

SOLUTIONS

FALL 2011

Talking Turkey

Research on how turkeys breed and feed helps industry thrive

Bad Boys

How the common carp became such a pest, and lessons for other invasive species

The Big Picture

Researchers partner with farmers and industry to build a biomass energy system that works

Thirsting for Sustainability

Scientists use balanced approach to mixing agriculture and water



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA



Photo by Mike Lee

Golfers—and Goldy—take off for a day on the links at the 2011 Golf Scramble for Scholarships in July.

Solutions magazine is published twice 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), nine 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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Photo by Patrick O'Leary

From the Dean

New academic year means new opportunities

This is always an exciting time of year on campus: Students are coming back (or arriving for the first time), classes are starting and the pace of campus events quickens. The 2011–12 academic year feels like even more of a fresh start, with Eric Kaler beginning his tenure as the University of Minnesota's 16th president.

We're also excited about the changes coming in our undergraduate majors: last spring, the faculty approved new policies that will give our students more opportunities for experiential learning and for interdisciplinary work while allowing increased flexibility in elective credits. The goal is to continue providing a rigorous scientific background while better training students to thrive in the modern workplace. This fall, we'll be working on how best to implement those policies.

And of course, we have groundbreaking research to showcase, as you'll see in this edition of *Solutions*. You'll read about the partnership between our scientists and Koda Energy to develop new ways of growing biomass; about how carp management techniques may translate to other kinds of non-native species control; about the intersection of water and agriculture; and about the important partnership between our animal scientists and Minnesota's poultry industry. Along with profiles of faculty and alumni, this edition reflects the broad range of interesting people and work taking place in CFANS every day.

I hope you enjoy reading. As always, I'm eager to hear your thoughts.

A handwritten signature in black ink that reads "Allen S. Levine".

Allen S. Levine ('73–M.S., botany; '77–Ph.D., nutrition), Dean

Calendar of upcoming CFANS events featured on back cover

On the cover: Turkeys' reproductive cycles are affected by different parts of the light spectrum. Photo by David Hansen



BAD BOYS

HOW THE COMMON CARP BECAME SUCH A PEST,
AND LESSONS FOR OTHER INVASIVE SPECIES

BY BECKY BEYERS



Carp are the original bad boys of Minnesota's waterways.

Although the common carp is Minnesota's first and arguably most damaging invasive species, it has attracted little attention from researchers who until recently viewed it (like many invasives) as a lost cause. The common carp dominates fish communities in shallow lakes, wetlands and rivers across most of the upper Midwest as well as vast regions of Australia, Argentina and South Africa. It may be world's worst invasive and damaging fish.

Through its habit of rooting in the bottom for food, this species literally turns aquatic food webs upside down, turning water in many lakes (including thousands of lakes in Minnesota) pea green to brown and removing beneficial vegetation. Because carp have been with us for more than 100 years, many people do not even know what their lakes should look like. Peter Sorensen, professor in the Department of Fisheries, Wildlife and Conservation Biology, is one of the world's top carp experts and along with his research team is finding solutions

to controlling this species that may provide lessons for controlling other invasives.

Lessons to be learned

The common carp was imported to the United States in the 1870s by the predecessor of the U.S. Fish and Wildlife Service, at the request of European immigrants who longed for the fish from home. The agency raised adults in Washington, D.C., and then stocked young carp across the country for nearly three decades before eventually realizing that they had inadvertently created one of the continent's worst environmental catastrophes.

Interestingly, the carp's origins as an invader can be traced back to the Romans who discovered it in the Danube River basin—which Sorensen notes is similar to Minnesota's environment—and spread it throughout Europe. Later, it was domesticated by the Catholic Church as a Friday fish choice. Even today, carp is prized by European aquaculture and in the United Kingdom it is a most prized game fish and



Research associate and coinvestigator Przemek Bajer held up a carp in Riley Purgatory Bluff Creek Watershed District in Chanhassen.

is always carefully returned to waters after being caught. However, it is generally not invasive there, which gave Sorensen and his associate, Przemek Bajer, a clue as to what might be done in Minnesota: the interactions between carp biology and our environment.

Sorensen and Bajer's approach is new and differs from that of fisheries biologists, waterfowl managers and watershed engineers (carp are often the leading cause of water-quality declines), who have desperately tried to reduce the number of adult common carp using poisons, water-drawdowns, barriers and commercial fishing. Generally, these nontargeted and expensive efforts have met with little sustainable success, which is not surprising given that a single female carp can carry several million eggs so carp populations can recover extremely quickly if any elude removal. Given that, the Sorensen lab has simultaneously targeted the origins of young carp in watersheds while removing adult carp. This has turned out to be surprisingly tractable because Bajer has discovered that young originate from only a few locations and can be controlled by native predatory fish.

Striking parallels may be found between the common carp and their nasty cousins, the Asian carp. Both are large, long-lived, fecund, produce many eggs and are highly mobile—and highly invasive and damaging. One species of Asian carp, the silver, is making headlines because it can grow to

Top left: Volunteer Dale Miller, Peter Sorensen and Loren Miller, research assistant professor and Department of Natural Resources employee, worked in Casey Pond last spring as part of a project with the Ramsey Washington Metro Watershed District.

Below: Technician Mary Headrick and Przemek Bajer examined weeds from Casey Pond.





Peter Sorensen stands next to experimental enclosures in Lake Casey, which demonstrated the role of native fishes in controlling carp. The enclosures were placed on the land of Glen Olson, an alumnus of the college and environmental advocate whose family has lived at that location for four generations.

40 pounds and when startled can jump as high as 10 feet out of the water, damaging boats and harming their occupants. Worse, Asian carp gobble up plankton in waterways, eliminating food for other, more desirable fish and disrupting food chains. Like common carp, Asian carp were purposefully introduced—in their case it was to clean sewage and aquaculture ponds—and now are moving up the Mississippi River and its tributaries and threatening to enter the Great Lakes. Officially, they haven't established themselves in Minnesota's section of the Mississippi, but Sorensen says that's likely only a matter of time and is starting studies on this species as well.

The one thing nobody has wanted to do, Sorensen says, is study the carp. Research funding has been hard to come by, perhaps because "people hate spending money on things they don't like." But he's been down this road before. His work on the invasive sea lamprey—and ways to control that species—showed him that with a deep understanding of a species comes an understanding of how to control it. Every species has its weaknesses; sometimes they are not obvious. After visiting Australia six years ago, where the common carp is considered a noxious species of national concern and the subject of 40-year management plans, he decided to take on the Minnesota problem.

Funding from many local watershed

groups and the state lottery now supports Sorensen's lab's work in several Twin Cities watersheds and has led to a wealth of new information about how common carp eat, reproduce, spend their winters and interact with other species. A neurobiologist by training, Sorensen pays attention to details. The DNR also provides in-kind support. Experimental management plans that rely on integrated tools also are now in place in several lakes and appear to have great promise. Basic advances in fish biology have gone hand-in-hand.

Sorensen has great respect for the carp, which he believes to be invasive because of several impressive adaptations. "The carp have a very sophisticated feeding system, and it is very efficient—capable of discerning and selecting complex flavors released by tiny organisms found deep in the mud," he says. Carp also hear and smell better than other fish, and they grow very fast. Their pheromone system is one of the most sophisticated of the fishes and while that's normally an asset, it can be used against them. The carp also appears to be relatively intelligent and easily able to recognize and remember specific locales. They then use these abilities, together with excellent swimming strength, to find and exploit very specific locations to spawn in ways that few native fish can. Further, because they live to be old (more than 50), their life history allows for them to tolerate

and exploit variable and often degraded habitats that other fish cannot.

Studying the carp's winter habits has also yielded some clues, and success, in eliminating adult common carp from two lakes in Chanhassen, Minn. "They move around differently from native fish," Sorensen says. In winter, common carp gather very tightly in schools, which provides an opportunity to selectively net large portions of the population.

Last winter's netting in Chanhassen netted more than 90 percent of the fish in one lake in one afternoon. The trick, then, is to prevent new populations from producing young, but this now appears solvable by managing native fish populations because, given the chance, bluegills and a few other fishes eat vast numbers of carp eggs if they are abundant, Sorensen says. At Lake Keller, in Ramsey County, an experiment directed by Bajer this spring showed that the strategy can work: native fish ate the carp eggs when present, while a control group that lacked these native fish saw normal numbers of carp hatch.

Strategies for attack

Multiple, integrated approaches likely are the key to controlling populations of carp and other invasive aquatic species, Sorensen says. "Rebalancing native communities in our overfished lakes is an excellent first step that naturally carries other benefits too." His team's future work is now seeking to employ pheromonal attractants in combination with radiotagged fish tracked by remote sensors to monitor carp populations in highly precise manners while their abundance can be measured using DNA.

Much of this work is being developed in the laboratory and appears to demonstrate that given a chance, creative modern science has a role helping Minnesota face what otherwise appear to be insoluble invasive-species problems. ■

The Truth About Jeff Gillman

Author/professor puts conventional wisdom to the test

Beer to get rid of slugs? Human hair to repel rabbits? Name a garden remedy, and Jeff Gillman can tell you whether it works.

