

Includes 2004 Guide to Consultants

June/July 2004

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Resources



Engineering & Technology for a Sustainable World

Gopalite®: Abrasive
Wear-Resistant Coating

Foundation Fun Day

ASAE Conferences and International Meetings

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

2004

Aug. 1-4 **Joint ASAE and CSAE/SCGR Annual International Meeting.** Fairmont Chateau Laurier and the Westin Hotel, Ottawa, Ontario, Canada.

Sept. 12-15 **Self-Sustaining Solutions for Streams, Wetlands, and Watersheds.** Radisson Riverfront Hotel, St. Paul, Minnesota, USA.

Oct. 7-8 **Automation Technology for Off-Road Equipment (ATOE 2004).** Kyoto, Japan.

2005

Feb. 14-17 **Agricultural Equipment Technology Conference (AETC).** Louisville, Kentucky, USA.

May **International Livestock Environment Symposium (2005 ILES).** Beijing, China.

July 17-21 **ASAE Annual International Meeting.** Tampa Bay, Florida, USA.

2006

TBA **ASAE Annual International Meeting.** Portland, Oregon, USA.

ASAE Section and Community Events

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

2004

June 27-30 **NABEC Section Meeting.** Penn State University, Nittany Lion Inn, University Park, Pennsylvania, USA. Contact Paul Heinemann, hzh@psu.edu.

Sept. 23-25 **Pacific Northwest Section Meeting.** Sunridge Inn, Baker City, Oregon, USA. Contact John Busch, 541-523-7121, ext. 211, john.busch@or.usda.gov.

Sept. 24-25 **Red River Valley Section Meeting and North Central Intersectional Conference.** Hosted by Manitoba Section. Winnipeg, Manitoba, Canada. Contact Danny Mann, danny_mann@umanitoba.ca.

ASAE Endorsed Events

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

2004

Oct 27-29 **International Conference on Pesticide Application for Drift Management.** Waikoloa, Hawaii, USA. Contact <http://pep.wsu.edu/Drift04>.

Other Events

For more information, contact the person identified in each listing.

June 28-30 **Riparian Ecosystems and Buffers.** Olympic Valley, California, USA. Sponsored by American Water Resources Association. Contact Harriette Bayse, 540-687-8390, harriette@awra.org, www.awra.org.

July 26-29 **Third Annual North American Surface Water Quality Conference.** Palm Desert, California, USA. Sponsored by StormCon®. Contact 805-682-0200, www.StormCon.com/events.

To have an event listed here, send information to Suzanne Howard, 2950 Niles Road, St. Joseph, MI 49085, USA; fax 269-429-3852, howard@asae.org. Information must reach us *at least* two months before the event.

Student praises Professor Ernest Johnson

For all his students, Professor Ernest Johnson was a visionary and an ultimate gentleman. Long before Microsoft Windows was in vogue, we were thinking about expert systems and intelligent control in the Food Engineering Department at the University of Massachusetts. He is also a down-to-earth and caring individual. He sparked interest in innovative and novel ideas in his students. He never sought publicity for himself.

I am very happy ASAE profiled Professor Johnson (April 2004 *Resource*). He deserves much more for all his contributions. I can say with confidence that a lot of our success in the profession is owed to Professor Johnson. The result is innovative machines designed by his students widely used in food plants in at least Asia, Europe, and the Americas.

Zubin Varghese

Student of Professor Ernest Johnson
Riviere Verte, New Brunswick, Canada

CLARIFICATION

Karl Theodor Renius, recently retired professor of the Technical University of Munich, received the "Ehrenzeichen des VDI," the second highest VDI award (126,000 members). Renius is a 10-year member of ASAE and an ASAE life member. This corrects information written in the April Issue of *Resource*, page 22.

You're invited to a party!



Please send us your recollections, reflections, and visions of the future to be used prior to and at the ASAE 100th anniversary celebration in 2007. All contributions will be preserved in the history files at ASAE. Some may be used in *Resource*, some on the Internet, some at the anniversary festivities.

Read Jimmy Butt's *Last Word* on page 29 for inspiration, then send your material(s) – 100 to 2,000 words – to hull@asae.org or Celebration! ASAE, 2950 Niles Road, St. Joseph, MI 49085-9659 USA.

We can't wait to hear from you!

Resource

Engineering and Technology for a Sustainable World

Vol. 11 No.5

June/July 2004

FEATURES

5 Gopalite®: Abrasive Wear-Resistant Coating

“Since the beginning of time, mankind has been seeking cost-effective solutions to wear,” muses Bruce Boardman, metallurgist, failure analyst, and author of several fatigue and materials selection articles in handbooks. “The path from the laboratory to the factory floor when pursuing the easy-to-apply, flexible, inexpensive, and long-lived coating is *still* the goal.” Boardman credits John Deere scientist Gopal S. Revanker with the latest breakthrough – Gopalite® – the culmination of a career addressing wear problems and applying materials solutions.



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AE50 Awards

Winners of the 2004 *AE50* competition are showcased in this special section. Photos and descriptions of each award-winning product are the highlights of our June/July *Resource* and can be found following page 6.



Guide to Consultants

Our annual listing of professional engineers and engineering firms can be pulled out and saved for future, handy reference. The 2004 *Guide to Consultants* is inserted in the center of the magazine.

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ON THE COVER



Each year, the *AE50* competition recognizes the companies that produce the best machines, components, and systems to improve and enhance agricultural, biological, food, and related industries. The 2004 award recipients introduced their products to the marketplace during 2003. Photos and descriptions of these products, in the special *AE50* section, give pause and applause for the high-tech but down-to-earth creativity and invention that lies behind each one.



Foundation Fun Day

- 7 A day of fun is being planned for Saturday, July 31, preceding the 2004 ASAE/CSAE Annual International Meeting in Ottawa, Ontario, Canada. The day's activities will support the ASAE Foundation and the Society. All ASAE members are welcome and encouraged to participate.

POSITIONS OPEN

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

Advertisements are \$110 per column (3.5-inch wide) inch, which includes placement on *Resource's* Personnel Service Web page at www.asae.org/resource/persads.html. Ads are posted on the Web site within three business days of final approval and remain there until the last day of the issue month (August 31 for the August issue). If the insertion order is for two months, the cost is \$99 per column inch per insertion.

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

We stand corrected ...

In the May 2004 issue of *Resource*, the feature article, "Ag Engineering at MSU," stated that Michigan State University was the first to grant a Ph.D. in agricultural engineering to a woman, Dorothea Haman Burgess, in 1983.

It has been brought to our attention that Irenilza A. Naas, after her successful defense in September 1980, was the first woman granted a Ph.D. not only at MSU but most probably in the United States. In fact, Dr. Merle Esmay, her then-adviser, suspected she might be the first woman worldwide to receive the degree as well as the first of her gender to become a full professor at an agricultural engineering department.

We regret any confusion this informational misstep has caused.

Resource

Engineering & Technology for a Sustainable World

VOL. 11 NO. 5

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS

Resource: Engineering & Technology for a Sustainable World (ISSN 1076-3333) (USPS 009-560) is the monthly publication of ASAE — the Society for engineering in agricultural, food, and biological systems. The Society is a not-for-profit professional and technical organization of members worldwide interested in engineering knowledge and technology for food and agriculture, associated industries, and related resources. The magazine maintains executive, editorial, subscription, and advertising offices at ASAE headquarters, 2950 Niles Road, St. Joseph, MI 49085-9659, USA; 269-429-0300, fax 269-429-3852, hq@asae.org.

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A subscription to *Resource: Engineering & Technology for a Sustainable World* is included in the annual ASAE membership dues. Annual nonmember subscription rates are \$75 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 ASAE order department, 269-428-6325. An application for membership can be obtained by contacting ASAE.

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

Postmaster: Send address changes to *Resource*, 2950 Niles Road, St. Joseph, MI 49085-9659, USA. Periodical postage is paid at St. Joseph, MI, USA, and additional post offices.

Permission to reprint articles available on request. Reprints, in black and white or color, can be ordered in large quantities for a fee. Contact Donna Hull, 269-428-6326. Electrostatic reprints of individual articles, issues, or entire volumes may be purchased from University Microfilms, Box 1346, Ann Arbor, MI 48106, USA; 800-521-0600.

Statements in this publication represent individual opinions. *Resource: Engineering & Technology for a Sustainable World* and ASAE assume no responsibility for statements and opinions expressed by contributors. Views advanced in the editorials are those of the contributors and do not necessarily represent the official position of ASAE.

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ASAE officers: Robert J. Gustafson, President; Jerry L. Wille, President-elect; Lyle E. Stephens, Past President; Ronald L. McAllister, Treasurer; M. Melissa Moore, Executive Vice President.

ASAE council chairs: James C. Converse, Meetings Chair; Gary A. Anderson, Membership Development Chair; Clifford A. Flood, Jr., Publications Chair; James A. Lindley, Standards Chair.

American Society of Agricultural Engineers

2950 Niles Road
St. Joseph, MI 49085-9659, USA
616-429-0300, fax 616-429-3852
hq@asae.org, www.asae.org



TEXAS A&M UNIVERSITY Biological and Agricultural Engineering Department

Assistant Professor/Tenure-track—Biosecurity and spatial sciences related to terrestrial and aquatic environments.

The successful candidate will establish a nationally recognized, integrated research program in one of the evolving areas related to contaminants in terrestrial and aquatic environments and their impact on homeland security. This could include development and application of sensing technologies, biogeochemical process modeling, spatial and temporal assessment of the transport and disposition of chemical and microbial contaminants, and risk assessment.

The faculty member will also be expected to play a principal role in building interdisciplinary teams to address above listed issues. Close collaboration with the Spatial Sciences Laboratory, the Institute for Countermeasures against Agricultural Bioterrorism, the Integrative Center for Homeland Security at Texas A&M and the Texas Water Resources Institute is anticipated.

Teaching responsibilities include undergraduate and graduate courses in water engineering and serving as an undergraduate and graduate advisor and mentor. Participation in professional society activities at the national and local levels is expected.

Candidates must have an earned Ph.D. in biological, agricultural, civil, chemical, environmental engineering or a related discipline. Demonstrated expertise in detection and modeling of chemical or biological contaminants transport in soil and water and in assessing risks to the environment is required. Effective verbal and writing skills are essential. Candidates must have a demonstrated ability to conduct innovative research, a positive interest in students, and the potential for effective classroom teaching. Incumbent should have the interest and capability to work both independently and as a multidisciplinary team member. The candidate will be expected to either hold a professional engineering license or be qualified for registration in the state of Texas.

Review of applications will begin on July 15, 2004, and continue until position is filled. Candidates should provide a letter of application, resume, a one-page statement of career goals in context of the position, college transcripts, and name, address, and phone number of five professional references to Dr. Gerald L. Riskowski, Head, Biological and Agricultural Engineering Department, Texas A&M University, College Station, Texas 77843-2117; phone 979-845-3940, fax 979-862-3442. E-mail applications cannot be accepted.

The Texas A&M University System is an Equal Opportunity Affirmative Action Employer. Committed to excellence through diversity, Texas A&M University particularly invites applications from minorities, women and other protected groups.

Personnel Service



RESEARCH LEADER

**Interdisciplinary Research Agronomist / Soil Scientist /
Research Chemist / Agricultural Engineer /
Research Animal Scientist**
(GS 14-15, Salary Range \$85,210 - 130,305)

The Animal Manure and By-Products Laboratory at the Beltsville Agricultural Research Center, Beltsville, MD is seeking applications for the position of Research Leader. The mission of the laboratory is to develop practical methods to reduce the environmental impact of dairy cattle and other livestock production practices in general. Research activities supervised include manure management and factors affecting alleviation of agricultural nitrogen and phosphorus losses to the environment, remediation of contaminated and nutrient loaded soils, composting, odor generation, and modeling and risk assessment of on farm practices. Supervises research, scientific support, technical, and clerical staff. Doctorate degree is desirable. U.S. CITIZENSHIP REQUIRED. For program information see http://www.anri.barc.usda.gov/amb/amb_new/. For application information, copy of announcement number **ARS-X4E-0221**, or forms call 301-504-1369, or visit the ARS website <http://www.afm.ars.usda.gov/divisions/hrd/index.html>. Applications must be submitted by closing date: July 26, 2004. USDA/ARS is an equal opportunity provider and employer.

ASSOCIATE/FULL PROFESSOR OF ENVIRONMENTAL SCIENCE/ENGINEERING

Division of Agriculture
West Texas A&M University, Canyon, TX

Responsibilities: Conduct research and develop a nationally recognized interdisciplinary program to address multi-faceted environmental challenges faced by the agricultural and industrial industries in the Texas Panhandle. Teach undergraduate/graduate courses and advise M.S./Ph.D. students (12-month position).

Qualifications: Ph.D. in Agricultural Engineering, Environmental Science, or closely related field. Demonstrated experience in waste management and applied modeling of air, surface water, or groundwater.

Applications: Review of applications will begin immediately and continue until filled. Provide a letter of interest, official transcripts, resume and arrange for three letters of reference to be sent to:

Dr. Don Topliff, Head, Division of Agriculture, West Texas A&M University, Box 60998, Canyon, Texas 79016-0001. Telephone: 806-651-2550, dtopliff@mail.wtamu.edu. Texas law requires that males, age 18 through 25, be properly registered with the Selective Service System in order to be eligible for employment. This is a security-sensitive position.



The U.S. Department of Agriculture, Agricultural Research Service, is accepting applications for an **Agricultural Engineer, GS-890-11/12/13** at the U.S. Dairy Forage Research Center in Madison, Wisconsin. Salary is commensurate with experience (\$50,708 - \$90,692 per annum) plus benefits. U.S. citizenship is required. Incumbent will conduct basic and applied research about harvesting, transport, and storage of plant materials for traditional and nontraditional, value-added products, including energy. Incumbent will supervise one or more technicians, and will be required to publish the results of the research. Research objectives are to increase efficiency and reduce unit cost of harvesting forage crops, and to improve the technical and economic feasibilities using crop quality characteristics of bio-based products and feedstocks including fuels. For information, contact Neal Martin, 608-264-5240, npmartin@wisc.edu. Candidates must request the vacancy announcement (ARS-X4W-0270) by calling 301-504-1482 or via the ARS Homepage at www.ars.usda.gov/careers. Location contact: Jean Weinbrenner, 608-264-5357, jweinbr@wisc.edu. Candidates **must** submit specific information as outlined in the vacancy announcement. Applications **must** be postmarked by August 16, 2004. USDA is an Equal Opportunity Provider and Employer.



INTERDISCIPLINARY: PLANT PHYSIOLOGIST/SOIL SCIENTIST/AGRICULTURAL ENGINEER/ECOLOGIST (MODELING) GS-11/12/13

Salary Range
GS-11 - \$48,947 to \$63,629 per annum
GS-12 - \$58,665 to \$76,261 per annum
GS-13 - \$69,762 to \$90,692 per annum

The Great Plains Systems Research Unit, Fort Collins, Colorado is seeking a permanent full-time scientist to serve as an agricultural system modeler. The incumbent's research focuses on synthesis and quantification of knowledge, including development of new concepts and theories of the water stress response of field-scale cropping systems and/or the range-crop-livestock production systems, and its interactions with other factors, and the development of improved simulation models of these systems under stress conditions. Salary is commensurate with qualifications and experience. A comprehensive benefits package includes paid sick leave and annual leave, life and health insurance, and a savings and investment plan (401K type), and a Federal retirement plan. For details and application directions, see <http://www.afm.ars.usda.gov/divisions/hrd/index.html>. The position is listed as announcement number ARS-X4W-0274. To have a printed copy mailed, call 301-504-1482. U.S. citizenship is required. Application must be postmarked by 07/06/04. USDA/ARS is an equal opportunity employer and provider.

