Includes 2006 Guide to Consultants

June/July 2006

Resource

Engineering & Technology for a Sustainable World

25x'25 Seeks Energy Solutions

Portland Welcomes Attendees to the 2006 Annual International Meeting

PUBLISHED BY ASABE - AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS

Events Calendar

ASABE Conferences and International Meetings

To receive more information about ASABE conferences and meetings, contact ASABE at 800-371-2723 or mcknight@asabe.org. For the complete list, see www.asabe.org/resource/asabevents.html.

2006

July 9-12 **ASABE Annual International Meeting.** Oregon Convention Center, Portland, Oregon, USA.

July 24-26 **2006 World Congress of Computers in Agriculture (WCCA).** Grosvenor Resort, Lake Buena Vista, Florida, USA.

2007

Jan. 21-24 **International Confernece on Agriculture, Food and Biological Engineering and Post Harvest Production Technology.** Khon Kaen, Thailand.

Feb. 11-13 **Joint Agricultural Equipment Technology Conference and Third International Conference on Crop Harvesting and Processing.** Louisville, Kentucky, USA.

March 11-13 **Fourth Conference on Watershed Management to Meet Water Quality Standards and Emerging TMDL.** San Antonio, Texas, USA.

June 17-20 **ASABE Annual International Meeting.** Minneapolis, Minnesota, USA.

Sept. 15-19 **International Symposium on Air Quality and Waste Management for Agriculture.** Broomfield, Colorado, USA.

Oct. 20-24 **11th National Symposium on Individual and Small Community Sewage Systems.** Warwick, Rhode Island, USA.

TBD **Sensors and Nanotechnology Conference.** Minneapolis, Minnesota, USA.

TBD **Sixth International Dairy Housing Conference.**

ASABE Section and Community Events

For more information, contact the person identified in each listing. For the complete list, see www.asabe.org/resource/community.html.

2006

July 16-19 **2006 National Technical Conference and Annual General Meeting of the CSBE/SCGAB.** Edmonton, Alberta, Canada. Contact www.bioeng.ca/Events/Edm2006/.

July 30-Aug. 2 **NABEC Meeting.** Holiday Inn, Pointe-Claire Montreal Airport, Quebec, Canada. Sponsored by McGill University. Contact Paul Heinemann, hzh@engr.psu.edu.

Oct. 11-12 **Texas Section.** Brenham, Texas, USA. Contact Catherine Nash, 254-742-9915, catherine.nash@one.usda.gov.

ASABE Endorsed Events

For more information, contact the person identified in each listing. For the complete list, see www.asabe.org/resource/endorsevents.html.

2006

Nov. 9-11 **5th International Conference of the Asian Federation for Information Technology in Agriculture.** Bangalore, India. Sponsored by the Asian Federation for Information Technology in Agriculture. Contact afita2006@yahoo.com, www.insait.org.

Resource

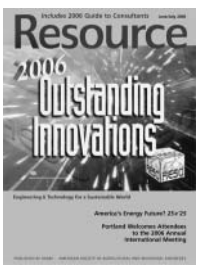
Engineering and Technology for a Sustainable World

Vol. 13 No. 5 June/July 2006

FEATURES

DEPARTMENTS

ON THE COVER



For 19 years now, the *AE50* competition has recognized companies that produce the best of the best – machines, components, systems to enhance and improve agricultural, biological, and food related industries. The 2006 award recipients, who introduced products in 2005, follow in a time-honored tradition of high-tech ingenuity and down-to-earth creativity. *Resource* is proud to give each winner the spotlight in a special section. Congratulations – applause, applause!

Portland Welcomes Meeting Attendees

5 "The City of Roses" offers something for everyone who attends this year's Annual International Meeting. In addition to an excellent convention and meeting facility for members, the beauty and diversity of the area is unsurpassed. See you in Portland!

Fast tractors challenge safety

A farmer who has purchased a "fast tractor" probably feels like the driver of a Ferrari on a road with a speed limit of 55 mph, says Wayne Dellinger, program coordinator for The Ohio State University Extension's Agricultural Safety and Health program. The fast tractors are comfortable and easy to drive, he says.

In most states, all farm equipment must carry the slow-moving vehicle emblem on the back. Any vehicle with a slow-moving vehicle emblem cannot, by law, go faster than 25 mph.

Dellinger has been consulting with the Ohio Highway Patrol, the Ohio Farm Bureau, and the Ohio legislature to determine how best to change Ohio law so the tractors can be permitted to go faster on roads when it is safe to do so, yet not undermine the integrity of the slow-moving vehicle sign.

An option under consideration for adoption is ASABE's recommendations. The Society recommends pairing the SMV sign with a "speed identification symbol," a black-and-white circle with a number inside indicating the highest speed at which the vehicle can be safely driven. The circular emblem would also be required on any equipment hauled behind a tractor. A farmer could drive only as fast as the lower speed allowed.

Dellinger says if Ohio does come up with an answer, it could be the benchmark for the nation.

"No state has legislation to address this issue yet. That's even more reason for us to do this right the first time. Safety always needs to come first," Dellinger says.

For more information, contact Dellinger, 614-292-1952, dellinger.6@osu.edu.

Rice camp for teens

While millions of people in Southeast Asia depend on rice, the grain attracts few young people as farmers or scientists.

However, an innovative project now launched in the Philippines and Thailand marks the start of a major new effort to encourage young Asians to consider a future in rice.

"It's a sad fact of life in modern Asia that many young people in the region don't think of rice as offering an exciting or promising career, so they focus on other industries and other careers," says Robert Zeigler, director general of the Philippines-based International Rice Research Institute (IRRI), the world's leading rice research and training center.

Working together with the Thai Rice Foundation and the Philippine Rice Research Institute, IRRI is hosting a five-day rice camp for Thai and Filipino teenagers.

Resource

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A subscription to *Resource: Engineering & Technology for a Sustainable World* is included in the annual ASABE membership dues. Annual nonmember subscription rates are $86 including postage in the United States. Add $25 for postage outside the United States. Overseas airmail rates available on request. Single issues are available for $5.50 for members, $7.50 for nonmembers. Contact ASABE order department, 269-428-6325. An application for membership can be obtained by contacting ASABE.

Change of address: Send recent mailing label and address with ZIP code. Allow four weeks for change to become effective.

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American Society of Agricultural and Biological Engineers

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The students – who have been selected because of their interest in, or knowledge of rice – will learn the latest scientific techniques in rice research and will be shown how rice research can provide a brighter future for the region.

"We want them to understand that rice research is on the cutting edge of international scientific activity," Zeigler says. "The recent sequencing of the rice genome attracted enormous international attention, yet most young Asians still don't know it even happened, let alone understand its implications for the food they eat."

For more information, visit www.irri.org.

Digital repository provides online access to selected USDA publications

The National Agricultural Library (NAL) has established an online digital repository providing convenient public access to the full text of selected USDA publications.

The NAL Digital Repository (NALDR) contains a wide variety of publications that have been digitized and made available online.

While documents will continually be added to NALDR, currently available in the repository are:

The Rural Development Publication Digitizing Project, which provides access to publications produced since the 1800s. These include the entire series of Rural Development Research Reports, Rural Development Perspectives, Agricultural Economic Reports, and Agriculture Information Bulletins, as well as selected Economic Research Staff Reports and the first 300 volumes of Agriculture Handbooks.

The Yearbook of the United States Department of Agriculture series were published from 1894 to 1992. The yearbooks contain statistical information, summaries of research developments, and comprehensive surveys of particular subjects important to agriculture. The yearbooks for 1894 to 1914 are currently available in the NALDR. The remaining volumes will be added in 2006.

To access online, visit http://naldr.nal.usda.gov/.

From nuts to beer

It's been said that chestnuts are "grains that grow on trees." This statement is certainly true for a Michigan brewer, who has taken locally grown edible chestnuts and brewed a one-of-a-kind beer.

The edible chestnut market is becoming increasingly profitable, and members of the Chestnut Growers, Inc., a group of 36 Michigan growers who produce and sell nuts, continue to look for new ways to market their crop. After tasting a chestnut beer produced by an amateur home brewer, growers realized that many possibilities exist for marketing the popular nut.

Chestnut beer could become a profit generator for chestnut growers. ***(Photo courtesy of MSU)***

With help from Michigan State University (MSU) professors from the departments of Food Science and Human Nutrition, Biosystems and Agricultural Engineering, and Horticulture and the MSU School of Packaging, chestnut growers learned how to grow their crop and let others become aware of their efforts. Growers invited brewers from the state to a gathering to sample the product.

Ron Jeffries of Jolly Pumpkin Artisan Ales in Dexter, Mich., became interested in the concept and set forth to produce a beer using chestnuts. Jeffries named his product *Fuego del Otono* ("Autumn Fire").

Though chestnut beer has been brewed in Europe for years, until recently there was no record of any being produced and distributed in the United States. Jeffries produces the only bottled chestnut beer commercially available here.

In contrast to most beers, which are made from and flavored with barley, Jeffries uses the carbohydrates found in chestnuts as a source of flavor in the beer. Jeffries makes a mash from barley and boils the chestnuts. Once combined, the barley mash, which is full of enzymes, helps break down the starches in the chestnuts and removes the nuts' flavor. When the brewing process is complete, the nuts are tasteless and the beer is full of chestnut flavor.

"The beer has a fantastic flavor," Jeffries says. "It tastes like fall and brings to mind leaves crunching under your feet on a sunny autumn day."

Jeffries says the chestnut beer has been so popular that he has already sold his entire supply. He plans to brew at least twice as much next year.

MSU researchers have conducted several research projects with chestnuts with funding from Project GREEEN (Generating Research and Extension to meet Economic and Environmental Needs), Michigan's plant agriculture initiative at MSU. To learn more about Michigan's plant agriculture initiative at MSU, visit www.greeen.msu.edu.

25x'25

Building a renewable energy future

Sara Wyant

All it takes is one stop at the fuel pump to realize that Americans are confronting one of their biggest challenges in decades. Soaring energy prices are impacting all sectors of our economy, whether you are a farmer trying to fuel up for field work, a trucker hauling goods across the country, or an office worker who commutes to work every day.

Allen Rider addresses the importance of the *25x'25* initiaive during the National Ag and Forestry Renewable Energy Summit in Washington, D.C., sponsored by the Energy Future Coalition.

Almost two years ago, a group of agricultural leaders joined forces to discuss how they could proactively address this growing challenge.

"We anticipated that this was going to continue to be a huge issue," says Steering Committee member Allen Rider, ASABE Fellow and past president. "But at that time, none of us would have predicted the hurricanes, the supply disruptions, and some of the dramatic price swings and economic impacts we are seeing now."

This Ag Energy Work Group spent about six months exploring questions like the following:

• What role can the farm sector play in producing energy?

• How big a contribution can the sector make?

• What will it take for ag and forestry to become major producers of energy?

• How could a broad-based energy alliance be established?

"We felt that the time has come for the ag community to come together, define 'our' vision for the role we can play in this area, and then work collectively to bring this vision to life," explains co-chair J. Read Smith.

After extensive dialogue with a wide range of stakeholders and energy advocates this working group became convinced that agriculture can play a key role in helping the nation move toward energy independence.

"We looked at the energy potential from a wide range of sources: wind, solar, methane, ethanol, biodiesel," adds Bill Richards, who also serves as co-chair. "We became convinced that America's farms, ranches, and forests can become suppliers for a new generation of fuels and energy feedstocks. At the same time, we'll contribute to a cleaner environment and enhanced rural economic development."

New technologies emerging

The technologies that could turn this vision to reality are rapidly emerging and providing new solutions, adds Rider. "In the past decade, there have been great strides in ethanol manufacturing facilities, substantially improving the efficiency of this fuel source. Seed companies are producing corn hybrids specifically bred for their enhanced ability to produce ethanol. Similar strides have been made with soy diesel, wind turbines, and methane digesters.

"Imagine the impact that could be made if every farm, ranch, and forestry operation in our vast nation were contributing energy in one form or another," suggests Rider. "And imagine the economic impact that could result. Landowners who produce grain, wood, or livestock would have a second crop to sell – energy. Jobs would be created in rural America through the processing of agricultural products and the maintenance of equipment for producing electric power. These increased domestic energy supplies would help reduce the price Americans pay to drive their cars and cool their homes."

Momentum grows

The *25x'25* Work Group has dramatically expanded in scope and size since its inception, and momentum continues to build for making theirs a national goal and building alliances in at least 20 states. As this issue of *Resource* went to press, the goal has been endorsed by the governors of Indiana, Minnesota, Montana, Nebraska, Pennsylvania and state legislatures in Colorado, Nebraska, and Vermont.

"We hope ASABE will join us in crafting this new energy paradigm," adds Rider. "Strong partnerships will drive the *25x'25* vision, and the work has just begun on that front."

To learn more about *25x'25*, go to www.*25x'25*.org.

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*Sara Wyant serves on the **25x'25** Steering Committee and is editor/publisher of Agri-Pulse Communications, Inc., 5N985 Rt. #31, St. Charles, IL 60175 USA; 630-443-3257, fax 630-443-3258, agripulse@aol.com.*

Inside ASABE

NEWS ABOUT THE SOCIETY AND ITS MEMBERS

Portland Welcomes Attendees to the 2006 Annual International Meeting

The "City of Roses" offers something for everyone who attends this year's Annual International Meeting. Not only does Portland provide an excellent convention and meeting facility for ASABE members, but the beauty and diversity of the area is unsurpassed.

More than 50 cultural tours are offered to meeting participants. These tours range from white water rafting, whale watching, wine tours, nature excursions, museum trips, cruises, shopping, garden tours, and even an amusement park. In addition, 16 technical tours are also available. Participants can learn about the kiwi fruit culture, visit Nike's world headquarters, tour a wheat marketing center, learn more about polyurethane technology at Griffith Polymers, and explore Portland's wildlife and wetlands.

This year's meeting will provide members access to 131 technical sessions, 16 continuing professional development seminars, and six divisional poster sessions. All of that is topped off with four days of product and service exhibits and 17 breakfasts and socials.

Portland has lots to do and even more to see. The city is a remarkable combination of newer areas and renovated historical areas, providing an atmosphere that is exciting and alive. Known for its architecture, historical sites, cultural activities, and outdoor recreation, meeting attendees can explore this exciting city with an easy-to-use public transit system that provides free rides throughout the 330-block downtown area.

In addition to shopping, museums, and art galleries, the city also has its own symphony orchestra, ballet and opera companies, live theater, and professional basketball. The natural beauty of the region is showcased by a large inner-city park system, encompassing everything from old growth forest lands to formal gardens, and spectacular vistas. Outside the city, meeting attendees have the opportunity to enjoy the natural beauty and wonder of Mount Hood, the Columbia River Gorge, and the the Oregon coast.

Known for its green spaces, the city is an incubator for progressive urban planning, environmentally conscious public policy, and the sustainable development movement. As an example of sustainable building practices, the convention center's "rain garden" collects storm water from the facility's roof and filters it through an attractive system of rock terraces, pools, and soil.

Portland has been named one of the 10 perfect places in North America to spend your summer holiday by *Money* magazine, best running town by *Runner's World*, and top recycler among the nation's 30 largest cities by *Waste News.*

This meeting will provide attendees a venue to exchange technology, network, and share ideas that can help advance the professions within agricultural and biological engineering. Participants will also be able to experience first-hand Portland's unmatched natural beauty, bustling local scene, sumptuous dining, and welcoming accommodations all effortlessly accessed with a light-rail system. See you in Portland!

2006 ANNUAL INTERNATIONAL MEETING

You Don't Need to Stand in Line

Tired of standing in line to register for a conference? Tired of waiting to pick up your registration materials? ASABE has the solution!

To thank you for attending the 2006 Annual International Meeting (AIM) in Portland, ASABE has made arrangements for anyone staying within the meeting room blocks to have their registration materials available upon check in. What's the catch? You must have registered in advance for the 2006 AIM, and you must be staying in one of the four designated conference hotels – the DoubleTree Hotel, Red Lion, Holiday Inn, or Courtyard Marriott.

ASABE is making this arrangement as a courtesy to members. Please be sure to book your rooms with one of the four hotels, then sit back and relax. ASABE will have your event registration materials available at your hotel upon check in. But, be sure to stop in and tell everyone at registration hello and enjoy the fun Portland has to offer.

Hotel Rooms Still Available

Housing for the Annual International Meeting is still available for all last minute reservations. Where can you stay?

Doubletree Hotel Portland Lloyd Center (headquarters hotel). Visit www.portlandlloydcenter.doubletree.com. Rooms are $119 for a single/double with student housing available for $89 for a single/double.* The hotel is a four-block walk to the Convention Center.

Courtyard by Marriott. Visit www.acep.com/courtyard.htm. Rooms are $109 for a single/double.* The hotel is a two-block walk to the Convention Center.

