



U of A  
UNIVERSITY OF ARKANSAS  
DIVISION OF AGRICULTURE

Department of Biological and Agricultural Engineering Newsletter  
Dale Bumpers College of Agricultural, Food and Life Sciences  
and the College of Engineering

## From the Head

**Lalit R. Verma**  
Department Head



It is a pleasure to report that our new science-based undergraduate program in **Biological Engineering** became official effective Fall 2001. We have a freshman class of 20 in the new program. All four new faculty members have joined the department and will strengthen our programs. Dr. G. Scott Osborn joined us in December and will initiate work in Biomedical Engineering concentration of Biological Engineering.



A faculty retreat was held in July focusing on our academic programs. The educational objectives, assessment measures and courses were discussed. Recruiting and technical elective offerings were discussed. This was followed by a meeting of the BAE Advisory Board. Plans are underway to form the Arkansas Academy of Biological and Agricultural Engineering in January 2002 with an induction ceremony for Charter Members.



Recruiting of undergraduate students is ongoing with leadership from Dr. Carol Gattis in Engineering and Dr. Julie Carrier in Agriculture. The Biological Engineering recruiting CD was revised based on suggestions from the BAE Advisory Board in July. This is also on our web page.

(Continued on page 2)

## XZIN McNEAL PLAQUE PRESENTATION



### Presentation of the Cotton Stacker Plaque outside Engineering Hall at the University

Pictured above, left to right, are Dr. Lalit R. Verma, department head, Jim McNeal and Mark Johnson, nephews of Xzin McNeal, and Billy Bryan, former department head, accepting the plaque in honor of Agricultural Engineering Professor Xzin McNeal for his contributions to the development of the Cotton Pallet Stacker System.

Professor McNeal designed, built, tested, and developed the Nation's first successful pallet trailer system of storing as much as seven or eight bales of seed cotton on a wooden pallet on a turn row in the field and later transporting it to the gin for processing when space was available. Between 1964 and 1970, a small number of the units were constructed and sold to local cotton farmers by a small private construction firm in Mississippi.

During this same period of time, agricultural engineers at Texas A&M University (led by Professor Lambert Wilkes), began developing a similar system. During this process of development at both universities, both McNeal and Wilkes were designated by the *Progressive Farmer* magazine as their "Man of the Year" for their accomplishments in this development.

Shortly after McNeal retired in 1971, the engineers at Texas A&M enhanced their system by adding a hydraulic compacting device and were successful in gaining a patent. Today the pallet system is used wherever cotton is produced in the United States. Before he retired, McNeal demonstrated in his experiments that storing the seed cotton in the field on these pallets, resulted in significant improvement in the quality of the fiber following the ginning process.



**Xzin McNeal**



The weekly Brown-Bag Program continued in fall with most of the sessions devoted to ABET- related items of educational objectives, outcomes assessment and curriculum matrix. Dr. Carl Griffis is coordinating the ABET items, and Dr. Tom Costello is coordinating the courses and curriculum. We will be preparing our ABET report in spring for the site visit in fall 2002.



Work is nearly completed on the construction of new lab rooms for research and teaching in our laboratory facility at the Central Research and Education Center. Furnishing of the labs will continue and require significant resources. Our goal is to have high-quality space for the research and teaching programs of our department.



## Faculty & Staff News

Sreekala Bajwa will serve as associate editor of the Information and Electrical Technology division of ASAE. She was elected vice chair of the Biological Engineering Education Committee, ASAE, and moderator for the technical session at the 2002 annual ASAE meeting in Chicago.



Indrajeet Chaubey was elected vice-chair of professional development for the Arkansas Section of the American Society of Agricultural Engineers (ASAE) for 2001-2002.



Tammie Edrington joined the office staff in August. She replaces Cecile Sands in the Secretary position of the department. Tammie and her husband Lee reside in Fayetteville with their six children. Tammie's oldest son, Justin, is a freshman at the University majoring in Turf Management.

