

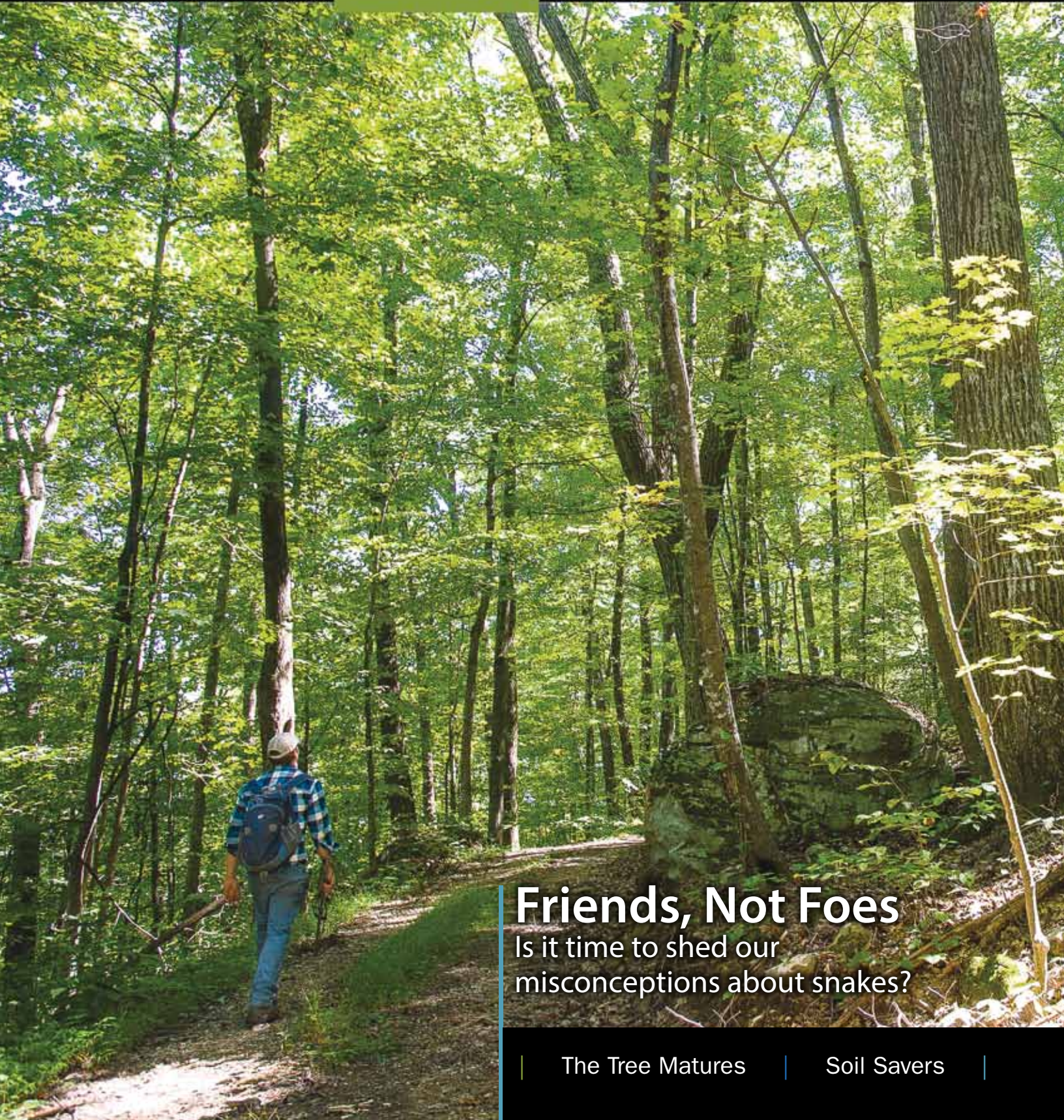
SPRING 2013

THE

# magazine

UNIVERSITY OF KENTUCKY

COLLEGE OF AGRICULTURE



## Friends, Not Foes

Is it time to shed our misconceptions about snakes?

| The Tree Matures

| Soil Savers



# *from the dean*

## What's in a Name?

IN DECEMBER, THE UNIVERSITY BOARD OF TRUSTEES VOTED to change the name of the College of Agriculture to the **College of Agriculture, Food and Environment**. The change will become effective on July 1.

Discussion about a new name began quite a while ago, when the College of Human Environmental Sciences and the College of Agriculture merged in 2003. Many believed a name change was needed to better communicate the evolving scope of our degrees and programs—changes that resulted not only from the merger but also from our response to new needs and opportunities. The College, however, reaches out to so many different stakeholders in so many different ways, at first we could not agree on a name that fully includes all we do.

So I set the question aside, promising to bring it back on the agenda after a few years. That happened in 2011. We sought opinions from many voices outside the College and from all the faculty and staff in the College. As the wheels slowly turned, it became apparent that almost everyone insisted on retaining “agriculture,” and the new words that repeatedly came forward were “food” plus either “environment” or “natural resources.”

Only about a half dozen land-grant colleges like ours have retained the name “College of Agriculture,” most adding to that “and Natural Resources” or “Life Sciences” or “Food” or some combination of these.



The advantage of the new name should be to clarify that, while we continue our fundamental ties to production agriculture, we have expanded our horizons to include all the pervasive and essential enterprises based on renewable natural resources. Why did this broader vision arise? Because we were following the wider and more diverse interests of those we serve, including a new and rapidly growing population of undergraduate students. Looking across Kentucky, our concepts of “agriculture” now include not only farming, but also agribusinesses and the full reach of food systems from local to global.

Does this mean we are pulling up our traditional roots and moving on? Not at all. I believe this signals that we are reacting to a changing world of agriculture with a commitment of continuing service and support. In fact, we plan to increase the use of our long-time slogan “We Grow Ideas.” You will still see all of our familiar logos like the 4-H clover. And no matter what the formal name, I know most of our friends, as they always have, will know us as UKAg, the Extension office, or in many circles just “the College.”

**M. Scott Smith**  
*Dean, College of Agriculture*

# We Grow Ideas

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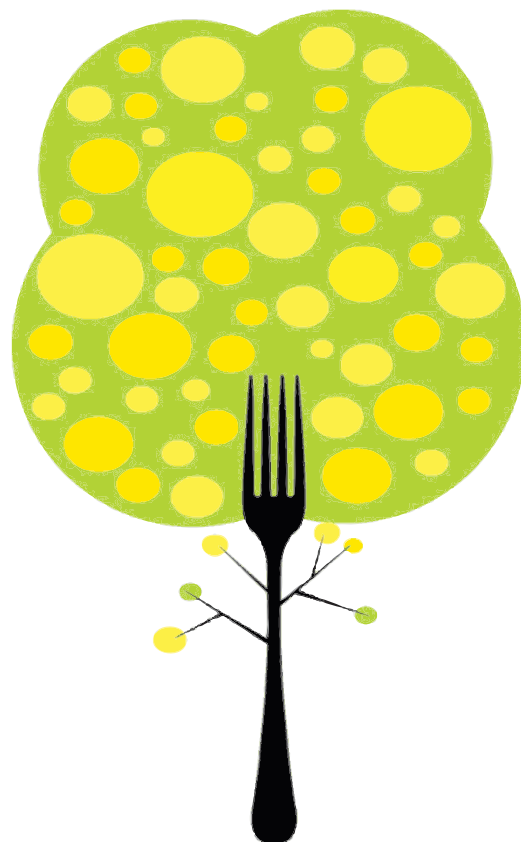


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## SHORT ROWS



### BEE BERRY GOOD

Early spring is the best time to plant matted row strawberry plants, says John Strang, extension fruit and vegetable specialist. Though in the first year, growers must remove all blossoms to promote runners, older plants need to be pollinated to produce berries, so a good colony of honeybees at the field's edge will do wonders for an acre of strawberries.



