

SOLUTIONS

SOLUTION ▶ DRIVEN SCIENCE™

SUMMER 2009



Long-distance Learning

"Cairo to Cape Town" class explored Africa by bicycle

Moooving Toward Organic Dairying

WCROC's unique research will fill growing demand for information

New Face of Renewable Energy

Search for sustainable fuel crosses disciplines

Frozen in Time

Graduate students search for new fungi in Antarctica



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA



Photo by Martin Moen

Solutions magazine is published three times a year for friends, alumni, faculty, staff and students at the College of Food, Agricultural and Natural Resource Sciences. Like the college, the magazine focuses on how science leads to solutions for today's problems in food and agricultural systems; global climate and environmental change; biodiversity; and bioenergy and bioproducts.

CFANS is composed of six divisions, 13 academic units (two are held jointly), seven research and outreach centers throughout Minnesota, the Bell Museum of Natural History and the Minnesota Landscape Arboretum. The college also participates in many interdisciplinary centers and cooperatives.

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Claiming Our Future: A Strategic Plan for CFANS Undergraduate Education

Editors note: Associate Dean for Academic Programs and Faculty Affairs Jay Bell is guest-writing the dean's column for this edition of Solutions.

CFANS is a relatively young college, but it builds on its predecessors' rich traditions of excellence in undergraduate education. In an effort to continue to prepare our students for the future amidst changing state, national and global trends, CFANS has been engaged in a comprehensive strategic planning process for undergraduate education. I am pleased to share the results of this ambitious task, *Claiming Our Future: A Strategic Plan for CFANS Undergraduate Education*.



The plan includes strong, vibrant and forward-looking mission, vision and values statements. It reveals a strategy of systems-level institutional change and clear direction for moving forward, one that will require innovative shifts in programs, organizational culture and campus-wide leadership. It builds on our strong faculty and staff commitment to (and engagement with) undergraduate students, high levels of student satisfaction, hands-on learning and job placement that is relevant to students' studies. In addition, the plan helps us define what it means to be a global land grant university in the 21st century and how the research, educational and civic engagement themes can be applied to undergraduate education.

But the real work is just beginning. Over the next 12 to 18 months, five task forces will continue to engage the CFANS community to work out the plan's details and begin the implementation process. The task forces are centered on the plan's three key initiatives:

- Curriculum Revitalization
- Transforming Campus Culture
- Faculty and Staff Capacity Building

As we move forward, I encourage you to become part of the process. Here are two potential ways to be involved, and others will no doubt emerge. In addition, you're welcome to send me e-mails with your thoughts and ideas: jaybell@umn.edu.

CFANS First Thursdays @ 4:00 are an informal opportunity to meet with others from across the CFANS community and share ideas related to undergraduate education and the Question of the Month. Our next gathering is Thursday, July 2, 2009, in 365 Haecker Hall, and will be followed by a barbecue. Updates on future First Thursday topics/locations will be posted on the strategic plan website.

The website contains the complete strategic plan, information on the task forces, background studies and supporting documents and places to express interest for becoming involved: www.cfans.umn.edu/CFANS_Strategic_Plan.

Jay Bell, Associate Dean, Academic Programs and Faculty Affairs

On the cover: A Tour d'Afrique rider on a road outside Marsabit in Kenya. Photo courtesy Paul Porter.

My intent is to view agriculture, food and agro-ecosystems as I move across these varying landscapes and relaying this back to class on the St. Paul campus... I hope the students will learn more about Africa in general, but also about food, cultures in Africa and that by learning about Africa they'll have a better appreciation for what we have here in the United States.

—Paul Porter, December 2008,
before leaving for his
Tour d'Afrique journey

**Read and listen to
more about the class at:
<http://paulporter.wordpress.com>**

It was like seeing Africa from the seat of a bicycle—without leaving Borlaug Hall.

Students in the spring semester class called “Food and Agriculture in Africa: From Cairo to Cape Town at 10 mph” followed along as Paul Porter, a professor in the Department of Agronomy and Plant Genetics, rode on the 2009 Tour d’Afrique, a 10-country, 12,000-kilometer bicycle trip that began in January. Under the guidance of teaching assistant Maggie Mangan (’09–M.S., applied plant sciences), the class rode along through Porter’s daily audio, photo and written blog entries, satellite phone calls from Africa, guest speakers in class and outside readings. Nearly every day, after riding an average of 75 miles, Porter would use a satellite phone to send back descriptions of what he had seen, eaten or experienced along the way.

January 10—First Day of Biking: *I’m speaking to you from a desert camp...today the ride begins. It started in Giza. By 6:45, we were packed, checked out of the resort, fed, geared up and ready to ride.... Let me talk about the agriculture I saw today: Nada, zip, nothing. It is a desert...tonight there’s a full moon, not a cloud in the sky. Beautiful,*

beautiful way to start a bicycle ride.

January 13—Safaga, Egypt on the Red Sea: *Today we rode 100 K, all along the Red Sea. Again, on the road we saw no agriculture—except for one farm of no more than 10 acres maximum and one greenhouse. No doubt both had a water source. Our camp this evening is on the sea front. TDA [Tour d’Afrique] rented the beach front and four rooms from a hotel so we could have a shower (first since Cairo). I walked downtown and took photos of some small shops: a butchery, a vegetable stand and a spice stand. Most all vegetables and fruit are brought in—most from the Nile Delta, but some from Syria. The TDA hired an expedition company to drive two custom trucks up from South Africa. They are our support vehicles—one is the lunch truck and the other the dinner truck. Both contain individual storage space for the riders and support staff. On the trucks they brought most of the corn flour, oatmeal and dried vegetables we will consume over the next couple months. It took the trucks one week to go from South Africa to Nairobi, and five weeks to go from Nairobi to Cairo.*

The 30 or so students in the class came

LONG-DISTANCE LEARNING

By Becky Beyers



from a broad range of disciplines, Mangan said: international studies, nutrition, public health and architecture as well as agriculture and plant sciences. Along with tracking Porter's progress, they learned from guest speakers, primarily CFANS faculty with experience working in Africa.

"It hasn't been just ag, or just food, or just ag-ecosystems," says Brad Bornstein, a junior nutrition major who said he appreciated the way the course pulled all those topics together. "It's really multidimensional. There's something in the class for everybody on this campus."

Deciding how to arrange the topics and speakers in the classroom "was kind of an experiment," Mangan says. "But the chemistry between the students and the guest lecturers has really seemed to flow in a natural way," by reinforcing Porter's observations and tracking current events in Africa. Because Africa is so big and so diverse, a broad range of topics and speakers was necessary to reflect that expansiveness, but linking them in a cohesive way was challenging. "But that's what ag is," she says. "It's all connected."

February 25—A New Culture, A New Landscape: Today we traveled 80K on rocky, gravel roads. It's been several days since we crossed a riverbed with water again, and I suspect it will be several more before we see flowing water. Our TDA trucks carry enough water for us to drink and do dishes; today and tomorrow there's a "no washing" restriction on the riders... We're being warned to check our shoes and tent mats for scorpions, which can crawl into those areas.

Porter wasn't the only blogger on the tour; of the 60 or so riders, he estimates a third were posting updates online, in a variety of languages. "We'd get to our campsite at the end of the day and it would be food first, then shelter, then journaling or Internet if available," he says. Some cafes had just one or two computers; in bigger towns, the rider/bloggers took turns at four or five stations.

Along the way, the cyclists attracted locals' curiosity and sometimes too much attention. Campsites are rented from local landowners and didn't always include the personal space Americans expect. In addition, "you'd have people watching us consume these huge amounts of food," Porter says, when often

"CAIRO TO CAPE TOWN" CLASS EXPLORED AFRICA BY BICYCLE

Main: Riding in the shadow of the pyramids, Cairo, Egypt, Jan. 10.

From Top: Riders at the start of the Tour d'Afrique 2009 in Cairo, Jan. 10; A foodseller on the streets of Cairo, Jan. 9; Camp in the Eastern Desert near the Red Sea, Jan. 11; Farmers transporting sugarcane near Luxor, Egypt, Jan. 15; Riders walk through sand in northern Sudan, Jan. 21; Irrigated wheat fields outside Wadi Halfa, Sudan, Jan. 21; A donkey cart carrying vegetables and feed near Dongola, Sudan, Jan. 26.



they didn't have enough to eat. Others crowded along the roads as the riders passed, begging or simply wanting to exchange high-fives. "That dynamic is certainly there," and it made some riders uncomfortable, Porter says. "But it was very safe. By and large, people are extremely kind, more than you might see in our society."

March 5—Crossing the Equator: It was

another fascinating day for agriculture. We passed mainly fenced pasture land and started seeing more cropland and more people living near the roads.... Rarely would you see a monocrop field. Instead, they're growing banana trees, mango trees, coffee and tea trees, corn, cassava, potatoes, tomatoes, maybe cabbage, inter-



All photos courtesy Paul Porter

Paul Porter

planted, multi-species all in one field. Near our camp I stopped and talked to a woman who's just moved back here from Mombasa. She's going to start farming. In talking to her you could tell she's an innovator, and she pumped me for ideas. The highlight of the day was a photo op at the sign marking the equator. Our total mileage on the bikes has recently passed about 5,000K so we still have miles and miles to go. I'm looking forward to it.

Then, on March 18, disaster struck.

