

THE UNIVERSITY OF TENNESSEE INSTITUTE OF AGRICULTURE

LAND, LIFE & SCIENCE

SPRING/SUMMER 2017

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EVERY DROP COUNTS

Finding solutions to the looming water crisis

Real. Life. Solutions.™

UTIA INSTITUTE OF
AGRICULTURE
THE UNIVERSITY OF TENNESSEE

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SUMMER 2017

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The UT Institute of Agriculture provides instruction, research, and public service through the UT College of Agricultural Sciences and Natural Resources; the UT College of Veterinary Medicine; UT AgResearch, including its system of ten AgResearch and Education Centers; and UT Extension with its offices in every county in the state.



Greetings From Our Chancellor

A WORD FROM TIM CROSS

Spring and summer signify a time of new beginnings and renewal, as our newest graduates receive their diplomas and our many agricultural crops across the state begin to thrive. I've always enjoyed this time of year, especially this visual reminder of the impact the University of Tennessee Institute of Agriculture has on so many lives. Our field day season is in full swing, reminding us of the role the Institute has had for more than a century in helping producers achieve their goals. Whether it's the results of our faculty research and education, our Extension work in communities, our state-of-the-art veterinary care, or our international outreach, we provide Real. Life. Solutions. every day.

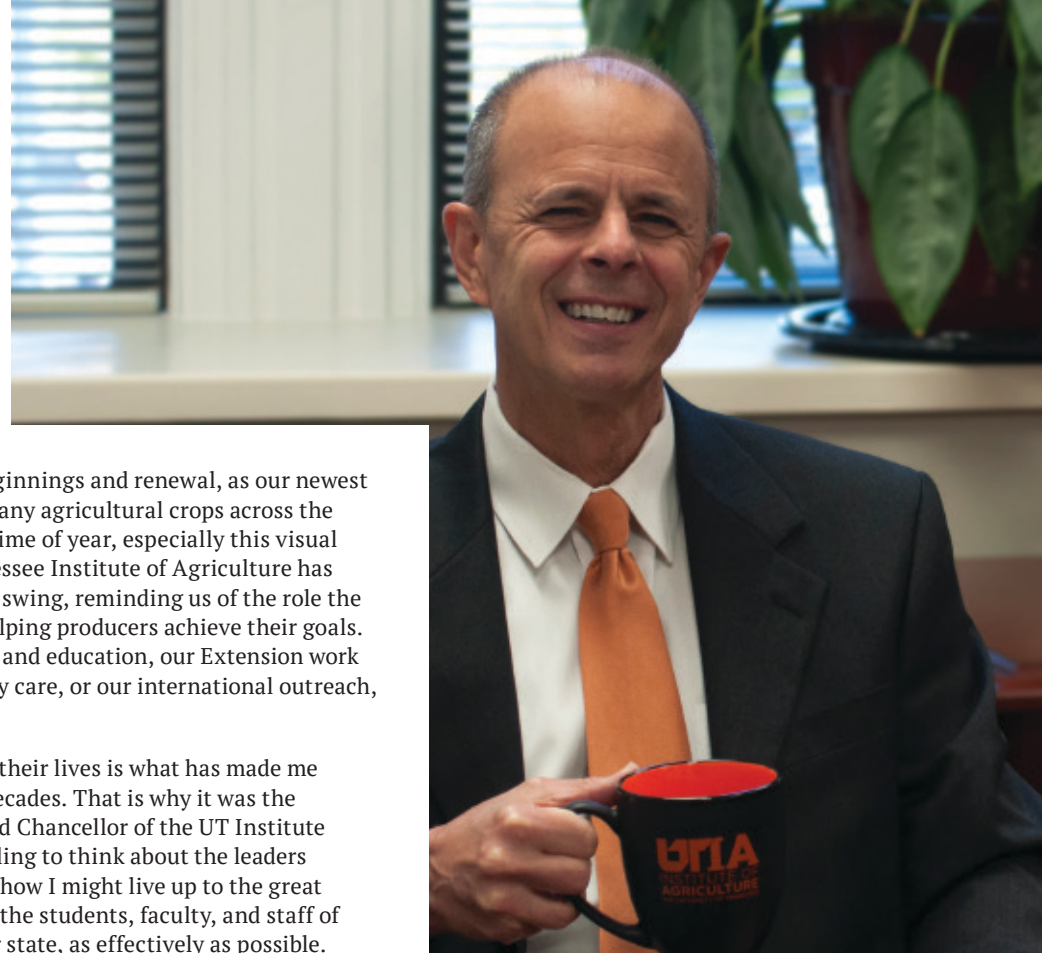
The Institute's passion to help people advance their lives is what has made me deeply proud to work here for more than two decades. That is why it was the greatest honor of my career to have been named Chancellor of the UT Institute of Agriculture earlier this year. It is very humbling to think about the leaders who have been in this position prior to me and how I might live up to the great expectations they have set. My goal is to serve the students, faculty, and staff of UTIA, along with the many stakeholders in our state, as effectively as possible.

To that end, we will be working on a ten-year strategic plan over the next months. The goal is to determine how we can best meet our stakeholders' needs. We are looking for input from all of our constituents as we create a vision for UTIA's role in the decade ahead, so don't hesitate to share your thoughts. Our Institute is focused on conserving and enhancing our many resources to provide the best life possible to all Tennesseans and beyond.

It is appropriate then that this issue of *Land, Life & Science* explores one of our most precious resources—water. Without water, we cannot survive and neither can the life systems we depend upon. Our researchers, specialists, and partners are engaged in ways to keep our water supply abundant and clean. Our students share their commitment, with some preparing to focus on water sustainability in their careers ahead.

Again, thank you for the privilege to serve as your new Chancellor. I am truly humbled and honored to take on this role for such an esteemed group of individuals who dedicate their lives to advancing agriculture.


TIM L. CROSS
Chancellor



 **Tim Cross** @UTIAChancellor · Jun 12
Enjoying my favorite @CruzeFarm vanilla with @ImHannahh. A great #Inmagicmoments on a sunny afternoon. @UTIAg Real. Life. Solutions.



 Follow me on Twitter!
@UTIAChancellor

AROUND UTIA

INSPIRATION FOR SPRING GRADUATES

A high-achieving graduate of the Department of 4-H/ Agricultural Leadership, Education and Communications was one of two commencement speakers addressing spring graduates of the College of Agricultural Sciences and Natural Resources. Joining Isaac Bennett ('84) at the podium was food science senior Jourdan Jones. Bennett is vice president of capital markets for Farm Credit Bank of Texas. The bank and its lending cooperatives are the single largest rural lending network serving Alabama, Louisiana, Mississippi, New Mexico, and Texas.

"You have chosen an honorable profession," Bennett told the 190-plus graduates. "It's from the College of Agricultural Sciences and Natural Resources that we feed, clothe, and in some cases heal the world. Many things can be replaced; however, we all have to eat—it's the common bond that binds every nation. No one produces food more efficient and safer than the American farmer."

For UTCVM's hooding and commencement ceremony, Dr. Joe Bartges, former faculty member and Small Animal Clinical Sciences interim department head, returned to campus as the invited speaker. During the ceremony, the College presented distinguished alumni awards to Major Chad Black (CVM '04, CEM '10), Dr. Marisa Shulman (CVM '09), and the late Dr. Penelope "Penny" Iannacone (CVM '05).

UT President Joe DiPietro conferred the degrees of Doctor of Veterinary Medicine during the ceremony. "At the University of Tennessee, we do three things: we educate, we discover, and we connect across the state," DiPietro told the audience. "Veterinarians are problem solvers."



 TINY.UTK.EDU/BENNETT

CELEBRATING AGRICULTURE & UT AT LEGISLATIVE PLAZA

The Institute was front and center in Nashville for two important events this spring—UT Day on the Hill and Ag Day on the Hill. These annual happenings showcase UT's impacts on the state's economy and welfare. At UT Day on the Hill, the Center for Agriculture and Food Security and Preparedness (CAFSP) represented UTIA with the theme of national security. Overseen by director Sharon Thompson, its mission is to ensure the safety of our food supply. Associate director Sheri Pugh showed legislators the potential dangers in various food preparation scenarios.

