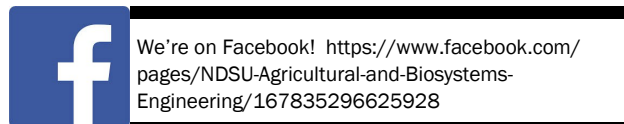


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### Why donate?

In order for a program to stay current and relevant, it has to change with the needs of the times. Our labs and course contents have to reflect the current technology, and our students need to be trained to meet the needs of the employers. ABEN has been proactively addressing the challenge of updating our teaching labs. Recently, we have expanded our "Instrumentation and Measurement" lab to increase the lab capacity to 24 to accommodate the growing enrollment in our programs. Currently, ABEN is working on generating support for equipping a much needed hydraulics lab with the state of the art technology. We are also addressing the need for expanded offering in precision agriculture with more hands on components. It is a huge challenge to stay ahead of the curve on precision agriculture technology. Your support is critical in maintaining current technologies in our teaching labs. Your contribution is also used for the much needed scholarships to our students, sponsor Ag Tech Expo, recruiting, and other teaching and student activities.

Lots of exciting things are happening at ABEN, and your contributions play a vital part in supporting ABEN activities. Thank you for your support of our great department!

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Enclosed is my tax deductible check payable to: Agricultural & Biosystems Engineering Department, NDSU in the amount of:

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I/We would like to help NDSU students majoring in Agricultural and Biosystems Engineering and Agricultural Systems Management with financial support with a contribution of \$ \_\_\_\_\_ to go towards the scholarship fund indicated below.

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2013-14

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### Message From the Chair



Greetings!

Yet another academic year has come to a successful completion. Thirty of our undergraduate students graduated in May. Congratulations to all the graduates! It is a gratifying experience to watch our students transition from excited high school graduates to confident college graduates, and move on to the careers of their choice to become successful professionals and community members.

This was a great year for our ABEN department. Several of our faculty and staff members were recognized for excellence. Our faculty are providing leadership on research and education in the application of unmanned aerial systems in agriculture, tile drainage, irrigation engineering, food and bioprocess engineering, grain drying, flood education and waste management. Many of our faculty are also maintaining active international programs. We hosted 6 visiting scholars from various countries last year. We also have new additions to our ABEN family. Sara Ogundolani and Julie Bietz are great addition to our front office. Lowell Disrud and Les Backer came back to teach some courses.

ABEN graduates are in high demand in the job market. Our graduate student numbers more than doubled in the last three years. ABEN student clubs have been very active with guest speakers, Ag Tech Expo, quarter-scale tractor design, and various fund raising activities. ABEN research productivity is at an all-time high. Although we are proud of the growing programs and our department's productivity, such success is exacerbating our ongoing challenge with space.

A hallmark of ABEN department is the strong support we enjoy from our alumni, employers, and stakeholders. ABEN advisory board met in June, and provided valuable feedback. ABEN organized the first Bio-industry conference in 2014, thanks to an endowment made by Bill Bickert, an alumnus. The Lundstroms have established a new scholarship for our students. We appreciate the strong support from our graduates and stakeholders as we strive to prepare a new generation of students for tomorrow's challenges, and address the research and education needs of the state and nation.

I have enjoyed meeting many of our alumni and stakeholders over the last three years. When you are in Fargo next time, please stop by to say hello! Please feel free to contact me with any suggestions and ideas you have for ABEN. **Sreekala Bajwa**

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## National Science Foundation awards \$250,000 to NDSU

NSF Award to Dr. Zhulu Lin - CNH-  
Ex: A Water Depot-Based Decen-  
tralized Optimization Model for  
Groundwater Allocation and Man-  
agement at the Bakken Shale in  
Western North Dakota—August  
2014



Dr. Zhulu Lin

Unconventional oil and gas production in U.S. has increased dramatically since 2008 due to advancement in hydraulic fracturing technology. According to Time Magazine (October 14, 2013), the oil production at the Bakken Shale of western North Dakota increased about ten times since 2008 while the combined oil production at the Permian Basin and Eagle Ford Shale in Texas more than doubled in the same time period. This project is a pilot study for the energy-water nexus at the Bakken Shale of western North Dakota, using a quantitative modeling approach to gain a better understanding of the complex interactions between socioeconomic and natural systems surrounding the unprecedented economic

A portrait of Dr. Zhulu Lin, a man with dark hair and glasses, wearing a light blue sweater over a red patterned shirt. He is looking directly at the camera with a slight smile.

**Dr. Zhulu Lin**

The rapid expansion of unconventional oil and gas production in western North Dakota, a region rich in energy but scarce in water, has given birth to a novel water allocation system – water depots, to distribute a large quantity of freshwater for industrial uses in rural areas. The region's largest aquifer – the Fox Hills-Hell Creek (FH-HC) aquifer – is the sole reliable water source for livestock watering in rural North Dakota and Montana. However, there are growing

and water resources developments in the region. This interdisciplinary study will also shed light on the existing gaps between current industry practices and government policy. Given that the use of hydraulic fracturing is still on from this Bakken great importance to communities in and fracturing oil regions of unconventional oil a western North Dakota energy but scarce in wa

concerns about the existing and potential water withdrawal from the FH-HC aquifer due to the large-scale water demand by the oil industry. It is imperative to understand the dynamics of the water depot-based water allocation system and its interactions with the underlying groundwater systems. This project will develop a hydro-economic integrated model to study the dynamics of the coupled water depot-groundwater system so that appropriate policy tools may be devised to manage the regional groundwater resources for long-term, sustainable use. **National Science Foundation** [http://www.nsf.gov/news/news\\_images.jsp?cntn\\_id=132412&org=NSF](http://www.nsf.gov/news/news_images.jsp?cntn_id=132412&org=NSF)

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### News About You (personal and professional activities)

List any hobbies, family news/updates, organizations you are currently active in and any other items that may be of interest to your former classmates:

This image shows a blank sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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Thanks to Our Donors! Donors make important contributions to the scholarship program and activites that enhance the student experience. Below is a list of donors who made gifts and memorials to the NDSU Development Foundation designated to ABEN in years 2013 and 2014.

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ABEN leads Unmanned Aerial Systems Research

John F. Nowatzki, an Agricultural Machine Systems Specialist with the NDSU Extension Service, has been conducting exciting research using Unmanned Aerial Systems (UAS) for Precision Agriculture uses.

John, along with his team, are planning to conduct several UAS research activities in 2015. These projects will demonstrate how university UAS research can be used to enhance economic development in North Dakota. Project activities include using selected UAS to enhance oil development activities, crop and livestock production, and agricultural service industries.

UAS will be used to monitor native plants, agricultural field crops, livestock performance and wildlife activities during drilling activity in the vicinity of the NDSU Dickinson REC's Manning Ranch. Oil drilling activity is being conducted on the Manning Ranch. The ranch covers 1,000 acres of land with ongoing beef cattle and rangeland research projects



John Nowatzki

conducted by NDSU research scientists. The ranch land is home to a variety of wildlife including deer, pheasant, sharp-tailed grouse, various songbirds and prairie rodents. UAS will be used to monitor the

impacts of oil drilling on livestock activities, wildlife activities and movements, and crop and native plant growth, development and yields.

Oil development activity involves significant ground vehicle activity, often resulting in increased dust. Investigators will use ground monitoring and UAS sensors to inventory dust particles in the air and on plants in rangelands. UAS will also be used to monitor livestock movements and pattern locations. The results will help evaluate the impacts of oil development on beef cattle grazing activities.

The team will also be collaborating with the North Dakota National Guard on a project in McLean County that will use color and infrared sensors on UAS to collect high-resolution imagery to identify critical habitat for Piping Plover and Dakota Skipper, and map areas of noxious weeds such as leafy spurge.

John was recently featured in an article in *Unmanned Unplugged* magazine. His quote from the article sums up the need for UAS research best, "UAS will provide timely, high-resolution imagery and a real-time eye in the sky for agricultural producers to use to more precisely apply crop inputs, to validate past management decisions and to adjust in-season practices."

To view the complete article: <http://increasinghumanpotential.org/news/unmanned-unplugged/john-nowatzki-north-dakota-state-university/>

# Dr. Kenneth Hellevang inducted as a 2013 ASABE Fellow



**Ken Hellevang** was inducted by ASABE as a Fellow at its 2013 Annual International Meeting in Kansas City. A Fellow is a member of unusual professional distinction, with outstanding and extraordinary qualifications and experience in, or related to, the field of agricultural, food, or biological engineering.

A Fellow shall have had 20 years of active practice in, or related to, the profession of engineering; the teaching of engineering; or the teaching of an engineering-related curriculum. The designation Fellow shall have honorary status, to which members of distinction may be elected, but for which they may not apply.

Dr. Hellevang was honored for his outstanding educational and extension contributions worldwide involving crop post-harvest engineering, structures and indoor environmental engineering, flooding preparation and recovery, energy efficiency, and service to ASABE.

