforts across the different universities.

"Our three primary goals are to reduce public health risk related to STECs in the beef system; provide scientific information and guidance to producers, processors, regulators, and consumers to help lower incidences of STEC in beef products; and recruit and energize the next generation of food safety professionals through degrees and training," said Phebus.

To ensure that all segments of the industry are represented throughout the project, the team assembled an advisory council. Mark Knight, owner and manager of Knight Feedlot in Lyons, serves as a stakeholder on the council.

"Our family and Knight Feedlot appreciate the work that has been done at Kansas State University," Knight said. "Whether directly or indirectly related to our feed yard, any type of outbreak in the beef industry causes catastrophic panic about the food we produce.

"This type of preventive research is what could save many family farms, our industry, and many operations out there that benefit from the beef industry such as ranchers, auction markets, farmers, truckers, ethanol plants, nutritionists, veterinarians, feed yards, and many others. So when I was asked to be a part of this project, it only made sense."

Phebus explained that one-third of the $25 million grant is to be used for education and outreach. Many of the educational materials and online training modules will be produced at K-State in English and Spanish.

To meet the grant's student recruitment goal, the group has launched a competitive internship and training program.

"The internships will be open to undergraduate, graduate, or veterinary medicine students interested in food safety, beef safety, beef processing, public health, or food safety education," Phebus said. "Students from across the nation — including K-State students — will apply to work with faculty at one of the collaborating institutions."

Phebus selected an undergraduate intern to help him set up and validate important beef processing equipment in K-State's Biosecurity Research Institute.

"One goal of K-State's Vision 2025 is to enhance undergraduate research," Phebus said. "These types of grants and research will help us achieve our goal."

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Grant Proposal Support

Research awards at K-State have increased continuously for the past two decades. These awards fund innovative projects not possible within the budget constraints of a public university. Awards also help support undergraduate research, train graduate students, and enhance and inform extension programming.

In 2011, K-State Research and Extension implemented a new support service to help faculty develop winning grant proposals. Grant specialists assist faculty and staff with applications and manage the challenging process of preparing grant proposals.

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Evaluating Progress

Independent evaluators in K-State's Office of Educational Innovation and Evaluation (OEIE) work with K-State Research and Extension faculty who have secured grants. The evaluators help monitor progress to make sure faculty are following procedures in the grant proposal and suggest ways to adjust time lines, if needed.

In the case of the STEC grant at left, OEIE will gauge the impact on protecting public health, monitor practices used in industry, and confirm that grant money is being used wisely. These data can be used to attract additional grant funds.

OEIE also evaluates professional development provided to K-State Research and Extension staff and training provided to program focus team leaders. They develop and maintain a Web-based evaluation reporting system, and assist with the development, delivery, and analysis of the organizations's program prioritization survey.

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Dan Donnert

Teens in USD 334 (Glasco) asked school officials to add salad bars to school lunch programs. The salad bar was partially funded by a $3,000 K-State Research and Extension Get It-Do It! grant, which is available to Kansas PRIDE communities to encourage youth and adults to collaborate on physical activity and health activities.

Kansas' adult obesity rate is 29 percent — more than double the 13.5 percent rate 15 years ago (Trust for America's Health and Robert Wood Johnson Foundation).

New Ways to Encourage Nutrition, Health

According to "F as in Fat: How Obesity Threatens America's Future 2011," a report from the Trust for America's Health and Robert Wood Johnson Foundation, Kansas' adult obesity rate is 29 percent — more than double the 13.5 percent rate 15 years ago.

The same report states that 15 years ago, Kansas had a combined obesity and overweight rate of 47.6 percent. Ten years ago, it was 56.6 percent. In 2011, it was 64.9 percent.

While some blame specific foods, K-State Research and Extension educators focus on research-based nutrition education:

• In Wyandotte County, Nozella Brown favors a positive, proactive approach. "Start where you are, and strive toward making healthier choices that will make a difference over time," she said.

"Many in our population are unfamiliar with the effects of obesity and chronic diseases such as hypertension or diabetes," said Brown, who often teams with urban partners such as El Centro, the Latino Health for All Coalition, and the University of Missouri Extension to serve a diverse population.

• In Seward County, Kathy Bloom collaborated with school nurse Ladona Roddy to introduce Walk Kansas, an eight-week fitness challenge, to high school youth. Twenty teams of six logged more than 5,000 hours of physical activity. They averaged 2,800 miles per week, covering 22,702 miles. Statewide, Walk Kansas 2012 attracted 18,653 participants committed to increasing physical activity and eating more healthfully.

• In Shawnee County, Lisa Martin — working with the USDA's Expanded Food and Nutrition Education Program (EFNEP) — serves on the leadership team for a community-based Centers for Disease Control and Prevention grant to reduce sodium. The grant also includes working with convenience stores and public sites, such as the Topeka Zoo's concessions stands, to identify healthy choices, she said.

• In Riley County, Ginny Barnard used EFNEP to teach a summer nutrition and cooking program for 150 first- through sixth-grade students from the Boys and Girls Club. In a post-program survey, 100 percent of the youth reported caring about eating healthy foods, 86 percent plan to eat breakfast every day, 78 percent plan to eat more fruit, 72 percent plan to eat more vegetables, and 65 percent plan to encourage their friends and family to eat more healthful foods.

• In 2012, Tanda Kidd, state nutrition specialist, developed a successful five-year, three-state $2.5 million adolescent obesity prevention grant awarded by the USDA's National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative. She will lead the community-based participatory effort to explore 12- to 15-year-olds' eating habits and barriers in choosing health-promoting foods. The Ohio State University and South Dakota State University will join Kansas in the research project.

• Paula Peters, assistant director for family and consumer sciences programs, is leading the research on the second year of a seven-state, five-year $4,500,652 NIFA grant to study how a community can influence eating and physical activity of 4-year-olds and whether a community coach can assist them. Sandy Procter, state nutrition specialist, along with faculty from the University of Wisconsin, Purdue, Michigan State, North Dakota State, Ohio State, and South Dakota State universities are following Peters' lead.

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Publications Available

Clients can download or order more than 2,000 research-based publications from the K-State Research and Extension Bookstore *www.ksre.ksu.edu/bookstore*.

Recent nutrition resources include:

Action Plan for Healthy Living (MF 3053), with how-tos for adopting a healthy lifestyle.

Making Everyday Choices for a Healthy, Sustainable Diet (MF 3060), with eco-friendly nutrition tips plus environmentally friendly time- and money-saving ideas.

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Reducing Soil Erosion

A pilot conservation program in Black Kettle Creek Watershed (Harvey and McPherson counties) targeted the most vulnerable sites and led to improved water quality and reduced soil erosion, while maintaining agricultural productivity.

Fields were ranked from most to least vulnerable for potential soil erosion and sediment delivery to streams using computer modeling and a field-by-field assessment. K-State Research and Extension and county conservation districts worked with 22 landowners to develop conservation practices for 141 fields. Implementation of this program resulted in a 60 percent reduction in annual sediment delivery to streams in the watershed, from 13,000 tons/year to 5,138 tons/year.

