

SUMMER 2014

THE magazine

UNIVERSITY OF KENTUCKY

COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT



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The Proof of a Good Education pg. 10

CEDIK: Working in Partnership pg. 14



The Economics Issue

.....from the dean

WE GROW IDEAS

Agriculture: Roots of a Strong Economy

Land-grant university colleges of agriculture have always been about opportunity and economic prosperity. The 1862 Morrill Act, which extended educational opportunities to less privileged students, provided opportunity that laid the foundation for economic development. In early days, this meant teaching “agricultural and mechanical arts,” and today it means teaching about families, consumers, communities, economics, technologies, and sciences. The 1887 Hatch Act, which established a national network of agricultural experiment stations, also enhanced the economy, by producing science-based information that led to more profitable farming and family operations. Many studies have shown that the federal Hatch fund investment provides at least a \$10 return for every federal dollar. The 1914 Smith-Lever Act created the powerful extension service, whose centennial we are celebrating this year. Today, the land-grant values of education, discovery, and outreach underpin everything we do in the college.

In more modern times, economic development is frequently associated with manufacturing jobs, and the continued role of agriculture and agribusiness has lost some of its luster. However, we are still here, and we have built on our long history of promoting prosperity to create a new suite of CAFE programs around the land-based economic cluster. In Kentucky, more than a quarter million jobs depend on agriculture and forestry lands and include wood finishing, transportation, and food processing, to name a few. The land-based cluster is just that, rooted in the land, and is not as easily recruited out of state as a factory.

We are thinking about land-based clusters in a new way because of a long commitment to community and economic development that is now crystallized in the form of our Community and Economic Development Initiative of Kentucky. But we are doing so much more to



expand the economy, through the Kentucky Small Business Development Center and numerous county extension initiatives to create and enhance local businesses. Both CEDIK and Cooperative Extension have prominent roles in Kentucky’s SOAR (Shaping Our Appalachian Region) initiative and the federally designated Promise Zone, as well as in programs led by the Kentucky Department of Agriculture in Eastern Kentucky. Attendant to these programs are the Managing in Tough Times Initiative to help families make financial decisions, the KyFarmStart programs to educate new farmers, and many more. In many of these programs, we partner with our fellow land-grant program, Kentucky State University. And in 120 counties, the extension offices are focal points for economic development programs, making these efforts real to each community.

The CAFE community strives to create value for Kentucky’s economy using the timeless land-grant philosophy and reinvigorating it every day. We know it has worked when we give our citizens new tools for prosperity and well-being.

Nancy Cox
Dean, College of Agriculture,
Food and Environment

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Never Standing Still

If Marcus Tyler's youthful achievements are any indication of his future success, his prospects appear to be very bright. The College of Agriculture, Food and Environment figures prominently in his plans.

During his senior year at Bryan Station High School in Lexington, the honors student and future UK agricultural economics major was in the Education-Based Community Education program in Fayette County, an academic internship program that uses the classroom and the community to provide hands-on career exploration. In that program, he shadowed people in different professions. Vickie Gross, a state administrative officer with the U.S. Department of Agriculture's Natural Resources Conservation Service in Lexington, was taken with the young man.

"He did whatever he was asked to do with a great attitude; he has good skills to be successful at whatever he does," Gross said.

Tyler has used his time well. During the past two summers he toured Spain and the western United States through the Black Males Working organization. And last summer, North Carolina A & T State University awarded Tyler a research apprenticeship, during which he researched agribusiness markets and created his own business with yeast and pastry products.

"I love business and economics, so it was fun learning about the different strategies I was going to use to attract customers to my product," he said.

He spent the rest of the summer as an intern in the Mt. Sterling Farm Credit Mid-America office. Active in Junior MANRRS, Minorities in Agriculture, Natural Resources and Related Sciences, in high school, Tyler received the John Deere Junior MANRRS scholarship for academic excellence, participation in extracurricular activities, and community involvement. Tyler plans to stay involved with UK's MANRRS chapter.

The College of Agriculture, Food and Environment welcomes Tyler and other students like him into the UK Class of 2018.

— Jeff Franklin



MATT BARTON

spotlight



STEVE PATTON

Ann Leed

Ann Leed is exuberant. Her laughter adds a running counterpoint to her words, which rise and fall like notes in a song. As academic coordinator for the Department of Animal and Food Sciences, Leed advises 190 students, leading them through a maze of options to what she hopes will be a successful career after graduation. And in her spare time, she teaches.

Ann: I've been here for about 2½ years. I came here from Mississippi State, where I worked as an instructor for four years. When this position opened up, it was one of the newer academic coordinators within the college. It was a great blend. It was advising and teaching and getting to work directly with recruitment, so I applied, and I was fortunate enough to get the position.

Q: Did you grow up in Mississippi?

A: No, I grew up in Eastern Pennsylvania on a small farm. Primarily we raised sheep. I was involved in 4-H and FFA on the livestock side. Then I went to Iowa State for my undergraduate work, and I did my master's degree in swine reproduction at the University of California, Davis. So I've been around the country. (She laughs.) This is actually the closest I've ever lived to my parents since I left their house.

Q: How did you develop an interest in swine after growing up around sheep?

A: I showed cattle and swine when I was a kid, as well as sheep. When I got to Iowa State, which is the swine place in the United States, I realized that I really liked pigs. I did undergraduate research with them, and I enjoyed it. So now I teach our swine production class for juniors and seniors. It's probably my favorite class that I teach here.

Q: You seem to genuinely like this job.

A: I really like the teaching aspect of working with college students and the advising and getting them on the right path, I hope, to success not only in college, but in whatever career they choose. I also love working with our faculty here. They've really embraced me. I get to work with them on their course designs and also help them with advising students. I like the college. I like that everybody works together as a team.

College of Agriculture, Food and Environment Hall of Distinguished Alumni

The College of Agriculture, Food and Environment and the UKAg & HES Alumni Association inducted 13 honorees into the 2014 class of the Hall of Distinguished Alumni, the highest honor the college bestows. These honorees have had outstanding careers and serve as important members of their fields and their communities. They also serve as models to students of the many diverse opportunities a degree from this college can offer.

2014 Living Inductees



James "Jim" Mahan, '67 animal science, of Lexington, has been an active and important part of Kentucky agriculture since his youth. After receiving his degree, Mahan devoted his life to his farm, family, youth, and agriculture. He advocates for youth leadership, having opened and shared his farm for many years with the local 4-H sheep club and provided leadership for the development of Locust Trace AgriScience Farm, a Fayette County high school. He also provided leadership and financial support for the construction of the Ag Pavilion at Masterson Station Park.



Herbert Ockerman, '54, '58 animal science, was born in Chaplin in 1932 and came to UK to play football under legendary coach Paul "Bear" Bryant in 1950, but an injury changed those plans. He went on to receive his bachelor's and master's degrees in animal science. Ockerman has had a distinguished faculty career in the Department of Animal Sciences at The Ohio State University, where he continues to teach. Through his philanthropic endeavor, he collects and distributes books to libraries throughout the world. To date, he has donated more than \$850 million in books to more than 350 global destinations. Ockerman lives in Columbus, Ohio.



Glenn Allen Stith, '78 agricultural economics, is a native of Meade County. Immediately following graduation from UK, he joined Monsanto and has held a variety of positions in the company. At his retirement in 2010, he was vice president of commercial operations, North America and Latin America North, for Monsanto's crop protection division. Stith also lends his time and talents to the country's youth, especially through FFA, Alpha Gamma Rho fraternity, and the UKAg & HES Lincoln Trail Scholarship endowment. Stith lives in Ankeny, Iowa.

