Capacity Building Grants to Underscore Seed Systems Development and Ag Biotech Innovation in the Philippines and Africa

Iowa State University’s Seed Science Center (SSC) has been awarded two back-to-back grants to strengthen the capacities of national seed and biosafety authorities in the Philippines and Africa.

The Center will lead a $350,000 grant from the United States Department of Agriculture’s Foreign Agricultural Service (USDA-FAS) to develop seed systems and encourage agricultural biotechnology applications in the Philippines and the African Union.

The goal is to train professionals who will drive seed policy development and reforms in biotechnology research and development, as well as scientists and researchers with a strong grasp of the role of biotechnology innovations in advancing seed production and trade.

The effort dovetails a grant from the United States Agency for International Development (USAID), “Biotech Innovations for Food Security: An Enabling Policy Platform.” The award aims to foster an enabling policy climate for the introduction of new crops developed using new breeding technologies. The SSC is a sub-grantee to this $20 million grant being led by the International Food Policy Research Institute’s Program for Biosafety Systems.

“These two projects recognize that any effort to stave off food insecurity and malnutrition, two grand challenges of our time, begins with quality seeds,” said Manjit Misra, SSC Director. “Ultimately, the goal is to help farmers generate more income so they can feed themselves and their communities. We have a better chance for enduring peace when people have adequate, safe and nutritious food to support a healthy and productive life.”

The two-year USDA-FAS grant involves the online and on-site training of scientists, executives and policymakers, senior technical officers and middle-level managers of national seed and biotech authorities. Face-to-face training of scientists, researchers and officers of African biotechnology and seed authorities will take place in Ethiopia.

“These two projects recognize that any effort to stave off food insecurity and malnutrition, two grand challenges of our time, begins with quality seeds.”

~Manjit Misra

Continued on pg 15
Growth Rooms Complete: Dedication Planned for Spring, 2021

The Seed Science Center Growth Room project is complete! A dedication is anticipated in the May, 2021. The SSC broke ground on the 2,000 square foot addition in December, 2019. The space, funded with a $1M donation from a donor, will provide the faculty and staff at the Center with unique opportunities to conduct research in a climate-controlled environment in seed physiology and in seed health for protecting seed export with science.

The new rooms will also provide both undergraduate and graduate students with opportunities to learn seed research and testing. The growth house will increase the capacity of the SSC to conduct trait testing, test for a wider range of seed-borne pathogens and improve the ability to do epidemiology experiments with the plant pathogens. The new growth rooms will be added onto the northwest corner of the existing SSC building.
During the COVID-19 pandemic, the seed health experts in Iowa State University’s Seed Science Center continue to work diligently to provide economic stability that helps protect $1.6 billion in annual seed exports by the U.S. seed industry.

“The global nature of the seed business makes this situation particularly difficult,” said Gary Munkvold. “International operations and the movement of seeds from country-to-country is vital to domestic seed supplies. The need is particularly critical right now as seed companies are working to get their product shipped in time to meet spring planting windows.”

Munkvold, a professor of plant pathology and microbiology, is co-director of the National Seed Health System that is administered by the Seed Science Center. The other co-director is Charlie Block, seed health testing coordinator for the Seed Science Center.

The National Seed Health System, authorized by the USDA Animal and Plant Health Inspection Service, serves to accredit both private and public entities to perform activities in support of issuance of federal phytosanitary certificates for the international movement of seed.

A phytosanitary certificate acts as a declaration that seeds are healthy. The certificate acts as a kind of passport, providing companies and other entities to the necessary paperwork to move seeds across borders.

The National Seed Health System is a public-private partnership that serves a critical role in protecting export of an estimated $1.6 billion in seeds annually.

“Access to quality seed is vital to maintain a sound economy,” said Manjit Misra, director of the Seed Science Center. “It is the foundation of feeding, clothing and fueling the globe.”

Seed Science Center faculty and staff are continuing to test samples to support phytosanitary certification and the movement of seed. They are following pandemic requirements to ensure social distancing, including offsetting staffing schedules for nights and weekends.

“Seed testing services are critical to the seed industry, so the Seed Science Center has made maintenance of these services a top priority,” Munkvold said. “The National Seed Health System is maintaining its activities and accommodating accredited companies so they can continue their seed testing and inspection activities without interruption.”

Some may be surprised to learn the seed production industry is a year-round global operation, according to Charlie Block, seed health testing coordinator in the Seed Science Center.
The National Seed Health System (NSHS) Administration Unit at the Iowa State University (ISU) Seed Science Center (SSC) is happy to announce the addition of Kelly Iverson to the NSHS team. Kelly will be taking over the role of Program Coordinator within the unit. Her responsibilities include coordinating the NSHS accreditation and auditing activities, acting as liaison with applicants and accreditees, and supporting our collaboration with the USDA-APHIS on the development and implementation of the ReFreSH (Regulatory Framework for Seed Health) program, among other duties.

“I can’t wait to broaden my knowledge into seed health and get an understanding of seed health testing in the lab,” Kelly said. “I have experience performing phytosanitary field inspections and want to expand my knowledge further in that area as well.”

Kelly has an Agronomy degree from ISU and comes to us from the Iowa Crop Improvement Association, where she served as their Program Coordinator. She has a great love for agriculture and the seed industry and has done everything from walking soybeans, detasseling corn, cross-pollinating soybeans, prairie flower production, and seed certification.

