Students from metro-area high schools explored career paths related to food systems and met with State Sen. Foung Hawj of St. Paul as part of the first “Growing Food, Growing Youth” day on campus in March. The event honored the late Bud Markhart, professor of horticultural science, and celebrated his passion for engaging youth in urban agriculture. See page 15 for more details.
A common criticism of higher education is that it doesn’t live in the ‘real world.’ In CFANS and the University of Minnesota, we’re trying to change that, through concurrent efforts to be more efficient and to be better partners with our business stakeholders.

Here in CFANS, we’ve spent the past four years working to make our undergraduate curriculum more relevant to 21st century workplaces and to adapt to changing demographics and student interests. Those efforts are coming to fruition when the class of 2017 joins us this coming fall, with the addition of new requirements for experiential learning and interdisciplinary education. We take our responsibilities of solving the world’s most challenging problems while educating the next generation of scientists very seriously, and this is a big step in that direction.

As a scientist and educator, it can be disheartening to see declining public perceptions about the value of higher education. But then you read stories like the ones in this edition of Solutions, and you can’t help but feel better about the future. Fertilizer made from wind? Dairy robots? The cause of a mysterious horse disease revealed? Students studying and working in Nepal to solve community problems, and blogging about the experience? It’s all pretty amazing stuff.

I hope you enjoy reading, and as always, I’m eager to hear your thoughts.

Allen S. Levine (’73–M.S., botany; ’77–Ph.D., nutrition), Dean
Horses were dying, and nobody could figure out why. Seemingly healthy animals put out to graze in pastures suddenly got very sick and died within a few days. Their muscles stiffened, they had difficulty walking or standing, breathed rapidly and finally lay down and died. It didn’t happen often, but over the course of a few decades, veterinarians saw enough similar cases to think that a common cause was to blame.

Scientists from CFANS and the university’s College of Veterinary Medicine now believe they’ve caught the killer and have clues as to how to prevent it.

“This phenomenon—Seasonal Pasture Myopathy—has been described for decades,” says Stephanie Valberg, director of the university’s Leatherdale Equine Center and a professor of veterinary medicine. “It’s the worst-case scenario when you...
have horse owners asking ‘what can I do?’ and there are no good answers.” The illness is fatal in about 90 percent of cases.

Until last fall, the cause was a mystery. Some experts blamed a perennial herb plant that’s a known toxin to horses that eat it—whitesnake root—but tests of the mysterious dead horses’ livers showed no sign of that toxin.

Scientists in Europe, where the phenomenon is even more prevalent, noticed that the victims were often younger horses and that they tended to die in October or November. But still, no one could explain the phenomenon.

Valberg wanted to learn more about the environments where Minnesota horses had died. “To me, a horse farm has wood fences around it and no trees,” she says, but in the fall of 2011, when she began visiting farms in southeastern Minnesota, she discovered that’s not always the case. She found sloping pastures filled or ringed with trees. Boxelder trees. Lots and lots of boxelder trees. Could they be the culprit?

After 11 pasture inspections, boxelders were clearly a common theme throughout all the deaths; in fact, one pony that died had been in a small enclosure where boxelders were the only plants it could reach. Valberg and her team traced weather patterns around the time of the deaths and found that in many cases, high winds a few days before the horses got sick had blown seeds from the boxelders into the pastures, where the affected horses may have gobbled them up. The researchers thought they had found their killer, but why boxelder seeds are so toxic was still unclear. European colleagues at first blamed a fungus on the trees’ leaves. Valberg’s hunch was that something in the seeds was toxic, and she found an obscure 40-year-old study that suggested an amino acid might be the cause, but she needed help from colleagues with expertise in plants.

So she contacted horticultural scientist Jeff Gillman and plant pathologist Bob Blanchette in CFANS. They, in turn, connected her with Adrian Hegeman, an associate professor in horticultural science whose expertise is in plant metabolomics. He started investigating, ran across the same 1972 study, and arrived at a similar

To learn more or to report a possible case, visit the Equine Center’s Seasonal Pasture Myopathy website: www.cvm.umn.edu/umec/SPM/home.html
conclusion: the boxelder seeds could be the culprit. “It made so much sense,” he says now. Further testing of tissue samples from horses that died proved the theory was correct: a metabolite of hypoglycin A, the toxin found in the seeds, could be found in all the horses’ tissues. The toxin gets into horses’ livers and muscles and blocks the metabolism of fats; the telltale sign is through testing horses’ blood or urine, and if a specific pattern of fats are there, it’s a confirmed case. The researchers’ work has been published in veterinary journals and is getting attention from around the world.

But even with a likely suspect, investigators still have questions about the deaths: Why do only some horses get sick? Do other trees make similar toxins? What environmental and weather factors might play a role?

Last fall, Valberg went to Switzerland, where colleagues are studying the phenomenon and hilly pastures are lined with Acer trees—which are in the same genetic family as the Western Boxelder so common to Minnesota. She collected leaves and seeds from as many trees as she could, which now are being analyzed in Hegeman’s lab to see if they contain similar toxins. It’s possible that tar spot, a fungus often found on similar trees, also might play a role. Hegeman, Gillman and Blanchette will use their expertise to help explore that possibility and to share best practices with horse owners.

Meanwhile, Valberg and Krishona Martinson, an associate professor in the Department of Animal Science, are working with horse owners statewide via University of Minnesota Extension to collect more information about horses that get sick and the conditions around their illnesses and deaths. Early analysis shows that younger horses and those who are new to a pasture are more susceptible, for example, but it’s not clear whether older horses developed immunity or simply learned not to eat the seeds.

It’s also unclear just how widespread the phenomenon is, Valberg says. In many cases, by the time a horse owner calls the local veterinarian, it’s too late for the horse to be brought to a university clinic. The horse is buried with no post-mortem testing, so nobody knows for sure what killed it. “Most of the cases we do diagnose are near vet schools,” she says, because owners and local veterinarians may not want to spend the time or money on post-mortem testing, especially if travel is required. “We simply don’t have a handle on how common this is in Minnesota.”

Ultimately, the research team expects to develop tests that can diagnose seasonal pasture myopathy earlier and to share ways that horse owners can prevent future cases. “We want to help the people who have lost horses,” Valberg says. “They really want to know what happened and how to prevent it from affecting their other horses.”