Red Lion Hotel. Visit www.acep.com/redlioncc.htm. Rooms are $109 for a single/double. The hotel is across the street from the Convention Center.

Holiday Inn. Visit www.hiportland.com. Rooms are $105 for a single/double with student housing available for $84 for a single/double.* The hotel is a four-block walk to the Convention Center.

*Triple/quad options are available where noted. Additional fees will apply.

Requests can be submitted by one of the following three methods: **Internet,** visit ASABE's Web site at www.asabe.org/meetings/aim2006/index.htm and reserve your room online; **fax,** 503-275-9782; or **mail,** ASABE 2006 AIM-POVA Housing, 1000 SW Broadway, Suite 2300, Portland, OR 97205. For questions only, send e-mail to housing@pova.com, by fax to 503-275-9782, or call 503-275-9764.

The Portland Oregon Visitors Association's Housing Bureau is looking forward to assisting you. You will not receive a confirmation from the hotel. Depending on how your request was made, acknowledgements will be sent via e-mail after being processed, by fax within a few hours of processing, or by mail within 10 business days. Please review all information for accuracy. If you do not receive your acknowledgement within 15 business days, please contact the Housing Bureau.

Rates/Taxes and Special Requests. Hotel rooms are on a first come, first serve basis and hotels may charge a slightly higher rate. Rates are per room and do not include the 12.5 percent occupancy tax (subject to change). Special requests cannot be guaranteed, however hotels will do their best to honor all requests. Hotels will assign specific room types upon check in, based on availability.

Reaching the Decision Makers?

Looking at the dollars spent on advertising and product promotion in the agricultural and biological industries (print publications and industry magazines, direct mail pieces, blind electronic advertising, and even billboards), one can't help but ask, "Who are they really trying to reach?"

You, the agricultural or biological engineer, are the decision maker the advertiser needs to reach when it comes to cutting-edge research and technical development. Agricultural and biological engineers confirm they are the first line of "no" people a sales person will hit whether they met directly or not. They are also the first line of support if they are sold on a product's capabilities or services.

To have your product or service used, you need to be able to market to the engineer. Calling on anyone else is futile, or at the least a long drawn-out process. Do you have that kind of time?

As a former director of sales and marketing, the one solid marketing tool I don't see being used more efficiently is the vast opportunity within the professional societies. If your company provides products for other cutting-edge companies and technical or professional services, you have an organization – ASABE – that can deliver your information directly to your target market efficiently and cost effectively. ASABE can be viewed as a primary resource for providing forums for the advance research and cutting-edge technologies in your industry.

Are you interested in what ASABE can do for your business? ASABE can be the primary tool for you and your company's marketing and promotion. ASABE has numerous conferences, meetings, and symposiums looking for product exhibits. Each conference, meeting, or symposium has event functions looking for sponsor support with ample opportunities for your company's name, brand identity, and service to become recognized by the members of ASABE.

If you are a sales representative, I expect we will hear from you soon, or have your marketing manager contact us. If you want to get your products sold, ASABE would like to show you how we can help build your company's business and product exposure.

Contact Wayne Maley, maley@asabe.org, or Michael Chesser, chesser@asabe.org, to discuss your company's needs. We will work with you to design a package to help drive results.

Mike Chesser, Director Meetings and Conferences

2006 ANNUAL INTERNATIONAL MEETING

General Session and Keynote

Monday, July 10, 8:30 a.m. - 9:30 a.m.
Location: Oregon Ballroom 201/202

Dr. Stanley R. Bull
National Renewable Energy Laboratory

Dr. Stanley Bull, Associate Director for Science and Technology for the National Renewable Energy Laboratory (NREL) and Vice President of the Midwest Research Institute, has more than three decades of experience in energy and related applications. He currently leads NREL's R&D, focusing on renewable energy and energy efficiency technologies in support of U.S. Department of Energy programs. During his 23 years at NREL, he has held positions of increasing responsibility. Bull has also held university faculty posts and private sector responsibilities. An author of many publications in diverse fields and within a variety of technical journals, Bull has Ph.D. and M.S. degrees from Stanford University and a B.S. from the University of Missouri-Columbia, all conferred in chemical engineering and mechanical engineering.

Topic: Renewable Energy for Tomorrow!

At the 2006 Annual International Meeting (AIM), Dr. Bull will challenge each ASABE member: How will you contribute to tomorrow's energy needs? Bull will address building national energy and self sufficiency, strengthening national security, and revitalizing rural economies while continuing to protect the environment.

U.S. agricultural and biological industries are addressing these challenges, advancing an initiative, ***25x'25***, with a targeted goal and vision. It is aspired that by 2025, America's working lands will provide 25 percent of the total energy consumed in the United States while continuing to produce abundant, safe, and affordable food, feed, and fiber. To help accomplish this task, ASABE has endorsed the ***25x'25*** program and believes it will be our members who help lead this charge.

"Renewable energy, where we grow our energy from the land, can provide a significant contribution towards making our country energy independent," says Charles Sukup, ASABE President-elect. "No other engineering society is better equipped to seize this opportunity and solve this problem than the American Society of Agricultural and Biological Engineers. The contribution that we can make is monumental."

Panel Discussion – Renewable Energy & The Bio Economy
Tuesday, July 11, 2:30 p.m. - 4:30 p.m.
Location: Exhibit Hall Main Stage

Experts will be discussing various renewable energy options within our world from sources such as wind, solar, hydro, and biofuels. The panel will discuss the renewable-energy economic impacts of these various options. Panel members will also include the challenges facing the renewable energy push and the upside potential returns for communities, individual states, and nations around the world.

Sessions Highlight Society Functions

How well do you know ASABE and what we have to offer? Let us answer your questions during a 20-minute session on one of the topics listed below. These sessions will be held throughout the meeting in the Exhibit Hall of Portland's Oregon Convention Center.

View the the online program on the ASABE Web site at www.asabe.org/meetings/aim2006/index.htm or browse your own printed copy of the meeting program for session times.

- Finding Your Way Around the ASABE Online Technical Library
- How to Get the Most Out of Your Member Benefits
- Conference Development 101 for Sections, Divisions, and ASABE Leadership
- The What and Why of E-Forums
- Publishing with ASABE
- Online Mentoring Program Overview
- G.A.P.S. - Finding Money for Section Meetings and Conferences
- Training for Committee Chairs

We hope to see you there!

Networking, Opening Doors, and Making Career Contacts

While the core reasons that ASABE members attend the AIM include technical and poster sessions, continued professional development seminars, technical tours, committee meetings, and the many exhibits, there are also a lot of opportunities to build your network and career at the same time.

If you have not yet decided whether or not to attend the meeting, the opportunity to make a contact that could lead to a new job or career opportunity should certainly sound appealing – even if you are not actively searching right now.

ASABE's AIM brings together members looking for career opportunities and employers looking to hire. ASABE's Job Fair on Tuesday, July 11, from 9 a.m. to 2:30 p.m. in the Oregon Ballroom 203/204, will open new doors for you. Companies looking to hire will be on hand to take resumés, conduct interviews, and provide information on employment opportunities.

For more details on the ASABE Job Fair, visit www.asabe.org/meetings/aim2006/index.htm.

If you have an agricultural or biological engineering position from within your company you would like to post, contact rimpson@asabe.org to make arrangements for your Job Fair table and/or position listing on our Career Center boards.

A WORD FROM THE PRESIDENT

Difference Makers Uniting a Flat World

ASABE President Otto J. Loewer, Director, University of Arkansas Economic Development Institute

The list of issues that divide people is growing ever more rapidly. In social settings, just mentioning the items on the long-time "divider" list, such as religion and politics, makes us feel uncomfortable and often evokes both an internal and external emotional response. Moreover, the "divider list" seems to be growing at an increasing rate with the recent additions that include gay marriage, illegal immigration, outsourcing, and terrorism, among others. I expect this list to lengthen considerably as society struggles with the tradeoffs involving who pays, who benefits, and who decides, especially regarding employment and similar issues related to economic well-being.

In this sea of divisiveness, our profession is strongly positioned to be a difference maker that unites people, especially if we understand why the divider list is growing. I offer that the underlying cause is that changes in technology drive changes in economics, changes in economics drive changes in societal values, and changes in societal values drive changes in technology. Today's rate of change is unprecedented.

For example, consider that Columbus used superior technology in discovering America in 1492. His average speed of discovery was about 2.7 mph, a moderate walk. Nearly 500 years later in 1969, astronauts flew to the moon at approximately 2,500 mph, more than 900 times faster than Columbus.

In the 100 plus years since the first airplane, one can travel to practically anywhere in the world in less than 24 hours, and in the last few years television, cell phones, and the Internet can take us there instantly. Nuclear power has become technologically feasible while remaining controversial. Comparatively recent developments in cloning, stem cell research, and human embryo implants are now generating serious public debate. And consider that all the above technologies and many others as well are converging to impact the continued globalization of commerce.

> We provide the engineering for the necessities of life.

It is global commerce that ultimately employs our profession. Thomas Friedman, in his recent best seller, *The World is Flat*, contends that work in the world now goes to the low-cost provider regardless of geographical location. From his perspective, the world became flat when it became possible to produce quality products anywhere in the world using computer technology and the internet.

Accordingly, I believe that in the flat world, our profession has the potential to be a difference maker that unites people in a time when divisiveness is the order of the day. Why? Because we provide the engineering for the necessities of life. And, all of humankind is united in its dependence upon these necessities, whether in the form of human consumables such as food, fiber, water, and energy; process productivity through mechanisms and methodologies; or environmental health that is required for productive soil and a sustainable ecosystem having sufficient quantities of high quality water and air.

Thus, at the end of the day, I foresee that our profession will proclaim with considerable pride that our engineering skills served as a unifying agent for bringing people together in a common quest for the common good through a common goal, even if the world is flat.

I welcome your thoughts, ideas, or concerns about your Society. E-mail them to OttoLoewer@asabe.org.

The Next 100 Years – An Invitation to Attend a Special Visioning Session in Portland

Do you have a vision about what the world will be like in 100 years? Will it be a place of joy and prosperity filled with technological wonders such as biomechanical robots, talking plants, and rain upon demand? Or will it be a "Mad Max" world of environmental and infrastructure destruction, where a few survivors live in squalor and chaos? Will ASABE be a "difference maker uniting a flat world" (*see column above*) or even exist? And will what we envision today seal our fate 100 years from now?

If you are interested in discussing how and why things will be "the way they are" in 2107 and the role that our profession will or should play in helping shape this future world, I invite you bring your crystal ball and compare visions with those of your colleagues who dare to predict the future. It should be fun! Furthermore, it most certainly will help in creating a greatly needed shared vision for our profession in moving towards the future.

This visionary session will be held on Tuesday, July 11, from 8 to 9:30 a.m. in the Oregon Convention Center.

I hope that you can attend.

Otto J. Loewer

YOUNG PROFESSIONALS COMMUNITY

YPC Hosting Several AIM Events

The Young Professionals Community (YPC) is putting the final touches on their program for the Annual International Meeting (AIM) in Portland. It has been an exciting year filled with many firsts for the YPC. We are more excited than ever for the upcoming meeting and will be hosting a wide range of events with several open to all members, not just young professionals. Take a look at some of the exciting events planned and mark your calendar.

In response to a survey of engineering managers and vice-presidents, the YPC is sponsoring a continuing professional development (CPD) course that was in high demand by those surveyed: Effective Communication. This course will be comprised of three parts: general presentation skills, presenting technical information to non-technical people, and making technical presentations to other experts in the field. It will be held on Saturday, July 8, and while geared toward young professionals, it is open to all members. To register for this course go to the ASABE Web site at www.asabe.org/meetings/index.html.

The YPC educational tour will begin at Hobo's Restaurant.

As in past years, the YPC will be hosting an educational tour on Saturday evening. The Portland Underground Tour is a great opportunity to learn about Portland's history, meet other members, and have fun. Preprofessional members are encouraged to join us. Experience the mystery that is the Shanghai Tunnels! There's so much history to discover in the Portland Underground – stories of sailors, loggers, cowboys, sheepherders, ranch hands, construction workers, and vagabonds being sold into seaboard slavery en route to the Orient.

We will also be visiting Hobo's Restaurant, the site of the tour entry. Known in the 1880s as the Lasso Saloon, it's the perfect spot for dinner and drinks to toast the old shanghaiers and their infamous and colorful maritime history.

New this year is the first annual YPC sponsored Fun Run. It will begin on Sunday at 8 a.m. along the Willamette River through Waterfront Park (just blocks from the convention center). The Fun Run is open to all meeting attendees and guests. Even if you are not a runner, please come join us and cheer on the participants. Registration is $15, and you can pre-register with your meeting registration. Participation is limited to the first 50 runners so sign up now.

Held for the second year, the YPC info session is at 7 a.m. Monday. We had a very positive response last year and will be adding even more to the program this year. Topics to be covered include: The Key to Getting to AIM, Professional Licensure, ASABE Communities, ASABE History, and Getting the Most Out of Meetings. This is the perfect session for both YPC and preprofessional members.

Our YPC business meeting will be held at 5 p.m. Tuesday. I would like to encourage all young professionals and preprofessional members to attend. This is an opportunity to get more involved in YPC events and sessions, including the planning of future meeting programs.

If you have any questions about the Young Professionals Community or would like to get involved, please e-mail me at Alexander_Audrey_j@cat.com. I look forward to seeing you at the international meeting.

Audrey Alexander, YPC Chair

Complete 30-Year Collection of Lecture Series Now Online

A grant from Deere & Company provided the resources needed to add 22 of the past lectures to the ASABE online Technical Library. Along with the current lectures already on the site, this brings the total full-text lectures to 30.

The Distinguished Lecture, normally presented at both AETC and the ASABE Annual International Meeting, provides in-depth design information for engineers in the agricultural industry. Topics relate to agricultural or industrial tractors or self-propelled agricultural equipment and cover areas such as the power train, hydraulic system, operator environment, tires, and electrical equipment.

Each year, the committee responsible for the series, PM-47 Lecture Series, selects a topic and invites a leading expert in the area to present the lecture. Deere & Company underwrites the cost of the author's honorarium and plaque.

The focus of the lecture is to emphasize practical guidelines, which have been established by experience, rather than focusing primarily on the theory. Students are encouraged to attend and are presented with a free copy of the lecture. This year's lecture will be held on Tuesday, July 11, at 2:30 p.m. during the ASABE Annual International Meeting. The subject is soil compaction.

A complete list of lectures along with links to the full texts can be found at asae.frymulti.com by clicking on the Publications Included button on the left menu.

World Congress of Computers in Agriculture and Natural Resources

WCCA2006, the 4th World Congress of Computers in Agriculture and Natural Resources, will be held in Orlando, Fla., July 24 to 26. It is a collaborative effort among agricultural information technology associations worldwide. The Congress is sponsored by ASABE and supported by the the Asian Federation of Information Technology in Agriculture, the European Federation of Information Technology in Agriculture, the International Association of Agricultural Information Specialists, and the International Commission of Agricultural Engineering.

WCCA2006 is a world-class event with 80 percent of attendees from abroad. Participants from 40 countries will present 182 papers with information leading our world's development.

Topics to be covered include new applications of well-established and understood technologies to innovative and entrepreneurial applications of emerging technologies. Issues related to policy and knowledge dissemination will also be covered.

The Congress provides a forum for agriculture related professionals to exchange information on applications and developments in the use of information technologies in areas such as diffusion and adoption of information technology, decision support systems, Web services, instrumentation and control, precision agriculture, modeling and simulation, and more. Congress attendees will receive an overview of current and leading-edge technology in information technology developments in agriculture worldwide. Contributions from various countries will allow a broadened perspective for meeting participants.

Visit www.wcca2006.org/TechnicalProgram.htm to view the WCCA 2006 tentative program. The program includes a keynote address and plenary session, concurrent technical sessions, poster presentations, workshops, and a technical behind-the-scenes tour of EPCOT.

WCCA2006's venue at the Grosvenor Resort at Walt Disney World in Florida is complimented by numerous fun activities for the family, too.

For more information and to register for WCCA2006 online, go to www.wcca2006.org or e-mail rimpson@asabe.org.

SECTION NEWS

Minnesota Section

Rain gardens and other bioretention structures were the subject of a presentation to the Minnesota Section on April 21 by Gregg Thompson of the Association of Metropolitan Soil and Water Conservation Districts. After a very informative presentation to approximately 25 members, the group toured rain gardens constructed on the University of Minnesota St. Paul campus. Appropriately, it began raining during the tour.

Section elections were held at the business meeting. New officers are: Chair, Sonia Maassel Jacobsen; Vice Chair for Awards, Jun Zhu; Vice Chair for Programs, R. Roger Ruan; Vice Chair for Membership, Ron Leaf; Secretary-Treasurer, Chris Beach; and Agrineer Editor, John Brach.