Kelly is excited about learning a new facet of the seed industry, along with meeting and working with new people at the SSC. The faculty and staff of the SSC look forward to learning from her unique experience too.

“I bring ISO 9001 experience with me, so if anyone ever wants to talk document control or quality management systems, I’m your person,” says Kelly.

Kelly has made her home in Ankeny, IA, since 2007 with her husband, 10-year-old daughter, and two dogs. In her spare time, she enjoys baking desserts and spending time outside with her family.
SSC Researchers Develop a Test Which Could Help Expedite Corn Seed Exports

Dr. Silvina Arias and Dr. Charles Block have received a $38,882 grant from the American Seed Trade Association's Seed Science Foundation (SSF) to develop a test that will differentiate between two closely-related corn bacteria. One of the bacteria causes Stewart's wilt, a disease that prevents corn seed from being exported. The other bacterium is a close relative that does not cause disease on corn. The problem with current testing methods is that they cannot tell the two apart, potentially resulting in false-positive test results.

“The industry agrees that this is very important and impactful work,” said Samantha Thomas, SSF Board Member. “An improved method could resolve the seed import rejections or destructions associated with false-positive tests known to occur with currently available testing methods.”

Corn exported as seed for planting usually needs to meet the importing country’s quality requirements. The most frequent requirement is to verify freedom from Stewart's wilt, a bacterial disease caused by Pantoea stewartii.

“What many don’t know is that Pantoea stewartii has two subspecies, stewartii which causes a leaf blight on corn, and indologenes which does not cause disease,” Arias said. “The standard lab test cannot tell one from the other.”

There are many published DNA tests for Pantoea stewartii but most have the same problem in not being able to separate the two subspecies. The Seed Science Center Seed Health lab has an assay that can separate the two, but it has not been rigorously tested on seed.

“Our goal is to develop a reliable seed health assay that works well with all types of seed (dent, sweet, and popcorn) and seed treatments,” said Block, SSC Seed Health Testing Coordinator. “The intent is not to replace the standard ELISA test, which is cheaper and quicker, but to have a supplemental follow-up method available.”

The successful award proposal titled “Validation study of a Real-Time PCR method for the detection of Pantoea stewartii subsp. stewartii (Stewart's wilt) in Maize Seeds” follows a journal publication from 2019 by Block in collaboration with two USDA scientists, Drs. Narinder Pal and Candice Gardner from the Plant Introduction Station in Ames, to develop a PCR method for differentiating the two subspecies.

Arias said the research’s focus is to optimize, extend the applicability, and conduct an interlaboratory validation of the DNA test method to fully verify performance criteria according to the National Seed Health System (NSHS) validation guidelines.

They hope to have many questions answered by mid-December 2020 such as the best DNA extraction method, the lower limit of DNA detection in seed extracts, and how the DNA test compares with ELISA sensitivity. The end goal is to have a robust set of validation data by spring 2021 so that the U.S. National Seed Health System can accredit the method.
ISU Researchers Receive $100,000 USDA Grant to Help Organic Farmers

Sales of certified organic goods have more than doubled since 2011, yet it remains difficult for a conventional farmer to transition to organic farming due to onerous government regulations, record keeping requirements, certification rules, and fees. It is a problem a group of Iowa State University (ISU) researchers would like to solve for small and mid-sized farms to help them become more competitive in the market. Priyanka Jayashankar, Adjunct Assistant Professor for the ISU Seed Science Center (SSC) and the Ivy College of Business is part of the group led by Principal Investigator (PI) Dr. Srinivas Reddy and Co-PI, Dr. Sree Nilakanta. The trio has landed a $100,000 USDA grant to develop a low-cost, easy-to-use commercial data capture and analysis tool to help farmers meet the certification requirements.

The grant was given to Big Data in a Box (BDiB) LLC which was founded by Dr. Nilakanta. This project titled “SPIDER” stands for A Small Portable Interactive Data Extraction and Reporting tool for Organic Farmers. It would be a small data collecting device, which can store and create digital documents for farmers, without the need of wifi. This is especially important since many rural areas don’t have reliable internet service. The core focus areas of this proposal are to enable organic farmers to record activities in the field with an edge computing device, record transactions with vendors and suppliers, and enable efficient organic certification compliance. Dr Jayashankar, who has co-authored with Dr Nilakanta papers in the areas of digital agriculture, agricultural marketing and sustainability, will design surveys on how farmers can effectively deploy BDiB’s SPIDER tool for certification and transaction recording purposes.

“The team will set up scenarios of data collection in the field and inside to elicit feedback on how well the processes we have developed work for the participants in the study.” Jayashankar, who teaches entrepreneurial marketing and other business courses, was chosen as co-PI because of her unique expertise at the intersection of marketing, digital agriculture and sustainability, all of which address the research needs of the BDiB project.

“My experience in surveying and interviewing farmers on business-to-business market linkages, technology adoption and sustainability are relevant to the upcoming studies for BDiB,” Jayashankar said.

Jayashankar and the BDiB team will develop and administer surveys to the farm participants before the end of the project to determine the farmers’ satisfaction with the data collection forms, the device interface and usability, and farmers will participate in tests designed by Jayashankar to informally collect feedback on the performance of the tool in field use. The project should take about nine months to complete.