MINIMIZING YOUR HORSES’ RISK

• Minimize the number of boxelder trees and seeds accessible to the horses, through trimming trees or moving fences. This is especially important in fall, when trees are shedding seeds. “We don’t need everybody to cut down all their boxelders,” Valberg says, but be careful about how reachable they are for horses and how far seeds spread

• Prevent overgrazing of pastures by moving the horses often, or by supplementing their diet with hay or grain so they don’t eat weeds, seeds and trees

• Reduce the number of hours a horse spends on pasture each day in the fall or after a heavy wind or rain if boxelder seeds are present

• Don’t pasture young horses or those that are new to a farm in an area with lots of boxelders in the fall or early spring.
Editor's note: “Ecological Services and Biodiversity in Nepal’s Community Forests” is being offered for the first time this semester. The 16-credit spring semester program is located in the biodiversity and wildlife rich Terai region of Nepal and emphasizes hands-on experience with rural communities combined with coursework. One of the participants, Nico Cruz, has been blogging about the experience, and parts of his blog are excerpted here:

Jan. 23 (from Kathmandu, before the group arrived at its final destination): We also had another series of lectures today on economics, on WATCH, and the economic and social benefits of community forestry. Fun fact! Many of the high up people in Nepal who are working so hard on conservation and community forestry have done their masters and PhD programs at the University of Minnesota.

Jan. 25: Today we also went for a walk around Sauraha, the town that we will be working in. Fun facts about Sauraha: It was originally settled by the Terai people. They are incredibly poor, still live in mud huts, and have sort of a natural immunity to malaria which is what allowed them to live in the Terai before malaria was eradicated. We also had our first language instruction today. It was 4 hours of language, and honestly we learned a lot, but not enough to hold any type of conversation with the villagers we were instructed to stop and talk to.

Feb. 10: The camp is full right now, there are about 50 researchers here every single day, all day long, working through the camera trap training for this census. They haven’t actually done a tiger census in the park since the early 70s, so this is a really big, really intense thing going on right now. I’m really excited to get to be a part of it.

Feb. 13: The air here is so magical I have to try and describe what’s going on because it is absolutely perfect. I am sitting outside my room on a bamboo chair with my back to the wall and my feet up on the deck railing. The sun is setting over the river, leaving streaks of pinks and purples over the tree line behind the elephant Hatisar and a sliver of the moon is visible in the sky from where I sit. Camp is quiet as everyone is done with work for the day and many of the mahouts are off at the festival while the rest of the students are in their rooms or off using a cyber cafe for faster internet and Skype.

Feb. 16: Bishnu and Dave taught us how to measure tracks, guess the sex of the tiger, how to tell left from right and front from rear, and how to look for scrape and scent marks. We found a place on a tree where a tiger had rubbed its cheek... I know they are big in zoos, and I know that these paw prints are from a big animal, but the cheek mark was nearly at my head level. That is a MASSIVE cat.

Feb 23: We said goodbye to our language teachers this week. They have been with us for 4 weeks, and we have learned a ton from them. My Nepali isn’t perfect, but it’s a lot better than I expected it would be. Also, Biru (an injured young rhino who lives near the camp) has learned to play futbol.

March 1: Camp 1 was the most beautiful place I think I have ever been... maybe second to Princess Point in Thailand. There was a beach with a swimming hole, and then a steep climb up to the camp. We got up, set up our camp Hatisar style (open on 3 sides), and then we all went down to the river to swim. After our hike to check the traps, we had another 9km to go down the beach. The first one was an absolute cake walk, I could have tap danced down the beach. The second... a bit tougher. We walked with all of our gear, and I had a lot of the food in my bag. I had the rice and the tarp and my pack was nearly 50 lbs. All I can say is: 9km, sand and rocks, no shoes... no problem. I didn’t know I had it in me.
From a sweet deal to the bitter end, there's no accounting for taste. Descriptions of flavor are littered throughout our common sayings, and there's a good reason for that. Food and flavor sensations are a key part of the human experience, and everyone knows what “bitter” feels and tastes like.

But what happens when a scientist tries to quantify taste? What, exactly, is flavor?

What makes a food taste sweet, or salty, or even cooked?

It turns out, the answer is complicated. There are about 10,000 taste buds in the human tongue, as well as texture and temperature receptors. All of those combined with smell create what we think of as flavor. It is a complex equation that involves thousands of chemical reactions.
in every mouthful. So while you might know what “sweet” is when you taste it, defining exactly what can cause a food to taste sweet is so complicated that scientists still struggle with the question. And food companies are very interested in the answers.

For example, what is it that makes whole grains taste bitter? Maybe more importantly, what does it take to change that bitter taste—to get more people to eat whole grain bread—without affecting the inherent health benefits? This is a question that plagues producers in the food industry, and it has framed one of the first projects for the University of Minnesota’s Flavor Research and Education Center. The only center of its kind in the U.S., the FREC is using cutting-edge technology and new analytical techniques to address current flavor challenges posed by its partners in the business community.

The business of taste

While the elements of flavor drive the food manufacturing industry, the number of research laboratories dedicated to questions about flavor and fragrance has fallen in recent decades as government research funds have focused more on issues of health and food safety. But Gary Reineccius, head of the Department of Food Science and Nutrition, saw a need in the industry for a better understanding of flavor itself and problem-solving tools to drive business units more effectively. Like how to produce the healthier foods Americans need that they will actually eat.

He brought in new associate professor and flavor researcher Devin Peterson ('97–M.S.; '01–Ph.D., food science), and together they founded the FREC in August 2011 as a partnership between scientists in the department and businesses in the food and flavor industries. The center’s business members contribute as much as $25,000 per year, which directly funds relevant research and graduate students. The concept attracted 12 members in its first year, including giants like Nestle, Pepsico and General Mills; that number has since grown to 19.

“The interest was there to develop a platform to help them understand common problems,” says Peterson. “At the end of the day, enjoyment of food is a huge part of our lifestyle. By helping processors put the pieces of the puzzle together, they’re better able to make healthier products more acceptable and, hopefully, more consumed—which is needed to make a health impact.”

The center operates out of three world-class labs on the St. Paul campus featuring state-of-the-art analytical equipment. There, researchers take a complex system—food—and break it down to its component parts, identifying single molecules or compounds that help create a target sensation. While the topics of the FREC’s research projects are influenced by its business members’ suggestions, the ultimate decision on a project’s plan and goals comes from Peterson, and the results and findings are published and shared with everyone.

“The center is about open innovation in taking foods apart and trying to understand what flavor is,” says Peterson. “There’s no directed research for any one particular company, no proprietary information. It’s about general ideas that can benefit the industry as a whole.”

For instance, food processing companies struggle to provide more nutritious food options that can sell competitively with less health-conscious option. Although children are taught in grade school that whole grains are vital to a healthy diet, only 5 percent of Americans consume the recommended amount of whole grains, and the average person consumes less than 11 percent. At the suggestion of the center’s members, the FREC has tried to identify what molecules in whole grains, or what chemical reactions in producing whole grain bread, generate bitterness. The hope is that this information can lead to solutions that don’t rely on the conventional solution of simply adding sugar to mask the bitterness.

“People say to me, ‘this is ridiculous—you can get good artisan breads and you
can make people learn to like them.’ And I agree that education and teaching behavior is important,” says Peterson. “But the point is that there are a lot of families that can’t afford artisan breads, and 95 percent of the population isn’t eating the mass-produced whole grain bread that is made for their budget. A success for us would be to provide a means for more accessible, healthier, higher-quality products for the general population.”

