Follow this and additional works at: http://digitalcommons.unl.edu/bsedeptnews

http://digitalcommons.unl.edu/bsedeptnews/22

This Article is brought to you for free and open access by the Biological Systems Engineering at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in BSE Department Magazine by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.
Hello. We are back with another installment of the newsletter of the Biological Systems Engineering Department at the University of Nebraska-Lincoln. As you will see here, our department continues to thrive due to the excellent work of our people. We have tremendous faculty, staff, and students; they work on very impactful activities and have been fortunate in many cases to have been recognized for their achievements.

While performing our faculty and staff reviews for my fourth time at UNL, I have been frequently amazed by the outstanding work by our people.

In this newsletter, you will see a variety of projects, student activities and awards, staff achievements, and faculty recognition. These articles only scratch the surface of the activities of our people.

We are at a transformative time for our institution and department. In the past year, the University of Nebraska has new leadership in President Hank Bounds. Chancellor Harvey Perlman has announced that he will be stepping down and returning to the faculty; Ronnie Green has been named our next chancellor. At the department level, we have been very fortunate to have run faculty searches which have brought in excellent new individuals. Aaron Mittelstet started in January 2016 as a watershed hydrologist; in January of 2017 Rebecca Wachs will be joining BSE as a biomedical engineer; and Tiffany Messer will come on board as a water quality engineer/scientist.

As always, we hope that our readers enjoy this latest installment of our newsletter. Please feel free to stop by the department when you have an opportunity or let us know if you have news to share with our community.

Best regards,
Mark Riley
Department Head
Biological Systems Engineering
University of Nebraska-Lincoln

The BSE Department received the CASNR Instructional Improvement Award in January at the College of Agricultural Sciences and Natural Resources Interim Teaching and Learning Workshop.

The Biological Systems Engineering Department was also selected as the 2016 recipient of the College of Engineering Lagerstrom Award. CoE commends BSE on its outstanding accomplishments in providing service to its students, the College, the University, and the broader community.

Deepak Keshwani (right) accepts the CASNR Instructional Improvement award from Dean Steve Waller on behalf of the department.
John Hay, BSE Extension Educator, is focused on renewable energy and bioenergy crops. The public’s interest in solar photovoltaic (PV) systems has steadily increased. To meet the demand for in-depth solar education, he has worked to build relationships with solar installers, utilities, and policy makers. In 2015, Hay hosted two in-depth solar workshops, two web seminars, three tours, one field day and spoke to numerous groups and individuals about solar PV feasibility and economics.

Based on the experience at the solar PV workshop, a Michigan Extension Educator who attended has scheduled four public trainings and one multistate solar training for educators in MI, IN, and OH.

Another project John is working on involves a CenUSA Bioenergy grant. The project addresses issues concerning implementation and commercialization of a regional system of biofuels derived from perennials grown on land unsuitable or marginal for row crop production. “We have two 2.5 acre perennial grass demonstration sites and have been taking samples and production data there for the past 4 years,” Hay said.

At the public workshop 60% had minimal knowledge before, 95% were knowledgeable or very knowledgeable afterwards.

12% of workshop participants have installed systems at their homes.
Vision: Transform Indian Villages into Progressive Farm Models
Initiative: #Give Back #Pay Forward by Santosh K. Pitla

In March 2014, I got an opportunity to visit villages in India, which allowed me to do what I always wanted to do, interact with farmers and listen to the pressing issues hindering productivity and quality of life. I visited Raghavampalli village, Ananthapur District, Andhra Pradesh in south India and found myself in the middle of hundreds of enthusiastic farmers who were motivated to improve their quality of life despite challenging situations. I made the trip on behalf of Sankalpa, an NGO student organization based in Ohio, which funds developmental projects in India. But after this trip, my desire to get involved with farmers in India came to fruition, and I ended up raising funds with the help of like minded friends. We supported at least three projects related to agriculture. Mr. Sanjeevu, a resident of Raghavampalli, who dedicated 30 years of his life serving the rural communities in AP, was instrumental in the execution and success of the projects.

I realized the value of a dollar and how small dollar amounts can change lives in Indian villages. Interacting with farmers and talking to Mr. Sanjeevu motivated me to start the initiative called “Vision Model Villages—Give Back and Pay Forward.” Almost $2,000 was raised to fund more than five projects, three of which were directly related to agriculture. Project #1 involved setting up a Sprayer Co-op with two chemical sprayers. The Co-op enabled farmers to use a backpack engine sprayer at a small cost (about 40 cents per acre of spraying) that allowed them to spray their fields in a timely manner and saved significant amounts in production costs.

The project activities are definitely impacting farmer families and drawing praise and participation from local agricultural officers and other volunteer groups. It is impressive to see agricultural universities, local government officials, and farmers coming together to solve the problems that really matter. Collaborating with an individual like Mr. Sanjeevu is making a real difference in the lives of farmer families in India. With the help of my friends, we were able to fund eight projects. I hope to continue this effort of giving back and paying forward for transitioning to progressive Indian villages through Initiative: #Give Back #Pay Forward.
Dr. Amy Millmier Schmidt, Assistant Professor and livestock bioenvironmental engineer, received the Nebraska Pork Producers Association award for Producer Outreach.