“I really look forward to working on the project as BDiB offers unique digital ag solutions to organic farmers, who constitute a market niche that is still untapped by ag tech providers,” Jayashankar said. “BDiB’s portable tools can help farmers meet sustainability goals and also gain better efficiency in documentation and certification.”
Seed Science Center graduate student, Chad Kimmelshue, and his Professor, Susana Goggi, are investigating the relationship between seed size distribution in a bag of seed and crop yield. Currently conducting their second year of field research, they are interested in analyzing how seed size and depth of planting affect seedling emergence uniformity and single plant yield. They evaluate these parameters under different field environments by using a conventional and a perennial ground cover system.

“Corn producers throughout the country are interested in establishing the effect of uneven seedling emergence on crop yield,” Goggi said. “National corn yield record-holders believe that even a few hours difference in emergence between plants may alter interplant competition enough to negatively affect yield. Our research aims to provide science-based answers to this dilemma.”

Producers speculate that seedling emergence variation may be due to a variation in seed size within a bag of seed. Some producers are testing seed size distribution within each bag they purchase and are returning to the seed dealer those bags where size distribution is too large.

The effect of uniform emergence on yield is difficult to estimate because of variation in a producer’s field conditions. Kimmelshue said most studies conducted to-date use different planting dates, growing degree days, time to 50 percent emergence, a leaf stage delay, or varying planting depth to simulate a variation in seedling emergence.

“These studies are important to understand the effects of delayed emergence, but fail to estimate interplant competition when seeds are planted on the same day and depth in a producer’s field,” Kimmelshue said. “Uniform emergence is especially important for producers adopting conservation practices such as perennial ground covers (PGC) and cover crops.”

Cover crops growing simultaneously with the cash crop are known as living mulches or PGC. New cover crop systems create new production challenges because they can change soil characteristics of the structure, temperature, organic matter content, and nitrogen availability. Understanding the effect of uneven emergence of a cash crop in a PGC and a conventional tillage system can increase crop yields and encourage producers to adopt new conservation practices such as PGC’s.

“Through our research, we are identifying optimum seed size and placement in both a conventional tillage system and a PGC system to ensure uniform emergence and maximum crop yield,” Kimmelshue said. “While producers understand the esthetic aspect of uniform emergence in their field, its effect on cash crop yield and grain composition is not fully understood.”

Kimmelshue thinks clearing up the relationship among these production challenges is essential for conservation practices adoption while harvesting high crop yield.
Cynthia Robertson, Program Assistant II, Seed Science Center was recognized by the ISU College of Agriculture and Life Sciences with a 2020 “CYtation” Award. This award is given to Professional and Scientific employees for performing above and beyond the call of duty, doing something extraordinarily well, and acting in such a way as to make a very real difference in the institution.

On the nomination Cindy was recognized for her efforts to plan and manage the bi-annual Seed Technology and Business short-course on campus which takes a lot of foresight, organization and communication.

The nominator wrote “She goes above and beyond to make participants' experience truly exceptional. She offers shuttle services, helps members get the things they need while they are here and takes providing excellence very seriously. She specifically gets recognition from participants for her hospitality, attention to detail, and for her 'above and beyond' mentality.”

In December 2019 Dr. Yuh-Yuan Shyy was the invited scientist and speaker for Jilin Academy of Agriculture Science (JAAS) annual seed conference in Jilin, China. Here he is pictured with Dr. Lu Ming, Deputy Director of JAAS Maize Research Institute. Dr. Lu was also one of the 24 participants in Dr. Shyy’s three-month training program for the China National Seed Association in 2013.

While on sabbatical in Spring 2020, Susana Goggi discussed the challenges and opportunities of biological seed treatments with her colleagues at PGG Wrightson Seeds Limited in New Zealand. While in New Zealand, Goggi was also the invited speaker at a seminar at Lincoln University BioProtection Center.
The Iowa State University (ISU) Seed Science Center (SSC) Seed Lab manager is recognized for his service to the seed industry. Mike Stahr was awarded the Meritorious Service Award from the Society of Commercial Seed Technologists (SCST). SCST board president, Heidi Larson says the award is given to a member for their service in the promotion and dedication of SCST. Stahr is currently the past president of the board, has served as president two times, and in many other capacities.

“The SCST merit award was started in 1965 and Mike is the 78th recipient," Larson said. “Mike was chosen for this award because of all the committees he has served on with SCST and his dedication to promote SCST and its high standards.”

“I am happy that the award was given to me for doing what I love – teaching and assisting with workshops, our hosting exams, and being active in SCST and AOSA,” Stahr said.

Mike has worked at the ISU-SSC Seed Lab since 1979 was promoted to manager in 2007. He and the ISU Seed Lab staff have mentored hundreds of student workers and made a profound impact on the ISU Seed Lab and the entire seed industry.

The Seed Science Center worked with ISU Extension and Outreach and the ISU Monarch Butterfly program to get educational materials to elementary, middle school, and high school students who were forced to learn at home when the COVID-19 pandemic disrupted traditional school in March.

Seed Science Center Communications Specialist, Cindy Hicks, put together more than 1,500 butterfly kits which included common milkweed seeds, peat pots, peat pellets, and instructions on how to cold stratify seeds.