Section members listen to Gregg Thompson explain the features of the rain garden on the University of Minnesota St. Paul campus. ***(Photo by John Brach)***

Awards were presented by outgoing chair, R. Roger Ruan, who was recognized for his leadership as section chair from 2003 to 2006. John Brach was recognized for his leadership as section chair from 2001 to 2003. Sonia Maassel Jacobsen was given an award for outstanding service to the section.

Sonia Maassel Jacobsen

Quad City Section

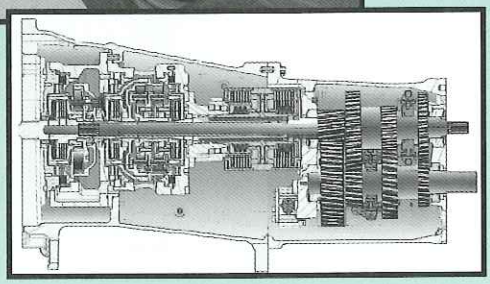
The Quad City Section recently presented its 2006 Outstanding Engineering Achievement Award to Sheldon Grywacheski and Ronald Sheedy for their design and development of the John Deere 615P Belt Pickup Header. Donald Kuska was presented the Section's 2006 Engineer of the Year Award for his career accomplishments and life-long devotion to his profession. Kuska is a 67-year member of ASABE.

Quad City Section award winners are (l to r): Sheldon Grywacheski, Ronald Sheedy, and Donald Kuska.

Resource Magazine's

2006 Outstanding Innovations

Versatile Dyna-6 transmission also a fuel-saver

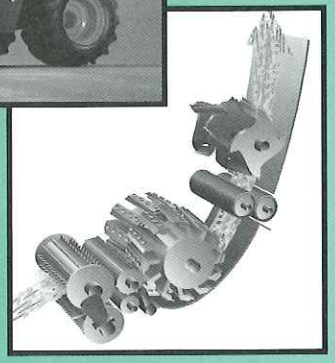


Introduced in early 2005, the Dyna-6 transmissions are standard on the 6400 series tractor line ranging from 95-115 hp. The semi-powershift 24 x 24 Dyna-6 transmission consists of four ranges with six powershift speeds in each range. To increase operator efficiency, this transmission features speedmatching and variable AutoDrive, which automatically shifts the transmission to an operator-preset rpm for adjustment of changing load requirements. Electrohydraulic range changing eliminates a gearshift linkage lever and allows clutchless forward/reverse power shuttling and clutchless gear and range changing. This transmission can be operated in manual, partial, and fully automatic speed selection to suit a wide range of field applications. Shifting through the powershift speeds can be done either on the armrest or by using the shuttle lever on the steering column. To save fuel, the Dyna-6 overdrive feature operates the engine at 1950 rpm at top speed.

Massey Ferguson, Duluth, Georgia USA; *800-767-3221, www.masseyferguson.com*

AE50 OUTSTANDING INNOVATIONS 2006

Crop flow system: cost cutting, Jaguar-powerful



The Jaguar crop flow system pounces on an industry-high, power-to-output ratio, thereby slashing fuel and operational costs. With the use of an efficient, direct belt drive, there is little power loss throughout the components of the system. By using chevron-arranged components, the scissor-like cutting technique not only uses the least possible amount of power but also yields the high accuracy and superb cut quality today's nutritionists demand. Along with an efficient cut, the crop is accelerated throughout its travel in the system by using in-line components along with a high-speed accelerator.

CLAAS of America, Inc., Omaha, Nebraska USA; *402-861-1000, www.claasofamerica.com*

Sprinkler development for using water wisely

The Rain Bird 5000/5000 Plus PRS combines industry-leading Rain Curtain™ nozzle technology with integral pressure regulation to provide users with a new standard in sprinkler performance. Building on the strength of the 5000/5000 Plus sprinkler family, Rain Bird has created another industry first – a pressure regulator module integrated into an existing short-throw, 3/4-in. (20/27) gear-drive sprinkler. This product gives users a cost effective means of obtaining optimal pressure at each sprinkler, thereby eliminating the head-to-head pressure variations that can lead to inefficient irrigation. This product is factory-installed within the sprinkler stem and is easily retrofitted into all models of the 5000/5000 Plus sprinklers by replacing the complete internal assembly.

Rain Bird Corp. – Commercial Mfg. Division, Tucson, Arizona USA; *520-741-6184, www.rainbird.com*

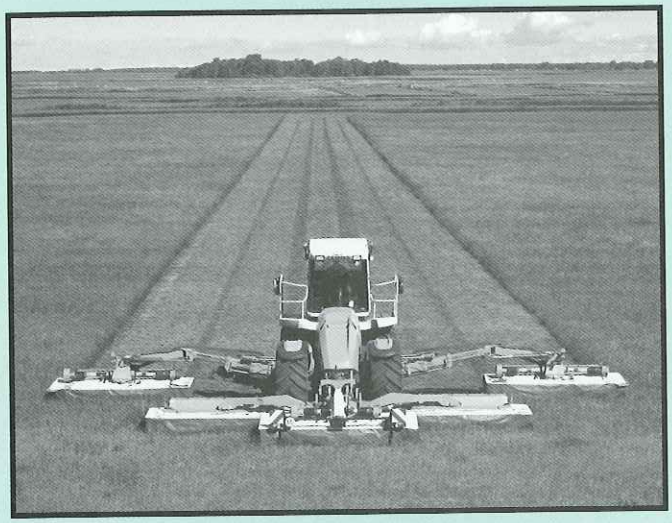
AE50 OUTSTANDING INNOVATIONS 2006

More speed, less loss

The John Deere 615P Belt Pick Up Platform allows small grain producers to harvest bigger windrows at faster ground speeds with fewer losses. The new 615P includes a dual belt-feeding system with an exclusive air bag suspension system, which keeps the platform stable and close to the ground. This design reduces crop losses in front of the header and feeds the windrow smoothly into the combine feeder house. Additional new features include a large-diameter feed auger, a heavy-duty auger drive system, and a hydraulic windscreen, which all increase productivity and uptime. A unique header-height sensing and a contour master system allow the platform to automatically adjust to uneven terrain and permit the operator to harvest faster in most field conditions. The 615P with improved performance and durability is designed specifically to match the productivity of the John Deere STS combines.

John Deere Harvester Works, East Moline, Illinois USA; *309-765-2177, www.JohnDeere.com*

Cougar mower conditioner covers ground



The CLAAS Cougar 1400 is arguably the widest self-propelled mower conditioner in the industry at 14-m (46-ft) working width. The Cougar uses five separate mower conditioners for smaller, faster-drying windrows and achieves over 20-ha (50-acres) per hour mowing capacity. The space-age design of the traction unit allows finger-tip control of individual raising/lowering and hydraulic float of each mower. Performance is enhanced by the transmission allowing the machine to travel up to 21 kph (13 mph) in the field and 40 kph (25 mph) on the road. The innovative transport mode allows the cab to rotate 180 degrees, so the operator has a clear unobstructed view. All five mowers fold to a transport width of under 3.4 m (11 ft). The Cougar 1400 has four 900/55 R32 tires for high floatation even in the softest fields.

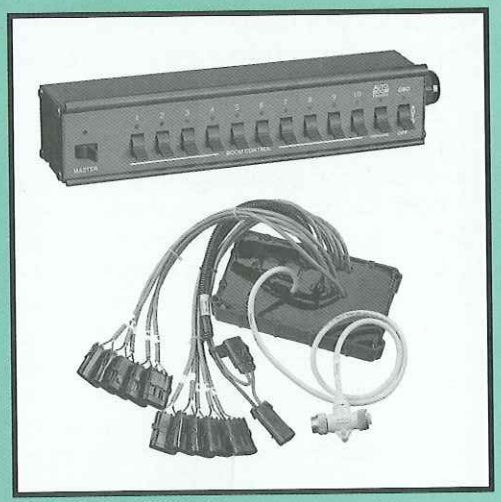
CLAAS of America, Inc., Omaha, Nebraska USA;
402-861-1000, www.claasofamerica.com

AE50 OUTSTANDING INNOVATIONS 2006

Boom section control simplified

The Mid-Tech BoomPilot Swath Manager performs automatic boom section control, shutting down boom sections based on previously applied areas or when leaving predefined field boundaries. The device will work with either a Mid-Tech CAN-based application control system or an external rate control system such as the Mid-Tech TASC or TeeJet 854. In certain applications it can function completely independent of a rate controller. When incorporated into the Legacy 6000 CAN-based control system, the BoomPilot Swath Manager adds automatic boom section control to a distributed system that provides multi-channel rate control, "as applied" mapping, prescription application, chemical injection control, and automatic steering control, all as one integrated system utilizing one user interface.

Midwest Technologies Illinois, LLC, Springfield, Illinois USA;
217-753-8424, www.mid-tech.com



Easy turns and easy on the turf

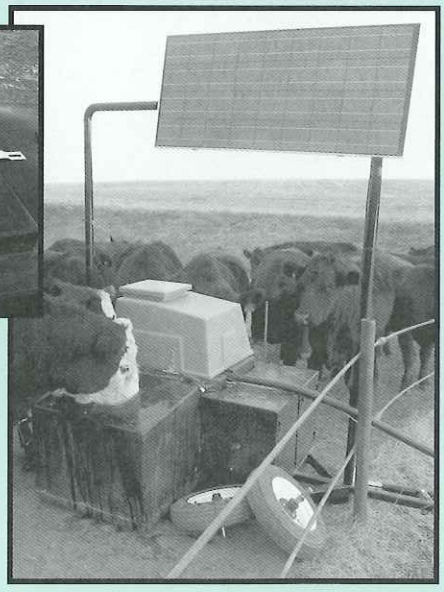
The GR2100 and GR2000 lawn and garden tractors are equipped with "Glide Steer" technology, which enables these tractors to maneuver in tight, congested spaces by disengaging the rear inside wheel clutch. Disengagement allows the wheel to "free wheel," even though the tractors have all-wheel drive. Though zero-turn mowers have excellent turning performance, it is difficult to drive straight across and maneuver on slopes. Although all-wheel drive tractors have excellent climbing ability, their turning radius is normally large. The GR "Glide Steer" is a user-friendly mechanism that allows an extremely small and stable turn with a round steering wheel. An important benefit is the reduction of turf damage. The "Glide Steer" technology rivals zero-turn machines in minimizing turf tear-up.

Kubota Tractor Corporation, Torrance, California USA; *310-370-3370, www.kubota.com*

AE50 OUTSTANDING INNOVATIONS 2006

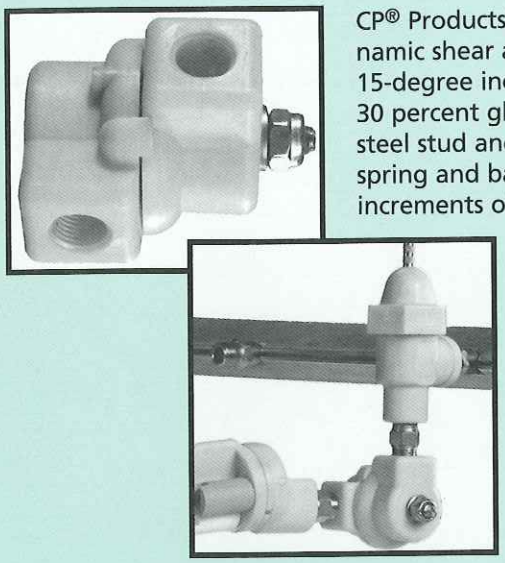
No matter the weather with EnerCAP™

EnerCAP™ is a totally portable livestock-watering tank system that will operate in winter or summer. The system can be operated in remote locations away from the farm site where no grid power is available. The tank system is designed using a solar-powered pump to deliver water from any source (pond, well, river). When the tank is full, a float control switch turns off the pump and the delivery line drains back to the source. The line is empty, so it will not freeze. The water temperature in the tank is maintained by a minimal heat source using a small LPG burner. The burner will run for approximately four weeks on a 20-lb propane bottle. The tank is made of a strong double-wall poly construction with a minimum of 10 cm (4 in.) of urethane insulation in between. The tank can be operated independently or can be mounted on a trailer for easier transport.



CAP Solar, Olds, Alberta Canada; *403-556-8779, www.capsolar.com*

Swivel facilitates droplet-size adjustment



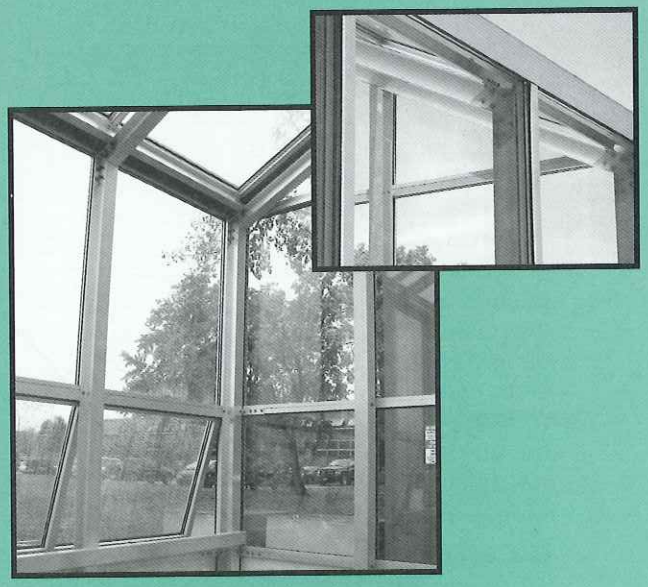
CP® Products' Swivel, the CP-06, is designed to change flat-fan nozzle aerodynamic shear angles on aircraft spray booms by movement downward in 15-degree increments. It consists of two primary component parts molded of 30 percent glass-filled polypropylene, held together by an embedded stainless steel stud and mounted between a check valve and flat fan nozzle. A detent spring and ball permit easily detectable downward adjustments of the nozzle in increments of 15 to 90 degrees. The CP® Swivel allows operators to fine tune applications for several droplet sizes using a single flat-fan tip, pressure, and airspeed. Adjustments are easily made for large droplets and herbicide drift control to the smaller droplet spectrum required for fungicides and insecticides. The swivel is easily installed on new or existing booms without special tools, wiring, or electronics. Current computer models allow operators to quickly input individual parameters and determine optimum angle setting(s).

The CP® Products Company, Inc., Tempe, Arizona USA;
866-303-0600, www.cpproductsinc.com

AE50 OUTSTANDING INNOVATIONS 2006

Greenhouse system grows space, raises enclosure performance

The Rough Brothers R-House greenhouse system, created for research and teaching applications, was designed from the inside out to provide flexibility of space utilization and equipment installation and a higher level of enclosure performance than previously available. A rigid frame structure is the foundation, with shade and vent operators mounted within or above the frame and not protruding into the growing space, which opens up the interior volume for larger crops or supplemental equipment to be mounted at optimum locations. The glazing system incorporates all the features of current window and curtainwall technology with four-side gasketed support of the glass, thermal improvement, one-inch insulated glass on the vertical surfaces, rain screen, pressure equalization, and anodized finish. Pre-engineered corner, eave, and gable closures allow for roof pitches from 3/12 to 12/12 without extrusion modification, or exposed fasteners.



Rough Brothers, Inc., Cincinnati, Ohio USA;
800-543-7351 or 513-242-0310, www.roughbros.com

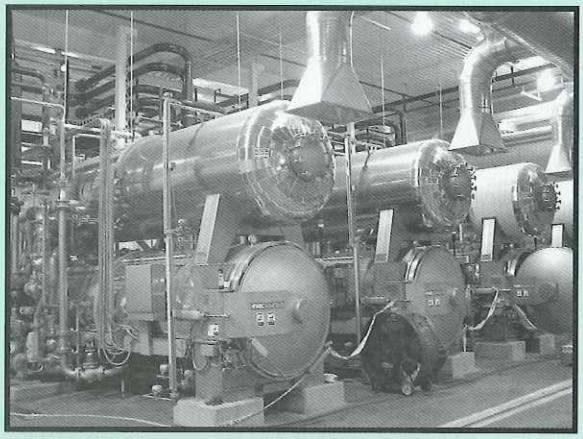
The end of subjective end-point determination: Leaf Porometer

The Leaf Porometer automatically measures stomatal conductance and eliminates human error by picking the end point. The direct readout gives either conductance or resistance, which can be saved or exported to a PC. The simple-to-use, automatic-read mode removes the subjectivity of determining the end point and allows for 30-second-fast measurement. A manual mode is used to see and record the data by hand. The Porometer measures stomatal conductance using a steady-state technique, which measures the vapor pressure and vapor flux of a leaf surface. Features include a robust delrin-and-aluminum sensor head, and a compact clip and box (easy to hold and extremely lightweight at 450 g (~1 lb). There are no tubes, pumps, fans, shoulder slings, or straps, and three selectable units: mmol/(m^2 s), (m^2 s)/mol, and s/m.