I thought today would be a breeze. About 9:30 a.m., I was on the flat land, going about 25K an hour—nothing too fast, nothing too special. I looked up the road and saw a nice clean line ahead. There was a big tree to the left. I was on the left. Only too late did I see the huge hole that was hidden by the tree's shadow. Swerve? No time. Going through it was the only option. Boom! I hit the hole, fell over to the right and instantly knew I was hurt. It didn't take long for me to realize I was dripping blood... other riders came along and helped bandage the wound. Should I ride on? Could I ride on? I rode on for about an hour like this, and went about 12K until we caught up with the other riders and the dinner truck, which carries more medical supplies. There was lots of swelling on the elbow. Alex (the paramedic) turned to

me and said, "Paul, you're riding the truck."... At Iringa there's a hospital, about 125K away. When we arrived, the wound began to bleed again. The doctor looked at the X-ray for a long time before saying "your ulna is fractured, it's a compound fracture; the bone went through the skin and you'll need surgery."

He wouldn't be able to ride a bike for at least six weeks, so the decision was clear: Porter would have to return to Minnesota for surgery. His ride was over.

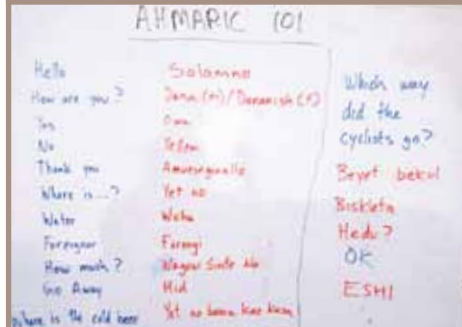
A few days later, as students settled in for what they expected would be a routine class session, a tan, thin, bearded man walked to the front of the classroom bearing an enormous cast on his right arm. "Hi," he said. "I'm Paul. I'm here and I'm live. I wish I weren't here...but we'll make the best of it. This is kind of cool, because now I get to meet you in person."

Porter and Mangan had to figure out how to switch gears quickly—a course based on reports from halfway around the world obviously wouldn't be the same without those reports. But because things had been going so well, they made a simple change. The class would stick to its syllabus—but instead of Porter's blogs, he could rely on his fellow riders' online reports and comment on them in person. Once a week, he updated his blog with a summary of what the remaining riders were seeing, doing and saying.

As his arm began to heal, Porter quickly realized he has a new goal. He wants to go back and join the 2010 Tour d'Afrique near the point where he had to stop this year; he'd spend the first half of spring semester teaching on campus and then the second half teaching via biking and blogging. He's talked with administrators and calls it "a possibility."

Students in this year's class give it high marks. "The technology worked so well; the first time he called in on the satellite phone and we were talking to him in Africa, it was almost surreal," says Rachel Kylo, a junior food science and nutrition major. "It was like in a way we got to see Africa with him." ■

From Top: Women carrying firewood near the Sudan-Ethiopian border, Feb. 1; Learning important new Ahmaric words in Ethiopia, Feb. 3; A pile of corn at a farm near Gondar, Ethiopia, Feb. 4; Farmers and their tools near Bahir Dar, Ethiopia, Feb. 10; Riders on the road near Addis Ababa, Ethiopia, Feb. 14; Planted fields in Kenya near the equator, Mar. 4; Cattle grazing outside Arusha, Tanzania, Mar. 9; A local's bicycle transporting chickens near Dodoma, Tanzania, Mar. 16.



Wolf Whisperer

Mech continues to enhance our understanding of wolves



Our relationship with wolves is a long one, going back some 14,000 years when humans began to tame wolves or the wolf adapted to our habit of leaving behind edible garbage. However it began, our symbiotic relationship with wolves is getting more interesting.

Much of what we know about gray wolves, the species found in the western Great Lakes region, is a result of L. David Mech's observations and research. He has studied wolves and their prey for over 50 years, authored leading books on wolves, founded the International Wolf Center in Ely, Minn., and mentored many of the leading scientists who now work with wolves. Mech is an adjunct professor in the Department of Fisheries, Wildlife, and Conservation Biology and Department of Ecology, Evolution and Behavior.

What keeps Mech engaged in his life's work is the opportunity to learn. He is currently working to dispel the myth of the alpha male and female dominating a wolf pack—fully acknowledging that his research and books helped make the concept universally accepted.

"Wolves in captivity behave differently with one another than wolves living in a natural setting," Mech says. "The typical wolf pack in the wild is a family, with the

adult parents guiding the activities of the group in a division-of-labor system."

Protected by the Endangered Species Act since 1974, the gray wolf is another example of the legislation's impact. Poisoned to near extinction in the lower 48 states, only a small population remained in northeast Minnesota when the gray wolf was protected.

In the past 40 years wolf populations have rebounded to roughly 4,000 in the western Great Lakes, greatly expanding their range. The human population has grown as well during that time, and a lake home and forest cabin culture has put wolves and humans in closer contact. You would expect conflicts to increase.

But the reality is that claims for reimbursement for livestock killed by wolves, a program run by the Minnesota Department of Agriculture, are holding steady. And, the number of "problem" wolves killed in Minnesota by the USDA's Wildlife Service program has pretty well stabilized since 1995. While that may have more to do with an abundance of white-tailed deer for wolves to eat, Mech is optimistic.

"I think people are a little more balanced in their approach to wolves



Photo by David Hansen

today," Mech says, "although there will always be extremists on all sides."

Mech is firmly on the side of people who are pleased the gray wolf was removed from the Endangered Species List earlier this year. "Federal protection has served its purpose. Today's population of gray wolves in the Midwest is more than three times the target we set when we put them on the list."

And how about controlled hunting? "It's not very easy to hunt or trap a wolf," Mech says. "I don't think a regulated hunt would harm our wolf population."

—Martin Moen

Moooving

By Becky Beyers

Toward Organic Dairying

WCROC's unique research will fill growing demand for information

MORRIS—Stocky red-and-whites, tall and bony black-and-whites, solidly built all-black. Dozens of dairy calves of every color and body type—separated into small groups by age and size—loiter and play in the straw-lined wooden pens and shelters at the West Central Research and Outreach Center.

Once a month, each calf is weighed and measured, with the results meticulously recorded. As they grow, they graduate up to larger pens, and eventually, some of the heifers will be moved out to the center's grazing fields, where the cows will become part of the research center's herd. The rest of the calves will move to other research projects or will be sold.

This generation of calves is being raised organically, part of the WCROC's conversion of about half its herd, or 70 cows, to organic production. When the transition is complete, the center will be one of only three organic dairy research facilities in the nation and the only one in the Midwest, says Dennis Johnson ('66–M.S.; '74–Ph.D., animal science), a professor of animal science and leader of the transition. The research and outreach center will be the only land-grant university facility in the United States that includes both organic and traditional dairy research.

What's more, the dairy facilities

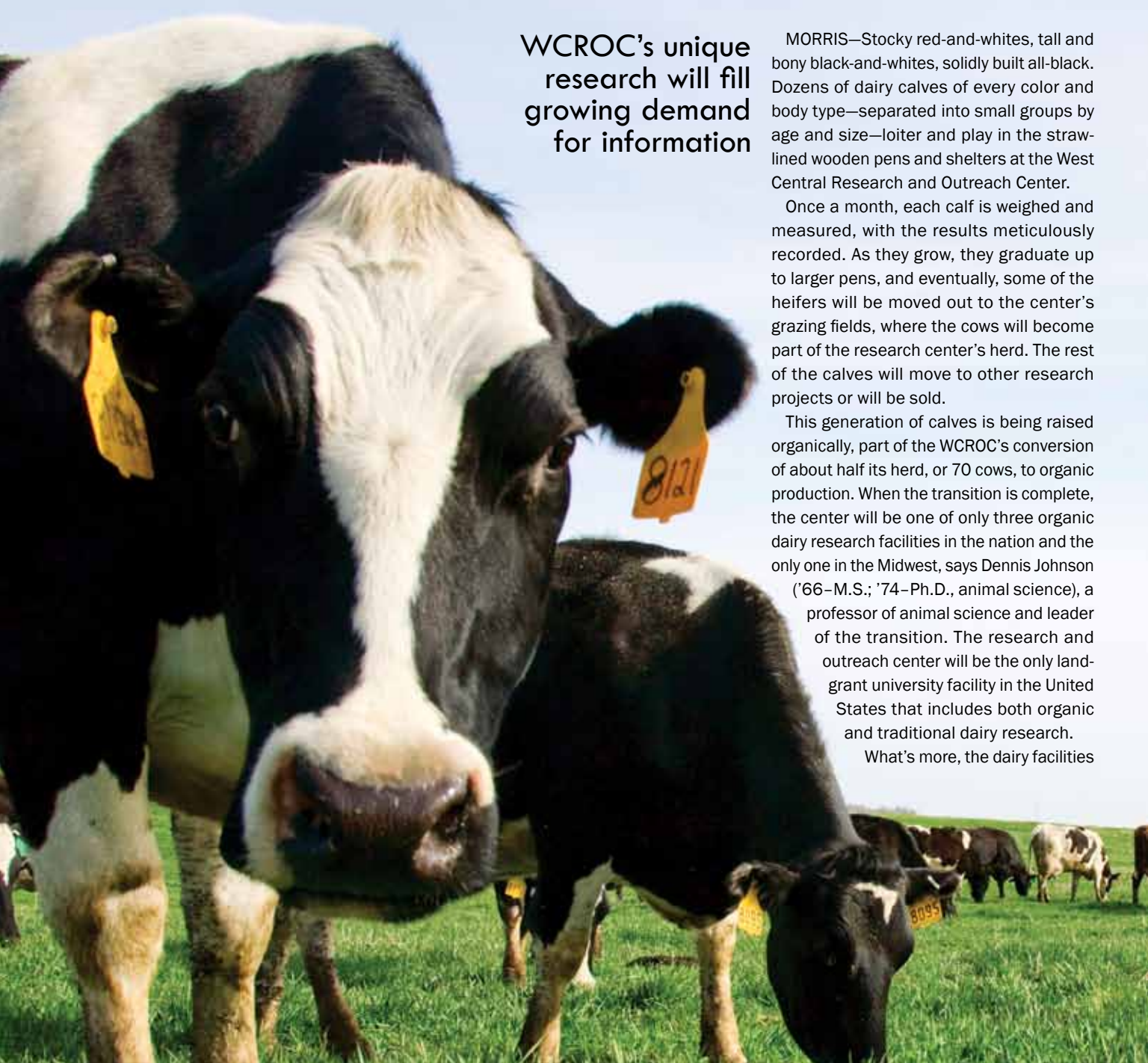




Photo by David Hansen

Calves at the WCROC are separated into pens according to their size and age.

in California, New Hampshire and were started with organic heifers; at Morris, the actual transition process—from conventional dairying to organic—becomes part of the research.