A Living Lab

The UK campus has storm water challenges, so the College of Agriculture, Food and Environment led a cross-campus collaboration to develop sustainable infrastructure to address these issues. As a result, they installed a rain garden, the first of its kind, on campus.

The garden, beside Farm Road near the Gluck Equine Research Center parking lot, will serve as an outdoor laboratory, providing a place for students to conduct environmental, ecological, and engineering research.

Faculty from a variety of departments contributed to its development, including Brian Lee, Landscape Architecture; Rick Durham, Horticulture; Brad Lee, Plant and Soil Sciences; and Carmen Agouridis, Biosystems and Agricultural Engineering. The Tracy Farmer Institute for Sustainability and the Environment coordinated the effort, with funding from Lexington-Fayette Urban County Government.

— Aimee Nielson

2014 Posthumous Inductees

Charles D. Bennett, '46, '61

Rose Mary Codell Brooks, '38 MS
home economics education

Jim Corbin, '43, '47 animal science

H. David Hilliard, '38 agriculture

George M. Kurtz, '37 agriculture

Ira E. Massie, '52, agriculture, '58 agronomy

William A. Seay, '42, '48 agronomy

Barbara Ellis Taylor, '54 home economics

Henry D. White, '52 agriculture

Patch G. Woolfolk, '47, '48 agriculture

Find more information about these honorees at <http://www2.ca.uky.edu/alumni>.



MATT BARTON

Shiver Me (Old Kentucky) Timbers

The original Mayflower that brought the Pilgrims to America is long gone, but her replica, the Mayflower II, carries her own historical significance. The United Kingdom presented the ship to the U.S. in 1957 to commemorate the deep ties between the two countries.

When the Mayflower II went into dry dock in 2013 for her annual Coast Guard inspection, the scuttlebutt around Plymouth, Massachusetts, was that the shipwrights would need some extraordinary white oak timber to repair about a dozen futtocks and 60 long planks in her hull.

What's a futtock? UK Extension forestry professor Terry Conners knew—they're curved timbers that make up the hull's framework—and he also knew the wood needed isn't available at lumberyards. The native New Englander, with family ties to Plymouth, immediately offered his landlubber expertise.

"Plimoth Plantation doesn't know much about forestry or wood sourcing," he said, "but I've got contacts."



If a tree falls in the forest, will it be suitable for repairs on the Mayflower II? Terry Conners (center) and Clint Patterson (r) examine a white oak felled by logger Holger Groessler (l), of Maple Log Farms, who was helping with the project.

Conners had set himself quite a task. The planks had to be 26 to 32 feet long and 3.5 inches thick, with a minimum of 10-inch-wide heartwood along the length. This meant looking for some very big trees. To complicate matters, they had to be practically defect-free.

After countless phone calls and site visits, he located a sawyer in Georgia who could supply much of the portside



White oak is used in the hull of The Mayflower II (above). When the wood is cut and dried, the tyloses in the vascular cells shut off the pathways that would normally carry water. This makes white oak exceptional at keeping water out—something near and dear to a shipwright's heart.

planking. Conners really wanted Kentucky to supply some of the timber, however. UK's Robinson Forest sounded like an ideal donor, but Robinson was clear-cut in the 1920s.

"We don't have the diameter or the quality timber that this particular project requires," he said.

But Conners was buoyed by the news that Berea College Forest did. Clint Patterson, a UK Forestry Department graduate student and Berea College forester, tagged eight trees with potential, though no one would know for sure until they were sawn.

Because of their size, two trees were sawed on site to see if they would meet the Mayflower's specifications. Conners took photographs and video of the boards, sent them off to Plimoth Plantation, and he and Patterson held their breaths until they heard back.

The wood passed muster. Conners was thrilled. It's not enough to supply all the planks, but it's a start, and more sawing is planned for this summer.

Conners is back on the phone, calling foresters everywhere to find the remaining wood, but he's content knowing that wrapped around the Mayflower II will be white oak from Kentucky.

— Carol Lea Spence

An Organic Dilemma

Since most poultry breeds can't get enough methionine—an essential amino acid—from their diet, farmers rely on supplements. Birds need methionine for growth, feathering, and egg production. Organic producers can add a limited amount of synthetic methionine to rations, but regulations may prohibit it in the future. Without sufficient methionine, birds grow slower, which ultimately affects the farmer's pocketbook.

UKAg animal scientists Anthony Pescatore and Jacqueline Jacob studied the methionine requirement of heritage breeds such as Black Australorp, Rhode Island Red, and Black Plymouth Rock. They found the methionine requirement is lower for heritage

breeds, but not enough to make them viable alternatives, because they still can't feed enough to satisfy industry growth standards.

"To meet the dietary requirement for methionine without using synthetic amino acid supplements, nutritionists would need to over feed methionine-containing feeds, which is not good for the bird's welfare or for the environment," Jacob said.

"In the future," Pescatore said, "if organic growers are completely prohibited from using synthetic methionine, heritage breeds may be necessary, despite their slower growth and less efficient egg production."

— Aimee Nielson

Native Bees to the Rescue (With Our Help)

National attention has focused on the decline of honeybees, but native bumblebee populations are also struggling. Diseases, pesticides, and habitat loss or fragmentation are all plaguing bee populations. UKAg entomologists say native bees need to pick up the slack left by honeybees, but they need some help from farmers and homeowners.

"Native bees are becoming more important as we lose honeybees," said Jonathan Larson, PhD '14 turfgrass entomology. "Homeowners and gardeners who are interested in helping promote native pollinators should be conscientious about what they plant."

Larson said native plants are a great benefit to these important pollinators. Native flowers and garden plants are easy to add into any landscape and possibly the best way to help the bees flourish. A range of plants that offer a succession of flowers will provide pollen and nectar throughout the growing season.

"You don't need a large area to plant things that attract native bees," Larson said. "You can start a pollinator garden in a small area in your backyard that gets about six hours of sun each day."

Cooking the Books

In Boone County, good food and conversation bring everyone to the table.

Diane Mason, the county's family and consumer sciences extension agent, started a program called Cooking the Books in 2010 after racially charged events occurred in the county. Her goal was to help individuals in her community understand and appreciate diversity through a shared interest in literature and cooking.

"We are all in this world together and have shared goals of providing for our families and raising successful children," Mason said.

Participants read a book about a culture or country and then, in teams of three or four, prepare foods inspired by the book. They discuss the book and its themes during the meal. While maximum participation for each meeting is 25, over 100 individuals have attended the program since its inception.

"Some people are hesitant to try the new foods, but they are here, and they want to expose themselves to something new," said Mary Ann Wolfe, a longtime participant. "The people I've met in this group, I probably wouldn't have met any other way."

— Katie Pratt



Bees may encounter insecticide residues on the crops they pollinate or on wildflowers or flowering weeds that have been inadvertently sprayed. Many chemical insecticides used to control insect pests in lawns, landscapes, and gardens are acutely toxic to bees, which is why they have label precautions not to apply them to plants that are in bloom when bees may be present. It's important to avoid treating blooming plants, especially with liquid sprays, as that could lead to bees feeding on contaminated nectar. Anyone using insecticides should carefully read the product's label before applying them to plants that native bees may frequent.

"As native bees are solitary or part of small colonies, the consequences of being poisoned could be more severe than if a few honeybees from a 30,000-member colony die," Larson said. "The old saying, 'an ounce of prevention is worth a pound of cure,' rings true. If people use caution and don't create scenarios where bees are exposed to insecticidal residues, then it's fine to use insecticides."

Many lawn-care providers use insecticides to control grubs and other pests. But they should understand the issue and be able to reassure customers their services don't contribute to the problem, said Dan Potter, UKAg entomologist.

