

IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences

STORIES

IN AGRICULTURE AND LIFE SCIENCES | SPRING 2008

Impact: Water Quality



ALUM GUIDES FARM BUREAU
AND HIGHER ED



YOUNG PROF HELPS STUDENTS
FIND FUTURE CAREERS



STUDENT SHARES RESEARCH
WITH THE PUBLIC

STORIES

IN AGRICULTURE AND LIFE SCIENCES

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College of Agriculture and Life Sciences



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FOREWORD

I LOVE SAMPLE DAY AT THE GROCERY STORE, DON'T YOU?

Perky retirees preparing and doling out tiny bits of product to savor and consider while strolling through the store is a welcome diversion for such a mundane chore. Even if they offered samples every day it would be impossible to taste everything in the store. How do they choose?

It felt a bit like sample day in our office when it came time to decide what stories would be included in our water quality section of this issue of STORIES.

It is impossible to represent the breadth and depth of Iowa State University's water quality programs, even in an entire issue of a magazine. Research, education and outreach is happening on micro and macro levels; regarding plants, animals and marine life; considering social and economic factors. For faculty and staff in our college, the efforts to preserve and enhance the quality and sustainability of our water resources truly embody the term "life sciences."

This issue of STORIES will introduce you to some new water quality research like the projects led by up and coming faculty member Matt Helmers and update you on long-term successful programs including riparian buffer research. Catherine Kling's study sheds light on how Iowans value water quality as she explores the cost of conservation. The impact of ISU faculty and students on water availability and food security in other countries is apparent in the story on the Center for Sustainable Rural Livelihoods.

Overall, the enclosed stories provide a nice sampling of how our college is improving and protecting water quality. But, there are countless other "samples" that couldn't fit in this issue. To learn more, I encourage you to visit www.ag.iastate.edu/stories for a summary of diverse efforts across campus.

In addition to our section on water quality, sample our profiles of nationally recognized teachers, high achieving and globetrotting students and renowned scientists. Meet alumni who inspire with their words and their actions, caring students and professors and extension staff partnering with citizens to make a difference in their communities. With such a wonderful array of personalities, it's obvious it's the people who make our college what it is, on campus, around the state and around the globe. Enjoy the flavor.

Kind regards,

Melea Reicks Licht

CONTENTS

FACULTY

2

Hank Harris
Levon Esters
Gail Nonnecke
Herb Fromm
Amy Kaleita
Lee Kolmer



9



STUDENTS

Joe Vanstrom
Kelsey Vincent
Klaire O'Rourke
Luke Gran

EVERY SEMESTER, A STUDENT MARSHAL LITERALLY carries the flag of the college, leading our procession of new graduates at commencement. In choosing this student, we look for someone who's been very successful academically, has been a leader on and off campus and whose story inspires others.

This spring, our student marshal was Lucas Carlstrom of Eldridge, Iowa. His story is inspiring, so I want to share a few things I learned about this new graduate.

Lucas, the son of Paul and Lynn Carlstrom, was an honors student who earned a B.S. in animal science. He conducted research with several mentors in animal science, primarily



Lucas Carlstrom

Matthew Ellinwood. The work examines what we may learn from animal genetics that translates into biomedical advances to improve human health.

Lucas helped identify a genetic mutation that's key to a disease afflicting some dog breeds. He was co-author of a published scientific paper.

Shortly after graduation, he headed to France to present a research poster at an international meeting.

Outside class, Lucas volunteered in the Emergency Room at the Ames hospital. He helped organize the annual ISU student dance marathon, which this year raised nearly \$200,000 for the Children's Miracle Network and the University of Iowa Children's Hospital. He tutored other



students in organic chemistry. He trained for triathlons to push himself physically as well as mentally.

After his junior year, Lucas completed an internship in the Mayo Clinic's molecular medicine program. This fall, Lucas will return to Mayo to enter the prestigious, highly competitive medical scientist training program. In the future, he hopes to be involved in applied clinical research involving gene therapy to treat diseases.

Lucas' story is one of an extraordinary young scholar. I'm certain we'll be hearing much more about him in the future. I can say the same about many of the young men and women who crossed the stage this spring.

Inside this issue of STORIES you'll read about other great students. And look for our ad on page 26 that highlights our young alums who find success in Iowa.

Wendy Wintersteen

Wendy Wintersteen
Endowed Dean of
Agriculture and Life Sciences

Editor's Note: This issue of STORIES was at press during the floods that devastated parts of the Midwest this spring. We've heard several heroic accounts from alumni about how people banded together to help each other through this disaster. Read a personal account of flood clean up efforts in the Cedar Rapids, Iowa area from the Dwight Hughes family (profiled on page 26) and find links to ISU Extension's flood and disaster recovery resources at www.ag.iastate.edu/stories. We know many of you have been touched by the Floods of '08 and invite you to share your own stories with us and your fellow alumni by e-mailing them to stories@iastate.edu.



ON THE COVER:

Catherine Kling is one of several faculty featured in the IMPACT: Water Quality section. She and a team of researchers examine the cost of conservation.

14

**IMPACT:
WATER
QUALITY**



**CAMPAIGN
IOWA STATE**
WITH PRIDE AND PURPOSE

28

**INVESTING IN
EXCELLENCE**

- Sustainable Rural Livelihoods
- Campaign Update

22

ALUMNI

Craig Lang
Karen Moldenhauer
Lowell Catlett
Dwight Hughes



**PARTNER
PROFILE**

30

- Northeast Iowa Watershed Partners
- On-farm Research Partners

FIGHT AGAINST INFECTIOUS DISEASES, FROM PIGS TO SHRIMP

By Barbara McBreen

HANK HARRIS GENTLY REACHES INTO THE SALT-WATER tank resembling a giant ice cream pail and pulls up a shrimp more than six inches long. The translucent crustacean is large for a shrimp grown in a nonnatural setting.

"It's more difficult to raise the larger shrimp in ponds or farms because of infectious diseases," Harris says. "That's why larger shrimp are more expensive."

Harris, Iowa State professor of animal science and veterinary diagnostic and production animal medicine, has been studying infectious diseases since 1967. He became interested in shrimp after he was contacted by the Oceanic Institute in Hawaii in the 1990s. They asked about his work with pigs and realized they could apply those methods to shrimp.

"There are some interesting bacterial diseases in shrimp and there wasn't much research being done at the time," Harris says.

Shrimp are difficult to grow in ponds or farms because of disease, Harris says. About half the shrimp consumed in the United States are farmed in ponds along the coastal areas of North and South America and Asia.

The growing period for marketable shrimp is four to five months. Those shrimp can weigh up to 30 grams. Harris orders about 4,000 larvae shrimp every three months to restock the tanks.

There wasn't much interest in shrimp research in Iowa, and why should there be? But then ethanol production began to boom, says Harris.

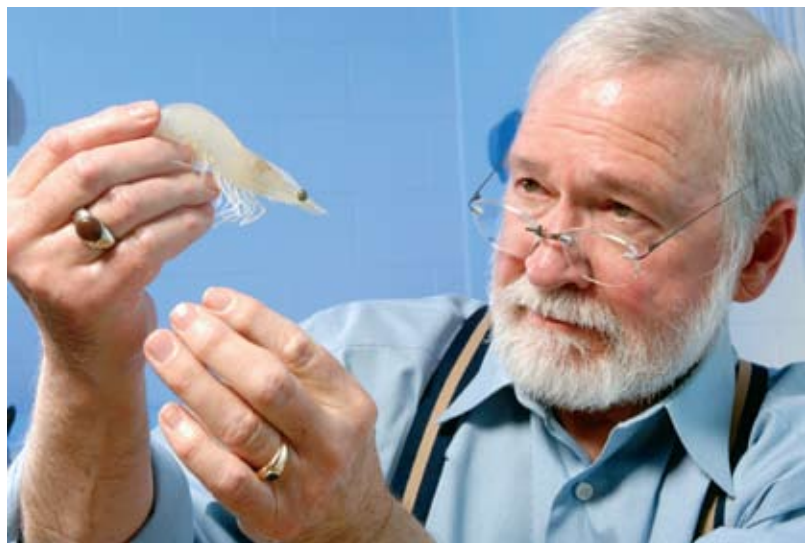
"The ethanol folks wanted to know if the byproducts from ethanol production could be used as a food source for shrimp," Harris says.

To find the answer, Harris received a grant from Midwest Grain Processors of Belmond, Iowa. He has also received funding from an Indonesian company, which supplies 10 percent of the world's farmed shrimp market, to study infectious diseases and food sources. His research includes the search for genetic disease resistance and the nutritional value of distilled dried grain solubles for shrimp.

But what are the similarities in studying infectious diseases in pigs and shrimp?

"The lab procedures are almost identical for pigs or humans or shrimp. The similarities are in disease control. Like pigs, we begin by eliminating the pathogens that cause disease. And, like pigs, we separate the shrimp by age," Harris says.

Harris has studied infectious diseases in swine for the past 40 years. During that time he and his colleagues have



Hank Harris has studied infectious diseases in pigs and shrimp for over 40 years. He is currently studying genetic disease resistance and the nutritional value of distilled dried grain solubles for shrimp.

made multiple discoveries that have benefited the pork industry including:

- identifying the bacterium that caused swine dysentery in the 1970s;
- developing a vaccine in 2005 to prevent Porcine Reproductive Respiratory Syndrome (PRRS), which causes infertility and reproductive problems in pigs; and
- isolating piglets after weaning, which formed the basis for multiple-site production, now an industry standard.

Harris has a long list of accomplishments and awards. In 2005, Harris was included in National Hog Farmer magazine's top 50 men and women who have made a difference in the pork industry. He also received the College of Agriculture and Life Sciences Henry A. Wallace award in 2004, which honors individuals who have had widespread influence in agriculture.

Harris continues to be amazed at how diseases continue to evolve and change.

"Twenty years ago, the World Health Organization believed infectious diseases would be conquered," Harris says. "Infectious diseases continue to be a problem and it appears they will keep evolving. There are more types of diseases we have to contend with, and it's probably due to increases in population, how we travel and how we move and raise animals around the world. All those factors contribute to infectious diseases." ©

ESTERS ENCOURAGES EXPLORATION

By Barbara McBreen

STUDENTS ENROLLING IN LEVON ESTERS' CAREER seminar class are encouraged to explore.

"College is about experience and the more experiences you have, the more you are exposed to new ideas," says Esters, an assistant professor in agricultural education and studies.

The class is a perfect fit for Esters because it complements his research, which is focused on the career development of students enrolled in secondary and postsecondary programs in agriculture. To understand how high school and middle school students make career choices, Esters began measuring their interest level and understanding of various agricultural tasks and activities.

"Research has shown that students who have a high degree of confidence in their skills in science, technology, engineering and math have a tendency to pursue majors and careers in those areas," Esters says.

Since little research had been done in the area of agriculture, Esters developed a survey instrument to measure high school students' understanding and confidence in performing tasks and activities related to agriculture.

"Historically we've assumed that it's the agriculture stereotypes that have dissuaded students from entering various agriculture majors and careers," Ester says. "My goal is to examine other factors that might predict why students chose agriculture as a major or career."

My goal is to examine other factors that might predict why students chose agriculture as a major or career.

Esters has surveyed more than 1,000 high school and middle school students in both rural and urban agricultural education programs in the United States, as well as students in South Korea and New Zealand. He says preliminary results indicate that confidence and interest in agriculture are important factors in the career choice process.

Robert Martin, chair of the agricultural education and studies department, says Esters' research is on target.

"He's developing an instrument that will be useful for career development," Martin says. "It's unique and we don't know anyone else that is doing this type of research in agriculture."




Levon Esters uses his expertise to guide students having problems with career decisions. He is certified as a global career development facilitator by the Center for Credentialing and Education.

As the pool of high school students diminishes, in some states, the competition to recruit students into agricultural colleges has increased. Martin says that makes this research even more important.

"People seem to think that because there are fewer farmers there are fewer opportunities in agriculture. It's exactly the opposite in agriculture because students can focus on careers in nutrition, microbiology, communications, teaching, turf management – the list is endless," Martin says.

Esters' ultimate goal is to provide information that will help students make better career-related decisions. To do that he encourages students to make the most of their college experience and explore every option available.

"Students use the Internet as a primary source of information, but they really don't have a good understanding of the vast number of opportunities available to them," Ester says. "I want students to explore, experience and discover careers in the agricultural sciences."

The National Academies Board on Agriculture and Natural Resources appointed Esters to a national committee to organize a leadership summit held in October 2006. The conference focused on helping universities attract, retain and prepare students for careers in agriculture and science. The report summary on data gathered at that meeting should be released late this summer. 

HORT PROF **HONORED NATIONALLY** FOR NURTURING STUDENTS

By Ed Adcock

HORTICULTURE PROFESSOR GAIL NONNECKE'S LOVE of agriculture can be traced back to many hours sitting on a tractor with her father as a young girl on the family's farm in southeast Pennsylvania.

Her love of teaching didn't surface until she was well into her college years. Her interest came as an intern at The Pennsylvania State University where she earned a bachelor's in general agriculture in 1975 and a master's in horticulture two years later.

"I was asked to lead an extension workshop on grapevine propagation before a group of novice grape growers. The four-hour session went over well and the group was so enthusiastic," she says. "After that, I was hooked on teaching and student learning."

As a graduate student on a research assistantship, Nonnecke became an informal teaching assistant by asking to help teach whenever she could. Her research specialty at Penn State, and later as she earned her doctorate at The Ohio State University, was small fruits and berries, which she still studies at Iowa State.