“We’ve been moving in this direction for the last 13 years,” Johnson says, with research projects involving reduced-input dairying and sustainable-ag practices like letting the cattle graze on grass and overwintering outdoors. But becoming certified as an organic dairy requires more intense documentation, record-keeping and inspections. “We’re in a position to do research during the transition, which is more like what Minnesota farmers would experience if they chose to go organic,” he says.

Transitioning to organic certification of crop land is a complex process that takes about three years; the center is about a third of the way finished. Cows that have been raised conventionally and are giving milk need a year of transition into organic management. New heifers during transition must be under

organic management for the last trimester of their mothers’ gestation. By November of this year, Johnson says, the whole herd will meet organic standards. The rest of the certification process involves ensuring that grazing lands have met organic standards for at least three years.

Organic management means not using antibiotics or synthetic drugs or hormones, Johnson says, along with restrictions on what the cows eat and their living conditions. The center’s longstanding dairy breeding program will be incorporated into the program, so that scientists can document which breeds respond best to organic management.

“We expect to end up with three genetic groups,” Johnson says. Each group will have

some cows raised under both organic and traditional methods. Dairy research at the center has long involved pure Holsteins as well as crossbred Jerseys, Montbeliardes and Scandinavian Reds.

“The idea is that depending on your situation, you might want a Jaguar or a Jeep,” Johnson says. “A pure Holstein is a Jaguar—it’s been selected for its high milk yield, but it might not have the characteristics that make it adaptable to lower input situations. For more rugged conditions, you want the Jeep,” one of the crossbreeds that don’t yield as much milk but might be better suited for spending the winter outdoors.

Research comparing the breeds and their responses to organic management will continue after the center is certified organic, Johnson says. The center also will maintain its herd of cows that have been bred to remain at the 1964 genetic level, because they’re an important part of ongoing genomics research.

Why organic? Why here?

Organic milk is the fastest growing and one of the most profitable products in the dairy industry. While nonorganic milk prices paid to farmers are set monthly—and have

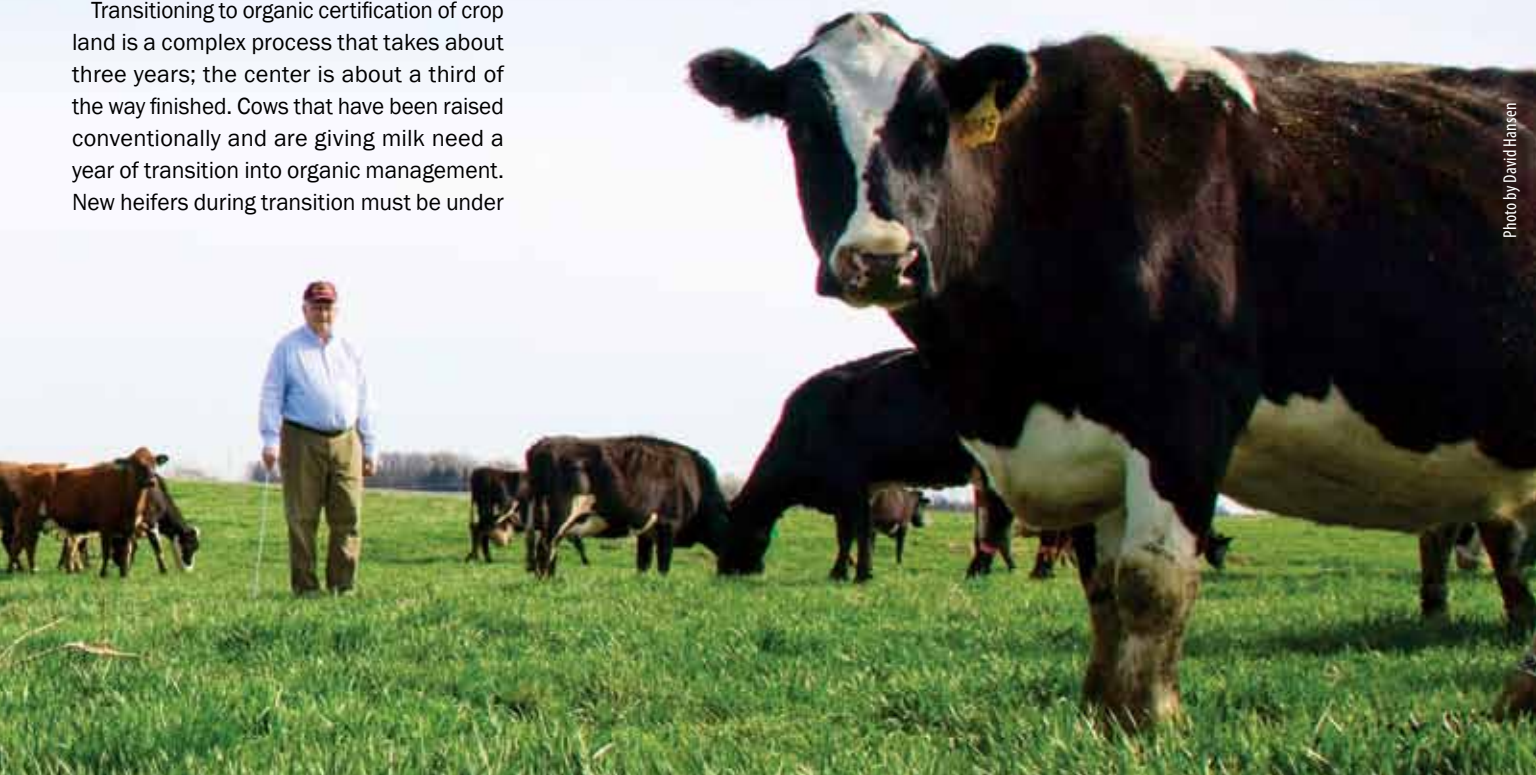


Photo by David Hansen



Photo by David Hansen

Dennis Johnson is overseeing the transition to organic dairy farming at the WCROC.

plunged in recent months—organic prices are set once a year and typically bring in more money for farmers.

All of Minnesota's organic production is growing fast, says Jim Riddle, organic outreach coordinator for the University of Minnesota. In every measure—number of farms, total acres and so on—Minnesota is among the top 10 in the nation. Riddle expects that the U.S. Department of Agriculture's latest organic census will show even more rapid growth.

"It was a natural progression" for the dairy research project to be located at the WCROC, he says, because of the research already being done there. "A lot of the fundamentals were already in place, but it did take leadership to get this going, along with public support," he says.

New funding for research is aimed specifically at organics. Before that, organic researchers had to compete for funding sources, Riddle says.

Along with the dairy research at Morris, the university is a leader in organic cropping research at the Southwest Research and Outreach Center in Lamberton, and is uniquely positioned for research into human nutrition and organics because of the U's research specialties, Riddle says. "There's huge interest right now in organic fruits and vegetables. There's an excellent opportunity there to do more."

Driven by consumers

Johnson notes that demand for organic products mostly has been driven by consumers' growing interest in food safety and knowing the origins of their food.

At public presentations about the transition, he shows a slide that details his own evolving perspective—from concentrating on increased production in the 1950s through a focus on genetics and diet in the '60s and '70s to an interest in more sustainable dairy systems today. He says he thinks the industry has gone through a similar progression. "People are starting to look at the entire food system, and there's also a desire to have more of a landscape vision...people want to know where their food is coming from."

Growth also was fueled by the USDA's creation in 2002 of a standardized way of certifying and labeling organic foods, says Rob King, a professor in the Department of Applied Economics who's helping coordinate organic research, teaching and outreach in CFANS. "Even though consumers may not completely understand what 'certified organic' means, it gives them a sense that it was produced within a set of standards, and it makes it easier for producers to convey that standard," he says.

Johnson sees the opportunity for the Morris research center to lead further research into the broader impact of organic agriculture, because of its size, location and combination of research topics. "There are a lot of other issues to be considered: cost, the rural lifestyle, what people expect their landscape to be like...we're trying to show how organic production works in the context of a farm." ■

About half of the WCROC's herd will be managed organically.



Photo by David Hansen

MORE ON ORGANICS:

- See a video story from the U of M News Service about the West Central Research and Outreach Center's conversion to organic production at www.cfans.umn.edu/solutions.
- An Organic Field Day is planned for July 9 at the Southwest Research and Outreach Center in Lamberton. See <http://organicecology.umn.edu> for details and more information about organic research at the center. You can also download publications and news about organic production and consumption.
- www.extension.org/organic is a national site about U.S. organic agriculture production that provides research, news and learning modules from land-grant universities nationwide.
- Rob King is spearheading a group called the "Organic Initiative" within CFANS that aims to pull together the organic and sustainable research, teaching and outreach from many disciplines. He expects to launch a searchable database later this year along with making published scientific papers available in an easy-to-search format.