"Bees in suburban areas commonly forage on flowering lawn weeds," Potter said. "Indeed, we've surveyed and collected dozens of species of native bees visiting dandelions and white clover in Central Kentucky lawns. Many of the species we caught are also pollinators of garden crops, fruits, and berries, and of ornamentals such as flowering crabapples and hollies. Bumblebees, for example, are especially good pollinators of tomatoes, eggplant, and peppers in home gardens."

Potter and Larson said that with a few sensible precautions, like controlling flowering weeds with herbicides before applying insecticide, delaying grub treatments until after peak bloom of spring-flowering weeds, using granular formulations, and notifying homeowners to mow off any flower heads before or soon after liquid applications have been watered-in, it should be possible to use insecticides for grub and billbug control without harming bees.

"It's important to remember that even if you think you are just one person following these considerations, individuals add up to change on a larger scale," Larson said.

— Aimee Nielson

Beyond Farm Gates

By Katie Pratt

Agriculture is an economic driver. From the Mississippi River to the Appalachian Mountains, Kentuckians and their businesses receive financial boosts from agriculture.

“Agriculture’s impact on this state is bigger than most people think, because the typical economic analyses usually only measure the number of on-farm jobs and on-farm sales and often exclude the industries that feed into or buy from farmers,” said Alison Davis, UK agricultural economist and lead author, along with Leigh Maynard and Lori Garkovich, of a report that examined the impact of agriculture on Fayette County.

In that study, they found that agriculture and the businesses clustered around it account for one in nine jobs in Fayette County and \$2.4 billion in annual revenue. While all aspects of agriculture were included in the study, the researchers found that equine and its associated services contributed to 95 percent of the county’s farm sales.

Soaring to New Economic Heights

Some businesses would not be in Lexington if the equine industry were not here, such as H.E. Sutton Forwarding Company, also known to frequent visitors to Blue Grass Airport as “Air Horse One.”

“We have been here since at least the early 70s, and it’s because Lexington is the horse capital of the world,” said Mike Payne, the company’s operations manager.

The company is the only airline in the United States dedicated solely to horse transportation and employs five crew members on the plane, two at the Lexington headquarters, and four sales people stationed at racetracks and competition facilities across the country. Some of the crew members and Lexington employees are Central Kentucky natives, but all reside in the area.

The airline makes between 200 and 250 trips a year, mostly to points to or from Kentucky, Florida, California, and New York, but they also fly to Canada and Mexico.

Of their passengers, 75 percent are Thoroughbreds and 25 percent are show horses. Flight prices vary based on current location, destination, and number of horses on the plane, but generally, to transport a horse from Los Angeles to Kentucky costs around \$3,600.

“Show horses always travel with a lot of stuff, because they need it for competitions, but racehorses do not travel with nearly as much. They’ll have a tack trunk with a feeder and a water bucket,” Payne said.

While their grooms sometimes travel with the horses, the on-flight crew handles the horses when the “flying stable” is in the air.

UK researchers found that, like Air Horse One, many of the businesses surrounding the industry are service providers. And many of these providers are high-paid professionals like accountants, land appraisers, bankers, lawyers, and veterinarians.

(opposite) Racehorses travel light—a tack trunk with a feeder and a water bucket. While 75 percent of horses transported by H.E. Sutton Forwarding Company are Thoroughbreds, show horses are a growing market for the business. Here, Stephen Gravett, flight supervisor and saddledbred sales agent, leads a passenger off the plane in Lexington.

(below) Wood chips are delivered by barge, where a conveyor belt will take them to Domtar to be turned into paper or to be used as boiler fuel. River transport is less expensive than overland methods. A barge can hold about 60 semitrailer loads and is easier on the environment.

“Farmers are consumers and need inputs and services to sustain their farms and way of life,” said Garkovich, professor in Community and Leadership Development. “They tend to buy these items locally or through local distributors.”

The UK report also showed businesses not directly associated with the industry take advantage of the picturesque beauty of the area to attract prospective employees.

“The equine industry spreads its benefits across many other sectors of the economy,” said Maynard, chair of Agricultural Economics. “You have this infusion of outside money, and the equine industry in Fayette County combines recreation and tourism with some very high-end services.”

Spreading the Wealth

The equine industry isn’t the only enterprise and Fayette County isn’t the only county to reap economic benefits from agriculture. The forest industry added an estimated \$12.8 billion to the state’s economy in 2013.

Kentucky is one of the top producers of hardwood sawlogs in the country. The industry has

over 700 facilities in 109 counties and employs around 59,000 Kentuckians. About 89 percent of the state’s forests are privately owned, with more than 430,000 owners. There’s no denying the industry is important.

“Our forest industry is not composed of a few well-known, high-profile companies,” said Jeff Stringer, UK extension professor of hardwood silviculture and forest operations. “Instead, our forest industry consists of a large number of family-owned logging firms, saw mills, and wood businesses. They are relatively small and scattered throughout the state. Many are in rural places, but there are some in urban areas too.”

On the Ohio River in Hancock County, the Domtar Paper Mill annually consumes 2 million tons of wood through paper production and boiler fuel. The wood chips, bark, and sawdust come from over 120 suppliers, of which more than 70 are Kentucky companies located from Olive Hill to Hopkinsville.

Working at the mill for 31 years, UKAg alumnus Dan Allard, ’83 forestry, has witnessed the importance of the state’s forest industry to the economy. Allard, a Hancock County native,



STEPHEN PATTON



STEPHEN PATTON

(top) Forestry alumnus Dan Allard oversees all wood purchases for Domtar Paper Mill in Hancock County. Domtar's location is perfect for acquiring wood chips from Kentucky, Tennessee, and Indiana, three of the top hardwood producing states.

(bottom) Paper rolls fresh off the assembly line are ready to be shipped. Each roll weighs about 3 tons.



STEPHEN PATTON

"We receive chips and boiler fuel 24/7, 365 days a year," he said. "On an average day, we'll receive 130 loads of chips and boiler fuel. About 45 percent of that arrives by barge, 45 percent comes by truck, and 10 percent comes by rail."

A Community Built on Ag

Further downriver in Owensboro, Brian Wright is the president and CEO of the Owensboro Riverport Authority, whose primary marketing functions are agriculture, metal storage, and warehousing.

"From the agriculture standpoint, a lot of what we do is bulk unloading for our tenants, who are made up of local agricultural companies who serve as fertilizer distributors to Western Kentucky," he said. "Through a partnership with a local grain company, we're also an outbound grain facility that services Daviess County and the surrounding area."

The 300-acre river port is one of the largest on the Ohio and imports between 250,000 and 300,000 tons of fertilizers per year. This includes most of the fertilizers for Western Kentucky with the exception of anhydrous ammonia, which is unloaded off barges in Henderson.

"We move over 900,000 tons through this facility. Of this, almost half is dedicated to the ag industry," Wright said.

Owensboro is a community built on agriculture; its farmers generated \$150 million in agriculture sales in 2013, said Clint Hardy, the county's extension agent for agriculture and natural resources. The county ranks eighth in the state in

agricultural sales, according to the 2010 county rankings by the National Agricultural Statistics Service.

"Every business in our community has a connection to agriculture," Hardy said. "It's an enormous part of our economy."

Hardy said area grain farmers set the goal to make a 10 percent return on their investments each year and much of the cost for crop inputs, machinery, and labor is spent locally.

"If people made their goal of 10 percent return on investment last year, that's \$136 million that farmers spent with suppliers and labor, based on 2013 revenue," Hardy said. "Those farmers will take that 10 percent return and use it to build or remodel homes, replace trucks, replace machinery, and allocate for family living expenses, such as education, dining out, clothing purchases, contributions to their church and other nonprofits, and taxes."

