It has been a time of change in the Department of Agricultural and Biosystems Engineering. Sreekala Bajwa left in January to become Vice President of Agriculture at Montana State University. Bajwa will oversee a teaching and research network that stretches across Montana with seven agricultural research centers, five academic departments and five Bozeman-based campus farms and ranches.

I added the role of Interim Chair of the ABEN department to my position of extension agricultural engineering specialist on February 15th. I have responsibility for leading all aspects of the department. It is an honor to be selected by colleagues and administrators to serve as interim chair. It is an exciting time for our department, offering engineering degrees with a biosystems concentration or agricultural concentration, an agricultural systems management degree that leads to employment in a broad variety of positions, and the new precision agriculture degree. There is a wide range of research being conducted in precision agriculture, grain storage and processing, and water resources. In addition, there is a vibrant Extension program providing education and technical assistance.

Our engineering program, after an extensive review by ABET, has received accreditation for six years. This is the maximum number of years that can be obtained. The Agricultural and Biosystems Engineering (Bachelor of Science) program has two concentration tracks, agricultural engineering and biosystems engineering.

The first course of the new major in Precision Agriculture was taught during spring semester. We have about 15 students already enrolled in the program, in addition to numerous additional students taking the courses. Drs. Rex Sun and Paulo Flores are our two faculty in precision agriculture. Joining them in conducting research are new Research Assistant Professors Yu (Heather) Zhang and Zhao Zhang. Assisting with the research are new Research Specialists D. John Stenger and Kenton Jensen. There is additional information included in the newsletter.

Students and faculty have received many awards this year. Dr. Borhan was recognized by the College of Agriculture, Food Systems and Natural Resources for his work as a research specialist, Dr. Steele was recognized by the College of Engineering for teaching excellence, I received the ASABE Sukup Global Food Security Award, and Ryan Carda was recognized by ASABE as undergraduate student of the year. Zhao Zhang was recognized by ASABE as part of the team to receive the Rain Bird Engineering Concept of the Year Award, and former department chair Dr. Sreekala Bajwa received the James and Karen Gilley Academic Leadership Award. There is more information on these awards in the newsletter.

A new Center for Digital Agriculture and Big Data at NDSU was approved by the State Board of Higher Education as part of the Agricultural and Biosystems Engineering Department with John Nowatzki serving as the Center Director and Drs. Rex Sun and Paulo Flores serving as associate directors. The center will address research and educational needs of the region to increase efficiency and sustainability of production agriculture through digital technologies to include collecting, archiving and distributing digital data, performing analytics and providing digital agriculture training. The Center is forming an industrial advisory board as well as a scientific advisory board of scientists and end users of technology.

We recently hired Ademola Hammed (Demmy) as a Research Assistant Professor in Bioprocessing. He has his office in the BioProcessing Lab (Pilot Plant). We are starting the search...
**Message From the Chair (cont.d)**

process to hire a new engineering faculty member in processing of biomaterials and are in the early stages of searching for a department chair. 

In addition to the Agricultural and Biosystems building, we have office, teaching or lab space in numerous buildings across campus including Morrill Hall, Hultz Hall, Waldron Hall, Van Es, the BioProcessing Lab (Pilot Plant), and Machinery Learning Center (old service center). We are updating some of the teaching, lab and student space. In addition, visuals are being developed in the ABEN building so people get a more accurate representation of the breadth of our programs and facilities when visiting our building.

Please read about the many student activities including senior projects, the Ag Tech Expo, and student club activities. The many scholarships received by the students are listed in the newsletter. Thank you to the many donors whose generosity make this possible.

Kenneth Hellevang

**Dr. Dennis Wiesenborn Retires**

Dr. Wiesenborn retired in December, 2019. He came to NDSU in 1995 and became Professor in 2002. His primary areas of research at NDSU were scaled-up processing of ND agricultural commodities, storage conditions effects, technical hurdles in the emerging industries of energy beets and biodiesel, oilseed extraction and conversion for bio-based polymers and fuels, and process modeling for biofuels and renewable products.
Dr. Wiesenborn taught ABEN 263 – Biological Materials Engineering every spring semester.
He was a Fulbright Senior Scholar to the University College Cork, Ireland, in 1997. He has published ~70 peer reviewed journal publications and received ~60 funded research grants. Thank you from all of us at ABEN and NDSU.