Personnel Service

PRODUCT ENGINEER

If you are seeking a company that offers exciting new challenges AND satisfying rewards as well, The GSI Group, Inc. is the place for you! We are an expanding world class manufacturer that specializes in products for the agricultural industry. Our small town, central Illinois location magnifies a family-oriented setting, but still has close access to metropolitan cities.

Position requires a BS degree in Engineering, steel design experience, and CAD proficiency. Experience with grain bins, grain storage structures, or industrial storage tanks is a plus. You will be responsible for structural design, development of grain storage structures, and related accessories and equipment.

Don't miss this excellent opportunity to join an agricultural manufacturing firm that offers a competitive compensation and benefits package, a team-oriented philosophy, casual work environment, and career growth potential. Qualified candidates are encouraged to send their resume and salary requirements to:

The GSI Group, Inc.
Human Resources - Engineer
PO Box 20
Assumption, IL 62510
Fax: (217) 226-6065
E-mail: karenf@grainsystems.com
EOE M/F/V/D

Visit our web site at www.grainsystems.com
to learn more about The GSI Group, Inc.



INTERDISCIPLINARY: AGRICULTURAL ENGINEER/ SOIL SCIENTIST GS-12/13/14

Salary Range
GS-12 - \$58,665 to \$76,261 per annum
GS-13 - \$69,762 to \$90,692 per annum
GS-14 - \$82,438 to \$107,170 per annum

The Northern Plains Agricultural Research Laboratory, Sidney, Montana, is seeking a permanent full-time scientist to work as part of a research team developing technologies and strategies for water quality protection and to develop new approaches leading to integrated, effective, and ecologically sustainable irrigated cropping systems appropriate to the semi-arid Northern Great Plains. Research responsibilities will primarily focus on soil and water management strategies for center pivot irrigated systems. Specifically, the incumbent's field of research covers critical problem areas of irrigation water management, salinity management, agrochemical management, soil management (compaction), surface and soil water monitoring as related to water quality protection. Specific projects include water movement in soils, quantification and mitigation of soil compaction, agricultural chemical leaching, water-energy relationships, and enhanced nitrogen and water use efficiencies. For details and application directions, see <http://www.afm.ars.usda.gov/divisions/hrd/index.html>. The position is listed as announcement number ARS-X4W-0205. To have a printed copy mailed, call 301-504-1482. **U.S. citizenship is required.** Application must be postmarked by 07/02/04. USDA/ARS is an equal opportunity employer and provider.

ASSISTANT PROFESSOR PRECISION AGRICULTURE/MECHANICAL HARVESTING UNIVERSITY OF FLORIDA, CITRUS RESEARCH AND EDUCATION CENTER, Lake Alfred, Florida

This 12-month, tenure-accruing faculty position is a 70% research (Florida Agricultural Experiment Station)/30% extension (Florida Cooperative Extension Service) assignment to address precision agriculture and mechanized harvesting programs for Florida's citrus industry. The incumbent is expected to develop an independent program with emphasis on variable-rate technologies, yield monitoring, real-time sensing, and strategies for mechanical harvesting and GIS implementation for citrus. Leadership in workshop development and computer-based extension tools which incorporate remote sensing mechanized harvesting and GPS/GIS will be key elements in the extension assignment. Graduate student and postdoctoral supervision are expected and the individual's academic appointment will be through the university's Agricultural and Biological Engineering department. Extramural program support should be developed through national grants, citrus industry programs, and state agencies emphasizing best-management practices for agriculture. Candidates should have a Ph.D in Agricultural/Biological Engineering or other agricultural or engineering disciplines with emphasis on mechanization, GPS/GIS or other precision agriculture technologies. Computer programming, electro-mechanical design, electronics and digital communications are considered essential skill areas. Postdoctoral experience is desirable. Selected candidate should be supportive of the mission of the Land-Grant system and have a commitment to IFAS' core values of excellence, diversity, global involvement, and accountability. Interested persons are requested to submit: (1) letter of application which includes summary of interests, experience, and qualifications related to this position; (2) complete resume of professional experience including all publications; (3) names and contact information of four references who may be asked for letters of recommendation; and (4) official transcripts of all academic training (transcripts must be sent directly from the institution to address below). All of the above items should be postmarked by 1 July 2004. Women and minorities are encouraged to apply. Refer to position # 924990. Inquiries and applications should be directed to: Dr. William M. Miller, University of Florida, IFAS, Citrus Research and Education Center, 700 Experiment Station Road, Lake Alfred, FL 33850. Phone: (863) 956-1151, FAX: (863) 956-4631, E-mail: wmm@crec.ifas.ufl.edu.

POSITIONS WANTED

ASAE members are entitled to a two-month listing free of charge. Nonmembers are charged \$55 for a one-month listing. Includes placement on *Resource's* Personnel Service Web page at www.asae.org/resource/persads.html. For more details on this service, contact ASAE Personnel Service Department, 2950 Niles Road, St. Joseph, MI 49085-9659 USA; 616-428-6337, fax 616-428-6329, bakken@asae.org.

AGRICULTURAL ENGINEER with over 10 years of consulting and university-research experience in remote sensing (VIS/SWIR/TIR via aircraft, satellite), GIS (ERDAS, RSI, ESRI), positioning (GPS, GPR, LIDAR), and datamodel/metadata issues (FGDC, NASA). Looking for public or private sector opportunity in Florida, Georgia, Alabama or Tennessee. Interests include agricultural, natural, and cultural resources mapping, RS/GIS coordination. Available May 2004. W-1048

Gopalite® – Abrasive Wear-Resistant Coating

The path from the laboratory to the factory floor

Bruce E. Boardman

Since the beginning of time, mankind has been seeking cost-effective solutions to wear. The advent of mechanized farming has further increased that need. Today, additional increases in abrasive material flow-through, over, or within a piece of machinery have raised the need for further increases in wear resistance. While heat-treated steel, hard metal platings, and ceramic inserts remain the mainstay for many wear protection scenarios, the easy-to-apply, flexible, inexpensive, and long-lived coating is still the goal.

Recent developments and understandings have resulted in a new, highly wear-resistant slurry coating process for steel and cast irons that can be applied in multiple ways (dip, brush, spray), will follow the contour of any shape (top, bottom, side, inner diameter, outer diameter), can be machined in the green state, will sinter to better than 99.5 percent theoretical density, will survive subsequent heat treatment of the base part, is highly available, and is moderate in cost. (Sound like an oxymoron?)

For the sake of definition

First, a brief comment on wear protection. Most wear conditions may be thought of as falling into one of two broad categories – tribological or abrasive wear. While a technically correct description would be two-body and three-body wear systems, for the purpose here tribological wear can be thought of as involving clean, lubricated sys-

tems (engines, transmission, hydraulics) and abrasive wear can be referred to as the flow of abrasive particles

(sand, crop, stones) across the mating surfaces and may involve high or low stress, erosion, corrosion, and/or impact events. In abrasive wear, the strongest correlation between the materials involved and the wear rate is the ratio of the hardnesses of the abrasive and the part. When protecting with a coating, the ability to withstand the point/line contact of the wear particle is just as important. (Think of thin ice on a mud puddle.) To put coatings into perspective, the thickness of a tribological coating is measured in microns

while the thickness of an abrasive coating is measured in millimeters.

In search of the perfect solution

John Deere scientist, Gopal S. Revankar, has spent a significant portion of his career addressing and applying materials solutions to wear problems. Over the last few years, through a series of failure-analysis events and the development of a root cause for wear on crop/soil engaging tools, Revankar identified changes relating to the particle size mixture and to the binders used to temporarily hold the coating prior to sintering. Changes were made to existing slurry-based coating systems which resulted in significant performance enhancements (upwards of 50 percent) while reducing the coating cost by an order of magnitude over other currently available wear coatings.



Revankar in the laboratory.

Abrasive beginnings

As with any new material and/or process, the design engineer demands performance data before committing to its use. (This time, think chicken and egg.) With limited ASTM Rubber Wheel Abrasive (G65) data and real-part field test data, the designer hesitated to make a change when things appeared to be working. It took the introduction of the John Deere STS (single-tine separator) combine to get things rolling. This new combine is a high productivity machine that processes significantly more crop material in a shorter period of time. In some abrasive crops, this increased processing rate resulted in increased abrasive wear. Unfortunately, since the customer thinks in terms of hours on the machine (from the engine hour meter) rather than bushels of crop harvested, the new machine *appeared* to not wear as well as the old version. Now the designer had reason to make a change, the previous concerns disappeared, and the Gopalite® coating was adopted.

Currently, there are two very different machines in the Deere line that are utilizing what Deere is calling the Gopalite® coating. The STS combine now has the high wear option (see the AE50 award section for the 60 Series machine® utilizing this coating) that relies on Gopalite® coatings on the working surface of the tine and element (as well as more traditional surface conditions and treatments for other parts). The other example that will soon be in production is a Gopalite®-coated track pin bushing for the undercarriage on earthmovers. This part is coated, machined, and heat treated to provide in excess of double the wear life of traditional, state-of-the-art bushing.

Engineers within the company are now exploring many other potential uses for this coating system where abrasive wear protection is desired. The possibilities range from cultivating tools and grain delivery chutes to other pin joints and cutting blades. The greatest value will be found when there is a small



Coated tine used in high-productivity STS combine.

wearing surface on a large expensive part or when the cost (time and material) to replace the worn part is high.

From production process to factory floor

The biggest challenge of entire project has been the transition from a laboratory process to a robust production process ready for the factory floor. Unlike the normal progression, where the laboratory process (beakers and test tubes, one at a time) proceeds to bench scale production (a few at a time) to small scale production (dozens at a time) to full scale production, Revankar was asked to go straight from bench scale to full scale production, on the above parts, at the same time. That is where the fun started. Actually, the initial plan was to include the small scale phase. But, when the first month's orders exceeded the projection for an entire year, the small scale stage grew into full production. Since Deere was not doing this in captive

facilities, the development team ended up spending many days learning more about their various supplier partners and technology licenses manufacturing processes, equipment, and facilities than may typically be required from a more mature process.

Lessons learned, lessons shared

Now that the process is in production, there are several lessons to be shared.

- Probably most important, is that when the technologies involved are independently well developed the probability of success is relatively high;
- Initial implementation is unlikely to be error-free, so there will still be nights of lost sleep, new gray hairs (or lost ones), and difficult discussions with nearly everyone involved; and
- The small-scale production phase serves to bring the technical and manufacturing staffs together earlier in the process where events are more controllable and the risks are lower.

The path to bring new technology into the marketplace is never easy, and there will continue to be new challenges. But anything worth pursuing is never easy, or someone else would have already accomplished it. **R**

Bruce E. Boardman is Metals Research manager, John Deere Technology Center, One John Deere Place, Moline, IL 61265-1792 USA; 309-765-3814, fax 309-765-3807, BoardmanBruceE@JohnDeere.com.



Coated element used in high-productivity STS combine.



Coated bushing used in tracked vehicle undercarriage.

Inside ASAE

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Welcome New Members

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Foundation Fun Day

A day of fun is planned for Saturday, July 31, preceding the 2004 ASAE/CSAE Annual International Meeting in Ottawa, Ontario, Canada. The day's activities will support the ASAE Foundation and the Society. All ASAE members are welcome and encouraged to participate.

Several activities are being scheduled, including a round of golf, a garden tour, and an evening at the National Arts Centre.



This golf course is well respected for its great layout and outstanding conditions.

Canadian Golf Country Club Outing

Enter yourself or a foursome in an 18-hole championship golf course at the Canadian Golf Country Club. Tee off time is 9 a.m. Included in the cost are greens fee and cart, transportation to and from the golf course, and a deluxe box lunch in the carts. Cost of the package including tax and service charges is \$134 Canadian and \$100 U.S. per person (portion tax deductible). Club rental is an additional \$12 Canadian and \$9 U.S.

Behind the Hedges Garden Tour

Ottawa is home to a number of beautiful, historic, and unique gardens. This tour features the oldest walled garden in Eastern Ontario and a private garden belonging to the vice president of the Canadian Peony Society in exclusive Rockcliffe Park. The tour also includes the Central Experiment Farm and the Dominion Arboretum, a 400-hectare (988-acre) farm in the center of the city that was established in the late 1800s as one of a network of working farms across Canada. The tour will be held from 9 a.m. to 1 p.m. Cost is \$67 Canadian and \$50 U.S. per person.



Discover the history and beauty of many of Ottawa's beautiful gardens.



The National Arts Centre is among the largest performing arts complexes in Canada.

Evening with the Arts

This evening of entertainment at the National Arts Centre includes a reception, a gourmet dinner provided by world renowned chef to the Canadian Prime Minister, music, and dancing. Opened on June 2, 1969, the National Arts Centre is one of the largest and most comprehensive performing arts facilities in the world. It features one of the largest stages on the continent. The cost for this fun-filled evening is \$101 Canadian and \$75 U.S. per person (portion tax deductible).

To register for any of these events, visit www.asae.org/meetings/am2004/index.html.

Join us for the Foundation Fun Day!

A WORD FROM THE PRESIDENT

Board of Trustees Expresses Opinion on Society Name

ASAE President Robert J. Gustafson, The Ohio State University

Since this will be my last opportunity to address you through *Resource* magazine as President of ASAE, let me start by saying it has been an honor and a privilege to serve the Society this past year. I come away with an increased optimism about our future as an engineering society and for our discipline. I hope my service has been worthy.

I want to use the remainder of this column to report to you on an activity of the Board of Trustees that is important for all of us at this time. At its May 1 meeting the Board continued its discussion of the Society name issue. Inputs from various sources including the surveys done by the task force on name issues (see the May 2004 issue of *Resource* and the ASAE Web site) were carefully considered. After thoughtful and lively discussion, the Board came to the point of unanimously passing a motion that “the Board of Trustees would support a name change to American Society of Agricultural and Biological Engineers.” The Board feels that including the word “biological” in the name of the Society is what will best serve the Society in the future. The Board did not support other changes embedded in the currently tabled motion. Since the name of the Society is an issue decided by membership vote, I encourage you to discuss this position with any of the Board members and others as opportunities arise. For this issue and any others you may want to discuss, the Board will continue the practice of having a booth staffed by one or more Board members at the annual meeting this year in Ottawa.

Actions at our business meeting during the summer meeting will likely determine if a ballot on name change is to occur and if so, what the proposed name on a ballot might be. If a name change motion is passed at the business meeting, it would then be balloted to the members early in 2005. Since the name is a constitutional issue, any change would require a two-thirds majority of those voting to pass. If passed, it would take effect at the end of the annual meeting of 2005.