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David Dunn

Jack Woods (left), vice president and branch manager of Centera Bank in Minneola, reviews financial records with a client, Mark Wideman.

Every one of Kansas' 105 counties was declared a federal disaster area by the USDA in 2012.

Working Together to Mitigate Drought Impact

Agricultural producers depend on timely rainfall to grow the crops needed to help feed the nation and the world. But the rainfall didn't come to Kansas in the 2012 growing season — not nearly enough.

Drought, combined with searing summer heat, forced difficult choices on Kansas farms and ranches — whether to sell off cattle because of a lack of forage, whether to plant seed into parched soil, hoping the rain will come, and whether it's cost effective to control weeds, given a sparse crop.

K-State Research and Extension specialists and county and district agents across the state responded by producing publications and videos, writing newspaper and newsletter articles, doing radio interviews, developing a drought resources Web page (*www.ksre.ksu.edu/drought)* and presenting programs on managing agricultural enterprises in drought conditions, including options for the upcoming growing season.

In her role as the agriculture and natural resources agent in Ford County, Andrea Burns considers helping farmers and ranchers learn about research-based options all in a day's work.

Like agents across the state, Burns, who is a member of the Ford County Local Emergency Preparedness Committee, wrote articles with a focus on drought and precautions Kansans should take for her county's newsletter and local media. She also worked with representatives of the USDA's Farm Service Agency to document conditions in the county in preparation for disaster designation.

But Ford County is just one of many dealing with drought. Every one of Kansas' 105 counties was declared a federal disaster area by the USDA in 2012.

"In response to the questions we were getting, the agriculture and natural resource agents from Ford, Gray, Hodgeman, and Edwards counties worked together to host a 'Dealing With Drought' meeting in Dodge City," Burns said.

The meeting drew attendees from six counties, including producers from large and small operations, as well as bankers and government officials.

Agents in Wildcat and Southwind districts hosted a similar meeting for southeast Kansas producers and bankers in Parsons.

"This meeting was put together to give producers and others a chance to sit down and have conversations about their situations and options," she said. "The agents and specialists worked together to get the latest research-based information to them in order to help them decide if and how it would work for their particular operation."

"This drought has been detrimental to our producers — we've raised fewer crops and have had to liquidate some herds," said Jack Woods, vice president and branch manager of Centera Bank in Minneola, who attended the meeting. "It's reduced customers' incomes and will impact agricultural operations for years to come."

Meetings such as the one hosted in Dodge City are important to keep farmers, ranchers, and related businesses aware of current conditions and research-based options, said Woods, whose bank makes agricultural loans and small business loans to businesses that also deal with farmers. The Minneola branch is one of five branch offices in southwest Kansas.

"These kinds of programs are important so that we, as farmers and lenders, know what we're dealing with now and in the future," Woods added.

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Drought Info Resource

To provide a one-stop resource for drought information, K-State Research and Extension compiled information from agents around the state and various state and federal resources on a drought links website. The site received more than 2,700 hits with 61 percent of the viewers "bouncing" to another site for more information. Visits peaked in late June and early July.

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Economic Resources

The *AgManager.info* website averages more than 70,000 visits by more than 25,000 unique visitors each month. Livestock marketing, grain marketing, crop insurance and government programs, and farm management information are the most popular.

Recent additions include RSS feeds and Web-browser dashboards for decision tools, which are complemented by more than 50 other spreadsheet tools to help crop and livestock producers manage risk and make decisions.

The grain basis tool provides weekly historical grain basis information (going back as far as 1998) for wheat, corn, grain sorghum, and soybeans from about 800 locations in the High Plains. Associated GIS maps of grain basis and the deviation from the three-year average are also available each week.

The Kansas Farm Management Association information also is better integrated into the site.

In 2010, the website received the Agricultural and Applied Economics Association Outstanding Electronic Media Education Award.

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Above: Students prepare videos during Cowley County's 4-H Tech Wizards sessions developed by 4-H Youth Development agents.

Below: Future engineers test their model at the GEAR-Tech 21 summer camp.

Courtesy of Kelsey Holcomb and Becky Reid

A five-year study by Tufts University shows that 4-H members are nearly two times more likely to attend college and more likely to pursue future courses or a career in science, engineering, or computer technology.

Kansas 4-H Prepares Youth for Hi-Tech Future

Children may avoid science classes; however, Mad Science Monday, an afterschool program offered in Cowley County, attracted 60 first- through sixth-grade students ready to learn.

Kelsey Holcomb, K-State Research and Extension 4-H Youth Development agent in the county, planned the science-is-fun afterschool program.

Youth who fail to embrace science and technology have difficulties staying in school and limit their readiness for post-secondary education and employment, said Holcomb, who has reached out to more than 100 at-risk youth.

To increase understanding of science and technology among underserved and at-risk youth, Holcomb and Becky Reid, family and consumer sciences agent, worked with Gary Gerhard — professor of youth development and 4-H state liaison for science, engineering and technology — to develop a grant proposal.

Holcomb secured an $82,000 grant from the National 4-H Council (charged with granting juvenile justice funds to aid underserved audiences) that allowed Cowley County agents to introduce 4-H Tech Wizards curricula to youth at day camps, afterschool programs, and in small-group mentoring opportunities.

The 4-H Tech Wizards model program was developed by Oregon State University to introduce at-risk youth to emerging technologies, encourage technology proficiency, and school and community involvement, said Holcomb. She worked with area schools to identify fourth- to fifth-graders in Arkansas City, and fifth- and sixth-graders in Winfield.

Program announcements were provided to families, and students were invited to a free introductory day camp and nine-week afterschool program focusing on robotics, Web 2.0, photography, and videography.

Holcomb coordinated the educational effort in Winfield, and Reid managed the Arkansas City program.

"Technology sparked the interest," said Holcomb, and she credited the content and a safe, caring learning environment with teen and adult mentors for holding students' interest.

Ninety percent of the parents responded to the evaluation. One parent stated, "I am more impressed with this project than any other project she has participated in outside of regular school."

Reid shared a few of the comments from the survey question that asked if the parents noticed improvement in their student's desire to attend school:

"He looks forward to school, especially on Mondays."

"Loves the program, disappointed the day it was cancelled. Not a problem getting her out of bed on Mondays."

"Yes, he has fun learning and spending more time with friends."

"Yes, she doesn't want to miss it."

"He loves school, but really loves Tech Wizard nights."

Students were enthusiastic about bringing family members to show-and-tell sessions, which provided opportunities for Holcomb and Reid to discuss important topics, such as food, nutrition, health, youth development, and community involvement.

Despite time and money constraints, Holcomb and Reid plan to continue 4-H Tech Wizards. They also are exploring funding opportunities to help area youth maintain their connection with emerging technologies and position them for success in school, work, and life in their community.

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International Experiences

In 2012, Kansas 4-H celebrated the 35th anniversary of its Kansas 4-H/Japanese Exchange Program. The month-long educational opportunity is part of the States' 4-H International Exchange Programs, which has provided opportunities for more 7,600 American 4-H youth, ages 12 to 18. The summer programs are intended to help increase understanding of cultural differences, global society, and the larger world.