The project was titled “Plant a Seed, Grow a Butterfly.” The kits were delivered to any Iowa teachers who requested them, to distribute to their students for a home school project. Part of the home growing experiment included keeping track of germination rates for the seeds. The kits are also currently available for free through the ISU Extension Store.
Eight scholarships were given to seven Iowa State University (ISU) College of Agriculture and Life Sciences (CALS) students at the 2020 Iowa Agribusiness Showcase and Conference on February 13, in Des Moines, Iowa. Five Iowa Seed Association (ISA) Scholarships of $1,000 each were awarded. One of ISA awarded students was selected as the Manjit Misra Outstanding Senior Scholar and received an additional $500 scholarship. The $1,000 Bill Latham Memorial Scholarship and the $1,000 Lisa Shepherd Jenkins Memorial Scholarship were also awarded at the ISA ceremony.

Louis Burton is from Rogers, Minnesota. He is a junior in agricultural business. Louis works at the ISU Seed Science Center where he has developed an interest in the seed business. He has completed internships at Domnick Seeds (a Dekalb Asgrow dealership) in western Minnesota, and CHS Co-op, also in western Minnesota. He hopes to work as a sales agronomist after graduation with the opportunity to work with farmers on a day-to-day basis. Louis has been on the dean's list four of the five semesters he has attended Iowa State. He is also a member of the Agricultural Business Club.

Madeline Frischmeyer is from Reinbeck, Iowa. Madeline is a junior in Agronomy with a Seed Science secondary major. Madeline has spent time working at Pioneer and Heartland and will be doing field-exploration this summer with Syngenta as a corn production intern. Madeline is actively involved in the ISU Farm Operations Club, where she has served as secretary and volunteers to help her fellow students who have special needs. She has received two academic scholarships based on her GPA of 3.7 or above and has been awarded recognition on the Dean's list. She says she is interest in the field of seed science because she knows it is a field where her education will never stop.

Malcolm St. Cyr is from Washington, DC. He is a freshman in Agronomy. Malcolm grew up in Senegal, West Africa in a farming community. Malcolm worked as a farm laborer for 10 years where he watched the impact that limited food yields have on an entire community. This experience has fueled his interest in Agronomy. He says seeds, along with soil are the foundation of agricultural sciences. He is an APEX Scholar, and was selected to attend the Minorities in Agriculture, Natural Resources and Related Sciences Conference last semester. He is actively involved in several campus organization and will be presenting at two conferences over the next year. Malcolm says he is interested in the science applied to seed selection, breeding and the seed industry. He hopes to someday
help the community he grew up in, as well as assist with solving international and regional food quality, security, and systems problems.

Haley Stahl is from Marshalltown, Iowa. She is a junior in Agronomy with a Seed Science secondary major. Haley studies in agronomy strongly emphasize seed science, crop development and funding, and management decisions and considerations within the seed industry. She has spent a considerable amount of time studying and identifying multiple varieties of seeds and plants, impacts on yield, and the genetics behind producing grain. She is an active member of the Agronomy Club and has worked as a research assistant and research intern for Beck’s Hybrids. She says these experiences have enabled her to utilize her classroom knowledge in a practical setting. She also plans to eventually pursue a graduate degree in seed science. In the future, she hopes to develop new ways to help the seed industry succeed and work to develop seed technologies to help plant breeders create better lines.

Eric Heick is this year’s recipient of the Manjit Misra Outstanding Senior Award in addition to an Iowa Seed Association scholarship. Eric is from West Branch, Iowa and is a senior in Agronomy. Last year he received the Bill Latham Memorial Scholarship. Eric works at the Seed Science Center with Alan Gaul which he says has confirmed his interest in seed conditioning. He has also interned with Syngenta Parent Seed in Slater where he assisted with planting, standing counts, and detasseling. He has been on the ISU Dean’s list from the fall of 2017 to the fall of 2019, a member of the University Honors program, served as secretary of the Ag Markets Club, and a member of the Agronomy Club. His goal is to graduate debt free with a double major in agronomy and seed science in just 4 years. He would like to work in Seed Corn Production and is considering attending graduate school.

Erin Stichter is the recipient of the Bill Latham Memorial Scholarship. She is from Erin, Illinois and is the daughter of Brandon and Casey Stichter. She is a junior in Agronomy. Erin has interned in seed corn production at Wyffel’s Hybrids where she experienced production of seed corn, field operations, bulk seed processing, warehousing, and distribution. Latham was a former president of the Iowa Seed Association, the American Seed Trade Association (ASTA), and the Independent Professional Seed Association (IPSA). He was also the former president of his family company, Latham Seed. Bill passed away on July 31, 2015.