Decagon Devices, Inc., Pullman, Washington USA; *509-332-2756, www.decagon.com*

AE50 OUTSTANDING INNOVATIONS 2006

SuperAgi™ takes on all products, more packages



The design of the SuperAgi™ retort utilizes an evolutionary process based on the FMC Steam Water Spray™ (SWS™) sterilizer. The SWS™ sterilizer delivers high-energy efficiency but in an agitating mode of centrifugal force limiting the speed to 12 rpm. Documented up to 25 rpm, the new design utilizes a slip ring to direct water into a basket or container-racking system. The design improves water penetration and completely eliminates the water-shearing effect of a fixed manifold application as an insert rotates past the nozzle's spray path. This improvement allows for higher rpm speeds while maintaining efficiency of the SWS™ process. SuperAgi™ is also more energy efficient than the conventional SWS™. The sterilizer, capable of multifunctional processing methods, can process in SWS™, partial, and full immersion environments. This flexibility provides the ability to process many kinds of products and a wide variety of packages including cans, glass, plastic, pouches, and more.

FMC FoodTech, Madera, California USA; *559-661-3200, www.fmcfoodtech.com*

Standard-setting step up: 8400 Dyna-Step tractors

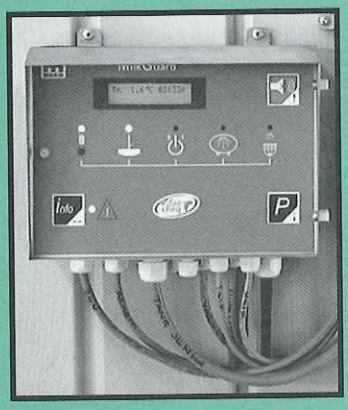
The Massey Ferguson 8400 Series tractors set a new standard for high-horsepower, fixed- frame tractors with model ranges from 180 to 240 hp. An entirely new chassis platform is backed by a 7.4-L (MF 8450 and 8460 models) or 8.4-L (8470 and 8480 models) Sisu diesel engine. Engines have increased torque back-up with excellent lugging ability allowing for optimal fuel efficiency. Power control comes through the all new, smooth shifting, 3-range, 21-speed Dyna-Step transmission, which utilizes a clutchless variable design with standard 540/1000 rpm PTO. The oil for the transmission is separate from the 39-GPM auxiliary hydraulics, keeping harmful contaminants out. Cab control is more efficient using the optional Console I terminal featuring Datatronics III programming with headland management. Cab comfort is first-rate with a low 71-dBa sound level and an optional two-stage pneumatic cab suspension.

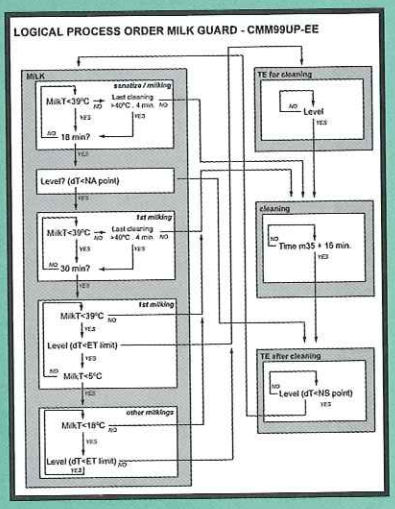
Massey Ferguson, Duluth, Georgia USA; *800-767-3221, www.masseyferguson.com*

AE50 OUTSTANDING INNOVATIONS 2006

Got MilkGuard?

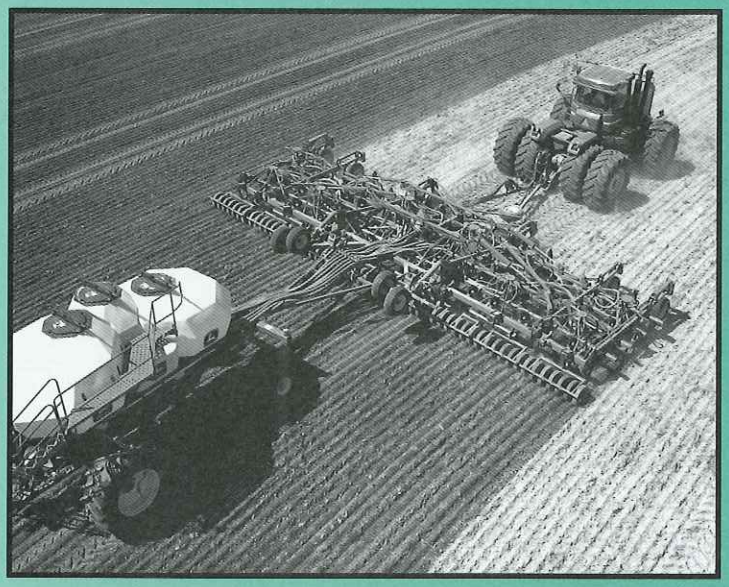
The MilkGuard is an electronic time-temperature recorder for monitoring the cooling, agitation, and storage of milk in a bulk tank as well as the washing of the bulk tank and milk harvesting equipment. Without any contact with the milk, the MilkGuard closely monitors these processes and warns the producer when measurements reach preset boundaries. With a combination of monitoring sensors, the different conditions inside the bulk tank (empty tank, milk in tank, milk being agitated) are accurately identified. Even though the producer makes visual checks, there are many unpredictable and difficult-to-detect problems that can occur with the equipment on a dairy farm. With the monitoring of the various processes, a possible failure will be detected and the producer notified, before the milk quality is in jeopardy. All data is stored on a memory card and can also be transferred wirelessly to a computer.





Dairy Cheq Inc., Waterloo, Ontario Canada; *905-821-8970, www.dairycheq.com*

Air hoe drills model versatility/reliability



The 1835 Air Hoe Drill from John Deere provides true separate placement of dry, liquid, and gaseous fertilizers in conjunction with a versatile and reliable air hoe drill system. Controlled seed and fertilizer placement protects young plants from fertilizer burn, thereby permitting higher fertilizer rates and maximum yields. Unique rockshaft mounted disk-based fertilizer openers are combined with shank-type seed openers on a flexing frame. Residue-tolerant and low-draft fertilizer openers and highly configurable seed openers optimize the overall seeding system. The companion 1830 Air Hoe Drill provides additional configurations with all functional and reliability advantages of the 1835 frame and seed openers but without separate placement fertilizer openers. Modular frame construction and a building block system of configuration options provide highly productive seeding systems tailored to the small grain, pulse, or oilseed grower's unique situation in operating widths from 10.19 to 19.05 m (33.33 to 62.50 ft).

John Deere Seeding Group, Moline, Illinois USA; *866-993-3373, www.deere.com*

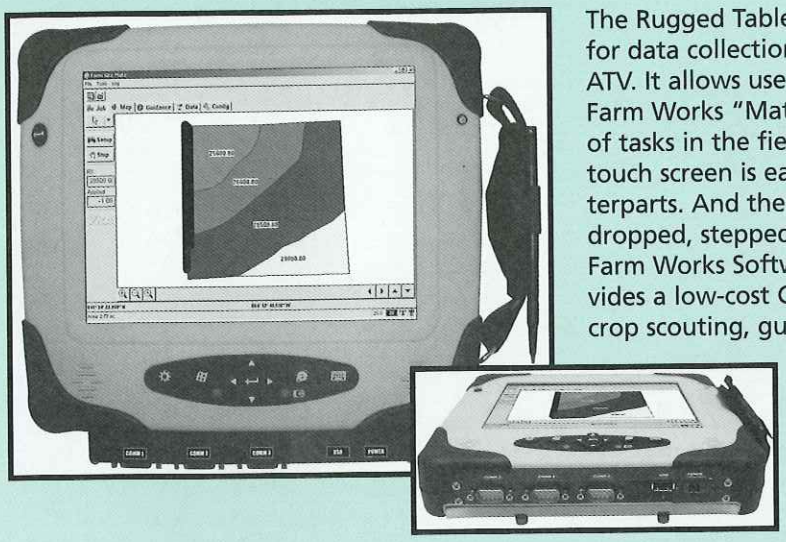
AE50 OUTSTANDING INNOVATIONS 2006

Z-Trak mows clean cut-quality

The John Deere 997 Diesel Z-Trak is a diesel-powered, mid-mounted rotary mower with a unitized hydraulic ground-drive pump and PTO clutch providing a durable and productive commercial mower. The hydraulic PTO clutch engages in 1 to 1.5 seconds for a quick, controlled engagement of the mowing deck. The clutch incorporates a spring-applied brake. The low-profile gearbox minimizes space to provide up to 12.7-cm (5-in.) cut height. The vehicle length is shortened by a compact drive between the diesel engine and pump. The 997 can be equipped with a foot-engaged hydraulic deck lift with < 0.25 seconds lift time, replacing the manual lift. The 997 includes 60-in. and 72-in. side discharge decks with revised baffles to improve cut quality and a 60-in. rear discharge deck for trimming on either left- or right-hand side. The industrial-design approach uses fuel and hydraulic tanks as styled parts.

John Deere Enschede, BV (Manufacturing Location), Enschede, Netherlands; *800-537-8233, www.deere.com*

Easy-to-see, at-the-wheel data gathering



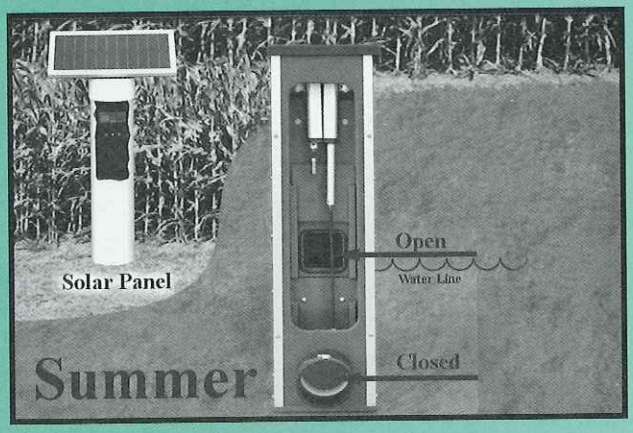
The Rugged Tablet, also known as Titan RT, is an alternative for data collection while driving a truck, tractor, sprayer, or ATV. It allows use of an existing GPS receiver along with Farm Works "Mate" programs and performs a wide range of tasks in the field. The over-20-cm- (over-8-in.-) wide touch screen is easier to read than smaller, handheld counterparts. And the tough Titan RT keeps working when dropped, stepped on, or even driven over. Combined with Farm Works Software programs, affordable Titan RT provides a low-cost GPS solution for field boundary mapping, crop scouting, guidance, soil sampling, and variable rate control. Crop record-keeping can also be integrated to generate application maps of seed varieties, fertilizer, and chemical usage. The tablet utilizes built-in ports that support a variety of GPS receivers, variable rate controllers, and other devices. Data entry is streamlined with an on-screen keyboard with large buttons. The Titan RT comes standard with mounting accessories for easy attachment to any vehicle cab or ATV.

Farm Works Software, Hamilton, Indiana USA;
800-225-2848, www.farmworks.com

AE50 OUTSTANDING INNOVATIONS 2006

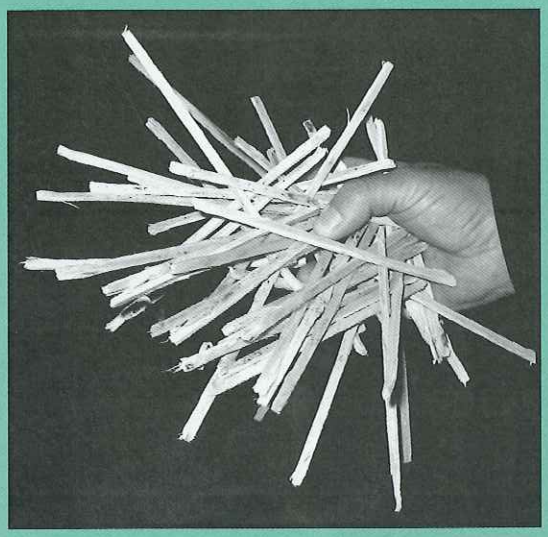
Smart control of subsurface water tables

The Agri Drain Smart Drainage System™ is used to control the level of the water table in the soil profile when installed in a subsurface drainage system. This reduces nutrient loss, increases yields, and improves water quality. An automatic water-level control structure is placed in the tile line and is used to raise or lower the water table based on the time of year and the needs of the producer and crops. The unit has two slide gates, one at the tile depth and one at approximately 0.6 m (2 ft) below ground level. The slide gates are opened and closed with two 12-volt linear actuators based on a schedule programmed into a controller. A solar panel keeps the battery charged to provide power for the system.



Agri Drain Corporation, Adair, Iowa USA;
800-232-4742, www.agridrain.com

Fishtails for erosion control mulch



WoodStraw™ mulch is a wood-strand erosion control material that equals or exceeds the functionality of agricultural straw while addressing straw's known limitations. WoodStraw™ long-strand material looks like agricultural straw yet is naturally weed-free and outperforms straw in many applications: forestlands, road construction, and other sites where it is important to have long functional life, wind resistance, and reliable performance. WoodStraw™ mulch is 100 percent post-industrial recycled content. Full sheets of scrap veneer ("fishtails") are processed through a "woodmuncher," a machine akin to "an office paper shredder on steroids." The woodmuncher is designed to slit the veneer to width and cut strands to prescribed length-blends — all in one pass. A blend of wood strands flow out of the machine having the percentage of different lengths prescribed by product specifications. Finished material can be compressed into standard bales for shipping and handling.

Forest Concepts, LLC, Federal Way, Washington USA; *253-838-4759, www.elwdsystems.com*

AE50 OUTSTANDING INNOVATIONS 2006

It's that simple ... operator-easy Rollant 255 Uniwrap

The Rollant 255 Uniwrap is a 4 x 4, Class I round baler with a mounted silage bale wrapper. The predominant benefit of mounting the wrapper on the back of the machine is combining two jobs, making them one. The innovative computer system handles the bale transition and wrapping process. When the baler is full, an alarm goes off. The operator simply stops, and the computer handles tying, tailgate opening, moving the bale to the wrapper, closing the tailgate, wrapping the bale, and ejecting the bale off the wrapper. The Rollant 255 Uniwrap increases the feed quality by wrapping the bale immediately after formation, creating a tight bale, and thus, not allowing the bale to heat and loose valuable nutrients.

CLAAS of America, Inc., Omaha, Nebraska USA; *402-861-1000, www.claasofamerica.com*

Fuel efficiency and productivity up with 8000 "30" Series tractors

John Deere 8000 "30" Series (8030) tractors meet European Union Stage IIIA and North American Environmental Protection Agency Tier 3 engine emission regulations using a new 9.0-L PowerTech Plus™ engine. Five-wheel models and three-tracks models range from 225 to 330 engine HP. The tractors incorporate a new AutoPowr™ infinitely-variable transmission, reduced sound levels, convertible CAT IV NL / CAT III rear 3-pt hitch Quick Coupler, and a CAN-based Solid State Electrical Load Center. The 9.0-L engine uses externally cooled exhaust-gas recirculation along with a variable geometry turbocharger to improve fuel economy. Integrated tractor systems and their technologies have lead to overall tractor-factory-observed fuel-efficiency improvements of 2 to 5 percent based on model and option. These tractors bring a new level of productivity while maintaining maneuverability, visibility, and ease of operation.

John Deere Product Engineering Center, Waterloo, Iowa USA; *www.johndeere.com*

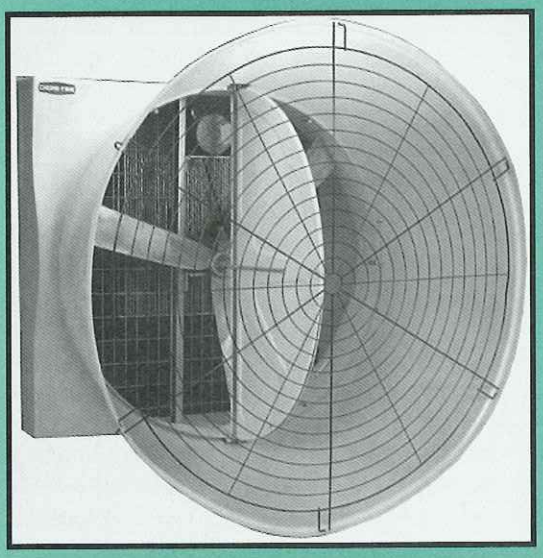
AE50 OUTSTANDING INNOVATIONS 2006

EZ-Steer™ system saves fuel, eases operator fatigue

*Ag*GPS® EZ-Steer™ System includes the EZ-Steer™ assisted-steering option, which extends the capability of the EZ-Guide™ Plus GPS guidance system by automatically turning the steering wheel of the vehicle with an electric motor. The EZ-Steer™ electric motor drive can be installed on more than 460 different models of agricultural vehicles with around 20 different low-cost, platform-specific steering column brackets. The product allows the operator to focus on other tasks — spray nozzle performance, planter operation, or combine header height. The EZ-Steer™ system gives the operator the fuel and input savings of straighter rows while reducing driver fatigue.