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Lifetime Wellness

An Atchison County 4-H member worked with her local agent to create a Lifetime Fitness Challenge to inspire youth and adults in the community. She combined 4-H curricula in food, nutrition, and health with dietary recommendations from USDA's "My Plate" to illustrate three key messages:

1. Eat healthy.
2. Exercise more.
3. Make healthy choices into easy choices.

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Volunteer Connection

In 2012, about 8,500 adults and teens volunteered to assist Kansas 4-H Youth Development programs. Volunteers average 500 or more hours per year. They serve as positive role models for youth, provide activities to help youth build important life skills, and offer opportunities for youth to use learned life skills as partners in — and leaders of — valued community activities.

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Dan Donnert

KC Olson, professor of range beef cattle nutrition and management, meets with a group of Flint Hills ranchers to discuss how to effectively manage invasive weed species, especially sericea lespedeza.

Sericea lespedeza aggressively competes with native grass. A K-State study shows that native grass production was reduced by as much as 80 percent in grassland severely infested with the noxious weed.

Noxious Weed Management a Priority for Ranchers

Like many ranchers, Bill Sproul experiences the rewards and challenges of ranching on Kansas' tallgrass prairie. And he considers sericea lespedeza the No. 1 long-term threat for ranchers in the area.

Sericea lespedeza is an invasive, noxious weed that infests approximately 600,000 acres of native tallgrass prairie in the Kansas Flint Hills. Tannins in the weed hamper protein digestion by beef cattle and cause abdominal discomfort, so cattle learn to avoid it, which renders some land useless for grazing.

"It's a major, major issue. Long term, I feel that it's the biggest threat to the tallgrass prairie," said Sproul, who grazes more than 3,000 head of cattle on his Chautauqua County ranch. "The drought is the No. 1 issue short term, but sericea is the No. 1 issue long term."

"We've been working on it for 10 to 12 years with chemicals, and it's only gotten worse," he said. "Chemicals are part of the solution but not the whole solution."

K-State Research and Extension scientist KC Olson agrees. He and a team of researchers and extension agents are working with Sproul and others — some of whom are part of an organization called the Tallgrass Legacy Alliance — to find ways to control the weed.

"One reason for sericea's invasive nature is its capability to reproduce," said Olson. "One plant can produce thousands of seeds annually. We address that currently with herbicides. But herbicides are not specific — they kill other valuable plants, plus rugged terrain and the robust tallgrass canopy prevent chemicals from contacting immature plants. Another reason for sericea's invasive nature is its ability to avoid grazing through its mildly toxic tannins. Without grazing pressure, sericea continues to reproduce unabated."

Wildlife biologist Jim Minterath is retired from the U.S. Fish and Wildlife Service but remains involved in the issue.

"KC's work stands out because he's trying to figure out how to live with sericea," Minterath said. "His approach is probably the only long-term feasible approach. If he succeeds, ecologists will be so thankful."

In looking for a safe, inexpensive supplement that could be fed to cattle that might counteract the protein-binding effects of sericea, the researchers identified corn steep liquor (CSL), a nonalcoholic by-product of corn sweetener production, as having strong anti-tannin properties. At the time of the study, CSL sold at about $5 per ton.

"In a series of five studies, cattle readily consumed it," said Olson of the supplement, "and suffered none of the digestive disorders characteristic of tannin consumption. Supplementation of 2 to 4 pounds of CSL per day increased acceptance of and tolerance for sericea lespedeza by beef cattle."

"That's significant," Olson said. "If we can remove the negative consequences of tannin consumption through strategic supplementation, we can probably apply significant grazing pressure to sericea lespedeza and achieve a measure of biological control using the most economically relevant herbivores in the Flint Hills — steers and cows. Benefits may include improved rangeland health, improved animal welfare, reduced herbicide usage, and an inexpensive and manageable control method for this plant."

To watch a video about this topic, go to *www.ksre.ksu.edu/sericea.*

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Research Benefits Kansas and Beyond

The Kansas Agricultural Experiment Station marked its 125th anniversary in 2012.

Here are a few historic highlights:

- Food scientists validated steam pasteurization technology for beef carcasses to help the meat industry control pathogenic bacteria and reduce foodborne illness.
- An agricultural economist developed the Crop Revenue Coverage (CRC) Insurance Program that provides greater availability of risk management tools to local farmers. CRC has provided more than $100 billion of protection for farmers.
- An entomologist taught the first course and published the first book on host plant resistance.
- A K-State graduate student, modified a shear, which is the most widely used and accepted method to determine the tenderness of meat.
- K-State scientists conceived and tested the idea of insecticide-impregnated ear tags for fly control on cattle.
- An irrigation engineer maintains the longest continuously operated subsurface drip irrigation (SDI) research system for row crops in North America.
- Agronomists developed the basic foundation of reduced tillage and herbicides in wheat-sorghum-fallow crop rotations.
- Animal scientists perfected the use of ultrasound technology to scan large numbers of cattle and accurately predict the optimum time they should be marketed.
- A grain scientist invented a way to modify plant-based starches to resist digestive juices.

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Renie Stephan (above), nurse practitioner, and Crystal Van Houtan, a registered nurse, partnered with K-State Research and Extension, to promote diabetes awareness and prevention.

Pat Melgares (2)

Medical expenses for people with diabetes are more than two times higher than for people without diabetes. Diabetes is the leading cause of kidney failure, nontraumatic lower-limb amputations, and new cases of blindness among adults in the United States. It also is a major cause of heart disease and stroke and the seventh leading cause of death (Centers for Disease Control and Prevention).

Promoting Diabetes Awareness and Prevention

The Centers for Disease Control and Prevention and the National Health Institute funded SEARCH for Diabetes in Youth to examine diabetes (type 1 and type 2) among children and adolescents in the United States.

Statistics for 2011 estimate 215,000 people younger than 20 have diabetes (type 1 or type 2), which represents 0.26% of all people in this age group.

When health officials in the northeast Kansas town of Oskaloosa saw the incidence of diabetes and related health problems rising — particularly among kids in the community — they knew they had to spring into action.

In 2011, registered nurse Crystal Van Houtan and nurse practitioner Renie Stephan won a federal grant to hold a free, monthly clinic at the Jefferson County Health Department. They would handle medical checkups, but turned to a trusted partner for diabetes outreach and education.

Enter Meadowlark District agent Cindy Williams.

"It took just one phone call to Cindy, and she was very willing to come and give us a hand," Van Houtan said. "She has a lot of passion about diabetes and has been instrumental in our coalition, as well as supporting and presenting at diabetes support group meetings."

Stephan noted that, as a health-care provider, she spends a lot of time treating diabetes, and she's not alone.

Working with K-State Research and Extension has helped Stephan promote better eating habits to those diagnosed with diabetes or at risk for diabetes. They look at food in a different way, learn what to eat, and how to prepare those foods.

"Cindy has been able to do that for us and help those participants," she added.

For her part, Williams has seen an increase in awareness of healthy habits. She noted one woman who tried a food sample for diabetics, now offers the item on a menu she prepares for a daycare center.

