

# INNOVATIONS

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# Cloudy with a chance of microbes

By Zeke Barlow

**A**s children, we are taught about the beautiful simplicity of the water cycle.

Precipitation cascades from the sky, falls onto plants and ponds and people, then evaporates back into the atmosphere and eventually descends back to Earth.

But what if it isn't that simple? What if instead of just modest H<sub>2</sub>O, there were also millions of microbes in the rain? What if these microbes then went back up into the atmosphere and became parts of clouds again? What if these bacteria and fungi and other tiny organisms actually contributed to the formation of rain itself?

Turns out, there is plenty of evidence for this.

"Clouds are actually teeming with microbial life," said David Schmale III, an associate professor in the Department of Plant Pathology, Physiology, and Weed Science. "But little is known about microbes in the rain."

Until now.

Schmale and Boris Vinatzer, an associate professor and geneticist in the same department, are part of an international team that is leading a first-ever study to examine and run DNA analyses on millions of microbes that hit the earth with each passing raindrop.

The work is being sponsored by a \$2 million grant from the National Science Foundation's Dimensions of Biodiversity Program, which asked scientists around the world to examine biodiversity in all corners of the world. While lots of work has been done to catalog microbes that live in the sea and on land, the study of microbial life in the atmosphere and in rain is largely unexplored.

Vinatzer and Schmale, along with visiting postdoctoral research associate Caroline Monteil of the French National Institute for Agricultural Research, are collecting samples of rain in buckets at Virginia Tech's Kentland Farm. But because rain serves as an excellent

**"This work has the potential to paint a picture of our environment that has never been done before."**

— Boris Vinatzer

atmospheric scrubber, Schmale will also gather precipitation from clouds using unmanned aerial vehicles to collect untainted samples for testing.

The group is working with Brent Christner of Louisiana State University, Caroline Weber of Idaho State University, David Sands of Montana State University, and Cindy Morris, also of INRA.

In the coming years, samples will be collected in Louisiana, Idaho, Montana, and France in order to glean a snapshot of microbial life in rain around the world. The team will also

David Schmale checks a weather gauge at Kentland Farm, where he is collecting rainwater to run DNA analysis of the microbes in rain.



Boris Vinatzer, Caroline Monteil, and David Schmale check on one of their rain samples at Kentland Farm.

examine microbial diversity in glacial ice core samples to see if the atmospheric microbial makeup has changed since the 1700s.

"We still know very little about the importance of rain in plant, animal, and human health, so this work has the potential to paint a picture of our environment that has never been done before," Vinatzer said.

The team has already cultured and identified thousands of microorganisms from rain that fell in Blacksburg this year.

Many of the bacteria will be characterized in detail by sequencing their genomes and testing them for their ability to catalyze the formation of ice. This could lead to more accurate weather forecasting and could potentially help with cloud seeding — when clouds are injected with a material that encourages rain.

Mark Twain once famously groused that everyone complains about the weather, but nobody does anything about it. Too bad he never got to meet Schmale and Vinatzer.



Caroline Monteil runs a DNA analysis of rain collected at Kentland Farm.



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Keep up with all the exciting research, academic, and Extension news at the College of Agriculture and Life Sciences website, [www.cals.vt.edu](http://www.cals.vt.edu), or find us on social media.



## INNOVATIONS

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# Dean's Update

## CALS growing and investing in the future

Greetings from the College of Agriculture and Life Sciences! This past year has been a continuation of growth for the college. I would like to take this opportunity to provide some updates on the progress the college is making in expanding its academic, research, and Virginia Cooperative Extension programs.

As we move into the next academic year and welcome 484 first-year students, 142 transfer students, and many returning students, this is an opportune time to highlight the significant increase we are seeing in student enrollment. There were 2,871 undergraduate majors enrolled in CALS this past year, a nearly 24 percent increase since 2007. We awarded 680 bachelor's degrees, 97 master's degrees, and 58 doctorates the last academic year — an increase of more than 60 percent compared to 2007.

As part of our strategic plan, we will continue this expansion over the next six years with an enrollment goal of about 3,000 undergraduate majors and 850 graduate students.

The college's research programs are growing, too. Annual grant expenditures swelled by 14 percent over last year to a total of \$45.7 million — a figure that nearly doubles the grant dollars of a decade ago. The bulk of our grant funding comes from federal agencies, but a sizeable amount is from industry, too.

We have been very fortunate to recruit a number of new faculty members in recent years. In 2010, when the college faced substantial budget cuts, the number of tenure-track and tenured faculty members dropped to 180, and the number of Extension agents dropped to 179. By the end of 2013, we expect 224 tenure-track and tenured faculty members (on campus and at the Agricultural Research and Extension Centers) and 235 Extension agents to be on board.

Our alumni and friends provide considerable support that has a significant impact on our students and on others who benefit from the many programs of the college. The college's three-year average gift income has increased from \$3.9 million in 2008 to approximately \$5.3 million in 2013. Our total endowment is more than \$58 million, which includes nearly 300 endowments that support many academic and research programs, scholarships, assistantships, professorships, and experiential learning activities. These funds and annual contributions allowed the college to award 575 scholarships this past academic year, which had a total value of approximately \$1 million and provided nearly \$2 million in income from endowments to support college programs, projects, and endowed positions.

The growth that CALS has been experiencing is the result of the work and assistance of many internal and external stakeholders of the college. We are very thankful to those who have made it possible to continue to grow and invest in our people and programs.

With this ongoing support, the future of CALS is bright!

Sincerely,  
Alan Grant  
Dean

## Alumni making a difference

Service dogs Bo and Ty are probably the most famous springer spaniels in Smyth County, according to Andy Overbay, a 1985 dairy science graduate and Virginia Cooperative Extension agent and unit coordinator.

Overbay and his canine ambassadors have been frequent visitors to hospitals and 4-H events for three years. He takes their wet noses and wagging tails all over Smyth County, offering therapeutic human-animal contact — complete with hound hugs and kisses — or just lending their long, floppy ears to those in need of a good listener.

