

FOCUS ON

Agriculture • Food • Family
Community • Environment



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

Annual Report 2011

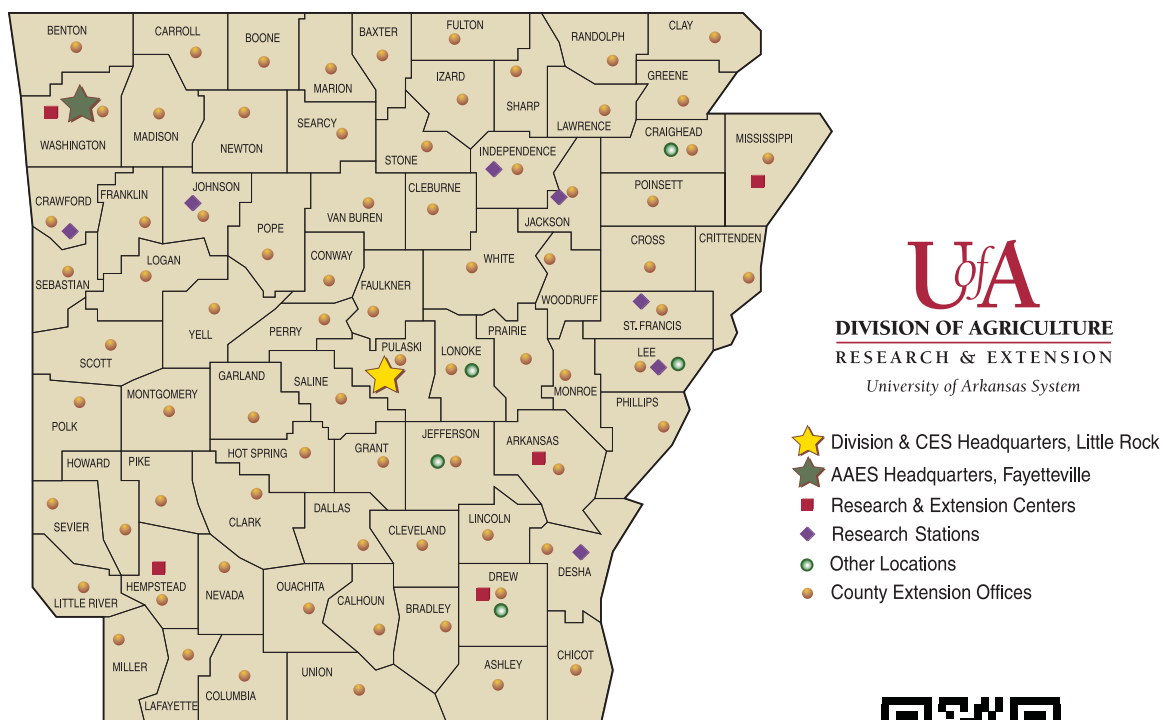
Arkansas is Our Campus

The Division of Agriculture is unique among the 18 campuses and units of the University of Arkansas System as the one with a presence in all 75 counties.

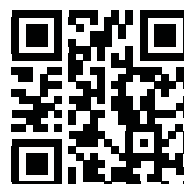
Our faculty, staff and facilities are located on five university campuses, at five regional Research and Extension Centers, seven Research Stations and other locations. An Extension office is located in all 75 counties.

The Division's two parts are the Arkansas Agricultural Experiment Station (AAES), which has research as its primary mission, and the Cooperative Extension Service (CES), which delivers appropriate technologies and information to the people of Arkansas.

Division headquarters are on the University of Arkansas System's administrative campus in Little Rock. AAES headquarters are on the U of A campus in Fayetteville. CES headquarters are adjacent to the U of A campus in Little Rock.



To access more information about the University of Arkansas System Division of Agriculture and its programs, visit <http://division.uaex.edu> or download a QR code reader to your mobile device and scan the codes in this report.





University of Arkansas System
Division of Agriculture
Annual Report 2011

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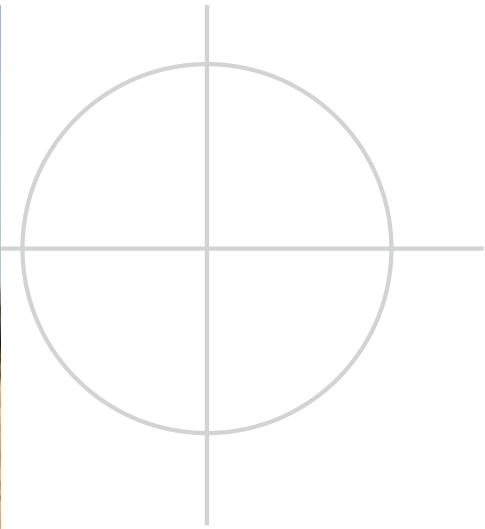
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Mark J. Cochran
Vice President for Agriculture

The Division of Agriculture's statewide infrastructure has been developed since the founding of the University of Arkansas in 1871 as a land-grant college. The state charter included the terms of the Morrill Land Grant College Act of 1862, which called for academic, research and service programs to advance the state's agricultural sector. From its base on the Fayetteville campus, the Arkansas Agricultural Experiment Station and the Cooperative Extension Service developed the statewide infrastructure that was necessary to address the needs of the state's farmers.

The statewide mission was reinforced in 1959 when the U of A Board of Trustees created the Division of Agriculture as an entity of the University of Arkansas System, with a legislative budget appropriation of its own rather than as part of the Fayetteville campus. Most Division Experiment Station and Extension faculty members also have academic appointments to a university campus faculty.

From the earliest years, it was clear that the statewide infrastructure with a presence in all 75 counties was uniquely suited to addressing not only the science and business of agriculture, but also the broader needs of families and communities.

The 2011 Annual Report provides examples of our focus on specific projects and programs in the Division's five areas of emphasis:

- Agricultural Production and Processing
- Environment, Energy and Climate
- Access to Safe and Nutritious Food
- Increasing Opportunities for Families and Youth
- Economic and Community Development

We believe that all Arkansans benefit from the progress we are able to make in each area in concert with partner agencies, communities, organizations, businesses and individuals.

Sincerely,

Mark J. Cochran
Vice President for Agriculture

Economic Contribution of Arkansas Agriculture



The agricultural sector is a major contributor to the state's interactive economy and a catalyst for economic development with direct, indirect and induced contributions.

- Direct contributions are the wealth generated from crops, animal products and forest products and also the processing and marketing of food and fiber products.
- In most Arkansas communities, indirect contributions of goods and services produced and marketed to agricultural producers and processors are a major part of the economy.
- Induced contributions occur when wealth generated from direct and indirect contributions is spent within the state.

The agricultural sector contributed*:

- More than \$17 billion of value added to the state's economy in 2009, the latest year for which data were available for analysis. That's more than 17% of all value added in the economy.
- 275,435 jobs, which is about one in six jobs in Arkansas.
- \$10.7 billion in labor income, or 17 % of the state's total labor income.

Aggregate of Value Added by the Agriculture Sector in Arkansas, 2009

Contribution Area	Million \$	% Total Contribution	% State Total
Production	2,483	14.6	2.5
Processing	5,296	31.1	5.4
Ag-Related	240	1.4	0.2
Total Direct	8,019	47.1	8.2
Indirect	5,145	30.2	5.2
Induced	3,854	22.6	3.9
TOTAL	17,018	100.0	17.3

Among states, Arkansas ranks*:

- No. 12 in agricultural cash receipts in 2009 with more than 49,300 farms on 13.7 million acres in 2010. (USDA: NASS, 2010 and 2011)
- No. 4 in saw-log production in the South with 18.7 million acres of forest land representing approximately 56% of the total land base.

*Economic Contribution of the Agricultural Sector to the Arkansas Economy in 2009," McGraw, K., J. Popp, and W. Miller. Research Report 990. AAES, U of A System Division of Agriculture, Fayetteville. 2011.

*Johnson, T.G., J.W. Bentley and M. Howell, 2009; U.S. Census Bureau, 2011; USDA Forest Service Forest Inventory and Analysis, 2011.

Arkansas agriculture contributes a larger share to the Gross Domestic Product (GDP), at more than 10%, than does agriculture in neighboring states.

Agricultural Sector as a percentage of GDP by State, 2009

State/Region	Percent of GDP by State
Arkansas	10.37
Louisiana	4.37
Mississippi	8.12
Missouri	7.10
Oklahoma	4.94
Tennessee	7.17
Texas	4.12
Southeast ^a	6.79
U.S.	5.33

For more information about the economic contributions of Arkansas agriculture, visit http://division.uaex.edu/news_publications/Economic_Contribution_2011.pdf to download the 2011 booklet report or download a QR code reader to your mobile device and scan this code.



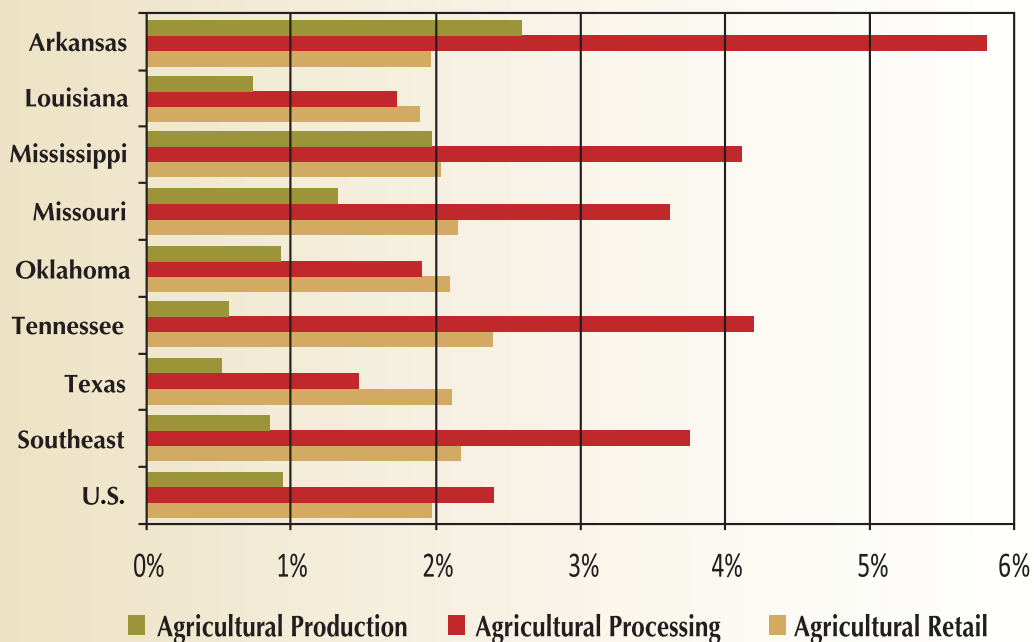
Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Accounts Data, 2011.