## MOTHER'S MILK

Colostrum provides newborns with the ability to fight disease while their own immune systems develop, a process that can take many weeks. Calves, foals, in fact, all mammals get nutrients and the antibodies they need from their mother's first milk, says Donna Amaral-Phillips, extension professor in Animal and Food Sciences. The baby absorbs the most antibodies in the first six to eight hours of life. After that, its gut gradually absorbs fewer and fewer of these immune system stimulators, with absorption ending at 24 hours.

### Stand Up to Falling



A third of those 65 and older fall each year, often suffering physical injuries or injury-related death. Falls or the fear of doing so can reduce activity and mobility, which then increases the risk of falling. It's a vicious cycle. Regular strength, flexibility, and balance exercises can help prevent falls, says Amy Hosier, family life extension specialist. Also have your health care provider review your medications, have your eyes checked at least once a year, and make your home safer. Turn up the lights and tape down those throw rugs for a start.

### De-myth-tifying Mulch

Termites aren't drawn to mulch. Nor does mulch extract nitrogen from the soil. And more isn't better. So forget about those old tales to the contrary, says William Fountain, horticulture professor. It turns out, typical mulches don't contain the good wood that termites like; they prefer construction debris and wood siding. Over time, mulch will actually release nitrogen into the soil, for which your plants will thank you. And don't pile it on. Any more than 3 inches deep will prevent oxygen and water from reaching the roots.



## Storm Savvy

A family plan and an emergency kit can help you survive spring's tumultuous weather, such as tornadoes and floods, says Andrea Higdon, agrosecurity program coordinator. Having a well-stocked and easily transportable disaster kit on hand can make a big difference. Stock the kit—which could be a backpack—with water, nonperishable food, first aid supplies, tools, and prescription medicines and store it where you'll take cover.





## SPOTLIGHT:

**Rebecca McCulley**

Steve Patton



**Rebecca McCulley, associate professor in the Department of Plant and Soil Sciences and head of UKAg's Climate Change Working Group, grew up liking science in suburban Houston. A summer internship at MD Anderson Cancer Center convinced her medicine wasn't in her future; she enjoyed the lab work but not the hospital. As an undergraduate at Rice University, she sought out another scientific venue.**

**Q: How would you describe what you do?**

**A:** My training is really as an ecosystem-scale ecologist. Most times I call myself either a grassland ecologist, or occasionally I might say agro-ecologist.

**Q: How did you get interested in working with grasses?**

**A:** My first summer at Rice, I applied to work for a forest ecologist in the biology program. We worked in the Big Thicket National Preserve in East Texas. There used to be longleaf pine savanna there, which is characterized by widespread trees with a grassy understory that we think fire had a major role in maintaining. That led to a master's degree at Texas A&M University, where I stayed in savannas but got interested in nutrient cycling and grass-woody transitions.

For my doctorate, I went to Colorado State University where I focused on Central Great Plains grasslands from the base of the Rockies into eastern Kansas.

**Q: In the process of all this, was there an aha moment career-wise?**

**A:** I guess one that I had was not so much ecology oriented as it was probably science and research oriented. Coming out of my master's degree, I debated about going into environmental consulting or moving on to get my doctorate. I had one environmental consulting interview, where I left the interview thinking, "That's not science!" That was my aha moment, because I knew I didn't want to do that; I actually wanted to do science. I never interviewed anywhere else. I went straight into a doctoral program.

## Decades of Counseling

The official grand opening of The Family Center on the UK campus was held in 1992, but actually the center has been around longer than that, providing low-cost clinical services to people who ordinarily wouldn't be able to afford therapy. The center started out in the Funkhouser Building, but for the past five years has been located in Scovell Hall. Center director Tracey Werner-Wilson calls it a "great location."

"It provides better anonymity and confidentiality for clients," said Werner-Wilson. "The improved training aspects, such as recording equipment and therapy rooms, help our students working with clients; it is unique."

The Family Center serves as a practicum location for graduate students in the Couple and Family Therapy Program to gain real-world experience. Prior to meeting with clients, the students are equipped with the skills necessary to help couples work through a variety of issues.

"Agencies in the area love our students," Werner-Wilson said. "The students hit the ground running after they complete the program, versus other programs where they haven't had as much experience."

The Family Center is open to clients from the UK Employee Assistance REFER Program, Fayette County Public Schools, and other sources.

—Jeff Franklin

**Q: You focus a great deal on climate change in your research. Is there any doubt in your mind that climate change is occurring?**

**A:** No, afraid not. Of course climate has changed in the past, but now it's changing quite a bit faster than most of us feel comfortable with. I'm not a gloom-and-doom person. I think it's just going to be different. Things are going to change, but I'm optimistic our systems will change too, and we'll adapt.

# Fighting the Sweet Fight

Kentucky is the top producer of sweet sorghum in the nation. In addition to syrup, sweet sorghum is a potential source for ethanol. As a result, it could be an attractive energy crop—if diseases don't get in the way.

University of Kentucky plant pathologist Lisa Vaillancourt, a leading researcher in the molecular mechanisms of corn stalk rots, and doctoral student Katia Xavier are looking at potential disease threats to sorghum yields, specifically from the pathogen anthracnose.

"Hopefully, we will find why sorghum is resistant to the corn anthracnose pathogen, why corn is resistant to the sorghum anthracnose pathogen, and if there are ways to breed resistance into each," Vaillancourt said.

The five-year project was funded by a nearly \$1 million grant from the U.S. Department of Agriculture.

Collaborators include researchers from Penn State and ICRISAT in India, location of the world sorghum germplasm collection and breeding program.

The UK researchers are collecting, analyzing, and cataloguing anthracnose and other pathogens in 25 sweet sorghum heritage varieties at UK's Spindletop Research Farm and from samples collected on corn, sweet sorghum, and the weeds Johnsongrass and shattercane in Russell County with the help of Raymond Thompson, the county's agriculture and natural resources extension agent.

—Katie Pratt

# Informed Eating

Exactly how much protein is in that deli sandwich? Students interested in the nutrition content of UK Dining Services menu items can have the facts at their fingertips with a new nutrition app developed by a UKAg student and a team of undergraduate computer science students.

Mallory Foster, a graduate student in the School of Human Environmental Sciences' Department of Dietetics and Human Nutrition, and College of Engineering computer science undergraduates Keith Moyer, Rakesh Patel, Matt Seabold, and Randy Luecke have developed the iPhone and Android smartphone app for menu items offered at Ovid's Cafe, Commons, Blazer, and K Lair.

Foster developed her idea during an undergraduate shadowing experience with Monica Fowler, a registered dietician who works with UK athletes. One of Foster's tasks involved providing athletes with nutrition information obtained from UK Dining Services. She and Fowler began to wonder if they could do that for every student on campus.

When Foster began her graduate studies, she pursued the idea as a master's thesis project.

Dining Services gave Foster access to the hundreds of recipes offered on campus. She used nutritional analysis software to get the nutritional value per serving size of each recipe. The app provides information on calories, fat, protein, carbohydrates, vitamins, and minerals. In addition, each user can put in their personal information, and the app will calculate body mass index and daily caloric needs.

—Katie Pratt



Steve Patton



## An Early Bond

Minorities in Agriculture, Natural Resources, and Related Sciences is a national society that welcomes members of all racial and ethnic groups interested in careers in agriculture and allied sciences.