At Ag Day on the Hill, legislators, along with Governor Bill Haslam, learned more about how UTIA's land-grant mission touches every aspect of our lives. Each of the Institute's units was represented, as were 4-H students who were recognized during the Ag Committee meeting. Chancellor Tim Cross also addressed the committee.



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TINY.UTK.EDU/BEES

BUZZED ABOUT BEES

Researchers with UTIA found the overall health of honeybees improved in the presence of agricultural production, despite the increased exposure to agricultural pesticides.

The finding comes from a study published in a recent issue of the *Journal of Economic Entomology*. The researchers evaluated

the impacts of row-crop agriculture, including the traditional use of pesticides, on honeybee health. Results indicated that hive health is tied to the presence of agriculture, while the colonies examined in a nonagricultural area struggled to find adequate food resources and produced fewer offspring. Read more at tiny.utk.edu/ag/bees.

MAGIC MOMENTS PODCASTS HIGHLIGHT AGRICULTURE IN TENNESSEE

Big or small, agriculture touches every moment in our lives. The goal of the TN Magic Moments campaign is to highlight agriculture’s influence in everyday moments. And now, you can listen to some of those highlights thanks to a series of podcasts that remind us how agriculture touches our lives and what the future holds for the industry in Tennessee. Tune in to learn more about topics such as careers in modern agriculture, horticulture tips and tricks, and events such as the Wilson County Fair, among others.

The **TN Magic Moments** podcast is available on iTunes, Soundcloud, or wherever you get your podcasts. Follow us @TNMagicMoments on social media.



TINY.UTK.EDU/SEVIERFIRERELIEF

UTIA UNITES TO ASSIST FIRE VICTIMS

The heartbreaking situation caused by the wildfires that ravaged East Tennessee in October and November led to quick responses by members and units of UTIA. The many ways our people have contributed shine a light on the diversity of the Institute's expertise and resources, and also makes clear our unity in assisting others. Among our efforts was the development of a website by UT Extension's Department of Family and Consumer Sciences that compiled resources to assist people struggling with how to find information: tiny.utk.edu/ag/recovery. Veterinarians with UTCVM aided animals injured by the fires, and UTIA and Tennessee 4-H continue to collect gift cards for victims of the Smoky Mountain fires. Forestry students, pictured, who were studying prescribed burning gained firsthand experience as they worked to control a fire at a unit of the Forest Resources AgResearch and Education Center. CASNR led a donation drive on the UTIA campus that quickly overflowed with clothing and food, and the dean's office sent out a call to any students affected by the fires asking them to alert the office about their situation and needs.

MILLION DOLLAR MILES

A detailed analysis conducted by AgResearch experts determined that the combination of aquatic recreation and waterfront property along the Tennessee Valley Authority’s managed river system creates \$11.9 billion in annual economic impact—the equivalent of \$1 million per shoreline mile. In addition, the TVA-funded study estimated that TVA’s forty-nine reservoirs support about 130,000 jobs annually.

The study was performed by a team of scientists from the Department of Forestry, Wildlife and Fisheries and the Department of Agricultural and Resource Economics, including Neelam Poudyal, an assistant professor of natural resource policy, and Burton English, Kim Jensen, and Jamey Menard, all members of the UTIA Agri-Industry Modeling & Analysis Group. AIM-AG is well known for performing economic impact evaluations for industries and government entities. Several graduate and undergraduate students also took part.



TINY.UTK.EDU/WATERWAYS

WILDFIRE RESEARCH UNDERWAY

After the devastation caused by the Smoky Mountain wildfires, it’s no surprise that research and teaching at UTIA will focus on the fire’s impacts and aftermaths.

Students of forestry associate professor Jennifer Franklin were in the lower elevations of the Smokies to take samples of the cambium layer of rhododendrons. They found sufficient damage to indicate that many of the dense, woody shrubs will die back then grow again from the live roots.

Forestry master’s student Matthew Aldrovandi (BS forestry, natural resource management ’15), pictured, says, “Most woody plants in the state are fire-adapted. Fire is a normal part of most ecosystems.”

Franklin says there’s a silver lining to the temporary thinning of rhododendrons: watch for greater numbers of wildflowers in the clearings when you visit.

Meanwhile, forestry MS students Coy Blair and Jessica Giacomini, working under the guidance of faculty members Joseph Clark and Lisa Muller, used GPS collars already fitted on eight American black bears to track their responses to the fires. Data analysis found no difference in movement among bears in the fire areas and those outside the fire areas. Theirs is the first study to evaluate how black bears in the Southeast respond to wildfire.



PARTNERING TO ADVANCE FINANCIAL LITERACY

The SunTrust Foundation has approved a \$75,000 grant to grow UT Extension's On My Own financial literacy program in Tennessee. UT Extension's Department of Family and Consumer Sciences, a part of UTIA, has been dedicated to supplementing financial literacy in Tennessee's schools for more than a decade. Its simulation-based program currently reaches more than 30,000 middle school- and high school-age children in approximately 275 schools.

“Building strong communities and partnering with organizations that align with SunTrust’s purpose of Lighting the Way to Financial Well-Being is a fundamental goal of the SunTrust Foundation. We are honored to partner with UTIA to help grow the On My Own financial literacy program,” says David Fuller, president of the SunTrust Foundation. “This unique program provides middle school- and high school-age children with the tools and skills they need to become financially confident later in life.”



FOOD SCIENCE'S GOLDEN NOW ASSISTING UT PRESIDENT

Longtime professor David Golden of the Department of Food Science has left the Institute to serve as executive assistant to UT President Joe DiPietro. At UTIA, Golden was held in very high esteem—as a high-achieving professor of food microbiology, as a respected colleague, and as an inspiration to hundreds of our students. He was also a faculty member of the UT Board of Trustees and former president of the UT Knoxville Faculty Senate.

Reflecting on his changing roles, Golden says, “I spent twenty-three wonderful years in the Department of Food Science, and I worked with some amazing people throughout the Institute of Agriculture. I never went to work a single day reluctant to face the day ahead. I am particularly fond of all the interactions I had with students, both in class and through advising.” In his new position, Golden now is serving students in a different way, as he serves the entire UT System.

