

FACULTY & STAFF

FACULTY

Thomas A. Bon
Ganesh Bora
Ighathinathane Cannanayen
Kenneth J. Hellevang
Xinhua Jia
Zhulu Lin
Scott W. Pryor
Shafiqur Rahman
Thomas F. Scherer
Elton G. Solseng
Dean D. Steele
James Venette
Dennis P. Wiesenborn

ACADEMIC STAFF

Roxanne Johnson
John F. Nowatzki
Carl Pedersen
Bradley J. Schmidt

STAFF

Jana Daeuber
Myron Flaagan
Darrin Haagenson
Dongqing Lin
James Moos
Nurun Nahar
Janelle Quam
Lori Sholts
Nancy Stroh
Sheldon Tuscherer

PROFESSOR EMERITUS

Leslie F. Backer
Lowell A. Disrud
Harvey J. Hirning
Vern L. Hofman
Henry L. Kucera
James A. Lindley
Darnell Lundstrom
George L. Pratt
Earl C. Stegman

ADJUNCT PROFESSOR

Robert G. Evans

MARK YOUR CALENDAR

MARCH

14-18 ... Spring Break Week
29-31 ... Extension Spring
Conf., Fargo, ND

APRIL

22-25 ... Holiday/Recess

MAY

6..... Last day spring classes
13..... Graduate/Professional
Spring Com-
mencement, 4 p.m.,
Fargodome
14..... Undergraduate
Student Spring
Commencement
10 a.m., Fargodome
17..... Summer classes begin
30..... Memorial Day Holiday

JUNE

2-5 1/4-Scale Tractor Intl.
Student Design
Competition,
Peoria, IL

JULY

4..... Independence Day
Holiday

AUGUST

7-11..... 2011 ASABE Annual
International Meeting,
Louisville, KY
22..... First day fall classes

DEPARTMENT OF AGRICULTURAL AND BIOSYSTEMS ENGINEERING

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NDSU
Extension Service

Academic Programs:

Agricultural and
Biosystems Engineering

College of Engineering
and Architecture

Agricultural
Systems Management

College of Agriculture,
Food Systems, and
Natural Resources

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Interim Chair Comments



James Venette

Greetings,

It is my distinct pleasure to contribute to the February, 2011 department newsletter. In July, 2010, I agreed to serve as Interim Chair of the Department, following the retirement of Les Backer and during the search for a new chair. I also retained my responsibilities as Associate Dean for the college. Both of these positions are full-time jobs, and I appreciate the professionalism and support provided by the faculty, staff and students of the department that has made my interim chairmanship possible.

I also have a deeper appreciation for the consistent and progressive leadership that Les provided. We thank Professor Backer for his 34 years of service to the department, to two colleges (College of Agriculture, Food Systems, and Natural Resources, and College of Engineering and Architecture), to the North Dakota Agricultural Experiment Station, and to the NDSU Extension Service, as a faculty member and administrator. He continues as a supporter of a number of departmental activities and a trusted advisor. His incredible knowledge of alumni activities and industry partnerships is irreplaceable.

A search committee identified a candidate for the chair position. An interview was completed in late January, and we are waiting for the decisions. Please check the department website for updates. www.ndsu.edu/aben

As interim chair, I have had the opportunity to learn more about the faculty, staff, and students who have brought distinction to the department. I have watched the faculty transition to new teaching assignments, build curriculum that is relevant and effective, and embark on new research projects that deal with issues important to the future of agriculture. I have new appreciation for the linkages the department has with other academic programs, with industry, and with alumni who have contributed to the success of the department and play a critical role in the future of the department.

The skills of agricultural and biosystems engineers and of agricultural systems managers remain critically important. All of agriculture is facing considerable challenges. World population growth, limitations in the factors of production, economics, and changing social/political structures are among the forces that are requiring more efficient production of food, feed, fiber, and fuels. Our faculty members and their associates, often in collaboration with colleagues from other disciplines, are seeking ways to improve the efficiency and sustainability of agricultural systems especially as external limitations become more acute. Their success is essential. The methods our researchers use in discovery and application elevate the academic experiences of our students. In this way we grow and insure that our students and innovations are fit for their future.

I am pleased to report that the department is strong, vibrant, growing and optimistic about the future. Enrollment has remained strong with nearly 90 students in each the ABEN and ASM programs. Employment of our graduates also remains high. The 2010 employment report notes placement rates of 100% for ASM graduates and 88% of ABEN graduates, well above the college totals of 74% and 68% respectively.

The faculty is energized and dedicated. Their achievements are impressive and a few are noted, but it is perhaps their day-to-day contributions to the educational, research, governance, and collaborative mission of the department that will have the greatest and farthest-reaching impact.

Graduates are successful. Many alumni have shared their success stories, and we thank them for keeping us updated. Some of our alumni received special recognition (e.g., Steve Edwardson, Cary Slominski, Matthew Wold) that we hope you enjoy reading about.

Change is happening. NDSU is now led by President Dean Bresciani and his administrative restructuring is underway. A budget shortfall at the University level has restricted academic programs and has limited hires in academic positions. Improvements have been made to research facilities especially for bioprocess engineering (in the pilot plant) and for livestock waste management (in Waldron Hall), which means departmental facilities continue to be spread across campus. Dr. Suranjan Panigrahi elected to retain his position at Purdue, and Dr. Ganesh Bora was named interim director of the Bio-Imaging and Sensing Center that Panigrahi formerly led. Janelle Quam resigned her position as Student Services Technician in the department to assume new responsibilities as assistant to the Dean of the College and Director of the ND Agricultural Experiment Station. Administrative staff in the main office are reviewing duties and defining positions as we seek to move forward. The entry to the ABEN building now showcases a portion of the 112-piece miniature farm equipment collection graciously donated to the department by NDSU Alumnus, Dave Sola (1974). New keyless entry locks have been installed to improve student access to the building and to students' rooms while maintaining a high degree of security.

I hope you enjoy the 2011 issue of the NDSU ABEN newsletter. As always, you are more than welcome to stop by for a visit. The faculty and staff enjoy the opportunity to hear from you. Thanks for your continued support.

James Venette

Department News

Leslie Backer, Department Chair, Retires



Leslie and Cathy Backer

Leslie F. Backer, Department Chair, retired June 30, 2010 after a 34-year career at North Dakota State University.

Les has been associated with NDSU for much of the past 46 years, beginning as an undergraduate student in 1964. He graduated with a bachelor's degree in agricultural engineering in 1969 and earned a Master of Science degree from NDSU in 1971. He returned to NDSU as assistant professor in 1976.

Les has conducted and supervised research in the areas of crop storage and conditioning, site-specific sugarbeet yield monitoring, vegetable oil processing for biofuels, tractor performance

and usage monitoring, and crop sprayer efficiency. His early work resulted in the current practice used by American Crystal Sugar Co. in ventilating and freezing sugarbeets to extend the processing time in the Red River Valley.

Although his primary appointment was with the North Dakota Agricultural Experiment Station, Leslie had heavy teaching, advising and recruitment responsibilities. He developed five new courses in the Agricultural and Biosystems Engineering and Agricultural Systems Management programs. He typically taught 14-17 credits per year and advised 30-50 undergraduate students in these programs each semester in addition to graduate students. He earned College of Engineering and Architecture and College of Agriculture, Food Systems, and Natural Resources awards for teaching excellence and the College of Agriculture, Food Systems, and Natural Resources Advising Award.

What I have enjoyed most about my time at NDSU as an educator is recruiting students into our programs, helping them through their struggles and watching them grow and mature... and knowing that I may have played some small role in making that happen.

Leslie F. Backer

He served as interim chair of the Department of Agricultural and Biosystems Engineering from 1990-91, was named interim chair in 2003 and chair in 2004. During his tenure as chair, faculty numbers increased from eight to 14. Undergraduate enrollment in the Agricultural Systems Management program increased from about 40 to near 80 and in the Agricultural and Biosystems Engineering program from about 60 to 100. Graduate student numbers have about doubled.

Les' wife, Cathy, also retired from NDSU on June 30. Cathy worked at NDSU from 1967-69 and returned in 1982.

In Memoriam...

Charles Moilanen



Charles "Chuck" Moilanen (MS AM 1963, BS AM 1953), 79, died August 23, 2010, at his home under the care of Hospice of the Red River Valley. Charles attended country school and

graduated from Brocket High School. He then attended North Dakota Agricultural College (now NDSU) and served in the Air Force from 1953 to 1955. He married Erva Rainsberry in Lakota, ND and taught in Rolla, ND. They later moved to Fargo, where he taught at NDSU and received his Master's Degree in Agricultural Mechanization. Chuck taught courses on ag mechanics, farm electricity and electronics, and landscape construction. He retired from NDSU in 1992. Chuck and his wife enjoyed 18 years of retirement living in North Fargo and wintering occasionally in Arizona. Chuck touched many lives through volunteering at the American Legion Bike Shop, Hope Lutheran Church and local food pantry. He also stayed busy looming rugs, creating stained glass, gardening and fixing "everything." He is survived by his wife, Erva, five daughters, a brother, three sisters, and seven grandchildren.