Trimble Navigation, Ltd., Sunnyvale, California USA; *913-495-2700, www.trimble.com*

Performance-plus tested, energy-conscious ventilation

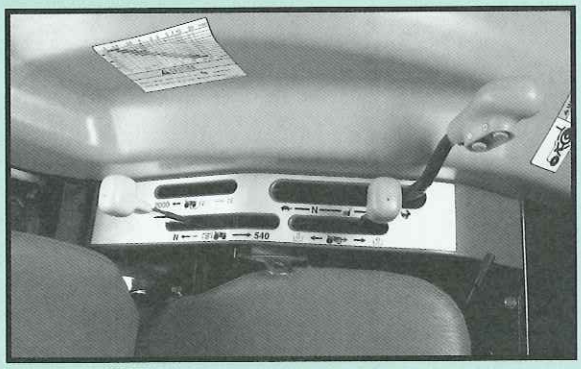


The Chore-Time 52" TURBO® Fan with HYFLO® Shutter is a corrosion-resistant, fiberglass fan with a butterfly-style damper, primarily used to ventilate animal production buildings. When compared to traditional, louver shutters, the HYFLO® Shutter increases fan performance up to 9.5 percent, seals better against outside air while the fan is not running, and reduces maintenance costs. Independent lab testing confirms that for its capacity [29,700 CFM (841,000 LPM)] 52" TURBO® fan is one of the most energy-efficient fans available [20.5 CFM/W (500LPM/W)]. Additionally, the two vertical doors are not subject to problems associated with poor louver maintenance. Restriction due to dirty, horizontal louvers can reduce a fan's capacity and/or energy efficiency by up to 30 percent. In a "patent-applied-for" process, the fan housing becomes the actual support for the doors, while the doors are manufactured from material that was formerly discarded.

Chore-Time, Milford, Indiana USA; *574-658-4191, www.choretime.com*

AE50 OUTSTANDING INNOVATIONS 2006

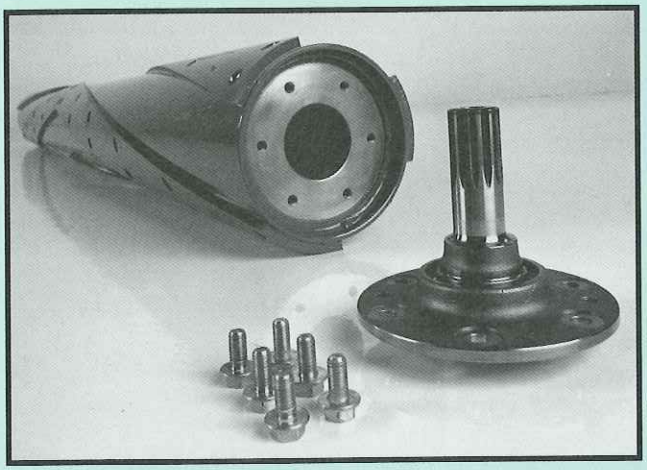
Speed selection without clutch depression



The Massey Ferguson 1547 and 1552 compact tractors can be equipped with the new DynaQPS™ transmission. This transmission allows the operator to select from four speeds within each of the three ranges, without depressing the clutch pedal. Two buttons are located on the range-shift lever, which are used to shift between the four speeds. This allows the operator the flexibility to change between speeds on the go without depressing the clutch pedal, improving operator efficiency and performance.

AGCO Corporation, Duluth, Georgia USA; *www.masseyferguson.com*

Improve up time, reduce maintenance with conditioning rolls



The John Deere Tri-Lobe Conditioning Rolls are used in rotary windrowers to shorten hay-drying time. Unique manufacturing techniques are used to make an extremely accurate and durable steel-conditioning roll. High accuracy allows a gap between rolls of less than one stem diameter in many crops. This crushes crop stems along much of their length to allow moisture to escape. Three intermeshing chevron lugs give smooth and positive crop feeding to produce a uniform windrow at rotary cutting speeds of 10 to 16 kph (6 to 10 mph) or more. Intermeshing lugs also crimp the crop stems and further improve drying. Steel construction provides longer wear life than rubber or polymer materials in abrasive irrigated soils. Long wear life maintains close clearance and improved conditioning far longer than for previously available rolls. Long wear and replaceable shafts improve up time and reduce maintenance for commercial hay producers.

Deere & Company, Moline, Illinois USA; *866-993-3373, www.johndeere.com*

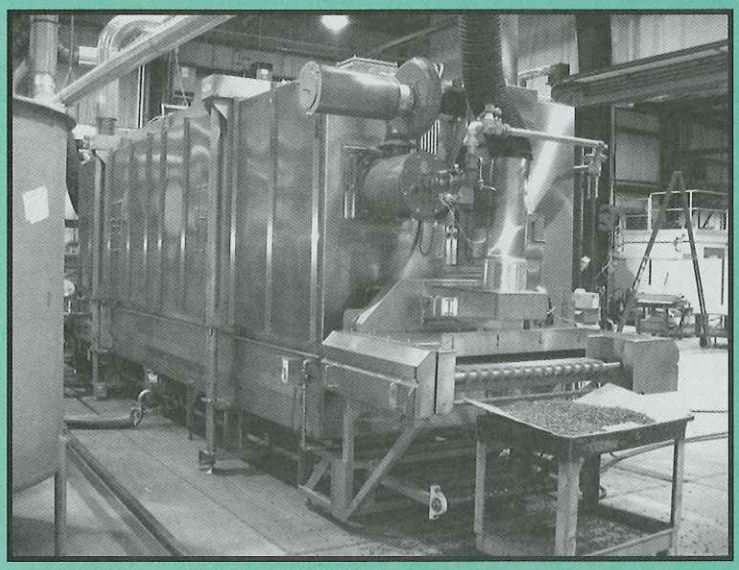
AE50 OUTSTANDING INNOVATIONS 2006

Tractors shift gears in sync with engines, radiator-cooling performance advances

The Kubota M105X and M125X tractor system enables the tractor to automatically shift gears by monitoring engine performance. Operating efficiency is increased, particularly in varying conditions. The system automatically controls the shifting among any three-gear ranges but can be set to control two-gear (one shift) to four-gear range (three shifts) as dictated by the application. Previous automatic transmission systems could not replicate normal shifting patterns of an experienced operator. The radiator-cooling performance of the M125X and M105X are improved over previous models. To better cooling performance in dusty fields, Kubota analyzed airflow in front of the radiator and front grill and optimized the flow using airflow-control plates. This allows for uniform airflow around the grill and reduces air velocity around the net to prevent clogging. The end result allows the operator to work longer hours without having to clean the grill or radiator.

Kubota Tractor Corporation, Torrance, California USA; *www.kubota.com*

Proven pathogen reduction with dry-food, surface pasteurization system



The FMC JSP-1 Jet Stream® Dry Food Surface Pasteurization System is an advanced, industry-scale, continuous dry-food, surface pasteurization system. It offers Jet Stream® technology, the LOG-TEC food safety controller system, and a unique process that delivers a minimum five-log reduction of pertinent pathogen on the dry-food surface while preserving maximum natural characteristics of the product. JetStream® technology consists of a short-time, steam-heating module and a steam-air impingement heating section, maintaining product-surface temperature at the desired dew point for sufficient pasteurization time. The LOG-TEC monitors, controls, and documents the food-safety factors and handles and corrects process deviations.

FMC Technologies, Inc., Madera, California USA; *559-661-3193, www.fmcfoodtech.com*

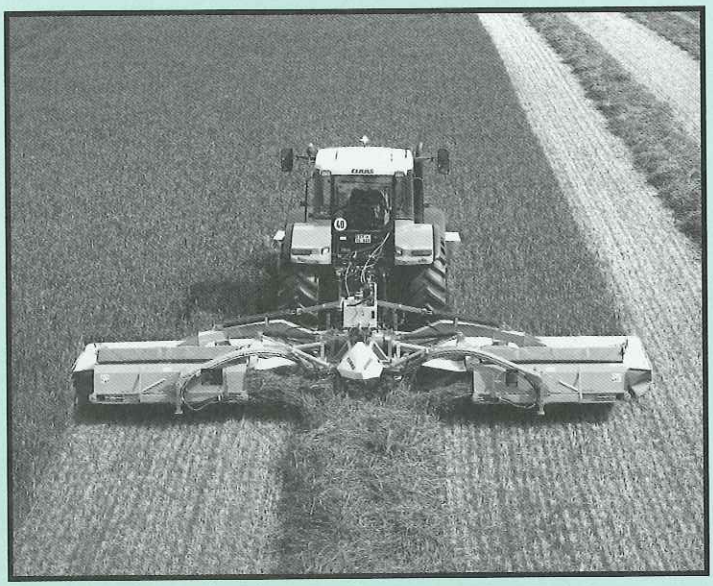
AE50 OUTSTANDING INNOVATIONS 2006

Riding in style

The 3000 and 4000 TWENTY Series ComfortGard Cab offers a big-tractor-cab feel in a small package. Engineers at John Deere's SouthEast Engineering Center used a state-of- the-art, virtual reality lab with actual John Deere customers to develop this cab. With optimized operator and controls placement, this product offers industry-leading advantages in comfort, convenience, and performance. This cab has 360-degree visibility, with a broad unobstructed view accomplished with a 4-post ROPS design, patented raised header bar, and curved glass. The mounting system and controls design provides noise levels as low as 78-80 decibels for an ultra-quiet ride. Features like 12-volt power supply, cell phone holder, dual cup holders, compact disc storage, hitch pin storage, and more, give the cab an intuitive automotive-like look and feel. The heating, ventilation, and air conditioning system is high capacity with eight adjustable air distribution vents to provide exceptional performance.

Deere & Company, Moline, Illinois USA; *309-765-8000, www.JohnDeere.com*

Mower conditioner merges as it mows



The DISCO 8550AS is a three-gang, tractor-mounted mower conditioner that cuts, conditions, and merges 8 m (26 ft) of any hay crop in a single pass. The power to merge the crop as it is mowed sets the DISCO 8550AS apart from other mowers. With revolutionary merge-on-the-go technology, the DISCO 8550AS speeds up harvest time, reduces compaction, and saves labor and fuel costs. By mowing 8 m (26 ft) in a single pass, the farm operation's number of machines and operators may be reduced, yet stay at the high level of performance required. In addition, by combining the mowing and merging operations, the DISCO 8550AS eliminates an entire process that is normally time consuming and requires additional labor. The increased efficiency yields a higher quality end product: feed for animals.

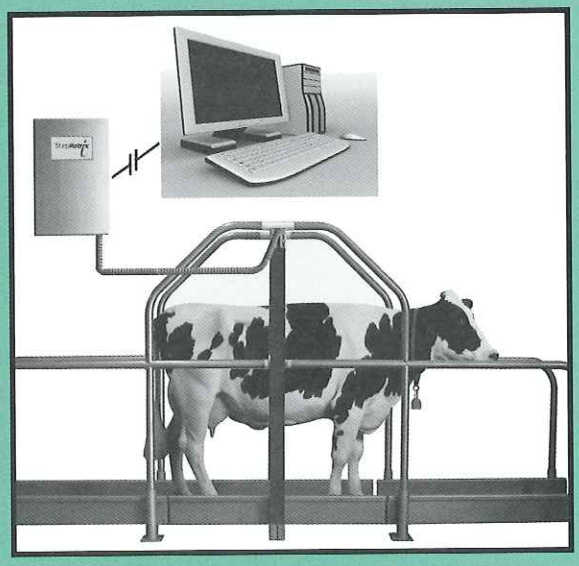
CLAAS of America, Inc., Omaha, Nebraska USA; *402-861-1000, www.claasofamerica.com*

AE50 OUTSTANDING INNOVATIONS 2006

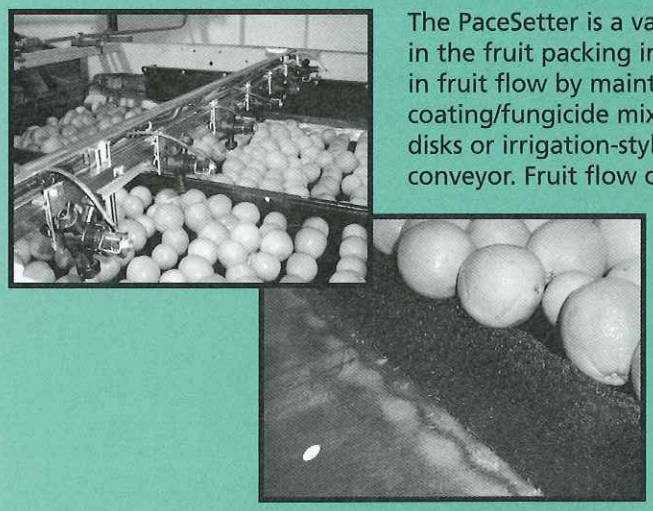
24/7 dairy-lameness diagnostics

StepMetrix™ is a revolutionary, real-time diagnostic tool that enables effective lameness management. It automatically identifies and monitors the soundness or lameness of every cow in the herd seven days a week, 365 days a year, before visual symptoms become apparent. The information obtained addresses the conditions of individual cows, lots, and/or herds to assist producers in management decisions associated with nutrition and medical treatments. Inaccurate lameness diagnoses and a lack of observable symptoms exacerbate economic loss and animal welfare concerns. Diagnostic accuracy has been hindered by subjective manual inspection, and annually, economic losses attributable to lameness cost U.S. milk producers more than $800 million cumulatively or $90 per animal. With StepMetrix™, producers are able to accurately and systematically identify lameness soon after onset, enabling early intervention to minimize economic loss.

Bou-Matic, Madison, Wisconsin USA; *608-222-3484, www.bou-matic.com*



Variable-rate fruit-coating applicator defines a new Pace



The PaceSetter is a variable-rate, fruit-coating applicator designed for use in the fruit packing industry. The PaceSetter system accounts for variability in fruit flow by maintaining a uniform application rate. Currently, fruit coating/fungicide mixtures are applied at a constant rate using spinning disks or irrigation-style drip emitters above fruit traveling on a brush-roll conveyor. Fruit flow can be highly variable, therefore a constant-rate method can be wasteful, costly, and result in a questionable application. With the PaceSetter accurately sensing fruit flow, a control algorithm controls solenoid valves which are used to vary fruit coating-spray application. The operator interface is a touch-screen, which is used for machine calibration and monitoring. Optimizing coating and fungicide application lengthens the market life of fruit by slowing dehydration and suppressing decay to ensure that consumers receive quality fruit in the marketplace.

Pace International, LLC, Seattle, Washington USA; *206-331-4700, www.paceint.com*

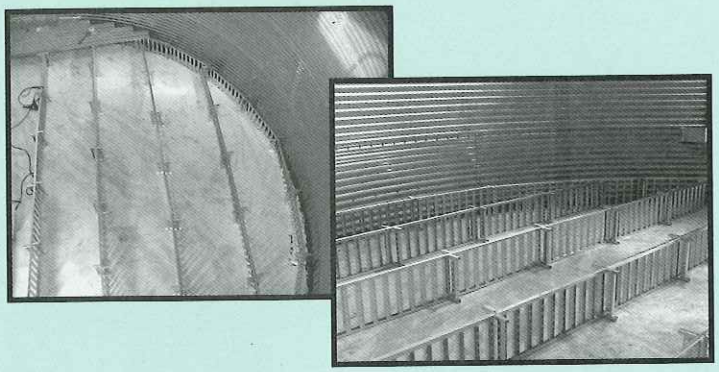
AE50 OUTSTANDING INNOVATIONS 2006

All the bells and whistles: AGCO DT Series, Generation A

The flagship of the AGCO tractor line, the DT Series Generation A, features the latest in tractor innovation for increased performance and efficiency. With models ranging from 180 to 240 PTO hp, the DT series tractors are powered with efficient 7.4-L (DT180A, DT200A) and 8.4-L (DT220A, DT240A) AGCO engines, putting power to the ground via the PowerMaxx Continuously Variable Transmission (CVT™). The transmission features clutchless operation, isolated oil reservoir to eliminate contamination risks, and infinite speed selection from 0-42 kph (0-26 mph). Optional equipment includes AGCO Global Technologies Console I tractor control terminal, featuring Datatronics III, and offering one-touch headland management, trailed implement control, electronic engine supervisor, control for up to five remote valves, and active memory and record keeping software. Other available features include AirMaxx pneumatic cab suspension, a front hitch with up to 4,990 kg (11,000 lb) of lift capacity, and AGCO Global Technologies AutoGuide satellite tractor guidance system.

