

# grow

Wisconsin's Magazine for the Life Sciences • Spring 2014

food systems • health • bioenergy • environment • climate • communities



## *Celebrating 125 years of* CALS



College of Agricultural & Life Sciences  
UNIVERSITY OF WISCONSIN-MADISON

OUR LATEST, GREATEST DEVELOPMENTS • GLOBAL HEALTH DRAWS STUDENTS • GOODBYE, BUG GUY





★ Ag Hall

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# grow

Wisconsin's Magazine for the Life Sciences

## 14 12 in 125: A CALS Celebration

This year marks the college's 125th anniversary. To celebrate, we present a dozen standout developments that have taken place at CALS over the last 25 years alone.

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No one knows insects like Phil Pellitteri—and no one has helped Wisconsin citizens more in dealing with them. We bid our state's beloved entomologist a fond farewell as he retires.

*By Ron Seely*

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What do millennials want? A certificate in global health, introduced two and a half years ago, is a runaway hit with undergrads.

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A special CALS history edition!

### New buildings on the CALS campus since our centennial:

- 1 Genetics-Biotechnology Center Building (1995)
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- 3 Microbial Sciences Building (2007)
- 4 Wisconsin Institutes for Discovery (2010)
- 5 Wisconsin Energy Institute (2013)
- 6 Hector F. DeLuca Biochemical Sciences Complex (dedication April 2014)

*Learn more about them on page 19.*

*Cover art of Ag Hall building detail by Diane Doering*

Dean Kate VandenBosch

## It's Your Party



This year marks CALS' 125th anniversary, a milestone known as a "quasiquicentennial." One hundred and twenty-five is a proud age to reach. And we invite you, as alumni, to come celebrate.

Most of our events this year will have a "quasqui" flavor as we offer tributes to historic moments, glimpses of our exciting future, and a special commemorative ice cream developed at Babcock Hall. Of particular interest to alumni this spring are Science Expeditions (April 4–6), where families can enjoy hands-on learning with CALS researchers; the CALS Undergraduate Research Symposium (April 22) showcasing work by our budding scientists; and on April 24, a dedication ceremony for the new Hector F. DeLuca Biochemical Sciences Complex.

Within CALS, our departments of soil sciences and horticulture are celebrating their own 125ths with festivities on May 23 and June 19, respectively.

**"We invite you, as alumni, to come celebrate."**

And not to be missed: a 125th celebration barn dance on June 28 at the family farm of Susan Crane, chair of the CALS Board of Visitors. All proceeds from the event, including a silent auction, will go to enhancing the student experience and growing the CALS Annual Fund, which allocates support to students and programs that need it most. You can learn more about this and other festivities at the website [cals.wisc.edu/125th](http://cals.wisc.edu/125th).

We see this year as an opportunity not only to toast our many achievements but also to help our alumni and friends more actively engage with CALS. As part of our strategic planning process we have formed an alumni engagement working group headed by assistant dean Heidi Zoerb.

Simply put, the goal of this group, which includes alumni, board members, faculty and staff, is to learn more about our graduates. What elements of your CALS connection do you find the most exciting and fulfilling? Many of you are involved with the Wisconsin Agricultural and Life Sciences Alumni Association (WALSAA), a hardworking volunteer group that supports the college through a number of important and very popular activities. But we believe that, across our campus, we could and should be doing more to strengthen your CALS connection, especially since our graduating classes keep getting bigger. What can we do to help keep you close, to make you feel like part of the CALS family? Many of you participated in a survey the group recently sent out asking for your suggestions. We still very much welcome your comments at [alumni@cals.wisc.edu](mailto:alumni@cals.wisc.edu).

Our 125th anniversary is your celebration. And we want to ensure that your celebration of CALS continues when the year is over. With your engagement, we can keep our college strong. I am certain that when we read about our latest, greatest achievements in the year 2039—our sesquicentennial!—they will be every bit as impressive as those we look back on today.

grow

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# On Henry Mall

News from around the college

## Stopping Multiple Sclerosis

A successful treatment in mice holds promise for humans

A diagnosis of multiple sclerosis (MS) is a hard lot. Patients typically get the diagnosis around age 30 after experiencing a series of neurological problems such as blurry vision, a wobbly gait or a numb foot.

From there, this neurodegenerative disease follows an unforgiving course. People with severe cases are typically bed-bound by age 60. Current medications don't do much to slow the disease, which afflicts around 400,000 people nationwide, with 200 new cases diagnosed each week.

Now a team of CALS biochemists has discovered a promising vitamin D–based treatment that can halt—and even reverse—the course of the disease in a mouse model of MS. The treatment involves giving mice exhibiting MS symptoms a single dose of calcitriol, the active hormone form of vitamin D, followed by ongoing vitamin D supplements in their diet.

“All of the animals just got better and better, and the longer we watched them, the more neurological function they regained,” says CALS biochemistry professor Colleen Hayes, who led the study and published her team's findings in the *Journal of Neuroimmunology*.

While scientists don't fully understand what triggers MS, some studies have linked low levels of vitamin D with a higher risk of developing the disease. Hayes has been studying this “vitamin D hypothesis” for the past 25 years. She and her researchers have revealed some of the molecular mechanisms involved in vitamin D's protective actions, and also explained how vitamin D interactions with estrogen may influence MS disease risk and progression in women.

In the current study, funded by the National Multiple Sclerosis Society, Hayes' team compared various vitamin D–based treatments to standard MS drugs. In each case, vitamin D–based treatments won out. Mice that received them showed fewer physical symptoms and cellular signs of disease.

Hayes' team compared the effectiveness of a single dose of calcitriol to that of a comparable dose of a glucocorticoid, a treatment now in use. Calcitriol came out ahead, inducing a nine-day remission in



PHOTO BY SEVIE KENYON BS'80 MS'06

92 percent of mice on average, versus a six-day remission in 58 percent for mice that received glucocorticoid.

“So, at least in the animal model, calcitriol is more effective than what's being used in the clinic right now,” says Hayes.

But calcitriol can carry some strong side effects—it's a “biological sledgehammer” that can raise blood calcium levels in people, Hayes says. After experimenting with various doses, her team arrived at a regimen of a single dose of calcitriol followed by ongoing vitamin D supplements in the diet. This one-two punch “was a runaway success,” she says. “One hundred percent of mice responded.”

While she is excited about the prospect of her research helping MS patients someday, Hayes is quick to point out that it's based on a mouse model. The next step is human clinical trials. A multicenter clinical study is currently being designed. If trials are successful, people experiencing those first warning signs—the wobbly gait, the numb foot—could receive the new treatment and stop the disease in its tracks.

“It's my hope that one day doctors will be able to say, ‘We're going to give you an oral calcitriol dose and ramp up the vitamin D in your diet, and then we're going to follow you closely over the next few months. You're just going to have this one neurological episode and that will be the end of it,’” says Hayes. “That's my dream.”

**Biochemistry professor Colleen Hayes (right) and researcher Faye Nashold have come up with a treatment for multiple sclerosis that works well in mice—offering hope for treatment in humans.**

—NICOLE MILLER MS'06



# Looking for “hotspots”

Researchers see promise in clusters of farmers who are willing to grow crops for biofuels



PHOTO BY RANDY JACKSON

**Lands unsuitable for growing food could be used to grow perennial grasses for biofuel.**

In their quest to make cellulosic biofuel a viable energy option, many researchers are looking to marginal lands—those unsuitable for growing food—as potential real estate for bioenergy crops.

But what do farmers think of that? Brad Barham, a CALS/UW-Extension professor of agricultural and applied economics and a researcher with the Great Lakes Bioenergy Research Center (GLBRC), took the logical next step and asked them.

Fewer than 30 percent were willing to grow nonedible cellulosic biofuel feedstocks—such as perennial grasses and short-rotation trees—on their marginal lands for a range of prices, Barham and his team found after analyzing responses from 300 farmers in southwestern Wisconsin.

“Previous work in the area of marginal lands for bioenergy has been based primarily on the landscape’s suitability, without much research on its economic viability,” says Barham, who sent out the survey in 2011. “What’s in play is how much farmers are willing to change their land-use behavior.”

Barham’s results are a testament to the complex reality of implementing commercial cellulosic biofuel systems.

Despite the minority of positive responses, researchers found that there were some clusters—or “hotspots”—of farmers who showed favorable attitudes toward use of marginal land for bioenergy.

These hotspots could be a window of opportunity for bioenergy researchers since they indicate areas where feedstocks could be grown more continuously.

“People envision bioenergy crops being blanketed across the landscape,” says Barham, “but if it’s five percent of the crops being harvested from this farm here, and 10 percent from that farm there, it’s going to be too costly to collect and aggregate the biomass relative to the value of the energy you get from it.”

“If we want concentrated bioenergy production, that means looking for hotspots where people have favorable attitudes toward crops that can improve the environmental effects associated with energy decisions,” Barham notes.

CALS agronomy professor Randy Jackson is also interested in the idea of bioenergy hotspots. Jackson, who co-leads the GLBRC’s area of research focusing on sustainability, says that just because lands are too wet, too rocky or too eroded to farm traditionally doesn’t mean they aren’t valuable.

“The first thing we can say about marginal lands is that ‘marginal’ is a relative term,” says Jackson. Such lands have a social as well as a biophysical definition. “This land is where the owners like to hunt, for example.”

The goal of GLBRC researchers like Barham and Jackson is to integrate the environmental impacts of different cropping systems with economic forces and social drivers.



The environmental benefits of cellulosic biofuel feedstocks such as perennial grasses are significant. In addition to providing a versatile starting material for ethanol and other advanced biofuels, grasses do not compete with food crops and require little or no fertilizer or pesticides. Unlike annual crops like corn, which must be replanted each year, perennials can remain in the soil for more than a decade, conferring important ecosystem services like erosion protection and wildlife habitat.

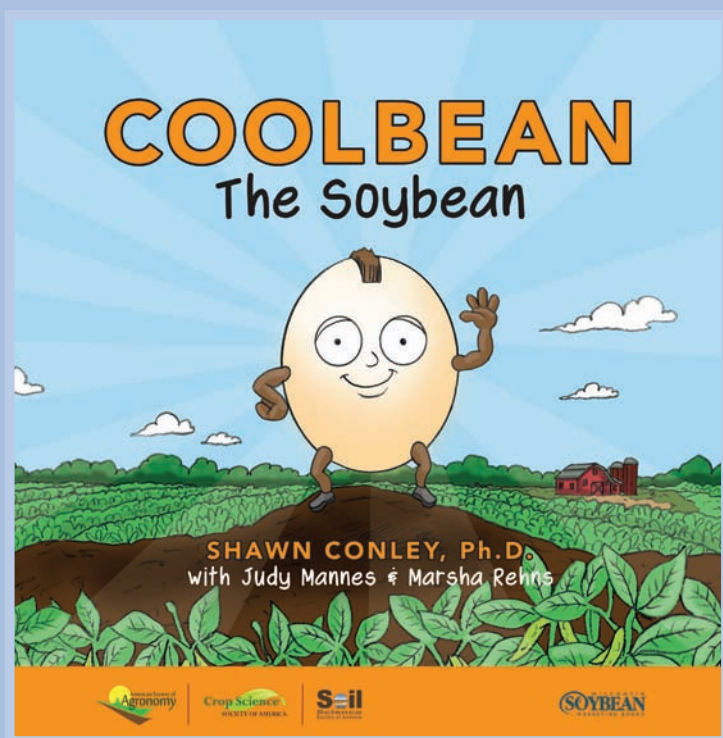
The ecosystem services, bioenergy potential and social values that influence how we utilize and define marginal land make it difficult to predict the outcomes of planting one type of crop versus another. To tackle that problem, Jackson is working with other UW–Madison experts who are developing computer-

based simulation tools in projects funded by the GLBRC and a Sun Grant from the U.S. Department of Energy.

Jackson hopes that these modeling tools will help researchers pinpoint where farmer willingness hotspots overlap with regions that could benefit disproportionately from the ecosystem services that perennial bioenergy feedstocks have to offer.

“These models will include data layers for geography, crop yield, land use, carbon sequestration and farmer willingness to participate,” says Jackson. “There could be as many as 40 data layers feeding into these models so that you can see what would happen to each variable if, say, you were to plant the entire landscape with switchgrass.”

—CELIA LUTERBACHER



Growing future farmers: “Coolbean” teaches kids about soybeans and more.

## Ag Science for Kids

**A PEER-REVIEWED SCIENCE BOOK** might not sound like much fun—but perhaps you haven’t met Coolbean the Soybean, the hero of a new book for kids by CALS/UW–Extension agronomy professor Shawn Conley. It follows the adventures of a friendly, mohawked soybean named Coolbean as he learns about agriculture. Colorful, playful illustrations make the science come alive, and explanations are accurate but simple. To explain photosynthesis, for example—the process by which plants convert light into energy—Conley has two plants chatting about how good the sun feels and how it makes them strong. “The sun gives us our energy,” says Coolbean. “Without it we couldn’t make food ourselves.”

There’s a serious intent behind the fun: to better educate children about agriculture and the science behind it as well as encourage interest in agriculture-related professions. *Coolbean the Soybean* was published by the American Society of Agronomy, the Crop Science Society of America and the Soil Science Society of America, with support from the Wisconsin Soybean Marketing Board. It is aimed at grades 3–5 and is being marketed to schools as well as to the general public. More information at <http://go.wisc.edu/2cx0d7>.



# Coming and Going

A new database offers a 60-year, nationwide and county-by-county look at net migration

You can tell a lot about what a community has to offer by the types of people who are moving in and the types who choose to leave.

Whether an area attracts or loses residents of a certain age group, race or gender says something about the opportunities and amenities you'll find there, points out Katherine Curtis, a CALS/UW-Extension professor of community and environmental sociology.

Curtis, a researcher at the CALS-based Applied Population Laboratory (APL), is part of a multistate

team that has developed new estimates of net migration—the difference between residents moving in and out—for every U.S. county from 2000 to 2010. The estimates are broken down by age, sex and race. Combined with similar estimates from previous decades, the new numbers offer a chance to make decade-by-decade comparisons of migration by age group from 1950 to present.

Those 60 years' worth of estimates are available online at [www.netmigration.wisc.edu](http://www.netmigration.wisc.edu), where users can graph, map and compare migration trends for counties across the nation. The site was created by APL web developer Jim Beaudoin.