Obituaries - Department Alumni



Darin Billing (BS AE 1991), 43, passed away July 12, 2010 at his home in Bismarck. He graduated from Fertile Beltrami High School in 1985 and worked on the family farm until 1991 when he graduated from NDSU with a degree in agricultural engineering. He worked for the State of North Dakota Health Department as an Environmental Engineer until the time of his death. Darin and his wife, Shelly, had one daughter, Taylor.



Ward R. Eichhorst (BS AM 1985, MS AM 1989), 46, passed away on May 27, 2010. Ward worked as a loan officer with the USDA Rural Development in Minnesota for ten years before he and his wife, Tania, moved to Coleharbor, ND to farm. He was active in the North Dakota Farm Bureau and participated in the initial trade mission to Cuba. He was the 25th recipient of the NDSU Agricultural Award for McLean County, and he and Tania were 2007 Harvest Bowl honorees. He and his wife had four children.



Peter "Pete" Lazorenko (BS AE 1959), 81, died on May 26, 2010 in West Fargo, ND. Pete served in the U.S. Army in Korea from 1952 until 1955. He worked for John Deere at the research center in Cedar Falls, IA. He returned to the Red River Valley to work for Pierce Incorporated. He and his wife, Joan lived in Moorhead, MN and Grand Forks, ND for 20 years before moving back to Moorhead in 1990 and then to West Fargo in 1996. In later years he managed properties for Loren Pierce. Pete was an active member of the Lions Clubs in Grand Forks and West Fargo.



Raymond Maas (BS AE 1959), 73, died on May 22, 2010 after a lengthy battle with cancer. Ray was a lifelong supporter of the Agricultural Engineering Department. He was awarded an honorary Alpha Epsilon membership in 2008. Ray worked for Ulteig Engineers before being recruited by Adams, Inc. as an HVAC Engineer. He started his own business, Environmental Control, Inc. (ECI) in 1977. ECI had branches in Fargo, ND, Bismarck, ND, and Rapid City, SD. ECI was purchased in 1983 by Baker Wholesale and Ray later became Fargo branch manager. Effective Concepts, LLC was started in 1991 by Ray and his son, Craig. Ray loved running this energy consulting and lighting sales firm. Ray is survived by his wife of 52 years, Charlotte, two children, three grandchildren, and two sisters.



Lee L. Palmer (BS AE 1950), 81, passed away May 17, 2010. Lee joined the Air Force during the Korean War and was based at Adak Island in the Aleutian Islands. He established the first Air Force Radio Outpost at Point Barrow, the farthest northern point of the U.S. In 1955, Lee and his wife, Marlene moved to Minneapolis and Lee managed the Broaster in Robbinsdale. At the same time, he went to the University of Minnesota and earned a Bachelor's degree in business. He worked in College Food Service Management for 12 years. The Palmers later bought the Restwell Motel and Distinctive Catering in Farmington, MN. They retired from the motel after 29 years. Lee was an active Lions member and was a layman minister for Community of Christ Church in Minneapolis, MN.

Department Highlights

Faculty, Staff & Student Recognition

Thomas Bon

- Recipient of a Fulbright Scholarship to Uzbekistan
- Promoted to Associate Professor of Practice

Igathi Cannayen

- Top 25 Hottest Articles Citations - 3 articles recognized

Scott Pryor

- Outstanding Reviewer, Biological Engineering div., ASABE, June, 2010
- Honorary Research Scientist (Bioenergy Conversion), Bio-energy Crop Research Center, National Institute of Crop Science, Rural Development Administration, South Korea

Janelle Quam

- Rick and Jody Burgum Staff Award nominee, 2010 Ag Faculty/Staff Awards

Thomas Scherer

- Innovation in GIS Award, Mid-America GIS Consortium (MAGIC)

Lori Sholts

- Five Years of Service, NDSU

Elton Solseng

- VIP award, North Dakota FFA, June, 2010

Ishara Rijal, Graduate Student

- Graduate Research Fellowship, North Dakota Water Resources Institute

Pryor Named Outstanding Reviewer



Scott Pryor, assistant professor, was named an outstanding reviewer for the biological engineering division of the American Society of Agricultural and Biological Engineers for his work in reviewing articles submitted for journal publication.

Each year only 10 to 11 reviewers are recognized by ASABE for their outstanding contributions. More than 900 reviewers participate each year.

Associate editors, who select the reviewers for each article, rate the reviewers on quality, thoroughness and timeliness. Based on these criteria, they assist the division in identifying reviewers who have made outstanding contributions during the past year.

Bon Receives Fulbright Scholarship



Working with electrical engineers in Uzbekistan.

Tom Bon, associate professor of practice, was awarded a Fulbright scholarship to teach in Uzbekistan in spring and summer of 2010. During this time Dr. Bon taught courses and technology transfer topics at the Tashkent Institute of Irrigation and Melioration and at

the Tashkent State Agrarian University. Classes were taught primarily for young faculty members, graduate students, and select undergraduate students.

The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to "increase mutual understanding between the people of the United States and the people of other countries." With this goal as a starting point, the Fulbright Program has provided almost 300,000 participants—chosen for their academic merit and leadership potential — with the opportunity to study, teach and conduct research, exchange ideas and contribute to finding solutions to shared international concerns.

Distinguished Alumnus

Steve Edwardson



The fourth annual NDSU Distinguished Alumni Award Program was held in April, 2010. The Department of Agricultural and Biosystems Engineering was proud to have an alumnus honored in the College of Agriculture, Food Systems, and Natural Resources.

Steve Edwardson earned bachelor's and master's degrees in Agricultural Mechanization. He began his career as an Extension agent for the NDSU Extension Service in 1987. He spent 12 years with Minn-Dak Growers Ltd. starting as a crop management specialist, advancing to station manager, director of research and development and director of information technology. He was promoted to vice president of general operations in 2002. Following his tenure with Minn-Dak Growers, he worked for Watts and Associates, a private insurance developer in Billings, MT. In 2004, he joined the North Dakota Barley Council as executive administrator.

He has experience in international trade and has conducted business in Japan, Taiwan, Argentina, Germany and England with projects ranging from specialty crop contracting and supply chain management, to crop production management for non-agricultural procurement personnel.

He is a member of NDSU's agriculture advisory boards and faculty search committees, and he continues collaborations with administrators in support of advancing the research and outreach missions of NDSU agriculture.

"New graduates should utilize that core base of knowledge that they've obtained through their curriculum and be open to various opportunities," Edwardson said. "It's rare that anyone gets to stay within their discipline throughout their career."

What continues to surprise him about the profession is the number of people working in food processing and buying agricultural products, yet they don't understand how the products are produced or stored.

"You have to correct misconceptions with a lot of crops for those folks to help them understand there are certain production practices involved in the product they are purchasing," he said.

Sponsored by all seven colleges at NDSU, the Distinguished Alumni Award Program is an opportunity to educate students by introducing them to successful alumni and to recognize and honor outstanding alumni.

Research Highlights

Canola-based Resins for Use in Composite Panels

The public increasingly seeks products derived from sustainable, bio-based alternatives to petroleum and produced through



Autumn McDougall performing tests.

environmentally-friendly processes. One example of such products being evaluated in the NDSU Pilot Plant is epoxy resin produced from vegetable oils. The resin is cured and reinforced with fiber for application in composite materials. This research makes use of an epoxidation process for canola oil and resin characterization techniques which were developed by post-doctoral scientist Judith Espinoza-Perez as part of her PhD research, and assisted by a number of undergrad ABEN students in the past few years. Resins from canola and soybean oil were used by the Bison Pullers in 2009 and 2010 for guards and shrouds on quarter-scale tractors. Recent research has focused on the evaluation of alternative curing agents for improved mechanical performance. Currently assisting Judith on this study are undergraduate ABEN students Katherine McKinnon, Autumn McDougall, and NDSU faculty Dennis Wiesenborn of ABEN, undergraduate student, Brent Nerenz, and Dr. Chad Ulven from Mechanical Engineering, and Dr. Zhigang Chen in the Center for Nanoscale Science & Engineering. The study is funded by the North Central Canola Research Program and the North Dakota Soybean Council. This collaboration recently led to collaboration in a related area with Tecton Products, a Fargo-based company that manufactures high-performance "pultruded" building materials.