AGCO Corporation, Duluth, Georgia USA; *800-767-3227, www.agcotractors.agcocorp.com*

Aeration floor-support system: a breeze for grain bins



The Parthenon™ Floor Support, a remarkably easy-to-install floor support system, saves an installation crew a substantial amount of time. The Parthenon™ system, which supports aeration flooring in grain bins, offers a revolutionary design and is very different than any other product on the market. It makes the installation of an aeration floor system much more simple and requires less "how-to" instruction than our older design. It also requires one-third the usually required parts for installation and comes with an industry-leading, five-year warranty.

Brock Grain Systems, Milford, Indiana USA; *574-658-4191, www.ctbinc.com*

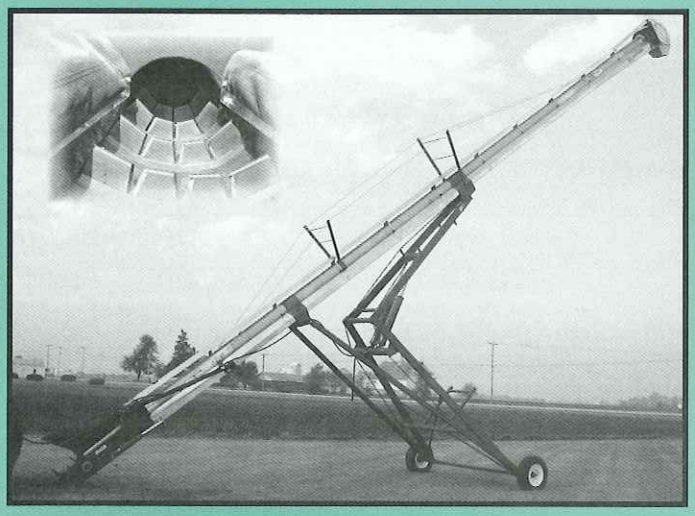
AE50 OUTSTANDING INNOVATIONS 2006

A new wrinkle in boom folding

The Summers Ultra Ultimate NT Supersprayer is a hydraulic-folding, suspended-boom pull-type field sprayer available in 37- and 41-m (120 ft and 133-ft-4-in.) boom sizes. The foundation of this new, longer boom is a circular member that resists torsion applied during folding operations. Electric switches allow operator control of a six-bank hydraulic multiplier for easy three-section boom folding. A piston accumulator provides cushioning for the vertical-height cylinders allowing the three-section boom to float as the sprayer bounces over bumps. Outer booms are protected by a patented, hydraulically dampened breakaway system that permits them to swing back freely upon contact with an obstruction yet return safely without any operator inputs. Two different main tank sizes are available along with two different tire sizes.

Summers Manufacturing Company, Inc., Maddock, North Dakota USA; *800-732-4347, www.summersmfg.com*

Easy-does-it conveyor



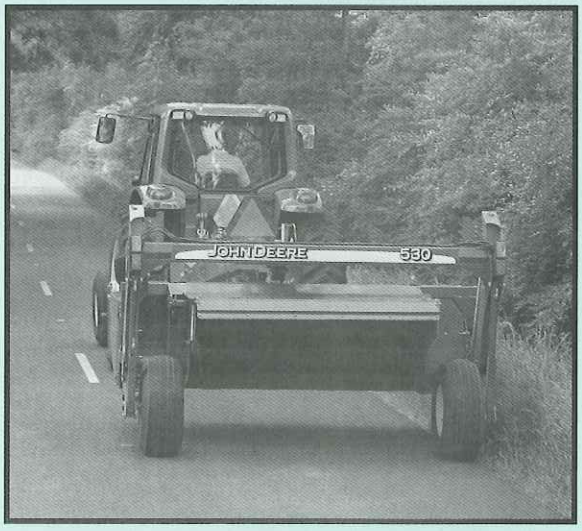
The KSi Model 1610 high-capacity, cleated-belt conveyor moves high-value seed and other fragile products gently and efficiently. Its patented, fully molded rubber belt with 5-cm (2-in.) notched cleats transports up to 211 m^3/h (6,000 bu/h) with minimal product damage. The patented, simple-drive configuration effectively powers the belt to inclines of 40 degrees while maintaining even tension across the belt width. The conveyor outperforms conventional augers and belt conveyors in speed of material flow, maximum degree of operation, power efficiency, and gentle material handling. Belt speed of 115 m/min (376 ft/min) within seed production plant specifications coupled with positive product transfer provides gentle, positive handling. Construction is based on a heavy 25-cm (10-in.) galvanized tube and has a completely enclosed belt return. It comes in lengths from 5.8 to 21.9 m (19 to 72 ft) with cable or hydraulic scissors-lift system. Electric, PTO, and hydraulic drive options are available.

KSi Conveyors, Inc., Cissna Park, Illinois USA; *888-574-2668, www.ksiconveyors.com*

AE50 OUTSTANDING INNOVATIONS 2006

Tailor-made, smooth cutting from new mower conditioners

The new 500 series mower conditioners from John Deere feature three models with cutting widths from 2.5 to 3.5 m (8.2 to 11.5 ft). Its slender transport width simplifies moving from field to field over narrow roads and through narrow gates. The low profile cutter bar and mounting structure allow a low cutting height without a steep cutter bar angle, which reduces knife damage from rocks and other obstructions. Its unique platform float combines low forces, a high range of motion, and a quick return to the ground. This provides firm and consistent contact with the ground for smooth cutting. Two conditioner styles and three different hitch types allow customers to tailor the machine to their crops and operating conditions. A unique double-telescoping power line is used with the clevis hitch version to provide high maneuverability with a simple attachment to the tractor.



Deere & Company, Moline, Illinois USA; *866-993-3373, www.johndeere.com*

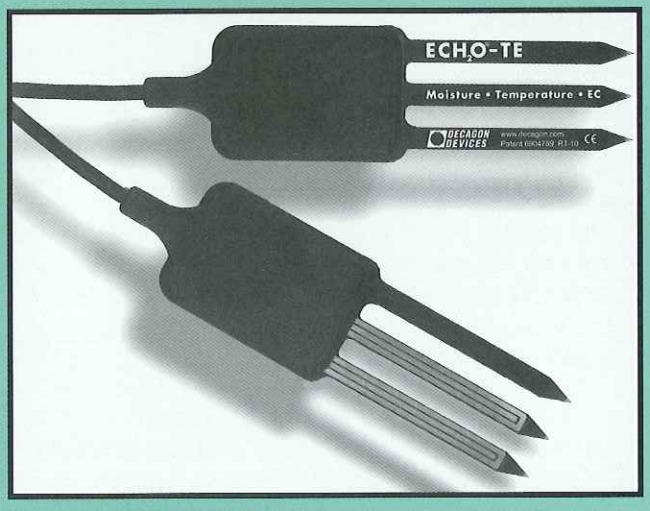
Best-in-class-performance three-wheel electric forklift trucks

Mitsubishi Forklift Trucks' new line of 1,360- to 1,815-kg (3,000- to 4,000-lb) capacity, electric lift trucks are 100 percent AC-powered and feature enhanced operator presence detection, longer service intervals, and longer battery life. The hydraulic and steering systems utilize the same motor, eliminating the need for a separate steering motor and thereby reducing noise levels. The drive system features dual-drive motors, providing acceleration and top-speed improvements to enhance customer productivity. Transistorized controllers provide proportional control of the drive wheels, allowing the unit to turn within its own length, improving warehouse space utilization. An Integrated Presence System includes warning indicators for seat belt and parking brake, and it disables all truck functions when the operator leaves the normal operating position. This feature reduces the risk of hazardous operating procedures. Planned maintenance intervals have been increased, reducing equipment downtime and overall expenses.

Mitsubishi Forklift Trucks, Houston, Texas USA; *713-365-1000, www.mit-lift.com*

AE50 OUTSTANDING INNOVATIONS 2006

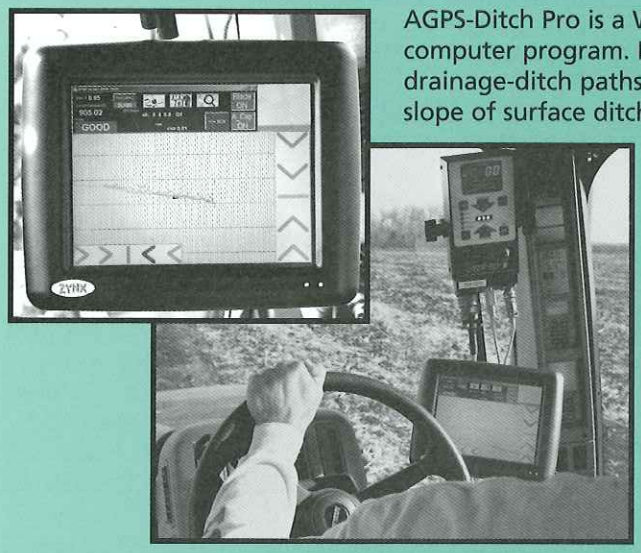
Three measurements, one probe



Measuring water content, temperature, and electrical conductivity is an essential part of commercial agriculture and environmental monitoring. Several probes are available that measure these three parameters, though many are limited by high cost and lack of robustness. The new ECH_2O-TE from Decagon Devices uses a much-improved water-content measurement derived from the original ECH_2O probe, an integrated thermistor temperature sensor, and a four-probe electrical conductivity (EC) array — and combines all three measurements into a single probe. Utilizing the unique ECH_2O circuit board design, the ECH_2O-TE is made of extremely rugged fiberglass with circuitry that is overmolded by thermoplastic and sealed with a xylene compound to guard against moisture intrusion. An integrated low-power microprocessor measures all three parameters and outputs to a readout device using RS-232 protocol. ECH_2O-TE's unique features and affordable price make it highly attractive for both researchers and commercial growers.

Decagon Devices, Inc., Pullman, Washington USA; *509-332-2756, www.decagon.com*

Survey drainage-ditch path, design/control vertical-curve slope

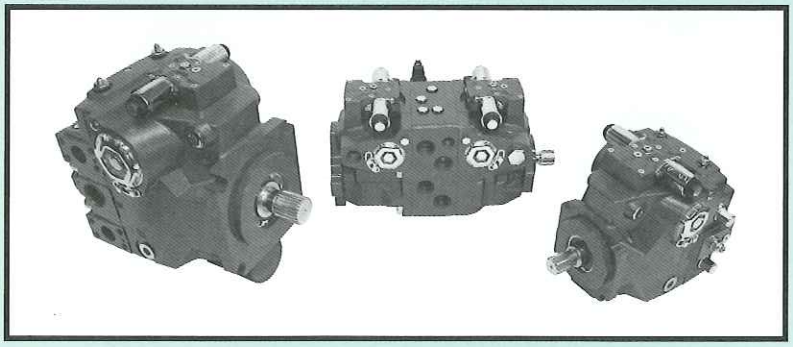


AGPS-Ditch Pro is a Windows-based agricultural drainage, machine-control computer program. Ditch Pro is used to survey existing or intended drainage-ditch paths and automatically design and control a vertical-curve slope of surface ditches utilizing non-brand specific RTK GPS NEMA string outputs and vertical curve algorithms. Vertical-curve-slope design incorporates natural grade breaks, curvature of the earth, and user-defined parameters in ditch design; as a result, less soil is moved to obtain optimal drainage. While in the ditch path, Ditch Pro displays a ditch-profile view including blade elevation, survey, design, and working paths. Away from the ditch path, an overhead view is automatically displayed. A geo-referenced bitmap image can be loaded into the background for the overhead view (i.e. satellite imagery, topographical flow patterns, depressions, etc.). Ditch Pro's machine-control option automatically controls the earth-moving equipment's blade elevation while ditching.

Advanced Geo Positioning Solutions, Inc., Fremont, Ohio USA; *888-301-2477, www.agpsinc.com*

AE50 OUTSTANDING INNOVATIONS 2006

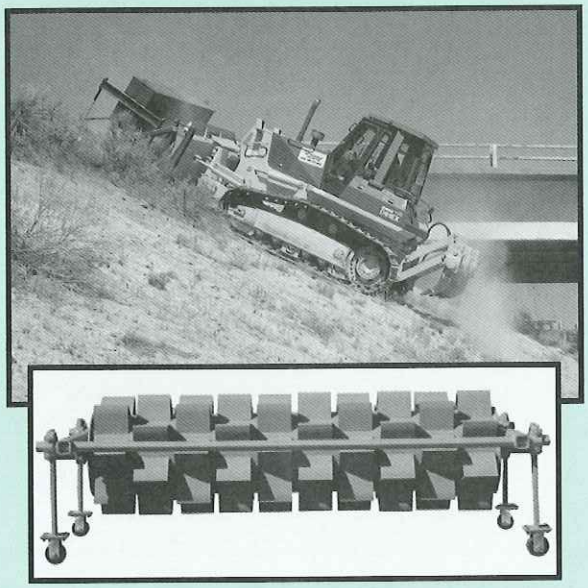
Pumping more into the next generation



Sauer-Danfoss introduces H1 as a family of closed circuit, variable-displacement hydrostatic pumps with a displacement range from 20 to 250 cc/rev (1.2 to 15.3 cu in./rev) designed to meet the needs of the off-road, mobile machinery market well into the future. The H1 family embodies a simple and common design throughout the displacement range. Sauer-Danfoss designed H1 with a primary focus on improved quality and reliability by utilizing a design with significantly fewer parts and optimizing the design for electric control only. H1 is available with electric displacement (EDC), non-feedback proportional (NFPE), and three-position (FNR) controls where the same control is used throughout the displacement range. H1 is the next generation of hydrostatic pumps from Sauer-Danfoss with a design focus on quality, efficiency, functionality, installation package, and optimization for electric control.

Sauer-Danfoss, Ames, Iowa USA; *515-956-5750, www.sauer-danfoss.com*

No-till implement intercedes by inter-seeding

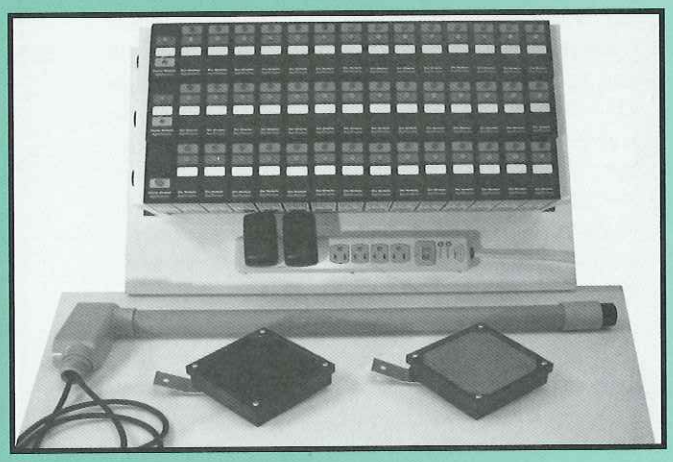


Simple seeders, directly driven from the Dixon Land Imprinter roller, deliver complex mixes of native seeds to the roller top where they are carried forward, dropped on the soil surface, and then imbedded in the imprint surfaces. Some can work on 2:1 slopes and even steeper. Land imprinting specifications have been developed for erosion control, ecological restoration, TMDL reduction, restoring perennial grasses, weed control, forage production, and sustainable agriculture. Imprinting accelerates the secondary succession of plant types past the weed stage through superior control of rainwater at the soil surface via V-shaped imprints, funneling for maximizing seed germination, seedling establishment, and the subsequent growth of plant communities. Dixon Land Imprinter, a no-till implement for seeding – under development in Tucson, Ariz., since 1976 – was developed through infiltration/erosion-control research. Today, more than 50,000 ha (123,553 acres) have been inter-seeded with grasses nationwide.

Western Ecology, LLC, Sante Fe, New Mexico USA; *866-992-2793, www.westernecology.com*

AE50 OUTSTANDING INNOVATIONS 2006

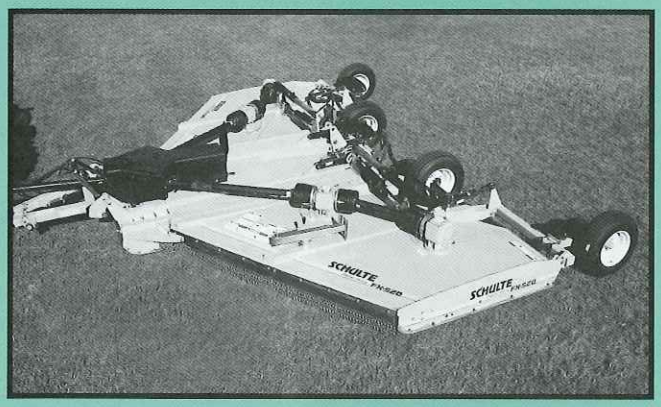
Modular Monitor System for hazardous dust applications



The Agritronics Modular Monitor System (AMMSV4) is an intrinsically safe monitor system used to monitor upper and lower bin levels (two wire-pressure activated and three-wire capacitive) and 5- to 10,000-rpm shaft speed (two-wire and three-wire magnetic) sensors installed in explosive gas (Class I, Group C and D) and combustible dust (Class II, Group G) locations. The CSA-approved (Canada and USA) system greatly reduces installation and maintenance cost compared to explosion-proof installations in grain, fertilizer, feed handling, and processing facilities. The modular system provides for one to 120 channels for easy expansion and can interface to programmable logic control for automatic batch control functions. The system operates on 12-15 Vdc (or from a 120 Vac-to-dc power adaptor) and has configuration for a timed or latching alarm, which also makes this system useful for monitoring air-seeders, fertilizer applicators, and combine harvesters.