"Examining net migration trends helps tell stories of regional and community character and social change," says APL director Dan Veroff.

For example, Kenosha County's migration signature shows the shift from manufacturing (an influx of people in their 20s) to rust belt decline (a net loss in the same age group) to suburban (a big gain of people in their 30s) as the area went through auto manufacturing's boom and bust, then became home to people commuting to Chicago-area jobs.

At the opposite end of the state, net migration in Burnett and Vilas counties is sharply negative for people in their 20s—an exodus typical in remote rural areas—and highest for those in their 60s, as retirees settle to enjoy the lakes and forests. As a result, these counties have some of the state's fastest-aging populations.

"When we see how these things line up over time we can get a glimpse of the future as well," Veroff says. "This is useful for people who need to plan for providing services. It can show if a certain population is going to be stable, or decline or increase. School districts, for example, can use it to project enrollment trends."

While net migration data has been available in the past, it used to require the skills and tools of a demographer to tease it out of large and complicated datasets. The new website eliminates that barrier, Veroff notes.

"One of our goals is to democratize data," he says. "This effort fits squarely in that realm—making useful data available and easy to use for people in many different positions."

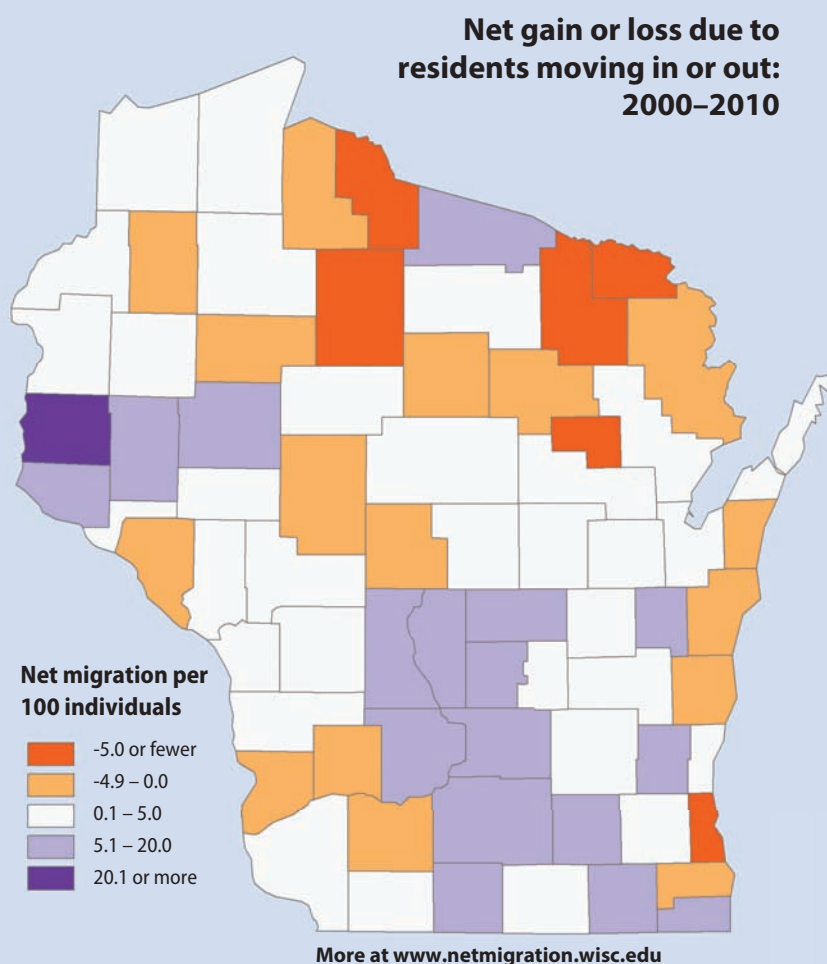


IMAGE PROVIDED BY APPLIED POPULATION LABORATORY/UW-MADISON

—BOB MITCHELL BS'76



## CENTRAL AMERICA

Seeds of Hope—  
Literally

Jim Nienhuis, a CALS professor of horticulture, spends a lot of time conducting research in Central America, a place he has cared about deeply since serving there as a Peace Corps volunteer in the early 1970s. He's never stopped thinking about how to address the region's most pressing problems. Among them: the striking number of single mothers among the rural poor.

"The men had used them and then left for the cities," says Nienhuis. "They were cast off, but they are young, they are smart, they are willing to work, and they love and care for their children. They can't abandon their young families and go to work in the city, but they can and usually do live with their parents, and together they survive."

Often, too, they have small parcels of land—and thus a means of support by intensively growing vegetables both to sell at local markets and to feed their families. Women's agricultural cooperatives—groups that allow these farmers to share resources and experience, ranging from shared tools to increased bargaining power at the market—were formed to help them in those efforts.

The problem: quality seeds are often beyond their means. Multinational seed companies looking to make a profit prefer to sell to large-scale producers—and at up to 15 cents per seed, women hoping to grow crops for market simply cannot afford them. And inexpensive local seeds are highly susceptible to plant diseases that substantially decrease yields.

That's where Nienhuis could help. With funding from USAID, three years ago he began a program called "Seeds of Hope" to teach women in Guatemala, El Salvador, Honduras and Nicaragua to raise their own seeds. As a plant breeder, Nienhuis helped develop open-pollinated varieties of disease-resistant tomatoes and peppers that women could save from their own crops and replant the following year.

The program is making a difference. "The women have really liked the new seed varieties for their rapid

growth and high demand in the market," says Doris Hernandez of CARE El Salvador, who works with the women.

Each year Nienhuis conducts at least one training program in Central America that brings all the women together. And each year the program brings the women to the CALS campus. Workshops have covered everything from small business management and greenhouse production to business technology and seed storage.



PHOTO COURTESY OF JIM NIENHUIS

Last summer, for example, they learned how to better save seeds with clay "drying beads" that are mixed with seeds to absorb moisture. In humid Central America, their use means much higher rates of unspoiled seed for the next planting season. Seeds of Hope supplied beads to each cooperative.

Having access to seeds and training has boosted the women's confidence. Not only do they raise and sell vegetables, they have taken their businesses in new directions. Many of them, for example, now raise seedlings on an increasingly large scale to sell to other local farmers' cooperatives.

"They continue to surprise me with their ingenuity," says Nienhuis. With the new skills and international networks they have developed from Seeds of Hope, women's cooperatives scattered across Central America are positioned for growing success.

—CATHY DAY

**Growing for the market:**  
Horticulture professor  
Jim Nienhuis offers  
women in Central  
America quality seed  
and technical assistance  
both in their native  
countries and on the  
UW–Madison campus.



## classAct

### Hong-En Chen Energizing the Classroom



PHOTO BY MATT WISNIEWSKI

Hong-En Chen worked with little ones at opening festivities for the Wisconsin Energy Institute.

When biochemistry senior Hong-En Chen first got involved with a student organization called Energy Hub, she knew she could bring something special to the table.

As the daughter of a preschool teacher, she'd interacted a lot with young children throughout her own childhood and adolescence. While in high school she worked as a teacher and tutor in music, math and reading in both English and Mandarin at the Einstein School in Madison, a private preschool and after-school enrichment center for elementary school students.

Based on her experience, she saw an important niche for Energy Hub: The group could go out to local elementary schools and hold after-school classes about energy.

"When kids are young, they're like sponges. They absorb a lot of information and are enthusiastic learners," notes Chen. "When we introduced concepts about energy use, conservation and sustainability, the kids impressed us not only by handling complex material, but also by applying ideas to their everyday lives."

As outreach director of Energy Hub, Chen got other club members on board to pilot their project, working with second- to fifth-grade students at four Madison elementary schools. Based on that experience, they applied for and received a Wisconsin Idea Fellowship grant to further develop their curriculum during the 2012–2013 school year. They created a 10-week program that is going strong this year.

Hands-on activities are key, says Chen, whether using an educational science toy like Snap Circuits to teach the concepts behind powering lights and fans, or having students divide into the fantasy cities of Greenville and Coaltown to talk about how they, as residents, would use energy from various sources to get through a day. "It was a fun way to get them thinking about the costs and benefits of renewable versus nonrenewable energy sources," Chen says.

Chen's thinking a lot about that topic herself. She is researching compounds for solar energy conversion in chemistry professor Song Jin's lab. And she is considering graduate programs in materials chemistry with an eye toward working in renewable energy research.

—JOAN FISCHER

Learn more about Energy Hub at [www.uwehub.org](http://www.uwehub.org).

**NAMED FELLOWS** of the American Association for the Advancement of Science (AAAS), **Dominique Brossard**, a professor of life sciences communication, for "contributions to our understanding of the role media plays in influencing public opinion and policy about science and technology, particularly controversial scientific innovations"; and **William H. Karasov**, a professor of wildlife ecology, for "contributions to physiological ecology, particularly in the areas of comparative and evolutionary digestive physiology with implications for basic science and ecological management."



**WINNERS** of the Leopold Conservation Award, the Cates Family Farm, owned and operated by **Dick Cates Ph.D.'83**, director of the Wisconsin School for Beginning Dairy and Livestock Farmers based at CALS, and his wife, **Kim Cates**

**MS'83** (photo above). The award is given by the Sand County Foundation and the Wisconsin Farm Bureau Federation to honor landowner achievement in voluntary stewardship and management of land and natural resources.

**AWARDED** a Rhodes Scholarship, UW–Madison senior **Drew Birrenkott**, a triple major in biochemistry, biomedical engineering and political science. During his two to three years of study at Oxford University Birrenkott hopes to combine those areas of study to prepare for a career in global health and international development.

**RECIPIENTS** of WARF Discovery Challenge Awards: CALS graduate students **Yi-Cheng Wang** (biological systems engineering) and **Ti-Yu Lin** (biochemistry); postdoctoral researchers **Ebony Murrell** (entomology) and **Pierre-Marc Delaux** (agronomy); and master's degree student **Jack Buchanan** (agroecology), who were selected from more than 100 participants in a research symposium and mini-grant challenge to develop groundbreaking interdisciplinary ideas. More info at <http://go.wisc.edu/g5upjx>.

## Number Crunching



## 25 YES, "125" IS STEALING THE SPOTLIGHT

this year, but two esteemed CALS organizations are marking their 25th: **Allen Centennial Gardens** and the **Center for Integrated Agricultural Systems (CIAS)**. A special celebration for Allen Centennial Gardens will be part of a **Posh Plants Auction & Runway Show** featuring new gardening products on **Saturday, June 14, 5–8:30 p.m.** CIAS anniversary events

include a **barn dance** on **Friday, June 27**, at Schuster's Farm in Deerfield. More information about both organizations at [allencentennialgardens.org](http://allencentennialgardens.org) and [cias.wisc.edu](http://cias.wisc.edu).



## Five things everyone should know about . . .

# Sinkholes

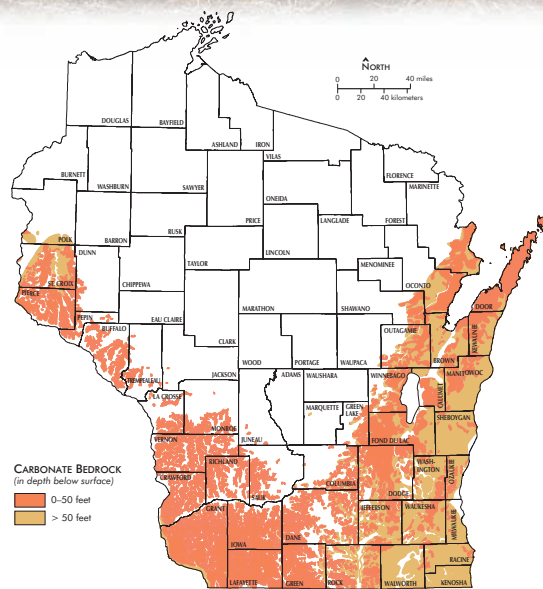
By John Panuska and David Hart

- 1 | They exist in Wisconsin.** Parts of the Badger State have bedrock consisting of dolomite, an easily fractured rock that can be dissolved by water seeping down beneath the surface soil. That erosion can create an underground cavity that becomes a sinkhole if the surface soil above it collapses.
- 2 | But they are relatively small.** The past year has been full of hellacious reports involving sinkholes: the man who survived an 18-foot fall into a sinkhole on an Illinois golf course, the Florida man who died after falling into a 60-foot-deep sinkhole that had formed beneath his home. In Wisconsin sinkholes tend to be much more tame—smaller than 10 feet across. (And, while their depth varies, most sinkholes are about as deep as they are wide.) Wisconsin sinkholes are smaller due to the bedrock found here. Dolomite is less easily dissolved than limestone and other types of rock that allow for bigger sinkholes in other parts of the world.
- 3 | Some parts of Wisconsin are more prone to sinkholes than others.** And to find them, follow the dolomite. It appears in a large V-shaped formation from Green Bay (including Door County) down to Dane County and then back up to St. Croix Falls. The map (right) shows Wisconsin's karst, a landscape created when water dissolves rock—thus making it susceptible to such things as fissures, caverns and sinkholes.

- 4 | Some sinkholes are not due to natural causes.** A water main break can create a large underground cavity with sinkhole potential. Another cause: a ruptured tile drain, a system of perforated pipes installed beneath cropland to remove excess water from the soil. If a section of pipe ruptures (in what is called a “tile blowout”) it may draw in large amounts of soil, thus creating an underground cavity above it.

- 5 | There's a sinkhole on my property!** First decide if the sinkhole is hazardous—and if it is, prevent access to it. Sinkholes should be filled to prevent falls and stop potentially contaminated water from flowing into the groundwater. The best way to fill a sinkhole is to use what is called reverse grading. Use large rocks at the bottom, switch to cobbles and gravel, and end with sand. Then place a seal over it using either a plastic liner or clay, followed by eight to 12 inches of top soil. Ideally the sinkhole should be slightly mounded to keep water away. The larger rocks will support the material above them and the smaller material and mounding will prevent water infiltration.

John Panuska is a distinguished faculty associate in the Department of Biological Systems Engineering and a UW-Extension natural resources specialist. David Hart is a professor of civil and environmental engineering and a hydrogeologist with UW-Extension and the Wisconsin Geological and Natural History Survey.



