



# IOWA SEED & BIOSAFETY

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THE NEWSLETTER OF THE SEED SCIENCE CENTER AND BIOSAFETY INSTITUTE FOR GENETICALLY MODIFIED AGRICULTURAL PRODUCTS



Iowa State alumnus and former Chairman and Co-CEO of the OSI Group LLC Jerry Kolschowsky (left) was a featured speaker at the Global Food Security Consortium Inception Workshop October 1. Right: GFSC workshop attendees discuss ways to partner using cutting-edge science and technology to address world hunger.

## GLOBAL FOOD SECURITY CONSORTIUM HOLDS INCEPTION WORKSHOP

**M**ore than 70 scientists and experts from around the world attended the Global Food Security Consortium (GFSC) Inception Workshop held at the Seed Science Center at Iowa State University on October 1 and 2.

College of Agriculture and Life Sciences Endowed Dean Wendy Wintersteen; retired Chairman and Co-CEO of the OSI Group, LLC, Jerry Kolschowsky; USAID Director for Agricultural Research and Policy Rob Bertram; and Former World Bank Lead Agriculturist Jitendra Srivastava were featured speakers at the event.

During her address, Wintersteen praised the consortium for its new partnership with Heifer International. She challenged attendees to think big and to think outside the box. "It is that kind of thinking and those kind of partnerships that will show the state of Iowa and the world that we are serious about making a difference," she said. "Clearly the global situation demands it."

The GFSC is a worldwide initiative centered at Iowa State University. It focuses on employing interdisciplinary, comprehensive, and innovative science-based approaches to mitigate food insecurity around the world. Led by Seed Science Center Director Manjit Misra and Charles F. Curtiss Distinguished Professor of Agriculture and Life Sciences and professor of animal science Max Rothschild, the consortium was recently chosen by Iowa State President Steven Leath to receive up to \$1.2 million in funding for three years as part of the Presidential Initiatives for Interdisciplinary Research (PIIR). (See article page 5.)

At the workshop, attendees brainstormed about ways to partner to address the five GFSC research platforms. "By the end of the inception workshop you could feel the energy in the room," said Misra. "This consortium's journey towards meeting the grand challenge of achieving sustainable global food security in our lifetime has begun. I am excited to see what this gifted group of individuals partnering together can achieve."



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*"By the end of the inception workshop you could feel the energy in the room. This consortium's journey towards meeting the grand challenge of achieving sustainable global food security in our lifetime has begun. I am excited to see what this gifted group of individuals partnering together can achieve."*

—Manjit Misra



To feed the future,  
we must first seed the future.

**IOWA STATE UNIVERSITY**

**SEED SCIENCE CENTER  
BIOSAFETY INSTITUTE FOR  
GENETICALLY MODIFIED  
AGRICULTURAL PRODUCTS**

AMES, IOWA, 50011-3228

Phone (515) 294-6821

Fax (515) 294-2014

Email [seedsci@iastate.edu](mailto:seedsci@iastate.edu)

*SSC Website*

[www.seeds.iastate.edu](http://www.seeds.iastate.edu)

*BIGMAP Website*

[www.bigmap.iastate.edu](http://www.bigmap.iastate.edu)

**PROGRAM LEADERS**

*Director*

Manjit Misra

*Seed Physiology*

Susana Goggi

*Seed Pathology*

Gary Munkvold

*Global Seed Programs*

Joe Cortes

*Seed Testing*

Mike Stahr

*Seed Conditioning*

Alan Gaul

*Computer Technology*

Yuh-Yuan Shyy

*Seed Health*

Lisa Shepherd

*DNA Laboratory*

Heather Simmons

*Risk Assessment (Plants)*

Jeff Wolt

*Risk Assessment (Food Safety)*

Scott Hurd

*Risk Communication*

Lulu Rodriguez

*Process Management/Biosafety*

Adelaida Harries

*Seed Technology and Business  
Curriculum*

Gary Munkvold, Anoop Sindhu

Simi Venkatagiri

*Center Administrative Assistant*

Connie Sandve

*Editor*

Regina Hendrickson

## ISU AND HEIFER INTERNATIONAL TO PARTNER TO END WORLD HUNGER

ISU News Service



Max Rothschild

Iowa State University and Heifer International, an international development nonprofit organization,

have agreed to explore new opportunities and projects to use science to address world hunger and poverty.

The collaboration is the first agreement from the Iowa State's Global Food Security Consortium, one of the recently announced ISU Presidential Initiatives for Interdisciplinary Research. The initiatives pull together researchers from ISU, other institutions, national labs and industry to tackle significant challenges of national and international importance.

"Our goal is to build on our research strengths and on Heifer International's long history of successful development work to get our faculty and students engaged in interdisciplinary approaches that provide sufficient food and nutrition," said Max Rothschild, a Charles F. Curtiss Distinguished Professor of Agriculture and Life Sciences and professor of animal science.

Rothschild and Manjit Misra lead the Global Food Security Consortium.

"Innovative advances in climate-resilient crop and livestock science and the ability to transfer technology to those who need it most are at the heart of addressing hunger and poverty," said Misra, professor of agricultural and biosystems engineering, Dean's Chair for Distinction in the College of Agriculture and Life Sciences and director of the Seed Science Center.

"With a projected world population of 9.6 billion people predicted by 2050, the challenge is to provide sufficient food and nutrition for all, while protecting natural resources," said Rienzzie Kern, senior director of program operations at

Heifer International, based in Little Rock, Ark. "Through the partnership, we'll continue to find new ways to deliver on a well-researched, impactful agricultural development model. That is our own challenge because the global situation demands it."

ISU's Global Food Security Consortium will bring an interdisciplinary, comprehensive, and innovative approach to world hunger and poverty through focused research in five major areas: germplasm and seed systems; climate-resilient healthy crops; climate-resilient healthy animals; post-harvest and utilization; and policies, regulations and trade. For more information about the GFSC, visit [www.globalfoodsecurity.iastate.edu](http://www.globalfoodsecurity.iastate.edu).

### CALS TO ENHANCE FOOD SECURITY IN GHANA

The College of Agriculture and Life Sciences (CALS) recently received \$1.69 million from the United States Agency for International Development (USAID) to increase the availability and use of agricultural technologies to sustain productivity in Northern Ghana.

As part of the five-year project, Iowa State will partner with the International Fertilizer Development Center (IFDC) to increase the competitiveness of Ghana's rice, maize, and soy value chains to foster broad-based and sustained economic growth in the region.

CALS Senior Associate Dean Joe Colletti and Seed Science Director Manjit Misra are co-PIs on the project titled "Ghana—Feed the Future Agriculture Technology Transfer."

The Alabama-based IFDC focuses on increasing and sustaining food security and agricultural productivity in developing countries through the development of effective and environmentally sound crop nutrient technology.



## CENTER FACILITATES 12-WEEK TRAINING PROGRAM FOR CHINESE MAIZE BREEDERS

Seed Science Center Scientist and Senior Engineer Dr. Yuh-Yuan Shyy recently hosted 24 Chinese maize breeders in one of the most extensive outreach programs ever facilitated by the center.