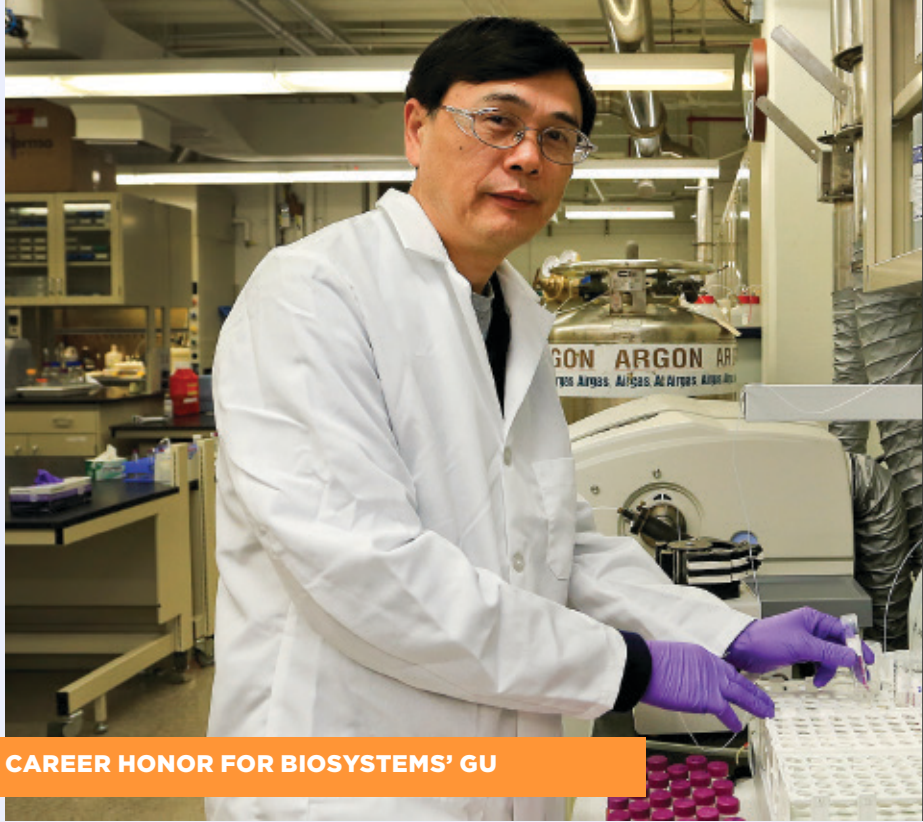


GROWING STEM THROUGH HYDROPONICS

Institute educators have received a two-year grant from the US Department of Agriculture’s National Institute of Food and Agriculture (USDA NIFA) to model how schools can use soilless vegetable growing systems to produce vegetables like bibb lettuce in controlled environments. The hands-on experience aims to enhance student learning in chemistry, biology, and agriculture science and open the eyes of youth in urban and suburban areas to the many opportunities in these fields and the breadth of studies they offer.

Natalie Bumgarner, an assistant professor and UT Extension specialist in the

Department of Plant Sciences, along with Jennifer Richards, Carrie Stephens, and Daniel Sarver of the Department of 4-H/ Agricultural Leadership, Education and Communications, will lead the Tennessee-based project to develop a curriculum and professional development products that teachers can use to encourage students in grades nine through twelve to pursue food, agriculture, natural resource, and human science (FANH) careers, with emphasis on engaging, hands-on learning.



CAREER HONOR FOR BIOSYSTEMS' GU

For his contributions to his profession, Biosystems Engineering and Soil Science professor Baohua Gu has been inducted as a fellow of the American Association for the Advancement of Science (AAAS). The AAAS Council elects fellows whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished. He was one of four scientists chosen for the honor.

Gu holds a joint appointment as a distinguished senior scientist at Oak Ridge National Laboratory. He is being honored for his achievements in environmental sciences research and technology development. Gu's specific impacts recognized include his work involving biogeochemical transformation of contaminants, trace metals, and natural organic matter in natural water and soil. He has authored more than 250 publications relating to environmental science and pollution, including mercury, uranium, and soil organic carbon transformations.

17 YEARS OLD & A DEGREE IN HAND

Kristina Kravchenko was one of the two top graduates of the College of Agricultural Sciences and Natural Resources this spring—but that’s not even her most amazing feat.

A Knoxville native, Kristina graduated with her bachelor’s degree at seventeen years old. Records indicate she’s one of the youngest UT graduates ever.

She majored in animal science and has gained additional hands-on experience with animals through her job as a kennel technician at Ideal Veterinary Hospital

in Oak Ridge, Tennessee. “I would like to work with large animals,” Kristina says. “Engaging in something active that involves physical activity and hands-on learning has also always interested me.”

Despite being younger than her fellow students, Kravchenko doesn’t think her college experience was much different than theirs. “The most challenging part of being in college at such a young age was not being able to drive or have a job until I was sixteen years old,” she says. “Otherwise, I wouldn’t know if I missed out on anything because I have nothing to compare it to.”



A PEEK INSIDE VETERINARY MEDICINE

Every spring, students in the UT College of Veterinary Medicine host an Open House for the community. The day is wildly popular, and this year drew more than 5,000 community members. While always fun, there’s also learning for children, for adults, and for potential

veterinary students. This year’s theme was “If the Shoe Fits,” representing the variety of shoes veterinarians fill and the roles they play in many industries and in government. Next year’s event will be Saturday, April 7.



TINY.UTK.EDU/TLLSGARDENSGALA

A BEAUTIFUL BENEFIT FOR THE GARDENS

This spring's fifth annual Gardens Gala hosted the largest crowd in the history of the event. More than 300 people gathered at the UT Gardens in Knoxville to enjoy wonderful food and fellowship in support of the important therapeutic gardening programs offered in our community to children, adults, and seniors. Sherri Lee was this year's honorary host for the gala themed "Gardens Legends—Rooted in Tradition." Lee is a well-known Knoxvillean, supporter of UT, and member of the Knoxville Garden Club. The Gala honored the Club for its rich history in beautifying our area. The wonderful food was a collaborative effort of the students of the Culinary Arts program at Pellissippi State Community College and the senior class of the UT Retail, Hospitality, and Tourism department.

UTIA RESEARCHERS CENTRAL TO TENNESSEE AG ANALYSIS

Seven UTIA Agricultural and Resource Economics faculty made key contributions to the Economic Report to the governor of Tennessee. The report provides Governor Bill Haslam and his administration with an in-depth analysis of how Tennessee's economy performed over the past year and how those economic indicators compare to recent and historical trends.

Burton English, Andrew Griffith, David Hughes, Kimberly Jensen, Jamey Menard, Aaron Smith, and Edward Yu of the Department of Agricultural and Resource Economics assisted with the report. Among the findings were a number of positive economic indicators for Tennessee's rural economy, especially in relation to the Governor's Rural Challenge

Recommendations for Tennessee Agriculture. Positive indicators reported progress in a number of areas, including increased productivity of agricultural lands, building on farm storage capacity, growth in economic activity from farming and associated activities, and increased numbers of graduates from four-year agricultural degree and Master Producer programs. ■

FROM 4-H TO GRAD SCHOOL, WE HELP STUDENTS EXCEL.

Children and college students. STEM learning and Extension studies. 4-H projects and industry insights. You'll find these combinations in the Department of 4-H/Agricultural Leadership, Education and Communications.

What else do these pairs have in common? They show the diversity of a department that prepares youth and young adults to be outstanding leaders, citizens, and employees.



Learn how 4-H grows our future at 4h.tennessee.edu.

Discover the ways ALEC equips students for success at ag.tennessee.edu/ALEC.



UT President Joe DiPietro (right) congratulates Chancellor Tim Cross at a reception in Hollingsworth Auditorium.

 [TINY.UTK.EDU/MEETDRCROSS](https://tiny.utk.edu/meetdrcross)

MEET TIM

In December, UT Extension Dean Tim Cross was appointed Institute chancellor. For those of you who have not met him, we'd like to offer an introduction. With eight months now under his belt, we sat down with Tim to get his impressions of his new job and thoughts about the future.

What was it like being appointed chancellor?

I'm honored and humbled, with capital H's in both cases. These first few months have been such an opportunity to deepen my knowledge of UTIA through working with our leadership team, our faculty, our staff, and our agents, both on campus and across the entire state.

What have your first eight months been like?

I have gained a much better appreciation for the scope and breadth of our work. I've learned about the excellent care provided to animals in our Veterinary Medical Center, the strong alumni network that supports our CASNR students and graduates, the cutting-edge, multidisciplinary research that takes place at our AgResearch facilities, and I've even seen more examples of the ways that our Extension programs benefit our youth, families, and communities. Meeting donors, exploring new partnerships, and serving on the University's senior leadership team have all been great learning experiences.

How deep are your roots with UTIA?

I arrived as an Extension specialist in agricultural economics twenty-three years ago. In that position, I focused on Tennessee's livestock and forage sector, one of the largest segments of our state's agricultural industry. It was a great introduction to the many individuals and businesses connected to it.

This led to my appointment as assistant dean of agriculture and community economic development with UT Extension. And in 2008, I had the honor of being chosen as dean of UT Extension. My time as dean gave me new experiences, both with our agents and staff in all ninety-five Tennessee counties and with citizens from all walks of life: all the people and agencies served by Extension. Last fall, upon Chancellor Larry Arrington's retirement, I was appointed interim chancellor. In all of these roles, I witnessed the positive impacts of our Institute.