Dr. Hellevang led a task force of representatives from agencies and organizations interested in biomass for energy

in North Dakota. Several action items developed by the task force have resulted in legislation, such as the creation of the Renewable Energy Council, \$5 million in funding for renewable energy grants, and creation of the NDSU Bio Energy and Product Innovation Center, of which he was director for two years. He has authored or coauthored more than 150 technical publications. He was the lead author of the Midwest Plan Service’s Dry Grain Aeration Systems Design Handbook.

In his 34 years of ASABE membership, Hellevang has provided leadership to Food and Processing and Structures and Environment division committees, served a term on the Board of Trustees, and chaired the Meetings council. Among the awards he has received are several from ASABE, including three Educational Aids Blue Ribbon awards, a Presidential Distinguished Service citation, and a Young Extension Worker award. He is an active member of four other professional organizations.

## Journal Articles continued

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**Dr. Jiacheng Shen** joined the department January 2, 2014 as a Research Specialist under the supervision of Dr. Igathinathane Cannayen. He is located off-campus at NGPRL, USDA-ARS, Mandan, ND and belongs to the NDSU research group. Dr. Shen’s current project is the utilization of flood affected woody biomass and was funded by North Dakota Forest Service, wherein educational material, workshops, and demonstrations will be developed and delivered. His previous experience involved bio-fuel production from lignocelluloses materials using both biochemical and chemical methods. He holds PhD in Biological Systems Engineering from Virginia Polytechnic Institute and State University (Virginia Tech), USA, MS in Chemical Engineering from McMaster University, Canada, MSc in Environmental Engineering from University of Ottawa, Canada, and BSc from Tianjin University, China.



**Dr. Ganesh Bora Receives Patent**  
Dr. Ganesh Bora is a member of the group which received a Republic of Kazakhstan Patent for the work on a Helium Dryer. This is part of the collaborative research conducted with National Agrarian University (KazNAU), Almaty, Kazakhstan. KazNAU and NDSU have signed MoU for research and teaching collaboration and NDSU faculty members co-supervise KazNAU’s PhD students.



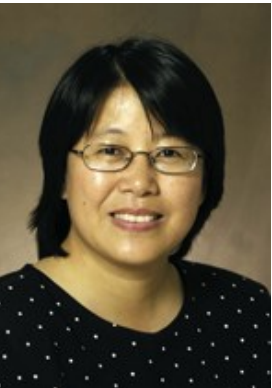
**Certificate of Excellence in Reviewing**  
**Dr. Igathinathane Cannayen** received a 2013 Certificate of Excellence in

Reviewing from Biosystems Engineering, Elsevier Press.

Congratulations Dr. Cannayen!



Promotions and Tenure



**Dr. Xinhua Jia** has been awarded tenure and promoted to associate professor effective July 1, 2013. Dr. Jia conducts fundamental research on hydrology and measurement of water balance components including rainfall, snowfall, evapotranspiration, irrigation, drainage, and surface runoff. Her research emphasis is on drainage water management to improve crop production and soil and water quality, which are very important and urgently needed in the Red River Valley of North Dakota and the Upper Midwest of the US. Dr. Jia teaches natural resource management systems, drainage and wetland engineering, and small watershed hydrology and modeling.

Congratulations Dr. Jia!



**Dr. Shafiqur Rahman**, awarded tenure and promoted to associate professor in 2014. Dr. Rahman’s Research and Extension activities include animal manure management, manure and animal mortality composting, anaerobic digestion of manure and agricultural wastes, best management practices for mitigating nutrient runoff from feedlot and land application of manure. In addition, his research activities include monitoring air pollutants and greenhouse gases (GHGs), and evaluation of new technologies to mitigate odor and air emissions from livestock production facilities. Rahman is currently conducting research on dust quantification in western North Dakota. He also mentors graduate and undergraduate students.

Congratulations Dr. Rahman!



**Dr. Xinhua Jia**

Dr. Jia is an associate professor who joined the Agricultural and Biosystems Engineering Department at NDSU in 2007 as the first female faculty

member. She received an M.S. and Ph.D. in Agricultural and Biosystems Engineering from the University of Arizona, with a research focus on evapotranspiration and nutrient management. She worked as a post-doctoral research associate on water resources at the University of Florida. Dr. Jia’s research addresses drainage, evapotranspiration, subirrigation, water recycling, water quality, soil quality, snow hydrology, and soil freeze and thaw, with a goal to optimally manage

water resources to improve crop production and soil/water quality for sustainable agriculture. Installing drain tile and controlling the water table by “shutting off” drainage flows at the outlet optimizes moisture conditions in the plant root zone throughout the growing season. Irrigation water can be added to the tile systems to provide more water to the root zone during high watering needs through a process called subirrigation. The research will help develop scheduling systems for conventional tile drainage and for subirrigation, a system similar to the Checkbook Method currently used for Irrigation Scheduling by ND producers. The Red River Valley is inherently flat and land is frequently flooded, making agricultural drainage water management one of the fastest growing practices. Xinhua strives to provide answers to important questions on the feasibility of subirrigation and its impact to soil and water quality, the rates of crop evapotranspiration rates between tile drained and un-tiled crop

fields, how a conservation drainage management scheduling practice will help control drainage and subirrigation practices, and the impact of tile drainage on snow melt runoff, freeze, and thaw, and the infiltration process. Dr. Jia has two MS graduate students working on drainage and subirrigation. Their projects are featured on the National Institutes for Water Resources page: [www.ndsu.edu/wrri/fellowship/Kelsey%20Kolars.html](http://www.ndsu.edu/wrri/fellowship/Kelsey%20Kolars.html); [www.ndsu.edu/wrri/fellowship/Kyle%20Horntvedt.html](http://www.ndsu.edu/wrri/fellowship/Kyle%20Horntvedt.html) Dr. Jia teaches Natural Resource Management Systems; Drainage and Wetland Engineering; and Small Watershed Hydrology and Modeling.

Research and Education Grant Portfolio (Total grants in 2013 = \$691,181)		
Title	Direct Grantor	Award PI
Federal Government		
Soil Health and Water Quality Impacts of Growing Energy Beets for Advanced Biofuel Production in North Central United States	USDA - NIFA	Lin, Z
State of North Dakota/Local		
Optical Crop Sensor Technology Applications to Soybean Production	ND Soybean Council	Nowatzki, J
Market Study of Flax Fibers for Industrial Applications	ND Ag. Products Utilization Commission	Bajwa, S
Ozone and Electrolysis Treatment to Mitigate Pollutant Gases and Chemical Oxygen Demand (COD) from Swine Manure	ND Pork Producers Council	Rahman, S
Coated, Hulled Confection Sunflower Seeds for Precision Planting	National Sunflower Association	Wiesenborn, D
Subirrigation with High Sodium Adsorption Ratio groundwater and its Effect on Soil and Water Quality	ND Water Commission	Jia, X
Research ND: Verify the Effectiveness of UAS-mounted Sensors in Field Crop and Livestock Production Management Issues	ND Corn Utilization Council	Nowatzki, J
Development of a Biofiber Composite Building/Landscaping Material with DDGS/Corn Fiber	ND Corn Utilization Council	Bajwa, S
Plastic Mulch Effects on Corn Yields	ND Corn Utilization Council	Jia, X
Mechanical, Thermal, and Storage Characteristics of Biomass	Agriculture Research Service	Cannayen, I
Energy Efficiency Education and Technical Assistance Program	ND Department of Com-	Hellevang, K
Statewide Energy Efficiency Educational Program	ND Department of Com-	Hellevang, K
Bio-industry Conference: Creating North Dakota's New Economy	ND Department of Com-	Bajwa, S
Bio-industry Conference: Creating North Dakota's New Economy	ND Department of Com-	Bajwa, S
Anaerobic Co-digestion of Livestock Manure to Reduce Odor and Greenhouse Gas (GHG) Emissions from Manure Management	ND Corn Utilization Council	Rahman, S
Effect of Optimal Water Management for Sustainable and Profitable Crop Production and Improvement of Water Quality in Red River Valley	ND Corn Utilization Council	Jia, X
Development and Adaptation of SEBAL/METRIC Evapotranspiration Mapping Capabilities for North Dakota	ND Water Commission	Steele, D
Industry/Companies		
Value Added Use of Cotton Ginning Byproducts - Fire Log	Cotton Incorporated	Bajwa, S
Field Evaluation of GreenIndex in Corn and Wheat Nitrogen Rate Trials in North Dakota	Spectrum Technologies, Inc.	Bora, G