Since she joined the ISU faculty 24 years ago, her love of teaching and agriculture have combined to win "every

Excellence in Teaching Award.

Nonnecke seems a bit overwhelmed by the awards. She especially appreciates a tribute that Iowa Rep. Tom Latham presented before the House of Representatives in honor of her Professor of the Year award.

Iles praises Nonnecke as a scientist and an educator. He says her research background gives her credibility in the classroom. She also stays current with the science of teaching, giving her students the benefit of the latest techniques.

"And I know it sounds trite, but she cares about students," Iles says.

"She's the nicest person in the world, but she's also tough. She expects her students to work hard."


Add to those qualities her excellent communication skills and an international perspective and Iles says it's no wonder she acts as a mentor to professors in the college and the university.

"Rarely do I encounter an individual who is so engaged and committed to such a variety of roles related to serving students," says Corly Brooke, director of Iowa State's Cen-

"SHE'S THE NICEST PERSON IN THE WORLD, BUT SHE'S ALSO TOUGH. SHE EXPECTS HER STUDENTS TO WORK HARD."

ter for Excellence in Learning and Teaching, who nominated Nonnecke for the U.S. Professor of the Year award.

Brooke noted Nonnecke's work with the horticulture learning community, which groups students with similar interests to help acclimate them to the university; mentoring professors; and her study abroad experiences. The last two summers, Nonnecke led a team of students that helped develop a school garden for teaching agriculture in rural Uganda (see story page 28).

"Undergraduate education is paramount for training our future professionals, to help not only our nation, but global communities," Nonnecke says. "Faculty and student collaboration is highly valued at Iowa State University. I have tried to embrace that value in my courses." 



Gail Nonnecke is shown with her USDA award. She also has been named a University Professor in 2008.



Award winning teacher Gail Nonnecke shares plant information with horticulture students (left to right) Lisa Wasko, Shane Mairet and Karli Christensen in the Iowa State University greenhouses.

prestigious teaching award there is," according to Jeff Iles, Iowa State's chair of the Department of Horticulture

She was selected last December as the Iowa Professor of the Year by the Carnegie Foundation for the Advancement of Teaching and the Council for the Advancement and Support of Education. The previous year she received the national U.S. Department of Agriculture (USDA)

FROMM CATALYZES ENZYME RESEARCH AND STUDENT SUCCESS

By Brian Meyer

IF YOU DON'T UNDERSTAND HOW ENZYMES FUNCTION, you don't understand how life functions.

Maybe that's why Herbert Fromm is fond of quoting Nobel Prize winner Richard Willstätter, who said life's nothing more than a series of cooperating enzyme-catalyzed reactions.

Fromm is an internationally recognized scientist who devoted his career to study how enzymes are regulated and how they catalyze chemical reactions.

Enzymes are the accelerators inside cells, spurring on thousands of chemical reactions every moment. "If you know a lot about enzymes, it's possible to design drugs or products to regulate their activity," says Fromm, a Charles F. Curtiss Distinguished Professor of Agriculture and Life Sciences in the Department of Biochemistry, Biophysics and Molecular Biology. "If you have an enzyme that's bad for some reason, you can inhibit its activity. If you have an enzyme that's good, maybe you can enhance its effectiveness."

In the 1960s, Fromm's pioneering theories led to the establishment of the field of contemporary enzyme kinetics, which studies the speed of reactions.

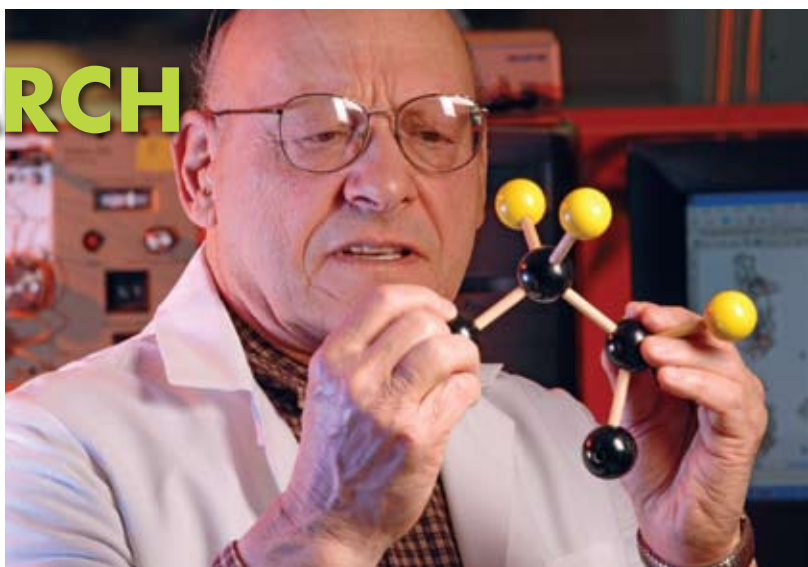
Fromm has been a national leader in studying an important enzyme involved in the regulation of blood glucose. Inhibiting the enzyme may be one way to control type 2 diabetes. His lab has studied hexokinase, an enzyme that helps prevent programmed cell death, which is beneficial for the integrity and longevity of brain cells. But it's terrible when the enzyme provides the same benefit for cancer cells. A better understanding of hexokinase may lead to ways to promote health or inhibit disease. He's also studied a key enzyme in growing cells important for production of DNA, RNA and the energy-rich molecule called ATP. Inhibit this enzyme and you open new possibilities for cancer therapies or more effective herbicides.

Fromm has been supported by an incredible run of competitively awarded federal grants. Some of his work has earned continuous funding for more than 50 years.

In many ways, Fromm was the enzyme that catalyzed his students to highly successful careers.

"Except for my parents, no one's had a greater impact on my life than Herb Fromm," says Dan Purich ('73 PhD biochemistry), professor of biochemistry and molecular biology at the University of Florida College of Medicine. "We were always expected to be on our toes and ready to learn more. Herb set a high standard for us to develop our fullest potential."

Mark Stayton ('80 PhD agricultural biochemistry), chair of the Department of Molecular Biology at the University



For nearly five decades, Herbert Fromm has taken a close look at enzymes, like the one modeled here, to gain understanding of cell function through enzyme-catalyzed reactions.


of Wyoming, says when he first arrived at Iowa State, other graduate students warned him to avoid the demanding professor.

"Disregarding that advice was the best choice I ever made," says Stayton, who believes that Fromm's work will become even more relevant.

"Now that the human and other genomes have been sequenced, the focus is shifting to how these proteins actually work and how some are defective, causing disease. That's driving a return in interest in Herb's approach to biology, which is quite fresh and relevant," says Stayton.

Stayton, who's stayed in touch over the years, says Fromm still demands rigorous thinking. "Your dad's always your dad and your major professor is always your major professor," he says, laughing.

Ask him about his most indelible accomplishment and Fromm, who will retire in 2009 after 43 years at ISU, says, "My kids." He and his wife Kathy have four children (an orthodontist, a pathology professor, a medical doctor and a mathematician) and six grandchildren.

Now that's a catalyst. 

Fromm's former student Dan Purich ('73 PhD biochemistry), professor of biochemistry and molecular biology at the University of Florida College of Medicine, is dedicating a new textbook on enzyme kinetics to Fromm. Part of the dedication reads:

"Above all, I fondly thank Professor Herbert J. Fromm... I still marvel at Herb's work ethic, his focus and intensity, his sustained excitement and passion for science and his ability to make indelible marks on intellectually susceptible students..."

Read more from some of Fromm's students at www.ag.iastate.edu/stories.

EXCELLENCE IN TEACHING PUTS KALEITA IN NATIONAL SPOTLIGHT

By Ivy Ulmer

AFTER HER JUNIOR YEAR AS AN AGRICULTURAL engineering major in college, Amy Kaleita wanted to travel to Europe to visit a friend. To earn money for the trip, she took a summer job close to home on a watershed modeling research project.

It was a turning point. The watershed work interested her and put to use what she'd been learning as an undergraduate. She thoroughly enjoyed her summer work experience and when it was over, she asked her supervisor about graduate schools to continue to pursue her interest.

According to Kaleita, now an assistant professor of agricultural and biosystems engineering, that summer job she took mostly in order to pay her way overseas opened up a world of possibilities she may not have considered otherwise.

Kaleita says she was drawn to Iowa State because of its strong commitment to quality teaching. Since she began teaching soil and water conservation management and water quality courses in 2003, she has played a large role in furthering that commitment.

Kaleita says her teaching philosophy fosters students' critical thinking skills to excel in and beyond the classroom.

"I strive to help students learn to be learners, so that they can use their foundation to continue to develop as engineers, technologists, environmental scientists and contributors to society," says Kaleita. "The knowledge gained through educational exploration will give them the building blocks, but a lifestyle of learning will help them to be innovative and adaptive."

Kaleita was one of two instructors in the nation to receive the 2008 U.S. Department of Agriculture (USDA) Food and Agricultural Sciences Excellence in Teaching Award in the new teacher category. She received the award for her teaching quality, philosophy, methodology, service to the profession and students as well as professional growth and development.

"Dr. Kaleita's national recognition is a testimony to her outstanding achievements in teaching and an indication of the college's emphasis on attracting faculty who are dedicated to teaching," says David Acker, associate dean of academic and global programs in the College of Agriculture and Life Sciences.




Amy Kaleita takes an interest in her students in and outside of the classroom. On average, she teaches 40-95 students per year and advises the engineering honor society, Tau Beta Pi and a Greek fraternity. She also mentors undergraduate researchers and advises graduate students.

The prestigious USDA award was not her first teaching honor. As a Ph.D. student at the University of Illinois, she received the Teaching Excellence Award from the Department of Agricultural Engineering. In 2006, Kaleita was honored for outstanding early achievement in teaching by Iowa State at both the university and the College of Agriculture and Life Sciences levels.

In addition to her teaching responsibilities, she conducts an active research program in remote sensing for natural resource conservation; hydrologic and crop growth models as decision support systems; and spatial variability of soil hydrologic properties and effects on management.

She says ISU's number-two-in-the-nation agricultural engineering program (so named by U.S. News & World Report) is a testament to the quality and preparedness of students coming out of the classroom.

"I believe that as educators, our task is to help students build a foundation of knowledge upon which they will build not only a career, but also a lifelong passion for learning and contributing to the advancement of food, agricultural and life sciences," says Kaleita. 

KOLMER REFLECTS ON 14 YEARS IN THE DEAN'S OFFICE

By Karen Bolluyt

EVERY DISTINGUISHED CAREER PROBABLY INCLUDES AN evening like the one experienced by retired dean Lee Kolmer in 1959 when he was an extension economist.

He was giving an early-evening talk in a hot church basement, the combination of a speaker's platform and low ceiling not ideal for his 6'3" frame. Most of the people listening were dairy farmers, fresh from their barns, carrying the aroma of their workplace. In the front row, despite his best efforts, two men fell asleep.

Thirty-three years later, Lee Kolmer retired from a distinguished career in Iowa agriculture and higher education.

Towards the end of his 14-year tenure as dean, Kolmer described his view of his job: to provide support and remove obstacles so that people in the college and in agriculture can do excellent work.



Retired Dean Lee Kolmer led the College of Agriculture and Life Sciences from 1972 to 1987.

His job did *not* include carrying a shovel behind the horses in the VEISHEA parade. That was something of a tradition for Iowa State deans when he arrived, but he declined to participate.

Today, his favorite memories reflect the job he described. They are stories of one faculty member or one farming couple who proceeded or succeeded partly because he provided a little path clearing.

He also mentions hiring some of the college's first female faculty members in traditionally male disciplines who, he is quick to point out, went on to be very successful.

Kolmer, named dean in 1972, served the college during the farm crisis of the 1980s. Despite the economic climate, it was his job to advocate for resources to conduct top-notch programs in teaching, research and extension.

Thamon Hazen, an agricultural engineer, joined Kolmer's administrative team in 1974 as assistant director and assistant dean, a position he held for 13 years.


"He had great people skills. He knew when kid gloves were needed and when it was time for a firm hand. He was not timid about saying what needed to be said, but he was great in difficult situations and people had confidence in him," Hazen says. "He treated everyone the same. Social and economic status didn't matter to him."

In particular, he worked on research funding, noting—at countless meetings in countless communities—that Iowa ranked poorly compared with other agricultural states, in its public investment in agricultural research.

During Kolmer's tenure, the university secured funding for a meats laboratory, a seed science laboratory, horticulture and agronomy buildings, the Leopold Center for Sustainable Agriculture and a crops utilization center. ISU also was named the location of the National Soil Tilth Laboratory while he was dean.

Also during his tenure, funding for scholarships increased significantly, especially in the emerging area of biotechnology, and the off-campus Master of Agriculture degree program was launched. He worked with farmers and other Iowans to establish a statewide friends group, the Friends of Agriculture. After Kolmer left the dean's office, this group continued a major role in getting increased state funding for research.

As dean, Kolmer supported international activities for faculty and staff and kept active in international programs himself. After he retired, he was involved in agricultural development programs in Russia and Kenya.

Today, Kolmer lives in Des Moines with his wife Jean and two cats bequeathed on them by their younger son. A daughter and her husband live in Des Moines. One son lives in Minnesota and one lives in Illinois with his wife and two children. 