Did you grow up on a farm?

Not precisely. We lived in the heart of New York's dairy region and our home was surrounded by a dairy farm. As a child, I

enjoyed riding with the farm crew as they plowed the cropland, planted corn, and spread manure. This was really the start of my interest in animal agriculture. Since we've lived in Knoxville, my wife, Denise, who is a former 4-H'er, has raised sheep, and our four children grew up as active members of UT Extension's 4-H program showing sheep and horses. I like to tell people my whole family is a product of 4-H and the land-grant system.

What are your thoughts on the mission of UTIA?

The Institute must serve a diverse state, with programs and resources tailored to all residents and based on local needs. The Institute has been active in the Governor's Rural Challenge and "Drive to 55" initiatives, as well as the Governor's Rural Task Force. All of these have given the Institute perspective and insight on key issues. With that in mind, I see both needs and great opportunities ahead for our agricultural industry.

What are the needs and opportunities you see?

Today's much lower prices for many agricultural commodities and goods challenge Tennessee producers to do everything they can to remain profitable. This includes lowering costs of production to increasing revenues through improved marketing or diversification of farming operations. Consumers today are very attuned to where their food comes from and how it's produced. For farmers and producers, this means potential to add value to their crops or livestock through marketing their farms and products in new ways, such as agritourism or educational activities. Many Tennesseans are also rediscovering the rich and abundant natural resources our state is blessed with, as they spend time enjoying our forests, lakes and rivers, and mountains. These new endeavors will involve all of the Institute's faculty and staff, whether it's related to health, economics, or the environment.

Other thoughts?

I am continually reminded that we enjoy shade today provided by trees planted many years ago by those who preceded us. We should always honor the past, while also striving to plant the trees that future generations will benefit from. I can't imagine a better brand promise for us than Real. Life. Solutions. It's who we are, what we do, and where we're headed. ■



HORSES, LIVESTOCK, STUDENTS, PRACTITIONERS, PRODUCERS & MORE

THIS UTCVM DEPARTMENT WORKS WITH THEM ALL.

Cattle, horses, sheep, goats, pigs, camelids. Just a few of the species faculty in the UTCVM Large Animal Hospitals treat.

In the unit's four hospitals, specialists along with students provide top-notch referral service, routine care, emergency care, and herd disease outbreak investigations for owners of horses and livestock.

The faculty of the Department of Large Animal Clinical Sciences are dedicated to providing the most up-to-date care for large animals, continuing education for the community and practicing veterinarians, and advancing discovery to serve the citizens of Tennessee and beyond.

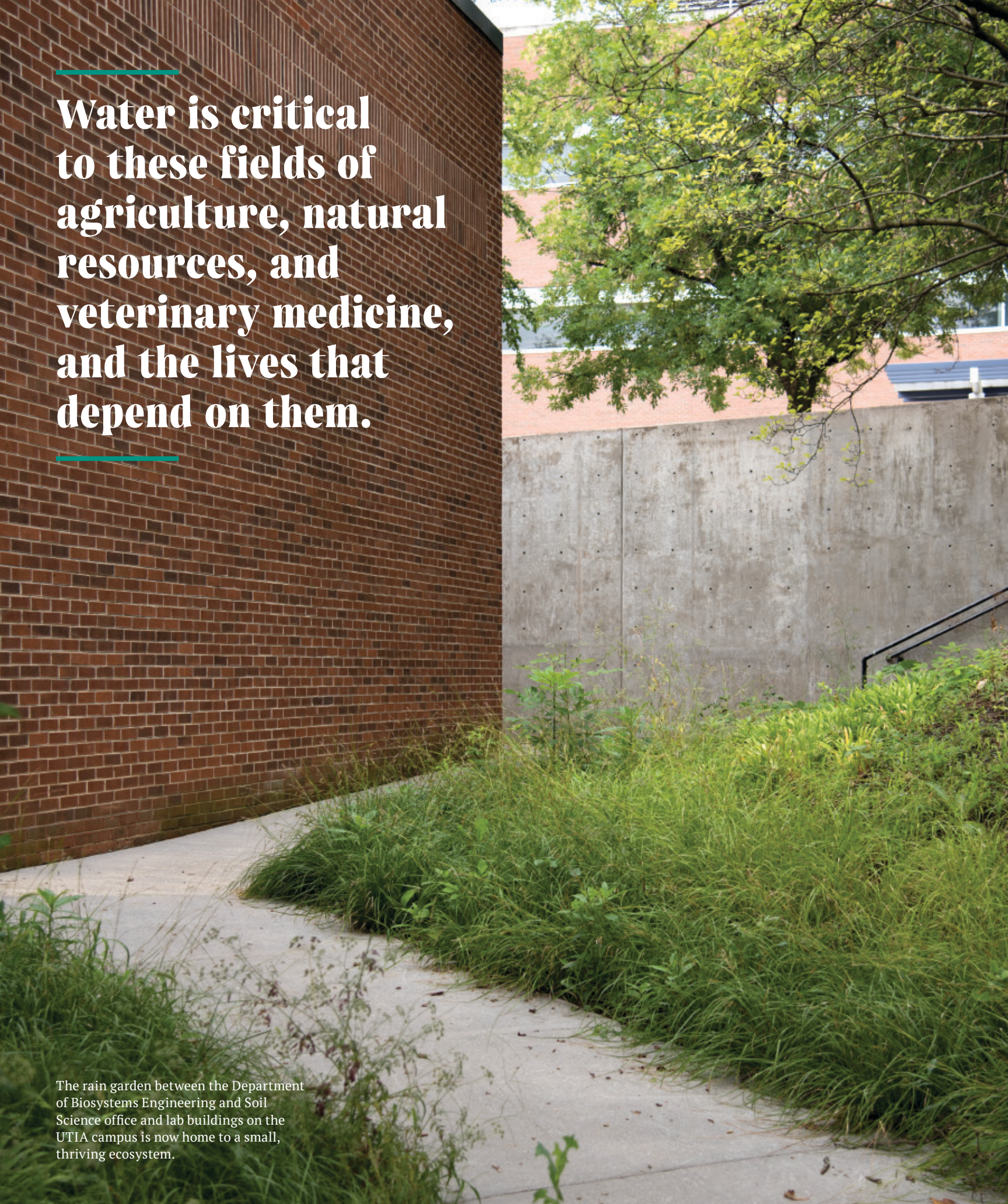
Learn more about Large Animal Clinical Sciences
at tiny.utk.edu/vetmed/lacs.

Visit vetmed.tennessee.edu/vmc to see the vast array of
medical services provided in the Large Animal Hospital.

EVERY DROP COUNTS

*UTIA faculty, staff, and students work toward solutions for
managing one of our most critical resources.*





Water is critical to these fields of agriculture, natural resources, and veterinary medicine, and the lives that depend on them.

The rain garden between the Department of Biosystems Engineering and Soil Science office and lab buildings on the UTIA campus is now home to a small, thriving ecosystem.

ALAWN MOWER, a hot summer's day, and a weekend warrior. Add up these common activities and you have the perfect conditions for dehydration. When people exercise vigorously or engage in heavy yard work during hot, humid weather, especially when not accustomed to physical activities, trouble can come in the form of water loss. By the time you feel thirsty, you are already dehydrated, and without replenishment to our bodies made of 50 to 65 percent water, the result can be life-threatening.

When water is scarce in the environment around us, we also face serious risk. For agriculture, droughts, crop failures, and hay shortages add up to economic challenges for producers and can hit everyone in the pocketbook. Globally, low water resources can trigger food shortages, hunger, and widespread famine, particularly in developing nations.

In sum, the threat of lack of water constitutes problems for us all.