Agricultural sector includes production, processing and retail.

^aThe Southeast is defined by BEA to include the states AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA and WV, and is not the sum of Arkansas' contiguous states listed in the table.



Agricultural Production, Processing and Retail as a percentage of GDP by State, 2009



*U.S. Department of Commerce, Bureau of Economic Analysis, Regional Accounts Data, 2011.

Arkansas is in the top 25 states in the production of 24 agricultural commodities.

(2010 Production Year)^a

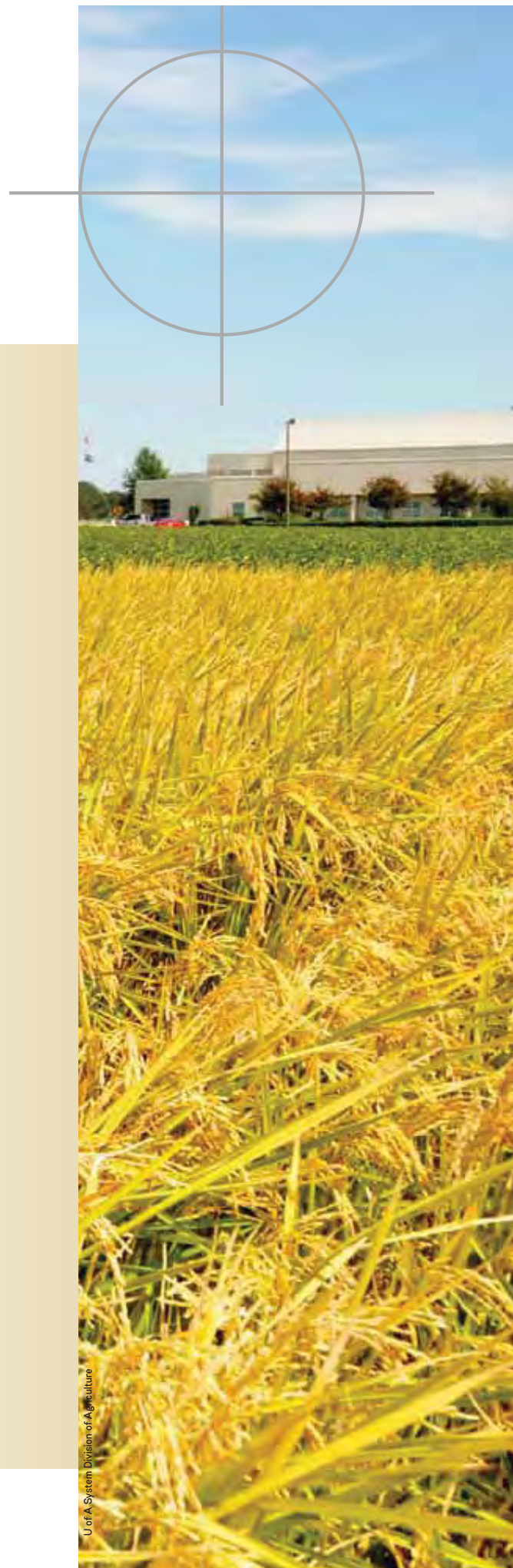
- No. 1 in Rice
- No. 2 in Broilers
- No. 3 in Catfish (foodsize)
- No. 3 in Cotton (upland)
- No. 3 in Cottonseed
- No. 5 in Sweet Potatoes
- No. 5 in Turkeys
- No. 9 in Chicken Eggs
- No. 10 in Beef Cows^b
- No. 10 in Grain Sorghum
- No. 11 in Soybeans
- No. 12 in Blueberries
- No. 13 in Grapes
- No. 13 in Pecans
- No. 13 in Tomatoes
- No. 15 in Watermelons
- No. 16 in Sod Production Acreage^c
- No. 20 in Honey
- No. 21 in Peaches
- No. 22 in Corn for Grain
- No. 22 in Hay
- No. 23 in Cattle and Calves
- No. 23 in Hogs and Pigs
- No. 23 in Oats

Source: National Agricultural Statistics Service, data for 2010.

^a Data for some states are unavailable due to nondisclosure, especially for livestock and livestock products commodities. As a result, these states are not included in the rankings, which may affect Arkansas' actual rank.

^b Beef cows is a Jan. 1, 2010, inventory comprised of "beef cows that have calved" and "beef cow replacement heifers 500 pounds and over."

^c Source: Census of Agriculture, data for 2007; Haydu, J.J., A.W. Hodges, and C.R. Hall, 2006.





Agricultural Production & Processing

Crops, Animals and Forest Resources

Producers and processors of agricultural commodities, who create one in every six jobs in Arkansas, rely on the Division of Agriculture to help solve problems and create new opportunities.

The economic base of all 75 counties includes farms and agribusiness enterprises in poultry, forest products, beef cattle and crops such as rice, soybean, cotton, wheat, corn and hay. Small acreage, high value specialty crops such as fruits, vegetables, turfgrass and ornamental plants are important in many communities.

The Division's Agricultural Experiment Station scientists and Cooperative Extension Service specialists partner with producers, processors and agribusinesses. Our programs include basic and applied research in a variety of scientific disciplines and practical applications under local Arkansas conditions.

Biomarkers could improve feed efficiency

Feed accounts for as much as 70 percent of the cost of raising poultry and livestock to market weight. Mitochondria — tiny organelles in most cells — perform the critical function of generating energy from food molecules. Division of Agriculture research on mitochondrial DNA is pointing toward biomarkers that are responsible for producing animals with superior feed efficiency. Such markers could be used to improve the selection of breeding animals for feed efficiency, which would ultimately reduce the costs of producing meat and poultry products.

HARVEST TIME – Post-doctoral Research Assistant Tetsuaki Ishibashi, left, harvests purified seed from amplification plots for advanced soybean breeding lines.

Fall calving avoids fescue toxicosis

In cow-calf herds where endophyte-infected tall fescue is the main pasture grass, which includes most beef cattle operations in Arkansas, a big advantage for fall-calving cows over spring-calving cows was documented by Division of Agriculture animal scientists. The difference is due to less consumption of a toxin in endophyte-infected fescue. Fescue is a cool season grass, and a lower level of toxin is produced in the winter than in warm weather. Many livestock producers tolerate fescue toxicity because endophyte-infected fescue is hardy and drought-tolerant. Patented Division technology has been used in new tall fescue varieties infected by non-toxic endophytes, which have the same benefits but without the toxicity. Producers can reap benefits by converting just a portion of their pastures. The study found that spring calving rates were much improved when cows were moved to non-toxic tall fescue pastures for seven to eight weeks in the spring beginning four weeks before breeding.



FALL CALVING – Division of Agriculture research has documented a big advantage for calves born in the fall compared to those born in the spring if endophyte-infected tall fescue is a main pasture grass.



PIGWEED PROBLEM – Weed scientist Jason Norsworthy conducts research on the growing problem of glyphosate-resistant weeds in Arkansas. In this test plot, Norsworthy is tracking the rate at which a 1-square-meter patch of glyphosate-resistant Palmer amaranth spreads through a cotton field.

Communities seek to evict an unruly neighbor: pigweed

Clay County farmers are presenting a unified front to evict an unruly neighbor: pigweed. “This is a good example of a community IPM for pigweed.” said Andy Vangilder, Clay County Extension Staff Chair based in Piggott. Pigweed has developed a fierce resistance to glyphosate, can produce millions of seeds per acre, and grows easily and everywhere. It’s tough, too — after reaching a certain maturity level, chemical control is impossible, prompting farmers to resort to an old weapon: hand-hoeing. This community effort began back in 2009, when Vangilder and Ken Smith, Extension Weed Scientist for the Division of Agriculture, gathered eight or nine local agribusiness people in a room to discuss the pigweed tidal wave they saw coming. Using a zero tolerance approach being researched by the Division, the growers must not only keep their crop rows weed-free, but also marginal areas such as ditches and turnrows. As more producers in the county see the results, “you hear other producers saying, ‘I guess I’d better get on the ball,’” Vangilder said, adding, “It’s nice to see all the real clean turnrows.” Smith is planning to roll out a community management program on a wider scale in 2012.

Five states cooperate in hybrid rice breeding

The Division of Agriculture is developing a hybrid rice breeding program in cooperation with Louisiana, Mississippi, Missouri and Texas. A single company is the current source of rice hybrids, which often outperform conventional, inbred varieties developed at public institutions. A successful public hybrid breeding program will provide an alternative source for producers. Division scientists based at the Rice Research and Extension Center near Stuttgart have produced a large number of experimental hybrid lines as a foundation for the program, which is funded by the Arkansas Rice Research and Promotion Board. This is a long-term effort that may require a decade or more to produce the first competitive hybrids.

First nitrogen soil test for rice rolled out

The Division of Agriculture in 2011 began accepting soil samples to analyze using the first and only site-specific test of mineralizable soil nitrogen as a basis for nitrogen fertilizer recommendations in any crop. Soil scientists have calibrated and field-verified the test for rice on silt loam soils. Next will be rice on clay soils and wheat on silt loam soils. This technological breakthrough will help farmers apply only the amount of nitrogen fertilizer needed to maximize yields. It replaces a method that estimated the nitrogen rate needed, which often resulted in too little or too much fertilizer being applied.

Forest entomologists prepare for possible invasive pest

Invasive forest insect pests are arriving in North America at an increasing rate. The 2.2 million acres of pine forests in Arkansas could be severely damaged if the European wood wasp (*Pinus echinata* Mill.) found its way to the state. This damaging pest has been found in New York and neighboring states. It has not been found in Arkansas, but Division of Agriculture forest entomologists are preparing for that possibility. They are studying related species in the state to provide the information that would be needed to detect, eradicate or manage populations of the European Wood Wasp if it does appear in Arkansas.

Parasite resistance to chemical controls increasing in cattle

Helminth (worm) parasites are common pathogens in all farm and companion animals. For production animals, parasitism is usually subclinical (no visible signs) but economically important, with most losses due to lowered feed efficiency and reduced animal productivity. It is estimated that animal productivity in the U.S. is reduced by 10 percent as a result of “normal” worm infections. No control measures are absolute in efficacy, with management and chemical means of intervention providing only partial and short-lived reductions of parasite populations. Division of Agriculture research has documented that parasite resistance to chemicals is measurably on the rise in cattle and no new chemicals are on the near-term horizon. Therefore, producers must use a multifaceted approach to parasite control.



QUALITY STANDARD – A cotton variety developed by the Division of Agriculture set “a new standard for fiber quality in upland cotton.” The variety, named UA 48, has a rare combination of exceptional fiber quality, high yield potential and early maturity.