"As an Extension agent, community is everything," said Overbay, who also earned his master's degree and Ph.D. from Virginia Tech. "Whether we are volunteering each week at the local hospital or sharing knowledge with 4-H youth, my ties to the community are made increasingly stronger through the adventures of Bo and Ty."

Follow Bo and Ty's exploits at [www.facebook.com/BoTyDawgs](http://www.facebook.com/BoTyDawgs).



Alan Grant, dean

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## Outstanding Senior gains experience around the globe

Shasta R. Sowers was never wanting for something to do at Virginia Tech.

The agricultural sciences major — who minored in international agriculture, animal and poultry sciences, and Appalachian studies — served as a College Ambassador, a member of Dairy Club and Collegiate FFA, the state secretary for Virginia FFA Association, and a participant in The Big Event and Relay for Life.



Shasta Sowers

In 2012, Sowers was selected for the International Collegiate Agricultural Leadership Program in Southeast Asia. She has taught farming techniques in Nicaragua and found time to volunteer at a local farm and at the Blacksburg Farmers Market. Sowers was also a researcher for the Appalachian Teaching Project and presented her findings to the Appalachian Regional Commission.

"Shasta is one of our shining stars in the college," said Susan Sumner, associate dean and director of academic programs. "She is bright, inquisitive, and has a deep desire to give back to her community."

## Biochemistry grad student wins Outstanding Dissertation Award

Justin Lemkul, who earned a Ph.D. in biochemistry in 2012, won the Graduate School's 2012-13 Outstanding Dissertation Award in the category of science, technology, engineering, and mathematics.



Justin Lemkul

Lemkul won the award for his research on Alzheimer's disease. He focused on determining how small molecules influence the aggregation of proteins involved in the progression of the disease. The award comes with a \$1,000 prize.

He was asked to write a review article in the journal "ACS Chemical Neuroscience," and his research was highlighted on the cover page of a special issue about Alzheimer's. In addition, he has been invited to give seminars at major research universities in the United States and Europe.

Winning honorable mentions were Kristen Capogrossi of Madison, Wis., who earned a doctorate in agricultural and applied economics, and Tracy Leigh Scheffler of Blacksburg, Va., who earned a doctorate in animal and poultry sciences — both in 2012.



Andy Overbay and his springer spaniels, Bo, left, and Ty, frequently visit hospital patients in Smyth County.

## INNOVATIONS

## Summer 2013

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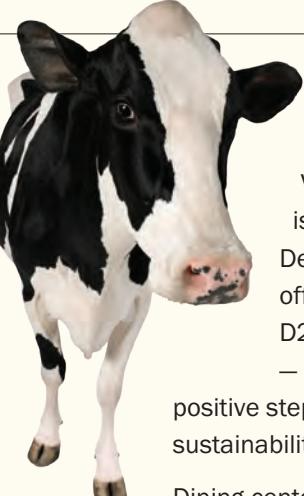
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Keep up to date with all the college's news and upcoming events at

**www.cals.vt.edu**

## Virginia Tech's got milk



Virginia Tech Dining Services is now partnering with the Department of Dairy Science to offer "Virginia Tech milk" in the D2 dining center in Dietrick Hall — a move that marks another positive step for Dining Services' sustainability initiatives.

Dining centers have been using meats purchased from the college's Meat Science Center for more than two years, and the university provides local produce through the Dining Services Garden at Kentland Farm.

Students harvest the milk from the herd of dairy cows at the Dairy Center, which is then pasteurized by the James River Department of Agribusiness.

"We are fortunate to have so many resources available to us as a land-grant university," said Dining Services Sustainability Coordinator Rial Tombes, a 2012 Virginia Tech graduate who minored in civic agriculture and food systems.

Similar to the Meat Science Center and Kentland Farm, the Dairy Center supports the university's focus on teaching, extension, and research. Dairy science classes meet at the dairy for at least one lab each week, and 10 to 15 students work in the dairy each semester. These students work directly in the milking parlor, harvesting milk and feeding the herd.

"This will be the highest quality milk served on campus," said Shane Brannock, the dairy farm superintendent.



Students work in the dairy, which now sells milk to the university.

## Alumni inducted into Hall of Fame



Dean Alan Grant, right, welcomes George E. Russell into the Hall of Fame.



Dean Alan Grant, right, presents an award to Winston and Marilyn Samuels, new members of the college Hall of Fame.



From left, Thomas Tillar, vice president of alumni relations, John L. Koontz, and Dean Alan Grant celebrate Koontz's Outstanding Recent Alumni Award.

George E. Russell of Blacksburg, Va., and Winston and Marilyn Samuels of Warwick, N.Y., were inducted into the college's Hall of Fame at the annual alumni awards reception held in March. John L. Koontz of Oak Park, Ill., was recognized with the college's Outstanding Recent Alumni Award.

Russell, vice president emeritus for alumni relations, earned his B.S. in animal science from Virginia Tech in 1952 and received a master's degree and Ph.D. from other universities. After a distinguished career with Virginia Cooperative Extension, Russell joined the Virginia Tech Alumni Association in 1968 as director of alumni affairs. Now retired, Russell remains active with his alma mater.

Winston Samuels completed his master's and doctoral degrees in animal science at Virginia Tech in 1980 and 1983, respectively. Marilyn earned a B.S. in psychology at Virginia Tech in 1982 and a master's degree at Radford University. They co-founded Maxx Performance Inc., a progressive biotech company that improves the functionality of raw ingredients for food and health.

A principal investigator and chemist at the U.S. Food and Drug Administration's Center for Food Safety and Applied Nutrition, Koontz earned bachelor's, master's, and doctorate degrees in food science and technology from Virginia Tech in 2000, 2003, and 2008, respectively. His current research focuses on food packaging safety.

Other award winners included:

- **Outstanding Ambassador:** Kiley Petencin of Charlottesville, Va., a senior majoring in human nutrition, foods and exercise.
- **Outstanding Faculty Service Award:** Kurt Stephenson of Blacksburg, Va., professor of agricultural and applied economics.
- **Outstanding Alumni Leadership Award:** Ronnie Gill of Tappahannock, Va., executive vice president with Colonial Farm Credit.
- **Outstanding Alumnus in International Programs:** Lire Ersado of Washington, D.C., senior economist with the World Bank.