CLOSE TO HOME

Here in East Tennessee, ringed and laced by rivers, lakes, and reservoirs, it's hard to imagine what it is like to experience severe water shortages. Yet last autumn, it was an absence of adequate rainfall combined with years of accumulated forest debris and strong winds that led small fires to explode into massive ones sweeping the Great Smoky Mountains. These unexpected flames took the lives of at least fourteen people, burned more than 10,000 acres, and displaced some 14,000 area residents and tourists. The fires and their aftermath have come to be regarded as one of the largest natural disasters in the history of the state.

Conversely, too much water can cause problems of its own, and some you may not expect. In West Tennessee, UT Extension experts are working with citizens to reduce nutrient loads flowing into the Mississippi River. Tennessee is but one state engaged in efforts like this, to reduce the causes of what is referred to as the Gulf Dead Zone. Agricultural runoff across the region is a problem, as you might expect, although Tennessee production land fares far better due to the adoption of no-till agriculture, a conservation approach long backed and advanced by UTIA.

What you may not realize is that the Dead Zone can trace back to you, personally, or your neighbors. Some of the nutrients that help make your lawn lush? They're part of the problem. So are elements of detergents used in washing cars. A bigger culprit is our tendency to overbuild and overpave our environment. In episodes of flash flooding, heavy rains have nowhere to go but into often inadequate stormwater systems. This, in turn, can flood into waterways before treatment and in some cases, overflow sewage treatment plants.

WATER, WATER EVERYWHERE?

Awareness of issues like these and the desire to ameliorate them are guiding faculty and students at the University of Tennessee Institute of Agriculture to

dedicate their education and life's work to finding solutions to a looming water crisis.

Whether it's a desire to safeguard our water supply, conserve water resources, or improve the health of river systems, even entire watersheds, you can find students in the College of Agricultural Sciences and Natural Resources (CASNR) who understand that water availability is crucial. Their interests span the economics of forage production to the health of livestock; the sustainability of wildlife populations to the biodiversity of streams; to water for forests and soil productivity; to the impacts of microclimates on vector development. Water, as in life, is critical to these fields of agriculture, natural resources, and veterinary medicine, and the lives that depend on them. Water touches us from so many directions.

For DeVone Coleman, a passion for soil science drew her into water issues. DeVone received a degree in environmental and soil science this spring, graduating with a concentration in conservation agriculture and environmental sustainability.

"My first love was soils and environmental health. I began realizing the importance of protecting the integral relationship that exists between the soil and water as it relates to water security and sustainability."

DeVone put that concern into action. During her time as a student, she interned as an assistant to Garrett Ferry, UT's stormwater management coordinator.

As Ferry (BS plant and soil sciences, '05) sees it, water sustainability starts at home. Ferry launched and now directs water conservation efforts on campus. These include the construction of campus rain gardens, such as one installed between the office and lab buildings of the Department of Biosystems Engineering and Soil Science (BESS). CASNR students helped build the gardens. Also, under his stewardship, UT is one of the first universities to commit to every new building having a roof system that captures the first inch of rainfall that occurs and keeps it on the site, through use of nearby green spaces.



TIPS FOR WATER CONSERVATION:

- If rain is near, delay running sprinklers.
- Choose native plants for your landscaping.
- Build a rain garden.
- Add rain barrels.
- Turn off the faucet while you brush your teeth or wash dishes.
- Wash vehicles and pets in the grass.
- Choose reusable water bottles and cutlery.

Visit tiny.utk.edu/savewater to learn the reasons why.

PICTURED: DeVone Coleman and Garrett Ferry in one of the flourishing rain gardens they implemented on campus.



A HEART FOR WATER VOLUNTEERISM

Water and environmental issues are what brought together students from diverse disciplines to found the UT Hydrolunteers organization. Part of their aim was to cross-pollinate understanding of resource issues. Another was to engage in monthly service projects, such as teaching about water issues to schoolchildren and participating in beautification efforts.

Jeffrey Collins-Key is a rising senior forestry major studying resource management. He attended a Hydrolunteer meeting to listen to a speaker discussing different methods used to monitor climate change and patterns that can be viewed by satellite. He says he sees intersections with his studies.

“I plan to do a watershed minor for my master’s study. My main interest is to understand how soil moisture and the water table dictate the behavior of fires; certainly, they’re a contributing and major factor.”



“When I think of the future, these are among the issues that pop out for me. It’s what I want these students to take away from the course—a thoughtfulness of how water connects to everything and a feeling of responsibility for its careful use, both personally and as a community, nation, and globally connected world.”

**- JOANNE LOGAN, ASSOCIATE PROFESSOR,
DEPARTMENT OF BIOSYSTEMS
ENGINEERING & SOIL SCIENCE**

“Without actions like creating rain gardens or capturing water runoff from roofs, without allowing water to filtrate underground, we’re essentially creating deserts underneath us. We need to be more efficient in the way we do things and more conscious of the impacts of our actions,” Ferry says.

ONE OF OUR GRANDEST SOCIAL CHALLENGES

Chancellor Tim Cross calls water availability one of the grand social challenges. “It’s often difficult to agree on the most important issues we face, but one that we can all agree on is water. It is critical for our farms, our families, and our environment, and there’s no doubt it will be a priority for the Institute’s teaching, research, and Extension programs as we look ahead to finding solutions to these issues.”

Jennifer DeBruyn saw the challenge firsthand. In 2012, she was one of an international team of scientists tasked with assessing sources of harm and routes

to recovery of China’s Lake Taihu, a source of water for more than 12 million people.

“China provides a unique opportunity to test ideas and management efforts in highly polluted and nutrient-enriched lakes that we predict we will see in North America in the coming decades,” says DeBruyn, an associate professor in BESS.

Forbes Walker, also an associate professor in the department, heads a \$4.9 million, five-year study funded by the USDA that proposes to model how changes in temperature, droughts, and flooding will affect land use in the Tennessee and Cumberland River basins. The study is also examining how changes in industrial and consumer demand for the water will affect its quality and availability for agricultural uses. Reflective of its importance, the project includes members of public and private entities across the state and researchers from other colleges and universities.

It was the health of a waterway that prompted a dozen students of Brad Collett, associate professor of landscape

architecture, to take to canoes to paddle 1,157 miles of the Tennessee River, stretching across four states. Their trip, which they completed in five days, was to understand the influences and impacts on the river system.

“It is unmistakable that the Tennessee River system and its watershed are the lifeblood of the region,” says Kenny Townsend. Townsend, a student in the College’s Master of Landscape Architecture program, adds, “The river system, much like any organic circulatory system, is a mode of transport, distributing sustenance and removing waste. The pulse and overall health can be measured by its water quality. In the case of the Tennessee River system, we found that it exhibits its fragility.”

LINKS TO YOUR POCKETBOOK . . . AND HEALTH

Water for agriculture connects to us at the grocery store and at home. That crisp lettuce? Those glistening strawberries, fresh fruits, and produce? Much of it

depends on irrigation. And while the water used sustains plants, it also represents one of the most likely points of pathogen contamination, such as *E. coli*, during fruit and vegetable production.

The Plateau AgResearch and Education Center in Crossville is the site of field evaluations by a team of researchers, students, and Center technicians. Using sprinkler systems and test plots of cantaloupe, the team is working to identify best practices producers can adopt to lower the risks of contamination.

“Our research can also benefit trade organizations and regulators looking to set parameters and guidelines for these processes,” says Stuart Gorman (MS food science and technology ’14), a research associate in the department. “With water becoming more scarce, increasing water prices may make surface water sources a more popular option for growers. Moving forward, we will need to know how to safely and efficiently use our available sources of water so that we can continue to produce food that is safe and nutritious.”

THE LIFEblood OF A REGION

Drawing in part from UT students’ study of the Tennessee River, associate professor Brad Collett and students from the School of Landscape Architecture (above) released a book this spring that aims at empowering Southeastern Tennessee to protect natural resources.

HydroLIT: Southeast Tennessee Water Quality Playbook underscores the relationship between the quality of regional water resources—groundwater, streams, rivers, lakes, reservoirs—and urban, suburban, and rural systems. The book is intended to provide the region both a plan and toolkit for water quality challenges faced now and anticipated ahead.

