BIGMAP, CAB INTERNATIONAL SIGN AGREEMENT TO DEVELOP COMPENDIUM

by Regina Hendrickson

On April 22, 2008, the Biosafety Institute for Genetically Modified Agricultural Products (BIGMAP) at Iowa State University and representatives from CAB International (CABI) signed an agreement to begin development of a compendium on GM agriculture and biosafety. Focusing on genetically engineered plants and animals, the compendium will be designed to communicate science-based information about the expressed traits and products of genetically modified agricultural products (GMAPs) and will serve as a tool to inform scientists, industry, educators, and the public about their safety and use.

The ceremony marked the culmination of over a year of negotiations between the two groups. In April 2007, 26 scientists and industry leaders from nine countries met on the Iowa State campus to take part in an International Expert Consultation where they discussed the need and the value of developing a comprehensive compendium on GM agriculture and biosafety. Representatives from both groups later met again in the United Kingdom in July 2007 to continue discussions on the project. A concept note for development of the compendium was drawn up as a result of that meeting.

Finally, an Inception Workshop was held at Iowa State in April 2008 to outline the steps necessary for development of the compendium. The meeting concluded with the signing of the joint agreement between BIGMAP and CABI to begin development of the compendium.

“CABI has a reputation for being a leader in technology and management and for (continued on page 10)
BIOTECHNOLOGY AND LAW IS FOCUS OF FIFTH BIGMAP SYMPOSIUM

by Regina Hendrickson

As many as 100 scientists and members of academia and industry attended the Fifth Annual BIGMAP Symposium held April 23, 2008, at the Gateway Hotel and Conference Center in Ames, Iowa.

Topics discussed at the symposium, which was co-sponsored by the Plant Sciences Institute at Iowa State, included current perspectives on the innovation, regulation, risks, and benefits of genetically modified agricultural products.

A highlight of this year’s symposium was the morning session titled “Biotechnology and Intellectual Property” which was chaired and moderated by former Iowa Governor and BIGMAP Distinguished Fellow Tom Vilsack. The session focused on legal and scientific perspectives of intellectual property for agricultural biotechnology and their policy implications.

Guy Cardineau, a research professor at the Arizona Biodesign Institute and the Sandra Day O’Connor College of Law at Arizona State University, began the session by talking about intellectual property and patents in the life sciences. Cardineau highlighted early patent laws and addressed the social costs of patents.

Following Cardineau, Jason Hunt of Dorsey & Whitney, LLP, spoke on “Protecting Yourself and Your Invention: Patent Strategies.”

George Elliott, group director for the Technology Center of the U.S. Patent and Trademark Office, ended the session with insights on intellectual property protection for plants in the United States. Elliott, who examines patent applications in biotechnology, organic chemicals, and pharmaceuticals, shared information on plant and plant utility patents.

The Senior Director of Agriculture and Rural Economy at the Millennium Challenge Corporation, Kristin Penn, served as symposium luncheon speaker. She outlined the mission of the Corporation and its work to support countries committed to development and building prosperity.

Iowa State University Agronomy Professor Jeff Wolt chaired the afternoon session that focused on biotechnology innovation and regulatory challenges.

“In the area of plant and agricultural biotechnology in general, the pace of change is absolutely enormous,” said Wolt. “The types of innovations that are coming forward and the pace at which these innovations are coming from the research community and moving towards development are just amazing. It puts a stretch on the research and development and the regulatory communities in terms of keeping pace with rapid innovation,” he added.

As first speaker of the afternoon session, Steven Strauss, professor at Oregon State University and director of the Program for Outreach in Resource Biotechnology, highlighted the impacts of regulation on the research and

(continued on page 11)
SEED SCIENCE CENTER HOSTS EASTERN AND SOUTHERN AFRICA SEED ALLIANCE IN AMES

The Iowa State University Seed Science Center and Global Seed Programs Leader Joe Cortes continued work to promote quality seed in Africa by hosting a meeting of the Eastern and Southern Africa Seed Alliance (ESASA) in the Seed Science Building April 15 - 21, 2008.

