

TENNESSEE

LAND *life &* Science

VOL. 9/NO. 2 2012 | UT INSTITUTE OF AGRICULTURE

The Plight of Pollinators

WORKING TO SUSTAIN OUR FOOD SUPPLY

THE UNIVERSITY of
TENNESSEE 
INSTITUTE of
AGRICULTURE

Dear UTIA Friends,

Welcome to the fall issue of Tennessee Land, Life and Science. We hope that you enjoy reading about some of the programs and accomplishments of our students, faculty and staff in the Institute of Agriculture. Also, we have highlighted several of our alumni members.

As we enter this season of Thanksgiving, we want to thank the many friends of the Institute of Agriculture who give of their time and resources to make our programs successful. We also pause to thank our forefathers for having the vision to create a land-grant university system in this country. This year we celebrate the 150th anniversary of the Morrill Act that created land-grant universities. The purpose of the Morrill Act was to increase access to higher education and provide educational programs in agriculture and the mechanical arts. We are proud that the University of Tennessee carries on the land-grant tradition through education, research and outreach.

Go Vols!



Dr. Larry R. Arrington
Chancellor, UT Institute of Agriculture



Chancellor Larry Arrington addresses the WestStar Leadership Class at the UT AgResearch and Education in Milan, Tenn. WestStar trains citizens to be influential presences in their communities. As they set out to tour the center, Arrington showed how the tractor could do all the steering itself using AutoSteer tied to a GPS unit.

President, UT

Joe A. DiPietro

Chancellor, UT Institute of Agriculture

Larry R. Arrington

Dean, UT College of Agricultural Sciences and Natural Resources

Caula A. Beyl

Dean, UT AgResearch

William F. Brown

Dean, UT Extension

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RESPONSIBILITY MATTERS

This issue of Tennessee Land, Life and Science was printed on 80-pound New Page Productolith cover and text, which is 10 percent postconsumer waste. In using this paper, the Institute of Agriculture affected the environment in the following ways:



Wood/Trees Used: 68 trees

Trees planted: 144 (net gain of 76 trees)



Energy Consumed: 115 million Btu

Energy saved through use of renewable resources: 56.35 million Btu



Greenhouse Gases Generated: 20,681 lbs. CO₂ equivalent

Greenhouse gases prevented: 2,923 lbs. CO₂ equivalent



Wastewater Used: 73,041 gallons

Wastewater recycled: 68,659 gallons



Solid Waste Generated: 8,021 lbs.

Solid waste not Generated: 1,037 lbs.

Energy saved is approximately enough to power one home for six months. Wastewater recycled is approximately enough to supply 325 people with drinking water for an entire year.

Mac Papers provided this data.

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News around the institute

ORGANIC LAND-GRANT ASSESSMENT GIVES INSTITUTE TOP SCORE

The Organic Farming Research Foundation has ranked the institute's organic and sustainable crop production program as one of the top six organic programs in the country.

Different universities were scored in the 2012 Organic Land Grant Assessment with six receiving the full eight points possible. UT is the newest addition to this assessment, yet still received top honors.

"We are very proud that the program has been recognized as one of the best in the nation," says Joe Gaines, assistant commissioner for market development at the Tennessee Department of Agriculture. "Tennessee agriculture is very diverse, and we are glad that Tennessee organic farmers will benefit from the work being conducted by the university."

Each university was scored based on organic research, extension and education. The assessment can be downloaded as a PDF from the OFRF website at <http://tiny.utk.edu/organicsranking>.

— Stephanie Grayson



Rich Maxey



Ginger Rowsey

Agriculture Proud

Animal science master's student Ryan Goodman is Agriculture Proud. That's the name of his Facebook community page. Goodman tells agriculture's story, particularly to people unfamiliar with real agriculture and food production. Consider sharing this link with folks who need a basic and interesting easy read about ag, and ranching in particular. He also blogged, and past entries can be found at www.agricultureproud.com.



COMBATING SYNTHETIC DRUGS

It's a scary problem — so-called “synthetic drugs” that are potentially hundreds of times more potent than traditional narcotics. UT Extension is teaming with law enforcement agents to fight this problem in Rutherford County, Tenn., where experts are seeing an increase in these drugs.

“A synthetic drug is a man-made drug that mimics the effects of so-called real drugs like cocaine, methamphetamine, ecstasy, marijuana,” says Lt. Egon Grissom of the Rutherford County Sheriff's Department.

The makers of synthetic drugs cleverly disguise the narcotics through packaging. “It's sold as incense. It's sold as bath salts. It's sold as fertilizer. It isn't any of those things. It says on the package not for human consumption,” Grissom says.

Still young people are abusing the drugs, so what's a community to do? At a recent session, Grissom educated members of a UT Extension family and community education club about synthetic drugs and gave them information to pass on to others.

“Our FCE clubs are really the eyes and ears all over the county in their local communities,” says Rutherford County UT Extension agent Pat Whitaker.

Whitaker says FCE clubs do many projects for schools, charities and assist many people. Synthetic drugs would seem an unusual project for this group, yet Whitaker believes these community leaders can be effective in this area. “Extension is very concerned about the health and safety of our citizens, and we certainly are in a unique position to help get the message out.” — *Chuck Denney*

UT EXTENSION LAUNCHES QUICK RESPONSE TO STATE'S DROUGHT CONDITIONS

As drought withered up crops and turned pastures to dust plots last summer, UT Extension launched a wide-ranging effort to assist the state's farmers and ranchers as they responded to the historic and unseasonably hot and dry weather. The drought's impacts led to drastic reductions in harvests this fall, especially in feed, pasture and hay available for livestock. This reduction may ultimately lead to lower profits in the short term.

Through a public website, farmers have direct access online to information that can help them make the critical and sometimes heart-wrenching decisions necessary to keep their operations and families financially viable. Information specific to Tennessee production systems has been



Angela Thompson McClure

Corn producers saw their crops fail during this year's drought.

collected and cross-linked on the website <https://utextension.tennessee.edu/drought>, which continues to be available to the public free of charge.

Dr. Justin Rhinehart, UT Extension beef cattle specialist, coordinates the effort, which includes livestock specialists, plant and pest specialists, veterinarians, family science experts, environmental engineers, horticulturists, and forestry and wildlife experts from across the state.

In a period of profound weather impacts, UT Extension is marshaling its resources to assist row crop and cattle producers in matters that affect their bottom lines and lives.

— *Patty McDaniels*



News around the institute



Dr. Fred Allen, left, and Dr. Sam Rogers.

INTERPRETIVE GARDEN HONORS NATIVE AMERICAN HERITAGE AND CULTURE

You may have walked by it on the institute campus and not recognized what it is. What many may think to be just a mound of soil is actually a Native American burial ground from A.D. 600-700.

A project is under way to enhance the educational value and aesthetic beauty of the Indian Mound and the surrounding Native American Interpretive Garden.

The NAIG project is an effort to feature a large collection of native plants that were used by the Cherokee and their predecessors for food, medicine, shelter, basketry and other purposes.

“We currently have about 800 individual plants representing approximately 80 different species of native plants, and we will add more,” says Fred Allen, professor of Plant Sciences.

“The collection contains species that are important to the Cherokee Indians, such as sassafras, white oak, Cherokee sedge, wild ginger, prairie coneflower and others.”

Signs depict the plant, its Cherokee name, the common and scientific name and its general uses.

The NAIG is located on the east side of the intersection of Joe Johnson Drive and Chapman Drive.

For more information, contact Fred Allen at allenf@tennessee.edu. – *Stephanie Grayson*

USDA CHALLENGE GRANT CREATES OPPORTUNITIES

Expanding awareness of agricultural research and how its importance to our world is a high priority for the institute. Now, the College of Agricultural Sciences and Natural Resources has been awarded a higher education challenge grant from the U.S. Department of Agriculture to help meet that goal.

CASNRR is using the \$370,000 grant to provide study opportunities in agricultural related fields for high school students and university undergraduates. Projects have been funded in all the priority areas for the USDA National Institute of Food and Agriculture: global food security, childhood obesity, climate change, food safety and sustainable energy.

Plant pathology professor Kimberly Gwinn, environmental science professor Joanne Logan and Dean Caula Beyl were instrumental in attaining the grant, which will run through 2014. – *Doug Edlund*

FORESTRY STUDENTS TAKE ON TIMBERSPORTS

It's not something you see every day, a makeshift lumberjack camp on the UT campus. The Department of Forestry, Wildlife and Fisheries; Stihl Timbersports; and the Lumberjack Feud in Pigeon Forge teamed up to bring a very unique event to campus earlier this year.

To help promote forestry education, a team from the UT Forestry Club took on the pros from Stihl Timbersports in an all-out lumberjack competition. Paul Bunyan had nothing on our team as they demonstrated their skills in such competitions as the ax throw, cross cut and speed climb.