The full palate

The most important tool in the center’s research approach is an analytical method it is pioneering, dubbed “flavoromics.” The concept was developed by Reineccius after he attended a presentation about the medical use of mass spectrometry to detect the cause of silent heart attacks. That field of study, called metabolomics, uses a big-picture approach to map every tiny molecular compound in the body that is a result of creating energy—breath, waste, circulation—and applies statistical analysis to identify cause and effect on the molecular level. That day it occurred to Reineccius that these doctors were looking at the same types of small molecules that he studied in relation to flavor and aroma.

“I thought, ‘look at these people, they’re investing billions of dollars in medicine, just for us!’” Reineccius said, laughing. “Instrument companies were developing tools. Today we collect maybe 50,000 data points to analyze per sample, but they’re developing software programs to do that for the medical fields. I’m not really interested in silent heart attacks, but I figured we could link all of these chemical components in food to aroma, to flavor. I thought we could use these tools they had created to identify the drivers of perception, the compounds in food that indicate ‘cooked’ or ‘salty.’”

Flavoromics uses the same high-throughput data collection and tools as metabolomics to separate and identify thousands of compounds in food and then statistically associate those compounds with changes in flavor perception. This research process wasn’t initially accepted by the scientific community—Reineccius’ first flavoromics paper was rejected—since it is basically the opposite approach than conventional flavor research takes. The FREC’s researchers are hoping their work will establish its usefulness.

The food industry traditionally solves flavor questions empirically, Reineccius says. When they encounter an odd flavor problem, they have no way to identify the source of the problem. They don’t know whether the good flavor disappeared at one stage of the process, or if a bad flavor appeared through processing. So food companies try empirical solutions until something works, and move on. If a processor wants to reduce sugar in its foods, it isolates sweet-tasting things, but it has no techniques to register compounds that enhance sweetness, or textures or smells that are perceived as less bitter.

The goal of the flavoromics approach is to understand those complex stimuli involved in different flavor perceptions, and to map the chemical differences between them.

“The tremendous power of flavoromics is that it gives us tools to find things that we have no other way to find except serendipity,” Reineccius says. “It’s not easy or straightforward, because we’re establishing statistical correlations between compounds and sensations. It doesn’t always mean they’re related, but at least we have a tool to start narrowing it down. Serendipity’s a tough way to go about life.”

To the bitter end

The first reports on the whole grains research have been published, and Peterson is looking forward to the next round of projects for the FREC. He says that project succeeded in telling the scientists a lot about what might be causing problems for whole grains in mass produced bread, but it didn’t give them the ability to tell industry how to improve taste without affecting health. There is still work to be done in the area, and he plans to craft a future project around filling in those gaps to make a positive impact in the business of healthy food.

“At the end of the day, understanding what we respond to, understanding our products better to make them healthier and more consumed, it’s what we should be doing,” Peterson says. “This isn’t making frankenfood. It’s just understanding the food we eat in life, and how we enhance it for the population.”
**Milking the Technology**

Robots add to dairies’ bottom line and quality of life

It’s kind of like an episode of “The Jetsons,” only set in a dairy barn. Robots are finding their way into Minnesota dairies, where they not only milk the cows but track every detail of the cows’ health and allow more flexibility in the day-to-day routine of dairy farmers.

For young adults, the robots provide a way to keep dairy farming interesting as well as increasing profits, says Jeff Reneau, a professor in the Department of Animal Science. “These people grew up with computers, and to them, doing things the same as they were decades ago doesn’t hold much appeal,” he says. “But by leveraging the technology, you can attract them back to the family farm (after college), expand the dairy and keep it alive.”

The systems generally work this way: Cows step into a milking station to get food; while they stand there eating, the robot identifies the cow, milks her and collects all kinds of behavior and health-related data about each cow. After she’s milked, the cow steps out of the station and returns when she’s hungry again. The system eliminates the need for cows to be milked twice a day at the same time.

Individual dairies’ robots may work a little differently, depending on the size of the herd, the age of the barn and other factors like the type of housing used.

Marcia Endres, an associate professor in the animal science department, is studying the data collected from most of the state’s 52 farms with automated milking systems through a partnership with the two largest robot manufacturers. “We’re very interested in what this data can tell us,” she says. “Do dominant cows get the freshest feed? Do they form groups who eat together? Are they consistently eating at the same time? What’s going on in the lives of these cows?”

Each robot can handle about 60 cows; some of the farms Endres and her co-investigator, Jim Salfer from University of Minnesota Extension, are studying have as many as eight robots milking and gathering data. Each robot costs around $250,000.

Along with vast quantities of information about the cows, farmers who convert to robotic milking say they most appreciate the improved quality of life, Endres says. “You can go to your kids’ games after school instead of milking,” she says, “but it’s not a matter of working any less. You still have to fetch a few cows (that don’t go to the milking station on their own), you still have to keep a close eye on your cows, and you have to use all this data to manage the herd” to make the investment worthwhile.

Robots won’t work in every dairy, Reneau says, but might be a solution for farmers who want to expand without adding employees. “The people who will be successful with this are those who are willing to invest time and interest in the details, as well as having the financial resources,” he says. “You need both equity and courage.” –Becky Beyers

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**Precision Dairy 2013**

The University of Minnesota is hosting the first U.S. Precision Dairy conference, which will include national and international experts in the field, the latest research abstracts, and panels of producers who are using robotic milking, sensors and automated calf feeders. The conference will be June 25–27 in Rochester, Minn., at the Mayo Civic Center. See precisiondairy.umn.edu for details.
Galatowitsch to lead FWCB department

Susan Galatowitsch (’84–M.S., botany) has been named head of the Department of Fisheries, Wildlife, and Conservation Biology. As one of the nation’s longest-standing and highest-quality fisheries and wildlife programs, the department focuses on the biological, ecological, social and policy aspects of understanding and managing natural biological systems from the molecular to landscape level. Galatowitsch is a professor of restoration ecology, where her research has focused on prairie pothole wetlands within Midwest agricultural landscapes and other regions and systems.

Earthman, Cohen honored for teaching excellence

Two CFANS professors have earned university-wide teaching awards. Carrie Earthman, left, associate professor in the Department of Food Science and Nutrition, is one of seven recipients of the Horace T. Morse Award for outstanding contributions to undergraduate education, and Jerry Cohen, professor in the Department of Horticultural Science, is one of eight faculty members recognized with the Postbaccalaureate, Graduate, and Professional Education award.

‘Saving Wheat’ earns a Midwest Emmy Award

A documentary about CFANS’ and the University of Minnesota’s past and present work in breeding disease-resistant wheat earned a 2012 Midwest Emmy award last fall. “Saving Wheat: Rusts Never Sleep” was created by the Department of Plant Pathology and local public-television station TPT Productions. It first aired in 2011 and occasionally is re-broadcast on Twin Cities public TV.