**A sinkhole in Wisconsin—  
and a map of where one is  
more likely to find them.**

PHOTO BY DAVID HART  
MAP COURTESY OF THE WISCONSIN  
GEOLOGICAL AND NATURAL HISTORY  
SURVEY



# Everyone around the table

Monica White works to ensure greater inclusion in our food system

Interview by Sevie Kenyon BS'80 MS'06



**M**ONICA WHITE arrived at the University of Wisconsin–Madison in 2012 as a professor of environmental justice, with a joint appointment between CALS (community and environmental sociology) and the Gaylord Nelson Institute for Environmental Studies. Previously she was a professor of sociology at Wayne State University in Detroit.

Her research engages communities of color and grassroots organizations that are involved in developing sustainable community food systems. She is working on her first book, *Freedom Farmers: Agricultural Resistance and the Black Freedom Movement*. Other projects include a multiyear, multimillion-dollar USDA research grant to study food security in Michigan.

**Q You're a fairly recent arrival at CALS and the Nelson Institute for Environmental Studies. What goals do you have for your work here?**

I am really excited because it is a position that allows me to talk about how communities are responding to food insecurity, how communities are engaged in local food and urban agriculture, and I can bring that into the classroom. I also bring activists to Madison and take students to Detroit. Madison has been a very welcoming place to integrate all of those pieces of who I am as an academic, as an educator and as a researcher. So there's a nice way that these pieces operate, and my departments are extremely excited about the work that we're doing.

**Q Do you have a specific project you're focusing on?**

One example is for the capstone course in the Department of Community and Environmental Sociology. I took students to Pleasant Ridge, Wisconsin, where students were able to look at a rural community that had a pre–Civil War black settlement. Students were involved in the archives and then we met with folks who live there. Unearthing the history of black farmers in the state of Wisconsin is something that I'm moving toward as we investigate the relationship between communities and agriculture and all the benefits that come from that.

**Q Is urban agriculture something new?**

I would argue not. I would say that as long as we've had people in cities we've had folks engaged in growing. My dad moved from Alabama to Detroit and he always had a garden. Often the assumption is that the northern migration meant folks were leaving behind their agricultural past. But they brought seeds with them and they

brought the knowledge with them to the north—to cities like Gary, Detroit and Chicago.

And if you look back to 1894, Hazen Pingree, then mayor of Detroit, passed an urban gardening ordinance where he encouraged those who owned land to allow that land to be used by those who were unemployed. If we go back to the 1890s, we can't argue that urban agriculture is new.

It's just new in terms of its current incarnation. More people are looking at it as a strategy to respond to food insecurity, and knowledge and news about it are more widely available through the Internet and many other forms of media.

What's encouraging about the movement is that people see themselves as agents intervening in the food system for their own and their community's best interests. So, for example, I see that I have a corner store selling mostly cigarettes, tobacco, alcohol and lottery tickets. And I see vacant land. And instead of saying, "Hey, give us a grocery store," people are using the land to grow food in response to food insecurity. I think that part of it—the intentional political engagement in growing food as a way to respond to neglect on the market side—is probably a way people haven't thought about urban agriculture before.

**Q How does this keen interest in history affect what might happen in urban agriculture today?**

That's a great question. And it's because of my work in urban agriculture that I've looked to other moments in history when communities of color, marginalized communities, have turned to agriculture to rebuild cities.

What I have found is that in moments when the United States has had economic downturns, black farmers have come together in an effort to rebuild or to survive, often in the form of agricultural cooperatives. You have moments where sharecroppers, tenant farmers, landowners—all kinds of agriculture workers—did things to ensure greater access to resources and to stay on and work the land. These agricultural cooperatives operated in three primary ways. One was through political mobilization and political engagement, such as harvest strikes and voter registration drives. Another way was that they pooled their resources. They bought land and tools together, and they would share labor as a way to increase capacity to meet their needs. And the other way was in terms of community and institution building. Way





PHOTO COURTESY OF TIM WOOD

Professor Monica White (foreground, second from left) and her students visiting Pleasant Ridge, a community that included black farmers prior to the Civil War. Many historic grounds, including the site of Wisconsin's first integrated school and a cemetery where black families are buried, are located on and around the CALS-based Lancaster Agricultural Research Station. Local farmer Maury McLean (foreground, left) showed students around those places and shared memories of growing up in an integrated rural community.

back into the 1800s you see black farmers who built and created schools and markets and all kind of things that were pivotal and critical to survival for folks in rural areas post-emancipation.

#### **What makes the process of urban agricultural community building so challenging?**

Young people, in particular, are aware of the trauma around growing food. You'll be on a farm in an urban area and you'll hear children say "I'm not a slave" or "Don't treat me like a slave," and so this conversation around agriculture as oppressive, and the economically exploitive relationships of sharecropping and tenant farming, is something that is very much in the purview of people's understanding of agriculture. Understanding the role of farmers in the civil rights movement and the black freedom movement gives people a different way to look at agriculture—at how black communities have benefited from a resurgence of growing food in the three key ways I've just described.

#### **Do you have a sense of further work that needs to be done in Wisconsin?**


It's similar to work that needs to be done in a lot of places. How do we broaden the audience? How do we broaden the conversation so that it's more inclusive of folks who have traditionally been marginalized or have been oppressed by agriculture? I don't think that's a Wisconsin thing, I think that's a national, even an international thing. So as we see folks moving from rural areas to urban areas, and then getting to urban areas and finding that there's a lack of access to healthy food, that really is the critical issue. How do you frame this discussion so that more people see

themselves at the table, literally and figuratively? It's about the language that we use and the connection that we make with folks to see themselves as members and agents in their own access to food, also in a community sense. When we grow food together, what does that look like for our community?

#### **Tell us what environmental justice means, since that's a component of your work that we haven't touched on here.**

Environmental justice was a term coined in the 1980s, so it's a relatively new movement. It's a social movement that has two critical points. One is the idea of equal distribution of environmental health benefits and the burdens of environmental degradation. The other is an interdisciplinary body of knowledge that includes theories of the environment, justice, law and governance, policy and planning, development and sustainability. Environmental justice looks at where brown fields and other environmental hazards are located, and asks if we can identify those communities as being ethnically, racially, culturally or economically distinct. It concerns the degree to which there are excessive amounts of environmental hazards in impoverished neighborhoods.

#### **Are people excited about urban agriculture and local foods?**

Absolutely. There are various reasons why people are engaging in the local food movement as growers or buyers or both. In some ways it has become more interesting because people see their place in the food system. Everybody can locate themselves in this movement and feel connected to why it's important to grow food and know where their food comes from. 



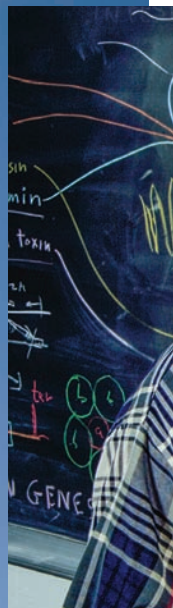


*Celebrating 125 years*

This year marks the 125th anniversary of the College of Agricultural and Life Sciences at the University of Wisconsin–Madison. In honor of the occasion, we present an admittedly arbitrary list—no ranking intended here—of a dozen paradigm shifts, great discoveries and shining moments at CALS since we marked our centennial 25 years ago.

STORIES BY CALS COMMUNICATION STAFF  
PHOTOS BY WOLFGANG HOFFMANN BS'75 MS'79  
UNLESS OTHERWISE NOTED

12<sup>in</sup>  
125





# The Genomics Revolution

When CALS geneticist Fred Blattner sequenced the genome of a harmless strain of *E. coli* back in the mid-1990s, it was a big deal. The bacterium was among the earliest organisms to be sequenced, and the effort, which landed a high-profile article in *Science* in 1997, took years to complete and involved the participation of more than 269 people.

How times have changed.

“Now you can just send something like that to a sequencing center and one person can do the work overnight,” says genetics professor Audrey Gasch, who joined UW–Madison in 2003 as part of a strategic hiring initiative to bolster research in genomics, the field of science that looks at the full set of DNA within organisms.

Over the years, UW researchers have also helped sequence the genomes of potatoes, corn (maize), multiple strains of mice, the leaf-cutter ant, the plant

pathogen that caused the Irish Potato Famine and 99 strains of cold virus, among others.

Beyond sequencing itself, CALS researchers are using genomic information to:

- study molecular evolution,
  - better understand virulence genes in pathogens,
  - find genes involved in human health and disease,
  - develop an optical map of the bovine genome,
  - locate genes associated with infertility in dairy cows,
- and much more.

Gasch, in one bioenergy-related project, compares the genomes of traditional laboratory yeasts to those of their wild relatives in order to pinpoint the genes that make the wild strains more stress tolerant.

“Down the line, this information will help us make customized yeast strains that are optimized to produce different types of biofuels,” she says.

New dairy barn at CALS’ Arlington Agricultural Research Station.



## Bigger, Better Dairy

The last 25 years of dairy research, education and outreach at CALS have driven progress and productivity gains in the Wisconsin dairy business. Since 1989, average milk production per cow per year has climbed 57 percent, from 14,000 pounds to nearly 22,000 pounds per cow today. The state’s dairy farmers reversed a 16-year decline in milk production in 2005. In the last nine years they have boosted annual output by 25 percent, producing a record 27.7 billion pounds in 2013.

These gains, the result of a combination of advancements in cow genetics, reproductive management, nutrition and facilities; adoption of professional management techniques; and a well-educated, receptive group of dairy producers, have revitalized dairying in the Dairy State.

CALS scientists developed mechanisms to mine the bovine genome and then put the results in the hands of dairy producers. Researchers refined and produced the tools needed to take advantage of genetic knowledge with novel methods for breeding and selecting cattle. Dairy nutritionists at



Genetics professor Fred Blattner





**CALS researchers were part of an international team studying how changing levels of carbon dioxide and ozone affect forest ecosystems, using these plots in northern Wisconsin.**

UW–Madison probed feedstuffs and the rumen to create total mixed rations that enable cows to produce to their full genetic potential.

Biological systems engineers, veterinarians and dairy scientists collaborated to develop new bedding and stall types to keep cows comfortable and productive. A complementary mix of educational resources—statewide UW–Extension programs, CALS Farm and Industry Short Courses, and campus teaching facilities and faculty—helped dairy farmers learn and adapt the new technologies to their needs. That extensive research and outreach network gives dairy producers access to the latest and most sophisticated management practices—a partnership that promises to keep Wisconsin dairy strong.

### 3 Coping with the Climate

CALS scientists had our changing climate on their radar screens 25 years ago, but it wasn't on their research agendas. Today the issue influences work being done in every corner of the college. CALS scientists are studying climate impacts at the ends of the earth, in the

Lake Mendota basin and everywhere in between. They're looking at the big picture (using satellites) and small (using genomic sequencing). They're looking under tree bark and inside the guts of dairy cows, and they're looking at impacts on the human animal—on farmers' management practices, for example, and the migration patterns of residents of low-lying coastal areas.

To name some examples: soil scientist Jim Bockheim is looking at whether warming will turn permafrost in Antarctica from a carbon sink to a carbon source, while wildlife ecologist Christine Ribic investigates what melting sea ice means for Adelie penguins. Forest ecologist Phil Townsend and entomologist Ken Raffa are studying the climate-fueled spread of tree-killing bark beetles into new habitats in the Rocky Mountains, while entomologist Rick Lindroth studies how rising levels of carbon dioxide affect forest tree susceptibility to a variety of insects. Soil scientist Matt Ruark leads a multistate project to help dairy farmers reduce their carbon footprint and adapt to weather extremes.

And Chris Kucharik, a climate scientist on the agronomy faculty, helps lead a campus-wide effort to model the impact of climate change on water quality, water

quantity and crop yields right where he lives—in the Yahara River watershed—over the next 60 years. Kucharik also serves as co-chair of the agricultural working group with the Wisconsin Initiative on Climate Change Impacts (WICCI), a partnership between UW–Madison, the Wisconsin Department of Natural Resources and an array of other public and private institutions.

These are but a few highlights. It is safe to say that researchers in every CALS department are working in some way on mitigating or adapting to the impacts of our changing climate.

## 4 Cross-Cutting Studies

There's a growing trend on campus toward interdisciplinary learning, and it's highly evident at CALS.

Consider the college's newest majors: agroecology, introduced as a graduate degree program in 2006, and environmental sciences, which debuted for undergraduates in fall 2011. Or such programs as the Undergraduate Certificate in Global Health, which launched in fall 2011 through the department of nutritional sciences and is open to students from all majors,

**Agroecology students visiting Fantome Farm.**





and the Integrated Studies in Science, Engineering and Society (ISSuES) certificate, which has enjoyed steady CALS student participation since its inception in 2009.

Demand for learning that crosses disciplines reflects a “millennial mindset,” observes Sarah Pfatteicher, CALS associate dean for academic affairs. Many students are interested in addressing the big global issues of our times (depleting energy sources, changing climate and threats to food security, to name a few examples). “They’re driven to pursue an education because they’re driven by grand societal challenges rather than necessarily by a specific career path,” she says.

That kind of thinking is nurtured by CALS faculty, many of whom have long-standing affiliations with the Nelson Institute for Environmental Studies or shared appointments and other close working relationships with various departments and units across the college and campus.

“A lot of the faculty we hire, their research cuts across departments or doesn’t fit under neat labels that we’ve had for the 125-year history of the college,” notes Pfatteicher. “And so we continue to see faculty interest in teaching and advising and thinking about curricula in ways that cut across departments and colleges.”

The college formally adopted an interdisciplinary approach to teaching, research and outreach in its new strategic plan. Under the leadership of Dean Kate VandenBosch, with participation and input from all corners of CALS and the statewide CALS community, the plan identifies the following areas as CALS’ “priority themes”: food systems, bioenergy and bioproducts, healthy ecosystems, changing climate, health and wellness, and economic and community development.

Pursuing those themes is nothing if not an interdisciplinary effort,

VandenBosch says: “I’m expecting we’ll see more new courses and programs that harness the energy of our students who want to cross disciplines to develop better solutions.”

## 5 The Skinny on Obesity

In 1982, a discovery by Dale Schoeller, now a CALS emeritus professor of nutritional sciences, turned the scientific community’s understanding of obesity on its head.