If you think a career in forestry is axes and saws, Jack Lipkin, a rising senior majoring in forestry, has something to say. "It's one of the broadest majors you can have at UT," he says. "There's so many avenues you can take with a forestry degree — from fighting forest fires to urban forestry, and that's what I really like about it." — *Doug Edlund*

Big Orange Protein

UT plant biotechnologists have put a new spin on Big Orange. This time the university's signature color is showing up as fluorescent proteins that make genetically engineered plants glow a bright orange when "excited" by a green light. The genes turn plants into phytosensors that help discover useful plant DNA and enable plants to sense and report on environmental contaminants, such as plant-disease causing bacterium.



Doug Edlund



Laura Abercrombie and Mary Rudis

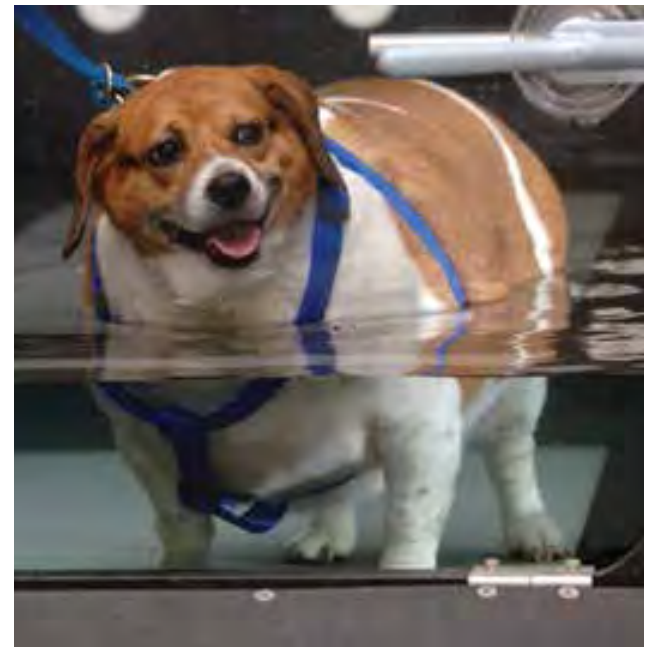
News around the institute

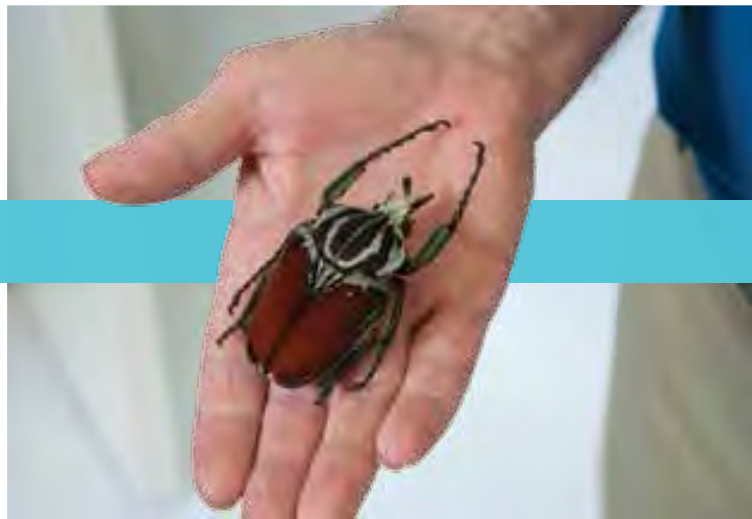


MABEL'S JOURNEY

The doctors and technicians of the UT Veterinary Medical Center continue to change Mabel's life. Last spring, we introduced you to the beagle mix, who arrived at an animal shelter last December weighing 67 pounds, more than three times her ideal weight. Since that time, Mabel has been working that weight off through the medical center's nutrition and rehabilitative services. In November, Mabel weighed 29.3 pounds and was closing in on her target of 23 pounds. Just like humans, it's regular exercise and healthy nutrition that are leading to the positive change.

Pictured clockwise from top, a lively and trim Mabel in September; Mabel when adopted in December 2011; starting on an underwater treadmill in January; and Mabel with Sara of the Today show when the program broadcast from Knoxville's campus in September. (Credits: the College of Veterinary Medicine)





In profile:

Dr. Paris Lambdin

NOT EVERYONE HAS A SYMPOSIUM IN HIS OR HER HONOR, but that's exactly what happened when the Entomological Society of America met in Knoxville in November.

WHAT'S IT LIKE HAVING A SYMPOSIUM IN YOUR HONOR?

To me, it's an opportunity to see some of my former students and colleagues. To see them and personally congratulate them for the excellent people they've become is exciting.

WHAT ARE THE PROUDEST MOMENTS OF YOUR CAREER?

I am proud of the students I've been able to assist along the way, and I am pleased for the opportunity to help them when they needed it most. I am fortunate to be able to work in an area that I thoroughly enjoy, such as biocontrol of exotic species and systematics. That's been a great pleasure for me.

YOU'VE NAMED 36 INSECT SPECIES AND SOME NEW GENERA. HOW DOES ONE DO THAT?

Naming a new species is rather easy; it's finding and describing a new

species that's difficult. Discovery of new species may be fortuitous while investigating a specific insect group. Once you determine a species may be new, you study its morphology, behavior and ecology to establish if it is indeed a new species or a deviant of a known species.

IN THE PAST 100 YEARS, WHICH DEVELOPMENTS HAVE HAD THE GREATEST IMPACT ON ENTOMOLOGY?

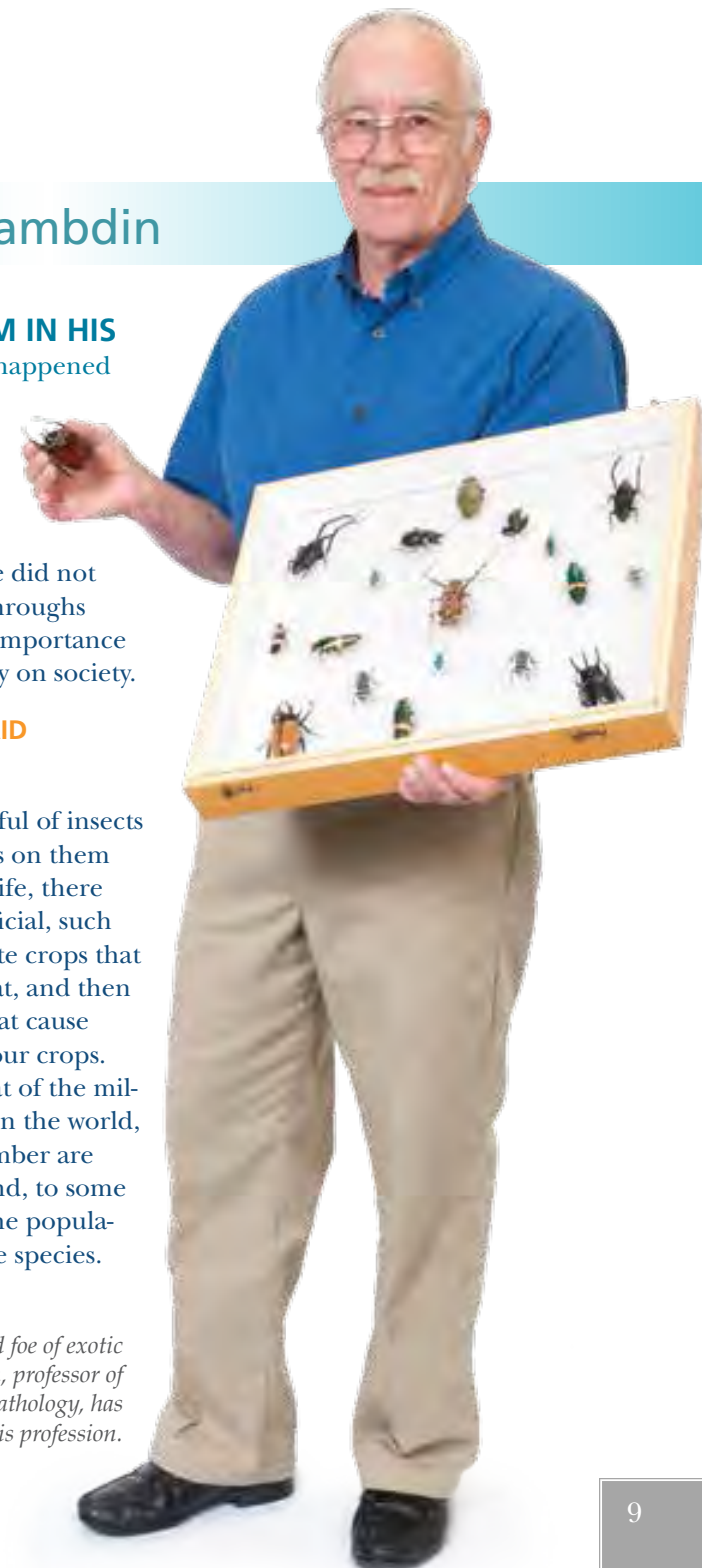
There have been numerous discoveries. For example, the revolution in the advancement of chemicals to protect crops and forests from insect pests and diseases almost instantaneously contributed to a higher standard of living for everyone by providing access to higher quantities and quality of food. Also, the development of various control tactics for pests responsible for insect-borne diseases has led to healthier populations throughout the world. Advances in the realm of genetics have provided us a different

way to view insects that we did not have earlier. Such breakthroughs greatly contribute to the importance and impact of entomology on society.