Traditionally, students joined the society during college, but recently, several county UK Cooperative Extension offices began offering 4-H'ers a chance to be involved in a Jr. MANRRS program.

In Christian County, 4-H youth development agents Antomia Farrell and Patrick Allen began leading club meetings at Christian County and Hopkinsville high schools during the fall of 2012.

"MANRRS empowers youth who are interested in agriculture and science, providing them with academic and professional development opportunities before they even leave high school," Farrell said. "Our club members are benefiting from a solid mentoring program, and they have opportunities for serving the community, learning to work in a team, learning to be great citizens, and getting ready for future careers."

In December, the Christian County 4-H program reached out to soldiers at Fort Campbell, where they have adopted the Wounded Warrior Battalion. They hosted a chili cook-off for the wounded warriors and their families.

"It is just one way our group is learning to give back," Farrell said.

Other groups are beginning to form across Kentucky. A statewide Jr. MANRRS conference, Turning Vision into Action, was held on the University of Kentucky campus in December.

"What we really want to do through MANRRS, and now Jr. MANRRS, is to increase the number of students studying agricultural sciences and

related fields at UK," said Quentin Tyler, assistant dean and director of the UK College of Agriculture Office of Diversity. "We want to foster a real bond among students, faculty, staff, and administration and encourage academic and overall excellence."

Tyler said it's important to show high school students a glimpse of the kind of mentoring and leadership they can expect from faculty and staff at UK and for potential students to see the opportunities they'll have in the College of Agriculture.

Jr. MANRRS clubs are currently available in Christian, Jefferson, Fayette, Daviess, and Franklin counties.

—Aimee Nielson



Matt Barton

## Feeding Chickens Before They Hatch

In the delicate stage of life inside the egg, UKAg researchers are providing important nutrition even before a chick hatches.

Chicks need selenium, an antioxidant nutrient, for normal growth and development. Normally it is added to poultry diets, but what happens when it's introduced during incubation?

Lizza Macalintal, a recent doctoral graduate, and Austin Cantor, associate professor in Animal and Food Sciences, with help from research specialist Mike Ford, injected different levels and forms of selenium into egg yolks on day 10 of the 21-day incubation period. They found that the controlled doses of both selenomethionine and sodium selenite were not toxic as previously thought and both increased tissue selenium levels. Selenomethionine was more effective in raising tissue selenium levels in both the embryo and the chick for several weeks after hatching.

Injecting selenomethionine was also more effective in reducing the risk of free radicals causing cell damage in the lungs and heart.

These encouraging results indicate that selenium can enhance the chick's nutritional status during development in and out of the egg.

—Aimee Nielson

Matt Barton





Civil War reenactors converged on the Henry Clay estate in Lexington to commemorate the 150th anniversary of the Battle of Ashland.

# Clothes Make the Reenactor

Dress played an integral part in the Civil War. Battles were fought over shoes, and Confederate Gen. John Hunt Morgan was widely successful at winning battles by having his troops dress in civilian clothes to surprise Union forces.

Each year, thousands of Civil War reenactors don wool uniforms, caged crinolines, and other period attire to recreate historic battles as accurately as possible. While the period clothing may not be the most comfortable or cool on a hot summer's day, University of Kentucky Associate Professor Kim Miller-Spillman knows that to reenactors the period dress is much more than blue or gray.

"Reenactors are learners and experiential people, each with his or her own reason for participating in reenactments," said Miller-Spillman, faculty member of the Department of Merchandising, Apparel and Textiles. "What a wonderful way to experience and study the transforming power of dress."

She has researched Civil War reenactors and their dress for the past 23 years to understand why they spend the time and money needed to participate and how important their dress is to creating a "magic moment," when a reenactor feels like he or she has traveled back in time to witness the battle firsthand.

Her research shows that 85 percent of male reenactors and 53 percent of female reenactors have experienced a magic moment. Most of those said historically accurate clothing was critical to making that event come to life for them.

She also found other reasons that reenactors

dress in historical costume. Some of the most popular answers among men were their love of history, fun and enjoyment, and a participation requirement. The most common response for female reenactors was the opportunity to escape and assume another persona.

She has found that dress is important no matter what role reenactors play in battle. Preliminary results from a 2010 survey targeting those who participate as cavalry members show that not only must they have the correct period riding attire for themselves, but also the correct equipment and accessories for their horses, including a historically accurate saddle and blankets.

"They use dress, in this case costume, in a deliberate and purposeful way," Miller-Spillman said. "They need specific dress items to make their impression complete and convincing. They research dress and the people they portray."

In her research, Miller-Spillman has found that reenactors are just like any other hobbyist and span gender, age, income, and socioeconomic lines. The average female reenactor is between 46 and 53 years old, a college graduate holding a professional job, with an average annual household income between \$50,000 and \$74,999. The average male reenactor is between 42 and 45 years old, a college graduate with a professional level job and an annual household income between \$35,000 and \$49,999. On average each one spends between \$1,000 to \$3,999 on historical clothing, artillery, and accessories.





Like Miller-Spillman, Avery Malone, '01, '08, believes historical dress can play a significant role today. Malone is the director of tour operations at Ashland, The Henry Clay Estate. While a graduate student at UK under Miller-Spillman, she researched whether historical dress had an impact on student learning. In her research, she presented the same lesson in two eighth-grade social studies classes, but she wore period dress to one class and professional attire to the other.

"After giving both classes pre- and post-tests, the class where I wore the costume improved twice as much," she said. "It's experiential learning, and that's an important, strong kind of learning. It's the same reason why people come to Ashland—to experience what it was like in Henry Clay's time."

The ability for reenactors to use costumes to accurately portray what life was like 150 years ago may be one of the reasons why thousands of attendees flock to reenactments across the country each year.

—Katie Pratt



# Integrated for Success

**The Master Cattlemen Program, Applied Master Cattlemen, Master Grazer and Kentucky Grazing schools, East Kentucky Heifer Development Project, and Genetic Improvement Program—those are just some of the programs that have emerged in Kentucky since the UK Beef Integrated Resource Management team formed in 1995.**

College of Agriculture administration charged the Beef IRM team with implementing a statewide educational program based on integrated concepts. Specialists, extension agents, and ultimately producers were to apply holistic concepts to management and problem solving, based on predetermined goals.

The Beef IRM team gained its initial momentum after meetings in Asheville in the late 1990s and early 2000s provided the foundation for a proposal to the Governor's Office of Agricultural Policy and the Agricultural Development Board. That proposal led to funding for many of the educational programs. The idea for holding the meetings in Asheville, near the famous Biltmore Estate, was to get participants out of their comfort zones and away from distractions so they could focus on issues. The Biltmore is recognized as a self-sustaining enterprise that profits from adding value to agricultural products.

"The main reason we chose Biltmore is it's truly the best example of value-added agriculture

in the entire country," said Les Anderson, UK extension beef specialist and chair of the IRM team. "Biltmore is the best example of total integrated management, not only with beef, but with grapes, vegetables, and more."

In August 2012, after many years of successful educational programs and changes in the beef industry, the IRM team felt it was time to reassess and redevelop a strategy for the future. More than a hundred leaders in Kentucky's beef industry again met in Asheville to help direct local and state educational beef programming for the next decade.

"We need to empower a new group of leaders, new programs that impact our industry in a measurable, marketable way," Anderson said.

Leaders were asked to identify five factors that are most important or most limiting to the beef industry today. The major issues they identified included limited public knowledge of agriculture, the dearth of young people in the beef industry, efficient use of land, marketing options and profitability, and animal welfare. With the issues identified and plans created, county groups, the UK Beef IRM team, and the Kentucky Beef Network are now tasked with implementing the plans and moving the industry forward.