The meeting was attended by Justin Rakotoarisona, African Seed Trade Association (AFSTA); Michael Hall, U.S. Agency for International Development (USAID); Richard Jones and Carlos Dominguez, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); Chris Muyunda, Common Market for Eastern and Southern Africa (COMESA); Peter Bloch, (CAS-IP); Kathleen Dunkle (CNFA, Inc.); Lloyd LePage, DuPont Agriculture and Nutrition; and Manjit Misra and Adelaida Harries (ISU-Seed Science Center).

Agriculture plays a crucial role in the livelihoods of individuals in eastern and southern Africa. In rural areas (which are mainly dependent on subsistence agriculture) the percentage of people living below national poverty levels ranges from 40 to 90 percent. With little or no access to improved seed technologies, 60 to 70 percent of African farmers are sowing unimproved, low-yielding, local seed varieties recycled from previous harvests.

The African Seed Trade Association, the International Crops Research Institute for the Semi-Arid Tropics, the Seed Science Center at Iowa State, and CNFA, Inc. formed the Eastern and Southern Africa Seed Alliance in 2008 to reinforce the links between policy, seed enterprise, and rural distribution networks in Africa.

The mission of the ESASA is to work to strengthen existing national seed industries in countries where weak or no national seed industries exist and to provide targeted seed industry development assistance. ESASA partners are working to develop the capacity of existing and potential local seed companies, to improve the policy environment for seed trade, and to strengthen commercial distribution networks in Africa for improved seeds, complimentary inputs, and resulting crop outputs.

“This meeting was an opportunity to develop a project proposal for the ESASA countries,” said Cortes. “We are working together to develop the seed industry in eastern and southern Africa and to harmonize seed policy and regulations for COMESA countries.”

The ESASA project is just one of several projects that Cortes and Harries are working on in Africa to improve seed policies and regulations and to reduce seed trade barriers. In the past two years they have facilitated over 14 workshops in southern Africa as well as technical agreements between the 14 member countries of the Southern African Development Community (SADC).

Cortes and Harries have also developed procedure manuals for the West Africa region for seed variety release and seed certification in accordance with the Economic Community of West African States (ECOWAS) convention and regulations.

In 2007 Cortes and Harries worked with alliance partners AFSTA, ICRISAT, and CNFA, Inc. and Resource Partners Pioneer, Monsanto, Kemseed, USAID, and Agra to develop the West Africa Seed Alliance (WASA). Since that time, WASA has been providing expertise, ideas, and solutions to subsistence farmers in western Africa.

For more information about ESASA or WASA contact Cortes at jcortes@iastate.edu or Harries at aharries@iastate.edu.
OPEN HOUSE PLANNED FOR SEED SCIENCE/ BIGMAP ADDITION

As construction winds down on the new $2 million, 5,000-square-foot addition to the Seed Science Building on the northeast corner of the Iowa State University campus, plans for an open house are under way.

According to Seed Science Center Director Manjit Misra, an open house for the new addition is being planned for October 14, 2008. During the celebration, attendees will have an opportunity to tour the new addition, enjoy refreshments, and learn about Center programs and research.

“The purpose of this addition is to enable us to better serve our customers as well as the students of Iowa State,” said Misra. “It was designed to provide additional lab space for our faculty and to accommodate visiting scientists from other countries and universities who wish to conduct research on seed and biosafety. We have worked hard to make this a facility that will serve the needs of many and we look forward to sharing that with the public at our open house.”

Several speakers, including Iowa State University President Gregory Geoffroy, Dean Wendy Wintersteen, and prominent seed leaders, will provide remarks at the ceremony.

The Seed Science Building was constructed on campus in 1977. Initially a 33,000-square-foot facility, a 1,600-square-foot addition was added in 1996. Baldwin White is the architectural firm working on the current addition with Welker Construction serving as contractor.

NEW COURSE OFFERED IN SCIENCE, POLICY, AND FOOD

A new course offered at Iowa State University this past spring titled “Science, Policy, and Food” offered students a unique insight into the role and use of science in the development and implementation of policies associated with food and agriculture.

The course was offered for both upper level undergraduates and graduate students as part of a proposed graduate minor in Risk Analysis and Decision Making. It was designed to challenge students pursuing careers in food production science to consider how to communicate scientific evidence for use in regulation. Students also learned about the ways that science is used to justify the development of public policies and regulation and to implement policies.