Dr. Schmidt joined BSE in 2012, bringing over 12 years of experience working with and for pork producers in Iowa, Missouri, and Mississippi. She began to cultivate a positive relationship with Nebraska’s Pork Industry. In 2013, she took on the role of state trainer for the Pork Quality Assurance Plus program and has since trained more than 100 advisors and producers, often conducting small group or one-on-one training to accommodate urgent needs for certification. She served on multiple National Pork Board (NPB) committees and is currently a member of the Swine Educators Executive Committee.

Dr. Schmidt recognized a need for addressing environmental vectors contributing to swine disease transmission and established collaborations with veterinary science faculty to identify biosecure methods of manure and mortality management. Her research produced valuable data to help producers manage disease risks. In 2016, she was awarded a USDA-AFRI grant to study on-farm remediation and prevention of swine enteric diseases. She assesses the environmental footprint of swine systems, improving manure value, and develops regulatory guidance tools for producers. She funded two undergraduate student research experiences through NPB Swine Research & Education Experience grants. These opportunities will inspire students to find careers in the pork industry.

To improve collaborations among UNL faculty and demonstrate a commitment to serving Nebraska’s Pork Industry, Dr. Schmidt initiated the UNL Swine Industry Focus Team in 2014. Members contribute to Pork Talk magazine, and share updates about research, student activities, and outreach. She helped establish a Future Pork Leaders student club, and serves as the faculty advisor.

Dr. Schmidt has truly embraced her role as an advocate for pork production. The Outstanding Pork Service Award appropriately recognizes her demonstrated commitment to improving the profitability and sustainability of Nebraska’s pork industry.

### Schmidt Lab Research

#### Fate of E. coli and Steroid Hormones in Soil and Tall Fescue

A Layman Award from the UNL Office of Research and Economic Development (ORED) and a USGS 104b grant through the Nebraska Water Center funded a recent laboratory trial by the Schmidt Lab to study the role of E. coli O26:H11 in the deconjugation of steroid hormones excreted in the urine of beef cattle to determine the potential internalization in the tissue of tall fescue. E. coli O157:H7 (associated with illness in humans) declared an adulterant in non-intact raw beef over 20 years ago following the Jack-in-the-Box outbreak. In 2011, E. coli O26 was among six additional serogroups of non-O157 pathogenic E. coli declared adulterants by the USDA, also the strain implicated in the recent outbreak of illnesses tied to Chipotle customers in nine states and previously linked to raw clover sprouts consumed at Jimmy John’s restaurants in several states.

The study utilized a unique method of tracking the bacteria in soil and plant tissue. E. coli O26:H11 culture was applied to soil surrounding tall fescue growing in a BSL-2 greenhouse on the UNL east campus. Plants were collected on multiple days over a month-long period and imaged whole following surface disinfecion to eliminate bacteria attached to the plant surface. Tissue and soil was collected from each sample, plated on selective media, and incubated. The cultured plates were imaged to quantify colonies of the transformed E. coli and enable comparison of bacterial concentrations among treatments. (Treatments included E. coli + cattle urine, E. coli, cattle urine, and control.) While analysis is still underway, preliminary results illustrate the internalization of E. coli O26:H11 in the fescue plant tissue beginning just a few days after treatment and remaining throughout the full project period for some plants. data agreeing with published research on the internalization of E. coli O157:H7 in tall fescue, but beyond the 14 days the referenced study lasted. Results for conjugated and deconjugated steroid hormone concentrations in the soil and plant tissue samples are forthcoming.

#### Swine Disease NIFA Grant

A NIFA grant under the Critical Agricultural Research and Extension (CARE) program was awarded to Dr. Amy Schmidt (PI) and collaborators, Dr. Dustin Loy (Veterinary Medicine and Biomedical Research), Dr. Dan Miller (USDA-ARS), and Dr. Kate Brooks (Agricultural Economics), to assess the efficacy of multiple remediation and prevention measures for swine enteric diseases on pork operations, to build on the past two years of research to evaluating environmental vectors for swine enteric disease transfer. The team will monitor enteric disease-positive swine farms over two years following an outbreak to assess industry-recommended practices for remediation and prevention and analyze the economic implications of remediation versus prevention and facilitate a grass-roots effort among producers to implement farm-level biosecurity plans for disease prevention.

---

### Subbiah Visits India

**Dr. Jeyam Subbiah**, Morrison Distinguished Professor of Food Engineering visited the Agricultural Engineering College & Research Institute in Kumulur, India Feb. 2016 to present a talk to students preparing for higher studies.
Dr. Mark Riley, professor and BSE department head, has been named fellow of the American Association for the Advancement of Science, the world's largest general scientific society. Fellows are selected by their peers for scientifically or socially distinguished achievements that advance science or its application.

Dr. Riley was selected for distinguished contributions to biological engineering, especially for fostering research on the development of novel instrument-sensing devices to monitor and evaluate dynamic living systems.

His research to develop novel sensors is significant to fields as diverse as agriculture, public health and renewable energy. He's also regarded for his national leadership in advancing the field of biological engineering, which integrates life sciences and engineering to create new knowledge, products and processes. Dr. Riley developed sensors to monitor and evaluate a diverse array of biological systems and processes, including renewable biofuels production, microbes in drinking water, inhaled airborne particulates and fruit ripeness.

“My early professional training helped me see the value of theory and simulation, but I wanted my work to have a greater and more immediate impact,” Riley said. His applied studies connect foundational research with immediate questions, and he enjoys working at the interface between controlled laboratory experiments and field studies.