“It all happened very quickly,” said Shyy. “We were contacted by the China National Seed Association (CNSA) who requested that we provide a training program for seed industry professionals from China. By May, we had signed an agreement with the Bureau of Seed Management of the Ministry of Agriculture in China, and by July 1st our visitors were at the Seed Science Center ready to begin their training.”

The group, which included 6 PhD and 16 master’s degree scholars, was made up of seed industry professionals with backgrounds in crop genetics, statistics, and conventional and biotechnological maize breeding theory. Participants spent July through September attending lectures and taking part in hands-on activities developed by Seed Science Center and campus faculty and staff focusing on seed production, seed conditioning, seed physiology, seed testing, seed pathology, breeding technologies, seed policy and regulations, risk management, and commercial breeding management.

Shyy, along with program assistant Michael Misra, student assistant Shayla Stephens, and other center faculty facilitated site visits for the group to numerous Midwest seed companies and farms. The group attended the Wisconsin Agricultural Technology Show and the U.S. Farm Progress Show in Illinois. In addition, they visited the USDA North Central Regional Plant Introduction Station in Ames and the National Center for Genetic Resources Preservation in Fort Collins, Colorado.

As Program Manager of the project, Shyy was responsible for operation of the program and designing the training agenda. He worked closely with Iowa State Global Agriculture Program Director Denise Bjelland. Bjelland helped to facilitate the group’s lodging, transportation, and cultural activities, while CNSA Director of International Programs Wenhui Ma helped tailor the training program to meet the needs of the Chinese seed industry. Lisa Nichols, director



*Above (clockwise from left): Chinese visitors try their hand at operating a vacuum planter at the Seed Science Center. Group site visits included a trip to the Wisconsin Agricultural Technology Show. Shyy and program participants review the training program with Chinese officials during a closing meeting in Beijing.*

of Science and International Affairs with the American Seed Trade Association, arranged site visits for the group with member seed companies throughout the Midwest including Pioneer Hi-Bred, Monsanto, Syngenta, Remington, Stine, and others.

“It was a very big undertaking,” said Shyy. “But at the same time it was very rewarding. When you are together that long you become like family. So in the end, I believe it was a valuable experience, not only for our visitors, but for center faculty and staff as well.”

Following the conclusion of the program, Shyy and group participants reviewed the program with officials from the Chinese Ministry of Agriculture, the Ministry of Education, and the CNSA in a closing meeting in Beijing. “Both the Chinese officials and the program participants had a lot of positive things to say about their time at the center. So I feel the program was very successful,” said Shyy. “I believe this project will pave the way for future collaborations.”



## HARRIES EARNS PBS LEADERSHIP AWARD

In September, Seed Science Center Global Seed Program Specialist Adelaida Harries (second row, fourth from left) received the annual leadership award from the Program for Biosafety Systems during their meeting in Washington, D.C.

UPDATES (cont'd)—

## SEED POLICY ENHANCEMENT IN AFRICAN REGIONS (SPEAR)

The Seed Policy Enhancement in African Regions (SPEAR) program ended in 2012. The project, funded by the Bill & Melinda Gates Foundation sought to improve the variety release systems in Malawi, Nigeria, and Zambia.

By the project's end, Iowa State Global Seed Program Leader Joe Cortes and Specialist Adelaida Harries succeeded in moving the system in-line with the policy of regional harmonization systems. They also improved breeder and foundation seed production availability for private sector access through licensing contract agreements.

"We developed variety release procedure guidelines and the software that was disseminated to key stakeholder groups in each country," said Cortes. "As a result, Malawi, Nigeria, and Zambia have streamlined their variety release systems to that of their regional seed protocols."

Government officers and private breeders were trained in database management using software developed by Iowa State to facilitate information on released varieties.

Finally, all three countries conducted studies to understand their Genetic Access and Transfer System (GATS)-related needs. In all, 153 breeders, seed companies, and seed regulators were trained in seed licensing. Nigeria and Zambia developed and had their GATS approved by authorities. Malawi was in the process of finalizing development of its GATS by project end.

Nigeria facilitated the signing of 87 contracts (involving 10 seed companies and four NARIs) with seed quantities equaling 13,830 kg. In Zambia, 8 licensing contracts were signed.

## COMESA AGRICULTURAL MINISTERS ADOPT HARMONIZED SEED REGULATIONS

After two years of efforts in the Common Market for Eastern and Southern Africa (COMESA) region, the Iowa State Global Seed Program, in conjunction with the African Seed Trade Association (AFSTA), reached an important milestone. On September 19, 2013, the Harmonized Seed Regulations technical agreement was adopted by the region's Ministers of Agriculture during their meeting in Addis Ababa, Ethiopia.

"This is an important breakthrough," said Seed Science Center Global Program Leader Joe Cortes. Cortes and Global Seed Program Specialist Adelaida Harries played a key role in facilitating the technical discussions and the proposed agreement.

Cortes and Harries worked with AFSTA from 2010 to 2012 to harmonize seed policies and regulations in the COMESA region. The final outcome of their joint efforts included technical agreements being reached in seed certification, variety release systems, and phytosanitary/seed import export procedures.

"Although this was a very slow process, it is a real success story for everyone involved," said Harries. "Now that final approval by the region's Council of Ministers will go into effect in December 2013 our mission is complete. Smallholders from 19 countries in the region will greatly benefit. Harmonization in the COMESA region will promote seed trade, enhance seed industry development, and ensure farmer access to high-quality seed."

## GLOBAL PROGRAM UPDATES— PROGRAM FOR BIOSAFETY SYSTEMS (PBS)

In the past year, Iowa State Global Seed Program Specialist Adelaida Harries continued her efforts with the Program for Biosafety Systems (PBS) on three initiatives.

The first initiative included collaborating with Iowa State University Greenlee School of Journalism and Communication Professor Lulu Rodriguez and PBS to develop science-based training materials on the topics of biotechnology policy and regulatory decisions.

Harries also developed standard operational procedures for confined field trials and multi-location trial guidelines, including biosafety and variety release. The guidelines will speed access to new technologies by streamlining the biosafety procedures and variety release systems at the national level.

## SEED ENTERPRISE MANAGEMENT INSTITUTE (SEMIS)

Iowa State is continuing its efforts with the Seed Enterprise Management Institute (SEMIs) in Kabete, Kenya.

The Global Seed Program is providing assistance for the physical design and acquisition of equipment for the processing plant and seed testing laboratory. Iowa State and UoN continue to conduct workshops on seed testing, seed conditioning and storage, and seed policies and regulations. ISU is also developing a quality manual for seed companies in Africa.

ISU has worked on the project since 2009 in an effort to eradicate food insecurity through capacity building in sub-Saharan Africa.

## Awards & Recognitions



Susana Goggi



### Goggi Receives CSSA Seed Science Award

Seed Science Center and Agronomy Associate Professor Susana Goggi was recently selected to receive the 2013 Crop Science Society of America (CSSA) Seed Science Award. The award recognizes distinctive service to the development and utilization of quality seeds in agriculture. Award recipients are determined by the significance and originality of their basic and applied research; outstanding contributions in extension and service activities; educational activities relative to the training of seed scientists; International contributions to seed science; and professional interactions with seed related organizations. Goggi, who has taught and conducted research at Iowa State for 13 years, will be recognized during the 2013 Crop Science Society Annual Meeting in Tampa, Florida, on November 6.