Bearer of Bad News

Stinson delivers the state's economic forecasts

Lately, when Tom Stinson speaks, everybody listens.

The applied economics professor is also Minnesota's state economist, a position that requires him and his team to prepare the state budget forecast twice a year and to deliver that news to the governor, the legislature and the public.

The state economist is a part-time position, purposely set up on a short-term contract so that the forecasts won't be influenced by political pressures. Stinson (73—Ph.D., economics) says one of the most important parts of the job is the actual presentation of his forecast to state officials and the press. "If nobody believes you, then even the most accurate forecast is no good. Our goal is to provide a credible, professional starting point for the state's budget debate."

Along with his official duties, since the current recession began he's been giving presentations to all sorts of groups, trying to explain what happened and why and when the economy might get better. His standard presentation includes graphs and trends that in another

setting might be eye-glazing—but his audiences are paying attention. "I'm primarily a teacher, and we're in a teachable moment right now," he says. "When times are good, nobody cares as much."

Even before the recession started, Stinson and his colleague, state demographer Tom Gillaspay, were sounding the alarm about other challenges facing the state over the next few years. As the baby boomers retire, Minnesota will face a worker shortage, they say, and state officials need to be considering the "three Rs" of economic success: retention of good workers, recruiting workers from other places and retraining newcomers and displaced workers.

"The thing we have to recognize is that our state's competitive advantage has been its productive workforce," he says. "If we don't have that anymore, we won't enjoy the same kind of economic success we've had."

While accomplishing those goals might be difficult when the economy

is slumping, Stinson says he's confident that people will make the right choices if they understand the significance of the situation. "That's why we're out there talking about it—people have to understand what's happening."

He's also worked with the National Center for Food Protection and Defense, which is based at the U of M, on measuring public attitudes about terrorism and food safety. Among other things, his research has looked at the potential national economic impact of terrorists compromising the U.S. food supply, and where food-protection funds should be spent.

Stinson has held the state economist's job since 1987, longer than all of his predecessors combined. He says it's important to recognize that each budget forecast is more than just numbers.

"You have to craft a story as you explain to people what's been happening. In the last year or so I've had to spread a lot of bad news. But people appreciate something that's not filtered through a bias." —Becky Beyers



Photo by David Hansen



The Hueg Family

Siehl Prize Laureates honored

An innovative corn breeder, a pioneering former dean who fostered international cooperation and the founder of one of Minnesota's most successful farms are this year's recipients of the prestigious Siehl Prize For Excellence in Agriculture.

The prize is awarded annually by CFANS. Recipients are chosen for three categories: academic (teaching, research and outreach), production agriculture and agribusiness. This year's winners are:



The Troyer Family

A. Forrest Troyer, Agribusiness

As one of the world's most effective corn breeders, Troyer ('64-Ph.D., agronomy) developed or co-developed 40 commercial corn hybrids for major agribusinesses that sold more than 60 million bags of seed corn—enough to plant all the corn in North America for two years.

William Hueg, Academic

As director of the Minnesota Agricultural Experiment Station and a University of Minnesota administrator, he developed an interdisciplinary approach in agricultural research that led to significant advances in addressing state and national global challenges in agriculture.



The Christensen Family

Bob Christensen, Production Agriculture

Since he co-founded Christensen Farms in 1974 with his brother and only a handful of hogs, the family business has grown exponentially. Today, it employs 1,200 people, contracts with more than 450 family farmers and produces enough pork each year to feed 14 million people.

The recipients were announced March 18 at the Minnesota State Capitol, as part of the celebration of National Ag Week and were honored at a ceremony in May.

The Siehl Prize was created by a generous gift from New Ulm-area livestock breeder and businessman Eldon Siehl, a dedicated philanthropist who had a lifelong interest in agricultural systems. Siehl was concerned that people were losing touch with their agrarian roots and wanted his gift to ensure that achievements in agriculture would be recognized and celebrated.

Two from CFANS named McKnight Land-Grant Professors

Assistant professors Sangwon Suh of the Department of Biosystems and Bioproducts Engineering and Jennifer Powers of the departments of Soil, Water and Climate and Plant Biology have been named 2009 McKnight Land-Grant Professors at the University of Minnesota. McKnight Land-Grant professorships are awarded by the Graduate School and are intended to advance the careers of promising junior faculty. Recipients hold the McKnight Land-Grant Professor title for two years and receive a research grant for each year, summer support and a research leave in the second year.



Sangwon Suh

Jennifer Powers

Spivak named McKnight Distinguished Professor

Marla Spivak, professor in the Department of Entomology, has been named one of the university's four Distinguished McKnight University Professors for 2009. The McKnight awards recognize and reward outstanding mid-career faculty who hold the title as long as they remain at the U of M. Spivak and the other recipients were recognized by the Board of Regents on May 8.

Distinguished teachers earn university honors



Albert "Bud" Markhart



Terry Roe

Two CFANS professors are winners of 2009 teaching awards from the University of Minnesota. Albert "Bud" Markhart, a professor in the Department of Horticultural Science is one of eight recipients of the Horace T. Morse-U of M Alumni Association award for excellence in undergraduate education. Terry Roe, a professor in the Department of Applied Economics, is one of eight recipients of the Distinguished Teaching Award for Graduate and Professional Education. Both were honored at a ceremony April 27 at the McNamara Alumni Center and will become part of the university's Academy of Distinguished Teachers.



Cold-hardy wine grapes to star in competition

This summer, winemakers who use cold-hardy grapes developed at the university's Horticultural Research Center can take part in a new professionally judged international wine competition. The first-of-its-kind competition is a partnership between the Minnesota Grape Growers Association, the State Fair and the University of Minnesota. Judges will do a blind tasting of the wines before the fair begins and award gold, silver and bronze medals; the winning wines will be displayed at the fair. The competition will be judged by internationally recognized wine experts.



Photo courtesy Gene Hayden

Norman Borlaug celebrates 95th birthday

Nobel Peace Prize Laureate and CFANS alumnus Norman Borlaug, center, celebrated his 95th birthday in March. Brian Steffenson, left, a professor of plant pathology, and Regents Professor of agronomy Ron Phillips, center, and his wife, Judy Phillips, joined the celebration.

Polasky named to American Academy of Arts and Sciences

Department of Applied Economics professor Stephen Polasky has been named a Fellow of the American Academy of Arts and Sciences, one of the nation's highest honors. The Fellows include scholars, scientists, jurists, writers, artists, civic, corporate and philanthropic leaders. This year's group also includes Nobel laureates and recipients of the Pulitzer and Pritzker prizes, MacArthur Fellowships, Academy, Grammy, and Tony awards, and the National Medal of Arts.



Photo by David Hansen

TELL US WHAT YOU THINK OF SOLUTIONS

We'd like to hear from readers about what they like and would like to change about the magazine. So here's your chance to give us compliments, constructive criticism, even story ideas.

We've set up an online survey for *Solutions* readers that you can access from the CFANS home page at www.cfans.umn.edu. Simply log on to the site, answer the few short questions and hit "send."

Of course, we always welcome phone calls, emails and letters about *Solutions* too. We'll use the information to guide planning for future issues. If you prefer a paper copy, call Holly at 612-624-0822 to request it. Thanks for your help, and for reading.

WWW.CFANS.UMN.EDU

Governor vetoes Bell Museum project

Minnesota Governor Tim Pawlenty used his line-item veto authority to trim the size of the state's 2009 bonding bill. The governor eliminated \$85 million worth of projects, including all higher education-related projects except for repair and maintenance funds. Included in the higher-education vetoes was the Bell Museum project.

Pawlenty's message to legislative leaders provided some advice: "While many of the vetoed projects are meritorious, they should be considered next year as part of the larger, regular bonding bill."

Bell Museum advocates were successful in building support within both the House and Senate for \$24 million in bonding support. The state funds would complement the more than \$10 million in private and federal support already collected for the project. More fundraising would be needed to complete the project. At the time of this writing, University officials are considering various next steps.

The building project would create a modern academic museum with updated classrooms, renovated dioramas, flexible touring exhibit space and the amenities students and visitors expect. The project includes outdoor classrooms designed to spark excitement for environmental science. The new facility would be built at the corner of Larpentour and Cleveland avenues on the University's campus in St. Paul.

Institute on the Environment names research fellows

Five CFANS faculty members have been named to the first group of research fellows at the University of Minnesota's Institute on the Environment. The fellows will receive flexible funding to engage in creative research and problem solving, to develop new models of teaching and training, and to build new networks and partnerships. In addition, they'll take part in leadership development activities, along with ongoing seminars, roundtables and other public engagement efforts. They are:

- Jason Hill, Research Associate, Applied Economics
- Stephen Polasky, Professor, Applied Economics; Ecology, Evolution and Behavior
- Jennifer Powers, Assistant Professor, Ecology, Evolution and Behavior; Soil, Water and Climate; Plant Biology
- Peter Reich, Regents Professor, Forest Ecology
- Timothy Smith, Associate Professor, Bioproducts and Biosystems Engineering and acting director, Center for Sustainable Enterprise Development.



Jason Hill



Peter Reich



Timothy Smith



America's Best Idea

August 8 – October 4, 2009

A Photographic Journey Through Our National Parks

The U.S. National Park System is quintessentially American—and a radical departure from Old World notions that kept large tracks of wild land off limits to common folk. This awe-inspiring exhibit features stunning color panoramic prints of America's national parks. The exhibit coincides with PBS' broadcast of "America's Best Idea" by filmmaker Ken Burns.

www.bellmuseum.org
museum information: 612-624-7083

BELL MUSEUM

OF NATURAL HISTORY

UNIVERSITY OF MINNESOTA

Illuminating the Future

Ag engineers helped bring electricity to rural Minnesota

They had never seen anything like it, these families who farmed the rolling land near the Mississippi River town of Red Wing.