UA 48 sets new quality standard for cotton fiber

A cotton variety developed by the Division of Agriculture has set “a new standard for fiber quality” in upland cotton, according to Cotton Incorporated (CI). The UA 48 variety has been widely praised for demonstrating a rare combination of early maturity, superior fiber quality and exceptional length, and high yield potential in performance tests in Arkansas and four other states. A limited quantity of UA 48 seed was sold for planting in 2011, and a seed company has since been licensed for commercial production. CI experts say yarn and fabric made from UA48 is clearly superior to that made from other upland cotton in “hand,” sheen and smoothness.

New vaccines for poultry diseases

Division scientists and colleagues in Texas and Canada developed a series of patented or patent-pending vaccines for several economically important disease pathogens. Candidate vaccines target the avian influenza, or bird flu, virus, which has not been reported in the United States, and foodborne bacteria such as *Salmonella*. The research team in the Division’s J.K. Skeeles Poultry Health Laboratory also has developed a pro-biotic culture that decreases foodborne pathogens in live chickens.



NEW VACCINES – Professor Bill Hargis, D.V.M., leads a research team that has developed a series of patented or patent-pending vaccines to help control several important disease pathogens in poultry.



ORGANIC GARDENING – Program Associate Heather Friedrich discusses organic gardening with visitors to the vegetable field day at Kibler.

Vegetable field day sows seeds with new visitors

This past June, more than 300 participants learned about vegetables “from garden to plate” — seeing not only how vegetables are grown and nurtured, but also healthy ways to incorporate them into their diet. If visitor feedback is any indication, they’re ready for more. This year’s event, which emphasized research and information for gardeners and small farms, brought plenty of new faces. Of those who responded to an after-event survey, more than 75 percent were visiting the University of Arkansas Vegetable Research Station in Kibler for the first time. Eighty-two percent of attendees said they grew their own vegetables and 93 percent said they grew vegetables for their own use. When asked what they liked best about the field day, the healthy cooking demonstrations got the most support from among 13 choices at 30 percent.

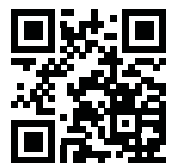
IPM smarts mean \$1.9 million savings for Chicot County growers

Farmers are constantly feeling a squeeze, caught between the costs of inputs such as fuel and pest controls, and the contract price they’ll receive after harvest. A production meeting featuring integrated pest management in soybeans provided growers the tools to head off weed and insect problems, said Chicot County Staff Chair Gus Wilson. Sixty-two producers, two county agents and six agronomists took part in the soybean IPM meeting and in follow-up interviews, 75 percent of producers said they’d learned to stage their crops, avoiding the need to spray for soybean disease. The growers represented 99,000 acres in Chicot County, with a savings of \$1.98 million in a county where farming is the biggest industry.

AgrAbility helps farmers stay in the business

The Arkansas AgrAbility program is enabling disabled farmers stay close to the work they love. In 2011, the program served nine clients in seven counties. The successes include allowing farmers in Garland and Crawford counties to remain at work. The Garland County client has arthritis, two hip replacements and limited mobility. On a typical day, he had to climb on and off his tractor nearly a dozen times to open and close gates. The addition of automatic gates has saved him nearly two hours of climbing daily and reduced the amount of pain he suffers in moving. A Crawford County cattle and hay farmer with Parkinson’s disease and a spinal cord injury has had a new house entrance ramp, specialized truck/tractor seating and other changes that allow him to be a more hands-on supervisor to his farm staff. This and other farm site modifications were made possible through collaborative efforts with Vocational Rehabilitation Services and the University of Arkansas’ Department of Biological and Agricultural Engineering.

Videos about the Arkansas AgrAbility program are available at <http://www.youtube.com/arextension#p/u/21/5i19n08szs4>, or download a QR code reader to your mobile device and scan this code.

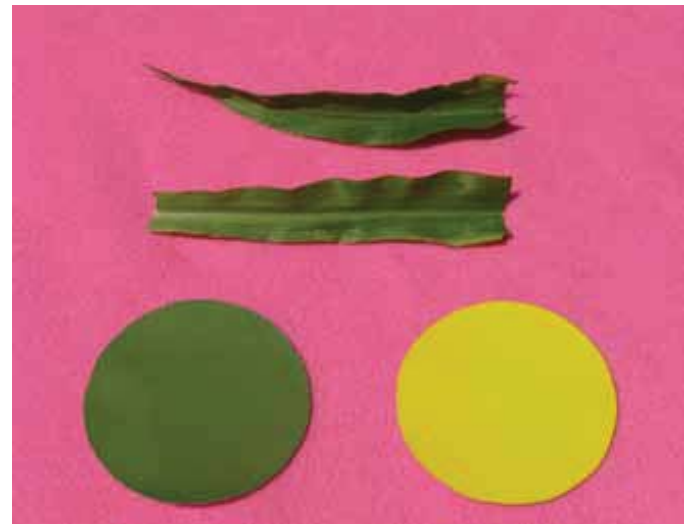


Smart phone 'app' could diagnose corn nitrogen deficiency

Farmers may soon be able to use a digital camera or smart phone to diagnose nitrogen deficiency in corn plants, based on patent-pending technology developed by Division of Agriculture plant scientists. Farmers watch for symptoms of nitrogen deficiency in corn and may submit plant samples for laboratory tests to determine if a supplemental nitrogen application is needed. The Division research could result in “an app for that” — a smart phone application. The research team developed a method to measure the “greenness” of corn leaves using a digital camera and commercially available software. Darker green leaves indicate a higher concentration of nitrogen. The system calculates the actual nitrogen concentration in the plant based on leaf color.

Loggers' training offers CEUs without taking a whole day off work

Loggers are required to be certified by the Arkansas Timber Producers Association, which means obtaining six hours of continuing education hours each year. With low prices and many mills and loggers squeezed by a limited market, loggers sometimes face the choice between working and attending class. Calhoun County Extension Agent Jaret Rushing offers a 90- to 120-minute training in environmental/forestry-related fields that would qualify toward their required six hours. In 2011, 20 people on four logging crews were certified. Because they didn't miss an entire day of work, the company they work for produced up to 30 loads of timber. This meant the crews produced \$15,000 of timber vs. being gone to class all day and earning zero.



SHADES OF GREEN – Green and yellow disks provide reference points, regardless of the light conditions, for analyzing corn leaf color based on a digital Dark Green Color Index (DGCI). Digital imaging software analyzes the variation from the DGCI level of greenness in leaves for a healthy nitrogen concentration to calculate the actual concentration in the plant tissue.

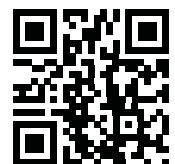
New approach to rice field day produces high-yield in attendance

Over the years, recession, diversification and disastrous inundation made it more difficult for producers to get away from the farm to attend field days. As attendance fell over the years for these events, it was time for a new look at an old learning tradition.

“It was time to get better or quit having them,” said Chuck Wilson, Director of the Rice Research and Extension Center, which traditionally hosted a rice field day each August with tours of experiment plots, talks by crop experts, and topped off by a catfish lunch. In 2011, the Rice Field Day transformed into the Arkansas Rice Expo, featuring field tours, farm-related competitions, equipment test drives and dozens of booths. “We wanted to create a family-fun event that highlighted not only new rice production technology, but also improved awareness of the importance of the rice industry to people outside agriculture.” Wilson and his committee set high expectations with a goal of attracting 1,000 people, and despite the 100-degree heat, the 2011 Rice Expo met the goal.

CHECKING IT OUT – Producers check out farm-related vehicles and equipment on display at the Arkansas Rice Expo.

Videos of some field day presentations at the Expo are available at <http://www.youtube.com/arextension>, or download a QR code reader to your mobile device and scan this code.



Vegetable soybeans (edamame) promoted as new Arkansas crop

A Division of Agriculture task force has helped lay the groundwork for Arkansas to be the first state for large-scale commercial production of vegetable soybeans to be marketed by a leading U.S. importer of edamame products. Edamame is a popular food in Asia with rapidly growing demand in the United States. Green pods or seeds are usually steamed and served warm or cold as a side dish or in salads or soups. Edamame beans are larger and have higher protein and sucrose levels than commodity soybeans. Houston-based JYC Foods proposes to contract with Arkansas River Valley farmers to grow vegetable soybeans for processing in a local plant. The Division's soybean breeding program has developed edamame breeding lines that are better adapted to Arkansas growing conditions than varieties from China that are currently used for most edamame production in the United States.



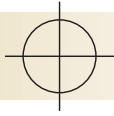
EDAMAME – A bean picker demonstrated at a Division of Agriculture field day last summer is being provided by Houston-based JYC Foods for harvesting edamame (vegetable soybeans). The Division and the Arkansas Soybean Promotion Board are promoting production of edamame in the state as a new specialty crop.

Extension education fights spread of bovine trich

When the State Veterinarian reported 20 cases of bovine trichomoniasis in the first six months of 2011, the Cooperative Extension Service was asked to conduct an educational campaign to fight spread of the disease. A news release was picked up by 34 media outlets, including the state's largest paper and the highest rated TV station. In addition, a fact sheet titled "Trichomoniasis in Cattle" authored by Dr. Jeremy Powell, D.V.M., and Associate Professor, and Dr. Tom Troxel, Professor and Animal Science Associate Department Head, was published in hard copy and placed on our website, and brochures based on the fact sheet were published for distribution. The topic was also included in the July issue of the Animal Science E-Newsletter that is sent to more than 900 recipients. A survey of County Extension Agents found that every county reporting has conducted at least one educational delivery method for this topic, including local radio, newspaper, newsletters, cattlemen's and other producer meetings, county fairs, mass e-mails, farm visits and clinics. Many indicate that this topic will also be on the agenda for future meetings.

Wheat trials boost wheat income more than \$350K for Lafayette Co. growers

With more than 12,000 acres in production, growers in Lafayette County depend on income from winter wheat to help with cash flow in the early summer months. Producers needed solid recommendations based on local conditions for weed control, fertilization, variety selection and disease control. County Staff Chair Joe Vestal arranged a wheat verification plot and a wheat variety demonstration plot on local farms' acreage. Based on Division recommendations, 17 wheat growers applied herbicides to control annual ryegrass on 4,600 acres in Lafayette County. As a result of timely applications and herbicide selection, wheat yields were increased 12 bushels an acre, up from the average yields of 42-47 bushels an acre, including a 60-acre verification field near Gin City that produced 87 bushels per acre. This represented an overall wheat yield increase of 55,200 bushels and an increase of \$358,000 in income for local growers.



Environment, Energy & Climate

No sector of the Arkansas economy or culture has a greater stake in the environment, energy conservation and climate change than agriculture. “The environment” is where farmers live and work. Soil and water resources are the most valuable assets they have to pass along to future generations.

The cost of the energy required to produce plant, animal or forest products can make the difference in a profit or loss for the year.