Antimicrobial Treatments for Buckwheat

Buckwheat is a specialty crop of interest because of its numerous nutritional, health, and agronomic benefits, and because it fits well with some North Dakota crop rotations. However, high microbial loads on grain surfaces during wet years limits its export and use in health foods.



Harry Dhillon and Bhavnita Dhillon

The buckwheat industry is reluctant to use chemical treatments such as chlorine which pose human and environmental risks. Therefore, several GRAS (generally recognized as safe) antimicrobial treatments are being evaluated in the NDSU Pilot Plant in cooperation with Minn-Dak Growers, Grand Forks, ND. This research makes use of a fluidized bed with an automated spraying system which was developed by post-doctoral scientist Bhavnita Dhillon as part of her PhD research on disinfection of durum wheat. One promising treatment is acidic calcium sulfate; however, some undesirable bleaching was observed. The process is being fine-tuned to achieve adequate reduction of microbes with minimal bleaching. Assisting Bhavnita on this study are Harjot Sidhu, Darrin Haagenenson, Jim Moos, and Dennis Wiesenborn of ABEN, as well Dr. Charlene Wolf-Hall in VMS. The study is funded by the ND Ag Products Utilization Commission.

Agricultural Practices on Snow Hydrology



Dr. Xinhua Jia taking measurements

Snow hydrology is one of the important components in the hydrology cycle, but it is often ignored in water resources management. Agricultural practices, such as subsurface drainage and tillage, influence of snow depth, snow properties and snowmelt rates, determine the magnitude and timing of spring floods. This then affects the soil moisture in the root zone and the timing for spring planting. This is similar to a "domino" process, which has dominated agricultural production in the eastern part of North Dakota for the last two years. With an understanding of how agricultural practices influence snow hydrology, good agricultural practices can be applied to reduce the flood potential and keep agricultural land sustainable.

A study is being conducted to measure the snowfalls, snow accumulation depth, snow properties, and snowmelt rates for fields with different agricultural practices, such as with and without subsurface drainage, with and without tillage, and non-harvested crop fields in the Red River Valley area. The results will be used to evaluate and compare flood potential due to different agricultural practices.

Bioproducts Research Laboratory

Students and staff working in the Dr. Pryor's Bioproducts Research Laboratory work on a variety of projects related to the production of biobased fuels and materials. Some of the projects include:

- Ethanol Production from Sugar Beet Pulp – Rachel Rorick (MS, 2010), Nurun Nahar (Research Specialist), Chad Sietsema (ABEN undergraduate).
- Impact of Biomass Densification on Ethanol Production – projects with C. Igathinathane (NDSU ABEN) and with South Dakota State University, Michigan State University, and Federal Machine (Fargo, ND) – Binod Rijal (MS, 2012), Dr. Bishnu Karki (Postdoctoral Researcher).
- NIR Modeling for Rapid Biomass Compositional Analysis – Ewumbua Monono (MS, 2011), B. Karki, N. Nahar.
- Ethanol Production using Oat Straw, Wheatgrass, and other Mixed Perennial Grasses – B. Karki, N. Nahar.
- Biobased Plastic Production using Proteins from Standard and Subcritical CO₂-Extracted Canola Meal – Dr. W. Asanga Manamperi (PhD, 2010).

Dr. Pryor is working on a project with ABEN faculty at Ohio State and several other universities to develop an online database for bioenergy courses [BioEnergy Educational Materials exchanges System (BEEMS)] to be used by faculty across the nation.



Biomass Testing



Dr. Igathi Cannayen carrying out mechanical drying studies on switchgrass biomass.

Research and Extension Highlights

Using Cellular Communication Technology to Display Remote Data on the Internet

John Nowatzki, Extension Agricultural Machine Systems Specialist, is collaborating with Roger Ashley, NDSU Dickinson Research Extension Center Cropping System Specialist to monitor soil and ambient conditions across North Dakota. The NDSU Residue Management Project monitors soil moisture and temperature under various residue management conditions in western, central and eastern North Dakota. The monitoring sites are located in Golden Valley, Stutsman and Cass Counties. The data are updated hourly. Electronic sensors connected to data loggers monitor soil moisture and temperature in tall, medium and short wheat stubble harvested with a combine equipped with a stripper header. Sensors are installed in 6-12", 12-18", and 18-24" stubble within the same field to determine how quickly soils dry in these stubble heights. Rainfall, wind speed and air temperature are also monitored at each location.

The data logger at each location is connected to a cellular modem. A remote computer is programmed to contact the cellular modem hourly to transfer the data to a computer that serves the data on www.ageng.ndsu.nodak.edu/farmmonitor. Go to this website and click on "Residue Management" to view real-time data from each remote monitoring site.

Data from this site will be used in a future Extension publication on managing crop residue for crop production.



Bio-Methane Potential of Dairy Manure Co-digested with Canola Meal

Livestock manure is the most abundant of all agricultural wastes, but poses challenges of handling, storage, and disposal. If not managed properly, it releases greenhouse gases (GHG; methane and nitrous oxide), which contribute to global warming. Producing and capturing methane from manure through anaerobic digestion (AD) and using it as a renewable energy will minimize environmental pollution and reduce emissions of carbon dioxide from fossil fuel combustion. In addition, AD not only serves as a potential process of renewable energy, but also can play a useful role in manure management strategy and reduce an odor nuisance. In spite of several advantages, limited numbers of anaerobic digesters have been embraced as a manure management system due to low biogas production and high capital and maintenance costs. One method of enhancing biogas production is the co-digestion of manure with various locally available organic substrates to produce a synergistic effect on production rates and methane yields.

The Northern Plains of North Dakota and Minnesota currently account over 90% of the canola acres planted in the United States (US Canola Association). Significant canola meal is produced from canola seed following oil extraction. Canola meal is a high-protein animal feed used by dairy, cattle, and poultry producers. Canola meal can also be used as a feedstock for the production of bio-methane. Similarly, North Dakota is the second largest sugar beet producing state in the United States and produces a significant amount of sugar beet waste that can be co-digested with manure. In addition, the growth of ethanol production has increased supply of dried distillers grains with solubles (DDGS), which creates handling challenges. Therefore, agricultural and food processing wastes, and ethanol plant by-products (DDGS) are locally available and can be co-digested with dairy manure to maximize methane gas production and can reduce GHG emissions from manure management. Therefore, the objective of this study is to evaluate the bio-methane potential of dairy manure when co-digested with different agricultural biomass, in this case canola meal.

Currently, batch anaerobic co-digestion of dairy manure and canola meal are underway. Total gas production is recorded daily for a period of 25-30 days, when no more gas is produced. Gases are collected periodically for lab analysis for methane content using a greenhouse gas GC. Preliminary results indicate that canola meal may not be a good biomass for co-digestion with manure. Further research is underway.



Experimental set-up of batch anaerobic reactors



Greenhouse gas GC for gas analysis

Educational Programming - Ken Hellevang

Storage recommendations on how to store and dry the 2009 corn crop were provided through numerous presentations, consultations, news articles and was distributed through the web. The crop had low test weight and surface mold infestations. Education was provided on grain dryer selection. Assistance was provided to compare the energy efficiency of grain dryers. A presentation on grain dryer selection and energy efficiency was placed on the web. It was part of the ABEN exhibit at the Big Iron Agricultural Exposition in West Fargo. A four-hour workshop on performing a grain dryer energy audit was conducted for professional engineers, grain dryer and electric utility professionals, and NDSU Extension agents. Energy audits are required to apply for a USDA Rural Energy for America Program grants and loans.

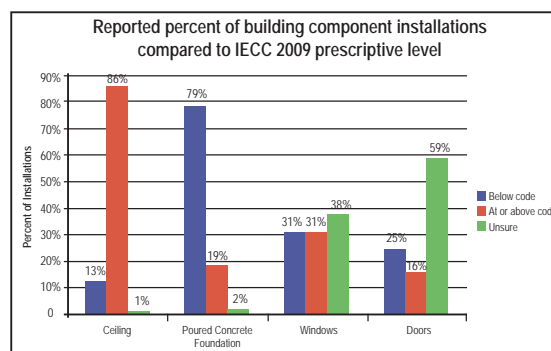
Education was provided on protecting property from a flood and moisture in buildings. Videos were developed on plugging floor drains to prevent sewer back-up, on sump pumps, and on sandbag safety. Education also included news articles, radio interviews, and material on the NDSU Extension Service flood website, www.ag.ndsu.edu/flood. As the flood team leader for www.extension.org/ and the flood resource person for the Extension Disaster Education Network, conference calls of flood education personnel across the country were conducted and educational materials were placed on the extension.org website. A series of four webinars were conducted for Iowa State University Extension professionals on resolving moisture and mold problems in buildings. A presentation on resolving mold problems was provided to North Dakota Environmental Health Association professionals at their annual meeting.