The associate professor in the Department of Horticultural Science is the author of five books about gardening and the environment. His first, and most popular, is *The Truth About Garden Remedies*, published in 2006.

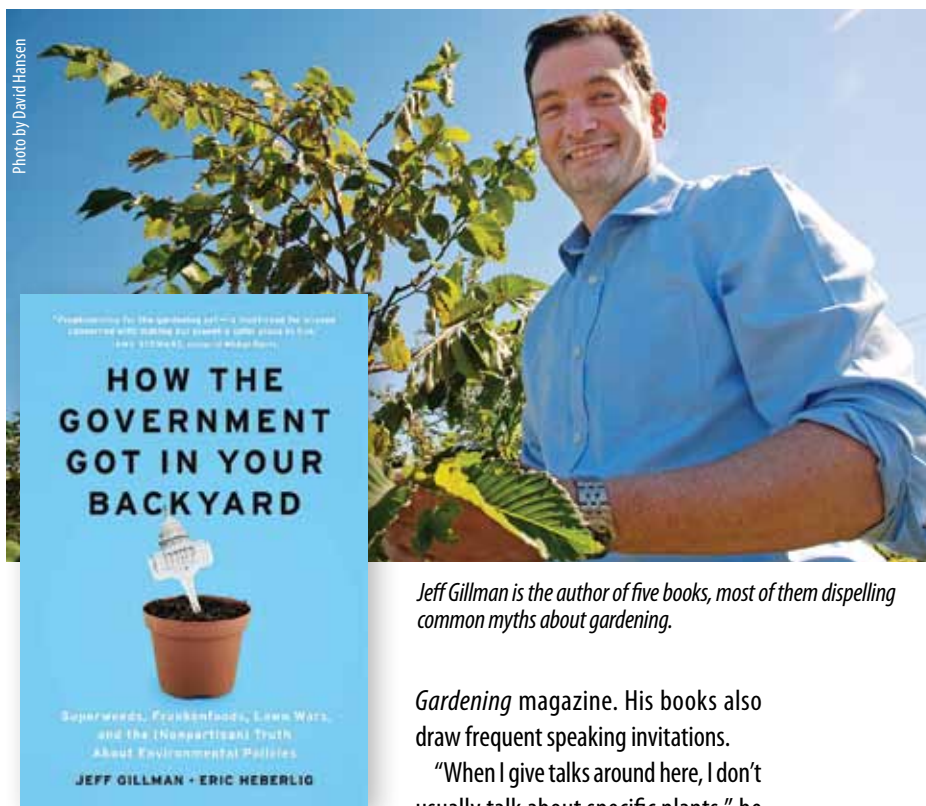
"I was watching TV one day and the host was making all these recommendations for 'common sense' garden solutions," Gillman says. "So I tested some of those ideas and wrote a book about it, and it's worked out really well for me."

Some of the remedies Gillman writes about really do work: milk clears up blackspot on roses, for example. Others never seem to go away, even though they don't work. "There are a lot of baking soda myths," he says. "Some of these remedies were being suggested back in 1926. Eighty years later, they still don't work."

His second book, *The Truth About Organic Gardening*, was not a criticism of organics, as the title might suggest. "I wasn't bashing organics," he says. "I love organics, but let's be honest about what's organic and what's not."

Feedback from readers is largely positive, he says. "But sometimes people write to me with great points about something that I didn't consider, and then I do what anybody should do in that situation: apologize and try to make it right."

His third and fourth books—*How Trees Die* and *How the Government Got in Your Backyard: Superweeds,*



Jeff Gillman is the author of five books, most of them dispelling common myths about gardening.

Frankenfoods, Lawn Wars, and the (Nonpartisan) Truth About Environmental Policies—explored larger environmental issues. The fifth, *The Real Dirt*, to be published this fall, is a return to his myth-busting roots.

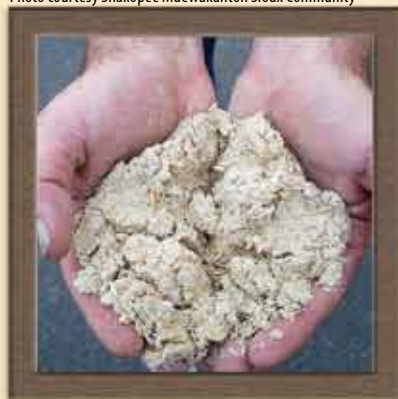
Gillman grew up in Pennsylvania and attended graduate school in Georgia, where he majored in entomology for his master's degree before switching to horticultural science for his doctorate. He's been at the University of Minnesota since 1998.

Along with writing books, Gillman teaches and conducts research on trees and shrubs; he's also a frequent contributor to local garden publications and blogs (www.gardenprofessors.com) and is a contributing editor of *Fine*

Gardening magazine. His books also draw frequent speaking invitations.

"When I give talks around here, I don't usually talk about specific plants," he says in a voice that still carries a bit of a Southern twang. "The cures are universal, and, as far as I can tell, I've investigated more of these crazy cures than anybody. Sometimes by conducting research myself, or with collaborators like Jeff Hahn in Entomology or Michelle Grabowski in Plant Pathology, and sometimes by reading other people's research. People appreciate hearing what really happens when they apply a cure that sounds silly." —Becky Beyers

The Picture



Big



Researchers partner with farmers and industry to build a biomass energy system that works

The conversation has been going in circles for years. That discussion about putting the great idea of bioenergy into action on a large scale in the real world—the one that inevitably ends up at, “yes, but....”

Fill in the blank.

Yes, but how do you grow enough feedstock to power a plant? Okay, but how do you move the fuel from farm to facility without harming the environment? Fine, but how do you make it financially viable?

How do you make it work?

The large, interdisciplinary team behind a five-year grant from Xcel Energy figured they might find the answers to that big question by bringing all the stakeholders together to assemble a picture of an entire working bioenergy system, from planning through infrastructure to implementation. Building on a wealth of related research, 11 scientists from six CFANS departments have partnered on the project with Rural Advantage and the Institute for Agricultural and Trade Policy (IATP), the Minnesota Department of Natural Resources and Koda Energy.

The aim of the study is to address the challenges facing biomass energy across all levels of the system. They will identify not only the type of feedstocks to farm, but where to plant, how to harvest and how big an area to convert from traditional cropping systems to be lucrative for both farmer and power plant. They will quantify the environmental implications of the change to the Minnesota River basin landscape. And when a system is devised to transport the feedstock, Koda Energy, a partnership between Rahr Malting Co. and the Shakopee Mdewakanton Sioux Community that houses a biomass power plant, will provide a real world example for renewable energy production.

“What really makes this project unique is that it’s fully integrated,” says Todd Arnold, a professor in the Department of Fisheries, Wildlife and Conservation Biology. “We’re harvesting biomass, and Koda Energy will use it. It’s not hypothetical—it’s integrating industry, research and landowners across the board. It’s happening.”

Where, what and how

Koda Energy’s biomass conversion facility is located in Shakopee at the Rahr Malting complex, which overlooks the Minnesota River. Another partner, Rural Advantage, is exploring the possibility of building a bioenergy plant in Madelia, in the Blue Earth river basin. The research team is exploring how big the surrounding fuelsheds would have to be to supply the facilities with enough biomass, and what the most beneficial combination of perennial feedstocks might be.



Photos by David Hansen

Photos by David Hansen except where noted.

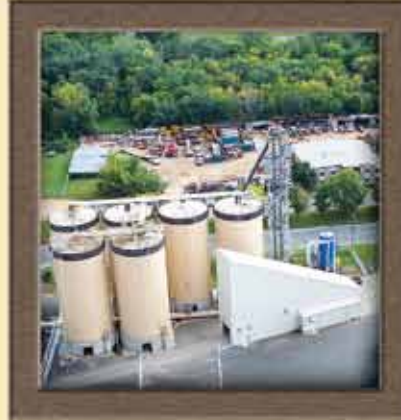
Left page:

Left: Western Meadowlark population fluctuation will serve as a measure of wildlife habitat success in grassland biomass cropping systems.

Center: Processed biomass ready to feed into Koda Energy's cellulosic energy converter.

Right: Prairie grass crops planted in agricultural ditches can capture and treat runoff water.

Photo courtesy Shakopee Mdwakanton Sioux Community



Far left: Planting perennial biomass feedstocks in typically unproductive riparian areas on agricultural lands can improve water quality.

Center: The Koda Energy plant in Shakopee overlooks the Minnesota River.

Above: Graduate student Joshua Gamble inspects biomass feedstocks at a research plot.

By Sara Specht

“What we’ve got right now in southwestern Minnesota are corn and soybeans, and those are valuable crops that we need as a food source,” says Dean Current (’85–M.S., forestry; ’97–M.A., anthropology; ’00–Ph.D., forestry) of the Department of Forest Resources, the principal investigator of the Xcel project. “But there are a lot of more environmentally sensitive areas near streams or on slopes that are not very productive for some of the more traditional crops. Our focus is on keeping lands productive and lucrative, so these are the areas that farmers would likely convert to perennial bioenergy crops. It can be a win-win situation.”