His national leadership in the biological engineering field includes heading newly established committees and institutes and spearheading the launch of the Journal of Biological Engineering.

Riley said the recognition was a happy surprise, “I am pleased that our team’s translational work, connecting biologists and engineers towards the development of biological engineering as a field, is being recognized.”

Ronnie D. Green, UNL Harlan Vice Chancellor for the Institute of Agriculture and Natural Resources and interim senior vice chancellor for academic affairs, was also named for his distinguished contributions to quantitative genetics, especially beef cattle breeding and genetics, and advancement of science through academic and federal administration, advocacy and service.

Excerpted UNL Today 11/23/15 Gillian Klucas
Upon invitation, **Dr. Suat Irmak** presented once before the U.S. Senate and once before the House of Representatives in February 2016. His presentation, “Technology Implementation in Agriculture for Enhancing Crop Water Productivity,” discussed water productivity, irrigation engineering and science, and water quantity and quality issues.

The presentations and following discussions focused on national water resources; irrigation engineering; water management; agricultural productivity issues; scientific research and extension/education programs, as well as on the role of the agricultural engineering and soil-water resources engineering profession in addressing these issues and on national water resources and agricultural and irrigation management challenges and programmatic solutions offered through the Land-Grant University system’s research and extension missions. Dr. Irmak presented specific examples of his successful programs addressing these issues, including a large-scale example of using technology in agricultural practices to reduce water withdrawals and energy use.

“In addition to many other benefits, including economic benefits, effective and efficient irrigation management can reduce the potential for nutrient and other chemicals leaching to the surface and groundwater resources,” Dr. Irmak said. “Efficiency is always an issue.” In Washington, D.C., Dr. Irmak stressed the importance of delivering research and science-based data, information and management strategies (rather than opinion-based information) to citizens to help them improve their management practices. One of the land-grant missions is to provide research and scientific information to citizens to enable them to use more profitable practices in their agricultural operations.

“If a true link between research and extension/education/outreach is not well-established to enable large scale adoption of research-based practices/strategies, then large-scale impacts of using resources more efficiently to sustain farming operations while protecting environmental services will not be accomplished,” Dr. Irmak said. “True integration of research and extension/education programs in water resources and agriculture, in general, is an extremely difficult task. It requires significant investments and efforts in areas such as developing novel ideas and establishing a strong and dedicated team, financial and other resources, and strong partnerships with state and federal agencies, producers and their advisors, irrigation districts, NRDs, private industry, and other professionals.”

He said the kinds of technology and educational tools a person needs and how they are implemented in production fields on large scales need to be determined and executed carefully, requiring strong partnerships with many disciplines and institutions to have a true impact in real-world conditions.

“The challenges we face in the U.S. are similar to those we face globally,” Dr. Irmak said. “The challenges may be similar, but tools, educational opportunities, technology, and other resources available to deal with those issues can be very different. The Land-Grant University model, though we may take it for granted, is an ingenious idea/model, and not many countries have that system. There are discussions in different platforms about how we can transfer this model to other countries. The land-grant mission or model creates excellent opportunities and tools to deal with local as well as global issues. The agricultural engineering profession plays a vital role in this process.”

Dr. Irmak’s research program also includes a large part that investigates the change in climate variables on water resources, agro-ecosystems, etc. In his programs, he works on transferring the knowledge, data, and information to help agricultural producers and other professionals to make better, more informed decisions.

One of Dr. Irmak’s signature programs is the Nebraska Agricultural Water Management Network (NAWMN) which he leads and works on with a team of extension educators and numerous state and federal agency partners. Formed in 2005, the network aims to transfer research-based information to farmers and their advisors through demonstration projects in farmers’ fields. The network also works with farmers in adopting newer tools and technologies to conserve and make better use of crop water and energy used in irrigation. One of the primary goals of the network is to build the scientific literacy of citizens in agriculture and educate Nebraska youth on soil and water resources and advanced/next generation technologies. All demonstration projects are supported by the scientifically-based field research and evaluation projects conducted by Dr. Irmak.

The network was formed with only 15 farmers as collaborators in only one of the 23 NRDs in 2005. As of 2015, the number of active collaborators reached 1,400 in 18 NRDs and 73 of 93 counties. The network has significantly improved water and energy conservation through farmers who have implemented technologies and information in their irrigation management practices. Since 2005, the NAWMN is estimated to have reduced pumping by 1 million acre-feet, helping to preserve Nebraska’s ground and surface water for future generations. Nebraska’s use of irrigation improves the state economy, with estimates that every inch of water applied per acre generates roughly $100 of economic benefit to the state. Total diesel fueled energy saving due to reduction in irrigation water withdrawal exceeded $60 Million since 2005.

The NAWMN is the largest and most comprehensive irrigation/water management network in the United States and its functions are being implemented in other states and countries.

*Continued on next page.*
The University of Nebraska-Lincoln has joined a new initiative aimed at helping farmers better control, manage and maximize the value of the data they collect every day in their fields.

The Agricultural Data Coalition is the result of years of planning and coordination by UNL, AGCO, the American Farm Bureau Federation, Auburn University, CNH Industrial, Crop IMS, the Ohio State University, Mississippi State University, Raven Industries and Topcon Positioning Group.

The coalition’s goal is to build a national online repository where farmers can securely store and control the information collected by their tractors, harvesters, aerial drones and other devices. Over time, that data can be scrubbed, synced and transmitted in an efficient and uniform way to third parties including researchers, crop insurance agents, government officials, farm managers, input providers and farm advisors.

