



working to  
make a  
difference

[2017–2023]

University of Arkansas System  
Division of Agriculture

## Strategic Plan

**UofA**

**DIVISION OF AGRICULTURE  
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*University of Arkansas System*



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**UofA**  
**DIVISION OF AGRICULTURE**  
**RESEARCH & EXTENSION**  
*University of Arkansas System*  
**Strategic Plan**

# The University of Arkansas System Division of Agriculture Strategic Plan

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## working to make a difference

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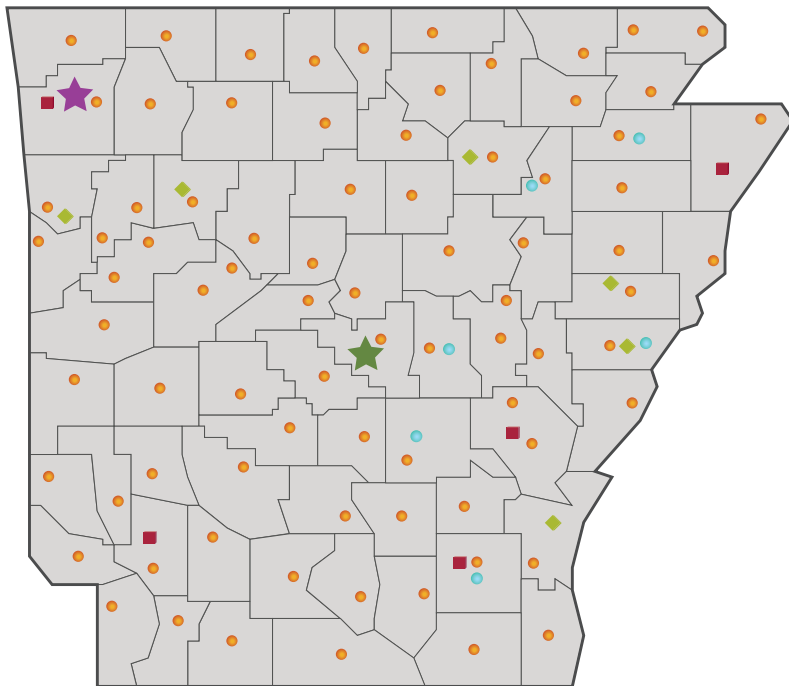
When Abraham Lincoln signed the Morrill Act of 1862, he envisioned a network of land grant university educators whose mission was to improve the lives of those in rural America.

There's no doubt that Arkansas was and is still rural. According to the 2010 Census, nearly half of all Arkansans identified themselves as rural, compared to one in five for rest the nation. And while Arkansas' hometowns and home counties are a source of pride, our populations are facing many challenges: declining numbers, an aging population, and slow economic recovery.

Rurality is a characteristic that's key to the state's unique people, culture and outlook. It influences seemingly everything: its music, its choices for recreation, its policies, even the parameters for urban and suburban development.

The University of Arkansas System Division of Agriculture understands this and for the last century, its people have worked at the county level to improve the quality of life for all people — rural or urban — in our state through uplifting

- ★ Division & CES Headquarters, Little Rock
- ★ AAES Headquarters, Fayetteville
- Research & Extension Centers
- ◆ Research Stations
- Associated Research & Extension Units
- County Extension Offices



community development programs such Breakthrough Solutions; teaching the leaders of the future through 4-H; and helping families manage their health and their dollars through our Family and Consumer Sciences programs. Of course, many are already familiar with the work we do with Arkansas' crop and live-stock farmers to help the state's largest industry thrive and remain competitive.

Our roots are rural. We were born to carry out the land grant mission set out in 1862 to offer education in agriculture, engineering and science to all. Being there for all of Arkansas, in all 75 counties, is our mission, our vision, and our promise.

*Mark J. Cochran*

**Dr. Mark J. Cochran**  
Vice President - Agriculture



Agricultural  
and Forestry  
Production  
and  
Processing



To stay in business, producers and processors must have the most efficient systems available. The Division works with stakeholders in all 75 counties to improve efficiency through discovery and delivery of science-based solutions. Critical areas for the present and future include energy, water, soil nutrients, pesticides and other production inputs. Environmental impacts of production practices must continually be considered.