Brandyn Chapman is the recipient of the Lisa Shepherd Jenkins scholarship. He is from Ames, Iowa. Brandyn previously received his B.S. in agricultural studies and has returned to school to earn another degree in Horticulture. Brandon has worked at the Seed Science Center for three years working as a Seed Analyst III. The $1,000 Lisa Shepherd Jenkins Memorial Scholarship is awarded by the ISU Seed Science Center to an undergraduate student engaged in seed science and seed technology. Shepherd Jenkins served as Seed Health Testing Coordinator for the Seed Science Center and as Director of the Administrative Unit of the National Seed Health System. She also headed one of the most active phytosanitary seed testing programs in the country and served as a chair on committees for both the American Seed Trade Association and the American Phytopathological Society. Lisa passed away on July 1, 2015.
Future Seed Leaders

Jensina Davis wins 2020 David Lambert “Hunger Fighter” scholarship

“Hunger Fighter” Scholarship Winner Passionate about Combatting Global Food Insecurity

Iowa State University (ISU) junior, Jensina Davis is the 2020 winner of the annual David Lambert “Hunger Fighter” scholarship award. She was presented the award during the virtual ISU Borlaug lecture, featuring 2020 World Food Prize laureate, Rattan Lal, on Monday, October 12. Davis, who is majoring in Agronomy and Seed Science, is passionate about global food security and child nutrition.

“Food security is integral to human life and essential to physical and mental health," Jensina said. “Food insecurity often acts as a comorbidity or causal agent to disease and illness. I firmly believe that global food security cannot be ignored.”

Administered by the ISU Seed Science Center (SSC), the $1,000 “Hunger Fighter” scholarship is awarded to one sophomore or junior each year who exhibits a demonstrated interest in seed science, global food security and/or childhood nutrition. Recipients are selected based on academic excellence, leadership skills and interpersonal skills.

“We are proud to reward such an outstanding student as Jensina for her dedication to food security and a sustainable future,” said scholarship committee chair and Iowa State Agronomy Professor Susana Goggi.

“Jensina is a fine example of someone interested in global food issues who demonstrates her passion through her studies and scholarship.”

Dave Lambert served as a Distinguished Fellow at the ISU SSC. He was principal in Lambert and Associates, a Washington, D.C.-based public affairs firm providing strategic policy advice on issues related to food safety, biotechnology, child nutrition and global food security. He was recognized internationally as an expert in global food security, and he was a passionate advocate in the fight against world hunger. Additionally, he served to promote the World Food Prize. This scholarship was established with contributions from his family and friends who wished to honor his memory and the strides he made to address global food security.

“It's uplifting to see today's youth engaged in improving the livelihoods of those less fortunate," Manjit Misra, SSC Director said. “Through the gift of this scholarship, we can help to educate the next generation of hunger fighters. And that is the very best way that we can honor David and continue his legacy.”

Jensina has also been the recipient of the College of Agriculture and Life Sciences Dean’s Leadership Scholarship, the Agronomy Academic Scholarship, the Agronomy Academic Fellowship, and recognized in the top two percent of Agriculture and Life Sciences sophomores with a 3.98 percent grade point average. Her involvement in student clubs like International Association of Students in Agricultural and Related Sciences has furthered her understanding of global agriculture.

She is also an associate member of the Society of Commercial Seed Technologists and a student member of the American Seed Trade Association.

After completing her undergraduate degree, she intends to pursue a graduate degree in Agronomy or related field and, eventually, a career in research in the seed industry, investigating how to produce enough quality, nutritious food for a growing population.
Manager’s Corner

Commentary: Year End
by Iowa State Seed Laboratory Manager Mike Stahr

From the Lab: October 2020

I will cover six topics in this Manager’s Corner: Update on testing during the pandemic, expectations for quality of incoming seed from agronomic species, testing industrial hemp & cover crop seed, Seed Science’s new growth room addition, virtual seed conferences and the FREE STB virtual fall short course.

Testing during the COVID-19 Pandemic: Our dedicated staff, temps and students have continued testing seeds and reporting results right through this terrible pandemic. We’ve taken the precautions of requiring face masks, social distancing, wiping down surfaces and restricting entry to the building. Those at Iowa State University as a whole have done a good job continuing to attend classes, work and even play football and do so as safely as is possible.

Early Report on Seed Quality: Quality of cereal seed samples has been good with many samples not having an issue with Fusarium (Wheat Scab). However for the ones that do we’ve added counts to our evaluations and spaced seeds further apart when retesting problem samples. Corn and soybean germs have looked good so far. It does appear that a significant number of soybean samples will have an issue with swollen and hard seeds. Swollen seeds slow down testing a bit as swollen seeds must be moved to fresh planting media and extended up to five days. With much of Iowa dealing with a drought there has been a surprising number of soybean samples with Fusarium and/or Phompsis present. The ISU Seed Lab tests many more species than these, over 300!

Industrial Hemp and Cover Crop Seed: Unlike what I’ve heard from other state seed labs, the ISU Seed Lab hasn’t been overwhelmed with samples of industrial hemp seed. This isn’t a bad thing as AOSA and SCST (seed testing organizations) are working to update testing requirements for hemp. Hemp has been in the AOSA Rules for Testing Seeds since the early 1900’s, but lack in some ways, such as ways to break dormancy. Testing of cover crop seed went smoother this year as our Purity and Germination labs efficiently moved samples along. Our newly purchased microscopes that utilize images appearing on a computer monitor aided in ergonomics and ease of identifying seeds. We also introduced sample bags specifically for cover crop seed.

Growth Room Addition: Thanks to a generous donor and the work of Seed Science Center Director Dr. Manjit Misra, ISU Seed Science has four new growth rooms to work in. Seed Science has utilized space in several greenhouses over the years, but they aren’t next to the building and there hasn’t always been enough space available for health testing and testing for biotech traits. Instead of adding greenhouse space to Seed Science, the four growth rooms utilize modern lighting so as to be energy efficient (and safe from hail storms!).