Just to be clear, the logo of the Society and the tagline are really separate issues that would have to be addressed if and when the Society name changes. These are covered by the Bylaws of the Society and as such become the responsibility of the Board of Trustees.

No matter where we come out on the issue of name, I want to thank the many persons who took the time to fill out the survey and make input in other ways. Both the response rate and the content of the responses indicate that our members really do care about the future well-being of the Society. We can certainly be rightfully proud of our Society, its members, and its accomplishments.

I have every intention of remaining very active in the Society and continuing my efforts on its behalf. However, I want to thank you again for the opportunity to serve as 97th President of ASAE.

Johnson Awarded ASAE Student Engineer of the Year Scholarship

Candice L. Johnson, a senior in biosystems and agricultural engineering at Oklahoma State University (OSU), is the recipient of the 2004 Student Engineer of the Year Scholarship.

This scholarship is presented annually to an outstanding engineering undergraduate ASAE student member enrolled in an ABET or CEAB accredited agricultural/biosystems engineering program in the United States or Canada. Applicants are required to prepare a paper detailing their engineering goals. The scholarship is made possible by the generosity of Roger R. and Laura M. Yoerger through the ASAE Foundation.

Johnson will receive the \$1,000 scholarship during the OSU Alumni and Friends Social to be held during the ASAE/CSAE Annual International Meeting in Ottawa, Canada.

Johnson plans to graduate in December 2004 and then pursue a master's degree in machinery design. She serves as president of the ASAE Preprofessionals Council and has been a member of ASAE for four years. She is a participant in the Scholars Program of the College of Engineering, Architecture, and Technology.

Johnson's goal is to obtain employment with an agricultural equipment manufacturer contributing to the advancement of farming practices. Having grown up on a farm in Iowa, Johnson says she realizes the need for the development of new machinery technology to help farmers gain more control over their destiny.

While attending classes, Johnson obtained practical work experience as an assistant to a department research engineer with projects ranging from electronic control systems and sensors to mechanical transmissions and engines. During her freshman year she was selected as a cooperative education student to work with Deere & Company, which resulted in her exposure to various aspects of the agricultural equipment industry including marketing, quality, production, and design engineering.



CAST Update

Did you know that ASAE is a member society in the Council for Agricultural Science and Technology (CAST)?

The CAST Board of Directors is made up of a representative from each of CAST's 38 member societies, an individual member representative, an eight-member Executive Committee, four ex-officio board members, and an Executive Vice President. The Board meets twice a year to conduct business and discuss ways to fulfill CAST's mission, which is to assemble, interpret, and communicate science-based information on food, fiber, agricultural, natural resources, and related societal and environmental issues.

CAST's Spring 2004 Board of Directors meeting was held in March in Washington, D.C. The meeting focused on strategically planning activities for 2005 through the development of an annual plan. Proposed action items were prioritized by the Board with the highest ranked items to be incorporated into the 2005 budget.

Three new publications/projects were approved during the spring meeting. These include an issue paper, *Postcommercialization Gene Flow from Biotechnology-derived Crops: Policy and Research Considerations*; a conference and special publication, *Water Quality and Quantity Issues for Perennial Grasses Used in the Urban Landscapes of North America*; and a symposium and special publication, *Nondietary Exposure to Organophosphate Pesticides; Reporting and Estimation of Exposure and Risk to Workers and Bystanders*.

The next CAST Board of Directors meeting will be held in September in Oklahoma City. As the ASAE representative to the CAST Board of Directors, I welcome any questions, comments, or issues you would like to bring to my attention. You may e-mail me at wcoates@u.arizona.edu or call 520-741-0840.

To learn more about CAST, visit their Web site at www.cast-science.org.

Wayne Coates
ASAE Representative
to CAST Board of Directors

ASAE Welcomes ISAE

ASAE has signed a cooperative agreement with the Indian Society of Agricultural Engineers (ISAE). The purpose of the agreement is to increase networking, technology transfer, and communication.

"We are looking forward to this agreement, and others, enhancing the communication and awareness of agricultural engineering worldwide," says Melissa Moore, ASAE Executive Vice President. "We have welcomed our first group of members from ISAE into ASAE, and they now have access to all our online member benefits including standards, the technical library, and our technical expertise database. The database should be especially helpful in increasing networking within India for our ASAE/ISAE members."

ASAE has two other cooperative agreements in place: a long-standing agreement with the Canadian Society of Agricultural Engineering and one with the Association of Overseas Chinese Agricultural, Biological, and Food Engineers.

2004 ASAE Nominating Committee Seeks Input

The 2004 ASAE Nominating Committee is seeking well qualified candidates for the following ASAE offices.

President-elect of ASAE

ASAE 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 2005.

Both the president-elect and the four new trustees at-large will join the board after the 2005 annual meeting. The trustees will serve two-year terms ending at the end of the 2007 annual meeting. The president-elect will serve one year as president-elect, one year as president, and one year as past president.

We are also seeking nominees for seven positions (14 nominees in all) on the 2006 ASAE Nominating Committee. This year's candidates will be selected to repre-

sent the following divisions and districts: BE, FPE, IET, PM, SW, District 2 (South/Southeast United States, (see page 270 *ASAE Member Roster*), and District 4 (West, Southwest).

The committee is soliciting suggestions for nominees for these positions. Selection of officers and members of the nominating committee is extremely important to the success of ASAE, and we will appreciate your help in identifying well-qualified candidates. You may submit your suggestions to a member of the nominating committee listed below. I will be happy to receive names of potential nominees by e-mail at skaggs@asae.org or phone 919-515-6739.

Members of the 2004 ASAE Nominating Committee are: Cady R. Engler, Shahab Sokhansanj, Douglas J. Reinemann, Raymond L. Hunhnke, Walter J. Rawls, Billy J. Barfield, Henry A. Affeldt, Ronald H. Campbell, Wayne Coates, James H. Dooley, David Friederick, Ronald L. McAllister, Richard J. Straub, and Lyle Stephens, Ex Officio.

Thanks for your help in this important ASAE activity.

R. Wayne Skaggs
for the 2004 Nominating Committee

Call for Nominations for 2005 ASAE 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, 2004

- **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 Bronze 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. Bronze 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.
- **ASAE 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.
- **IAFIS-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. 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 ASAE Annual International Meeting. Gold medal, certificate, \$2,000 and travel expenses to the IAFIS conference; bronze medal presented at the ASAE 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 & 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 ASAE 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 ASAE standards. Engraved plaque.
- **PEI Professional Engineer of the Year Award.** New for 2004. Recognizes a licensed engineer who has made outstanding contributions to the engineering profession, the public welfare, and/or humankind.

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

Streams, Watersheds, and Wetlands are September Conference Topic

Self-Sustaining Solutions for Streams, Watersheds, and Wetlands, an ASAE speciality conference, will be held Sept. 12-15, 2004, at the Riverfront Radisson Hotel, St. Paul, Minn.

For years humanity has been modifying wetlands, streams, and watersheds. However, most of these modifications have occurred in the last 200 years. There are dams, bridges, and river lock systems worldwide that are astonishing engineering feats. Some of these structures have adversely impacted channel systems, eliminated wetlands, and caused streams and rivers to have been straightened, dredged, and banks artificially hardened. Often the focus has been on hydraulics with little regard to ecology or natural stream processes and limited understanding of the influence of rapid land-use change on watersheds. Wetland losses worldwide exceed 50 percent and continue to grow.

The last few decades have seen increasing interest in enhancing, restoring, and protecting the ecology of wetlands, streams, and watersheds. To achieve these goals requires sound fundamental and applied knowledge, close interaction between scientists and engineers, a systems approach, and a good understanding of spatial and temporal scales. A better approach might be to reduce the amount of initial engineering of the system and assist nature in developing a more self-sustaining system.

This conference will explore innovative solutions for stream and wetland restoration and management that seek to re-estab-

lish and maintain self-sustaining ecosystems; expand the understanding of stream and wetland processes and how knowledge of these processes can be used in water resource protection, design, and management; have experts provide cutting-edge knowledge on theory, methods, and tools that will aid in maintaining or developing self-sustaining high quality stream and wetland systems; enhance the capabilities of professionals engaged in natural channel design; and provide knowledge and training through workshops that will better position participants to protect and enhance water resources.

We would like to thank those people who have offered to participate in this conference. They include experts who have been in the forefront in developing methods to further the development of fully functional and self-sustaining stream, wetland, and watershed systems. We are also excited by the response and high caliber of over 80 oral and poster presentations to be made during this four-day conference. Registration is \$625 and allows you to participate in two full-day workshops, hear all the keynote presentations, attend many of the 80-plus technical presentations, and receive workshop materials, a proceeding of all the papers, and at least one textbook by Bill Mitsch or Dave Rosgen.

Visit www.asae.org/meetings/streams2004/Index.html for more information. We hope you will join us.

Andy Ward, Conference Chair



COOPERATIVE STANDARDS PROGRAM

New Standard

ASAE EP505 APR04, Measurement and Reporting Practices for Automatic Agricultural Weather Stations. Approved by the ASAE Soil and Water Division Standards Committee April 2004. This new standard was developed by SW-244, Irrigation Management Subcommittee. It was developed to establish minimum recommendations for measurement, reporting, siting, operation, maintenance, and data management procedures for automatic agricultural weather stations.

New Revision

ASAE S561.1, Procedure for Measuring Drift Deposits from Ground, Orchard, and Aerial Sprayers. The revision encompassed changes to sections dealing with topics such as reference spray application, mass balance, atmospheric stability, number, size, and orientation of sampling stations, referencing of appropriate ISO standards, air assist spray application, and revision to normative references section. This project also set guidelines for measuring drift deposits from spray activities.

New Project

X589, Odor Detection – Threshold Measurement and X590, Odor Intensity Measurement. The need of a uniform procedure to measure odors from livestock facilities is increasing since the Environmental Protection Agency of the U.S. government and many state regulator agencies are now focusing on odor and air quality emissions from confined animal feedlot operations. Discussion with involved individuals indicates an interest in developing an odor threshold standard.

X591, Standardized Procedure for Measuring Trip Force on a Tillage Shank Trip Mechanism. Based on a demonstrated need within the industry, the Farm Equipment Manufacturers Association Tillage Council has recommended this project for consideration as a standardized method for testing tillage equipment as a marketing comparison tool. Currently there is a lack of consistency in the values advertised in the marketplace. This standard will eliminate that issue.

For more information, contact ASAE Standards, 2950 Niles Road, St. Joseph, MI 49085-9659, USA; 269-428-6331 or 269-429-0300 ext. 315, fax 269-429-3852, or visit www.asae.org/standards/index.html.

YOUNG PROFESSIONALS COMMUNITY

Young Professionals, There's a Committee For You!

Are you looking for a creative outlet for your talents? Serving on an ASAE committee is the way to go. No matter what your particular interest or field of expertise, there is an ASAE committee for you. My manager loves that I'm involved with ASAE committees because they allow me to learn to work with diverse groups of people and provide an opportunity to develop leadership skills. I feel a sense of ownership in the Society through my committee involvement and am excited that I have the opportunity to help guide and improve the Society. Members looking to serve on a committee usually struggle with two questions: "Which committee is right for me?" and "How do I get involved?"

Which committee is right for you? Well, ASAE has both technical and non-technical committees. To learn more about technical committees, visit www.asae.org/membership/committees/committee.html. This link will give you a listing and brief description of the technical committees. Non-technical committees include award selection, meeting planning, Society education, curriculum accreditation, and preprofessional competitions, to name a few. Keep an eye on the ASAE Web site for a listing of non-technical committees soon to be posted.

How do you get involved? Personally, I looked at all the committees meeting at the Annual International Meeting, asked some experienced ASAE members about the ones I thought sounded interesting, and chose a couple to sit in on. Once in the committee meetings, I volunteered to help. Easy, right? For some, this would be an overwhelming experience. So, during the Annual International Meeting, the Young Professionals Community will host a Committee Education seminar on Sunday afternoon. ASAE committees will be discussed, and a number of committee chairs will be in attendance to answer your questions. If you want to get involved but don't know how, this session will prove invaluable. In the meantime if you have questions about ASAE committees, e-mail Mark Crossley at crossley@asae.org or myself at yagowjohnl@johndeere.com.

Chad Yagow, YPC Chair

The Forum ... More than Just Roman Architecture

You might be wondering what I'm talking about. The Roman Forum was the social center of ancient Rome, shaped by the surrounding architecture to promote the co-mingling of all classes and to strengthen the sense of the Roman community. It was where news was dispensed and matters of importance were discussed. We have the same social center, only in cyberspace, known as the Young Professionals Community (YPC) Web Forum. The YPC Web Forum serves

the same purposes as its historic counterpart, with the latest news on YPC activities and the discussion of topics important to YPC members. It allows all our members to network with each other while never having to leave home or office. Visit the YPC Web Forum and help strengthen our community.

To access the public YPC Web Forum:

- a) Point your Web browser to www.asae.org.
- b) Click the "Forums" link on the left-hand side.
- c) If you don't already have a Forums username and password, click the "Register" button. If you're an ASAE member, please use an upper-case "M" followed by your 7-digit member number as your login name; use any password you choose; if you're not an ASAE member, use any login name and password you choose.
- d) After you register and log in to the Forums, you should see a link in the right-hand column that says "Young Professionals." Click this link.
- e) Postings will now appear which you should be able to view and reply to at your leisure. Older postings are available in the Archived Postings folder.
- f) Contact Travis Tsunemori at travist@asae.org or 269-429-0300, ext 309 with any problems.

Chad Yagow, YPC Chair

Annual Meeting YPC Activities

The Young Professional Council would like to invite you to attend the 2004 ASAE Annual International Meeting in Ottawa. As part of this year's festivities, the YPC is hosting several activities ranging from a relaxed fun-filled evening on the Ottawa River to an enlightening continuing professional development (CPD) course.

The schedule for this year's meeting begins on Saturday, July 31, and includes a riverboat cruise on the Ottawa River followed by dinner at the Marbleworks Steakhouse. The evening will end with a YP business meeting and then a night on the town in beautiful downtown Ottawa.

Extreme Project Management, a CPD course, will be held from 10 a.m. to 3 p.m. Sunday. The cost is \$70 (U.S.) for YPs and Preprofessionals, \$80 for all others. A Standards and Committee session to discuss the standards process and committee structure is also scheduled on Sunday from 3:30 to 5 p.m. The Standards Council mentoring program will be mentioned and committee chairmen will have the opportunity to talk about their committees. There is no charge for the session on standards and committees.

Any questions about this year's activities or the Young Professionals can be directed to myself at serucker@travelers.com.

Stefanie Rucker

SECTION NEWS

New Mexico Section

The ASAE New Mexico Section annual meeting featured a field trip to learn about the pipelining project of the Elephant Butte Irrigation District. In addition to irrigation developments, members heard reports about production of energy from partial aerobic composted dairy waste, thermal defoliation of cotton, and problems with machine harvesting of chile.

Section President Dean Pritchett conducted an efficient business meeting which included authorization for a scholarship for a student studying engineering for agriculture.