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# food, fuel & fiber

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The Division serves diverse agricultural sectors, with a wide range of plant and animal enterprises from the Delta to the Ozarks. The state is a leader in the production of major commodities including rice, broilers, cotton, catfish, turkeys, soybeans, feed grains, beef and timber, as well as locally important enterprises such as hay, fruits, vegetables and other specialty crops.

## **Promote sustainable and efficient production and processing**

Modern production systems are becoming larger and more complex and face the challenge of integrating established practices with new, emerging technologies for managing resources, ensuring sustainability and improving production efficiency.

*Dr. Matthew Pelkki records the diameter, height and other data of oaks in a forest rehabilitation research plot at the University of Arkansas Division of Agriculture Savoy Research Unit in Washington County.*



The Division's services, expertise, and unbiased research information helps stakeholders manage production, verify the utility of new and old technologies, and devise socially and environmentally sustainable yet productive and resourceful production systems.

A diverse portfolio of analytical services and expert advice are used by small and large stakeholders to plan and improve management decisions. Research-based nutrient management decisions are provided with soil and manure analyses to ensure soils remain fertile but limit nutrient movement into the surrounding landscape. Division scientists have developed a system of screening weed seeds for herbicide resistance and are

developing sustainable weed management systems that integrate cultural, mechanical and chemical control methods. The majority of Arkansas agricultural enterprises are highly productive and depend upon efficient use of irrigation water. Division programs aid in the efficient use of irrigation water and energy by measuring pumping plant efficiency, using novel programs for scheduling irrigation, and designing or equipping delivery systems to use less water and energy.

### **The Division of Agriculture will:**

- ▶ Develop, evaluate, verify, and deliver technology for food, fiber and forest production and processing
- ▶ Discover and encourage the use of technologies that reduce waste, increase efficiency of resource use, and reduce environmental footprint of production and processing
- ▶ Serve producers and consumers by providing unbiased research-based solutions to practical problems.

American Consumers are concerned about how their food is produced.



## Highlight and expand the contribution of Arkansas agriculture to society

Agriculture contributes and improves to the wealth, culture, and quality of life of Arkansans. The Division measures how agriculture and forestry provides jobs, income, and value added to the economy of Arkansas. The data is used as a benchmark to identify opportunities for growth in novel agricultural and forest products. The Division remains committed to providing unbiased, cutting-edge research that producers need to make informed decisions. Two new innovative forest products are cellulosic nanotechnology for medical applications and engineered timbers for multi-story construction. Research including the use of aerial platforms and remote sensing data for identifying crop and forest stresses, and identifying site specific technologies to enhance crop and forestry production.

Arkansas agriculture has the potential for growth in local, regional, national, and global markets through the adaption of novel and innovative products and tech-

nologies. Examples of this include, clean bioenergy through wood pellets that can be used to decrease the carbon footprint of fossil fuel based energy production. Identifying new global export markets for rice, soybean, poultry, and wood fiber, and helping producers meet certification requirements in response to regulatory policies and consumer demands.

### The Division of Agriculture will:

- ▶ Analyze and explain the impact of issues affecting Arkansas agricultural production and processing.
- ▶ Research and develop novel agricultural and forest products
- ▶ Identify, analyze, and educate about new market opportunities

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## Educate Arkansans about the importance and safety of agricultural production and technologies

American consumers are concerned about how their food is produced. Division research and extension pro-



*Program associate David Moon, right, and research assistant Aaron Manjarrez evaluate wheat germplasm for resistance to stripe rust.*

grams examine questions and provide science-based knowledge to address public concerns about agriculture and offer solutions. The Division of Agriculture research is shared with the public to inform and educate Arkansans about existing and emerging agricultural technologies and practices to produce safe food, fiber and wood products.

Programs such as Discovery Farms and Moms on the Farm provide many with firsthand experience with agricultural production systems and practices. The Division's 4-H youth development program provides many opportunities

for Arkansas youth to participate in agriculture related projects and explore future careers in agriculture. The Master Gardener program educates residents about horticultural practices that beautify communities and provide fresh garden fruits and vegetables. Division personnel communicate with individuals, small groups and local organizations in all 75 Arkansas counties about the importance of agriculture and forestry to the state. The Arkansas Rice Expo, field days and workshops demonstrate Division research and extension efforts that benefit Arkansas' agriculture, communities and quality of life.