Finally, please visit our booth at ASTA’s virtual seed conferences (CSS and the Vegetable & Flower conference). Also virtual this early November will be the STB Fall short course. For more information on the FREE short course visit https://www.seedgrad.iastate.edu/virtual-webinar-series/.

Best wishes for a safe and healthy winter!
For many graduate students at Iowa State University (ISU) and across the nation, the coronavirus pandemic interrupted more class time than any other event in U.S. history. The ISU Graduate Program in Seed Technology and Business (STB) minimized the COVID-19 disruptions for its enrolled students. Since its inception in 2007, the STB program curriculum—offered entirely online—allows graduate students to earn their master’s degree from anywhere in the world and accommodates the demanding schedules of professionals already working full-time in the seed industry.

During the Covid-19 pandemic, the STB program had the honor of congratulating seven graduates, including Enock Maereka of Norton, Zimbabwe.

“The online STB program sharpened my independent thinking and reduced tendencies toward groupthink,” Enock said. “The program helped me express my thoughts. Embracing diversity was one key element in the program; classmates come from diverse backgrounds.”

Enock understands how valuable international experience can be. From Zimbabwe, one of Enock’s major objectives as a professional in the seed industry in Africa is to ensure farmers benefit from modern genetics. Working with legumes specifically, he has noticed there is a tendency to keep varieties for decades. Enock believes that African farmers’ education is a work in progress.

“Growing up in rural Zimbabwe, I was curious to understand why we labored a lot on the fields, yet our circumstances never really changed,” Enock said. “I realized that seed could be a key entry point to fighting global challenges, food and nutrition insecurity, poverty, and climate change.”

Our rapidly changing world demands that online learning programs work to increase globalization in the classroom. The STB program delivers guidance to professionals in developing countries by providing educational resources on agricultural advancements. The international students who have participated in the program are an excellent addition to the online classroom environment because they offer a unique perspective on global agriculture that our domestic students might not otherwise be exposed to.

“One of the biggest assets for all the students in the STB program is learning from each other. The diversity of crops, seed companies represented, and students are the STB program’s biggest strengths,” says Lori Youngberg, STB graduate program coordinator.

Enock believes his new knowledge and skills will enhance scientists’ capacities in national research programs, emerging seed businesses, and farmers to understand that the building of sustainable demand-driven seed legume seed systems requires strategic links and leveraging on modern information systems.
The five-year USAID grant calls for an integrated package of technical assistance to implement regionally harmonized seed regulations and agreements for the licensing and release of new biotech varieties in select countries in the Common Market for Eastern and Southern Africa (COMESA) region and the Economic Community of West African States (ECOWAS). The training component of this grant will familiarize leaders and decision makers of agencies with regulatory powers to the entire lifecycle of genome-edited and genetically engineered products.

“Our trainees’ increased capacities to manage and conduct research and development initiatives, as well as drive and implement critical policy reforms, will consequently foster conditions that buttress food security,” said Lulu Rodriguez, SSC Global Programs Leader. “I’m really pleased with the creativity and enthusiasm of our staff and the speakers that made this series come together very quickly.”

The webinar sessions were facilitated by some of the most respected seed experts and scientists in the industry. The webinar sessions topics included: what you need to know about phytosanitary certification for moving seed across borders; the latest in CRISPR genome editing technology; plant biotechnology regulations; innovations in improved crop production; new plant science technologies for seed companies; current technologies in seed sorting; and lab testing for hemp and cover crops.

“We had a nice mixture of seed industry scientists and Seed Science Center faculty and staff; all have extensive experience in one or more aspects of seed technology that are important to the industry today,” Munkvold said. “The sessions differed in their focus, so each one might appeal to a different segment of seed professionals, depending on their current job and goals.”

STB program leaders say they hope to be back 2021 to continue the on-campus, hands-on short course.

The Graduate Program in Seed Technology and Business (STB), A(ISU) Seed Science Center (SSC), sponsored a free week of virtual webinars addressing current special topics in seed systems, science, and technology. Due to the Covid-19 pandemic, the decision was made to cancel the annual November STB on-campus short course in Seed Science and Technology. While this meant the popular weeklong short course was not conducted in person, the program leaders decided to create the live, interactive webinars for seed industry professionals. Over 350 people from countries all over the world signed up and attended the week of November 2 - 6.

“It’s much more challenging now to offer in-person workshops, but we really didn’t want to lose the chance to continue with educational opportunities for the industry,” said Professor Gary Munkvold, STB Program Director. “I’m really pleased with the creativity and enthusiasm of our staff and the speakers that made this series come together very quickly.”

STB Live Webinar Series Attracts Over 350 Participants

The five-year USAID grant calls for an integrated package of technical assistance to implement regionally harmonized seed regulations and agreements for the licensing and release of new biotech varieties in select countries in the Common Market for Eastern and Southern Africa (COMESA) region and the Economic Community of West African States (ECOWAS). The training component of this grant will familiarize leaders and decision makers of agencies with regulatory powers to the entire lifecycle of genome-edited and genetically engineered products.