Bundled up on the darkening Christmas Eve of 1923, they gazed expectantly at a lone pine tree on the W.A. Cady farm in the community of Burnside. Strung with electric lights, the pine awaited the flip of a switch to burst into radiance.

The families were among the first beneficiaries of the Red Wing Project, an experiment to test the feasibility and value of bringing electricity to rural America. University of Minnesota professor E.A. Stewart had worked tirelessly with Burnside families to make their new power line a reality. Soon feed grinders, water pumps, cream separators, grain threshers and other farm implements would run on electricity.

When the switch was thrown, the Christmas tree lit up as if to symbolize rural electrification's bright future—and the success of the Red Wing Project. The project was commemorated March 26 at a centennial celebration of CFANS' Department of Bioproducts and Biosystems Engineering (BBE).

Formed in 2006, BBE united the faculties of agricultural engineering and bio-based products (formerly forest products). It traces its ancestry back to the founding of the Division of Agricultural Engineering in 1909 and to the wood technology program of the 1920s.

The Red Wing project stands out as the first great example of service by the academic ancestors of BBE faculty.

"It led to a whole series of developments, one of the biggest of which was making life for people in rural areas more like life for people in urban areas," says BBE professor Vance Morey. "It led to more efficient and productive farms and reduced the drudgery of farm work, which was just as important because it gave people more time to do other things."

Power surge

In early 20th-century America, supplying the countryside with electricity was not a universally popular idea. Private utility companies tended to oppose it because they believed that having long power lines serving widely spaced farms would be unprofitable.

But the Red Wing project proved them wrong. It brought University agricultural engineering faculty and farmers together with other parties, including other faculty and Northern States Power Co. (NSP), in pursuit of the stated objective "to determine the optimum economic uses of electricity in agriculture and to study the value of electricity in improved living conditions on the farm."

Engineers had to figure out how to transfer all kinds of machines run by human or horse power to electric power. How were they to integrate motors into a feed grinder? Where to run the wiring in a barn?



Workers put up the first power poles near Red Wing, Minn., in 1923.

Historians often see the formation of the national Rural Electrification Administration in 1935 as the seminal event in the electrification of the American countryside. But the success of the Red Wing project in the previous decade provided the prime model for the REA's effort.

Although the Red Wing project's power line was experimental, "it arguably provided the greatest impetus to rural electrification of any event prior to the establishment of the REA in 1935," says Xcel Energy (formerly NSP) spokesman Patrick Cline.

"We are proud that some of the most important early developments related to rural electrification occurred at the University of Minnesota," adds BBE department head Shri Ramaswamy.

—Deane Morrison

The Face of new Renewable Energy



Ethanol, biodiesel, hydrogen, solar, wind—no matter which technology seems most promising on any given day, virtually all national energy policy experts agree that ending our reliance on petroleum products probably will depend on more than one renewable energy source.

So we decided to find out: who are all the people in CFANS working on renewable energy research, and what are they working on? We built a list of names and project descriptions using recent grant awards and faculty expertise, and asked all of them to show up for a group photo. Turn to page 18 to read about their work.



Photo by David Hansen

While it's not possible to list all of the projects and researchers, much less get them all in one place at the same time—believe us, we tried—it's still an impressive group. Some of the scientists described on this page are involved in one project; others are principal or co-principal investigators on multiple projects. On page 19, you'll see a list of key renewable energy researchers who couldn't be at the photo shoot.



- 1 ▶ **Ben Senauer** (APEC): Exploring how biofuel production affects global food prices and availability.
- 2 ▶ **Yi-ru Chen** ('93–'M.S.; '98–Ph.D., forestry) (BBE): Looking for new enzymes that would hasten the conversion of plant materials to liquid fuels.
- 3 ▶ **Nancy Ehlike** (APG): Developing genetic, breeding and management strategies for grasses and other potential sustainable fuel sources in order to maximize the profitability and sustainability of grass and legume seed production in northern Minnesota. Head of the agronomy and plant genetics department.
- 4 ▶ **Tim Smith** (BBE): Evaluating organizational adoption of energy efficiency, renewable energy and other environmental performance enhancing technologies, as well as the effectiveness of marketing communications around "green" messaging and life cycle assessment (LCA) information.
- 5 ▶ **Frank Summerfield** (BBE): Studying how fungal enzymes degrade plant materials to simple energy-rich chemicals.
- 6 ▶ **Roger Ruan** (BBE): Works on several projects, including: Making biodiesel from algae; extracting the oil from high-oil corn; developing commercially transferable biomass conversion technologies; life-cycle and total-cost assessment of cellulosic ethanol production; and developing sustainable renewable energy systems for practical use of bulky biomass.
- 7 ▶ **Sangwon Suh** (BBE): Assessing the environmental and economic impacts of ethanol production systems; developing sustainable pathways to achieving policy goals on biofuels.
- 8 ▶ **Craig Sheaffer** (APG): Assessing the environmental and economic impacts of herbaceous and woody plants for their potential yields of biomass, fiber and fermentable sugars.
- 9 ▶ **Ron Phillips** ('66–Ph.D., agronomy) (APG): Exploring the genetics of high-oil corn from North Korea and how it could be duplicated and used as a starch for ethanol and an oil for biodiesel.
- 10 ▶ **Mike Sadowsky** (SWC): Constructing a series of metagenomic libraries that can be used to identify novel biocatalysts for alternative energy and other needs.
- 11 ▶ **Doug Tiffany** ('74–B.S.; '77–M.S., applied economics) (APEC and Extension): Developing commercially transferable biomass conversion and refining technologies; evaluating systems for collecting, densifying and delivering herbaceous biomass material to users; and developing a clear methodology for the full-cost accounting of energy use, including environmental costs and direct costs of energy use.
- 12 ▶ **Jeff Apland** (APEC): Evaluating the economic and environmental impacts of biofuels in Minnesota.
- 13 ▶ **Bill Lazarus** (APEC): Measuring the health and environmental benefits of bioenergy crop production; and examining the economics of anaerobic digester systems that produce hydrogen fuel.
- 14 ▶ **Shri Ramaswamy** (BBE): Assessing the energetic, kinetic and thermodynamic constraints, technical and commercial barriers; and environmental impacts of producing liquid fuel from lignocellulosic biomass. Head of the Bioproducts and Biosystems Engineering department.
- 15 ▶ **Simo Sarkanen** (BBE): Searching for new biochemical approaches to lowering cellulosic ethanol production costs.
- 16 ▶ **Jerry Shurson** ('81–B.S., animal science) (ANSCI): Analyzing how dried distiller grains, a byproduct of ethanol production that's used in livestock feed, affect animal nutrition and well-being.
- 17 ▶ **Jin-Young Moon** (APEC): Modeling land use and cropping changes with alternative forms of feedstocks for biofuels.
- 18 ▶ **Paul Porter** (APG): Developing on-farm sustainable fuel sources, such as canola and other oils.
- 19 ▶ **Ulrike Tschirner** (BBE) : Assessing the barriers and impacts of producing liquid fuel from lignocellulosic biomass; assessing environmental and economic effects of using herbaceous and woody plants in biofuels; and studying a novel cellulose enzyme system in brown-rot fungi.
- 20 ▶ **Dennis Becker** (FR): Measuring how removing biomass from forests may affect hazardous fuel in areas of the U.S. affected by wildfires; and determining availability of forest biomass for use in bioenergy and fuels applications in Minnesota.
- 21 ▶ **Hans-Joachim Jung** (USDA-ARS): Assessing the environmental and economic impacts of herbaceous and woody plants for their potential yields of biomass, fiber and fermentable sugars.



Department abbreviations:

Agronomy and Plant Genetics (APG); Animal Science (ANSCI); Applied Economics (APEC); Bioproducts and Biosystems Engineering (BBE); CFANS administration (CFANS); Forest Resources (FR); Horticultural Science (HORT); Soil, Water and Climate (SWC); Southern Research and Outreach Center (SROC); and West Central Research and Outreach Center (WCROC).

22 ▶ Grant Domke (FR): Assessing sustainable forest-based biomass energy resources in northern Minnesota, including the assessment of carbon flows associated with forest biomass use.

23 ▶ Jonathan Schilling (BBE): Studying a novel cellulose enzyme system in brown rot fungi.

24 ▶ Mike Reese (WCROC): Testing the prototype of a system that converts wind power to fertilizer; collaborating with a public/private team to assess and evaluate the use of corn cobs in biomass gasification systems; and providing biomass fuel stock suppliers with accurate guidelines for management of biomass harvesting and maintenance of soil quality.

Not pictured:

Marv Bauer (FR): Quantifying the full carbon budget of a suburban landscape by simultaneously measuring changes in carbon dioxide and carbon monoxide using satellite-based maps of the landscape and GIS databases of traffic counts and natural gas usage.

Paul Bolstad (FR): Inventorying forest biomass in the Great Lakes region and central Norway using airborne remote-sensing systems.

Paul Chen (BBE): Investigating the feasibility of using a variety of techniques to convert swine manure into biofuels and biohydrogen; using nonthermal plasma technology to develop and demonstrate the scalable and efficient synthesis of ammonia from renewable hydrogen; and developing sustainable systems for practical use of bulky biomass.

Greg Cuomo (CFANS): Testing the prototype of a system that converts wind power to fertilizer.

Dean Current (FR): Preparing guidelines for sustainably harvesting forest residues and estimating costs of moving biomass for processing; determining the availability of forest biomass for use in bioenergy; developing an efficient system for producing and delivering biomass feedstock; and evaluating nitrogen-fixing *Alnus* and *Salix* germplasm for biofuel use.