“There have been extensive activities focused on agriculture data management platforms within the past couple of years and we’re excited to be part of such advances in which the farmers’ needs are at the core of the platform development process with input from a variety of industry partners,” said Joe Luck, BSE assistant professor. “I think the development approach taken by the ADC will serve as an industry model for adding value to small and large farm operations with respect to agricultural data privacy, access and utilization.”

“The key is that farmers are in complete control, and they decide who is allowed access to their data,” said Matt Bechdol, interim executive director of the coalition (at the press briefing March 3, New Orleans, annual Commodity Classic). “That’s what sets ADC apart. This is not about profit for others, it’s about streamlining data management, establishing clear lines of control and helping growers utilize their data in ways that ultimately benefit them.”

Farmers interested in learning more about data collection and organizations interested in joining the coalition’s efforts should visit the ADC website: agdatacoalition.org.

“Excerpted from UNL Today March 4, 2016.”

Water Monitoring

Continued from page 7

Since the beginning of the NAWMN, over 10,000 producers, crop consultants, and agricultural industry personnel have been reached and educated at over 600 education/outreach meetings in Nebraska alone. The NAWMN has received numerous regional, national and international recognitions for its success in enhancing crop water productivity using science and research-based data, information, and practices. In 2014, the NAWMN Team received the prestigious USDA-NIFA National Innovative Programs and Partnership Award for its groundbreaking water management work and contributions in advancing agricultural science. The award was presented by the USDA Undersecretary Dr. Catherine Woteki and the USDA-NIFA Director Dr. Sonny Ramaswamy. In Washington, D.C., some of the project accomplishments were also presented to President Obama in a briefing by Dr. Sonny Ramaswamy.

Dr. Irmak’s visit to Congress was supported/sponsored by the Association of Public Land Grant Universities (APLU)-Extension Committee on Organization and Policy (ECOP)-Experiment Station Committee on Organization and Policy (ESCOP), USDA, National Coalition for Food and Agriculture Research (NC-FAR), UNL-IANR, and Nebraska Extension. Dr. Irmak expresses his gratitude to all these institutions.
Jeyam Subbiah Flips Course Instruction

Dr. Jeyam Subbiah, BSE Associate Professor, is increasingly utilizing technology for course instruction. “To improve learning, the culture and student expectations must change,” he said. While helping his son with homework, he saw the success of narrated screen recordings from Kahn’s Academy. Shortly thereafter, he made his first videos using his Microsoft Surface Pro 3 and put them on YouTube to maximize ease of access for his students.

Already a user of active learning techniques called peer instruction, where students attempt to convince their peers of correct answers to questions, and just in time teaching or “JiTT,” in which lectures are modified in response to formative assessment, he wanted to increase student engagement during class sessions. Subbiah consulted with Tareq Daher, Instructional Design Technology Coordinator for the College of Engineering. Together, they flipped BSEN 303, Principles of Process Engineering, devising a pedagogical strategy and identifying appropriate technologies to address two primary problems impacting student learning.

First, students in large-enrollment courses literally couldn’t see what Subbiah wrote when he worked problems during lectures. By setting up an Adobe Connect meeting on his Surface, and sharing his screen, he was able to work problems, during his presentation and project his slides and annotations to the lecture hall screens, by logging the classroom computer into the meeting. Students were able to see materials at a legible size, and he was free to move around the hall and engage with students.

Second, as faculty know, students often neglect to do readings or other activities before a lecture session and arrive unprepared. Subbiah began to use recorded narrated screen captures as part of a “front-loading” package with the videos and included readings and activities, followed by a quiz, which encouraged students to fully interact with content, and helped Subbiah identify the most troublesome concepts for his students. The quiz includes a short-answer question for students to indicate the material they understood the least. He then modifies his lecture to go more deeply into these topics. The remaining time is used to work problems, discuss content-relevant current events, and provide an introduction to what the class will learn next.

Student response was mixed, but generally positive. According to feedback, it seemed that the more organized, higher performing students liked it, but that some of the less organized, lower performing students experienced increased frustration during class sessions. He hypothesizes that this may be because the class session in the flipped format becomes more demanding and therefore less amenable for students unprepared to participate. Students learning English also found the techniques helpful. They were able to download the problems worked in class in addition to being able to repeatedly watch and listen to the videos. 40% of students said the flipped approach provided “equal or similar learning experience,” but 42% said flipped was a better learning experience. More than half the students believed they were better engaged in class activities and that after participating in this course, that they would be more likely to attend other flipped classes offered in the science or engineering programs. Subbiah believes that as more faculty start to use such techniques, students will come to expect the work outside of class and preparation for the in-class session will become routine.

BSE External Advisory Committee

The BSE Department External Advisory Committee met in Lincoln on November 20, 2015. The group includes individuals from companies, government agencies, and academic institutions that have either hired our recent graduates or are partners with departmental faculty.

The meeting this year addressed a number of planning questions for the department’s B.S. programs in Agricultural Engineering and Biological Systems Engineering along with its graduate programs for M.S. degrees in Mechanized Systems Management and in Agricultural and Biosystems Engineering, and the Ph.D. in Biological Engineering. Our B.S. engineering programs have accreditation through ABET, which necessitates that we gather feedback from clients of our programs.

