

UPDATE

A Newsletter of the University of Wisconsin-Madison
Biological Systems Engineering Department

Spring 2005

Vol. 8, No. 1

—The Chair's Chips

Spring on campus is always a time of transition. Many of the students we have come to look on as family graduate and begin their careers or enter graduate school. We have watched them grow from gangly, tentative freshmen into confident engineering professionals. They have learned much about what it will take to succeed and how their skills and commitment to professional ethics will help make our society better.

For our faculty, graduation is always bittersweet. We're sorry the students are leaving after we've just gotten to know them well, but excited for them as they take their great potential into the future to work on real world problems and solutions. We feel in BSE they have received some of the best engineering education they can receive anywhere. Now it is up to them. We have no doubt that they will continue to make the department, college and university proud as their careers unfold.

The descriptions in this newsletter of student awards and activities show that life as a student in BSE is about more than just taking courses and getting grades. It is about growing as a person, learning to be a leader and team player, having new experiences, making friends, and having fun. All of our students are proficient academically or they wouldn't be in the department or the university. Student activities expand their learning opportunities, allowing them to build new social and analytical skills as they interact with fellow students and faculty.

A good example is our ASAE student section. The section is extremely active and provides a variety of opportunities for students to learn leadership skills, work on joint projects, and meet with students from other campuses. The students bring high levels of energy and interest to projects like the annual Lawnmower Clinic fundraiser, the ASAE Quarter Scale

Tractor Team, and regional ASAE events like the Winter Shindig here and the Midwest ASAE Rally in Kentucky. The section also sponsored an exhibit at the College of Engineering 2005 Engineering Expo, which has an attendance in the thousands, from school kids to senior citizens.



The student section combines fun with challenging activities, getting everyone involved and sharing the work. It provides just the type of experience that will better prepare our students for the professional world they will soon enter. It is no coincidence that many of the students receiving awards are also active in other student activities. They are strong students whose excitement for learning induces them to look for interesting opportunities for growth and enjoyment while in the department.

If you asked our faculty, they would tell you that it is the students who keep us working at the university. These students, the engineering professionals of the future, continue to reenergize the faculty, challenging us with their energy and commitment to learning. They also continue to amaze us with their accomplishments after they leave BSE. Seeing our students come to the campus, work hard and blossom is exciting and fulfilling. We wish this class of graduates our best and look forward to the task of developing the future engineers that the world will need to address the critical problems facing the global family.

Sincerely,
Patrick Walsh
BSE Department Chair

Department News

Thank You

A special "Thank you" to the following for their contributions to Biological Systems Engineering Funds at the University of Wisconsin-Foundation from 11/09/2004 through 4/15/2005.

David L. Ahlgren
Alliant Energy Foundation
Craig L. and Elizabeth A. Beecher
David A. Broten
Gary D. Bubbenzer
Frederick H. and Lois Buelow
James C. Converse
James P. Doering
Peter R. and Joy H. Dohr
Kenneth V. Fiske
Jacob L. Gruenewald
James L. Halderson
Richard D. Holloway
Brian M. and Jill A. Huenink
Jim Beaton Insurance Agency
John Deere Foundation
John Deere Ottumwa Works
Richard G. Koegel
Irma G. McFee
Gail E. and Janice Janssen
Paul A. and La Vay E. Morrison
John W. O'Connor
Edward J. Odgers
Daniel L. Pederson
James D. Rauwerdink
Sol D. Resnick
Kenneth M. Russell
Robert and Teresa Satori
David K. Schirer
Walter M. Schlessner
Ronald T. and Barbara L. Schuler
Kenneth A. Steele
Richard J. Straub
Jeffrey A. Zimmerman



James C. Converse Receives NOWRA Recognition



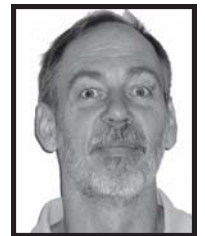
James C. Converse received an award from the Wisconsin Onsite Wastewater Recycling Association (WOWRA) for his outstanding teaching, research, and extension work in onsite wastewater treatment and management. Converse has worked with the onsite industry for the

past 35 years. The award was presented at the Annual meeting held in LaCrosse on Jan. 29, 2005.

The NOWRA is a statewide organization of installers, soil testers, designers, manufacturers, and related governmental and educational personnel. The Association was formed in 1974 as the South Central Septic Association by a group of installers interested in improving the trade and having a voice in legislation affecting their business. In 1976, the group was reorganized and renamed the Wisconsin Onsite Waste Disposal Association. In 2001, the name was changed to WOWRA. The Association aims to: provide statewide association and professional identity, promote better communication within the trade, and promote recognition of the profession.