### Munkvold Earns Distance Education Award

At the ISU College of Agriculture and Life Sciences (CALs) Spring Convocation in February of 2013, Seed Science Endowed Chair and professor of plant pathology and microbiology Gary Munkvold received the CALs Distance Education Teaching Award. Munkvold has served as chair of the Online Graduate Program in Seed Technology and Business (STB) since 2008; he teaches "Seed Health Management" in the STB program and has developed on-line course material for other Iowa State graduate programs. STB students describe Munkvold's teaching methods as innovative, motivated, and patient.

### Espinosa Accepts Job At DuPont Pioneer

Former graduate student Katherine Espinosa recently accepted a position with DuPont Pioneer in Johnston, Iowa. Espinosa is a Requirement Analyst with the Introgression Program in Soybean Genetics at the company. As part of her PhD program at Iowa State, Espinosa conducted research with Drs. Susana Goggi and Reid Palmer. In December 2012, Espinosa earned first place honors in the American Seed Trade Association Future Seed Executives (FuSE) and Dow AgroSciences "Best Poster Awards" student competition for her research titled "Allele switching" at the Aconitase-2 and Aconitase-4 Loci in Inbred Soybean Plants. Authors included: K. Espinosa, R.A. Rolling, M. Hopkins, S.J. Lolle, A.S. Goggi, and R.G. Palmer.

### Lauver Named Future Giant of Seed Industry

Andrew Lauver was named *Seed World Magazine's* 2013 Future Giants of the Seed Industry Award Winner in June at the American Seed Trade Association's annual convention. Lauver was a 2010-11 and 2011-12 Iowa Seed Association Scholarship recipient and a 2012 Undergraduate American Seed Trade Association Convention Scholarship recipient. Lauver is a Frank Ross International Business Emerging Leader at DuPont Pioneer.



## GLOBAL FOOD SECURITY CONSORTIUM AWARDED PIIR PURSUIT FUNDING

The Global Food Security Consortium, led by Seed Science

Center Director Manjit Misra and Charles F. Curtiss Distinguished Professor of Agriculture and Life

Sciences and professor of animal science Max Rothschild, was one of four Iowa State University research teams recently named to receive up to \$1.2 million over three years to pursue competitive grants to fund large-scale, multidisciplinary research efforts of national and international importance.

The grant is part of the Presidential Initiatives for Interdisciplinary Research (PIIR), a program launched by Iowa State University President Steven Leath to support research efforts that could lead to major advances, discoveries, and technologies.

"These proposals are just what we wanted to see," Leath said. "They pull together talented researchers from our university, other institutions, national labs, and industry to tackle some of the grand challenges facing our world. I believe we will see real progress coming out of these scientific collaborations."

The projects also will further the excellence of Iowa State University, building upon the strengths of the university and expanding the overall research structure," he added.

During the funding period, project teams will submit multiple proposals for external large-scale research grants. Pursuit funds can be used for such things as teaching releases, hiring consultants to add value to teams, and holding workshops to strengthen connections among ISU and external partners.

"Global Food Security is the grand challenge that we will face as our population continues to grow," said Misra. "We need to begin planning now, on ways that we can utilize new technologies that do not harm our environment, to rise to this challenge. The GFSC is a world-wide initiative located at Iowa State University that is interdisciplinary, comprehensive, and innovative so that we can begin to address these challenges today. I believe that this award is the first step towards realizing that goal."

For more information about Iowa State University PIIR pursuit funding awards, visit: <http://www.news.iastate.edu/news/2013/06/06/researchawards>

(Excerpts from ISU News Service Release, 6/2013)





Margaret Karembu (left), director of the International Service for the Acquisition of Agri-biotech Applications Africenter, and Walter de Boef (right), senior program officer for the Bill & Melinda Gates Foundation, were featured speakers at the Leroy and Barbara Everson Seed & Biosafety Symposium April 24th.



College of Agriculture and Life Sciences Endowed Dean Wendy Wintersteen (right) and Seed Science Center Director Manjit Misra (left) present a plaque to John Everson commemorating his parent's contributions to Iowa State.

## CENTER LAUNCHES EVERSON SYMPOSIUM SERIES

On April 24, the Iowa State University Seed Science Center launched a new symposium series supported by a generous contribution from the family of Leroy Everson, former director of the ISU Seed Laboratory.

The first Leroy and Barbara Everson Seed & Biosafety Symposium “Seeding the Future: Emerging Policy and Science,” held at the Gateway Hotel in Ames, Iowa, was attended by 110 scientists, academics, and seed industry officials

“The symposium addressed important issues that face not only the seed industry, but also those who depend upon it for their livelihoods. It continues Everson’s legacy of service to others,” said Adelaida Harries, global seed program specialist and co-organizer of the event.

The symposium highlighted issues of importance to public sector seed science as well as to the seed industry. It also examined changes in seed science and technology that have occurred in the 30 years since Everson last served as Seed Laboratory director.

Keynote Speakers for the event included Marcel Bruins, secretary general of the International Seed Federation, and Margaret Karembu, director of the International Service for the Acquisition of Agri-biotech Applications Africenter. Bruins shared his perspectives on seed science and the seed industry in the 21st century and Karembu gave an overview of the global status of commercialized biotech/GM crops. Walter de Boef, senior program officer for Seed Systems Access & Markets Global Development at the Bill & Melinda Gates Foundation, gave the luncheon address.



### Other symposium speakers included:

**Moses Siambi**, Malawi representative for the International Crops Research Institute for the Semi-Arid Tropics, “Seed of Orphan Crops for Food Security”; **Miller McDonald**, professor emeritus, Ohio State University, “Public Sector Seed Science”; **Kenneth Ostlie**, professor and extension entomologist, University of Minnesota, “Emergence and Implications of Resistant Corn Rootworm”; **Iain Kelly**,

Bayer CropScience, “Seed Treatment and Pollinators”; **Dave Stimpson**, seeds regulatory specialist, Dow AgroSciences, “Refuge in a Bag”; **Micheal Owen**, extension weed specialist and professor of agronomy, Iowa State University, “Herbicide Resistant Crops: Old Chemistry and New Traits”; and **Alan Taylor**, professor of seed science and technology, Cornell University, “New and Emerging Seed Treatments.” **Audio presentations of the Leroy and Barbara Everson Seed & Biosafety Symposium can be found online at: [www.extension.iastate.edu/broadcasts/bigmap/2013](http://www.extension.iastate.edu/broadcasts/bigmap/2013).**

## CELEBRATION HONORS FORMER SEED LAB DIRECTOR LEROY EVERSON

A celebration honoring the legacy of Leroy Everson, former director of the Iowa State University Seed Laboratory, was held at the Seed Science Center April 23. Everson family members, former colleagues and students, as well as faculty and staff who worked with Everson, attended the event that highlighted Everson’s many contributions to Iowa State and the seed industry.

Wendy Wintersteen, endowed dean of the College of Agriculture and Life Sciences, Hans Arne Jensen, former chair of the International Seed Testing Association Purity Committee, and Manjit Misra, director of the Seed Science Center, joined John Everson, ISU alumnus and son of Leroy and Barbara, in sharing insights on Everson’s career.