Topics that were addressed included: evaluating AGEN and BSEN degree program objectives and outcomes, senior design and communication course programming needs, and graduate program student recruitment and job markets.

The meeting was held at the East Campus Union in Lincoln on a day when a large snow and ice storm hit eastern Nebraska and eastern Iowa. Individuals braved the difficult weather to provide us with their valuable insight.
Lincoln’s Tetrad Property Group provided a sponsorship for students to attend ASABE’s 2016 Agricultural Equipment Technology Conference. 22 AGEN and MSYM students attended the event in Louisville, Kentucky (far more than any other university). Tetrad paid for 13 conference registrations that were matched by ASABE, allowing all UNL students to be funded.

The AETC meeting offers students much needed interaction and networking opportunities with industry personnel from sectors in which they ultimately search for careers. In many cases, interactions at the AETC meeting have resulted in internship and job interviews for our students. Another positive is that many of the students form a lasting relationship with the ASABE group, which is beneficial for both the students and ASABE.

Students enjoyed a tour at the Louisville Slugger Museum that provided them with a chance to interact more with other industry representatives at the meeting.

Back row: Micah Bolin, Devon Vancura, Colton Rathman, Jason Shultis, Cody Kneifl, Zak Kurkowski, Greg Frenzel, Caleb Lindhorst, Ethan Mosel.
Front row: Jake Will, Ryan Hanousek, Travis Classen, Jennifer Wynn, Mandy VanSant, Josh Murman, Anna Siebe, Jennifer Smith.
Under the direction of Dr. Greg Bashford, the Biomedical Imaging and Biosignal Lab (BIBA), in collaboration with Dr. Edward Truemper, Pediatric Research Director of Children’s Hospital and Medical Center in Omaha, has made an important impact in the lives of children’s cerebral health through the amazing story of Eli Grady and his family. Lindsay and Tom Grady lost their child, Eli, when he was only six days old.

An MRI revealed Eli had meningitis and the outlook was poor, but in the midst of the tragedy, the Gradys found a way to help others. Drs. Bashford and Truemper asked if Eli would be part of a study that would help make a device using transcranial Doppler ultrasound (TCD).

At two days old, Eli Grady was one of the first participants in an important study of the BIBA Lab, funded by the Gerber Foundation, which uses TCD to look deep within the infant brain, in an effort to provide doctors with early information on children’s cerebral health.

For the past eight years, the BIBA team has been working on a device using TCD and has been testing a prototype at Children’s Hospital and Medical Center of Omaha. The device allows researchers to wirelessly transmit signals from the brain for monitoring anywhere, instantly. The Grady family has raised over $50,000 to support this research. In honor of their son, the device will be called ELI, short for electronic link interface.
Louis I. Leviticus retired BSE professor and Engineer-in-Charge from 1976 to 1998 of the Nebraska Test Laboratory passed away December 12, 2015 at age 84. He tested over 565 tractors and traveled throughout the world sharing his knowledge of tractor testing. After retirement in 1998 he was Curator of the Lester F. Larsen Tractor Test and Power Museum.

Born in 1931 in The Netherlands, he was a Holocaust survivor. His book Tales from the Milestone is about his personal World War II experiences and his escape from the Nazis. He gave public talks about his early life as a child in the Netherlands during the Nazi invasion and occupation, his personal story of how the Holocaust ripped apart his family.

He began his escape by jumping from a third-floor balcony in an apartment in the Dutch city of Amersfoort when police stormed the hideout searching for his family. He was 11 that day in late 1942. Just before he jumped, he saw his father close the balcony door behind him. An awning broke his fall.

It was the last time he saw his parents, who died at Auschwitz a few weeks later. He spent the next three years evading Nazi soldiers and even killed one and helped kill another to survive. He slept in hay in barns. He killed chickens and sucked eggs before he was taken in by Karel Brouwer, a young civil servant, and his wife Rita. The couple, who treated Lou as their own son, helped many Jews avoid arrest during the Nazi occupation. He lived under the alias Rudi Van Der Roest until the war ended in 1945. Then he emigrated to Israel, where he earned bachelor’s and master’s degrees in engineering from Technion-Israel Institute of Technology. Later, he traveled to America to earn his doctorate at Purdue University.

He returned to Israel after obtaining his Ph.D. and served in two wars against Egypt—in 1967 and in 1973 (the October War). In the latter conflict he was a liaison between the U.S. and Israeli armies, working with the armored division and corps of engineers on the mobility of military vehicles and their off-road conditions. He helped engineer a bridge crossing the Suez Canal. He returned to the U.S. in 1974, Dr. Leviticus joined the UNL faculty in 1975.

Leviticus took a faculty position in agricultural engineering. Until his 1998 retirement, he served as Engineer-in-Charge at the Nebraska Tractor Test Laboratory. In retirement, Leviticus volunteered in the community and as curator at the Larsen Tractor Test Museum, which he helped to found.

Leviticus especially enjoyed speaking to troubled youth as he felt they could relate to his story, having experienced tragedies of their own. “There is always a way out,” he would tell them.

BSE alumnus Howard Lamb, a former senator in the Nebraska Legislature, died Nov. 24, 2015, from injuries sustained in a car accident south of Broken Bow, NE, Nov. 23. He was 91 years old.