If carbon emissions cause climate change, farmers can help solve the problem. Plants absorb carbon dioxide from the atmosphere. Forests can remove a ton per acre per year of carbon, and crop fields also remove a substantial amount, depending on management practices.

Objective, science-based information is essential for making wise environmental, energy and climate policy decisions and implementing effective, economically sustainable management practices.

POLINATORS – As they gather nectar from the flowers honeybees pollinate sunflower plants at the Arkansas Agricultural Research and Extension Center in Fayetteville.

Feral bees more genetically diverse than domesticated bees

A lack of genetic diversity in honeybee queens may be a factor associated with colony collapse disorder, which is the term for the loss of bee colonies due to high bee mortality.

Queen breeders are the primary source of honeybee queens. A Division of Agriculture entomologist sequenced mitochondrial DNA from 140 colonies from 14 queen breeders in 11 states. Analysis revealed seven different mitotypes (differences in mitochondrial DNA), which is much lower than the variation found in feral bee populations. Feral populations may have adaptations to better survive honeybee pests, such as varroa mite and small hive beetle. Breeders of queen bees might be able to use feral bee parents in crosses to increase genetic diversity in an attempt to reduce the incidence of colony collapse disorder.





BIOFUEL FEEDSTOCK – Division of Agriculture Professor Chuck West shows a switchgrass research plot at the Arkansas Agricultural Research and Extension Center in Fayetteville.

Conservation project focuses on spatial technologies

The Division of Agriculture is helping farmers in northeast Arkansas use spatial technologies such as auto steer equipment linked to the GPS satellite system. Such technology allows farmers to adjust fertilizer application rates for optimum yields with less risk of nutrient runoff from fields. The project is funded by a Conservation Innovation Grant for \$205,343 from the U.S. Department of Agriculture with a matching grant from Cotton Incorporated. Project partners include the Northeast Arkansas Association of Conservation Districts, which is working with USDA's Natural Resources Conservation Service (NRCS) and Agriculture Research Service to provide farmers technical and financial assistance through the Environmental Quality Incentives Program.

'Energy crops' research prepares for possible future biofuels technology

The Division of Agriculture and partner agencies are studying potential biofuel crops, with funding from the U.S. departments of agriculture and energy. The research is laying the groundwork for Arkansans to develop feedstock production systems in the event of a technological breakthrough that would make it economically feasible to use cellulosic feedstock to produce ethanol and other biofuels. Research and demonstration projects are conducted at nine locations across the state with several species including switchgrass and other grasses and fast-growing trees such as cottonwood and willow. Researchers have found that careful management is required to establish a productive "energy crop" planting, and different species perform differently on different soils. Once established as a perennial crop, several species have proven to be highly productive with minimal use of fertilizers and no irrigation.

Cap-and-Trade could benefit farmers

Proposed legislation to create a national "cap-and-trade" system for reducing greenhouse gas emissions has the potential to provide a new market for Arkansas farmers. Agriculture is one of the few ways to sequester carbon to sell, and each crop sequesters a different amount of carbon. A Division of Agriculture research team created a model to estimate the impact of a cap-and-trade system on agricultural producers in Arkansas. This model can estimate changes in cropping allocations as well as changes in producer revenue on a county level under the specifications laid out the proposed system. The model is able to estimate crop-specific carbon foot-print (both emissions and sequestration by production practice and production location) and county crop farm income impacts of various policies to reduce greenhouse gas emissions.

Entomologist leads North American water mite study

A Division of Agriculture entomologist will lead a five-year project to conduct an in-depth study of the diversity of water mites in North America. Under a National Science Foundation grant of \$725,557, a research team will investigate the diversity and evolutionary biology of North American water mites in the family *Torrenticolidae*. The study will focus on the collection and description of hundreds of species new to science and will investigate the evolutionary history of the group using DNA and morphological data. The results of the project will be valuable for future research on aquatic community dynamics, biodiversity, biogeography and water quality biomonitoring, all of which could have impacts on conservation status and trends in freshwater habitats.

Rain barrels save gardens, waterways

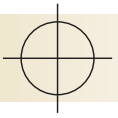
Stormwater runoff as a non-point source pollutant has been identified as a major contributor of pollution such as excess nutrients, bacteria and sediment in Arkansas waterways. Expansion of impervious surfaces make addressing runoff essential. Capturing the water and rerouting it to areas where it can soak into the landscape means groundwater is being recharged and filtered of pollutants. Rain barrels are one way to reduce runoff and preserve landscapes through dry periods. Washington County Extension Program Associate Jane Maginot said that in the seven workshops she and Washington County Extension Agent Katie Teague offered, 136 barrels were created and shared through local schools, a state park and a museum. One 55-gallon rain barrel can save 1,300 gallons of water through up to three dozen empty and refill cycles during peak summer months. With the installation and use of the 136 barrels built during the workshops, approximately 176,800 gallons of water are being captured and diverted from stormwater runoff.

LET IT RAIN – Faculty and summer school students at T.G. Smith Elementary School in Springdale built 10 rain barrels to capture rainfall from the roof of their gym to irrigate the school garden. Jane Maginot, Extension Program Associate, left, works with faculty.

'Clean' added to 'precise' gene integration

A Division of Agriculture biotechnologist who developed a process for “precise” transgene integration in a plant genome has now developed a follow-up process for “clean” integration by removing marker genes whose only function is to mark the presence of a transgene. The refinement, resulting in precise and clean transgene integration, contributes to the evolution of biotechnology as a tool both for research and for increasing the efficiency and environmental sustainability of crop production.





FOCUS ON

Access to Safe & Nutritious Food

The processing and marketing of food products is a mainstay of the Arkansas economy. The Division of Agriculture partners with the food industry to solve problems and develop opportunities to enhance the efficiency of operations and the quality and affordability of consumer products.

Assuring access to safe, affordable and healthy foods is one of the keys to battling the obesity epidemic in our state and nation.

Food safety and security research and extension programs are focused on safeguarding our food supply from pathogens and the possibility of contamination by terrorists.

Elimination of alum from fermented cucumber pickle products

Division of Agriculture researchers have found that replacing aluminum salts (alum) in fermented pickle products with calcium got around a problem that had been affecting marketing of pickle products. Processors were using alum to improve the pickles' firmness and crispness by strengthening their structure. But its presence in the pickles also adversely affected acceptance by consumers and restaurants. The researchers collaborated with pickle manufacturers to find ways to keep pickles firm and crisp without alum. They discovered that they could eliminate alum and still keep the pickles firm and crisp by instead using calcium at a level three times the amount usually applied commercially.

Strategies to eliminate *Campylobacter* in poultry

Campylobacter is one of the most commonly reported bacterial causes of human foodborne infections in the United States. Innovative on-farm strategies to prevent colonization of birds are critical to prevent the contamination of poultry with the pathogen. Division researchers conducted studies to evaluate the ability of caprylic acid to reduce *Campylobacter* in chickens. They found consistent reduction in *Campylobacter* colonization, which was a significant development because there are few successful strategies to reduce *Campylobacter* in live birds once they are contaminated. The results demonstrate that both therapeutic and prophylactic supplementation of caprylic acid in feed can effectively reduce *Campylobacter* in poultry. The use of caprylic acid in poultry would likely reduce the incidence of *Campylobacter* infections by 30-fold, resulting in reduced human suffering and medical savings.



Biosecurity practices and disease recognition in poultry

Division research scientists developed and conducted educational programs about dangers to poultry from avian influenza and H1N1 diseases. The programs were presented to veterinarians, poultry producers, county agents and exotic pet bird producers. The programs covered biosecurity procedures to prevent the introduction of disease into their flocks, farms or ranches. The diagnosis of diseases allowed producers to initiate a course of treatment or practice to contain the diseases. The continued dialogue has assisted greatly with biosecurity and increased awareness of disease and preventive measures for the Arkansas poultry industry.

Assessment of preparedness for agricultural bioterrorism in Arkansas

Division researchers surveyed Arkansas grain, feed and oilseed facilities to assess their preparedness for agricultural bioterrorism. The use of biological weapons to cause destruction of agriculture and its related industries has become a possibility that could have major repercussions for producers, consumers and the food and feed processing and distribution systems. A questionnaire was mailed to all Arkansas grain and feed elevators and processors and to seed and feed dealers. The survey sought information about their facilities, testing procedures, plant security and whether changes in preparedness had been made in recent years.

The study found that record-keeping systems that track commodities were in place at 71 percent of the facilities before 2002 and that 17 percent had added systems since then. More than two-thirds of the facilities do not have quarantine procedures. Nineteen percent of the facilities added employee training for security and disaster-specific issues after 2002. Employees are trained to report suspicious activity at 93 percent of the facilities. Half of the facilities have no computer security measures, disaster training or first responder agreements.



4-H SERVICE – 4-H'ers tackle hunger by setting up a food pantry. From left to right, Kaylee Crowl, Hayden Webb, McKenzie King, Dakota Tapp, Lane Callahan, Kaitlyn Gramling, Elizabeth Pratt, Hannah Crowl, Kenzi Dunegan, Ryan Shane and Tyra Stubbs.

Independence County 4-H'ers see need, establish food pantry

Hard work by members of a 4-H club in Independence County has resulted in help for those struggling through hard times. On June 2, members of the Southside 4-H Club, surrounded by parents, local officials and media, cut a clover-covered ribbon marking the opening of the Southside School District Food Pantry. “The parents said, ‘we see a need,’ and the kids asked ‘what can we do?’ This was a great partnership between parents and kids,” said Stephanie Schindler, Independence County Extension Agent with the University of Arkansas System Division of Agriculture.

Schindler said the food pantry was needed because the closest one was 10 miles away, and this location is more accessible for the students in the Southside School District. The pantry is open all year. The goal for the 4-H'ers was to open it by the time school was out so the kids would never go without food, Schindler said. The food pantry takes donations like any other pantry, and the 4-H'ers plan to work to make the site a government commodity distribution site.



BONE LOSS – Graduate student Jordan Teeple shows femurs (leg bones) from a study of rats fed red and black rice. Results suggest that colored rice might help prevent bone loss in post-menopausal women.

Extracts of natural green tea and grape seed partially replace chemical preservatives in hot dogs

To reduce the risk of *Listeria monocytogenes* contamination in ready-to-eat deli foods such as hot dogs, Division researchers responded to consumers' preference to use more natural and fewer chemical preservatives to inhibit pathogens. They conducted a study to determine the optimum concentrations of green tea extract and grape seed extract in low-fat chicken hot dogs. The results showed that chemical preservatives in hot dogs can be partially replaced by the natural plant extracts. Reducing conventional chemical antimicrobials and incorporating natural plant extracts will provide the processing industry with alternatives that are attractive to consumers and also effective and inexpensive.