Developed and co-taught by Annette O’Connor, associate professor of Veterinary Diagnostic and Production Animal Medicine; Helen Jensen, professor of Economics; and Tom Vilsack, former Iowa Governor and BIGMAP distinguished fellow; the course emphasized models and applications of decision-making processes when there is risk or uncertainty about outcomes. Presentations from experts aided students taking the course to better understand risk-based decision models, the basic budgetary process, and institutions associated with food policy in the United States. In addition, methods of synthesizing primary research data and applying analysis in policy review and implementation, as well as economic methods of policy evaluation were explored through a series of case studies related to food and agriculture. Through the case studies, students taking the course gained skills for analysis and description of the costs and benefits of regulation.

Students were exposed to experts from outside of academia who provided practical examples of how science impacts food policies within the U.S. and internationally. In addition to presentations from Vilsack, where he shared experiences from his service in the state legislature and as governor, students were also exposed to insights from business leaders. Chris Nelson from Kemin Industries was one of the guest speakers that addressed the group. Walter Robb of Whole Foods and Gary Hirshberg of Stonyfield Farms also discussed the organic food business and its role in environmental sustainability with the class.

For more information about the graduate minor in Risk Analysis and Decision Making or the course in “Science, Policy, and Food” visit www.bigmap.iastate.edu/radm.

Above: Former Iowa Governor and BIGMAP Distinguished Fellow Tom Vilsack (right) introduces Gary Hirshberg of Stonyfield Farms (left) during Hirshberg’s visit to Iowa State University in March.

DID YOU KNOW?

Iowa State University is the home of the nation’s only undergraduate seed science degree. The curriculum is designed as a secondary major to be taken in conjunction with a major in another agricultural or life-science discipline. The program began more than 10 years ago.
Iowa Seed & Safety  |  winter/Spring 2008

CORTES, HARRIES
CONDUCT SEED
QUALITY MANAGEMENT
WORKSHOPS

Seed Science Center Global Programs Leader Joe Cortes and Scientist Adelaida Harries provided training on quality management systems to four African seed companies this past June in Malawi and Zambia.

Companies attending the workshops included Seed Co of Malawi; and MRI, Zamseed, and Kamano Seed of Zambia. A total of 49 individuals from the four companies attended the workshops.

The training course focused on process management, auditing, accreditation, and revision of a first draft of seed quality manuals being developed by each of the companies.

“We made good progress towards developing a second draft of each company’s quality manual,” said Cortes. “There was great participation by the managers and staff of each company.”

Cortes added that once the seed companies implement their quality management systems, continuous improvement should be seen. “It will allow them an opportunity to be accredited by the national seed authority and to conduct their own seed certification processes,” he said.

The workshops were part of the Southern African Seed Systems Development Initiative project for the SADC countries that is funded by USAID Southern Africa. Seven companies in other African countries have previously been trained under the program.

MISRA RECEIVES ORDER OF THE KNOLL AWARD

Seed Science Director Manjit Misra was among twelve individuals presented with one of Iowa State University’s most prestigious honors April 11th at the 2008 Distinguished Awards Ceremony.

Misra was awarded the Order of the Knoll Faculty/Staff Award. The award, presented by the ISU Foundation, recognizes individuals who are employed by or are retired from Iowa State University who have brought distinction to the university through their work.

Prior to presenting the award, Iowa State President Gregory Geoffroy acknowledged Misra for his national and international leadership in seed research and technology, his initiation of fundraising campaigns to endow undergraduate scholarships and to create graduate assistantships, and his establishment of strong partnerships between Iowa State University, the American Seed Trade Association, and the Food and Agriculture Organization.

Presented during Veishea, the Distinguished Awards are considered to be one of the university’s highest honors. For more information about the celebration visit http://www.isualum.org/en/awards/distinguished_awards_celebration.

SEED SCIENCE CENTER, BIGMAP
JOINT ADVISORY COUNCIL MEET

Members of the Seed Science Center, BIGMAP joint advisory council met at the Gateway Hotel on April 24, 2008.