KOLMER'S WINDING ROAD TO THE DEAN'S OFFICE

The path to Lee Kolmer's university career began on a farm in one of four southern Illinois counties settled largely by German immigrants. When Kolmer was stationed with the U.S. Army in Italy in 1947, he realized that he might have been a Hitler youth, sacrificed to the Nazi cause, had his family not emigrated to the United States. Kolmer says he recognized part of what he became was due to good fortune. "I saw that my grandparents' emigration was a great gift to me... It changed the way I saw the world," he says. Learn more about Kolmer's career path at www.ag.istate.edu/stories.



Wendy
Wintersteen



Michael
Thompson



Basil
Nikolau



Dan
Nettleton



Patrick
Schnable

COLLEGE HONORS NEW ENDOWED POSITIONS

Several college faculty have recently been awarded endowed positions, including Dean Wendy Wintersteen who has received the first endowed deanship at Iowa State University. Michael Thompson, professor of agronomy, has been presented with the Pioneer Hi-Bred Agronomy Professorship. Basil Nikolau, professor in biochemistry, biophysics and molecular biology and food science and human nutrition, is the Frances M. Craig Professorship. Dan Nettleton, professor of statistics, is the new Laurence H. Baker Endowed Chair in Biological Statistics. Patrick Schnable, professor of agronomy, has been named the Laurence H. Baker Endowed Professor of Agronomy. See a full list of all endowed positions in the college at www.ag.iastate.edu/stories.

DEAN'S CITATION FOR EXTRAORDINARY CONTRIBUTIONS

The 2008 Dean's Citation for Extraordinary Contributions to the College of Agriculture and Life Sciences was presented to Mark Huss, Joe Detrick and Dennis Shannon for their expertise and assistance with the opening of the new Dairy Farm. Huss was the project manager for the construction of the farm and is an engineer and manager of agricultural project services with ISU Facilities, Planning and Management. Detrick is the Dairy Farm manager and coordinated the move of more than 300 cows from the Ankeny farm to the new farm south of Ames. Shannon, farm manager for Iowa State Research Farms, coordinated the auction of surplus farm machinery and equipment from the Ankeny farm. He also coordinated the clean up of the Ankeny farm. The team received the award at the college's spring convocation.

COLLEGE OF AGRICULTURE AND LIFE SCIENCES AWARDS

- **Outstanding Adviser** - Phil Spike, professor of animal science
 - **Early Achievement in Teaching** - Lyric Bartholomay, assistant professor in entomology
 - **Outstanding Achievement in Teaching** - Janette Thompson, associate professor of natural resource ecology and management
 - **Early Achievement in Research, Baker Agronomic Excellence Award** - Palle Pedersen, assistant professor in agronomy
 - **Outstanding Achievement in Research** - Matt Liebman, Henry A. Wallace Endowed Chair for Sustainable Agriculture and professor of agronomy
 - **Early Achievement in Extension** - Alison Robertson, assistant professor of plant pathology
 - **Outstanding Achievement in Extension** - Micheal Owen, professor of agronomy
 - **Team Award** - The Resource and Environment Policy Division at the Center for Agricultural and Rural Development.
- Catherine Kling, professor of economics, heads the team that includes Hongli Feng Hennessy and Silvia Secchi, both associate scientists; Philip Gassman and Manoj Jha, both assistant scientists; and Todd Campbell, systems analyst.
- **Excellence in International Agriculture** - Gail Nonnecke, professor of horticulture
 - **Merit Staff Award** - Cindy Pease, secretary in economics
 - **Professional and Scientific Staff Award** - Ann Bugler, program coordinator in the Brenton Center for Agricultural Instruction and Technology Transfer
 - **Diversity Enhancement** - Nancy Grudens-Schuck, associate professor in agricultural education and studies
 - **Student Recruitment and Retention** - Doug Kenealy, University Professor in animal science
 - **Learning Community Coordination** - John Burnett, student services specialist in natural resource ecology and management

MACDONALD APPOINTED TO IOWA ECONOMIC DEVELOPMENT BOARD

Governor Chet Culver has appointed Ruth MacDonald, professor and chair of the Department of Food Science and Human Nutrition, to the Iowa Department of Economic Development Board. She will represent the life sciences industry on the board until her term expires in 2010.



John 'Jack' Bremner, 85, died in July 2007 at his home in Palm Desert, Calif. A native of Scotland, Bremner was a researcher and professor of agronomy and biochemistry at Iowa State University from 1959 to 1992. He authored more than 300 scientific publications and made seminal contributions to the fields of soil chemistry and biochemistry. He was a world leader in research developing methods of reducing environmental problems associated with the use of nitrogen fertilizers. He received numerous national and international awards for his contribution to science, including Carnegie, Rockefeller and Guggenheim fellowships. He was one of only nine faculty members in the history of Iowa State to be named a member of the National Academy of Sciences. He also received an honorary doctor of science degree from the University of Glasgow in 1987. A memorial symposium in honor of Bremner is being planned for the next annual Soil Science Society of America meeting.

STORIES online extra:

Learn more about Bremner and his prestigious career at www.ag.iastate.edu/stories.

'GENTLE GIANT' HELPS OTHERS MAKE GAINS ON AND OFF THE FIELD

by Susan Lucke

AT FIRST GLANCE, JOE VANSTROM MAY SEEM A BIT intimidating. At 6'6", the ISU offensive lineman and senior in industrial technology has a sizeable presence. But his warm smile and laidback personality make him a favorite with his peers and professors.

Mentoring peers and younger students has been an interest of Vanstrom's since his days as a fourth grade peer mentor and later in high school as a 4-H mentor. Today he serves as president of the ISU student chapter of the National Association of Industrial Technology (NAIT) and is a teaching assistant and peer mentor to entering industrial technology (I Tec) students.

"Teaching has been good for me because I enjoy helping students," Vanstrom says. "For almost as long as I can remember, I've been willing to try and help people. If I had the opportunity to teach as a profession, I would absolutely consider it."

As president of the NAIT chapter, he hopes to expand group activities, increase professional networking and inspire a win at the NAIT Robotic Manipulator Contest. This summer and in graduate school, he hopes to work with his agricultural and biosystems engineering professor and mentor David Grewell on the economical manufacturing of biomass fuel.

"Joe is a wonderful person to work with. The 'gentle giant' is an apt term," says Grewell. "Students love him. He inspires them to participate and become interactive. He



Joe Vanstrom helps I-Tec sophomore Mathew Moehn work with an engine lathe to complete a final project. Vanstrom says it is important for students to learn the fundamentals about the lab equipment even though the machines are operated by computers in industry.




Joe Vanstrom, a senior in I Tec and a Cyclones offensive tackle, relaxes after practice at Jack Trice Stadium.

challenges them while assuring they are comfortable with their settings."

Vanstrom appreciates the opportunities to try new things at Iowa State. He says he used to feel "pigeon-holed" as an athlete at his Ham Lake, Minn. high school and sought a collegiate experience where he could discover new dimensions of himself and meet people who would recognize his potential. He says he found that at ISU, where he now sees football and education as complementary forces shaping his life.

Education is his primary goal, and he sees the discipline and commitment of athletics as valuable to academic success. Vanstrom grins as he speaks of his close friends inside and outside of football. He describes the group as his "rock in turbulent times" during highs and lows in his athletic and academic experiences.

"Being at ISU has opened so many doors that I could not possibly have thought about," says Vanstrom. "I know I like where I'm going, coming from Iowa State." 

WHAT'S I TEC?

An Industrial Technology (I Tec) major is one of 25 majors (plus three secondary majors) offered by the College of Agriculture and Life Sciences. The major, and a minor, have been administered by the Department of Agricultural and Biosystems Engineering since 2004. Students majoring in I Tec select an emphasis in one of the following: Systems Technology Management, Occupational Safety Technology, Biological Systems Technology or Industrial Systems Technology. For more information visit www.ag.iastate.edu/stories.

FROM MEDICINE TO BIODIESEL, AST STUDENT FINDS HER OWN PATH

By Susan Lucke

Kelsey Vincent worked with ABE professor Tom Brumm to create this biodiesel stand showing various stages of fuel production. The demonstration produces fuel in 90 minutes and was displayed at the 2007 World Food Prize celebration and at VEISHEA 2007 and 2008.



KELSEY VINCENT LOOKED AROUND THE ROOM. SHE had a sinking feeling she wasn't in the right place. As the presenter continued on with the orientation presentation at Iowa State, it became obvious to Vincent she wasn't in the orientation she'd originally chosen, but instead seated with entering freshman in engineering. Rather than leave in the middle of the presentation, she decided to stick it out.

Four years later, as a senior in agricultural systems technology, the Conesville, Iowa native is glad she did.

As Vincent listened to the engineering orientation, the new opportunities intrigued her, especially agricultural and bioengineering courses in biorenewable energy. She had planned to major in some area of biomedicine and go on to medical school. But she realized that she could use her scientific talents, as well as her knowledge of agriculture, to benefit the environment.

"Changing to engineering during orientation kind of set the tone for my college career. Being willing to see opportunities to try something different, and maybe not stick to the original game plan, has enabled me to get a broader experience at ISU and has helped me find my passion," says Vincent.

She started out in agricultural engineering. As Vincent concluded her sophomore year, she realized that she wanted to work more with people and less in an office or laboratory. She spoke with her adviser, agricultural and biosystems engineering associate professor Tom Brumm, who suggested a transfer to agricultural systems technology, with specialization in systems technology management.

Vincent finds satisfaction using her engineering knowledge to help develop agricultural systems that balance


sustainability and conservation with profitability. She is able to focus specifically on biorenewables and biodiesel fuels, the areas she initially found intriguing at orientation.

Currently a lab assistant to Brumm, Vincent assists with biodiesel laboratories, teaching high school and college students about "green" energy and biodiesel production. She and Brumm also built a portable demonstration of the biodiesel process based on a photograph of a similar display. She considered it an opportunity and a challenge to "do something great."

"Creating the biodiesel display, and being able to show it to thousands of Iowans, has been one of the biggest highlights for me during my school career," Vincent says. "The stand has been a great tool for educating the public about the biodiesel production process."

"Kelsey is the kind of student faculty love to work with — smart, articulate, motivated and reliable," says Brumm. "She's helped me teach hundreds of students about biodiesel. I'll be sad when she graduates because I'll be losing someone I depend on to get things done."

This summer, Vincent will intern with Renewable Energy Group, Inc., in Ames, the market leader in biodiesel. She is considering graduate school in 2009, to study biorenewables or public health and epidemiology, and she hopes to remain in Iowa.

Vincent looks back on her ISU experience with appreciation for the unexpected. "My experience at Iowa State definitely has changed me," she says. "I thought I was going to end up an engineer, working in the biomedical field. But Iowa State offers many opportunities to explore your talents and try new things." 

O'ROURKE'S FOCUS IS ON PEOPLE

By Susan Lucke


KLAIRE O'ROURKE IS ONE OF THOSE "PEOPLE" PERSONS. "People" make their way into her answers on questions about her choice of Iowa State for an agricultural business degree, her most enduring memories of school and reasons she looks forward to her career.

O'Rourke has built on her love of working with people through her term as president of the Agriculture and Life Sciences Student Council in 2007. O'Rourke led a group of 53 fellow students representing 33 agricultural clubs in organizing student activities for the entire college. She credits the committee for successfully bringing people together for

her introduction to the university through tours and talks during annual 4-H state conferences and FFA state conventions that she attended throughout her high school years.

"I knew when I came to orientation that I'd made the right decision because the professors in ag business were just so friendly," she says. "Once I started classes, I wasn't sure if ag business was right for me or if I could handle all the economics, but they really encouraged me. I could always go in to see my adviser (Jim Kliebenstein) when I was really stressed and he would bring me back to center."

What does she see for herself in the future? O'Rourke laughs as she says, "I'd like to be the ISU Ag Career Services director someday. But really I'm looking forward to a career in sales, communications, marketing."

One thing is clear – it's sure to involve people. 

"I have particularly enjoyed working in the agricultural industry with professors and professionals," she says. "There is something about them that is down to earth and easy to visit with."

barbecues, a hayrack ride, a softball tournament and the annual Agricultural Career Day.

"As president, I learned so many lessons and so many things that are going to be of value moving into the workforce," she says. "I learned that it takes a wide variety of people and skills to make the agricultural industry as successful as it is today and that teamwork and communication is a must to any successful organization."

In her work-study position with the College of Agriculture and Life Sciences Career Services, she has learned to assist staff and help students use an online program to locate and apply for internships and jobs. O'Rourke has been able to test her knowledge and gain more experience through internships with 4-H, the Iowa Farm Bureau Federation and agribusiness giant Bunge North America in St. Louis.

"I have particularly enjoyed working in the agricultural industry with professors and professionals," she says. "There is something about them that is down to earth and easy to visit with."

O'Rourke, a senior from Earlham, Iowa, says she knew early that Iowa State was her only choice for college. She notes



It's evident that it's the people at ISU that matter to Klaire O'Rourke as she refers to career placement director Mike Gaul and Lois Benning (left), administrative specialist, as her "parents away from home." Her duties as a student assistant include helping organize the nation's largest agricultural and life sciences career day.

FORESTRY STUDENT'S **WORLD VIEW** SHAPED BY **STUDY ABROAD**

By Susan Lucke

POTENTIAL EMPLOYERS SHOULD review LUKE GRAN's passport as well as his transcript when evaluating his education at Iowa State. His study abroad experiences have provided him insights into agriculture around the world and made a profound impact on the way he views agriculture locally and globally.

The senior in forestry and international agriculture speaks passionately about pursuing sustainable means to meet society's demands for food, energy and nature.