Energy-related Residential Building Practices

The North Dakota Department of Commerce commissioned Carl Pedersen with the NDSU Extension Service through the NDSU Dept. of Agricultural and Biosystems Engineering to conduct an evaluation of current energy related residential building practices in ND. The purpose of this study was to identify residential energy efficiency related building practices in ND and compare current practices with the most recently accepted national building standards. This information is being used to identify areas where increased attention and concentrated educational programming can have the greatest impact on encouraging economical building practices to improve residential energy efficiency and energy code compliance.

North Dakota builders who participated in the study were using building techniques in their homes that meet or exceed recommended energy related requirements from the 2009 International Energy Conservation Code in a number of areas. However, builders have an opportunity for improvement concerning energy-related measures in portions of residential structures that could result in energy savings, greater comfort and compliance with the IECC. The areas of construction that were identified as possibly needing greater attention include foundation insulation, air-sealing measures, and window and door U-values.

Visit www.ndsu.edu/energy for a full report or executive summary of the study.



Information for walls and floors is addressed separately due to variations in code requirements and multiple climate zones in North Dakota.

Alumni Updates

Robert Adamek (BS AE 1985) is manager of Wanner Engineering in Minneapolis, MN.

Bruce Adams (BS AE 1969) is retired and lives in Botineau, ND.

Wayde Altendorf (BS ABEN 2002) is a project engineer with Cray Industries/Lockwood in West Fargo, ND.



Chris Althoff (BS ABEN 2001) and **Erica (Disrud) Althoff** (BS ABEN 1999) welcomed a baby boy, Brady, to their family in September, 2010.

Dale O. Anderson (BS AM 1959, MS Ag Econ 1960) and his wife, Claudia celebrated their 50th wedding anniversary this summer. Dale retired as president of the Greater North Dakota Association (GNDA) in 2003.

Paul R. Anderson (BS AM 1989, MS Ag Econ 1993) farms near Coleharbor, ND and is on the District 7 North Dakota Corn Utilization Council.

Sundar Balasubramanian (PhD ENGR 2005) and his wife, Mini, welcomed a baby girl, Vasuprada, in September, 2010. She joins big brother, Vishnu. Balasubramanian is a research associate in the Biological and Agricultural Engineering Department at Louisiana State University in Baton Rouge, LA.

Joshua Behrens (BS ASM-DMS 2006) returned to Larson's Inc. in Wheaton, MN. He was previously an agricultural account manager with RDO Equipment.

Kermit Bjorlie (BS AE 1942) is retired from the USDA Soil Conservation Service after 37 years. He also worked two years for the MN Agricultural Extension Service.

Robert J. Bishop (BS AE 1961) is retired from the USDA and lives in McCall, ID.

Md. Saidul Borhan (PhD ENGR 2002) is a post doctoral research associate – assistant research scientist in the Biological and Agricultural Engineering Department at Texas A&M University.

James M. Britt (BS AM 1968) owns Maintenance By Prevention, a heating contracting company in Gillette, WY. He is an associate member of the Campbell County Conservation District board of supervisors in WY.

Norman Buckhouse (MS AE 1963, BS AE 1962) is a senior project engineer with Husqvarna Home Products in McRae, GA. He received a patent on a steering system for walk behind snow throwers, and pioneered quick chute rotation systems and simplified chute mounting.

Gary Carlson (BS AM 1968) farms near Cleveland, ND.

Curtis Chambers (BS AE 1951) is retired and lives in Highlands Ranch CO.

David Clough (BS AM 1969) was re-elected to serve the South Central District of the ND Wheat Commission (NDWC). He has served as the Wells Co. representative to the NDWC since 1994. Clough raises wheat, soybeans, edible beans and sunflowers, and is a Vermeer equipment dealer. He and his wife, Aileen, have two children.

Glen DeKrey (BS AM 1955) lives in Steele, ND. He retired from the North Dakota State ASCS office in the early 1990s after serving 23 years as district director.

Roger E. Diehl (BS MA 1959) is president of R.E. Diehl Inc. in Hillsboro, ND but retired from the farming operation. He is director and chair of the Nodak Electric Cooperative, former director of the North Dakota Power Use Council, and former instructor at the Northwest School of Agriculture, Crookston, MN.

Aaron Disrud (BS ABEN 2001) and his wife Ember, welcomed a baby boy, Niklas, to their family in July, 2010.

Tyler Doeling (BS ASM 2008) joined Farm Credit Services of North Dakota, Carrington Branch, as a loan officer. He is a native of Carrington.

Mark Dose (BS ABEN 2009) is an agricultural engineer with the MN NRCS area 1 office in Thief River Falls, MN.

Carroll Drablos (MS AE 1959, BS AE 1954) is Emeritus Professor at the Department of Agricultural and Biological Engineering, University of Illinois. He served the Department from 1959 until his retirement in 1990.

Robert Drees (BS AM 1979) owns and operates Drees Farming Association in Grand Forks, ND. He is a member of the Grand Forks/East Grand Forks Chamber.

Matt Drewlow (BS ASM 1998) married Lisa Kesler in June. He is a delivery coordinator at The Home Depot, Fargo.

Charles Durham (BS ABEN 1999) is the Quality Manager at LINDAR Corporation, a thermoforming plastics company in Baxter, MN.

Arden Freitag (MS AE 1982, BS AE 1980) Chief, Rural Water Division, U.S. Department of the Interior, Bureau of Reclamation, in Bismarck, manages rural water construction and O&M for ND and SD. He received the Commissioner's Superior Service Award in Oct. 2009 for his efforts leading the emergency operations center during the 2009 flood operations and for his efforts implementing rural water operations and maintenance programs on Indian Reservations in ND and SD.

Dale Frink (MS AE 1971, BS AE 1969) retired last summer after 39 years as state engineer and head of the North Dakota Water Commission. He hopes to relax and spend more time with his family.

Ramesh Kumar Gautam (PhD ENGR 2005) is an associate land and water use scientist at the California Department of Water Resources in Sacramento, CA.

Lyle Gorseth (BS AE 1978) farms near Blaisdell, ND.

Michael Gross (BS ABEN 2008) is a senior associate engineer – transmissions in Caterpillar's drivetrain systems business unit in Peoria, IL. He was accepted to the master's program in Mechanical Engineering at Bradley University in Peoria, IL.

John Gulleason (BS ASM 1996) is a research associate with Monsanto's soybean breeding project. He has also been involved with durum wheat breeding (NDSU), corn breeding (Monsanto), and hard red spring wheat breeding (NDSU) projects. He recently applied for a soybean variety patent, along with another inventor, on behalf of Monsanto Technology LLC. John and his wife Teresa live in Casselton, ND, with their two daughters.

Aaron Haaland (BS ABEN 1998) farms near Carpio, ND. He was previously with Bobcat Co.'s attachment group for several years.

Andrew Haataja (BS ABEN 2009) is a product engineer with Amity Technology in Fargo, ND. He married Erika Peuser in July, 2010.

Ross Haugeberg (BS AE 1989) is the Inventory and Quality Control Manager at Agri-Cover, Inc. in Jamestown, ND.



Photo courtesy of SDSU

Mylo Hellickson (MS AE 1966, BS AE 1964) is professor in the Dept. of Agricultural and Biosystems Engineering at South Dakota State University (SDSU). He serves on the University's Intercollegiate Athletics Board and chairs its Compliance Review Team. He was named acting Athletic Director at SDSU from January to May, 2009 and served on the SDSU NCAA Certification Steering Committee. Hellickson previously served six years as head of the Dept. of Agricultural Engineering and 10 years as director of the SD Cooperative Extension Service.

Jill (Kluck) Helmuth (BS AE 1992) is an agricultural engineer at the USDA NRCS Bismarck State Office. She provides statewide engineering leadership and oversight for irrigation, animal waste and other on-farm conservation practices for NRCS. Jill and her husband, Keith, operate a cattle ranch near Walford City, ND with their sons, Kell and Koen.

Jay Herman (BS AE 1984) is Manager of HR Technology for Sauer-Danfoss and works out of the Minneapolis, MN location. His team is responsible for HR systems that are used globally such as their core HRIS system, and systems that support and enable Talent Management (includes Learning Management, Performance Management, Succession Planning, and Recruiting). Last year, they selected a new SaaS (Software as a Service) Talent Management platform.

Jeremy House (BS ABEN 1999) is a mechanical engineer at Basin Electric's Leland Olds Power Plant in Stanton, ND.