## Our New Faculty



**Sreekala Bajwa,** Ph.D., 2000, University of Illinois, joined the BAEG staff in August 2001. Dr. Bajwa received her Ph.D. in Precision Farming from the University of Illinois

and M.Eng. (1994) in Agricultural Engineering from Indian Institute of Technology, Kharagpur, India. Dr. Bajwa will be working in the area of precision agricultural machinery and equipment, sensors and controls, remote sensing for crop monitoring and soil characterization, GIS, GPS and decision support systems. Dr. Bajwa is married to Dr. Dilpreet Bajwa and they have one son.



**Jin-Woo Kim,** Ph.D., 1998, Texas A&M University, will be serving the department as assistant professor. Dr. Kim received a

B.S. degree in Microbiology from the University of Iowa, a B.S. degree in Chemical Engineering from Seoul National University, Seoul, Korea, and his M.S. degree in Biology from the University of Wisconsin. He will be focusing on biotechnological and biochemical engineering, with particular environmental biotechnology and extremophilic fermentation and biocatalyst technology. Dr. Kim is married to Hee-Jung Kim, and they have a daughter and a son.



**Marty Matlock,** Ph.D., 1996, Oklahoma State University, comes to us from Texas A&M University. Dr. Matlock joined

our staff August 2001 as assistant professor. He received his B.S. degree in Soil Chemistry from Oklahoma State University in 1984 and his M.S. degree in Plant Physiology in 1989 also from Oklahoma State University. Dr. Matlock's area of focus will be bioenvironmental engineering. He and his wife Stephenie have three children.



**Scott Osborn,** Ph.D., 1994, North Carolina State University, joined our staff in December 2001. He comes to the

University of Arkansas from Texas A&M University. Dr. Osborn has a B.S. and M.S. in Agricultural Engineering from the University of Kentucky. He had served as Assistant Professor at Texas A&M since 1996. Dr. Osborn will be focusing on the area of Biomedical Engineering while serving as Assistant Professor in our department. He and his wife, Laura, have two daughters.



Under the direction of Dr. Ivan Berry, the University of Arkansas at Fayetteville has been working on the creation of the State Chapter web site. The address is [www.baeg.engr.uark.edu/ASAE/asae.html](http://www.baeg.engr.uark.edu/ASAE/asae.html). The site includes the state by-laws, annual meeting minutes, officer list and state rooster. Suggestions for the site can be submitted to Ivan Berry via e-mail: [iberry@arkansas.net](mailto:iberry@arkansas.net).

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## AWARDS & PRESENTATIONS

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### Presentation of the Grain Aeration Plaque at Stuttgart Agricultural Museum

On August 25, 2001, ASAE State Chapter proudly dedicated a plaque honoring Meryl Todd for his work in grain aeration. The plaque will be displayed at the Stuttgart Agricultural Museum in Stuttgart, Arkansas. The State Chapter was honored to have Gerold Isaacs, former ASAE President, in attendance for the dedication. Dr. Isaacs was privileged to have worked with Meryl Todd and gave an informative presentation to all in attendance. Pictured from left to right are Dr. Gerold Isaacs of the University of Florida and former ASAE President; David Handwork, State Chairperson, who is employed by Chamfil Farr; Karl VanDevender, State Treasurer, who is employed by the State Cooperative Service; Charolette Bowie, State Secretary, who is employed by the Natural Resources Conservation Service; Kenny Dryden, Vice-President of Operations for Producers Rice Mill; Keith Glover, President and CEO of Producers Rice Mill; and Dr. Ivan Berry, Vice-Chair for Professional Development, who is a professor from the University of Arkansas at Fayetteville. A special thanks was given to Producers Rice Mill for their contribution of the plaque.

## Highlights, Presentations and Awards

The following departmental personnel attended the national ASAE meetings, July 29-August 1, 2001:

**Dr. Indrajeet Chaubey** presented a paper entitled “Statistical Analyses of Land Use Effect on In-Stream Nutrient Concentrations” and also chaired two sessions entitled “GIS, Remote Sensing and Modeling for Watershed Management” and “Statistical Methods in Hydrology.”

**Drs. Carl Griffis** and **Lalit Verma** presented a paper entitled “Criteria 2000–The Long View.”

Ph.D. student **Omar Trujillo** presented a paper entitled “Rapid Recognition of *Salmonella typhimurium* Using Image Processing and Statistical Pattern Recognition Techniques.”