"My travels deeply affected the way I view food cultures as reflecting agricultural production systems," Gran says. "I have seen agricultural alternatives that involve more community, earth care and lower input costs supporting a food system that can promote a healthy society. This is a global agro-environmental movement that is in Malaysia and right here in Ames, Iowa."

Gran began his ISU studies in biology after graduating from high school in Newton, Iowa. But the course "Religion and Sustainable Agriculture" drew him to science involving

applied land management. He also credits speakers encountered through ISU lecture series and the Leopold Center for Sustainable Agriculture as well as influential ISU program leaders and professors.

Participation in an ISU summer abroad program in India to study sustainable agriculture, democracy and globalization furthered his interest. A meeting with Joe Colletti, then the chair of the Department of Natural Resource Ecology and Management, started Gran in pursuit of his academic passion—forestry with an emphasis on national and international land management and sustainable agriculture.

After becoming a forestry major, Gran set about discovering his niche, "one foot in food issues and one in forestry." Study abroad, including a second summer in India and side-trips to Borneo and Malaysia, provided valuable insight into global forces affecting agriculture that he believes seriously threaten global ecology.

According to Gran, it was his time working in applied forestry in Oaxaca, Mexico, that forged his commitment to forestry. He spent six months participating in a student exchange among American, Canadian and Mexican schools to explore the effects of the North American Free Trade Agreement, or NAFTA.

With graduation in sight, Gran, who is fluent in Spanish, is considering career choices with a special interest in private forestry consulting.

"I want to be part of meaningful landscape change and genuine land stewardship in my country. I am a part of it with each meal I eat and each landowner I work with to use perennials to improve their farm watershed or their forest, prairie or wetland," Gran says. "When woody biomass ethanol starts cranking, people are going to see their woodland as a fountain of new wealth. I intend to be a part of that discussion in directing prudent management." **S**



Photo: Luke Gran

Luke Gran takes a hands-on approach to learning and travel. He is shown planting a tree during a study abroad course in southern India in July 2006.



Gran learned to make charcoal in a non-timber forest products class in Oaxaca, Mexico in 2007.

Photo: José Antonio Gutierrez Lopez

PLANT PATHOLOGY GRAD STUDENT WINS NATIONAL RESEARCH PAPER COMPETITION

Emmanuel Byamukama, graduate student in plant pathology, received first place for a paper in a national competition sponsored by the American Phytopathological Society (APS) Foundation and the APS Epidemiology Committee. Byamukama, a native of Uganda, received the highest scores from APS judges based on the research and the impact it will have on the science of plant pathology. As part of the award, Emmanuel was one of four graduate students selected to receive \$500 in travel expenses to participate in the 8th I. E. Melhus Symposium. The award is named for Irving Melhus, a pioneer in plant disease epidemiology who was the first full-time plant pathologist hired at Iowa State. Byamukama works with Forrest Nutter and Alison Robertson, in the Department of Plant Pathology.

LIVESTOCK JUDGING TEAM FOURTH AT HOUSTON EVENT

The livestock judging team finished fourth at the Houston Livestock Show and Rodeo Intercollegiate Livestock Judging Contest March 19. Team member Matt Mensing was 13th overall. Team members include Cole Burrack of Arlington; Morgan Core of Pleasantville, Troy Kane of Fairbank, Matt Mensing of Orient, Andy Platner of Lisbon and Dustin Smith of Storm Lake. The team is coached by Jeff Thayne.



IOWA STATE STUDENTS WIN SEVENTH TURF BOWL IN A ROW

Iowa State horticulture students won the seventh consecutive Turf Bowl in February in a national competition of 92 teams. The 2008 Turf Bowl championship team consisted of Adam Hebbel, Brad Johnson, Shane Brockhoff and Matt Hoffman. Matt Klingenberg and Marcus Jones were the team's coaches, and Nick Christians is the adviser of the Turf Club. The competition was sponsored by the Golf Course Superintendent's Association of America. A video report of the event is on the Web. Visit www.ag.iastate.edu/stories to view.

Two other horticulture student teams finished second and third in the Sports Turf Managers Association's 2008 Student Challenge. The second-place team consisted of Joe Bowser, Dirk Sorensen, Derrick York and Drew Kleinmeyer. The third-place team consisted of Brad Johnson, Adam Hebbel, Matt Hoffman and Shane Brockhoff. David Minner, horticulture professor, and Andrew Hoiberg, horticulture grad student, mentored the teams.



COLLEGE SENIOR ELECTED GSB PRESIDENT

Daniel Fischer, agricultural business senior, was elected president of the Government of the Student Body (GSB) March 14. He and vice president candidate Maggie Luttrell, senior in history and women's studies, received 66 percent of the vote. Fischer and Luttrell were inaugurated into GSB office on April 15.



ISU MANRRS CHAPTER VOTED BEST IN NATION

Iowa State's Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) chapter was honored as the chapter of the year in March at the organization's national conference in Denver. This is the third year in the last four that the ISU chapter has won this national recognition. Marcus Glenn, agricultural education and studies graduate student, was elected as this region's graduate vice president and Aurelio Curbelo completed his term as the national graduate president. Mary de Baca, the college's diversity program manager, continues to serve on the advisory committee to the national MANRRS society.

BUFFER PROJECT IMPROVES WATER QUALITY, EXPLORES BIOMASS POTENTIAL

by Laura Miller

HIGH ABOVE THE CENTRAL IOWA landscape, even untrained observers can spot the area. Deep green strips hug the curves of a creek, forming irregular shapes that fade into the tidy patchwork of corn and soybean fields.

When Dick Schultz ('65 forestry, MS '68, Ph D '70 forest biology) flies over this area, he sees a wildlife corridor, home to a growing number of pheasants, deer and quail for hunting and many more species of song birds that can provide insect controls for neighboring crops as well as excitement for bird enthusiasts. He envisions a healthy stream corridor of diverse perennial plants that provides ecosystem services to both the aquatic and terrestrial communities that lie along it.

Producers might imagine potential future income generated from the harvest of biomass for production of renewable fuel. And environmentalists might foresee the crucial role this area could play in sequestering carbon and offsetting greenhouse gases.

These are just some of the many possibilities arising from the Bear Creek demonstration project, the crown jewel in pioneering research begun by Iowa State's Leopold Center for Sustainable Agriculture to design and manage streamside buffers to improve the state's water quality. In 1990 when the first buffer system was planted along Bear Creek on Ron Risdal's farm, near Roland, Iowa, it was one of the first such restorations in the United States.

"The Bear Creek buffer project was unique because most of Iowa's native vegetation—tallgrass prairie and wetlands—have been removed," says



Learn how research on this buffer in the Bear Creek National Research and Demonstration Watershed near Roland, Iowa progressed from 1990 to today in the online extra – Bear Creek timeline at www.ag.iastate.edu/stories.

Schultz, a professor in natural resource ecology and management. He leads the Agroecology Issue Team that coordinates Bear Creek research from across the college including agricultural and biosystems engineering; agronomy; animal science; ecology, evolutionary and organismal biology; economics; geological and atmospheric sciences; and sociology.

"Riparian research projects in other parts of the country had native plantings that had been in place for a long time," Schultz recalls. "But here was an opportunity to see how we could design native vegetation corridors that could provide water quality and wildlife habitat benefits in a landscape dominated by agriculture."

Today thousands of miles of streams throughout the United States are protected by buffers, and farmers can participate in government cost-

share programs to use this conservation practice.

The Bear Creek project includes 10 continuous miles of buffers along both sides of the stream. The buffer design consists of rows of trees and shrubs, and a wide grass filter of switchgrass or other native grasses and forbs to trap nutrients and sediment in the surface water runoff from adjacent crop fields. The system also includes constructed wetlands, examples of streambank bio-engineering to stabilize eroding banks, and in-stream structures to improve channel conditions.

Much has been learned at Bear Creek and the project has placed Iowa in the national spotlight and sparked international interest.

But Schultz says the fascinating part is how research continues to evolve, such as a current project on biomass production. When the Bear Creek



Students in a natural resource ecology and management watershed management course install a beaver decoy to lower water levels behind the dam.



A four-year-old buffer in the Bear Creek National Restoration Watershed consists of a native grass filter (on the left) and several rows of native shrubs and trees.

project began, analyses showed that markets for biomass just weren't there. Nineteen years later, the silver maple, green ash, willow and poplar planted on the buffer strips have matured and offer another avenue for research on the economic viability of generating income from biomass.

Other projects seek to quantify the potential of buffers for carbon sequestration and measure the amount of nitrous oxide, a greenhouse gas, contributed by the buffer as compared to crop fields. Another recent project tackles streambank erosion, a major source of in-stream sediment.

The value of buffers for wildlife habitat has not been overlooked by




Members of the Skunk River Navy install willow whips that help stabilize the stream bank. Sites in the Bear Creek watershed are used extensively as field labs for several courses in the college.

the nine landowners whose land is part of the Bear Creek project. They use the area for hunting deer and pheasant and one landowner has released quail in hopes of establishing a population. Aquatic life also has flourished in the protected streams.

A song bird survey in the Bear Creek Watershed showed 43 species in the riparian forest buffer after 10 years of growth, compared to nine in the narrow grass and weed strips typically left along unbuffered streams. Researchers are conducting a 2008 survey to update the information.

The Bear Creek project also has been a valuable teaching tool. At least seven Iowa State classes regularly visit the area, and more than 30 graduate students have conducted their research projects at Bear Creek. Visitors have come from more than 30 countries, including four visiting professors from South Korea and Venezuela.

Iowa ranks third among all states in use of riparian buffers with more than 64,000 acres. This accounts for eight percent of all the acres currently classified by the U.S. Department of Agriculture as protecting streams.

"We think the high use of buffers in Iowa is partially due to work at Bear Creek," Schultz says. "It's so visible and concrete, a place you can visit. We've been able to keep this issue on the front burner for a long time, and I hope for a long time to come." 

LESSONS LEARNED FROM BEAR CREEK

Buffers can

- Cut sediment in surface runoff as much as 90 percent
- Cut nitrogen and phosphorus in runoff by up to 80 percent
- Entice and support five times as many bird species as row-cropped or heavily grazed land
- Allow water to infiltrate five times faster than row-cropped or heavily grazed land
- Remove up to 90 percent of groundwater nitrate under the right geological settings
- Cut streambank erosion by as much as 80 percent from row-cropped or heavily grazed land
- Reach maximum efficiency for sediment removal in as little as five years
- Reach maximum nutrient removal efficiency in 10 to 15 years
- Increase soil organic carbon up to 66 percent
- Produce less nitrous oxide, a greenhouse gas, than adjacent crop fields
- Be most effective located at upper reaches of a watershed
- Provide maximum ecosystem services through tree, shrub and grass communities

LONG TERM AG DRAINAGE RESEARCH BALANCES PRODUCTION, ENVIRONMENT

By Ed Adcock

MATT HELMERS IS THE CURRENT STEWARD OF many of Iowa State's long-term water quality research projects seeking to balance environmental and crop production aspects of agricultural drainage systems.

Several of Helmers' current research projects in the agricultural and biosystems engineering department support ongoing work started by Jim Baker and Stu Melvin. Shortly before those two veteran researchers retired in 2004, Helmers joined the department as an assistant professor, and he ended up taking over many of their water quality projects.

The longest-running project began in 1988, studying agricultural drainage wells near Gilmore City, Iowa. Helmer's research now investigates fall versus spring fertilization and the impacts of different cropping practices including perennial cover crop and winter rye cover crop. Overall, the study has shown that as nitrogen application rate increases, nitrate levels in drainage water increase. The work also has found similar nitrate levels in the water draining from the fields whether fertilizer was applied in spring or fall or even whether corn or soybeans was the crop grown in a corn-soybean rotation.

"One of the big causes of the high nitrate is our land use, not necessarily mismanagement of the resources or the fertilizer. It's the kind of land use that we have," Helmers says. "We need to continue to study and improve our nitrogen management. Even when nitrogen is applied at recommended rates in the spring, we generally see nitrate concentrations that exceed the drinking water standard of 10 parts per million of nitrate-nitrogen. Under a perennial pasture or forage system, we see concentrations less than 5 parts per million."

"WE NEED TO CONTINUE TO STUDY AND IMPROVE OUR NITROGEN MANAGEMENT."

One of the problems is that spring rains come when there is no crop growing, so excess precipitation commonly shows up as subsurface drainage. The research favors cover crops to reduce that type of nitrate loss.

Another study Helmers is conducting looks at shallower drainage systems, tiles that are three feet deep, instead of four or more, and closer together. "Some of the research in other states has shown 20 to 40 percent reduction in nitrate




Matt Helmers, ABE assistant professor, studies new designs for agricultural drainage systems and carries on several of the college's long-term water quality research projects.

export, and some potential for having a little bit more water for crop production," he says.

Roughly a third of Iowa cropland is tiled. Helmers says the tile was likely installed decades ago when drainage tile was smaller and farming consisted of corn, small grains and pasture cropping systems instead of today's common corn and soybean rotations.

Helmers leads new research on another way to slow the flow of subsurface drainage water from fields – water table management or controlled drainage. Under study at three sites, the research involves adjusting the outlet level of the drainage system at certain times of the year, with the goal of minimizing the volume of drainage and holding some water for crop production.

Helmers also is part of a research team studying how the percentage of and placement of perennial plants in small watersheds can be used to reduce sediment and nutrient losses. Fourteen small watersheds are being studied with five treatments that include various amounts of perennials planted in buffers and/or strips.