Previously, it was believed that obese people had a low-energy requirement, meaning they burned off calories more slowly than others. But when Schoeller, who was at the University of Chicago at the time, applied a technique known as the doubly labeled water method to measure human energy expenditure, he proved this pervasive hypothesis false.

“This group actually had the same energy requirement, or even a little bit higher, but had been under-reporting their caloric intake on surveys,” says Schoeller.

This paradigm shift changed obesity researchers’ assumptions, helping to point many research projects in the proper direction.

Over the past two decades, scientists—including a number from CALS—have also made great progress understanding the role that genes play in obesity. Biochemist James Ntambi, for one, cloned and studies the SCD-1 gene, which produces an enzyme critical in how the body stores fat. Mice that lack SCD-1 can eat a high-calorie, fat-laden diet but put on virtually no weight.

Fellow biochemist Alan Attie discovered the gene responsible for diabetes susceptibility in obese mice, and nutritional sciences professor Eric Yen is probing the effects of MGAT, a

gene involved in energy metabolism.

While drug companies seek a weight loss pill based on this kind of work, it’s heartening that obesity rates seem to have leveled off—though at 35 percent of the U.S. adult population.

“People are starting to pay attention,” says Schoeller. “They are choosing a healthier lifestyle—walking more and eating better.”



Biochemistry professor James Ntambi and mice, fat and slim.







PHOTO BY LAUREL BACQUE

**Bioenergy researcher at work in the lab of bacteriology professor and GLBRC director Tim Donohue.**

## 6 Bioenergy Booms

Nearly 10 years ago, when the U.S. Department of Energy (DOE) was considering how best to jump-start efforts to convert biomass into biofuel, it convened scientists from UW–Madison and Michigan State University (MSU) at a workshop to identify critical research gaps.

DOE awarded CALS \$125 million over five years to pursue those questions, establishing the Great Lakes Bioenergy Research Center (GLBRC) in 2007 in partnership with MSU and involving a number of other institutions on and off campus. It was the largest federal grant the college had ever received.

GLBRC and other bioenergy researchers have found a new home at the Wisconsin Energy Institute, and their work already has yielded numerous discoveries. Among their achievements:

- Advancing the understanding and use of lignin, a tough compound in plant cell walls that must be broken down to release sugars for processing into biofuel. New enzymes have been discovered to aid in its breakdown, modified plants are in trials, and pretreatment methods have opened the door to using lignin as a valuable co-product.

- Designing pretreatment and conversion processes in tandem. When creating fuels biologically, yeast are often sensitive to the by-products of the fermentation process, including ethanol

itself. Working together, yeast experts and engineers have reduced the processing time and improved yeast to better tolerate those conditions.

- Reimagining the dairy farm as a potential biorefinery in which manure is separated and converted into products ranging from biogas and fertilizer to useful chemicals and bio-plastics, animal bedding, mulch and starting material for ethanol fermentation.

- Committing to economic and environmental sustainability—a cornerstone of the GLBRC’s mission—by producing data on such topics as the impact of biofuel crops on biodiversity, bioenergy crop yield and the feasibility of growing biofuel crops on marginal lands.

More discoveries are under way. The center recently was awarded \$125 million from DOE to continue for another five years.

## 7 The Rise of Organic

When the late Josh Posner, a CALS professor of agronomy, began field trials at the Arlington Agricultural Research Station in 1989 growing crops using a diverse rotation, minimal applications of fertilizer and pesticides, and other “low input” methods, he was also launching one of CALS’ first major efforts to support organic farming. The Wisconsin Integrated Cropping Systems Trial Project (WICST), still going strong, is one of the nation’s longest-running systems trials including organic management.

That same year, the Center for Integrated Agricultural Systems (CIAS) was founded to serve as an incubator and outreach center to farmers and citizens for the college’s bur-

geoning sustainable agriculture research programs.

Wisconsin now has more organic dairy farms than any other state and is home to the Organic Valley farmer cooperative, which is approaching \$1 billion in annual sales and enjoys strong participation among Wisconsin producers.

CALS and UW-Extension efforts in organic farming research have both contributed to and grown with that boom, inspiring interdisciplinary collaborations from agronomy, horticulture, soil sciences, plant pathology, entomology, dairy science and other departments as well as undergraduate courses in organics to help develop future leaders, notes Erin Silva, who joined agronomy in 2006 as the college’s first dedicated organics researcher.

Optimizing organic management practices and plant breeding for organic systems are two areas in which CALS has been particularly strong, Silva says,

**Harvesting at Tipi Produce, an organic farm in Evansville owned by Steve Pincus BS’90.**







**Biochemistry professor  
Hector DeLuca's pharmaceuticals  
have been highly lucrative for  
UW–Madison.**

citing a pasture management project conducted in collaboration with Organic Valley and two organic plant breeding fellowships funded by Seed Matters, an initiative of the nonprofit Clif Bar Family Foundation.

Part of Silva's job is to foster university–industry partnerships—and she sees more of them happening in the future. “They have definitely increased over the last few years,” says Silva. “As organic producers have been in business for a longer period of time, they’re realizing the need for more research-based recommendations and more advanced management practices.”

## 8 The New CALS Campus

Campus buildings often tell a story about directions in research, education and outreach. If you take a walk along and around Henry Mall, you'll see facilities opened during the past 25 years that have been key to CALS activities:

- The Genetics–Biotechnology Center Building (1995) on Henry Mall, housing the Biotechnology Center, the Genome Center of Wisconsin, the Center for Nanotechnology and the Laboratory of Genetics, which is comprised of the Department of Genetics (CALS) and the Department of Medical Genetics (School of Medicine and Public Health).

- D.C. Smith Greenhouse (1996) on Babcock Drive, a 10,000-square-foot space used to grow plants primarily for CALS instruction, especially for undergrads. The greenhouse is also used for outreach to learners of all ages as well as

## 9 Discoveries Hit the Market

The Wisconsin Alumni Research Foundation (WARF), the nation's first university-based patent and licensing office, was launched with a discovery from CALS. Biochemist Harry Steenbock learned how to fortify food with vitamin D by exposing it to ultraviolet light, an innovation that led to the almost complete eradication of rickets. Steenbock wanted to ensure that proceeds from university-based patents would be invested in further university research—and so WARF was born.

That was last century, but the path from CALS through WARF to the marketplace remains vibrant. We asked the intellectual property staff at WARF to consider significant CALS-based inventions from the past 25 years based on such criteria as benefit to the university, societal impact and staying power. We present a half-dozen standouts\*:

**1990 Ann Palmenberg (biochemistry)**

**An RNA translation enhancer** to enable the efficient production of proteins outside of cells, offering biotech companies a more effective way to produce commercial-scale amounts of proteins that they can sell for scientific study and other uses.

**1996 Mark Cook (animal sciences), Michael Pariza (food science)**

**Products using conjugated linoleic acid (CLA)**, a natural fatty acid that has many positive health effects, including preventing body fat accumulation and increasing lean body mass, reducing inflammation and decreasing atherosclerosis. CLA also helps improve feed efficiency and fat quality in animals.

**1998 Hector DeLuca (biochemistry)**

**Zemplar**, a prescription drug based on an active form of vitamin D, used to treat renal disease. Zemplar is one of eight pharmaceuticals to have come from the DeLuca lab over a 30-year period (1968–1998) based on the discovery of the vitamin D endocrine system. Altogether they have earned WARF and UW–Madison more than \$500 million.

**2002 Franco Cerrina (engineering), Michael Sussman (biochemistry), Fred Blattner (genetics)**

**DNA arrays**, chips containing microscopic DNA spots for genetic research. Scientists use DNA chips to measure the gene expression levels of large numbers of genes—thousands of them—all at the same time. This invention simplifies the process of making the chips, making them much more affordable for researchers everywhere.

**2004 Eric Johnson (bacteriology)**

**Highly purified botulinum toxins** for the treatment of neurological disorders (including involuntary muscle movements and spasticity) as well as for potential use in removing wrinkles. “Evabotulinum toxin,” as it is called, is now in clinical trials and is being pitched as a longer-lasting, better formulated alternative to Botox.

**2005 Brent McCown (horticulture), Eric Zeldin (horticulture), Peter Normington**

**HyRed cranberry**, a high-pigment, high-yield cultivar that matures quickly, thus allowing farmers in cold-weather regions to harvest their cranberries after full development of fruit color.

\* Some of these inventions encompass multiple patents; the listed dates represent the year the invention was first licensed or introduced into the market.



public receptions and other events.

- The Microbial Sciences Building (2007) on Linden Drive, home to CALS' Department of Bacteriology and the Food Research Institute as well as the Department of Medical Microbiology and Immunology (School of Medicine and Public Health).



In the conservatory of the D.C. Smith Greenhouse.

- The Dairy Cattle Center (2013) on West Linden Drive, a remodeled facility offering a state-of-the-art home to 88 milking cows in a tie-stall barn, established in partnership with the School of Veterinary Medicine and located one block away from the classrooms and laboratories of CALS' Department of Dairy Science.
- Our newest construction: The Hector F. DeLuca Biochemical Sciences Complex (Henry Mall), which includes the Biochemistry Building, the Biochemical Sciences Building and the Biochemistry Laboratories, each bearing DeLuca's name. The facilities

house members of the Department of Biochemistry in CALS and the Department of Biomolecular Chemistry in the School of Medicine and Public Health. Dedication ceremony on April 24; details at [cals.wisc.edu/125th](http://cals.wisc.edu/125th).

Nearby and noteworthy:

- The Wisconsin Institutes for Discovery (2010), on North Orchard Street, and the Wisconsin Energy Institute (2013), on University Avenue, serve as home to numerous CALS researchers who have labs and offices there. Many CALS activities for the public take place in both facilities, most notably during Science Expeditions and the Science Festival.

## 10 Growing with GMOs

Twenty-five years ago there weren't any genetically modified (GM) crops available for farmers to plant. Since then, hundreds of different GM corn hybrids and soybean varieties have been developed, and top performers are grown widely across America's cornbelt.

How did this explosion happen?

One early advance had a CALS tie-in: CALS-trained plant breeder John Sanford helped jury-rig the first gene gun, a tool to insert foreign genetic material into plants, while working at Cornell.

"It was literally a gun—an air pistol—that he modified to shoot DNA into plant tissues," says Joe Lauer, a CALS professor of agronomy and UW-Extension corn specialist.

Today the gene gun has largely been replaced by an approach called "bacterial-mediated transformation"—a process whereby natural, DNA-transferring bacteria are used to insert genes into plants—and most GM crop varieties are developed by large agribusiness companies. Yet CALS still does a significant amount of work in this area.

Agronomy professor Heidi Kaeppler, a plant molecular geneticist, runs one of the few public labs that regularly performs GM transformations in crop plants. Much of her work is relatively basic, focusing on understanding how the process works and how to increase its efficiency. On a routine basis, however, her lab also produces GM crops for researchers in the Great Lakes Bioenergy Research Center seeking to develop improved biofuel feedstocks.

Lauer, for his part, has been gathering, assessing and disseminating key performance data about GM corn hybrids for the past 18 years as part of the Wisconsin Corn Hybrid Performance Trials. He recently partnered with researchers in agricultural and applied economics to analyze this huge data set and quantify the value of GM corn for farmers.

Other CALS agronomists are monitoring the rise of herbicide-resistant weeds associated with some types of GM crops, and developing management strategies that farmers can use to minimize their spread.

Last but not least, notes Lauer, "We're the nation's largest producer of plant breeders. CALS is instrumental in educating the students who go on to work in the areas of crop breeding, genetics, biotechnology and production."

## 11 RNA: More Than a Messenger

The central dogma of biology is often summed up this way:

**DNA → RNA → Protein**

This simple equation describes the flow of genetic information in living organisms: from the genes in our DNA to messenger RNA to proteins—the building blocks of our bodies.

For a long time, messenger RNA, or





Wisconsin became an artisan cheese mecca over the last two decades.

PHOTO COURTESY WISCONSIN MILK MARKETING BOARD

mRNA, was the only RNA known to science. In recent decades, however, it's become clear that there are many, many other kinds.

Known by abbreviations such as rRNA, tRNA, snRNA, miRNA, long ncRNA, and siRNA, these other RNAs play similarly critical roles in the body. Some function as the key catalytic components of cellular machines, while others regulate gene expression by binding to particular mRNAs and turning them "off."

"We now know that there are hundreds of these RNAs that affect gene expression, and we missed them forever. They're involved in cancer and in other diseases. They're everywhere," says biochemistry professor Marv Wickens, who co-founded the RNA MaxiGroup in the late 1990s to bring together the university's diverse RNA research community.

The RNA MaxiGroup currently includes 32 faculty members who hail from bacteriology, biochemistry, genetics, nutritional sciences and plant pathology, as well as from various medical school units.

They are a powerful force, having made numerous key contributions to the field. To name a few:

- Figuring out the 3-D structures of important protein-RNA complexes that control key events in our cells
  - Identifying molecules that degrade specific RNAs or deploy them for new purposes
  - Discovering families of proteins that modify and control RNAs and play important roles in stem cells
- The list goes on and on—and it's getting longer every day.

## 12 Wisconsin Cheese Gets Artisanal

It's hard to believe, but at the time of CALS' centennial there was no such thing as a Wisconsin Master Cheesemaker. That certification program, launched in 1994, marked the renaissance of a Wisconsin specialty cheese industry that now encompasses 55 Master Cheesemakers and more than 600 kinds of cheese, and accounts for 22 percent of Wisconsin's cheese production.

And the market is still growing. Production of specialty cheese in Wisconsin in 2012 totaled a record 611.2 million pounds, up 6 percent from 574.9 million pounds in 2011. In terms of quality, Wisconsin specialty cheeses—which include both artisan dairy (handmade products made in small batches) and farmstead dairy (products made on the farm from milk produced by cows on that farm)—regularly win top awards at national and global competitions.

This exciting new sector was cultivated with care, and a number of players contributed to its success. Chief among them was the CALS-based Wisconsin Center for Dairy Research (CDR), which shares its cutting-edge findings and innovations with the cheese industry through both product development assistance and hands-on training. The CDR partnered with the Wisconsin Milk Marketing Board to offer Wisconsin Master Cheesemaker certification, a rigorous three-year program unique to Wisconsin, as a way to both brand the state's artisan cheese and ensure the highest level of expertise in the people making it.