**Dr. Yanbin Li** coordinated a session on biosensors and presented a review of biosensors for rapid detection of pathogens in foods. Also during the biosensors session, **Dr. Chuanmin Ruan** presented a paper entitled “Immuno-electrochemical bienzymebiosensors for detection of *E. coli* O157:H7” and **Dr. Youngcheng Liu** presented a paper entitled “A bioseparator/bioreactor for detection of *E. coli* O157:H7.”

Graduate student **Sunny Wallace** presented a paper entitled “Botanicals as a specialty crop: the Echinacea example.”

The Sophomore Design Team took their design project “Design of an Aeroponic Growth Chamber” (see Student Activities) to the finals of the National Student Design Competition in Sacramento. **Tyler Gipson, Chris Long, Ray Avery, Mark Orlicek, Gloria Hebert, and Clay McDaniel** attended the competition. **Ryan Nelson** and **Johnny Mason** were also on the team and **Dr. Tom Costello** was the project advisor.

**Omar Trujillo, Sunny Wallace, Dr. Yanbin Li** and **Dr. Verma** also attended the IBE meeting July 28-29, 2001, in Sacramento, Calif. **Sunny Wallace** presented a paper entitled “Harvesting, Drying, and Extracting of Milk Thistle”.

**Dr. Li** also attended the International Association of Food Processors meeting August 3-8, 2001, in Sacramento.

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Engineering for Life

[www.baeg.engr.uark.edu](http://www.baeg.engr.uark.edu)

## Design of an Aeroponic Growth Chamber

*Team Members: Ray Avery, Tyler Gipson, Gloria Hebert, Chris Long, Johnny Mason, Clay McDaniel, Ryan Nelson, and Mark Orlicek.*  
*Instructor: Dr. Tom Costello.*

The students in the sophomore course (BAEG 2622) were given the challenge to design and build a plant growth chamber in order to learn about the engineering design process and to study techniques for meeting the physiological requirements of organisms in a controlled system.

Dr. Paul Counce of the Department of Crop, Soil, and Environmental Sciences suggested that an aeroponic system was needed for rice physiology research. An aeroponic growth system provides plants nutrients to their roots, which are suspended in air (no soil, not submerged) and periodically sprayed with a nutrient solution.

The students designed, built and tested a system of multiple chambers for Dr. Counce that provides independent control of chamber temperature, spray cycle frequency and light intensity. The design included a component that will allow Dr. Counce to simulate the light regime of any location at any time of the year — the system computes expected solar energy intensities and then using



an experimentally-determined calibration curve, specifies the height needed for the artificial lights and the time of sunrise and sunset.

Temperature in the chambers was modified by circulating heated or chilled water through heat exchangers submerged in the nutrient solution at the bottom of each chamber. All pumps, solenoid valves and lights were controlled using a data acquisition unit attached to a computer.

User interfaces and hardware interfaces were also designed and built by the team. Testing showed a dramatic impact on root growth by varying the nutrient spray duty cycle.

Successful completion of this project illustrates the remarkable capabilities of our students, even at the sophomore level. The design placed 3rd at the 2001 ASAE National Student Design Competition held during the National ASAE meetings in Sacramento, July 29-August 1, 2001. Six of the eight team members and Costello attended the competition.

## ASAE Student Branch News

Rachel Davis, President  
Chris Long, Vice President  
Tyler Gipson, Sec./Treas.  
Dr. Griffis, Faculty Advisor

ASAE co-sponsored the Annual Fall Barbeque. A good time was had by all.

We also have had two other meetings this past semester.

We plan on winning Engine Week in the spring and will be hosting a spring outing.



## In Memory



Warren Harris, former assistant professor, died Friday, November 23, 2001, at his home in Springdale, Arkansas. Mr. Harris was

78 and had been a professor at the University of Arkansas for 35 years.

Memorials may be made to the American Cancer Association's local chapter, care of Mida Neff, memorial chairman, 102 Woodcliff Road, Springdale, AR 72764.