"We're looking at how to redesign the system for the future. We're trying to answer what's the most environmentally friendly way to redesign it as well as how the different designs impact crop production," Helmers says. 

TRACKING GRAZING CATTLE'S IMPACT ON STREAMS

By Susan Thompson

IT'S A PICTURESQUE SCENE — CATTLE GRAZING IN A GREEN pasture near a meandering stream. But is there a threat to water quality? Researchers at Iowa State University are looking for ways to keep the pretty picture, without the impaired water.

James Russell, animal science professor, has a lead role in the interdisciplinary effort, which also involves the Department of Natural Resource Ecology and Management, the U.S. Department of Agriculture, Agricultural Research Service (USDA-ARS), National Soil Tilth Laboratory and the College of Veterinary Medicine.

"Some studies have shown that poorly managed grazing increases sediment, phosphorus and fecal bacteria in pasture streams," Russell says. "But no one has looked at the effect of well-managed grazing on those streams."

The original project began in 2005, funded by the Iowa Department of Natural Resources and ISU's Leopold Center for Sustainable Agriculture. It involves evaluating the effects of grazing management strategies on stream bank erosion and phosphorus loading of pasture streams, the forage in riparian or upland areas and the time cattle are in or near pasture streams.

The project at the Rhodes Farm, an ISU-owned satellite site for research, uses 180 acres divided into six 30-acre pastures. Fifteen fall-calving Angus cows are placed in each pasture in May and remain there through September.

Willow Creek runs through the pastures. "We're evaluating three treatments," Russell says. "The first treatment involves continuous grazing, where the cows have full access to the stream. The second also involves continuous grazing, but access to the stream is limited."

For this second treatment, the cows can reach the stream only at locations where the bank has been stabilized with fabric and rock. The remainder of the stream is fenced off as riparian buffers.

The third treatment involves intensively managed, rotational grazing. "The cows are fenced into smaller paddocks," Russell says. "They never graze in the riparian paddock longer than four days, and are moved before they get the grass down to less than four inches." These cows can't access the stream, unless they are grazing the riparian paddocks, so alternative water sources are provided.

To track cattle movement and behavior, a global positioning system (GPS) collar is placed on one cow in each pasture for two weeks each month. Collars are programmed to record cattle position data at 10-minute intervals, 24-hours-a-day for the two-week period.

Three years of data suggests that, with unrestricted access, cows will be in the stream an average of 1.5 percent of




Jim Russell (left), animal science professor, is assisted in the grazing research by assistant scientist Mat Haan, shown at right ('96 animal science, '05 MS animal science/sustainable agriculture) and graduate student Doug Bear ('07 animal science).

the time and within 110 feet of the stream 11.1 percent of the time. Rising temperatures increase the amount of time the cows are in or near the stream.

The continuous grazing system that restricts stream access to stabilized crossings and the rotational grazing treatment both offer better results. Both reduce the percentage of time cows are in or near streams and the percentage of bare or manure-covered ground. These treatments also help maintain forage quantities and stream banks.

Research field days have been held each of the last three years to demonstrate the potential to enhance pasture and water quality with improved grazing management practices.

The initial three-year project has been extended through 2009, thanks to two USDA grants totaling nearly \$1 million.

"In addition to the work at the Rhodes site, we've expanded the project to 13 farms in the Rathbun Lake watershed," Russell says. "The project now has education and extension components, as well as research to further evaluate grazing management that will enhance water quality in pasture streams." 

USING WATERSHEDS TO STUDY THE STATE OF CONSERVATION

By Barbara McBreen

EVERY DROP OF WATER THAT FALLS IN IOWA, NOT consumed by plants, animals or people, eventually flows through one of 13 watersheds and into the Missouri or Mississippi rivers. Watersheds overlap the state's boundaries and lace across Iowa like giant puzzle pieces allowing water to flow from creeks to streams to rivers.

"Watersheds are what you have to talk about when you talk about water quality," says Catherine Kling, professor of economics and division head of the Resource and Environment Policy Division at Iowa State University's Center for Agricultural and Rural Development (CARD).

Kling and a team of researchers took on the task of assessing the "state of conservation" practices in Iowa. The Leopold Center for Sustainable Agriculture, Iowa Farm Bureau Federation, Iowa Soybean Association and the Iowa Corn Growers Association provided the funds to begin assessing the costs and benefits of conservation practices in Iowa.

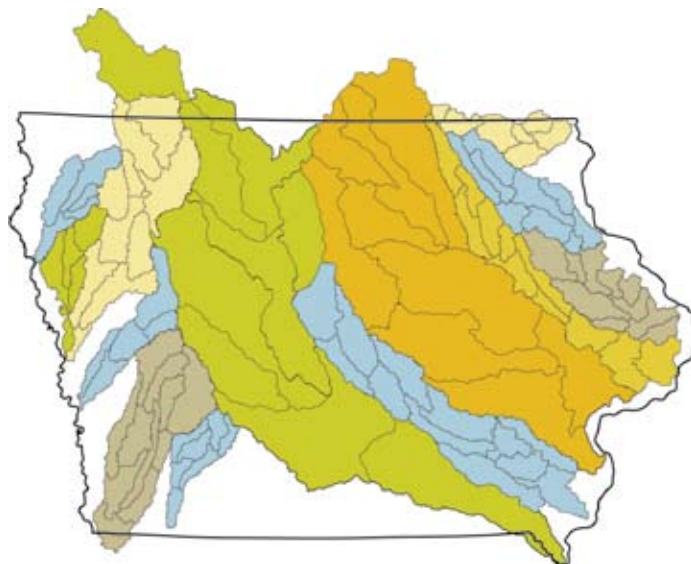
"We're thinking of costs in broad terms," Kling says. "For example, to consider the full cost of changing the way you farm, you need to include the cost of adopting new practices as well as any lost profits. If you change the way you farm and you don't make as much money, that is a cost and ideally those costs should be included."

The researchers set out to answer three questions. What conservation practices are currently used in Iowa? What are the effects of those practices? And what would it take to improve water quality?

"It sounds easy but to do this well requires a great deal of data collection, modeling ability, computer work and knowledge of conservation practices. I am lucky to be able to work with a wide variety of folks at Iowa State who bring these talents together," Kling says.

Cost of current conservation

The results indicate that Iowans invest about \$435 million annually in agricultural conservation practices. The costs include \$37 million for conservation structures, such as terraces and grassed waterways, and annual payments of \$175 million to farmers in the Conservation Reserve Program, plus the cost of options like contour farming, strip cropping, no-till and mulch-till practices in farming operations. The research model did not include longer or more varied crop rotations, buffers, cover crops or the use of manure in place of fertilizer inputs.



Research investigating the costs of conservation practices in Iowa included data gathered from the state's 13 watersheds.

Effects of conservation practices

Researchers used the Soil and Water Assessment Tool (SWAT) to incorporate data on land use, soil, management practices and climate. The SWAT model is a compilation of 30 years of modeling efforts led by the U.S. Department of Agriculture, Agricultural Research Service.

To analyze the effects of conservation practices in Iowa, researchers used the model to perform a hypothetical experiment, removing all existing conservation practices from the

CONSERVATION COSTS

PRACTICE	COST	
Terraces*	\$27,685,907	\$37,194,949
Grass Waterways*	\$9,509,042	
Contour Farming	\$30,889,200	\$397,490,205
Contour Stripcropping	\$3,552,000	
No-Till	\$104,308,740	
Mulch-Till	\$82,861,900	
CRP	\$175,878,365	

*Annual average of total installation costs divided by the life span of the practice. The estimated life span is 25 years for terraces and 10 years for grass waterways.

landscape and assessing how water quality would change. The results indicated that the seven primary conservation practices in Iowa eliminate from 11 to 38 percent of the total nitrogen, 6 to 28 percent of the nitrates and 25 to 58 percent of the phosphorus from Iowa's watersheds.

Targeted suggestions improve water quality

Researchers looked at three potential water quality targets, which included the reduction of phosphorus by 40 percent, nitrates by 25 percent and the simultaneous reduction of phosphorus by 40 percent and nitrates by 25 percent.

Using these target levels the researchers used an evolutionary algorithm method, a new tool that can systematically analyze enormous data sets. The tool can identify the combinations of conservation practices that can achieve the targeted goals at the lowest cost.

After 91 days of computer processing and over 116,000 SWAT model runs, there are no one-size-fits-all answers. The report states, "The effectiveness of a given conservation practice on a given field depends on the placement of other conservation practices and cropping systems in the watershed."

"This type of modeling can really be helpful because it can provide the information about trade-offs," Kling says. "If you are worried about hypoxia in the Gulf of Mexico, that gives you one way to use your funds. If you are interested in improving Clear Lake, that may suggest another use of conservation funds."

Research guides future conservation

Jeri Neal, who leads the Leopold Center's ecological systems research initiative, says the research provides a benchmark of conservation practices and possible solutions for the future.


"We are impressed with these baseline numbers as an indicator of how much Iowans invest in conservation practices because clearly, Iowans care," Neal says. "The models show we also can improve a lot more, but that it's going to take a lot more dollars. From the Leopold Center's perspective, the model looks past single solutions toward a combination of practices that give us multiple benefits for our conservation dollars."

Kling's team of researchers was recognized for its work in water quality in February when they received the College of Agriculture and Life Sciences Team Award. Team members include: Hongli Feng Hennessy and Silvia Secchi, both associate scientists; Philip Gassman and Manoj Jha, both assistant scientists; and Todd Campbell, systems analyst. The team has been successful in competing for research funds, bringing in \$1.5 million in competitive grants since 2003.

Kling says it takes a team of experts to understand hydrologic water quality modeling, economics and computing algorithms.



Catherine Kling points out that it takes a team of researchers to analyze watershed data, which is key to understanding Iowa's water quality.

"All this stuff sounds very academic, but it is absolutely critical to have a knowledgeable team to answer these questions," Kling says. "It's really exciting to do research that people care about, that is grounded in academics and requires peer review because that input sometimes flags problems that you can't see without that intensive final review." 

KLING SERVES ON EPA SCIENCE ADVISORY BOARD

Catherine Kling has served on the U.S. Environmental Protection Agency (EPA) Science Advisory Board since 1998. She currently serves as chair of the board's environmental economics advisory committee. Members of the board are nominated by peers and EPA staff to serve. The board was established by Congress in 1978 to advise the EPA on technical matters. The board reviews the quality and relevance of scientific and technical information being used or proposed as the basis for EPA regulation. The board also reviews guidelines governing the use of scientific and technical information in regulatory decisions and critiques such analytic methods as mathematical modeling.

SAFE, "SWIMMABLE-FISHABLE" WATER IS THE GOAL

By James Baker

ESTABLISHING A COMMON GOAL IS THE FIRST STEP TO building consensus. In the case of Iowa's water quality, that common goal is easy. Iowans want safe-to-drink, "swimmable-fishable" water.

Iowa State University has been, and continues to be, a leader in water quality research and demonstration with respect to agriculture in the Corn Belt since the late 1960s.

An early example of substantial federal funding for ISU water quality research was a five-year study (1976-80) of field-to-stream transport of sediment, nutrients and pesticides in the Four Mile Creek watershed in Tama County. The research, led by faculty in agricultural and biosystems engineering, agronomy and sociology, was funded by the U.S. Environmental Protection Agency and later by the U.S. Department of Agriculture.

The basic information on hydrology and chemical fate and transport gathered from this and multiple companion projects in the intervening years set the stage for more federally funded research and demonstration projects, as well as projects funded by the Leopold Center for Sustainable Agriculture, the Iowa Water Center, Iowa state agencies and industry and commodity groups.

The research quantified nutrient losses associated with crop production and the use of fertilizers and manures. We've learned systems that affect land use and drainage,

SYSTEMS THAT AFFECT LAND USE AND DRAINAGE, HYDROLOGY OF THE LAND, MANAGEMENT PRACTICES AND WEATHER PLAY DOMINANT ROLES IN THE TRANSPORT OF NONPOINT POLLUTANTS.

hydrology of the land, management practices and weather play dominant roles in the transport of nonpoint pollutants in general, and different forms of nutrients in particular.

Drainage from agricultural lands dominates water flow in most parts of the Corn Belt because agriculture occupies a major portion of the land area. In flatter, tile-drained landscapes, nitrogen losses, dominated by nitrate-nitrogen leaching, are of most concern and usually occur with sustained subsurface flows in spring and fall at times of little row-crop water use and nutrient uptake.

In contrast, in rolling landscapes with good surface drain-



James Baker

age, phosphorus losses with runoff water and sediment are of more concern. These occur with rainfall-runoff events that can happen year-round, but are generally greater in spring when the soil has less cover.

The most important natural factors affecting nutrient losses are soil properties and weather. The Corn Belt is fortunate to have fertile soils and generally ample precipitation, but both lead to nutrient losses.

Information on management practices and systems garnered from Iowa State studies has been used to assess options available to reduce agricultural nutrient losses to water resources in the Corn Belt. Yet the number of acceptable tools is limited, must be targeted to site-specific conditions to be effective and come with significant costs.

For nitrogen losses the most important management factor is land use. The conversion to row crops with installation of artificial subsurface drainage where needed has created a productive system, but also has increased the potential for nitrate-nitrogen loss.

For phosphorus, land use in conjunction with tillage is generally the most important management factor affecting hydrology and erosion potential, and thus phosphorus loss. The combination of rate, method and timing of nutrient additions also affect loss, but generally is of lesser importance. Weather patterns often have more affect on nutrient losses than nutrient management.