A combination of potential feedstocks ranging from switchgrass and mixed prairie grasses to fast-growing woody perennials is being tested both at research plots at the Southern Research and Outreach Center in Waseca and on participating landowners’ properties within the fuelsheds. The team has found that their efforts need to extend beyond establishing crop yield and optimal planting location. While there exists voluminous research on cultivating food crops, there is relatively little on these plants as crops. When should fields be planted; when should they be harvested? Can ash from the facility be recycled back onto the fields as fertilizer? Once basic management practices are better understood, Current says, hopefully productivity and cost effectiveness will follow.

“We’re trying to get down to the nitty gritty of what to plant and where and how—what this new agricultural landscape could look like so that everyone gets what they want from it,” says Nick Jordan, a professor in the Department of Agronomy and Plant Genetics. “Then we can start the flow from crops to energy to make a fundamental change in how we plan agricultural lands.”

Streams and songbirds

As a consequence of the success of profitable corn and soybean production on agricultural lands, the southern Minnesota watersheds have lost much of their biodiversity and perennial ground cover. One point of environmental concern in the Xcel project is to design feedstock cropping systems that alleviate the flow of sediment and nutrients into the rivers.

“If you look at satellite imagery of the upper Midwest in the spring after the snow melts in April, much of the landscape is all brown and subject to runoff until well into June when annual crops start to grow,” says Ken Brooks, a professor in the Department of Forest Resources. “Realistically we need to figure out how to get some of these perennial crops and wetlands back on the landscape to capture and treat the runoff before it gets into the stream channel.”

It’s easy to say from a scientific standpoint that there should be more green crops on the ground to improve water quality, Brooks says, but the challenge is to determine the hydrologic benefits that come from more diversified perennial cropping systems. Monitoring nutrient flow and water quality



Photo by David Hansen

coming off of small watersheds, they are trying to quantify the relative benefits that can be achieved and at what scale. If they discover, for example, that in order to make a measurable impact on water quality half of the watershed would have to be converted to perennial feedstocks, then that obviously won't be practical, he says. So what other environmental benefits can alternative cropping systems reap?

One such potential benefit to reintroducing diversity to the agricultural landscape is increased wildlife habitat. Grassland songbirds in particular have declined more than any other group of birds in North America, and they serve as a good indicator species for whether the new cropping systems would provide a stable habitat, Arnold says. Tracking key grassland bird populations through harvests year after year will predict whether they can sustain new, productive habitats for wildlife.

"Compared to water quality, wildlife benefits are just nice little trinkets in this project," says Arnold. "But I think about a species like the Western Meadowlark that has declined at a catastrophic rate of 7 percent per year. There used to be meadowlarks perched on telephone and fence lines every half mile. My vision for the future includes a productive landscape, but it's also one where we can hear meadowlarks singing again."

Building up and buying in

Once the fuelshed is populated with perennial feedstocks and crops have been harvested, there must be an infrastructure

in place to move them to the facility, to load, unload, store and process them. The challenge is how to develop policy and incentives to support innovation in how farmers use the land, says Jordan. The team will determine what kind of service providers could be established to keep energy costs low and create a competitive economic model for renewable energy.

Those logistics of moving and processing biomass is a piece of the puzzle that hasn't received as much attention as feedstock crop cultivation. That is where Koda Energy, a private sector partner with an operating bioenergy facility, gives this project a unique advantage, says Current. With a functioning demand for biofuels, they can determine

real market values for energy biomass.

"And that's the key to the whole project—getting farmers to buy in," says Current. "If we want them to adopt new biomass cropping systems, we need to make it economically beneficial. Maybe there are opportunities for carbon credits or payments for environmental services. How do we balance the risk to make it work for them?"

According to Linda Meschke ('76–A.S., animal science, poultry science), president of Rural Advantage, support from farmers is there for sustainable alternative cropping systems that diversify their landscape. Meschke's ties to the farming community helped bring neighbors and local landowners into the project, providing research plots and survey participants. She hopes the project can come up with workable alternatives her community can adopt to improve their environment while producing the food and feed the nation needs.

"If we can create a system that works, it's going to be great." Current says. "It's a challenge, but we feel that you've got to really look at the whole picture to make something big happen." ■

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Paul Kramer

Koda Energy

Jesse Theiss

Koda Energy

Soybean Futures

Soy technology could replace petroleum-based plasticizers

Talk of reducing the world's consumption of petroleum-based products usually revolves around driving fuel-efficient vehicles, turning down the thermostat or cutting back on bottled water.

But what if the toxic plastic additive used to make PVC into everyday items such as clothing, building materials and small electronics could be replaced with a non-toxic, sustainable substitute?

Dharma Kodali, research professor in the Department of Bioproducts and Biosystems Engineering, aims to find out. His lab has developed a new kind of PVC additive derived from soy oil that acts as a plasticizer, or an agent that makes plastic flexible. The process uses the soy-based plasticizer in varying proportions to create PVC materials with different degrees of strength and flexibility.

Before joining the department, Kodali spent most of his career working in the food and agribusiness industry, developing new uses and applications for plant-based oil products.

"There are some problems with petroleum-based plasticizers," Kodali says. A number of studies show that petroleum-based plasticizers—known as phthalates—leach out of PVC materials and can be harmful to humans as well as the environment. And when phthalates leach out, PVC materials can become brittle.

Lucas Stolp, Assistant Scientist



Dharma Kodali's research found that soy-based plastics hold up as well as those made from petroleum.

By using soy-based plasticizers, Kodali says, those problems can be eliminated and product costs may be lower. One challenge is figuring out which applications work best with the new material. He's working with Twin Cities-based Andersen Windows, for example, to test how the soy-based plasticizers could work with window weatherstripping that needs to expand and contract as temperatures rise and fall.

As he demonstrates how a strip of soy plasticized PVC bends just as flexibly as one plasticized with petroleum materials, Kodali says the next step is to go from lab scale to making 50-gallon batches of soy-based plasticizers over the next few months, and then to full-scale production.

He's also working with the University of Minnesota's Office for Technology Commercialization, which says bio-based polymers are a fast-growing and very large potential market. The licensing process likely will take place over the next few months, Kodali says. "Using renewable and natural resources as a substitute for phthalates is a much safer solution."

—Becky Beyers



Siehl Prize laureates recognized for excellence in agriculture

An innovative farmer who's known worldwide for his conservation practices, a steadfast leader in the agribusiness finance industry and a longtime voice of agriculture in southwestern Minnesota were recognized May 26 as this year's recipients of the prestigious Siehl Prize for Excellence in Agriculture. Recipients are chosen for three categories: knowledge (teaching, research and outreach), production agriculture and agribusiness. This year's winners are, from top, **Wallace "Wally" Nelson** ('50—Ph.D., soil science), knowledge; **James "Tony" Thompson**, production agriculture; and **Paul DeBriyn** ('77—B.S., agricultural business administration), agribusiness.

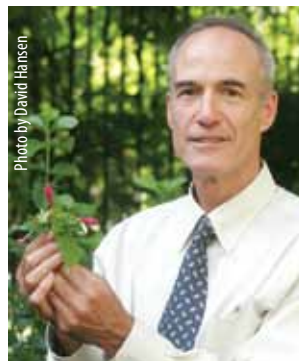


Awards honor faculty and staff's great work

CFANS faculty and staff awards were announced in May. This year's winners are:

- Non-tenured faculty: **Joseph Knight**, Department of Forest Resources
- Tenured faculty: **Charles Clanton**, Department of Bioproducts and Biosystems Engineering
- Graduate faculty: **Roger Moon**, Department of Entomology
- Administrative staff: **Bonnie Anderson**, Water Resources Center
- Scientific/ Technical staff: **Jodi Nelson**, Department of Food Science and Nutrition
- Professional staff: **Jennifer Menken**, Bell Museum of Natural History

Peter Reich named to American Academy of Arts and Sciences



Regents Professor **Peter Reich** of the Department of Forest Resources has been named a 2011 Fellow of the American Academy of Arts and Sciences, where he'll join some of the world's most accomplished leaders from academia, business, public affairs, the humanities, and the arts. The Society's members have included influential Americans down through the ages in the arts, humanities and sciences.

Franken speaks at undergraduate commencement

More than 260 undergraduates celebrated commencement in May, with U.S. Senator Al Franken as keynote speaker at CFANS undergraduate ceremonies. After a long career in writing and comedy, Franken was elected as Minnesota's junior senator in 2008. He currently serves on committees overseeing energy and natural resources; Indian affairs; judiciary; and health, education, labor and pensions.



New president visits Farmfest and the Southwest Research and Outreach Center

U of M president Eric Kaler made his first visit to Farmfest in August to meet with producers and agricultural groups. Afterward, he stopped at the Southwest Research and Outreach Center, where he talked with students learning hands-on science at University on the Prairie.