“Our trainees’ increased capacities to manage and conduct research and development initiatives, as well as drive and implement critical policy reforms, will consequently foster conditions that buttress food security,” said Lulu Rodriguez, SSC Global Programs Leader. “These include a vibrant seed sector able to produce quality seeds and make them available to small-scale farmers, biotech products to feed and nourish growing populations while sustaining the environment, and enhanced trade capacity.”

In these two projects, SSC coordinates the work of a pool of Iowa State College of Agriculture and Life Sciences researchers and external experts on the science and policy applied to plant and animal biotech innovations—from development to commercialization—and seed systems development.

“The SSC has an extensive history of global engagement and experience in this type of collaborative work,” Rodriguez said. “We have been in more than 80 countries over the past 25 years, helping to expand producers’ access to quality seed, facilitate seed trade, and promote the growth of national seed industries.”
Tessa Casanova Joins Seed Lab Staff

Tessa Casanova is a South Texas native who has now made her home in Ames, Iowa. She came to work as a temp through Advance Services Inc. in September 2019 and has now been hired by the Iowa State University Seed Lab at the Seed Science Center, in the Purity Lab. She says the job fits her personality because of the attention to detail it requires.

“There are MANY different seeds out there and sometimes it can take a lot longer than normal to identify a seed contaminating a sample, but in the end it is always satisfying being able to end the process assured in yourself and your ID,” Tessa said. “Ultimately, I look forward to adding many more seeds to my expanding seed knowledge.”

The Seed Lab Manager, Mike Stahr, says “sky is the limit” for Tess, she picks up things fast, is always thinking about how to do things better, and has become a valuable member of the team in a short time.

“Tessa is a conscientious worker plus she has the ability and stamina to identify seeds of very small and difficult to identify species” Mike said. “Tessa is a self-starter who has quickly shown her abilities in both the Dividing room and the Purity lab.”

Tessa received her bachelor’s degree in geology and a minor in chemistry from Texas A&M University-Kingsville. She was on the Dean’s List multiple times, graduated Magna Cum Laude and received a scholarship for field camp from the Corpus Christi Geological Society. She takes pride in making improvements where she is working.

“Before the Seed Lab, I worked in the ISU Soils Lab as a temp helping homogenize their samples for further testing, but I enjoyed helping further along their science” Tessa said. “It was fairly rigorous and fast paced, and I enjoyed helping further along their science and seeing what went into the process of testing all of their samples.”
Save-the-Date for 2021 Seed Quality and Conditioning Workshops

Due to the COVID-19 pandemic, the 2020 Seed Quality and Seed Conditioning Workshops were cancelled. We hope to change that in 2021 by holding virtual workshops if in-person programming is not available.

Seed Conditioning Specialist Alan Gaul and Seed Lab Manager Mike Stahr facilitate Seed Science Center shortcourses and workshops for seed industry professionals around the world each year from April through August.

According to Gaul, one highlights of the workshops series is the Seed Treatment Workshop in mid-July. “We like to hold the workshop in the Hansen Agriculture Student Learning Center,” said Gaul. “Because there is basically no limitation on the amount or size of the machinery that we can use for demonstrations. That workshop is an extremely effective and enjoyable one. We hope to be able to use that venue again in the future.”

The Seed Science Center at Iowa State has provided training for seed industry professionals for more than 42 years. Seed Industry professionals have traveled all over the U.S. and the world, including Canada, China, Germany, Mexico, Turkey, the U.S., and Zambia to attend seed conditioning and quality workshops at Iowa State. Visit seeds.iastate.edu for a full list of workshops and short courses.

Workshops and Shortcourses

Food Grade Bean Conditioning
MAY 22-24, 2021
Focuses on the storage and cleaning requirements for food grade identity-preserved soy and dry edible bean markets, emphasizing primary export market issues. Includes equipment demonstrations and discussion of end-use applications.

Color Sorting
JUNE 1-3, 2021: SATAKE (SM, EVO, FMS)
Offers “brand-specific,” advanced hands-on training on the color sorting of corn and soybean seed. Company representatives available on site. Additional coverage of advanced optical sorting and sample analysis.

Specialty Seed Conditioning
JUNE 15-17, 2021
Focuses on conditioning small lots of unusual or high-value products such as vegetable, flower, tree, or grass seed. Early registration is strongly advised.

Seed Corn Conditioning
JUNE 21-24, 2021
AUGUST 2-5, 2021
Highlights seed corn conditioning methods for lot sizes typical of larger foundation and commercial seed production. Includes operations from ear corn drying through sizing and warehousing.

Soybeans and Small Grain Seed
JULY 5-8, 2021
JULY 19-22, 2021
Covers general operations required for conditioning soybean seed. Additional information provided on edible beans, small grains, sunflowers, and other crops. Includes operations from bulk storage and handling through packaging.

Seed Treatment
JULY 14-15, 2021
Provides current, in-depth information on seed treatment products, seed pests and pathogens, chemical stewardship, application equipment, and calibration procedures. Includes indoor equipment displays, presentations from company representatives, and multiple concurrent sessions.

Gravity Separation
JULY 28-29, 2021
Reviews in detail the operation, adjustment, and effectiveness of de-stemmers and gravity tables for removing foreign material to upgrade seed quality. Primary focus will be on seed corn and soybean separation, with brief discussion of other seed and food grade applications.