LJB Agritronics Ltd., Edmonton, Alberta Canada; *780-413-4286, www.agritronics.ca*

Innovative mowing technology for crop residue management

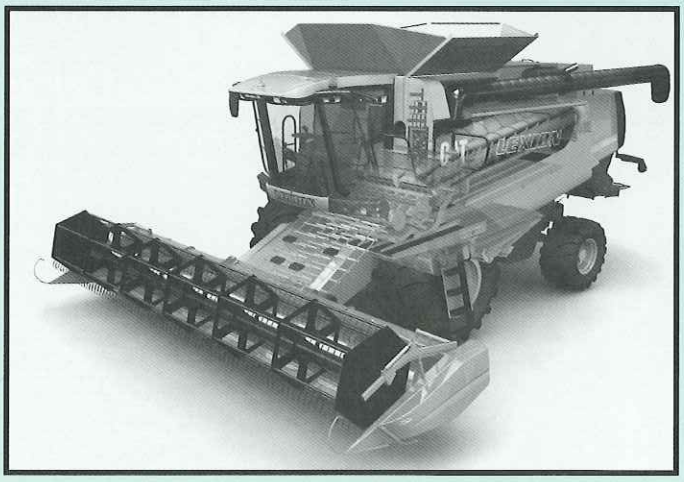


The FX520 uses a five-rotor design, which optimizes cutting performance, increases productivity, and delivers extremely even distribution. The FX520 fixed-knife option includes eight fixed knives, three on each wing and two on the center section, 22 rotating blades, and crop specific distribution kits. With these fixed knives and high rpm rotors this machine rips through crop residue faster and shreds it finer. This reduces the number of field passes and decomposition time of material allowing for other field operations to occur sooner. The FX520 uses 142-kW (190-hp) down boxes and a 194-kW (240-hp) splitter. The driveline consists of Category 7 and 6 low-maintenance shafts with Rilsan coating for ease of telescoping. The FX520 features Hitch Lift Assist, independent suspension, and walking axles for increased ground following capabilities.

Schulte Industries Ltd, Englefeld, Saskatchewan Canada; *800-404-6044, 306-287-3715, www.schulte.ca*

AE50 OUTSTANDING INNOVATIONS 2006

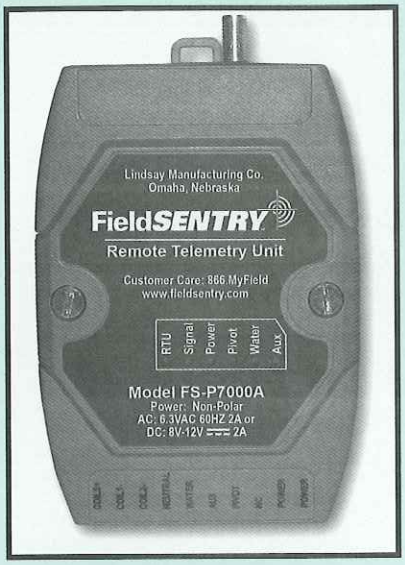
Combine series boosts productivity



The Lexion 500R series self-propelled combine harvesters use advanced technology to harvest multiple crops, employing a variety of Lexion header types and sizes to increase productivity by as much as 25 percent over previous models. The combines feature a unique, hybrid processor unit — a tri-cylinder, tangential threshing system and a twin-rotary separation system — allowing efficient adaptation to changing conditions and crop types. Each combine features a cascade precleaner; optional fully active, slope-compensating (3-D) cleaning shoe (up to 20 percent slope); right-hand control console with a single monitoring device for total machine monitoring and finger-tip control in line-of-sight with the header; and optional header-pitch feederhouse for header adjustability/adaptability to conditions, providing the carrying capacity and automatic contouring for the Lexion 40-ft platform headers and 16-row, 30-in. corn heads. All 500R combines are equipped with Caterpillar Tier III ACERT® diesel engine technology, that, when combined with the hybrid-system provides leading throughput capacity and fuel economy, reducing overall machine cost and maximizing productivity.

Claas Omaha Inc., Omaha, Nebraska USA; *402-861-1000, www.lexioncombines.com*

Telemetry service stands guard



FieldSENTRY™ Wireless Irrigation Network is simple, reliable, and affordable telemetry service. Growers can effectively monitor multiple center pivots directly from the Internet or a cell phone. Labor, fuel, and time are all reduced through eliminating trips to the field to monitor irrigation operation, and shut-downs are sent via text messages or alerts to notify the grower to take action immediately and prevent crop damage. FieldSENTRY's remote telemetry unit installs easily inside nearly all center pivot panels and has a built-in cellular device that wirelessly connects pivots from virtually anywhere in the United States. Optional service plans are available for monitor and basic control, and the plans allow irrigation activity to be charted, recorded, and graphed from a secure Web portal.

Lindsay Manufacturing Co., Lindsay, Nebraska USA; *800-829-5300, www.lindsaymanufacturing.com*

AE50 OUTSTANDING INNOVATIONS 2006

First intercooled, turbocharged engine among compact tractors

The John Deere 3000 TWENTY Series Compact Utility Tractors feature four models from 22- to 32.8-kW (29.5- to 44-hp) engine power. The 3720 model provides the highest power in its class and features the first intercooled, turbocharged engine among compact tractors. A new performance tracking system provides operators with a digital speedometer and nine adjustable levels of motion control characteristics and gives technicians easy access to diagnostics. The electronically controlled hydrostatic transmission features cruise control that can maintain constant ground speeds as low as 0.16 kph (0.1 mph). Operator comfort is improved via the optional air-ride seat, integrated cab, and a new self-aligning A-frame front hitch that eases attachment of selected front implements. Three models of tractors are also available in EEC homologated configurations and have available an optional independent front PTO. The tractors were designed for ease of assembly, the total part count decreased by 16 percent compared to previous models.

Deere & Company, Moline, Illinois USA, *866-993-3373, www.johndeere.com*

Easy-install steering kit for economical versatility

The GreenStar™ AutoTrac Universal Steering Kit is an assisted steering system for a farmer's entire fleet of approved agricultural equipment. A universal guidance system has the advantage of mobility over integrated designs. A farmer can pay for the system once and use it with different equipment throughout the seasons to maximize payback on the investment. Installation of the AutoTrac Universal Steering Kit requires minimal time, with a typical installation taking less than an hour. The AutoTrac Universal Steering Kit replaces the pre-existing machine steering wheel. The operator can activate the system by pressing a single button on the steering kit and then regain control by moving the steering wheel. Advantages of the GreenStar™ AutoTrac Universal Steering Kit over competitive equipment include higher accuracy, cleaner installation, and significantly less obstructions around the steering wheel.

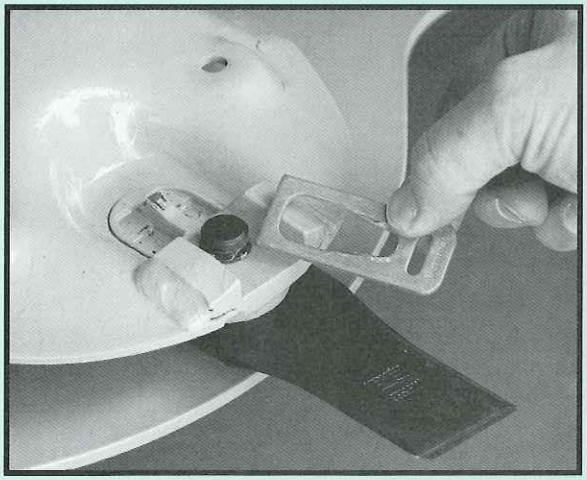
John Deere Agricultural Management Solutions, Urbandale, Iowa USA; *515-331-4750, www.deere.com*

AE50 OUTSTANDING INNOVATIONS 2006

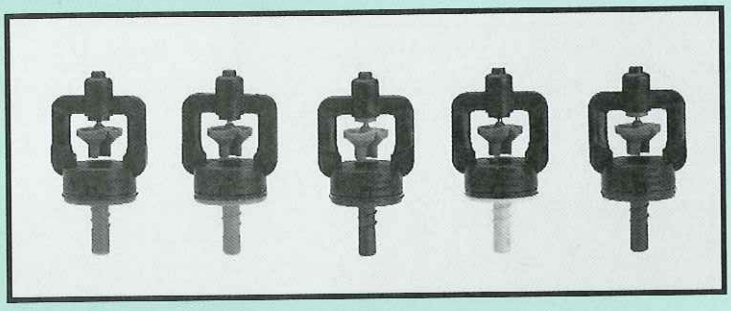
Attaching blade "system"atically simpler and quicker

The Quick-Clip™ blade-retention system is an improved mounting arrangement to attach a cutting blade to a disc on a rotary disc mower. It eliminates the need for a threaded connector and associated nut and provides a positive retention method on the topside of the disc. In addition, the system provides a method of removing the knife from the disc without the use of wrenches, only requiring a tool for prying, and is faster and more efficient than common blade-retention systems. In addition, the low-profile retainer does not require a wear protector.

Vermeer Manufacturing Company, Pella, Iowa USA; *800-370-3659, www.vermeerag.com*



Micro sprinkler nozzle shrinks water use, improves crop uniformity



5FC Flow Control nozzles are an option for the Nelson R5 Rotator, a micro sprinkler for the irrigation of tree and vine crops. As pressure increases, 5FC nozzles flex to a smaller size to deliver a constant flow over a range of pressure and assure uniform application of water throughout the crop. The 5FC nozzles regulate flow with greater accuracy and provide more reliability than comparable micro sprinklers. Regulating flow at each micro sprinkler improves field uniformity, which in turn, improves crop grade and value and reduces water use.

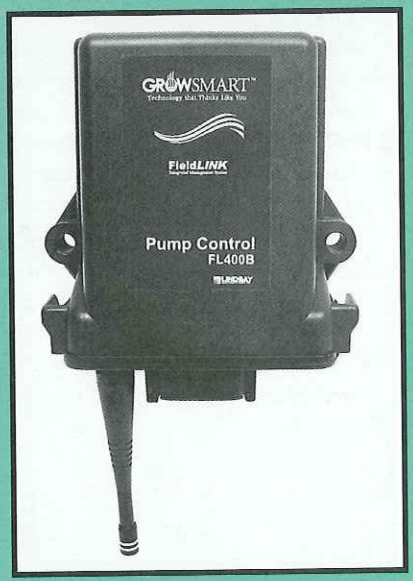
Nelson Irrigation Corp.,
Walla Walla, Washington USA;
509-525-7660, www.nelsonirrigation.com

AE50 OUTSTANDING INNOVATIONS 2006

Management tool for center pivots/linear-move systems

The FieldLINK Pump Control is a wireless solution for automating the interaction between pumps and center pivots. With easy installation in all field conditions, the system also offers reduced input costs of water, energy, labor, chemicals, and fertilizers. It avoids the expense and time of burying control wires for new pivot installations and provides quick replacement of existing damaged control wires. The system consists of a license-free radio control unit, which can be connected to any pivot controller and communicates with up to 100 pump or valve units. Timers and delays may be set up preventing water hammer and allowing an engine to cool down before shut down. FieldLINK allows automatic start for one or more remote pumps from the irrigation controller and provides critical pump shut down whenever the irrigation system stops, preventing over-irrigating and chemigating expense. With an ultra-simple configuration procedure, a single button allows in-field setup in seconds.

Lindsay Manufacturing Co., Lindsay, Nebraska USA; *800-829-5300, www.lindsaymanufacturing.com*



Spray-pressure changes? Flow-rates range extends

The unique design of the VeriRate Nozzle provides for an extended range of flow rates with changes in spray pressure while maintaining droplet size and spray coverage. The nozzle improves chemical savings, boosts spray productivity, and aids in environmental protection. The design is a combination of a flexible pre-orifice with a flexible-spray orifice. Tests have shown that as the spray pressure varies from 207 to 345 kPa (30 to 50 PSI), the flow rate of the VeriRate Nozzle varies from 1.1 to 11.4 L/m (0.3 to 3.0 GPM) while the volume median diameter of the spray droplets for the 0-degree nozzle orientation varies from 250 to 350 microns and the spray angle from 20 to 40 degrees. The rate change response time is less than 0.25 seconds. The nozzle is adaptable to conventional spraying systems and can be used with pressure regulators or automatic rate controllers for applications of varying rates.

SprayTarget, Rosemount, Minnesota USA; *651-485-2410, www.spraytarget.com*

AE50 OUTSTANDING INNOVATIONS 2006

"Breathe-easy" HVAC system protection

The 5400SA Series tractors are designed to give specialty application operators unsurpassed respiratory protection while maintaining maximum productivity in the 90 to 105 PTO hp range. Cab respiratory protection is achieved with the MF5400's heating, ventilation, and air conditioning (HVAC) system, which filters foreign particles larger than 3 microns in size from entering the cab. Air inside the cab is circulated back through the HVAC system every 36 seconds while pressurizing the cab to achieve optimal protection in up to 22 mph outside-wind force. The HVAC system complies with the ASAE S525-1.2 standard for operation in spraying applications. A comfortable cab carries a narrow profile with high visibility and low clearance.

Massey Ferguson, Duluth Georgia USA; *800-767-3221, www.masseyferguson.com*

AE50 2006
WINNERS INDEX

AE50
Outstanding Innovations 2006

Published by
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2950 Niles Road, St. Joseph, MI 49085-9659 USA
269-429-0300, fax 269-429-3852, hq@asabe.org, www.asabe.org

STANDARDS

ISOBUS (ISO 11783) Task Controller and Data Dictionary Precedent

A new precedent has been set in the agricultural arena. On March 30, 2006, the inaugural online meeting was held for the ISOBUS Data Dictionary Maintenance Agency (DDMA).

The intent of this small experts group is to facilitate the speed and communication of standardizing an important area of ISO 11783 (ISOBUS) Data Communication and Control. This group of worldwide online agricultural experts has been set up to expedite the consideration and approval of valid Data Dictionary (DD) requests. These requests can come from designers and manufacturers of controllers that work with the ISO 11783 Part 10 Task Controllers and Part 11 Data Dictionary. This standardized data is what is communicated between implement controllers and a resident task controller on an agricultural machine. The task controller can then communicate with its counterpart at the home farm/network. What this means to the designers is that a fast, effective approval process is now in place, i.e. you don't have to show your cards too early in the game anymore. You should not have to wait the 3, 6, or 18 months it can take to get your communication parameters discussed, approved, and assigned. For those folks who were leery of showing design information too early, or trying to juggle the production of their units with some hoped-for day of approval, this should help immensely. Obviously the DDMA is interested in keeping this DD trimmed down to an effective size and approving valid parameters, so not all requests may be granted.

What else does this mean to the agricultural community? This supports the continued work of standardizing Agricultural Communication and Control along with the other parts of the ISO 11783. For those who wish to converge on standardized methods, messages, diagnostics, etc. in agriculture, this is the arena to participate in. Those in construction, forestry, or other areas might also want to consider the same methods and means?

The Data Dictionary can be found online at www.isobus.com/isobus_E/isobus.html. It is the first online type of item hosted by the secretariat of ISO/TC 23/SC 19 at the VDMA Agricultural Machinery Association in Germany. The VDMA and ISO have approved an agreement about the hosting of the Internet-based data dictionary and the installation of an DDMA expert group.

Additional information can be found on the North American ISOBUS Implementation Task Force (NAIITF) site hosted by the Association of Equipment Manufacturers. For new users who wish to find the ISOBUS basic type of information, visit the Documents page on the NAIITF Web site at www.aem.org/Technical/NAIITF/Documents/index.asp. Good starter documents recommended are: ISOBUS Compliance Terminology.doc, ISOBUS Awareness for mfrs.ppt, and ISOBUS Diagnostics Top Level View.ppt.

Keith Hudson
Gerhard Henningers

2006 CSP Constituents

The following companies have contributed to the Cooperative Standards Program for 2006: Bilt Rite Buildings, GKN Walterscheid, Hydratec, Martins Native Lumber, National Frame Builders Association, Netafim, and Roberts Irrigation Products, Inc.

COOPERATIVE STANDARDS PROGRAM

Proposed Projects

X239.1WD, Hitch and Box Dimensions for Agricultural Grain Wagons. This standard applies to the wagon box dimensions required to enable the unit to be pulled behind a corn picker. There are so few pickers in use today that this standard is no longer required and has no relevance with present-day modern equipment.