Research and Education Grant Portfolio (total grant portfolio 2014 = \$2,674,017)		
Title	Direct Grantor	Award PI
International Organizations		
Capacity Building for Mitigation of Climate Change by use of Precision Agriculture	Asia-Pacific Network for Global Change	Bora,
Federal Government		
Soil Health and Water Quality Impacts of Growing Energy Beets for Biofuel	USDA - NIFA	Lin, Z
Mechanical, Thermal, and Storage Characteristics of Biomass	ARS	Cannayen, I
Energy Beets: A New Industrial Sugar Source - Front-end Processing Project	US DOT	Cannayen, I., Pryor, S.W, Wiesenborn, D
Agricultural Energy Efficiency Education Program 2014 - 2015	DOE	Hellevang K
ND Water Resources Institute 104(B) Program - Fellowship	US Geological Survey	Jia, X
Reducing Sodification in High Risk Northern Great Plains	NRCS	Lin Z, Steele, D
Soil Health and Water Quality Impacts of Growing Energy Beets for Advanced Bio-	USDA NIFA –AFRI	Lin Z
Evaluating market and policy effects on water quality in biofuel feedstock produc-	USDA NIFA –AFRI	Lin Z
CHN-Ex: A Model of Groundwater Allocation and Management at the Bakken Shale	NSF	Lin Z
State of North Dakota/Local		
Specialty Crop Block Grant Program - Farm Bill Activities	ND Dept of Ag	Jia, X
FY 2010 Great Plains Tree and Forest Invasives	ND Forest Service	Cannayen, I
Optical Crop Sensor Technology Applications to Soybean Production	ND Soybean Council	Nowatzki, J
Digital Imaging Technique to Detect and Count Aphids in Soybeans	ND Soybean Council	Bajwa, S
Demonstrate the Effectiveness of Unmanned Aircraft Systems (UAS) in Soybean	ND Soybean Council	Nowatzki, J
In-Field Crop Sensing Technology Applications to Soybean Production	ND Soybean Council	Nowatzki, J
Commercial Evaluation of Novel Soy Based Resin in Wood Composites	ND Soybean Council	Wiesenborn, D
Market Study of Flax Fibers for Industrial Applications	ND Ag. Products Utilization	Bajwa, S
Ozone and Electrolysis Treatment to Mitigate Pollutant Gases and Chemical Oxy-	ND Pork Producers Council	Rahman, S
Coated, Hulled Confection Sunflower Seeds for Precision Planting	National Sunflower Assoc	Wiesenborn, D
Subirrigation with High Sodium Adsorption Ratio groundwater and its Effect on Soil	ND Water Commission	Jia, X
Research ND: Verify the Effectiveness of UAS-mounted Sensors in Field Crop and	ND Corn Utilization Council	Nowatzki, J
North Dakota Corn Innovation Program	ND Corn Council	Pryor, S.
Development of a Biofiber Composite Building/Landscaping Material with	ND Corn Utilization Council	Bajwa, S
Plastic Mulch Effects on Corn Yields	ND Corn Utilization Council	Jia, X
Mechanical, Thermal, and Storage Characteristics of Biomass	Agriculture Research Ser-	Cannayen, I
Energy Efficiency Education and Technical Assistance Program	ND Dept of Commerce	Hellevang, K
Statewide Energy Efficiency Educational Program	ND Dept of Commerce	Hellevang, K
Bio-industry Conference: Creating North Dakota's New Economy	ND Dept of Commerce	Bajwa, S
Verify the Effectiveness of UAS-mounted Sensors in Feld Crop and Livestock Pro-	ND Dept of Commerce	Nowatzki J
Anaerobic Co-digestion of Livestock Manure to Reduce Odor and Greenhouse Gas	ND Corn Utilization Council	Rahman, S
Effect of Optimal Water Management for Sustainable and Profitable Crop Produc-	ND Corn Utilization Council	Jia, X
Acquisition of 1412 Photoacoustic Multigas Monitor	ND Corn Council	Rahman, S.
Development and Adaptation of SEBAL/METRIC Evapotranspiration Mapping Ca-	ND Water Commission	Steele, D
North Dakota Water Resources Research Institute Graduate Fellowship Program	ND Water Commission	Jia X, Steele, Simsek
Commercial Application of Soybean Stalk as a New Alternative Fiber in Particle	ND Industrial Commission	Bajwa, S
Demonstration and Evaluation of Vegetative Buffer Strips	ND Dept of Health	Rahman, S.
Assessing ND Wheat Varieties and Germplasm for Waterlogging Tolerance	ND Wheat Commission	Jia X
Economic Development of ND through UAS Research and Education in Agriculture	NDSU Develop Found	Bajwa, S
Evaluating Wheat Germplasm and Wheat Varieties for Waterlogging Tolerance	MN Wheat Research & Pro-	Jia x
Industry/Companies		
Value Added Use of Cotton Ginning Byproducts - Fire Log	Cotton Incorporated	Bajwa, S
Field Evaluation of GreenIndex in Corn and Wheat Nitrogen Rate Trials in North	Spectrum Technologies, Inc.	Bora, G
Energy Beet Research Yield Trials	Green Vision Group	Cannayen, I
Verify the Effectiveness of UAS-mounted Sensors in Feld Crop and Livestock Pro-	Pulsar Operational Bounda-	Nowatzki J

Subirrigation featured in Corn + Soybean Digest



Xinhua Jia (left), an agricultural engineer in collaboration with North Dakota State University Extension, is testing combined subsurface drainage and irrigation on this 108-acre cornfield, with Fairmount, N.D., farmers Alicia Miller Holubok (center) and Amanda Miller Fisher.

See the article at <http://cornandsoybeandigest.com/conservation/combined-drainage-and-subsurface-irrigation-cuts-water-use-management-challenging>

Photo: Liz Morrison

Dr. Shafiqur Rahman Receives Grant Funding for Research on “Quantification of Road Dust and its Effect on Soil Quality”

Five research proposals were selected to receive seed funding to research the impact of road dust issues in areas of energy development across western North Dakota. Here is a brief summary of the research award, areas of study and those leading the project for Dr. Rahman, NDSU, AGEN:

“Quantification of Road Dust and Its Effect on Soil Quality”  
**Shafiqur Rahman**, Ph.D., Agricultural and Biosystems Engineering; \$59,956 grant  
Research team includes: Kris Ringwall, Director, Dickinson Research Extension Center; Bernie Saini-Eidukat, Geosciences; and Larry Cihacek, Soil Science.  
<http://www.newswise.com/articles/ndsu-awards-research-grants-to-study-road-dust-impacts-in-bakken>



Study Abroad



**Scott Pryor** Co-led a group of 16 students (1 ABEN student) on a study abroad course (PLSC 379/779: Bioenergy Crops: The European View) to Austria, Germany, and Italy for 2 weeks in late June and early July. They visited bioenergy crop production research sites as well as facilities for biomass gasification, anaerobic digestion of animal manure and energy crops, composting and biochar production.



Awards

The 2013 NDSU Agriculture and Extension Faculty/Staff Awards Program was held December 12, 2013. Ken Grafton, VP for Agricultural Affairs; dean of CAFSNR; director of the North Dakota Agricultural Experiment Station, presented the awards.

Jim Moos, Rick and Jody Burgum Staff Award

This annual award recognizes significant contributions to the mission of NDSU Agriculture and/or Extension. The purpose is to encourage and reward excellence in job performance by support staff in technical and paraprofessional; crafts/trades; or services. Selection will be based on significant contributions by the nominee to the mission of the College of Agriculture, Food Systems, and Natural Resources; North Dakota Agricultural Experiment Station; or NDSU Extension Service.



Scott Pryor, Larson/Yaggie Excellence in Research

Research findings judged to make significant contributions either in addressing an applied problem or to the basic knowledge of the area investigated. Significance of the research, verified by supporting letters from three individuals with expertise to evaluate the research submitted.

Research results for which the nominee was primarily advanced for this award must be in press or published. If published, the article must have appeared within the two years preceding the nomination for this award. He/she has received outside invitations for the presentation of results of research which has been cited as the significant contribution by this person or team.



Dr. Tom Bon receives Teacher of the Year Award, 2014



Fall 2014 ABEN graduate, Jacob Hanson, presenting Dr. Bon with his award.

The College of Engineering held its annual awards ceremony in October 2014. Dr. Tom Bon was recognized with the Teacher of the Year Award for his teaching accomplishments and impact on students. Dr. Bon joined NDSU as a faculty member in 1989.

Dr. Bon helped develop the Finite Elements course and Fluid Power Systems. He teaches Electrical Energy Applications, Agricultural Power Systems, Machinery Design, Fluid Power Systems Design, Instrumentation and Measurements, Engineering Ethics, and ABEN 496 Ag. Tech Expo. He has also taught numerous other ABEN and ASM classes in the past.

He advises approximately 32 students.

He is affiliated with ASABE, TBH, and ASME.

Elton Solseng receives Teaching Award of Merit, 2014

Elton Solseng, long time instructor in the ASM program, was presented by Dr. Sreekala Bajwa with the North American Colleges and Teachers of Agriculture (NACTA) award for the “Teaching Award of Merit” at the 2014 annual spring picnic.



In conjunction with NACTA, the College of Agriculture selects one faculty member each year to present the award to for their meritorious efforts in college teaching.

Elton joined the department in 1972 and has been an integral part of the ASM program since.

He currently advises approximately 21 students.

Congratulations Elton!

Weddings



Wallace-Muhl

Nicole Wallace and Kelly Muhl were united in marriage on June 29, 2013. Nicole graduated in 2008 from Frazee High School and in 2013 she graduated from North Dakota State University with a bachelor’s degree in agricultural engineering. Kelly graduated in 1998 from West Fargo High School and in 2007 he graduated from Minnesota State Community and Technical College, Moorhead. He is a diesel technician at RDO, Casselton, N.D. Nicole and Kelly enjoy attending steam shows and are active volunteers at the Western Minnesota Steam Threshers Reunion, Rollag, MN.