“Leroy Everson dedicated many years of his life to improving seed testing and the seed industry,” said Misra. “We are very pleased to have this opportunity to honor him, not only with this celebration but also with this new symposium series.”

*Family members of Leroy and Barbara Everson pose with Seed Science Center Director Manjit Misra at the first Leroy & Barbara Everson Seed & Biosafety Symposium.*



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## STB PROGRAM MANAGER TO FOCUS ON RECRUITMENT, NEW COLLABORATIONS



Anoop Sindhu

Anoop Sindhu, new program manager for the Iowa State Graduate Program in Seed Technology and Business (STB), is making it his priority to expand the distance education program by developing collaborations within industry and other leading institutions to increase student recruitment. “I hope to explore new initiatives with Indian institutes as well as expand student recruitment from within the seed industry,” said Sindhu.

“This distance education program is very popular with the industry which is good. But like other institutions, we face competition from other universities.”

The Graduate Program in Seed Technology and Business is an interdisciplinary degree that is a cooperative effort between the Colleges of Business and Agriculture and Life Sciences at Iowa State University. Classes are offered through the Internet and are scheduled so that working professionals can participate.

Sindhu began his duties at Iowa State in August of 2013. He came to Ames from the University of Saskatchewan, located in Saskatoon, Canada, where he served as a Project Coordinator in the Department of Plant Sciences. Sindhu holds a Ph.D. in plant breeding and genetics from Punjab Agricultural University, India, an MBA from the University of Saskatchewan, and a B.S. in Agricultural Sciences from Haryana Agricultural University, in India.

Fluent in several languages, Sindhu is confident that his extensive training in agricultural science and his experiences with the seed industry and academia will be valuable when serving in his new capacity. “My background, which includes various aspects of breeding, genetics, plant pathology, and business, should prove helpful when working with the STB students,” says Sindhu. “I will be able to understand their needs and help them—especially in developing their creative component and when linking them with faculty.”

As STB Program Manager, Sindhu will work closely with Program Chair Gary Munkvold and Program Assistant Simi Venkatagiri. His responsibilities will include coordinating the delivery of lectures and working with instructors on course curriculum improvements to reflect seed industry advancements. “My major interactions will be with the students,” says Sindhu. “I will be assisting them with their day-to-day logistic and other needs.” Other projects on Sindhu’s agenda include working with other institutions to develop a collaborative online training program and writing proposals for joint funding to expand the STB program.

“In the Fall of 2013 enrollment in the STB program increased to a total of 45 students,” said Munkvold. “We have a healthy enrollment and instructor feedback from our students is positive. We plan to continue to build on this success and we welcome Anoop’s assistance as we work towards these new goals. We feel he will be an excellent addition to the program.”

For more information about the Graduate Program in Seed Technology and Business contact Anoop Sindhu at [sindhu@iastate.edu](mailto:sindhu@iastate.edu) or phone 515-294-5681.

## 2013 STB SUMMER GRADUATES

In the summer of 2013 five students graduated from the Online Graduate Program in Seed Technology & Business (STB). They included: Matt Cope, Ian Dielschneider, Emmanuel Mubangizi, Michele Quinn, and Scott Raubenstine.

There is no residency requirement to take part in the STB program. International students are encouraged to apply.

For more information, visit [www.seedgrad.iastate.edu](http://www.seedgrad.iastate.edu)

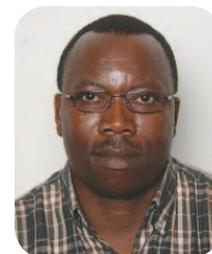


### Najjar Seminar Focuses on Ghanan Agricultural Sector

Chief Executive Officer of New Agricultural Services, Ltd. (AGRISERV) Raja Najjar visited the Seed Science Center in January. Najjar collaborated with center faculty and presented a seminar titled “The Agricultural Sector of Ghana.”

### Agriculture in Malawi is Topic of Jumbe Seminar

Felix Jumbe, president of the Farmers Union of Malawi, gave an overview of agriculture in Malawi as part of a seminar hosted by the Iowa State Seed Science Center in January.



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Seed Conditioning Specialist Alan Gaul demonstrates a bagging scale for Agronomy 338 laboratory students visiting the Seed Science Center's seed conditioning facility.

## UNIQUE FACILITY SERVES AS VALUABLE TEACHING AND TRAINING RESOURCE

Each year hundreds of students, seed industry professionals, and others from around the nation and the world pass through the doors of the Seed Science Center's full-scale seed conditioning facility. Known to many as simply "the tower" the approximately 3,200 square foot, multi-level facility has served as a hub of activity in the center since the original Iowa State Seed Laboratory building was erected during Leroy Everson's directorship in 1978. The tower was designed to simulate industrial situations and provides companies with a facility for training and conducting seed conditioning research. Today instructors, center faculty and staff, students, and industry personnel use the facility for class demonstrations and content development, seed research and sample analysis, international "train-the-trainer" sessions, faculty training and technical support, informational tours, and other purposes. However, even though its applications are many, few pause to reflect upon the uniqueness of this facility.

### One-of-a-Kind Learning Opportunities

"We are so fortunate to have this facility and this equipment, that sometimes it's easy to take it for granted," says Agronomy Associate Professor Susana Goggi. "To my knowledge there is no other facility like this currently anywhere in the nation. Having this equipment available here on the ISU campus—right here in the Seed Science Center—gives our students an edge when they go out into the seed industry," says Goggi. "I have had students tell me that when they start their jobs, they have us to thank because they are already familiar with the operation of various machines they learned about here at the center."

Former ISU student Kevin Boyer, now a quality assurance lead for Syngenta, is one example. Boyer recently wrote Goggi to thank her for the hands-on learning opportunities he gleaned from class lab visits to the tower. "My job will involve process simulation lab work, very similar to what we learned in your lab performing small-scale conditioning operations," said Boyer. "I'm very glad I took your course."

### 39 Years of Seed Industry Training

Iowa State Seed Conditioning Specialist Alan Gaul is tasked with sharing the intricacies of the facility's equipment. He designs and implements workshops, assists instructors and center faculty with ongoing research and undergraduate education, and works with equipment manufacturing firms and plant designers to keep the equipment up to current industry standards.

*"To my knowledge there is no other facility like this currently anywhere in the nation. Having this equipment available here on the ISU campus—right here in the Seed Science Center—gives our students an edge when they go out into the seed industry."*  
—Susana Goggi



Above: Students take turns analyzing the efficiency of an air screen cleaner.

Determining seed count for packaging is another skill students learn in the conditioning facility.



An Oliver GVX-1020 PLC-based gravity separator is one example of cutting-edge equipment provided by seed industry equipment manufacturers for use in the Seed Science Center's conditioning facility.

For more than 39 years, the Seed Science Center has provided training for seed industry professionals through short courses and workshops. Each April through August Gaul and Seed Lab Manager Mike Stahr facilitate workshops covering topics from seed testing and cleaning, to gravity separation, color sorting, and seed treatment. According to Gaul, 2013 was one of the busiest summers on record. During the five months, 213 individuals traveled from 19 states in the U.S., Canada, Ecuador, and Kenya to attend 12 regularly scheduled Iowa State workshops. Multiple custom seed conditioning workshops were also provided for various seed companies and international seed organizations.