Attending the meeting were (pictured below from left) Jim Bair, North American Millers’ Association; Rob Robinson, Syngenta Seeds; David Lambert, Lambert & Associates; Judy Chambers, Emerging Market Solutions; Gregory Jaffe, Center for Science in the Public Interest; Sano Shimoda, BioScience Securities, Inc.; Alan Walker, Monsanto Company; Dean Kleckner (IFSS Advisory Council), Truth about Trade & Technology; Jitendra Srivastava, The World Bank; and Bruce Maunder, retired senior vice president of Dekalb Genetics. Council members not pictured are Mike Gumina, DuPont Agriculture & Nutrition; Neil Hoffman, USDA/APHIS; Bill Horan, Horan Brothers; Richard Jones, ICRISAT; Josette Lewis, USAID; and Joan O’Brien, Iowa Seed Association.

As a start to the meeting, the council members toured the Seed Science Building addition. Maunder then welcomed the group and Director Manjit Misra presented an overview of the accomplishments of the Seed Science Center and BIGMAP. Council members discussed research with Center faculty members and offered guidance for future direction.

The joint council is made up of 15 individuals representing academia, government, and the public and private sector.
The DNA laboratory at the Seed Science Center is currently developing a Magnetic Capture Hybridization-Polymerase Chain Reaction (MCH-PCR) seed assay for the detection of multiple pathogens of corn in a single PCR reaction.

Seedborne pathogens such as fungi, bacteria, and viruses are serious constraints to crop productivity. Because of this, the detection of pathogens and elimination of infested seed lots is the primary goal of the Plant Diagnostic Laboratory.

Traditional detection methods for pathogens in seed involve bioassays, culturing on semiselective agar media, or use of immunodiagnostic methods followed by confirmatory tests. These methods are still prevalent in the plant industry. Many of these older tests, while effective, are slow, relatively insensitive, and labor intensive.

DNA-based technologies such as the polymerase chain reaction (PCR) were developed to overcome these limitations. PCR allows scientists to isolate, characterize, and produce large quantities of specific pieces of DNA from very small amounts of starting material. A specific piece of DNA is repeatedly copied, resulting in enormous amplification of starting material that would otherwise be undetectable. Advances in molecular-biological techniques have helped to develop rapid and sensitive PCR detection assays for several seedborne pathogens. While PCR has been routinely employed in food and clinical microbiology, its adaptation in plant clinics has been limited mainly by two major obstacles: low pathogen DNA concentrations and the effect of PCR inhibiting compounds found in seed and plant tissues. Elimination of inhibitors of PCR amplification present in a sample permits optimal PCR sensitivity. Unfortunately, the standard processes for obtaining high purity DNA have many steps and are difficult to apply in routine practice (Mangiapan et al. 1996).

**SAMPLE PREPARATION/GENOMIC DNA ISOLATION: A BOTTLE-NECK FOR PATHOGEN DETECTION BY PCR**

The inability to efficiently extract PCR-quality DNA from seed has lead to general reluctance to abandon traditional methods for reliance on any single molecular test. Classical methods for DNA isolation are either column-based techniques or include precipitation and centrifugation steps with toxic organic solvents. The need for chemicals, equipment, and trained personnel for DNA extraction methods is a drawback for using PCR as a standard procedure (Alvarez 2004). These procedures are time consuming, difficult to automate, or difficult to downscale to small sample volumes.

**PRINCIPLES OF MAGNETIC CAPTURE HYBRIDIZATION: A DNA PURIFICATION AND CONCENTRATION TECHNIQUE**

In order to reduce the effects of inhibitors and non-target DNA on PCR amplification, a novel technology was introduced by Jacobsen (Jacobsen 1995) that allowed microscale detection of specific bacterial DNA in soil with a magnetic capture-hybridization (MCH) and PCR amplification assay. Jacobsen’s technique (Jacobsen 1995) separates specific target DNA from all other DNA, humic acids, and other interfering compounds in very small samples, thus facilitating detection of specific bacterial cells or genes by PCR. In this novel process, paramagnetic streptavidin-coated beads conjugated with biotin labeled oligonucleotide probe are used to capture single-stranded target DNA from crude DNA preparations (Jacobsen 1995) (Fig. 1). Briefly, MCH combines an initial DNA extraction and purification step, including hybridization with a single-stranded DNA probe on magnetic beads, and a subsequent PCR amplification step of the extracted gene. This increased the efficiency of isolation of target DNA. It has been widely confirmed that MCH-PCR assay improves the detection sensitivity of target DNA in biological samples.