Larry Chapman Receives College Award

Dr. Larry Chapman, a Senior Scientist in BSE, received the College of Agricultural and Life Sciences Award for Excellence in Research. The award was presented by Dean Elton Aberle at the annual awards program on April 20, 2005. Dr. Chapman has been on the BSE staff since 1990 when he was a co-



investigator on an Agricultural Health Promotion Systems project funded by the US Centers for Disease Control (CDC). Shortly after completion of this four-year project, Dr. Chapman was given principal investigator status where he has developed a very successful agricultural safety and health research program.

His major program has been Healthy Farmers/Healthy Profits project which evaluates practices which both reduce the risk of injuries and increase the potential for profitability. The focus of this project is injury prevention using intervention methods with education. The farm enterprises primarily involved were nursery, fruit and vegetable production, and dairy farms. Dr. Chapman has been successful in receiving continued support from US CDC since obtaining principal investigator status.

Wisconsin Section ASAE Awards

At the March 30, 2005 meeting of the Wisconsin Section of ASAE in Oshkosh, numerous awards were presented. Naomi Uhlenhake received the Agricultural Engineering Undergraduate Student of the Year and Matthew F. Digman received the Agricultural Engineering Graduate Student of the Year. Roger D. Mayhew, BSE friend and supporter, received the Agricultural Engineering Career Achievement Award.



Pat Uhlenhake (L), Section Awards Chair, presents career award to Roger Mayhew (R)

Roger Mayhew was employed at Weasler Engineering Inc. from 1982 to 2004, first as product development engineer and later as vice-president of the Engineering Department. Earlier, he was employed in engineering positions with International Harvester and Bolens. He received his undergraduate degree in Agricultural Engineering from the University of Illinois. Roger has been active in numerous ASAE committees at the national level, including Cooperative Standards, Turf and Landscape, and Distinguished Lecture. During recent years Roger has served as chair of the ASAE Lecture Series committee. He also has been involved in Association of Equipment Manufacturers and SAE. He received twelve ASAE AE50 awards and had a role in thirteen US patents.

Matthew Digman, the graduate student award recipient, is pursuing a Masters degree in the area of machinery systems. He completed his BS degree in Mechanical Engineering at the Milwaukee School of Engineering. As an undergraduate, Matt was involved in the Society of Model Engineers, Student Government Association and Tau Beta Pi. Between undergraduate and graduate programs, Matt was employed as an engineer with Kuhn-Knight in Brodhead, WI.

As a graduate student in Madison, Matt has been involved in Lawnmower Clinic and the ASAE Quarter Scale Tractor Team. His research is directed at using near infrared reflectance spectroscopy (NIRS) to determine alfalfa forage moisture content. Matt's career goal is to obtain a research engineering position utilizing engineering principles and biology to develop agricultural solutions to challenges facing today's society. Matt is from the Bloomington area of Wisconsin.

Naomi Uhlenhake, a senior from Bristol, WI and recipient of the Undergraduate Engineering award, is in the Natural Resources and Environment area of Biological Systems Engineering. Naomi has been very active in department and campus activities. She served as president of the UW ASAE student group for 2004-05. Other involvement in club activities include student club secretary, Quarter Scale Tractor team, Association of Equipment Manufacturers report writing team, Lawnmower Clinic, homecoming float, intramural sports, and Science Olympiad.

She served as vice-president of the Midwest Region for student ASAE clubs. Other campus activities include Badger Dairy Club and Association of Women in Agriculture. Naomi plans to graduate in December, 2005 and to pursue a career in conservation or waste management and become a registered professional engineer.

Philip Halbach received the ASAE Agricultural Mechanization Student of the Year award. He is a senior at the University of Wisconsin-River Falls majoring in Agricultural Engineering Technology with a minor in Agricultural Business.



From left to right: Matt Digman, Phil Halbach, Naomi Uhlenhake, and Patrick Uhlenhake, Section Awards Chair

Students meet in Madison



From left to right: Chris Tamm, Nate Dudenhoefer, and Amanda Crowe participating in the Winter Shindig-skiing at Cascade Mountain.

On January 15 - 16, 2005, the University of Wisconsin-Madison ASAE Preprofessionals hosted the Wisconsin Winter Shindig in the Madison area. ASAE Student Club members from the neighboring states were invited to participate in a weekend of activities in Madison. Visiting students could arrive one day early to attend a UW hockey game with Alaska-Anchorage on January 14. On January 15, the students visited the Agricultural Engineering Laboratory where faculty shared information regarding their research programs. This was followed by a lunch and a tour of Capital Brewery in Middleton. In the evening the students had another opportunity to attend a hockey game.

On Sunday, the students went skiing at Cascade Mountain near Portage and the program ended with an evening gathering in Madison. Thirty-one students were in attendance from University of Illinois, Iowa State University and UW-Madison.