**Dr. Md Saidul Borhan Receives Award**

Md. Saidul Borhan, left, receives the Charles and Linda Moses Staff Award from David Buchanan, associate dean for academic programs. (NDSU photo)
Dr. Borhan has worked with Dr. Shafigur Rahman as a research specialist since 2011. His work entails air and water quality measurements and analysis using advanced instrumentation and technology. Their projects include evaluating vegetative filter strips in reducing feedlot nutrient runoff, monitoring greenhouse gases from feedlots, evaluating a novel flax horse bedding product, ozone and electrolysis treatment to mitigate pollutant gases from swine manure, and fate and transport of zinc and silver nanoparticles in livestock manure and their impact on the environment. Dr. Borhan assists in teaching ASM 354 – Electricity and Electronics in Agriculture. He has published many peer-reviewed scientific papers and presented them at professional meetings. His exemplary performance in service and research merits this award.

**Dr. Dean Steele Recognized for Excellence in the Classroom by the College of Engineering**

Dean Steele was given the 2018 Excellence in Teaching Award for his work incorporating hands-on experience and real-world examples in his courses. “Dean is an invaluable, effective and dedicated teacher and mentor,” said Sreekala Bajwa, department chair for agricultural and biosystems engineering. “He has been a dedicated teacher and mentor to our students, and well regarded by his class. I often hear the graduating seniors and students registered for internship credits comment about how important his course was in their job. His contribution to assessment and continuous improvement of our programs has also been invaluable.” Dr. Steele joined NDSU in 1991.
Department Highlights

New Faculty and Staff Join the ABEN Department - Precision Ag Group
The ABEN department would like to welcome the following new faculty and staff that have joined within the last year.

Exciting Updates from the New Precision Ag Program

Research

The Precision Ag program is collaborating with many academic departments and industry corporations across the Midwest region which include USDA, Microsoft, National Pork Board, John Deere, Sentera, etc. Since July 2018, the precision ag team submitted over $7.7M dollars in total research proposals and have over $1.1M in funded research.

Teaching

In January 2019, the ABEN department taught it's very first Precision Ag major course, PAG 215: Mapping of Precision Ag Data. The course was taught by Dr. Rex Sun, and based on student feedback, this first offering was very successful - “As a senior, this introduction level class was one of the best classes I took at NDSU. I would recommend any student of any major to take a class from Rex or in this program.” In the fall of 2019, Dr. Sun will be teaching PAG 115: Introduction to Precision Ag (24 enrolled) with the other faculty (Dr. Paulo Flores) in precision ag at our Department. Dr. Sun and Dr. Flores also are developing four additional courses for the Precision Ag program.

Team Members

Our new program consists of a total of 27 members who have joined or worked with our Precision Ag team. We currently have two assistant professors, one extension specialist, two research assistant professors, two research specialists and 8 graduate students (crop and livestock) working in the precision ag program. The precision ag research also attracted many part-time student assistants from other majors which include electric engineering, ag economics, business, architecture, and computer science.

Our Precision Ag program team members have various of expertise which include: sensor technology, computer science, plant science, artificial intelligence, robotics, drone imagery, automation, GIS (Geography Information System). With all the Precision Ag team members' efforts and expertise in our ABEN Department, we believe the PAG program will continue to have success.

Hellevang Receives Global Food Security Award

Ken Hellevang, interim chair, professor, and NDSU Extension agricultural engineer received the American Society of Agricultural and Biological Engineers (ASABE) 2019 Sukup Global Food Security Award during the annual international meeting in Boston, Mass., on July 10. This award is one of the ASABE's top honors. It recognizes exemplary work in the enhancement of food security by innovative engineering or the application of engineering in the production and distribution of food, grains and oilseeds, and the handling of grains, oilseeds and other food products. The award honors him for his exceptional engineering-based educational Extension program that has enhanced drying, storage and handling of grains, oilseeds and other food products.

He serves as an educator and consultant internationally. He also has conducted considerable research on grain drying and storage. In addition, he is Extension's resource for mold topics and structural flooding. Hellevang has authored or co-authored more than 220 peer-reviewed articles, conference proceeding papers and other publications.

Hellevang has received numerous awards, including the ASABE Professional Engineering Institute's Engineer of the Year Award, the Distinguished Alumnus Award from SDSU ABEN, and was inducted as an ASABE Fellow. The ASABE has more than 7,000 members in more than 100 countries.
71st Annual Agricultural Technology Exposition

"Growing Tradition"

The 71st Annual Agricultural Technology Exposition was held on February 9, 2019. As always, the Expo gave our ABEN and ASM students an opportunity to showcase their knowledge by presenting projects dealing with technology and agriculture. Our students planned, organized, and ran a very successful Expo. Projects were outstanding and diverse. Over $1,000 in scholarships were awarded.