Other key players in developing the specialty cheese sector include the Wisconsin Department of Agriculture,

Trade and Consumer Protection, which ensures food safety and quality, and such industry affiliates as the Wisconsin Cheese Makers Association, the Wisconsin Specialty Cheese Institute, Wisconsin Cheese Originals, the Wisconsin Artisan Cheesemaker Guild and the former Dairy Business Innovation Center.

Cooperation continues to fuel the success of Wisconsin cheese. The CDR surpassed its private fundraising goal of \$16 million to begin construction of a state-of-the-art dairy research and education facility on campus, now in the design phase—an achievement made possible only through the support of industry, government, alumni and other committed stakeholders throughout the CALS community. 🍷

## Join the Celebration

Your place for all things CALS quasiquicentennial is [cals.wisc.edu/125th](http://cals.wisc.edu/125th). There we invite you to share your favorite CALS historical moments, keep apprised of events and learn more about the college's past. Events featuring anniversary celebrations include:

- Science Expeditions, **April 4–6**
- CALS Undergraduate Research Symposium, **April 22**
- Dedication ceremony for the Hector F. DeLuca Biochemical Sciences Complex, **April 24**
- Commencement reception, **May 17**
- Department of Soil Science's 125th, **May 23**
- Department of Horticulture's 125th, **June 19**
- Barn Dance at Susan Crane's family farm, **June 28**
- Science Festival, **October 16–19**
- Honorary Recognition Awards, **October 16**

More info at [cals.wisc.edu/125th](http://cals.wisc.edu/125th).



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# Goodbye, Bug Guy

He's been helping farmers, gardeners, landscapers, science students and pest-plagued citizens for decades. We present a fond look at Wisconsin's rock star entomologist on the eve of his retirement.

By Ron Seely

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**F**OR 35 YEARS PHIL PELLITTERI, an entomologist with CALS and UW-Extension, has provided patient counsel to a bug-plagued populace on everything from bedbugs to lice and bird mites to fleas.

Now 62 and set to retire in March, Pellitteri has this sage bit of advice gleaned from a long and accomplished career as an insect diagnostician: The bugs are going to win.

"The insects are in control and we're not," says Pellitteri. "They've been here since before the dinosaurs. They'll be here after we go."

Indeed, the task faced by the affable Pellitteri each day for all these years takes on Sisyphean qualities when the challenge he has faced is fully understood.

This is what Pellitteri is up against: According to the Entomological Society of America, there are nearly 10 quintillion insects in the world. That's a 10 followed by 18 zeros. Experts say more than one million different species of insects have been identified. And it is estimated that as many as 30 million insect species in the world have yet to be discovered and named.

No less an expert than Edward O. Wilson, the world's foremost source on ants and curator of Harvard University's Museum of Comparative Zoology, points out that the world's other creatures exist in paltry numbers compared to insects. Of the 42,580 vertebrate species that have been scientifically described, Wilson says, 6,300 are reptiles, 9,040 are birds, and 4,000 are mammals. Of the million different species of insects that have been described, 290,000 alone are beetles, Wilson marvels in his book *In Search of Nature*.

"If humans were not so impressed by size alone," Wilson writes, "they would consider an ant more wonderful than a rhinoceros."





Holding a hornworm, surrounded by friends: Pellitteri's excitement about insects is contagious.



## WHAT I DO: ENTOMOLOGIST



Phil Pellitteri, entomologist for UW-Extension in Madison, processes up to 2,500 insect samples each year. Here, he shows an atlas beetle (not from Wisconsin), which typically is found in Southeast Asia. It's part of the Extension's display collection.

## He knows what bugs people

**T**o be honest, when I was a kid, I did collect butterflies. I went to the UW for school and was originally interested in wild-life ecology. I eventually took an introductory course in entomology and basically got interested enough to transfer into the program and got my undergrad and master's degrees here.

I did do a little bit of environmental consulting for environmental impact statements at one point and was then hired by the university to run this insect diagnostic lab. That was May of 1978. The UW-Extension people tend to be on the road in the summer, so we had no one sitting back here in the lab. People would submit insects and if no one was there for a week, we'd be in bad shape. I've now been here about 29 years.

What I do now is mainly

Name: Phil Pellitteri  
Age: 54  
Occupation: UW-Extension entomologist

run the insect diagnostic lab. In a given year, I'll process between 1,500 and 2,500 samples — which means I look at the insects, identify them and then people usually want to know what to do about them.

I get to kind of play with all kinds of bugs and ticks and spiders. We get about 4,000 to 5,000 phone calls per year and I handle about 3,000 to 4,000 e-mails per year.

About 45 percent of what I see comes from the statewide Extension office and probably another 20 percent comes from pest-control companies.

Sometimes I work with landscapers, sometimes I do forensics stuff. Our priority is also to deal with commercial concerns that come from the farmers and growers. At certain times, I'm out traveling and lecturing, but in the summer when things are the craziest, I'm in the lab.

Probably one of the funniest things that ever happened to me is one you wouldn't expect. I get this mailing that says "Caution: Live spider inside." I open it up and I'm looking inside for the spider, then I turn around and sitting about 2 inches from my face is this big wolf spider — they look like a baby tarantula. I know they're harmless, but because I was surprised I turned and jumped. I still giggle about that.

Yes, I like what I do. One of the things that blows me

away is if I'd put up a list of insects that are in the state now that weren't when I started. Back then even earwigs were just starting in this state. We're starting to see a lot that belongs south of us, but now in the bug world that's what's happening with these warmer winters.

Even things like watching Lyme disease and West Nile virus evolve amazes me.

Most people don't pay attention to insects until they're eating your roses, but to a person like me, that's really a teachable moment. With this job, I'm never for a lack of entertainment or a laugh.

What I do lets people tell in their own words what they do to make a living. It runs every Tuesday. Contact Amanda Kramer at [Kramer.News@gmail.com](mailto:Kramer.News@gmail.com) to suggest someone to feature.

**Beloved in the media: A profile of Pellitteri in the *Wisconsin State Journal* and (right) Pellitteri in one of his frequent appearances on Larry Meiller's call-in radio show.**

adviser to generations of students. Department chair David Hogg calls Pellitteri "the face of the department."

But it is Pellitteri's self-made role with UW-Extension that has allowed him to bring his and the department's expertise to bear on the challenges of keeping the insect horde at bay. Technically he is called a diagnostician. To the gardeners of the state, he is more fondly known as the "bug guy."

Whatever he is called, he is beloved by those who run panicked from their gardens to the telephone or computer with news of the latest insect disaster. Lisa Johnson BS'88 MS'99, a Dane County UW-Extension horticulture educator, works with Pellitteri on the Master Gardener program and knows how much people have grown to rely on him. He is, she says, the embodiment of both Extension's outreach mission and the Wisconsin Idea.

"Phil will go anywhere he's asked to and talk about insects," says Johnson. "He'll take any phone call or e-mail. He'll take crushed-up, desiccated little samples in envelopes. And he gives everyone his personal attention."

For all the years he has served as Wisconsin's insect wizard, for all the thousands of questions he has fielded and happily answered, those who know him best and regularly watch him work say they cannot recall an instance when his patience wore thin or his enthusiasm wavered.

Larry Meiller, a CALS professor of life sciences communication and host of one of the most popular call-in radio shows on Wisconsin Public Radio, counts Pellitteri as one of his most popular regular guests over the last 25 years.

"We've grown old together," says Meiller. "He hasn't changed a lot in all those years. He has just as much enthusiasm and just as much wonder in his voice as he did 25 years ago. I have never

Count Pellitteri among those who would side with the ant—that is, when he is not conspiring with a caller on how to get rid of a nest of the pesky insects.

Since May 1978, Pellitteri has built a statewide reputation as the go-to expert on everything insect. In the summer months he fields an average of more than 30 calls a day that run the gamut from somebody being bitten by a mysterious insect to someone accidentally swallowing one.

Pellitteri's fiefdom is a suite of bug-filled (most of them mounted) rooms in the CALS Department of Entomology on the first floor of Russell Labs. He has worked for years with one foot in academia and the other, through his work with UW-Extension, in the world of gardens, termite-infested homes and insect-riddled farm fields. In the entomology department he is a faculty associate, and he has played an important role over the years as a teacher and an





seen him get angry or even get to the point where he says, 'I have no idea what you're talking about.'"

Johnson agrees. She also has a long perspective on Pellitteri's career, having been a student in one of his entomology classes in the mid-1980s. His enthusiasm was evident in his teaching, Johnson says, and in his stories and lectures students learned to appreciate insects as more than just pests but as remarkable, adaptable creatures that play crucial roles in the earth's ecosystems. Rarely, it seemed, did he come across an insect he didn't like.

"Once, in his classroom in Russell Labs, a cockroach ran across the floor during his lecture," Johnson recalls. "He bent over and picked it up and started lecturing about cockroaches."

Pellitteri's wife, Terri, has learned to live with her husband's penchant for bringing his work home. "If you look in our freezer, that's an easy way to find out if somebody has dropped off a specimen," Terri says.

Terri, an occupational therapist who works as a training coordinator for Journey Mental Health Center, has also learned that living with a bug diagnostician requires some special adjustments and a certain level of wariness. "It's

better now that we have digital pictures," Terri says. "But I still do have the habit of looking before I put my hand in the mailbox."

Sometimes, Terri says, the work that Pellitteri brings home gets loose—mostly, it seems, in the car. "Once he lost a giant slug," Terri recalls. "I was going somewhere and went out to the car and the slug had slimed the seat and he realized he had probably lost it in the car."

Or there was an incident involving a cockroach of large proportions. "He told me he had lost a giant cockroach in the car. He assured me that it was winter and the cockroach wouldn't be laying eggs or anything like that. I told him that if I found a giant cockroach crawling up my leg, it could be a relationship issue," she says.

But there are benefits to living with an insect expert. The Pellitteris' two children, Molly and Nicholas, are grown now, but Terri has very fond memories of all the time the family spent outdoors and the rather unique hikes they enjoyed.

"Phil was always stopping every five minutes to look at insects," Terri says. "It has certainly been a part of our lives."

And now there is a grandson who, at two and a half, pays rapt attention

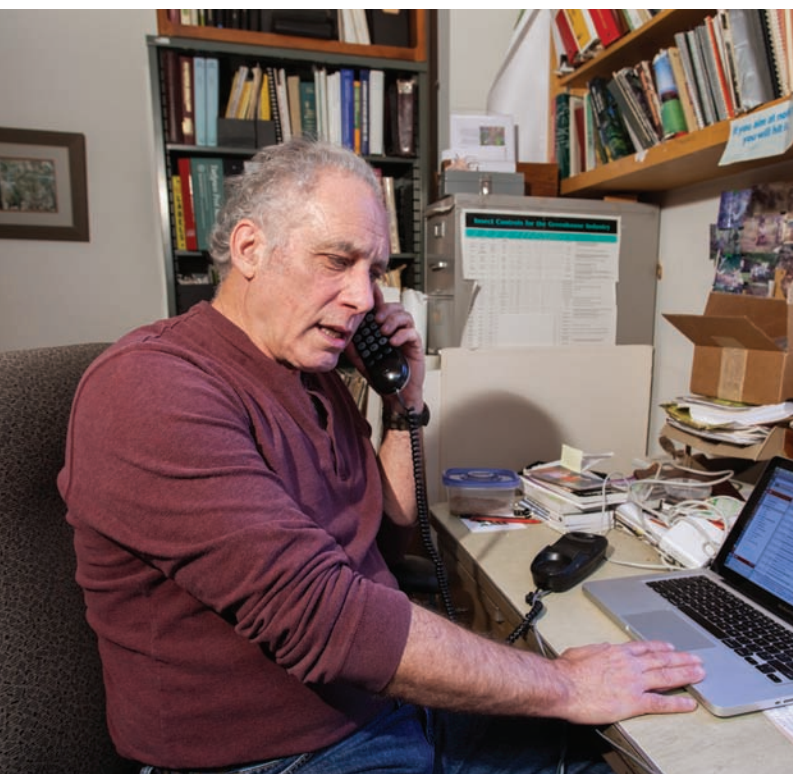
as his grandfather shows off an insect, patiently explaining what kind it is and identifying all of its various parts.

**Where does such passion—**especially for the multi-legged, creepy-crawly inhabitants of other people's nightmares—come from?

Surprisingly, Pellitteri, who grew up in Madison, doesn't recall being particularly fascinated by insects as a child, though he does remember collecting butterflies. He grew up in a family that had made a living in waste disposal. In fact, in Wisconsin, when people hear the name "Pellitteri" they probably think first of a big garbage truck with that name in giant letters on the side.

So, Pellitteri likes to joke, he could easily have ended up driving a garbage truck and running the family business for a living instead of identifying insects. Even after entering college, he would return to driving garbage trucks to earn money.

"I will argue that was the best education I had in my life for two reasons. One, you get to see what hard work is like. But then you also sit back and say, 'You know, driving a garbage truck at 20 below zero in January is not my idea of fun.'"



**Words of comfort:**  
Pellitteri gets many calls  
from concerned state  
residents.

Even so, it was a powerful and early introduction to the ubiquitous nature of insects. He particularly recalls hauling what he politely calls “monkey waste” from UW–Madison laboratories and how, especially on hot days, that particular cargo became a magnet for some very unsavory insect hitchhikers.

When he first started his studies at UW–Madison, he was contemplating a career in wildlife ecology. Then he turned to pre-med. But a fateful—and for thousands of Wisconsin gardeners, fortuitous—decision to take an entomology class set him on a career path that he has made uniquely his own.

He would settle into the Department of Entomology, carve out the previously nonexistent diagnostician post with UW–Extension and, eventually, settle into the offices into which so many have traipsed bearing bugs.

A visit to those offices is revealing of Pellitteri’s enthusiasms, his hybrid approach to entomology that involves both lab work and field study, and, finally, his sense of humor.

Most noticeable of the many curiosities on his office walls is a giant item labeled a “Texas fly swatter.” From a corner of the ceiling hangs a hornet nest. On disorderly lab benches, microscopes

are surrounded by slides and assorted bugs in various stages of disassembly. There are model bugs that come apart, charts of ants, and small containers everywhere bearing insects and festooned with sticky note labels with names and phone numbers and e-mails. There are mounted insects everywhere, from butterflies to one large winged creature labeled “Day flying moth—African.”