*Liliana Florez collects pollen from plants in a breeding plot.*

### **The Division of Agriculture will:**

- ▶ Understand consumer concerns and help discover solutions
- ▶ Use technology and social media to increase public awareness of Arkansas agriculture's economic and environmental benefits
- ▶ Recruit and retain agricultural and forestry professionals and leaders
- ▶ Analyze and communicate science-based information about sustainable agriculture issues to the public

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## **Support local and regional production and processing systems**

With the increased popularity of the local foods movement, the Division works

*Southern pea breeder Ainong Shi discusses varieties and breeding lines with field day visitor Ruben Medina of Siloam Springs.*

with stakeholders to review and explain local and federal regulations regarding production and processing of products at all levels. Critical areas are inspection facilities and personnel for meat processing, fruits, vegetables and other specialty crops, and major commodities including rice, broilers, cotton, catfish, turkeys, soybeans, feed grains, beef and timber. Stakeholders are continually seeking innovative ways to improve local and regional production practices. The Division will research new technologies such as high tunnel agriculture, organic and sustainable options for insect and disease control, develop new varieties, and explore the opportunities for new and unique crops to Arkansas.

The Division actively listens to consumers, producers and other clientele about issues and opportunities they face in production and develops solutions to meet their needs. Among the issues facing stakeholders include invasive species such as the Asian longhorn beetle, emerald ash borer, bermudagrass stem maggot, Japanese beetles, hydrellia fly



in rice, spotted wing drosophila in small fruits, sugar cane aphid in grain sorghum, diseases such as Avian Flu, Rose Rosette virus, and bacterial leaf streak of rice, and weeds such as cogon grass, hydrilla, Palmer amaranth and invasive plants such as Bradford pears.

### **The Division of Agriculture will:**

- ▶ Identify and analyze state and federal policies that limit local and regional processing
- ▶ Engage traditional and new stakeholders in innovative production and processing technologies
- ▶ Categorize challenges/opportunities and conduct research that provides solutions for local and regional production systems

“The Division will work on researching new technologies and exploring opportunities for new and unique crops to Arkansas.”



Access  
to Safe  
and  
Nutritious  
Food



At its very heart, the purpose of agriculture is human sustenance. Although crops grown in Arkansas and elsewhere are used in a vast array of applications, the essence of farming is the proliferation of human health and survival through providing safe, nutritious food.

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# affordable, smart & healthy meals

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The production of quality crops is only the first step in a complex process of ensuring that Arkansas families have access to safe, quality nutrition. Processing, packaging, preparation and distribution are each critical steps in the effort, and the Division of Agriculture offers proven tools for ensuring success at each stage. From certifying kitchens and cooks to helping establish local farmers' markets, we are dedicated to improving and maintaining the health of Arkansans through access to the safest, most nutritious food available.



*Division of Agriculture researchers are focused on helping producers find innovative ways of feeding the nation and the world.*

The Division of Agriculture works to promote healthy diets through research and public education efforts, targeting obesity and encouraging better consumer habits. It seeks to enhance food safety through research and to teach best practices to commercial operators.

As a state, Arkansas has struggled with problems of obesity and nutrition for decades. While Division of Agriculture research and outreach efforts have made demonstrable impacts, there is still much work to be done. More than one-fifth of Arkansas households lack

The Division of Agriculture works to promote **healthy diets** through **research** and **public education**.

access to enough nutritious food to support healthy, active lifestyles. More than two-thirds of the state's adult population is overweight or obese, more

than one-third have high blood pressure and more than 9 percent struggle with diabetes.

Division of Agriculture faculty and staff are working to help Arkansans achieve healthier diets, gain access to nutritious food and manage financial challenges.

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## **Strengthening food systems through research and innovation**

The long-term growth of the food industry in Arkansas is dependent upon the industry's ability to innovate, to respond to consumers' taste and expectations, to employ a quality workforce and to minimize environmental impacts and the use of natural resources while maintaining economic viability.

New products that meet individual consumer's nutritional needs, deliver health benefits and satisfy the desire for high quality ingredients will be in demand.