—Jeff Franklin



Matt Barton



# Friends, Not Foes

Snakes are important to the health of the environment and, increasingly, to human health as well. Is it time to shed our misconceptions?

By Carol L. Spence  
Photography by Matt Barton

Tom Maigret spends a great deal of time on a quest that would make most people cringe.

"I try to reassure my parents by saying I'm much more likely to be killed by a coal truck on one of these roads than by a rattlesnake," the second-year forestry master's degree student joked while searching UK's Robinson Forest for eastern timber rattlesnakes. "I don't know if that was really reassuring."

Maigret is working under UK Forestry professors John Cox and Christopher Barton on a project to study the ecology of timber rattlesnakes, one of Kentucky's four types of venomous snakes. The reptiles have always intrigued Cox, even though he's known professionally as being "more of a mammal and bird guy."

"I've always been fascinated about the toxicity of certain animal species, whether that be black widow spiders or venomous snakes—knowing how potent that venom is, but also that it has medicinal uses," said Cox, who spent his early career in medical research.

Snakes, both venomous and nonvenomous, play a large role in controlling rodents, which are important vectors of many diseases, including hantavirus, a disease spread to humans through rodent droppings and urine, and many tick-borne diseases such as Lyme disease. Steven Price, UK Forestry's new herpetologist, said he knows farmers who toss rat snakes or kingsnakes into their barns to control mice.

Tom Maigret homes in on radio-tagged timber rattlesnakes in UK's Robinson Forest for a study that may result in the development of optimal snake habitat during mine reclamation.



"People always ask what good is it? What good is this plant, this mushroom, this snake?" Cox said. "I don't think there's any better example than some of these venomous snakes. They're control agents, and now we're finding out that some snakes have venom with potential pharmaceutical benefits, including dissolving blood clots for stroke victims or attacking cancer cells, while leaving healthy ones alone."

Prior timber rattlesnake studies in the state have looked at small samples. Cox wants to take his research to a new level and focus on Kentucky-specific questions. His goal is to tag and track 50 to 100 rattlers to gain information on survival, density, dispersal, and population genetics in what he hopes will turn out to be the largest study that has been done in central Appalachia.

Robinson Forest is relatively roadless, making it one of the most intact forests in Kentucky. With its plethora of rocks and downed timber, it's good habitat for timber rattlers. The surface mining surrounding the forest has essentially created an island that makes it a prime location to study rattlesnakes. Maigret spent several months in Robinson Forest tracking and capturing timber rattlesnakes late last summer. He said the job isn't as dangerous as most people think, though he was still careful.

"Snakes aren't very aggressive," he said. "Most people think they are, but they're pretty calm. They're not going to waste venom if they don't have to."

The hard part is actually finding the snakes. So far, Maigret has captured and tagged six.

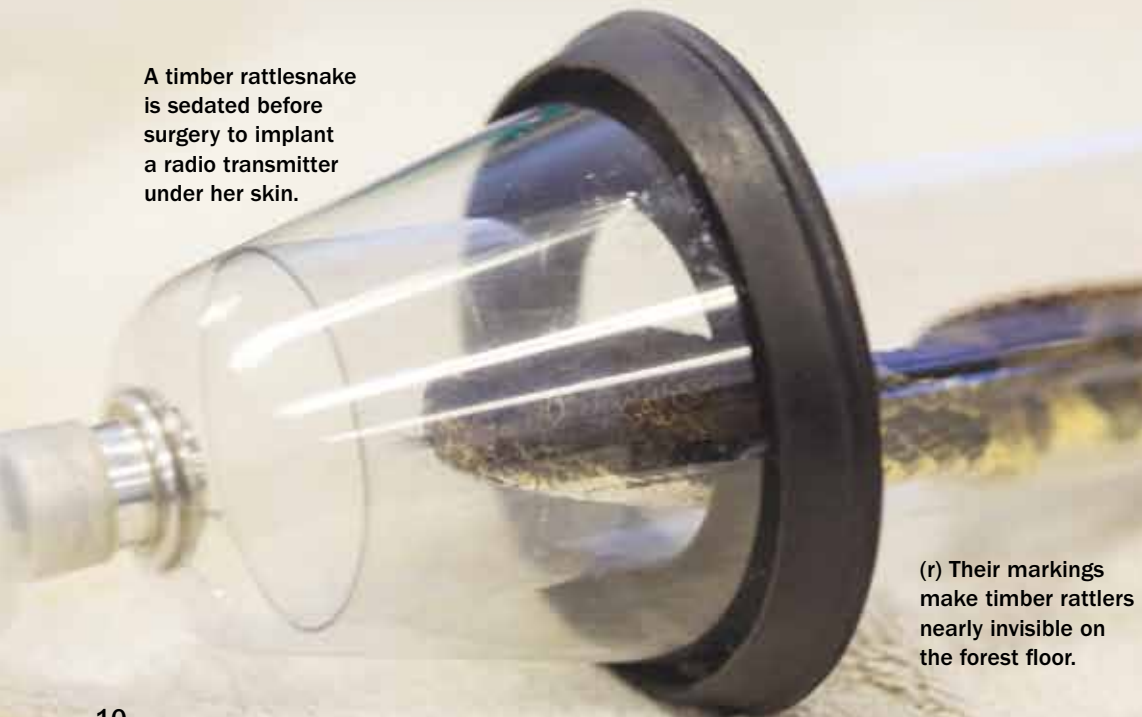


"Both copperheads and rattlesnakes are so well camouflaged, that when the light comes through the canopy and dapples down on the leaf litter on the forest floor, it's very hard to see them," Cox said.

Maigret looks for them in places they frequent, such as open areas on log piles. Using GPS, he notes where he found them, then gently captures them using a 48-inch set of snake tongs and transports them to Ashley Keith of Crossroads Veterinary Clinic in Versailles. Keith, who is the go-to veterinarian for the Kentucky Reptile Zoo in Slade, performs the minimally invasive 10-minute surgery needed to implant a radio transmitter and antenna into each animal. Radio collars aren't suited for a creature with no neck, so the light, flexible antenna is threaded under the

(l-r) Steven Price, Chris Barton, and John Cox take a closer look at a rat snake, one of the most common snakes in Kentucky. It's an excellent climber and can grow to be 6 feet long.

A timber rattlesnake is sedated before surgery to implant a radio transmitter under her skin.



(r) Their markings make timber rattlers nearly invisible on the forest floor.





animal's skin. A few days later, Maigret returns the reptiles to the exact spot he found them.

"If we have a model of the forest—canopy cover, tree types, slopes, things like that—we can use the location of a snake each time we find it to build a model of where the snake might occur next. Integrating that with strip mines, we may be able to design optimal snake habitat during reclamation," he said.

This is the kind of single-species information that's important for larger types of research, for example Barton's hydrological study in reforestation and timber harvesting methods.

"We harvested six watersheds, about 800 acres of forest, using different treatments to study how they each affect the water chemistry and the hydrology in that area. But that is just one aspect of it, because what we did technically affects the entire ecosystem," Barton said. "We now have ongoing studies looking at how these treatments have affected aquatic insects, salamanders, and snakes that utilize these areas."

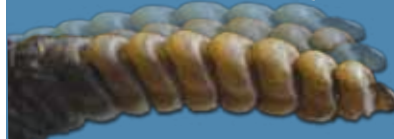
This is just the start of an extended study, but the team of UKAg researchers is excited about the data they will be able to glean in the upcoming years.