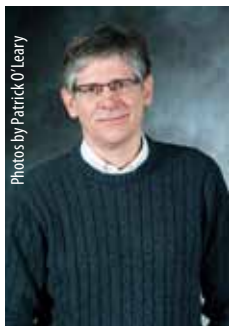




Photo by Patrick O'Leary

Big fish will make its home at Bell Museum of Natural History

Former University of Minnesota President Robert Bruininks made a big donation to the Bell Museum of Natural History. He donated the second-largest walleye caught in Minnesota history, which he landed on July 4, 1989, on Loon Lake along Minnesota's Gunflint Trail. At 17 pounds, 6 ounces, the lunker is two ounces shy of the state record. It will eventually find a home in the museum's permanent aquatic exhibit.



Photos by Patrick O'Leary

Two professors honored with teaching awards

Two CFANS professors are recipients of the university's Outstanding Contributions to Postbaccalaureate, Graduate and Professional Education Award: **Ralph Holzenthal**, Department of Entomology and **Ray Newman** ('82-M.S.; '85-Ph.D., fisheries), Department of Fisheries, Wildlife and Conservation Biology. Along with six other recipients from across the university, they were honored April 25 at a ceremony in McNamara Alumni Center.

HONORING THOSE WHO HELP FEED THE WORLD

Laureate nominations are open through January 15 for the 2012 Siehl Prize for Excellence in Agriculture, the University of Minnesota's recognition of how Minnesotans put food on tables around the globe.

www.cfans.umn.edu/siehlprize

Siehl Prize for
EXCELLENCE in
AGRICULTURE

UNIVERSITY OF MINNESOTA



“Roots of the Green Revolution” opens in Andersen Library

“Minnesota Roots of the Green Revolution: A Legacy of Greatness” is an exhibition of unique historical documents from the University Archives featuring newly cataloged and digitized papers of Norman Borlaug, E.C. Stakman and their colleagues at the University of Minnesota. The exhibit is open now through October 21 in the Elmer L. Andersen Library Gallery. *Saving Wheat: Rusts Never Sleep*, a new documentary about Minnesota’s role in the Green Revolution and beyond, will premiere on Twin Cities public television beginning October 9.

Wheat rust research takes two big steps forward



Two new developments will help advance the study of wheat rusts: Establishment of the new Stakman-Borlaug Global Rust Center and the expansion of the USDA’s Cereal Disease Lab on the St. Paul campus. Both are aimed at stopping the spread of dangerous diseases that kill cereal crops and threaten global food supplies; in addition, the center will focus on training the next generation of wheat scientists. The new center and expansion both were announced in June during the annual Borlaug Global Rust Initiative technical workshop. Biggest discussion at the conference: Research breakthroughs in the battle against wheat stem rusts, including the dangerous Ug99, which has the potential to threaten global food supplies.

Experiment Station gets new leadership

Oversight and administration of the Minnesota Agricultural Experiment Station will move to CFANS dean Allen Levine as of October 1. Levine also will gain the title of director of the experiment station, which funds research by U of M scientists on ways to improve Minnesota’s agricultural and forest products, horticulture, human nutrition, family and community life, and environmental quality through both basic and applied research. In any given year, Experiment Station funding supports about 400 research projects in five different U of M colleges involving more than 300 faculty members.

The administrative realignment came out of recommendations by the college’s Blue Ribbon Committee and will continue a strong partnership between the Experiment Station, CFANS and University of Minnesota Extension.

Applied Economics will celebrate 100 years

Alumni, friends, faculty, staff and students in the department of Applied Economics will celebrate the department’s centennial beginning this fall. The Department was established as the “Bureau of Research in Agricultural Economics” on February 1, 1912, when it was approved by the Board of Regents, after being proposed in November 1911. A series of lectures, seminars and special events will mark the anniversary through the rest of 2011 and 2012.

CFANS junior wins prestigious Udall Scholarship

Siri Simons, a junior majoring in environmental sciences, policy and management, has been awarded a 2011 Morris K. and Stuart L. Udall Scholarship in recognition of her commitment to the environment. Simons is enrolled in the University Honors Program and intends to work in the field of sustainable agriculture. She is only the second University of Minnesota student to achieve the honor.



New faculty join CFANS this fall

Four new faculty members will be joining the college for the start of fall semester 2011. They are:

- **Marin Bozic**, Assistant Professor, Department of Applied Economics
- **Omar Espinoza**, Assistant Professor, Department of Bioproducts and Biosystems Engineering
- **Kabir Peay**, Assistant Professor, Department of Plant Pathology
- **Paul Venturelli**, Assistant Professor, Department of Fisheries, Wildlife and Conservation Biology

OVERHEARD

"I've been in this new role as president for a month and two days now, learning about Minnesota and listening to Minnesotans, meeting with students, alumni and friends of the university...faculty, donors, elected officials and business leaders. This is my first community visit and it was important to me that this maiden voyage to Greater Minnesota be about the issues in rural Minnesota and, particularly, those that involve agriculture.

As a globally recognized public research university, we are leaders in groundbreaking food safety and food science research and development. We are proud of this heritage and proud of producing scholars, researchers and well-trained young people to be your employees and partners in the state's second largest industry."

U of M President Eric Kaler, speaking at Farmfest on Aug. 3

"I think my story is pretty good evidence that it's impossible to predict in advance exactly where your interests will lead you, what opportunities may arise, or what choices you'll get to make down the road.

You can't control these things. But you can develop the tools that will serve you well no matter what choices you make. You can learn to follow your passions and disregard your own, or other people's, expectations. You can learn to be resourceful, to be stubborn in the face of adversity, to fight through self-doubt. And if you do these things, you'll be ready to achieve whatever you decide matters to you, whether it's what you expected or not."

U.S. Sen. Al Franken, speaking to CFANS graduates at spring commencement 2011

"Research on bees has clear benefits to society: Bees are the most important insect pollinators of many fruits, vegetables, nuts and flowers. Promoting the health of bees involves promoting the health and stewardship of our urban, agricultural and natural ecosystems."

MacArthur Foundation "Genius Grant" winner and entomology professor Marla Spivak, interviewed in 'Live Science.'

"The Minnesota roots of the Green Revolution is the University of Minnesota's greatest story never told—it was and remains our highest-impact moment, but is unknown to most."

Richard Zeyen, Professor Emeritus in the Department of Plant Pathology, talking about a new exhibit at University of Minnesota libraries

Undergraduate vision moves ahead this fall

A new vision for undergraduate education in CFANS is taking important steps this fall. Last spring the faculty voted to implement new policies expanding the role of experiential and interdisciplinary education and curriculum flexibility across all majors in the college. This fall, CFANS faculty are being asked to create proposals for new and innovative experiential learning opportunities for our students including internships, student research, international education and engagement with local communities and industries. Faculty also are working on proposals to provide significant interdisciplinary learning opportunities. Proposals will be reviewed by a panel of faculty and external reviewers and the top proposal will be funded for development over the next year.

The new policies were in response to feedback from employers and students and aim to provide students with a rigorous scientific background while also giving them the skills they need to succeed in a modern workplace—without adding so many requirements that the students can't graduate on time. Groups of faculty also will be convening this fall to discuss ideas for a couple of new majors to help students compete in emerging areas in food, nutritional and natural resource sciences.

"This is really a critical time in the process," says CFANS associate dean Jay Bell, who's spearheaded the undergraduate strategic planning process for the past three years. "I'm expecting that the proposals we get will reflect this college's broad range of creative, collaborative thinking and will benefit our students and employers as they enter the workforce."



Global Engagement commitment lauded

Claudia Parliament of the Department of Applied Economics is one of three recipients of the University of Minnesota's Award for Global Engagement this year. The award to faculty and staff members recognizes outstanding contributions to global education and international programs.



RESEARCH ON HOW TURKEYS BREED AND FEED HELPS INDUSTRY THRIVE

BY BECKY BEYERS

Every year, about 49 million turkeys are produced in Minnesota, more than anywhere else in the nation.

But how do you get that many birds to market? It's not as simple as one might think. Turkeys don't reproduce easily, and the cost of feeding them until they reach market size can make or break a producer. Poultry scientists in CFANS have been studying turkeys for over a century, and their work continues today, concentrating in particular on reproduction and turkey feeding and growth issues.

Lights, camera, action

Modern commercially grown turkeys can't breed naturally because over the last few decades, breeders have been selecting for fast growth and large, meaty breasts. Artificial insemination arrived in turkey barns in the 1960s and now virtually all domestic turkeys reproduce only with help. Turkey reproductive cycles are affected by light, so they produce the most eggs when photoperiods—daylight—last for at least 14 hours. That might work



TALKING TURKEY



A research project under way at the Rosemount Research and Outreach Center is exploring how red and blue lighting play a role in how turkeys know when they're supposed to start and stop laying eggs.

fine in nature, but not in modern year-round turkey production.

Mohamed El Halawani, a professor in the Department of Animal Science, says turkeys “see” light for reproduction through their brains rather than through their eyes, and they seem to have a specific gene that allows them to sense the passing of another night/day cycle. A series of experiments he’s now conducting at the Rosemount Research and Outreach Center will explore how different parts of the light spectrum affect the birds’ photostimulation and photorefractoriness—how they know when it’s time to start and stop laying eggs, as well as which parts of their brains trigger which activities.



Mohamed El-Halawani studies how brain activity affects turkeys' reproductive cycles.