### State-of-the-Art Equipment

As a result of agreements with seed industry equipment suppliers, the conditioning facility prides itself on offering training opportunities with state-of-the-art conditioning equipment. “We make it our priority to offer training using the most widely installed equipment on the market,” says Gaul. “That is because that technology is what the individuals traveling to our workshops and students will most likely encounter when they leave here.” Gaul says that equipment suppliers often offer to help demonstrate their equipment during the workshops. “We encourage that interaction because they offer special insight that others can’t. It is a win-win situation because it advertises their product while educating the end-users.”

“We are all very proud of this facility and the work that Alan does here,” says Seed Science Center Director Manjit Misra. “Like our own hidden gem, it plays a significant role in ensuring that the Seed Science Center remains a center of excellence on the Iowa State campus and beyond. It definitely has made, and will continue to make, an impact on the careers of those that enter its doors for years to come.”

**For more information about Seed Science Center training opportunities, visit [www.seeds.iastate.edu/seedtest/training.html](http://www.seeds.iastate.edu/seedtest/training.html).**

## SEED SCIENCE CENTER CONDITIONING FACILITY EQUIPMENT

### Pilot Plant Equipment:

- Bulk receiving & handling machinery
- Crippen H-434 air screen cleaner
- Oliver 212 Size-Right sizer
- Carter-Day 1VT sizers
- Carter-Day #3 Uniflow indent cylinders
- Carter-Day 24" fractionating aspirator
- Amos dual core conventional spiral separator
- Profile Industries single core rotary spiral separator
- Harada dual slope belt separator
- Oliver GVX-1020 PLC-based gravity separator
- Forsberg 40V & TKV-25 vacuum gravity separators
- Heid GA-30 and LMC 241 gravity separators
- Satake ScanMaster II IE-200 and DE-200 color sorters
- Buhler/Sortex Z+V color sorter
- Gustafson GLCPS treater components
- Express Scale 5GV bagging scale
- Fischbein portable sewing machine

### Laboratory Equipment:

- Westrup LA-H brushing machine
- AEC roller concave ear corn sheller
- Moisture meters and air oven dryer
- Custom stacked tray dryers
- Portable riffle divider
- Perforated hand screens
- Strand model P & AEC TSV-90 screen shakers
- Test weight apparatus
- Bench and platform scales
- Carter-Day closed circuit Duo-Aspirator
- Westrup LA-LS air screen cleaner
- Profile Industries lab static spiral separator
- Carter-Day rotary batch sizer
- Carter-Day batch indent cylinder
- Westrup spiral & LA-BS belt separator
- Sutton & Steele gravity separator
- IMD and Seedburo vibratory seed counters
- Dubois high speed pneumatic seed counter
- OptiCount laboratory imaging seed counter
- Hege model 11 batch seed treater
- Gustafson BMC automatic batch treater
- Quantachrome MPY-1 micropycnometer
- SUET 601 830/17 laboratory fluidized column dryer



### Seed Lab “Lives Green”

As part of Iowa State’s Live Green Initiative, the Seed Lab is in the process of installing energy efficient LED lights in its walk-in germination chambers. Unlike fluorescent bulbs, which lose a fair amount of light intensity in the first year of use, LED lights maintain light quality and intensity for up to 10 years. The LED lights will have a relatively quick payback period because they save energy and eliminate the cost and labor involved in replacing bulbs and ballasts. Perhaps most importantly, the LED lights offer germinating seedlings consistent high-quality light.

### Crop Bioengineering Consortium to Host Workshop November 4-5

The newly organized Crop Bioengineering Consortium at Iowa State is hosting the workshop “Science and Opportunities in Using Site-Directed Mutagenesis for Plant and Animal Improvement” at the Gateway Hotel in Ames November 4 - 5, 2013. The workshop represents an inaugural outreach activity for the Consortium and will feature three sessions, beginning the afternoon of November 4 and finishing on the afternoon of November 5. Sessions will address technological opportunities and state of the science; the product development landscape; and questions of safety, acceptance, and regulation. The event is co-organized by Martin Spaulding, consortium project director, and Jeff Wolt, Biosafety Institute for Genetically Modified Agricultural Products. **Details and registration information can be obtained by contacting [jdvolt@iastate.edu](mailto:jdvolt@iastate.edu) or by visiting [www.extension.iastate.edu/registration/events/Conferences/cbcworkshop/index.html](http://www.extension.iastate.edu/registration/events/Conferences/cbcworkshop/index.html).**



Rating field inoculations for Goss's wilt (left) and Stewart's wilt (right).

## RESEARCH HIGHLIGHT —

### RELATIONSHIP BETWEEN RESISTANCE TO STEWART'S WILT AND GOSS'S WILT IN DENT CORN INBREDS

Charles C. Block (USDA-ARS) and Lisa M. Shepherd (Iowa State University)

Stewart's wilt, caused by *Pantoea stewartii* subsp. *stewartii* and Goss's wilt, caused by *Clavibacter michiganensis* ssp. *nebraskensis* (*Cmn*), are the two prominent bacterial leaf blight pathogens in maize in the US. Goss's wilt has become much more widespread in geographic range since 2008, and many popular hybrids are susceptible. Previous research showed a good correlation between sweetcorn hybrid reactions to Stewart's wilt and to Goss's wilt (Pataky, 1985).

The objective of this study was to compare the disease resistance responses of an array of field corn inbreds to Stewart's wilt and Goss's wilt inoculation.

In 2010 and 2011, we screened 35 dent corn inbreds for resistance to Goss's wilt infection. The pool of inbreds represented a broad range of known Stewart's wilt disease reactions. Plants were grown in inoculated field trials and individual plant disease reactions were scored during the seed filling period, using a 1 to 9 scale (1= highly resistant, 9= highly susceptible). As a group, inbreds showing good resistance to Stewart's wilt, with mean scores ranging from 1.3 to 3.0, also showed good resistance to Goss's wilt, with mean scores ranging from 1.0 to 2.6. Inbreds that were systemically infected by *P. stewartii*, with mean scores ranging from 5.2 to 8.3, were also systemically infected by *Cmn*, with mean scores ranging from 5.5 to 8.0. (Table 1) The Pearson's correlation coefficient, calculated from mean disease severity ratings, was 0.92 and the Spearman's rank correlation of inbred rankings was 0.88.

Although the two pathogens are considerably different, *P. stewartii* subsp. *stewartii* being gram-negative and insect-vectored while *C. michiganensis* subsp. *nebraskensis* is gram-positive and splash or wind-dispersed, the similarity of inbred response to the two pathogens may indicate a similar mechanism of resistance.

The strong correlation between Stewart's wilt and Goss's wilt resistance may allow maize breeders to select potential Goss's wilt-resistant parent lines based on available Stewart's wilt resistance data. There are approximately 5,000 accessions in the Germplasm Resources Information Network (GRIN) database with Stewart's wilt data. They can be found at <http://www.ars-grin.gov/cgi-bin/npgs/html/listdsc.pl?MAIZE>.