WHY ARE PEOPLE AFRAID OF INSECTS?

I often have students fearful of insects in class, so I try to impress on them that, like many things in life, there are species that are beneficial, such as honeybees that pollinate crops that provide us with food to eat, and then there are those species that cause harm or disease to us or our crops. The fortunate thing is that of the million or so known species in the world, only a relatively small number are considered major pests and, to some degree, we can manage the population size for many of these species.

As a mentor to students and foe of exotic pests and weeds, Lambdin, professor of entomology and plant pathology, has served the institute and his profession.



BEE SERIOUS, REALLY

The Plight of Pollinators

John Skinner and his colleague Michael Wilson have always been serious about bees, but they and other bee scientists throughout North America really have their work cut out for them. In 2006, the mysterious colony collapse disorder (CCD) caused extensive bee colony losses measuring regionally between 30 and 90 percent. The bee colonies died for no apparent reason.

CCD creates alarming headlines and blog posts the world over because bees are responsible for about one mouthful of food out of every three we eat. Bees pollinate many of the crops that provide our food, and as Skinner is fond of saying, “If you like to eat, you need bees.”

The phenomenon of CCD coincided with the release of the National Research Council report Status of Pollinators in North America, which outlined declines of all pollinators — not just honeybees, but also bumblebees and more than 4,000 native bee species that pollinate most of our plants and trees. This dire situation became the focus of a multi-institution project supported by U.S. Department of Agriculture’s National Institute of Food and Agriculture (NIFA). In this coordinated agricultural project (CAP), Skinner, a UTIA professor of entomology, and Wilson, a UT Extension specialist, are members of a team of research and Extension experts studying CCD. Skinner and Wilson’s contribution is to develop and maintain the Bee Health Community of Practice for the national Extension website, eXtension (http://www.extension.org/bee_health). The two are providing CAP members and eXtension users research-based information about bees and beekeeping as well as news and current research in apiculture.

Scientists now understand that CCD is part of a much bigger concern called bee decline. Skinner says the current theory is that bee decline results from a combination of stressors on bee health, including exotic mites, new viruses and diseases, poor nutrition, pesticides, and stress caused by moving bee colonies for the purpose of pollinating large crops. “All beekeeping is local,” says Skinner. “So in regions where not enough pollinators are available to service a large crop, producers import bees. For example, more than 1.25 million colonies are annually imported to California to pollinate the massive almond crop each spring. Many crops like cereals and grains are wind pollinated, but other valuable species, especially vegetables, require insect pollination.”

The successes of the first CAP grant lead to USDA approval for additional and promising studies. Skinner and Wilson are involved in the Bee Informed Partnership (BIP), through which scientists are surveying beekeepers throughout the U.S. to determine what tactics are aiding colony survival.

Skinner is co-chairing a symposium, “Perspective of Bee Decline: Situation, Strategies and Successes,” at the annual meeting of the Entomological Society of America in Knoxville in November. This symposium will bring new information and address global issues.

What about the native pollinator species? These too are in decline, but their exact populations remain uncounted because they are not commercially managed. Skinner and Wilson are also involved in a project that will study native bees such as bumblebees, squash bees, leaf cutter bees and digger bees, and Skinner credits the attention focused on

CCD as benefiting these species as well. “The CCD crisis opened up funding for all kinds of pollinator research,” he says. “This is the most exciting and crucial time ever to be involved in bee research and Extension. There’s so much more going on out there than just CCD.”

Because nutrition is key to health maintenance, the two bee scientists are examining new methods to provide sustainable food sources for pollinators, especially those needed by organic and conventional crop growers. Wilson says, “Bumblebees have shown themselves to be very important pollinators at farms where I have conducted research in East Tennessee. The surrounding landscape provides for these pollinators, so we need to be sure that suitable nesting sites and pesticide-free food sources are conserved or supplemented.”

The two entomologists are comparing different mixtures of wildflower seeds of primarily native perennial plants with the expectation of finding a combination that will provide a continually blooming source of food for pollinators throughout the growing season. “Establishing these ‘wildflower gardens’ on farms that must have pollinators should substantially improve bee health and, therefore, increase production of fruits and vegetables,” Skinner says. – *Patty McDaniels*

Information about the bee programs at UT, including beekeeping courses, is available online at <http://www.bees.tennessee.edu>.





Above: Dr. Graham Hickling inspects a corduroy “drag cloth” used to survey the abundance of questing ticks in understory vegetation in Illinois. Left: A nymphal blacklegged tick waits in the leaf litter midsummer for a passing host. Below: UT wildlife health students use a lint roller to collect larval lone star ticks, known as seed ticks, from a drag cloth during early fall in East Tennessee.



Precautions for tick-borne disease should extend beyond Lyme

INSTITUTE RESEARCH HIGHLIGHTS DISEASE RISKS OF SPREADING TICKS

When a tick bite results in infection, most people think first of Lyme disease. But depending on where you live, the disease may be something else entirely. While Lyme disease, which is transmitted by blacklegged ticks, is common in the Northeast and Upper Midwest, ticks in the eastern U.S. collectively carry more than a dozen agents that can cause human disease, says biologist Graham Hickling, director of the institute's Center for Wildlife Health.

Sometimes the differences in disease symptoms are subtle. The bite of the lone star tick can also create a bull's-eye rash that appears like that of Lyme disease, but the rash isn't caused by the Lyme bacteria. Scientists say that this almost certainly leads to misdiagnosis of some patients.

A National Science Foundation-funded study under way at the institute is

documenting the geographic variation of tick-borne diseases in the eastern United States. The project is part of a four-year research initiative involving investigators at five universities. Their research is yielding the first systematic, regionwide look at tick distributions and tick-borne diseases.

Field studies led by Hickling have found no occurrence of Lyme disease in more than a thousand blacklegged ticks sampled in Tennessee. Instead, lone star ticks, which are prevalent in the state, have been found carrying the bacteria that cause ehrlichiosis and rickettsiosis, which includes Rocky Mountain spotted fever. Last spring, the Tennessee Department of Health reported a 500 percent increase in tick-borne rickettsiosis.

Ehrlichiosis and Rocky Mountain spotted fever were once uncommon in Tennessee, but lone star ticks have

been moving north in recent decades, just as Lyme disease is spreading out of the Northeast and Upper Midwest. Lyme-infected blacklegged ticks presently are spreading south through Virginia, and increases have been seen this past year in Ohio and Kentucky.

The scientists believe changing environmental conditions are behind the shifts, as well as regional variation in the wildlife hosts used by ticks. As wildlife populations, forest habitats and weather patterns change across the continent, so does the geographic distribution of ticks and the disease organisms they carry.

"Identifying health risks in the face of changing climates will be critical in coming years," says Sam Scheiner, National Science Foundation program director for the joint NSF-National Institutes of Health Ecology

and Evolution of Infectious Diseases program, which is funding the tick research.

"This study will inform public health officials about what diseases are found in which areas," says Scheiner, "so they can minimize human health problems."

The biologists say they are happy that recent treatment recommendations have begun to emphasize the importance of considering the tick species and its infection status as part of the diagnostic process.

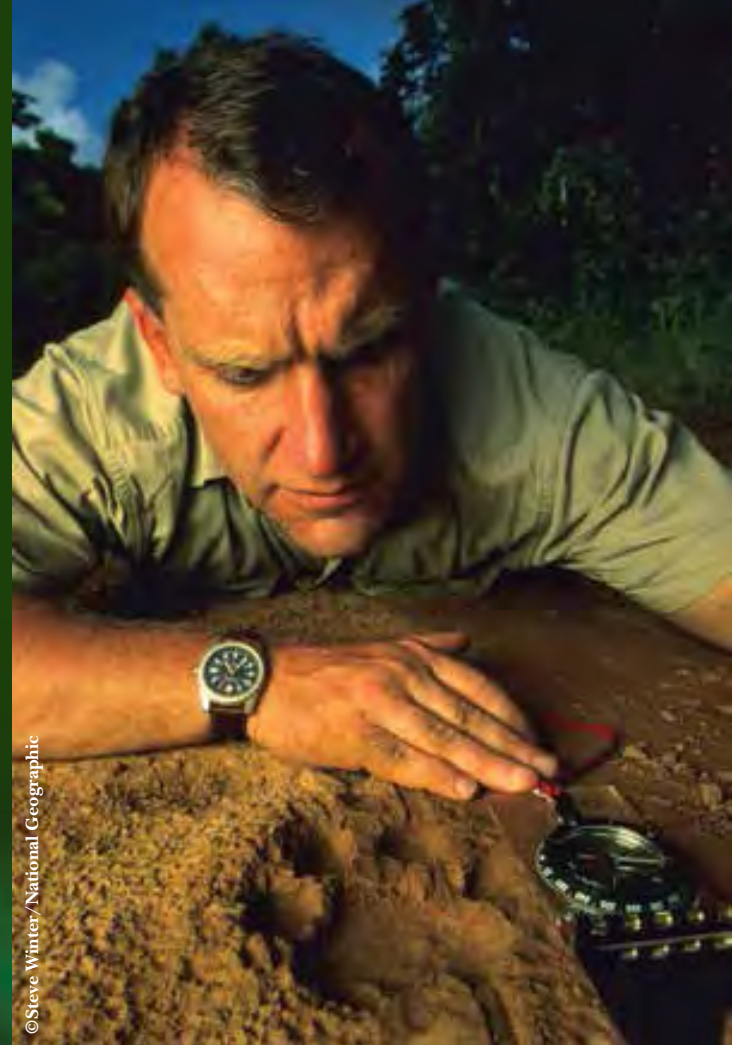
Their advice: Stay open-minded about which tick-borne diseases are most common in your area — and save the tick that bites you. — *NSF news report*



A vial of adult blacklegged ticks collected during winter near Tallahassee, Fla.