As a district agent, Williams has been able to specialize on what citizens say they want and take those programs more often to all counties in the district.

"I have more of a concentrated effort to spend in these particular areas, and I can focus just on one or two areas, rather than three, four, or five," she said. "What we've noticed being in the district is that once one county has a program, the other counties want it as well."

Williams' time was not paid for by the diabetes coalition's grant; it was part of her service through the Meadowlark District. The group is continuing to seek ways to offer the free clinics and education throughout the district.

In addition to the three counties in the Meadowlark District, agents in the Wildcat, Post Rock, and Southwind districts promoted diabetes awareness in 10 counties. At least 16 more agents in counties throughout the state also presented programs on diabetes awareness and prevention in the last year, with several more planning programs for 2013.

According to the U.S. Department of Health and Human Services' Office of Minority Health website, Mexican Americans are almost twice as likely as non-Hispanic whites to have diabetes.

To address the problem, Wyandotte County agent Nozella Brown and two Latino paraprofessionals offer Dining with Diabetes programs. The project is funded through a mini grant from the Latino Health For All Coalition, which is part of a larger five-year grant from the National Institute of Minority Health and Health Disparity.

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District Success

In 1994, Mitchell and Lincoln counties formed the first extension district – Post Rock. Jewell and Osborne counties joined in 2005, and Smith County came onboard in 2012.

Tom Claussen, a Mitchell County resident involved in the initial planning, said forming a district was a good decision.

"Our agents have been very, very good at holding the line on spending; it's almost as if they're spending their grandmother's last penny," he said. "We really feel like we're good stewards of the taxpayer's money, but we're also hired to present a good program."

Plus, he said, residents have the ultimate say on the district's operations.

"It's been a joint effort between the full time staff, the board members, the university, and also our area directors," he said. "At this point, I have no regrets; none whatsoever. I think we have served the people of these five counties very well, and I hope to continue to do that job."

Allen Warren was instrumental in forming the Southwind District with Allen, Bourbon, and Neosho counties. He served on the Bourbon County extension board before being elected county commissioner in 2010.

"Districting took a year longer than what I had hoped for, but I feel like it was the right decision for Bourbon County. From a county commissioner's perspective, instead of having two generalists in our county extension office, we now have six specialists who can work with the people of Bourbon County. And, I think, down the road that it will save us taxpayer dollars, as well."

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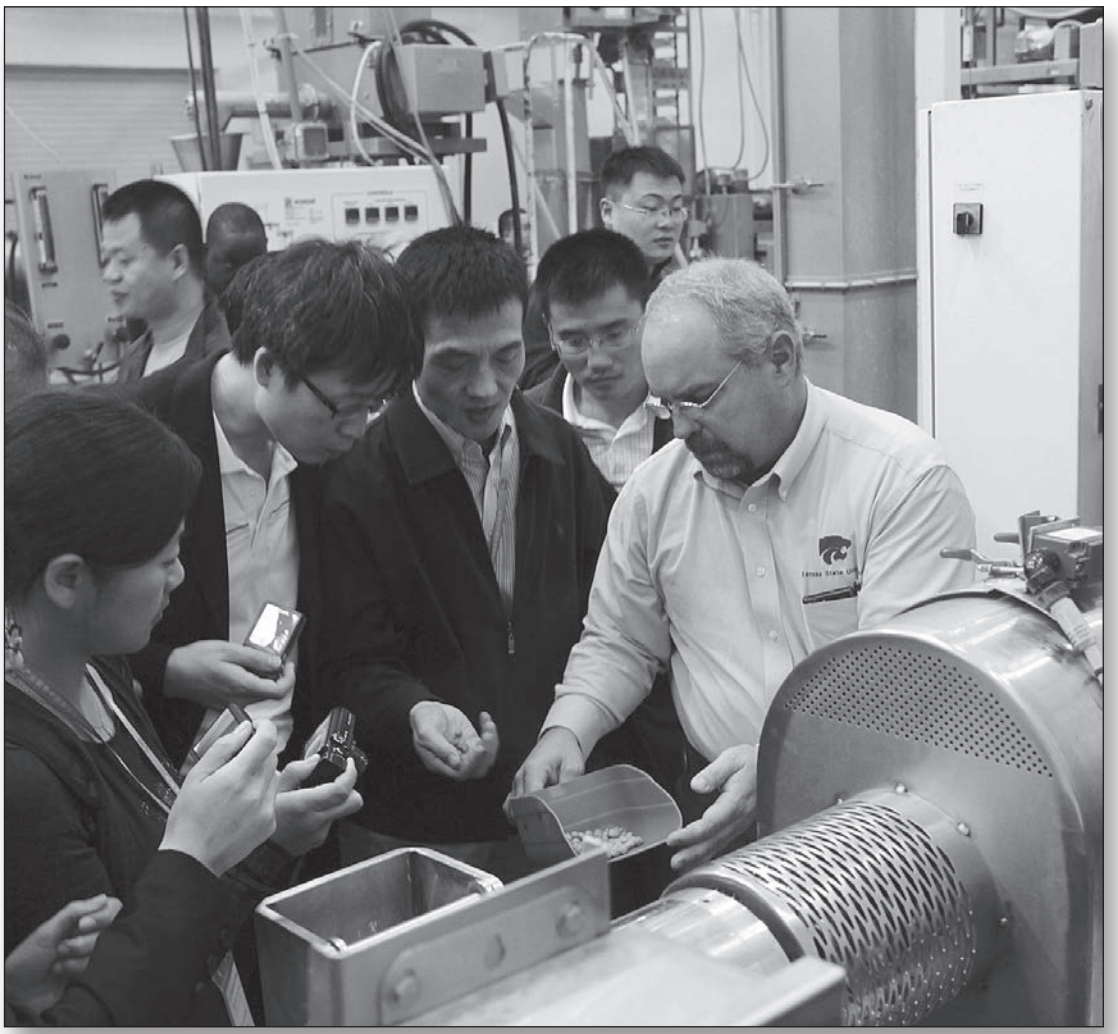

Courtesy of International Grains Program

Eric Maichel, Bioprocessing and Industrial Value-Added Program extrusion lab manager, shows extruded product to American Soybean Association International Marketing short course participants. The extrusion process forces mixed ingredients through an opening in a perforated plate, or die, designed specifically for a food or feed product, which is then cut to a specified size by blades.

In 2012, K-State's International Grains Program hosted 530 participants from 35 countries, who attended one of its 32 short courses.

Educating the World about Kansas Grain Products

To native Kansans, fields of rolling, golden wheat and deep red, harvest-ready sorghum are familiar sights. But to a visitor from another country, those fields might be as foreign as the metric system is to a Kansan.

For those attending International Grains Program training sessions, that unfamiliarity soon fades. IGP's mission is for those visitors to gain a new understanding of Kansas and U.S. cereal grains and oilseeds.

"The International Grains Program provides the global grain-based food and feed industry with leading-edge continuing education and technical assistance that increases the preference for Kansas wheat, corn, soybeans, and grain sorghum in the global marketplace," said Dirk Maier, IGP director and head of the Department of Grain Science and Industry.