Because inorganic forms of nitrogen and phosphorus must be present in the soil at concentrations sufficient

ANY NEW APPROACHES MUST BE SUSTAINABLE WITH RESPECT TO
BOTH SOIL AND WATER QUALITY, MUST BE ECONOMICALLY FEASIBLE
AND MUST BE SCIENCE-BASED.

for crop production, whenever excess water moves over or through the soil, nutrient losses will occur. Controlling these losses by a prescribed amount is extremely difficult.

In terms of a viable vision for future water quality improvements, there are no easy answers and improvements will be incremental.

But please know this — returning the Corn Belt to pre-settlement conditions is neither socially nor economically feasible, nor in the best interest of maintaining our nation's food, feed and fuel production infrastructure.

The potential and limitations of in-field and off-site management practices and systems need to be considered relative to their costs and acceptance for implementation. Off-site management systems that include structural practices need to be implemented at a large number of sites to achieve landscape-level environmental improvement. Constructed wetlands are a vital part of these systems, and regulatory frameworks need to be compatible with this practice and scale of implementation.

Science indicates current nutrient impairment problems are not due mainly to mismanagement of fertilizers and manures, although certainly some improvement in management can and should be made. Overall, the majority of our nutrient impairments are due more to historic changes in

land use and hydrology that came with the conversion of prairie and wetlands to productive cropland, using artificial subsurface drainage where needed.

Given this perspective, and that these historic changes have created a very productive system critical to our country's food security, new, broader approaches to solving water quality problems are needed.

That's why the work continues. Between 2002 and 2007, researchers at Iowa State University received external grants totaling more than \$11.6 million for projects on water quality, watersheds and related activities. More than 60 water quality research and demonstration projects are underway.

Further research is needed to design and refine new management practices and develop cropping system alternatives, possibly with more sod-based rotations. This research and new information is even more critical in these times of change with respect to food and energy issues, and use and protection of our natural resources. However, any new approaches must be sustainable with respect to both soil and water quality, must be economically feasible and must be science-based. ⑤

James Baker is a University Professor Emeritus in Agricultural and Biosystems Engineering

ALUMNI NAMED FELLOWS IN AGRONOMY ORGANIZATION

The American Society of Agronomy elected college alumni as fellows at its annual meeting in November. Fellows are chosen for their professional achievements and service to the organization.

John Lamb, a professor at the University of Minnesota, who earned a bachelor's degree in agricultural business in 1978 and a master's of agronomy in 1980; **David Nielsen**, researcher with U.S. Department of Agriculture-Agriculture Research Service in Colorado, who earned a master's degree in agronomy in 1979; and **Robert Wych**, research coordinator at Pioneer Hi-Bred in Johnston, who earned a bachelor's degree in agricultural business in 1970; were elected fellows. Alumnus **Jerry Hatfield**, who earned a doctorate in agricultural meteorology in 1975, finished his term as the society's 100th president as it begins its centennial celebration. **Ken Moore**, Iowa State agronomy professor, succeeded him as president.

BOTANY ALUM HELPED FIGHT HUNGER IN GUATEMALA

Iowa State alumnus **William Paddock**, 86, a plant pathologist who developed a disease-resistant strain of corn high in Vitamin A, died Feb. 28 from complications of a stroke at his home in Antigua, Guatemala. Paddock first went to Guatemala in 1952 to serve as the director of the Iowa State College-Guatemala Tropical Research Center. He developed Tiquisate Golden Yellow, a corn strain able to resist disease and produce higher yields in the Guatemalan soil. The Minneapolis native graduated from Iowa State in 1943 with a bachelor's degree in botany and earned a doctorate in plant pathology from Cornell University. (Washington Post, March 13)

ALUMNI PRESENTED NATIONAL TEACHER AWARDS

Neil Knobloch ('92 ag education and ag extension education, '97 MS ag education) was named a winner of an Excellence in College and University Teaching in the Food and Agricultural Sciences Award by the North Central Region of the American Association for Agricultural Education. He was presented one of two awards in the new teacher category. The other winner was Iowa State professor **Amy Kaleita**, agricultural and biosystems engineering. Knobloch is a professor of agriculture education and outreach at the University of Illinois. Alumnus **Brad Greiman** ('78 ag education, '91 MS) was presented the Outstanding Early Career Agricultural Educator Award from the association. Greiman is an assistant professor of agricultural education at the University of Minnesota. He was the agricultural education teacher at Algona, Iowa, for 21 years.

MEMBER OF NEW ISU YOUNG ALUMNI COUNCIL

Eric Peterson, who earned a bachelor's degree in agricultural business in 2007, is a member of the new Iowa State Alumni Association's Young Alumni Council. It is made up of graduates from the past 10 years. Over the next several years, the Alumni Association will place an increased emphasis on creating and sustaining meaningful connections with Iowa State's "young alumni" (graduates of the past 10 years). Targeted event planning, financial and human resources, membership drives, marketing campaigns and various communications will be directed toward this growing demographic. More: www.ag.iastate.edu/stories.



Eric Peterson

AG BUSINESS CLUB NAMES OUTSTANDING ALUM

ISU's Agricultural Business Club honored **Doug Dashner**, retired executive director of the Dekalb County, Ill. Farm Bureau, as its 2008 Outstanding Alumnus. The club recognizes an outstanding alum who earned a degree in agricultural business and honors that person at its annual banquet each March. Dashner graduated from Iowa State with a bachelor's degree in agricultural business in 1968 and earned his master's in agricultural economics in 1970. In 1983, he earned a master's of business administration from Northern Illinois University.



Laura Larson, agricultural business club secretary, presents Dashner with the outstanding alumni award.

LEOPOLD CENTER HONORS ALUM WITH SPENCER AWARD

The Leopold Center for Sustainable Agriculture honored **Laura Krouse** ('77 agronomy, '78 ag business), a farmer and biology instructor, with its 2007 Spencer Award for Sustainable Agriculture. Krouse owns and operates a 72-acre farm near Mount Vernon, Iowa, where she teaches full-time at Cornell College. She also is the proprietor of a 104-year-old open-pollinated



Laura Krouse

seed corn business and Abbe Hills Garden, a Community Supported Agriculture enterprise that serves 120 families. The award honors farmers, educators or researchers who have made a significant contribution toward the stability of mainstream family farms in Iowa. Krouse received the award in January at the annual Practical Farmers of Iowa winter conference.

COLLEGE ALUM TO HEAD PIONEER HI-BRED

James Borel has been named group vice president of DuPont's Pioneer Hi-Bred. In the new position he will lead the company's production agriculture businesses and DuPont's crop protection business. Borel has held several leadership positions at DuPont, including leading the company's agricultural products business in Canada and Asia Pacific. He graduated from Iowa State in 1978 with a degree in agriculture business.

CRAIG LANG LOOKS AT ISU THROUGH REGENT'S EYE

By Susan Thompson

THE ASSIGNMENT: INTERVIEW CRAIG LANG, PRESIDENT of the Iowa Farm Bureau Federation (IFBF), member of the Iowa Board of Regents and 1973 Iowa State University dairy science graduate.

Lang suggests meeting in Kildee Hall, where he spent much of his time during his four years at Iowa State. We agree on Kildee 121, a reading room adjacent to the dairy science offices. By chance, the Farm Bureau Spokesman is displayed on a shelf, sporting a large cover photo of Lang speaking at the 89th annual IFBF meeting.

Lang grew up on a dairy farm near Brooklyn. His parents, Maynard and Dorothy, worked hard to make sure their four children had the opportunities they deserved. "They insisted we all attend college. We really didn't have much choice," he says.

Small college football scholarships beckoned, but Lang decided on Iowa State. He admits he wasn't a "Grade A" student.

"I did what I needed to do to pass. I didn't understand the value of the education I was getting. But I had an extremely good experience at Iowa State. Many of the practical things I use today, I learned here," he says.

After graduation, he returned to the family farm, a move he hadn't planned. "Once I started farming, I realized I enjoyed the challenges," he says.

At the time, the family farm included a 24-cow dairy herd. Farming in partnership with his parents and his brother Eric ('84 dairy science), the farm now includes a 500-cow dairy herd and 1,250 acres of land. "It's a self-sustaining farm," Lang says. "Animal nutrients are returned to the soil to grow crops to feed the animals."

Lang and his wife Mary have four children. The youngest, Cade, is the sixth generation to join the family farm.

Lang's Farm Bureau involvement began when he was asked to serve as a township director on the Poweshiek County Farm Bureau board. "I discovered this was a policy organization that did more than I thought," he says.

He was elected to the IFBF board in 1992, and served as vice president from 1996 to 2001 before being chosen as the organization's president. He was elected to his fourth two-year term in December.

Lang ran for the top job because he wanted the organization to focus on rural vitality. "I was traveling the state as vice president. It was alarming to see what was happening to rural Iowa," he says.



As a student Craig Lang participated in Iowa State Singers, Dairy Science Club and dairy judging teams. He is shown with his fellow Junior Dairy Cattle Judging Team members in 1971. From left to right: Stan Henderson ('73 ag education), Steve Henderson ('73 dairy science), Lang, Jim Ellis ('72 dairy science) and Coach W.W. Wunder ('58 dairy science).




Under Lang's leadership, the organization launched "Re-new Rural Iowa," which provides grants and loans for a wide variety of initiatives.

He was tapped by Gov. Tom Vilsack to chair the board of the Grow Iowa Values Fund, which supports university innovations with commercial potential. When Gov. Chet Culver was looking for a new Board of Regents member, he called Lang.

"He wanted an Iowa State grad who would bring transparency and openness to the Regents," he says. "He knew I would bring my passion for agriculture, life sciences, veterinary medicine and engineering to the table."

Lang says the Board of Regents plays an important role in Iowa.

"The future of Iowa is in the young people who graduate from Regents' institutions. We have to watch budgets closely, and make sure tuition keeps the system viable, yet still attractive to students from Iowa and around the world," he says. 

Lang's many accomplishments earned him the 2007 Distinguished Graduate award from Iowa State's Dairy Science Club. The annual award honors an ISU graduate who has had an impact on the dairy industry through off-farm activities beyond dairy production.

SHE BLAZED HER OWN TRAIL TO ADVANCE RICE BREEDING

By Melea Reicks Licht

IF THERE WAS ONE WORD KAREN KUENZEL MOLDENHAUER ('75 biology, PhD '82 plant breeding) would use to describe her career, it's "fun." The word creeps into her descriptions of her early days blazing trails for women researchers in the fields of North Carolina and Arkansas to her current work selecting genetic markers for breeding rice.

As the Rice Industry Chair for Variety Development and professor of crop, soil and environmental sciences at the University of Arkansas, she uses her enthusiasm and passion for plant breeding to discover ways to improve yield, milling quality and disease resistance in rice.

"Plant breeding to me is exciting, it's fun. It's really interesting to look at the variability in the field, make selections and watch what happens," Moldenhauer says. "You have to be able to throw things away that you don't like in the field. Like Walt Fehr always used to say, 'once a dog, always a dog.'"

Before landing in agronomy distinguished professor Fehr's classroom as a graduate student at Iowa State, Moldenhauer studied biology, botany and food science. She was intro-



Karen Moldenhauer and colleague James Gibbons are both University of Arkansas Division of Agriculture rice breeders based at the Rice Research and Extension Center near Stuttgart.

duced to plant breeding by friends in the Botany Club. She credits faculty Lois Tiffany, George Knaphus and Detroy Green for encouraging her interest.

She found when she arrived at North Carolina State University to pursue a master's in plant breeding she was one of their first women graduate students. Upon completion of her master's in 1977, she returned to study under agronomy distinguished professor Ken Frey at ISU for her Ph.D. in a program that was nearly 50 percent women. However, when she began her career at Arkansas a few years later in 1982, there were not many rice breeders and even fewer women. "When I came for my interview there was obvious con-



Karen Moldenhauer is as comfortable in the field as she is in her laboratory developing genetic markers for use in her rice breeding program.

cern about how I would relate to the men at the research stations. One question was, 'What would you do if you saw a snake?' she says, laughing. "I reminded them I would have hip waders for the field. I told them I didn't expect any problems and never had any. I've had great people to work with."


Some of Moldenhauer's research focuses on developing markers for milling quality and sheath blight tolerance as part of the U.S. Department of Agriculture Applied Plant Genomics Coordinated Agricultural Program for rice (RiceCAP).

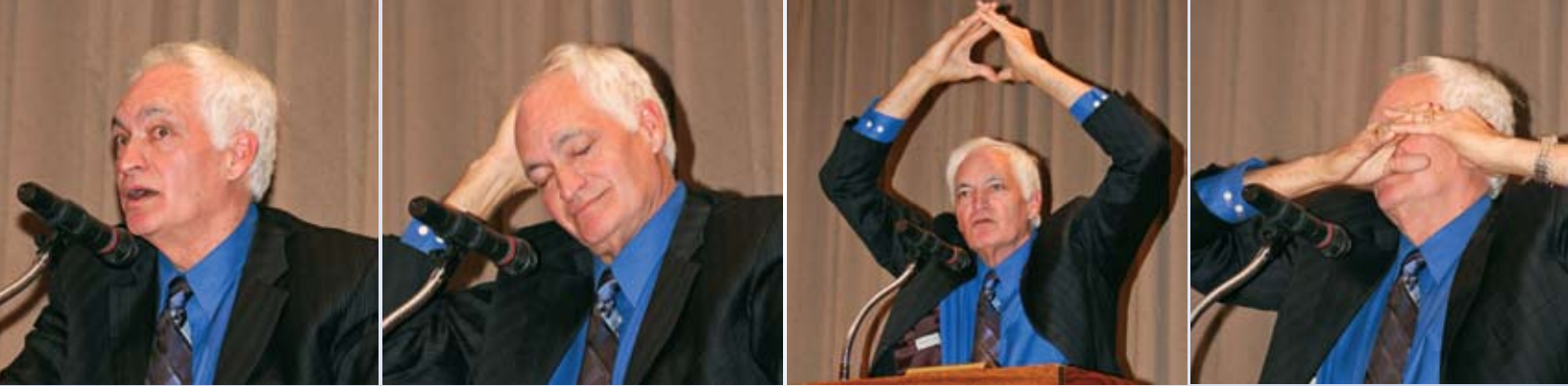
"In the last five to seven years, markers have become very important in our program and every breeding program in the country," Moldenhauer says.