In a prominent spot on one wall is a note written in a child’s scrawl: “Dear Mr. Pellitteri, Thank you for visiting our class. I enjoyed looking at your collections. I liked touching things, too.”

From a back office comes Pellitteri’s voice. He’s speaking to someone on the telephone, engaging in a conversation probably very similar to thousands of others that have unfolded in these rooms over more than three decades. Pellitteri is leaning back in his chair, his legs crossed, listening intently. He wears jeans and tennis shoes, an open-necked knit shirt. Slight and fit, he looks considerably younger than his age, though his hair has thinned and turned silvery gray.

The subject is bedbugs, specifically a home infestation that apparently had the poor caller at wit’s end.

Pellitteri’s voice is animated but calm, soothing, understanding. He listens patiently, the caller’s voice rising and falling on the other end of the line.

Almost as though he’s talking someone off a ledge, Pellitteri walks the caller through a number of inexpensive, common sense solutions. One of them involves using cheap commercial hand warmers, such as those used by hunters, and combining them with

sticky insect traps.

“The reason it works,” Pellitteri tells the caller, “is because bedbugs are attracted to carbon dioxide and that’s what those hand warmers use. You can buy an \$80 trap, but I just don’t see the need. There’s also a place called ‘Bedbug TV’ on YouTube that you might want to check out.”

After hanging up, Pellitteri spends several moments commiserating with the caller, shaking his head and saying how the man was so bothered by the bedbugs that he had considered spending \$1,200 on an exterminator.

## Seeing Pellitteri in action, it

is easy to understand why so many who have worked with him shake their heads at his retirement and wonder how his knowledge and personal style can ever be replaced.

Meiller attributes Pellitteri’s success and popularity to the depth of his knowledge, his sense of humor and his ability to tell a story. Pellitteri, Meiller says, is one guest on his radio show who keeps the telephone lines filled with callers from beginning to end.

“He’s just so down to earth. And he’s good with the language. He’s got a story for every insect that people call about. He’ll take a call and lean back in his chair and look out the window and start telling a story. He makes my job easy. I’m really going to miss him and I know our listeners will miss him,” Meiller says.

Pellitteri has a rich store of tales about his adventures and about his dealings with a public that never ceases to surprise. He’s reluctant to share too many of them because he’s in the midst of writing a book. But he’s enough of a storyteller that he couldn’t help himself.

There was the time, he remembered, when tales of earthworms showing up in bologna started spreading.

“There was a rumor that they were putting earthworms in bologna,”



**An avid outdoorsman, Pellitteri is looking forward to more time for hunting, archery—and writing a book about his life experiences.**

Pellitteri says. “Apparently it was a Michigan rumor. A quality control person comes in and said, ‘We got a bunch of very cold, dead earthworms that a client suggested they found in a bologna pack.’ Well, the earthworms were not cooked, they were not chopped. These were just a bunch of cold earthworms. And so it was very obvious. But the best part of it is that worms are going for about \$4.50 a pound and bologna is going for 89 cents a pound so I said to the guy, ‘You guys would be losing money!’”

But Pellitteri has also learned that insects, small though they might be, can have a societal impact that far surpasses their size.

On his watch, for example, the emerald ash borer, a brilliant green insect smaller than a penny, has destroyed entire ash forests across the upper Midwest. Pellitteri has found himself advising communities across Wisconsin that face the loss of much of their urban forests. The invasive insect—believed to have entered the country by hitching rides on shipping pallets—will end up costing millions of dollars as cities and towns struggle to dispose of dead trees and replace them with hardier alternatives.

It is difficult to predict the next such scourge, Pellitteri says. The one certainty is that it is out there somewhere in the insect world and headed our way.

Ironically, Pellitteri is leaving at a moment of upheaval in not only the insect world but in all of nature. Insect populations, he notes, are beginning to reflect ominous changes wrought by what is likely the world’s most pressing environmental issue—a changing climate.



Pellitteri knows something is afoot, based on his observations in the summer of 2012 when Wisconsin was besieged by record heat and drought. “I saw things I’ve never seen in my career,” he says. “Some of the cutworm plagues we had were biblical.”

One problem, Pellitteri says, is that a shifting climate makes Wisconsin warmer on average and brings insects that are normally seen in southern states, leaving farmers and gardeners to deal with pests they know little about and for which we may have no defenses. Also, warmer winters and less snow cover mean some insects that don’t usually survive now thrive and multiply.


It’s not all necessarily bad, Pellitteri points out. The warming climate can also gift us with insects such as the giant swallowtail, a large and beautiful butterfly that is now surviving milder winters and becoming more common.

But the vagaries of climate change will, on balance, bring challenges to a

state that is so reliant on agriculture and outdoor pursuits. And Lisa Johnson, Pellitteri’s colleague at UW-Extension, says the problems posed by growing seasons turned topsy-turvy will only serve to make his absence more noticeable.

Not that his absence will be complete. Pellitteri has been doing this job too long and remains too enthusiastic to quit cold turkey. He plans to keep his hand in the business by doing some consulting, and he’ll probably still be making public appearances now and then.

But the long summer days marked by 30 or more phone calls will be over. Instead, more of his time will be spent working on the aforementioned book, which will recount his adventures as well as provide some insect education.

And he intends to indulge in his favorite hobby—archery. He loves using a bow for both hunting and target shooting. “My zen is shooting a bow,” he says. 





PHOTOS CONTRIBUTED BY STUDENTS AND RESEARCHERS UNLESS OTHERWISE NOTED

# CREATING A HEALTHIER

Students help with home cooking and grinding coffee in Ethiopia (top and far right) and observe tortilla production in Mexico.





**What do millennials want? The popularity of a new CALS-based program addressing global health concerns offers at least one answer.**

**BY ROBIN MITTENTHAL**

# WORLD



**Y**OU CAN'T SPOT THEM RIGHT AWAY—they're hidden in plain sight, often disguised as majors in the life sciences—but there are thousands of undergraduates on the University of Wisconsin–Madison campus who, in terms of their future careers, consider themselves “pre-health.”

What are their reasons? For some students, the motivation is acutely personal. As a child, Kevin Cleary BS'13 (biology) felt an urgent need to help as he watched his father deal with recurrent brain tumors. “By age 11, I knew I had a future in health care,” says Cleary. Many others aren't yet sure what role they will play, but they are eager for guidance on how to use their majors to address an array of global problems including hunger, disease, poverty and environmental degradation. Says senior biochemistry major Yuli Chen, “I want to make an impact on people, and I believe that every person has the right to be provided basic necessities such as clean water, education and food.”

For much of the past century, young people seeking to address health-related suffering may have felt relatively limited in their options. Most considered medical school (still the gold standard to many), nursing school or other familiar allied health occupations that are largely oriented toward addressing disease after it occurs.

In recent years, however, health experts worldwide have placed an increasing emphasis on the importance of prevention in achieving health for the largest possible number of people. This was illustrated at UW–Madison in 2005, when the University of Wisconsin Medical School changed its name to the School of Medicine and Public Health, offering the following reason: “Public health focuses on health promotion and disease prevention at the level of populations, while medicine focuses on individual care, with an emphasis on the diagnosis and treatment of disease. Ideally these approaches should be seamlessly integrated in practice, education and research.”

The founding in 2011 of the interdisciplinary Global Health Institute (GHI), a partnership of schools, colleges and other units across campus, broadened the university's approach to health still further:

“We view the health of individuals and populations through a holistic context of healthy places upon which public health depends—from neighborhoods and national policies to the state of the global environment. This approach requires collaboration from across the entire campus to address health care, food security and sustainable agriculture, water and sanitation, environmental sustainability, and ‘one health’ perspectives that integrate the health of humans, animals and the environment.”





Learning from a corn grower in Mexico.

## Linking Agriculture and Nutrition in Mexico

MANY OF THE WORLD'S poorest and most vulnerable people never see a trained medical specialist—but they all need to eat. Having regular access to nutritious food is at least as important for their health and well-being as improving local medical care.

One of our best tools for getting this message across is a field course titled “Linking Agriculture and Nutrition in Mexico,” for which Tanumihardjo partners with a rotating set of CALS agronomy faculty to lead groups of students to the International Maize and Wheat Improvement Center in Texcoco, Mexico.

Better known by its Spanish acronym, CIMMYT (pronounced “SIM-it”), the center focuses work with maize (corn) and wheat on breeding and production methods aimed at supporting the needs of small-scale or subsistence farmers. Unlike American farmers who use such inputs as machinery, fuel, fertilizers and pesticides to grow large amounts of one or two crops for processing, animal feed and export, subsistence farmers grow most or all of the food they eat themselves. For subsistence farmers, improving both yield and nutritional content is critical, but improvements must come without increasing reliance on costly inputs.

Students spend an intensive week learning about the challenges, opportunities and health stakes that exist at the intersection between agriculture and nutrition. A plant breeder explains efforts to increase the vitamin content of corn. Farmers show students their crops and talk about how their families use them to prepare meals. A tour of a local tortilla factory includes discussion of which local varieties of corn are suitable for tortillas. Visits to the National Institutes of Health of Mexico shed light

Demand by UW students for educational options built around this broad concept of health had been growing for some time. Before the creation of the GHI, an Undergraduate Certificate in Global Health was introduced to offer students an understanding of public health in a global context. The certificate explores global health issues and possible solutions—and shows students how their own majors and intended professions might make those solutions reality. Although administered from CALS and directed by CALS nutritional sciences professor Sherry Tanumihardjo, the certificate accepts students from across campus and highlights ways in which teachers, engineers, farmers, social workers, journalists, nutritionists, policy makers, and most other professions can play a role in global health. Funding is provided through the Madison Initiative for Undergraduates, grants and private donations.

Earning the certificate requires completion of core courses focusing heavily on agriculture and nutrition, the importance of prevention and population-level approaches in public health, and the role of the environment in health. Students also complete relevant electives (examples: women's health and human rights, environmental health, international development), and—most transformative for students—a field course, usually a one- to three-week trip either abroad or to a location in the United States where a particular global health issue is being addressed by one or more local partner organizations in ways specific to the

place and the people who live there.

Although the program is young, it already has made an impressive impact on campus. A few statistical highlights (as of January 2014):

- Nearly 400 declared students and 250 graduates drawn from more than 80 majors across campus.
- More than 500 students completed intensive, faculty-led small-group field courses either in the U.S. or abroad. More than 60 others have completed individualized experiences.
- 2014 will see more than 20 field courses spanning 14 countries on four continents.

Program alumni are pursuing careers in global health:

- 30 students went on to graduate programs in public health, medicine, nursing, nutrition and related fields.
- 34 others have taken jobs with the Peace Corps, Americorps, and Teach for America. 13 are addressing health disparities with Wisconsin's Department of Health Services or county-level agencies around the state.
- In exit surveys, 82 percent of alums said that the certificate was either “important” or “very important” in shaping their view of health and well-being in the world.

We are pleased to present here a few compelling stories from the program's field courses. We hope they convey at least some of the excitement students express at combining the tools and practices of diverse majors with cultural competency, language skills and key concepts in public health.





Searching for medicinal plants in Ethiopia.

that I needed to pursue public health.” She is now pursuing a master’s degree in public health at the UW School of Medicine and Public Health.

## Food Systems in Ethiopia

**MOST AMERICANS** who have any impression of Ethiopia think of televised reports of famine from the mid-1980s—images that conveyed hopelessness and dependency. But the six students (four of them from CALS) who took “Biodiversity, Health and Food

Security in Sidama, Ethiopia,” a course launched in 2013, had a life-altering experience of a country that is far more diverse, vibrant and invested in its own sustainable development than they could have imagined.

The course is led by Heidi Busse, a vascular surgery researcher, and Girma Tefera, a professor and vascular surgeon (and a native Ethiopian), both of them with the School of Medicine and Public Health. Ethiopia struggles with a severe shortage of medical professionals, and Busse and Tefera are involved in ongoing efforts to address that. But their understanding of the root causes of many medical conditions motivated them to create a field course emphasizing how such nonmedical interventions as improved agricultural productivity and access to clean water also can support health.

Students on this course spend two weeks in an agricultural region named for the Sidama people. Though most farmers there still practice subsistence agriculture, Busse says that “the landscape and communities in Sidama are changing rapidly, largely due to external factors that impact local economic, environmental and social and household

structures. These changes are often guided by market goals that may conflict with the values of local communities and are not ecologically sustainable.”

One factor driving change is global demand for coffee, which can be grown either in large, single-species plantations or in multipurpose agroforestry systems that also produce timber, food crops, fodder for livestock and medicinal plants. The large plantations produce more coffee and profits, but they require more water, fertilizer and other resources than smaller, traditional systems. Maximizing human and environmental health requires Ethiopians to perform a very intentional balancing act between traditional and modern production systems.

To explore how Sidama residents are finding that balance, students meet with representatives from a wide variety of governmental, nongovernmental and community groups. One is the Fero Coffee Farmers Cooperative, which has more than 4,000 farmer members. During a tour and coffee ceremony students learn how co-op growers integrate coffee production with growth of other crops (Busse calls these growers the “elders of permaculture”) and also how the group is working toward a balance of male and female members. These and other lessons reinforced themes of community empowerment and “asset-based community development,” which focuses on how existing skills, resources, institutions and other strengths can be organized for maximum effectiveness.

Students also participated in a service project with Common River, a local NGO. As part of it, students under the guidance of Alex McAlvay, a UW doctoral student in botany, local elders and other community members investigated the distribution, abundance, diversity and uses of local medicinal plants. Their work resulted in the *Handbook of Sidama Traditional Medicinal Plants*, a 40-page book that “formalizes” a large

on Mexico’s severe obesity problem. Even visits to restaurants include discussion of traditional versus “modern” dishes, portion sizes, nutrient content and the sources of different ingredients. Visits to sites such as the amazing pyramid complex at Teotihuacan and the Anthropology Museum in Mexico City help students appreciate Mexico as a culturally distinct place with natural and human-made beauty that Mexicans are proud of and working to preserve.

The course has had a transformative effect on many of the some 40 students who have taken it so far. For some, the trip resulted in a major change of direction. “I was lost at UW–Madison as a freshman general biology major,” says Nicole Bacheller, who traveled to Mexico in 2011. “Visiting CIMMYT helped me see connections between my interest in plants and my desire to support community health. I changed my major to plant pathology, confident that I could study biology and save lives without being in a medical field. I have since focused my pathology work on questions related to international food security.”