University will offer free online courses

The University of Minnesota announced in February that it will partner with Coursera, a leading massive open online course (MOOC) platform, to develop free online courses as part of the university’s efforts to improve teaching and learning through technology. Jason Hill (’04–Ph.D., plant biological sciences), an assistant professor in the Department of Bioproducts and Biosystems Engineering, is one of five U of M faculty who will teach the first courses. His course, “Sustainability of Food Systems: A Global Life-Cycle Perspective,” begins in June and as of late April had more than 10,000 students enrolled.

Tiny wasps could eat their way to big environmental benefits

Researchers in CFANS working with the Minnesota Department of Agriculture and the U.S. Forest Service are the first in the nation to study how tiny stingless wasps could help win the battle against Emerald Ash Borer. The wasps are being tested by entomologists on the St. Paul campus for cold-hardiness and for their ability to fly long distances in pursuit of the destructive ash borer, which threatens millions of trees in Minnesota and the Upper Midwest.

The strategy seeks to control EAB populations through introductions of EAB’s natural enemies—stingless wasps that prey on the tree pests. Rob Venette, a biologist with the Forest Service and adjunct assistant professor in the Department of Entomology, is leading studies of EAB cold hardiness as well as the hardiness of three species of stingless wasps to determine the insects’ potential range.

Graduate student Sam Fahrner and assistant professor Brian Aukema, also in the Department of Entomology, are studying the distance stingless wasps can fly through an unusual machine called a flight mill. The device allows an insect to fly while attached to a tiny wire. The flight mill is connected to a computer, which tracks the distance the stingless wasps can fly. The mill Fahrner uses can track up to 32 stingless wasps simultaneously.
Siehl Prize laureates will be honored for excellence

A world-renowned expert in wheat diseases, an executive who developed important new packaging and food safety techniques and a pair of entrepreneurs who lead an international technology company grounded in the poultry industry are this year’s recipients of the prestigious Siehl Prize in Agriculture. Recipients are chosen in three categories: knowledge (teaching, research and outreach); agribusiness; and production agriculture. This year’s winners are:

Yue Jin (knowledge): He is among the leaders of two major global projects aimed at stopping the spread of rust in wheat and barley, which is a significant threat to the world’s food supply. His laboratory at the Cereal Disease Lab on the U of M’s St. Paul campus is a unique resource for testing and analyzing deadly rust samples from around the world. He’s also recognized as a mentor to the next generation of top wheat rust scientists from around the world.

Phillip Minerich (agribusiness): As vice president of research and development at Hormel Foods, he has led innovations in packaging, food technology and food safety as part of his 35-year career with the Minnesota-based company. His team also is known for its work in hunger relief, as creator of shelf-stable, nutritious products that can be distributed in developing countries. The U of M alumnus (’99–M.S.; ’02–Ph.D., food science) also has been active in a number of food-industry groups and as an adviser to the U’s food science and nutrition department.

Ted Huisinga and Ray Norling (production agriculture): The son and nephew of Willmar Poultry Co.’s founders have built the company into a multi-faceted firm with a dozen subsidiaries, all related to the turkey industry. They recently took over the site of a former state hospital and converted it to a high-technology campus aimed at expanding biotechnology, genetics, engineering and agriculture in west-central Minnesota. They’re also well-known in the industry for their active work in food safety and animal health.

The new laureates will be honored at a ceremony on May 23. The Siehl Prize was created by New Ulm-area livestock breeder and businessman Eldon Siehl, a dedicated philanthropist who had a lifelong interest in agricultural systems and wanted his gift to ensure that achievements in agriculture would be recognized and celebrated. Recipients receive a $50,000 award as well as a sculpture and lapel pin designed especially for the Siehl Prize winners by Minnesota artist Thomas Rose.

Bike tour promotes farming

Bicycles usually aren’t considered farm implements, but for three CFANS alumni, they’ll be a useful tool for promoting farming.

In May, alums Siri Simons and Christy Newell will begin a journey on bicycles from the Mississippi Delta in Louisiana up to the headwaters of the Mississippi River on a tour aimed at spurring more young people to get into farming. The cyclists have dubbed themselves the Fresh Forks team.

Because the average age of American farmers today is 55, the Fresh Forks team worries about whether younger people will choose farming. They want the tour to raise awareness about the future of farming and to generate more interest in farming among young people. They’ll meet with farmers of all ages and gather their stories as they pedal up the Mississippi River route. They will visit with people in youth-led agricultural endeavors in each of the 10 states connected to the river and convene four multi-day intergenerational dialogues that engage a host of food system participants to discuss common values and create community action plans. They’re blogging about the trip at www.freshforks.org.

Two other cyclists will join them on the tour. Nate Joseph, who graduated from the University of Vermont in 2011 with a degree in environmental studies, lives in New Orleans and will bike the full journey. Another CFANS alum, Kiley Friedrich, who graduated in 2012 with a major in environmental sciences, policy and management and a major in global studies, will begin cycling with the team once they get to Prairie du Chien, Wis. Prior to that, Friedrich will be doing technical support while the team travels. —Patty Mattern
Waseca Research and Outreach Center celebrates centennial

The Southern Research and Outreach Center in Waseca will celebrate 100 years of agricultural service from 3 to 7 p.m. on Sept. 19 with an open house, tours, demonstrations and a picnic supper. The celebration will feature a historical display highlighting pictures, exhibits and a timeline of agricultural science from 1913 to present. A short program will be held at 5 p.m. featuring special guests, alumni, and staff.

Gophers in the Gardens
Music in the Gardens series
Family outdoor movie nights

Presented by www.arboretum.umn.edu

www.arboretum.umn.edu
In Brief

“God created Pinot Noir and the Romans brought it to France 2,000 years ago, and not much had changed since then... It’s very exciting. They are literally changing the landscape of worldwide winemaking.”

—Drew Horton, winemaker at the newly opened Chankaska Creek Ranch and Winery in Kasota, Minn., talking about CFANS scientists’ work on developing cold-hardy wine grapes.

“There’s nothing about the physical nature of our river systems that should give you any comfort that they couldn’t be up here in some abundance.”

—Peter Sorensen, director of the Aquatic Invasive Species Research Center after a study using environmental DNA technology found that earlier results might have overestimated the number of Asian carp in Minnesota rivers.

“During mating, the male usually receives a tummy full of quills!”

—A sign in front of a diorama with a porcupine at the Bell Museum of Natural History’s Valentine’s Day event.

“You’re fighting against millions, perhaps hundreds of millions of years of evolution and that’s sort of the secular equivalent of going against the word of God.”

—Applied economics professor C. Ford Runge, talking about the difficulty of making biofuels from the woody and fibrous parts of plants.

“We really have a flowerless landscape out there, and bees need flowers for good nutrition.”

—Entomologist Marla Spivak, talking about the long list of threats to bees.

“The sons of today’s farmers will bear the brunt of these bad decisions.”

—Applied economics professor Phil Pardey, talking about the need for a new generation of agricultural researchers.