Development of a direct-fed microbial for replacement of growth-promoting antibiotics

In response to pressure from consumers and government regulatory agencies, Division researchers have explored alternatives to antibiotic usage in animal agriculture. Although scientists have previously shown that certain formulations of beneficial bacteria could protect commercial poultry from infection, the most effective cultures were non-spore forming probiotics that were not suitable for inclusion in poultry feed.

The researchers subsequently isolated spore-forming Bacilli that reduce infections of *Salmonella* and *Clostridium perfringens* in poultry. They also developed a high-yield method of amplification of the spores for cost-effective commercial production. Testing has shown that these spores withstand commercial feed pelleting and are stable when incorporated into poultry feed. In late 2010, the resulting product under the trade name Sporulin was commercially launched in the United States under license from the University of Arkansas.

Portable biosensor developed for in-field detection of avian influenza H5N1

A portable biosensor that was developed by Division researchers will make possible rapid detection of the avian influenza virus H5N1, which is a key in controlling the disease and in enabling producers to eradicate infected animals and to quarantine and vaccinate still-uninfected animals. Previously developed technologies for detecting the disease have been complex and some can be performed only in enclosed facilities. The portable biosensor is designed for in-field sensitive and specific detection of the virus in poultry swab samples. The biosensor will help the poultry industry to be better prepared for the virus, to ensure poultry product safety and security and to minimize the testing cost.

Videos about research conducted by the Arkansas Agricultural Experiment Station are available at <http://www.uark.edu/admin/aes/videos.html>, or download a QR code reader to your mobile device and scan this code.



Franklin County Reshape Yourself fights obesity

A program to learn healthier living through better nutrition and exercise, plus support, was a losing proposition in Franklin County, as 13 Reshape Yourself participants together lost more than 100 pounds in three months. Offered from Jan.-March 2011, Reshape Yourself showed clients how to lose weight by following the Dietary Guidelines for Americans. In total, participants walked more than 500 miles, 81 percent lost weight, 56 percent ate more fruits and vegetables, and 75 percent reported lower cholesterol while 50 percent reported lowered blood pressure. Franklin County Extension Agent Susan Holman said one client reported: “This class has really been an eye opener as to how many calories I have been eating.” Better yet, 88 percent said they planned to continue implementing what they learned to remain on their weight-loss quest.

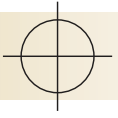
Nanoparticle-based sample preparation allows for rapid detection of foodborne pathogens

Rapid detection of major foodborne pathogens is possible through a magnetic nanoparticle-based sample preparation method developed by Division researchers. The process enables the rapid capture, separation and concentration of target pathogens in foods. This method enables processors to rely less on certain time-consuming and expensive laboratory methods. The research results could provide the food industry with new technology to prepare food samples for rapid detection of pathogens. Food samples from poultry, meat, dairy, vegetables and fruits can be treated to capture, separate and concentrate the target pathogens in less than 30 minutes. This sample preparation method, coupled with any rapid detection method, could reduce microbial detection time from the current eight-to-24-hour range to between one and two hours. This can save the food processing industry millions of dollars annually by avoiding product recalls and can reduce foodborne illnesses and associated medical costs.

Cirtilow, a hydrochloric/citric acid blend, reduces bacteria in ground beef

Using a hydrochloric/citric acid blend called Cirtilow in combination with other applications has been found by Division researchers to successfully reduce the populations of pathogens in ground beef. Cirtilow had not previously been investigated for its potential as a pre-grinding treatment for beef trimmings. Scientists found that using Cirtilow with combinations of cetylpyridinium chloride, sodium metasilicate or trisodium phosphate significantly reduced the populations of microbials in the ground beef. Using Cirtilow followed by a sodium metasilicate and trisodium phosphate application also provided an additional benefit of retaining ground beef color properties for up to seven days of display.





FOCUS ON

Increasing Opportunities for Families & Youth

The investment of Division of Agriculture resources and energy in providing opportunities for families and youth is an investment in our future.

Local 4-H clubs across the state involve young people in hands-on educational and service programs that enhance life skills such as decision-making, leadership and communication.

The Division of Agriculture partners with communities and other agencies to address major problems such as childhood obesity and the lack of jobs in economically distressed areas.

Division of Agriculture professionals in all 75 counties partner with families to help them deal with the challenges of raising children, balancing career and family priorities, caring for elders and other concerns.

Child development center to enhance training of students and practitioners

The Jean Tyson Child Development and Study Center at the University of Arkansas in Fayetteville, to be completed in the fall of 2012, will help support Division of Agriculture efforts to promote access to quality child care services statewide. The Center will replace outgrown facilities used for the child development academic and service program of the School of Human Environmental Sciences, which is part of Dale Bumpers College of Agricultural, Food and Life Sciences. It will help meet child care needs of the campus community and will be a learning laboratory for students in child development courses. The Center will also be a resource for continuing education of child development professionals statewide. Construction of the 22,800-square-foot facility is funded in part by a \$2.5 million lead gift from the Tyson Family Foundation and the Tyson Foods Foundation and gifts from other benefactors.

Jean Tyson Child Development Study Center, southwest corner



'Guiding Children Successfully' rates highly among participants

Guiding Children Successfully has earned the highest ratings among the vast majority of parents and child care professionals who have taken part in the training. The 30 hours of self-guided training includes 12 hours of video-based training based on the series developed in cooperation with the Arkansas Educational Television Network, as well as print-based training using resources from Parenting Journey, See the World Through my Eyes and Managing Stress: Turning Challenges into Blessings. During the 2010-2011 fiscal year, the 808 participants completed 6,773 hours of training. Evaluation data found that 80 percent of those taking the training rated their session as excellent.

Self-confidence seen as key to consumer behavior

Researchers have developed a Consumer Confidence Behavior Scale, which can be used to assess a person's self-confidence in his or her ability to make sound financial and consumer decisions. The instrument is being tested with college students and will be refined to provide insight into the level of confidence a person has in making decisions ranging from shopping for necessities to making investments. The goal is to provide a tool that educators, counselors and planners can use to help improve financial behavior of consumers.

Best Care participants offer better care thanks to training

Best Care is a program offered by the Family and Consumer Sciences section that provides 10 hours of face-to-face training to Arkansas child care professionals in the areas of child development, nutrition, health and safety, and resource management. In the 2010-2011 fiscal year, 72 courses were held in 25 clusters across Arkansas, and 1,851 participants completed 13,898 hours of training. In a post-course survey, 91 percent of participants said they planned to adopt one or more new actions to be a better child care professional, and follow-up interviews revealed that 86 percent of them had changed their behavior in response to the Best Care training.



EATING HEALTHY – Parents at Fouke Elementary say their children are eating more healthy foods and spending more time talking about healthy eating thanks to the Arkansas SNAP-Ed program. SNAP-Ed gives students a chance to try different, healthier alternatives to junk food.

Parents report that SNAP-Ed weans children off steady junk food diet

Fouke Elementary is addressing child obesity in Miller County by partnering with the Division of Agriculture SNAP-Ed program to provide nutrition education in classrooms. Fouke Elementary in Miller County has a dynamic SNAP-Ed Program, and students, parents and teachers benefit.

In a recent survey, 85 percent of parents reported children talking about healthy foods, and 79 percent said children asked for more or different fruits, vegetables, milk or yogurt. One parent reported her child “only ate chicken nuggets and pizza before the program and now he eats apples and carrots and will try new foods.”

Ninety-four percent of teachers surveyed think the program is “very valuable” and 83 percent reported being motivated to eat healthier and be more active. One teacher says the best part of the program is “the kids love tasting new foods,” another says the program is “an exciting program that I would like to see continued at our school.”

Statewide, SNAP-Ed school-based nutrition education programs in 58 counties reached more than 33,000 youth in 26 preschools and 153 schools.

Coupon College creates savvy back-to-school shoppers

Coupon College, a program that helps families manage their budgets better, enabled two-dozen Craighead County adults to save more than \$1,000 apiece in grocery and back-to-school spending over an eight-week period. Craighead County Extension Agent Debbie DeRossitte worked with the Cornerstone United Methodist Church Library to create a program in which church and members of the community at large donated coupons they didn't plan to use. Library staff clipped and organized the coupons and sales flyers. Participants chose coupons and deals each week, while tracking their savings on food and school supplies, including a computer. The 24 participants, from four communities, saved \$2,450 over an eight-week period thanks to coupon use and other strategies learned to make the most of their money.

Competitive 4-H forestry team produces three for forestry/wildlife college course

Calhoun County is one of the most heavily forested in Arkansas, and in an effort to shore up forestry education County Extension Agent Jaret Rushing established a 4-H forestry competition team. The program's twin goals in 2011 were to win the state 4-H forestry contest and represent Arkansas at the nationals, where the team finished fifth in 2011. More importantly, there was county support for the team, which raised more than \$4,000 through fundraisers. The program also grew from six participants in 2008 to 16. Team members have earned about \$8,000 in prize and scholarship money and so far, three youth from the program have enrolled in natural resources majors at the University of Arkansas at Monticello.



Statewide project targets childhood obesity

The Division of Agriculture is leading a statewide project aimed at understanding and arresting the growth of obesity among young children. The project is funded by USDA's National Institute of Food and Agriculture and involves innovative research and educational programming designed to bring several complementary interventions to scale, each addressing different aspects of the childhood obesity crisis. Researchers are identifying characteristics of the food environment that contribute most to childhood obesity so that interventions can target those children most at risk. Goals are to improve the diets of young children, promote physical activity and encourage other healthy behaviors. Partners include Dale Bumpers College of Agricultural, Food and Life Sciences and the Walton College of Business on the Fayetteville campus; U of A, Medical Sciences; Arkansas Children's Hospital Research Institute; and the Arkansas Center for Health Improvement.

Mother-son relationship a key to elder support

Ninety-five percent of older adults in need of assistance rely on younger family members for support. Determining factors contributing to positive intergenerational relationships will facilitate stronger support networks. Previous research has suggested that when the child available to provide care for an aging parent is a son, the responsibilities for that care fall primarily on the daughter-in-law. However, recent research has found that for the mother-in-law, three fourths of the difference between the perception of satisfactory and unsatisfactory support was related solely to the mother-in-law's satisfaction with her relationship with her son. The significance of the mother-son relationship in the quality of elder support had not previously been documented. The knowledge gained from these research efforts will lead to the development of interventions that can help strengthen family relationships to lessen the social and economic dependence of frail older adults on local and state services.

4-H FORESTRY COMPETITION TEAM – The Calhoun County Senior team – (from left) T.J. Chandler, Tiffany Hamilton, Michael McMahan, Jaret Rushing (team adviser), Brianna Hamilton and Dustan Harper – placed first in the Arkansas 4-H forestry contest and fifth in the national 4-H forestry competition.