Says Stephanie Kroll BS’12, who took the trip as a genetics major, “The course was like a shot of enthusiasm





**Jordan Wackett (front, right) designed his own field experience teaching CPR in El Salvador.**

body of knowledge that had been passed along over generations but was never put on paper. With luck, it may help justify the preservation of these plants and their habitats in the face of a regional loss of biodiversity and related cultural change.

Besides the handbook, Lennea Rylander BS'13 (agricultural and applied economics) worked on a blog about the Ethiopian coffee industry for the Madison-based fair trade coffee roaster Just Coffee. "Visiting Ethiopia makes the world feel both smaller and larger," she says. "On the one hand, Ethiopia is no longer some far-off place on the other side of the world. On the other hand, learning so much about a country makes me think about the rest of the world and how big it is. There are endless possibilities to learn and grow from other cultures in other countries throughout my life."

## CPR in El Salvador

A MEDICAL SERVICE trip to Nicaragua had taught biology major Jordan Wackett BS'13 about the extreme limitations in access to health care faced by many people there—and he was determined to address them. Other assets: Wackett was certified as both an emergency medical technician (EMT) and cardiopulmonary resuscitation (CPR) trainer, and he spoke fluent Spanish. Those interests and credentials put him in a position to design his own field course for an Undergraduate Certificate in Global Health.

After speaking with various experts—including a physician acquaintance in Nicaragua, Global Health Institute associate director Lori DiPrete Brown, and School of Medicine and Public Health professor and emergency medicine physician Nestor Rodriguez—Wackett concluded that working to improve CPR education would address an obvious need. "It came to me that there was a knowledge gap," says Wackett. "They have incredible physicians down there, but they don't have what we see as this basic skill. It's medicine but it's also preventive, especially for people with no other health care."

Wackett and another certificate student, Beau Trapp, applied for and received a Wisconsin Idea Fellowship from UW's Morgridge Center for Public Service to pursue their work. Originally the two had planned to work in Nicaragua but, networking through Rodriguez, they found more receptive partners in El Salvador.

They ended up conducting four CPR classes in San Salvador for a total of 165 physicians, residents and medical students. Prior to, during and after their trainings, Wackett says, "We met with physicians and just talked." Before start-

ing, they asked their local contacts what they felt the CPR-related need was. "We wanted to get an idea of how effective our training would be because of the cultural barriers, the language barriers—stuff like that," Wackett says.

Feedback on their classes was uniformly positive, but to them the courses (which they ran with equipment purchased with Wisconsin Idea Fellowship funds) highlighted the scarcity of both equipment and skilled trainers. "We learned that most people had in fact had a CPR course at some point, but had not had refresher courses or learned about changes in CPR protocol," says Wackett. "The barrier is financial—one CPR class costs as much as one month's tuition at the best private medical school in El Salvador."

Wackett expects that those discoveries will help shape his future visits to El Salvador. "Even more than training in CPR, they need trained trainers," says Wackett, who is now enrolled in both an M.D. and a public health program at the UW School of Medicine and Public Health. "If we can help create those people, then we're not needed so much. They also need low-cost equipment for both training and actual CPR. What we use here is not necessarily appropriate for them, but other things could work."

Wackett is one of more than 70 students who have designed their own field experiences and worked with the program's executive committee to get them approved. Through internships, research projects and study tours, they have explored subjects as diverse as human trafficking, the management of refugee camps, and the prevention of asthma and allergies for residents of low-income housing. These unique experiences require a disproportionate amount of work by students, certificate staff and diverse partners on and off campus, but they clearly are having an outsized impact on the development of the students involved.






PHOTO BY MARK HOFFMAN/MILWAUKEE JOURNAL SENTINEL

Pete's Fruit Market in Milwaukee has pioneered best practices in helping food assistance recipients purchase fresh produce.

Fruit Market, a WIC-friendly vendor in south Milwaukee, addresses the problem by packaging produce in even-dollar amounts, a practice that could be made more widespread.

More recently we investigated a concern that surfaced last year, when some WIC clients reported that cashiers didn't know what foods WIC clients were allowed to buy or were not well versed in processing WIC transactions. Through interviews and observation, students were able to confirm those reports and offer WIC staff the data they need to convince some large grocery stores to use the interactive, Wisconsin-specific cashier training WIC provides rather than generic materials produced at their corporate headquarters.

As close as this experience is to campus, this course and others like it can still teach students new things about seemingly familiar places. Says Sara Mutnick, a certificate student and WIC course alum who graduated in 2013, "I learned how not having the basic necessities like a secure home, a place to sleep and enough food to eat makes a really big impact on health." With respect to completing her field experience in Wisconsin rather than somewhere more exotic, Mutnick says, "You don't have to go that far to make a difference." 

*Robin Mittenthal works in the CALS Department of Nutritional Sciences as a global health administrative program manager. Elyse Guizzetti, a junior nutritional sciences major, contributed to this story.*

## SUPPORT THE CERTIFICATE

Field experiences can change a student's life—but they cost students an average of \$2,000, despite university subsidies. Please help students in need participate in these courses by contributing to an endowment for that purpose. You may donate here: <http://ghi.wisc.edu/undergraduate-certificate/support-the-certificate/>

## Global Health at Home

### NOT ALL STUDENTS

have the time or money to travel to far-flung places. Nor must they in order to develop what DiPrete Brown calls "local-to-global awareness." To a greater or lesser extent, any health issue that you might find abroad is manifested in the United States, often in or near Madison.

As the global health administrative program manager, I have partnered for two years with Gayle Coleman BS'77, a nutrition program specialist with UW-Extension, to run a course focused on Wisconsin's USDA-funded Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC is a public health intervention that is active in communities in every state.

Unlike the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps), WIC does not allow participants to buy whatever food they want, but instead provides vouchers or checks that can be redeemed at grocery stores for foods deemed particularly healthful, including whole-grain breads, beans, fruits and vegetables. Enrollment in WIC is limited to low-income pregnant and postpartum women, infants and children under age five because this population is particularly vulnerable to malnutrition. In Wisconsin alone, WIC provides food to more than 100,000 women and children a month.

Our fall semester class covers the history and administration of WIC and related programs, a discussion of poverty, and cultural competency exercises to prepare students for effective interactions with WIC clients. Each student

also gets a small amount of money for a WIC-like shopping experience used as the basis for discussion. In January students travel to relevant locations in southern Wisconsin, talking with WIC staff and participants and integrating their findings for a final presentation to WIC staff in Wisconsin's Department of Health Services. WIC director Patti Hauser and several of her staff serve as guest instructors for the course and facilitate access to key parts of the WIC program.

While participants join WIC for the food benefit, the program also provides or connects them with such public health services as vaccinations, basic physical exams, blood lead testing and early literacy initiatives. When students visit WIC clinics (where women and children apply to join WIC and receive health screenings and benefit checks) they get to see and talk with a diverse group of administrators, nurses, dietitians, translators and other professionals in addition to WIC clients. Visits to food pantries, soup kitchens, grocery stores and other food-related sites highlight how WIC fits into the bigger picture of food security.

We've run the course twice so far and intend to have a different emphasis each year. Last year we learned about an important—and resolvable—barrier impeding some clients from using their full fruit and vegetable benefit. It concerns how grocery stores price produce. If apples are \$1.59 a pound and you have exactly \$10, how many pounds can you buy? Some WIC clients either under-purchase or don't buy apples at all rather than exceed the funded amount. Pete's



## in the field



Courtney Booth



Debra Crave



Dorothy Farrell



Amy Fischer



Elizabeth Henry



Christine Lindner

**Courtney Booth** BS'97 Agricultural Journalism **Alice in Dairyland 1997** • Today Courtney Booth's most important job is being a mom of four. Booth and her husband Chris, who is president of the Wisconsin Veterinary Medical Association, own Booth-Haven Holsteins, a small show heifer and cow care operation in Plymouth. As a student Booth served as editor of the first-ever CALS student newsletter and won awards for her volunteer work and class leadership. Serving as the 50th Alice in Dairyland provided Booth and the program the fulfillment of reaching many milestones, including raising more than \$1.4 million in non-paid media exposure. As Alice, Booth also had the opportunity to travel to Japan as an ambassador of Wisconsin agriculture. Booth continues her role as an ag educator through her family's business and many community organizations.

**Debra Crave** BS'81 Horticulture, Forest Science **Alice in Dairyland 1981** • Every Wisconsin cheese lover knows Crave Brothers Farmstead Cheese, where Debra Crave is vice president. The company regularly wins awards and other honors (including a Dairymen of the Year title at the World Dairy Expo) for cheese made right on the farm with milk from a herd of 1,500 Holsteins. Crave is involved in many key facets of the company, especially marketing, which was her focus in previous positions with the Wisconsin Department of Agriculture, Trade and Consumer Protection and the Wisconsin Milk Marketing Board. A memorable experience as Alice, she says, was participating in a crawfish-eating contest with

a New Orleans Saints football player. (She did not win.) In her free time Crave serves as an officer on the World Dairy Expo board of directors.

**Dorothy Farrell** BS'82 Agricultural Journalism **Alice in Dairyland 1982** • As Alice, Dorothy Farrell was introduced to Sargento Food's VP of marketing—and just three days after ending her term she began her career with Sargento, where she now is a director in the company's consumer products division. Among Farrell's most memorable experiences at CALS was participating in the Association of Women in Agriculture and serving as a Farm and Industry Short Course house fellow. The evening of her selection as Alice was the beginning of the greatest adventure of her life, she says. She especially enjoyed interviews with broadcasting personality Orion "The Big O" Samuelson.

**Amy Fischer** BS'97 Meat and Animal Sciences, MS'99 and PhD'04 Animal Sciences **Alice in Dairyland 1999** • Amy Fischer serves as coordinator for the Companion Animal Biology and Humane Education programs at the University of Illinois, where she enjoys connecting with students and helping them shape their career paths. Her most memorable experience at CALS was time spent in the lab of mentor Jack Rutledge, a professor of animal sciences and genetics. For this Alice, 11 days at the Wisconsin State Fair did not just mean making appearances, it also meant a marriage proposal; it was there that her boyfriend (now her husband) popped the question.

**Elizabeth Henry** BS'83 Meat and Animal Sciences, **Alice in Dairyland 1986** • As associate director of the CALS-based Renk Agribusiness Institute, Liz Henry develops agribusiness educational programs, provides leadership to the Renk Scholars Program, which offers scholarship support to outstanding undergraduates, and teaches CALS undergraduates and Farm and Industry Short Course students. Henry is co-owner and VP of Henry Farms, LLC, which is developing a brand of bourbon for release in 2015. As Alice, Henry traveled to six states, Canada and Puerto Rico, where she promoted Wisconsin agricultural products to cruise lines and international restaurant chains. She is an active member of the Wisconsin Agricultural and Life Sciences Alumni Association (which she served as president) and the CALS Board of Visitors.

**Christine Lindner** BS'06 Agricultural Journalism **Alice in Dairyland 2010** • Christine Lindner is a national sales representative with Alsum Farms & Produce, a Friesland-based company responsible for growing, sourcing, packing and delivering high-quality fresh vegetables and fruits to supermarkets. Having grown up on her family's fourth-generation dairy farm, Lindner takes pride in helping people understand the connection between farm and food—and in offering them access to the best food available. Participating in the National Agri-Marketing Association while at CALS offered her real-world experience that influences her career to this day, she says. In her free time Lindner enjoys spending time with family and outdoor activities including biking and hiking.



# Alumnae who became Alice in Dairyland

by Claudia Roen



Jill Makovec



Barbara McCrory



Kristin Olson



Rebecca Plantz



Vicky Scharlau



Jolynne Schroeffer

**Jill Makovec** BS'00 Agricultural Journalism, Dairy Science, MS'02 Dairy Science **Alice in Dairyland 2007** • An alumna of both CALS and the UW Marching Band (instrument: trumpet), Jill Makovec works as an account executive with Learfield Communications, which through the Wisconsin Radio Network and Brownfield Ag Network provides consumer and ag news to Wisconsin and neighboring states. As a CALS student, Makovec researched antibiotic resistance of bacteria that cause mastitis in dairy cattle—work that helped her connect with and educate consumers during her year as Alice. She treasures memories of her time as Alice, especially connecting with, teaching and learning from fourth-graders across the state. Makovec enjoys spending time at her family's dairy farm near Muscoda and serving the community through various activities, including the Wisconsin Agricultural and Life Sciences Alumni Association (past president).

**Barbara McCrory** BS'83 Agricultural Journalism **Alice in Dairyland 1983** • Barbara McCrory's ag journalism background has been vital to her success as a circuit court judge—she graduated from the UW–Madison School of Law in 1992—in that it provided her with the ability to distill large amounts of information down to what is most important for her ruling, she says. Her experience as Alice required McCrory to be able to change gears quickly, from spending the morning at a local TV station to teaching a fourth grade ag history class in the afternoon. Her reign saw the founding of “Something Special from Wisconsin” (SSfW), a program promoting local food systems. McCrory presented

country music legend Willie Nelson with a “SSfW” T-shirt at the Wisconsin State Fair—which he quickly modified by removing the sleeves.

**Kristin Olson** BS'10 Agricultural Journalism **Alice in Dairyland 2013** • As the reigning Alice, Kristin Olson travels around Wisconsin promoting the state's \$59 billion ag industry in her E85 Chevy Tahoe, which by using 85 percent ethanol fuel promotes the corn growers' role in ethanol production. She will make about 400 appearances throughout the course of the year. Her most memorable experience thus far has been the 11 days she spent at the Wisconsin State Fair, where she taught audiences of all ages and backgrounds about agriculture and paraded the Grand Champion Barrow (castrated male pig) to the Camp of Champions. When Olson is not busy being Alice, she enjoys spending time with her husband and dog, working with her Holstein cattle and singing in her church choir.

**Rebecca Plantz** BS'88 Agricultural Economics, Agricultural Journalism **Alice in Dairyland 1988** • When Rebecca Plantz was five years old, her mother asked, “Why are you always the kid who has to ask why?” Reflecting on that question, she feels she should have known that a position in operational excellence, which she now holds at PayPal, would be a great fit. Her time as Alice honed her ability to shift topics quickly. One moment she might be discussing the economics of farming and another, the nutrition in a particular recipe. That skill helps her to this day. A memorable Alice moment: Upon asking a fourth grade class to name

products produced in Wisconsin, one student answered, “Cholesterol.”