"There are a lot of reasons we should keep timber rattlesnakes around," Maigret said. "This study will help us protect them in this forest and the adjoining surface mine."

Those fangs look vicious, but when threatened, a timber rattler would prefer to escape or stay hidden, rather than strike out and waste its venom on something inedible.



## Snake Bits



- Out of 32 species of snakes in Kentucky, only four are venomous—northern copperheads, eastern timber rattlesnakes, pygmy rattlesnakes, and western cottonmouths.
- Timber rattlers are found everywhere in Kentucky except the Bluegrass. Their populations are thought to be declining in most parts of their range.
- Timber rattlers typically live 12 to 20 years. They breed every other year, starting at 4 to 5 years of age and give birth to live young.
- Kentucky's venomous snakes are pit vipers. Pits are small heat-seeking openings on the face that help them detect prey and find thermally suitable habitat.
- Snakes can't blink; they have no eyelids, only a clear scale over their eyes.
- Snakes are an important part of the food chain. Not only do they eat rodents (and often other snakes), but they also are an important food source for hawks, raccoons, and other wildlife.
- Each time a rattlesnake sheds, it adds another rattle to its tail. Rattles are dead skin and feel as light and dry as a molted cicada skin.

Veterinarian Ashley Keith threads a radio antenna beneath the skin of a sedated timber rattlesnake.



# The Tree Matures

More than 40 years ago, the late Joe Paulk had an idea that would give students one of the most interactive learning experiences on campus.

Paulk was an associate professor of nutrition and food science in what was then the College of Home Economics. He wanted to teach students about food service and hospitality. So in 1971, a small group of students served lunch to 24 of their friends for \$1 each, and The Lemon Tree was planted.

The Tree grew leaves and began to mature as Paulk's students designed the restaurant over several semesters and finally opened it to the public in 1976 as the Lemon Tree Tea Room. Students staffed the tearoom, and by 1981, they were cooking and serving patrons three-course meals in an upscale setting in Erickson Hall for \$2, two days per week.

A 1981 news article in *The Kentucky Kernel* quoted Paulk as saying "I took one idea here and another one there and put the best ones together. I think all the students felt they had a part in it."

In the early days, Paulk and about 12 students ran The Lemon Tree, which was always filled to capacity with 40 patrons who had to make reservations sometimes months in advance to get a seat at the table. With such popularity, service was expanded to four or five days a week by 1989, and paid employees supplemented students from the quantity food production class. At that time, patrons were treated to a soup or salad, a choice of two entrees, two vegetables, fresh baked bread, a choice of two made-from-scratch desserts and bottomless beverages for \$4.55.

Students also helped operate the deli next door, then called Block and Barrel.

By Aimee Nielson  
With contributions from Debbie Clouthier  
Photography by Steve Patton





Student Jinho Park serves Sandra Bastin and Lemon Tree guests at the last meal of fall semester, which is always a "picnic" lunch.

## Real-World Experiences

Through the years, The Lemon Tree has gone through a few organizational changes. While the class and restaurant began in the College of Human Environmental Sciences, née Home Economics, The Lemon Tree came under the umbrella of UKAg and the Department of Dietetics and Human Nutrition when HES merged with the College of Agriculture in 2003. The focus, however, has never changed. It has always been about providing real-world, science-based experiences to students in the quantity food production class, a capstone course for dietetics and hospitality undergraduate students.

Liz Kingsland oversaw The Lemon Tree experience for about three years.

"We had some great students," said Kingsland, who is now the family and consumer sciences extension agent in Bourbon County. "It was an interesting mix with hospitality majors, who knew a lot about the restaurant business, and dietetics majors, who were great organizers and minders of detail; they all worked so well together to get things done."

Kingsland said the biggest benefit for the students was getting real-life experiences in a controlled environment. As with any real-world business, the students experienced unforeseen setbacks such as running out of a meal component or a dessert not working.

"Sometimes they really had to scramble to come up with solutions, but that was the beauty of it," she said. "In this scenario, they really couldn't fail; they had advisers to help them through it."

Many students look back on their Lemon Tree experiences with fondness. Liz Combs was part of the class in 2005.

"The very first day of service, I was in charge of making the entrée, eggplant parmesan, which I had never made before," she remembered. "Even though the situation was stressful, I remember being so proud of the final product."

Combs said her experiences served her well as she began a dietetic internship. She is now the academic coordinator for Dietetics and Human Nutrition for the College.

Kingsland said the class did much more than run The Lemon Tree. She remembers several extra research projects they did such as a linen comparison survey, making note of how patrons responded to different table settings. One year, she even took the students to the National Restaurant Show in Chicago.

"It was a fun time in my life," Kingsland said. "I was always grateful for the experience."

## Lessons Behind the Scenes

Since 2007, Sandra Bastin and Bob Perry have directed The Lemon Tree experience and taught the quantity food production class. Bastin is the interim chair of the Department of Dietetics and Human Nutrition, and Perry is the department's food laboratory coordinator. Together, they maneuver students through a series of stations designed to provide quality instruction and hands-on learning activities.

Bastin explained that the core course is required for dietetics and hospitality management and tourism majors.





"It encompasses principles of quantity food preparation and processing, food production and control processes, sanitation and safety, equipment and facility planning, waste management, food science, and sustainability," she said. "But even more than that, students experience food systems management, strategic and operational planning, workload productivity, fiscal management, interpersonal communications, leadership styles, conflict resolution, problem solving, decision making, marketing analysis, quality control, public relations, and ethical practices."

Good food is essential to the success of The Lemon Tree, but Bastin said the behind-the-scenes lessons are what make the course challenging for students and ultimately play a large role in their future career success.

"The Lemon Tree allows students to put their food science and leadership knowledge into practice in an environment where learning is the top priority," she said.

Perry is also part of the College's Sustainable Agriculture and Food Systems Working Group. He tries to include local food in every meal, whether from the local farming community, the UK Horticulture Research Farm or the College's meat lab in the Department of Animal and Food Sciences.

They still make every menu item from scratch, "even the ketchup," he said, and try to use as few processed foods as possible.

## Teamwork (and Dishwashing)

"We have 40 students who are paired to make 20 teams," he said. "We do 20 meals a semester and each team rotates through different stations in the front and back of the restaurant. We only do 20, because it's not really fair for a team to have to do dishes more than once."

It may sound comical, but Perry is serious. Because of the limited time frame, washing dishes is a monumental task after preparing a meal for 50 people plus themselves.

Students also rotate through the restaurant critic station. As patrons, they use their observation skills to critique the plate presentation, the taste of the food, and the hospitality provided by their server and front of the house managers. Then the students write a restaurant critique which is posted on The Lemon Tree Facebook page, along with the photos of the day taken by the food stylists.

Students in Perry's and Bastin's class also rotate through a station in the next-door deli, now called Fusion, as part of their Lemon Tree experiences.

"We have a unique arrangement with UK Dining Services," Perry said. "We operate as a unit of dining services during The Lemon Tree service; they purchase the food and collect the revenue, while students work the back of the house and front of the house to provide a quality experience for patrons."

Perry said the bottom line is The Lemon Tree experience helps expose students to leadership roles within the food service arena, and to the difference in preparing food for large crowds as compared to preparing food for a family.

"It's a very positive experience for them," Perry said. "They learn new tastes and cooking



Chef Bob Perry (in chef's garb at left) said the bottom line is The Lemon Tree experience helps expose students to leadership roles within the food service arena.



techniques—especially the quality and quantity aspect. Students are amazed at how big everything is; for each veggie we prepare, we need 20 pounds. Students are not used to the larger equipment and tools found in an institutional kitchen.”