For more information on these and other departmental award recipients, visit [www.cals.vt.edu/alumni/awards](http://www.cals.vt.edu/alumni/awards).

## Virginia Tech sends first Presidential Fellow to Washington

By Amy Loeffler

Presidential Fellow, nonprofit organization founder, world traveler, and scholar are just a few titles Austin Larrowe has acquired in his short time at Virginia Tech. With a double major in applied economics management and agricultural sciences, he has two more years at the university to work toward his goal of establishing a career in international agriculture development and education. But Larrowe, of Woodlawn, Va., is on his way.

His most recent accomplishment — being selected Virginia Tech's first Presidential Fellow by the Center for the Study of the Presidency and Congress — gave him a glimpse into how policy is crafted inside the Beltway. Larrowe traveled to the nation's capital to network and attend workshops with policymakers. He also conducted research about food security and its correlation to increasing food production worldwide by closing the gender gap in agriculture.

Larrowe has also participated in Virginia Tech's Presidential Global Scholars program in Switzerland to study policymaking.

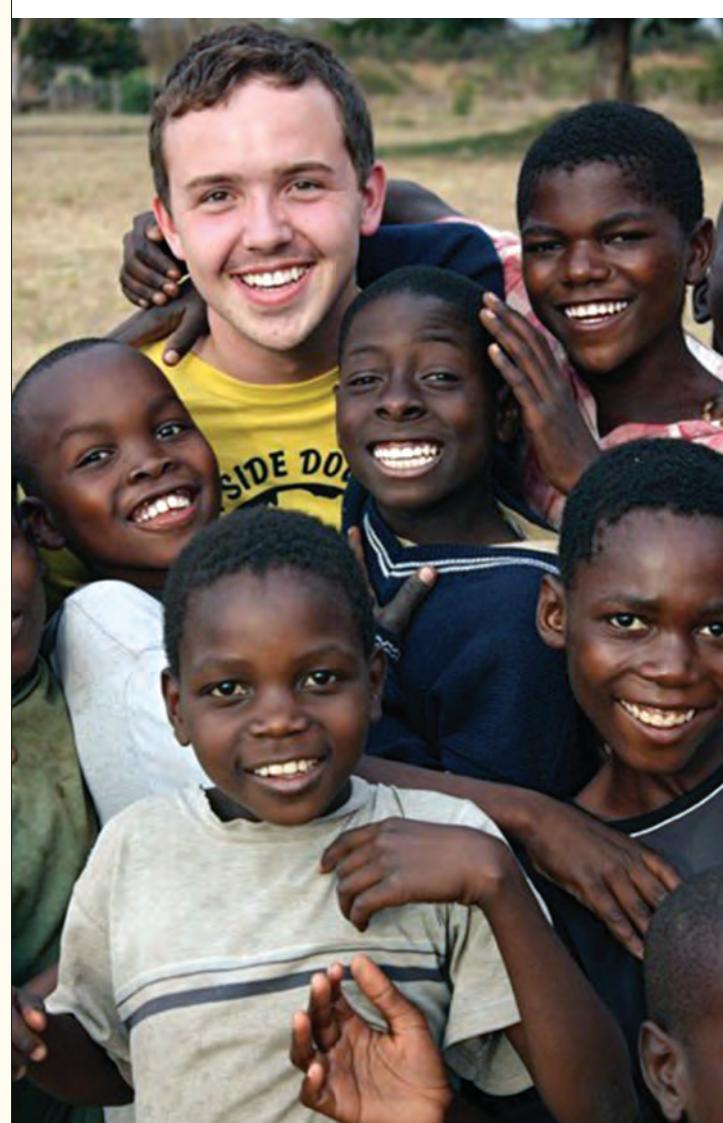
"My paper on the relationship between global security and food security helped me see the interconnectedness of policy changes to virtually every part of human life," said Larrowe.

