

DEPARTMENT OF BIOLOGICAL SYSTEMS ENGINEERING

ISSUE 4 Vol. 1

NEWSLETTER OF ACHIEVEMENT

AUGUST 2008

New Biomedical Lab Makes Debut



Dr. Prem Paul takes a look through one of the microscopes as Dr. Bashford looks on.

Taking another step forward in new technology, the new Nonviral Gene Delivery and Cell Culture labs were introduced to visiting dignitaries, department members, and students during an open house on Friday, February 29. Dr. Angela Pannier and members of her lab group provided tours and discussed the equipment while providing explanations of the research being undertaken. Among the visitors were Prem Paul, Vice Chancellor for Research and Economic Development; Kim Espy, Associate Vice Chancellor, Research; Judith Burnfield, Ph.D., P.T., Director, Movement Sciences Center, Institute for Rehabilitation Sciences and Engineering, Madonna Rehabilitation Hospital in Lincoln, and Edward Truemper, M.D., Clinical Director, Pediatric ICU at Nebraska Medical Center Children's Hospital, Omaha. To learn more about this lab, visit the Web site:

<http://bse.unl.edu/pannierlab/index.shtml>

Across the hall, Dr. Greg Bashford's Biomedical Imaging lab, was also open. Visitors explored several student-manned stations around the lab, as they learned about ultrasound applications and other student research. Students in the department help conduct research and gain valuable educational experiences through opportunities to work with faculty and professional partnerships.



Senior Rob Corn monitors blood flow through the middle cerebral artery using a transcranial doppler machine on department staff member Monte Shomaker, while staff members Teresa Ryans (R) and Laura Hayes (L) look on.



View of Dr. Pannier's new lab.



Michaela McBride (in blue) and Megan Krause (in stripes) explain their project with Madonna Rehabilitation Hospital during the open house.



UNIVERSITY OF NEBRASKA-LINCOLN

BIOLOGICAL SYSTEMS ENGINEERING DEPARTMENT

From the Department Head



Ron Yoder

This issue of our newsletter highlights the achievements of our students, current and past. To the right of this column you will note an extensive list of our students who were recognized for their academic excellence by being named to the Dean's list for the spring semester. As you peruse the newsletter you will also note

graduates who received their degrees with Highest Distinction, students who were named academic Big-12 and academic All-Americans in wrestling and in track and field, five students who are members of the select Honor Society, the Mortar Board, and an undergraduate student who received a \$25,000 competitively awarded national scholarship. Seven of our undergraduate students, representing all three of our undergraduate degrees, competed for and were awarded UCARE (Undergraduate Creative Activities and Research Experiences) funds to complete undergraduate research projects.

Past students featured in this issue are Agricultural Engineering graduate John Miller who has developed a unique and highly successful business making premium foods for small animals, and Wayne Choat, a Mechanized Systems Management graduate, who is Applications Engineering Manager at Lindsay Corporation. As Wayne notes "Lindsay is a worldwide leader in providing irrigations solutions for agriculture." Lindsay is one of the four major center pivot irrigation manufacturers located in Nebraska; the four manufacturers command nearly 70% of the world market in center pivot sales.

This obviously is a very incomplete list of the accomplishments of our current students and our graduates. One of my purposes in introducing them here is to give you an idea of the past and present excellence of the students in our Department, and if you are an alumnus of the Department, to encourage you to share your experiences with us. My second purpose is to thank you for your help in recruiting the excellent students we currently have in our programs, enrollment is strong in all three programs, and to solicit your continued help in spreading the word about our academic programs, and the strong job market for our graduates. As always, we welcome your visits to the Department, to the Nebraska Tractor Test Lab, and to the Lester F. Larsen Tractor Test and Power Museum.

Ron Yoder

Biological Systems Engineering Newsletter

Ron Yoder Editor

Gail Ogden Editorial Coordinator

Sheila Smith Graphics and Design

Contributors Dane Mosel, Suat Irmak, Wayne Choat, Curt Weller, Loren Isom

The Dean's List

* indicates 4.0 gpa for spring semester

MSYM:

Patrick Moser
Alan Wiese
Daniel Stoll
Daniel Leiser
Corey Smith
Brent McKinney
Joseph Holubek
Ben Fitzwater

AGEN:

Wes Cammack
Joseph Darrington
Brady Folck
Ryan Hulme
Grant Janousek
Jason Johnston
Andrew Landgraf
Isaac Mortensen
Andrew Volkmer

BSEN:

David Adams
Andrew Anderson
Santiago Arciniegas *
Stephanie Baird *
Scott Barker
Nicholas Behm
Stephanie Berger *
Dennis Bierle *
Brenden Boyle
Anne Bradford
Whitney Brown
Prakash Chapain
Wei-Jian Chin
Robert Corn *
James Dalton *
Quentin Dudley *
Austin Dudzinski
Heidi Gengenbach
Andrea Gilkey

BSEN:

Brent Hall *
Rachel Hanigan
Brent Hanson
Harrison Hoffman
Brant Hubbard *
Ashley Johnson
Kathleen Johnson
Stacey Joy
Lisa Karel
Shannon Killion *
Megan Krause *
Peter Larson
Joshua Lee *
Erica Levorson
Donna Lounsbury
Jacob Maxson
Michaela McBride
Michael McKinney *
Abbey McTaggart
Daniel Menter
Allison Mettler
Nguyen Nguyen
Stephen Nogel *
Laura Podany
Mary Regier *
Ryan Roemmich
Joseph Rose
Catherine Sargus
Tyler Scherr
Kristine Seier
Chi Min Seow
Dipika Singh
Allison Smith
Nathan Stahr *
Bradley Staskiewicz
Chance Thayer
Elizabeth Thrailkill *
Cassandra Wehling
Issar Yazhbin *
Cze Song Yeo
Simeng Zhang
Yueying Zhang *

Mention of trade names in this publication does not imply endorsement by the Biological Systems Engineering Department.