The meal is now three courses for \$10. They also accept donations, which go to The Lemon Tree Scholarship Fund. Through that fund, two students each year receive a \$500 scholarship to help with expenses for their required professional internship experience.

Kenyatta Chandler is a 2012 Lemon Tree student. She considered the experience vital to her education.

“Many different qualities surface while working in The Lemon Tree,” she said. “Your teamwork, leadership, and hospitality (skills) are put to the test. Teamwork was critical; a team was responsible for every plate that was served and service could not be completed properly without the coordination of everyone working together toward a common goal.”

Kenyatta was also responsible for painting the new Lemon Tree logo on the walls in the dining room.

When The Lemon Tree first opened, a real lemon tree stood in the dining room. That tree

is long gone, but over the years, through changes in directors and decor, the restaurant's goal of offering an enjoyable, upscale dining experience at a reasonable price remains the same. And students still take away valuable experience that gives them a solid foundation for their future careers.





# Soil Savers

By Katie Pratt

Photography by Matt Barton

**IN THE 1930S, DUST STORMS ROLLED ACROSS THE SOUTHERN GREAT PLAINS AND MUCH OF THE EASTERN UNITED STATES DUE TO CONSECUTIVE YEARS OF DROUGHT AND INAPPROPRIATE FARMING PRACTICES.**

*The Gleaner* in Henderson reported on April 12, 1935, “the effect of the storm could be told plainly on clothing, buildings, and automobiles, and the inhaling of the dust was almost stifling.” By mid-decade, approximately 100 million acres of the country’s cropland had lost most or all of its topsoil to erosion.

Fast forward to 2012. Much of the United States, including Kentucky, was faced with a drought that rivaled the droughts of the 1930s. In June 2012, the state received 0.88 inches of rain, comparable to June 1936, when the state received 0.79 inches. The drought dealt a severe blow to crops and livestock. Once again, the southern Great Plains was hard hit. This time, however, no massive dust storms blew into Kentucky from the parched region. Farmers across the country, supported by federal regulations and academic research and outreach, have implemented modern conservation practices that hold the soil and minimize erosion.

## Wonder grass

While most of the dust from the 1930s is attributed to the southern Great Plains, Kentucky had its fair share of erosion issues. Huge gullies formed in fields and made all parts of crop production more difficult.

“During the Dust Bowl, the Jackson Purchase area of Western Kentucky was about to wash away because of soil erosion,” said Ken Wells, a retired UK soils specialist. “This area, along with western Tennessee, eastern Arkansas, and Missouri, has a silty loess soil that is very easily windblown.”

About that time, UK College of Agriculture agronomist E.N. Fergus discovered what he called “wonder grass” preventing erosion on a hillside on a Menifee County farm. The “wonder grass” was tall fescue. Fergus obtained seeds from the farm and began experimenting with the grass. The trials continued until 1939, when UK’s W. C. Johnstone began distributing the grass to farmers for on-farm trials. In 1942, the College released KY-31 tall fescue to farmers, and it was readily adopted in Kentucky and neighboring states.

While KY-31 tall fescue would have its shortcomings, it kept the soil in the Tennessee and Ohio valleys in place, Wells said.



## No-till, no loss

KY-31, though good at controlling erosion, still wasn't a silver bullet. Farmers continued to cultivate cropland, and their tilling of the soil created conditions favorable for erosion.

In 1962, Christian County farmer Harry Young Jr., '41, planted what's believed to be the first successful no-till grain crop in the nation—0.7 acres of corn. Shortly thereafter he began working with UK field crops specialist Shirley Phillips, '48, to advance the no-till movement. Despite its success, no-till was not readily adopted statewide for some time.

"When I first got here (to Western Kentucky), erosion was a huge problem," said Lloyd Murdock, who's been a UK extension soils specialist since 1969. "Some of the bays in Kentucky Lake and Lake Barkley were difficult to navigate with boats in places, because they were filling up with soil. Ditches along the road would fill up with soil and spill over onto the road. Road crews would have to clean the ditches and some of the road during rainy springs. Ditches in fields would sometimes get several feet deep where the soil had eroded during the worst times. Much of this land is woodlands now, because it can't be farmed."

Union County ag extension agent Rankin Powell believes in no-till and other soil conservation practices, such as this grade stabilization structure along a creek.





Throughout his career, Murdock has advocated for no-till crop production. He conducted several fertility studies to show farmers that they can maintain their yields using no-till methods. Other studies involved stand establishment, nitrogen management, and water holding capacity. He also worked with personnel from the Natural Resources Conservation Service on researching many aspects of no-tillage.

As the advantages of no-till became apparent, many farmers readily accepted and implemented the practice. Some corn farmers, though, abandoned the practice due to problems with Johnsongrass and returned to no-till only after glyphosate herbicides, which provide control against Johnsongrass, became less expensive. No-till acreage increased further when the 1985 farm bill tied conservation tillage to government payments.

“They (farmers) knew they weren’t being good stewards to the land, and the land was the most precious thing to them,” Murdock said. “They wanted to do a better job, but they didn’t know if they could make a living doing it because of the problems with no-tillage.”

Today, Murdock said about 70 percent of the state’s wheat acreage, 50 percent of the corn acreage, and 80 percent of soybean acreage is no-till.

“No-tillage is one of the top five agricultural advances in the last century,” Murdock said. “Kentucky was at the epicenter for the birth of no-tillage.”

## Conserving for the future

As a UK graduate student, Rankin Powell, ’64, Union County agriculture and natural resources extension agent, worked with agronomist Tim Taylor and agricultural engineer Ed Smith on the first no-till pasture drill for alfalfa and clover. He also worked with Phillips to plant the first no-till corn crop on UK’s research farm.

After graduation, he worked as a county extension agent for several years, farmed full-time for 20 years, and then returned to Extension as an agent. Throughout his life, he’s used and



advocated no-till. Just ask Union County farmer Randy Hagan. Hagan’s operation is 100 percent no-till on rolling ground and 60 to 75 percent no-till on bottomland because of what he saw on Powell’s farm.

“I saw the benefits of what he’d been doing for years,” Hagan said. “We’ve seen an increase in the quality of the soils and yields in our operation. My costs for equipment, fuel, labor, and lost production time are down.”

Land preservation and conservation are very important to Hagan who, along with his son Jonathan, farms the land his family has owned since the 1950s.

Hagan has worked with Powell and Lester Carrithers, who’s retired from the NRCS, to increase his no-till production and install other conservation practices including waterways, terraces, cattle panels, and gully plugs as needed.

Jonathan Hagan said he’ll continue to no-till the land and install other conservation practices including precision agriculture technologies, because he hopes his children will one day inherit the farm.

## Mud = Erosion

Even though management practices are far better than they were 75 years ago, they haven’t completely stopped erosion. Steve Higgins, ’87,

**(l-r) Jonathan and Randy Hagan's extensive no-till practice has led to increased yields and better soil.**

**(At right) Steve Higgins is not a fan of mud, so he has installed various hardened surfaces and other best management practices in livestock areas of the College's Spindletop Farm.**



'95, '04, the College's director of animal and environmental compliance, demonstrates ways to limit erosion by decreasing mud on the farm.

"When an animal is standing, it applies a certain amount of pressure to a surface," he said. "The foot pressure of standing cattle and horses applies about 66 percent more pressure to the surface than a 50-ton dozer, and the pressure increases when they're moving."

Many times, foot pressure from livestock is too much for the soil and it fails, creating mud. To show farmers how they can reduce mud on their farm, Higgins installed various hardened surfaces and other best management practices in livestock areas of UK's Spindletop Research Farm.