Giving voice to wildlife

"I know that I can do anything. Anyone can. You just have to learn your life's purpose and dedicate yourself to it."



©Steve Winter/National Geographic

Born into Brooklyn, Rabinowitz has reached the world's wildest places to create preserves and political will to conserve wildlife.



©Steve Winter/Panthera
©Steve Winter/National Geographic

For Alan Rabinowitz, a career that began as a student conducting fieldwork through the Department of Forestry, Wildlife and Fisheries has grown into a magnitude of achievements in global wildlife conservation.

Working to preserve the world's last wild places, Rabinowitz (M.S. '78, Ph.D. '81, ecology) has negotiated with the leaders of nations to create preserves and political will to conserve wildlife. Through saving territory for big cats, the apex predators, he has led to the establishment of areas that protect entire ecosystems of living things.

Rabinowitz convinced the dictators of Myanmar to create the world's largest tiger preserve. In Belize, his work resulted in the world's first jaguar sanctuary. In Taiwan, he negotiated the establishment of that country's largest protected area and last piece of intact lowland forest. And in South America, he and his organization Panthera have pieced together biological and genetic corridors designed to allow jaguars to move across their entire range from Mexico to Argentina.

As Rabinowitz tells it, it all began with stuttering. As a child, his stutter was so severe that he could not speak to humans. But he discovered he could talk to animals. With them he did not stutter. Drawn to wildlife at the zoo, he made a promise that if he ever learned to overcome his stutter, he

would give voice to animals to protect their future. He did, and he has. He says the focus of mind that led him to find his voice taught him how to work toward incredible goals, to persevere against all odds.

"I was told the Jaguar Corridor was too ambitious. It's now being implemented by many of the jaguar countries throughout Latin America. I was told that I'd never get to the dictators of Myanmar. It took five years, but I not only reached them, I had them sign off on the world's largest tiger reserve in one of the world's most oppressive governments.

"I know that I can do anything. Any one can. You just have to learn your life's purpose and dedicate yourself to it."

For big cats and other wildlife to survive, he says people need to learn to live with them, to not see them as adversaries.

"We see a big cat in the zoo or go to a park, but they've got to be safely distant. People need to realize there can very well be a world where we live among the big predators. It sounds almost

clichéd, but people truly have to figure out that human beings are a part of nature and not apart from it. The more we place ourselves apart from nature and think we can control it, especially through technology, the more we speed up our demise and that of the natural world."

Through that vision and the achievements that back it, Rabinowitz continues to give voice to the animals. He sees it as vital, for their sake and for humankind. — Margot Emery



©Alan Rabinowitz

UT alum Alan Rabinowitz discovered the world's most primitive deer, the leaf deer.

Alan Rabinowitz is not the only person affiliated with UTIA fighting to protect big cats. See page 26 to learn about the UT Veterinary Medical Center's work to save an African lion.



©Steve Winter/National Geographic

Watch a video about Alan Rabinowitz's life at his organization, Panthera, www.panthera.org/video/man-and-beast.



Country hams as teachable moments



Country hams are a tradition in the Southeast, cherished for the way they summon memories of old-time ways of doing things, such as how parents and grandparents preserved meat and served it on the farm.

In three Tennessee counties, 4-H youth are learning to cure country hams. Through the 4-H Country Ham Project, the 4-H'ers gain insight not only into their agricultural heritage, but also in important life skills such as record keeping and public speaking, personal responsibility and self-esteem.

"So many of our young people think food comes from Walmart or the drive-through," says Michael Murphey of family business Clifty Farm in Paris, Tenn.

"As the 4-H'ers prepare their hams, you can almost see the light bulb come on as they realize how food is produced."



“So many of our young people think food comes from Walmart or the drive-through.”

Youth in grades four through 12 in West Tennessee’s Henry and Benton counties have the opportunity to participate in the ham project with Clifty Farm, a major supplier of country hams and meats throughout the Southeast. In Middle Tennessee’s Rutherford County, 4-H’ers join with Murfreesboro-based business The Hamery.

At Clifty Farm, preparing a ham typically takes 100 days. The process starts with cleaning freshly processed hams then curing them with salt, washing, bagging and aging them and then giving the hams a flavorful hickory smoke at the end. “We have a particular way of doing things,” Murphey says. “We’re proud of how we take our time with the product, particularly in an era of everything being so fast.”

Youth cure two hams, selecting the best for the county fair and taking the other one home to enjoy with family. During the project, they track each

stage of the curing process, documenting how their hams mature and recording their weight as they dry. Summing up the experience, they give a speech to families and friends on what it takes to prepare a ham or their experiences through the process.

“It’s not uncommon to see an audience of 50-plus people following their every word,” says UT 4-H Extension agent Staci Foy, who coordinates the ham project with Clifty Farm.

“This project is a way for youth in rural cities, as well as in agricultural areas, to participate in a 4-H project and the fair,” Foy says.

“Not everyone has the ability to raise a lamb or steer or hog or take part in



a chick chain. Through preparing a country ham, they get to experience a hands-on 4-H project. I think that’s why we have such high participation.”

Some 300 youth have cured hams through the project. In Murfreesboro, The Hamery owner Bob Wood believes in passing along his knowledge of country hams to others.

“One generation really owes a responsibility to the next to pass on what we know,” he says.

For 4-H’er Savannah Sandlin, it was an irresistible opportunity.

“I was like, ‘Well, it looks fun and you get to eat it, so let’s just jump in.’”

The lessons the project teaches matter.

“What 4-H is trying to teach is not how to cure a ham,” says Barbara Davenport, 4-H agent in Rutherford County with UT Extension. “We’re teaching the young people life skills like responsibility, achieving goals and self-esteem.”

All through a special, much-loved country food. – Margot Emery and Chuck Denney



Thirty-Seventh Congress of the United States of America;

At the Second Session.

Began and held at the city of Washington, on Monday, the Seventh day of December, one thousand eight hundred and sixty-six.

AN ACT

For the lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.

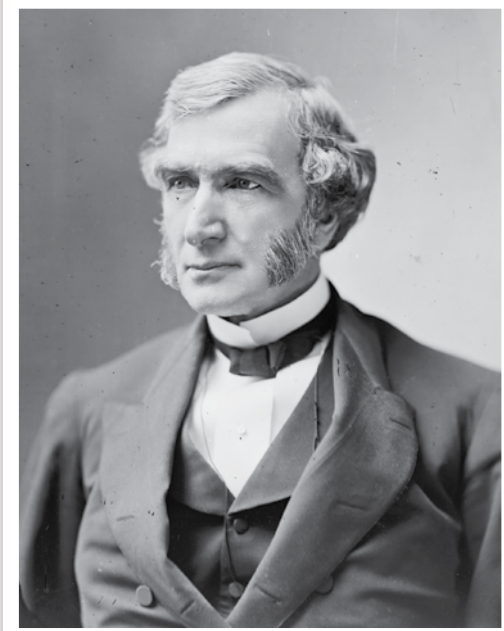
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That there be granted to the several States for the purposes hereinafter mentioned an amount of public land to be apportioned to each State equal to thirty thousand acres of public land as it existed at the first meeting of the Congress respectively entitled by the apportionment under the census of one thousand eight hundred and sixty: Provided, That no internal lands shall be selected under the provisions of this act: Sec. 2 And be it further enacted, That