Distinguished McKnight Professors include two from CFANS

Two professors—Paul Glewwe, top, from the Department of Applied Economics and Gary Muehlbauer (’94–Ph.D., plant breeding), from the Department of Agronomy and Plant Genetics and the Department of Plant Biology—have been named to the 2013 class of Distinguished McKnight Professors by the University of Minnesota. The program recognizes outstanding faculty members who have recently achieved full professor status. Recipients hold the title “Distinguished McKnight Professor” for as long as they remain at the university.

Food Day brings youth to campus

High school students from across the Twin Cities learned how food affects their lives and how it can be fun, too, at the first Bud Markhart Urban Youth and Food Day on the St. Paul campus in late March.

Markhart, a professor in horticultural science who died last June, worked to increase interest in agriculture among students from different cultures.

“With contemporary life, [students] tend to see food as beginning in a restaurant or in a grocery store,” said Food Science and Nutrition professor Craig Hassel. “We’re trying to bring back a more meaningful experience around food for students.”

Throughout the day, students experimented with foods native to Minnesota, cooking wild rice and concocting their own all-natural salad dressing.

They also got a taste of college by exploring the St. Paul campus and learning about the university’s admission process.
Myth 1: All soil is alike.

Walk through the Bell Museum’s “Hall of Soils”—part of the “Dig It!” exhibit—and any notion that soil is alike will quickly disappear. All 50 states’ soils are on display, from the volcanic dusty reddish-brown stuff of Hawaii to the deep red Georgia clay to the black-as-dirt topsoil from South Dakota. Within each soil monolith, visitors can see the “horizons” layers that show how soil was formed and affected by climate, decaying organisms, topography, parent materials and time. To soil scientists, the layers tell the story of life underground and provide a way to classify and describe similar kinds of soils.

Minnesota’s state soil, Lester, was chosen because of its rich, loamy topsoil that nourishes crops in almost half a million acres of southern and central parts of the state. Soil scientists waited years to make the designation official and in April 2012, lawmakers approved it. One senator’s comment as the votes were taken: “Maybe with this [vote], we’ll stop treating our soil like dirt.”

By Becky Beyers

The rich resource under our feet is gaining respect as a key to environmental health
Myth 2: You can’t hurt soil, and even if you do, it can be repaired.

Nearly a century ago, agriculture in the southern plains was booming. Farmers planted every possible inch of cropland, plowing up centuries-old grasslands that retained water and helped hold soil in place. But in the 1930s, historic drought dried out the soil and when the Dust Bowl windstorms came, the rich topsoil that had nurtured those lucrative crops blew away.

Modern soil conservation practices were born as a result, along with scientific societies dedicated to soil as well as soil and water conservation districts that govern natural resource policy in small, localized areas. Today’s farmers treat their soil more carefully but the eerie similarities between heavy production on agricultural soil, extreme heat and lack of rain worried members of the Soil Science Society of America enough that they organized a special conference last fall to discuss the latest research.

Their conclusion: While soil that was managed using no-till and other water conservation practices fared better in the 2012 drought, another year of dry conditions will make matters worse because any moisture that had been reserved in the soil is now gone. The scientists also called for new techniques for reserving water in soil, along with better long-range weather forecasting, to help farmers make smarter soil- and crop-management decisions.
Myth 3: A good rain (or a lot of snow) will take care of this drought.

Historically, the current drought is “significant,” says Mark Seeley, professor in the Department of Soil, Water, and Climate. Since it began in the summer of 2012, more than 80 percent of agricultural land in the United States has been affected, he says—almost like 1936, the peak of the Dust Bowl.

In southern Minnesota, where the drought is classified as “extreme,” soil needed 3 to 6 inches more than normal to be back in normal range, Seeley says. Spring storms are likely to be spotty and not every drought-stricken area will get enough rain.

Long-term, if soil moisture remains far below normal, Minnesota farm producers might consider changing the crops they grow, from corn and soybeans to more grains, which can better withstand dry soil. Some farm companies also are marketing special drought-resistant crop varieties, but choosing drought-resistance generally means giving up some crop yield—not an easy choice when crop prices are reaching record highs.

Myth 4: We can’t see the soil, so it doesn’t really affect us.

“Soil is underneath us, so there’s a tendency to see it as not important,” says Terry Cooper, professor in the Department of Soil, Water, and Climate who has taught introductory soil classes and coached the college’s soils team. “Unless you’re a gardener or a farmer, most people don’t see it as sustenance, but in fact soil has tremendous value. It needs to be protected just as much as water and air.”

He’s a fan of farming practices that focus on soil health rather than annual production or artificial fertilizers, using cover crops to increase organic matter and a healthy soil profile—the layers of different soil horizon that help retain or shed water—to avoid the flood-or-drought cycle sometimes created by drainage tile.

Soil’s unique ability to provide plant nutrients, absorb waste and sequester carbon become even more important in a time of climate change, Cooper says. But even though scientists have been talking about the need to protect soil for decades, current laws provide no requirement or incentive to do so. And there’s no advocacy group for soil as there is for water and air, at least not yet. “We need to be thinking down the road,” he says. “If you kill the soil, it will kill you.”

Myth 5: We already know all there is to know about soil.

Like everything else in the Earth’s atmosphere, global climate change will affect soil. Combine those changes with the questions raised by new technologies like fracking—extracting oil and gas from under the soil—and you have a long list of things we still don’t know.

Five years ago, a team from the Soil Science Society of America identified the most urgent questions facing humanity and how research in soil science might help address those questions.

They found eight critical issues: demands for food, water, nutrients and energy; and the challenges of climate change, biodiversity loss, biological waste recycling and global resource equity. They recommended four ways soil scientists could address the issues: refocusing research to the most urgent problems; broadening their vision from soil to entire ecosystems; enticing young scientists to pursue careers in the field; and improving soil science’s image with better stories of its past successes and future prospects.

“ Soil provides nutrients for our plants. It’s a resource for protecting our environment, both in terms of cleaning water and collecting water,” Cooper says. “In all of that, it’s soil that’s critical. Now you add in the climate change aspect and other challenges to our environment, and what soil can do for us is even more important, probably more important than we now know.”
What’s Up, Ducks?

Banding data show an increase in Minnesota-grown mallards

They call it “the great Canadian duck factory,” or sometimes just “up north.” That’s where most Minnesota hunters will say their migratory ducks come from. And a few decades ago, it was true.

In the past 15 years, the source of the local duck harvest has shifted—over half of the mallards obtained by local hunters originated right here in Minnesota, compared to about 30 percent two decades ago. Todd Arnold, a professor in the Department of Fisheries, Wildlife and Conservation Biology, has been analyzing 50 years of banding data on mallards in collaboration with the Minnesota Department of Natural Resources. He has found that by comparison, Canadian ducks have dropped from 65 percent to only 20 percent of the Minnesota duck harvest since the 1960s.