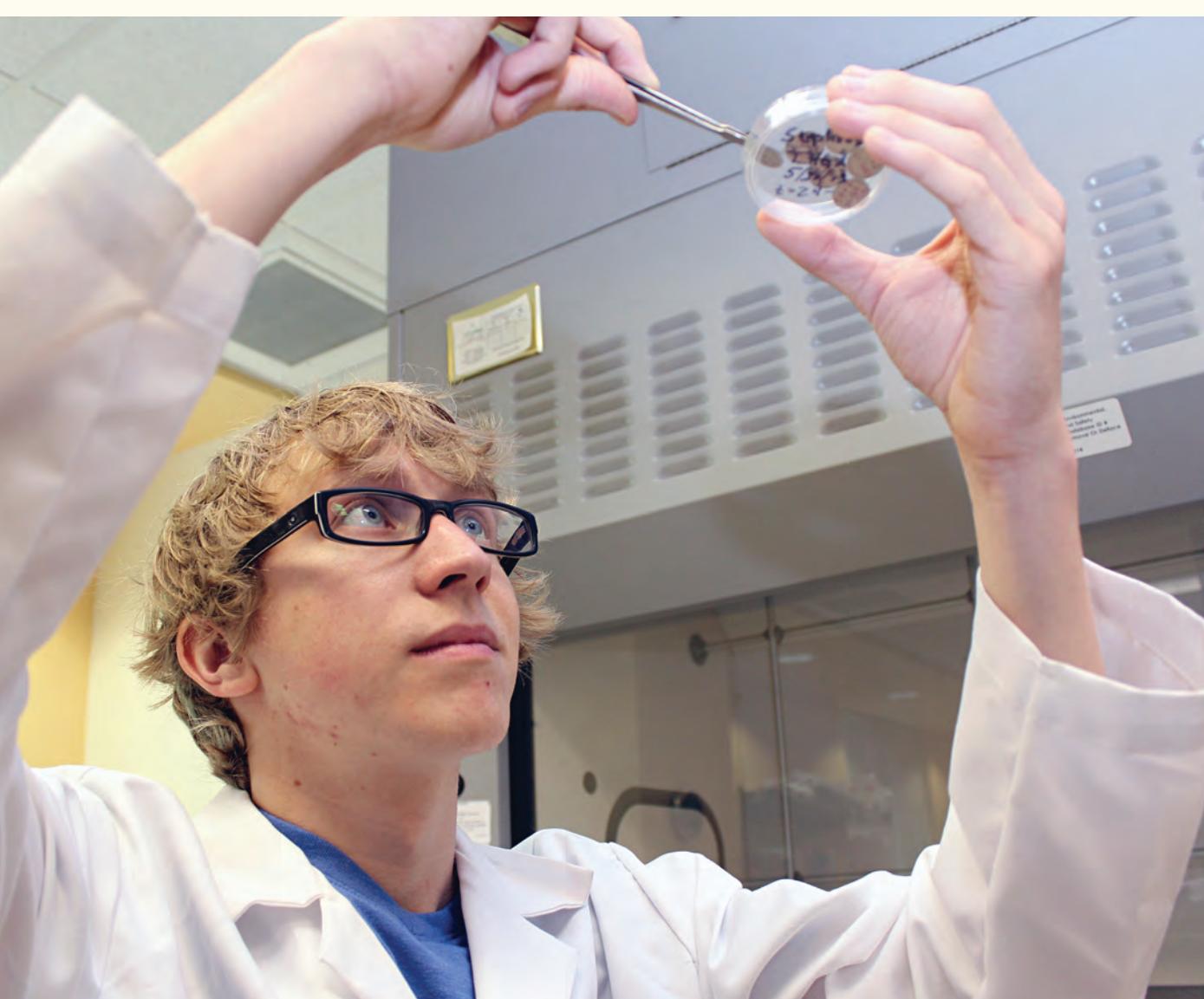
Not one to rest on his laurels, Larrowe founded the nonprofit Feed by Seed — a Nicaragua-based organization he established after a trip to Africa with FFA inspired him to make international agriculture education his priority.

Larrowe has traveled to 30 countries, including Ghana, where he studied this summer through the Virginia Tech-University of Cape Coast, Ghana Research Experience — a program funded by the National Science Foundation.

"My hope is that after school I can turn Feed by Seed into a full-time job," Larrowe said. "We are already starting to see very positive results in the communities in which we are working."

Austin Larrowe in Zambia, one of the many places the Presidential Fellow has visited in order to study global agriculture.





Stephen Lowery, a math major, prepares plates for use in a powerful microscope that will let him see the progress he is making in synthesizing silk proteins. Lowery and other students in the Bioprocess Engineering for Sustainability program synthesize natural fibers as part of their research.

## Students tackle weighty issues in Research Experiences for Undergraduates

By Amy Loeffler

Global warming, drought, and lack of renewable resources are all defining societal concerns of the 21st century. Undergraduates tackled these daunting subjects and had the opportunity to explore the challenges and possible solutions to these age-defining crises during this summer's Research Experience for Undergraduates program.

The REU program – funded by the National Science Foundation – emphasizes the opportunity for students from four-year and community colleges to engage in research they might not be able to do otherwise. This summer, students from a host of colleges and universities worked with professors from the Department of Biological Systems Engineering in two programs: Bioprocess Engineering for Sustainability and Dynamics of Water and Societal Systems.

Students in the Bioprocess Engineering for Sustainability program focused on converting biological material such as plants into fuels, chemicals, materials, and pharmaceuticals. Students also attended the American Chemical Society Green Chemistry Institute's 17th Annual Green Chemistry & Engineering Conference.

"We try to accept students who would not otherwise have this opportunity," said Justin Barone, associate professor of BSE and program site director. "We also focus on accepting underrepresented groups in science and engineering."

Students in the water-focused project investigated complex, systems-level interactions within a relatively small, manageable watershed at the Stream Research, Education, and Management (StREAM) Lab. In addition to exposing students to the diversity of related research in this area, W. Cully Hession, professor and site director, gave students opportunities to engage with various community stakeholders and the general public. They also attended the 13th Annual American Ecological Engineering Society Conference at Michigan State University.

"Summer undergraduate research programs are a win-win experience for the department and the student participants," said Mary Leigh Wolfe, head of biological systems engineering. "The students work with faculty and graduate students on cutting-edge research and discover their level of interest in including research in their future studies and careers."

## A new look for Virginia Cooperative Extension

After a lengthy development process Virginia Cooperative Extension unveiled its new visual identity and logo in May.

"We believe the new logo reflects a modern image that embodies the partnership between Virginia Tech and Virginia State University," said Ed Jones, director of Extension. "And while our look may be different, we are still focused on providing practical education to help people, businesses, and communities solve problems, develop skills, and build better futures."



Local Extension offices will be transitioning to the new visual identity over the coming months.

## Governor says university plays key role in agricultural trade

When Virginia Gov. Bob McDonnell announced the state's second year of record agricultural trade export figures, he recognized the vital role Virginia Tech plays in helping to expand and diversify the commonwealth's largest industry.

"Virginia Tech has been a remarkable source of expertise," McDonnell said at the Governor's Conference on Agricultural Trade, held in Richmond, Va., earlier this year. The event was sponsored in part by the Department of Agricultural and Applied Economics.

Soybean, lumber, tobacco, wheat, and pork – all commodities for which Virginia Tech provides crucial research and extension services – were among the top exported products that helped push 2012 export figures to a record \$2.61 billion.

"We have the commitment and competitive ability to assist our agricultural constituents to prosper and meet the challenges of the 21st century," said Virginia Tech President Charles W. Steger, who also spoke at the conference.



Virginia Tech President Charles W. Steger addresses the crowd at the Governor's Conference on Agricultural Trade.

## New 'Water Cluster' will strengthen interdisciplinary water programs

The number of people who live in areas with water scarcity is expected to rise from 1.6 billion today to 2.8 billion by 2025, according to the World Bank. Integrated approaches to water resources management are needed to meet the water shortage challenges and mitigate the anticipated impacts of climate change.