Wayne Maley



Standing on a covered section of a major irrigation lateral, project designer Henry Magallanes points out features of the electronic monitoring system.

Iowa Section Officers Meet



The ASAE Iowa Section outgoing (2003-2004) and incoming (2004-2005) officers held an executive committee meeting in April for officer transition and to plan upcoming meetings. Officers attending the meeting included l to r: (kneeling) Kapil Arora, Tom Glanville, Rob Malone, Carl Anderson, and Amy Kaleita; (standing) Josh Englebrecht, Elizabeth Earles, Jason Eubanks, Ryan Benning, Mark Jensen, Joe Ruhland, Tom Colvin, Norm Fredrich, Mark Hanna, and Isaac Bowers.

Minnesota Section

Post-frame buildings were the topic for the April 23, 2004 meeting of the Minnesota Section of ASAE. In 2001, Lester Buildings of Lester Prairie, Minn., erected a 12 × 61 m (40 × 200 ft) building solely for the purpose of testing the behavior of metal-clad wood frame buildings under wind loads. A system of cables and hydraulic cylinders is used to apply loads to the structure. The instrumentation and load system allows the company engineers to simulate wind stress and measure the effects of lateral force, movement, pressure, and bending. This is a joint effort between Lester Buildings and the University of Wisconsin-Madison.

Paul Boor, Lester's divisional Engineering Manager, presented background information on the design of post-frame buildings and the test building prior to a tour of the facility. Prior to the tour at Lester, an ASAE business meeting was held at the University of Minnesota-St. Paul campus in the Biosystems and Agricultural Engineering building. A highlight of that meeting was a presentation by the student chapter members who will be competing in the 1/4-scale tractor pull contest in June, including a look at the completed tractor.

Sonia Maassel Jacobsen



Paul Boor of Lester Buildings talks about the equipment in the test building for measuring wind stresses. (Photo by Sonia Maassel Jacobsen)

Ottawa Meeting Updates

For the latest meeting updates visit www.asae.org/meetings/am2004.

You'll find the most up-to-date information on technical sessions, committee meetings, tours, travel information, registration, and more.

MEMBER NEWS

ASAE Fellow John S. Cundiff P.E.,



a professor of biological systems engineering at Virginia Tech since 1980, was recently awarded the Virginia Tech College of Engineering Certificate of Teaching Excellence.

Cundiff is active in curriculum development and was an early advocate of science-based curriculum in the biological systems engineering discipline. He has published three text books and is a 32-year member of ASAE.

Mary Leigh Wolfe, associate professor of biological systems engineering at Virginia Tech,



was part of a group awarded the USDA Secretary's Honor Award. Wolfe was honored for her work with colleagues at Virginia Tech in developing the

Virginia Phosphorus Index. She has been a member of ASAE for 19 years.

Mike Zhang, assistant professor of biological systems engineering at



Virginia Tech (VT), recently received the College of Engineering Dean's Award for Outstanding Assistant Professor. This honor was based on Zhang's extraordinary level

of activities and accomplishments in curriculum development and teaching, development of a viable research program, and forging an extraordinary level of collaborations with colleagues at VT and across the United States.

Zhang obtained his bachelor and master degrees in metallurgical physical chemistry from the University of Science and Technology in Beijing, China. In 1999, he received his doctorate in chemical engineering from Iowa State University. He has been a member of ASAE for one year.

Edward C. Martin was recently presented the Arizona Agriculture "100"



Council Faculty Member of the Year Award for 2004. He is an associate professor and associate extension specialist in the Department of Agricultural and Biosystems

Engineering at the Maricopa Agricultural Center at the University of Arizona. The award was given in appreciation of Martin's service and dedication to the University, the Arizona Agriculture Industry, and his extension work to the state community.

He earned his bachelor's degree in agricultural engineering, master's degree in agricultural and extension education, and doctoral degree in agricultural technology and systems management, all at Michigan State University. He is a 21-year member of ASAE.

Daniel E. Martin has joined the USDA's Aerial Application Technology



Team at College Station, Texas. He received his bachelor's degree in agricultural engineering from Virginia Tech in 1988 and his master's and doctoral degrees in biological

and agricultural engineering from Louisiana State University in 1994 and 2003, respectively. He has conducted Louisiana's Aerial Application Program

for the past 10 years, providing pattern testing clinics and educational programs in drift minimization and pilot safety. His new position will emphasize precision application technologies. He is a 19-year member of ASAE.

Roger D. Mayhew, P.E., of Fredonia, Wis., retired April 1 from



Weasler Engineering where he was vice president of engineering. He graduated from the University of Illinois in 1961 and started working as a test engineer for

International Harvester. He also worked for FMC Corp., Bolens Division, in a number of design engineering positions. Mayhew has been a member of ASAE for 43 years.

ASAE Fellow James H.



Dooley, P.E., was elected ABET secretary for 2004-2005. He is serving his second year of a two-year term as board representative to ABET's executive committee representing

ASAE. He holds engineering degrees from Cal Poly, San Luis Obispo, University of California at Davis, and the University of Washington. He is President and CEO of Silverbrook Limited and is Executive Manager of Forest Concepts in Federal Way, Wash. He has been a member of ASAE for 32 years.

Members ...

Send your news to Suzanne Howard at howard@asae.org.

IN MEMORIAM

William A. Bailey, P.E., 80, of Riverdale, Md., died Dec. 15, 2003. He served as a consultant with the Agricultural Research Service on plant growth chambers. Bailey received his bachelor's degree from Princeton University and his master's degree from the agricultural engineering department at the University of Nebraska. He joined the Farm Structures Research Branch of the Agricultural Engineering Division, Agricultural Research Service-USDA in the 1950s. He moved to Beltsville, Md. in 1962 to work with plant growth scientists studying the effects of environment on plants for which he gained international recognition. At the time he retired, he was researching problems with rail and truck transport of animals.

He was a 53-year member of ASAE and active with the District of Columbia-Maryland Section. He served with the U.S. Marine Corps. Survivors include five children, 12 grandchildren, and seven great-grandchildren.

ASAE Fellow Robert A.

Kepner, 88, University of California at Davis professor emeritus, died Dec. 19, 2003 in Davis, Calif. following 58 years of service to the university.



Kepner completed his bachelor's degree at UC-Davis in 1937.

From 1937 to 1942 he worked on orchard heating research at the University of California Agricultural Experiment Station. From 1942 to 1947 he was employed by the Stewart Warner Corp. In 1947 he rejoined the Agricultural Engineering Department at UC-Davis, becoming full professor in 1956. He retired in 1981.

Kepner's compilation of data on the costs and performance of agricultural machinery served as the basis for an early ASAE standard. His design of a gopher-bait applicator continues in pro-

duction today. Kepner is the primary author of a textbook, *Principles of Farm Machinery*. He was a member of ASAE for 62 years and was elected ASAE Fellow in 1970.

He is survived by a daughter, Dorothy Kepner; a son Harold Kepner; two grandchildren and two great-grandchildren.

ASAE Fellow Bernard F.

Vogelaar, 86, of Bloomington, Ind., died May 12, 2004. He graduated from Central College in Pella, Iowa in 1939 with a bachelor's degree in math and physics and in 1940 from Iowa State University with a bachelor's degree in agricultural engineering.

During WWII, his engineering skills were solicited to work on classified projects for the war effort. In 1951, he started working for John Deere Harvester Works in East Moline, where he was employed as a design engineer until his retirement in 1982. He was instrumental in developing the hillside combine. He had been a member of ASAE for 42 years and was elected ASAE Fellow in 1977.

He is survived by his wife, Helen; three daughters; seven grandchildren; 12 great-grandchildren; two stepdaughters; and four stepgrandchildren. Memorials may be made to the First United Presbyterian Church, Moline, IL 61265.

James L. Calhoun, 90, of

Blacksburg, Va., died April 4, 2004. He received his bachelor's degree in agricultural engineering from Virginia Tech in 1935 and a master's degree in 1939. Calhoun spent 27 years in the agricultural engineering department (currently biological systems engineering) as an extension specialist in rural electrification for the Virginia Cooperative Extension at Virginia Tech. He retired as a professor emeritus in 1976.

He was a retired Army officer and served during WWII. He had been a member of ASAE for 67 years. He is survived by his wife, Lucille.

ASAE Fellow June "Butch"

Roberts, P.E., 93, of Peoria, Ariz., died Jan. 23, 2004 in Peoria. He was former head of the Agricultural Engineering Department at Washington State University, which he joined in 1940 and served until 1975. He earned his bachelor's and master's degrees from Kansas State University and served in the Naval Reserves during WWII.

Roberts was elected ASAE Fellow in 1974 and had been a member of ASAE for 70 years. He served as Foundation President in 1987.

Evan R. Allred, P.E, 87, of

St. Paul, Minn. died April 17, 2004. He joined the faculty at the University of Minnesota in 1945, retiring as professor emeritus in 1986 after more than 40 years of teaching and research. He had been a member of ASAE for 40 years.

Survivors include his wife, Donna; two daughters; a son; seven grandchildren; and six great grandchildren. Memorials may be sent to the Allred Scholarship Fund, University of Minnesota Department of Biosystems and Agricultural Engineering, 1390 Eckles Avenue, St. Paul, MN 55109.

Attention Ottawa Meeting Attendees

Be sure to book your hotel room for the annual meeting in Ottawa through the Ottawa Tourism Housing Bureau. You'll save the new hotel levy tax of 3 percent which went into effect June 1.

To access the Housing Bureau Web link go to www.asae.org/meetings/am2004/index.html or call the housing bureau at 613-237-6822, ext. 126; 800-363-4456, ext. 126; or fax 613-237-4748.

When making your reservation, please make reference to ASAE or CSAE to receive your special rate.

WELCOME NEW MEMBERS

ASAE welcomes the following new members who joined the Society, reinstated a lapsed membership, or upgraded to full membership from student/preprofessional membership in April. When available, the member's place of employment has been provided. Please join us in extending a warm welcome to these new and returned members of our Society.

New Members for April

Nawab Ali, Central Institute of Agricultural Engineering
 Prakash Prabhakar Ambalkar
 Pedro Andrade Sanchez, University of California-Davis
 Peter Beavers, Dept Local Government & Planning
 Chad R. Beranek, Feterl Mfg. Co.
 Deepak Bhalla
 Neil E. Bowsher, Agri-Fab Inc.
 Quy D. Bui, Delavan Spray Technologies
 Pitam Chandra, Indian Council of Agricultural Research
 Dhirendra Kumar Das, IRC Village OUAT
 Shashikumar D. Deshpande
 Kevin R. Duemmel, Oklahoma State University
 Israel Sunday Dunmade, Mt. Royal College
 James Dunn, City of Albuquerque Park
 Richard L. Echols, Lockwood, Andrews & Newnam Inc.
 Sandun D. Fernando, Mississippi State University
 Shannon FitzGerald, U.S. Environmental Protection Agency U.S.
 EPA Region 9 Ground Water Office (WTR9)
 John Fuglesten, SJE-Rhombus
 Girish M. Ganjyal, MGP Ingredients, Inc.
 Laxman Punjaji Gite, Central Institute of Agricultural Engineering
 Kelly J. Granberg, Lake County Illinois
 Elliott M. Hedin, Brown Hay & Stephens
 Sarah A. Henderson, Colorado State University
 Jason M. Honeycutt, John Deere Turf Care
 Vivek Jain
 Elizabeth Janes, U.S. Environmental Protection Agency-Water
 Division
 Wayne E. Johnson, WE Johnson Engineering
 Polamarasetty Venkata Kali, Jagannadha Rao
 Muhammad Wasim Asghar Khan, University of Agriculture
 Faisalabad
 Hsieh Kuang-Wen, National Hsing University
 Nath Saran Lal Srivastava, Sardar Patal Renewable Energy
 Research Institute
 Wanda H. Lawson, CDP Engineers
 Varsha Levi
 Janet R. Maas, John Deere Harvester Works
 Rick D. Madson, John Deere Product Engineering Center
 Devanand Maski, SJ College of Engineering
 Jennifer J. Mathieu, Cornell University
 Jitendra Pal Mittal
 Rajendra Kumar Nema
 Ha Xuan Nguyen
 Isaac Adeadeboye Obasoro
 Gbenga T. Ogunyomi
 Ramabhau Tumadu Patil
 Robert M. Podoloff, Product Genesis Inc.
 Lester G. Power, Weyerhaeuser Co.
 Singh Ramadhar
 Kondapally V Ramana Rao
 A B. Rashid-Noah, Njala University

Matt Rayl
 Kyoung S. Ro, USDA-ARS
 Richard R. Roloff, AGCO Corp.
 Angela Schroeter, State Water Resources Control Board
 Kazuto Shigeta, National Institute of Livestock and Grassland
 Science
 Odin H. Shipstead, Cenex Harvest States
 Dev S. Shrestha, Iowa State University
 Dhirendra Kumar Singh, Indian Agricultural Research Institute
 Lalan Kumar Sinha
 Subash CB Siripurapu, AD Patel Institute of Technology
 Lisa M. Stahr
 James D. Strader, Trussco Inc.
 Huawei Sun, Ohio State University
 Suresh Kumar Tandon
 Tara Chandra Thakur, GB Pan University of Agriculture &
 Technology
 Edward M. Trentham, R.L. Craig Company Inc.
 Xiu Ying Wang, Blackland Research and Extension Center
 Richard C. Warner, University of Kentucky
 Jeff A. Wead, Lockheed Martin
 Stuart M. Wipperfurth, Germania Dairy Automation
 Ram Nayan Yadav
 Victoria Zavras, Anotec Pty Limited
 Xiaojing Zhou, University of Manitoba

Ottawa Quick Facts

- A population of over 1.2 million makes the Ottawa region the fourth-largest urban area in Canada.
- Ottawa is the home of government organizations such as the Government of Canada, Parliament, the Senate, and the Supreme Court of Canada.
- Ottawa is also home to such high-tech giants as Nortel Networks, Alcatel, JDS Uniphase, Cognos, Tundra, Cisco, MDS Nordion, and Entrust.
- More than 1,500 advanced technology companies employ more than 65,000 people.
- With the highest educated workforce in Canada, Ottawa has more engineers, scientists, and Ph.D.s per capita than any other city in the country.
- Canada's capital region welcomes over 7 million visitors per year, who spend over \$1.3 billion.
- The Capital's tourism and convention industry generates more than \$2 billion in economic activity.
- Languages spoken include English (50 percent), French (32 percent), and a host of other languages including significant capabilities in Spanish, Italian, Portuguese, Chinese, and Arabic.

(Source: 2004 City of Ottawa)

You're invited!

Jimmy Butt

A major event is nearing and you're invited to participate! ASAE will celebrate its 100th birthday in just a few years. We'll be reviewing with pride the achievements of the past century and sharpening our vision as to what the years ahead hold for ASAE and the profession. And ASAE *wants your input* – for stories and materials that will be used at and before the big event. Scan through the following thought-ticklers and see what *you* can contribute to this effort.

There are good memories ...