The eggs each hen lays over a period of about 20 to 30 weeks generally go to hatcheries, but occasionally a hen will “get broody” and try to hatch her eggs in the nest—which means the end of egg production for that season. A few years ago, El Halawani and his colleagues discovered that broodiness is caused by a specific brain chemical known as vasoactive intestinal peptide, and could be prevented with a vaccine; the technology has been patented, but so far has not been commercially adopted.

The research could have major implications for producers, as El Halawani and his colleagues noted in documentation for funding the light-spectrum research. Assume that each fertile egg costs about 68 cents, and hens average 75 to 120 eggs in a season; multiply that by the typical 5,000 to 20,000 hens in a flock and a producer could lose many thousands of dollars in a single season if a whole flock of hens wasn’t able to lay eggs.

Food for growth and health

Turkeys eat a lot, because they grow fast and are sent to market at heavier weights than other poultry; toms are sent to market at between about 18 and 22 weeks. By some estimates, about 70 percent of the cost of raising a turkey is in feed, says Sally Noll (’74–B.S.; ’78–M.S.; ’85–Ph.D., animal

sciences), a professor in the animal science department who specializes in poultry nutrition. In recent years, much of that work has focused on how distiller’s dried grains with solubles (DDGS), a byproduct of ethanol production, can be used as animal feed. When DDGS is priced economically as compared to other types of grain, it’s attractive as a substitute turkey feed.

“When we first started looking at this about 10 years ago, the industry was asking us a lot of questions—what is the nutrient composition, what’s the quality, how much can you put into the turkeys’ diet, and what other things might influence using DDGS as feed,” Noll says. Because turkeys are raised to about 20 weeks before going to market, the research is time-consuming. But so far her team has found that turkeys can tolerate a fairly high level of corn DDGS in their diet, as much as 20 percent for toms in a research setting. The turkeys do best if the DDGS level returns to 10 percent in the last few weeks prior to market, she says.

As the ethanol industry evolves, the makeup of DDGS will too, so research likely will be ongoing. Scientists also want to look at other effects of a new diet, such as whether it influences the amount of ammonia released in turkey waste, and how different additives such as added fat or supplements might affect turkeys’ growth on a DDGS diet.



Sally Noll's experiments at the Rosemount Research and Outreach Center focus on turkey nutrition and growth.

Future opportunities

Turkey science in CFANS faces some challenges: research animals are expensive, so most work involves an industry partner. Willmar Poultry Company, for example, is providing the turkeys for El Halawani's study at Rosemount. The Rosemount facility, one of a few university turkey research facilities in the country, could be displaced or moved as part of UMore Park development at the site. Perhaps most troubling, Noll says, is the dwindling number of students being

trained in poultry science, despite high demand from the industry.

"It's starting to get to a crisis situation," she says. Companies looking for a poultry nutritionist find it can take up to a year to hire one, and even fewer graduates go into academic poultry-science roles. Challenges remain to find interested students and the required funding for training. While major advances in turkey production have helped expand the industry dramatically over the last 50 years, plenty of challenges remain in breeding: stronger legs to support ever-larger birds, finding ways to boost immune responses and more work on the birds' well-being.

"People ask me all the time why we're the number-one turkey producing state," says Steve Olson ('87-B.S., agricultural education), executive director of the Minnesota Turkey Growers Association. "One of the big reasons is the industry infrastructure we have, including the university."

Noll and El Halawani are respected nationally for their work, Olson says, and having them here helps producers and processors identify challenges and opportunities as they arise. "They've really been crucial to the growth in our industry." ■



TURKEY FACTS

- Turkeys have approximately 3,500 feathers at maturity. The costume that "Big Bird" wears on "Sesame Street" is rumored to be made of turkey feathers.
- Domesticated turkeys cannot fly. Wild turkeys can fly for short distances up to 55 miles per hour and can run 20 miles per hour.
- Only tom turkeys gobble. Hen turkeys make a clicking noise.
- A baby turkey is called a poult and is tan and brown.
- Turkey eggs are tan with brown specks and are larger than chicken eggs.
- The "caruncle" on a turkey is the red-pink fleshy growth on the head and upper neck. The "snood" is a long, red, fleshy growth from the base of the beak that hangs down over the beard. The "wattle" is the bright red appendage at the neck and the "beard" is a black lock of hair found on the chest of a male turkey.
- Turkey consumption has more than doubled over the past 25 years. In 2009, per capita turkey consumption was 16.9 pounds compared to 8.3 pounds in 1975.

Source: National Turkey Federation

Food Coach

Carrie Peterson advises professional athletes on healthy eating

When Carrie Peterson needs batting tips, she has a good source of expert help: her nutrition clients, the Minnesota Twins.

Peterson, who directs the dietetic internship program for graduate students in the Department of Food Science, dreamed in college about being a nutritionist for the Minnesota Vikings, but at the time, no such job existed. She didn't let that deter her, and today she's the sports nutritionist for the Vikings, Twins, Timberwolves, Lynx, and for nine years, the Minnesota Wild.

Her journey to being a sports nutritionist was long and filled with various jobs including one at sports outfitter Eastern Mountain Sports. During her time there, she became interested in nutrition and athletic capabilities on extended backpacking and climbing trips. That interest turned into what she calls her "mountain-climbing phase," on five continents and over 22,000 feet. Around the same time Peterson became the nutritionist for polar explorer and Minnesotan Ann Bancroft.

However, Peterson was only assisting these Antarctic expeditions on the side. Her main focus was as a dietitian at University of Minnesota hospitals. In 1997, she met the Timberwolves' medical director, who asked her to meet the Timberwolves players at their physicals and offer nutritional advice. That short meeting blossomed into doing talks with the team and working with players on meal plans, weight gain, weight loss and body-fat management.

Things snowballed from there. She added the Minnesota Lynx and Wild as clients. In 2001, after a Vikings player died from heat stroke during training

camp, the team's coaches asked her to look at nutrition during training camp and on game days, and the Vikings became another client. When she was giving a talk for the Twin Cities Marathon, she met a physician for the Minnesota Twins, and that turned into a role with the team. "See, this is how things happen; I always think 'fine, I'll take that. That sounds good,' and little opportunities turn into bigger opportunities," says Peterson. She also earned her CSSD (certified specialist in sports dietetics), a process that only a few registered dietitians complete.

What she tells professional athletes about nutrition also applies to average people. "In general, I believe all foods fit, and I try to get players to eat healthy for the most part throughout most days," she says. But even athletes have some mistaken ideas about healthy eating. "I had to convince one of the Timberwolves players that Skittles are not actually fruit even though it said 'mixed fruit flavors' on the outside," she says.

Part of her work as team nutritionist isn't merely teaching players how to eat healthy but also how to grocery shop and cook their own food. "I can tell a guy to eat something in particular, but I never do because it always has to do with what they *will* eat and what they like," she says, so she focuses on where players call home and plans their meals around that. For example, many Vikings are from the south, so they tend to like crawfish and grits, which are now on the team menu.

Even though she's working at her dream job, she says her favorite role is directing internships. "My number-one responsibility is working here," she says. "I love what I do with the students. I love my job. I'm very fortunate and I recognize that. And I just want to keep doing a good job for people and for myself. You've got to stay true to yourself." —Veronica Hemmingsen



Mention agriculture and water in the same sentence, and the response is almost guaranteed to be passionate.

Somehow, the intersection of food and fuel production with one of Minnesota's most precious natural resources has become highly charged, with "whose fault" fingers pointed in every direction.

Who's really to blame for the state's impaired waters? We don't know. That's not the point of this story. Regardless of who bears responsibility for protecting our state's water, a variety of CFANS scientists are doing their part to bring new ideas to the table and reach the ultimate goal: clean, safe, adequate water supplies. Several of them spoke in May at "Water and Agriculture in the 21st Century," a college Solution Driven Science symposium; this is a condensed version of some of their presentations.

Drainage decisions

In southern Minnesota, a network of drain tile lies beneath millions of acres of farmland, a lifeline for farmers who need to get rid of excess water so they can work their fields. Drainage has been an accepted technique for hundreds, maybe thousands of years. What's different today, says Gary Sands, associate professor in the Department of Bioproducts and Biosystems Engineering, is awareness among all parties that human actions have an impact on the landscape.

"We've changed the way we think about traditional drainage practices," Sands said. "It's a complicated picture, and we need to realize the danger in pulling on just one thread in the agricultural drainage system."

Drainage experts now suggest living by the "Golden Rule of Drainage," he says: Only release the amount of water necessary

to ensure trafficable conditions for field operations and to provide an aerated crop root zone. "The goal for drainage systems is to put both production and environmental goals out there," using a suite of new practices and techniques.

Among that suite: Redesigned drain tile and drainage ditch systems; improved management of wetlands and alternative production and cropping. But the new technique getting most of the attention is controlled drainage—a management device attached to the underground drain tiles that allows farmers to raise or lower the amount of water in their fields depending on the season, rainfall and other factors.