Several types of magnetic solid particles are available for magnetic separation of biological organisms, organelles, or molecules. All of these particles offer distinct advantages such as paramagnetic properties, biocompatibility, and ability to capture DNA under mild conditions.
particles permit binding molecules to be attached to them, as described in detail by Olsvik et al. (Olsvik et al. 1994). Most particles are super-paramagnetic, i.e., they are magnetic in a magnetic field, but nonmagnetic as soon as the magnetic field is removed.

As I mentioned, the DNA laboratory at the Seed Science Center is currently developing an MCH-PCR seed assay for the detection of multiple pathogens of corn in a single PCR reaction. For each of the 2 model pathogens, specific-sequence modified with biotin was used as capture probe to coated streptavidin-coupled Dynabeads M-280 (Dynal Biotech ASA, Oslo, Norway). The capture probe was employed to isolate and concentrate target DNA as described previously. Only DNA sharing homology sequences with all P. stewartii subsp. stewartii and Diplodia maydis will undergo hybridization, all non complementary DNA are in the supernatant along with the interfering compounds and are removed by repeatedly washing the beads (Fig 2 and 3). The separation of target DNA by MCH improves the detection of pathogen DNA by at least 100-fold.

ADVANTAGES OF MCH-PCR OVER DIRECT PCR CAN BE SUMMARIZED AS follows:

MCH-PCR has the advantages over direct PCR in that the MCH process purifies and concentrates the DNA of interest while removing nontarget DNA and other substances that can inhibit the in vitro enzymatic manipulation of nucleic acids that are normally found in complex starting biological material.

CONCLUSIONS

- Concentrations of organism DNA can be quantified using sampling techniques.
- Magnetic capture is compatible with simultaneous detection of many unrelated pathogens.
- The ability to detect low concentration of disease organisms increases ability of researchers to understanding the link between the presence of organisms and the occurrence of disease. This understanding of the linkage between the presence of disease organisms, and the occurrence or level of disease may be far more costly and difficult than the development of the detection methods.
- The Seed Science Center is attempting to advance both detection technology and the ability to use detection information in industry decisions.

REFERENCES


Anania Fessehaie is a molecular quality research associate at the Iowa State University Seed Science Center. His research interests include developing DNA-based multi-pathogen detection assays; exploring advances in nanotechnology aimed at improving diagnosis and molecular epidemiology of pathogenic bacteria, fungi, and viruses harmful to plants, humans, and animals; and investigating the potential of DNA micro array technology and DNA chips to the screening of event-specific DNA sequences of genetically modified agricultural crops. Fessehaie received his PhD and M.S. in plant pathology from the Institute of Plant Pathology and Plant Protection, Georg-August University of Göttingen, Germany prior to coming to Iowa State in 2005.
2008 VEISHEA DISPLAY OFFERS FUN FOR ALL AGES

by Regina Hendrickson

Faculty and staff of the Seed Science Center proved that neither snow, nor sleet, nor extremely cold temperatures could prevent them from taking part in the 2008 Veishea celebrations at Iowa State.

Promises of free warm popcorn, a space heater, and a dry floor were just a few of the many reasons spectators made their way to this year’s Seed Science Center/BIGMAP Veishea tent. In addition to providing the much sought after creature comforts, the display also offered opportunities for learning and fun for young and old alike.

The newest addition to this year’s tent was the inclusion of a spiral seed separator. The device allowed the public an opportunity to pour a container of mixed grain into the top and watch as it sorted the rolling from non-rolling seeds as they traveled down the spiral. A seed identification game also invited visitors a chance to “name the mystery seeds” and buckets of seeds allowed hands-on contact with seeds of differing shapes, textures, and sizes. Also on display was a vibratory seed counter like those used by seed scientists and a cross section of soybean and corn sprouts. In addition, over 55 pounds of free popcorn was served by Seed Science Center staff, students, and faculty members throughout the day.