Mallards are the most widely-hunted migratory bird species in the region, and they have been banded more heavily than any other duck species, with more than 4 million bandings since 1961. Using this wealth of data as a representative of waterfowl species, Arnold is trying to determine trends not only in where migratory birds are produced, but in survival rates from season to season. The results have shown that the populations are strong and have not been over-hunted in recent decades.

“The Minnesota mallard population has been growing,” Arnold says. “We tend to think of ‘the good old days’ as being old days, but ‘the good old days’ for Minnesota duck populations have been the last 20 years. We’ve been doing something right.”

Some of the population fluctuations can be attributed to climatic shifts and droughts in the regions where mallards tend to nest—primarily the Saskatchewan and Manitoba prairie lands, the Dakotas and Minnesota. But looking at the 50-year decline in Canadian-produced mallards, Arnold cites long-term changes in agricultural policies and equipment. Better machines and equipment have allowed farmers to cultivate more of their land, leaving fewer wetlands and unplowed nesting habitat for ducks.

Arnold credits the local surge in duck populations to the success of strong habitat preservation programs and policies, such as the Conservation Reserve Program, which compensates farmers for planting long-term conservation plots on their land. The annual sale of Migratory Bird Hunting and Conservation Stamps—state and federal Duck Stamps—funnels money directly from hunters into wetland habitat purchase and preservation. Additional resources come from preservation organizations formed by sport hunters passionate about preserving habitat for waterfowl, like Ducks Unlimited, which began during the Dust Bowl drought when duck populations plummeted. Arnold’s research has produced a clear message—those programs are working.

“There’s a message here that we’ve done well,” Arnold says. “We have done things right in taking care of our waterfowl populations in Minnesota. If we want to have good duck hunting into the future, we should continue to pay attention to the habitat in our own back yard.” —Sara Specht

Sources of Minnesota Mallard Harvest

![Graph showing sources of Minnesota mallard harvest](image)

Todd Arnold is analyzing 50 years of banding data to track the survival of Minnesota’s mallards.

–Sara Specht
MORRIS, MINN.—Stand at the top of the hill under these wind turbines and you can hear the wind whistling across the prairie, all the way from Saskatchewan or perhaps points north.

It’s the sound of opportunity.

Researchers at the West Central Research and Outreach Center are ready to launch continuous operation of a process that takes the energy from these prairie winds, converts it to hydrogen and then to ammonia that can be used as fertilizer on the surrounding crop fields. The processing plant is part of the center’s larger efforts to reduce fossil-fuel consumption in agriculture over the next five to 10 years, says Mike Reese, director of renewable energy research at the center and leader of the project. As far as anyone knows, it’s the only plant of its kind in the world.

Capturing wind

Making fertilizer from wind has been on the center’s agenda since before 2005, when the first 1.65-megawatt wind turbine went up. Today it provides more than half the electricity to the nearby University of Minnesota-Morris campus and has become a visual symbol of the university’s interest in sustainable energy.

Take a strong wind, convert it to hydrogen, add nitrogen—and you’ve got an eco-friendly fertilizer
in sustainable energy. A few years later, a companion facility was built that converts wind into hydrogen. In the past few months, the final pieces to the puzzle were locked in with the installation of equipment that takes nitrogen from the air, combines it with hydrogen from the plant and makes anhydrous ammonia that can be used to fertilize farm fields.

The process takes place in two sheds marked “ammonia production room” and “hydrogen production room” that sit a few feet apart in a fenced-in area near the wind turbine. Inside the ammonia room, a complicated series of pipes and gauges connect to a tall pressurized reactor where the chemical conversion takes place. It’s called an ammonia production skid because it sits on runners that could be pulled out of the building for upgrading technology or maintenance, if needed.

The pipes bring in hydrogen and nitrogen under high pressure, mix the gases, preheat them to 800 degrees Fahrenheit and then send them into a reactor, pass the gases through an iron-based catalyst to create ammonia gas, which is then cooled to become liquid anhydrous ammonia. The pipes then take the ammonia back out and into waiting storage tanks, and residual hydrogen and nitrogen are recycled through the system. Sensors continuously monitor heat, pressure and other factors and can be read inside the building or from the team’s offices.

Asked how the team learned to run the equipment because it’s one of a kind, researcher Cory Marquardt, who manages operations, grins a little sheepishly. “A lot of trial and error,” he says.

**Economies of scale**

“The idea is that one of these could run with three or four people trained,” perhaps producing enough fertilizer for a group of farms or a small-town cooperative, Reese says. This year, the center will produce about 25 tons of fertilizer and sell to farmers via Morris area co-ops; that’s a tiny portion of what the local farmers need, but it provides an alternative that may grow over time.

Whether similar facilities would be economically viable in the short term remains to be seen, Reese says, because the energy market is so volatile and agriculture production costs are currently high.

The project also considers the larger economic and environmental costs of the system. Scientist Joel Tallaksen (’93–B.S., ’02–Ph.D., plant biological sciences) is using life-cycle analysis models to evaluate exactly how much fossil fuel can be saved by using the new system as well as the costs of energy inputs and the net carbon balance once the equipment is running continuously.

Economics are part of the puzzle, Reese says, but consumers’ opinions also will play a role in whether the process catches on. “It’s kind of like the swine industry, where consumers are driving change in production,” he says. “Consumer demand eventually will drive us toward greener fertilizers.”

The team’s efforts are gaining worldwide attention; scientists from the World Wildlife Fund have visited to see the plant, as have colleagues from the Swedish University of Agricultural Sciences. Wind power is used in Sweden for electricity but hasn’t been used as an alternative to petroleum-based products, says Serina Ahlgren, a researcher who spent a week in Morris this January, but “interest is very high. Things are happening here.”

From left: Ammonia produced at the plant is stored in outdoor tanks. Cory Marquardt manages operations at the wind-to-ammonia plant. Serena Ahlgren is a visiting researcher from Sweden; Joel Tallaksen uses life-cycle analysis to evaluate the economics of the plant. Eric Buchanan is looking at additional uses for alternative fuels.

All photos by David Hansen
Beyond the fertilizer

The center’s renewable energy work goes well beyond the fertilizer project. Research projects are under way that could find new ways to store large quantities of wind energy for non-windy days; to create fertilizers from other processes such as using non-thermal plasma; or to create other kinds of fertilizer beyond anhydrous ammonia. Reese and his team are working with faculty from several colleges and institutes across the university.

The hydrogen created from wind also is being used as a test fuel in two Workman utility vehicles that were donated to the center by Toro Co. The vehicles can run on electricity or hydrogen or, possibly, ammonia. The company tried them out at a New York state facility, but discovered limitations on hydrogen availability. So the vehicles were donated to the center for further research.

When renewable energy scientist Eric Buchanan fires up one of the vehicles on a cold winter day, it sounds like a small jet pressurizing before takeoff, until he puts it in gear. Then it’s silent and emits no smoke or fumes—just what a groundskeeping crew on a golf course or a farmer going out to check a field might want for early-morning maintenance. “We’re in the very beginning stages of deciding what we can do with them,” Buchanan says, but this summer the alternative fuels will be tested and evaluated for efficiency and economy.