Jeff Strock, associate professor in the Department of Soil, Water, and Climate who is based at the Southwest Research and Outreach Center in Lamberton, has been working with controlled drainage for several

THIRSTING FOR SUSTAINABILITY

By
Becky
Beyers

Scientists use balanced approach to mixing ag and water



Photos by David Hansen



Jeff Strock, left, and Gary Sands, right, work with a variety of stakeholders on how drainage can work with agriculture to create minimal environmental effects.

years, most notably in partnership with a farm producer near Tracy, Minn., where the results have been mostly positive.

Like all drainage technologies, controlled drainage has benefits and drawbacks, he says. Such a system is fairly expensive to install, and it needs frequent monitoring. It won't work in every topographic situation, and it's not clear that yields always are improved under controlled drainage. But the network of sub-surface tile and above-ground ditches provides an opportunity to affect the quality of water before it drains into streams, rivers and lakes. "There is no silver bullet," Strock says. "What we're doing with these multiple approaches is more like silver buckshot."

A framework for the long range

Last January, the university's Water Resources Center finished its 25-year "Minnesota Water Sustainability Framework" project. The resulting 150-page report, requested by legislators after the 2008 passage of the Clean Water, Land and Legacy Amendment, recommends a series of large and small strategies for ensuring a clean, sustainable water supply for Minnesota.

Deb Swackhamer, codirector of the center, led the 18-months-long project, which involved dozens of stakeholders and advisers from all parts of the state and a broad range of interests. She quickly points out that the framework is not, however,

designed to be the consensus of all those groups: "It would be a pretty watered-down document if we had to get agreement. These are the long-term recommendations from the University of Minnesota for the state."

The framework addresses 10 issues, and agriculture is woven through at least seven of them, Swackhamer says, in particular issues around excess nutrients and other pollutants; the water-energy nexus; and the connections between land, air and water.

Among the key recommendations is that improvements in water quality need to be made more quickly, and that agriculture could play a role in that process. "Ag has done a great job in this state," Swackhamer says. Minnesota is well-known for its voluntary programs and widespread compliance with water-quality rules, but meeting new standards simply isn't happening fast enough. Making things move faster is tricky, though: one set of rules may not apply or be realistic everywhere, and enforcing standards on a farm-by-farm basis "would be just silly," she says, because it would require management at such a micro level. So the framework recommends evaluating compliance on a watershed level, using groups of farmers from each watershed who would be responsible for meeting standards and developing their own solutions if the standards aren't met.

You can see video of all the symposium speakers at www.cfans.umn.edu/ResearchOutreach/Research/SDS/Water_Ag_Video

The Minnesota Water Sustainability Framework is at wrc.umn.edu/WaterSustainabilityFramework

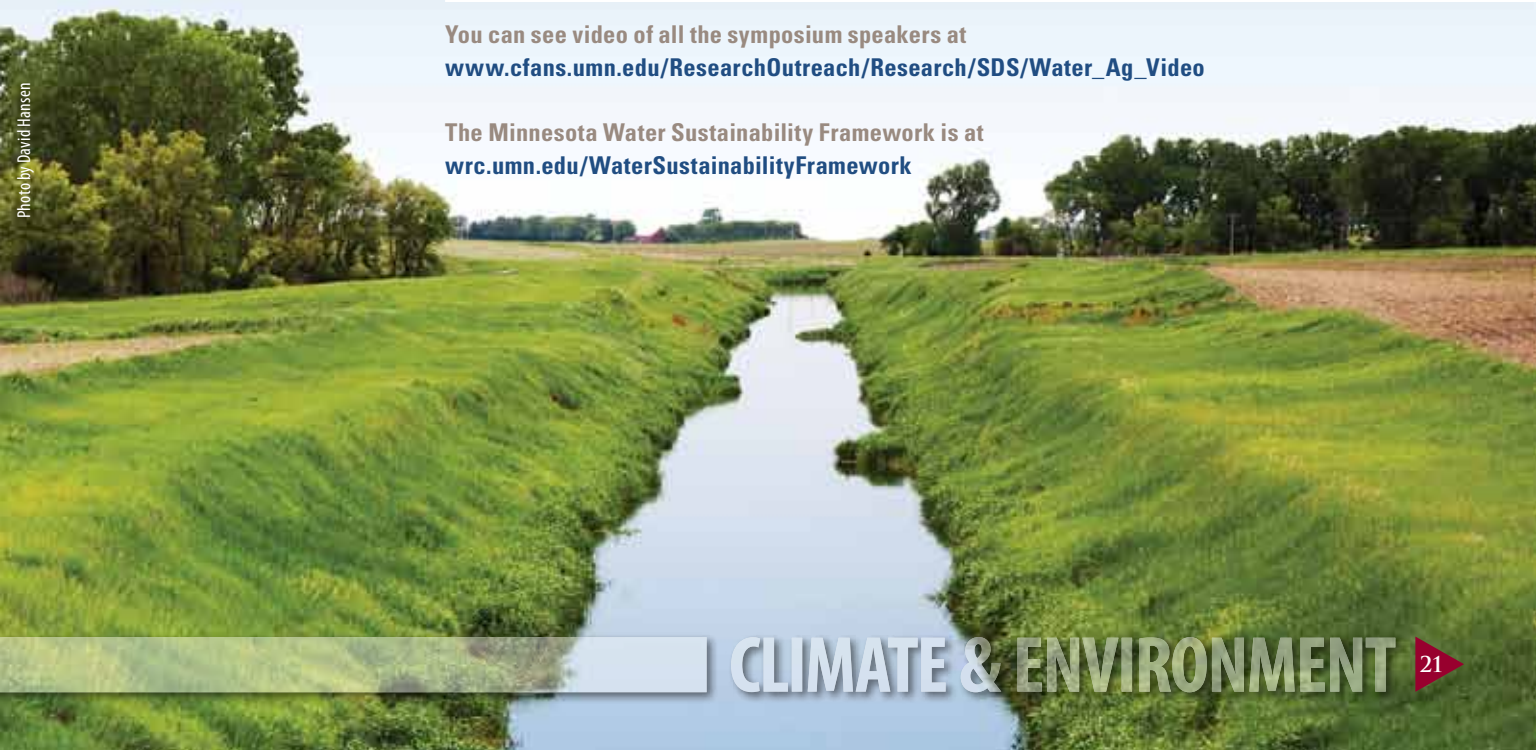


Photo by David Hansen



As codirector of the Water Resources Center, Deb Swackhamer led an 18-month effort to compile the state's first Water Sustainability Framework.

The framework's recommendations all take a long-term view and wouldn't be in place for 10 to 25 years, she says. The first step will be evaluating and creating baselines, and then developing new processes. Since the framework was submitted, legislators have not taken any action on the recommendations.

One watershed's impact

Tackling the problems of Minnesota's 1,700 impaired watersheds individually would be impossible. But by looking at one watershed in detail, a team led by Department of Soil, Water, and Climate professor David Mulla hopes to learn more about the ecological and economic effects of a variety of proposed water sustainability solutions.

Mulla's past work has traced the sources of water impairment in the Lake Pepin watershed: focusing primarily on sediment, phosphates and nitrates. Sediment in the lake—which is really a wide spot in the Mississippi—has been increasing in recent decades, mostly because of increased sediment from the Minnesota River. Within the Minnesota River watershed, the primary sources of sediment are the bluffs, ravines and banks of the Blue Earth and Le Sueur

ivers. At the same time, use of fertilizers on area farm fields is producing increased phosphorus runoff.

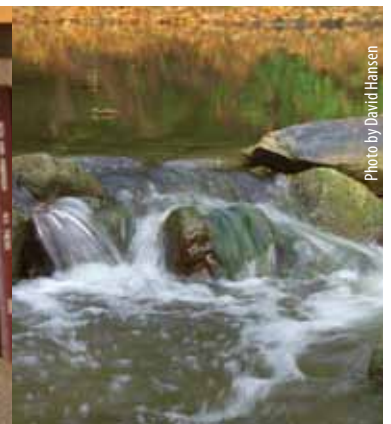
Because the Lake Pepin watershed is so large and encompasses so many rivers and their tributaries, it's difficult to show a cause-effect relationship between human action and river impairment. So the team, which is co-led by Department of Applied Economics professor Stephen Polasky, is looking closely at the much smaller watershed around Seven Mile Creek, a Minnesota River tributary near St. Peter, Minnesota. Using a series of

biophysical and economic models, they're examining the impact of various agricultural management practices and calculating the costs and benefits to humans from cleaning up the river, with the goal of finding win-win scenarios on both an ecological and economic level, Mulla says.

The models help show how any change to the watershed's ecosystem could have far-reaching and possibly unforeseen effects. Because, as Mulla's past work has shown, changes in climate and upstream land management affect runoff and drainage, "we need to look at the upland practices that would either store more water on the land, or reduce the discharge of water to the streams," thus reducing channel sources of erosion and resulting sediment, he said. Scenarios to be evaluated include the effects of conservation tillage; of planting woody biomass or prairie grass as biofuel crops; and improved fertilizer management, among others. The team also will model scenarios that involve creating buffer zones around water, increasing wildlife refuge areas and planting highly erodible areas with grass, and eventually make recommendations for the watershed that take into account all of the possible effects.