Meet the Faculty

This section features newer faculty members, highlighting their unique expertise and commitment to excellence. In research, teaching, and extension, our faculty provide the creative energy that makes this Department so widely acclaimed.

Suat Irmak is an Assistant Professor and an Agricultural Water Management Specialist with appointments in research (40%) and extension (60%). He joined the Department in 2003. (His wife, Ayse, is an Assistant Professor in the School of Natural Resources and the Department of Civil Engineering. They both completed their Ph.D.'s at the University of Florida in Gainesville.) Suat has developed research projects to address critical agricultural water management issues in Nebraska. His research projects focus on agricultural water management issues and include: developing strategies to increase crop water use efficiency; quantifying surface soil evaporation losses from a variety of till or no-till practices; measurement of evapotranspiration, consumptive water use, and crop coefficients; center pivot deficit irrigation; and evapotranspiration- and soil moisture-based irrigation management. Suat is also conducting research on operational characteristics of subsurface drip irrigation (SDI).

The SDI project supplies water directly to the crop root-zone while minimizing surface soil evaporation and runoff. To accomplish this, irrigation laterals were buried below the soil surface, typically between 13 to 20 inches (depending on such factors as the soil, crop type, climate, and management practices) to deliver water via polyethylene drip lines and emitters. With an effective irrigation-scheduling program to supply crop water and nutrient needs directly to the plant root-zone, crops can be "spoon-fed" water and nutrients.

The spoon-fed characteristic of the SDI system has great potential to minimize or eliminate the movement of water and nutrients below the

crop root-zone. With SDI, the irrigation water is filtered and fertilizer is mixed at the control station before application to the field. When properly managed, irrigation application losses (drift, soil evaporation, deep percolation, and runoff) with SDI are significantly lower compared to other irrigation systems. Potential applications can be to fields with relatively large slopes, to small and/or odd shaped fields where installation of a center pivot may not be feasible, to areas with low-capacity wells, or for producers wanting to convert from surface irrigation.

Some of the SDI research project objectives are: 1) to determine evaporative losses from three different tillage practices (no till, ridge till, and conventional-disk till); 2) effect of irrigation frequency on crop growth and yield; 3) crop water use efficiency response to fertigation and irrigation; and 4) quantifying the relationships between crop water stress and available water and crop yield. The System Control unit, includes solenoid valves, air/vacuum release valves, filters, and an irrigation controller. The system is designed so that each dripline can be flushed at the lower end of the field.

Beginning in 2004, two SDI systems were installed—11 and 33 acres—at UNL's South Central Agricultural Laboratory near Clay Center, Nebraska. Among the largest SDI research projects in the country, these research projects were designed as a split-split plot with main plots arranged in randomized complete block. The SDI laterals were installed, every other row, in the center of the row. The drip emitters are pressure compensating with a 0.26 gal/hr ted in each system and crop evapotranspiration is



Dr. Irmak connects individual drip lines to the main lines. A total of 344 drip lines were connected.



About 5 miles of 3-inch pvc pipe were installed to deliver variable rates of water to twenty treatments with three replications each.



Connecting the main lines (beneath the control unit) to the manifold.

discharge rate. In the first field, each replication (plot) is 850 feet long and 16 rows wide on 30-inch row spacing. In the second field, the plot is 400 feet long and 8 rows wide, also with 30-inch row spacing. Three and five irrigation levels are being evaluated in each system and crop evapotranspiration is determined on a daily basis. Soil water content is measured twice a week at different locations, in different treatments, every foot up to six feet using a profile probe and/or neutron scattering soil moisture probe. In addition, soil moisture is being measured on an hourly basis every foot up to six feet using Watermark Granular Matrix sensors and Watermark Monitor dataloggers. Infrared thermometers are used to monitor the crop canopy temperature continuously at 30-minute intervals to quantify crop water stress.

Dr. Irmak is working with university faculty in the Departments of Agronomy and Horticulture, Computer and Electronics Engineering, the School of Natural Resources, and with Extension Educators. He is also collaborating with the High Plains Research Climate Center, USDA-ARS (TX, CO, ID, CA, AZ), the Agricultural Research Division, the staff at the South Central Agricultural Laboratory, Natural Resource Districts, and Natural Resources Conservation Districts to accomplish his research. You can read more detailed articles of Dr. Irmak's research linked from his faculty Web page: bse.unl.edu/faculty/IrmakS.shtml



The SDI control unit includes: irrigation controller, variable speed controller, water and fertilizer flowmeters, chemical injection pump, along with numerous filters and valves.

Alumni News

2000s

Max Porter (2007, B.S., AGEN) is a design engineer with Behlen Manufacturing Co., in Columbus, Nebraska.

Melissa (Eman) Collins (2006, B.S., BSEN) is a Graduate Research Assistant in the Department of Biomedical Engineering at Texas A&M. She is working towards her Ph.D. in cardiovascular biomechanics. Her research involves atherosclerosis and its effects on the abdominal aorta regarding the possibility of it leading to abdominal aortic aneurysms.

Dan Meir (2005, B.S., MSYM) is a Production Supervisor with Cargill, Inc. in Lincoln, Nebraska.