“It’s definitely a viable technology,” Reese says of the utility vehicles. “It may be three or four years down the road, though, and that’s a long time for a company (like Toro) to wait. But we have the infrastructure here to really take advantage of the opportunity.”

Director of Renewable Energy Research Mike Reese and scientist Eric Buchanan are part of the team that will evaluate how the Workman utility vehicles run on different types of fuel cells.
In Search of “Greener” Grass
Research led by U scientists could result in more sustainable and drought-resistant grass options

The summer and fall of 2012 were not kind to grass. That’s not much of a news bulletin for anyone who saw brown grass lying flat last fall or, worse yet, flat-lining grass. Which makes the following bulletin more newsworthy.

A vast majority of the grass seed sold and planted in Minnesota is either Kentucky bluegrass or perennial ryegrass, says Eric Watkins (’98–B.S., science in agriculture), associate professor of horticultural science and lead investigator for the project.

The five-year project is funded by a $2.1 million grant from the U.S. Department of Agriculture and is part of a national effort to improve specialty crops.

A vast majority of the grass seed sold and planted in Minnesota is either Kentucky bluegrass or perennial ryegrass, says Eric Watkins (’98–B.S., science in agriculture), associate professor of horticultural science and lead investigator for the project.

The grasses being studied are “fine fescues,” a group of five species that are available at some nurseries and superstores, but much harder to find than the current mainstays.

The fine fescues generally have much narrower blades than our conventional grasses, Watkins says, and they tend to lie down a bit more—especially when mowing heights are raised—“so they might not be quite as uniform and upright as a typical lawn would be.”

But they have a lot of great attributes. First and perhaps foremost, they don’t grow very fast, “so you don’t have to mow nearly as much,” he says. In addition, they’re pretty drought tolerant; they stay greener much longer when precipitation is scarce. And they’re fairly resistant to disease.

“They just have a lot of nice low-input attributes,” Watkins says.

However, the fine fescues do have some less desirable characteristics. They have low heat tolerance, so they don’t fare particularly well in triple-digit temperatures, especially if recently mowed. They also don’t tolerate a ton of foot traffic and are more susceptible to snow mold—an annual occurrence in Minnesota.

Watkins says the researchers hope to breed fine fescues with better characteristics, “so that we can release varieties that have all these good things that are present now, but then are even better [because] we’ve overcome the other negatives.”

Changing habits
The project also includes components of outreach (U of M Extension will work to deliver information on these grasses more effectively), marketing and social science.

As Watkins points out, a big issue is that people are used to buying Kentucky bluegrass, and the public needs to be informed of its other options.

“I think if consumers were demanding more low-input grasses—such as these fine fescues—then the seed companies would sell them [more readily],” he says. But “getting people to switch means we really need to take care of these other deficiencies.”

Once that happens, consumers will still be able to have green lawns while knowing they’re contributing to a greater, greener good. Just think of the sheer number of lawns in the metropolitan area alone.

“Let’s say you reduce mowing by one-third on those lawns, or you reduce fertilizer use by a third. That’s a huge reduction in inputs,” he says. “Just small changes in species use can make big impacts down the road.”

Which could make the grass greener on your side of the street. —Rick Moore

This story originally appeared in UMNews.
Still Hibernating?
A message from CFANS Alumni and Constituent Relations director Mary Buschette

As I write this, winter is maintaining its icy grip on Minnesota well past the time when spring should have arrived. Do you find that you tend to keep to yourself more in the winter, and do more socializing in warmer months?

I recently had lunch with a friend and colleague I have seen but not really talked with in a while. We had some business to discuss and we traded a few “Did you hear about…” stories. Days later I am basking in the glow of our conversation, enjoying how easy it was for us to pick up where we’d left off years ago.

Renewing friendships—it’s a good thing.

For many of us, our closest friendships developed during our college years. And they’re also the type of friendships that can easily be eroded by distance and time. That’s where your CFANS Alumni Society and U of M Alumni Association can help. We have resources to assist you in tracking down the Bailey Hall roommate from your freshman year, the lab partner who saved your project from oblivion, the person who made the spring break trip so memorable. Here are some of the ways we can help:

• U of M Alumni Association directory can help connect you with fellow grads: z.umn.edu/umnalumniod
• Join the CFANS LinkedIn group or one of the many special interest subgroups: z.umn.edu/cfanslinkedin
• Connect with your favorite CFANS department via Facebook, Twitter and more at z.umn.edu/cfanssm

Renewing friendships isn’t just about the past. It’s also about the future. My lunch friend and I have agreed to make this a regular thing and not let so much time pass between visits. One way we can fulfill this promise is by attending a CFANS alumni event or two in the coming year. There are many opportunities to reconnect with your college in the months ahead. Consider these programs:

• Pull together a group of friends and register to attend the Golf Scramble for Scholarships in July
• Consider signing up to be a mentor and support a current student while networking with fellow professionals
• Make plans to return to campus for Homecoming September 22-28

Learn more at z.umn.edu/cfansalumni.

I look forward to the arrival of spring in Minnesota and hope to hear your stories about reconnecting.
CFANS Alumni Society

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Did you start out wanting to be a medical doctor?

I started out as a kid with a great interest in science. I initially thought I would be a mathematician, physicist or an engineer. But growing up in a home with a father who was a very well-known agronomist and being exposed to veterinary medicine as an undergraduate led me initially to veterinary medicine.

How do you think having a background in agriculture affects your medical practice today?

Growing up in a house surrounded by agriculture probably influenced my initial choice to go to veterinary school. For my current medical practice it is what grounds me, helps me to understand rural patients, farmers and others. I think (CFANS) teaches great science, but more importantly teaches students that science is about the people. Agriculture is an applied science, not a theoretical science. Agriculture does not work or succeed without the people: farmers, consumers, industry, researchers, and students.

Did your father influence your decision to attend the U of M?

Dad is a very straightforward communicator. When I was a sophomore in high school he sat me down and said, “you will go to college. It is your job to figure out how to do it and what to do.” I was a good student with a talent for science and numbers, and knew that I would do something in the sciences, and I knew that an undergraduate degree was just the start. After all, I grew up with a father who was a college professor and a little eccentric.

I applied to the U of M, St. Thomas and Montana State. Both St. Thomas and Montana State offered me full football scholarships and the U of M offered a small academic scholarship. For several reasons, St. Thomas was an easy choice. Plus I didn’t want a long-distance relationship with my then-girlfriend, Debra McNaughton. (We’ve been married since 1979).

To cover my living expenses, I found a job as caretaker for the Apache Animal Hospital which included a small apartment. You could lie on the bed, change the channel on the TV, open the fridge and reach the sink in the bathroom without getting up. The surprising fringe benefit was that I could work in the veterinary clinic as an aide, and I found I really liked the science of medicine.