"The main idea is to start to optimize our landscapes so we can provide ecosystem services while also making good productive use of the landscape," Mulla says. ■

David Mulla's study of one watershed on a micro scale may lead to recommendations for water use on a larger scale.



The Forest or the Trees

Examining oak wilt management policy from the ground up

Under the old oak tree in the back yard a disease may be spreading, offering only some wilted, falling leaves as a sign of infection. When that warning comes, that homeowner has a narrow window to deal with the dying tree, before the sickness spreads through the area.

Caused by an invasive fungus, oak wilt is an aggressive disease that spreads through root systems and through spore production that affects all species of oaks in Minnesota, and is especially lethal to red oak. It can kill trees in a single season, and the primary management tools are root graft barriers, fungicide injections, and the removal of infected trees. The Minnesota Department of Natural Resources offered the Releaf community assistance program to help stem the spread of oak wilt, but because it was decentralized, communities developed very different management strategies with varying degrees of success.

Adam Kokotovich and Adam Zeilinger, graduate students in the Introduced Species and Genotypes IGERT program, went to the source—interviewing local land and forest managers—to find out what was influencing policy enforcement in their districts. They gathered information on 16 oak wilt management programs in the Twin Cities area, illustrating the financial

and social challenges facing invasive species management at the local level.

What they found was that both policy and enforcement varied wildly among districts. While about 20 percent of participating communities didn't have ordinances requiring removal of spore-producing trees at all, almost half of those that did were reluctant to enforce the ordinances because of the financial burden to individual landowners. A few others expanded their oak wilt policy beyond removal to strategically plant other native trees in public lands and to develop relationships for combating future invasive pests. Only about half of the program managers felt the DNR's goal for oak wilt suppression was obtainable.

"There also was a big difference in the tools people chose to deal with infected trees, depending on whether it was a more rural or urban area," said Zeilinger, a conservation biology major. "Urban landowners tended to want to save one really old tree in their front yard and were willing to implement fungicide injections even though they aren't covered by state funds, whereas rural landowners with an

acre of oak trees just wanted to stop the spread."

The research project was part of a semester-long IGERT practicum tackling a real-world invasive species management issue in the spring of 2008. Using in-depth interviews to gather information from an underrepresented source yielded a wealth of data that the team hopes can guide state programs in developing flexible policies for local invasive species management. Their findings were published in the January 2011 issue of the professional journal *Urban Forestry and Urban Greening*.

"Scientists often focus on the scientific or environmental aspects of policy and management issues," said Kokotovich, a natural resources science and management major. "Yet equally constituting them are these social and political factors. By looking at them, we can provide important insights for designing improved programs that could otherwise be missed."

—Sara Specht

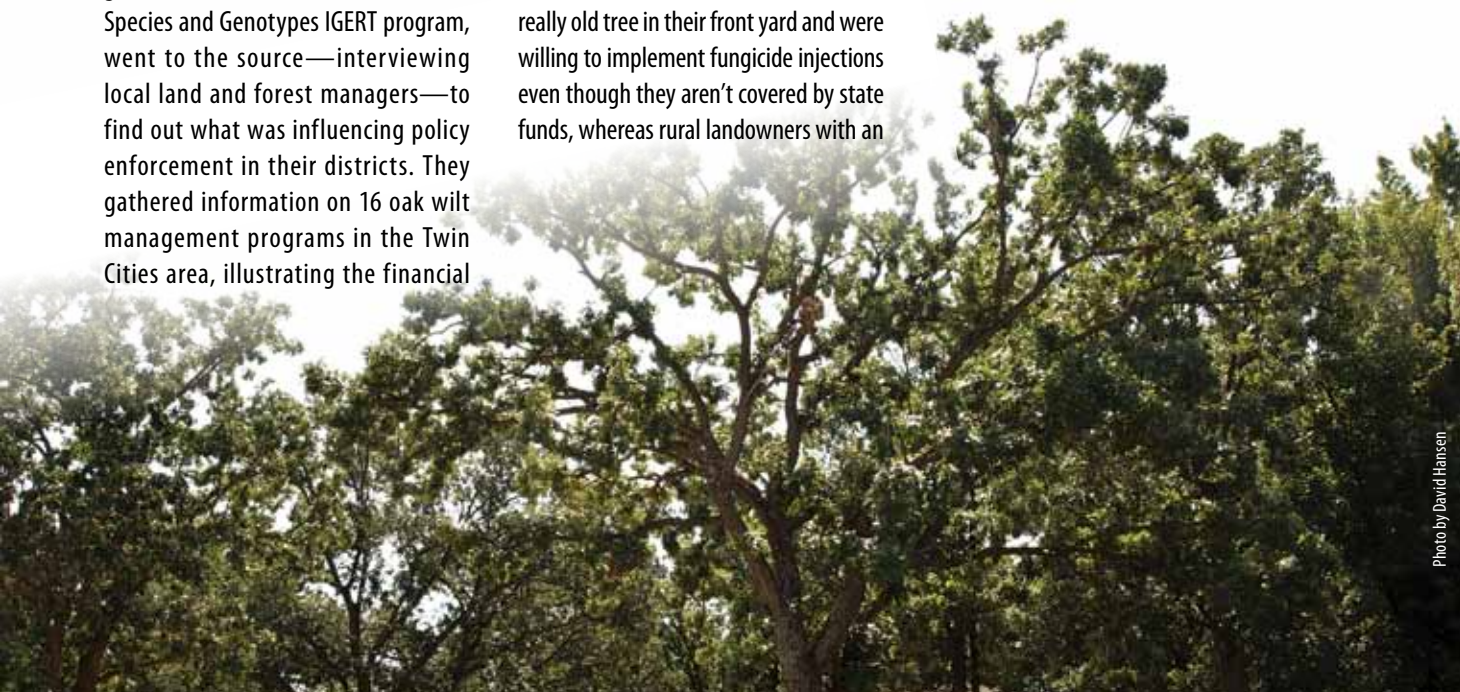


Photo by David Hansen

Make Time for the Future

The engine that keeps Alumni Society programs thriving

Photo by Martin Moen



By Roger Chamberlain, CFANS Alumni Society 2011–2012 board president

There are days when I am quite simply overwhelmed with the continuous drumbeat of life—how it just doesn't seem to stop to offer one the opportunity to take a deep breath. It's at these times it would be easy for me to say I just don't have time for the CFANS Alumni Society. But then I get kicked back to reality (sometimes by Mary Buschette!) by remembering the value the Society provides to alumni, students, faculty, staff and friends of the university and college. I also remember that things get done because we band together—no one person on their own can accomplish all that is necessary.

The Alumni Society Board of Directors holds an annual board retreat—just a half day session—to focus on our purpose and what we'd like to see done during the coming year. Nearly every one of our board members attended this year's retreat on July 12 and it was the start of what I am confident will be a rewarding year of activities and accomplishments. Here is a list of some of the just passed and upcoming board-sponsored activities along with the name of the person who has or will lead the event.



Photo by Mike Lee

2011 Golf Scramble for Scholarships



Photo by Darren Lochner

2011 Classes Without Quizzes



Photo by Darren Lochner

2011 Mentor Program Kickoff

Golf Scramble for Scholarships—Scott Manwarren: This annual golf event is held at the U of M Golf Course. Golf registrations and a silent auction have raised about \$150,000 over the past eight years and have already provided scholarships to roughly 45 students.

Borealis Night of Excellence—Val Aarsvold: Students, faculty, alumni and friends are recognized for excellence and service to CFANS.

Classes Without Quizzes—Shawn Haag: This annual, half-day event showcases research done by CFANS faculty through presentations to attendees. A kids' program has been added to inspire children to love science.

Mentor Program—Paul Hugunin: This program matches students and professionals to help guide the student to a more rewarding college experience and to open more doors to professional opportunities.

Homecoming—Quincy Lewis and Bob Lefebvre: A week of Homecoming events is planned to bring alumni back to campus, to allow alumni and students to interact and to build university and CFANS spirit and loyalty.

Science Achievement Award—Kent Horsager: A program that reaches out to high school juniors to recognize academic achievement in science.

Not every leader is a member of the CFANS Alumni Society Board of Directors. We encourage any and all alumni to seek ways to get involved and give back to CFANS. If you see a program or event you have a keen interest in, please feel free to contact me or Mary Buschette, director of alumni and constituent relations. Maybe you have an idea for a new program or event. Let us know.

The CFANS Alumni Society Board is a working board. We get very involved in the planning and execution of sponsored events. However, we receive excellent support from staff, principally Mary Buschette, Darren Lochner and Holly Klinger. I extend a hearty "thank you" for their strong and ongoing contributions.

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HOME COMING 2011

OCTOBER 16-22

SAVE THE DATES!

FRIDAY, OCTOBER 21

CFANS Fall Fest: St. Paul Campus, 1:00-4:30 pm

Alumni & Friends Pre-Parade Reception:

Bell Museum of Natural History, 5:00-7:00 pm

U of M Homecoming Parade:

University Avenue, 7:00-9:00 pm

SATURDAY, OCTOBER 22

CFANS tailgate: Ski U Mah lot of TCF Bank

Stadium, 10:00 am - game time

More details will be posted on our homecoming page as they become available.

z.umn.edu/cfanshomecoming



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA



Nature's Resources

For the DNR commissioner, it's all about appreciating the outdoors



Photo courtesy University Minnesota Department of Natural Resources.