Jennifer (Muller) Frey (2005, B.S., BSEN) is a Process Engineer for ADM Corn Processing in Clinton, IA. She is currently the Interim Alcohol Department Superintendent.

Garrett Pommeranz (2005, B.S., AGEN) is finishing his M.S. in Biosystems and Agricultural Engineering at the University of Minnesota. He will graduate in August.

Philip Christenson (2003, B.S.; 2004, M.S., AGEN) has returned to Aurora, NE, to begin farming after he worked for three years at John Deere IVS in Des Moines, IA.

Matt Foral (2003, B.S., BSEN) is a Process Engineer in R&D with ConAgra Foods in Omaha. He enjoys the challenges and the exposure to a variety of processes. He and his wife, Anna, welcomed their first child, a daughter, in May.

Tim Bray (2003, B.S., AGEN) is a Design Engineer with Ailite Plastics Company in Omaha.

Mark Major (2003, M.S., MSYM) moved his career to Montana State University Extension in Teton County, in January 2007. Now living in Choteau, he and his family are right up against the Rocky Mountain front and they love the land. Mark reports that he still waves a large Nebraska flag in his office!

Matthew Jorgensen (2001, B.S., BSEN) is working with Abengoa Bioenergy in Colorado, as a Process Engineer. He is part of the process design team for a one-of-a-kind starch/biomass hybrid bioethanol plant set to be constructed in Hugoton, Kansas.

Shelby (Pridie) Fuerst (2001, B.S., BSEN) is an Industrial Engineer (Package IE Planner) with UPS in Omaha. She received her M.S. in Industrial Engineering, also at UNL, in 2003. She has been a supervisor in the IE department for the past four years. She and her husband, Nathan, welcomed their first child, a daughter, in April 2007.

Michael Kimmel (2001, B.S., BSEN) recently completed his Ph.D. in Biomedical Engineering at the University of Minnesota. He is a Senior Design Engineer with Medtronic in the Cardiac Rhythm Disease Management group. Mike and his wife, Janis, have one child, with another on the way, and live in Minneapolis.

Blaine Christiansen (2001, B.S., BSEN) holds a postdoctoral fellowship at Beth Israel Deaconess Medical Center in Boston (affiliated with Harvard University) and works in the Orthopedic Biomechanics Laboratory. He finished his Ph.D. in biomedical engineering at Washington University in St. Louis, Missouri.

Brian Magnusson (2001, B.S., AGEN) received his P.E. license in 2006 and is in the process of finishing his MBA at Harvard Business School with plans to graduate in June. After graduation, he will be working for Bain & Company, a management strategy consulting firm, in their Chicago office.

Spencer Vorderstrasse (2005, B.S., AGEN) is working as an Irrigation Design Engineer for Reinke Manufacturing Co. Inc., in Deshler, Nebraska.

1990s

Located in Central Nebraska, **Jason Gross** (1997, B.S., MSYM) works as a Project Coordinator/Engineering Tech with Chris Henry in managing the Small Livestock Producer Environmental Assistance Extension Program. Jason and his wife, April, are the proud, first-time parents of a daughter.

Steve Weier (1998, B.S.; 2003, M.S., MSYM) is the General Pilot Plant Manager for the UNL Food Processing Center. He and his wife, Carissa, recently added a second daughter to their family.

After ten years in Washington, D.C., **David Milligan** (1996, B.S., BSEN) and his wife moved back to Nebraska to raise their family. David is a patent attorney and a partner with Husch Blackwell Sanders LLP in Omaha. He is starting a patent law and intellectual property law practice in Omaha and Lincoln.

1980s

Patrick Lee (1981, B.S., AGEN) was recently named President of Gates North America Fluid Power Division. He began with Gates as an Applications Engineer after graduating from UNL. He held several positions in Engineering, Global Business Development, and most recently as Vice President of North American Sales, before this promotion.

Mark Schroeder (1980, B.S.; 1985, M.S., MSYM) has been named the ARDC Acting Director and General Farm Manager. Mark is the current Associate Director and General Farm Manager.

We offer an update of your career and life changes. Let us know what's new. Update your profile at:
bse.unl.edu

Select Alumni Update under the Department heading. Inclusion in the newsletter is optional.

Student News

For the last couple of years **Jared Schmidt**, an undergraduate Mechanized Systems Management major, has worked for John Lindquist, Associate Professor of Agronomy and a Crop/Weed Ecophysicologist. Last spring and summer he took on an independent research project that led to presenting a poster at the North Central Weed Science Society meeting in St. Louis, MO, on December 10-13, 2007. At the meeting, Jared won second place in the Undergraduate Poster Contest, which earned him \$50. The paper was titled *Corn and velvetleaf transpiration in response to drying soil*, by Jared J. Schmidt and John L. Lindquist.

Students **Dane Mosel** (MSYM), **Alexander Austin** (MSYM), **Nate Kelly** (MSYM), **Jared Koch** (AGEN), and **Aspen West** (MSYM) attended the ASABE 2008 Midwest Regional Rally in Madison, Wisconsin, in early March. These gatherings are an opportunity for pre-professional students to meet with the president of ASABE, provide social networking opportunities, and to discover career possibilities in other parts of the country. The group toured various manufacturing facilities including Kondex, Windsor Builders, Wolf Industries, and Renew Energies. During the meeting, the University of Nebraska–Lincoln was chosen as the site for the 2009 ASABE Midwest Regional Rally; Dane Mosel was elected President and Alex Austin was elected as Vice President.

Ph.D. candidate **Octavio Lagos** and his wife, Nayade Sanfueza, are pleased to announce a new addition to their family. Tomas was born on February 18, 2008. Tomas's five-year old brother, Octavio, Jr., also looks forward to having a younger brother.