## The Division of Agriculture will:

- ▶ Improve existing, and develop new, processing technologies to produce healthy, high-quality foods and reduce environmental impact.
- ▶ Conduct research in rising food systems, such as local foods, farmer's markets, and organic, including need for infrastructure.
- ▶ Investigate approaches to improve efficiency and stability of food systems.
- ▶ Assist with programs to cut food waste and improve recovery
- ▶ Develop uses for agricultural processing co-products to reduce waste and add value within food systems
- ▶ Conduct research to improve the sensory and nutritional quality in the food supply.
- ▶ Support the creation of food manufacturing companies to strengthen local food systems by assisting entrepreneurs at the Arkansas Food Innovation Center.

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## Providing technical assistance and workforce training across food systems sectors

The Centers for Disease Control estimate that foodborne pathogens are responsible each year in the United States for millions of cases of illness. For example, incidents stemming from *Campylobacter*, *Salmonella*, *Listeria*, *E. coli* O157:H7 and *Shigella* account for nearly 4 million cases annually. A foodborne pathogen such as Norwalk virus is estimated to account for

almost 10 million illnesses annually. The estimate of total costs of these cases of foodborne illness approaches \$50 billion.

## The Division of Agriculture will:

- ▶ Develop, implement and evaluate food safety programs for market managers, growers, and consumers to enhance the food safety in local and regional food systems.
- ▶ Develop, implement and evaluate workforce education to improve food processing, regulatory and food safety
- ▶ Educate consumers using science-based information to increase food, nutrition and food systems literacy.
- ▶ Provide technical assistance to stakeholders on emerging issues related to food systems and safety.



*Cindi Brownmiller processes strawberry puree in a chamber filled with carbon dioxide or nitrogen to help preserve the pigments that have significant health benefits for consumers.*

*Dr. Jamie Baum conducts a study on the health benefits of a healthy breakfast to combat obesity.*



## **Developing research base for nutrition, health and food safety innovations**

Providing access to safe and nutritious food requires the nation and Arkansas to increase the availability of food choices which improve health and reduce obesity, particularly among children. It also requires safeguarding our food supply from pathogens and terroristic attacks.

Recent studies have found more than 75 percent of American consumers want to know where and how their food is grown and processed. However, when making choices, most consumers consider taste and hunger satisfaction

over questions about the health benefits of food consumed. Science-based information gained through research focused on food production, processing and consumption plays a vital role in the health of Arkansans.

### **The Division of Agriculture will:**

- ▶ Develop and investigate strategies for the prevention and treatment of obesity and other diet related chronic diseases.
- ▶ Investigate the interaction between diet composition and gut microbiome on health outcomes.
- ▶ Enhance nutritional properties of food to optimize health.
- ▶ Investigate the impact of food environment and nutrition education on health related indicators in children.
- ▶ Conduct research to control foodborne pathogens and toxins throughout food systems.
- ▶ Develop innovative methods to detect, identify and control foodborne pathogens, toxins and contaminants in agricultural production and processing.

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## **Providing education, inform policies and support access to safe and healthy foods**

Arkansas has the third highest poverty rate in the nation, with one in four children living in poverty. Food security is defined as access at all times to enough nutritional foods for an active and



healthy lifestyle. Arkansans in many areas of the state have limited access to nutritious and affordable food.

Arkansas has the **third highest poverty rate**. We teach families with **limited resources** to select, prepare and preserve foods.

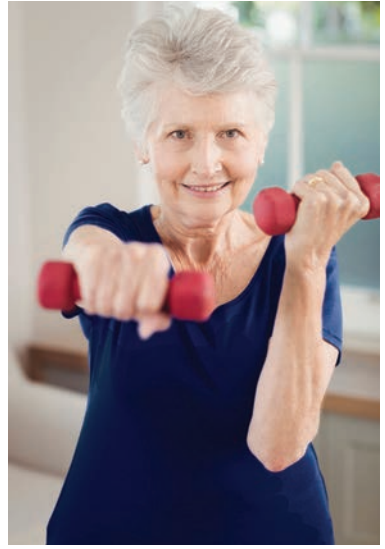
The Division of Agriculture's Supplemental Nutrition Assistance Program (SNAP-Ed) and the Expanded Food and Nutrition Education Program (EFNEP) teach families with limited resources to select, prepare and preserve healthy foods. Working at the county level, the Division's Cooperative Extension Service provides science-based educational programs to help families, communities and schools develop gardens and other resources to increase access to health foods.