4-H Afterschool sharpens skills of afterschool providers

4-H Afterschool works to provide “extraordinary learning opportunities” to youngsters using the 4-H credo of learning by doing. Professional 4-H and Family and Consumer Science Extension agents offer five hours of training in the areas of leadership, critical thinking and teamwork to those who provide afterschool programs, school personnel, 4-H adult volunteers and 4-H teen leaders. During the 2010-2011 fiscal year, 158 participants completed 790 hours of training. On a scale of 1-5, with 1 being “poor” and 5 being “excellent,” participants gave a 4.75 in their understanding of how to use what they learned and strongly agreed that the training was quality professional development 4-H has 1,015 youth engaged in 37 after school clubs across the state.

Grants fund new camp, backpacking for youth of military families

The camping programs offered by the Division of Agriculture’s 4-H youth development program give youngsters from all over the state an opportunity to come together for an exciting and educational camping experience.

A weeklong camp added this year for 9-12 year olds focused on activities celebrating 150 years of organized camping. Campers began their week in 1861 and worked their way to 2011, learning about events from the past, including a Great Depression simulation. The summer of 2011 also saw eight interns “learn by doing,” in accordance with 4-H’s central educational philosophy. The interns planned the activities for six camps and then instructed various workshops they had planned. The intern experience and the camp for 9-12 year olds were funded in part by a grant from the Donald W. Reynolds Foundation.

The 4-H High Adventure Backpacking program teamed with the Department of Defense and the National Institute of Food and Agriculture to allow eight youth from military families and three advisers to participate in a backpacking trip to Pisgah National Forest near Asheville, N.C. Over the course of the 2011 camps, teen counselors and camp leaders volunteered 3,450 hours.



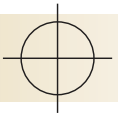
PLANNING HEALTHY MEALS – Pulaski County 4-H’ers learn to cook healthy as part of the Afterschool program.

Consumer education programs add up to consumer savings

Food prices are rising faster than overall inflation. USDA is predicting overall food inflation to be 2-3 percent next year. Fresh vegetable prices are up 4.4 percent from last year. All of which adds difficulty for the many Arkansas families already living in food-insecure households.

Arkansas consumers are finding ways to save money in spite of the economic downturn. The Cooperative Extension Service provided educational programs to teach consumers how to cut their food budgets. Participants learn a variety of smart shopping techniques to save money on food including using coupons. An evaluation of the coupon savings revealed that the average participant can save nearly \$2,000 a year just by using coupons. This is in addition to the money saved by applying the other food shopping strategies.

At a time when savings rates have been at or below zero for several years, finding \$2,000 to save can be critical for low to moderate-income consumers. Two thousand dollars is a great start for an emergency savings fund, an IRA for retirement, or saving for a child’s college education. These educational programs, along with many more on topics ranging from credit management to estate planning, are helping Arkansas residents become financially secure.



FOCUS ON

Economic & Community Development

With a broad program and a presence in all 75 counties, the Division of Agriculture is well positioned to support economic development in cooperation with local communities and other agencies.

Efforts are focused in five areas:

- Economic viability and sustainability
- Rural infrastructure
- Leadership development and community involvement
- Quality of life, and
- Population composition and change.

Managing the odds for farmers through 'suitable fieldwork days'

The phrase “days suitable for fieldwork” has an impact larger than whether a farmer can get into the field or not — it's critical data for helping producers manage risk, especially weather risk, said Terry Griffin, Assistant Professor of Economics for the Division of Agriculture. “Every farmer understands that each growing season is a gamble,” he said. “Variables that can put his or her crop at risk, such as weather, insects and market pressures, seem to be endless. Farm decisions are based on the likelihood of having an expected number of days suitable for fieldwork and should anticipate a below-average year rather than a good or average year.” Griffin bases his calculations on National Agricultural Statistics Service figures from 1975-2009.

Southern Risk Management Education Center provides local marketing assistance

The Division of Agriculture plays a leading role in the Southern Risk Management Education Center, which focuses on assisting smaller-scale agricultural producers. One promising development is growing consumer demand for locally grown foods. Electronic marketing networks gather information from producers and potential customers and give farmers greater access to local and regional markets. Large retail chains are now exploring how electronic markets can be used to meet demand for locally grown foods. The Southern Risk Management Education Center developed training materials in English and Spanish for direct marketing of local food products. The material includes a train-the-trainer curriculum for legal, financial and marketing risk management education. All materials are available in hardcopy, on CD and online at www.manageyourrisk.net.

Septic system research assures proper effluent renovation

The design criteria for septic system absorption fields in Arkansas uses a progressive approach that considers soil characteristics as indicators of the soil's ability to transmit and renovate effluent. Design criteria are evaluated to determine if the soil is profile-limited or if the absorption field can be loaded at the state's recommended maximum loading rate. In cooperation with the Arkansas Department of Health, 13 septic system absorption field products of four differing architectures were field tested. The results indicated that the current loading rate design method is functioning properly. Though manufacturers of alternative architecture designs have claimed that their products provide more room for effluent storage and call for loading rate allowances, preliminary results did not indicate that a reduction should be granted.

FIELDWORK – Rice is harvested in the Grand Prairie.



Farmers' markets organize to address common needs

Consumer demand for locally produced food is driving growth in small-scale farming and farmers' markets. Market managers, established vendors and new market members have education and training needs in order to better serve the markets and customers. The Division of Agriculture is addressing this need with an annual statewide Arkansas Farmers' Market Association (AFMA) meeting and projects such as mystery shopper evaluations and customer surveys. Market managers and board members from survey participant markets in northwest and central Arkansas were invited to a workshop to learn how to use these techniques for their market.

Agritourism supplements farming businesses

Agritourism is a growing segment of the agricultural enterprise. However, there is limited information available to agritourism operators for improving their efficiency. The Division of Agriculture participates in the Arkansas Agritourism Initiative to support such enterprises. A survey of operators identified specific needs for support and preferred methods of receiving training and information. Training in agritourism along with marketing and promotion were viewed as the most important factors that affect operators' decisions to participate in the program. This information will help Extension leaders and administrators at the Arkansas Department of Agriculture plan future agritourism programs.



EBT TOKENS – Fayetteville Farmers' Market Business Manager Joe Canfield shows the EBT (electronic benefits transfer) computer patrons use to buy tokens for purchase of items from market vendors. The Division of Agriculture is helping farmers' markets promote healthy food choices for low-income consumers.

Latin Americans adding entrepreneurial resources in rural communities

Rural communities are experiencing substantial change as a direct consequence of demographic dynamics such as population growth and decline as well as changes in age structure and migration-induced ethnic diversification. Research on Latin American migration patterns in rural areas has demonstrated a "rural brain gain" or the addition of human capital with in-migration. Continued analysis is underway to understand how the human capital gained through in-migration interacts with the longstanding problem of young people leaving rural communities, the so-called "rural brain drain." Research indicates the presence of untapped human resources in many rural communities and the emergence of an important "entrepreneur class" within the migrant community.

U-PICK – Sylvia and David Reddin have operated one of South Arkansas' leading "U-pick" fruit farms for more than 30 years near Hampton in Calhoun County.

State's first agritourism meeting helps operators

Arkansas' first statewide agritourism meeting in August drew nearly 100 attendees and coverage by local and national media. Industry experts hosted sessions on topics including media relations, financing, marketing, insurance, customer service and social media. Surveys of the attendees found that using social media in marketing and learning about legal protections were among the most important topics. Participants also said they were eager for future sessions to continue building knowledge. The agritourism conference was sponsored by the Arkansas Agritourism Initiative, a partnership among the University of Arkansas System Division of Agriculture, University of Arkansas Winthrop Rockefeller Institute, Arkansas Department of Parks and Tourism, National Agricultural Law Center, Arkansas Agriculture Department and Arkansas Farm Bureau.

Public Policy Center provides unbiased special election information

Since its inception in 2005, the Division of Agriculture Public Policy Center has provided Arkansas' electorate with unbiased information on issues appearing on the ballot, and 2011 was no exception. This year, the PPC issued a fact sheet about a ballot issue that would authorize the state Highway Commission to issue bonds to fund improvements to interstate highways within Arkansas. The fact sheet includes easy-to-understand information about the ballot issue, as well as the major points from supporters and opponents. Each PPC fact sheet undergoes peer review to ensure accuracy and an absence of bias. Reviewers include the National Agricultural Law Center, the University of Arkansas at Little Rock Bowen School of Law, Arkansas Development Finance Authority and the U of A Department of Agricultural Economics and Agribusiness, sponsors and other entities. The fact sheets are also very clear if there is the potential for a conflict of interest with the University of Arkansas Cooperative Extension Service, which houses the Public Policy Center.

Master Gardeners from 43 counties attend state meeting

The 2011 Master Gardener state conference was not only front-page news for a week, but its 500 attendees from 43 counties made a noticeable impact on the local economy. The 2011 State MG Conference was held in Harrison on June 24. The event was truly a boon to Boone County, so much so that an individual whose motels were full for the conference donated money to the Boone County Master Gardeners shortly after the conference ended, according to Nita Cooper, Boone County Staff Chair. The *Harrison Daily Times* gave front-page coverage all week, plus inside stories and editorials, including a Welcome Master Gardener banner on the top of the newspaper all week. Additionally, \$72,000 was spent by attendees in Boone County while at the conference, based on evaluations.



FRESH – Shoppers take advantage of fresh and locally grown produce at the farmers' market at the Little Rock River Market. Farmers markets and roadside stands are among the mainstays of agritourism in Arkansas.



ExCEL-ROPES – Participants challenge themselves on the high-ropes course during ExCEL training.

2011 legislature stocked with LeadAR graduates

LeadAR, the leadership development program of the Division of Agriculture, has become something of an incubator for legislators, with five graduates serving in the 2011 session. LeadAR was established to help develop leaders in Arkansas' rural areas and has now expanded to leaders anywhere in the state. Class members are accepted following a thorough interview process. The two-year training program includes study trips to Washington, D.C., and to an international location. Past classes have visited Bolivia, Vietnam and Greece, all to gain insights into other cultures and learn how other countries govern and deal with economic and rural development. The program marked its 25th anniversary in 2010.

Class 4 had two alumni elected, State Rep. David Branscum of Marshall and State Sen. Randy Laverty of Jasper. Also elected were Reps. Nate Bell of Mena, Class 12; Clark Hall of Marvell, Class 7; and Bryan King of Green Forest, Class 10.

ExCEL marks 25 years of hands-on challenges

More than 75,000 people have used a day at the C.A. Vines 4-H Center to rock-climb, plan and zip-line their way to a better understanding of themselves and better working relationships with their colleagues, thanks to the ExCEL program, which marked its 25th year in 2011. ExCEL stands for Experience the Challenge. Experience the Leadership. The program has used a variety of challenges, including ground-based and high-ropes courses, to teach the basics of cooperative decision-making and team work.