New Bison



Marlee Grace Beckstrand was born at 5:30 p.m. on April 25, 2013 to Calby (ABEN ‘14) and Ciarra Beckstrand. The 7lbs. 9 oz. bundle of

joy has turned into a bundle of energy!

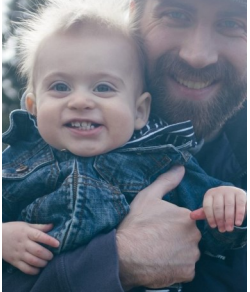
She likes pretending to be a princess and watching movies. She can’t wait for the warmer weather so she can go for longer walks and play outside with her favorite puppy, Moose!

The Becstrand family have made their home in Fargo, ND. Welcome to the Herd, Marlee!



Buchholz-Lund

Lisa Buccholz and Taylor Lund were united in marriage on September 13, 2014 in Cooperstown, ND. Lisa graduated from North Dakota State University with a degree in Agricultural Engineering in 2013. Taylor graduated from Minnesota State University Moorhead in 2009. Lisa is currently employed as a Manufacturing Engineer for John Deere. The couple has made their home in Gackle, ND.



Theodore (Theo) Kent Hellevang Ken Hellevang’s first grandchild was born April 3, 2014 to parents Ryan and Jessica Hellevang. Theo arrived weighing

9 lbs. 10 oz. but has grown into a very active little boy! He keeps his parents guessing where he will be climbing next. He knows some sign language to communicate and is starting to talk. The family lives in Duval, WA.

Welcome Theo!

Obituaries

Gloria Krohn Wiesenborn

passed away on November 17, 2014. She is survived by her husband of 61 years, Robert Wiesenborn; daughter Robin (James) Pike; sons, Mark Wiesenborn and his wife Kristen, Dennis Wiesenborn and his wife Diane. Grandchildren Scott and Amanda Wiesenborn, Kyle and Lindsey Wiesenborn, Jason and Cinny Pike, Paul Wiesenborn, Jared Pike, and Jesse Wiesenborn; Great-grandchildren Dustyn Pike, Caleb Pike, Carson Wiesenborn, Zoey Wiesenborn, Ella Wiesenborn, and Katelyn Wiesenborn. Sister, Ruth (John) Meyer. Our condolences to the Wiesenborn family.



Breck Hudson Hellevang

Ken Hellevang’s 2nd grandchild was born April 28, 2014 to parents Brandon and Mikaela

Hellevang. Breck surprised mom and dad and arrived early! He was a peanut at 6 lbs. 3 oz. and 19.5 in., but has grown to be a big boy. Breck is always smiling and enjoys all his toys that make noise. Grandma and Grandpa enjoy keeping connected via Skype, as the family lives in Lincoln, NE.

Welcome Breck!

## Alumni

### Experience as an Agricultural Engineer

by Shane Kjellberg, P.E., K<sub>2</sub>S Engineering Inc.

Shane is a 1993 ABEN NDSU graduate and worked in the construction and engineering field. Shane founded K<sub>2</sub>S engineering in 2003. His company provides a range of services primarily for the rural and ag sector. Shane is a licensed professional engineer in MN, ND and SD trained in wetland delineations through the Minnesota Board of Water and Soil Resources. Shane has over 20 years of experience in the agricultural and environmental fields in MN, North & South Dakota and NY state. He has engineered and implemented hundreds of practices: animal waste, livestock water supply systems, stream bank and shoreline restoration and stabilization, natural channel restoration using "Rosgen" concepts, wetland restorations /creations (dams & stream analysis), sediment control basins, odor management plans, assisted with regulatory permitting, construction management, operation and maintenance plans and other environmental related work. Shane has done several environmental assessments and impacts



on existing and proposed animal feeding operations, and developed several sediment control plans for permitting compliance. He covered

engineering, ethics, lessons learned and providing testimony in his seminar.

## Cody Montgomery elected to Foster County Soil Conservation Board



Cody Montgomery is an NDSU alum with a major in Ag Systems Management, and Animal Science and Ag Econ minor. He is currently working for Titan Machinery at the Jamestown location.

Cody and his wife Kim decided to move back to the Carrington area to reside and become more involved on the family ranch. They recently welcomed baby Layne to the family.

Cody says "On the ranch we have become more aware of the need for conservation and the unique programs that encourage these practices. This led me to become

interested in the vacant supervisory board position. I look forward to promoting conservation and how it can be tailored to assist producers in preserving our natural resources while still remaining economically viable."

December 2014

## New Faculty and Staff



**Harjot Sidhu**  
The National Sunflower Association sponsored funding to Dr. Dennis Wiesenborn's project "Coated, hulled confection sunflowers for precision planting". Harjot is the research specialist on the project for 2014.



**Sara Ogundolani** joined our department in 2013 as our Account Technician. She previously lived in Houston, TX before coming to Fargo. She and her husband, Oluwaseyi, have 2 daughters and a little boy on the way. Welcome!

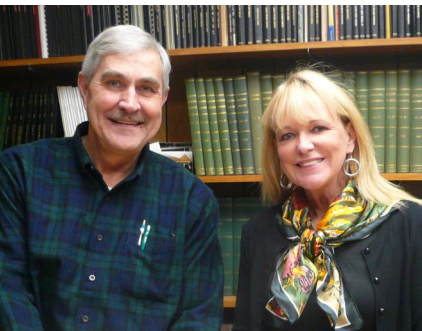


**Julie Bietz** joined our department in May 2014 as Student Coordinator. She lives in West Fargo with her husband, Glenn, and sons Gavin, 8 and Henry, 4. She enjoys gardening and camping. Welcome Julie!



**Toby Burnside** joined our department in December 2014 as custodian, having previously worked in Sheppard Arena. Toby is married with two children, daughter Liberty (8) and son William (20 months). In his spare time he likes to hunt, fish, camp, enjoy the outdoors and spend time with his family. Welcome!

## Departures and Retirements



**Roxanne Johnson's** position ended in November, 2013 after working as an Extension Water Quality Associate since November 2006. We bid her farewell and wish her

the very best in the next chapter in her life.



**David Fahey**  
Dave retired on November 7, 2014. Dave was our custodian for a year and half. He is now living in Denver, CO



**Myron Flaagen** Retired on June 30th, 2013. Myron gave us 12 years of service as our custodian. Now he has plenty of time to follow the Bison.

## Staff Recognition

**Staff recognition luncheon:** The following staff members were recognized for their years of contribution. We congratulate them!



**Nurun Nahar**  
was recognized for 5 years of service.



**Jana Daeuber**  
was recognized for 15 years of service.



**Melanie Ziegler**  
was recognized for 15 years of service.



**Deb Baer** was nominated for the individual staff recognition award.

Seminar Series

Mar 2013. **Greg LaPlante**, Director of Research, North Dakota Corn Growers and Utilization Council. Increasing research opportunities through better understanding of all interested groups.

Apr 2013. **Chris Boerboom**, director of the North Dakota State University Extension Service. “The scope of the NDSU Extension Service”, highlights of Extension work.

April 2013. **Mansur Amonov**, visiting Fulbright Scholar. Agricultural Engineering Program at the Tashkent State Agrarian University where he is employed as a senior lecturer.

April 2013. **Atikur Rahman**, Ph.D. Vegetative filter strips for controlling feedlot runoff pollution in ND.

May 2013. **David Dvorak**, founder of Field of View, a company that designs and sells remote sensing products and provides consultation in this growing industry. UAS seminar

Aug 2013 **Greg Holt** Research at the Cotton Gin Lab in Lubbock Texas. The ARS research center in Lubbock TX developed ways to use cotton ginning waste in composites, and as an eco- friendly Styrofoam replacement.

Sept 2013. **Dr. Shafiqur Rahman**. Research and Extension Activities in the Last Five Years. Dr. Rahman’s research program focuses on air and water quality relating to livestock facilities and land application of manure. Rahman also conducts research on dust and particle matter.

Sep 2013. **Tina Joe**, PhD. BAE, UC Davis. Investigating Enzymatic Hydrolysis of Lignocellulosic Biomass at Multiple Length Scales.

Oct 2013. **Kendal Nichols**, Director of Research, ND Soybean Council. ND Soybean Council and its activities

Oct 2013. Blaine Schatz, Director, Carrington REC. The Carrington Research Extension Center and Collaborative Research Opportunities

Nov 2013. **Erica Althoff**, Area Engineer, NRCS. Engineering Projects Installed by NRCS.

Nov 2013. **Dr. Marat Khazimov**. Professor of Engineering in Kazakh National Agrarian University (KazNAU), Almaty, Kazakhstan. Dr. Khazimov specializes in Agricultural Machinery in Engines. His presentation was on the collaboration between NDSU and KazNAU.

Nov 2013. **Mike Eli**. ND Dept of Health. Protecting North Dakota’s Land, Air, Water: Responsibilities of the North Dakota Dept of Health’s Environmental Health Section. Surface Water Quality Management Program.

Nov 2013. **Mohammedmehdi (Reza) Maharlooei**. Visiting Scientist. The history and culture of Iran and Precision Agriculture in Iran Today.