### **The Division of Agriculture will:**

- ▶ Train teachers and food service personnel on implementation of nutrition programs and policies.
- ▶ Educate students and parents on healthy nutrition.
- ▶ Assist schools in the establishment of school gardens to promote healthy eating.
- ▶ Educate employees on healthy food choices and wellness.
- ▶ Assist employers with developing policies that improve access to healthy foods.
- ▶ Develop, implement and evaluate food safety education to improve food handling and safety practices in the home.
- ▶ Develop, implement and evaluate nutrition education programs to improve health.
- ▶ Support farmers' markets and other local venues to improve access to healthy foods.
- ▶ Disseminate current health research to encourage healthy choices

*Community outreach through Division of Agriculture programs is key to helping Arkansans develop healthy eating habits from a young age.*





Strengthening  
Arkansas  
Families



Arkansans are facing many serious challenges to health and well-being, including high rates of obesity, poverty and family instability. With faculty and staff in each of Arkansas' 75 counties, the Division of Agriculture is uniquely positioned to address these needs.

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# strong, successful & happy people

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The Division is committed to helping Arkansans develop and transition through life stages by offering programs for children and youth, young adults, families, adults, and senior adults.

We strengthen individuals and families by preparing Arkansans of all ages to meet the challenges associated with health, personal finance, family relationships, and personal development.

## **Investing in Responsible Children and Youth**

High rates of poverty, low educational attainment, and high engagement in risky behavior negatively influence opportunities for a healthy start. Twen-



*The Division of Agriculture provides team-building and outdoor exercise opportunities to Arkansans of all ages.*

ty-eight percent of Arkansas's children live in poverty, and Arkansas had the highest rate of teen births in the U.S. in 2015. Division of Agriculture research and programs address these issues by offering education and tools to increase resilience and well-being among children and youth.

The Division is committed to preparing our young people to become the leaders of tomorrow.

Responsible youth become contributing Arkansans and the Division is committed to preparing our young people to become the leaders of tomorrow. There are more than 700 Arkansas 4-H clubs and more than 151,000 youth take part in 4-H activities. Programs such as leadership and citizenship, agricul-

ture and STEM, and healthy living are designed to prepare the next generation of Arkansans.

Through non-formal, science-based experiential education activities, 4-H participants gain knowledge and enhance life skills enabling them to become positive, productive, capable and compassionate members of society. Annually more than 19,000 volunteers contribute more than 255,000 hours to the Division of Agriculture youth programs. Of 475,963 educational contacts made in 2015, 50 percent were STEM-based science projects.

Our programs for children and youth are rooted in experiential delivery methods where participants “learn by doing” critical career and life skills from trained and compassionate adults. While 4-H is a foundational program, the Division of Agriculture cooperates with other community and school-based programs for children and youth.

## The Division of Agriculture will:

- ▶ Increase outreach into schools and community-based organizations.
- ▶ Research critical and emerging issues facing children and youth.
- ▶ Instill essential life skills to prepare for responsible adulthood.
- ▶ Build resilient children and youth through physical health and well-being.
- ▶ Empower children and youth to make informed consumer and career decisions.
- ▶ Strengthen understanding of connections between food, agriculture and the environment through STEM education.
- ▶ Provide training and opportunities to facilitate growth in citizenship and leadership skills.

American carries more than \$15,000 in credit card debt. The Division's Consumer Economics programs offer resources and tools for families to address these issues and to take an active approach to their finances.

Family and Consumer Sciences program areas address these issues through research and programming designed to increase knowledge of effective parenting practices, healthy food choices and physical activity, financial literacy, and healthy relationships. Extension training programs offer workforce training for childcare professionals to increase confidence and knowledge of early childhood development.