Senior Design Projects

This year's senior design projects were:

1. Small Scale Juice Pasteurization System – Gene Chyou and Kate Eckhardt. A system was designed for pasteurizing juice. The system is cost efficient for a small scale production unit in Western Wisconsin and meets food safety requirements.

2. Wetland Detention System for Stormwater Management at the UW Arboretum – Stephanie Eberley, Jessica Fenno, Josh Harder, Amy Kuhn, Tim Voelker. This design is an innovative solution for stormwater drainage area located in the UW Arboretum. The area sustains severe soil erosion during large stormwater events.

3. Quarter Scale Tractor Design – Eric Fox, Josh Garrington, Josh Kappelman, and John Richards. This project involves the design and fabrication of a quarter scale tractor to enter in the annual ASAE competition and is designed to be marketed.

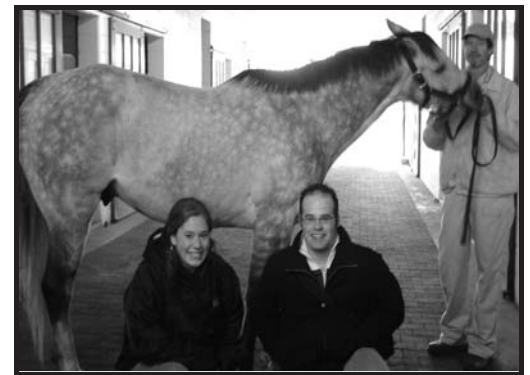
4. Quick-Attach Grapple for Prentice 490 Skidder – Matt McDonald. A quick attach grapple system was designed for the commercially available skidder.

5. Lunar Surface Conditioning Vehicle – Andy Feisthammel and Aaron Kurth. A vehicle was designed to grade plots on a lunar surface. It will remove major rocks and lay down electrical systems.

6. Camp Upham Woods Emergency Shelter – Jeremy Graveen and Matt Kohls. The goal of this project was to design an emergency shelter on an island at Upham Woods. The island is a natural preserve and therefore the shelter needed to be a low environmental impact design. It involves restrooms and emergency facilities for poor weather.

Midwest Region Students Meet in Kentucky

From March 31 through April 2, 2005, members of ASAE student clubs in the Midwest met at the Department of Biosystems and Agricultural Engineering



Naomi Unhlehake and John Richards at horse farm.

at the University of Kentucky. UW students Aaron Flouro, Naomi Uhlenhake, John Richards, and Tony Vandermuss participated in the program and Naomi served as vice-president of the Midwest organization for 2004-05. The program consisted of tours to Animal Research Center, Link-Belt Construction Equipment, JIF Peanut Butter, Wild Turkey Bourbon, and a horse farm. ASAE President Jerry Wille attended the conference and was a speaker.

Student News

Quarter Scale Tractor Team is Busy

The Quarter Scale Tractor team once again has a new design with some characteristics of the 2003 tractor which had an electric drive system. The 2005 design is a four-wheel-drive tractor with an engine-mounted generator to provide power to two electric motors, one to drive the front wheels and one to drive the rear wheels. Their written report has been submitted for the ASAE competition. The remainder of the competition will take place in the Quad-Cities area June 2-5, 2005. Team leaders are Josh Garrington, Josh Kappelman, John Richards, and Eric Fox. The other events include pulling, oral presentation, safety check, maintainability, and ease of fabrication.



Testing the 2005 Quarter Scale Tractor.

Students Participate in Engineering Expo

BSE students participated in the 2005 Engineering Expo with two major projects Quarter Scale Tractor and Juice Pasteurization. For the tractor display, the students showed their first quarter scale tractor and a modern tractor. They described the ASAE competition and the awards received while competing.



Matt Herzman at the Quarter Scale Tractor Display at Engineering Expo.

Students Travel to Chicago

On April 8 and 9, members of the student club traveled to Chicago to visit the Museum of Science and Industry and to Beloit to visit Fairbanks Morse, an



Bryan Yanke holds connecting rod from Fairbanks Morse engine.

EnPro Industries Company. At Fairbanks Morse they were hosted by Jon Frey, a 2001 graduate of the Agricultural Engineering program. Fairbanks Morse manufactures extremely large internal combustion engine for large boats. At the Museum of Science and Industry, the students were able to view the history of agricultural machinery. The exhibits included machines currently being marketed. Participating in the trip were Eric Bergum, Nate Dudenhoeffer, Eric Fox, Chris Tamm, Richard Wipperfurth, and Bryan Yanke.



Jon Frey (left), 2001 graduate, with students during the Fairbanks Morse tour.

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or visit our website at <http://bse.wisc.edu>.

Food Engineering in Focus

Mixing it up with Strikes and Spares

Undergraduate and graduate students got to see a new side of some of the faculty members as well as getting to know fellow students at different points in the program at the Food and Bioprocess Engineering Program (FBEP) Fall

2004 Mixer on November 11, which was funded in part by General Mills. Six undergraduate students, seven graduate students and four faculty members had a great time getting to know each other better

while bowling and eating pizza. Professor Gunasekaran showed that professors really do know how to have fun with his great enthusiasm for bowling—in spite of his score.