“Taking part in this year’s Veishea celebration was definitely a challenge,” said project coordinator Alan Gaul. “But as usual our faculty and staff came up with several ingenious ways to make the weather conditions tolerable while providing entertainment for the crowd. We were amazed at the number of people who visited our tent and stayed to take part in all the activities. In spite of the bad weather, we felt like it was a success.”

Despite unseasonably cold weather, the 2008 Seed Science Center/BIGMAP Veishea display offered learning opportunities for all ages.
Visiting Scientist

V.L. Maheshwari

The faculty and staff of the Seed Science Center welcomed visiting scientist V.L. Maheshwari for five weeks this past spring.

Maheshwari, a Borlaug Fellow and director of the School of Life Sciences in North Maharashtra University in Jalgaon, India, came to Iowa State in April. While in Ames, Maheshwari studied food biosafety and risk analysis with Agronomy Professor Jeff Wolt.

According to Maheshwari, genetically modified foods are an important issue in India at the present time. He pointed out that even though India ranks fifth in the world in biotech crop cultivation, cotton is currently the only biotech crop that has been approved for use. Biotech food crops are yet to be accepted.

Maheshwari said that working with Wolt has helped him to get a good understanding of the framework involved in the adoption of biotech crops. “It is necessary to have the capacity to analyze new trends and to spread awareness among stakeholders,” he said. “There are many myths about biotech crops in the minds of people. After I return to my country, I’ll be able to share the message about biotech crops and to better explain the scientific processes necessary for their approval.”

During his stay, Maheshwari met several professors on the ISU campus with expertise in risk analysis. He also visited Pioneer Hi-Bred in Johnston, Iowa, and the DuPont R & D Centre in Wilmington, Delaware. “These visits helped me to better understand the framework from the developer’s point of view,” he said. “All in all, it has been a great learning experience.”

What did Maheshwari think of his stay in Ames? “I enjoyed Iowa,” he said. “People in Iowa are very forthcoming. They are just awesome.”

Visiting Scientist

Felicia Wu

Felicia Wu, assistant professor of environmental and occupational health in the Graduate School of Public Health at the University of Pittsburgh, was invited by Seed Science Center Endowed Chair Gary Munkvold to spend two weeks at Iowa State University this past June.

Wu applies mathematical modeling, economics, risk analysis, risk communication, and policy analysis to diverse areas of environmental health; including indoor air, food safety, and biotechnology. Recently, she co-authored a paper with Munkvold that was published in the Journal of Agricultural and Food Chemistry on the potential risks of mycotoxins in corn-based ethanol co-products. “There are three times the concentration of mycotoxins in ethanol co-products compared with the original grain, and 90 percent of these co-products are fed to our livestock and poultry,” Wu said. “We wanted to examine, ‘What risks are associated with this practice?’”

Wu also researched the benefits associated with lower mycotoxin levels in Bt corn, and the impact of harmonized mycotoxin standards on global health and trade.

While at Iowa State, Wu met with researchers from several departments including agronomy, plant pathology, mechanical engineering, veterinary medicine, and astronomy. She also toured a local ethanol plant, presented a seminar on campus, visited with former Iowa Governor Tom Vilsack, and exchanged ideas with Professor Jeff Wolt and Assistant Professor Ana Correa regarding curriculum for the graduate minor in Risk Analysis and Decision Making.

Wu has a Ph.D. in engineering and public policy from Carnegie Mellon University, and an AB in Applied Mathematics from Harvard University.

Graduate Student

Saritha Muppa

Growing up in India, Saritha Muppa learned at an early age that major yield losses could result from bacterial, fungal, and viral plant diseases.

Muppa began work in the DNA facility of the Seed Science Center in September 2007. There she conducts research with Plant Pathology Associate Professor Gary Munkvold. “My research with Dr. Munkvold involves the isolation of DNA from corn root tissues obtained from different locations in Iowa and Nebraska,” Muppa said. “It uses real-time PCR methods for quantification of Fusarium species in corn hybrids with or without resistance to corn rootworm feeding.”

Muppa, who is from Nalgonde in Andhra Pradesh, India, is working towards a master’s degree in interdisciplinary graduate studies at Iowa State. She is majoring in biological and physical sciences with areas of interest in plant pathology, genetics, and food science and human nutrition.