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## Equipping Young Adults and Families

Arkansas ranks 46th in the U.S. in number of citizens who live in poverty. Living in poverty has wide-reaching effects on individuals and families including increased risk of obesity, stressed relationships such as child abuse and maltreatment, lower educational attainment, and lack of access to healthcare and social support. Financial stress related to student loan and other debt interferes with Arkansans' ability to gain financial stability and security. The average Arkansas student loan debt of 2014 graduates is more than \$25,000, and the average



*Through the Arkansas 4-H program, the Division of Agriculture puts a strong emphasis on learning by doing, with an increasing focus on science, technology, engineering and math.*

## The Division of Agriculture will:

- ▶ Provide training to give young adults and families the knowledge and skills needed to build financial security.
- ▶ Strengthen families by encouraging adoption of research-based parenting and relationship skills.
- ▶ Address concerns of social isolation resulting from overuse of digital media and other causes.
- ▶ Teach early childhood professionals practical, research-based knowledge to help them provide care and education for young children.
- ▶ Identify and investigate critical and emerging issues related to young adults and families.

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## Developing Contributing Adults

The Division of Agriculture prepares adults to reach their full potential as

active, contributing members of society. These efforts include confronting the epidemics of obesity and chronic disease through research and education, and by developing financial stability through money management, wise use of credit and consumer awareness.

The Division of Agriculture encourages Arkansans to embrace diverse family structures and to engage their communities through volunteerism and service.

## The Division of Agriculture will:

- ▶ Confront the obesity and chronic disease epidemic through research and education.
- ▶ Educate consumers to maintain financial stability through money management, wise use of credit, and consumer protection.
- ▶ Encourage Arkansans to adapt to and embrace evolving family relationships.



*Community engagement, and developing Arkansans who feel a strong, vested interest in helping their communities to thrive, are cornerstones of the Division of Agriculture's mission.*

- ▶ Motivate and train individuals for community engagement, volunteerism, and service.

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## Preparing Aging Seniors

The proportion of Arkansas' population over 60 years of age is growing while the proportion that is under 60 is shrinking. The need for education on health literacy and caregiving is well documented. Education can increase healthy aging and community volunteerism and leadership for all older Arkansans. Division programs such as

The population over 60 years of age is growing. Education can increase healthy aging, volunteerism and leadership for all older Arkansans.

“How to Talk to your Doctor,” “Extension Wellness Ambassadors,” “Keys to Embracing Aging,” and “Estate Planning” are available to all senior adults, no matter what their health, relation-



*The Division of Agriculture strives to help Arkansans stay healthy throughout their entire lives, by providing avenues to nutrition, education and exercise.*

ship or financial status. We will continue to stay abreast of the emerging issues in the field of aging through ongoing research and program development.

### **The Division of Agriculture will:**

- ▶ Promote successful aging through research and education on health, housing, social interaction, emergency preparedness and other emerging issues.
- ▶ Guide seniors in fraud prevention, succession plans, estate planning and end-of-life preparation.



# Building Communities and Strengthening Economies





Changes in the economy, technology and population are transforming the ways Arkansans live and work. Employment for the state has reached pre-recession levels, but rural employment declined by 3.5 percent between 2007 and 2014. This is largely the result of lost jobs in natural resources and manufacturing even though those sectors remain critical to the state's economy.

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# innovative towns & thriving populations

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With broad programs and a presence in all 75 counties, the Division is uniquely positioned to support communities and local economies. Efforts are focused in four areas: economic viability and sustainability; entrepreneurship in evolving economies; leadership and civic engagement; and quality of life and place.

## **Economic Viability and Sustainability**

Farmers, small business owners and other entrepreneurs are critical for the viability of Arkansas communities, yet many rural communities and regions are facing



*The Division's Arkansas Food Innovation Center helps entrepreneurs like A.B. Merritt and Denise Rohr develop products for local food distribution systems.*

severe economic challenges as the economy evolves. Successful communities and regions muster local assets and collaborate to implement effective economic development strategies. Businesses must understand their changing economic environment and effectively employ tools and resources. At the same time, the labor force requires enhanced skills and training to succeed in today's global economy.

Arkansas communities and regions require innovative strategies to grow jobs and income to survive. Increasing global competition forces all businesses and communities to reinvent their marketing and development strategies.

### **The Division of Agriculture will:**

- ▶ Enable communities and regions to identify and implement innovative economic development strategies.
- ▶ Provide businesses with innovative risk management strategies.
- ▶ Help businesses identify marketing opportunities and develop strategies for selling to the public and private sectors.
- ▶ Assist community leaders in efforts to create a trained and motivated workforce for an evolving economy.