To agricultural economist Andrew Griffith, the amount of rain livestock producers receive is a balancing point carrying risks on either side.

“Weather, such as drought and floods, is the one thing livestock producers have

THE HEALING POWER OF WATER

At the UT College of Veterinary Medicine, water is central to physical rehabilitation, conditioning, and weight loss of large and small animal patients.

The Equine Performance and Rehabilitation Center is home to a cold saltwater spa, and underwater treadmills can be found there, the Large Animal Hospital, and the John and Ann Tickle Small Animal Hospital. Among their benefits are decreases in acute inflammation, resistance and buoyancy during rehabilitation or conditioning, and excellent cardiovascular exercise. The goal of physical rehabilitation at UTCVM is to return animals, whether athletes or companions, to the highest level of function possible.



no control over in this business,” says the assistant professor. “Adverse weather events can impact producer management and marketing decisions.” Having to harvest forage in conditions of too much moisture, which we had this spring, can lead to lower nutrition and rot, forcing livestock producers either to purchase additional feed resources in the seasons ahead or make emergency livestock sales. Drought can have the same net effect, Griffith adds, with both drought and high rainfall leading to production challenges such as failure of cattle to breed or poor growth of animals. Those deficits hurt Tennessee’s beef industry, the number one driver of the state’s agricultural economy, and ultimately affect us all through rising beef prices.

Crops depend upon water, of course, and at the West Tennessee AgResearch and Education Center in Jackson, crop physiologist Tyson Raper is working to fine-tune one of the region’s key crops, cotton, and figure out how to sustain it during extended periods of low water availability.

“Given close to 95 percent of our cotton acreage is dryland, our drought stress work has focused on determining the drought tolerance of varieties and how incorporating cover crops can increase water infiltration and soil water holding capacity,” says the assistant professor of plant sciences. “A new partnership with the Natural Resources Conservation Service will allow us to look at the impact

of cover crops on crop water status in much closer detail.”

Dr. Sharon Thompson, associate professor and director of the Center for Agriculture and Food Security and Preparedness, has different concerns.

“Water sources can be contaminated accidentally or intentionally with chemicals or pathogens. Although the dilution effect of water can minimize the impact of this contamination, numerous studies have shown that contaminated water leads to public health illnesses.” The Center she directs prepares training and curricula for health inspectors, among others. Preparation for crises and crisis management is part of that.

It is from these diverse programs and perspectives that the Institute of Agriculture, its scientists, and students are probing water issues and acting to ensure we become better stewards, and more sustainable, in using this finite resource.

CLAIMING A BETTER FUTURE

Every year, as environmental scientist Joanne Logan teaches students in a Water and Civilizations course, she’s thinking of the future, as well as the present. The associate professor in the Department of Biosystems Engineering and Soil Science wants to prime students to be aware and knowledgeable of challenges connected to water ahead as civilization depends upon

sustained resources. Among the topics she teaches are groundwater overpumping; the human costs of effort spent gathering household water; and the great cost and infrastructure required to clean water to meet drinking standards. Logan asks the tough question about water justice: Is clean water a commodity or a basic human right?

“When I think of the future,” Logan says, “these are among the issues that pop out for me. It’s what I want these students to take away from the course—a thoughtfulness of how water connects to everything and a feeling of responsibility for its careful use, both personally and as a community, nation, and globally connected world.”

Logan and colleague Andrea Ludwig believe education about water needs to start at an early age at home, in primary schools, and through youth programs. Ludwig provides tools for STEM learning to 4-H teachers and, through them, reaches Tennessee youth.

“Our economy and quality of life benefit from a clean environment. Incorporating land and water stewardship in youth education creates a citizenry that values clean air and water resources and takes actions to protect the natural resources of our state,” Ludwig says.

“Water awareness is needed, and it is critical to everyone’s future.” ■

FEEDING THE FUTURE

UTIA team members help to facilitate sustainable agriculture in Rwanda





Rwandan farmers will soon be familiar with the volunteer spirit that makes up the University of Tennessee.

Earlier this year, a group from the UT Institute of Agriculture arrived in Rwanda to kick-start a small farmer initiative in partnership with USAID/Rwanda, Zamura Feeds Ltd., and the Africa Sustainable Agriculture Project Foundation (ASAP), launched by UT alum and former Tyson CEO Donnie Smith (BS animal science '80).

The US Agency for International Development (USAID) administers the US foreign assistance program, providing economic and humanitarian assistance in more than eighty countries worldwide. USAID's office in Rwanda has pledged a grant, which is being matched by ASAP, totaling more than \$1.7 million to develop the Feed the Future project, Tworore Inkoko, Twunguke, which means "Let's raise chickens for profit," in the nation's official language, Kinyarwanda.

Smith drew heavily from his corporate experience in the agricultural industry to assist with the sustainable economic model for the project. The project aims to provide 750 Rwandan smallholder farmers with the skills and tools to successfully produce broiler chickens. This was the first trip on the project for the UT team, led by UTIA's Office of International Programs. Their objective was to join with in-country partners on strategic planning and team building. Poultry husbandry training for farmers began this summer.

"This is really just the beginning," says Tom Gill, the Donald and Terry Smith Endowed Chair in International Sustainable Agriculture and director of International Programs. "We have the unique opportunity to impact the livelihoods and nutritional

"This is really just the beginning. We have the unique opportunity to impact the livelihoods and nutritional needs of low-income Rwandan families."

**– TOM GILL, DIRECTOR OF
INTERNATIONAL PROGRAMS**

needs of low-income Rwandan families. This project will allow us to develop a sustainable model of smallholder poultry production in northern Rwanda that will translate well to the Great Lakes region [of East Africa]."

The project will work to increase the income and improve the nutrition of rural Rwandan households through increased production of poultry and increased access to chicken meat as a vital dietary source of low-cost protein. The project is a three-year pilot located in the rural Musanze District of Rwanda, where the country's first commercial feedmill, Zamura Feeds Ltd., is located.

The project runs parallel to the government of Rwanda's Vision 2020, which aims to transform the country into a middle-income economy by 2020. Rwanda has experienced rapid economic growth and development over the past two decades but still faces the dual challenges of poverty and malnutrition. The National Institute of Statistics of Rwanda estimates that more than 40 percent of the population lives in poverty and faces the chronic challenge of malnutrition.

Explore more through a video about our team on the ground in Rwanda at tiny.utk.edu/ag/Rwanda. ■

The following UT faculty and staff traveled to Rwanda last winter to work on the initiative:

Tom Gill
Smith Chair & Project Director

Emily Urban
Rwanda Program Coordinator

Susan Schexnayder
Program Administrator
Department of Forestry, Wildlife & Fisheries

David Ader
Postdoctoral Scholar
UTIA International Programs

Amanda Kaeser
Postdoctoral Scholar
UTIA International Programs

Eric Bisangwa
PhD candidate
Natural Resources

Brynn Voy
Associate Professor
Department of Animal Science

Patsy Watkins
UT Extension Agent
Department of Family & Consumer Sciences

Lauren Vath
Director of Communications
UTIA Advancement

In addition, the following UT faculty are part of the project team:

Caela O'Connell
Anthropologist

Dayton Lambert
Professor
Department of Agricultural & Resource Economics

Mike Smith
Professor
Department of Animal Science

This article is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the University of Tennessee and do not necessarily reflect the views of USAID or the United States Government.

MAKING A DIFFERENCE IN TENNESSEE

EVERY DAY, THE PEOPLE WHO REPRESENT the University of Tennessee Institute of Agriculture provide Real. Life. Solutions. to many of society's most pressing problems. As Tennessee's land-grant university, our priorities focus on boosting our economy, protecting the environment, and enhancing health for humans and animals. Here are just some of the ways we make a difference.