Governor Pete Ricketts said he was “saddened to learn of the passing of Senator Lamb. He will be remembered for his commonsense, conservative leadership and advocacy for rural Nebraska.” Lamb served in the Legislature from 1977 to 1993.

He was born in Bassett, Oct. 8, 1924 in Rock County on the Niobrara River. He farmed and ranched for 50 years in Dale Valley and the sandhills. He was commissioned an ensign in the U.S. Naval Reserve at Notre Dame University. After service in the Pacific Theater of Operations, he was released to inactive duty in 1946. He returned to Nebraska, was a member of Sigma Tau, a national engineering honor society, and received a B.S. in agricultural engineering from UNL in 1949. For the next six years, Howard worked for International Harvester.

During his time as state senator Howard served as chairman of both the Executive Board and the Transportation Committee, and as vice chairman of the Natural Resources Committee. In 1989 Howard managed to pass a legislative bill which provided $100 million in property tax relief. He was a member of President George H. W. Bush’s delegation to observe the first free elections in Romania, May 20, 1990. His awards include the Senator of the Year award from the Nebraska Stock Growers Association in 1978, the Silver Eagle award from Nebraska Farm Bureau in 1995, and the Nebraska Bankers Association's Agribusiness Recognition award in 2009. In 1997, he was inducted into the University of Nebraska Agricultural Engineering Hall of Fame.

As a Custer county Public Power Director in the 1970’s, Howard, along with UNL Ag Engineers and Custer county personnel, was active in developing “Off Peak” irrigation, a system that saved considerable money, was adopted by other rural districts, and is still in use today.

Howard was president, and director of the Custer county Public Power District; director, Federal Land Bank Association of Broken Bow; and president of the Anselmo-Merna Board of Education and president of the Custer County Extension Board, and helped organize and served as the first president of the Nebraska Association of County Extension Boards.

He was also a member of the Nebraska Hall of Agricultural Achievement, Agriculture Builders Nebraska, Nebraska Farm Bureau, National Cattlemen's Beef Association, and Nebraska Cattlemen.
Paulina Guzek is from Palos Hills, Illinois, a BSEN Sophomore whose emphasis is Environmental & Water Resources Engineering. She says that at UNL “everyone is so friendly and willing to help out and share their experiences. There is also an abundance of opportunities to get involved, whether that be through research or student clubs, and there are always new events going on around the corner.” She is in the student branch of the ASABE, and on the Engineering Student Advisory Board (eSAB), the Fountain Wars design team, and the Society of Women Engineers. And she is working with a professor on research into the Water-Energy-Food Nexus in Nebraska, particularly how it relates to and impacts irrigation practices. Her most enjoyable class is a lab for organic chemistry, “We got to use different lab equipment and chemicals that we’ve never been able to use before. On the last lab we learned about polymerization and got to make slime!” Paulina studied abroad in Spain this past summer. She may want to pursue a master’s degree or go right into the working world; she says, “Both are valid options. I’ve been trying to do a little bit of everything to see what will fit best.”

Her advice to students: Don’t be afraid to admit that you have absolutely no idea what you’re doing. There’s always someone there to help you figure it out. However, even if you don’t know what you’re doing: DO SOMETHING. Get involved, participate, and have fun! I guarantee that there is something out there that fits you perfectly and will make your time at UNL that much more special.

Wyatt Kastl is a sophomore from David City, NE, majoring in Mechanized Systems Management, with an emphasis in business. He says that the thing he most enjoys about UNL is the diversity of the student body, “There are all different types of people I have had the opportunity to meet and converse with. People all the way from South America to people from here in Nebraska. These different types of people have had an impact on my experience here at UNL and many of which I have enjoyed.” He is a member of Sigma Phi Epsilon and the MSYM club. His favorite class is UHON 198H, required of all freshman in Sigma Phi Epsilon, “It is about life and the opportunities life has to offer. It was meant to broaden our mindsets and to help us open our eyes to the rest of the world, not just our daily lives we live here in Nebraska where all is well and we get to wake up each morning with very few worries.” He also traveled to Ecuador in the summer with Sigma Phi Epsilon. He reports, the difference in cultures from here in America to there where many people live in poverty was very evident: “It was enjoyable to see so many people happy with having very little though; there were people in the Amazon who have lived their entire lives without things we take for granted here, such as a warm shower or a new pair of shoes, and yet they live a joyful life, filled with laughter between them and their families.” A big part of the trip was to leave the world a better place than you found it. After he graduates, Wyatt says he may be interested in getting into some sort of transportation management system, such as a railway, that allows him to travel.

His advice to students: Get out of your comfort zone and try new things. It will help you grow as an individual. Get involved in a campus organization; there are many different types of clubs and organizations to join.

Deidre Sandall is a BSEN junior focusing on Bioenergy and Food Engineering from Blair, NE. She says, “I love that everyone is friendly, and that we are our own community within the city of Lincoln and the state. The faculty, students, and staff do a great job of making students feel like this is home.” She has been involved in ASABE, University Honors Program, and been a part of residence hall government. She just returned from a co-op term with Cargill. She considers her greatest UNL achievement working as a TA for ENGR 100 and fostering other young engineers, “I loved being able to see the development of students from the beginning of the semester and how much their views had changed on leadership and themselves.” After graduating, she plans to work within either food or pharmaceutical industries and use her engineering knowledge to aid in production or research, with the goal of earning a master’s degree in engineering or business.