At the UNL February Forum, *Breaking the Mold, Bridging the Gap*, outstanding women scientists of junior and senior standing from across the university were recognized. The following students, all BSEN majors, from our department were recognized: **Stephanie Baird** (Sioux City,

IA), **Shannon Killion** (Kearney), **Abbey McTaggart** (Dubuque, IA), and **Mary Regier** (Julesburg, CO).

Michaela McBride (BSEN, Lincoln) is the recipient of a Science, Mathematics, And Research for Transformation Program (SMART or the Program) \$25,000 scholarship. She was one of about 200 selected from a competitive field of over 2,000 applicants. This scholarship program is managed by the Naval Postgraduate School on behalf of the Office of the Secretary of Defense. She will intern in the Army Research Lab, Department of Human Research and Engineering Directorate in Aberdeen, Maryland, during the summer of 2009, and then work in the lab for 18 months after graduation. On February 25th, Michaela was selected for membership into the Black Masque Chapter of the UNL Mortar Board Society. She joins other Department BSEN student members of Mortar Board: **Rob Corn** (Omaha), **Megan Krause** (Omaha), **Laura Podany** (Clarkson), and **Brandt Hubbard** (York). Mortar Board, Inc., is a national honor society that recognizes college seniors for distinguished ability and achievement in scholarship, leadership, and service. Members of the Black Masque Chapter have been serving the University of Nebraska–Lincoln since 1905.

Ajay Kumar, a Ph.D. candidate, received a Graduate Fellowship from the Office of Graduate Studies and a Milton E. Mohr Fellowship.

Heartwin Pushpadass, a Ph.D. candidate, received a fellowship through the Office of Graduate Studies.

Former Husker track and field star **Issar Yazhbin** of Yavne, Israel, was one of 25 Chancellor's Scholars honored on April 6, at the Lied Center for Performing Arts during UNL's All-University Honors Convention. Chancellor's Scholars are students who will receive degrees in May or August and have maintained a 4.0

grade-point average on all of their collegiate work at UNL and elsewhere.

Issar earned his first College Sports Information Directors of America (CoSIDA) Academic All-America honor in 2007 after producing a perfect 4.0 GPA in Biological Systems Engineering. He also earned three consecutive first-team academic All-Big 12 awards and appeared on the Big 12 Commissioner's Honor Roll seven times.



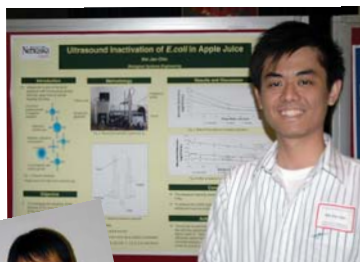
Issar excelled in the hammer throw at Nebraska when he competed for the Big Red from 2004 to 2007, and was team co-captain in 2006 and 2007. He earned a Big 12 Championship in the hammer throw in 2004 with a toss of 203-8. He also competed at the NCAA Outdoor Championships twice, finishing 15th in the hammer throw in 2005 and 17th in 2007. Issar currently holds the hammer throw record at Nebraska with a mark of 207-7 from the 2007 NCAA Midwest Regional. (Photo (Scott Bruhn) and copy (Jeremy Foote) courtesy of NU Media Relations.)

Craig Brester, a junior in MSYM, was named "Big 12 Wrestler of the Week" in February 2008 and received recognition from the web site, TheMat.com. Craig was also named a "1st Team Academic All-American" in the Big 12 Conference this year. He achieved academic distinction on the Big 12 Commissioners Honor Roll for both the Fall 2007 and Spring 2008 semesters.

UCARE



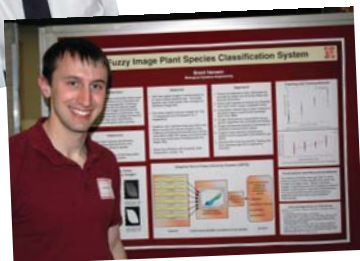
Prakash Chapin



Wei Jian Chin



Chi Min Seow



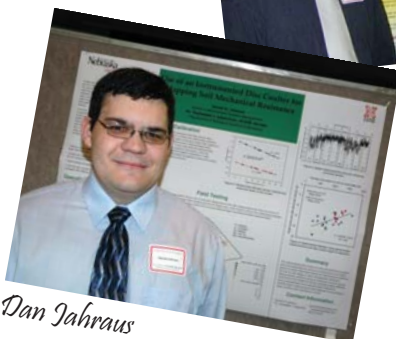
Brent Hanson



Grant Janousek



Isaac Mortensen



Dan Jahraus

The Department was well represented at the University's annual spring poster presentation for the Undergraduate Creative Activities and Research Experiences (UCARE).

Prakash Chapin (BSEN),
Detection of Bone Fragments for Different Concentration Levels in Deboned Chicken Using Ultrasound.
Dr. Gregory Bashford, advisor.

Wei Jian Chin (BSEN),
Ultrasound Inactivation of E. Coli in Apple Juice.
Dr. Suat Irmak, advisor.

Chi Min Seow (BSEN),
Online Robotics Simulation for Collaborative Engineering.
Dr. Carl Nelson, Mechanical Engineering, advisor.

Brent Hanson (BSEN),
Fuzzy Image Plant Species Classification System.
Dr. George Meyer, advisor.

Grant Janousek (AGEN),
The Design and Implementation of a Hydraulic Dynamometer for Testing Power Mix in Agricultural Tractors.
Dr. Roger Hoy, advisor.