Anthony D'Amato (FR): Determining the availability of forest biomass for use in bioenergy and fuels applications in Minnesota.

Vern Eidman (APEC): Preparing a thorough assessment of the barriers to and impacts of producing liquid fuel from lignocellulosic biomass; determining a clear methodology for the full-cost accounting of energy use; and economic and environmental implications of coal/biomass fired ethanol plants.

Lee Frelich (FR): Preparing guidelines for the sustainable harvest of forest residues and creating a model for estimating cost and energy expenditures for moving biomass for processing.

Jason Hill (APEC): Assessing the effects of the expanding global biofuels industry on climate change, land use, biodiversity and human health.

Stan Hokanson (HORT): Evaluating nitrogen-fixing *Alnus* and *Salix* germplasm for potential biofuel use.

Gregg Johnson (SROC): Assessing the environmental and economic impacts of herbaceous and woody plants for their potential yields of biomass, fiber and fermentable sugars; and evaluating production of bioenergy and bioproducts from alfalfa and willow.

Vance Morey (BBE): Evaluating systems for collecting, processing, densifying and delivering herbaceous biomass material to users; and evaluating and addressing economic and technical issues related to electricity generation at ethanol-producing plants.

Jim Orf (APG): Using genomics to increase the oil yield in soybeans for biodiesel.

Steve Polasky (APEC): Preparing a thorough assessment of barriers to and environmental impacts of producing liquid fuel from lignocellulosic biomass; full-cost accounting of energy use; and conducting interdisciplinary research, education and outreach activities related to terrestrial carbon sequestration.

Ford Runge (APEC): Evaluating the economic and environmental effects of renewable energy policy.

Steve Taff (APEC): Investigating the policy and economic implications of implementing a low carbon fuel standard in Minnesota and selecting and calibrating an appropriate life cycle assessment model; and finding sustainable pathways to achieving policy goals on biofuels.

Joel Tallaksen (WCROC): Collaborating with a diverse public/private team in assessing and evaluating the utilization of corn cobs in biomass gasification systems.

Don Wyse (APG): Assessing environmental impacts, conducting economic analyses and characterizing a diverse set of herbaceous and woody plants for their potential yields of biomass, fiber and fermentable sugars at two locations in Minnesota.

Jun Zhu (SROC): Investigating the impact of mixing grain straws and corn stover with liquid swine manure for producing methane in an anaerobic digestion process; investigating the feasibility of converting swine manure into biofuels and biohydrogen; and transforming biogas produced from anaerobic digestion of dairy manure to clean hydrogen fuel for use in rural communities.

A view of Whaler's Bay from a glacier atop Mount Pond.
Photo by Benjamin Held



Graduate students search for new fungi in Antarctica

By Sara Specht

The P/V Laurence M. Gould in Whaler's Bay at Deception Island, watching a group of fur seals nap.



Why did the plant pathologists go to Antarctica? Because that's where the fungi are. CFANS graduate students Benjamin Held ('98–B.S., forestry) and Brett Arenz ('05–M.S., plant pathology) might seem like unusual passengers aboard the research ship, the P/V Laurence M. Gould, as it sailed for the frozen reaches of Antarctica, but their presence makes sense given our warming world.

This was a return trip for both Held and Arenz, members of a team researching fungi in Antarctica led by Robert Blanchette, Department of Plant Pathology professor. Blanchette's specialty is forest pathology and wood deterioration, which was what brought him here to begin with. Ten years ago representatives from the Antarctic Heritage Trust in New Zealand approached Blanchette for help identifying the cause of deterioration in several historic wood huts on the Antarctic continent.

Constructed by British explorers Ernest Shackleton and Robert Scott at the turn of the last century during the "heroic age" of polar exploration, these and other outposts had

been remarkably well preserved in the dry, freezing climate. But over time deterioration had taken its toll, and Blanchette's research group discovered the source. In a place that hasn't seen trees in millennia, the culprits were wood-degrading fungi.

In the time since, Blanchette's goal has broadened from preservation to include research into Antarctic ecosystems: what roles do fungi play, and how do they survive in such an extreme environment? The team has made yearly treks to the continent, cataloging samples of unique fungal growth, many of which had never been identified. Arenz and Held made this year's voyage with continuing grants from the National Science Foundation (NSF) to islands off the Antarctic Peninsula near South America.

Season's end

Five months of summer come to the Antarctic Peninsula each year between November and March, bringing longer days and temperatures as high as 45 degrees F in February. Hoping the weather would hold out to ease their work with substrates buried



Photo by Brett Arenz

Right: Benjamin Held
Below: Brett Arenz



Photo by Benjamin Held

in the soil, Arenz and Held departed March 21 from Punta Arenas, Chile, aboard the NSF's last scientific voyage of the summer season. The ship took them through the Strait of Magellan and across the Drake Passage to the islands off the peninsula—a three-day journey.

"When you're crossing through the Drake to get to the Peninsula, it's the stormiest area in the world, so you can get some significant wave action going on," Arenz said just before the trip. "It's always something to look forward to. Or not, depending on how you feel about it."

Stormy seas met them at the passage, forcing the ship to take shelter on the east side of Tierra Del Fuego and costing them a day of travel. Sailing again on rough waters, the Gould made an uncomfortable trip down to the shelter of the Shetland Islands to its first stop at Deception Island. Harsh weather followed them into Whaler's Bay, normally a calm haven at the heart of the island. Winds of 60-70 knots (70-80 mph) kept Held and Arenz aboard the ship for another day. The sun set earlier each day—dark fell around

6 p.m., and they were losing seven minutes a day—shortening their window for shore excursions. Things were getting stressful.

"One thing you have to learn when you go down is that you're at the mercy of the weather," Held says. "Things go wrong, and NSF plans the events with time built in for it. We were getting kind of worried, but at the end of the trip we got an extra day at Deception Island. It all worked out great in the end."

Extreme Living

When calmer waters finally allowed them to catch a boat ride to the bay's black sand beaches, Arenz and Held hiked up Mount Pond in search of a truly unique living environment. The bay they'd just left, part of the larger port that forms the center of the island, sits in a sunken caldera—a crater formed by a violent eruption of the volcano that forms Deception. Over half the island is covered by glaciers, and the rest of the

landscape has been created by frequent eruptions from the still-active volcano.

Midway through their climb, snow flurries and a light fog limited visibility. Passing by sheets of ice and fields of snow, they found what they were looking for: a carpet of green. Deception Island hosts many extreme

Surrounded by snow, this geothermal site on Mount Pond produces blankets of moss and hosts a diverse mix of microorganisms.



Photo by Benjamin Held

microclimates created by vents of volcanic heat. Near the vents the ground is baked by temperatures up to 195 degrees F, but the cooler surrounding areas exhibit some of the greatest plant diversity and abundance that has been discovered in the Antarctic.

“This was the most exciting point,” Arenz says. “We’re looking at the map trying to find the place, and it’s hard to imagine because everything is so frozen. Then right at the top was steam and green carpets of moss. It’s not what you think when you imagine Antarctica.”

Samples and soil readings taken from two geothermic sites will help the research team better understand how fungi survive in this varying, extreme climate. They know that microorganisms are fundamental to Antarctic ecosystems, Arenz says. In fact, they are some of the only organisms to be found on the continent apart from seal and penguin colonies concentrated around the coasts. But scientists know little about the biology or mechanisms they have developed to survive in a polar environment.

Eating history

Back at the bay, Held and Arenz found treasure. Previous visits to the island hadn’t allowed enough time for thorough exploration of the wooden structures still standing here. This time they found fungi devouring wood in a pattern they hadn’t seen before. Excitement filled the air, Held says. They were anxious to get back to the lab to find out what new answers this discovery might give them.

Whaler’s Bay holds several generations of wooden structures, dating back to the first whaler’s station a century ago. After it was abandoned in the ’30s, several nations



Photo by Brett Arenz



Held collects samples from the remains of wooden buildings on the black sand beach of Whaler’s Bay.

vied for control and built bases across the island. Eruptions in 1967 and 1969 demolished much of the construction, and subsequent volcanic activity has kept the beach unoccupied. A few buildings remain, though, in various stages of disrepair, and all of it playing host to wood-degrading fungi.

If they find enough new pieces of the puzzle in the wood remains of buildings past while studying the biology and ecology of these organisms, Blanchette’s team hopes to formulate a plan to save historic sites across the continent, like the huts that drew his attention in the beginning.

“We’re really trying to understand where they came from, and how they survive here when nothing else can,” Held says. “It’s so rewarding to look at these fungi, to solve a problem of historical significance and to have some real-life impacts.”

Trapping Biodiversity

Palmer Station, a smooth night’s sail from Deception Island, became Arenz and Held’s base of operations for a week of the trip while the Gould ferried other researchers to complete their own projects. Taking boat rides to islands surrounding the station, the graduate students picked up the pieces of Antarctic adventures past.

On previous trips they and their team members buried sterilized pieces of wood at five different locations, to serve as bait for any hungry fungi that might be in the area. Retrieved after intervals of two and four years, the samples they collected should give the researchers a good picture of local fungal biodiversity. With the weather on their side, they managed to get to all their study sites, even when a couple territorial fur seals tried to chase them off.

Arenz plans to use the soil samples he collected to help fill in the next few chapters of his Ph.D. thesis cataloging Antarctic fungal biodiversity. The next step will be to analyze all his soil samples to try to discover what characteristics help fungi survive from one short polar summer to the next.