Michael Hunt (BS ABEN 2004), founder of GeoFurnace Manufacturing Inc. in DeSmet, SD, is a geothermal engineer. He is an International Ground Source Heat Pump Association (IGSHPA) trainer and designer.

S. Zach Jacobson (BS ASM 2007) married Andrea Puppe (BS Business 2008) in December, 2010. He farms with his family near Langdon, ND.

Cassie Joecks (BS ABEN 2005) is an agricultural engineer at the USDA-NRCS Brooklyn Center, MN Area Office. Last year she worked in Fergus Falls, MN and completed a detail to the State of Rhode Island.

Aaron Johnson (BS AE 1992) is chief engineer at Duratech Industries in Jamestown, ND. He is involved with the engineering design of ag and industrial products, current products and new product development.



Nicholas Johnson (BS ABEN 2003) relocated with Caterpillar in July, 2010 to Paving Products in Minneapolis, MN. He performs structural analysis and weldment design and now is working with compaction equipment. He married Christina Kempenich in September, 2009 and they are the proud parents of Levi Anthony, born in January. They live in Eagan, MN. He also passed the PE exam last year.

Jason E. Johnston (BS ABEN 1998) is a project and maintenance coordinator with the North Dakota Parks and Recreation in Bismarck, ND.

Brady Kellerman (BS ASM 2005) married Tonya Brekhus (BS Nursing 2007) in November, 2010. He farms with his family near Davenport, ND.

Shane Kjellberg (BS AE 1993) is president of K2S Engineering Inc. in Ypsilanti, MI. He is a licensed professional engineer in MN, ND and SD and has been trained in wetland delineations through the Minnesota Board of Water and Soil Resources.

Ronald Kochevar (BS AM 1962) is retired from the U.S. Air Force. He lives in Manvel, ND.

Badger Koeplin (BS ABEN 2008) is an assistant roadmaster production for Burlington Northern Santa Fe (BNSF) Railway Company. He manages a 35-person production group and contractors who are replacing rail and repairing ties. He is responsible for safety, meeting production goals, and ensuring that quality work meets BNSF standards and federal regulations. His group works in WA, ID, MT, ND and SD. He and his wife welcome son, Cody, to their family in March 2010.

David Lehman (BS ABEN 2000), manufacturing state extension specialist, works with inventors and companies as part of the newly formed Dakota MEP – NDSU partnership.

Alumni Updates

Charles Linderman (MS AE 1969, BS AE 1967) continues to farm near Carrington, ND where he and his wife, Ellen, grow spring wheat, durum, food grade soybeans, and irrigated corn. Charles serves as director and secretary of the local Arrowwood Prairie Co-op, president of Foster County Farmers Union, treasurer of Foster County Agricultural Improvement Assoc., and Foster County representative of the ND Wheat Commission. Charles is a former ND State Representative and he and Ellen are active in both North Dakota and national politics.

Andrew Marks (BS ASM 2003) farms near Elbow Lake, MN. He was previously with ADM in Winona, MN.

Cory Marquart (BS ABEN 2005) is an engineer at the Renewable Energy Center, West Central Research and Outreach Center, in Morris, MN. Since 2005 he has been in charge of the daily operation of a utility-scale 1.65 megawatt wind turbine. He has also worked on the development of the wind to hydrogen to anhydrous ammonia project.

Randall Mauch (BS AM 1972) was elected director and secretary of the Golden Growers Cooperative in Fargo.

Darwyn Mayer (BS AM 1988) is owner/operator of a farm and ranch operation near Mott, ND.

Collin Miller (BS ABEN 1999) is a design engineer with Amity Technology. He and his wife had a baby girl, Elizabeth, in February, 2010.

Celia Norgaard (BS ASM 2009) is an agronomy sales trainee at Alliance Ag Cooperative in Hettinger, ND. She was previously a field inspector with the Minnesota Crop Improvement Association.

Orlin R. Oium (BS AM 1958) retired from ranching near Towner, ND.

James Ostlie (BS AM 1969, MS AM 1971) farms 1,500 acres of various crops; barley, wheat, edible beans, soybeans and corn near Northwood, ND, and is a board member of the Dakota Lamb Growers Co-op.

Kate Overmoe (MS ECS 2009) is pursuing a PhD in Earth System Science and Policy at UND. She was married in August, 2010.

Paul Petersen (BS ABEN 2000) relocated with Caterpillar to Cat Paving in Brooklyn Park, MN. He was previously a test engr. at the Peoria Proving Grounds, East Peoria, IL.

Peter Polansky (BS ABEN 2007) is maintenance supervisor and plant engineer with ADM in Lloydminster, Alberta, Canada. He is pictured below with Department students and a faculty at the 2010 regional ASABE/CSBE conference in Saskatoon, SK, Canada.



L to R: Katie McKinnon, Peter Polansky, Tom Bon and Harjot Sidhu

Ralph Polasky (BS MA 1966) is a senior project engineer with US Filter/Plymouth Products Div. in Sheboygan, WI.

Dean Potts (BS AE 1982) is a senior engineering specialist with Caterpillar in IL. He is responsible for research and development of GPS-based systems and business solutions.

Randall L. Preston (BS MA 1960) retired from John Deere Co. His three sons graduated from NDSU and he currently has two grandchildren attending NDSU.

Douglas Puckering (BS AM 1960) is an emeritus professor at Mendocino College, Ukiah, CA. He lives in Washington.

Blaine Rekken (BS AM 1989) is an energy services supervisor with Nodak Electric Cooperative Inc. in Grand Forks, ND.

Adam Riesen (BS ASM-DMS 2007) married Kathryn Pratt (NDSU Apparel Studies) in March, 2010. He is employed in ag sales at Evergreen Implement Co., Warren, MN.

Justin Risovi (BS ASM 2005) is business manager with Total Ag Industries in Hillsboro, ND.

William Robinson (BS AE 1973) is associate professor of mathematics at Johnson County Community College in Overland Park, KS. He received his MS in Statistics in 1990 from the University of Minnesota.

Nathan Ruckheim (BS ASM 2005) is a terminal supervisor with Gavilon Fertilizer LLC in Shakopee, MN.

Leland Saele (BS AE 1968) retired from the USDA-NRCS in 2007. Leland and spouse (Margo), have two sons, a daughter, and four grandchildren. Leland keeps busy with a number of projects at their new home in Vancouver, WA, emergency baby-sitting, and volunteering for their church and one day a week at Habitat for Humanity.

Joseph Sauvageau (BS ABEN 2004) is a power electronics mechanical design engineer with Phoenix International, a John Deere Company.

Mark Schields (BS AE 1981) is an area engineer with the USDA-NRCS in Dickinson, ND.

William Scoville (MS AE 1974, BS AE 1971) is general manager and CEO of Green Iron Equipment with six John Deere dealerships in southeast ND and SD. He is married to Wanda (Larson) Scoville (BS Home Ec Ed 1974) and has two children, Amy (Seth) Johnson, and Michael. He enjoys traveling and spending time with family and friends in the summer at Battle Lake, MN.

Kent Schmidt (BS ABEN 1996) is team leader of the wire systems design group with John Deere Waterloo Works in Waterloo, IA. His team works on all John Deere series tractors from 5000 through 9000.

Kristopher Schmidt (BS ABEN 2001) is a mechanical engineer and assistant coal and yard supervisor at Basin Electric Power Cooperative's Leland Olds Station in Stanton, ND.

John L. Seppanen (BS AE 1986) is an innovation business partner with Kellogg Company in Battle Creek MI.

Tom Soucy (BS AE 1990) is a design construction supervisor with the Cass County Highway Dept. in West Fargo, ND.

Harley Steffen (BS AM 1960) farms near Parshall, ND.

Alfred Steinke (BS AE 1949) farms near Bismarck, ND. While his cropland is in CRP, he is responsible for noxious weed control, maintenance of a 2A food plot, and maintenance of tree shelter belts. He was an irrigation engineer with the Bureau of Reclamation from 1949-1979 and became a registered engineer (#406) in 1954.

Joshua Stroh (BS ASM 2003) is a precision product specialist with RDO Equipment Co. in Moorhead, MN. He is responsible for training and supporting company sales, service and part specialists on the latest technology. He also assists salespeople in training their customers to troubleshoot GPS issues.

John Swanson (BS AM 1968, BS Ag Educ 1971), Mentor, MN, has been elected to the board of directors of Minnesota's sunflower growers and will oversee their recently established research and promotion council.

Gerald Uglem (BS AE 1970) farms near Northwood, ND and serves in the ND House of Representatives from District 19. He also continues to serve as the Grand Forks County representative of the ND Wheat Commission's District VI.