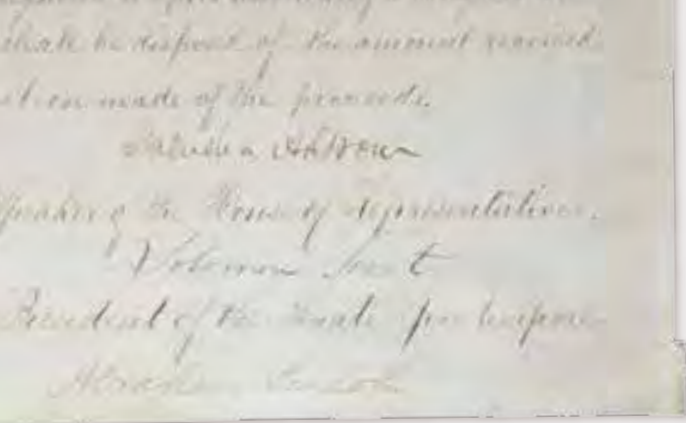
after being surveyed, shall be apportioned to the several States, sections, not less than one quarter of a section, and whenever there shall be any lands subject to sale at private entry at one dollar and twenty cents per acre, the quantity to which said State shall be entitled shall be set apart within the limits of such State, and the Secretary of the Interior shall locate to each of the States in which there is not the quantity of public land sufficient to satisfy the amount to which said State shall be entitled under the provisions of this act, land scrip to the same amount, the proceeds of the sale of which scrip shall be sold by the Secretary of the Interior and applied to the uses and purposes provided in this act and for no other purpose whatever: Provided, That in no case shall any State to which land scrip may thus be issued, be allowed to locate the same within the limits of any other State, Territory, or the United States, but later acquisition may thus locate said land scrip within any other or unappropriated lands of the United States subject to sale at private

CELEBRATING OUR LAND-GRANT HERITAGE

Morrill Act marks 150 years



Left: In the midst of the Civil War, President Abraham Lincoln signed the Morrill Act into law. Right: Justin S. Morrill transformed UT and other land-grant universities.
(Credits: Library of Congress)



UT President Charles Dabney tries out a new plow at the College Farm around 1904. Dabney reorganized the university to focus more on scientific and agricultural subjects.



Although you may not have realized it, 2012 marks an extraordinary year for our alumni and the thousands of citizens the institute serves in its educational, research and Extension programs.

This year, the institute and UT, along with other land-grant universities throughout the nation, are celebrating the 150th anniversary of the Morrill Act. This act has directly affected the education that each of our students has received, from the present back to the years following 1862, when President Abraham Lincoln signed the legislation into law.

The Morrill Act established land grants for each state, allowing states to receive payment from sales of public lands. The states were charged to use these funds to create “such branches of learning as are related to agriculture and the mechanic arts ... in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.”

It was the Morrill Act that opened schools of higher education to citizens from all walks of life, not just the privileged few. The legislation also laid the groundwork for the establishment of agricultural research programs and outreach by Extension agents, created through the subsequent Hatch and Smith-Lever acts of 1887 and 1914. The second

Morrill Act of 1890 established historically black colleges and universities as land-grant institutions, and Tennessee State University officially became Tennessee’s second land-grant university in 1958.

“This is an exciting time to be celebrating the 150th anniversary of the land-grant universities and what Justin Morrill did to create them,” says institute Chancellor Larry Arrington. “To think about the impact that this one law had — that’s a revolutionary piece of educational legislation in this country, and it’s the reason today that one farmer can feed so many people.

“Our farmers are able to do that because of all the technology and change that have occurred as a result of having a land-grant university system in the country, where new technology is developed and makes its way into the classroom to train future professionals, and also makes it out into the communities and onto the farms.”

It’s tempting to speculate that Vermont native Justin Morrill foresaw such far-reaching impacts of the legislation he drafted. Although his formal education ended when he went to work as a store clerk at age 14, he went on to a successful career in business and farming. In 1854, he was elected to Congress, serving first in the House of Representatives, then

in the Senate. In 1858, he introduced the legislation to create public schools of higher education to provide training in the applied fields, as well as in traditional liberal arts.

Winning passage wasn’t easy. Morrill’s first bill narrowly passed in Congress, only to be vetoed by President James Buchanan, on the grounds that, historically, educational matters had been left to the states.

But Morrill, who sought to open universities to what he called “regular people,” ultimately prevailed and, despite the turmoil of the Civil War years, the bill won passage, with Lincoln signing it into law in 1862.

In this anniversary year, the institute, its academic departments and units have reflected on their land-grant heritage and explored how it informs their mission and focus. In early November at Ag Day, the institute’s annual street fair for alumni and friends, Chancellor Arrington, university President Joe DiPietro and UT Knoxville Chancellor Jimmy Cheek dedicated historical markers to be placed at the institute and on the Knoxville campus, to commemorate the land grant act that continues to shape our mission and the education our students receive. — *Margot Emery*

Institute's first Farm Credit Scholars start their studies

This autumn, the institute's inaugural class of Farm Credit Scholars began their studies in the College of Agricultural Sciences and Natural Resources. Earlier this year, the institute and Farm Credit Services of Mid-America announced the scholarship program that brings them to campus.

The program selects outstanding students for specialized studies in CASNR. The Farm Credit Scholars will engage in customized coursework, as well as an international experience, mentoring opportunities and a Farm Credit internship. Students may enter the program in their freshman year and renew the scholarship for a total of four years of study, provided they meet the requirements from the previous year.

"Farm Credit saw the need to attract a high caliber of student, and with this initial group of Farm Credit Scholars, the program is off to a very successful start," says Dr. Larry Arrington, chancellor of the institute.

As Farm Credit Scholars, the students take courses in agricultural law, finance, policy and sales, rural development, leadership, and production agriculture. In addition, students are required to complete a research project with written and oral reports to Farm Credit leadership, students and faculty.

According to program coordinator John Riley, the initial group of scholars is up to the challenge. "We had excellent applications this year,

and we expect that will hold true for the future, as this is a very competitive scholarship opportunity."

CASNR Dean Caula Beyl says the world faces a critical need for agriculture majors and the future job market is tremendously strong. "There are exciting careers because you know that you're fulfilling something that is very important. By 2050, the world's population is estimated to be 9 billion people, if not more. As long as people need food, fiber and fuel, agricultural careers are going to be in the forefront."

"We're looking for the brightest and most exceptional students across all segments of agriculture," explains David Lynn, Farm Credit senior vice president of financial services. "We are structuring this program to be very open. The majority of scholars may come from the agricultural economics and agricultural business curricula, but we want the program to be available to other exceptional students in CASNR. We want these students to become valuable contributors to their communities and to agriculture." – Doug Edlund



The 2012 Farm Credit Scholars pictured from left to right are Forrest Duncan, Ashlee Ailshie, Peyton Graham, Erin Brinkley and Billy Rochelle. Dr. John Riley, UTIA Farm Credit Scholar program administrator, is also pictured.

Peyton Graham



Graham is from Munford, Tenn., and is pursuing a degree in agricultural business. She developed a passion for agricultural finance in college and during an internship with Farm Credit during last summer. "I know I want to return to my family farm, while still being able to have a stable career in the agricultural industry. The reality is that there are not many opportunities to do what I love and still be close to home, which is why a career with Farm Credit is so appealing to me."

Ashlee Ailshie



Ailshie, who is from Columbia, Tenn., credits her upbringing as the foundation of her decision to pursue an agriculture-related degree and career. “My degree is ag business, and that will require me to take a broad range of classes that expose me to various areas of business. I found my strength in accounting, and I realize that accounting, financial planning, and record keeping are essential parts to the success of today’s farms.”

Billy Rochelle



A native of Nunnely, Tenn., Rochelle is pursuing a degree in food and agricultural business. He’s interested in a career that will allow him to actively represent the agricultural industry and portray agriculture as a positive and essential industry for a growing population. “From an early age, I knew that I wanted to spend my life working in the agricultural field. I like people, the philosophy of rural life and helping people realize their dreams.”

Erin Brinkley



Brinkley is from Jonesborough, Tenn., and is pursuing a degree in agricultural education. She’s interested in a career in agriculture with a focus on education, finance or policy. “As fewer people grow up on farms and have less exposure to agriculture, it is important that we continue to influence policymakers and opinion leaders in support of agriculture.”

Forrest Duncan



Duncan comes to UT from Decherd, Tenn., and is working toward a degree in agricultural business. He is a fourth generation farmer who plans to use his agricultural education to expand and diversify his family farm. “I am an avid reader, and I enjoy agricultural publications. I enjoy comparing and contrasting farming methods in publications and the ones I use on my family farm.”

UT RESEARCHERS

devise new precision ag technology for row-crop producers

The idea began with a question put to Tennessee cotton producers: What if they had a technology that precisely sprayed fungicide to seeds as they were being planted?

Ten producers, gathered in a conversation with a UT biosystems engineer, said that was a technology they could use. Dr. John Wilkerson, an expert in sensors and controls, ran with the idea. Now he and a small team of institute researchers have developed a new precision agriculture technology that is being delivered to the marketplace, one that will improve the bottom line of crop producers, both large and small.

In fact, the new system, which is a specialized seed furrow detector, is expected to cut their amount of fungicide used by 50 percent or more, depending on seed spacing. That's a lot of savings, and it's good for the environment, too — a winning solution for everyone. It's also merited two patents issued to Wilkerson and team members Dr. Melvin Newman and graduate students John Hancock and Henry Moody. But the real winners here are crop producers.