With more than 250 samples between them on the voyage home, many of which they said are new to them, Held and Arenz couldn’t see running out of work before the next expedition. “It’s just an incredible opportunity to see a part of the world that so few people get to see,” Arenz says. “I’ve always been interested in things at the fringes of knowledge. These fungi are definitely operating at the fringes of what we consider to be livable environments.” ■

Palmer Station houses scientists and staff year-round, and serves as a base for research trips to the surrounding islands.



Photo by Benjamin Held

Photo courtesy Wikipedia Commons



Deception Island and the port at its center are formed by a volcanic caldera, and steam vents around the island form unique geothermal environments.



Ross Island
Scott & Shackleton Huts

The Political Environment

Swackhamer leads the way to future environmental policy

Change is in the air—and in the water, the land, the planet. In the country's evolving political administration, Water Resources Center co-director Deborah Swackhamer has a new voice in how we'll react to all those changes.

Swackhamer's two-year appointment as chair of the Science Advisory Board for the Environmental Protection Agency (EPA) sprang from her unique background straddling environmental and human health. In her role at the School of Public Health she is considered an expert on the effects of exposure to toxic chemicals on human health, and in water resources she studies the impact and movement of chemicals in the environment. As chair, Swackhamer will lead more than 30 experts in diverse scientific fields related to the environment to review and recommend science decisions for the EPA.

"It's a very exciting time to be a part of the Science Advisory Board because the new administration has been so clear that they want to restore the integrity of science in decision-making," Swackhamer says. "That's been woefully lacking, and it's been very heartening to see that change already."

Among her first actions as chair, Swackhamer is putting together two sets of recommendations for the EPA. The first is a projection of big problems the Science Advisory Board sees in the country's future: or opportunities for the EPA to get ahead of, rather than reacting to, policy issues. The second project is a series of recommendations for how the

administration might better incorporate science in decision-making.

A unifying message between the two, Swackhamer says, is that the EPA is uniquely poised to lead the way in integrating science across specialization, from chemistry to behavioral science, and quantifying the impacts of policy decisions. For instance, a major issue on the first list is climate change. Different agencies are researching a variety of aspects of the topic, producing options for addressing or adapting to the climatic shift.

From the Science Advisory Board's perspective, the EPA should then be the point where that science is applied to understand what the impacts of those options will be on species, on human health, on human disease. Only then can the agency make informed policy decisions.

"Environmental problems are all multimedia," Swackhamer says. "They're complicated problems with impacts on human and environmental health, that can't be dealt with in a stovepipe way. That is the bread and butter of what the EPA is regulating, and it should be the leader on that research."

Beginning this fall, Swackhamer will bring her interest in the interface of policy and science to the university's Hubert H. Humphrey Institute of Public Affairs. She'll hold the Charles M. Denny, Jr. Chair for Science, Technology, and Public Policy, teaching a graduate water policy course while continuing her work with the water resources program.

—Sara Specht



Alumni Update

A message from CFANS Alumni Relations director Mary Buschette



Photo by Tom Foley

I arrived on the St. Paul campus in the fall of 1982, the first year the Gophers

played at the Metrodome, and never experienced a game in Memorial Stadium. After 27 years, football is returning to campus. It has been an interesting journey. Here are a few things you might not know,

- The TCF Bank Stadium is on track to become one of only three LEED certified—the new gold standard for the design, construction, and operation of green buildings—stadiums in the country.
- The structural frame of the building is made of 90 percent recycled steel.
- As many materials as possible are being purchased from manufacturers within a 500-mile radius.
- The 50,300-seat, horseshoe style stadium is currently sold out until season ticket holders renew.

An exciting aspect of Homecoming 2009 is the launching of new traditions. This year Homecoming will kick off on Sunday, October 4, and “Homecoming Week” will focus on the academic mission of the university. There will be opportunities for everyone to reconnect with the U of M during Homecoming Week.

The Ultimate Open House—Tour the stadium and participate in interactive experiences provided by participating academic and outreach units.

Research Expo—Students will share their research via a University-wide poster exhibition for the public.

University of Minnesota Alumni Association Awards Celebration—The UMAA will recognize exceptional volunteers, including Alumni Service Award recipients.

Global Maroon and Gold Day—Alumni and friends across the country and around the world are invited to wear Maroon and Gold to support the Golden Gophers and be a part of the event.

Homecoming Parade—Will include academic units, colleges and alumni organizations. A pep fest, royalty coronation and fireworks display will follow the parade.

I hope that you will make plans to return to campus and help celebrate the academic and research achievements of the U of M. And for those too far away, don your Maroon and Gold on Oct. 9 to show your Gopher spirit and pride and be a part of the ultimate homecoming experience in 2009.




HOMECOMING 2009

THE ULTIMATE HOMECOMING

Event Schedule

October 4-11

Friday, Oct. 2
Homecoming Art Exhibition: Through the Years

Sunday, Oct. 4
The Ultimate Open House

Tuesday, Oct. 6
Great Conversations

Thursday, Oct. 8
Alumni Association Awards Banquet

Friday, Oct. 9
Maroon & Gold Day
Homecoming Parade

Saturday, Oct. 10
Homecoming Football Game vs. Purdue

Student Unions
& Activities

For a full list of events visit
www.homecoming.umn.edu

UNIVERSITY OF MINNESOTA
Driven to Discover™

BY THE NUMBERS 4 years of CFANS grads

14.9

Average number of college credits already earned by new freshmen, Fall 2008

86.8

PERCENTAGE OF NEW FRESHMEN APPLICANTS OFFERED ADMISSION, 2004

385

Number of bachelor's degrees awarded, 2008

49.7

PERCENTAGE OF CFANS DOCTORAL STUDENTS WHO ARE FEMALE, 2008

58.8

percentage of new freshmen applicants offered admission, 2008

204

NUMBER OF BACHELOR'S DEGREES AWARDED, 2004

25.2 AVERAGE ACT SCORE OF NEW FRESHMEN, 2008

61.2

PERCENTAGE OF NEW FRESHMEN WHO STARTED COLLEGE WITH SOME CREDITS ALREADY EARNED

81.6

Percentage of CFANS seniors who said they would "probably" or "definitely" choose to attend CFANS again

Source: University of Minnesota Office of Institutional Research

SUMMER EXHIBITION OPENS JUNE 6



WATEROSITY
go green with a splash

What's bubbling up?
Fresh thinking about people, plants and water.

Intriguing Art in the Garden

Interact with 10 outdoor art exhibits including dancing frogs, a jumbo crawl-thru water bottle and the Iris Pond Monster.

Harvest Your Rain

Check out the new picnic shelter green roof in the works, rain gardens and rain barrels; and how to handle rain water at home.

Cutting Edge on Lawns

See lawn grasses of the future; discover water-wise gardening practices for your backyard

www.arboretum.umn.edu/waterosity.aspx

PREMIERE

Galleria

Minnehaha Creek Watershed District

IBD IRRIGATION BY DESIGN
Award-Winning Excellence, Nationally Renowned

Water in Motion

UNIVERSITY OF MINNESOTA
EXTENSION



Minnesota Landscape
ARBORETUM

UNIVERSITY OF MINNESOTA

3675 Arboretum Drive
Chaska, MN 55318 • 952-443-1400
www.arboretum.umn.edu

Located 9 miles west of I-494 on State Highway 5 in Chanbassen.
The Minnesota Landscape Arboretum is part of the College of Food, Agricultural and Natural Resource Sciences at the University of Minnesota.

SAVE THE DATE

July 11-12
go green with a splash party weekend



Wednesday
June 17, 6-9 p.m.
\$175 Individual and Patron Sponsors from \$250 - \$5,000



Wednesday
June 24, 7-9 p.m.
\$60 members/\$80 non-members.
Pre-party reception begins at 6 p.m. \$100 members / \$135 non-members

building BRIDGES

Partners Advancing Shared Goals



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA



CFANS hosted the 34th annual conference for the
National Agricultural Alumni and Development Association (NAADA)
June 14-17, 2009.

NAADA brings together professionals and volunteers in
the advancement areas of student affairs, alumni, development
and communications and provides education, support and recognition for
individuals dedicated to expanding resources for land-grant colleges
of agricultural sciences and related programs.

CONGRATULATIONS TO OUR CFANS COMMUNITY MEMBERS WHO WON NATIONAL AWARDS:

Dr. William and Hella Mears Hueg,
Ruby C. McSwain NAADA Outstanding Philanthropist Award

Linda Norcross,
NAADA Front Line Award

Dan Kennedy,
NAADA Volunteer Service Award

Wolves and Wild Lands in the 21st Century

Through August 23, 2009

Living with wolves and other big predators has become increasingly difficult as wild lands disappear and habitat for wildlife becomes more fragmented. Developed by the International Wolf Center, this exhibit takes up the topic of disappearing wild lands and fragmented habitat, and addresses the question: What can people do to make living with wolves easier?

Exhibit Walkabout with Dave Mech

Wednesday, July 22, Noon to 1 p.m. • Free with museum admission

Join internationally recognized wolf researcher David Mech for a personal, close-up tour as he shares stories and insights about one of Minnesota's most fascinating animals.

BELL MUSEUM
OF NATURAL HISTORY

UNIVERSITY OF MINNESOTA

www.bellmuseum.org

museum information: 612-624-7083 / program registration: 612-624-9050



CFANS Alumni Awards

Alumni Society honors seven outstanding individuals

Seven people were selected as 2008–09 CFANS Alumni Society Award recipients for their outstanding contributions to the college and the Alumni Society. They were honored April 9 at the college's Borealis Night of Excellence, an event held jointly with the CFANS Student Board. This year's recipients include:

Distinguished Alumni Award: Catherine McCarty

Catherine McCarty ('86–B.S., nutrition; '90–M.P.H., public health nutrition) earned her bachelor's and master's degree at the U of M and is currently principal investigator for the Personalized Medicine Research Project at Marshfield Clinic, the largest population-based biobank in the United States. She often works with groups from around the world who want to set up biobanks for genetics research. Her volunteer work includes being a CFANS mentor, making the effort to drive three hours from central Wisconsin to meet with students.