Machinery Division -
1st: Andrew Junglen, Jordan Zunker, Mathew Blum “HOPS Harvester”
2nd: Lillian Bergman “Amity Defoliator Active Height Control”
3rd: Statler Olson & Ben Vetsch “Gates Manufacturing Coulter Harrow”

Precision Ag Division -
1st: Philip Steffan & Chase Bader “Spraying Into the Future”
2nd: Cody Mauch, Garrett Mogck, Mason Falk “Telematics”
3rd: James Radtke “Robotic Milkers”

Structures, Energy & Processing Division -
1st: Breeya Pederson & Gabriel Beaver “Miscanthus for Ethanol Production”
2nd: Preston Wilson “Sugar Beet Ethanol”
3rd: Makenson Maisonneuve “Summer Product Processing”

Soil, Water & Environment Division -
1st: Maribel Vargas, Addison Helgaas, Josh Brilz “Automate That Sprinkler”
2nd: Kimberly Cress “Daikon Radishes as a Cover Crop”
3rd: Alex Frisch, Aaron Kalthoff “Variable Rate Irrigation”

Grand Champion - Philip Steffan & Chase Bader
Freshman Champion - Philip Steffan & Chase Bader
Reserve Champion - Mathew Blum, Andrew Junglen, Jordan Zunker
People’s Choice - Philip Steffan & Chase Bader
Senior Design Champion - Tyler Borgerding, Andrew Junglen, Austin Trustheim, Nathan Palmer “Designing a Bale Processor Attachment for Use on a 500-800 Series Bobcat Skid Loader”

Grad Research Project-
Nadia Delavarpour “Navigation Sensors Usage in Auto Steering Agricultural Equipment”

Carda Received the 2019 Roger & Laura Yoerger Preprofessional Engineer of the Year

The award acknowledges and recognizes an outstanding undergraduate engineer who has excelled scholastically and as a leader.

Ryan Carda was the 2019 recipient of the Roger R. and Laura M. Yoerger Preprofessional Engineer of the Year award during the ASABE’s annual international meeting in Boston, Mass., on July 10. for being an outstanding student, humble servant to his community, and strong leader to the agricultural and biosystems engineering student clubs at North Dakota State University. Carda graduated in May 2019 from NDSU with a degree in agricultural and biosystems engineering. Carda is working as an environmental GIS assistant for Kanabec County in Minnesota. Carda has been a leader in the NDSU ASABE student chapter and has served as an engineering ambassador. He worked as a peer mentor at with the local chapter of Alpha Epsilon. Carda was a member of the NDSU Horticulture and Forestry Club and the Mortar Board Honor Society. As president of the NDSU ASABE student club, Carda led the group to engaging with a more diverse group of speakers, allowing a better demonstration of careers available to students in the department. He also served as the STEM Outreach Coordinator for the NDSU Engineering Ambassadors, this required him to give tours to prospective high school students. Carda excelled in this role and was very positively reviewed by future students and their families. As Carda moved through the agricultural and biosystems engineering program, he realized that his studies would enable him to work on projects that have a big impact on people’s lives. His skills as an engineer would enable him to create tools that vastly improve the world and lives across the globe. His work focuses on making the world better by finding more efficient ways to use natural resources and ensuring current processes are working sustainably.

71st Annual Ag Tech Expo Management Team

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Grad Research Project-
Nadia Delavarpour “Navigation Sensors Usage in Auto Steering Agricultural Equipment”
Bison Pullers compete at the 2019 International Quarter-Scale Tractor Competition

The 2019 Bison Pullers team endured a challenging year. The tractor completed the maneuverability event then bent parts of the rear suspension mounting during durability practice. This was reinforced and we completed the 3rd highest number of laps on the durability course, 16, with the most being 21. We were very confident in our tractors performance until a catastrophic failure of the transmission during a practice pull which made the tractor unable to compete in the pulls. Even with the difficulties the team experienced, the team still managed to place 11th out of 24 teams overall. The team learned quite a lot this year, had a lot of fun, and are looking forward to next year!

Congratulations ABEN and ASM Graduates!