Isaac Mortensen (AGEN),
Comparison of Near-Infrared Transmission Spectroscopy and Raman Spectroscopy to Quantify Yolk Contamination in Egg White.
Dr. Jeyamkondan Subbiah, advisor.

Dan Jahraus (MSYM),
Use of an Instrumented Disc Coulter for Mapping Soil Mechanical Resistance.
Dr. Viacheslav Adamchuk, advisor



A few of the graduating BSEN students, back row, left to right: Laura Podany, Rob Corn, Megan Krause. Front, left to right: Erica Levorson, Andrea Tuma.

Graduates



Dr. Jones congratulated Amy Jorde on her Masters.

December Graduates

B.S. in Agricultural Engineering

Zach Alger, Ravenna, OH
Brad Salber, Albion
Jason Schafer, Vista, CA

B.S. in Biological Systems Engineering

Bill Alms, Eden Prairie, MN
Crystal Bryan, Falls City

B.S. in Mechanized Systems Management

Jordan Carlson, Arnold
Gary Garms, Smith, NV
Tim Keller, Lincoln
Jason Kepler, Chappell
Jason Krueger, Lincoln
Weston Rathje, Roseland
Heath Renfro, Stratton

Master of Science

Denis Mutibwa, Kampala, Uganda
Thesis title: Penman-Monteith: Scaling Up Leaf Stomatal Resistance to Canopy Resistance For One-Step Estimation of Crop Evapotranspiration

May Graduates

Outstanding students for each department are selected by the College of Engineering. Grant Janousek was selected from Agricultural Engineering and Erica Levorson was selected from Biological Systems Engineering.

B.S. in Agricultural Engineering

Isaac Mortensen, Curtis

B. S. in Biological Systems Engineering

Robert Corn, Omaha, with Distinction
Brant Hubbard, York
Megan Krause, Omaha, with Distinction
Peter Larson, Sioux Falls, SD
Erica Levorson, Overland Park, KS, with Highest Distinction
Laura Podany, Clarkson
Jakeb Riggle, Elkhorn
Andrea Tuma, Waukomis, OK
Issar Yazhbin, Yavne, Israel, with Highest Distinction

B.S. in Mechanized Systems Management

Wes Eckwall, Omaha
Adam Flaugh, Madison
Levi Gunn, Superior
Daniel Jahraus, Omaha
Tim Mattson, Chapman
Austin Merz, Falls City
Jeffry Morris, Fremont
Jared Schmidt, Grand Island
Doug Triplett, Sumner



Dr. Yoder presented Shah Huda with his Doctoral Hood.

M.S. in Agricultural & Biological Systems Engineering

Amy Jorde, Sioux Falls, SD
Thesis title: Comparison of Pitch Synchronous Overlap-Add (PSOLA) and Praat Algorithms on Intelligibility of Time-scaled Speech Without Frequency Shift

Ph.D. in Engineering

Shah Huda
Dissertation title: Composites from Chicken Feathers and Cornhusk – Preparation and Characterization



Spring semester graduating MSYM students, from left to right: Tim Mattson, Jessica Geis (graduating in August), Austin Merz, Levi Gunn, Doug Triplett, Jared Schmidt, Dan Jahraus, and Adam Flaugh. Not pictured: Wes Eckwall who was being commissioned as a 2nd Lieutenant in the U.S. Air Force, and Jeffrey Morris.

John Miller A Success Story



John Miller

the education he received in agricultural engineering was instrumental in his effectiveness to visualize and create

Rabbits, guinea pigs, chinchillas, and other small pets are eating better thanks to John Miller, a 1971 UNL agricultural engineering graduate. John is the founder and president of Oxbow Animal Health, maker of premium foods for small animals, in Murdock, NE.

Similar to many other well-known inventors, John started Oxbow in his garage in Murdock, moved it to his parents' larger garage in Elmwood, then returned to Murdock, where the business is now centered on his farm. The renovated barn, built in 1901, houses offices for an approximately 50-person staff. The business has grown tremendously and now ships products throughout the United States and to 26 countries. "We were really lucky to have the right idea at the right time," he said. "The market was ready for innovative products."

Having a successful business was far from his mind when he was a student at UNL. John was a member of Farmhouse Fraternity, and said the members had a reputation of being aggressive leaders. He added that his experiences gained from his fellowship in the Nebraska LEAD program also contributed greatly to his innovative ideas and leadership skills. After graduation, he worked as a petroleum engineer for Amoco then returned to his family farm in Elmwood a couple of years later.

He decided against growing corn and soybeans since they were traded on the Chicago Board of Trade. Alfalfa was not a traded commodity;

he could therefore have more control over the price. "I've always been really independent," he said. "That's one of the reasons I came to the farm and the reason I raised alfalfa instead of corn and soybeans."

He started the Oxbow Hay Co. in 1980, learning to grow premium-quality alfalfa that he sold to dairies and horse owners. As he grew adept at marketing alfalfa he decided to add value to his product. Realizing the types of available food for small animals was limited, "I started thinking about the pet food market," he said. "I knew I could do a better job."

He made his first bag of packaged alfalfa hay in 1993. Miller said the education he received in agricultural engineering was instrumental in his ability to visualize and create the custom hay stuffing machines that now package 2,000 tons of hay per year into 15-ounce and 40-ounce bags.

At the time, people were beginning to place a higher value on small animals as pets and were taking these pets to veterinarians. So in addition to trade shows and conferences, he also marketed his product to veterinarians who, in turn, promoted it around the world. John created a Web site in 1994, before most businesses had sites, and began to sell his product online.