Using the detector, farmers will be able to ensure that each seed going into their field is fully coated with fungicide without a drop being wasted. Even if their planter misses a seed or drops two at once, the laser-driven applicator does not miss a beat.

"We wanted a valve that would turn on and off fast enough to spray seeds falling at a 30th to 40th of a second," Wilkerson says. "We started thinking of fuel injectors in a car going 60 miles an hour. That's



John Wilkerson

Research associates Henry Moody, left, and John Hancock measure the pulsed spray target accuracy for each seed metered by a row-planter.

about the same rate producers are planting seeds, at 6 to 7 miles per hour."

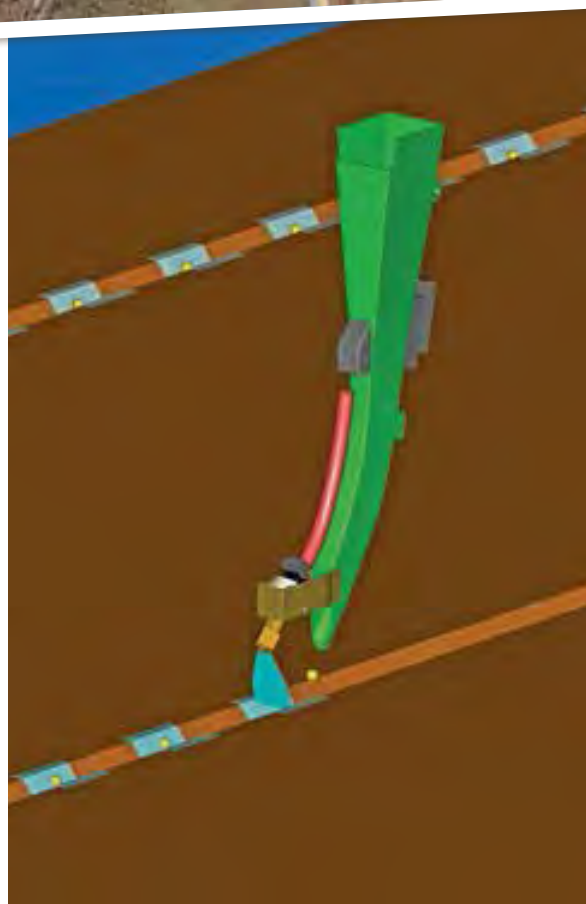
The technology, which is licensed through the UT Research Foundation, is essentially an algorithm that detects events and determines when the crop protectant application should be made. "The typical application is where we detect seeds falling from a seed metering unit, and we apply a chemical band on the seed before it hits the ground, which is a 10th of a second," Wilkerson says.

The technology was developed on research plots at the UT AgResearch and Education Centers in Milan and Jackson, underscoring their importance to innovation in the institute's land-grant research.

"To me, it's a big deal when you take a concept and it turns into intellectual property that someone is willing to invest in for commercial purposes that solve problems for producers," Wilkerson says.

"This also shows the significance of the people we serve investing in the university. This project involved a fairly small amount of investment in a grant by producers to AgResearch, which we were able to leverage into a new precision ag technology."

The planter technology is expected to become commercially available in the near future. For more information, contact John Wilkerson at 865-974-7266 or wilkerj@tennessee.edu. — Margot Emery



This diagram shows how the new precision ag technology applies in-furrow crop protectants as seeds fall from the planter into the furrow.



1

Who we are. What we do.

With a goal of showing who the Institute of Agriculture is and what we do, the Tennessee Chapter of Gamma Sigma Delta launched an annual photo competition this spring. The agricultural honor society's contest drew 77 entries by students, faculty and staff, with images representing our impacts across the state. We'd like to share a few with you.

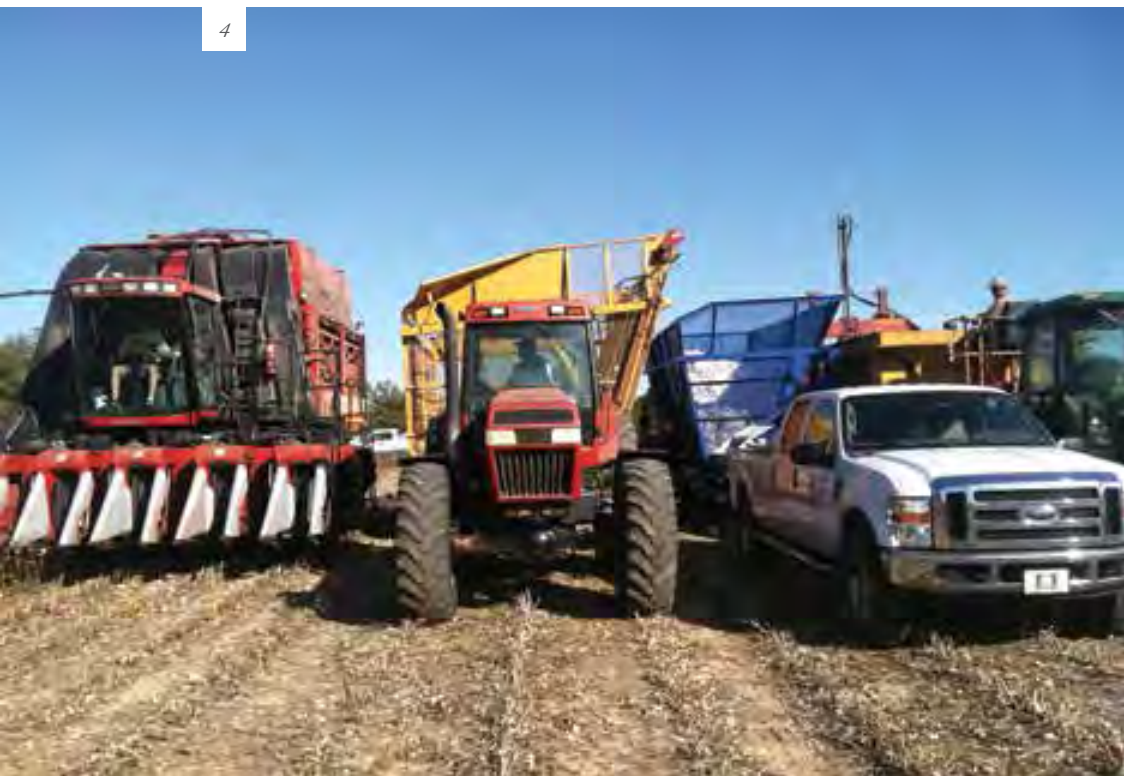
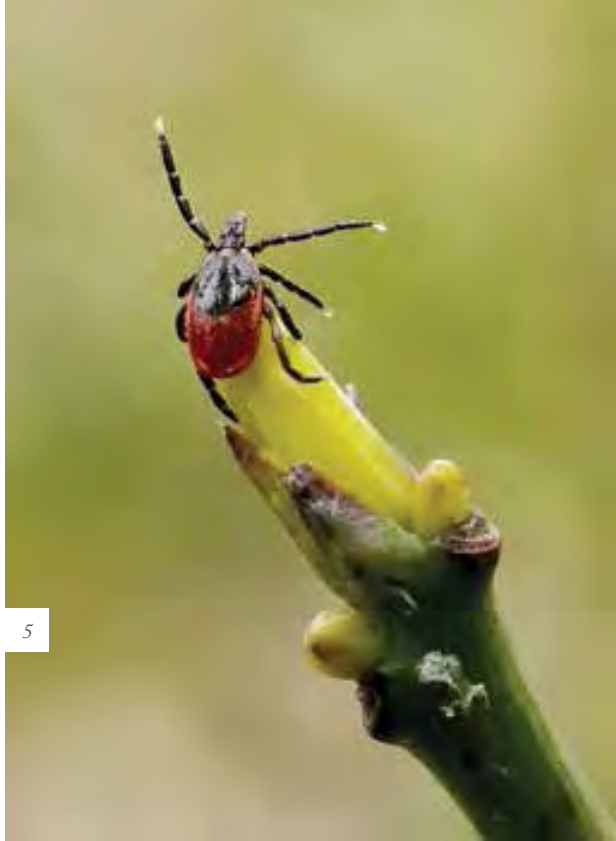
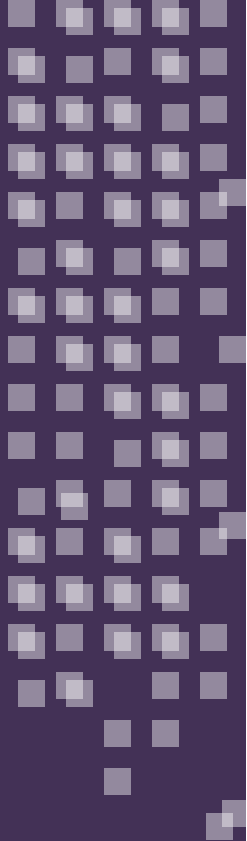
Photo Credits: 1. John Cummins 2. Carrera Romanini
3. Craig Canaday 4. Jake Mallard 5. Graham Hickling
6. Dena Wise 7. Jose Vargas 8. Dena Wise



2



3





“We are so fortunate to have such a medical facility here to help these cats. When we take in animals, we promise to give them the best life possible. The medical care they receive from UT helps us accomplish that.”