“The ExCEL program is by far the best in the state,” said Lindsay Grifford, Director of Membership Services for the Conway Area Chamber of Commerce. “I assure you your group will leave with a new outlook on their purpose and future contributions to the mission of your group or organization.”

Flooding cost state more than 2,000 jobs, \$335 million net loss in farm income

Damage reports from county agents and work by Division economists during and after the spring flooding were critical in obtaining much needed disaster help for the state's agricultural sector. A study released in August found that the spring floods cost the state nearly 2,150 full- and part-time jobs and a \$335 million net loss in farm income due to crop damage. Initial estimates of the economic losses due to flooding include a reduction of approximately \$102 million in labor income and a decline of \$181 million to the gross state product.



SURROUNDED – This grain storage bin in Woodruff County is surrounded by flood water in this photo taken May 4.

John W. White Awards

John W. White awards recognize excellence in scholarship, teaching, research and extension. John White was the first U of A System Vice President for Agriculture, serving from 1959 to 1974.

Outstanding Student

The John W. White Outstanding Student for 2011 is Kristen Alicia Byrne, the daughter of Pat and Karla Byrne of Dierks. She is an Honors Program student majoring in Poultry Science with a minor in Global Agricultural, Food and Life Sciences. In 2009 and 2010 Kristen was a peer mentor for the Bumpers College Connection program and a member of the Dean's Student Advisory Board. She is currently president of the Poultry Science Club and active in a children ministry local program. After graduation Kristen will begin graduate school in Poultry Science with a focus in avian immunology.



Kristen Alicia Byrne



UNIVERSITY OF
ARKANSAS
DALE BUMPERS COLLEGE
OF AGRICULTURAL, FOOD
& LIFE SCIENCES

For more information about the Division of Agriculture John W. White awards, visit <http://arkansasagnews.uark.edu/5828.htm>, or download a QR code reader to your mobile device and scan this code.



Outstanding Teaching Award

Associate Professor Thomas A. Costello is a leader of the senior design capstone experience in Biological Engineering, which includes hands-on prototyping, mentoring, working with real clients and outreach to meet community needs. His students have won numerous national design competitions. He plays a lead role in curriculum development, including help in organizing retreats and workshops. He acquired a grant to support senior design projects as part of the Arkansas AgrAbility Project and additional gifts to support student projects. He participated in a program with the NASA Advanced Life Support group, which led to his development of a sophomore course in which students produced a working system to grow food plants in a space environment. He has a doctorate from Louisiana State University and B.S. and M.S. degrees in Agricultural Engineering from the University of Missouri.



Thomas A. Costello

Outstanding Research Award

Professor Billy M. Hargis, D.V.M., Ph.D., Diplomate of A.C.P.V., is Director of the Division of Agriculture's J.K. Skeeles Poultry Health Laboratory. He was instrumental in developing a series of patented or patent-pending bacterial vectored vaccines to help control several economically important pathogens, including the avian influenza virus. His research has enabled poultry producers to reduce foodborne pathogens pre-slaughter by introducing a pro-biotic culture, called FloraMax B11, that decreases certain pathogens. The Early Bird product developed in his lab provides water and nutrients to chicks and poults during transport. Graduate students covet assistantships on his projects. His many publications include an article in the influential journal, *Science*. His degrees include a B.S., D.V.M. and Ph.D. from the University of Minnesota and an M.S. from the University of Georgia.



Billy M. Hargis

Outstanding Extension State Faculty Award

Associate Professor Ronald L. Rainey has developed innovative Extension programs on the economics of specialty crops and alternative agriculture, which include organic and direct marketing enterprises. Products of his work range from crop enterprise budgets, to the MarketMaker electronic program that helps match producers with produce buyers, to the Horticulture Business Resources Website. He helped secure a grant that resulted in Arkansas being the lead institution for the Southern Risk Management Education Center and is Co-director of the center. He was instrumental in organizing the Arkansas Farmers Market Association and initiated the first-ever economic analysis of the state's horticultural sector. His degrees, all from the University of Arkansas, include a B.S. in Agricultural Business, an M.S. in Agricultural Economics and a Ph.D. in Economics.



Ronald L. Rainey

Outstanding County Extension Educator Award

Lisa Washburn, County Extension Agent—Family and Consumer Sciences in Garland County, provides local and statewide leadership for health promotion programs. She initiated the Strong Women fitness program as a county extension activity in Cross County in 2003. She developed and conducted a “train the trainer” program, and Strong Women is now a popular activity in most Arkansas counties. She is also active in Extension Homemakers Club volunteer development, youth development in 4-H and other programs, and communication/marketing activities for FCS programs. Washburn has a B.S. degree in Family and Consumer Science from Henderson State University and an M.A. degree in Health Studies from the University of Alabama. She expects to soon complete requirements for a Doctor of Public Health degree from the University of Arkansas for Medical Sciences.



Lisa Washburn



Nilda R. Burgos



Jason K. Norsworthy



Bob Reynolds



Robert C. Scott



Kenneth L. Smith

Herbicide Resistant Weed Management Team

Outstanding Team Award

The Herbicide Resistant Weed Management Team is addressing one of the most economically important issues in Arkansas agriculture. The team includes weed scientists who were working well before the emergence of glyphosate-resistant weed populations to develop and promote the use of practices to avoid or delay the selection of resistant weed populations in crops fields where the same herbicide is applied year after year. As glyphosate resistance has increased in crop fields, team members have intensified their efforts on many research and extension fronts. Extension communications pushed to producers, consultants and the agriculture industry through traditional and new media timely and continuous updates about new control techniques determined by weed scientists on the team. Team members are Nilda R. Burgos, Professor of Crop, Soil, and Environmental Sciences (CSES); Jason K. Norsworthy, Associate Professor, CSES; Bob Reynolds, Director of Extension Communications and Marketing; Robert C. Scott, Professor of Weed Science, CSES; and Kenneth L. Smith, Professor of Weed Science, CSES.



Hoisting shovels at the ceremonial ground-breaking for the new UAM forestry annex were (from left) Rep. Eddie Cheatham, Rep. Jeff Wardlaw, Vice President for Agriculture Mark Cochran, Mike Akin of the UA Board of Trustees, former Representative Greg Reep, Rep. Sheilla Lampkin, UAM Chancellor Jack Lassiter, Larry Nance of the Arkansas Forestry Commission, Jerry Davis of the Arkansas Forestry Commission, Maxine Clippert of Camden, David Clippert of Atlanta, Sen. Jimmy Jeffress, Monticello Mayor Allen Maxwell, Matt Pelkki, George H. Clippert Endowed Chair and Professor of natural resource economics, and UA System President B. Alan Sugg.

George H. Clippert Forest Resources Annex at UA-Monticello

Construction began in April 2011 at the University of Arkansas, Monticello, on the George H. Clippert Forest Resources Annex, named for the late George H. Clippert of Camden. The Clippert family gave a \$1.2 million gift for the project after previously donating \$1 million to create the George H. Clippert Endowed Chair in Forestry.

The 15,100-square-foot facility will include classrooms, laboratories and offices. The original building in the Henry H. Chamberlin Forest Resources Complex, built in 1957, will also receive a complete interior renovation and a new roof. The north wing of the complex, completed in 1987, will also receive minor space renovations.

The buildings will house faculty and staff of the Division of Agriculture's Arkansas Forest Resources Center, the UAM School of Forest Resources and the U.S. Forest Service.

For more Division of Agriculture news for 2011, visit <http://arkansasagnews.uark.edu/392.htm> or <http://www.uaex.edu/news/default.htm>, or download a QR code reader to your mobile device and scan this code.



Milo Shult retires after 18 years at Division of Agriculture helm

Vice President for Agriculture Milo Shult retired January 1, 2011, after 18 years as head of the University of Arkansas System Division of Agriculture.



Milo Shult

University System President B. Alan Sugg said, "During his tenure, the Division has expanded its vital role in supporting the University of Arkansas' land grant mission by conducting cutting-edge research and providing outstanding Extension education to the agricultural industry, families, youth and communities of Arkansas."

"He is widely recognized as one of the most effective leaders among our nation's land grant universities," Sugg added.

Dr. Shult led a transformation of Division facilities across the state, from a new Cooperative Extension Service headquarters facility in Little Rock to new facilities at all five Research and Extension Centers, eight Research Stations, a number of County Extension Offices and other units.

Mark J. Cochran appointed Vice President for Agriculture

University of Arkansas System President Alan B. Sugg appointed Mark J. Cochran as Vice President for Agriculture, head of the Division of Agriculture, in January 2011.

Cochran had served as Division of Agriculture Associate Vice President for Research and Director of the Arkansas Agriculture Experiment Station since 2006 and before that for 10 years as Head of the Department of Agriculture and Agribusiness at the University of Arkansas.

“Mark has a wide array of experience in agricultural economics and research,” Sugg said. “His 28-year career at the university has given him an excellent understanding of the challenges and opportunities that face the Arkansas agriculture community. We are excited to welcome Mark as our new Vice President.”

Cochran is now responsible for leading the university’s coordinated agriculture program, which includes the Cooperative Extension Service and the Agriculture Experiment Station. He replaced Milo J. Shult, who served 18 years in the position.

“I’m honored and humbled by this opportunity to lead the Division of Agriculture,” Cochran said. “Arkansas is blessed to have a very supportive community of agriculture stakeholders and I’m excited to partner with them to advance agriculture in our state.”



Mark J. Cochran

Greenhouse Campaign Thrives

Pulaski County Master Gardeners launched a fundraising effort in February 2011 to renovate existing greenhouse space and to construct additional work areas needed. After months of selling calendars and books to raise funds, the county’s Master Gardener leadership decided a more direct fundraising campaign would be more effective.

Five months later, greenhouse space was renovated, work benches purchased and a circulation fan installed — thanks to the generous support of 230 donors. A gift from the Stella Boyle Smith Trust prompted the naming of the greenhouse as the Stella Boyle Smith Greenhouse.

“The investments made by the Stella Boyle Smith Trust and all of our other donors will strengthen the Pulaski County Master Gardeners’ capabilities to deliver quality educational programs,” Beth Phelps, County Extension Agent and Staff Chair, said.

The Pulaski County Master Gardeners will utilize the greenhouse for growing plants for community beautification projects and educational workshops and for plant sales, which provide additional operating income.

The Pulaski County Master Gardener program began in 1988, one of four counties to charter the volunteer-led horticulture educational program of the University of Arkansas System Division of Agriculture’s Cooperative Extension Service. Today, the Arkansas Master Gardener program is present in 62 counties, with a membership of 3,000 statewide, who annually volunteer 120,000 hours for community service projects.