Table 1. Maize inbred reactions to Stewart's wilt and Goss's wilt.

Entry	Locale	Inbred	Average Stewart's wilt rating	Average Goss's wilt rating	
PI 558533	Missouri	MO 21R; (Check 1)	1.3	1.2	Non-systemic
Ames 25559	Indiana	H60	1.6	1.1	
Ames 26121	Missouri	CI 28	1.7	1.2	
PI 601008	Iowa	PHG35	1.7	2.6	
Ames 27193	Virginia	Va85	1.8	1.0	
PI 601037	Iowa	G80	1.8	1.1	
Ames 10261	Georgia	GE335	1.9	3.0	
Ames 19314	USA	CI64	2.0	1.3	
PI 531509	Illinois	R225	2.0	3.0	
PI 550467	Iowa	B37; (Check 2)	3.0	2.1	
NSL 30884	Illinois	R134	3.1	2.2	
PI 550463	Iowa	B65	3.1	2.5	
PI 601171	Iowa	LH93	3.1	2.1	
Ames 26134	Missouri	CI 75	3.2	3.8	
NSL 30875	Illinois	R76	3.2	5.0	
PI 600955	Iowa	LH51	3.2	2.3	
Ames 19284	Connecticut	C103	3.3	1.6	
Ames 26135	Missouri	CI 82B	3.3	2.8	
PI 550455	Iowa	B67	3.3	4.0	
Ames 24719	Michigan	MS79	3.4	2.8	
Ames 23465	Minnesota	A629; (Check 3)	4.0	3.9	
Ames 23447	Minnesota	A509	5.2	7.8	
Ames 23455	Minnesota	A588	5.2	5.5	
Ames 23417	Minnesota	A305	5.3	7.3	
Ames 19311	Minnesota	A641	5.4	5.5	
Ames 22011	Arkansas	C5 Ark 1956	5.5	6.2	
Ames 23468	Minnesota	A632 Ht; (Check 4)	5.8	6.5	
Ames 23471	Minnesota	A633	5.5	6.8	
Ames 24752	Michigan	MS1334	5.5	7.4	
PI 550541	North Dakota	ND253	5.6	7.2	
PI 600729	USA	LP1 NR HT	5.6	5.8	
NSL 32738	North Dakota	ND283	5.7	8.0	
Ames 8399	Wisconsin	W117HT	5.8	6.0	
Ames 20140	Minnesota	Mt42; (Check 5)	7.2	8.0	
Ames 23507	Minnesota	C42; (Check 6)	8.3	8.0	

Charles Block is a Plant Pathologist for the North Central Regional Plant Introduction Station in Ames Iowa.

Lisa Shepherd serves as Director of the Administration Unit for the National Seed Health System and Seed Health Testing Coordinator for the Iowa State University Seed Laboratory.



*Gladys Mbofung is a Postdoctoral Research Associate in the Department of Plant Pathology and Microbiology at Iowa State University. Russell Mullen and Susana Goggi are Professor and Associate Professor in the Department of Agronomy, respectively. Leonor Leandro is an Associate Professor in the Department of Plant Pathology and Microbiology.*

*Gladys Mbofung evaluates germination tests in the Seed Science Center as part of her research project.*



## RESEARCH HIGHLIGHT –

### EFFECT OF STORAGE TEMPERATURE AND RELATIVE HUMIDITY ON VIABILITY AND VIGOR OF CHEMICALLY TREATED SOYBEAN SEEDS

**Gladys Mbofung, Susana Goggi, Leonor Leandro, and Russell Mullen  
Iowa State University**

A research article published in the 2013 issue of *Crop Science* offers important findings for farmers unable to plant their soybean crop due to abundant rainfall in the spring of 2013.

“Our research shows that soybean does not survive in storage beyond the normal 6 to 8 months,” says Agronomy Associate Professor Susana Goggi. “This is especially true in warehouse storage conditions, where seed germination was 0% at 20 months of storage.”

Even in conditioned storage of continuous 50 degree F temperature and 50% relative humidity, soybean seed loses seed vigor within a year, even though the germination under these ideal storage conditions remained in the 90s after 20 months. Seed treatment actually seems to protect the seed from deterioration in storage, but in a warehouse storage environment, soybeans are unlikely to survive.”

Goggi says the researchers measured seed viability and vigor using the standard (warm) germination test and the accelerated aging test. Seed vigor is a measure of the physiological fitness that allows seeds to emerge under stressful weather conditions. If planted later when soils are warmer and chances of cold, wet conditions are less likely, then field emergence is closer to the seed germination (warm germination) value.

In the study, seed treatments are applied to soybean [*Glycine max* (L.) Merr.] seeds to control early season diseases and insects. Unsold, treated soybean seed must be disposed in a different manner than untreated seed. To minimize treated seed disposal costs, it is necessary to improve seed storage. The objective was to determine the best storage environments that would minimize deterioration of treated soybean seed. Twenty four soybean varieties, different in lipid and protein contents and from four maturity groups, were treated either with fungicide or a mixture of fungicide plus insecticide or were untreated and were stored in three storage environments differing in temperature and relative humidity: a cold storage (CS) (10°C), a warm storage (WS) (25°C), and a warehouse (WH). Seed viability and vigor were evaluated each 4 months for 20

months using standard germination and accelerated aging tests. Seed viability remained high throughout the study for seeds stored in CS (>92%) and moderate in the WS (>78%) but decreased to almost 0% after 20 months in the WH. The seed viability of treated seed was significantly higher than that of untreated seed after 16 months in the WH while in the CS and WS the positive effects lasted for 20 months. Seed vigor was affected by only seed lipid content for seeds stored for 12 months, regardless of storage environment. Treated soybean seeds could be carried over for two seasons if the storage temperature is maintained at 10°C and the relative humidity is below 40%.

To access the full article visit <https://www.crops.org/publications/cs/pdfs/53/3/1086>.



## COMMENTARY:

### UNIFORM TESTING METHODS FOR RIB CORN, SEED LAB UPDATES

by Iowa State Seed Laboratory Manager Mike Stahr

#### REFUGE IN A BAG

Refuge in a Bag (RIB), or integrated refuge management as it is now referred to, came about primarily as a means to safeguard the technology that protects corn against insect pests without the necessity of spraying non-selective insecticides or planting a portion of a field as refuge. Last spring was the first large-scale release of the RIB technology and therefore the first time some RIB corn was either returned by farmers, or didn't leave the warehouse in the first place.

For the last two years or so, I and others have been encouraging the development of uniform testing methods for carryover RIB corn. However, determining the appropriate amount of RIB seed to test and the most effective method of testing has proved confusing to seed companies and testing labs. One industry group discussed this dilemma with its members during several meetings. Background information on RIB along with general testing scenarios was presented. (See the ISU Seed Lab website: [www.seeds.iastate.edu/seedtest/](http://www.seeds.iastate.edu/seedtest/) for details/recommendations.) After much consideration and discussion with others, I recommend the following for determining the quality of the refuge portion of carryover RIB corn: Send two pounds or more of the mixed product for testing. We will conduct a 400-seed warm germination test and a 200-seed cold test (if requested) using mixed seeds. We will also test 100 seeds of the refuge portion only of the sample in a warm germ. Using this approach, seed companies will have a warm germ that can be used for labeling and also get a good idea of the quality of the refuge portion.