Just south of Owensboro in the McLean County town of Livermore, Derek Miller, the general manager of B.F. Evans Ford, said there's been a Ford dealership in the town for 90 years, partially because of the support from farmers in the Green River area.

"Agriculture is a big part of our customer base," he said. "They are primarily buying trucks as a farm tool, but it's also a personal tool. We are very blessed to not only have a loyal customer base of farmers, but of agri-based businesses like crop insurance salesmen and implement dealers."

Miller said if the agricultural industry in the area weren't there, it would definitely change the look of his business.

"The mix of the vehicles we stock and sell would be different," he said. "We stock a lot of F-Series Super Duty diesel pickup trucks to accommodate farmers and pull in farmers from surrounding counties."

In many communities, the success of the local economy is directly tied to the success of agriculture. Garkovich said studies have shown that when the industry was faced with a major depression in the 1980s, for every three farms that shut down operations, one Main Street store in a rural community closed as well.

From Pike to Fulton counties, there's no denying agriculture's economic impact extends well beyond farm gates. ✎



STEPHEN PATTON

Bruce Cabbage, operations manager for Owensboro Riverport Authority, speaks with Clint Hardy, Daviess County ANR extension agent. The riverport imports more than 250,000 tons of fertilizer a year.

The Proof of a Good Education

By Carol Lea Spence



THINKSTOCK.COM

The yeast always gets the blame.

So laments Pat Heist, '96 BS A&S, '00 MS, '03 PhD CAFE, as he talks about the fuel and beverage alcohol distillation business. It's a bittersweet lament, because Heist, double-degreed in plant pathology, has made quite a career from detecting and fixing the "150 or so ways" the fermentation process can be thrown off kilter.

Heist partners with Shane Baker, a UK mechanical engineering alum, in Ferm Solutions, a Danville-based business that provides yeast and antibacterial products for U.S. and global fuel and beverage clients—clients that produce anywhere from millions of gallons of 200-proof ethanol a year to thousands of barrels of beverage alcohol a month. Perhaps even more important to those clients, Heist and Baker provide training and consultations to track down solutions to problems that can result in yield losses and cost overruns.

"We are literally the world's experts in fermentation and process support for fuel and beverage alcohol facilities," Heist said.



STEPHEN PATTON

(above) Pat Heist took his UK degrees, two of which are in plant pathology, and turned them into a successful global support business for the fuel and beverage alcohol industries.

Could've been a mushroom farmer

Heist's story has almost as many layers as there are potential problems in alcohol production. He developed an enduring interest in microbiology as an undergraduate, which carried through to his masters and doctoral degrees in plant pathology. In Professor Chris Schardl's lab, Heist worked primarily with the tobacco blue mold pathogen.

"The problem with doing studies on a pathogen in an outside environment is that you get contamination," he said. "Was that a contaminating bacteria I sliced through or was that part of the pathogen? It was all microbiology, preventing contamination."

If that sounds similar to his present occupation—well, it is.

"You can contaminate a plate in a lab or you can contaminate a million-gallon fermenter. It's all the same."

Armed with his doctorate, Heist took a route few expected. He joined the faculty of the University of Pikeville-Kentucky College of Osteopathic Medicine, teaching microbiology.

"You can't just let opportunities go by. There aren't a million plant pathology jobs, but there are a million microbiology jobs, and plant pathology is microbiology," he said. "Just realize everything you can do with your skill set and don't be afraid to go out on a limb."

Though he loves teaching, Heist is a born entrepreneur—"I was always looking for opportunities. I was the guy who got in trouble

(below, l-r) Joy Ghosh, molecular sciences lab manager, works with summer intern Kevin Hawk, a UK ag biotechnology major. "Kevin's working in the distillery, he's doing tours, working point of sale, milling grain, doing molecular biology; he's getting a lot of exposure," Heist said. "We're grooming him to be CEO."



STEPHEN PATTON

at school for selling candy, and they found out because the concession stands noticed a significant drop in sales.”

Inspired by all the unclaimed logs left from surface mining around Pikeville, he started to get into shiitake mushroom production. He took an extension class offered by now retired UK Forestry Professor Deborah Hill. He found “the mushroom thing kind of cool,” but he soon had the opportunity to consult for a few companies, one of which dealt with fuel alcohol.

Heist watched as that company pulled in millions of dollars and realized he could either be a consultant helping them make money or he could start his own business. He chose the latter.

This all starts with rock 'n' roll

As it turns out, his future partner Baker—“the business guy” to his “science guy”—was only an amp away, the lead guitarist in the rock band in which Heist sang lead.

Like all good musicians, their timing was perfect. They started Ferm Solutions from nothing—“two guys, an accountant, and a Maxima”—about the time when renewable fuel standards first kicked in. When the federal government mandated 12 percent ethanol in all fuel by 2012, the fuel alcohol industry rapidly expanded to meet the demand.

Working out of Baker’s garage at first, they could barely keep up with the demand.

“We would literally spend all weekend packaging antibiotics, and, oh wow! We’ve got 900 pounds.” Heist said. “Then someone would call and need 900 pounds. Just like that, gone!”

Today that garage is just a fond memory.

“If you get the yeast business of a customer at a fuel alcohol plant that has million-gallon fermenters, you’re talking up to 8 tons a month for one customer,” Heist said. “We’ve got 40, 50 customers across the globe. That’s a lot of daggone yeast, so we do a lot of business.”



MATT BARTON

You can take the guy out of the lab, but...

If Heist and Baker’s relationship started with rock 'n' roll, Heist and Luke Moe began their affiliation over pizza and, appropriately, a fermented beverage—beer. They’re part of a UKAg group who call themselves The Deadbeats and meet weekly to “talk about whatever, even science,” said Moe, an assistant professor in the Department of Plant and Soil Sciences.

Together they obtained a grant from Kentucky Science and Engineering Foundation. The grant has funded Qing Li, a graduate student who works with Moe, to study microbial communities in bioethanol fermentations.

“Pat’s been great to work with,” Moe said. “At heart he really is a basic scientist, and he wants to understand how these things work.”

When Heist talks about the science, his enthusiasm quickens his speech, nudging his usual good ol’ boy drawl aside. “Our laboratory has multiple capabilities now. We do a lot of supportive work for our customers, but we also have the technical support that goes along with it. So you can have a starch issue and call your yeast people—us—and we’ll help fix the problem.”

More than 600 different yeast strains reside in Ferm Solutions’ repository, each with its own “skill set.” One might be good at using sugar. Another survives in high heat.

“That’s when you get into crossing them, just like traditional breeding. If I cross those, I’ll have one that makes high alcohol and is heat resistant,” Heist said.

Ferm Solutions also markets products to control bacteria, so in addition to their depository of yeast, they have more than 6,000 different isolates of bacteria on site from distilleries all over the world. Of course, knowing what he does about bacteria, Heist wonders, are they changing over time? Are they becoming antibiotic resistant?

That’s where Moe and Li enter the picture. A dedicated yeast fermentation is supposed to be a sterile environment, basically just yeast digesting the sugars and producing ethanol as a byproduct. When bacteria does get in there, they use the same nutrient sources as the yeast, so not only are they competing with the yeast for food, they don’t make ethanol as a byproduct. Yields drop precipitously. A serious bacterial contamination issue at a fuel alcohol plant can cost hundreds of thousands of dollars a day.

Moe is an environmental microbiologist. He believes the bacteria are getting a bad rap.