The Hardy-Caviness Greenhouse Complex

The Hardy-Caviness Greenhouse Complex at Northeast Research and Extension Center (NEREC) was named in honor of former Dean Glenn Hardy and the late Professor Charles E. “Chuck” Caviness. The complex includes a new greenhouse and another that was renovated, along with a headhouse for both units. The greenhouses will provide for an energy-efficient, controlled environment for the crops and entomology research conducted at NEREC.

Dr. Hardy was Dean from 1965 to 1987 of what is now Dale Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas in Fayetteville. Early in his career, he was Director of the Division of Agriculture

Soil Testing and Research Laboratory at Marianna.

Dr. Caviness was a member of the University of Arkansas Agronomy faculty from 1949 to 1991. As the Arkansas soybean breeder, he led a team effort to develop seven important soybean varieties widely planted in the Midsouth and South.

The project was made possible by the generous support of the R.E. Lee Wilson Trust, E. Ritter and Company based in Marked Tree, Charles Moore of Mississippi County, Mrs. Sarah Moore and the Laura E. Moore Trust, Fred Bourland of Keiser, David Wildy of Mississippi County and Adams Land Company at Leachville.



Michael L. Looper

Michael J. Looper appointed Animal Science Department Head

Michael L. Looper was appointed Head of the University of Arkansas Department of Animal Science, effective Sept. 1, 2011.

Dr. Looper coordinates Animal Science Experiment Station and Extension programs of the statewide Division of Agriculture, along with Tom Troxel, Associate Department Head for Extension, based in Little Rock. He also coordinates academic programs leading to B.S., M.S., and Ph.D. degrees in Animal Science in Dale Bumpers College of Agricultural, Food and Life Sciences on the Fayetteville campus.

"I'm an alumnus of the University of Arkansas and from this department, and it's an amazing opportunity for me to be able to come back and help lead our people," Dr. Looper said.

Mark J. Cochran, the U of A System's Vice President for Agriculture, said, "I am excited that Dr. Looper is joining the leadership team for our teaching, research and Extension programs in support of the state's livestock industry."

Dr. Looper had served since 2002 as a USDA Agricultural Research Service Animal Scientist at the Dale Bumpers Small Farms Research Center in Booneville.



Philip A. Tappe

Phillip A. Tappe named Arkansas Forest Resources Center Director

Philip A. Tappe was named Director of the Division of Agriculture's Arkansas Forest Resources Center (AFRC) and Dean of the School of Forest Resources at the University of Arkansas at Monticello.

Vice President for Agriculture Mark J. Cochran and UAM Provost David Ray said Tappe was selected after a nationwide search.

"Dr. Tappe has our utmost confidence that under his leadership the School and the Center will continue to provide the quality programs so essential to the continued sustainable development of this vital multi-faceted sector of our state's economy and environment," said Dr. Cochran.

Dr. Ray said, "Dr. Tappe's familiarity with the academic, research and public service components of forestry education made him the ideal candidate and will ensure a seamless transition in leadership."

Dr. Tappe came to UAM in 1991. He was named Associate Dean and Associate Director in 2010. He had served as Interim Dean and Director since January 2011.



Charles E. "Chuck" Wilson Jr.

Charles E. Wilson Jr. named Director of Rice Research and Extension Center

Charles E. "Chuck" Wilson Jr. was named Director of the Division of Agriculture's Rice Research and Extension Center (RREC) near Stuttgart in September. He had served as Interim Director since October 2010 and as Extension Rice Agronomist since 2001.

Dr. Mark J. Cochran, University of Arkansas System Vice President for Agriculture, said, "Based on his performance as Interim Director and in his previous position as Extension Rice Agronomist, Dr. Wilson is clearly the right person at the right time to provide leadership for the Rice Research and Extension Center.

Eleven resident faculty members and about 25 other Division of Agriculture scientists conduct research and Extension projects at the center. They often collaborate with scientists at the nearby USDA-ARS Dale Bumpers National Rice Research Center.

As Director, Wilson said, "I want to make the Center a leader in rice research and Extension, increase the integration of research and Extension programs that come out of the Center, and provide information that can help Arkansas producers be more productive."



Yvonne Thaxton

Center for Food Animal Well Being established

The Division of Agriculture and University of Arkansas, Fayetteville, established the Center for Food Animal Well Being, based on the Fayetteville campus, with the support of a \$1 million gift from the Tyson Foods Foundation matched by the University's Matching Gift Program funded by the Walton Family Charitable Support Foundation. The Center's mandate is to improve animal health, animal handling, food safety and productivity.

Yvonne Thaxton, Director, said "The center is going to identify areas of research to get projects done and identify people to do the research. I'll be working with poultry, swine, cattle, goats, all food animals."

The Center is associated with the Division of Agriculture's Food Science and Poultry Science Departments and with the National Agricultural Law Center at the UA School of Law.

Thaxton, who came to the University from Mississippi State University where she was a Poultry Science Professor, has also been Vice President for Science and Quality Assurance at Marshall Durbin Food Corp.

Honor Roll of Donors

July 1, 2010 – June 30, 2011

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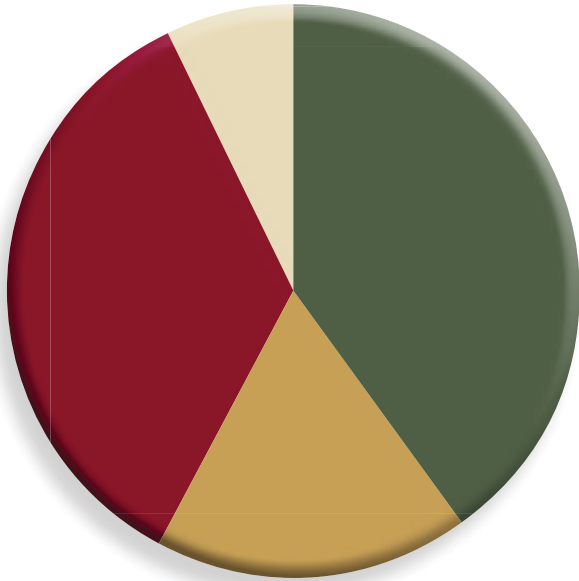
Sonya Mendelsohn
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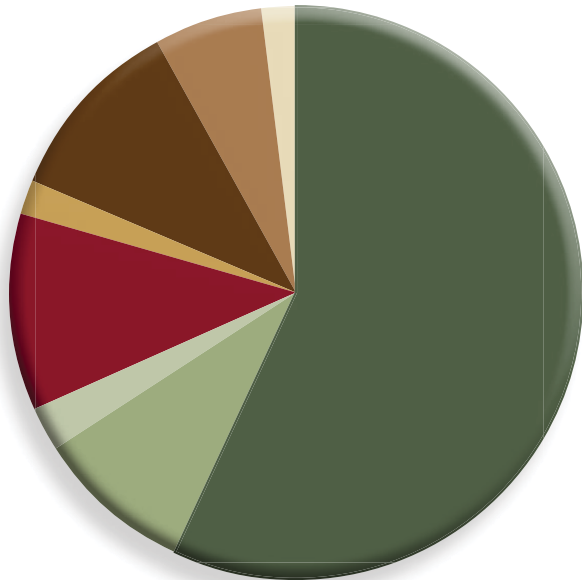
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Year Round Grounds Care
Patricia & Bill Yick
Zee Company, Inc.
Jan Ziegler
Deborah Zimmer
Zinpro Corporation

Division Funding



Division Funding Breakdown

Research – Unrestricted	\$49,064,903
Research – Restricted	\$21,630,905
Extension– Unrestricted	\$42,849,823
Extension – Restricted	\$8,573,873
TOTAL	\$122,119,504



Division Funding Sources

State Appropriations	57.0%
Federal Appropriations	9.1%
County Appropriations	2.4%
Federal Grants & Contracts	11.0%
State Grants & Contracts	1.9%
Private Grants & Contracts	10.8%
Sales	6.1%
Other	1.7%
TOTAL	100.0%

University of Arkansas System Division of Agriculture

Administration and Organization

The Division of Agriculture is one of 18 major units of the University of Arkansas System.

Administration

Vice President for Agriculture

Mark J. Cochran
2404 N. University
Little Rock, AR 72207
501-686-2540

Associate Vice President for Agriculture – Extension

Tony Windham
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Little Rock, AR 72204
501-671-2001

Interim Associate Vice President for Agriculture – Research

Richard A. Roeder
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University of Arkansas
Fayetteville, AR 72701
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Associate Vice President for Agriculture – Academic Programs

Michael E. Vayda
AFLS E108
University of Arkansas
Fayetteville, AR 72701
479-575-2034

Arkansas Agricultural Experiment Station

State Headquarters and
Departments, University
of Arkansas, Fayetteville

- Agricultural Economics and Agribusiness
- Agricultural and Extension Education
- Animal Science
- Biological and Agricultural Engineering
- Crop, Soil, and Environmental Sciences
- Entomology
- Food Science
- Horticulture
- Human Environmental Sciences
- Plant Pathology
- Poultry Science

Cooperative Extension Service

State Headquarters and
Divisions, Little Rock

- Agriculture and Natural Resources
 - Agricultural Economics and Agribusiness
 - Animal Science
 - Biological and Agricultural Engineering
 - Crop, Soil, and Environmental Sciences
 - Entomology
 - Forest Resources
 - Horticulture
 - Plant Pathology
 - Poultry Science
- Community and Economic Development
- Family and Consumer Sciences
- 4-H Youth Development
- District Directors
 - Delta, Ouachita and Ozark
- County Programs

Research and Extension Centers and Research Stations

- Arkansas Agricultural Research and Extension Center, Fayetteville
- Northeast Research and Extension Center, Keiser
 - Lon Mann Cotton Research Station, Marianna
 - Judd Hill Cooperative Research Station, Trumann
- Rice Research and Extension Center, Stuttgart
- Southeast Research and Extension Center, Monticello
- Rohwer Research Station
- Southwest Research and Extension Center, Hope
- Fruit Research Station, Clarksville
- Livestock and Forestry Research Station, Batesville
- Pine Tree Research Station, Colt
- Vegetable Research Station, Alma
- Newport Research Station, Newport

Other Units

- Arkansas Forest Resources Center, Monticello
- Institute of Food Science and Engineering, Fayetteville
- Soil Testing and Research Laboratory, Marianna
- UA/ASU Cooperative Research, Jonesboro
- CES Agricultural Center, Lonoke
- UAPB Cooperative Research and Extension, Pine Bluff
- Savoy Research Unit, Savoy
- UALR Cooperative Research, Little Rock



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DIVISION OF AGRICULTURE
RESEARCH & EXTENSION

University of Arkansas System

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Little Rock, AR 72207

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