—Mary Lynn Haven

FIGHTING to save a king

Mary Lynn Haven cried the first time she saw Tsavo about 11 years ago. Less than 8 months old, the lion cub was malnourished, infected with intestinal parasites and covered with mites causing mange. As director of Tiger Haven, a big cat sanctuary in Roane County, Tenn., Haven has been rescuing lions, tigers and other big cats for more than 20 years. “It’s not a job, it’s a calling. These cats have been through so much,” Haven says about the 288 animals at the 70-acre facility. “Tsavo was so pitiful. He’d had a hard life his first year and has had medical issues on and off throughout his life.” But nothing prepared Haven for a diagnosis of cancer.

Earlier this summer, a swollen lump appeared on Tsavo’s face. At first, veterinarians thought a scratch had abscessed. “When we immobilized him with anesthetic drugs to lance the abscess, it ended up being a large pigmented, highly vascular mass,” said Dr. James Steeil, a third-year resident in zoo medicine at the UT College of Veterinary Medicine. Biopsies confirmed the diagnosis: malignant melanoma.

A CT scan, radiographs and regional lymph node size indicated the tumor had not yet metastasized (spread). Given Tsavo’s age and location of the mass, his medical team and caregivers turned to the linear accelerator at UT Veterinary Medical Center to deliver radiation therapy to reduce

the tumor’s size. If necessary, surgery would follow. Dr. Nathan Lee, a CVM board-certified radiation oncologist, scoured the literature and believes Tsavo is the first lion treated with radiation. “It’s a very unique case. This type of melanoma is unusual in domestic cats, never mind big cats.” Lee hopes the knowledge gained from Tsavo will help others. “After four radiation treatments and immunotherapy, the tumor’s size decreased by about 50 percent.” Advanced medical techniques used in domestic animals to treat cancer can be used in big cats.

Several weeks after Tsavo’s last radiation treatment, UT veterinary surgeons were able to remove the tumor as well as the mandibular lymph node (near the tumor site), which was enlarged and appeared metastatic. Histopathology confirmed that indeed the melanoma had metastasized to the lymph node.

Haven and Tsavo’s medical team are working together to map out the care for this king of the jungle. Right now, he sports a healthy appetite and appears to be free of pain. Haven says that is the bottom line for all the cats at Tiger Haven. “We are so fortunate to have such a medical facility here to help these cats. When we take in animals, we promise to give them the best life possible. The medical care they receive from UT helps us accomplish that.” – Sandra Harbison



Mary Lynn Haven

Opposite page: Dr. James Steeil checks Tsavo’s vital signs before the lion is wheeled to the linear accelerator for his radiation treatment. Above: Tsavo back home at Tiger Haven after a successful surgery.



Pam's Mountain Bouquet

Hello, Pam's Mountain Bouquet!

The institute's dogwood research team is well known for its "Appalachian" series of dogwoods, which can be found or ordered at garden centers and nurseries. Appalachian Spring is resistant to dogwood anthracnose, a deadly disease for dogwoods. Appalachian Mist, Appalachian Snow and Appalachian Blush, which can have a pink tinge, are white-bracted cultivars that are highly resistant to powdery mildew, another serious threat. Appalachian Joy is also highly resistant to powdery mildew. But it's this cultivar's blossoms that catch attention, because the tree has extra bracts that make for a showy spring display.

THE VIVID WHITE FLOWERS ON THIS new dogwood look like nothing more than perfect squares of white paper. Meet Pam's Mountain Bouquet, the latest dogwood variety developed by the institute's team of dogwood researchers and Extension personnel.

This *Cornus kousa* dogwood's eye-catching fused bracts make for a distinctive and showy spring display. Pam's Mountain Bouquet joins five other cultivars that the institute has developed and released. The trees provide nurseries with high-demand stock and landscapers and homeowners with lovely, disease-resistant dogwoods that enhance their homes and lands.

The work that resulted in the new release started more than two decades ago, when scientists with UT AgResearch began evaluating *kousa* species for



Appalachian Snow



Appalachian Mist



Appalachian Blush

resistance to anthracnose, a serious disease that can lead to dogwood death. The best of the trees were planted and preserved at the UT Forest Resources AgResearch and Education Center in Oak Ridge, Tenn. The dogwood team then chose Pam's Mountain Bouquet as the best of the best.

Kousas bloom later than flowering dogwood species, extending the season of spring blooms. When hot spring weather led flowering dogwoods to bloom early this year, it was *kousas* that saved the day for Knoxville's famed Dogwood Arts Festival, blooming as they did during the festival's set schedule of days.

In addition to Pam's Mountain Bouquet, the dogwood team is releasing two cultivars that will be sold by nurseries in Japan.

"The Japanese don't have a lot of space in their gardens, so they are fascinated with tall, narrow dogwoods, which we are releasing there," says dogwood team member Mark Windham, a professor of plant pathology.

Extension plant pathologist Alan Windham and plant pathology professor Bob Trigliano are also members of the dogwood team. Trigliano is chief manager of the team's business, Creative Agricultural Technologies LLC. CAT is one of UT's longest-running spinoff companies.

"Bob and I formed the company to provide AgResearch with a mechanism to release genetically improved ornamental plants," Mark Windham says.

"We give Tennessee nurseries first right of refusal on our varieties for at least two years, which gives them a head start on the market."

Pam's Mountain Bouquet is expected to become available to homeowners in four years, allowing nurseries time to build up their stock. The team's previously released varieties, in their Appalachian series, are sold at U.S. nurseries. – *Margot Emery*



Appalachian Joy

For more information, contact Mark Windham, mwindham@tennessee.edu, or Trigliano, rtrigliano@tennessee.edu, or call 865-386-1872.

UT Extension's road map for the future

by Tim Cross, dean, UT Extension

The zero-energy Living Light house.



As I think about strategic planning, a quote by Benjamin Franklin always comes to my mind. Franklin said, "To fail to plan is to plan to fail." Strategic planning can be expensive and time consuming, but what about the costs for an organization of not establishing a common vision, an explicit mission statement, and strategic directions and goals for the future? In the absence of strategic organizational plans, each individual is left to set their own goals and directions, which can lead to conflict, stress and tension as individual agendas are carried out. Just as in our personal lives, organizational long-term decision-making is very challenging with no priorities or end points in mind. According to Yogi Berra, "If you don't know where you're going, you'll end up someplace else."

While it's easy to talk about the benefits of strategic planning, what most of us want to see is direct evidence that positive impacts have occurred due to the development of a strategic plan. Cause and effect is often difficult to prove, but I'd like to illustrate what I see as several direct benefits in UT Extension that have resulted from the development of our Advancing Tennessee strategic plan.

- UT Extension partnered with the College of Architecture and Design and other colleges from UT Knoxville to co-host a statewide tour of the award-winning Living Light solar and green energy home.
- A new 4-H Lodge in Greeneville, Tenn., was made possible through a private gift to the Clyde Austin



Taking research-based information to Tennesseans.



The new lodge at the 4-H center in Greeneville.

Read more about how UT Extension is using its strategic plan at <https://utextension.tennessee.edu/strategicplan>.



4-H Center, providing a retreat style conference facility that will complement our summer camping programs.

- A statewide IT coordinator position was created for UT Extension to help lead efforts to coordinate our use of information technology statewide.
- UT Extension implemented a staffing plan to balance needs and funding across the state.
- On Jan. 1, 2012, starting salaries for UT Extension agents were increased to \$30,000 for new hires with B.S. degrees and \$34,000 for new hires who have earned their master's. This was the first increase in starting salaries since 2003.

These are just a few examples of progress we have made in implementing our plan, which includes goals to expand our partnerships, deliver innovative programs, be an employer of choice, operate efficiently and increase our visibility. I'm confident that you'll see similar progress as the UT system and all the units of the institute carry out their strategic plans in the coming years. With our continued dedication and commitment, our future is bright, and we will be well positioned to realize the visions that have been created. I'd like to leave you with one final quote: "The future depends on what you do today." Thanks to our Extension agents and specialists for all that they do to serve Tennessee and the Institute of Agriculture.

4-H'er Tori Bryant learning civic engagement from Tennessee Gov. Bill Haslam.



Strengthening individuals, families and communities through education.

For more than 100 years, UT Extension has helped Tennesseans solve problems and implement changing technologies to improve the quality of life in all 95 counties. In 2010, as Extension celebrated its centennial year and reflected on its heritage and accomplishments, it seemed an appropriate time to take an active role in planning its future.

That year, Extension launched a strategic planning effort to map the future for the next decade. Extensive input from employees, stakeholders and clients shaped the goals contained in the strategic plan that will serve as a map for the future. They include:

- Preparing for future growth.
- Advancing Tennessee through innovative programs.
- Investing in Extension's human capital.
- Maximizing organizational efficiency.
- Increasing visibility of UT Extension.