Jan 2014 Shane Kjelberg, K2S Engineering. Livestock Facility Design.

Feb 2014 Tommy Kenville, founder, Unmanned Applications Institute. **Unmanned Systems & Agriculture: an Industry on the Rise.**

Feb 2014 **Mehmet Odabas**, PhD. The Turkish Culture and Studying at Turkish Universities

Mar 2014 **Josh Lisne**, Digital Strategy, Director, AdFarm Wearable Technology. Josh develops digital strategy for clients with tactics including websites, social media, online media, mobile, and email. Josh was chosen by Google to be one of the original Explorers or beta testers for Google Glass. He demonstrated some of the capabilities of Google Glass and how wearable technology can change business and communication.

Apr 2014 **Kris Ringwall**. Overview of NDSU Dickinson REC

Apr 2014 **Karl Rockeman**, PE, ND Dept of Health. Wastewater in the Wild West

May 2014 **Corne’ and Connie van Bedaf**, Van Bedaf LLP, Carrington. Dairy Production and Manure Management Systems.

Jun 2014 **Bruce Sundeen**, Ag Communication. Photography Tips for Researchers, Teachers, and Extension Specialists

Sep 2014 **Kris Poulson**, North Country Ag Services, Farm Intelligence. Ag Drones and Big Data

Sep 2014 **Dr. Matt Sanderson**, USDA, ARS, Mandan. The USDA Long Term Ecosystem Research Network

Oct 2014 **Randy Mehlhoff**, Langdon REC Director. Langdon REC, Serving ND for over 100 years

Oct 2014 **Dr. Asanga Manamperi**. Animal Nutrient Feedblock Operations

Nov 2014 **Michael Goetz**. Site Design and Gateway Building Systems

Nov 2014 **Steven Edwardson**, ND Barley Council. Crop Enterprise Selection Factors Farmers Use in Deciding Which Crops to Plant

Dec 2014 ABEN 790 Graduate student seminar



Alumni

Eric Halverson promoted to CEO of Black Gold Farms

Black Gold Farms is a multi-state potato production organization, headquartered in Grand Forks ND, growing in excess of 20,000 acres of potatoes in 10 states. Eric was promoted to CEO of Black Gold Farms in October of 2014, succeeding his father Gregg Halverson.

Eric graduated from NDSU Agricultural and Biosystems Engineering in 1999. He was active in the Alpha Gamma Rho fraternity. Eric graduated from the Executive Program for Agricultural Producers (TEPAP) in 2004. He was elected Grower Leader for 2009 at the Potato Industry Leadership Institute in 2008. He represented North Dakota on the US Potato Board in 2008 and served on the Administrative committee in 2009. He serves on the Executive Committee of the US Potato Board, and is co-chair of the International Marketing Committee.

Eric helped with the design and implementation of the Black Gold Systematic approach protocols, one of the systems that helped Black Gold Farms win the National Potato Council Environmental Stewardship Award in 2008. He successfully headed a team to design the first bulk chip potato hydro-cooler in the industry which resulted in Black Gold Farms winning the Clem Kuehler World-wide Innovation Award from Frito-Lay. Eric was chosen as a panelist on the Sustainability Panel at the 2012 Potato



Expo in Orlando. FL. He was named to the 2012 “40 under 40” list by Business Watch Magazine of ND. Eric was awarded Spudman Magazine’s Emerging Leader Award in 2013 and named to the 2014 class of “40 under 40” by Produce Business magazine.

Eric is the son of Gregg & Linda Halverson, the fourth generation of Halverson’s producing potatoes. He graduated from Midway High School in

1995, and returned to the family farm (Black Gold Farms) upon graduation from college. He married Yvette Heiser November 1, 2003. They have 3 daughters: Lucy age 10, Stella age 8, and Ruby age 5. They are members of Calvary Lutheran Church in Grand Forks.

Eric’s interests include spending time with his family, hunting, cooking, and tailgating at NDSU football games.

Eric writes “*The ABEN department at NDSU is a great place to learn. It was also comforting to be around students with similar interests in agriculture yet with the diversity in the crop types they grew up with, not to mention their native geographies which allowed a cross pollination of real world experiences. My advisor, Dr. Steele was there to help with any questions I may have had, even if my focus strayed every so often from my basic educational curriculum. The most impactful thing that I learned from my time in the ABEN department was how to solve problems. I learned to look at a challenge in a step by step fashion and dig deep to find the most basic drivers of the issue. We know this as root cause analysis and it is foundational in engineering. Surprisingly it can be overlooked in the business world where the same principles apply. This approach has served me well as an engineer and as a CEO*”.

Graduations



Congratulations to our Spring 2013 graduates:

- |                       |                   |
|-----------------------|-------------------|
| <b>ABEN</b>           | <b>ASM</b>        |
| Aidarus Abdinasir     | Mitchell Agre     |
| Lisa Bucholz          | Derek Aho         |
| Zane Frick            | Samuel Anderson   |
| Steve Gruber          | Michael Burkle    |
| Jody Hanson           | David Dybdahl     |
| William Knox          | Daniel Eslinger   |
| Jacob Livingston      | Brandon Flynn     |
| Janelle Mauch         | Ryan Heiser       |
| Christopher Mortenson | Jacob Keith       |
| Joshua Seibert        | Samuel Livingston |
| Nolan Swenson         | Tyrell Martin     |
| Nicole Wallace        | John Sandvig      |
|                       | Michael Steeke    |
|                       | Jacob Weinreis    |
|                       | Shane Weller      |
|                       | Christopher Wilke |

Congratulations to our Fall 2013 graduates:

- |                    |                  |
|--------------------|------------------|
| <b>ABEN</b>        | <b>ASM</b>       |
| Calby Beckstrand   | Adam Braegelmann |
| Lucas Laudenschach | Cody Brantner    |
| Derek Olson        | Mitchell Field   |
| Robert Wolsky      | Adam Windjue     |



Congratulations to our Spring 2014 graduates:

- |                    |                    |
|--------------------|--------------------|
| <b>ABEN</b>        | <b>ASM</b>         |
| Hannah Bye         | Michael Backman    |
| Andrew Church      | Marshall Bjorklund |
| Sonny Ehli         | Jared Deutz        |
| Jalen Getting      | Kalen Goeser       |
| James Johnson      | Brandon offer      |
| Connor Kelley      | Ethan Huttunen     |
| Nathan Leingang    | Justin Johnson     |
| Richard Lewis      | Andrew Knox        |
| Tyler Mann         | Jacob Longlet      |
| Katherine McKinnon | Jadon Messer       |
| Derek Olson        | David Staples      |
| Chase Rosenau      | Justin Wehri       |
| Joel Shipley       |                    |
| Eric Vein          |                    |
| David Watson       |                    |
| Nathan Wiese       |                    |
| Thomas Wilen       |                    |
| Derek Zerface      |                    |

Congratulations to our Fall 2014 graduates:

- |                     |                   |
|---------------------|-------------------|
| <b>ABEN</b>         | <b>ASM</b>        |
| Tyler Bergh         | Matthew Dahlke    |
| Jeffrey Dockendorf  | Tanner Martinson  |
| Jacob Hanson        | Nicholas Morrison |
| Jake Hodorff        | Cade Robertson    |
| Christopher Koudela | Andrew Siemon     |
| Thomas Pederson     | Brandon Weber     |
| Elsie Satterfield   |                   |
| Mitchell Sawicki    |                   |



Ashani Samaratunga, pictured with her advisor, Dr. Scott Pryor, passed her M.S. defense. She participated in NDSU graduation commencement December 2013. Ashani joined us in 2011 from Sri Lanka.



Atikur Rahman, PhD successfully completed his PhD dissertation defense and received his PhD degree during NDSU's May 2013 graduation ceremonies. Atikur is congratulated on his success by (from left) Dr. Sreekala Bajwa, Dr. Shafiqur Rahman, Advisor, and Dr. Dean Steele, committee member.

Advisory Board started in 2013



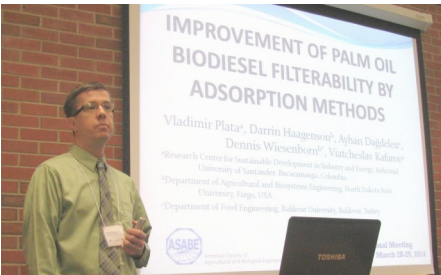
An ABEN advisory board was organized in 2013, and the first meeting of this Board was held in June 2013. There was good attendance from alumni and excellent discussion on ways to enhance collaboration with our constituents and to improve our programs. The meeting focused on teaching,, research and extension programs. The one-day meet-ing was very productive, and the group decided to meet again every 6 months.

EPA administrator Gina McCarthy holds energy policy panel in Bismarck



Dr. Igathi Cannayen participated in a discussion panel headed by Senator Heidi Heitkamp on issues surrounding the Renewable Fuels Standard and the production and use of biofuels as part of the all-of-the-above approach to energy policy. The participants were able to give the administrator a thoughtful overview of how EPA actions impact stakeholder in the renewable fuels industry.