#### TRAINING OPPORTUNITIES

Training opportunities will abound at the Seed Science Center in 2014. In addition

to a summer of conditioning workshops organized by Alan Gaul, the Seed Lab will present two training sessions: 1) The two-week Seed Analyst Short Course April 14-17 (Purity week) & April 21-24 (Germination, Vigor, Trait, and Seed Health week) and 2) The Corn & Soybean Seed Quality Workshop, expanded to three days for the first time in 2014. During each week of the Seed Analyst Short Course, participants will work with a wide variety of species of seeds (including crops, flowers, vegetables, and grasses). Individuals that qualify will be able to take RST, CSA, or RGT certification exams each Friday of the short course. Corn & Soybean Seed Quality Workshop participants will have the opportunity to analyze two seed lots of corn and two seed lots of soybeans through most testing methods (warm germ, vigor, biotech traits, health, and more) on multiple planting substrates. And finally, a bonus week of workshops will be offered in 2014: The Society of Commercial Seed Technologists (SCST) Genetic Testing Super Workshop February 3-7. This workshop consists of a series of genetic workshops including herbicide bioassay immunoassay (ELISA, lateral flow strips), PCR, electrophoresis, and molecular biology.

#### AOSA RULE CHANGES

Each year at the Association of Official Seed Analysts (AOSA)/Society of Commercial Seed Technologists (SCST) annual meeting, attendees consider Rule change proposals during an open session. They then vote whether to add the proposals to the AOSA Rules for Testing Seeds. While all approved proposals are important, two this year are likely be of particular interest to seed lab customers: 1) Adjusting how corn is evaluated in a warm germination test, and 2) promoting uniformity in testing. Several years of

lab and field referees involving multiple seed labs demonstrated that some field corn hybrids have slow leaf development when grown in rolled paper towels, but have normal leaf development when grown in sand or on crepe cellulose paper (and in the field). A majority of seed labs use rolled towels for corn germs, and so voters agreed that a slow first leaf in field corn doesn't make a seedling abnormal. This Rule may result in higher germination values for some seed lots than in previous years. The second Rule proposal of interest in part requires seed labs to list warm germ test conditions on the report when the method used differs from options in the Rules.

#### TESTING NEW SEED TREATMENTS AND COATINGS

Seed treatments have been used for many years to protect seeds against soil-borne fungi or to lessen the effect of seed-borne fungi. Fungicides have also proven useful this summer on wheat seed infected with Fusarium. Of more recent importance, are seed-applied insecticides that reduce or eliminate the need for applying insecticides in the field. These are exciting times as many new products are being developed with benefits that range from promoting vigorous growth to helping seeds grow in dry conditions. At the Iowa State Seed Lab we play an important role in developing these products by testing various species of seeds treated and stored in refrigerated and ambient warehouse conditions. Seed companies and seed treatment developers recognize our reputation for excellence in testing a wide range of seed species and draw on the experience and knowledge of our personnel and that of other ISU researchers. For more information call 515-294-6821 or visit [www.seeds.iastate.edu/seedtest/](http://www.seeds.iastate.edu/seedtest/).



## VIGUE NAMED MISRA SCHOLAR

Samuel Vigue of Brimfield, Illinois, was named the Manjit K. Misra Outstanding Senior Seed Scholar at the Iowa Seed Association (ISA) Annual Convention awards ceremony. The event was held in conjunction with the Agribusiness Showcase and Conference in Des Moines in February.

Vigue was also awarded an American Seed Trade Association scholarship at the event.

Vigue majored in agronomy and horticulture at Iowa State. He held a secondary major in seed science. During his college career, Vigue was employed in the Seed Science Center seed conditioning facility. He also participated in an Iowa State Honor's Research Project with Susana Goggi and Gary Munkvold. Vigue says that his long-term goal is to conduct research in seed science.

Eight Iowa State students were also awarded \$1,000 ISA scholarships at the event. They included: Schylor Altenhofer, Andrew Heath, Taylorann Smith, Jon Olsen, Tory Mogler, Kellie Walters, Jay McCoskey, and Elliot Reicks.

This is the seventh year that the Misra Scholarship has been awarded to Iowa State students. Bruce and Kathy Maunder provide funding for the scholarship that is awarded on the basis of academic excellence, leadership, and interpersonal skills, along with a demonstrated interest in a career in the seed industry or in seed science.

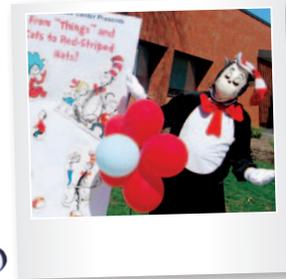


Nine ISU scholars were honored at the Iowa Seed Association Annual Convention in February. Front row (from left) are: Iowa State College of Agriculture and Life Sciences Senior Associate Dean Joe Colletti; Samuel Vigue; Schylor Altenhofer; Andrew Heath; Taylorann Smith; and ISU Seed Science Center Director Manjit Misra. Back row (from left): Jon Olsen; Tory Mogler; Kellie Walters; and Russ Mullen. Not pictured: Jay McCoskey and Elliot Reicks.



## VEISHEA 2013: THE "CAT" COMES BACK!

The Cat in the Hat and his friends Thing 1 and Thing 2 made a return appearance April 20 at the Seed Science Center's VEISHEA 2013 open house celebration. During the event, center staff members taught visitors about seed science, seed conditioning, and seed identification. There were also opportunities to plant seeds and eat free popcorn. Red and white hats abounded—and some lucky visitors even left the center with their own Cat in the Hat whiskers!





## **AFRICAN WOMEN IN AGRICULTURE:**

### *Putting Food on the Table Every Day*

**Interview with Graduate Student Grace Kaudzu**

*by Regina Hendrickson*

*“Women [in Africa] are actively involved in farming, especially in growing neglected crops that men do not like to grow. They are the ones who make sure that there is food on the table every day.”*

International graduate Student Grace Kaudzu knows first-hand the challenges that African women face in agriculture.

Kaudzu is working towards a PhD in crop production and physiology with a specialization in seed science at Iowa State. On a five-year study sabbatical, Kaudzu plans to return home to Malawi after graduation. In her home country, Kaudzu is not only a civil servant for the Department of Agricultural Research Services (DARS) in the Ministry of Agriculture and Food Security, she also operates a small-scale farm and is a wife and mother of two young daughters ages 8 and 5.

Kaudzu is passionate about agriculture and in improving livelihoods for subsistence farmers in Africa. “My parents are small-scale farmers, but my enthusiasm for seed grew when I started to work on seed at DARS,” said Kaudzu. “Women [in Africa] are actively involved in farming, especially in growing neglected crops that men do not like to grow,” says Kaudzu. “They are the ones who make sure that there is food on the table every day. Men are mostly involved in growing cash crops.”

Kaudzu says that there are many challenges facing African smallholders today. “Topping the list is lack of access to high-quality agricultural inputs such as fertilizer and seeds,” she says. “Women farmers lack financial capital to help them access inputs. This continuously forces them to use farm-saved seeds that do not give high yields,” she said.