The college already has significant strengths in its water research, education, and Extension programs. To achieve its goal of establishing a premier water resources program, the college – in collaboration with the College of Natural Resources and Environment – is adding seven tenure-track faculty positions to address water-related issues. The new faculty members are collectively being called the Water Cluster.

The departments of crop and soil environmental sciences and biological systems engineering will each add two water experts, with the remaining three positions located in the College of Natural Resources and Environment. These faculty members will complement Virginia Tech's existing water science expertise by exploring interdisciplinary subjects as diverse and complex as water itself, including the effects of climate change on agriculture, management of water and natural resources, transport of chemicals to surface water and groundwater, and development of decision-support tools to mitigate the negative impacts of human activities.

"We currently have an exceptional group of scientists and engineers who are examining the many challenges facing the management of water resources and quality," said Saeid Mostaghimi, associate dean of research and graduate studies. "These new positions will effectively integrate our research, education, and Extension programs and allow us to conduct interdisciplinary programs by bridging water science and engineering with social sciences to more effectively address global water issues."

## Character counts – here and abroad

By Lori Greiner

Since 1994, Virginia 4-H has provided training and support for CHARACTER COUNTS!, an education program developed by the California-based Josephson Institute of Ethics, which promotes character education throughout the country.

In 2004, Glenda Snyder, senior Virginia Cooperative Extension agent emeritus, introduced CHARACTER COUNTS! to schools in Brazil. She was invited by Partners of the Americas, a humanitarian organization, to train school personnel and implement character education. At the time, Brazilian school systems were characterized by high rates of violence and crime.

Snyder and a local school principal trained 80 school and community representatives, and CHARACTER COUNTS! was implemented as a pilot program in Brazilian schools. Officials reported positive results such as improved student conduct, decreased violence, more respectful behavior, and increased numbers of parents volunteering.

The relationship with educators in Brazil has grown and developed over the past nine years as Extension faculty members have trained more than 1,000 Brazilian teachers, principals, and community leaders, which has impacted 70,000 students annually.

The work has expanded to include a Virginia-Brazil teachers exchange, trainings in additional locations in

Brazil, and an agreement with Virginia Tech and the University of Santa Catarina for a student-faculty exchange for academics, extension, and research.

While these training efforts have had a positive effect on participants in Brazil, the impact is being felt in Virginia as well. Faculty participants in the exchanges have reported improvements in their training skills and their ability to adapt teaching methods to different audiences. Agents also report a heightened awareness of, and need for, flexibility and creativity when working with diverse audiences, which is increasingly important as Virginia becomes more diverse.

This spring, Snyder and her CHARACTER COUNTS! team of John Blankenship, Tazewell County Office; Jocelyn Dailey, Goochland County Office; Brian Hairston, Henry County/Martinsville Office; Jeremy Johnson, James City County Office; Robert Meadows, state 4-H director emeritus; and Tonya Price, associate specialist for 4-H youth development; were honored with the university's 2013 Alumni Award for Outreach Excellence for their contribution to promoting the university's mission of outreach throughout the commonwealth and beyond.



"Respectacles" help teach the concept of respect, being a respectful person, and seeing respect more clearly.



Brazilians learn about trustworthiness by working as a team.



Teachers and community leaders learn about trustworthiness, deception, and lies by completing puzzles.

## Pre-med student's desire to serve others leads to the Dominican Republic

By Amy Loeffler

The only tropical flora most people encounter in a doctor's waiting room is a fake plastic flower. But for aspiring medical student and animal and poultry sciences major Amber Rosser, her waiting room this spring was just as much medical unit as it was tropical garden.

That's because the Lynchburg, Va., native took her scrubs to the verdant Dominican Republic to prepare for a career in health care and gain experience working with patients as part of a medical team. Rosser received travel assistance from the John "Buster" Beier Memorial Excellence Fund — a fund established by the College of Agriculture and Life Sciences Alumni Organization and friends and family of 1974 graduate John Beier — that provides resources for experiential learning by students.

Rosser trekked to the Caribbean with other students and staff from the Edward Via

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College of Osteopathic Medicine. She treated patients at mobile clinics and educated them about disease prevention and good hygiene practices during the week she spent on the island nation.

Until last year, she had only journeyed outside of the country once, and that was to Honduras — also on a medical mission trip.

"These experiences have reinforced my desire to spend the rest of my life doing for others," said Rosser, who graduated in May. "I cannot wait until I am able to serve as the attending physician on multiple mission trips."

Another goal Rosser has set for herself? To improve her Spanish.

It's apparent through Rosser's volunteer spirit, however, that "gracias" and "de nada" are words she already knows well.



Amber Rosser volunteering on a medical team in the Dominican Republic.

## Healthy cake recipe takes FST team into finals



The Food Science Product Development Team was selected as a 2013 finalist in The Knowledge Award competition, sponsored by DuPont Nutrition & Health, for its red velvet cake recipe.

Team leader Ershad Sheibani and members Allison Pisieczko, Ian Niblock, Jordan Newkirk, and Jian Wu developed Red VelVEG cake — a cake mix product that provides a full serving of vegetables. The students are all in the Department of Food Science and Technology.

The healthy cake mix comprises beet, carrot, and sweet potato powder. The frosting is made from nonfat cream cheese fortified with blueberry powder and chia seeds and supplemented with synbiotics — a combination of prebiotics and probiotics.

The idea for using beets in the cake was inspired by the team's desire to use something other than red dye to give the cake its signature color, but the team took the nutrition component a step further after experimenting with recipe development.

Ershad Sheibani and Jordan Newkirk examine feedback from taste tests of their Red VelVEG cake.

## Interest in Extension e-books growing

Virginia Cooperative Extension began offering free e-book versions of several of its most popular publications in 2012. Since then, the e-books have been downloaded more than 2,000 times and Extension is releasing two to three new e-books every few months.