She advises students: Don’t be afraid to try something new or out of your comfort zone. Sometimes the best opportunities are the ones you don’t seek out or expect. You will learn so much more about yourself if you have diverse experiences.
Luke Monhollon, a biological systems engineering major and the project manager, for the UNL Air and Space Research team of five engineering students, took part in a design challenge to develop a hand-held device that could take small samples from the surface of an asteroid during a space walk. The UNL team was one of 18 from colleges around the country that participated in the event, and produced a relatively simple device that captured the attention of NASA engineers and astronauts. The tool, which has a spring in the handle and collection cups on the other end of the arms, operates much like scissors—closing when a hand closes the handle and opening when the hand opens. The ASR team spent three days at NASA's Johnson Space Center in Houston, Texas, making presentations about the tool, testing it, and gaining valuable professional experience. The ASR team met with the NASA divers who would test the tool in the Neutral Buoyancy Laboratory—a massive pool used to simulate the zero-gravity conditions in space. Luke said the design challenge did more than give NASA ideas for its design of a tool, it gave the UNL students a unique real-world experience, "In engineering, you all have things you specialize in but you have to come together and work as a team. We didn't have a formalized leadership structure, but we knew who was good at doing different things and we leaned on that; because we had a small team, we also learned how valuable communication is. When we got to Houston, we got to talk to the faculty who work at NASA.”
FarmAfield, an online marketplace being developed by three University of Nebraska-Lincoln students, has been named a finalist in the international Thought for Food Challenge. More than 500 entries from more than 100 countries were submitted in the competition aimed at finding creative ways to face the challenge of feeding the world.

Brennan Costello, a senior agribusiness major from Gothenburg; Matt Foley, a junior economics and management major from Lincoln; and Andrew Minarick, a sophomore biological systems engineering major from North Bend; have worked with Mitch Minarick, a research assistant professor in the Department of Biological Systems Engineering, to develop a transparent exchange of small production contracts between everyday people and farmers to address income volatility and increase investments in agriculture. The idea is to simplify the process for everyone to connect to agriculture.

As a finalist, the FarmAfield team will travel to Switzerland in April for the Thought for Food Global Summit. Before the trip, they will have the opportunity to consult with agricultural and entrepreneurial experts. While in Switzerland, the team will take part in a three-day startup accelerator program before pitching their idea to global experts in food security. One of the 10 finalists will be selected to receive $10,000 in seed funding.

“Experts from around the world will be there who could help us take FarmAfield to the next level,” Costello said.

Costello and Andrew Minarick are both entrepreneurs in the Engler Agribusiness Entrepreneurship Program at UNL. Andrew and Mitch Minarick are brothers.

Thought for Food is a movement dedicated to tackling the global challenge of feeding 9 billion people through bold, breakthrough solutions. The annual competition is designed to catalyze university students from all fields of study to learn more about the complex challenges surrounding food security.

To learn more about FarmAfield, visit http://www.farmAfield.com.
The department held its annual Edible Vehicle Competition in December, the 23rd year in a row. Students in the AGEN 100 course (led by Roger Hoy) and BSEN 100 (led by Mark Riley) presented and demonstrated their vehicles. A change this year included students building prototypes a month earlier as an opportunity to test unique concepts. In addition to the vehicles, our event included presentations by AGEN/BSEN 460/860 students, and display booths by alumni and partners in industry and government agencies.
Donor Sends Tractor Restoration Club on John Deere Tours

Roy Yanagida, Friend of the Larsen Tractor Test & Power Museum, former John Deere dealer and classmate of Dr. William Splinter, generously donated funds to the UNL Foundation with the request that the monies be spent to provide educational field trips for UNL’s Tractor Restoration Club. On March 3rd, the club made their way to Waterloo, Iowa, where they toured the John Deere Product Engineering Center facilities the next day. They toured both the tractor cab assembly and the engine works, as well as the newly built John Deere Tractor and Engine Museum. On their way back, they made a stop in Ames to touch base with the Iowa State University Antique Tractor Club. The group had a great time, learned a lot about older and current John Deere tractor production, and are looking forward to planning another trip next school year. Thanks Roy!
**Alumni News**

Anthony Klein (MSYM Spring 2015) accepted a position with Lindsay Fieldnet in November. He was previously with NECO in Omaha.

Megan Lush (BSEN Spring 2015) received a Nebraska Industrial Council on the Environment Specific Environmental Project Award at the Nebraska Safety, Wellness & Environmental Conference & Trade Show in Oct. She was an intern with the P3 program, and her project with Abengoa Bioenergy related to in-process recycling of their biological solids into wet distiller’s grain.

Matthew Wold (M.S. in Agricultural and Biological Systems Engineering under the Supervision of Professor Michael Kocher) was honored as Young Member of the Year; Quad City ASABE Section.

Dr. Vivek Sharma has accepted a tenure-track faculty position at the University of Wyoming. Vivek has been Dr. Suat Irmak’s M.S. and Ph.D. student and also worked with Dr. Irmak as a post-doctoral research associate. “Vivek has represented UNL and IANR extremely well in every setting during his about 7 years at UNL; and I am very proud of him for his outstanding achievements,” Irmak said. Vivek is the sixth person who became a faculty member from Dr. Irmak’s research team.

Teresa Ryans left the BSE Department in October, after 8 years of excellent work with professors and graduate students, to accept a new position with the Electrical and Computer Engineering Department at UNL.