**Vicky Scharlau** BS'82 Agricultural Journalism **Alice in Dairyland 1980** • In 1994 Vicky Scharlau founded 501 Consultants, a company based in Washington state that offers a wide range of services to nonprofits, from bookkeeping and staff recruitment to administration and strategic planning. While she fondly remembers participating in CALS student organizations, Scharlau admits one of her most influential experiences was enduring a statistics course. During her time as Alice, Scharlau logged 100,000 miles and gave more than 500 presentations. To this day, she says, she can close her eyes and imagine herself in waders in a cranberry bog or visiting with international buyers at the World Dairy Expo.

**Jolynne Schroeffer** BS'96 Dairy Science, Agricultural Education **Alice in Dairyland 1995** • Jolynne Schroeffer recently brought a mint perennial with her to the agriscience course she teaches at Antigo High School—a plant the students had never seen before, but that she had learned about in her first month as Alice. Teaching has always been an important facet of Schroeffer's career. Her most influential experience as a CALS student, she says, was the opportunity to serve as a teaching assistant for Dairy Science 101. While serving as Alice, one of her fondest memories is when a kindergarten student asked if she had a horse and carriage to go with her tiara. In her free time Schroeffer enjoys exploring old dairy barns to relive the history they represent.



## Catch up with ...

Carl T. Wahl MS'10 Agroecology



Carl Wahl out in the field, far right.

Carl Wahl's interest in farming was sparked during a stint with the Peace Corps in Zambia, a landlocked country in southern Africa. His work on maternal and child health and nutrition led him into agriculture as he sought to integrate edible legumes into local farms and diets. Wahl returned to the U.S. to study agroecology at CALS and then went back to Africa, first with the Peace Corps and now with the Ireland-based charity Concern Worldwide, which he serves as the conservation agriculture coordinator in Zambia and neighboring Malawi.

● **What's your understanding of "conservation agriculture"?** Conservation agriculture (or CA) is a practice to retain moisture and nutrients in the soil to boost short-term crop productivity and long-term sustainability of farmland. CA is essentially a combination of three principles: minimum tillage, retaining soil residues and crop rotation with legumes.

It is similar to what is increasingly a practice in the Midwest. However, in Zambia, Concern Worldwide is working with the poorest (i.e., resource-limited) farmers, who essentially have a hoe and possibly an axe as their entire repertoire of farming tools and farm in an incredibly less forgiving environment. Therefore we include such sustainable agriculture aspects as agroforestry, supplemental mulching and micro-dosing of inputs (fertilizer, manure, compost, indigenous tree leaves, wood ash, etc.) in order to better translate limited funds and labor into greater yields.

● **How does conservation agriculture work in Zambia and Malawi?** In either country, the word "food" means maize (corn), specifically maize meal for a dish called *nshima*. Both countries consider *nshima* a staple food to the extent that they rank in the world's top three per capita direct consumers of maize. However, a heavy feeder like maize in an environment with limited nutrient (fertilizer) supply and undependable rainfall is an unreliable crop. In Malawi and Zambia, CA practices help mitigate much of the risk associated with growing maize. Additionally, CA's capacity to include legume crops provides more protein to the household's diet.

● **How have you seen conservation agriculture help people?** The Western Province of Zambia, where I work, is situated on a drift of eolian sand that is roughly the size of Wisconsin. In the 2012–2013 season, our cumulative rainfall was above normal; however, instead of being distributed over four to five months as usual, we received two-thirds of it over 4.5 weeks and the other third in three days. All the conventional maize failed. Though the CA farmers were also affected, nearly everyone reported that without CA, they would have had no maize whatsoever. That is a pretty powerful incentive to adopt the technology.

● **What projects are you most excited about?** The first is our effort to engage and develop certified seed grower groups on a larger scale to provide a variety of quality seed to farmers at lower cost. We are over 300 miles from most of the seed producers in Zambia, so bringing that resource closer can really relieve the chronic pressure of getting an adequate and high-quality seed supply.

The second is use of the burgeoning mobile phone network to send text messages that can pass on Extension messages as well as market information to farmers, enabling them to both produce more and sell more at a better price. The potential ability to transmit information quickly and cheaply could be a real game-changer in our agriculture picture in both Zambia and Malawi.

—JOAN FISCHER



## Givers

In honor of CALS' 125th anniversary, a look at how alumni and friends help keep the college strong

nextSteps

### Never Too Early to Start Giving



**Y**ou can't be too young or too busy to make a difference as a CALS graduate. Sara Schoenborn BS'10 (dairy science/life sciences communication) is proof of that.

Last year Schoenborn, 27, stepped into a new job as executive director of the Wisconsin FFA Foundation, where her duties include spearheading ambitious fundraising efforts. She's also served on committees for Cows on the Concourse and Dane County Farm Technology Days.

Yet she still finds time for CALS. Schoenborn is vice president of the board of directors with the Wisconsin Agricultural and Life Sciences Alumni Association (WALSAA), a nonprofit membership organization offering a range of activities for CALS alumni and scholarships and awards for current students and faculty.

And she helped charter a Sigma Alpha Alumni Chapter at UW-

Madison, with the goal of helping current members of the sorority for ag professionals through networking, scholarships and loans.

What motivates her, as an alumna, to give so much of her time and energy?

"CALS did more than simply provide me with an excellent education," she says. "It gave me the chance to meet some of my best friends through student orgs, prepared me for both internships and my postcollegiate career by connecting me to influential members of the industry, and taught me the importance of being involved and continuing to grow as a person and member of the community."

Schoenborn wants to make sure students continue to have the same opportunities.

"When I ask current students what they hope to acquire from alumni, they almost always say 'networking,'" she says. "Staying connected to CALS students can be as simple as attending events such as WALSAA Football Fire-Up, offering to give a presentation to a class or even inviting a student org to tour your business."

Even as a young alumna, Schoenborn contributes regularly to the CALS annual fund.

"It's often difficult for a new grad to justify a contribution, particularly when repaying student loans—but even small gifts make a difference," she says. "And it's important to remember that there are additional ways to give back—through time, energy and support."

—JOAN FISCHER

*Help CALS continue to flourish. Your support is needed at [www.supportuw.org/giveto/cals](http://www.supportuw.org/giveto/cals).*

*Learn more about WALSAA at [walsaa.org](http://walsaa.org).*

**CELEBRATE OUR 125th**—Start with the events listed on page 21. And for updates and further inspiration, visit: [cals.wisc.edu/125th](http://cals.wisc.edu/125th) throughout the year.

**TAKE UP BEE-WATCHING** using an online **Wisconsin Wild Bee Guide** produced by CALS entomology professor Claudio Gratton and his associates. Their goal is to promote understanding of how land use and agricultural management affect wild bee abundance and diversity—and how wild bees contribute to the pollination of crop plants. Learn more at: <http://energy.wisc.edu/bee-guide/>.

**MEET A BLIND COW** you'll never forget at CALS' Arlington Agricultural Research Station. "Ping," as she is called, has earned her way into the herd and won the hearts of her caregivers. Get to know her on YouTube at <http://go.wisc.edu/c36w16>.

**BIKERIDE FOR A CAUSE** with **Ride to Farm**, a fundraiser for the Wisconsin School for Beginning Dairy and Livestock Farmers. This year's ride takes place on **Saturday, May 31**. It starts and ends at Birch Lake Park in Barneveld and covers some 60 miles (100K) of rolling countryside, with rest stops and lunch along the way. To learn more and to register, visit: [ridetofarm.dojiggy.com](http://ridetofarm.dojiggy.com).

**BE A FRIEND** of **Allen Centennial Gardens**, which will have especially lively programs during 2014, the organization's 25th anniversary (a special heads-up for a **Posh Plants Auction & Runway Show** featuring new gardening products on **Saturday, June 14, 5–8:30 p.m.**). Friends of Allen Centennial Gardens "support efforts to educate students, businesses and the public and increase awareness and appreciation of ornamental horticulture through membership, events and fundraising." A fact you might not know: Allen Centennial Gardens is 100 percent operationally self-funded, including salaries. Learn more at [www.allencentennialgardens.org](http://www.allencentennialgardens.org), see "Membership & Classes."

For more information, go to:  
[www.grow.cals.wisc.edu](http://www.grow.cals.wisc.edu)





# Growing the Future for 125 Years

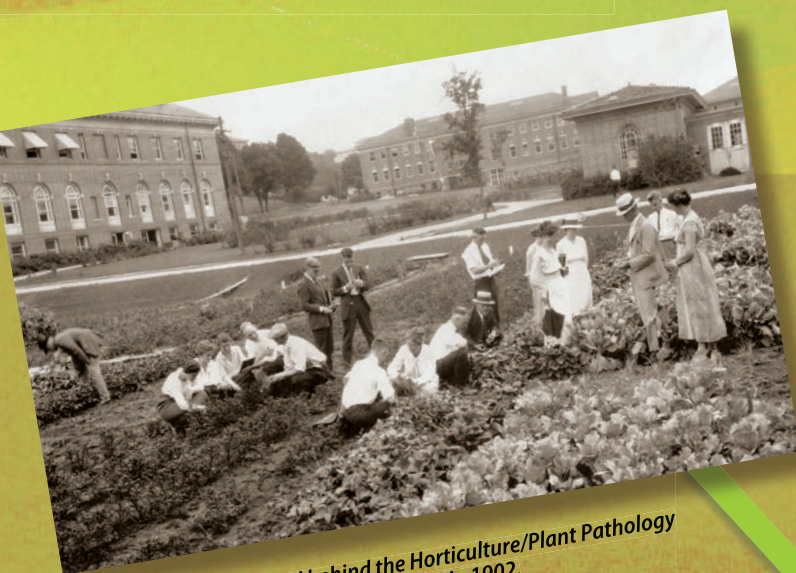
**2014 marks CALS' 125th anniversary.**

As we celebrate the past, we are planning for the future—and we need your help. Your support allows us to continue to provide quality education, make life-changing discoveries and pursue the Wisconsin Idea via outreach around the state and beyond.

[www.supportuw.org/giveto/cals](http://www.supportuw.org/giveto/cals)



*Demonstrating a new milk vending machine in 1955.*



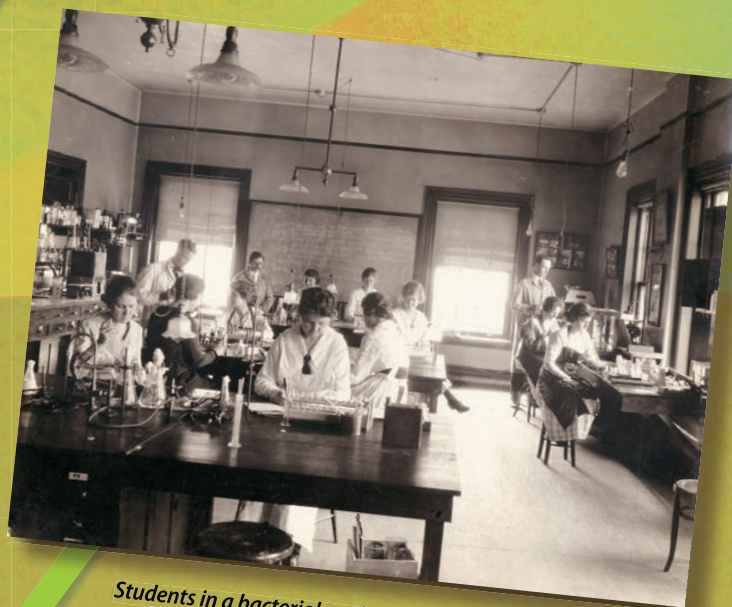
*In the field behind the Horticulture/Plant Pathology building in 1902.*



*Posing with Bucky at commencement in 2013.*



*Students monitor CO2 release from soils in 2010.*



*Students in a bacteriology lab in 1919.*

To make a gift, please visit [supportuw.org/giveto/cals](http://supportuw.org/giveto/cals)

or mail to UW Foundation, U.S. Bank Lockbox, Box 78807, Milwaukee, WI 53278-0807

You may also contact Sara Anderson (608) 263-9537 or [Sara.Anderson@supportuw.org](mailto:Sara.Anderson@supportuw.org) to learn more.



# Take the FINAL EXAM!

## This Edition: THE CALS HISTORY CHALLENGE!

A special Final Exam in honor of the college's 125th anniversary  
Fill out your answers online. Ace our quiz and we'll enter you in a drawing for a gift box  
of Babcock Hall cheese. Go to: [www.cals.wisc.edu/grow/](http://www.cals.wisc.edu/grow/) for more details.

**1. CALS scientists are credited with finding treatments for the following conditions:**

- a) iron deficiency anemia, rickets, scurvy
- b) rickets, pellagra, pneumococcal disease
- c) goiter, pellagra, rickets
- d) rickets, hoof-and-mouth disease, pellagra

**2. We know warfarin, invented by K.P. Link, as a commonly used blood-thinner.  
For what other purpose was it widely used?**

- a) chemical weapons
- b) insecticide
- c) rat poison
- d) prevention of hair loss

**3. Wildlife ecologists at CALS developed techniques credited with increasing populations  
of the following endangered animals:**

- a) California condor
- b) Mauritius kestrel
- c) peregrine falcon
- d) a and c
- e) a, b and c

**4. These CALS departments were the first of their kind nationwide:**

- a) agricultural economics, soil sciences
- b) agricultural bacteriology, wildlife ecology
- c) genetics, wildlife ecology, agricultural journalism
- e) a and c

**5. Which innovation comes from CALS?**

- a) round silo
- b) mechanical cherry harvester
- c) beef sticks
- d) winter-hardy alfalfa
- e) a, c and d
- f) a, b and d

Last issue: Answers were: 1:B, 2:A, 3:B, 4:D, 5:E. Congratulations to Christine Rademacher,  
BS'80 Soil Science, who was randomly selected from 11 people who answered all questions  
correctly. She wins a Babcock Hall cheese box.



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**This friendly goat**, shown here with agroecology students, represents some of the great things that have happened at CALS over the past 25 years (including the rise of artisan cheese and interdisciplinary majors). Learn more about these and other important developments starting on page 14.

PHOTO BY WOLFGANG HOFFMANN BS'75 MS'79