“In any type of fermentation, regardless of how sterile you think it is, there’s going to be bacteria in there. The question is, what triggers this event where the bacteria suddenly start to out-compete the yeast?” Moe said. “It’s not super sexy science maybe, because we’re not necessarily engineering a new pathway to make fuels, but it is every bit as important. As we scale up production of liquid fuels from biological resources, it’s going to continue to be a problem. Now’s the time to address it.”

(l-r) Qing Li and Luke Moe discuss research on microbial communities in bioethanol fermentations. The time to address bacterial blooms, which can cost ethanol firms thousands of dollars a day, is now, Moe said.

Now I'm running a distillery

On solid ground with their yeast and antibacterial business, Heist and Baker have expanded their opportunities yet again.

“I could have been a mushroom farmer. I could have stayed a medical school professor. I could have done fuel alcohol,” Heist said. “Now I’m running a distillery.”

The partners explained that their recent venture into opening a craft distillery, Wilderness Trail Distillery, strengthens their core competency in fermentation. Open for only a few months, the business is already producing impressive liquor from a copper still Baker designed and Louisville’s Vendome Copper and Brass Works built. Their Blüe Heron vodka and sorghum-based Harvest Rum have taken six major awards. Their single-barrel batch bourbon has begun its five-year aging process in barrels on racks in the room next to the still.

“We automatically know any problem that you can have in a distillery. We’ve got a tiny distillery, so we can manage it as efficiently as possible and produce a product that we think is going to be one of the best products out there. Every step of the process is all based on scientific data or observations that we’ve made in almost 200 distilleries worldwide,” Heist said.



STEPHEN PATTON

It's a deep blue connection

To walk into Ferm Solutions’ one story concrete block building is almost like walking into a satellite site of UK. In the lab, researchers work on a variety of projects, such as determining the yield from an all-malt fermentation, documenting yeast propagation times, and breeding new yeast varieties. And most of those researchers have UKAg ties.

“I always look for every opportunity possible to give back to UK, because I definitely got a lot out of it and got a lot of opportunities to go places,” Heist said.

Heist and Baker make a serious effort to hire UK alumni and interns. Ag biotech alumni and students fill the place. Kevin Hawk has just finished his junior year as an ag biotech major.



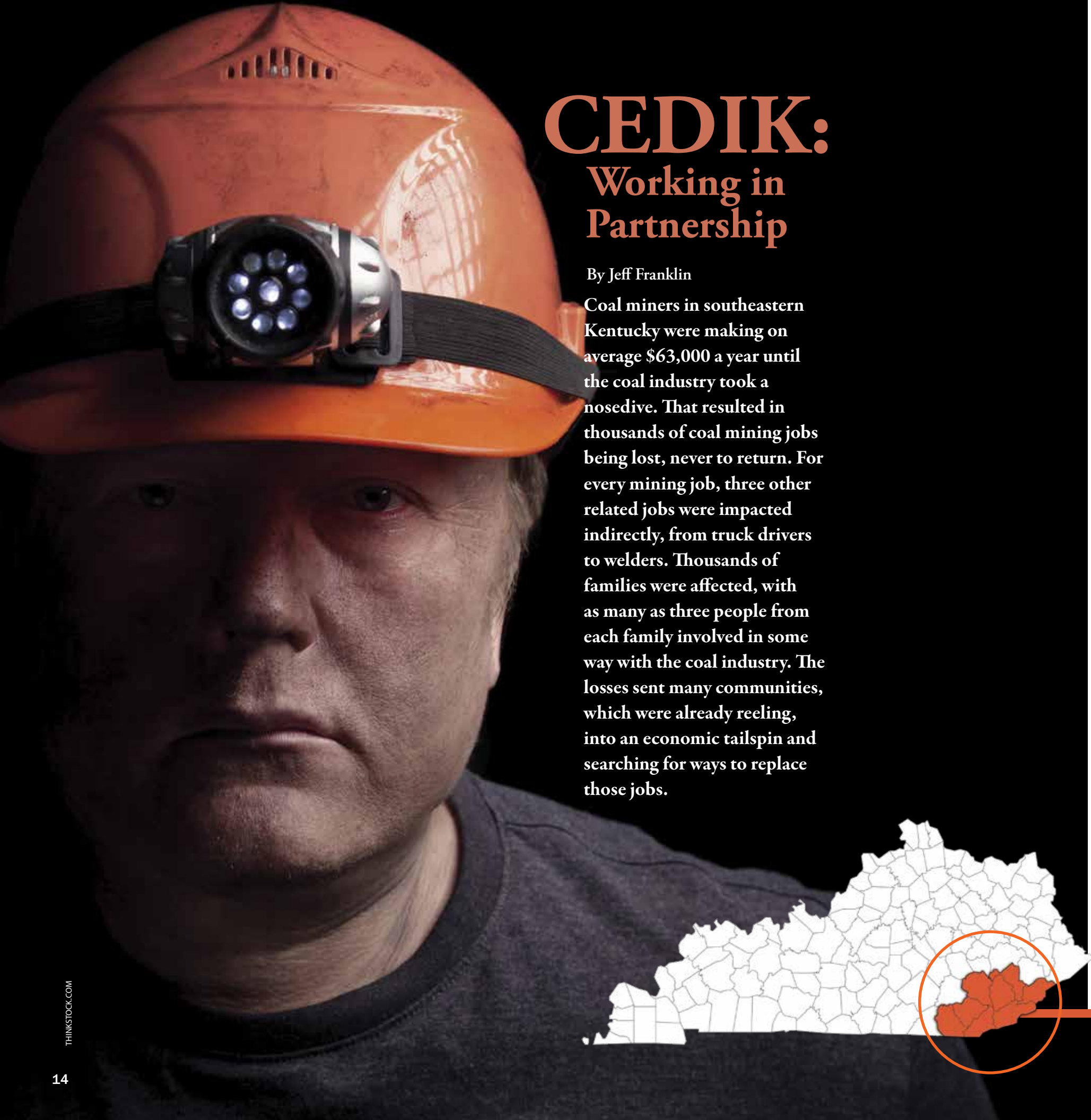
STEPHEN PATTON

(left) Partners Pat Heist and Shane Baker know the alcohol industry inside and out. They are also Kentucky Proud®.

(above) Baker pours yeast into the cooked locally grown grains that will soon be distilled into vodka at their latest enterprise, Wilderness Trail Distillery. Behind Baker is the copper still he designed, which is capable of distilling vodka to the required 190-proof before it is diluted to 80 proof with local Highbridge Springs water. “Our fermentation ingredients are all sourced locally,” Heist said. “In fact, our vodka travels less than five miles from field to bottle.”

He’s worked as an intern with Ferm Solutions for two summers and a semester. Robbie Brooks, ’11 ag biotech, is a laboratory technician with the company. Lab manager Brian King, ’06 ag biotech, ’11 PhD plant biochemistry and physiology, studied and worked under Professor George Wagner. Even Joy Ghosh, who received his doctorate in biology, worked for a while in UKAg Associate Professor Michael Goodin’s lab.

And every one of them, supported by their research, would probably say, “Don’t just blame the yeast. Let us figure it out.” 🍷



CEDIK:

Working in Partnership

By Jeff Franklin

Coal miners in southeastern Kentucky were making on average \$63,000 a year until the coal industry took a nosedive. That resulted in thousands of coal mining jobs being lost, never to return. For every mining job, three other related jobs were impacted indirectly, from truck drivers to welders. Thousands of families were affected, with as many as three people from each family involved in some way with the coal industry. The losses sent many communities, which were already reeling, into an economic tailspin and searching for ways to replace those jobs.



"It is probably going to take two of the type of jobs that have been generated, to replace one of those," said Jerry Rickett, president and CEO of Kentucky Highlands Investment Corporation. "Around 30,000 people have lost their way to make a living. Trying to replace that without bringing additional revenue from outside, which is in short supply, is going to be a challenge."