First, there was the quarter-century that began with horses and mules for power, outdoor toilets, wood-burning stoves, kerosene lamps, and lots of human labor. ASAE's emphasis was on plowing matches, tractor motor contests, electric lighting plants, home site locations, irrigation pumps, tractor tests, and erosion control. There were discussions of standards, student members, the need for hands-on-instruction in classes, and how to fund a permanent secretary for ASAE. Few of you can remember those times; but if you can, please share with us what you recall about the good ol' days.

In the 20s and 30s, ASAE hired a permanent secretary, launched a monthly journal, formed four divisions, began enhancing the curriculum and evolving from farm mechanics to agricultural engineering. Several curriculums became accredited, ASAE sections emerged, and meeting attendance grew to 450 for the 25th anniversary meeting. And the technology was encompassing things like combines, the general purpose tractor, terraces, drainage, confinement housing of livestock and poultry, and rural electrification. I can personally recall the first electric service to our farm – what a blessing! Can you contribute some experiences along these lines that can become part of the permanent record of those times past?

and not so good memories ...

But all was not rosy in those years. There was the stock market collapse, the Great Depression, the Dust Bowl days, WWII, bank failures. The impact on the profession was profound: business failures, farm foreclosures, unemployment, reduced enrollments, and ASAE struggled to avoid collapse. Surely, many of you can help us record those years and how your particular interest survived.

and changing times

Following WWII, the Society really blossomed. Enrollment was up, business was good, research efforts

multiplied, most college departments became accredited, P.E. registration soared, and ASAE found it necessary to launch new publications to accommodate the influx of research papers. Meetings attracted up to 2,000 attendees, specialty conferences were launched, some 50 sections were active, and G. W. Giles, at the 1960 Memphis meeting, urged members to give more attention to the “biological factory” by focusing on “the internal mechanism of biological production and to the external operations and environment that influence this mechanism.” Some say this was the birth of biological engineering within ASAE.

This was also the period when ASAE became more active internationally. Members from all over the world became active in the Society and have been a growing influence ever since. The partnership with CSAE, affiliation with CIGR, cooperation with groups or individuals in Asia, Australia, Africa, Europe, South America has flourished. *Please, members abroad*, tell us how agricultural engineering has changed your country since 1907.

There have been many interesting “side” stories: members taking President Coolidge fishing and opening the door for the formation of the Bureau of Agricultural Engineering; the effort to exchange tractors for prisoners with Fidel Castro; building ASAE's headquarters building; developing industry support for ASAE standards; the publication of the ASAE history books. What favorite side story can you contribute to add to the record?

To assist you, I recommend that you read Robert E. Stewart's *Seven Decades that Changed America*. It's a well-written, captivating history of the profession in those years. Other thought-starters include the issues of agricultural engineering covering the 25th, 50th, and 75th anniversaries.

What does the future hold?

Finally, we want you to use your crystal ball and look into the next century. Tell us what you see. How will agriculture change? What will our machines, our buildings, our processes and practices be like? How will ASAE change in this computer-dominated era? What will we be teaching in 2032? Here's your chance to earn fame: supply the most accurate forecast of what's to come! Come on, don't hold back! Turn back to the inside front cover for information, then send your contribution to hull@asae.org!

ASAE Fellow and past president Jimmy Butt is retired but still enjoys the good life at 2572 Stratford, St. Joseph, MI 49085 USA; jimmybutt@webtv.net.

Views expressed in this article are those of the author and do not represent the official position of ASAE.

Resource
Magazine's

**OUTSTANDING
INNOVATIONS
2004**



AE50

AE50 2004

Products winning the 2004 AE50 awards represent the best and the brightest developed throughout the world for the agricultural, food, and biological systems industries.

The innovations highlighted in this issue were chosen from numerous entries in the competition sponsored by *Resource*. The judges who chose the winners represent all factions of the agricultural, food, biological, and related systems engineering professions. The expert panel selected the best of products first introduced to the marketplace during 2003. These products are expected to save producers time, costs, and labor while improving user safety.

Problem solving is a major goal in designs whether one is developing a better way to spread manure, water a golf course, or monitor weather conditions. Environmental concerns must also be factored in while keeping production and operating costs low.

The annual AE50 program has been honoring engineering achievements for more than a decade. Past winners include companies of all sizes throughout the world.

Many of the new ideas are patented and their names trademarked. Some may become household words in the future. Others will be improved upon as technology advances.

From improved tractors and implements to computer software and high-tech electronic measuring devices, the 2004 AE50 winners cover a gamut of devices.

The AE50 is the only awards program of its kind to reward companies for developments in specific areas of agricultural, food, and biological systems.

For information on how to enter next year's competition, please contact Sandy Rutter at 269-429-0300 ext. 345 or rutter@asae.org.

Information on the AE50 and *Resource* magazine is also available on the ASAE Web site at www.asae.org.



● Pow'r Trak finely shreds



The Flory Model WS900 Pow'r Trak shredder is a self-propelled, rubber-tracked hammer mill developed to effectively shred orchard prunings as large as 100 millimeters (4 inches) in diameter. Friendly to the environment and the grower, this machine eliminates the necessity of burning prunings and monitoring agricultural burn days, thereby contributing to cleaner air. The resulting finely shredded material remains on the orchard floor where it decomposes, promoting healthier soil. The front-feed design eliminates driving over prunings, and the rubber-track drive allows continuous operation in all weather conditions. Features include a fuel-efficient 425-horsepower

Caterpillar engine, automatic reversing engine fan to keep radiator clean, and low ground compaction. Other user conveniences include the "Comfort Cab," which is both heated and cooled for the comfort of the operator; hydrostatic drive for smooth variable speed control; and easily replaceable shredding hammers and cutting inserts.

Flory Industries, Salida, California USA; 209-545-1167, www.FloryIndustries.com

AE50 OUTSTANDING



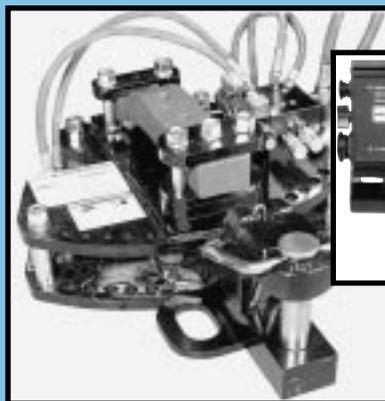
INNOVATIONS 2004

● Outback® Hitch gives automatic, instant correction

Outback® Hitch is an automatic drawbar hitch attachment which receives and responds to GPS guideline information. It automatically and instantly corrects inadvertent driving error. Even if the tractor is not following the GPS guideline, Outback® Hitch seeks to place the hitch pin directly over the guideline. In addition, Outback® Hitch has a "Match Tracks" mode which seeks to match the implement track

lines to the tractor tracks when operating in curves and hillsides. For example, when side-dressing standing crop, "match tracks" will allow the driver to follow rows with the tractor and be confident his implement is also tracking the same rows without damaging crop.

RHS, Inc., Hiawatha, Kansas USA; 800-247-3808, www.outbackguidance.com



● Square Baler performs with top auger pickup



This large, square baler with pre-cutter option has significant performance and capacity improvements with newly designed top auger pickup. The full-width, cross-top auger takes control of the crop in most hay and straw baling conditions as crop is transferred from the pickup reel. It allows large, low-density crops, such as straw, to move quickly from the outside of the pickup into the narrow center feed area of the baler. This powered auger also helps higher-density crops with greater friction (like hay silage) to move across the pickup. It adds additional power to feed the crop into the baler quickly and smoothly. Because the crop is moved into the baler more uniformly, other feeding elements behind the pickup perform more efficiently. The pre-cutter baler performance has been improved considerably through these synergies with the addition of the top auger to the pickup.

AGCO Corp., Duluth, Georgia USA;
770-813-9200, www.agcocorp.com

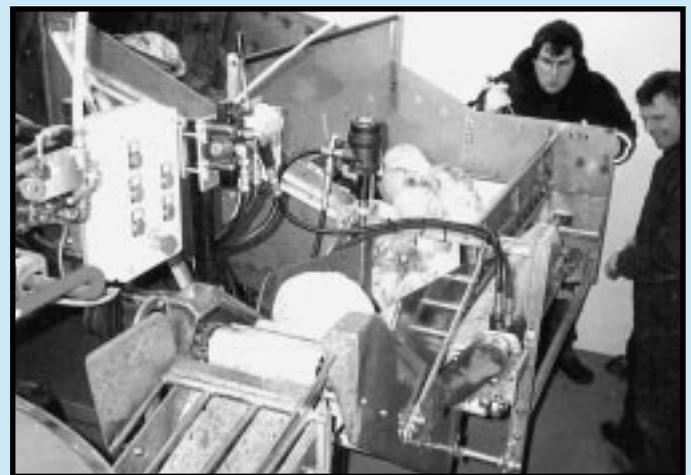
AE50 OUTSTANDING



INNOVATIONS 2004

● The Olden Cabbage Trimmer triples output

The Olden Cabbage Trimmer eliminates all hard, manual labor and triples output per man-hour. Cabbages are delivered on the carousel, where the stalks are cut and necessary leaves removed. This is followed by an inspection, after which the cabbages are automatically placed in marketing crates. The Olden Cabbage Trimmer is made of stainless steel and hot-galvanized mill steel. All functions are hydraulically powered and all speeds are infinitely adjustable. A pneumatic adjustable system blows off desired quantity of leaves and holds the heads in place during operations. Electronics are used to operate the hydraulic system and to regulate the flow of cabbages, the level of filling in marketing crates, and the monitoring of safety systems. The unique combination of known techniques combined with the innovative carousel and lifting/turning mechanism has made a successful automatic cabbage trimmer. Electric power supply: 7.5 kilowatt (10 horsepower). Air supply at 10 atmosphere bar (14.5 pounds per square inch), 1.4 cubic meter (50 cubic feet) per minute.



Olden Maskinfabrik ApS, Houvej 139, 9370 Hals, Denmark; +45-9825-4866, www.olden-maskinfabrik.dk

● Solar Mini-Pivot System reduces energy and water consumption



Greenfield Irrigation Systems, developed by Lindsay Manufacturing, are leaders in intelligent water utilization focused specifically on high-value crops such as vegetables, hay, alfalfa, small grains, and turf grown on fields that are less than 32 hectares (80 acres) in size. The principal uses for the Greenfield Solar Mini Pivot are in crop areas that do not have developed rural electrical power, areas where the cost to run electrical power is prohibitive, and areas set aside for environmental conservation of electricity and fuel. This solar-powered machine is as full-featured and capable as its single and three-phase AC counterparts, therefore providing significant potential for underdeveloped countries. No special tools or heavy machinery are needed to erect the equipment, and it is simple and easy to use requiring no special skills for

operation. The Greenfield Solar Pivot System reduces energy and water consumption over non-pivot irrigation systems and improves yields as well.

Lindsay Manufacturing Co., Omaha, Nebraska USA; 800-829-5300,
www.lindsaymanufacturing.com/default_greenfield.asp

AE50 OUTSTANDING



INNOVATIONS 2004

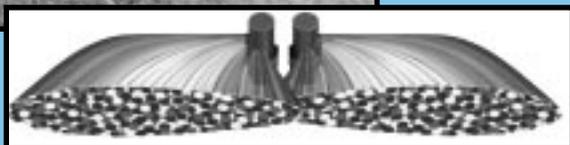
● 200 V/P Series supplies specialty market with high technology and comfort

AGCO Corp.'s FENDT® 200 V/P Series 50-80 horsepower, 2WD or 4WD, cab or foldable ROPS brings high technology and comfort to the specialty, orchard, and vineyard tractor market. Operators are comfortable and in control with up to six mid-mount and rear electrohydraulic SCVs with flow controls for 73.8 liters (19.5 gallons) per minute, shock-load stabilizing, and patented side-shift and tilt adjustment three-point hitch controls – all located on the right console. A Tier 2 engine powers 540/540Economy/1,000 rpm rear PTO speeds and optional 1,000 rpm front PTO for front three-point hitch work. Push-button automatic 4WD and differential locks with a tight 58-degree turning angle make the compact series nimble in tight areas.

AGCO Corp., Duluth, Georgia USA; 800-767-3221, www.fendt.com/index_US.html



● XP BoomJet® reduces driftable droplets



The XP BoomJet® nozzle manufactured by Spraying Systems Co. demonstrates a performance breakthrough in wide-coverage spray nozzle design. The wide-coverage spray pattern distributes spray solutions evenly across the full width of the pattern while significantly reducing driftable droplets. The design combines a removable pre-orifice for easy cleaning and a unique teardrop-shaped exit orifice. XP BoomJet nozzles are available in four flow rates ranging from 7.6 to 30.3 liters (2.0 to 8.0 gallons) per minute at 276 kilo pascals (40 psi) and are suitable for use at pressures from 138 to 414 kilo pascals (20 to 60 pounds per square inch). They provide spray pattern coverage up to 5.6 meters (18.5 feet). Each nozzle capacity is color coded for easy identification. All XP BoomJet nozzle capacities are available in an

all-polymer construction and in a durable stainless steel with a polymer pre-orifice.

Spraying Systems Co., Wheaton, Illinois, USA; 630-665-5000, www.TeeJet.com

AE50 OUTSTANDING



INNOVATIONS 2004

● 7020 series replaces 7010 product line

The new 7020 Large Chassis Row Crop Tractors replace the 7010 series product line. The lineup includes the 7720 at 140 PTO horsepower, 7820 at 155 PTO horsepower, and a new 7920 at 170 PTO horsepower. All models feature Tier II emission engines with a new 6.8 liter 4 valve in the 7720. Three transmissions are offered including a IVT™ (Infinitely Variable Transmission). A new frame improves maneuverability and torsional stiffness. Other new features include increased hitch capacity, improved vehicle weight distribution, increased fuel capacity, larger tires, redesigned TLS front suspension, and tilt hood for serviceability. Factory-installed trailer hitches, front hitch, front PTO, and loader are options. A new larger cab incorporates many features of the 8000 series providing industry-leading interior sound levels, full-featured instrumentation as standard equipment, and optional Active Seat suspension. All models use Can Bus operating system and are GPS-capable. Hydraulic flow has been increased as well as the number of circuits available.



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

● Comfort Zone 20™ provides more uniform heat



Retrolite and Sylvania have teamed to produce a heat lamp system designed specifically for the swine industry. Farrowing creep heat systems have traditionally been a challenge as newborn 1-kilogram- (2.2-pound-) piglets are confined adjacent to 200-kilogram- (440-pound-) sows. Piglets and sows have very divergent comfort levels for optimum production — sows at 18°C (64°F), and piglets 35°C (95°F) at birth to about 27°C (81°F) at weaning. The Comfort Zone 20™ system consists of two main components: The Hang Straight Heat Lamp Fixture (HSHLF) and the Sylvania 175 W PAR 38 energy efficient heat lamp. This system provides more uniform heat at 35°C (95°F) within a 51-centimeters (20-inch) diameter circle beneath a heat lamp at an operating height of 51 centimeters (20 inches). There are no hot spots directly beneath the heat lamp. Piglets rest where they should, reducing crushing losses and improving overall health with improved, more uniform microclimate.