The ASABE intersectional meeting was held at SD State on Mar. 28-29, 2014



Field Day: Agricultural Drainage Water Management & Subirrigation



Xinhua Jia, Tom Scherer & Dean Steele gave a presentation to tile drainage construction companies, farmers, Natural Resources management and other water management specialists. Participants were taken to the subirrigation research site at Gerry Zimmerman's farm by Kragnes, MN.



X. Jia



T. Scherer



D. Steele

FFA

Each year ABEN faculty and staff assist with four North Dakota and Minnesota FFA contests. Minnesota Region III Ag Mechanics, Advanced, Intermediate and Basic Ag Mechanics involve 250+ students. The contest includes written and hands on tests.

The top individuals and teams go on to compete in state and national competitions. Winners may also receive tool sets.



Elton Solseng working with an FFA student.



65th Annual Agricultural Technology Exposition

Growing a New Tomorrow, 2013

Every February for the past 64 years, the Ag Tech Expo has given students the opportunity to showcase their knowledge by presenting projects dealing with technology and agriculture. Over \$1000 in scholarships are typically awarded.

Power Div.

1st: Hydraulic System Maintenance & Care for Agricultural Equipment; Matthew Dahlke; 2nd: TECHstar CVT Transmission; Benjamin Dingmann, Zach Canton, Adam Billings; 3rd: Adjusting Hydraulics for Different Attachments on a Skidsteer; John Sandvig.

Machinery Div.

1st: Kinze Autonomous Grain Cart; Tyson Pfungsten; 2nd: John Deere D-Series Skid Steers; Alex Krebsbach; 3rd: Versatile RT 490 Class 9 Com-

bine; Logan Miller & Nick Steffl.

Precision Ag Div.

1st- Canola Oil; Isaac Bower, Scott Cowan, Brett Wilson; 2nd: Field Drainage Tile; Tanne Perhus, Ryan Johnson, Ted Brandt; 3rd: Accelerated Genetic Intervention; Jonathan Ketterling.

Structures, Electrical Power, and Processing Div.

1st: Low Cost Milking Parlor; Kalli Berning; 2nd: Fertilizer Oil System; Dan Bjertness, Austin Nyhof, Caylor Rosenau; 3rd: Grain Bin Safety; Karl Kenner, Thomas Peterson.

Freshman Champion Canola Oil

Reserve Champion Hydraulic System Maintenance & Care for Agricultural Equipment; Matthew Dahlke.

Senior Design Champion Design & Evaluation of a Sunflower Dehuller to Aid in Precision Planting

Grand Champion Canola Oil



Grand Champions: Isaac Bower, Scott Cowan, Brett Wilson



Senior Design Champions: Jody Hanson, Janelle Mauch, Lisa Buchholz

66th Annual Agricultural Technology Exposition

Harvesting Our Potential, 2014

As always, our students planned, organized and ran a very successful expo. Projects were outstanding and diverse.

Power Div.

1st: John Deere Tier 4 Engine; Joseph Burner, James Johnson and Even Robertson; 2nd: ASM Club H John Deere; Benjamin Dingmann and Nick Steffl; 3rd: John Deere 8360R Tractor; Matthew Luther, Ben Mattson and Ryan Thompson.

Machinery Div.

1st: Round Baler Comparisons; Kade Karsky, Chance Moran and Zachary Rhone; 2nd: Auger Hopper Walker; Kelan Goeser and Cody Jenson; 3rd: Erskine Post Driver; Payton Lautenschlager.

Precision Ag Div.

1st: Chemical Drift Control; Kade Hilde, Yuri Johnson and Christian Ogaard; 2nd: Trimble CFX 750 Guidance Monitor; Daniel Deck; 3rd:

Seed Monitory System; Justin Wehri.

Structures, Electrical Power and Processing Div.

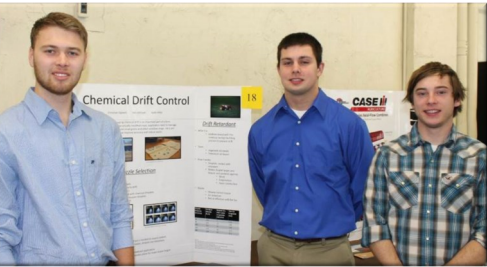
1st: Maple Syrup Production; Tyler Cebulla; 2nd: Grain Engulfment Rescue Tubes; Scott Peterson; 3rd: Vertical Farming; Justin Kiesow and Jason Klebe.

Freshman Champion Hydraulic Fracturing and the Environment; Logan Brink and Brady Schmitz

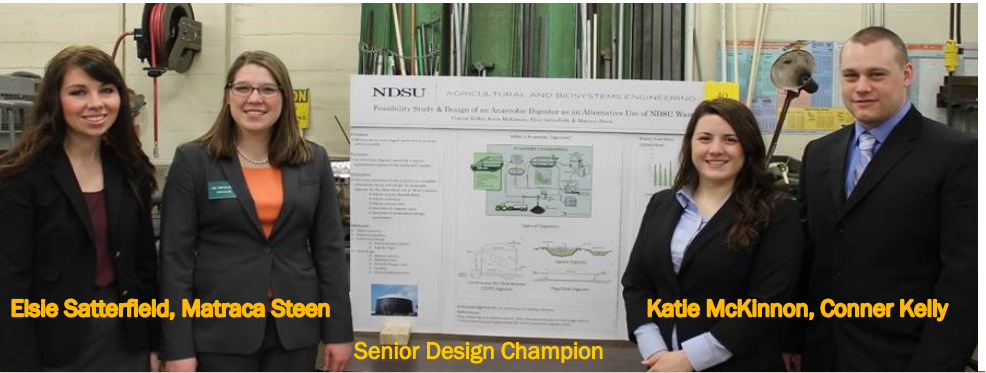
Reserve Champion Round Baler Comparisons.

Senior Design Champion Feasibility Study and Designs of an Anaerobic

Digester for Alternative Use of NDSU Waste; Matraca Steen, Elsie Satterfield, Katie McKinnon and Conner Kelly.



Grand Champion: Christian Ogaard, Yuri Johnson, Kade Hilde



Elsie Satterfield, Matraca Steen

Senior Design Champion

Katie McKinnon, Conner Kelly

ABEN Senior Design Projects

Teams	2013 Projects	Sponsoring Organization
Chad Sietsema Andrew Kuch Nathaniel Holmes	Design, Construction and Implementation of a Lab Scale Algae Photobioreactor	Dr. Shafiqur Rahman ABEN Faculty
Jesse Jangula Jason Pecka Ethan Dick	Development of an Electronic Seed Singulation Device	Titan Machinery West Fargo, ND
Joshua Feil Ethan Liebswager Blake Wagner	Energy Beet Crushing and Juice Extraction for Bio-fuels Production	Dr. Igathi Cannayen Dr. Dennis Wiesenborn ABEN faculty
Steve Gruber Michael Woodbury Adam Borgerding	The Use of Urethane Arm on Gate Coulter Disk	Gates Manufacturing Lansford, ND
John Morman Daniel Merrit	Water and Salt Recovery Vs Atmospheric Dis-charge and Land Filling Feasibility Analysis	Red River Commodities Inc. Fargo, ND
Jody Hanson Janelle Mauch Lisa Buchholz	Design and Evaluation of a Sunflower Dehuller to Aid in Precision Planting	National Sunflower Association ABEN faculty, lead by Dr. Dennis Wiesenborn

Teams	2014 Projects	Sponsoring Organization
Elsie Satterfield Connor Kelley Katherine McKinnon Matraca Steen	Feasibility Study and Design of an Anaerobic Di-gester as an Alternative Use of NDSU Waste	Dr. Scott Pryor ABEN Faculty
Hannah Bye Tyler Mann Joel Shipley	Design of a Soil Penetrometer to Reach a Depth of 48 inches	Advisor: John Nowatzki ABEN Extension
Sonny Ehli Jacob Hanson Nathan Leingang Chase Rosenau David Watson Derek Zerface	Development of Powertrain, Structural, and Elec-trical Components of a Small Engine Test Stand	Dr. Tom Bon ABEN Faculty
Andrew Church Richard Lewis Thomas Wilen Tyler Bergh	Large Round Bale Grapple Developed to Improve Bale Handling Ability with Compact Equipment	Matthew Kaldor, PE Product Development Mgr.

International Collaboration

**Dr. Marat Khazimov**, Professor of Engineering in Kazakh National Agrarian University (KazNAU) Almaty, Kazakhstan, led a group of Graduate Students from KazNAU for a month visit to NDSU in November 2013, hosted by Dr. Ganesh Bora. Dr. Khazimov was part of the Kazakhstan Delegation to Big Iron in 2007, which led to further under-standing between NDSU and KazNAU, formally establishing MOU between the two universities and NDSU facul-ties co-supervising Ph.D. students in KazNAU. He and other faculty mem-bers from KazNAU, extensively collab-orates with ABEN faculty members specially Dr. Bora and Dr. Tom Bon.