Brian Uran (BS ASM 2006) and Matt Borud (BS ASM-DMS 2009) represented Gooseneck Implement at an NDSU career fair. Uran is a sales representative with Gooseneck in Stanley, ND, and Borud is a sales representative with Gooseneck in Kenmare, ND.

Claire Vigesa (BS AE 1982) is vice president of development and energy services at Cass County Electric Cooperative. He was presented the Touchstone Energy Cooperatives Brand Champion Award in 2010.



Bobby Volesky (BS ASM-DMS 2008) is an account manager in agricultural sales at RDO Equipment, Inc. in Fargo, ND.

Steven Wagner (MS AE 1986, BS AE 1983) is an electronic engineer with the USDA-ARS North Central Soil Conservation Research Laboratory in Morris, MN.



Aaron J. Walsh (BS ASM 2008) married Jayme Fiesel (NDSU Vet Tech) in July, 2010. He is an AMS consultant and partsman at Gooseneck Implement in Harvey, ND.

Mark Walter (MS AE 1996, BS AE 1994) is an engineer with AGCO Corporation in Jackson, MN. He continues to work on special options on Ag-Chem sprayers and fertilizer spreaders.

Larry Waswick (BS AE 1977) is in software development with Wycliffe Bible Translators in Dallas, TX.

Ryan Waters (BS ABEN 2002) is a general engineer, facilities management division in the Bureau of Reclamation's Great Plains Region, Bismarck, ND.

Jason Webster (BS ABEN 2005) is an environmental engineer with the Minot Air Force Base. He was previously a design engineer at Bobcat Company.

Richard Wenstrom (BS AE 1964) retired in 2007 from active farming at Wenstrom Farms, an irrigated farm operation in west central KS where corn, soybeans, wheat and alfalfa are raised. Richard began the operation in 1976 when he and his wife, Jane, moved to Kansas. The farmland is leased out but they continue to live there six months out of the year and travel the rest of the time. Richard came back to Fargo in 2008 for NDSU homecoming and was able to visit with Howard Olson, his friend and mentor, about a month before he passed away.

Andrew Wilhelmi (MS ABEN 2008, BS ABEN 2006) relocated to the Devils Lake Area Office of the USDA-NRCS.

Richard Willows (BS AE 1971) retired from BAE Systems Armament in Fridley, MN in October, 2009.



Szymon Woznica (MS ABEN 2007, MS Comp Sci 2009) is a software development engineer in test at Microsoft Corporation, Fargo, ND. He and his wife, Sylwia, had a baby boy, Kevin Anthony, in January.

Department Highlights

Faculty, Staff and Students Participate in 2010 ASABE International Conference

Department faculty, staff and graduate students attended the 2010 American Society of Agricultural and Biological Engineers (ASABE) annual international meeting held June 20-23 in Pittsburgh, PA. Faculty members Ganesh Bora, Igathinathane Cannayen, Kenneth Hellevang, Xinhua Jia, Scott Pryor, John Nowatzki, Shafiqur Rahman and Dean Steele moderated sessions, presented papers and posters and participated in technical committee meetings. Bhavnita Dhillon and Bishnu Karki, postdoctoral research associates; and Hongjian Lin, Xiao Pang and Ishara Rijal, graduate students, also attended.

Bora, assistant professor, presented "Energy Savings by Adopting Precision Agricultural Technology in North Dakota" written by Bora and Nowatzki. Bora also was elected co-chair of the safety, education and training committee and tasked with developing a standard for "Safety for Anhydrous Ammonia Application Equipment." He leads the committee with Mark Hanna of Iowa State University. The ASABE Standards, Engineering Practices and Data division, developed and maintained through the cooperative standards program, provides technical basis for international standardization.

Cannayen, assistant professor, presented "Development of Advanced Pixel-March Algorithm to Determine the Width of Non-Convex Shaped Biomass Particles by Machine Vision" written by Cannayen, Staffan Melin, Lester Pordesimo, Shahab Sokhansanj, Eugene Columbus, Xiaotao Bi and Jim Lim. Cannayen also presented "Effect of Angle of Cut on Corn Stalks Mechanical Cutting Strength and Energy" written by Cannayen, Alvin Womac and Shahab Sokhansanj.

Hellevang, professor, presented "Education and Technical Assistance for the Grain Industry," an invited oral presentation in the session, "Crop Storage and Handling: Capabilities and Needs for the 21st Century." Hellevang also participated in several technical committees and will lead the development of the standard, "Terminology for Grain Drying, Handling and Storage."



Hongjian Lin, Xiao Pang, John Nowatzki, Jan Nowatzki, Lav Khot, Shafiqur Rahman, Scott Pryor, Ganesh Bora, Malika Bora, Sindhuja Sankaran and Bhavnita Dhillon.

Nowatzki, agricultural machine systems specialist, wrote and presented "Precision Agriculture on eXtension Web Site."

Pryor, assistant professor, presented three posters: "Composition Analysis of Perennial Grass Species to Evaluate Potential as Individual or Conglomerate Bioenergy Crops" written by Ewumbua Monono, Bishnu Karki, Nurun Nahar and Pryor; "Fermentation of Sugar Beet Pulp Hydrolyzate with *Saccharomyces cerevisiae* and *E. coli*" written by Rachel Rorick, Nahar and Pryor; and "Preparation of Plastics from Acetylated Canola Proteins" written by Jaidev Sehwat, Wajira Asanga Ratnayake Manamperi and Pryor. Pryor also presented the paper "Enzymatic Saccharification of Switchgrass and Tall Wheatgrass Mixtures Using Dilute Acid and Aqueous Ammonia Pretreatments," written by Pryor and Nahar. Pryor was named an associate editor for the Biological Engineering Division of ASABE's journals and a special guest editor for a bioenergy issue.

Rahman, assistant professor, presented "Efficacy of Bacterial Treatment to Mitigate Odor, Ammonia and Hydrogen Sulfide Emissions from Gestation-Farrowing Barns in North Dakota," written by Rahman and David Newman. Rahman also presented "On-Farm Turkey Carcass Composting Using Sunflower Hulls-based Turkey Litter in North Dakota Climatic Conditions," written by Rahman and Saqib Mukhtar. Rahman was elected

secretary of the Agricultural Waste Management Committee (SE-412). Rahman also was selected as associate editor for the Structure and Environment Division of the ASABE.

Steele, associate professor, presented a poster, "Water Balance Evapotranspiration Estimates for the Devils Lake Basin Water Utilization Test Project," written by Joshua Moeller, Steele, David Hopkins and Xinhua Jia.

Dhillon, postdoctoral research associate, presented "Improved Microbial Quality of Buckwheat Using Ozonated Water and Acetic Acid Solution in a Fluidized Bed," written by Dhillon, Dennis Wiesenborn, Rachel Brudvik and Charlene Wolf-Hall.

Lin, graduate research assistant, presented "Effect of Trace Contaminants on Cold Soak Filterability of Canola Biodiesel," written by Lin, Darrin Haagenson, Wiesenborn, Pryor and Brudvik.

Pang, graduate student, presented "Effect of Subsurface Drainage on Water Availability in the Red River Valley of the North," written by Pang, Jia, Thomas DeSutter, Steele and Ishara Rijal.

Rijal, graduate research assistant, presented "Comparison of Reference and Actual Evapotranspiration in North Dakota," written by Rijal, Xinhua Jia, Steele, Thomas Scherer, Xiaodong Zhang and Pang.

Research Highlights continued

Machine Systems Engineering and Precision Agriculture

Dr. Ganesh Bora's main research activities are in the area of Machinery System Engineering and Precision Agriculture. He collaborates with faculties at NDSU and other institutions across the country and internationally. His recent project on "Estimating Energy Savings by Adopting Precision Agricultural Technologies in North Dakota," found 34% of farmers in North Dakota use GPS guidance systems. They reported saving an average of 6.04 % of time and 6.32 % of fuel by using guidance systems. Several on-going projects include, remote sensing applications in crop management, whole-field comparison of soybean production using strip till, conventional till, and no-till grown on wheat and corn stubble, and a study of precision planting techniques in different tillage systems.

A project on "Weed Recognition Using Image-processing Technique" has been undertaken at NDSU in collaboration with the Central Institute of Agricultural Engineering, Bhopal, India. Dr. Bora is participating in an ongoing collaborative study with Prof. Marat Khazimov of Kazakhstan National Agrarian University (KANU), Almaty, Kazakhstan as a part of co-supervising a PhD student in KNAU. The research area is the "Study of Technological and Structural Parameters of Device Used for Mulching in the Soil-Plastic Cover in Planting Vegetable Seedlings." A collaborative project with the University of Florida on the "Study of Force Distribution in the Citrus Tree Canopy during Harvest using a Continuous Canopy Shaker" has been collaborated with University of Florida was recently completed.