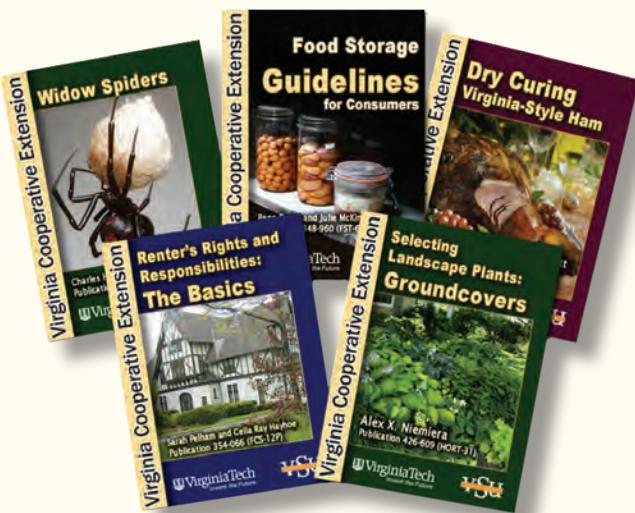
Publications are chosen from the hundreds of peer-reviewed resources written by Extension specialists. They address key issues in agriculture, finance, animals, home and family, community development, lawn and garden, the environment, and foods, nutrition, and health.

Besides being an environmentally friendly way to disseminate valuable and practical information, e-books have other advantages over hard copies, including the ability to search for keywords, copy and email content, add notes or highlight text, and adjust font size.

"The e-books reflect our commitment to reach larger and more diverse audiences," said Ed Jones, director of Extension. "They provide another valuable tool for putting knowledge into the hands of Virginians."

E-books are available for the iPad, iPhone, and iPod Touch, as well as non-Apple e-reader devices. Publications will continue to be available in PDF format for desktop and laptop users.

To see a complete listing of available e-books, visit <http://pubs.ext.vt.edu/category/ebooks.html>.



## Connecting alumni

CALS Connections, a monthly alumni e-newsletter, was launched earlier this year to provide an avenue for alumni and friends of the college to connect with academic departments, catch up on the latest college news, and find invitations to activities that provide opportunities to network with alumni, faculty and staff members, and students. It is also the best way to stay up to date on news and announcements from the CALS Alumni Organization.

If you have news you would like to share, please contact Jamie Lucero, director of alumni relations, at [jlucero@vt.edu](mailto:jlucero@vt.edu) or 540-231-9666.

Not receiving CALS Connections? Update your email address at [www.alumni.vt.edu/gateway](http://www.alumni.vt.edu/gateway).

Read archived issues of CALS Connections at [www.cals.vt.edu/alumni/connections](http://www.cals.vt.edu/alumni/connections).

## Entomologists battle bed bugs

By Allison Hedrick

Insecticides of the 20th century nearly eradicated bed bugs, but since 2000 they've returned with a vengeance. Their re-emergence has made managing and preventing them a challenge.

"Because they are so highly resistant to the pesticides we use for their control, they are spreading faster than ever," said Dini Miller, urban pest management specialist for Virginia Cooperative Extension and associate professor of entomology.

Miller's team focuses on the bed bug problem in multiunit housing complexes, particularly where tenants have limited resources.

Molly Stedfast, an entomology master's student who works with Miller, teaches apartment dwellers to recognize bed bug infestations and to safely use easy, inexpensive, nonchemical methods to better protect themselves and their homes.

Stedfast also trains apartment employees how to apply diatomaceous earth — a nontoxic dust made from fossilized remains of diatoms, a hard-shelled algae — to



Professor Dini Miller, left, and master's student Molly Stedfast are studying bed bugs and teaching people how to manage infestations in homes and businesses.



the inside perimeter of apartments. When bed bugs walk through the dust, it clings to their exoskeleton, absorbing their wax layer and causing them to die of dehydration.

Stedfast said it is rewarding to have helped people from Richmond to New Orleans with bed bugs.

"Most grad students don't get to see their research actually help people face to face," she said. "I feel like I'm making an impact."

## Transfer student thrives on biochemistry and SURF research opportunities

By Amy Loeffler

Sydney Vaughan's academic career planning never included Virginia Tech. As a transfer student from Virginia Western Community College in her hometown of Roanoke, Va., Vaughan's dreams of becoming a neurosurgeon were pinned on locations farther afield.

Then a friend convinced her to visit the university and the Hokie Stone buildings and surrounding bucolic rolling hills won her over.

"After my visit, I fell in love with the campus, the atmosphere, and all the possibilities and future opportunities that Virginia Tech could offer," said Vaughan.

Since transferring to Virginia Tech for her junior year, she has flourished.

Vaughan was awarded an ACC Creativity and Innovation Fellowship earlier this year and served as a 2013 Fralin Summer Undergraduate Research Fellow (SURF).

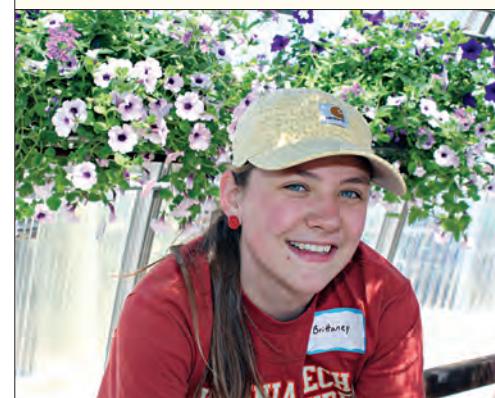
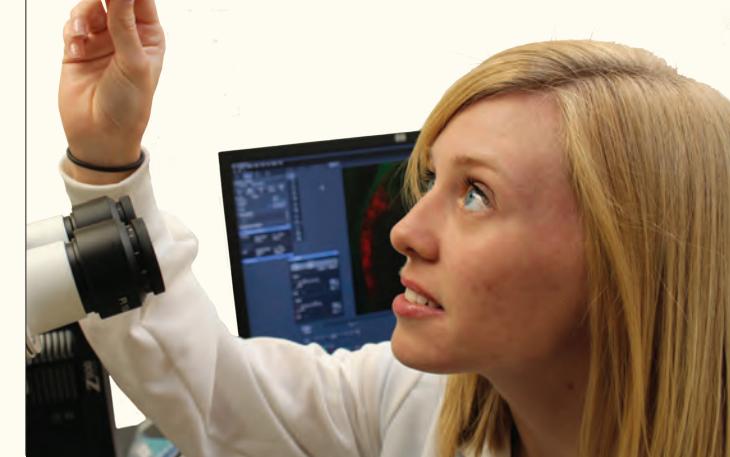
A rising senior majoring in biochemistry, Vaughan is now studying amyotrophic lateral sclerosis or ALS — more commonly known as Lou Gehrig's disease — in conjunction with the Virginia Tech Carilion Research Institute.