Prior to coming to Ames, Muppa earned an undergraduate degree from Osmania University in Hyderabad, India, and a master’s degree in microbiology from Kakatiya University in Warangal, India.

Even though her background in science is broad, Muppa says that working at the Seed Science Center has provided several unique experiences to gain additional skills. “I have enjoyed learning new methods for the quantification of DNA using real-time PCR applications,” she said. Muppa added that screening commercial seed samples for the presence of CaMV promoter (which indicates the presence of most GMOs in seed) is also something she has enjoyed. “I am interested in working in molecular detection studies related to seed technology after I graduate from Iowa State,” she says.
Novel Techniques for Seed Health Testing” was the topic of a three-day workshop held May 12-14 in the High Tech Room of the Iowa State University Seed Science Building.

Scientists from academia and the seed industry attended the event that was funded by the USDA CSREES Plant Biosecurity Program.

In addition to listening to speakers introduce cutting-edge technologies, workshop attendees had the opportunity to gain hands-on experience during the event by learning about multiplex real-time PCR and performing tasks such as seed vacuum extraction, magnetic capture and hybridization for detection of multiple pathogens, and pathogen DNA extraction.

Speakers for the event included William Kiffmeyer, Applied Biosystems; Carla Stephens, Invitrogen; and Andre Levesque, Agriculture and Agri-Food Canada.

Ron Walcott, University of Georgia Department of Plant Pathology; Anania Fessehaie, ISU-Seed Science Center molecular quality research associate; and Lisa Shepherd ISU-Seed Science Center seed health testing coordinator facilitated the event. The USDA North Central Region Plant Introduction Station, Clemson University, USDA Vegetable Laboratories of Charleston, SC, and STA Lab, Inc. also took part in organizing the workshop.

“The seed health testing workshop was very successful,” said Fessehaie. “A number of the scientists signed up for our second workshop which was held during the 2008 American Phytopathological Society (APS) meeting.”

Fessehaie and Shepherd helped to facilitate the second workshop titled “Novel Molecular Assays for Seed Health: Dead or Alive?” The workshop took place on July 26 during the APS Centennial Meeting held in Minneapolis, Minnesota. Ron Walcott organized the event which was sponsored by Syngenta Seeds, Harris Moran Seed Co., and Seminis Vegetable Seeds.

For more information contact Anania Fessehaie at fessehai@iastate.edu.

BIGMAP, CABI SIGN AGREEMENT

(continued from page 8)

developing very successful compendiums,” said Manjit Misra, Seed Science Center and BIGMAP director. “In addition, BIGMAP is regarded as an unbiased source of information on risk assessment, mitigation, and communication. I predict that a lot of good things will come out of this collaboration. It is definitely a worthwhile project. Working together we will get it done.”

JAMES AKETCH OKENO

(continued from page 8)

He cites Europe’s lack of acceptance of GM products as one of the reasons why they have not been accepted yet in Kenya. “I think they would benefit from cotton, corn, and soybeans if they would grow them,” he said. Okeno added that the biotech crops grown in Africa are mainly located in South Africa.

Originally from Homa Bay, Lake Victoria, Kenya, Okeno says that he grew up on a farm that was less than one acre in size. “We had to do all our farming by hand,” he said. “That included hoeing, weeding, and harvesting.” Okeno said that in many areas in Africa subsistence farming is still the norm with farmers working 1/2 to 2 acres of land. “Our efforts now should be to improve livelihoods and to invest in schools and in health care,” he said.

The father of four children ranging in age from 13 years to 7 months, Okeno says his children are looking forward to attending school in Ames. “They are looking forward to meeting new friends,” he said.

DID YOU KNOW?

In 1914 Professor H.D. Hughes initiated a second Seed Laboratory at Iowa State College. In 1932, under the new leadership of R.H. Porter, this second seed lab (located in the Agronomy Department) merged with the original Seed Lab (the Botany Seed Laboratory established in 1905) and moved to Old Botany Hall.
cases, biotechnology offers some real advantages,” Hall said. He added that it is important to develop crops that improve productivity through the application of modern science and technology and to create an enabling policy environment for the safe production and trade of bioengineered crops. Getting technologies to the farmer and fostering public outreach to improve understanding of the role of modern technologies in agriculture were other methods Hall cited as effective ways to promote the acceptance of biotech crops.