2018-19 ABEN Graduates

Samuel Ecker
Darrin Frederick, Jr.
John Naas
Grady Reinking
Jonathan Roe
Calvin Aichele
Ryan Carda
Ethan Haley
Tyler Heil
Alexa Hoffarth

Andrew Junglen
Joanna Larson
Ryan Stieg
Austin Trustheim
Matthew Werlinger
Brandon Wyum

2018-19 ASM Graduates

Allison Fox
James Grommes
Ryan Stieg
Kevin Libbrecht
Grant Pedersen
Pryce Pinney
Brady Schmoll
Nicholas Schutt
Landan Tollefson
Andrew Weber
Kody Grandalen
Andrew Halstead
Carson Hagen
Daniel Stibral
Jackson Tripplett
Devon Volk
Andrew Weber
Chase Zenker

2018-19 ABEN Projects

Ethan Haley
Alexa Hoffarth
Joanna Larson

Andrew Junglen
Joanna Larson
Ryan Stieg
Austin Trustheim
Matthew Werlinger
Brandon Wyum

Beef Feedlot for John Langerud
Designing a Bale Net Wrap Removal Attachment for 500-800 Series Bobcat Skid Loader
Designing a Drainage Structure to Improve Vertical Drainage of Water in Clayey Soils
Designing a Front Mount Sugar Beet Defoliator for Use in International Markets

2018-19 ASM Projects

Andrew Halstead
David Glen
Kody Grandalen
Alex Jarrett

Spot Spraying Drones
Return on Investment of Precision Tools for Planters
T-T Ranch Shop/Office Project
Building a New Shop for C.C. Borgen, Inc.

ASM Capstone Projects

Andrew Halstead
David Glen
Kody Grandalen

Spot Spraying Drones

Return on Investment of Precision Tools for Planters

T-T Ranch Shop/Office Project

Building a New Shop for C.C. Borgen, Inc.
Student Club Officers 2019-2020

**Ag Systems Mgmt**
President: Sean Hertz  
Vice-President: Ben Schiller  
Secretary: Darris Thoreson  
Treasurer: Cade Blickensderfer  
Advisor: Matt Olhoft

**Bison Pullers**
President: Carter Peterson  
Vice-President: Aaron Kalthoff  
Secretary: Parker Barth  
Treasurer: Maribel Vargas  
Advisor: Tom Bon, Matt Olhoft

**Alpha Epsilon**
ELECTIONS HELD  
IN FALL  
Advisor: Xinhua Jia

**Precision Ag**
President: Austin Eide  
Vice-President: Devin Flanders  
Secretary:  
Treasurer: Steven Taves  
Advisor: Rex Sun

Scholarship Recipients 2019-2020

_College of Engineering_

**Lawrence & Elizabeth Shaw Scholarship**
Zachary Tschida  
Scott Folz  
Tyler Borgerding

**Marvin and Doris Jensen Scholarship**
Abbi Klos

**Lundstrom Family Scholarship**
Teresa Wald

**Brian & Debra Houkom Scholarship**
Sawyer Burchill

**Thoreson Engineering Scholarship**
David Hein  
Lane Jeffers

**Ernie French Scholarship**
Blake struthers

_University of Agriculture, Food Systems, and Natural Resources_

**Elton Solseng Scholarship**
Teresa Wald

**Vernon Lee Scholarship**
Mackenzie Schultz  
Nathan Steffan

_Scholarship Donor Contributions_

Over $50,000 in scholarships were awarded to our students! Donors make important contributions to the scholarship program and activities 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 2019.

**ABEN Department Fund**
John Deere Foundation - Matching Gift  
Dilpreet and Sreekala Bajwa  
Alan Bergman  
David & Mary Broten  
Bryan & Karen Buerkle  
Kevin & Nancy Erickson  
Bob & Diane Fritel  
Myron Iszler  
Russell & Lori Johnson  
Stephan & Rita Johnson  
Gary & Karen Justus  
Siew Lim & Zhulu Lin  
Dan Lugert  
Richard & Sandra Lunde  
Paul & Lindsey Petersen  
Scott Pryor & Amy Rand  
Rixon Rafter  
Shafiqur Rahman & Nurun Nahar  
Jeffrey D. Sather  
Robert & Eiko Schiffman  
Cary & Hannah Slominski  
Lowell & Birgit Solien  
Gary & Judith Spangelo  
Robert & Etta Strand  
Kyle & Michelle Vig  
Jared Walter  
Mark Walter  
John Witz  
ABEN Scholarship Fund