Enter the Community and Economic Development Initiative of Kentucky, CEDIK, to help Kentucky communities find solutions for their most serious needs. CEDIK is both the consolidation and the strengthening of the former UK Cooperative Extension Community and Economic Development program. Executive Director Alison Davis said her goal is for CEDIK to stand above the rest, even though it is a very young initiative.

CEDIK seeks to empower individuals by engaging community members, incorporating the interests and cultures of the community in the development process, and enhancing the leadership capabilities of community members, leaders, and groups. Jimmy Henning, director of the Kentucky Cooperative Extension Service, believes there is something very special about CEDIK.

"CEDIK doesn't talk about what's wrong with you. They talk about your strengths and how to build on them," he said.

Promise in the Promise Zone

Because of that passion and commitment to local communities, CEDIK was tapped to be among the implementation partners working with the project administrator, Kentucky Highlands Investment Corporation, for one of the first Promise Zones from the Obama administration. The Promise Zone is an eight-county area in southeastern Kentucky with a 10-year designation to focus resources and expertise in those communities. The goal is to help improve the economy, health, and education in Bell, Clay, Harlan, Knox, Leslie, Letcher, Perry, and Whitley counties, which were hardest hit by the coal industry decline. Rickett said 4,000 coal mining jobs have been lost in the region.

"With the catastrophic job loss we have had in the Promise Zone, it is going to take all hands on deck to work with the local communities to try to enhance income to get some revenue back in the region," Rickett said. "As you can tell, CEDIK is a critical partner in the Promise Zone."

The first priority in the Promise Zone will be to create employment opportunities in those eight counties to try to replace some of that lost income. CEDIK personnel conducted public forums in each county. The information they gathered will be analyzed to develop a 10-year strategic plan. UK Community and Leadership Development Professor Lori Garkovich, who is working with the counties on the strategic plan, said she sees real promise in the zone.

"These counties decided a while ago that they can't just sit back and wait to see what happens to them," said Garkovich. "I think CEDIK is one of the pieces of that puzzle, but it is really the ability of all these nonprofits, like CEDIK, Kentucky Highlands, and the Foundation for Appalachian Kentucky, to call on each other and be able to help them."

The Health Arena

Though an initiative of UKAg, CEDIK puts a strong emphasis in the area of rural health. Davis was selected a 2014 Rural Health Fellow by the National Rural Health Association, one of only 15 chosen. The fellows program provides an opportunity for health care leaders from around the country to network and to work collectively to advocate for rural communities' health care needs.

"The program provides an opportunity to learn about federal health care legislation and its implications for rural communities across the U.S.," said Davis.

CEDIK staff worked alongside the UK Center for Excellence in Rural Health to assist hospitals and health providers in implementing strategies that address the health needs in their communities. Rhonda Bowling, a health educator for the Cumberland Valley District Health Department in Clay, Jackson, and Rockcastle counties, worked with Garkovich in developing a strategic plan.



“Lori was a fantastic facilitator and pulled us along, and we have used that strategic plan she developed to leverage other funds,” Bowling said. “It’s not just a piece of paper that someone wrote that’s just sitting there, it’s an active document that has been very worthwhile and beneficial to us. She knows her stuff.”

Each county in the Cumberland Valley Health District has some form of a coalition that is having a positive impact on the health of their communities.

“That’s what is good about coalitions; it is good networking, and it is good to see what is going on,” said Bowling. “We can celebrate our successes, but we can build that capacity and impact health and those poor health rankings.”

CEDIK, primarily under the leadership of Senior Extension Associate Marisa Aull, also assisted 30 hospitals in Kentucky, West Virginia, and Ohio with the Community Health Needs Assessment mandated by the Affordable Care Act. The new Kentucky Community Health Grants were a direct result of the assessments. A total of \$26,000 in grant monies were awarded to communities across the state.

“The whole region seems to be hungry for action,” Aull said. “It is exciting that people want to get down to work.”

Kentucky Small Business Development Centers

Kentucky Small Business Development Centers, which the College of Agriculture, Food and Environment administers and the U.S. Small Business Administration co-sponsors, works closely with CEDIK in all 15 of KSBDC’s statewide service centers. Each center partners with regional universities, community and private colleges, and the private sector. Becky Naugle, KSBDC director, said the center’s mission is to create wealth and jobs through hands-on business consulting to both existing and start-up businesses.

There is no better example of the center’s mission than at Horseshoe Bend Vineyard and Winery in Willisburg. Rick Greenwell, Washington County agriculture and natural resources extension agent, approached Patricia Krausman, the director in Elizabethtown’s Small Business Development Center office.

“Rick is the consummate champion for Washington County in agriculture, and he saw the need for the area, and initiated the contact with our office,” Krausman said.



STEPHEN PATTON

At the Jane Todd Crawford Memorial Hospital in Greensburg, CEDIK’s Marissa Aull (back center) led a hospital focus group through an assessment of their community’s health needs. She’s excited that “people want to get down to work.”



STEPHEN PATTON

“Throughout the life of their business, we have worked with Horseshoe Bend to grow and develop to be the successful business they have become.”

Horseshoe Bend owners Bob and Ann Karsner, and their son Greg, moved from Virginia to the Bluegrass State in the late 1990s because they wanted to grow grapes in Kentucky’s limestone-rich soil. They met Greenwell and Krausman, and you could say the rest is history.

“We sure did luck out having Rick Greenwell and Patricia Krausman at our availability. We bought our farm in the right place,” Ann Karsner said. “Rick introduced us to Patricia who guided us through the process of applying for a grant from the ag development board.”

Krausman also taught a business plan class in Washington County for agribusiness entrepreneurs called Tilling the Soil of Opportunity. Needless to say, the Karsners were in that class. Ann Karsner said she keeps in touch with Krausman.

“I check with her periodically, maybe bi-yearly. She helps keep us on track,” she said. “I like her and her personality. She knows what she is doing.”



STEPHEN PATTON



STEPHEN PATTON

Open the Door to Ideas

“We don’t want to impose our own vision or goals on any community or organization,” Davis said. “We are there to provide evidence-based research and to facilitate the discussion to assist these groups in finding and owning the solutions that work best for them.”

CEDIK has both an agent advisory council, made up of Cooperative Extension agents, and a statewide advisory council, which is a diverse group of people who are connected to community and economic development. Garkovich said CEDIK’s work with advisory councils has reinforced the idea out in the state that community and economic development are important to the college and to UK.

“And we are willing to acknowledge that if we don’t have the resources to do something, we can call on others to create partnerships in support of these communities,” she said.

“At the end of the day,” Henning said, “I would want people to know that



STEPHEN PATTON

(top) Ann Karsner (pictured) said KSBDC’s Patricia Krausman helps keep their vineyard and winery on track. They were introduced by Rick Greenwell, Washington County ANR extension agent.

(above) CEDIK’s Ron Hustedde discusses entrepreneurship and business basics to the Bath County Wildcat Leadership Council.

the College of Agriculture, Food and Environment is doing significant work in communities beyond the traditional things people think of.”

In other words, CAFE is open for business. 🍷

Academic Programs

2013 Annual
Report

The Office of Academic Programs is dedicated to helping students, staff, and faculty succeed in the teaching and learning environment provided by the College of Agriculture, Food and Environment. We do that by helping prospective students find out if the college is a good fit for them, working with students on scholarships, helping students find their way when they sometimes struggle, and developing possibilities for internships and permanent employment. Rather

than bragging about what we do, we prefer to highlight a small sample of the students who come through the college; they are influenced in remarkably positive ways by other students, faculty, and staff. We like to think of ourselves as facilitating this very constructive learning environment.