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## **Entrepreneurship in Evolving Economies**

Many rural communities have lost population and other resources. The challenge of this century is to make rural

The challenge is to **make rural communities attractive to business.** Communities and local governments **play an important role.**

communities attractive to business and social entrepreneurs, thereby creating new opportunities for rural citizens. Communities and local governments play an important role in entrepreneurial development. Entrepreneurship is also facilitated by research discovery and technical assistance.

### **The Division of Agriculture will:**

- ▶ Move our discoveries out of the lab and test plots to growers' fields and start-up companies to create opportunities in rural communities.
- ▶ Provide entrepreneurs education and technical assistance to compete in an evolving economy.
- ▶ Engage local leaders to create entrepreneurial communities.
- ▶ Produce research-based information and assistance to facilitate growth in value-added and local food systems.
- ▶ Assist in transforming scientific discoveries into new businesses, products, and services.

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## **Leadership and Civic Engagement**

Effective and inclusive leaders working with engaged citizens is vital to sustainable and economically viable communities. Equipping community leaders and citizens with knowledge and skills can help them understand and address critical issues. Diversity of populations and ideas is increasingly important to community planning, public support and effective implementation of plans. Engaging the public, expanding access to research-based information on public issues, and creating a local environment that



*Extension economist Ron Rainey counsels growers on how to succeed in farmers markets around the state.*

encourages collaboration and innovation are critical for communities and their leaders to be successful in today's economy and in maintaining a high quality of life.

**The Division of Agriculture will:**

- ▶ Engage and educate current and future leaders.
- ▶ Encourage diverse and under-served populations in civic engagement.
- ▶ Teach tools and skills for civic engagement to communities.
- ▶ Provide research-based education on public issues affecting the citizens of Arkansas.

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## Quality of Life and Place

We live in an era in which much work and many jobs can be performed anywhere there is high speed broad-

Arkansas communities can take a proactive approach to create a high quality of life and place.

band connectivity. Quality of life and place has become a driver in the 21st century global economy, a key factor in attracting and retaining entrepreneurs, businesses, workers, families, and retirees. While quality of life includes basic services, education, health care, and recreational opportunities, quality of place refers to those vibrant downtowns, neighborhoods, and public places that offer a beautiful creative, and dynamic setting to live, work, and play. It makes a community where people want to live.

Arkansas communities and regions can take a proactive approach to create a



*The Division helps communities develop farmers markets for local growers that also contribute to higher quality of life for Arkansans.*

high quality of life and place. Successful communities leverage their unique assets, develop amenities and experiences for a high quality of place, and create a sense of identity and pride that differentiates them and draws people from all over the world.

**The Division of Agriculture will:**

- ▶ Equip community leaders to understand and leverage their quality of place assets.
- ▶ Empower communities to identify, develop, and market services and amenities.
- ▶ Research critical and emerging issues for local communities.

*The Division's soybean breeding program developed Kirksey, the first edamame soybean adapted to grow in the U.S., that has helped open a new agricultural industry in Arkansas.*





Natural  
Resource  
Conservation  
and  
Management



The economy of Arkansas, deeply rooted in the success of agricultural ventures, is essentially reliant upon a healthy environment. While our natural resources are abundant, without proper care and conservation efforts, the thriving heart of agriculture in the Mid-South could be jeopardized.

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# environment energy & climate

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Division of Agriculture research and extension programs are developing new technologies and methods for making more efficient use of the state's natural resources, as well as protecting them for future generations. Advanced management practices protect water quality and seek to maintain and bolster the available quantities, promote sustainable agricultural production, safeguard natural habitats for wildlife and improve the quality of life for all Arkansans.

Changes in the environment — as gradual as a depleting underground reservoir or as sudden as a summer flood — can be crises that become succeed-or-fail turning points for Arkansas farmers, ranchers and other residents. The same goes

*Undergraduate researcher Ashley Rodman measures oxygen levels in an Ozark Mountain stream. She worked with Dr. Kris Brye to assess the environmental health of Arkansas streams.*



for changes in the production and consumption of energy, as well as changes in the climate. The University of Arkansas System Division of Agriculture will provide Arkansans with the best foundation of non-biased scientific research to prepare for those changes and make the right decisions for both themselves and their communities.