**ABEN/ASM/PAG Scholarships**
A.R. Bon Memorial Scholarship  
Sean Hertz  
E.L. Bon Memorial Scholarship  
John Haverland  
Landon Overbo  
F.A. Bon Memorial Scholarship  
Jordan Zunker  
M. Bon Memorial Scholarship  
Carson Peterson  
Holman-Breuer Scholarship  
Matthew Kittelson  
Scott & Mary Handy Scholarship  
Preston Wilson  
Marvin & Doris Jensen  
Abbi Klos  
Walter & Pearl Nyquist Scholarship  
Matthew Kittelson  
Bill & Ann (Wick) Promersberger Scholarship  
Maribel Vargas-Aguilar  
Dr. George & Patti Pratt Scholarship  
Gabriel Beaver  
Earl & Dotty Stegman  
Kat Anderson

**ABEN Department Scholarship**
Allysa Kemp  
Reed Nelson  
Broden Frolek  
Anna Muggli  
Hunter Frederick  
Breeya Pederson  
Dylan Johnson  
Aaron Dean  
Nathan Palmer  
Cordell Eaton  
Kendra Haller

**ABEN Graduate Student**
Frank Bain Agricultural Scholarship  
Talon Mack  
Subha Navaneetha Srinivasagan  
Cristiano Barros Da Costa

**Bon Family Memorial Scholarships**
Tom Bon

**Ernie W French Memorial Scholarship**
Mary Ann French
In Memorium

Lester Stine, 93, BS ’50, agricultural engineering, was a minister, teacher and Navy veteran. He lived in Lindale, Texas.

Gordon Cowan, 77, BS ’68, agricultural mechanization, farmed most of his life near Church’s Ferry, North Dakota.

Thore Ulberg, 84, BS ’61, agricultural engineering, was a farmer until his retirement in 1996.

John T. Pearson, 57, BS ’83, agricultural mechanization, was the founder of Glacier Salt and owned Hungry Lake Ranch. He lived in Frazee, Minnesota.

Gene Weixel, 74, BS ’71, MS ’72, agricultural mechanization, was an Extension agent and later a farmer in Lisbon, North Dakota.

Donald E. Berge, 82, BS ’57, agricultural engineering, retired as a colonel from the North Dakota Air National Guard after 39 years of service. Hatton, North Dakota.

Earl Stegman, 81, BS ’59, MS ’61, agricultural engineering, was an NDSU faculty member for 37 years, and served as chair of the agricultural engineering department for 12 years. He lived in Fargo.

Richard Duncan, 69, BS ’71, agricultural mechanization, operated the family farm and ranch southeast of New Salem, North Dakota, for 46 years.

Larry Orke, 68, BS ’72, agricultural mechanization, lived in Fargo.

Ronald Ulven, 80, BS ’59, agricultural and biosystems engineering, was vice president of the State Bank of Hawley.

Alfred Steinke, 95, BS ’49, agricultural engineering, was an irrigation engineer at the Bureau of Reclamation for 30 years. He lived in Bismarck, North Dakota.

David Porter, 68, BS ’74, agricultural mechanization, worked in Sydney, Montana; Torrington, Wyoming; and Wahpeton, North Dakota, as a field rep for Holly Sugar and Minn-Dakota Cooperative. He lived in Fargo.

Gary Burau, 76, BS ’64, agricultural mechanization, held numerous positions for the John Deere Company during a 38-year career. He lived in Frisco, Texas.

Cyril “Bud” Mondry, 89, BS ’51, agricultural mechanization, was the owner and operator of Our Own Hardware in Oslo, Minnesota, for 48 years.

Allen Groven, 85, BS ’60, agricultural engineering, was a civil and forest engineer for the U.S. Forest Service for more than 30 years. He lived in Windsor, Colorado.
Why Donate?

In order for a program to stay current and relevant, our labs need to be updated to current technology. ABEN has been proactively updating our teaching labs. Recently, we expanded our “Instrumentation and Measurement” lab to increase the lab capacity to 24 students, are equipping a hydraulics lab with the state of the art technology and are also addressing the need for precision agriculture instructional components. Your support is critical in maintaining current technologies in our teaching labs. Your contributions are also used to sponsor scholarships for 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!

Alumni Contributions

Enclosed is my tax deductible check payable to: NDSU Foundation & Alumni Association, with a memo indicating ABEN, in the amount of:

- $25
- $100
- $1,000
- $50
- $500
- Other $________

Or, if you wish to designate your contribution to a particular use, please feel free to do so here:

- Ernie French Memorial Scholarship
- Holmen-Breuer Memorial Scholarship
- Elton Solseng Scholarship
- ABEN Scholarship Fund
- Un-designated

Return to:
NDSU Foundation & Alumni Assoc.
Harry D. McGovern Alumni Center
1241 N. University Drive
Fargo, ND 58102

Or, online at:
www.ndsualumni.com/contribute