After two years at St. Thomas and taking as many credits as allowed per semester, I was academically a senior. Then I found out that my football scholarship was not renewed for the next year. I transferred to the U of M as an animal science major.

I worked out a plan with my adviser that would allow me to receive my bachelor’s degree after one more year. I applied to veterinary school for entry in 1980, asked Debra to marry me and went to Wyoming to work in the logging industry with my older brother Todd (who later returned to the U of M and graduated in agronomy). Logging was dangerous but paid well enough to fund my entry into veterinary school.

After graduating from the College of Veterinary Medicine in 1984 I became a veterinarian in large animal practice. I found that I loved surgery and had some natural skill at it. I started talking with Debra about how I could learn more complex surgical skills and if I should return to the veterinary school or consider human medicine and surgery. Her advice was to “do what you feel is best, but you don’t want to someday be 50 and ask ‘what if?’”

So four years after finishing veterinary school I applied and was accepted to the U of M medical school for the class to start fall of 1990. As the start date grew closer I became more anxious and
almost decided not to go. Despite all my previous college, I had the same anxieties as every student: Is this the right choice? How am I going to pay for school? Will my wife (and family) tolerate me being a student again? Where will I live?

As a “nontraditional” medical student I found medical school less stressful than I had expected and academically no more difficult than veterinary school. My education at CFANS and veterinary school had prepared me very well. The maturity of being 10 years older than the other students gave me a different perspective than the other students, the ability to see the larger picture without being lost in the details.

Today I am a general surgeon for Mayo Clinic Health Systems, and on a daily basis feel blessed to be paid to do something that I truly enjoy. My father once told me, “a job you go to daily, a career you build, a reputation you protect, and learning is forever.” Even with four years of undergraduate study, four years of veterinary school, four years of medical school and six years of residency (4+4+4+6=18) I still continue to learn. I just returned from a three-day surgery course at University of Southern California. The learning is forever.

Can You Identify this Photo?

Who are these people and what are they doing?

Hint: They are not on the St. Paul campus in this photo, but are at a CFANS-related place that is celebrating a milestone anniversary this year. The person who knows the correct answer and sends it to us at solutions@umn.edu will receive a CFANS coffee mug.
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BY THE NUMBERS  CFANS’ Class of 2016

- **20** Percentage who were in the top 5 percent of their high school class academically
- **62.3** Percentage who are female
- **264** CFANS students who are younger than 19
- **26** Median ACT score (of a possible 36)
- **39.4** Percentage who are from the Twin Cities
- **302** Students who call North Dakota home

Sources: Office of Institutional Research; CFANS internal reports

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**CFANS Development Team**

The College of Food, Agricultural and Natural Resource Science’s development staff are available to discuss giving opportunities with you and to answer any of your questions. Contact us anytime!

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Tonight I want to tell you about the what, why and how of my college career so far.

I’ll start with the ‘what.’ I’m a busy guy, and that’s putting it lightly. People say that they’re busy and maybe they mean that they’re working overtime at their job or have a lot going on around the house. I secretly wish that I had just one thing to keep track of like that.

To summarize: I’m taking 16 credits this semester, but that’s spread over 7 courses. I have three part-time jobs. I’m doing an undergraduate research project. I try to get to church every Sunday and to stay active in two student organizations, the Forestry Club and the Society of American Foresters. And this is with an hour and a half round-trip commute to school, and I’m in the middle of my job searching because I’ll be graduating in May. I’m also doing some professional interviews in forestry to try to get a better feel for the industry and my job prospects. So anyone would agree that that makes for a pretty busy student.

But that’s actually only half of it in my case. I’m also a husband, homeowner and father of three. My wife, Nicoleen, can tell you that although it seems like I’m a ‘go-getter’ I’m actually not. I have five alarms every morning but actually it’s her elbowing me in the ribs that wakes me up. So I don’t tell you all of what I have going on to make you marvel at my motivation, because I’m actually faking that. I’m also not telling you to make you feel sorry for me. My circumstances are self-imposed. It wasn’t a natural disaster or a health problem that’s made it difficult for me to do school.

And now for the ‘why.’ I graduated in 2000 from Maple Grove Senior High School. I didn’t have any idea what I wanted to do. I was 18 so I was basically trying to figure out how I could have more fun today than yesterday. We got married in 2005; we knew we wanted to have children early and get into a house as soon as we could. It all would have worked out fine if I would have done school in those years between high school and my home and family. But, as I said, I had no clear direction at that time. So I’m in school now and I’m willing to deal with all the challenges, because I love forestry.

And now the ‘how.’ How is this all possible for me? When Nicoleen was pregnant with our first daughter we were kind of toying with the idea of me going back to school. I had been working construction and that was starting to dive with the housing market. We knew that if I were to go back to school, it would occupy a lot of my time and everyone around me would have to pick up the slack. But my passion for forestry made me want to attempt this challenge. And I can do it through the financial support that the benefactors provide. With one income in the household there was no way I would be able to pay for school myself.

There have been times I wanted to quit. If I just stopped for a year to work, you know, get some job and pay off some of my bills, that would get me set and then I could start again. Everyone said, ‘No, no, don’t do that because you’ll never go back.’ When I got the scholarship letter this year I was very relieved.

It’s been said before: it’s not only the money, it’s the motivation knowing that somebody out there who doesn’t know me somehow through this scholarship application could sense the passion for my field.

And that’s really what has kept me going. I think I can speak for all the recipients here tonight by saying that there are people with better grades, maybe more dire circumstances financially, but it’s the combination of those plus our passion for these important fields. CFANS has the departments and careers that are going to be important in the future of the world.

I really thank you benefactors and the scholarship committee, the faculty and staff and everyone who makes it possible for us students to do this. When you applaud, please don’t make it for me—make it for yourselves and all the other students and faculty and staff and everyone else who can be a part of this for all of us. Thank you, thank you.
A multicolored Asian Lady Beetle will emerge from this pupa. Soybean aphid adults and nymphs rest on the leaf around the pupa. The Asian Lady Beetle’s larvae and adults feed on aphids and other insects.

The small white bits are cast aphid skins. At the rear of the pupa and attached to the leaf, you can see the black cast skin and yellow spines of the Lady Beetle larva. You can also see some of the features of the adult (segments, eyes, antennae, legs, wings) in the pupal skin.
May 17
CFANS undergraduate commencement, Mariucci Arena

May 23
Siehl Prize for Excellence in Agriculture ceremony, McNamara Alumni Center

June 1–August 31
“Gophers in the Gardens,” Minnesota Landscape Arboretum

June 14–15
Bell Museum BioBlitz, Coldwater Spring in Southeast Minneapolis

July 12
Golf Scramble for Scholarships, Les Bolstad Golf Course

September 3
Fall Semester 2013 begins

September 19
Centennial Celebration, Southern Research and Outreach Center, Waseca

September 22–28
University of Minnesota Homecoming celebration