It has been widely understood that ALS is a degenerative neuromuscular disease that affects motor neurons, which control movement. Recent discoveries have revealed that sensory neurons that transmit information from organs and tissues to the central nervous system are also affected.

Vaughan's research is making inroads to a better understanding of ALS by studying which population of neurons is affected first. She does this by examining the integrity of the sensory neurons and the motor neurons simultaneously — first by dissecting a muscle of interest and labeling the muscle with specific antibodies and fluorescence. These antibodies, in turn, label the receptors on the muscle, the synapse of the nerve, and the nerve fiber. Vaughan then images the slides using confocal microscopy and analyzes the integrity of the neuromuscular junctions.

"After only seven months, I have learned far beyond what I imagined, and I've had incredible opportunities to present my research and meet distinguished scientists in my field of interest," she said.

Sydney Vaughan is conducting research to better understand ALS.



Members of the Horticulture Club spend countless hours getting ready for the annual plant sale.

## Annual horticulture plant sale grows into multiday spring fling

The Horticulture Club kicked off the planting season with its annual plant sale in April. The sale was just one of the events included in a spring fling that featured garden tours of area homes and a barbecue sale by the Agricultural Economics/National Agri-Marketing Association Club.

"The plant sale is an annual tradition for some members of the community and is timed so they can make their first plant purchases with us," said Horticulture Club member Brittney Nelson. "With community support, we hope to make the spring fling an annual event during the plant sale."

## Public food safety on the front burner for Extension

By Susan Felker

Virginia Cooperative Extension is expanding its food safety programs by adding area specialized food safety agents. These agents will help develop and deliver education programs to the general public, farmers, wholesalers, food producers, and vendors, as well as to places where food for the public is handled, such as restaurants, fairs, and community events.

"There are already Extension agents across the state who have food safety as part of their responsibilities, but we haven't had agents just focusing on food safety," said Renee Boyer, consumer food safety specialist and associate professor in the Department of Food Science and Technology.

Eric Bowen, who serves the Central District from his office in Nottoway, Va., began work as the first new regional food safety Extension agent in September 2012. Joell Eifert began her position as the Southwest District's food safety agent in March.

"We are very pleased to add an area specialized food safety agent position to the team," said Central District Director Dan Goerlich. "These agents will work closely with Extension agents in all program areas to address interests and needs brought forth by our clients and local government partners. Food safety starts in the field and continues to the dining room table. We try to help Virginians at every step of the way."

The six primary training programs offered by the new agents, which were developed in collaboration with government agencies, other universities, and industry, include:

■ **ServSafe food safety management** course and certification testing is offered for restaurant managers (including chefs) along with a short ServSafe course for food handlers.

■ **Cooking for crowds** trains those who sell food at fairs, festivals, and other public events.

### ■ Starting a home food-based business

guides Virginians who would like to start new value-added food businesses and those who are new food entrepreneurs.

### ■ Home food preservation

teaches safe practices for canning, drying, pickling, and freezing for homeowners.

### ■ Enhancing the safety of locally grown produce

training targets local farmers and farmers market managers as a joint venture between Virginia Cooperative Extension, University of Georgia Cooperative Extension, and Clemson University Cooperative Extension in South Carolina.

### ■ U.S. Department of Agriculture Good Agricultural Practices

education and training targets vegetable producers desiring to obtain GAP certification through the federal program.

According to Boyer, the food safety agents will also provide training in procedures for producing safe food, as stipulated under the federal Food Safety Modernization Act.

"We don't have a timeline for the other positions yet, but we will be supporting the district directors in their efforts," Boyer said.

For more information on these and other food safety programs, contact your local Extension office or visit [www.ext.vt.edu](http://www.ext.vt.edu).



## New alumni launch party



Even the HokieBird turned out for the college's new alumni launch party.

The college's Alumni Organization hosted a picnic for the 2013 graduates in the Ag Quad this spring. Alumni were on hand for networking, helping with check-in, staffing the photo booth, handing out lithograph prints of Ag Quad buildings, and cheering on those playing corn hole and a Hokies version of Angry Birds.

Foods for Thought Inc. of Troy, Va., owned by 1980 dairy science graduate Rob Harrison, donated burgers for the picnic. Participants had a great time, and the Alumni Organization looks forward to future launch parties to welcome our newest alumni!

## Diversity Enhancement Awards presented

This spring, the College Diversity Council recognized three people for their commitment to diversity and the efforts they put forth to promote it.

"We are extremely grateful for the work these individuals have done over the years to ensure our college is a reflection of our larger community," said Dean Alan Grant, who is a member of the council and presented the Diversity Enhancement Awards. "This diversity and inclusion helps us all gain a deeper understanding of our world."

Stephanie "Nikki" Lewis, a genetics, bioinformatics, and computational biology Ph.D. student, received the Dr. Randolph Grayson Student Diversity Enhancement Award, which was renamed in honor of Grayson this year after students continually cited the encouragement and support he has given them over the years. Lewis is the preeminent diversity point of contact for her department and the Initiative for Maximizing Student Development Program doctoral scholar.

Grayson, a professor emeritus of plant pathology, physiology, and weed science and the program coordinator for the George Washington Carver Program, received the faculty award for diversity enhancement. He has made a lifelong priority of ensuring that the Virginia Tech community benefits from including students from myriad backgrounds.