Evapotranspiration Mapping

Dr. Hakan Buyukcangaz, an Associate Professor from the Agricultural Structures and Irrigation Department, Uludag University, Bursa, Turkey, has joined the department as a visiting scholar to develop and apply evapotranspiration mapping capabilities based on remote sensing and ground-based weather data for use in North Dakota. The project is funded by the North Dakota State Water Commission and Dr. Buyukcangaz is working with Dean Steele and Sheldon Tuscherer.

Department Highlights

Slominski Named one of the New Faces of ASABE for 2011



Cary Slominski (BS ABEN 2006) was recognized as one of ASABE's New Faces of Engineering for 2011.

ASABE salutes all those who have newly entered the profession, and especially the ten ASABE members nominated to be ASABE's New Faces of Engineering for 2011. These individuals have distinguished themselves with outstanding achievements

that serve as inspiration to their peers and to the future engineers who will follow in their footsteps.

Cary Slominski exemplifies industry's ideal engineer, combining strong technical skills with a sensitivity to customer and market needs. Cary started his career with John Deere in the engineering development program. He later became the lead test engineer at field development sites in North America, South America, and Europe, verifying and validating the performance of experimental harvesting equipment. A notable achievement was assisting in the design, set-up, and completion of component lab testing at the Worldwide Combine Product Development Center that led to improved product function and reliability. Cary used his field background to design robust parts and assemblies for new header platforms, and recently he collaborated with hay and forage engineers to generate customer requirements and product specifications for a new header and self-propelled windrower combination. He worked directly with customers, dealer personnel, and the dealer technical assistance center, and also supervised technicians and contract engineers. Cary recently joined the John Deere Agricultural Marketing Center as a territory customer support manager. He works with dealers in Washington, Oregon, and Idaho to enhance the overall customer experience. Responsible for supporting company policies and procedures, he works with the territory manager to provide dealers the tools they need to become "Dealers of Tomorrow." Cary has also served as a representative for John Deere Recruiting at NDSU.

Wold Recipient of International CLAAS Foundation Scholarship



Matthew Wold (BS ABEN 2009) was awarded one of four international scholarships from CLASS Foundation. Wold traveled to Germany at the end of October, 2010 and was awarded 3rd prize, a scholarship of 250 Euro per month for a duration of 12 months. The scholarship award is about \$4,100.

The awards from the Helmut Claas Scholarship support students during their university career. Wold received the award based on his research on "Design and Development of a Continuously Variable Transmission (CVT) and Front Axle for a Quarter Scale Tractor." Helmut Claas, chair of the Foundation board of trustees, presented awards to students from Germany, Russia, and the USA.

Matt is currently a graduate research assistant at the University of Nebraska-Lincoln in the Biological Systems Engineering Department where he is pursuing a master's degree. His research is on the economics and logistics involved in the collection of agricultural residues for biomass.

Wold earned a bachelor's degree in agricultural and biosystems engineering at NDSU in Dec., 2009. While at NDSU, Wold was a \$10,000 scholarship recipient of the 2008-2009 Astronaut Scholarship Foundation.

Wold extends sincere thanks to Leslie F. Backer, former Chair, for supporting his nomination, and Drs. Bora and Bon for all their help and encouragement with his senior design project as an undergraduate student at NDSU.

2010-2011 Scholarship Recipients

Clarence and Irene Becker Scholarship
- Justin Johnson, ASM

A. R. Bon Memorial Scholarship
- Jacob Weinreis, ASM

E. L. Bon Memorial Scholarship
- Adam Aakre, ASM

Caterpillar Foundation Scholarships
- Jody Hanson, ABEN
- Michael Meschke, ABEN
- Chad Sietsema, ABEN

Warren B. Diederich Fund
- Cody Frauenberg, ABEN

Ernie French Memorial Scholarship
- Francis Dierickx, ABEN

Holmen-Breuer Memorial Scholarship
- Jayme Helmer, ASM

Vernon C. Lee Memorial Scholarships
- Brandon Dingmann, ASM
- Shane Weller, ASM

Walter and Pearl Nyquist Memorial Scholarship
- Tyler Rath, ABEN

Bill and Ann (Wick) Promersberger Scholarship
- Kyle Pietruszewski, ASM

Sherman and Loretta Quanbeck Scholarship
- Paul Readell, ABEN
- Nolan Swenson, ABEN

Department Scholarships
- Autumn McDougall, ABEN
- Jason Pecka, ABEN
- Derek Aho, ASM
- Aaron Hoppe, ASM
- Tyrell Martin, ASM

Frank Bain Agricultural Scholarships
- Eric Michieka Atandi, ABEN graduate student
- Md. Atikur Rahman, ABEN graduate student

Thanks to all the donors who helped our students and the Department! If you would like to donate, please return the enclosed form.

2010-2011 Student Organization Officers

Agricultural Systems Management (ASM) Club

President Francis Dierickx, Marshall, MN
Vice President Josh Martinez, West Fargo, ND
Secretary Greg Benz, Dunn Center, ND
Treasurer Nate Bumgardner, Miles City, MT
CSO Rep Francis Dierickx, Marshall, MN
CASAC Francis Dierickx, Marshall, MN
Advisor Elton Solseng



Francis Dierickx

Student Engineering Branch of the American Society of Agricultural and Biological Engineers (ASABE)

President Michael Meschke, Welcome, MN
Vice President Will Knox, Fisher, MN
Secretary Marissa Nelson, Watford City, ND
Treasurer Tyler Rath, Belgrade, MN
CSO Rep Garret Brown, Bathgate, ND
CASAC Garret Brown, Bathgate, ND
E&A Rep Chad Smith, Maple Grove, MN
Scribes Katie McKinnon, Bemidji, MN; Garret Brown, Bathgate, ND;
Jody Hanson, Comfrey, MN; Jason Pecka, East Grand Forks, MN;
Justin Stoe, Badger, ND; and Derek Zerface, Hillsboro, ND
Advisors Tom Bon and Dennis Wiesenborn



Mike Meschke

Alpha Epsilon

President Ewumbua Monono, Buea, Cameroon
Vice President Eric Atandi, Keroka, Kenya
Secretary Ishara Rijal, Kathmandu, Nepal
Treasurer Mohamed Mizanur Rahman, Comilla, Bangladesh
Advisor Scott Pryor



Ewumbua Monono

Bison Pullers (1/4-Scale Tractor)

President Michael Meschke, Welcome, MN
Vice President Will Knox, Fisher, MN
Secretary Will Knox, Fisher, MN
Treasurer Derek Zerface, Hillsboro, ND
Advisors Tom Bon and Elton Solseng

Student News

2010 Agricultural Technology Exposition

The 62nd Annual Agricultural Technology Expo was held February 13, 2010. Managers and staff of the 2010 Expo include:

Managers

- Adam Novak (ASM, Hillman, MN)
- Tyler Rath (ABEN, Belgrade, MN)

Assistant Managers

- Brandon Dingmann (ASM, Cold Spring, MN)
- Steve Gruber (ABEN, Belgrade, MN)

Secretary

- Matt Moxness (ASM, Maple Plain, MN)

Treasurer

- Alan Maier (ASM, Elgin, ND)

Booklet Manager

- Anthony Roy (ASM, Langdon, ND)

Public Relations Manager

- Dylan Zubke (ASM-DMS, Watford City, ND)

Awards and Banquet Manager

- Cody Frauenberg (ABEN, LaMoure, ND)

Machinery Division Manager

- Austin Williams (ASM, Fulda, MN)

Power Division Manager

- Adam Borgerding (ABEN, Brooten, MN)

Precision Agriculture Division Manager

- Brandon Hoffman (ASM, Williston, ND)

Soil, Water, and Environment Manager

- Chad Sietsema (ABEN, Sacred Heart, MN)

Structure, Elec. Power & Process Division

- Mitch Zachman (ABEN, Belgrade, MN)

Expo Results:

Power Division

- 1st.....Randy Schaley: Biobased Energy
- 2nd.... Calby Beckstrand and Nolan Swenson: Number 1 vs. Number 2 Diesel
- 3rd.....Riley Schaefer and Blake Johnson: Viscous Couplings

Structures, Electrical Power, & Processing Division

- 1st..... Paul Readle: High Voltage Power Inverter
- 2nd.... Darin Spelhaug and Adam Bettenhausen: Smart Bins
- 3rd.....Jayme Helmer and Travis Weinreis: Auger Safety

Machinery Division

- 1st..... Tyler Hendrickx and Tyler Mann: John Deere 400 Series Windrower
- 2nd.... Wade Woodbury: Vermeer Cornstalk Baler
- 3rd.....Jacob Rust and Derek Zerface: 1/4-Scale Tractor