In 2012, IGP hosted 530 participants from 35 countries, who attended one of its 32 short courses. The program, which was started in 1978, is divided into three curriculum areas: feed manufacturing and grain management, flour milling and grain processing, and grain marketing and risk management.

To keep up with market demands and trends, IGP has expanded its curriculum to offer customized courses in Spanish and via distance education. Additionally, throughout the year the IGP Conference Center hosts many academic and industry conferences, meetings, and tours.

As the second vice president of the National Association of Wheat Growers and a past president of the Kansas Association of Wheat Growers, Paul Penner has seen the opportunities participants have by attending IGP short courses.

"IGP brings customers and users to the source and gives them tools and knowledge that are invaluable," Penner said.

Ivonne de Alvarado of El Salvador is a two-time participant who has put this training to practice.

"I came home after the grain-purchasing course and talked to my boss about the things I learned, de Alvarado said. "We changed the way we were buying and saved nearly $200,000."

She added, "He sent me back to learn more."

Recognizing that opportunity, Lance Rezac, at-large commissioner at the Kansas Soybean Commission, explained why creating that experience for participants is an investment for Kansas and U.S. agriculture.

"Any time that the customer can get to know you, put a name with a face and can actually see the process by which we produce a healthy, clean product with nutritional value, I think that they can leave with a good comfort level about buying our product," Rezac said.

According to IGP associate director Mark Fowler, the program continues to be a source of education and training in the grain science industry because of the collaborative dedication and common goal of many people.

"The partnership IGP has with state, national, and international groups expands our influence and enhances the reach of our program," Fowler said. "With participants from more than 30 countries annually, IGP does have a global impact."

The short courses are conducted at the International Grains Program Conference Center and the Bioprocessing and Industrial Value-Added Program building in the Grain Science and Industry Complex on Kimball Avenue, northeast of the Bill Snyder Family Stadium.

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New Center Under Way

Construction on the O.H. Kruse Feed Technology Innovation Center in the Grain Science and Industry Complex began in early July. It's a joint effort between the departments of Grain Science and Industry and Animal Sciences and Industry. The new facility will replace the feed-production capability provided by the current feed mill and will significantly enhance the research capacity of both departments. The project should be completed and the facility operational in time for the fall 2013 semester.

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Australia Agreement

K-State plant pathology, entomology, grain science, and agronomy experts are partcipating in a six-year partnership with scientists from the Australian Plant Biosecurity Cooperative Research Centre (CRC). Through this partnership, researchers will study emerging plant diseases and insect pests that threaten American and Australian agricultural systems and develop new strategies and technologies to defend against them. K-State will be the only American university involved.

The CRC initially contacted K-State Research and Extension about the Great Plains Diagnostic Network — which helps researchers obtain quick, accurate identification of plant diseases and insect pests — because the network matched their vision for Australia's agricultural future. In 2009, they visited K-State to learn more about the university and its research efforts in plant diseases and insect pests. They were impressed with K-State's faculty and special facilities and requested to work together.

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Pat Melgares

Kenneth and Retabess Ling of Iola saved more than $3,000 on Medicare costs in 2011, based on advice from their K-State Research and Extension agent in the Southwind Extension District, who was a state licensed counselor for Senior Health Insurance Counseling for Kansas (SHICK).

Kansas Medicare beneficiaries who worked with K-State Research and Extension SCHICK certified counselors saved more than $3 million that can be used to meet their needs and achieve other financial goals.

Insurance Counseling Saves Seniors Thousands

Retabess Ling couldn't imagine that sorting through Medicare options for herself and her husband, Kenneth, could be as simple as making a phone call to their local K-State Research and Extension office.

"Our district agent, Tara Solomon, was like an angel," said Ling, 81. "I saw the number in the local paper, so I called the office. She talked to me over the phone and took the information that she needed.

"She came to our house one rainy night and actually spelled out exactly which options were the best and how much they would save us. We were very pleased ... very pleased."

According to Retabess, the Lings saved more than $3,000 on Medicare costs by finding the right plan. Their annual premium is lower, and they pay less for prescription medications.

Diane Burnett, family and consumer sciences agent in Miami County, became a state-licensed counselor in 2006, before Medicare D was introduced. The current program known as Senior Health Insurance Counseling for Kansas (SHICK) provides free Medicare counseling to those 65 and older.

"I enjoy the work I do with the Medicare beneficiaries and their family members," Burnett said. "It's a challenge to help them by comparing the plans for them to make a wise consumer choice considering cost, coverage of all their meds, and convenience. Every client is different, depending upon the medications they take.

"The *www.Medicare.gov* website has the tool we use to compare the plans to show the estimated costs for the next plan year," Burnett said. "We interpret the report and help the Medicare beneficiaries understand what it is telling them. Many folks are changing plans for 2013, and for many the total savings over their 2012 plan has been substantial. The impact of the program is evident when you consider total dollars saved and the clients' favorable comments regarding this learning experience."

In Kansas, the SHICK program is administered by the state's Area Agency on Aging, with help from local volunteers and K-State Research and Extension.

Current estimates in Kansas indicate that more than 400,000 residents are age 65 and older. About 1 in 7 individuals have Medicare.

In north-central Kansas, family and consumer sciences agent Deanna Turner in the four-county River Valley District manages several volunteers who provide SHICK counseling to local residents. In 2011, Turner says she and her team educated 491 residents, who saved $113,575 on Medicare costs.

According to Elizabeth Kiss, K-State Research and Extension family resource management specialist, 24 agents completed or maintained certified SHICK counselor status through the Kansas Department for Aging and Disability Services in 2011.

Certified staff members reported conducting 3,693 face-to-face appointments and responding to 2,103 phone calls. They guided 6,243 Medicare beneficiaries through the process of comparing insurance company plans and reevaluating their Medicare Part D prescription drug coverage.

"Medicare beneficiaries learned how beneficial it is to review their Medicare Part D enrollment every year," stated Kiss. "Those who switched to a more cost-effective plan cut their insurance costs an average of $832 per person."

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Military Leader Training

During fall 2011 and winter 2012, faculty and staff from K-State Research and Extension and other K-State colleges and offices carried out Extension, Civilian, and Female Engagement Team training for the top leaders of the 1st Infantry Division Headquarters and the 4th Infantry Brigade Combat Team 4th Infantry Division. Classes were offered at Fort Riley and on the K-State Manhattan campus. Maj. Gen. William C. Mayville of the 1st and Col. Joseph D. Wawro of the 4th praised the training and the support shown by K-State for the Fort Riley community.

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Help for Wounded Warriors

Volunteers from the Department of Biological and Agricultural Engineering, Fort Riley extension, citizens from the Manhattan area, and Fort Riley soldiers built a greenhouse — or high tunnel — that will serve as important therapy for soldiers hurt in the line of duty. Taking care of plants helps those who have suffered a traumatic brain injury learn sequential events to help sharpen their memory.

The project is funded through a grant from the Assistive Technology for Kansans and K-State Research and Extension's Kansas AgrAbility project, which focuses on helping people with disabilities working in agriculture-related occupations.