U.S. Department of Agriculture Deputy Under Secretary for Food Safety and BIGMAP faculty member Scott Hurd wound up the sessions by explaining ways that the Food Safety and Inspection Service (FSIS) is working to ensure that meat, poultry, and processed egg products distributed in commerce for use as human food are safe, wholesome, and accurately labeled. Hurd examined risk analysis activities at the USDA/FSIS and highlighted future directions of the organization.

According to BIGMAP Director Manjit Misra, feedback on the symposium was positive. “BIGMAP is in the business of helping people,” he said. “As the pace of innovation of biotech products increases, we need to be ready to respond to the needs of the public through the safe and responsible application of science and technology and by providing tools and information from independent third-party unbiased sources. This symposium was an excellent opportunity to bring people together to share the latest in research and information about genetically modified agricultural products.”

For more information about the symposium, visit www.bigmap.iastate.edu.

**FIFTH BIGMAP SYMPOSIUM**

(continued from page 2)

development of genetically modified woody biofuels crops.

**Gregory Jaffe**, director of the Project on Biotechnology for the Center for Science in the Public Interest (CSPI), followed Strauss with a presentation titled “The Second Decade of Biotech Products: Domestic and International Regulatory Challenges.” Jaffe highlighted the regulation of biotech crops, future biotech products, and the regulatory challenges faced by both the United States and by developing countries. Jaffe said that he believes that the second decade will offer both promise and controversy. “The U.S. regulatory system is evolving, but I think it has some tough issues to address. It needs to move a little faster to really stay on top of things, to keep the consumer confident,” he said. Jaffe said that he believes that the Cartagena Biosafety Protocol will continue to play a major role in establishment of national regulations throughout the world.

“What happens in that arena is very critical and is something that is driving a lot of countries to move forward,” he said. “I would say that there are a number of hurdles to greater adoption worldwide and one of those is the regulatory issue.”

**Michael Hall**, regional biotechnology advisor for the U.S. Agency for International Development (USAID), addressed innovation and biosafety regulatory systems in developing countries. “We are looking for solutions to local problems. In certain

**SEED TECHNOLOGY AND BUSINESS PROGRAM ADDS NEW COURSES**

Academy members involved in the Graduate Program in Seed Technology and Business (STB) continue to be hard at work. Two new courses were offered this summer and two are being offered for fall 2008.

Summer Session I featured STB 547 “Seed Production” taught by David Dornbos, professor of biology at Calvin College located in Grand Rapids, Michigan. At Calvin College, Dornbos teaches cell biology and genetics, botany, and plant physiology. Dornbos is also a veteran of several years in seed production at Syngenta Seeds. STB 547 was the first Seed Technology and Business Program class in which both the instructor and the students were located off-campus.

STB 534, “Seed Variety, Testing, and Technology” is being offered during Summer Session II. Iowa State Seed Testing Laboratory Manager Mike Stahr is assisting Seed Science Center Program Manager Paul Christensen in teaching the course.

Upcoming courses for fall 2008 include STB 539 “Seed Conditioning and Storage.” Seed Science Center Director Manjit Misra will teach the course with assistance from Alan Gaul, Seed Science Center assistant scientist. In addition, Iowa State Horticulture Professor Rajeev Arora will teach Horticulture/STB 543X “Seed Physiology.”

A new sequence of courses will be offered in Summer 2009.

For more information about the Graduate Program in Seed Technology and Business contact Paul Christensen or Ted MacDonald at seedgrad@iastate.edu.
<table>
<thead>
<tr>
<th>Workshop/Shortcourse Title</th>
<th>2008 Training Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Corn/Soybean Quality Evaluation</td>
<td>August 20 - 21</td>
</tr>
</tbody>
</table>

For updates or more information about ISU seed workshops/shortcourses, visit [www.ucs.iastate.edu/mnet/seedscience/home.html](http://www.ucs.iastate.edu/mnet/seedscience/home.html) or email agaul@iastate.edu.