X602, Safety Requirements for Agricultural Scraper Tractors. This standard will provide an agreed methodology for the safe design of agricultural scraper tractors.

Proposed Revision

X365.7, Braking System Test Procedures and Braking Performance Criteria. This revision is a result of the annual review of the standard's Future Provisions. It will incorporate the following Future Provisions: Annex B.1, Annex B.2, Annex B.3, Annex B.4, Annex B.6, Annex B.7, Annex B.8, Annex B.9, Annex B.10, Annex B.12, Annex B.13, Annex B.14, Annex B.15, Annex B.18, and Annex B.20.

For more information contact the ASABE Standards Department at 269-429-0300.

In Memoriam

Robert R. Roth, 85, of Rock Island, Ill., died May 3, 2006.

He retired in 1981 from John Deere Harvester Works, Moline, Ill., where he was a project engineer from 1962 until his retirement. He was previously employed by the J.I. Case Co. and the Minneapolis-Moline Co. He also served as an instructor in the Department of Agricultural Engineering at the University of Missouri, where he earned a bachelor's degree in agricultural engineering in 1943, and a bachelor's degree in mechanical engineering in 1947. A holder of nine U.S. patents, Roth was a World War II Army veteran. He had been a member of ASABE for 62 years.

Survivors include his wife, Jean; a son; a daughter; and four grandsons.

Memorials may be made to the Broadway Presbyterian Church, Rock Island, Ill., or the American Red Cross.

2006 Nominating Committee Seeks Input

The 2006 ASAE Nominating Committee is seeking well qualified candidates for the following ASABE offices.

2008-2009 President of ASABE

ASABE presidents are selected in alternate years from the public and private sectors. The nominee selected by this committee will be from the private sector.

Trustees At-Large

Eight nominees will be selected, from which four will be elected in early 2007.

Both the president-elect and the four new trustees at-large will join the board after the 2007 annual meeting. The trustees will serve two-year terms ending at the end of the 2009 annual meeting. The president-elect will serve one year as president-elect, one year as president, and one year as past president.

Nominees are also sought for seven positions (14 nominees in all) on the 2007 ASABE Nominating Committee. This year's candidates will be selected to represent the following divisions and districts: BE, FPE, IET, PM, SW, District 2 (South/Southeastern United States), and District 4 (West, Southwest).

The committee is soliciting suggestions for nominees for the above positions. Selection of officers and members of the nominating committee is extremely important to the success of ASABE, and we appreciate your help in identifying well-qualified candidates. You may submit your suggestions to me or any member of the nominating committee listed below.

Members of the 2006 ASABE Nominating Committee are: John Cundiff, Robert Gustafson, Conly Hansen, Zachary Henry, Larry Jacobson, Richard Job, Edward Martin, Gregory Osborn, Richard Peterson, Gary Roberson, Philippe Savoie, Terry Siebenmorgen, Kenneth Sudduth, and Mary Leigh Wolfe.

Thanks for your help in this important ASABE activity.

Robert J. Gustafson
2006 Nominating Committee Chair
Gustafson.4@osu.edu

Let the Mentoring Begin

We are pleased to present an innovative online mentoring program available to all preprofessional/student and young professional members of the Society as a benefit of membership. Young professional members are defined as non-student/preprofessional members aged 34 and under.

As a student, you probably receive first-rate technical training from academic programming, but what you also need is the benefit of experience that can only be found on the job. Having a mentor, who is established in his or her career, provides you with first-hand knowledge of what to expect in the work world after graduation. Young professionals may face an entirely different set of issues and also need the benefit of a mentor who can give them practical career advice on the day-to-day issues facing them in the workplace.

We currently have a database of over 60 mentors who are willing to share their experiences and perspectives. Each mentor has been asked to electronically provide a brief profile detailing his or her work experience, technical interests, and contact information. This profile has been assigned a random number and posted online (behind the password-protected, members-only section of the ASABE Web site) without name or contact information.

Mentees will then be able to search all profiles for mentors who most closely fit with their career interests via an online search tool. Using an online application, mentees select their top choices for a mentor. The application is then submitted and evaluated by ASABE staff and matched with the available mentor on a first-come, first-served basis. The mentor and mentee are then contacted by e-mail and provided with each other's names, company or school, relevant background information (as provided), and e-mail addresses. It is now up to the pair to start the mentoring relationship.

Ready to search for a mentor or become one? Please log into the members-only section of the ASABE Web site from the home page at www.asabe.org, click the E-Mentoring program link near the top of the page, read the program overview, and click either the "Mentee Application Form" or "Mentor Submission Form" links at the top of the page.

Questions? Contact Mark Crossley at crossley@asabe.org.

Call for Nominations for 2007 ASABE Awards

Do you know someone who is an unsung hero or heroine of engineering? Perhaps you know a designer whose products are exceptional or a researcher whose work is the foundation for significant developments. How about that teacher who inspires greatness? Help give them the recognition they deserve.

Nomination deadline is Oct. 31, 2006

• Cyrus Hall McCormick-Jerome Increase Case Gold Medal. Honors exceptional and meritorious engineering achievement in agriculture that has resulted in new concepts, products, processes, or methods that advanced the development of agriculture. Gold medal.

• John Deere Gold Medal. Honors achievement through engineering for improved manipulation, use and conservation of soil-water resource, and that which has resulted in applications of a new concept, product, art, or science that advanced the development of agriculture. Gold and bronze medal.

• Massey Ferguson Educational Gold Medal. Honors those whose dedication to the spirit of learning and teaching in the field of agricultural engineering has advanced our agricultural knowledge and practice and whose efforts serve as an inspiration to others. Gold medal.

• Henry Giese Structures and Environment Award. Honors distinguished service in advancing the knowledge and science of agricultural structures and environment. Engraved plaque on a wooden base.

• Hancor Soil and Water Engineering Award. Honors contributions to the advancement of soil and water engineering. Contributions may be in teaching, research, planning, design, construction, management, or development of materials. Bronze medallion on a plaque.

• ASABE Kishida International Award. Honors outstanding contributions to engineering-mechanization-technological programs of education, research, development, consultation, or technology transfer that have resulted in significant improvements outside the United States. Engraved plaque and $1,000.

• G.B. Gunlogson Countryside Engineering Award. Honors outstanding engineering contributions to the development and improvement of the countryside. Engraved copper plate on a hardwood plaque.

• NAMIC Engineering Safety Award. Honors outstanding contributions to research, design, education, or promotion that have advanced agricultural safety engineering. Engraved desk pen set.

• FPSA-FPEI Food Engineering Award. An annual award, alternating between recognition of a *distinguished* food engineer in odd-numbered years, and an *emerging* food engineer with less than 10 years practice in even-numbered years. The award honors original contributions in research, design or development, the management of food processing equipment, or techniques of significant economic value to the food industry and the consumer. Award presented during the International Association of Food Industry Suppliers Annual Conference in the spring with re-presentation at the ASABE Annual International Meeting. Gold medal, certificate, $2,000 and travel expenses to the FPSA conference; engraved plaque presented at the ASABE annual meeting.

• Sunkist Young Designer Award. Honors the development or creation of a technical plan that is materially influencing agricultural engineering progress, as evidenced by use in the field. Bronze medallion on a plaque. Nominee must be under the age of 40 at time of selection.

• Young Extension Worker Award. Honors outstanding success in motivating people to acquire knowledge, skills, and understanding to improve agricultural operations. Bronze medallion on a plaque. Nominee must be under the age of 40 at time of selection.

• New Holland Young Researcher Award. Honors dedicated use of scientific methodology to seek out facts or principles significant to agricultural engineering. Nominee must be under the age of 40 at time of selection. Engraved bronze medallion on a hardwood plaque.

• A.W. Farrall Young Educator Award. Honors outstanding success motivating the application of engineering principles to agricultural engineering problems. Nominee must be under the age of 40 at time of selection. Bronze medallion on a plaque.

• Mayfield Cotton Engineering Award. Honors outstanding contributions to the cotton industry. Engraved plaque.

• National Food and Energy Council Electrification Award. Honors contributions to the use of electrical energy in the production and processing of agricultural products and to emphasize the unique role of agricultural engineering. Engraved plaque.

• Robert E. Stewart Engineering Humanities Award. Honors a graduate or undergraduate student who is a member of ASABE at the time of nomination for outstanding contributions to the profession and humanities. Engraved plaque.

• Rain Bird Engineering Concept of the Year Award. Honors an engineer or engineering team for contributions to the development or advancement of a new engineering concept. Engraved plaque.

• Award for the Advancement of Surface Irrigation. Recognizes and publicizes efforts that enhance the acceptance and efficient use of surface irrigation methods. Engraved plaque and $500.

• Evelyn E. Rosentreter Standards Award. Recognizes individuals who have given exceptional contributions toward the generation, maintenance, and administration of ASABE standards. Engraved plaque.

• PEI Professional Engineer of the Year Award. Recognizes a licensed engineer who has made outstanding contributions to the engineering profession, the public welfare, and/or humankind. Glass trophy.

For instructions on how to nominate a colleague and nomination forms, visit www.asabe.org/awards/major/major.html. For more information, contact Carol Flautt, 269-428-6336, flautt@asabe.org.

POSITIONS OPEN

The deadline for copy to be received at ASABE is the first day of the month preceding the month of publication (July 1 for the August 2006 issue). Each issue mails on the first day of the month.

Beginning with the January/February 2006 issue, advertisements are $125 per column (3.5-inch wide) inch, which includes free placement on ASABE's new Career Center Web page at www.asabe.org/membership/careercenter.htm. The minimum ad size is two inches — approximately 100 words. Ads are posted on the Web site within three business days of final approval and remain there for 30 days. If the insertion order is for two months, the cost is $110 per column inch per insertion and includes a 60-day free Web listing.

For more details on this service, contact Pam Bakken, ASABE Personnel Service, 2950 Niles Road, St. Joseph, MI 49085-9659, USA; 269-428-6337, fax 269-429-3852, bakken@asabe.org, www.asabe.org/resource/persads.html.

Washington State University – Assistant Professor/Assistant Scientist (Biomass Processing and Bioproduct Development) in Pullman, WA. The Department of Biological Systems Engineering invites applications for a permanent, 9-month, tenure-track Assistant Professor/Assistant Scientist in biomass processing and bioproducts development. The position is 85% research and 15% teaching. Required: Ph.D. (at time of hiring) in Biological Systems Engineering, Chemical Engineering, Biochemical Engineering or a related field with experience and educational background in biomass processing and bioproducts. Send letter of application, curriculum vitae, a statement of research interest and teaching philosophy (3 pages), transcripts, and names, addresses, electronic mail addresses, and telephone numbers of three references to: Shulin Chen, Search Committee Chair; Department of Biological Systems Engineering; Washington State University; P.O. Box 646120; Pullman, WA 99164-6120; telephone (509) 335-1578; fax (509) 335-2722; electronic mail chens@wsu.edu. Screening: August 1, 2006. For a complete notice of vacancy listing qualifications for this position, visit: http://www.chr.wsu.edu/vacancies.asp (Search #3667). EEO/AA/ADA.

POST-DOCTORAL OPPORTUNITIES
Department of Biosystems Engineering
University of Manitoba

Post-doctoral position available in the area of imaging and spectroscopy of cereal grains. Applicants must have a PhD in Biosystems/Agricultural Engineering, Electrical Engineering, or Optical/Instrumentation Engineering. Good knowledge of optical spectroscopy, digital image and signal processing, wavelet transform, hyperspectral imaging, electro-optical instrumentation, chemometrics, and artificial neural networks required. Salary commensurate with experience and skills. Inquiries and applications should be addressed to **Dr. Digvir Jayas,** Department of Biosystems Engineering, E2 376 Engineering Building, University of Manitoba, Winnipeg, MB, Canada, R3T 5V6 OR Digvir_Jayas@UManitoba.Ca

WASTE TREATMENT ENGINEERING

Waste treatment engineering positions are available to provide technical support towards food processing, industrial and animal waste treatment activities.

Candidates must be knowledgeable in aspects of waste handling processes in the abovementioned areas. This includes knowledge in waste storage structures, systems, retention times, pump stations, flow patterns, solids build-up and treatment plants. Knowledge of treatment systems design, maintenance and operation a plus. This individual will work in a multi-disciplinary team of scientists and engineers. Excellent written and verbal communication skills, people skills, organizational and record keeping skills essential. The position will require national and international travel.

A minimum of a B.S. in agricultural/civil/environmental engineering or related fields and 5+ years of experience in waste management is required. Industry and/or professional certifications a plus. United States citizenship or existing lawful authorization to work in the United States is required for eligibility. Salary is commensurate with qualifications and experience.

Applicants should submit a letter of application (including a description of their expertise and experience), resume, and a list of five references to:

AgCert Services (USA) Inc.,
Science and Technology Dept.
1901 S. Harbor City Blvd., Suite 400
Melbourne, Florida 32901, USA.

Or email: stjobs@agcert.com

Applications will be considered only when all materials have been received. Only qualified candidates will be contacted. AgCert Services (USA) Inc. is an equal opportunity employer.

Visit
www.asabe.org/meetings/am2006
for updates on meeting activities.

Innovation Nation

Seven principles for training engineers to be quantum leapers

Joel L. Cuello

We live in interesting times. Only six years into the 21st century and the global economic terrain has been transformed by the tectonic shifts of advanced computing technology, cheaper telecommunications, and lower trade barriers to form a truly global economic landscape whose borders breach national and regional boundaries. What has emerged is a rearranged global economic order. Today China has become the factory of the world, India the software and service center of the world, and the United States has remained the leading innovator of the world.

Massive offshore outsourcing, or offshoring, of U.S. and European jobs to China, India, and other low-wage countries has made possible – and currently sustains – the new global economic order. For America, it has brought about painful job dislocations and a hard-to-ignore mounting trade deficit. Indeed, the U.S. Department of Commerce reported that the U.S. international trade deficit reached a record level of $726 billion last year, representing an 18 percent increase over 2004. Not surprisingly, China's trade surplus with the United States rose by 24.5 percent in 2005, to $202 billion, representing America's largest bilateral trade deficit.

With such a gargantuan trade deficit, how then does the United States manage to close its gigantic economic loop? Many economists believe that the positive flow of global investment capital into the country balances out its negative trade flow – and that it is sustained economic growth that attracts the flow of global investment toward the United States. Indeed, the U.S. economy grew last year by 4.4 percent, a much healthier number compared to that for Japan of 0.8 percent or for Europe of 1.6 percent. Thus, global investment keeps flowing in, and the new global economic arrangement is upheld – for the time being.

In regard to the principal engine that propels America's protracted economic growth, there is consensus that that engine is America's high-technology innovation.

Thus, setting aside for now the bane and virtues of unrestrained offshoring (in contrast to strategic offshoring), which the U.S. engineering community needs to discuss and debate and whose policy or lack thereof it needs to influence, it is incontrovertible that innovation is a winning ticket for the United States or for any other nation in this globalized, offshoring world. Indeed, it is especially critical for America to maintain and continuously nurture its culture of innovation if it is to preserve global economic leadership. While it is in the world's best interest for China and India to win (and they should), it is also in the world's best interest for the United States not to lose (and it should not).

With engineers inhabiting the arena of high-technology innovation, a prodigious responsibility rests on their shoulders in sustaining and grinding the machinery of high-technology innovation, which their economy greatly needs for its nourishment and continued growth.

How can future engineers be trained to be innovative? It is, of course, easier to sketch the contours of a general solution rather than its intricate details, but here are seven general principles that can be applied for training engineers how to be innovative.

1. Expose them to the principles of engineering design from day one.

2. Make them learn that design is pliable, elastic and flexible, not rigid like a mathematical equation with only one correct solution, but changes shape and responds accordingly to demands and constraints.

3. Make them appreciate that design is a creative art form which applies the same principles of synthesis, fusion, abstraction, adaptation, transference, transformation, and invention that were employed in achieving the great innovations and movements in art, literature, music, government, biology, martial arts, and computers among others.

4. Make them see that mathematics and the sciences are the frameworks that buttress the engineering design art form, making it work in the real world.

5. Arrange for them to be exposed to and experience the high-technology industry.

6. Arrange for them to have study or research experience abroad.

7. Prepare them for life-long intellectual curiosity, learning, and engagement.

In today's globalized economy, it pays for each nation to have innovation as a potent ingredient of its citizens' culture. In this new century, innovation is a state of mind, a way of life, and the new global currency that moves freely between cultures and continents.

ASABE member Joel L. Cuello is an associate professor at the University of Arizona, Agricultural and Biosystems Engineering Department, 507 Shantz Building, Tucson, AZ 85721 USA, 520-621-7757, fax 520-621-3963, cuelloj@email.arizona.edu.


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