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Dan Donnert

Allen Moore (left), director of engineering and maintenance for Frito-Lay Topeka, and Larry Biles, state forester, examine wood chips that will be used to heat the Frito-Lay plant and produce its products. The Kansas Forest Service conducted a waste wood survey to determine if there was sufficient local wood waste to convert the plant's energy source.

The Kansas Forest Service's direct impact on the Kansas economy in 2010 was almost $27 million (Bureau of Business Research).

Kansas Forest Service Addresses Client Needs

PepsiCo's Frito-Lay manufacturing facility in Topeka produces snack foods around the clock using wood chips that otherwise would be tossed into landfills. The company made the switch in September 2010 from natural gas to wood chips, using data provided by the Kansas Forest Service.

The plant requires about 520 tons of wood chips per week, which is more than 25,000 tons per year, said Allen Moore, director of engineering and maintenance for Frito-Lay Topeka.

The forest service's survey showed that wood from Kansas' native forest and waste from cabinet makers, utility companies, recycled pallets, local arborists, and natural disasters could provide ample wood to meet the plant's needs from surrounding communities.

"We keep a seven-day supply of wood chips on site at all times to accommodate bad weather," Moore said. "The plant incorporated other green initiatives and now is about 98 percent energy efficient. In April 2010, the Topeka facility became the state's first manufacturing site — and the nation's second food manufacturing site — to be awarded LEED Existing Building Gold Certification from the U.S. Green Building Council."

LEED is the nation's preeminent program for the design, construction, and operation of high-performance green buildings.

Moore and Larry Biles, state forester, have spoken to various groups about the project. Biles also advocates for the many other services offered through the Kansas Forest Service, which celebrated its 125th anniversary in 2012.

"We provided more than 350,000 tree and shrub seedlings in 2012," said Biles. "Windbreaks for animals increase calving success and weight gain, and farmstead windbreaks offer energy savings. Plantings along streams help slow sedimentation and flood water, which otherwise would affect water quality and quantity in federal reservoirs that supply municipal and industrial water for two-thirds of the state's population.

"The community forestry program offers advice on what types of trees to plant, where they should be planted, and how to safely remove damaged trees. We also cooperate with energy companies to promote calling 811 before digging to avoid hitting electrical and gas lines."

Biles noted that a forester teaches fire science at Hutchinson Community College to educate students on fighting wildfires. In addition, the forest service helps 500 rural fire departments train volunteers and acquire excess military equipment for its local units.

"We work closely with K-State plant pathologists and entomologists and the Kansas Department of Agriculture on best practices to protect Kansas trees from insects and disease," Biles added.

Millions of black walnut trees could be at risk from a disease called thousand cankers that has been documented in Colorado. With an estimated 1.3 billion board feet of black walnut in Kansas, the economic loss could exceed $500 million. The exotic emerald ash borer has been discovered in Wyandotte County and now threatens millions of Kansas ash trees. Homeowners and communities continue to battle pine wilt, which decimates Scots and Austrian pines.

"We also are working on ways to deal with diseased trees in an environmental manner by keeping them out of landfills," said Biles.

To view a video about the Frito-Lay project, go to *www.ksre.ksu.edu/fritos*.

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Gardening Gets Hits

In the last year, the K-State Research and Extension YouTube channel had 624,838 views for 1,114, 646 minutes watched. The Top 10 videos are:

1. Caring for Knock Out Roses
2. Self-Watering Planter Saves Time
3. Growing Vegetables in Containers
4. Tips for Growing Blueberries
5. Common Tomato Problems, Part 1
6. Flower Bed Design
7. When is Watermelon Ripe on the Vine?
8. Supertunias Grow Big!
9. How to Care for Palm Plants
10. How to Grow Big, Bushy Mums

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Value of Wheat Research

K-State Research and Extension has released 44 wheat varieties, including four of the top 10 varieties grown in the state. Every dollar spent on wheat research returns $18.50 to the state's economy.

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Wheat Genetics Resource

Since 1984, wheat research has been enhanced by K-State's Wheat Genetic and Genomic Resources Center. The center has five main missions to assure future advances in wheat breeding: maintain a gene bank, develop and register improved wheat germplasms, analyze and map genetics, provide stock for gene mapping, and train future plant geneticists. More than 30,000 samples from the collection have been distributed to scientists in 45 countries and 39 U.S. states.

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Above: Elementary students (grades 3 to 5) use nets to "sweep" insects in a soybean field.

Below: Students collect soybean leaves during the field trip. Their teachers attended a Summer Soybean Institute and developed lesson plans to incorporate in their classrooms.

Dan Donnert

There are more than 4 million acres of soybean in Kansas, and 60 to 70 percent of processed foods contain soybean products.

Institute, Field Trip Spark Interest in Science

Molly Emert's fifth-grade students don't bring her apples or candy. They bring her bags of insects because they are excited about learning, especially about soybeans and insects.

Emert joined four teachers from area elementary schools at a three-week Soybean Summer Institute on the K-State Manhattan campus. Entomologist Brian McCornack, postdoctoral research associate Wendy Johnson, and other faculty helped the teachers learn about soybeans and insects. The teachers developed 15 lesson plans to take back to their classrooms.

The institute was developed by a group in Nebraska and sponsored by the United Soybean Board. This year, K-State supplied the teachers with iPod touches and macro bands which allowed the teachers to take close-up pictures of soybean structures and insects for use in their classrooms.

In September, the teachers and four parents took the combined classes — about 150 students — on a field trip to K-State's North Agronomy Farm. In addition to seeing the plants and research equipment used to plant and harvest soybeans, the kids used large nets to sweep for insects.

"The kids loved being up close and personal with soybean plants," Emert said. "They were excited to be out there and were fearless about touching insects."

A video of the soybean field trip is posted to *www.ksre.ksu.edu/bugs.*

McCornack's goal was to empower teachers with knowledge to inspire others.

"The children are learning to ask relevant questions and see science as a system," McCornack said. "They learned the difference between beneficial insects and pests. They looked at bugs they caught in their nets and asked what makes them a pest?

"We chose soybean because there are more than 4 million acres of soybean in Kansas, and 60 to 70 percent of processed foods contain soybean products."

Emert has already incorporated four of the lesson plans in her classroom. Students identified and pinned insects to foam boards, discussed products made from soybeans, and made detailed drawings of soybean plants.

"Some focused on the roots and some noticed the tiny hairs on the stem," Emert said. "They all took it from a different perspective. It helped me get to know my students — their attention to detail and thinking process."

When the first-graders at her school were studying insects, the teachers asked Emert if her students would help.

Each fifth-grader researched an insect and created a visual aid for the presentation to a first-grade partner.

Emert added, "It really sparked interest in the first graders. They are excited about what they will do as fifth-graders."

The teachers stay in contact with McCornack using PATH, a free message board application for their iPod touches.

McCornack also is involved with a USDA-funded project with crop scientists across the Southern Great Plains. The Web-based wheat decision support system (*www.iwheat.org*) can be used on all mobile devices and helps make quick management decisions, as well as report pest issues to research scientists.