(Left to Right); Dr. Marat Khazimov, Dr. Bajwa, Ms. Ultanova Ingkar, Dr. Bon, Mr. Danabek Nurzhan, Ms. Akhmetkanova Gulnar, Mr. Lazyuta Mikhail and Mr. Khazimov Kanat

ABEN Faculty members invited to teach in Kazakhstan

Dr. Ganesh Bora and Dr. Tom Bon visited Kazakh National Agrarian University (KazNAU), Almaty, Kazakhstan in May – June, 2013 to teach courses on Advanced Agricultural Technology Management. They are also co-supervising PhD students in KazNAU. Their visit also coincided with visit of NDSU’s Vice President for Agricultural Affairs to KazNAU to renew the existing MoU between the two universities. ABEN hosted one Professor, two PhD and three master students from KazNAU in November 2013.



Dr. Shafiqur Rahman visits Çanakkale Onsekiz Mart and Namik Kemal Universities in Turkey

Dr. Shafiqur Rahman visited Çanakkale Onsekiz Mart Üniversitesi (COMU), Çanakkale, Turkey, and Namik Kemal University, Tekirdağ, Turkey from May 31 to June 9. During that time he presented his research to both universities and onducted collaborative research at COMU with Dr. Unal Kizil.

Dr. Halis Simsek visits Balıkesir, Namik Kemal, and Selçuk Universities in Turkey

Dr. Simsek’s group met with the university president, vice president and many faculty members. They presented our research and provided information about NDSU, ABEN for future collaboration. Dr. Sreekala Bajwa presented her research and ABEN facts online from NDSU. Based on their visit to Selçuk University, the president and vice president of Selçuk University will visiti NDSU to sign an agreement between Selcuk University and NDSU.

Dr. Wiesenborn Visits China



I had the good fortune to spend four weeks at Jinan University in Guangzhou, China late last Fall. This was a “mini-sabbatical,” and a wonderful opportunity to build on professional ties in an increasingly important part of the world. China is already home to some of my family. All of my international exchanges have been positive experiences, and Chinese

hospitality is second to none.

My main teaching assignment was three classes a week on food engineering principles for students in the Food Quality & Safety Bachelor’s Degree program. This program is offered under the International School of Jinan University, thus all of my lectures were delivered in English without a translator. Most of the students appeared to understand me just fine. But they were taken aback when I asked them to come to the front of the classroom on that first day to say their names and pose for a photo; they were amazed that I wanted to learn their names. The biggest teaching challenge was that the “three” classes were scheduled back-to-back (45 minutes each with 10 minute breaks) on Monday nights! Food engineering classes are difficult for non-engineering students even when spread out across three separate days, so this schedule was initially a big concern to me. My first night of teaching was not something I am proud of, but I adapted to this schedule.

My stay provided very good opportunities to get to know Dean Shiyi Ou and Professor Yong (York) Wang and their graduate students. Faculty and students at Jinan work more closely together within formal teams, compared to my experience in the US, and grad students are often expected to socialize together within their teams outside of work hours. Not uncommonly, such as in the case of one gathering that Diane and I attended, everyone takes a turn or two at karaoke! Professor Wang and I share a particular interest in biodiesel and other non-food products from vegetable oil. China is investing heavily in research in many areas, and providing travel grants to enable faculty and students to conduct research internships abroad. One of Professor Wang’s students, Sun Guo, will spend 6 months with us beginning in August, as she continues her development of a biolubricant from waste cooking oil.



Source: Wikipedia

My city (Guangzhou) lies in a part of southeast China known as the Pearl River Delta. This is truly a megalopolis! Guangzhou is a city of 14 million inhabitants, and sits elbow-to-elbow with a string of cities (extending even to Hong Kong) with a combined population of 57 million. So most of the inhabitants live in high-rise apartments and rely on mass transit. Certainly, this population density poses huge challenges. But Guangzhou is a livable city with many, large parks; a vast, efficient subway system; and an endlessly fascinating blend of traditional and ultramodern architecture. People function well with such patience, fortitude and good will, it gives me hope for the world and its growing population.



Dr. Wiesenborn with his family on a side trip to Qingdao Harbor (NE China)

Scholarship recipients 2013–2014

College of Engineering and Architecture  
Lawrence & Elizabeth Shaw Scholarship  
Matraca Steen  
Thomas Pederson  
Lucas Salfer

AGCO Scholarship  
Nathan Wiese  
Jalen Getting

Ernie French Scholarship  
David Watson

Marvin and Doris Jensen Scholarship  
Hannah Bye

Frank Mirgain Scholarship (Combined with ABEN)

College of Agriculture, Food Systems,  
and Natural Resources  
Vernon Lee Scholarship  
Cade Robertson  
Michael Backman

ABEN/ASM SCHOLARSHIPS  
A.R. Bon Memorial Scholarship  
Kalli Berning  
E.L. Bon Memorial Scholarship  
Justin Johnson

Holman-Breuer Scholarship  
Calby Beckstrand  
Shane Maas

Walter & Pearl Nyquist Scholarship  
Matthew Dahlke

Bill & Ann (Wick) Promersberger Scholarship  
Andrew Knox

ABEN Department Scholarship  
McKenzie Ernst,  
Wyatt Cameron  
Aaron Rekken  
Jonathan Ketterling  
Evan Robertson  
Logan Miller  
Yuri Johnson

ABEN Graduate Student  
Frank Bain Agricultural Scholarship  
Kelsey Kolars  
Dhan Gautam

Caterpillar Scholarships  
Matraca Steen  
Tom Peterson  
Hannah Bye  
Nathan Wiese



Club Officers 2013–2014

ASABE Club Officers  
President: Richard Lewis  
Vice President: Matraca Steen  
Secretary: David Watson  
Treasurer: Jacob Hanson  
Advancement of Agriculture Committee Representative:  
Doug Lee  
College of Engineering and Architecture Representative:  
Kalli Berning  
Congress of Student Organizations (CSO) Representative:  
Matt Mortenson  
Head Scribe: Jeff Dockendorf  
Scribes: Lucas Salfer, Derek Zerface  
Advisors: Dr. Bon, Halis Simsek

ASM Club Officers  
President – Brandon Hofer  
Vice President – Matthew Dahlke  
Secretary – Scott Pederson  
Treasurer – Ryan Monsen  
Advisor Elton Solseng

Bison Pullers Officers  
President: Derek Zerface  
Vice President: Douglas Lee  
Secretary: David Watson  
Treasurer: Matthew Mortenson  
Public Relations Chair: Christopher Fedje  
Advisor: Dr. Tom Bon  
Alpha Epsilon Officers  
President – Juan Vargas-Ramirez  
Vice President – Harjot Sidhu  
Treasurer – Ewumbua Monono  
Advisor Dr. Scott Pryor



Club Officers 2014–2015

ASABE Club Officers  
President: Matraca Steen  
Vice-President: Tyler Cebulla  
Treasurer: Ryan LaCanne  
Secretary: Kalli Berning  
Head Scribes: Lucas Salfer  
Scribes: Doug Lee, Megan Thormodson  
Andrew Praus, Isaac Bower  
Advisors: Dr. Bon, Halis Simsek

ASM Club Officers  
President – Evan Robertson  
Vice President – Ryan Monson  
Secretary – Logan Smith  
Treasurer – Nick Steffl  
CSO – Cade Robertson (fall); Joe Burner (spring)  
Advisor Elton Solseng

Bison Pullers Officers  
President: Matthew Mortenson  
Vice President: Tim Novak  
Secretary: Aryel Smith  
Treasurer: Tyler Cebulla  
Public Relations Co/Chairs: Aryel Smith, Andrew Praus  
Public Relations Committee: Andrew Whalen, Doug Lee, Jesse Cickavage  
Advisor: Dr. Tom Bon

Alpha Epsilon Officers  
President – Dhan Gautum  
Vice President – Anthony Wamono  
Treasurer – Matraca Steen  
Advisor Dr. Scott Pryor



## ASM Club Activities

The ASM Club started the year, as in the past, with an outing to Thunder Road for go-karting. ASM members worked on tractors to drive in the Homecoming Parade. New tractors were added and everything was organized, but then the parade was canceled due to weather issues. So they created their own parade around Campus.

Work progressed on the two JD H tractors. Several speakers presented at meeting and students arranged tour of local companies. The club was involved with the Ag Tech Expo, the spring and fall picnics and the lawn mower/snowblower clinic. To help finance the tractor project they work at the Rodeo at the Fargo Dome.

## Bison Pullers Rank #1 in Maneuverability, 2013



Team members are Chris Fedje, Matt Mortenson, and Nolan Swenson

Bison Pullers participated in the 2013 Quarter Scale Tractor Pull Competition in Peoria, IL. They were ranked number one in tractor maneuverability test, and took 16<sup>th</sup> position in overall ranking. Twenty-nine teams from universities across North America vied for prizes and global recognition for their design innovations in the 16th Annual International Student Design Competition, sponsored by the American Society of Agricultural and Biological Engineers (ASABE). The event was held May 30-June 2, at the Expo Gardens in Peoria, Ill. Corporate sponsors are AGCO, Briggs & Stratton, Case IH, Caterpillar, Deere & Company, New Holland, Solidworks and Titan.

Each team gets one 31-hp Briggs and Stratton Vanguard Big Block Engine and a set of Titan tires; they acquire all other components. Tractors run on a 10% ethanol fuel blend.