Things were simpler when Tom Landwehr was a student.

When he began studying natural resources management at the U of M back in 1973, Minnesota had fewer people, more wild land and not as many outreach programs. The public believed strongly in government's ability to protect nature: it was a time when Earth Day was created and Congress passed the Endangered Species Act and other protective laws. His fellow students were largely from rural backgrounds and had experience camping, hunting and fishing.

Now, as commissioner of the Minnesota Department of Natural Resources and an adjunct instructor in the Department of Fisheries, Wildlife and Conservation Biology, Landwehr ('80—B.S.; '86—M.S., wildlife; '01—M.B.A., business administration) faces a different set of challenges.

"Minnesotans are much more concentrated in urban areas now, and conservation has become an extremely multi-faceted arena," he says. "At the same time, issues are so much more visible; people can organize and engage on any topic." His agency's high profile means managing natural resources becomes a question of managing citizens' expectations too, he says.

While managing the state's 5.5 million acres, 67 state parks and thousands of miles of trails, fish and wildlife populations will continue to be the agency's bread and butter: getting more people to spend time outside is a key goal for the DNR, Landwehr says. "I'm very concerned with the trends that are showing people spend less time outdoors," he says, "this portends a reduced level of interest in caring for our natural world." Part of the DNR's mandate is to reach out to citizens, and while he's commissioner, the agency will work to encourage outdoor activity participation.

Programs like "I Can Camp," which helps beginning campers overcome obstacles such as lack of equipment or knowledge, give people the skills they need to start enjoying Minnesota's resources at a low cost, he says. "If they do something like that and enjoy it, then their interest in the outdoors will blossom. And if you get engaged in one form of activity, chances are you will do more."

The same trend is showing with students, he says. Some students come into his class saying they want to work in the environment, but have very little actual experience outside; much of what they know, they've learned by watching, not by doing. He encourages them to spend time outdoors, and to expand their academic horizons to acquire a broad range of skills if they want to influence natural resources policy.

Landwehr started his career as a wildlife biologist at the DNR, spent 17 years there in a number of roles, earned master's degrees in natural resources and in business, and then spent 12 years working with nonprofit conservation groups—Ducks Unlimited and The Nature Conservancy—before he was appointed by Governor Mark Dayton to head the agency.

That experience in both the public and private sectors will serve him well throughout his term as commissioner, Landwehr says. "The conservation community is a continuum; everybody, whether they know it or not, has an interest in natural resources, so in this state you can have 6 million different opinions. The job of the department is to balance the need for creating wealth and providing opportunities with sustaining resources for the future."

—Becky Beyers

Fall is **BIG** at the Bell!



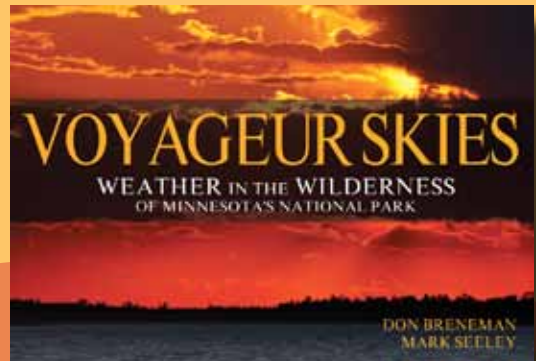
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Voyageur Skies: Weather in the Wilderness of Minnesota’s National Park

October 1 through December 31

This exhibit features the artistry of former UMN professor and photographer Don Breneman who captures four seasons in Voyageurs National Park, paired with text by UMN professor and climatologist Mark Seeley to illustrate the risk and impact of climate change on the waters and landscape of Minnesota’s only national park.



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SAVE THE DATE!

October 16–22

Homecoming

Friday: CFANS Fall Fest &
Pre-Parade Reception

Saturday: CFANS Tailgate

January 5, 2012

Alumni Social at the Northern
Green Expo

April 7, 2012

Classes Without Quizzes

Last issue's answer

OK, so it was sort of a trick question. Department of Forest Resources associate professor Rebecca Montgomery is working here with then-students Amber Ellering and Chris Gronewald, using a compass to get a bearing along which they will run a transect with the meter tape that Chris is holding. Lots of readers correctly pointed out that they're using a compass, but Patrick Scheller (B.S. Forest Resources, '82) looked closely enough to notice that it's a staged photo—they're not sweating or dirty. Gronewald also wrote in: "I had better know what they were doing, I'm one of them! Funny part is, we were posing for that photo." Both Scheller and Gronewald will get a CFANS coffee mug.



Can You Identify this Photo?



Photo courtesy University Archives. Copyright Regents of the University of Minnesota. All rights reserved.

We couldn't resist this photo from the home economics department back in 1961. Why is the dress so small? And why does the woman who's watching look so deadly serious? If you know the answers—or even better, if you recognize the women in this photo—let us know at solutions@umn.edu. The correct—or maybe just the most entertaining—answers will receive an official CFANS coffee mug.

BY THE NUMBERS U of M's Economic Impact

1.5 billion

ANNUAL ECONOMIC IMPACT OF RESEARCH
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How much every dollar invested in the U generates for **Minnesota's economy**

5

Rank of the university among Minnesota's **top employers**

14,000

NUMBER OF DEGREES THE U OF M AWARDS EACH YEAR

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TOTAL NUMBER OF JOBS ON U OF M CAMPUSES

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U of M Tax Revenue generated annually

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Estimated number of business enterprises **FOUNDED BY U OF M ALUMNI**

Source: University Office of the Vice President for Research

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Third Thursdays after 4:30 p.m., free admission, April-Oct.; Memberships start at \$45.



Minnesota Landscape
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www.arboretum.umn.edu

Pursuing Her Passion

Scholarships help environmentally minded student thrive



Photo courtesy Eliza Grames

Eliza Grames, a soon-to-be CFANS junior, was thrilled when she found out she was honored with not one, but two prestigious scholarships for the coming academic year.

Grames is excited for the opportunities the Robert D. Peterson Award, as well as the Robert Henton Fund Award, will provide.

Growing up on a rural farm in Wisconsin gave her a strong passion for the environment that led to her major in Environmental Sciences, Policy and

Management. She hopes to use what she learns as an undergraduate to conduct communications and public relations for a nonprofit or governmental organization focusing on raising public support for policies related to public transportation, energy usage, corporate sustainability, environmental protection funds and wilderness preservation.

But none of it would be possible without the help of the two scholarships, she said. "Having scholarships like the Robert Henton Fund and the Robert D. Peterson Award helps me to maintain my GPA by allowing me the time I need to prepare for my classes and also motivates me to work hard and achieve good grades."

Not only do the scholarships allow her to be stress free, they have also given her many chances to contribute to the University of Minnesota and the Twin Cities area through leadership and volunteer opportunities. She has volunteered with Dodge Nature Center

to create an exhibit in the Minneapolis skyway system and as a worker on a family-owned organic banana farm in Hawaii, been a committee leader for the university's Quiz Bowl team, and finally she was able to obtain an internship as a watercraft inspector with the state Department of Natural Resources this past summer.

"I believe that every human has the right to clean water, unpolluted air, green grass and a sustainable food supply," Grames said.

The Robert D. Peterson Award encourages students to develop written communication skills. The Robert Henton Fund was established to support students studying agriculture and related fields. Both scholarships were created through the college and university's Future Gifts program. For information on the program, see www.cfans.umn.edu/CFANSGiving/FutureGifts. —Hayley Vogt

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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DISCOVER CEANS

Photos by Don Breneman



VOYAGEUR SKIES: Weather and the Wilderness in Minnesota's National Park

Stunning photographs from Voyageurs National Park and descriptions of how weather has shaped Minnesota's only national park are combined to illustrate the risk and impact of climate change on the park's pristine waters and landscape. This exhibit at the Bell Museum of Natural History features the artistry of former U of M professor and photographer Don Breneman, who has spent a lifetime photographing the park near his boyhood home, and text by Department of Soil, Water, and Climate professor Mark Seeley. Their work richly describes all four seasons in this diverse national park. The exhibit opens Saturday, October 1 and is free with museum admission. Signed copies of Breneman's and Seeley's book of the same name will be available for purchase in the lobby.






College of Food, Agricultural
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CFANS 2011 CALENDAR OF FALL 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.

September 6

Fall 2011 semester begins

September 15

Southern Research and Outreach Center's
10th Annual Open House, Waseca

September 22

University of Minnesota President Eric Kaler
inauguration ceremonies

September 30

Willard Cochrane Lecture in Public Policy
Speaker: Per Pinstrup Andersen
Cargill Building, St. Paul Campus

October 16–22

University of Minnesota Homecoming

October 20

University of Minnesota Alumni Association annual awards
McNamara Alumni Center

November 17

Thanksgiving for Scholarships, McNamara Alumni Center

December 22

Fall semester ends

January 17, 2012

Spring semester Begins