McCornack and his lab have developed other Web-based systems (*www.thebugspot.org, www.soypod.info*) for monitoring pests in Kansas and are actively looking for participants to test the technologies.

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Protecting Stored Products

Faculty at Kansas State and Oklahoma State universities compiled *Stored Product Protection*, an updated companion to OSU's 1995 *Stored Product Management*. It has new chapters from the world's leading experts, including K-State's Bhadriraju Subramanyam, Tom Phillips, and David Hagstrum. The book is a valuable resource for grain, food, and pest control industries.

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Scientist Earns Patents

A university distinguished professor of Grain Science and Industry has developed advanced technologies that convert agriculture feedstocks and under utilized by-products into environmentally safe biobased products, such as biobased adhesives for wood products, crafting glues, and foundry adhesives; biodegredable plastics for disposable items; and biobased grease for food processing and packaging uses. Recent patents include biobased resins for transparent tapes, film, flexible coatings; and protein-based self-assemble and self-healing hydrogels for controlled release drug delivery, 3D cell culture, and tissue repair for healing wounds.

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100th Cattlemen's Day

On March 1, 2013, K-State Research and Extension will host its 100th Cattlemen's Day event, which provides current research-based information to Kansas ranchers. The annual cattle sale, will be in the new Stanley Stout Center that will be dedicated on that date.

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620-431-1530, *jdmcnutt@ksu.edu*

Director, Southwest Area Extension Office
Phil Sloderbeck
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Bioprocessing and Industrial Value-Added Program
Praveen Vadlani, 785-532-7035,
vadlani@ksu.edu, www.grains.ksu.edu/bivap

Director, Food Science Institute
Curtis Kastner, 785-532-4057,
ckastner@ksu.edu, www.foodsci.ksu.edu

Director, Kansas Center for Agricultural Resources and the Environment (KCARE)
Dan Devlin, 785-532-0393,
ddevlin@ksu.edu, www.kcare.ksu.edu

Director, International Agricultural Programs
Nina Lilja
785-532-5627, *nlilja@ksu.edu*

Check out these websites for more information

A growing number of Kansans are turning to the Internet for answers. To provide information to Kansans when and how they need it, K-State Research and Extension maintains links to numerous helpful websites. Our main site is www.ksre.ksu.edu. Other useful sites are listed below:

Ag Manager
www.agmanager.info

Find the latest agricultural economics information, including agricultural economics news, grain outlooks, livestock marketing graphs, and farm management guides.

Animal Sciences and Industry
www.asi.ksu.edu

Links to upcoming events and newsletters related to animal agriculture.

Bioprocessing and Industrial Value-Added Program (BIVAP)
www.grains.ksu.edu/bivap

Links to projects specializing in the development of biomaterials processing technology and using agricultural-based materials.

Entomology Extension
http://entomology.k-state.edu/extension/

Links to hot topics, newsletters, crop and household pests, 4-H and youth insect collecting techniques, and insect identification.

eXtension
www.extension.org

An Internet-based collaboration effort where U.S. land-grant universities provide and exchange information and research to help solve public challenges.

Financial Management
www.ksre.ksu.edu/financialmanagement

Helps people build financial security by improving their financial skills and changing negative behaviors.

Horticulture Information Center
www.hfrr.ksu.edu/HortInfo

Includes links to the weekly Horticulture Newsletter, common plant and pest problems, and horticulture-related publications.

Kansas Center for Agricultural Resources and the Environment
www.kcare.ksu.edu

Links to publications, conferences, and contacts about Kansas environmental issues.

Kansas Healthy Yards
www.kansasgreenyards.org

Information and videos on environmentally conscious lawn- and garden-care techniques.

Kansas Saves
www.kansassaves.org

Assistance for those who wish to pay down debt,build an emergency fund, or save for a home, education, or retirement.

Konza Prairie Biological Station
www.konza.ksu.edu

Information about the tallgrass prairie preserve owned by The Nature Conservancy and Kansas State University.

K-State Research and Extension Bookstore
www.ksre.ksu.edu/bookstore

Provides access to K-State Research and Extension publications that can be downloaded or ordered.

Plant Diagnostic Information System
www.pdis.org

Access to labs that provide services for plant disease diagnosis, plant identification, and insect identification.

Rapid Response Center
www.rrc.ksu.edu

Timely information on food science safety and nutrition and links to other health-related sites.

Southeast Agricultural Research Center
www.ksre.ksu.edu/searc

Links to research conducted in southeast Kansas.

Walk Kansas
www.walkkansas.org

Learn about the successful eight-week walking program, along with tips to stay fit and healthy throughout the year.

Western Kansas Agricultural Research Centers
www.wkarc.org

Links to research conducted at centers in western Kansas.

Weather Data Library
www.ksre.ksu.edu/wdl/

Weather-related information, such as precipitation, frost-free dates, drought, and forecasts.

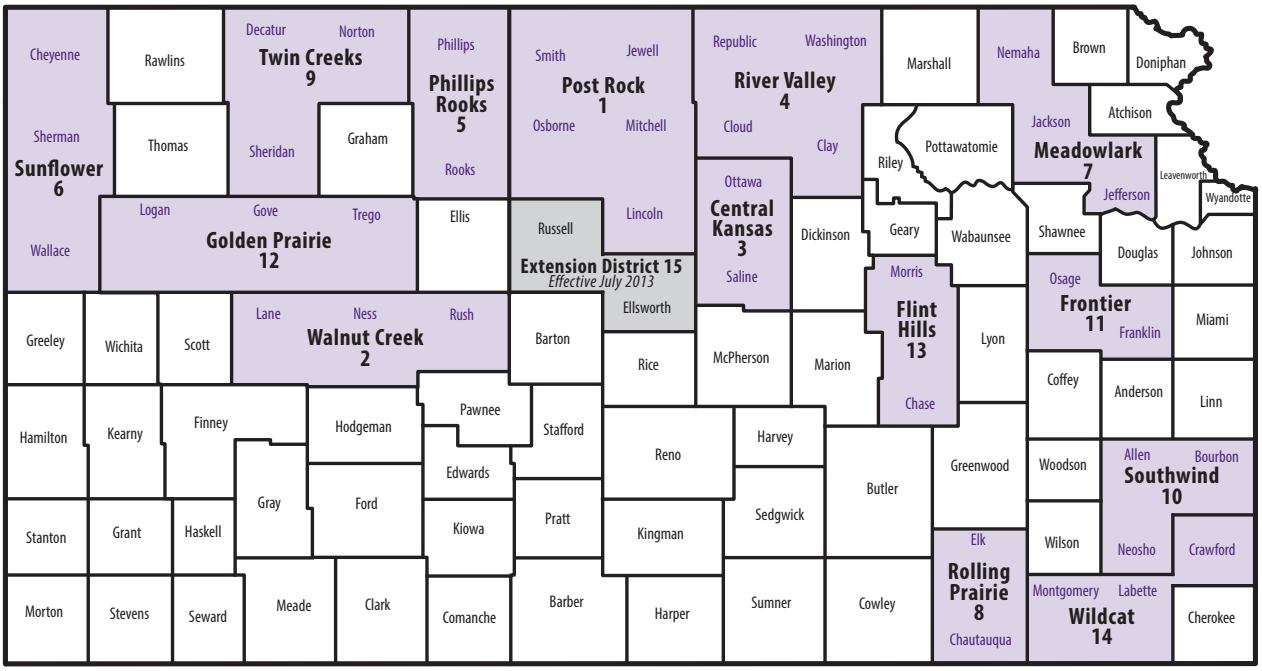
Wheat Page
www.ksre.ksu.edu/wheatpage

Links to the markets and conditions of the different wheat types. Also provides links to helpful sites about wheat in Kansas, the United States, and the world.