## Pumpkin Carving a “Ghoul” Time for the Student Clubs



The students of the ASM Club, ASABE, Alpha Epsilon and Bison Pullers enjoyed an evening of creativity and dirty hands! The students, using their own designs, worked diligently on carving, cleaning and lighting the large pumpkins.

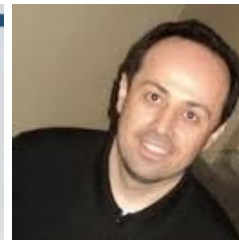
The ABEN building was very festive for Halloween!



## Visiting Scientists



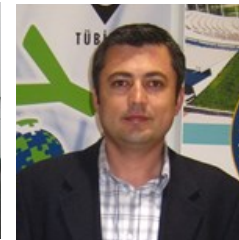
M. Maharlooei



M. Serhat Odabas



Dr. Zhou



Dr. Dağdelen



Dr. Lee



V. Plata-Chavez

**Mahommadmehdi Maharlooei, (Reza)**, Shiraz University, Shiraz, Iran, was awarded a scholarship by the Ministry of Science, Research and Technology of Iran in 2012 to visit NDSU as a visiting scholar. He is continuing his research in Precision Agriculture. Dr. Bajwa

**Mehmet Serhat Odabas**, Professor, Ondokuz Mayıs University, Vocational School of Bafra, Bafra, Samsun, Turkey - Sreekala Bajwa & John Nowatzki

**Dr. Haibo Zhou**, Associate Professor, Dept. of Agriculture Engineering, College of Mechanical Engineering, Jiamusi University, China - Shafiqur Rahman

**Yrd. Doç. Dr. Ayhan DAĞDELEN**, Balıkesir Üniversitesi Bandırma MYO. Dennis Wiesenborn

**Dr. K. N. Tiwari**, Indian Inst. of Tech., Kharagpur, India. Sreekala Bajwa

**Dr. Myung-Gyu Lee** visiting Professor from the Dept. of Environmental Engineering, Sangji University, South Korea August 2014. Shafiqur Rahman.

**Vladimir Plata-Chavez**, Industrial University of Santander, Colombia. PhD student in Chemical Engineering. Dennis Wiesenborn. May to Dec. 2013

**Dr. Dechang Wang**, Assistant Professor, School of Electromechanical Engineering, Qingdao University, China, 11/2012-04/2013 (Co-supervised with Dr. Sumathy Krishnan & Dr. Shafiqur Rahman)

**Assoc. Prof. Gülcan ÖZKAN**, Food Engineering Professor, Süleyman Demirel University, Turkey - July 2014 to September 2014

**Dr. Sarkynov Yerbol**, Dean of Engineering, Kazakh National Agrarian University, Kazakhstan. - 09/08/2014 - 09/22/2014. Dr. Shafiqur Rahman

**Ms. Aldiyarova Ainura**, Kazakh National Agrarian University, Kazakhstan. - 09/08/2014 - 09/22/2014. Dr. Shafiqur Rahman

**Mr. Zulpykharov Bauyrzhan**, Kazakh National Agrarian University, Kazakhstan. - 09/08/2014 - 09/22/2014. Dr. Shafiqur Rahman

**Mr. Akimzhanov Darkhan**, Kazakh National Agrarian University, Kazakhstan. - 09/08/2014 - 09/22/2014. Dr. Shafiqur Rahman

## 2013 North Dakota Water Resources Research Institute Graduate Fellowships Awarded

**Kyle Horntvedt** is an M.S. student in ABEN at NDSU, Dr. Xinhua Jia, advisor. He graduated with his B.S. degree in Civil Engineering NDSU, with a focus in water resources. Kyle is working on a research project funded by the USDA-Sustainable Agriculture and Research Education (SARE) grant, titled “Effect of optimal water management for sustainable and profitable crop production and improvement of water quality in the Red River Valley”, focusing on subsurface drainage and subirrigation at the field scale.

**Kelsey Kolars** is an M.S. graduate student in ABEN at NDSU, Dr. Xinhua Jia, advisor. Kelsey holds a BS degree in Mathematics from NDSU. She is researching the relationship of water tables to crop water consumption by measuring water table levels, soil moisture, irrigation and drainage variables, and weather data. She will incorporate her findings into a new application for subsurface drainage and subirrigation water management.

**Mengqi (Ivy) Xiong**, an M.S. student who Dr. Zhulu Lin co-advises with Dr. G. Padmanaban from the Civil Engineering Department.



## NDSU Development Foundation grants endowment



**Saravanan Sivarajan**, Research Associate, Agricultural and Biosystems Engineering, received the Board of Trustee Endowment. Congratulations Saravanan!

## Harjot Sidhu featured in 3D Printing Showcase



**Harjot Sidhu** was featured in the 3D Printing Showcase on October 20 2014. **3D Printing and practical uses with agriculture.** Harjot discussed her grooved feeding extension she created for a sunflower seed huller.

## Graduate Student Juan Vargas-Ramirez award the Graduate Student Teaching Award of Merit, 2014



Juan Vargas-Ramirez, graduate student under the supervision of Dr. Dennis Wiesenborn was presented by Dr. Sreekala Bajwa at the Spring picnic with the 2014 “Graduate Student Teaching Award of Merit” sponsored by the North American Colleges and Teachers of Agriculture (NACTA) and the College of Agriculture, Food Systems & Natural Resources.

Juan will be completing his Doctorate in August 2015, and will begin Post-doc work for Dr. Scott Pryor following the completion of his degree.

Congratulations Juan!

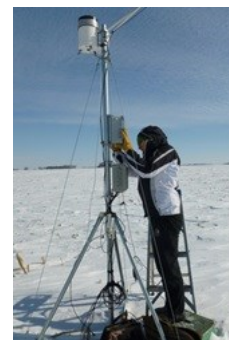
## Debjit Roy receives 2014 ND WRRRI Fellowship—Snowmelt water infiltration into frozen soil in Red River of the North Basin”



**Debjit Roy** joined ABEN in 2013 as a Ph.D. student. He earned his M.Sc. Engineering degree in Water Resources Engineering from Bangladesh University of Engineering and Technology. His advisor is Dr. Xinhua Jia. His supervisory committee members are Drs. Dean Steele and Zhulu Lin of ABEN, and Dr. Xuefeng (Michael) Chu of Civil

and Environmental Engineering. He has been working with other team members on calibration and installation of field equipment, collection and processing of research data as well as various field activities in an USDA Sustainable Agriculture Research and Education (SARE) funded project, “Effect of optimal water management for sustainable and profitable crop production and improvement of water quality in Red River Valley”. He conducted field observations for crop growth and soil analysis for physical parameters on a project funded by ND Corn Council, “Using plastic and biodegradable mulches to improve corn production in North Dakota”. Prior to joining NDSU, Debjit was serving as Senior Scientific Officer at Irrigation and Water Management Division in Bangladesh Rice Research Institute (BRRI), a government research organization. He has been doing research there since 2007. His major responsibilities were on conducting field experiments, data collection and data analysis, new experimental program planning, design and setup, field visit and survey.

## Kelsey Kolars receives 2014 ND WRRRI Fellowship-Development of a Model for Subsurface Drainage and Subirrigation Water Management Decisions



The research project will focus on subsurface drainage and subirrigation water management by modifying the Checkbook irrigation method. The specific objectives of the study are to: 1. Determine the relationships between shallow water tables and crop water consumption. 2. Develop net irrigation amount using field measured water table, soil moisture, irrigation/drainage, and weather data. 3. Incorporate SI and SSD into the modified Checkbook method for a best water management practice for SSD and SI systems.

## Anthony Wamono receives 2014 ND WRRRI Fellowship—Effects of calcium based surface amendments on the hydraulic conductivity and selected physical properties of subsurface drained sodic-saline soils



**Anthony W. Wamono** is a Ph.D. student advised by Drs. Dean Steele and Zhulu Lin at Agricultural and Biosystems Engineering Department. He is working on the “Effects of calcium based surface amendments on the hydraulic conductivity and selected physical properties of subsurface drained sodic-saline soils” for his thesis topic. He has a MS in Environmental and Conservation Science from NDSU,

where he evaluated the influence pore size and surface charge on filtration process of nitrate ions in bentonite clays, and modeled nitrate breakthrough effluent concentrations through the membranes. Anthony got his bachelor’s degree in Agricultural Engineering at Makerere University Kampala, Uganda in his home country. Prior to joining NDSU, he worked with ministry of water and environment, Uganda, as the technical officer for Eastern Umbrella of water and sanitation.

## Jingyi Sun receives 2014 ND WRRRI Fellowship - Evaluation of Bioavailable Dissolved Organic Nitrogen Using Various Algal Species



**Jingyi Sun** obtained B.S degree in Water and Wastewater Engineering from Beijing University of Civil Engineering and Architecture, Beijing, China in June 2013. During B.S. education, she was an exchange student in Civil Engineering Department at NDSU from August 2012 to May 2013. From August 2013, she became an M.S. student in Agricultural & Biosystems

Engineering at NDSU. Her research focus is to evaluate bioavailability of dissolved organic nitrogen using various types of algae for samples obtained from two different wastewater treatment plants (WWTPs) and animal feedlots.