Retrolite Corporation of America, Hatboro, Pennsylvania USA; 888-717-3688, www.retrolite.com

AE50 OUTSTANDING



INNOVATIONS 2004

● AccuPAR aids plant and forest research

The AccuPAR model LP-80 PAR/LAI ceptometer is a handheld instrument for measuring photosynthetically active radiation (PAR) and calculating leaf area index (LAI) in plant canopies. It is primarily useful in plant and forest research, but is also advantageous in some commercial applications, such as vineyards and orchards. The most important feature offered by the AccuPAR is the display of real-time PAR values on screen. LAI calculations and related variables are also displayed and updated in real time as measurements are made. This saves valuable post-processing time where LAI calculations are traditionally done. Since calculations are computed automatically and displayed in the field, the researcher can then correlate in-field data with conditions and observations at the site and make any necessary decisions. The AccuPAR has a simple six-key panel with a menu-driven user interface making it easy to change settings and move between functions.

Decagon Devices, Inc., Pullman, Washington USA; 800-755-2751, www.decagon.com



● Reach Trucks effective in variety of applications



Mitsubishi Forklift Trucks has developed a new generation of electric reach trucks. These 36-volt models help improve end user cost of ownership while delivering advanced levels of reliability and performance. With capacities ranging from 1,200 to 2,000 kilograms (2,500 to 4,500 pounds) and lift heights as high as 10,750 millimeters (425 inches), this Orion family of reach trucks is effective in a variety of applications, including everything from high-density storage to distribution of palletized products. Along with an extended reach, the new compact ergonomic design enables product storage in warehouse aisles as narrow as 2.3 meters (7.5 feet), allowing customers to reach new heights in storage capabilities and space utilization. Alternating current electric power technology helps yield faster cycle times and improves electrical efficiency. Product features such as rapid lift and travel speeds, low effort operator controls, and a flexible side-stance compartment make N-Generation electric reach trucks a productive material-handling solution.

Mitsubishi Caterpillar Forklift America Inc., Houston, Texas USA;
713-365-1000, www.mit-lift.com

AE50 OUTSTANDING



INNOVATIONS 2004

● MACDON 974 FLEXDRAPER™ boosts productivity up to 20 percent

The MacDon 974 FLEXDRAPER™ available in 9.1- and 11.0-meter (30- and 36-foot) sizes boosts combine productivity up to 20 percent in most crop conditions and in uneven terrain when cutting off, on, or close to the ground — especially in low podding crops. It features a three-section frame with balanced linkage allowing each section to independently follow ground contours in a balanced floating action, reacting to minimal changes in ground pressure. The header utilizes a two-piece reel, which maintains a close relationship to the cutter bar when the header is following uneven ground undulations. The crop is cut and swept onto a live moving surface, then conveyed “heads first” into the combine feeder. When operating in level terrain or cutting off of the ground, the header can be locked to a rigid profile in seconds without the use of tools, and without sacrificing any feeding performance.



MacDon Industries Ltd., Winnipeg, Manitoba, Canada; 204-885-5590, www.macdon.com

● Big Baler improves capacity and reliability



The upgraded New Holland BB960A Big Baler includes improvements resulting in increased operator convenience, higher quality bales, improved capacity, and a 20-percent increase in reliability. For convenience, the baler hitch can be adapted to tractor pins of both ASAE Cat3 and ISO Cat3 standards simply by exchanging the ball in the hitch. Also the baler's on-board computer has been adapted to ISOBUS standards allowing communication with any type and brand of tractor-monitors that adhere to the

same standard. A rotor cutter feeding system utilizes paired tines of different length in a "W"-pattern for increased capacity. This balanced feeding system helps produce well-formed, high-density bales. Additionally, an integrated plunger design with incorporated grease channels increases reliability, and a totally cam-controlled shuttle feeder runs smoothly with less noise.

New Holland, New Holland, Pennsylvania USA; 888-290-7377, www.newholland.com

AE50 OUTSTANDING



INNOVATIONS 2004

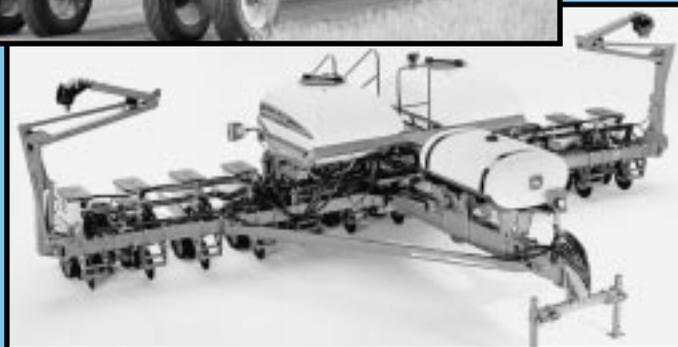
● Greenhouse Growth Tracker gets measurements throughout growing season

The Greenhouse Growth Tracker was developed to capture, process, and store light and temperature measurements throughout the growing season. It measures photosynthetic active radiation (PAR) as $\mu\text{mol}/\text{m}^2 \text{ s}^{-1}$ (micromoles of photons per meter squared per second) and calculates the daily light integral (DLI – moles per day). Historically, light meters that measure only instantaneous light intensity in foot-candles were used. (Foot-candle meters can have a margin of error up to 45 percent when measuring light.) In addition, light intensity is variable throughout the day. DLI refers to the total quantity of light delivered to a surface for the day. Another important growth input is temperature. This device reports daily high/low temperatures, average day/night temperatures, and DIF temperature (difference between daytime and nighttime temperature) and calculates degree-days and chill hours. Values are archived for 30 days; monthly summaries, for the growing season. The battery-powered recorder has an integrated data logger with non-volatile memory and date-and-time clock.

Spectrum Technologies, Inc., Plainfield, Illinois USA; 800-248-8873, www.specmeters.com



● Planters boast improved frame



The new 12-Row and 24-Row 1770NT are both front-fold, three-section flex planters with an improved frame, and fertilizer and hydraulic systems. Both frame configurations now enable transport width of 3.65 meters (12 feet), wing flex of $\pm 21^\circ$, and 0.56 meter (22 inches) of under frame clearance during transport. The telescoping hitch on the 12-Row provides a 0.91-meter (3-foot) shorter hitch when planting, while the 24-Row provides a 0.3-meter (1-foot) shorter hitch. The 12-Row fertilizer system utilizes an on-board 1,703-liter (450-gallon) tank, while the 24-Row provides 2,271-liter (600-gallon) capacity. Both machines can be factory equipped with frame-mounted fertilizer openers and can also tow an additional 7,570-liter (2,000-gallon) nurse tank. Both machines can also be equipped with a bulk-fill CCS (Central Commodity System). The 12-Row now offers 2,469 liters (70 bushels) of seed capacity, while the 24-Row provides 3,527 liters (100 bushels).

John Deere Seeding Group, Moline, Illinois USA; 309-765-7388, www.johndeere.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Sensortec 4QC transforms quarter conductivity sensing

This quarter conductivity sensing system eliminates non-mastitic variables affecting milk conductivity and focuses on conductivity increases related solely to tissue damage within the cow's udder. A relative conductivity measurement by quarter eliminates the normal biological variations between cows that distort absolute conductivity values. A powerful database is created comparing conductivity variations between quarters, across the herd, and longitudinally over time. Since conductivity in milk rises with temperature, temperature compensation removes this source of variation. A system for "smoothing" values by calculating rolling average conductivity values reduces the effects of random "noise." Central reference values are created as an automatic correction mechanism for any drift in absolute and relative values between flow cells or for any bias between individual flow-cells. Sensortec's 4QC technology has thus achieved a quantum leap in sensitivity and specificity levels that transforms quarter conductivity sensing into a reliable tool for the early detection of mastitis.

Sensortec Ltd., Hamilton, New Zealand;
+64 (0)7-859-3364, sales@sensortec.co.nz, www.sensortec.co.nz



● Agri-Vator System for Plasticulture: mechanization for the rice paddy



The Agri-Vator System for Plasticulture is an all-inclusive ground preparation and planting system designed for introducing mechanization to the Asian rice paddy cultural practices. The Agri-Vator System is configured with a unique design that has the ability to condition soil that would normally be too wet for conventional tillage practices. It consists of a central power unit with three basic accessories. First, the power bed maker is a new design, which utilizes concepts from a rototiller and a hammermill to grind and condition the wet, heavy, clod-laden soil into a fine consistency, leaving a raised bed in its path. Second, a mulch layer presses and shapes the soil into a pre-determined profile while covering the bed with plastic mulch. Third, a manual-type wheel planter places transplants into the raised mulch covered bed.

Faulring Mechanical Devices Inc., North Collins, New York USA;
716-337-3682, www.faulring.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Bunks boost efficiency of wood handling and transport

Multi-Modal Wood Bunks for Small Diameter Roundwood enable efficient transport of wood from forest thinning programs and provides labor-efficient handling of smallwood at community-based forest product firms. The all-steel bunks are designed to hold approximately 1.5 cubic meters (1/2 ton) of roundwood. A pallet jack or forklift can move the bunks at a production facility. The design facilitates tipping by automated equipment to feed roundwood onto a log deck or into a processing line. The bunks also can be lifted from the top by a log loader for easy stacking, placing, or loading in the forest. The bunks can be hauled on a self-loading flatbed trailer, conventional flatbed truck, and small trailers. The bunks are designed to nest when empty so they may be efficiently stored or transported back to the forest from town.

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



● AGCO® RT Series offers hi-tech advances



AGCO Corp. introduced AGCO® RT Series tractors (100 to 150 PTO horsepower) to North America in the autumn of 2003. This series features advanced technology – the PowerMaxx CVT™, HydraMaxx front suspension, and AirMaxx cab suspension – providing productive features for today's farmer. The PowerMaxx CVT™ transmission combines an efficient, continuously variable design with simple-to-use controls. Two modes, "lever" and "pedal," allow easy, shift-less speed changes from 0 to 52 kilometers per hour (0 to 32 miles per hour). Two pre-determined speeds can be set in increments of 0.16 kilometers per hour (0.1 miles per hour) using rotary dials to adjust values in an LCD screen. The "engine supervisor" function enables automatic speed adjustment as the working conditions of the tractor change. The HydraMaxx front suspension system provides constant tire-to-ground contact to allow for less slippage and more pulling power. The dual stage AirMaxx cab suspension uses pneumatics similar to suspensions on highway trucks for comfortable field operation.

AGCO Corp., Duluth, Georgia USA; 770-813-9200, www.agcocorp.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Sugarcane Loader features all-new boom design

The Cameco SP1850 Sugarcane Loader features an all-new boom design to accommodate the large size of today's modern crop transport trailers. The boom affords operators faster cycle times and a 35-percent larger grab. Those features, coupled with the ability to put more crop in the transport, equal lower overall transportation costs. The new John Deere 4045 engine at 78 kilowatts (105 horsepower) lowers fuel consumption, and an all-new hydraulic system eliminates external priority, relief, and swing cylinder cushion valves. Hydrostatic drive gives operators an infinitely variable range of speeds up to 25 kilometers (18 miles) per hour and simplifies operation versus tractor-mounted loaders. The SP1850 loader offers advancements in serviceability over other whole-stalk cane loaders. Remote grease lines simplify daily maintenance while chromed and hardened pins throughout increase life. The SP1850 offers growers an economical alternative to larger, more costly loaders that have become commonplace throughout the world.

Cameco, A John Deere Co., Thibodaux, Louisiana USA;
985-447-7285, www.camecosugar.com



● Outback eDrive™ installs easily, operates simply



Outback eDrive™ teamed up with Outback® S to provide automatic steering for tractors, combines, sprayers, and other self-propelled machines. eDrive™ benefits from the patented Outback® S dynamic look-ahead capability in order to smoothly and precisely control steering. Primary benefits of eDrive™ are easy installation (about two hours), simple operation, and the ability to drive in straights and smoothly along compound curves. eDrive™ also features automatic disengage and engage at each turn. Model specific installation kits must be used.

RHS, Inc., Hiawatha, Kansas USA; 800-247-3808, www.outbackguidance.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Two-Speed Square Jack improves ease and speed

BULLDOG®'s 12,000-pound Two-Speed Square Jack makes cranking easier when fully loaded, fast operation when moderately loaded, or quick travel when unloaded. In low gear, the total gear ratio delivers full lifting capacity of 10,000 pounds with reasonable input torque (well within ASAE S485 guidelines). In high gear (the second working speed), the total gear ratio allows reasonable lifting of moderate loads. For travel "through the air" after the implement or horse trailer is attached to the towing unit, the pinned "drop leg" provides the ultimate in rapid travel. The two working gear ratios are specifically chosen to be used in conjunction with a pinned "drop leg" to achieve a "three-speed" affect at the cost and complexity of a two-speed product.

Cequent Trailer Products, Mosinee, Wisconsin USA; 715-639-1700, www.cequentgroup.com



● INSIGHT perfects precision farming system



INSIGHT from Ag Leader Technology is a complete precision farming system. The primary component of the INSIGHT system is the 10.4-inch color, touch-screen display. Interfaced with GPS and sensors, the INSIGHT display generates color maps of varieties while planting, product application rates while applying fertilizers or chemicals, and yield and moisture maps while harvesting. The INSIGHT display provides real-time mapping while simultaneously recording many operating parameters and communicates with sensor and controller modules over a CAN-bus interface. Ag Leader Technology's grain harvest sensors have been redesigned to incorporate CAN-bus technology providing increased flexibility and future expandability. Application control is performed with a new CAN-bus controller module that interfaces with popular non-CAN-bus rate controllers. The CAN-

bus provides an expansion path for future precision farming capabilities of the INSIGHT system. A flexible internal data model and scalable logging format provide seamless integration of the INSIGHT display with desktop mapping software.

Ag Leader Technology, Inc., Ames, Iowa USA; 515-232-5363, www.agleader.com

AE50 OUTSTANDING



INNOVATIONS 2004

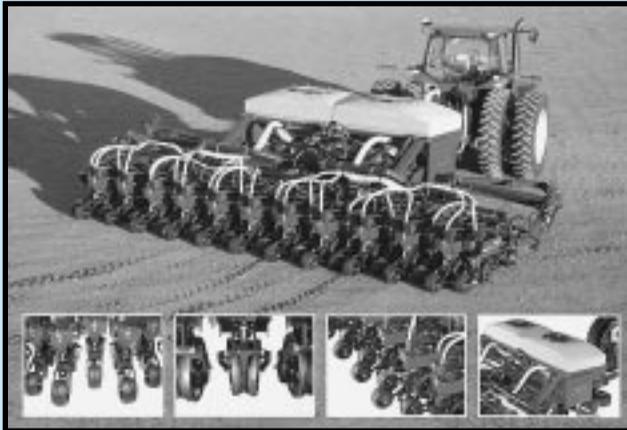
● Bale wagons improve stacking and moving

The new-generation BW Series Self-Propelled Automatic Bale Wagons combine frame and powertrain improvements with improved electronic and electro-hydraulic controls to make stacking and moving bales more effortless and productive. Sophisticated software coupled with electronic controls makes operation by inexperienced operators nearly "idiot-proof," and experienced operators even more productive. These wagons feature a higher horsepower Tier II New Holland engine with greater fuel economy and lower emissions. The new engine is coupled to a state-of-the-art five-speed, electronically controlled automatic transmission. A single, multi-function handle puts control of 16 loading and unloading functions at fingertips. This increases operator efficiency resulting in greater daily productivity as measured by the number of stacks completed. Designers used Finite Element Analysis (FEA) to produce an all-new frame featuring one-piece, full-length frame channels to eliminate high stresses and to predict frame-fatigue life beyond the expected design life of the entire unit.