John has added production and warehousing facilities to his operations and expanded the line of pet food. Oxbow now has 25 different products for a variety of carnivores and herbivores. It was the first company to package and market timothy grass hay, which is now a staple food for small animals. The company recently changed its name from Oxbow Pet Products to Oxbow Animal Health, a move, he said, that better defines the professional image and direction of the company's mission. In 2006 the Small Business Administration cited Oxbow as the National Exporter of the Year.

—Lori McGinnis

*Used with permission of CIT and Lori McGinnis
Photo used with permission of CIT*

Discover Your Career in Mechanized Systems Management

By managing people, systems, processes, equipment, and natural resources Mechanized Systems Management (MSYM) graduates have rewarding careers developing, manufacturing, and managing the equipment and systems for producing and processing food, feed, fuel, and fiber. Their understanding and application of the principles of physical and biological sciences, mathematics, and management increase the effectiveness and efficiency of systems, processes, and machines.

The flexible MSYM curriculum permits in-depth study of agronomy, animal science, agricultural economics, agricultural education, computer science, food science, engineering mechanics, management, marketing, natural resources, and biological sciences, and other areas of specialization. Using the knowledge and skills obtained from the curriculum, graduates pursue careers in Machine Testing, Equipment Dealership Management, Extension Education, Plant Operations, Personnel

Supervision, Vocational Education, Production Agriculture, Irrigation Manufacturing and Management, Quality Control, Natural Resources Management, and many other areas. Their skills are highly sought after and recent graduates have found positions with companies such as John Deere, Cargill, Hormel, ADM, Irrigation and Natural Resources Districts, Orthman Manufacturing, Farmland Foods, and Altec Industries, to name a few. Post-graduate study in MSYM is also available at the University of Nebraska-Lincoln.

To learn more visit:
msym.unl.edu



Alumnus Profile

By Wayne Choat



Wayne Choat

Since the time I graduated from college in 1993, I have recommended the Mechanized Systems Management major to several aspiring college students. This recommendation is based upon my experience going through the program, what I have accomplished since graduation, and seeing the different careers that my college friends are now pursuing. I have no doubt that Mechanized Systems Management develops a solid foundation to build many different career paths for a young person's future.

Admittedly, when I started college, I was undecided in what I wanted to pursue. Coming from the farm, I had a strong agricultural background, a keen interest in design, machinery, and "how things work." I also was interested in agronomics, animal husbandry, and finance. Given my interests, I knew that I wanted to remain agriculture-focused in my educational pursuit, but wasn't certain how I was going to package those interests into one major. Then I discovered Mechanized Systems Management.

Mechanized Systems Management offered me the technical classes, such as hydraulics, engines, electricity, and machinery management, that fed my interests in the machine and design arenas. In addition, I was also able to pursue opportunities and interests in animal science, agronomy, and business classes that I felt would round out my needs to step into an agricultural career. The unexpected bonus from this major (albeit stressful at the time) was the heavy emphasis placed upon written and oral communication. All technical classes aside, communication skills have been, hands down, the most valuable asset gained from my college career.

Since graduation, I have been communicating with customers in one fashion or another, whether that customer has been a cattle buyer, seed purchaser, land owner, or center pivot customer. The communication process has been the key to all aspects of the business being conducted. Every day presents new challenges in communicating my message, interpreting the messages of those around me, and striking a balance between the different perspectives. I am in continual contact with our dealers and the farmers purchasing our equipment, working to develop and release new products. I draw upon technical knowledge and a myriad of agriculturally related topics to understand the needs and develop solutions for the farmers.

I currently work within the Engineering Department of Lindsay Corporation in Lindsay, NE, as an Applications Engineering Manager. Lindsay Corporation is a worldwide leader in providing irrigation solutions for agriculture. Some of the products we manufacture include center pivots, corner systems, and lateral move systems. We also have a robust control system that allows the irrigation equipment to be managed remotely through phone and internet access.

Fellow classmates in Mechanized Systems Management are currently working as farmers, agronomists, engineers, researchers, and managers. Mechanized Systems Management is an excellent program that develops a student's skills and creates exceptional potential to enter into many different career fields. It was certainly a good choice for me.

Faculty & Staff News

A Significant Difference

Once a year, the UNL Teaching Council and the UNL Parents Association recognizes outstanding faculty members for making a “. . . significant difference” in the lives of students. Department faculty members acknowledged at the January 25, 2008, ceremony were:

Jack Schinstock (11th time)

Dennis Schulte (10th time)

Greg Bashford (2nd time)

Roger Hoy (first time)

Jeyam Subbiah (first time)

Bruce Dvorak (3rd time)

Drs. Bashford, Hoy, and Subbiah joined the Department within the past five years, and are continuing our tradition of service to students. Providing experienced guidance for students is just one more aspect of the quality found in the Department of Biological Systems Engineering.

Annual CoE Awards

The annual Faculty and Staff awards from the College of Engineering were held in April. **David Jones** received the Holling Family Master Teacher Award, **Dean Eisenhauer** received the Holling Family Distinguished Senior Faculty Teaching Award, and **Greg Bashford** received the Henry Y. Kleinkauf Family Distinguished New Faculty Teaching Award. **Bruce Dvorak** received the College of Engineering Faculty Service Award.

No-Till Presentation Award

At the 16th annual National No-Tillage Conference, 750 meeting attendees voted **Paul Jasa** one of the top four speakers (out of 47). He received a plaque commemorating the honor for his presentation on no-till planting equipment. Paul has conducted thirty years of research and extension programs on no-till equipment and system management.