Larry Grabau
Associate Dean for Instruction
N-6 Ag Science North
(859) 257-3469
lgrabau@uky.edu



STEPHEN PATTON Courtesy of Wine and Market

COLLEEN HAGGARTY

Year: Senior

Major: Hospitality management and tourism

Career goal: Event planner for a vineyard. "You don't do it for the parties; you do it to make other people happy."

Why a vineyard, specifically: "I grew up with a wine-loving family; wine was served with every dinner. My mother's side has a lot of French in it. So I grew up to love and respect wine."

Hometown: Raised in Saskatoon, Saskatchewan, Canada, until sixth grade, then lived in Wisconsin and Minnesota, and finally settled in Williamstown. "People ask me, what do you remember about Canada? I say, the snow. As cheesy as that sounds, you really just remember the snow."

Most memorable moment at UK: "Having Lilly Pulitzer's dream team come to UK was absolutely amazing. I got to be one of the students who were involved with it. I got to work with a corporate-level, very professional industry. I made business connections. The fact that UK gave me the opportunity to work with such a well-respected company is amazing. It was a very big honor to be able to work for them."



MATT BARTON

COLTON WOODS

Year: Senior

Major: Equine science and management

Hometown: High Point, North Carolina

Why UK? "My dad went here, so I grew up bleeding blue. But as an equine major, you can't beat the atmosphere here and all the connections the university has for internships and career opportunities."

What about horses attracts you? "My passion for horses started when I worked with an equine rescue group in High Point. I was one of the younger guys there, so I could help them with a lot of the physical labor. Then I got interested in helping them rehome horses. I think they're the most honest species you can work with. They give you a real honest sense of how to go about your day and how to live life in general."

Extracurricular: Alpha Gamma Rho, an agriculture fraternity. "AGR's professional and social opportunities have made my collegiate experience complete."

Proud moment: Being named 2013 Equine Science Management Intern of the Year. "That was absolutely phenomenal to receive that. That is definitely something I'll treasure for a long, long, long time."



STEPHEN PATTON

DANIELLA STRAATHOF

Year: Junior

Major: Ag economics. "I have a passion for the people aspect of agriculture—helping farmers become more efficient and effective, because they already perform such a noble task. Farmers work so hard, they have such great character. They've done a lot for me, so I want to see what I can do for them."

Home: Raised on a hog farm near Siebengewald, the Netherlands, until she was 12, when her family moved to Washington Court House, Ohio, to farm.

Extracurricular activities: CAFE student ambassador, Agricultural Economics Quiz Bowl team member, a UK Chellgren Fellow, and active in Fellowship of Catholic University Students.

Career plans: "I don't know what I'm going to do yet, but I want to try as many things as I can possibly try to make sure I know what I enjoy the most and where I can make the most significant impact."

Impressions of the college: "I love the College of Agriculture. I love its personality. As an ambassador, people expect you to say great things, but I truly believe them with all of my heart."

Fast Facts for 2013-2014:

Total College Enrollment—**3,144**

Freshman class—**412**

Undergraduate students—**2,665**

Graduate students—**479**

Undergraduate students in Human

Environmental Sciences—**969**

BS degrees awarded—**576**

MS and PhD degrees awarded—**113**

Faculty named Great Teacher—

Mark Coyne

Female students—**65%**

Dollars of undergraduate scholarships

awarded—**\$612,519**

Undergraduate students receiving a

CAFE scholarship—**440**

Selected Undergraduate Enrollments:

Animal Sciences—**294**

Human Nutrition—**284**

Retailing and Tourism Management—**281**

Agricultural Economics—**266**

Equine Science and Management—**266**

Dietetics—**248**

Agricultural Biotechnology—**177**

Family Sciences —**156**

Community and Leadership Development—**155**

Biosystems Engineering—**144**

Jeremy Ashby: Cooking Up A Career



Chef, business owner, and local television host Jeremy Ashby, '06 hospitality management, has been a friend to Kentucky farmers since he opened his restaurant Azur in 2007. Ashby was committed to using as much local product as possible and even opened a farmers market in the restaurant parking lot to spread the farm-fresh goodness with locals in south Lexington.

Ashby said the market really formed a close-knit community where chefs were learning about the farms and the farmers were eating in the restaurant and learning what they need. The market has been so successful that Bluegrass Farmers Market is taking over operations.

Ashby earned a culinary degree from Johnson and Wales University in Charleston, South Carolina, before earning his bachelor's degree from the UK College of Agriculture, Food and Environment. Ashby said his UK degree taught him vital skills in marketing, sales, and business accountability.

"Cooking was the easy part," he said. "The business side of things is a whole other story and it actually makes up about 90 percent of the job at the management level."

Earlier this year, Ashby, Chef Miguel Rivas, and their Azur partners opened Brasabana in Lexington, serving Cuban cuisine with a Caribbean flare. When he worked as a chef in Charleston and Miami early in his career, Ashby picked up a keen interest in Latin fare.

He said the new venture allows an even deeper relationship to local agriculture.

"More and more farmers were telling me they don't have a market for their lower-end cuts of meat," Ashby explained. "But those cuts are actually staples of Latin and Cuban food, where slow-roasting and braising gives them huge appeal. And when you think about it, things that usually accompany Latin food—peppers, onions, garlic, tomatoes, cilantro, and fresh herbs—are in huge abundance at the farmers market."

— Aimee Nielson

2014 AREA SUMMER EVENTS

AREA MEETINGS

Bluegrass	July 25
Fort Harrod	June 23
Green River	July 29
Lake Cumberland	July 28
Licking River	June 10
Lincoln Trail	Aug. 2
Louisville	Aug. 1
Mammoth Cave	July 7
Northeast	July 8
Northern KY	June 3
Pennyrile/Purchase	July 31
Quicksand	July 15
Wilderness Trail	TBA

EVENT DATES

Roundup	Sept. 6
HES Hall of Fame	Oct. 17
UK Homecoming	Nov. 2
Scholarship Luncheon	Nov. 22

FOR MORE INFORMATION about becoming a donor, contact the Office for Advancement at (859) 257-7200.

2013 ANNUAL EVENTS SPONSORS

PLATINUM: \$10,000+

Kentucky Farm Bureau

GOLD: \$5,000–\$9,999

Kentucky Association of Electric Cooperatives Inc.
Kentucky Thoroughbred Owners and Breeders Inc.

SILVER: \$2,500–\$4,999

Farm Credit Services of Mid-America
Whayne Supply Company

BRONZE: \$1,000–\$2,499

UK Alumni Association

BLUE: \$500–\$999

Alpha Gamma Rho Active
Alpha Gamma Rho Alumni

WHITE: \$250–\$499

Robert Conley Livestock
Edgeview Farms
Larry Grabau
Stith Wimsatt and Associates

Katie Skarvan: Gone to the Dogs



Roger Brown may have said it best in his letter nominating Katie Skarvan, '14, as a candidate for the humanitarian Sullivan Award.

"Katie Skarvan demonstrates those characteristics of heart, mind, and conduct as evince a spirit of love and helpfulness to other men and women, particularly those who are challenged with disabilities," wrote the UK agricultural economics professor.

After all, Brown should know. He serves as faculty adviser to Wildcat Service Dogs, a student-run organization that Skarvan founded when she was a freshman. The group trains service dogs for people with disabilities.

Skarvan received the Sullivan Medallion this spring, which UK presents annually to a graduating female, a graduating male, and a citizen who have selflessly given of themselves.

"I was really surprised when I found out. There are some very talented, deserving people that were considered, and I am very honored to even be considered," Skarvan said. "I am in shock over winning it."