FOR MORE INFORMATION & TO REGISTER: recytes.extension.iastate.edu/seedsscience/
While the COVID-19 virus disrupted many of our lives when it hit in the middle of March, one visiting scholar didn’t let it stop her from having a great internship at the Iowa State University Seed Science Center (ISU SSC). PhD student, Agustina del Palacio is a microbiology major from the Universidad de la Republica, Montevideo, Uruguay. She arrived in Ames in March, just days before the COVID-19 virus shut down nearly the entire country.

“We experienced some delays on my research project due to COVID-19,” Agustina said. “But luckily, we could manage to solve the problems and I could still do what I came here for,”

Some of those delays included nearly all faculty and staff leaving campus and working from home, vendor and equipment delays, and construction on the SSC building. But Agustina and the Plant Pathology team worked around these roadblocks with great success by being creative; wearing masks, staggering work schedules so fewer people were in the lab at a time and using technology to communicate.

“Agustina is a very patient and resilient person to overcome the weeks of waiting experimental protocol delays, major laboratory construction, and the constant warnings of shutdown and mostly empty hallways due to the worldwide COVID-19 pandemic,” said Derrick Mayfield, Pathology Lab Manager. “Her research is fun and exciting because it answers questions regarding the interactions between storage fungi and their corresponding mycotoxins on grain.”

She chose to study under Professor Gary Munkvold and the ISU Seed Pathology team because one of her doctoral advisors, Silvina Stewart, achieved her PhD in Plant Pathology at Iowa State and recommended Munkvold.

“I was very impressed with Agustina’s positive attitude and perseverance,” said Munkvold. “I’m sure it has been a stressful time for her to be here during the pandemic and all its consequences, but she really stayed focused and accomplished a lot.”

Munkvold’s group is involved in working with Fusarium fungal species. They are also in close contact with international working groups which makes them very up-to-date on this issue. It was this vast experience and knowledge which attracted Agustina to this internship.

“I came here to study the effect of the interaction between different Fusarium species that are commonly found together in maize,” she said. “I am studying how the co-occurrence of them affect each other’s growing and toxin production by comparing gene expression levels.”

She says she hopes she can apply all new techniques she has learned in Iowa to new types of research opportunities in the future.

“I would like to thank Gary Munkvold, Derrick Mayfield and ISU for the opportunity of this internship,” Agustina said. “I appreciate all the time and dedication they are spending on me and my work.”

Agustina returned home at the end of July 2020, but left quite an impression in the short time she was at the SSC.
The 2020 Faces of Hunger Film Festival will featured one episode of a six-part film produced by the Iowa State University (ISU) Seed Science Center (SSC). “Let Seed be Thy Medicine” was screened on Thursday, October 16 at 3 p.m. This episode, from Seeds! Diversity of Wonder, takes the viewer to Zambia where white maize is eaten in every meal. But while it grows well in the region, it lacks the key nutrient, vitamin A. A deficiency of this essential nutrient has left over half the population with weak immune systems, stunted growth, and night blindness. This has led scientists to explore how breeding this vitamin into the seed used by the Zambians could help end what is known as “hidden hunger.”

The annual Faces of Hunger Film Festival, produced by New York City based non-profit Palms for Life, is dedicated to exploring food security, health and waste issues. Organizers say over one billion people suffer from starvation and undernourishment worldwide and claims conflict is a major driver of hunger. The executive producer of Seeds! Diversity of Wonder, takes the viewer to Zambia where white maize is eaten in every meal. But while it grows well in the region, it lacks the key nutrient, vitamin A. A deficiency of this essential nutrient has left over half the population with weak immune systems, stunted growth, and night blindness. This has led scientists to explore how breeding this vitamin into the seed used by the Zambians could help end what is known as “hidden hunger.”

The Palms for Life mission is to advocate for and support the creation of infrastructure that provides access to education, food, water and sanitation for vulnerable communities throughout Africa, Latin America and Asia. In 2009, Palms for Life launched the Faces of Hunger film contest in which young filmmakers were invited to reveal the nature of hunger in their communities.

“Palms for Life’s mission is to bring the needs of the poor and hungry onto everyone’s radar screen because it’s everyone’s business if any child in this world goes to bed on a hungry stomach,” said Hannah Laufer-Rottman, Palms for Life’s Founder. The ISU-SSC has a similar goal and has worked in over 80 countries around the globe to help expand farmers’ access to quality seed, facilitate seed trade, and promote the growth of national seed industries. Misra said he produced this film because he knows seed technology affects so many issues of global importance, such as food, nutrition, energy security, and safety.

“From eastern Iowa to East Africa, farmers must plant good quality seeds if we want to improve security and safety, especially in light of climate change,” said Misra.

This award-winning documentary, produced by Pierce Mill Media, takes viewers from the ISU campus and Iowa farms to locales as far away as India and Africa. Comprised of six segments of roughly 10 minutes each, the film can be viewed separately or as a single, hourlong presentation.

In the Spring, 2020, Seeds! Diversity of Wonder was honored with a Gold Award and The Outstanding Professional Skill award from the Association of Communication Excellence and a Circle of Excellence Gold Award from the Council for Advancement and Support of Education. The film also took home a first place award in the Marketing and Communications Video category from the Ag Communicators Network awards in November 2020.

You can view the film at seeds.iastate.edu
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