Statewide District and County Offices

Districting — Finding new ways to work together to serve Kansans

K-State Research and Extension is working to provide research and outreach educational opportunities in the most efficient and cost-effective way. Since 1991, Kansas counties have had the opportunity to create extension district partnerships. The partnerships provide better public access to agents with specialized expertise, better support for local offices, and often better use of human and financial resources. At this time, 40 counties have formed 14 districts.



1994 **Post Rock Extension District #1** — Mitchell and Lincoln counties; Jewell and Osborne counties joined in 2005. Smith County joined in 2012.

1997 **Walnut Creek Extension District #2** — Lane, Ness, and Rush counties.

2004 **Central Kansas Extension District #3** — Saline and Ottawa counties.

2005 **River Valley Extension District #4** — Clay, Cloud, Republic, and Washington counties.

Phillips-Rooks Extension District #5 — Phillips and Rooks counties.

Sunflower Extension District #6 — Sherman and Wallace counties; Cheyenne County joined in 2006.

2006 **Meadowlark Extension District #7** — Jackson, Jefferson, and Nemaha counties.

2008 **Rolling Prairie Extension District #8** — Chautauqua and Elk counties.

2009 **Twin Creeks Extension District #9** — Decatur and Norton counties. Sheridan County joined in 2011.

2010 **Southwind Extension District #10** — Allen and Neosho counties. Bourbon County joined in 2011.

Frontier Extension District #11 — Franklin and Osage counties.

Golden Prairie Extension District #12 — Logan and Trego counties. Gove County joined in 2011.

Flint Hills Extension District #13 — Chase and Morris counties.

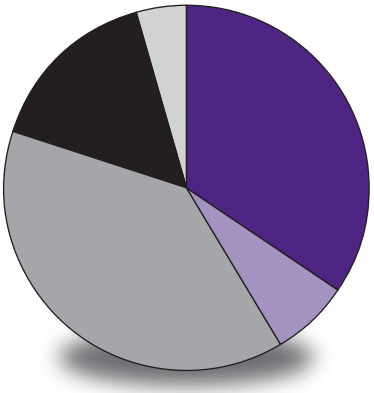
2011 **Wildcat Extension District #14** — Crawford, Montgomery, and Labette counties.

2013 **Extension District #15** — Ellsworth and Russell counties (effective July 1, 2013).

To learn about districts, go to *http://www.ksre.ksu.edu/districts.*

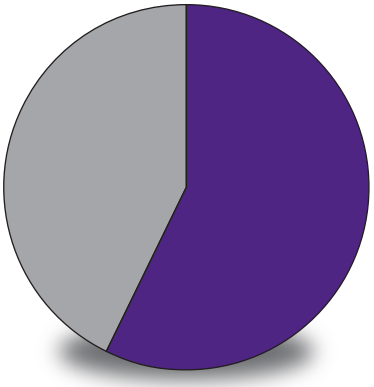
Budget Data for Fiscal Year 2013

Source: Geneva Jahnke, Business/Fiscal Officer, 785-532-7139, geneva@ksu.edu



K-State Research and Extension Budget Fund Source

- State Appropriation (AES/CES) $48,557,750
- Federal Appropriation (AES/CES) $9,900,000
- Grants and Services $54,367,145
- County Funds $22,000,000
- Main Campus Allocation $5,963,996

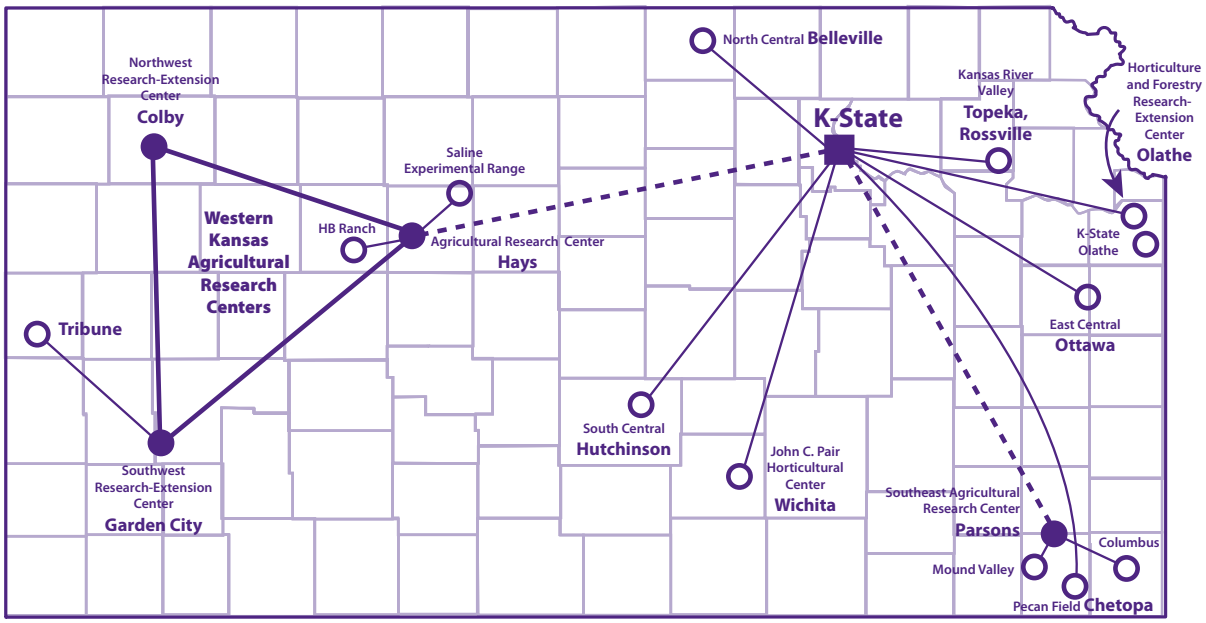


K-State Research and Extension Budget Responsibilties

- Agricultural Experiment Station $81,101,472
- Cooperative Extension Service $59,687,419

Research Facilities Across the State

Headquartered in Manhattan, K-State Research and Extension includes statewide county and district offices, research centers, and experiment fields supported by county, state, federal, and private funds. K-State Research and Extension supports faculty in 23 academic departments across five K-State colleges.



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K-STATE Research and Extension

Knowledge for Life

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Kansas State University Agricultural Experiment Station and Cooperative Extension Service
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