Skarvan embodies the very definition for which the Sullivan Award was established. She led efforts to secure a State Farm Insurance community service grant of \$25,000 for Wildcat Service Dogs that ensures the organization's future.

"It is the best student-run organization I have worked with," Brown said. "Katie has a knack for getting people organized."

Brown said Wildcat Service Dogs is now a "rock-solid" student organization, which Skarvan has handed over to a new group of student leaders. The organization also received the 2014 Outstanding Leadership Award from the UK chapter of Omicron Delta Kappa, the National Leadership Honor Society.

An animal sciences major, Skarvan graduated this spring and is working in a research internship with Alltech this summer.

— Jeff Franklin

Carolyn Workman Breeding: Not Many Dull Moments



By her own admission, Carolyn Workman Breeding, '72 BS home economics, '78 MS food and nutrition, was not the “be-all, end-all student.” That never held her back though, she often tells UK dietetics students. Her success as an entrepreneur is certainly indicative of that.

Early in her career, Breeding worked in long-term care, first for a small chain of nursing homes and then, when a larger corporation purchased the chain, overseeing half of their 21 care facilities. She loved working in the field.

“In long-term care, I could get to know the patients, have a relationship with them. I felt that I could make a difference.”

In 1991, she went out on her own, starting Dietary Consultants Inc. A succession of profitable service businesses followed, all nontraditional, dietetics-related companies that impacted the long-term care field. Today, Breeding employs 65 people in four businesses, Dietary Consultants, Quality Provider Services, Breeding and Associates, and Napa Health Care Connections. In her latest venture, she is consulting with school food services on procurement, distribution, and production of food.

Throughout her busy professional life, Breeding has remained active at the district, state, and national levels of the Academy of Nutrition and Dietetics. In 2008, the organization recognized her outstanding service and leadership to the dietetics profession with its Medallion Award. In 2011, she was inducted into the UK HES Hall of Fame.

“I haven’t had too many dull moments,” Breeding said. “I consider myself lucky, because I’ve had opportunities, and I’ve worked with great people.”

In 2006, Breeding and longtime friend, HES alumna Marianne Smith Edge, BS '77, created the Breeding-Smith Edge Scholarship, benefiting students pursuing a dietetics internship with a focus in business and consultation.

“You don’t have to be perfect,” Breeding tells students. “You should take a look at your strengths and weaknesses and what you really want out of life, then go for it.”

— Carol Lea Spence

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Total Gifts:	5,419
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Total Giving:	\$208,099
Total Gifts:	1,514
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Total Giving:	\$6,525,971
Total Gifts:	6,933
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NRES Academy: Endow Opportunity



Josh Baker, 15, of Dema in Knott County, didn’t know about the possibilities available in agriculture and natural sciences until his seventh grade science teacher and a librarian at Beaver Creek Elementary suggested he apply for UK’s Natural Resources and Environmental Sciences Academy.

With support from former Knott County 4-H agent Jim Phelps, Josh was accepted into the academy, and this summer the now high school freshman will be a member of its first graduating class.

“If it weren’t for the academy I probably would not be interested in science,” Baker said. “I never really enjoyed it, until I was in this program.”

The academy accepts 16 seventh-graders from eight Eastern Kentucky counties each year with the goal of exposing them to opportunities available in their own backyard.

“We chose this age group because studies show this is when students make career choices,” said David Ditsch, director of the academy and UK’s Robinson Center for Appalachian Resource Sustainability. “Robinson Forest is a 10,000-acre controlled research forest; the students learn in one of the most unique settings in the nation.”

Each year of the three-year academy, the scholars spend three days in the forest learning about the Appalachian environment. They also attend quarterly daylong field trips, culminating with a graduating experience. Last year’s experience was to Glacier National Park, Flathead Lake, and Yellowstone National Park.

The academy began through a 4-H₂O Water Quality grant. The plan is to establish a \$1.25 million endowment to fund future programs, which annually cost \$50,000.

Melissa Baker, Josh’s mom, said the academy has greatly benefited her son.

“The academy has helped him to mature and opened his eyes to the job opportunities that are available in agriculture and natural resources and helped him realize what a good place he’s growing up in,” she said.

For more information on donating to the academy’s endowment, contact Marci Hicks, UKAg director of development, 859-257-7200 or marci.hicks@uky.edu.

Over 400 endowed funds in the college

Awarded 440 students \$612,519 from
214 individual scholarships.


14 Kentucky area
alumni association chapters

Total annual Ag & HES Alumni
Association members: 546

Total lifetime Ag & HES Alumni
Association members: 2,423

Total College of Agriculture, Food and
Environment graduates: 23,228

Living College of Agriculture, Food and
Environment graduates: 18,520




.....short rows

Pick a Peck of Pectin

It's summer, which means fruits galore and jams bubbling on the stove. Ever wonder what makes them gel? Pectin in the fruit reacts with added sugar and forms insoluble fibers. The mesh-like fibers hold liquid like a sponge and form a gel. The more pectin, the thicker the gel. Sandra Bastin, chair of Dietetics and Human Nutrition, says slightly under-ripe fruit contains more pectin than fruit that's too ripe, so at least one-fourth of the fruit in a recipe should not have reached its peak. Commercial pectin is sometimes added to fruit to sustain a stable gel.

Read more about canning and making jams:
www2.ca.uky.edu/hes/fcs/factshts/FN-SSB.110.pdf



Factors Figure In

Successful farmers know their soil. They know not all soils are equal, and their individual properties are important factors in efficient nutrient management for crops. Different soils have different drainage properties, which can directly affect recommendations for nitrogen fertilizer. And some soils naturally contain higher levels of potassium and phosphorus, so crops may not require a supplemental fertilizer at all. Your local extension office can help with soil tests.

Read more about nutrient management: www2.ca.uky.edu/agc/pubs/agr/agr1/agr1.pdf

Lilliput Love

Butterflies are particular, it seems. Given their choice of four common zinnia cultivars, twice as many butterflies visited 'Lilliput' than any of the others, in a study conducted by college entomologists Ken Yeargan and Sarah Colvin. And not only were the numbers of visiting butterflies greater, but more overall species visited 'Lilliput'—27 to be precise. 'Lilliput' is an heirloom zinnia dating from the 1870s, but the seeds are still available today.

Read more about butterflies and zinnias:
www2.ca.uky.edu/entomology/dept/images/09yearganzinnia.pdf



STEPHEN PATTON

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Living Green

In the winter, we can keep the thermostat low by throwing on an extra sweater or blanket, but there's only so much we can legally take off when summer heats up. Air conditioners start to blow away our savings and good intentions. Ashley Osborne, of UK's Environmental and Natural Resource Issues Task Force, says don't despair. Living green in the summer is still possible. Reduce heat by closing curtains on south- and west-facing windows during the day. And a ceiling fan creates a bit of a wind chill effect causing a room to feel up to 4 degrees cooler.

Read more about living green:
www2.ca.uky.edu/agc/pubs/henv/henv706/henv706.pdf

Sun Safe

Nothing feels better than basking in the warmth of the summer sun. It's the ultraviolet rays that warm our skin, but it's also those rays that can damage it too. Nearly half of all cancers diagnosed in this country are skin cancers. So take steps to take care, says Kim Henken, Family and Consumer Sciences. Limit the time spent in the sun between 10

a.m. and 4 p.m., use sunscreen, seek shade, dress in light-colored, firmly woven clothing that will block the rays, and wear a hat and sunglasses to protect your eyes.

Read more about staying safe in the sun:
www2.ca.uky.edu/hes/fcs/nepieces/July/July_news_1.htm



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