These goals reflect the need for innovation and technology while maintaining Extension's tradition of community-based education. The plan engages employees, partners, volunteers and those Extension serves to positively impact Tennessee communities. Working closely with these groups, UT Extension will advance Tennessee.

ADVANCING
TENNESSEE

Alumni Memories

JOE ADCOCK

Dr. Joe Adcock (CVM '79) is the first graduate of the UT College of Veterinary Medicine. Period. He's quick to point out he wasn't first in his class but graced with a last name that started with the letter A. He was the very first student to walk across the stage and be declared a doctor of veterinary medicine by the University of Tennessee.

"When we first started veterinary school, the present day building didn't exist," Adcock says. The students in the Class of 1979 had their classes in Brehm Hall — in one classroom. "Most people in our class sat in the same chair eight hours a day for two years. It was a three-year curriculum with just one week off between quarters. It worked out fine; we didn't have to catch a bus and ride to other places, and we could leave everything at that chair."

When asked about yesteryear, Adcock laughs and says he hesitates to share many memories. While the statute of limitations may have expired, retaliation remains a possibility. "I'm not certain I want to tell too much," he says, adding that the entire class was kept busy. "Actually, we worked a lot. Back then, the college didn't hire a lot of people to work in the hospital and students had to do everything. We didn't have a whole lot of fun." One might almost believe Adcock. Almost.

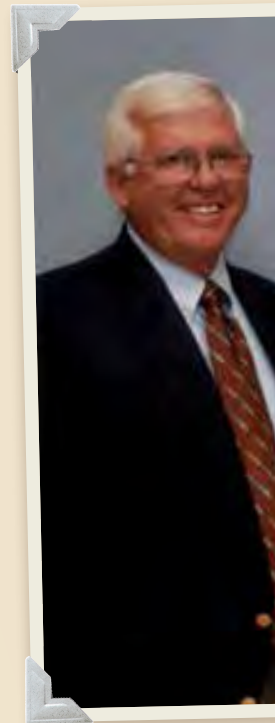
It was the very last week of class, and the students were in the large animal facility. A massive water fight broke out. "It wasn't necessarily students

versus faculty," Adcock recalls. "It was more students ambush faculty! We took advantage of the surprise, and they didn't have enough time to retaliate." With a straight face, he says the water fight, complete with filled balloons and fire hoses, wasn't his brainchild. "No, it just sort of happened and everyone jumped on board. They knew what they'd put us through." Adcock says all but one faculty member took it in good spirits, and that person's identity is a secret he's keeping to himself. — Sandra Harbison

Veterinary medicine graduate Joe Adcock has many happy memories from his days as a student.



In 2009, Murray Miles was presented with the Gamma Sigma Delta Alumni Award of Merit. The agricultural honor society honored Miles for a lifetime of achievements. Dr. Fred Allen, Plant Sciences, (left) made the presentation, and Dr. Michael Davidson, Food Science and Technology, made the nomination.



A glimpse of the CVM water fight pitting students versus faculty.



Trevor Ruskowski



MURRAY MILES

When Murray Miles arrived on campus in 1948, there were only two main buildings on the ag campus: Morgan Hall and Ag Engineering. But McCord was nearing completion, and in front of Morgan Hall stood a barn structure known as Temple Hall along with a small lunchroom. “Mabel Davenport was here at that time, and that’s where she was working,” he says. The cafeteria, in McCord for decades now, is named Mabel’s in her honor.

Miles has memories he cherishes of his time at UT. “Foremost is the friendship of people; I met so many of them. I was active in the Young Farmers and Homemakers program and the Ag Club. The Physical Education Department asked me to teach folk dances and games that I learned as a 4-H youth. I also had the opportunity to be a member of the UT Chorus. I thoroughly enjoyed that.”



Just a month before entering UT in 1948, Miles was elected state 4-H Council president. Miles is fourth from the left on the front row.

One facet of campus life specific to his time was Home Management Houses, where students gained practical experience in managing a household for one quarter. “I was dating a young lady majoring in home ec. I’d shop with her, and when she’d cook, she’d invite me over for supper. That’s where I first tasted broccoli. It wasn’t very common at the time.”

Miles arrived on campus thinking he’d major in dairy, but his father, a dairyman, persuaded him to choose something else since he already knew dairying. Miles majored in agronomy. In the end, though, he entered a very different field. “I wish I had taken more, but I only took one quarter of

journalism, and then I ended up editing the largest circulation newspaper in Tennessee, the Farm Bureau News. So you never know where you’re going to be led.”

Miles made his career with the Tennessee Farm Bureau Federation and is known today for his weekly television program, daily radio show and his “For Miles Around” weekly newspaper column. He has also been honored by the institute and national 4-H for his work with youth and commitment to Tennessee agriculture. He now lives on Miles Manor Farm in Maury County. — Margot Emery



Tom and Grace Parkhill

TOM PARKHILL, INDEPENDENT IRIS HYBRIDIZER

Parkhill earned his bachelor's in animal husbandry in '49, yet it is his skill in hybridizing iris of which we're most proud. Parkhill discovered iris through his wife, Grace, when he was 28 and newly married. Love of iris led to collections of iris that led to crossing them. Parkhill, who lives in Knoxville, has now released 18 tall bearded hybrids, the latest named Glorious Grace. His orange-blooming iris, Volunteer Pride, has captured the hearts of staff with the UT Gardens. Parkhill's blooms are praised for their clear colors and significantly better substance than most in their categories. Several have won national honorable mentions and advanced, through national voting, to awards of merit: the best in show. Volunteer Pride is expected to win that honor. His Chief John Jolly won the American Iris Society's 2012 Wister Medal, signifying that it is considered the third best tall bearded iris growing in the world.

Alumni Dream Jobs



Hugh Stout

Chief John Jolly iris

**READ ABOUT THEIRS,
TELL US ABOUT YOURS AT
AGALUMNI@TENNESSEE.EDU**

MIRANDA MARSHALL CLARK, BAYER CROPS SCIENCE

Clark manages Bayer's greenhouses for cotton trait introgression. She supervises a team of employees. The goal of trait introgression is to provide seed sources to Bayer's cotton breeders that contain traits of commercial interest, such as insect resistance or herbicide resistance, while maintaining the highest possible recurrent parent background. Clark earned a B.S. in ornamental horticulture and landscape design in '02 and an M.S. in entomology and plant pathology in '06. "This is not the line of work I expected to be in as I was earning my degrees at UT. But I love it! I have learned a great deal about the biotechnology industry through training and networking in my job. I have also had fantastic opportunities to develop my leadership and management skills. There are always new technologies being developed, which keeps the job interesting, as well."

Miranda Marshall Clark





Lynn Murray, left, with dry bean grower Mark Sletten in Hatton, N.D.

LYNN MURRAY, BUSH BROTHERS AND COMPANY

Bush Brothers means beans, and Murray is in charge of getting them. The '67 agronomy major is senior manager of dry bean procurement for Bush. His work takes him to places like Michigan, North Dakota, Minnesota and California. There's a UT connection, too. Trains deliver the beans to the terminal beside campus. On a typical day, 10 to 15 truckloads of beans pass through the agricultural campus on their way to the Bush facility in Dandridge. "I've had the blessing of having worked in the food processing industry, including the last 27 years at Bush, for my entire career. It's been a good trip," Murray says. When he retires in a year or so, he plans to continue working for Bush as a guide at the company's popular new museum and visitor center in Chestnut Hill. "I'm just going to change jobs and not even change employers. The visitor center will give me the opportunity to continue to meet people to tell our story and about how vital agriculture is to all our lives."



REID HARVEY, FEDERAL LIAISON, INTERNATIONAL BIOENGAGEMENT

When Dr. Reid Harvey (M.S. Public Health '09, DVM '10) began veterinary school planning a career in small animal private practice, he could not have imagined the experiences he would have under his belt just six years later. "Each and every opportunity has been more eye-opening than the last," says Harvey. "But my training in veterinary medicine and public health has opened doors on Capitol Hill and now in the international biodefense arena." Following graduation, Harvey completed a one-year small animal clinical internship before being named one of three 2011-2012 American Veterinary Medical Association Congressional Fellows. In that capacity, Harvey recently completed his fellowship in the office of Sen. Kirsten Gillibrand (N.Y.), where he advised the senator on issues surrounding food safety, live animal imports, antibiotics in agriculture, and biosecurity. "Working on Capitol Hill offered unique challenges day in, day out. As a public health veterinarian, I found my input was valued, and my colleagues on the Hill truly came to appreciate that the breadth of our profession goes well beyond treating dogs and cats." Since leaving the Hill in August, Harvey has begun work as a liaison for the U.S. federal agencies involved in international bioengagement to reduce the threat of biological attacks. "It's been a wild ride thus far, and I hope I can continue to add value in whatever direction I go."

Sen. Kirsten Gillibrand with Dr. Reid Harvey

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