Outstanding Young Scientist

Dr. Suat Irmak was promoted from Assistant to Associate Professor (effective July 2008) and given tenure. He was also selected by The University of Nebraska Chapter of Sigma Xi for the Outstanding Young Scientist Award for his novel contributions to understanding and optimizing water use in irrigated agriculture.

IBE Presidential Citation

The Institute of Biological Engineering (IBE) presented its Presidential Citation to **David Jones** at the annual meeting, held this year in

Chapel Hill, North Carolina. This award recognizes Dr. Jones' exemplary service to the Institute for his leadership and dedication in facilitating the IBE Fellow and Brahm and Sudha Verma Visionary Awards.

A Rose

Dr. Jeyam Subbiah and his wife, Latha, added a daughter, Roja (meaning rose), to their family in April.

Lighten Up

Wearing pedometers and making efforts to adopt a more healthy lifestyle through basic activity, the Chasers team participated in N-Lighten Nebraska, a statewide voluntary health campaign. Valdeen Nelsen served as the team captain, and encouraged her 9 team members over the course of 3 months, from February 1 to May 1, on an imaginary walk to New Orleans. The team finished 61st in the top 7%, of 848 statewide teams. Go “Chasers.”

Marathon Man

Has an activity trend started in Chase Hall? **Dean Eisenhauer** ran the half marathon in Lincoln on Sunday, May 4, with a finish time of 2 hours and 36 minutes. Way to go Dean!

Mid-Central States ASABE Meeting

The Mid-Central region began rotating meeting sites in 2006. This year's meeting opened on Friday, April 4, in Chase Hall. About eighty members participated, with 37 students also attending. Group tours included Kawasaki's manufacturing plant, Pfizer's Animal Health pharmaceutical production, and LI-COR. The UNL faculty team won the infamous bowling competition held at Madsen's Bowling & Billiards. The Iowa State University team won the student bowling match.

With 12 students attending, Iowa State won the Student Mile award by logging 1,800 miles. Kansas State University and the University of Missouri were also well represented. A Friday evening barbeque was hosted by the UNL ASABE student branch at the Splinter Lab. In addition to the paper competition and technical sessions on Saturday, a workshop on GIS software was also offered by Dr. Slava Adamchuk.

NTTL Quality

The Nebraska Concrete Paving Association presented an Award of Merit to the Nebraska Tractor Test Laboratory (NTTL)

in recognition of the high-quality concrete pavement used to construct the new testing track. The certificate reads: “Your efforts to achieve quality construction through superior skills, integrity and pride-of-workmanship are honored on behalf of users everywhere.” The NCPA also recognized NTTL Director Roger Hoy, Kevin Herr from UNL Facilities, David Morgan, NTTL, and Ron Yoder, BSE Department Head, for their efforts in construction of the new track.

Corn Utilization and Technology Conference

The University of Nebraska and Nebraska Corn Growers were well represented at the 2008 Corn Utilization and Technology Conference in Kansas City during the first week in June. BSE was represented with six posters by students (Ajay Kumar and Heartwin Pushpadass) and staff (Dr. Milford Hanna, Dr. Yixiang Xu, Loren Isom, and Robert Weber). Additional posters were presented by two students from Animal Science and two students from Chemical and Biomolecular Engineering. Dr. Yiqi Yang presented his work on “Properties and Potential Applications of Zein Extracted from Distillers Dried Grains.” Milford, Yixiang, and Loren hosted a post-conference workshop for regional researchers and corn board representatives that focused on green chemicals. Funding for the workshop and student travel was provided by the Nebraska Corn Board and the Nebraska Corn Growers Association.



Milford Hanna (left) congratulates Heartwin Pushpadass.

Spring Banquet Capping off the College of Engineering's E-Week, the annual Department spring banquet brought faculty, alumni, emeriti, and students together for an evening for recognizing accomplishments. **Donald L. Eret** and **Ned H. Meier** were inducted into the BSE Hall of Fame this year. Student teams in Senior Capstone Design presented their projects. (see projects online: <http://bse.unl.edu/undergrad/capstone1.shtml>) Dr. Milford Hanna presented **Heartwin Pushpadass** (above), from Nagercoil, India, with the Bill A. and Rita L. Stout Outstanding International Graduate Student Award for 2008.

Comings and Goings



Gina Boanca

Welcome to **Gina Boanca**, Research Technologist II in Dr. Pannier's new lab. From Cluj-Napoca, Romania, Gina holds a B.S. in Biochemical Engineering and an M.S. in Catalysis, Biocatalysis from Babes-Bolyai University, Cluj-Napoca. Gina also received an M.S. in Biochemistry from UNL. In the Pannier lab, she is currently studying intracellular signaling pathways involved in nonviral gene delivery, as well as working with Dr. Ravi Saraf's lab (in UNL's Chemical and Biomolecular Engineering Department) to develop a novel imaging system to detect ions on a single mammalian cell.



Sohan Birle

Sohan Birle, Ph.D., is a new postdoctoral research associate with Dr. Subbiah's laboratory. Brought up on a family farm in India, he received a Bachelor of Technology degree at Jawaharlal Nehru Agriculture University in Jabalpur. Sohan continued his studies and earned an M.S. in Dairy and Food Engineering from the Indian Institute of Technology (IIT) in Kharagpur. After graduation he joined Jain Processed Foods in Jalgaon, the world's third largest producer of dehydrated fruits and vegetables. After four years of learning about dehydration operations, he decided to obtain a Ph.D. His research project at IIT, Kharagpur, focused on developing a radio frequency (RF) assisted drying process. During preliminary study, he established a connection with Dr. Tang's research program at Washington State University and relocated to WSU, where he finished his degree. He shifted his research to the application of RF heating in pest control in fresh fruits. One of his grant-writing efforts resulted in a \$50,000 grant from the Washington Technology Center to develop shelf stable, ready-to-eat organic soups for FungusAmongUS, Inc.