According to Kaudzu, climate change is another obstacle to sustainability. “Most of the countries in Africa are experiencing prolonged dry spells or droughts that impact crop productivity,” she says. “Farmers do not harvest enough grain to last for a year.”

Kaudzu points out that low-adoption levels of improved agricultural technologies are also a problem. “There are a lot of new technologies that have been developed, such as improved varieties of crops, agronomic practices, etc. that have not been adopted by farmers,” she says.

Kaudzu and her husband, who is an accountant, have farmed small rental parcels of land in Africa for 7 years. In total, they farm 100 acres on which they grow maize and peanuts. As a farmer, Kaudzu puts the concepts that she has learned both academically and from experiences gleaned through her past government positions into practice on her farm. When in Malawi, in addition to her job with DARS, Kaudzu serves as farm manager for her farm making decisions on such things as seed variety selection and marketing, in addition to her responsibilities as a wife and mother. Kaudzu hires local workers to provide the labor for her farm.

While in Iowa, Kaudzu stays in touch with her family and provides long-distance input on the management of her farm. She admits that being away from her husband and daughters takes a toll. “I miss my family in Malawi quite a lot,” says Kaudzu. “I am so thankful for their support and encouragement.”

What can be done to help subsistence farmers in Africa? Kaudzu offers several insights. “I personally feel that the first step is to educate farmers on the advantages of using improved farming technologies such as use of improved varieties of crops and improved agronomic practices over unimproved technologies,” she says. “Farmers should know the benefits of using improved technologies. This will have a positive impact on production.”

Kaudzu adds that continued research on the development of biotic and abiotic stress resistant/tolerant varieties would also greatly help reduce the negative impact of climate change on agriculture. This, in turn, will increase crop production.

“Formation of farmer groups, training them to bargain for better prices for their produce and to be able to access loans for their agricultural inputs, will also improve agricultural sustainability,” Kaudzu says.

In addition to working on her PhD and serving as a teaching assistant, Kaudzu conducts research on genome fluidity with Agronomy Associate Professor Susana Goggi. They examine agronomic performance and genomic changes in soybeans exposed to different abiotic stresses. Kaudzu believes that her research will benefit African women and others by improving access to high-quality seed and by explaining the implications of climate change on crop production. “Because my work involves working with farmers, what I learn [at Iowa State] will definitely be useful in my work as well as in my small farming business,” she says.

**Kaudzu holds a BSc in agriculture and an MSc in horticulture from the University of Malawi. She serves in the seed certification and quality control unit at DARS.**

**Prior to coming to Iowa State in 2012, Kaudzu was a USDA Borlaug International Agricultural Science and Technology Fellow. She has worked extensively to improve the seed sector in Africa and has collaborated with Adelaida Harries and Joe Cortes on harmonization of seed regulations in the Southern Africa Development Community (SADC) and Common Market for Eastern and Southern African (COMESA) regions as well as on the Seed Policy Enhancement in African Regions (SPEAR) project.**

**Tracy Bruns**  
Graduate  
Student



Working at the Seed Science Center has been an eye-opening experience for graduate research assistant Tracy Bruns. “I had never worked in a seed lab before coming to ISU, so it has been very interesting to learn about everything that goes into producing healthy seed,” she says.

A native of Cedar Falls, Iowa, Bruns joined the center in 2009 after earning a bachelor’s and master’s degree in biology from the University of Northern Iowa (UNI). Once at Iowa State, Bruns’ interest in mycotoxins lead her to Plant Pathology and Microbiology Professor Gary Munkvold. “During my research for my master’s degree I worked with *Fusarium verticillioides*, which is what led me to Dr. Munkvold’s lab,” she said.

At UNI Bruns worked at the National Ag-Based Lubricants Center where she developed industrial-grade lubricants out of soybean and other plant-based oils. “It was really interesting work and I learned a lot about biorenewable technologies and different ways to utilize agricultural products to reduce dependence on fossil fuels,” Bruns said.

Now Munkvold and Bruns research the impact of mycotoxins produced by *Fusarium graminearum* and *Fusarium verticillioides* in seedling diseases of corn, wheat and soybeans. “We are interested in the impact that these mycotoxins have on the severity of these seedling diseases,” says Bruns. “This research will benefit the seed industry because a better understanding of the mechanisms of disease can lead to ways to prevent disease—and that is always a good thing,” she says.

**Erin Bilsten Bowers**  
Graduate  
Student



Seed Science Center graduate student Erin Bilsten Bowers, a native of Denison, Iowa, was no stranger to Iowa State or Ames when she came to the Seed Science Center in 2008. “I had been living in Ames and attending ISU for the majority of the past 10 years,” she said. From 2003-2008 Bowers worked on and completed her B.A. in Chemistry, “I have been working on my PhD ever since,” she says.

A doctoral candidate in the Interdepartmental Toxicology Program, Bowers conducts research with Plant Pathology and Microbiology Professor Gary Munkvold. Their research focuses on the impact of using fumonisin-contaminated corn for fuel ethanol production. “Dr. Munkvold and I are especially interested in how mycotoxin affects ethanol production efficiency and its enrichment in dried distiller’s grains and solubles (DDGS),” said Bowers. DDGS are a co-product of corn ethanol production. Their use for livestock feed depends on limited mycotoxin contamination.

Bowers says that her research has proven beneficial to her in many ways.

“Not only has it provided me with learning experiences on everything from planting corn, to hatching out insect larvae, to validating analytical methods for detecting fumonisins in grain and DDGS,” she says. “But field trials conducted for the project have added to the existing body of knowledge recognizing the capacity of Bt corn hybrids to produce grain with lower levels of fumonisins than non-Bt hybrids.”

Bowers had no farm background when she came to the Seed Science Center. “This may be the best part about having spent my time in the Seed Science Center,” she says. “I was exposed to agriculture from a lot of angles. I didn’t just learn about how to grow corn. From agricultural practices and challenges in developed versus developing nations, to challenges of co-existence among biotechnology-derived crops and organic crops, to trade issues that arise from varying international standards regarding grain, I feel like the experiences I’ve had working in and around the Seed Science Center have taught me how to think about agriculture as a global system.”

Bowers has accepted a postdoctoral position with the Iowa Grain Quality Initiative housed in the Food Science Building on the Iowa State campus. Both avid Cyclone fans, Bowers’ husband Isaac is also an Iowa State graduate. He is employed at Ag Leader Technology in Ames.

### **Tracy Bruns** (continued)

Bruns admits that another reason she enjoys her research so much is because it fulfills her need to find solutions to challenges facing agriculture. “I really enjoy solving problems, so working in research is perfect for me. I feel like it puts my desire to find answers to good use,” she says.

At an early age Bruns learned about tree diseases, plants, and turf diseases from her father and grandfather who served as a golf course superintendent and as an arborist for the city of Cedar Falls, respectively. “Spending time with them always meant learning a few things about tree diseases whether I wanted to or not,” she said. In turn, Bruns enjoys working with Munkvold, who is an expert on seed pathology and seedling diseases. “He always seems to have a good answer for the many random questions I come up with,” she jokes.

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