Ronica Stromberg began in January as the BSE graduate studies coordinator. Formerly, she was a proofreader for Dana F. Cole & Company and had worked as an editor for Research & Training Associates in Kansas City and a copy editor for newspapers and newsletters.

Lance Todd, the Manager of the Larsen Tractor Test and Power Museum, accepted a new position in Nov. in graphic design with a local firm that provides websites and promotional material to race car teams and affiliated businesses. Lance did an excellent job at the museum developing displays, organizing archives, and planning and constructing the Splinter Gallery. He developed a new and unique brand for the museum and it is not uncommon to see Larsen museum logo shirts and hats across campus and beyond. Julie Thomson, BSE office associate, was asked to step in as part-time museum manager.

**Promotions**

Dr. Rick Koelsch is back with BSE after serving as Associate Dean for Extension since 2008. In his extension and research responsibilities, he has provided national leadership in livestock and poultry environmental and animal manure issues.

Dr. Aaron Mittelstet joined BSE in Jan. as watershed hydrologist, assistant professor in both research and teaching. His background includes a Ph.D. in Biosystems and Agricultural Engineering from Oklahoma State.

Dr. Jia Jia Chen (Ph.D. UNL 2015) joined the department last summer as research assistant professor working with Jeyam Subbiah. His expertise is in Biosystems Engineering and Food Science.

Greg Bashford is promoted to Full Professor.

Lameck Odhiambo is promoted to Research Associate Professor.

Jeyam Subbiah is promoted to Full Professor.
Farmer’s Cooperative Internship

Jordan Busboom, a junior Mechanized Systems Management major with an agronomy minor from southeast Nebraska, worked for Farmer’s Cooperative in Plymouth, NE this past summer. He reports, “My various jobs included delivering seed across the area to different customers and company locations, tissue sampling corn and soybeans at different stages, and scouting fields for customers. This internship helped teach me how to spot some of the various issues that can come up in corn and soybean fields across southeastern Nebraska and northeast Kansas. Tissue sampling is a great tool for producers because it allows them to see how a plant uses nutrients throughout the growing season. Tissue sampling even allows a mid-season application of certain nutrients that are lacking, where soil sampling is used more for post-season application. Having worked on a family farm my whole life, I have never had the experience of working for someone I’m not related to, so this was a great experience for me. I got to see how a large company communicates across different locations, and how different employees work together to get things done. My favorite part was getting to meet lots of different farmers and discussing their operations with them while learning from one another.”

$One in a $Million
Give to Lincoln & Larsen Museum
May 1–26

With the Give to Lincoln Day event in May, the Larsen Tractor Test & Power Museum Friends will kick off the $One in a $Million fund raising campaign. The goal is to raise a million dollar endowment to sustain the Museum into the future by encouraging supporters and visitors to become “One in a Million” and donate to the campaign. The Lincoln Community Foundation is matching funds for Give to Lincoln Day, so any donations made through their website between May 1st and 26th will grow.

Go to www.givetolincoln.com to donate.

DECEMBER GRADUATION

AGEN
Nicholas Christensen
Tyler Manning
Kevin Pulec

BSEN
David Bunker
Brian Burris
Lisa Gran
Rudolph Lackner III
Aaron Matzke
Mallory Morton
Tuan Nguyen

THE DEAN’S LIST
December 2015

AGEN
Kelsey Bohling
Briza Braga Lopes
Nicholas Christensen
Lilian da Silva
Jared Donoghue
Adam Duensing
Julia Franck
Adam Freirichs
Ryan Hanousek
Petir Firs
Tyler Manning
Jack Moore
Joshua Murman
Aaron Steckly
Amanda Van Sant
Devon Vancura
Ruilin Zhang

BSEN
Janelle Adams
Ellie Ahquist
Paula Andrie
Freshta Baher
Alea’s Beard-Dorm
Emily Bender
Conner Beyersdorf
Connor Blankenau
Kenneth Bristol
David Bunker
Madison Burger
Kevin Cahoy
Jocelyn Carter
Connor Christensen
Hannah Christian
Aaron Cronican
Christopher Davidson
Rebekah DeFusco
Danielle DeGroote
Erica Dolph
Drew Dudley
Katherine Dudley
Zachary Duncan
Collin Erickson
Ben Everswick

Elizabeth Phillips
Kelli Rice
Travis Classen
Latham Fullner
Ethan Heser
Ethan Nutter
Landon Rhodes
Marcus Sandberg
Levi Schlick
Alex Teten
Jeremy Vonasek

Connor Weihrs
Daniel Willer

Master’s Degree
Meetpal Kukal
Keith Miller
Albert Nguyen
Bryan Smith
Nicole Schuster

Ph.D.
Sreenivasula Boreddy

Larsen
Tractor Test & Power Museum
EST 1918

$One in a $Million
Give to Lincoln & Larsen Museum
May 1–26
The next generation of BSE students could use your help. Your generous donations support student scholarships and special opportunities, as well as equipment for classrooms and laboratories. Please consider making a donation to the Biological Systems Engineering Excellence Fund to provide student programs and scholarships. If you prefer, you can establish your own fund and name it for a family member, friend or mentor.

To arrange a gift, contact:
Kristen Hassebrook, (CASNR/MSYM)
402-458-1160
kristen.hassebrook@nufoundation.org
OR
Justin Carlson (COE, AGEN/BSEN)
402-458-1196
justin.carlson@nufoundation.org