Sara Weixleman joins us as a member of the re-organized Filley Business Center, of which our Department is part. She is responsible for job descriptions, works in employee relations, and ensures that our positions are classified correctly with Ag Hall and Human Resources. She has been with UNL since March 2004—all with the Filley Hall Business Center—after 25 years in the restaurant business, the last 10 of which she spent at Misty's



Sara Weixleman

Restaurant. That's where she learned payroll, benefits, how to cook prime rib, and the not-so-refined art of keeping most of the balls in the air, most of the time.

Other Business Center members who divide their time between Filley and Chase Halls are shown below, back row, left to right: **Terri Butler** (grant monitoring), **Lori Byrne** (administrative team manager and liaison between UNL departments), and **Tina Andrews** (time sheets, employee leave), and front row, left to right: **Belva Harris** (purchasing) and **Lynda Clause** (daily reconciliation).



We congratulate **Rick Koelsch** as he assumes duties as the new Assistant Dean of Extension. He succeeded **DeLynn Hay** (Emeritus in BSE), who retired in December. Rick's emphasis will be extension program leadership for agriculture and natural resources. Known nationally and regionally for his work on Nutrient Management Planning related to animal production, Rick will continue aiding Nebraska producers with environmental issues and providing statewide education programs through the extension network. Rick was also promoted to Professor, effective July 1, 2008.

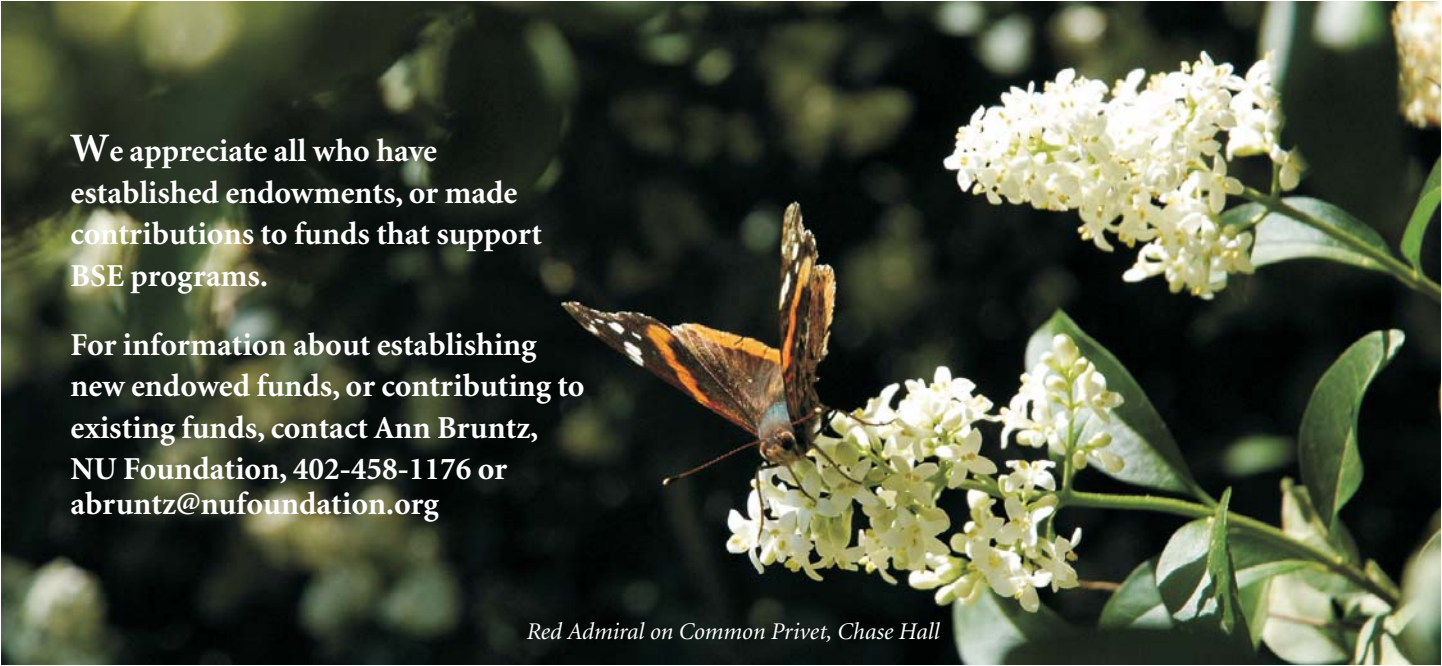
So long to **Teresa Loseke**. She moved to the Beadle Business Center as a Financial Associate.

Spreading the word about No-till

Neil Parish, chairman of the European Parliament's agriculture committee, listens as Biological Systems Extension Engineer Paul Jasa discusses no-till farming. Parish is flanked by Gov. Dave Heineman, left, and Greg Ibach, director of the Nebraska Department of Agriculture.

(Photo used with permission from University of Nebraska Institute of Agriculture and Natural Resources.)





We appreciate all who have established endowments, or made contributions to funds that support BSE programs.

For information about establishing new endowed funds, or contributing to existing funds, contact Ann Bruntz, NU Foundation, 402-458-1176 or abruntz@nufoundation.org

Red Admiral on Common Privet, Chase Hall

The University of Nebraska-Lincoln is an equal opportunity educator and employer with a comprehensive plan for diversity.

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