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## **Sustaining water quantity**

Row crop farming can be intensely water-reliant. Much of the state's agricultural industry benefits from karst geology in the northwest and the rich soils of the Delta region and proximity to the Mississippi River in the east. But maintaining aquifer

levels for future generations presents a challenge.

### **The Division of Agriculture will:**

- ▶ Improve irrigation and other water use efficiencies to promote conservation through research and education.
- ▶ Educate Arkansans about competing water quantity demands for agricultural, residential, recreational, wildlife, industrial and municipal needs.
- ▶ Inform decision makers with science-based information on water quantity.
- ▶ Collaborate with public and private partners to sustain water resources.
- ▶ Provide the legal and science-based information needed to understand changing environmental regulations.



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## Water, Soil and Air Quality Stewardship

Agriculture draws upon many essential natural resources, including water, soil and air. For the state's number one industry to thrive, those resources must remain clean, abundant and viable, both before the first seed is planted and after the last row is harvested.

### The Division of Agriculture will:

- ▶ Develop and improve management practices and maintain and protect water, soil and air quality through research and education.
- ▶ Educate Arkansans and inform decision makers about the value and benefits of resource conservation.
- ▶ Collaborate with public and private partners to address resource sustainability.
- ▶ Provide the legal and science-based information needed to support the development and implementation of sound environmental policies and regulation

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## Forest Health

Arkansas is home to about 19 million acres of natural hardwood forests and vast expanses of piney woods, providing amazing landscapes for state and national parks as well as a powerful and growing timber industry. Sustain-

For agriculture to thrive, **natural resources** must remain **clean, abundant and viable**.

ing healthy forests through proper management of growth, pests and other factors is key to the success and beauty of the state.

### The Division of Agriculture will:

- ▶ Collaborate with public and private stakeholders to expand wood utilization and market opportunities that ensure healthy forests.

*A healthy forest is a managed forest. The Division of Agriculture works with other agencies to ensure forest experts are trained for the tasks of managing pests, disease, wildfires and other dangers through controlled burns and other means.*



- ▶ Investigate strategies to reduce risks from various disturbances.
- ▶ Develop and improve management strategies to ensure sustainable production and maintenance of ecological functions.
- ▶ Promote and perpetuate healthy wildlife populations through research and education.
- ▶ Provide the legal and science-based information needed to navigate forest and wildlife management policies and regulations.
- ▶ Educate Arkansans and inform decision makers about the value and benefits of healthy forests.



*Dr. Phil Tappe conducted a habitat study for alligators in the bayous surrounding Arkansas Post.*

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## Climate Variations

As climate patterns become less predictable, producers in Arkansas will face increasing challenges such as high temperatures, record rains, heavy snowfalls and drought. Division of Agriculture researchers are driven to help Arkansans adapt to and overcome challenges posed by future climate variations.

### The Division of Agriculture will:

- ▶ Provide research and education on profitable agricultural and forest production practices regarding greenhouse gas emissions and carbon footprint.
- ▶ Inform Arkansans on how to mitigate risks related to climate variations through research and education
- ▶ Provide objective research and information regarding legal aspects of climate issues.

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## Wildlife Conservation and Management

Arkansas' spectacular rivers, mountains, forests and pastures are teeming with native wildlife. The Division of Agriculture will serve a key role in helping Arkansans understand the natural world around them and how to preserve the variety and beauty for future generations.



*A bull elk in Boxley Valley wears a GPS collar used by Division wildlife researchers to study elk habitat patterns in the Buffalo River Valley.*

### **The Division of Agriculture will:**

- ▶ Provide information to public and private stakeholders on healthy wildlife populations and habitats through research and education.
- ▶ Address nuisance wildlife and damage issues through research and education.
- ▶ Provide legal and science-based information regarding wildlife leases, policies and regulations.
- ▶ Develop a better understanding of social and economic aspects of wildlife management decisions and enterprises.
- ▶ Collaborate with public and private partners regarding wildlife conservation and management.

The Division of Agriculture will play a key role in helping to **preserve the natural variety and beauty** of Arkansas for **future generations.**



**DIVISION OF AGRICULTURE**  
**RESEARCH & EXTENSION**

*University of Arkansas System*

2404 North University Avenue  
Little Rock, Arkansas 72207  
(501) 686-2540  
[division.uaex.edu](http://division.uaex.edu)