Scaling Up “There and Back Again”

On April 29, 2005 a group of three undergraduate and 10 graduate Food and Bioprocess Engineering students took a trip “there and back again” to Minneapolis, MN to visit Crown Iron Works (the world leader in the design and building of oil extraction facilities) and the General Mills Riverside location.

Before touring the Crown Iron Works facility, we were provided some history of Crown Iron Works, which was a major ship builder back in WWII, as well as an explanation of how oil is extracted from oil seeds and other oil containing materials by Chas Teeter. The highlight of our visit to Crown was seeing the scale-up units in their pilot plant from a miniature table top unit to one that was two stories high. The state of the art

safety features in their facility also helped the students appreciate that the facility around the processes we work with must also be considered in process design. The General Mills visit, which was

organized by Dennis Lonergan, began with an excellent presentation entitled “Process Development Best Practices” by Mark Boyd, where students were able to get a better appreciation of how what they are

learning fits into process development, as well as what other skills they will need to draw on as they work in multidisciplinary teams. Then we were given a tour of the Riverside facility that emphasized the compartmentalized structure typical of a large operation

such as General Mills, which was a contrast in

scale to the structure of the much smaller operation at Crown they had seen earlier in the day where every employee performed multiple tasks. The visit culminated with a talk about Food Rheology by Sumana Chakrabarti in the New Technology Unit, before the whole group headed “back again” to Madison.



In Memoriam

On May 25, 2005, Edward Bruns, 90, a Professor Emeritus in the department, passed away in Verona, WI. A long time Middleton resident, Ed was a member of our faculty from 1948 to 1977 when he retired. He was an extension specialist in the agricultural buildings and was known for an educational program that used farm visits. It was estimated that he made in excess of 14,500 farm visits during his career.



University of Wisconsin-Madison. He completed a BS in Agriculture in 1936, majoring in Agricultural Engineering, and a BS in Civil Engineering in 1937. He completed an MS in Agricultural Engineering from the University of Illinois. Before joining the department he served in the US Navy and worked for the Federal Land Bank in St. Paul, MN, the US Engineers in Hattiesburg, MS, and the Sheboygan County Extension.

Ed grew up near Elkhart Lake, WI and attended Lakeland College in Plymouth before coming to the

Opportunities to Support BSE Scholarships and Activities

We encourage our alumni and friends to consider support for one of the funds listed below. Please note, contributing to one of the departmental funds below will also be counted as part of the UW-Madison campaign, "Create the Future: The Wisconsin Campaign".

- Agricultural Safety and Health Fund
- Alfred and Edna Krenz BSE Fund
- Biological Systems Engineering Fund
- Biological Systems Facilities Fund
- Biological Systems Student Activities Fund
- Dick and Grace Stith Scholarship
- Ervin W. Schroeder Scholarship
- Farm Machinery Research Fund
- Gail Edwin and Janice Faye Janssen Scholarship
- Ham Bruhn BSE Scholarship
- Hjalmar D. and Janet W. Bruhn Fellowship
- Lynndon A. and Norma A. Brooks Scholarship
- Martin E. and Kathleen M. Burkhardt Fund
- Orrin I. Berge Scholarship
- Robert H. and Willa Meier Scholarship
- Sixties Decade Student Computer Lab Equipment
- White Clover Dairy Research
- Wisconsin BSE Scholarship

Biological Systems Engineering Campaign

I/we wish to join other students, alumni, industry and friends in enhancing the teaching, research and outreach programs in the Department of Biological Systems Engineering by contributing as indicated below to the Campaign.

_____ \$250 _____ \$500 _____ \$1,000 _____ \$5,000 _____ \$10,000 _____ Other

I/we wish to pledge \$_____ each year for _____ years beginning in _____ (year).
Please remind me of the annual amount I have pledged in _____ (month).

I/we wish to make a single gift at this time. Enclosed is my/our contribution of \$_____.

Please charge my gift of \$_____ to my: Master Card Visa American Express

Card Number _____ - _____ - _____ - _____ Expiration Date _____

Cardholder's name (please print) _____

Signature _____ Date _____

I/we wish to designate this gift: Where the need is greatest in the Department, for facility enhancements, for faculty/research support, for student support, other _____

Name: _____

Address: _____

Please make checks payable to **UW-Foundation-BSE Campaign**.
Mail to: University of Wisconsin Foundation, 1848 University Avenue,
P.O. Box 8860, Madison, WI 53708-8860

Alumni Update

Name: _____

Degree and Date(s): BS () MS () PhD ()

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Position: _____

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News to share: _____

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