New Holland, New Holland, Pennsylvania USA; 888-290-7377, www.newholland.com

● Planter provides excellent maneuverability



The CASE IH Pivot-Transport Split Row Planter features high capacity/productivity with excellent maneuverability, serviceability, and convenience. With two 1,410-liter (40-bushel) central-fill hoppers and four-section control of seed and fertilizer, more time can be spent planting and customizing seed populations and fertilizer application rates to achieve optimal yields. Offered in both 12/23 and 16/31 configurations, each 38-centimeter (15-inch) row is equipped with a row unit lock-up mechanism for quick soybean/corn conversion. Large flotation tires are mounted on a double telescoping retractable frame to minimize ground compaction and provide an unmatched single-pass headland turning radius. Despite its large field width and

close-coupled planting dimension, the Advanced Farming Systems™ in-cab touch screen display folds the planter to a transport envelope of 3 meters (10 feet) high and 3.8 meters (12 feet, 7 inches) wide in less than a minute. Furthermore, the planter toolbar can be raised over 1.5 meters (5 feet) for complete access of row units and other tillage attachments.

Case IH, Racine, Wisconsin USA; 262-636-0000, www.caseih.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Nozzles generate water savings

Matched precipitation rate nozzles consist of three sets of four nozzles each and can be used with all 5000 MPR Series gear-driven sprinklers. These nozzles uniquely allow rotors to be installed with a matched precipitation rate within and between radii from 7.6 to 10.7 meters (25 to 35 feet) and may generate over 2 billion gallons of water savings in 2004. The nozzle sets are designed to cover radii of 7.6, 9.1, and 10.7 meters (25, 30 and 35 feet) at an inlet pressure of 45 pounds per square inch. The nozzles on each set have flow rates that are sized to cover arcs of 90, 120, 180, and 360 degrees, which represent the most common patterns in typical irrigation installations. For a square spacing pattern, the designed precipitation rate is 15.2 millimeters (0.6 inches) of water per hour.

Rain Bird Corp. - Residential Manufacturing Division, Azusa, California USA; 626-812-3430, www.rainbird.com



Meter measures turf grass quality



The Field Scout® TCM 500 Turf Color Meter makes an objective measurement of turf grass quality. Today, this measurement is done subjectively by a visual assessment using the 1-9 scale (dormant turf to dark green) that is naturally biased by the observer and varies through time and space. The problem that challenges the turf industry is that turf grass quality is a critical measurement of turf performance. Color is a key indicator of turf grass quality, particularly nitrogen content and water status. Reflected red, green, and blue light from a controlled light source is instantly measured and stored in an integral data logger. Three different measurement modes, including the traditional 1-9 green index scale, quantify the color characteristics of turf grass describing color and quality.

Spectrum Technologies, Inc., Plainfield, Illinois USA; 800-248-8873, www.specmeters.com

AE50 OUTSTANDING

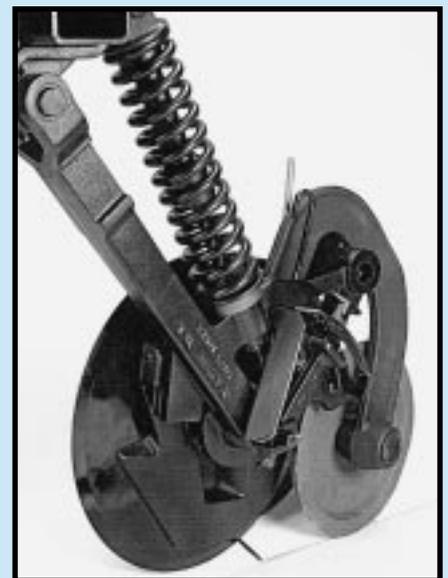


INNOVATIONS 2004

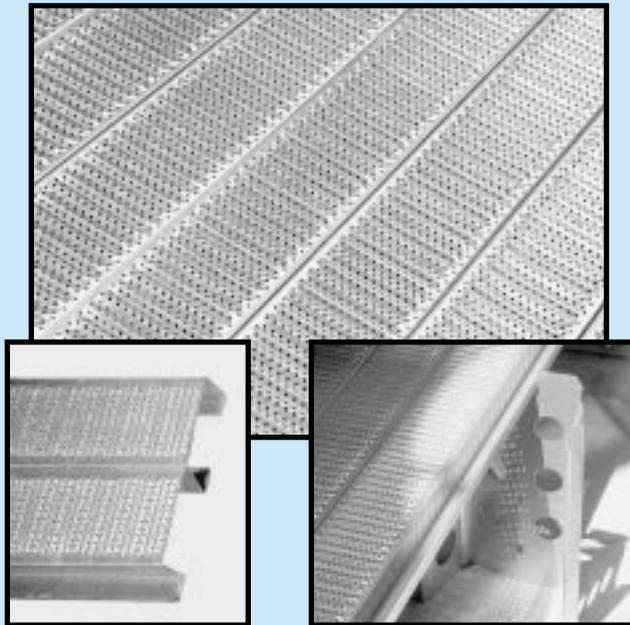
Opener advances latest in boot development

The new Separate Fertilizer Placement Opener is a unique, purpose-designed opener for use in no-till and min-till farming practices where it is desirable to apply fertilizer at the time of seeding. This opener is specifically designed for placement of fertilizer separate from the seed openers. It maintains the fundamentals of the John Deere No-Till Opener and includes the latest in boot development for the ultimate in fertilizer placement with a single disc opener, along with superior closing of the trench. This opener includes a reduced steer angle of 5 degrees for ease of penetration and formation of the narrow fertilizer trench. The narrow trench is further formed by the slim profile boot/scrapper, which includes mounting for three styles of fertilizer tube. An optional closing wheel attachment (required for anhydrous ammonia gas fertilizer) quickly closes and seals the trench to ensure retention of fertilizer in the ground.

John Deere Seeding Group, Moline, Illinois USA; 866-993-3373, www.deere.com/en_US/ag/servicesupport



● Aeration floor provides unique support leg



The TRI-CORR™ Aeration Floor utilizes a newly designed floor plank that has a unique center support leg substantially adding to the crown strength of the plank. It has an unmistakable center triangle that supports the center of the plank. It allows aeration of grain up to 30.5 meters (100 feet) in depth without extra crown support required. Its flat top profile allows for easy grain cleanup when the bin is empty. It also has corrugations on the sides and the top for added strength while maintaining backward compatibility with our previous design.

BROCK Manufacturing, Milford, Indiana USA;
574-658-4191, www.brockmfg.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Veris Soil pH Manager gives on-the-go mapping

The Veris Soil pH Manager is an automated sampling and sensing system that provides on-the-go soil pH mapping. This unit utilizes a unique soil sampling device and ion-selective electrodes to capture pH readings at a sampling density of 5-10 samples per 0.4 hectare (1 acre) at a rate of 10+ hectares (25+ acres) per hour. On-board instrumentation controls all automation and logging functions and allows the operator to immediately download and map the data. The result is a map of pH variability at a density that is not feasible with traditional soil sampling. The Veris Soil pH Manager can be towed with a four-wheel drive pickup or mounted on a tractor equipped with a Category I or II hitch. The unit can be operated as a stand-alone pH mapping system or combined with soil electrical conductivity electrodes to provide soil EC data, which can be utilized to model pH buffer.

Veris Technologies, Salina, Kansas USA;
785-825-1978, www.veristech.com



● Terrain Compensation Module ups accuracy, reduces steering activity



GPS-based steering systems are rapidly becoming broadly available for agricultural machines. It is well known that the measurement of the vehicle orientation provides significant improvement to the overall system accuracy under many field conditions and operations. Typically, attitude correction systems are expensive because they utilize a full suite of three gyros and three accelerometers or multiple GPS antennas. The John Deere Terrain Compensation Module uses only a single rate gyro and a single accelerometer to provide the same performance increase at a significantly lower cost. The improved machine measurement allows the John Deere

GreenStar AutoTrac system to increase its accuracy while at the same time reducing the steering activity under similar conditions versus uncorrected GPS signals.

John Deere Ag Management Solutions, Urbandale, Iowa USA; 888-GREENSTAR, www.johndeere.com

AE50 OUTSTANDING

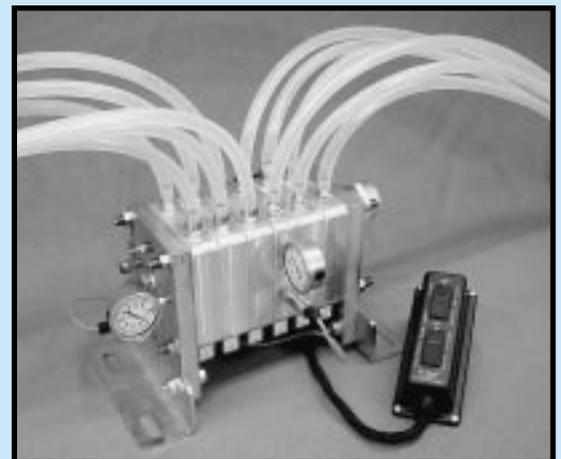


INNOVATIONS 2004

● N-Ject™ enhances uniformity, reduces anhydrous rates

The N-Ject™ anhydrous ammonia metering system developed by Capstan Ag Systems, Inc. utilizes pulse-width modulated valves and a stacked manifold to meter anhydrous ammonia fertilizer to each knife on the tool bar. The patent-pending design of the manifold allows the metered anhydrous to pass through the manifold to super-cool the incoming anhydrous ammonia. The super-cooled anhydrous ammonia existing as a liquid can then be accurately metered with the pulse-width modulated valves. Benefits of the system include improved uniformity over the tool bar, variable rate ranges of 25:1, and sectional control of the tool bar for irregular fields and point rows. Improved uniformity allows anhydrous rates to be reduced without affecting yields. The reduced application rates offer savings to the grower and helps protect the environment from nitrogen leeching.

Capstan Ag Systems, Inc., Topeka, Kansas USA; 785-232-4477, www.capstanag.com



● Merger gets hay, independent of direction cut



The OXBO® 310 Windrow Power Merger picks up a 9.14-meter (30-foot) wide swath of cut hay independent of direction the hay was cut to form windrow(s). The merger uses three hydraulically-driven finger pickup-heads and three cross conveyors to lift and move the cut hay. Windrows can be formed to the right, left, or divided between the left and right of the merger. Each pickup lifts independently to allow single windrow or swath merging. A PTO-powered, self-contained hydraulic system powers merger functions. Operator adjusts head height, speed, and merging direction with cab controls. The merger hydraulically folds from a working width of 9.14 meters (30 feet) to transport

width of 4.04 meters (13 feet and 3 inches) from the tractor seat. Adjustable hydraulic float system carries a portion of the head and conveyor weight, lightening the gauge wheels footprint. The hay pick-up height hydraulically adjusts from the tractor cab while merging.

OXBO International Corp., Byron, New York USA; 585-548-2665, www.oxbocorp.com

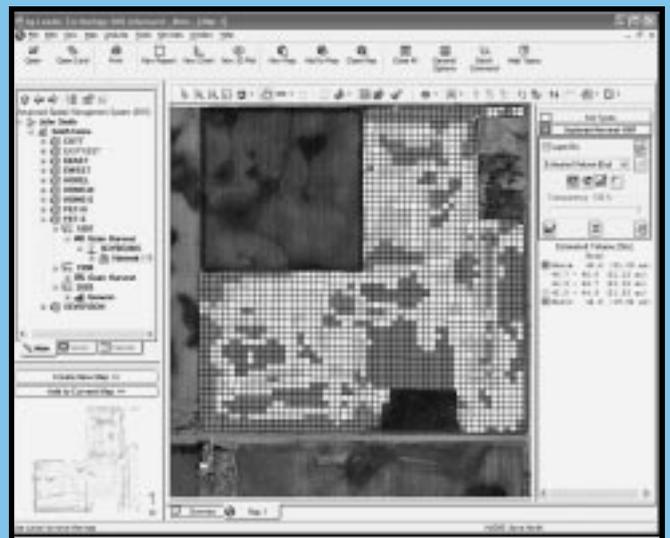
AE50 OUTSTANDING



INNOVATIONS 2004

● SMS Advanced presents software solution

SMS Advanced by Ag Leader Technology provides a software solution for creating, managing, editing, reporting, charting, visualizing, and analyzing site-specific data. The software provides analysis tools, usually reserved for highly trained individuals using high-end GIS products, that entry-level users can utilize to run attribute comparisons, write complex equations using a point and click interface, perform profit/loss mapping and reporting, and generate multiple year averages of yield data across products. SMS Advanced also integrates 3D visualization tools, which provide a terrain view based on topography or a 3D plotting option for viewing of data in the third dimension. In addition, the software provides an exclusive Calendar View of all data. The Calendar View automatically creates events for all data that is read into the software. The user can then select an event from a calendar to see a summary of that event as well as a spatial map.



Ag Leader Technology, Inc., Ames, Iowa USA;
515-232-5363, www.agleader.com

● 800 VARIO® TMS series decreases downtime and operator fatigue



AGCO Corporation's FENDT® 800 VARIO® TMS Series (130-160 PTO horsepower) equipped with new screen and cubical cooling system, chassis, front axle. VARIO Tractor Management System (TMS) and VARIOtronic Ti headland management system decreases downtime and operator fatigue and improves productivity and efficiency. VARIO TMS communicates between engine and transmission to obtain the ideal mix of engine power and transmission ratio. In the field or during transport, TMS holds the selected ground speed by maintaining only the minimum power necessary but accelerates when more power is required. TMS always finds the best possible fuel economy and ideal ground speed. VARIOtronic Ti, displayed in the

color VARIO terminal, records, re-plays, and edits repetitive operations with up to 13 functions/sequence. Touch any of four buttons on the VARIO joystick and program or reactivate up to 208 tractor functions. Ti reduces operator stress and fatigue and repeats operator's actions exactly as recorded every time.