Soil, Water, and Environment Division

- 1st..... Sandeep Loi: Aeroponics
- 2nd.... Paul Mylykangas: Environmental Benefits of Switchgrass as a Biofuel
- 3rd.....Marissa Nelson: Modern Feedlot Engineering

Precision Agriculture Division

- 1st.....Jared Wiegandt: AgriData Inc., Surety
- 2nd.....James Faul, Brent Pederson, and Mike Torrence: John Deere RTK GPS
- 3rd Tyrell Martin: AGPS Ditch Pro

Senior Design Award

- Rohit Agrawal and Mukesh Kumar: Precision Design for a Lab-Scale Syngas

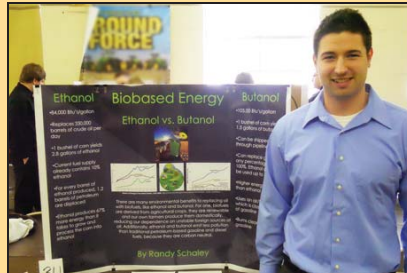
Sixty-four students were involved in the 62nd Annual Agricultural Technology Expo. These students displayed 35 projects in five divisions plus a senior design division. The Ag Technology Expo is a valuable learning experience for those who participate as well as for those who attend. Students have the opportunity to develop organizational and communication skills as either a manager or a show participant. Skills learned in this activity are directly applicable in their careers after graduation. Elton Solseng serves as the advisor to the Expo staff. The event is hosted by the Student Engineering Branch of ASABE and the ASM Club.

Grand Champion



Sandeep Loi: Aeroponics

Reserve Champion



Randy Schaley: Biobased Energy

Freshman Award



*Tyler Hendrickx and Tyler Mann:
John Deere 400 Series Windrower*

www.ndsu.edu/aben/ag_tech_info

New Members Initiated into Alpha Epsilon



Five new members were initiated into the Theta Chapter of Alpha Epsilon at initiation ceremonies on November 29, 2010. The ceremony was attended by outgoing president, Francis Dierickx, and faculty adviser, Scott Pryor. The new members include Eric Michieka Atandi, Ewumbua Menyoli Monono, Md. Atikur Rahman, Mohammed Mizanur Rahman, and Ishara Rijal.

Alpha Epsilon is an honor society for outstanding biological and agricultural engineers. The objectives of the honor society are to promote the high ideals of the engineering profession, to give recognition to those biological and agricultural engineers who manifest worthy qualities of character, scholarship and professional attainment, and to encourage and support such improvements in the biological and agricultural engineering profession that make it an instrument of greater service to mankind.

Memberships in Alpha Epsilon consist of three classes: honorary, active, and alumni. Active members are chosen only from students registered in the upper portion of their engineering class, and who exhibit outstanding qualities of character, leadership, and personality. Graduate members may be chosen from outstanding graduate students in biological and agricultural engineering.

Student News

1/4-Scale Tractor Student Design Competition



The 1/4-scale tractor "Bison Pullers" team participated in the 13th Annual ASABE International 1/4-Scale Tractor Student Design Competition, held June 3-6 in Peoria, Illinois. The team was recognized with a plaque for outstanding effort in sound level. They were also ranked first in the design judging area, coming in third in test and development. Twenty-one collegiate teams participated from across the U.S. and Canada.

The students raised funds, designed, and built the tractor. The teams and tractors are judged on oral presentation, written report, static design judging, maneuverability, and performance (tractor pull).

The ASABE Annual International 1/4-Scale Tractor Student Design competition provides university students with a "360-degree" design experience, in which they must build a tractor from the ground up, documenting their market research, testing and development; presenting their design to a mock corporate management team; and demonstrating performance in a live tractor pull.

The 14th annual competition will be held June 2-5, 2011 in Peoria, IL.



L to R: Jake Ellwein, Josh Martinez, Nolan Swenson, Michael Meschke, Derek Zerface, Jacob Rust, Advisor: Elton Solseng, and Will Knox.

www.ndsu.edu/aben/bison_pullers

2009-2010 Graduates (December 2009 - December 2010)

BS DEGREE: Agricultural and Biosystems Engineering

Rohit Agrawal Optional Practical Training (OPT)
 Mohammed Tafseer Ansari Continuing education at NDSU
 Nicholas Bendickson Farming, Garrison, ND
 Thomas Curley CNH, Fargo, ND
 Jake Ellwein CAT Paving, Minneapolis, MN
 Brandon Giesler Continuing education at NDSU
 Jason Gross Black Gold Farms, Grand Forks, ND
 David Hagemeister Farming, Argusville, ND
 Reed Hanson Hanson Farms, Forman, ND
 Matthew Hawkins Amity Technology, Fargo, ND
 Michael Hiedeman Horsch Anderson LLC, Andover, SD
 Blake Johnson USDA-NRCS, Fargo, ND
 Mukesh Kumar Univ. of MN West Central Research Center, Morris, MN
 Nikhil Kumar
 Jeremiah Lang
 Chad Mayfield Buhler, Fargo, ND
 Austin McLaen Graduate studies - MBA at NDSU
 Aakanksha Rastogi
 Joseph Sheldon Amity Technology, Fargo, ND
 Ruchi Shukla Cummins Filtration, Cookeville, TN
 Harjot Sidhu Graduate studies - MS Ag and Biosystems Engr., NDSU
 Vishal Verma Processing business, India
 Jay Wardner
 Dustin Weber
 Matthew Wold Graduate studies, Biological Systems Engineering Dept.,
 University of Nebraska-Lincoln
 Derrick Wolter Amity Technology, Fargo, ND
 Thomas Young

BS DEGREE: Agricultural Systems Management

Adam Aakre Rust Sales Inc., Harwood, ND
 Daniel Blille Triangle Ag, Ulen, MN
 Dustin Erickson Farming, Kindred, ND
 James Faul Farming, McClusky, ND
 Brandon Hoffman Continuing education - Northwestern Health
 Services University, Bloomington, MN
 Preston Leier Titan Machinery, Casselton, ND
 Robert Mahar Farming, Cavalier, ND
 Matthew Moxness Beyer Seed Farm, Kent, MN
 Adam Novak Black Gold Farms, Grand Forks, ND
 Brent Pederson Farming, Dumont, MN
 Steven Pranke COP, Lincoln, NE
 Tyler Qual Farming, Lisbon, ND
 Justin Quandt Farming, Oakes, ND
 Anthony Roy Langdon Implement, Langdon, ND
 William Stansbery Titan Machinery
 Michael Torrence C&B Operations LLC, Roscoe, SD
 Benjamin Tufte Farming, York, ND

*Congratulations
Graduates!*

M.S. Agricultural and Biosystems Engineering

Hongjian Lin
 Graduate Research Assistant
 Bioproducts and Biosystems Engineering
 University of Minnesota
 Thesis: *Advanced Quality Analysis Methods for Cold
 Weather Performance of FAME from Canola Seeds*

Rachel Rorick
 Quality Assurance Engineer
 MillerCoors, Greensboro, NC
 Thesis: *Enzymatic Pretreatment
 of Sugarbeet Pulp for
 Cellulosic Ethanol Production*

M.S. Environmental Conservation Sciences

Kate Overmoe
 Pursuing a PhD in Earth System Science and Policy
 University of North Dakota, Grand Forks, ND
 Thesis: *Water Quality and Effectiveness of Artificial Aeration
 on Heinrich-Martin Dam, LaMoure County, ND*

Ph.D. Agricultural and Biosystems Engineering

Bhavni Dhillon
 Post Doctoral Research Associate
 Agricultural and Biosystems Engineering
 North Dakota State University, Fargo, ND
 Thesis: *Development and Evaluation of an
 Ozonated Water System for Durum
 Wheat Grain Processing*

Wajira Asanga Ratnayake Manamperi
 Post Doctoral Research Associate
 Agricultural and Biosystems Engineering
 North Dakota State University, Fargo, ND
 Thesis: *Canola Meal Fractionation and
 Utilization for Protein-Based
 Thermoplastics*

Punyatoya Mohapatra
 Thesis: *Identification of Gaseous and
 Liquid Metabolites in Contaminated
 Beef Using Surface Enhanced
 Raman Spectroscopy as a Form
 of Artificial Taste Sensor*

Judith Delores Espinoza Perez
 Post Doctoral Research Associate
 Agricultural and Biosystems Engineering
 North Dakota State University, Fargo, ND
 Thesis: *Production and Characterization
 of Epoxides from Canola Oils*

North Dakota State University
Department of Agricultural and Biosystems Engineering
NDSU Dept. 7620
PO Box 6050
 Fargo, North Dakota 58108-6050

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