Other characteristics she scans for include resistance to blast (a rice disease), yield performance, cold tolerance, herbicide resistance and water savings.

She and her colleagues cooperate with the University of Puerto Rico at Mayaguez to advance lines in a winter nursery. She's also worked internationally to consult and teach through the International Atomic Energy Agency.

Moldenhauer doesn't currently use biotechnology tools in her breeding program since she says the technologies haven't yet gained worldwide acceptance, but she does see many future opportunities with genetically modified organisms (GMO).

"I think GMOs with nutritional characteristics, like brown rice with a longer shelf life, will be a focus of the future," she says. "Genetic enhancement through biotechnology is one way to produce more food, reduce pressure on natural resources and meet population demand." 



Lowell Catlett's love of teaching inspired him to share his positive outlook nationwide through his animated and entertaining presentations.

ANIMATED ALUM'S VISION OF FUTURE ATTRACTS CROWDS

By Ed Adcock

LOWELL CATLETT SAYS HIS SPEECH TOPICS COME FROM his "heart and soul."
"Some people call me a futurist, but I'm not trying to forecast the future, I'm trying to get people to think positively about the future and know that they have an influence on it and that it can be multiple futures," Catlett says. "I just developed a hodge-podge style of trying to understand the world."

The Iowa State economics alum is in demand nationwide for his animated and entertaining presentations. He says his speaking engagements arose out of his love of teaching.

Catlett was a professor at New Mexico State University when he took the advice of James Halligan, the university's president at the time (and an Iowa State engineering alum), by speaking to groups off campus. Catlett says Halligan promoted the idea that faculty should get away from campus one day a week to get out into the "real world" and help fulfill the institution's mission of solving people's problems.

Catlett now is in his third year as dean of the College of Agriculture and Home Economics at New Mexico State after joining its faculty in 1978. He earned a master's in agricultural economics at NMSU before completing his doctorate in economics at Iowa State.

Catlett estimates he gives about 50 speeches a year and makes another 50 shorter presentations for groups around New Mexico. The College of Agriculture and Life Sciences sesquicentennial lecture he gave at Iowa State on the coldest day in February attracted nearly 200 people.

You have to see Catlett as well as hear him. He uses his hands and arms nearly as much as his voice. Catlett speaks from memory instead of referring to notes or slides, the same technique he used when he lectured in class. His enthusiasm is obvious in the video of his sesquicentennial lecture available online at: www.ag.iastate.edu/stories.

"I like to use my hands. I found early on that I needed to work on my speech and memorize it, but I'm animated and that's who I am," he says. "The beauty of memorizing is that if you forget something, nobody knows except you."

Catlett grew up on a ranch in the panhandle of Texas. He was involved in FFA, attaining state and national offices. That experience and taking drama in high school is what he credits with getting him started in public speaking.


"I've been doing it ever since I was in high school and don't have enough sense to shut up," he says.

I JUST LOVE THE PROCESS OF LEARNING. I JUST LOVE STUDENTS. AND PART OF IT IS SELFISH. I FIND OUT THAT WHEN I TEACH IS WHEN I REALLY LEARN. IT FORCES ME TO BE IN A CONTINUOUS LEARNING MODE JUST TO BE A TEACHER

Catlett also writes books with his NMSU colleague James Libbin, who also earned an ISU doctorate in agricultural economics in 1982. They started collaborating on journal papers while students at ISU and have written four textbooks together, the last one being, *Risk Management for Agriculture : A Guide to Futures, Options, and Swaps*.

For someone who has come so far in higher education, Catlett says he never thought he would be a teacher, let alone a college professor.

He recalls confessing to his father that although he liked some parts of ranching, he didn't like most of it. Catlett's father advised him to find out what he loved to do.

"I just love the process of learning. I just love students. And part of it is selfish. I find out that when I teach is when I really learn. It forces me to be in a continuous learning mode just to be a teacher," he says. 



The Hughes family business began in 1908 when Dwight's grandfather, William, sold nursery stock from this buckboard wagon displayed in the family's museum. From left to right are: Megan, Hannah, Tom, John, Hillary, Dwight and Debby. The family will share the museum with friends and family in August when they celebrate 100 years in the nursery business.

DEEP ROOTS: HUGHES FAMILY NURSERY BUSINESS

By Melea Reicks Licht

THE ROOTS OF THE HUGHES family tree run deep in the nursery industry. Born into a family landscape nursery business dating back to 1908, Dwight Hughes, Jr. ('70 horticulture and landscape architecture), began to accompany his father to nursery association meetings at the age of five.

Today Hughes carries on the family business, known for efficiency and innovation, in Cedar Rapids with his wife Debby and sons. Tom ('02 horticulture) and wife Megan ('02 horticulture) have one daughter, Hannah, and John ('05 industrial technology) married fellow ISU alum Hillary ('05 economics, ag business, finance). Together they own and manage 1,400 acres of farm ground and 40 acres of specimen nursery stock. His daughter Judy, a Northwestern grad, coordinates a music theatre program in Evanston, Ill.

Like his father, Dwight introduced his children to the nursery business early.

"I've been teaching our boys like my father taught me, from the same textbook if you will," Hughes says. "We designed the business around our family, we discussed business issues on a daily basis with the kids and I took them on field trips, conventions and meetings."

Formal education has always been encouraged in the Hughes family, and Iowa State University has played a special role as three generations have studied in the Department of Horticulture.

"My mom and dad actually met at ISU and I was introduced to ISU personnel early through the state nursery association," Hughes says.

Distinguished Emeritus Professor Bob Dyas' courses in landscape design and plant materials rank high on Hughes' list of useful information learned at Iowa State. Both Dyas and John Mahlstede, emeritus professor of horticulture, took a special interest

in Hughes and served as his mentors.

"Mahlstede took me on a tour of the greenhouses and conservatory when I was ten. It was almost like a recruitment mission," he says. "By the time I arrived on campus as a student he was associate dean and director of the Agricultural Experiment Station and hosted me for personal short courses at his home on Sunday evenings."


In Hughes' current role as president of the American Nursery and Landscape Association (ANLA) he represents what he describes as the fastest-growing industry segment in American agriculture.

"Nearly every building built in America today has some type of landscaping. Every community has a form of environmental beautification and future generations of people will continue to expect this level of beautification," Hughes says.

With a long, celebrated career as a nurseryman Hughes sports an impres-

sive resume. He has published a book and video on efficient strategies in landscape installation and nursery production and is a nationally recognized speaker on the topic.

Hughes is an active philanthropist and leader in numerous community organizations. Among his highest awards are the Nursery Hall of Fame Award from the ANLA and the prestigious Distinguished Eagle Scout from the Boy Scouts of America. However, it is his family that he prizes most.

"The most comforting feeling is having Tom and John come home to the family business," Hughes says. "Our two boys are going to start the next 100 years. That's the biggest honor in the world." 

STORIES online extra:

Read a personal account of flood clean up efforts in the Cedar Rapids, Iowa area from the Hughes family and find links to ISU Extension's flood and disaster recovery resources at www.ag.iastate.edu/stories.

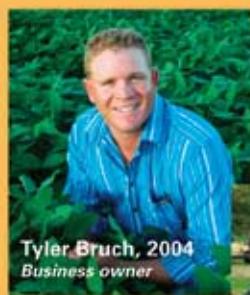


HUGHES' HIGHLIGHTS: Looking back on his life and career in the nursery industry, Dwight Hughes shares his **TOP TEN** high points.

- 1.** Parenting three responsible, caring children who completed four-year, double-major degrees and are successfully contributing to society.
- 2.** Maintained a family business tradition through the third generation, creating pleasing landscape experiences.
- 3.** Provided leadership to the American Nursery and Landscape Association (ANLA) that built the Lighthouse Program from zero to 18,000 firms in 10 years.
- 4.** Presented 150 seminars in 40 states and three Canadian provinces promoting professionalism, proficiency and profit.
- 5.** Coordinated and moderated the ANLA "New Ideas Session" twice a year for 17 years; 800 shared concepts that impacted the entire industry.
- 6.** Published a book and companion video/DVD that provides take-home material for the seminars.
- 7.** Chaired a national nursery mechanization thrust that received \$1 million from the NASA Transfer Technology Fund.
- 8.** Volunteered on numerous local non-profit boards to enhance cultural opportunities in the Cedar Rapids community.
- 9.** Created a family museum that displays and captures 100 years of the family business.
- 10.** Restored and preserved a 1917 historic barn on one of the family farms.

98% of our graduates have jobs within six months

70% of our graduates begin their careers in Iowa



Tyler Bruch, 2004
Business owner



Bryan Arndorfer, 2003
Business owner



Justin Hanson, 2002
Farmer



Jón Schmidt, 2000
Veterinarian



Megan Gogerty, 2002
Professor



JoAnn Barten, 1994
Lawyer



Teresa Sigafosse, 2003
Microbiologist



Nathan Brockman, 2000
Entomologist



Jenna Dolbeare, 2007
Teacher



Nicky Williams, 2005
Soil Conservationist

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IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences

See our young alum of the month at
<http://www.career.ag.iastate.edu>

COLLEGE CENTER ADVANCES **FOOD AND WATER SECURITY** IN UGANDA

By Melea Reicks Licht

CLARK RICHARDSON COULDN'T believe his eyes. This wasn't the Africa he'd imagined. Surrounded by skyscrapers, busy city streets and crowded sidewalks, he felt Kampala, Uganda's capital city, was as developed as other cities around the globe he had visited.

In Namasagali, a rural community 95 miles from Kampala, he found a landscape closer to what he'd expected when he signed up for the service learning project with the Center for Sustainable Rural Livelihoods (CSRL) in the College of Agriculture and Life Sciences — a landscape of dirt roads,



Clark Richardson is shown teaching sanitation and hygiene to Ugandan grade school students as part of a CSRL program. Mukebezi Rebecca, one of three students from Makerere University who participated in the program, is shown at Richardson's left.

CSRL project goals and activities are shaped by local farmers and derived from indigenous knowledge and experiences combined with science-based methods. Examples of completed projects include:

- Constructing a biogas digester (which creates energy from animal waste)
- Conducting malnutrition and health examinations
- Developing a rainwater harvesting tank
- Coordinating funding and construction of six boreholes (deep wells)
- Establishing school fruit and vegetable gardens
- Providing farmer education, including marketing and crop and livestock management
- Educating community-based agriculture and nutritional outreach specialists and trainers

Learn more about **CSRL**, and animal science distinguished professor Max Rothchild's experience in Uganda at www.ag.iastate.edu/stories.

dilapidated dwellings and barefoot children playing in fields.

But, he was still surprised by what he found.

"It was amazing to see agriculture practiced as a means for sustenance, rather than the big scale we're used to. My view of Africa completely changed. These people aren't all starving or uneducated," Richardson says. "They're not poor because they're lazy. They're poor because they lack the inputs to improve their lives. They want to do better, they just need a little help."

Richardson, a senior in agricultural business, economics and political science, is one of 21 Iowa State students who have worked in Uganda through CSRL. In addition to teaching at a local school, Richardson conducted research to help a local development organization identify new ways to better serve youth in the community.

CSRL provides leadership and support to discover and apply sustainable solutions to world hunger. It was cre-

ated in 2003 based on a vision shared by ISU and its founding benefactors - the vision of rural people in developing countries empowered to achieve food security and sustainable livelihoods.

After selecting the initial location of Uganda, with hopes to replicate success in other developing countries, the center now facilitates collaboration among faculty from Iowa State with partners at Makerere University in Kampala and Volunteer Efforts for Development Concerns (VEDCO), an indigenous nongovernment organization. The work of CSRL is currently focused on the Kamuli District in Uganda.

Wendy Wintersteen, endowed dean of the College of Agriculture and Life Sciences, sees CSRL as a way for the college to make meaningful impacts on the world while providing students with opportunities to gain experience and expand their world views.

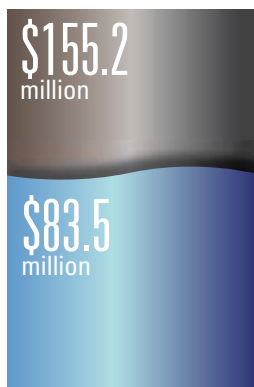
"Establishment of the CSRL, through a significant gift from a generous couple, has allowed the college to provide



CAMPAIGN IOWA STATE UPDATE

**CAMPAIGN
IOWA STATE**
WITH PRIDE AND PURPOSE

IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences



Campaign totals as of March 31, 2008

FREVERT: CAMPAIGN HELPS GIVE STUDENTS AN EDGE



"One of the major reasons that my wife, Clare, and I feel good about giving back to ISU is the outstanding performance of our ISU Foundation. They continue to dramatically increase the number of donors that are participating in the campaign. It's all about the ISU family and networking. If we all step forward with our support we can each be proud of helping Iowa State University reach its campaign goal and help our students have a competitive edge as they learn to live as well as learn to make a good living."