I loved my time in 4-H in Dyer County. Through conferences like Congress and Round-Up, I was given the opportunity to meet many people across Tennessee and from other states as well. I still see some of those past 4-H'ers today. Also, doing all of those demonstrations and public speaking contests helped give me a great foundation for my job today as a meteorologist.

– Lelan A. Statom, WTVF-NewsChannel 5, Nashville



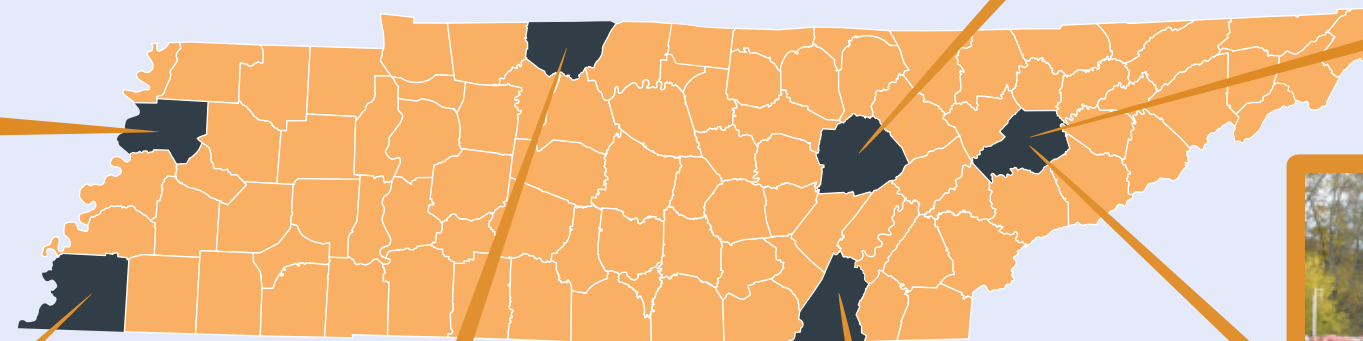
Storm 5HD Weather/
Co-Host Talk of the Town



Chris Cooper and Stephanie Alligood

The Collierville Food Pantry serves as a supplementary food provider to the residents of Collierville and nearby Shelby County who lack the resources to purchase adequate nutrition. Produce from the Collierville Victory Garden provided by the Tennessee Extension Master Gardeners in Memphis is highly sought after by our clients and nutritionally very important as a source of fresh food.

– John Wasilik, Collierville Food Pantry



WE PROVIDE REAL. LIFE. SOLUTIONS.



When farmers have more disposable income it creates a ripple effect on jobs in other industries as they spend that money in local businesses. So through servicing the agriculture sector, the centers in rural areas become a significant economic driver for their communities.

– Margot Fosnes, Robertson County, President and Chief Economic Development Officer, Chamber of Commerce



Gregg Upchurch and Gardens interns

The UT Gardens, Crossville, is a huge benefit to people in our region. From a retired farmer driving up from Chattanooga to learn fruit tree grafting, to a teacher who says bringing students here on a field trip hits most all of her science benchmarks, this validates all we do.

– Nancy Christopherson, Master Gardener, Cumberland County



The doctors at the UT Vet School were absolutely wonderful to work with. The entire staff made the experience so much easier for us by treating us and Barkley like family.

– Al Foster, Knoxville



As a mom, having safer fields for my kids is extremely important, and UT's turfgrass team is a big part of the reason why they are. They do a great service to our community, and their work means a lot to all parents of Knoxville's athletes.

– Jill and Ian Startup, Knoxville



Teaching personal finance to high school students is very rewarding because all aspects of this class are real-world applications. The UT Extension Personal Finance Training for Teachers offers great exercises that students will really learn from and have lots of fun, too!

– Sherry Konwaler with James Talley, Chattanooga

“Follow any road in Tennessee and you'll find people whose lives have been influenced by at least one of our program areas.”

–TIM CROSS, CHANCELLOR



IN PROFILE:

DERRICK STOWELL

As HGTV-UT Gardens education director, Derrick Stowell creates fun and learning-focused experiences enjoyed by East Tennesseans of all ages. As a registered horticultural therapist—one of three in the state—he tailors garden and gardening experiences for youth and adults with special needs, as well as the elderly, among others, for whom gardening offers benefits.



How do the therapy programs offered by the UT Gardens, Knoxville, assist people?

There are so many ways. For people who have disabilities, participating in gardening experiences can prepare them for vocational employment, not only in horticulture, but in general fields because they're learning important skills such as showing up on time, listening and following instructions, and following through.

Do the programs all occur on campus?

While we encourage participants to come to the Gardens, I also visit people in assisted-living facilities. At these, we may discuss vegetables and how to plant them. Then, I'll ask about their earliest memories of gardening, and that can take them back to happy times with parents or grandparents in home gardens and on the farm. At one center, a staff member told me the gardening sessions are the only activity a patient with dementia leaves her room for. At another, there's a woman who sits on a bench outside waiting for us to arrive. The impacts I see are incredible. Our on-campus sessions include students from the Tennessee School for the Deaf and organizations of youth with intellectual impairments or physical disabilities, many of whom schedule sessions every week. Cherokee Health brings patients from Morristown and Newport once a month.

What are some of the challenges you encounter?

It's not just intellectual impairments we work with. Sometimes, they're physical. One participant was in an electric wheelchair. I told her I wanted her to plant in the raised beds we had. But even the raised beds were not high enough for her needs, so we improvised a tool that extended her reach. I also saw the difficulties she experienced rolling along gravel paths in areas where rains wash them out. Stabilizing these areas is a need for us, to better serve all visitors. I told her I was learning more than she was. People who are dealing with disabilities or challenges need to know there are resources for them, including adaptive tools to assist in gardening. And that includes everyone. As we age, we may find it more difficult to perform tasks, and some of us may experience an injury that hinders our work outside. Therapists serve those needs, as well, and we can make recommendations to address them.

How is the demand for the Gardens' therapy programs?

It definitely outpaces our ability to serve. Part of the challenge is that funding for these programs depends on funding from each organization as programs like ours are not covered under health insurance. With more funding ourselves, I know we could keep a staff of three to four therapists engaged full-time in meeting the number of individuals and groups who would like our assistance.

This seems like a fairly new field. Is it?

Actually, it's quite old. Benjamin Rush, a signer of the Declaration of Independence, was a physician. Rush studied mental disorders, among other health issues, and noticed that patients who spent time digging in the "dirt" exhibited less mania and problems, and he wrote about this. Today Rush is regarded as one of the founders of American psychiatry.

How do people specialize in this area?

Recreational therapists, physical therapists, nurses, and others all are among the members of the American Horticultural Therapy Association (**ahta.org**). These people have seen the benefits of horticulture as therapy and want to know more. I entered the field through a path that linked my areas of study, which were in environmental studies and outdoor recreation and therapeutic recreation. When I learned about horticulture therapy, it seemed perfect for me, so I took the classes necessary to become registered and also had a supervised internship.

Your work benefits others. In what ways do you benefit?

Being able to work with individuals gives me a sense of joy and seeing the progress that they make is really amazing. ■

Derrick Stowell welcomes your questions about horticultural therapy. Reach him at dstowell@tennessee.edu. If you are interested in supporting Derrick's work, please visit [Advance UTIA at \[tiny.utk.edu/ag/\]\(http://Advance-UTGardens.tiny.utk.edu/ag/\)](http://Advance-UTGardens.tiny.utk.edu/ag/)



A LEGACY OF LEARNING

A farm often ties a family together across generations. In the case of the Elliott family, so does a university.

February 2017 marked the eighty-second anniversary sale of Robert Elliott & Sons Angus. It was during the heart of the Depression when the patriarch of the Elliott family, Robert Elliott, purchased four registered Angus bred heifers and changed the direction of the family farm dating back to 1807. By the 1950s, the high school educated farmer decided to integrate science into his venture by methodically recording weaning weights, calving intervals, and identifying cows and sires with problems.

By 2015, its eightieth year, the farm had expanded to include 2.5 million tobacco transplants, grass hay, and its core Angus breeding stock featured in a digital sale.