"Farmers are losing money by creating mud," he said. "Livestock that have to walk through mud require more feed for energy but actually eat less because walking in mud requires more effort."

Livestock with muddy feet wading in a stream or pond can have negative health implications for livestock and humans. Higgins has led an effort on UK's farms to fence off livestock from streams, install gravity flow tanks in pastures as alternative water sources, and build stream crossings to give

livestock access to pastures on both sides while limiting their access to the stream.

Higgins said farmers can get cost-share dollars for many of these environmentally friendly improvements. His projects were funded through grants from the Kentucky Division of Water and Division of Conservation.

"Implementing these practices may not cost a lot of money because of cost-share dollars, and it will improve your livestock productivity and your life," he said.

Additionally, Higgins has planted more than 6,000 trees along the stream that runs through UK's Maine Chance Farm as part of a Conservation Reserve Program to control erosion and filter runoff.

"Most practices take time and adaptive management," he said. "It requires a conscious effort."

In 2050, the world is expected to need almost twice as much food and energy, with virtually no increase in water and cropland. That will require not only more intensive farming practices, but also new and even more intensive conservation practices. Agricultural producers and practices have come a long way since the Dust Bowl storms blew in to Henderson, but meeting the challenges of sustaining precious soil and water resources will be just as critical in the future. College of Agriculture specialists, researchers, and extension agents will continue to work hand-in-hand with farmers to develop and implement best management practices to sustain their natural resources, their families, and the world.





# Working Differently

Working differently is not new to Cooperative Extension. Extension tends to be an early adopter—the first to try a new path. Sometimes the path does not go far (remember satellite dishes), and we move on. Sometimes it leads us to exciting new methods for providing information.

Technology, especially that which allows us to reach our clientele in new and preferred ways, seems to be maturing at just the right time. Couple the increased ability to communicate—are we ever disconnected?—with pressures on budget for travel and salaries, and you have need and opportunity.

Extension and the College are using new technologies to leverage our knowledge and resources to do more and do it more efficiently. By using online meeting software for agricultural agent trainings, more than \$10,000 in travel costs and more than 1,000 hours, roughly six months, of agent time were saved. More timely training is an added benefit.

Faculty can use on-line meeting software to deliver timely information and interact with

farmers in a breakfast meeting in western Kentucky and then teach a grain production class in Lexington at 9 a.m. That's not just working differently, it's working more efficiently.

Recently a family and consumer science specialist was able to stream live online lessons to Extension Homemakers in 10 counties. She recorded a second set for later, more convenient viewing for Homemaker clubs. A total of 20 lessons were delivered in the time it normally took for two, without travel time.

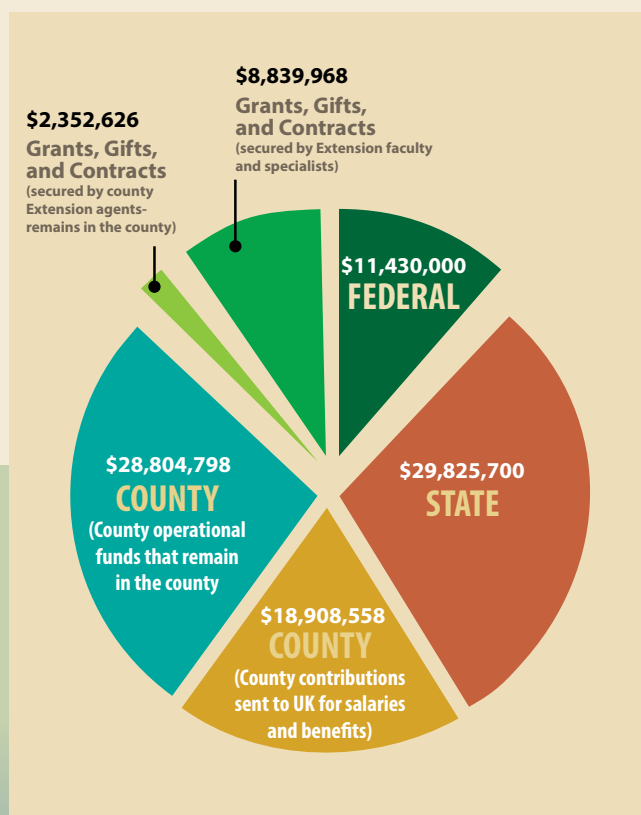
Forestry has a fall webinar series and three e-newsletters on specific topics delivered directly to woodland owners' smartphones.

Videos posted on YouTube get messages to hundreds, quicker and at much lower cost than mailing DVDs. Nationally, the eXtension initiative ([www.eXtension.org](http://www.eXtension.org)) provides collaborative tools to faculty and agents that result in shared resources across state lines and delivery of the “best of the best” to clientele.

Delivering programs by distance technology does not mean the College values traditional delivery less. It does mean that the same people are able to do more, reach more, and improve more lives. That is the right kind of working differently.

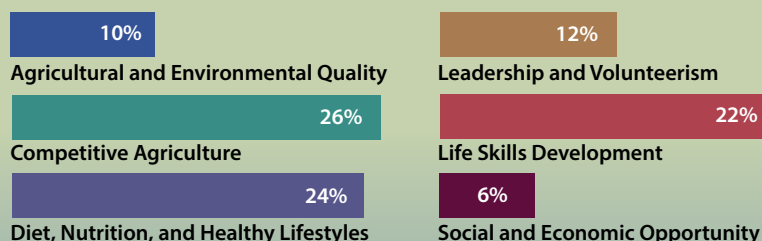
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## Program Emphasis

(as defined by number of contacts)





# Adding Spark to the Classroom



It's been said when a student finally understands a concept, or gets their head around a point a teacher is trying to make, a light bulb goes on. That's literally the case in Campbell County when 4-H youth development agents teach fourth-graders about electricity. The students get to build their very own lamp from an empty soda can, complete with light bulb and lampshade.

"The best part I like about it is when we plug the lamps in and they work; the looks on their faces make it all worth it," said Owen Prim, Campbell County 4-H youth development agent. "Their faces light up when the light bulb lights up."

Prim, along with fellow 4-H agent Sherri Broderick, collaborate with elementary schools in Campbell County to engage students in science and electricity programs. The electricity lessons integrate and enhance the curriculum being taught in the schools. At Lincoln Elementary in Dayton, Ky., where 94 percent of students eat free or price-reduced lunches, fourth-grade science teacher Kelly Christen says she couldn't teach students about electricity without 4-H.

"If it weren't for 4-H, we couldn't do this activity and have students pay for it," said Christen.

The lamp kits cost about \$10 each, which the 4-H agents provide free of charge. Students bring empty soda cans to have holes drilled in the top and bottom for the body of the lamp. Step-by-step assembly instructions are given to each student, which they must read and follow as the 4-H agents show them how to put the lamps together.

"It's hands-on learning introducing the concepts of electricity and reinforcing what the teacher has covered with them," Prim said.

After assembling the lamps, the students get to take them home and can even display them in the county or state fair. In another activity, students use snap circuit kits, which show them how to power a fan or light bulb and how circuits work.

"We reach over 600 urban and rural youth each year with these electricity programs," said Sherri Broderick.

—Jeff Franklin



## BY THE NUMBERS

A total of **7,162,126** Extension contacts were made in fiscal year 2012.

**35,000** Kentuckians were involved in addressing significant community issues through Extension-sponsored programs. As a result, their efforts generated **451,228** volunteer hours. Based on the 2011 Independent Sector's estimated value of volunteer time of \$17.65 per hour in Kentucky, volunteers contributed **\$7,964,174**.