Jim Frevert ('60 farm operations), ISU Foundation Governor, member College of Agriculture and Life Sciences Campaign Committee

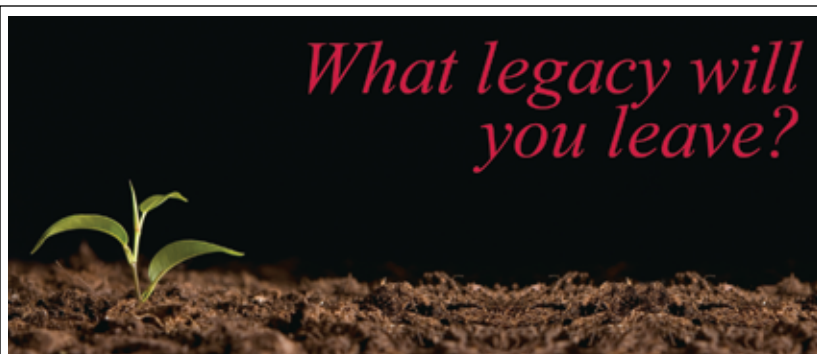
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an opportunity for our students, staff and faculty to be engaged in addressing issues of poverty and hunger on a global scale. Engagement in these issues provides a new perspective that deeply changes their future education and work experiences," says Wintersteen.

Through the service learning project and many other efforts, CSRL has helped its partners use indigenous and scientific knowledge to increase food security and incomes for small farmers in the Kamuli District. Since 2004, more than 7,500 people in 800 households benefited from CSRL training and assistance. As of mid-2007, 77 percent of participating farm families reported that they had achieved food security, up from 40 percent in 2006 and only 9 percent in 2005.

Richardson returned not only with a new understanding of Africa, but also of himself and the United States.

"Seeing the drastic need for education in Uganda made me more aware of the state of education in the U.S.," Richardson says. "I know now that I want to participate in Teach for America (a national corps of recent college grads who teach in underserved public schools), and make a difference in our country's educational system." 



A **bequest** is a gift through your will or trust. There are several ways to make a bequest:

- Specific asset (farm, stock, IRA, etc.)
- Specific dollar amount
- Percentage of your estate
- Residue of your estate



Consider the impact your gift will have on the students, faculty, programs and facilities in the College of Agriculture and Life Sciences. A few of our current priorities include:

- Agriculture and Life Sciences General Scholarship Endowment
- Agriculture and Life Sciences Development Fund
- Curtiss Hall Renovation Fund
- Study Abroad Scholarships
- Ag 450 Farm Endowment

For more information please contact the ISU Foundation at **800.621.8515** or visit **www.isugift.org**.

ISU, LOCAL LEADERS PARTNER TO IMPROVE WATER

By Brian Meyer

AT A MARCH MEETING OF THE COLDWATER/PALMER Watershed Council, John Rodecap offers encouragement to the farmers sitting around the tables in the Butler County Extension Office in Allison, Iowa.

"You've done a tremendous job your first two years," Rodecap tells the council members. "The major issue you've identified is nitrogen, and we've got numbers in front of us that show you've done exactly what you intended to do — lower the levels of nitrate coming off fields."

Rodecap ('64 dairy science) is the Iowa State University Extension specialist who serves as coordinator for several performance-based watershed projects in northeast Iowa. He facilitates the projects led by farmers and other citizens to improve the waters of their watersheds.

It's been estimated that 90 percent of contaminants in Iowa waters are attributed to agriculture. But the farmers making the day-to-day decisions had never before been asked to organize and collectively address water quality.

"The powerful thing is involving them," says Rodecap. "They're proud of their community and their heritage. They don't like the finger of regulation pointing at them. It helps spur them to action."

Scott Bruns ('85 farm operations) chairs the watershed council and also is an elected member of the county soil and water conservation district. "We had some eye-opening experiences with nitrate. That's why we're focusing on nitrogen and nitrate management. I grew up here and remember playing in the creek as a kid. In a generation, things can really change and it impacts our water."

It's a community effort. Students in the Rockford FFA Chapter collect cornstalk nitrate samples. A retired farmer collects water samples. A woodchip bioreactor was installed on one farmer's land to help determine its effectiveness. ISU Extension models farmers' performance field by field and to track farm-level improvements. ISU also tracks data from results of nitrate, phosphorus and soil organic matter tests so farmers can compare their performance year by year.



ISU Extension's John Rodecap (standing) advises a group of farmers and citizens working to improve water in their watershed.



A woodchip bioreactor was installed in the Coldwater/Palmer Watershed in November 2006. The bioreactor helps determine the effectiveness of nitrate management in the watershed.


"When you make it personal and share your performance results neighbor-to-neighbor, it helps build local pride in watershed improvement. It's also peer pressure for others to participate," Rodecap says.

Farmers who cooperate are paid incentives for measured improvements in environmental performance. The Coldwater/Palmer Watershed Project and others have benefited from financial support from the Iowa Corn Growers Association and the Iowa Farm Bureau Federation. U.S. Department of Agriculture, Environmental Protection Agency and State of Iowa water-quality programs also help fund the work.

"What I see is trying to avoid potential regulations," says Bruns. "We'd like to do it our way, in ways that are both feasible and economical."

What have farmers done to change? Farmers like Bruns have latched on to strip-till or no-till practices. They more accurately credit manure nutrients applied to their fields. They've installed or improved waterways or buffer strips.

Because of these efforts, results can be impressive. Cornstalk nitrate levels were 44 percent lower for farmers who participated two years in the project compared with results from farmers in their first year. Participant's average corn yields were six bushels higher than their neighbors'.

Rodecap also shares other good news at the March meeting. "Our goal has been to get 60 percent of the watershed acres enrolled. We've exceeded that. We know that it takes that level of participation to change water quality. So, congratulations. Because of your efforts in talking with your neighbors about our goals, it's beginning to make a difference." 

FARMERS AND ISU COOPERATE IN ON-FARM RESEARCH

By Anne Marie Edwards

RODNEY MOGLER OF ALVORD, IOWA, HAS ALWAYS DONE research-type strip trials on his own. He has recently found partnering with Joel DeJong ('80 ag business, '88 MS professional ag) and Josh Sievers ('98 ag systems technology) with Iowa State University Extension gives him a more complete picture of the results.

"With our type of personal on-farm research, we just got a snapshot in time of what was happening in that particular field," Mogler says. "Participating in on-farm research gives us the opportunity to work with ISU to collect the data and share and compare information with farmers across several counties who have different soil types and weather conditions. This gives us a higher confidence level in the numbers we are getting back on our own farm."

The Northwest Iowa On-Farm Research Program that DeJong and Sievers coordinate has created a new synergy among ISU Extension, ISU's Northwest Research and Demonstration Farm, the Northwest Iowa Experimental Association and farmers in northwest Iowa.

The program, which began in 2006, includes farmers (cooperators) in Sioux, Lyon and Osceola counties. Nearly 20 cooperators completed more than 30 replicated comparisons in their fields each of the last two years. This year they expect to have about 30 cooperators with close to 50 projects.

"Our general goal is to try small-plot research on a field-length scale to see if we can replicate what we have seen on the ISU research farms and determine if it is different in the northwest corner of Iowa," says Joel DeJong, ISU Extension field agronomist based in LeMars.

Joel DeJong (left), Josh Sievers and Rodney Mogler (right) look over results from last year's on-farm research. "This program has allowed us to do more field-length research and has brought a new energy to those of us who've been conducting research for years. Farmer interest is very strong as well," says DeJong.



Josh Sievers, agricultural specialist at the Research and Demonstration Farm at Sutherland, and DeJong show farmers how to replicate trials, they analyze data and bring cooperators together to discuss results. They also involve cooperators in determining future projects.

Mogler, who works with his father and brothers on 2,500 acres in Lyon County, says the research has been easy to incorporate into his operation.

"The process is a pretty unintrusive and it doesn't take a lot of extra time," says Mogler. "We keep it pretty simple by testing planting rates, planting speeds, corn insecticides and other projects. Even at harvest, they offer to bring out a weigh wagon or tell me how to collect the data with my grain cart."

The Northwest Iowa On-Farm Research Program was the result of a proposal DeJong submitted in cooperation with David Haden, who was the superintendent at the Northwest Research Farm at that time. This was a direct response to ISU budget cuts that prevented positions to be filled at nearby research farms.

Sievers says, "The cooperators who are involved are very sophisticated, interested farmers who are eager to help us with this information. At the end of the season, when we bring all the cooperators together to review the data results, there is a good interaction among them."

Mogler agrees that the information is valuable. "This program gives us the opportunity to look at what they're doing on other research farms and put it into practice on our own farms," says Mogler. He is applying what he has learned, by implementing soybean seeding rate recommendations that were researched.

To see the Northwest Iowa On-farm research results from recent years, visit www.ag.iastate.edu/stories. 

ON-FARM RESEARCH PROJECTS

Research projects have included replicated, field-length trials on:

- soybean seeding rates
- corn fungicides
- planting populations
- Soybean Cyst Nematode trials
- specialty trait bean yield comparisons
- other management practices

FOOTNOTES

COLLEGE WOMEN HONORED FOR "IMPACTING ISU"

Dean Wintersteen, entomology professor Bryony Bonning, agronomy senior Rachel Cox and environmental science senior Kelli Huser were among the twelve women honored by the Carrie Chapman Catt Center for Women and Politics on the second annual "Women Impacting ISU" calendar poster. The poster features photographs of the six students and six faculty and staff members who were selected based on their achievements in administration, teaching, research, service and various other campus activities.



ALUM PROMOTES SOY ON THE ROAD

Agricultural education grad Dan Dreher ('07) logs a lot of miles in his position as a producer services coordinator with the Iowa Soybean Association. His vehicle is a traveling billboard for soy products, especially soy biodiesel. "I'm like the delivery system for ISA projects needing statewide exposure," Dreher says. "I serve as a liaison for the ISA to members, soybean producers, corporate partners and the general public through educational meetings, on-site promotions, county activities and trade shows." Dreher's fellow producer services coordinators at ISA can be spotted in similar vehicles - be on the look out for Amanda Wall ('03 ag education), Valerie Plagge and Jen Barglof ('02 ag business).

BURRITO CALENDAR FUNDS FARMER EDUCATION THROUGH LEOPOLD CENTER

Thanks to a gift from Chipotle Mexican Grill, the Leopold Center for Sustainable Agriculture offered 10 Iowa farmers an opportunity to participate in a national sustainable agriculture conference in March. Nine farmers participated in the trip to the 20th anniversary National Sustainable Agriculture Research and Education in Kansas City as guests of the Leopold Center. Last December, the fast-growing, Denver-based restaurant chain chose the Leopold Center as one of two recipients for the funds earned from selling a unique burrito-themed calendar in their restaurants.

COLLEGE, EXTENSION HOST OPEN HOUSE FOR MORRILL ACT

The College of Agriculture and Life Sciences and ISU Extension hosted an open house April 15 to view the Morrill Act at the Christian Petersen Museum in Morrill Hall. The historic document was



President Geoffrey and Morrill Act

on display from Mar. 22 to April 27. The Morrill Act was signed by President Abraham Lincoln in 1862 establishing land-grant universities. The Act was on loan from the National Archives and Records Administration. The ISU exhibit was the first time the document has been outside of Washington D.C.

NEW COURSE GIVES STUDENTS A TASTE OF WINE SCIENCE

A new course in the College of Agriculture and Life Sciences gives students a taste of grape and wine science, but not wine. Taught by Gail Nonnecke, horticulture, and Murli Dharmadhikari and Cheryll Reitmeier, food science and human nutrition, "Understanding Grape and Wine Science" is a scientific introduction to viticulture (grape-growing) and enology (wine-making). Topics include grape species and cultivars, fruit quality, geography, history, principles of fermentation and aging, wine classification, evaluation, storage, service and regulations. The role of wine as alcohol is discussed, but does not involve wine tasting. The course filled quickly attracting students from across the university community.



MOOOVING INTO THE NEW DAIRY FARM

Nearly 1,000 head of dairy cattle settled into their new digs at ISU's 27-acre dairy farm south of campus in November. Young cattle were moved from the Ankeny Dairy Farm to the new farm in about seven hours and the milking cows traveled over 150 miles from the Northeast Iowa Dairy Farm in ten hours. An auction held in December at the Ankeny farm netted over \$200,000 from the sale of ISU surplus dairy and farm machinery. More than 500 buyer numbers were given out for the auction, proceeds from which will be used to support ISU farm operations. The highest selling item was a 7410 John Deere tractor and loader with more than 12,000 hours, which sold for \$27,000.

STORIES

IN AGRICULTURE AND LIFE SCIENCES

FALL 2008

IMPACT: HUMAN HEALTH



In the upcoming issue of STORIES in Agriculture and Life Sciences discover how college faculty and researchers are **ADVANCING HUMAN NUTRITION**, **GAINING INSIGHT INTO CAUSES OF OBESITY** and working to **ENHANCE AND PROTECT HUMAN HEALTH**.

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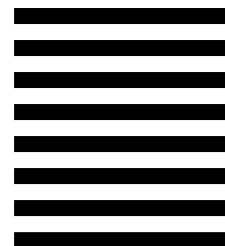
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