AGCO Corp., Duluth, Georgia USA; 800-767-3221, www.fendt.com/index_US.html

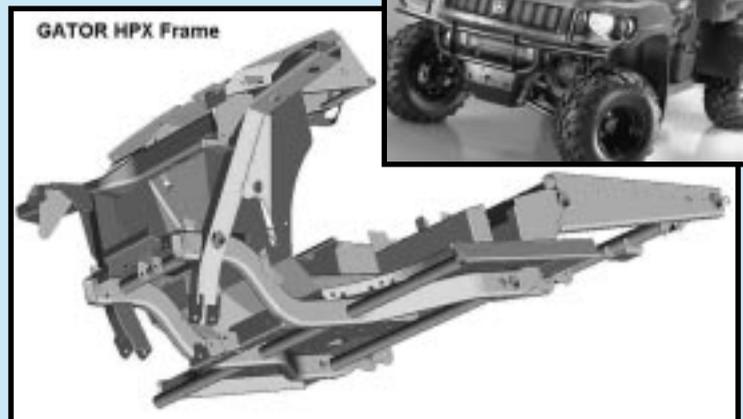
AE50 OUTSTANDING



INNOVATIONS 2004

● Hydroformed frame incorporates high-tech ladder design

The GATOR™ HPX - High Performance Work-Oriented Utility Vehicle incorporates robust hydroform technology in its frame design. Pickup truck frame hydroform technology is utilized for its ladder frame design providing superior strength with high ground clearance. This automotive process is used for the frame rails and front strut support member giving repeatable accuracy, improved structural strength and stiffness, optimized cross sections, and a reduction in parts and welds. The frame is robotically welded utilizing self-locating features in the parts for weld and assembly. The frame provides a common platform for four-wheel drive and two-wheel drive, gas and diesel models. Integral attaching points are included for the many available attachments, including front blade, ROPS-certified canopy and cab. The design was qualified through FEA and extensive torsional lab and field durability testing. The GATOR™ HPX has been designed from the ground up, maintaining the reliable, stable tradition of the current GATOR™ line.



● Redesigned driveshaft retains lubrication



Walterscheid's redesigned Wide Angle Constant Velocity Driveshaft significantly improves Walterscheid's Wide Angle Constant Velocity offerings. Cross kit seals were improved and floating disks were added to the centering mechanism to keep out contaminants and to better retain lubrication. The lubrication interval is five times longer than the previous generation. The reduced maintenance eliminates work for the end user and makes product performance less dependent on the end user. The centering mechanism was further improved by the addition of precision, spherical bearings. The spherical bearings provide a larger contact surface and greatly reduce contact pressures versus the previous generation. The reduced pressure translates into less wear, less vibration, and significantly longer life. Walterscheid's redesigned Wide Angle Constant Velocity Driveshaft provides maximum performance for today's high horsepower applications.

GKN Walterscheid, Inc., Woodridge, Illinois USA;
630-972-9300, www.gkn-walterscheid.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Probe direct-measures nutrients in greenhouse soilless media

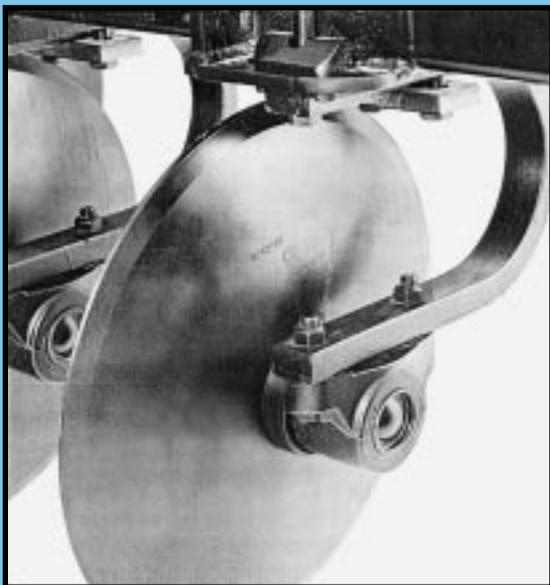
The Field Scout® Direct Soil EC Probe makes direct measurement of soluble salts (nutrients) in greenhouse soilless media. No longer are growers required to collect soil samples and prepare the media for measurement (one part soil: two parts water). Greenhouse growth media have chemical and physical properties that are distinctly different from field mineral soils. This soilless media has good moisture holding and aeration properties but limited nutrient holding capacity. Therefore, frequent EC measurement is essential to producing high quality plants on a consistent basis. Proper pH and EC levels are important to starting seedlings in plug trays, yet these measurements require cannibalizing several plugs in order to have a representative sample for measurement. Accurate, direct readings of soil EC can be made 30 to 60 minutes after irrigation or watering of plug trays or pots in the greenhouse.



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Spectrum Technologies, Inc., Plainfield, Illinois USA; 800-248-8873, www.specmeters.com

● Sealed-for-life technology introduced



The Dura-Pak™ Disk Hub and Bearing Assembly introduces sealed-for-life technology with redundant sealing for primary tillage individually mounted disk blade applications. Individually mounted blades provide unmatched clearance for mud and corn stalks by eliminating spools and scrapers, which tend to plug in wet, sticky conditions. New challenges are created by individually mounting disk blades. Protection against bearing contamination is more difficult because fieldwork may be performed in muddy conditions. Thrust loads induced by the ground on the disk blade generate higher bearing loads due to the overturning moment. Frequent greasing to flush contaminants has been a common practice to achieve acceptable bearing life, but this becomes a maintenance problem for machines with individual blades because of quantity of grease locations and interval between lubrications. Assisted by the efficiencies of Pro/Engineer and Finite Element Analysis of stresses, the Dura-Pak™ Disk Hub and Bearing Assembly went into production in May 2003.

John Deere Des Moines Works, Ankeny, Iowa USA; 515-289-3389, www.deere.com

AE50 OUTSTANDING



INNOVATIONS 2004

● T-Tank Sprayer offers compact transport dimensions

The Top Air TA1600 T-Tank Sprayer is a high speed, high capacity towed sprayer with compact transport dimensions. An independent axle suspension system with variable rate rubber springs works in conjunction with a tuned boom suspension system to allow exceptionally high field speeds. The available 27.4-meter (90-foot) boom is a tri-fold design, which greatly reduces transport height and length. This allows coupling the sprayer closer to the tractor for improved wheel tracking during turns. Outer boom wings can be folded during field operation to spray at an 18.3-meter (60-foot) width. The molded polyethylene tank has a special sump design to reduce the possibility of pump cavitation when operating on sloping terrain. Sculpted areas in the sides of the tank allow dual wheels to be placed on 1,524/3,048-millimeter (60/120-inch) gauge and permit mounting the boom closer to the axle for improved balance and minimized tongue weight fluctuations from changes in liquid volume.



Unverferth Manufacturing Co. Inc., Alliance Product Group, Kalida, Ohio USA; 419-532-2585, www.allianceag.com

FILTRAP offers on board implement testing



FILTRAP is an integrated and complete system on-board an agricultural tractor for thorough field-testing and evaluation of any implement that runs with the tractor. The system consists of a PC data acquisition and various transducers to measure, monitor, and record in real-time the tractor's fuel consumption, travel speed, theoretical speed, rear wheel torque, drawbar pull, PTO torque, three-point linkages forces, tillage depth, and terrain slope. With the added DGPS option, the system can be used for spatial mapping of the tractor-implement field performances. Under such configuration, the system is capable to measure, display, and record in real-time tractor-implement's geo-position in the field with respect to its measured performance. Accordingly, spatial variability information can be extracted from the generated maps to assist field managers in the decision process of optimizing the field operation of the tractor-implement.

Universiti Putra Malaysia, Selangor D.E., Malaysia;
603-8656421, azmiy@eng.upm.edu.my, www.upm.edu.my

AE50 OUTSTANDING



INNOVATIONS 2004

Case IH FLX series floaters lead next generation

The FLX Series three- and four-wheel floaters lead Case IH Application Equipment into the next generation. The sloped hood and curved glass of the cab have marked styling improvements. Unrestricted visibility from the cab is unmatched with 6.22 square meters (67 square feet) of glass. The cab features enough space at 3.2 cubic meters (113 cubic feet) to stretch your legs. Convenient ergonomic layout of the control panel on the RH side is attached to and moves with the seat, leaving the controls always at your fingertips. The chassis are propelled by 223-kilowatt (300-horsepower) or 261-kilowatt (350-horsepower) rated engines. The optional auxiliary gearbox allows for four gear ranges with six gears available in each range. Stopping the three-wheeled units is assisted by a front disc brake. Compartments along the side of the three-wheeler add extra storage, swinging out for servicing the engine from the ground, along with a forward opening fiberglass hood. The three-wheel frame is redesigned and uses HSLA cold-formed tubes for added strength.



Case IH (a brand of CNH), Racine, Wisconsin USA; 262-636-6011, www.caseih.com

● Hypro Hi Flow Spray Tips reduce fine droplets



The Hypro Hi Flow 140° Spray Tip revolutionizes high volume spray applications with uniform application, drift reduction, and flexible equipment configuration. A multi-stepped, flow-regulating orifice and large atomization orifice produce a consistent pattern and reduce the production of fine droplets. It achieves an ASAE S572 spray quality of "extremely coarse" for maximum resistance to spray drift and pattern distortion. The unique straight-through design allows tips to be used on standard spray booms without adaptors required for flood-pattern nozzles. In place of a standard gasket, an o-ring provides positive sealing of the nozzle and internal orifice to a standard

bayonet-style nozzle holder. The wide, consistent spray pattern of the Hypro Hi Flow Spray Tip maintains application uniformity while allowing applicators to triple their choices of application rates by using every nozzle position, every other nozzle position, or every third nozzle position on standard spray booms.

HYPRO, New Brighton, Minnesota USA; 800-424-9776, www.hypropumps.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Perma-Loc™ redefines sweep installation

The Perma-Loc™ is a quick-change, sweep system designed to meet customers' needs for a quick and easy way to change worn field cultivator and air hoe drill sweeps without unbolting them from equipment shanks. Patent coverage for Perma-Loc describes the unique features of a secondary spring locking system that enable customers to install sweeps by hand and without tools. The current industry terminology for a quick-change sweep is "knock-on," because current quick-change systems require the sweep to be driven on with a hammer for retention. The Perma-Loc system redefines installation of sweeps. It is simply slipped onto the adapter until the retention spring seats into one of several notches formed into the stem of the sweep. The spring holds the sweep on the adapter until



soil pressure firmly wedges the sweep onto the adapter. By using a special tool to depress the spring to unseat it from the notch and rapping the top with a hammer, removal of worn sweeps is quick and easy.

John Deere Des Moines Works, Ankeny, Iowa USA; 515-289-3344, www.deere.com

MIX 'N FEED easily moves grain, silo to trough



A mobile hydraulic-driven mixer/feeder for livestock operators, this 1,480-liter (42-bushel) capacity unit is designed for a 3/4-ton flatbed pickup to easily transport, mix, and deliver mixed grains from a silo to a feed trough. The compact nature, ease of attachment to existing power take-off systems, and thorough mixing within a vertical auger assembly provide great advantage for the livestock feedlot setting. The unit provides visual gauge windows, collapsible discharge auger, quick-connect fittings, and several other innovative design elements. The MIX 'N FEED may also be operated from a flatbed pickup, tractor's three-point hitch, or front-end loader.

B&D Enterprises, Thermopolis, Wyoming USA; 307-864-2902, machine@trib.com

AE50 OUTSTANDING



INNOVATIONS 2004

Green Machine Pro® installs easily

The Green Machine Pro® injects fertilizer at a consistent, pre-determined rate for drip and conventional sprinkler irrigation systems. Designed for constant line pressure up to 690 kilo pascals (100 pounds per square inch) and available in capacities ranging from 4 to 208 liters (1 to 55 gallons), each self-contained unit is coated with a durable coating. The injector manifold is connected to the tank with PVC-lined, braided flexible stainless steel connectors.

Installation is easy. A slight pressure differential is created with a spring-loaded baffle located between the inlet and outlet of the injector manifold. During operation, this pressure differential causes a small amount of water to be constantly diverted from the mainstream and discharged into the top of the additive tank. This action forces a small amount of fertilizer to be drawn from the bottom of the tank and pushed back out to the injector manifold where it is blended with the flow of water passing to the irrigation system.

Strong Enterprises™, Roseville, California USA; 916-797-1056, www.fertilizerdispensers.com



● Drain Gauge augments efficient analysis



The Drain Gauge Gee Passive Capillary Lysimeter is a sensor that allows researchers, government officials, and consultants to monitor the total amount of water and chemicals that may be leaching into ground water with a simple and robust technique. The drain gauge is installed in the soil below the root zone, where it collects deep percolating water into a duct and wick system. The volume of the collected water is measured and transferred to a reservoir, where water samples can be extracted and analyzed for chemicals, fertilizers, and other contaminants.

Decagon Devices, Inc., Pullman, Washington USA; 800-755-2751, www.decagon.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Case IH SPX4410 Sprayer addresses agronomics

The Case IH SPX4410 Sprayer is the first world-class sprayer designed specifically around key agronomic principles (minimizing soil compaction and maximizing timely chemical performance on cropping pests) and environmental spraying challenges (management of the right amount of pest control coupled with excellent management of undesired off-target application). The SPX4410 starts with a non-standard machine configuration and features the next generation of spray technology putting the engine in the rear, the cab forward, and the 4,543-liter (1,200-gallon) product tank slightly ahead the machine center of gravity. This 50/50 weight distribution in the field spray mode minimizes rutting and soil compaction. Noise in the Surveyor™ cab is a mere 72 decibels. The SPX4410 features the innovative, environmental friendly AIM Command spray technology permitting independent control of sprayer speed, pressure, and chemical rate. Independent control of the number and size of droplets, independent of speed, gives the operator fingertip agronomic and environment management tools.



Case IH (a brand of CNH), Racine, Wisconsin USA; 262-636-6011, www.caseih.com

● 60 Series STS adds two new models



Building on the technology of the John Deere 50 Series combines, the 60 Series STS combines offer new features that raise productivity and performance to new levels. Two new models are added to the STS (Single-Tine Separation) lineup with the addition of the 265-horsepower 9560 STS and the 375-horsepower 9860 STS. A single-point latching system for header attachment enables hookup of electrical, hydraulic, and mechanical components with a single lever, reducing hookup time by 75 percent over previous models. Remote chaffer and sieve adjustment as well as automatic separator adjustment to pre-set conditions are made through the TouchSet™ control system. A significant boost in cleaning capacity is the result of a cleaning shoe design that features a fan delivering 35 percent more air flow over previous STS machines. A new grain tank unloading system includes a longer unloading auger and a 76.5-liters (3.3-bushels) per second unloading rate.

John Deere Harvester Works, East Moline, Illinois USA; 309-765-8000, www.johndeere.com

AE50 OUTSTANDING



INNOVATIONS 2004

● Impellicone utilizes impeller-shaped needle

The Impellicone is a flow-dividing manifold that evenly distributes anhydrous ammonia (NH_3) to multiple rows across an applicator. It is a self-powered unit that uses an impeller-shaped needle to evenly mix and distribute the two phases (liquid and gas) of NH_3 to multiple outlets. It allows the user to operate across a broad range of application rates and the ability to block ports according to machine size with no sacrifice in accuracy. The Impellicone's accuracy allows end users to apply their target application rate (as opposed to over-application to account for distribution inaccuracies) resulting in less nitrogen leaching, lower crop-yield variability, and ultimately lowering overall application costs. The Impellicone concept was researched by Iowa State University and collaboratively developed with and licensed to CDS-John Blue Co. It is offered in two versions: the IP-1300, a 13-port divider; and the IP-1800, an 18-port divider.

CDS-John Blue Co., Huntsville, Alabama USA; 800-253-2583, www.cds-johnblue.com



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Published by
ASAE – The Society for engineering in agricultural, food,
and biological systems

2950 Niles Road, St. Joseph, MI 49085-9659, USA

269-429-0300 • fax 269-429-3852 • hq@asae.org • www.asae.org