Extension collaborates with community partners. As a result of partnering with **439** organizations, nearly **\$14 million** was generated through grant funding or leveraged within counties.



# At a Technological Crossroads

Time is limited. People are pulled in multiple directions at once. So how does Kentucky Cooperative Extension fit into today's hectic lifestyle? At least part of the answer lies in the latest technology.

"I think we're at the crossroads," said Gary Palmer, Cooperative Extension assistant director of agriculture and natural resources. "We have to figure out how we can deliver the information on their schedule—because producers still want the information we have."

Instant messaging and meeting software applications can quickly connect Kentucky growers with experts and answers.

According to Palmer, many of the frequent meetings between specialists and agents would not happen without such instant cyber access.

"These meetings contain cutting-edge information, and specialists are able to address agents' needs more efficiently and cost-effectively," he said. "We have had serious flooding in some areas of the state in the past. What were producers going to do with those fields they had prepared for corn and were going to have to switch to soybeans? We got information about the options to their agents, and the agents were able to quickly pass along that information to the producers."

"The biggest plus is being able to stay on top of issues," said Brandon Sears, Madison County agriculture and natural resources extension agent. "We had issues with nitrate poisoning of livestock, and then we had the aflatoxin issue in grains last year. This system has saved an immense amount of time for everyone."

Frequent district-wide meetings that connect more producers with specialists are also made possible through the new software. When weed science specialist J.D. Green travels to Boyd County for a presentation, he not only meets with local farmers in the county's Extension office, he also connects live via computer with nearly 200 producers gathered in other offices in the northeastern Kentucky district. And technologies, like USB microscopes paired with meeting software, allow specialists to see a close-up of a disease symptom or an insect, enabling them to identify something in less time than it used to take.

Technology—it's making the familiar Cooperative Extension services that much better.

—Breanna Shelton with Carol L. Spence



Extension continues to offer support for those dealing with tough economic times. While **34,033** of our clientele reported changes in knowledge, opinions, skills, and aspirations related to economic or enterprise development, more than **16,000 individuals** reported implementing at least one financial management strategy learned by participating in Extension programs.

**25,978 farmers** adopted resource management technologies as a result of Extension programs. In turn, **13,611** reported an increase in profits as a result of adopting new practices.

Efforts toward sustainable agriculture continue to advance in our state. While **15,188 individuals** reported an increased awareness due to the work of Extension professionals, **10,480** have implemented best practices that promote sustainable agriculture.



# X-tending Extension's Reach

Launched in 2008, eXtension celebrates its fifth anniversary this month. More than just another information-based website or Internet search engine, eXtension is an interactive learning environment. It provides a forum for researchers, specialists, county agents, and the general public to collaborate and find creative solutions to everyday challenges. At its heart is engagement, with more than 17,000 university experts throughout the land-grant system providing timely and credible information customized to specific regions or states.

Extension Horticulture Professor Rick Durham is UK's lead on the eXtension Institutionalization and Integration team. He was one of the first subject matter coordinators for consumer horticulture, one of eXtension's eight original Communities Of Practice. Now more than 70 Communities of Practice make up eXtension's diverse group of specialty subject areas ranging from dairy production to agritourism. And the number continues to grow.

"It's exciting!" Durham said. "eXtension has the ability to reach out and connect to a whole new group of people." He views this new non-traditional audience as urban, technology- and social media-connected, and often more willing to "virtually" seek out expertise from Extension.

"These days people may be more willing to interact with a county office on a less formal basis," he said. "After initial contact, sooner or later they may decide to come in for a class or soil testing services."



"We know demographics for Extension are constantly changing," said Terry Meisenbach, eXtension communications and marketing leader, who works out of California. He offered that many new audiences don't necessarily want to take the time to drive to the Extension office for information; they want it on the Internet, and they want it now. Ask An Expert, one of eXtension's best tools—upgraded in December 2012 to Ask An Expert 2.0—offers even more localized answers to agricultural production and consumer questions.

Meisenbach stated that engagement at the county level remains key. "This is a great opportunity for collaboration and creativity as well as service to clientele. Being able to work across state boundaries and bring value back to the institution and its state adds value to local Cooperative Extension."

—Brad Beckman

Extension continues to hold leadership development as a major component of program efforts. More than **24,000 citizens** learned skills through Extension that they use in their everyday life.

Extension helps young people develop skill sets that allow them to serve as leaders in their communities. **61,375** used these skills in communication and problem solving to address community issues. More than **8,000 youth** took the lead in addressing local issues.

A total of **156,641 families** were reached with Extension-related information on accessing healthy foods. Of those, **64,277** reported eating more healthy foods, and **22,006** reported supplementing their diets with healthy foods that they produced.



## No Holding Her Back

Thelma Banks Johnson, 103, passed away Oct. 26, 2012. For 23 years, she served as both a UK Cooperative Extension home economist and a role model.

When she entered the world 44 years after the Civil War and three years before the Titanic hit the iceberg, her future didn't look promising.

Born to cotton field workers—the fifth of six children—she was poor, female, and African-American. In that spring of 1909, white females didn't have a lot of rights, and black females had far fewer.

Her parents kept her in school as long as they could, but after her eighth-grade year, they told her that her education had ended and she would have to labor with them among the rows of cotton. Many people, no doubt most people, would have resigned themselves to their situation.

But not Thelma.

Her life is proof that if the heart and the mind want something badly enough, they will get it no matter what the sacrifice.

Imagine the courage it took a few years later to leave her Florida family and board a train to Savannah, where she enrolled in Georgia State Industrial College's high school. She combined study with back-aching jobs that included working in kitchens, doing laundry, and cleaning cottages to come up with the \$13 tuition and board fee every month.

From there, she went on to get her baccalaureate in home economics and later studied at four additional universities, including the University of Kentucky.



the Gleaner photo by Donnie Beauchamp, 1978

"If I'd had more money, I would have earned a PhD," she said when she was a mere 100.

Johnson, who moved to Henderson 65 years ago to serve as a home extension agent, racked up more honors than she ever thought possible, including being the first African-American to be elected to public office in Henderson County. She served on the county school board with distinction for eight years, six of them as chairman.

Thelma was once asked how she'd like to be remembered.

"For being a good person," she said.

She was one of the very best.

*Condensed from  
an article  
by Judy Jenkins*

*Courtesy of  
The Gleaner*

Extension improves environmental quality by encouraging the adoption of safe practices. **17,528 citizens** learned more about best practices related to protecting soil resources. Among these individuals, **13,050** adopted one or more practices as a result of Extension programming.

Tourism continues to be a priority in many Kentucky counties. **579 of 1,659** tourism and agritourism businesses, or one out of three, were assisted by Extension.

Kentucky 4-H provides youth with exposure to a number of critical life skills and other subject areas that are pertinent to youth development and academic success. Together, **180,155 youth and adults** have demonstrated an increase in practical living skills. Extension 4-H programs have engaged youth in the following:

- **Science, Engineering & Technology – 147,417**
- **Citizenship – 109,011**
- **Healthy Lifestyles – 75,609**



# imAGine

her future

**We are.**

We in the UK College of Agriculture envision a future filled with important scientific discoveries, thriving communities, healthy families and food for all.

That's not too much to imAGine.

We strive toward that future every day.

We hope she will join us.

ImAGine that you can be part of her future, too.

Bring her imAGination to life by contributing to the UK College of Agriculture.

<http://www2.ca.uky.edu/alumni/giving>



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*Change Service Requested*

Producers who adopted soil conservation practices, like Jonathan and Randy Hagan, helped prevent another Dust Bowl during the 2012 drought. Story on page 16.