Alumni Service Award: Don Kvasnicka

Don Kvasnicka ('55–B.S., agricultural education) was the founder and chair of the Mankato Area Golf Tournament, which raised scholarship funds for CFANS students from south central Minnesota. He and his wife Joanne dedicated countless hours to the event. He's also been an active member of the South Central Alumni Chapter of the U of M Alumni Association.

Outstanding Friend Award: William Nelson, CHS Inc.

As a faculty member at the University of Minnesota–Waseca and now as a leader in the agricultural business sector, William Nelson ('73–B.A., philosophy and sociology) guided and built partnerships that serve CFANS, particularly with cooperatives. As president of the CHS Foundation, he has been actively involved in restructuring the Agricultural Education program.

Distinguished Faculty Award: Tony Seykora

Tony Seykora is well known for his teaching excellence as well as his advising of students in dairy and animal science programs. Outside the classroom, he sponsors, volunteers and organizes numerous dairy industry and youth leadership activities.

Student Leadership Award: Pam Dickman and Joe LeVoir

Pam Dickman, a senior nutrition major, is president of the Student Organization of Nutrition and Dietetics as well as other student/alumni professional development and networking activities. Joe LeVoir is a senior in Environmental Horticulture with an emphasis in turf management who is president of the Turf Club. He's volunteered and helped organize professional events for students and alumni in his field.

Lifetime Achievement Award: Lee Sandager

Lee Sandager ('49–B.S., '52–M.S., agricultural education) has been a teacher, a mentor and an advocate for the education of young people about agriculture for his entire adult life. He has worked nationally and internationally training teachers and advancing agriculture production and policy and spent 30 years teaching ag education at Forest Lake High School. Since his retirement in 1990, Sandager has worked on volunteer projects with Volunteer Oversees Cooperative Agriculture/USAID.



From Top: McCarty and CFANS Alumni Society President Keith Wolf; Kvasnicka and Wolf; Nelson and Wolf; Mike White, Seykora and Les Hansen; LeVoir, CFANS Alumni Relations Director Mary Buschette and Dickman; Sandager and Wolf.

CFANS Alumni Society BOARD OF DIRECTORS

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Leah Peterson, Seattle University School of Law ('03)

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www.cfans.umn.edu/2009directors

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Mentor program runs from
November to April 2010

Foster

the development of
future professionals
in your field

Share

your insights and
make a difference
in the life of a student

Network

with professionals
in your field and
other industries

Contribute

to higher education
in a meaningful way

Build

positive morale
by helping others
grow and learn



*"I'm always learning.
This program is a great way to stay connected to the fresh
ideas and perspectives of the students while helping them
to develop both personally and professionally."*

—Kristen, CFANS Mentor

To learn more, visit
www.cfans.umn.edu/mentorprogram



College of Food, Agricultural
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UNIVERSITY OF MINNESOTA

SAVE THE DATE!

June 26, 2009
St. Paul Campus Reunion
Minnesota Landscape
Arboretum, Chaska

July 10, 2009
Golf Scramble for Scholarships
Les Bolstad Golf Course, U of M

July 20-25, 2009
Cloquet Forestry Center
centennial celebration
Cloquet, Minn.

July 24: All Class Reunion

July 25: CFANS Alumni &
Friends Day

August 23, 2009
Maroon and Gold Day
Minnesota State Fair

October 10, 2009
Homecoming 2009—the first in
the new TCF Stadium on the U
of M campus

Can You Identify this Photo?



Please tell us who these people are and what they're doing. Everyone who sends in the correct answer will be entered in a drawing for a CFANS coffee mug. Send your answers to bbeyers@umn.edu.

Last issue's answer



Lots of readers knew that the instructor in this photo was Paul Marvin, an agricultural education professor, and that he was teaching the students how to splice a rope. But only a couple of those who wrote in were able to identify the students, who are Paul Day and Ernie Knutson. Alums Dave Resch '73 and Joe Nuebauer '77 correctly identified all three, so they each win a CFANS coffee mug.

Why Scholarships Matter

A donor's story of how scholarships make a difference



The 2008-09 recipients of scholarships sponsored by Charles Lofgren posed with him at last fall's Thanksgiving for Scholarships dinner. From left: Thomas Evans, Molly Feiro, Allen Brandt, Lofgren, Samantha Iazzo and Sonja Davidson.

Editor's note: Charles Lofgren ('51–B.S.; '57–M.S., agriculture), a longtime supporter of the college, spent his career with Pfizer, in a variety of countries and roles. Lofgren was the keynote speaker at last fall's "Thanksgiving for Scholarships" event, where students and scholarship donors get a chance to meet in person. This is an edited transcript of his remarks. To see video of all the speakers, go to www.cfans.umn.edu/Thanksgiving_for_Scholarships.html.

I was raised on a dairy farm near Moose Lake, Minnesota. As a boy, you could find me with my ear glued to the radio listening to my favorite football team, the Golden Gophers, and I had dreams of attending the U of M, specifically the college of agriculture.

My dream did come true, and I still remember that day in September when I boarded a Greyhound bus for what we called "the Cities." At the bus depot in downtown Minneapolis, I ran into a fellow named Larry. He also came from a dairy farm in northeastern Minnesota and we became good friends. Larry was an honor student, and he told me that his older brother and sister were enrolled in a community college near their home.

He thought that was where he was going too, except that he got a scholarship that paid his tuition at the university.

He was majoring in agronomy and wanted to get into agribusiness. I had similar aspirations and one day during fall quarter, to my surprise and delight, I got a letter from the dean saying that I had been granted a scholarship that was going to pay pretty much all of my tuition for that year.

We went home for the summer and in August, I got a letter from Larry saying his scholarship was not renewed and his applications for other scholarships were to no avail.

He said, "I won't be back in the fall, but maybe I'll be back for winter or spring quarter." Nope, that didn't happen. And I thought, what a pity, what a shame, what a waste, here this young brilliant student who is highly motivated and well focused—I was thinking of all of the contributions he could have made. At that moment, I said, "someday, when I have the opportunity, I am going to contribute to a scholarship fund or maybe even have a scholarship program of my own." It took me 40 years, but in 1993, I established the Charles

Lofgren Scholarship and in these 15 years, I am very pleased to say, over two dozen students have benefited from my scholarships.

Every time I have a chance, I sit down with my students, such as the five at the dinner table tonight, and discuss what they are doing and what their aspirations are. I get emails, phone calls, letters from former students, asking me for advice, and thankfully, giving me some advice too. That's good.

A few years ago, I was at a reunion in New York and I told a friend who graduated from Texas A&M about my scholarship fund. He said, "that really is a big annual expense on your part." I said, "no, that's not an expense. It's an investment, an investment in the lives and the futures of deserving students."

Two weeks later I got a call from him. He said when he got home, he had written a check to the Aggie Assurance program, a program at Texas A&M for deserving students. He's still contributing.

So it's with great satisfaction that I have been granting these scholarships, and now I would like to address all of those here who sponsor scholarships or represent organizations that grant scholarships. We're in a pretty tough economy right now, but let's keep up with our scholarships and even, if possible, increase it, because every one of the students here is worth every penny.

I would urge you—but don't wait 40 years like me—to get involved in the scholarships, because it will make you proud. You are contributing to the well-being and the future of deserving students. —Charles Lofgren



Scientists and homeowners in Minnesota have long feared the arrival of the emerald ash borer, a destructive insect that destroys ash trees. In May, their fears came true when the insect was found in St. Paul ash trees.

The EAB, formally known as *Agrilus planipennis*, lives only in ash trees. It's a native of Asia with its natural range including China, Japan, Mongolia, Korea, the Russian Far East and Taiwan. It arrived in North America in 2002. Since then, it has killed tens of millions of ash trees. Minnesota is especially vulnerable because the state has about 870 million ash trees, one of the largest concentrations of ash of any state in the country. Research has not found any resistance in the state's native ash.

Department of Entomology professor Jeff Hahn advises homeowners how to spot the EAB: It's a slender, elongated insect about 1/3–1/2 inch long. It is widest just behind the head, gradually tapering back to the abdomen. It is a bright iridescent green to copper-green color, often with a copper colored area behind the head. Its body underneath the wings is a purplish-magenta color.



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CFANS 2009 CALENDAR OF SUMMER EVENTS

These are some of the many events supported by the College of Food, Agricultural and Natural Resource Sciences. All are open to the public; some may require a registration or fee to attend. Visit www.cfans.umn.edu/Events2.html or contact Honey VanderVenter at 612-625-6710 or hvander@umn.edu for more information.

June 25

St. Paul Campus Reunion
Minnesota Landscape Arboretum, Chaska

July 10

Golf Scramble for Scholarships
Les Bolstad Golf Course, University of Minnesota

July 20-25

Cloquet Forestry Center Centennial Celebration
Cloquet, Minn.

July 30

Horticulture Night
West Central Research and Outreach Center, Morris, Minn.

August 4-6

Farmfest, Redwood Falls, Minn.

August 4-6

University on the Prairie
Southwest Research and Outreach Center, Lamberton, Minn.

August 20

Open House, UMore Park, Rosemount, Minn.

Aug. 27-Sept. 7

Minnesota State Fair

Sept. 2-7

Welcome Week for new CFANS freshmen

Sept. 8

Fall semester classes begin

Sept. 20

Open House, Southern Research and Outreach Center,
Waseca, Minn.