Robert Elliott passed away in 2015, leaving behind that legacy and the family still tied

to the same land where his forebearers settled. William Elliott, a 1976 animal science alumnus, shares the family business with his older brother, Joe Elliott, and nephew, Lake Elliott, the seventh generation Elliott to farm the 700 acres spread across Robertson and Montgomery Counties. Joe is the former president of the Angus Association, a 1971 animal husbandry alumnus, and influential within the Angus community. All three attended UT.

William and his brother Joe are technically first-generation college students but never considered their degrees as pioneering steps for the family. Their mother, Margaret, was trained as a nurse during a time it wasn't considered a collegiate degree and college was always part of the plan for the Elliott boys.

"There wasn't a question of if but when," William says. "It was something we wanted to do, and our parents always

A FAMILY OF UT ALUMS

Members of the Elliott family pause during a get-together on the family farm. Front row, from left, are Megan (married to Will), Lindsay (married to Robert B.), Cheryl (married to William), and Anne (married to Joe). Second row are Will and Robert B. (both sons of William and Cheryl), William, Joe, and Lake (son of Joe and Anne). At top is Meredith (daughter of Robert B. and Lindsay). All in this picture attended UT except Cheryl, Joe says, adding that Meredith plans on going to UT in about sixteen years.

wanted us to better ourselves."

William's own children are UT graduates and still involved in agriculture. The oldest, Robert, B '05 in agricultural economics and business and MS '08 in agricultural and extension education, is a certified crop advisor and owns his own company, Reliance Ag LLC, which uses technology to advance farming techniques. Will, BS '11 in agricultural science, is the youngest son and teaches agriculture at East Robertson High School.



Alison Williams and her fiancé, Petty Officer Mike Franklin of the United States Navy.

A PIONEER & AGRICULTURE VISIONARY

Alison Williams, a 1998 agriculture economics graduate, is a pioneer. Her job as the North American account manager with DuPont Crop Protection means she is often the only female in the boardroom and sometimes a surprise to clients. In fact, one of them questioned her ability to calibrate equipment with long fingernails.

"It takes time to prove yourself," Williams says.

She's taken the time. Today, Williams' work impacts almond farmers in California, citrus growers in Florida, tobacco farmers in the Carolinas, and even apple growers in New York.

Williams arrived at the College of Agricultural Sciences and Natural Resources with no farm experience, but she rapidly expanded her knowledge and understanding. She considers her experience as an Ag Ambassador and in Pi Beta Phi as the catalyst for the people and

relationship skills that are keystones of her career.

For the past two years, Williams has been a member of the UTIA Advancement Board and recently included UTIA in her estate planning. "It's my turn to give back," she says. "I loved my time at UT, and I want to do my part to help and communicate all the great things UTIA continues to do."

She also wants to encourage the next generation of agriculturists—no matter what path, race, or gender. The development of the newest UT 4-H and conference center in West Tennessee, Lone Oaks Farm, has become close to her heart.

"It is important to support agriculture education at a young age," Williams says, and she sees diversity in agriculture growing. At DuPont, for instance, the corporation runs focus groups in agriculture for women. However, she says the rapidly evolving industry calls for an

ever-larger range of skills and interest, and this opens doors for even wider representation. ■

LEARN HOW TO PLANT SEEDS FOR UTIA

Planned gifts often allow you to make a larger charitable gift than you ever thought possible. With a planned gift, you can leave your legacy your way. When people think about planned giving, they usually think about gifts under Wills—but there are so many other options.

Our office can assist you in making a gift that can increase your current income, provide for your spouse or other loved ones, reduce your income tax and/or avoid capital gains, diversify your portfolio, and leave a legacy for future generations.

For more information, please contact Angelia Nystrom in the UTIA's Office of Planned Giving. She can be reached by phone at 865-974-7423 or by email at anystrom@tennessee.edu. Just for reaching out and providing us with your contact information, you can receive a free gift.



Expert Knowledge Face-to-Face

FIELD DAYS CONTINUE THEIR HISTORIC MISSION

There's an old black-and-white photo at the West Tennessee AgResearch and Education Center of a field day from long ago. A large group is standing on the edge of a corn research plot, listening to a presenter. Almost everyone is wearing a necktie.

In the days before instant access to information, learning about the latest research often required a little travel. Field days became an opportunity to get educated on the best agricultural practices. They also became social gatherings, a time to visit with fellow farmers, see old friends, and make new ones.

Even though we can now find out almost anything by pressing a few buttons, thousands of people continue to turn up in the turnrows, the gardens, or the barns of UT AgResearch and Education Centers for traditional in-person instruction. (Although, admittedly, you may be hard pressed to find a necktie at a twenty-first-century field day.)

“We’ve made it easier for our clientele to access information about our research programs anywhere and anytime,” says Barry Sims, executive director, UT AgResearch, “but face-to-face interaction with peers and experts still provides tremendous value.”



A trade show vendor explains the added-value features on new cattle handling equipment at the Northeast Beef Expo.

Cyd Riede, a UT Extension Master Gardener from Cumberland County, agrees. Riede is a devoted attendee of the Fall Gardeners’ Festival, held each August at the Plateau AgResearch and Education Center. Since its inception eight years ago, the festival has grown to a regional event, drawing hundreds of outdoor enthusiasts.

“It’s something my neighbors and I look forward to every year—getting lots of great information about all things in our local landscape direct from the experts,” says Riede. “I always learn something new and make sure to schedule my summer so I don’t miss it.”

The 2017 field day schedule includes fifteen unique events. You can learn to grow your own fruits in the grape vineyard at the Middle Tennessee AgResearch and Education Center. Discover best methods for managing forages in the pastures at the East Tennessee AgResearch and Education Center. A new field day, the Forest Research Overview, will provide opportunities to learn about natural resource management while touring the woodlands of the Forest Resources AgResearch and Education Center. The program topics vary greatly, but the goal of each field day is the same: Take visitors to the research and show them how to apply it where they live and work.

“By showing me the proper ways to manage forages, animal health, and reproduction, UT researchers have helped me be as efficient as possible in my beef operation,” says Jason Bradshaw, a busy

bi-vocational beef cattle farmer and teacher from Wilson County. “Attending classes in person limits distractions and helps me focus on making my operation more profitable.”

The benefits of attending a field day are not just educational. Most events boast an industry trade show, allowing local businesses to connect with customers and provide hands-on demonstrations of new equipment or technologies. Field days continue to be social gatherings, as well, providing opportunities to network with those who share interests or challenges, gain insight from one another, and develop valuable professional relationships.

To find information on an upcoming field day that interests you, go to agresearch.tennessee.edu. We invite you to make the drive to one of our AgResearch and Education Centers to see it for yourself. Neckties are not required. ■



A FARM KID ON MARS

When it came to selecting James Bevington (biosystems engineering, '11) as a crew member for an eight-month simulation of life on Mars, the resourcefulness and self-sufficiency he developed growing up on a Tennessee Century Farm impressed mission organizers of HI-SEAS. So did Bevington's technical abilities and experience working in teams at UT and strong interpersonal skills he gained through living abroad—all are high-priority skills CASNR fosters in its students. For Bevington, the qualities factored into his selection as mission commander.

Bevington says testing the feasibility of life on the Red Planet is on target for his goals. This farm kid turned scientist aims to become an astronaut. Does he believe life on Mars is realistic? "It is as doable as anything. To make it reality, though, the international community must commit to seeing this goal through, as has been done with the International Space Station." The most frustrating thing he's experienced in isolated life? "Google searches. A deliberate twenty-minute delay in communications means we cannot research on our own." And that Spam-heavy diet? He says he could pass on that, too.

Watch videos about the HI-SEAS missions in this *Daily 360 Series* by the *New York Times* at tiny.utk.edu/HISEAS.



One of many UTIA field days, this year's Summer Celebration in Jackson, TN, was a success with garden experts and amateurs alike.