Alumni Albert H. Miller, died Saturday, November 24, 2001, at the age of 68. Mr. Miller was a 1955 agricultural

engineering graduate. He continued his education at the University of Missouri where he received his Masters Degree in Agricultural Engineering in 1957. Mr. Miller served as President of NSPE during 2000-2001. He was also President of Miller-Newell Engineers, Inc., Newport, Arkansas, and Cassville, Missouri. His career had spanned many phases of engineering.



## ASAE Outstanding Senior Award



Gabe Chedister, senior Biological and Agricultural Engineering student, was chosen as this year's Outstanding Senior by the Arkansas State Section of the ASAE. Gabe received recognition of this honor at the Arkansas ASAE meeting that was held in Little Rock on October 4, 2001.



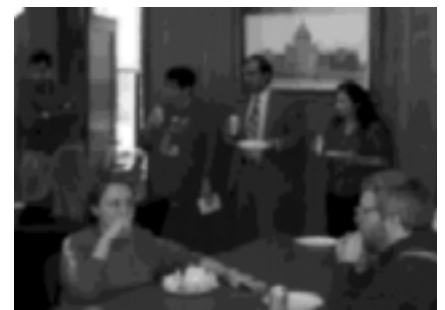
## BAEG SCHOLARSHIP RECIPIENTS

This fall our department gave out 17 scholarships totaling \$11,650.00. Our department is very fortunate to have scholarships sponsors such as Xzen-McNeal, Riggs Tractor, John W. White/Odom, and Staplcofn. Pictured at left are Fall 2001 Scholarship recipients, they are from left to right front row Cory Scott, second row Dylan Carpenter, Chris Pixley, Rachel Davis, Sterling Powers, third row Chris Long, Amber Gosnell, Tyler Gibson, Shelly West, fourth row Jennifer Knepper, Drake McGruder, Johnny Mason, and Mark, Orlicek. Not Pictured are Gabe Chedister, Andrea Ludwig, Elizabeth White, Carrie Hawkins, and Chris Young.

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## STUDENT RECEIVES SUPRISE VISITOR

Senior BAEG student, Rachel Davis, received a suprise visit in Dr. Costello's BAEG 4403, Controlled-Environment Structures for Biological Systems class. Her boyfriend, Matt, came into class pretending to be lost and ended up offering Rachel a marriage proposal. Her answer was "Yes" and they will be getting married in June of 2002. Congratulations Rachel!!



Our department has enjoyed several outings this fall. Pictured above are members of the department socializing at the Fall picnic and the Christmas lunch.

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## WE NEED OUR ALUMNI

Our alumni are valuable resources to the Department. Consider visiting high school science classes in your area to speak on careers in biological engineering.

We can provide you with an MS Powerpoint presentation on CD or

videotape as well as brochures to distribute.

Please clip and return the form below if you would like to **contribute** to the continuing **success** of YOUR department.

**Yes! I will visit a high school in my area!**

Please send me a CD \_\_\_\_\_ or videotape \_\_\_\_\_ (check one) and \_\_\_\_\_ (indicate number) brochures.

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_

STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

Return to: Biological & Agricultural  
Engineering Department  
203 Engineering Hall  
University of Arkansas  
Fayetteville, AR 72701



## Alumni News —

The Department welcomes all alumni back to visit any time.

If you would like to visit with one or more of our classes, please let us know.

Please check out our new web site: [www.baeg.engr.uark.edu](http://www.baeg.engr.uark.edu). There have been several changes and additions. Let us know if you have suggestions on what you would like to see on our site.



## Calendar of Events

### JANUARY

- 10 Arkansas Academy of BAEG Induction Banquet
- 11 Annual Review & Advisory Board Meeting
- 14 Classes begin
- 21 M.L. King Holiday

### MARCH

- 18 - 22 Spring Break

### APRIL

- TBA Spring Outing
- 8 - 12 Academic Festival Week

### MAY

- 3 Dead Day
- 4 - 10 Final Exams
- 11 Commencement
- 20 Summer Sessions I & III begin
- 27 Memorial Day (UA closed)

## BAE Lifeline

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