Susan Rosebrough, winner of the staff award, is the academic programs coordinator for the Department of Biological Systems Engineering. She was recently appointed to serve as an at-large member of the University Commission on Equal Opportunity and Diversity and is also a Virginia Tech Safe Zone member.

All three received a letter of commendation, a plaque, and a \$500 award.



From left: Dean Alan Grant presents Randolph Grayson, Stephanie "Nikki" Lewis, and Susan Rosebrough with Diversity Enhancement Awards.

## Forest management education benefits landowners

By Samantha Huff

More than 65 percent of Virginia's 15.6 million acres of forestland is privately owned. Through the Virginia Forest Landowner Education Program, landowners are able to gain valuable management skills to help them maintain sustainable forests and get the most out of their woodlands.

"Many of Virginia's 365,000 landowners are new to forest management and have questions about what they should do and what assistance is available to them," said Jennifer Gagnon, statewide coordinator of VFLEP.

In conjunction with Virginia Cooperative Extension, the U.S. Forest Service's Forest Stewardship Program, Virginia Department of Forestry, Sustainable Forestry Initiative State Implementation Committee, and American Tree Farm System, VFLEP provides a series of short courses on topics geared toward sound forest stewardship and sustainable forestry practices. Since its inception in 1996, more than 6,000 people have participated in the courses that are sponsored and taught by local professionals from natural resources agencies at locations across the commonwealth. VFLEP also offers a 12-week online course.

One of VFLEP's newest programs, Real Forestry for Real Estate, is designed to educate real estate professionals about forest management. So far, more than 450 have participated in the program. "The courses emphasize the importance of planning and professional management assistance and introduce participants to practical forest and wildlife management principles and techniques," Gagnon said.



Real estate professionals learn how to identify common Virginia tree species in a Real Forestry for Real Estate class in Charlottesville, Va.

In addition to its course offerings, VFLEP holds landowner retreats and field tours, produces a quarterly newsletter mailed to 7,500 landowners statewide, and maintains a website with newsletter archives, a calendar of events, and links to reputable natural resources websites and publications.

Gagnon recently received the university's 2013 Alumni Award for Excellence in Extension for her management of the program. With Gagnon's leadership and ongoing support from volunteers, VFLEP will continue to strive to influence the health and productivity of Virginia's forests through education.

For more information about VFLEP, visit [www.forestupdate.frec.vt.edu](http://www.forestupdate.frec.vt.edu).

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# FALL FEST Homecoming Celebration

JOIN THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES FOR A PREGAME CELEBRATION BEFORE THE VIRGINIA TECH – MARSHALL UNIVERSITY FOOTBALL GAME

Saturday,  
Sept. 21, 2013



- Three hours prior to kick-off at the entrance of Litton-Reaves Hall
- Special appearance by the HokieBird
- Music
- Tailgate buffet and adult beverages
- Games and activities for Hokies of all ages
- Raffles, door prizes, and Hokie game-day tattoos

**Cost:**

Registration: \$25 per person

Children ages 6-12: \$10  
5 and younger: Free

Preregistration is required.  
Sign up at [www.alumni.vt.edu/reunion/cals](http://www.alumni.vt.edu/reunion/cals).



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## CALS Alumni Organization Scramble for Scholars Golf Tournament

Friday, Oct. 18, 2013

Pete Dye River Course of Virginia Tech,  
8400 River Course Drive, Radford, VA 24141

11 a.m. – 12:30 p.m. Registration, lunch,  
and putting contest

1 p.m. Shotgun start: Four-person captain's choice  
\$125 per player

Proceeds benefit experiential learning opportunities  
outside of the classroom.

Participants must register by Oct. 4, 2013.

Registration form at [www.cals.vt.edu/alumni/events](http://www.cals.vt.edu/alumni/events).



## Obenshain endowment provides students with opportunities to travel, discover new ideas

By Amy Loeffler

Sam Obenshain — one of Virginia Tech's earliest professors in what was then called the agronomy department — traveled throughout the state of Virginia and the world during his career. For Obenshain, travel was an opportunity to gain a different perspective, learn something new, or spark inspiration.

He believed in the educational aspects of experiential learning as much as formal classroom instruction, and travel was integral to the hands-on learning he fostered. Obenshain often recommended that his star pupils go far afield from the familiar surroundings of Southwestern Virginia, where clay soils were dominant, to the colder climes of Iowa or Wisconsin to study the properties of calcareous glacial till.

So it's fitting that a former student of Obenshain's, Bill White (agronomy '49), has established a travel endowment that lets students carry on Obenshain's educational philosophy.

"We are increasingly emphasizing the importance of experiential learning to create a well-rounded education for our students," said Tom Thompson, head of crop and soil environmental sciences. "More than 60 years ago, Sam Obenshain knew and practiced this."

"He always thought it was important to broaden your view, and he would be extremely pleased with the notion that students were expanding their intellectual horizons in his name," said Joe Obenshain, Sam's son.

Sam Obenshain also had a voracious appetite for the latest technology and was one of the first professors at

**“He always thought it was important to broaden your view, and he would be extremely pleased with the notion that students were expanding their intellectual horizons in his name.”**

— Joe Obenshain, Sam's son



Sam Obenshain conducting research in the field. His love of travel and exploration is encouraging others to do the same.

Virginia Tech to use radioisotopes to study soil.

"He was quite ahead of a lot of his compatriots at the time," White said. "He could talk about the soils of the Ukraine just as easily as he could talk about those of the Piedmont or Blacksburg. He made the study of soils come alive."

White hopes that students will carry on Obenshain's legacy of seeking out novel ideas and have the opportunity to travel and see new things through the inspiration that comes from disrupting the familiar and sojourning to other parts of the world. During his career, Obenshain traveled to Korea, India, and Bangladesh as part of a State Department delegation assessing soil quality for public works projects.

"I urge students to be on the leading edge of soil science and plant growth and be particularly eager to be inspired to expose themselves to new concepts," White said.