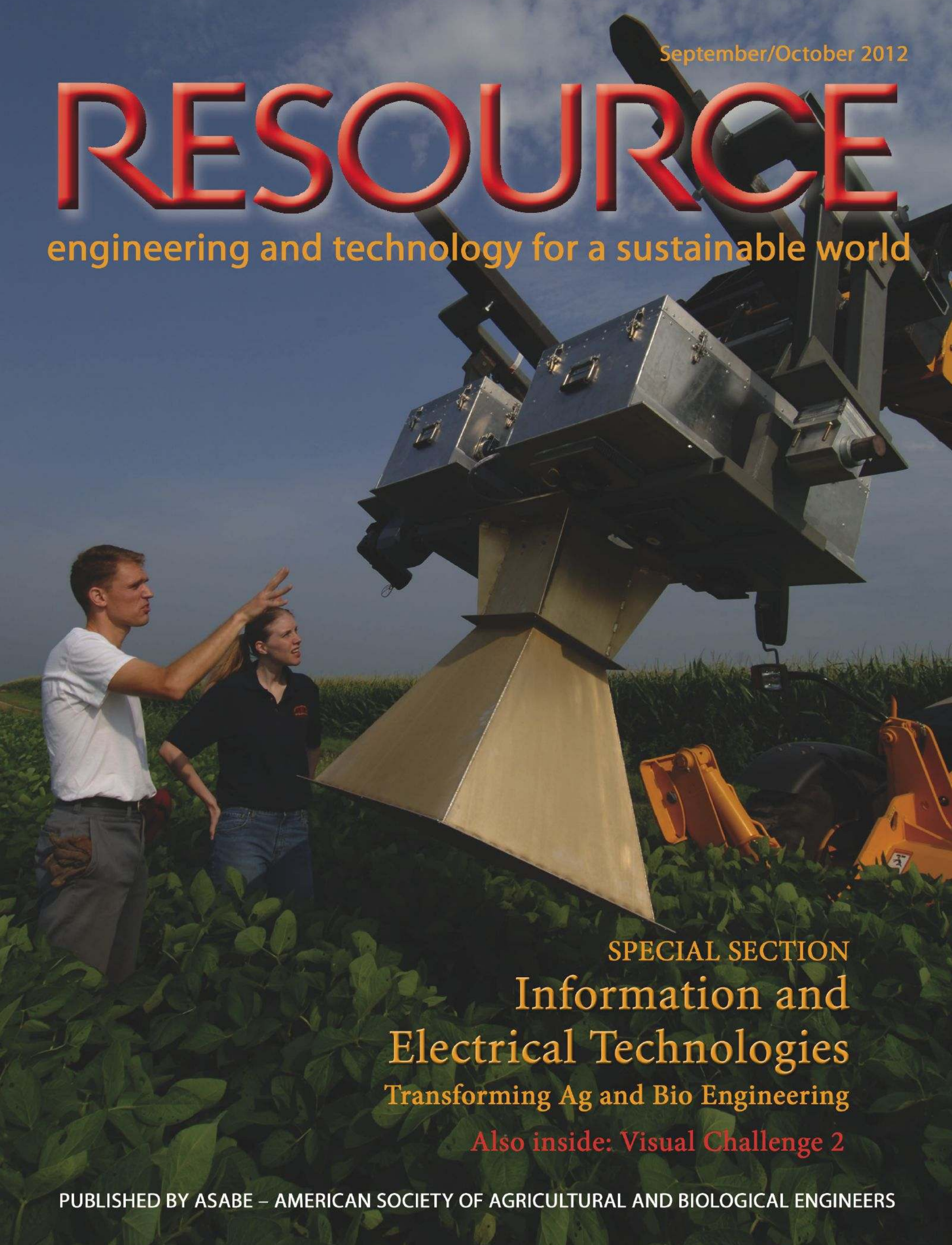
September/October 2012

RESOURCE

engineering and technology for a sustainable world



SPECIAL SECTION

Information and Electrical Technologies

Transforming Ag and Bio Engineering

Also inside: Visual Challenge 2

PUBLISHED BY ASABE – AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS

September/October 2012
Vol. 19 No. 5

Resource: Engineering & Technology for a Sustainable World (ISSN 1076-3333) (USPS 009-560) is published six times per year—January/February, March/April, May/June, July/August, September/October, November/December—by the American Society of Agricultural and Biological Engineers (ASABE), 2950 Niles Road, St. Joseph, MI 49085-9659, USA.

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.

SUBSCRIPTIONS: Contact ASABE order department, 269-932-7004.

ON THE COVER

ASABE member Amy Kaleita and Brian Hornbuckle discuss the validation of remotely sensed estimates of the water cycle under a microwave radiometer positioned over a cornfield in Ames, Iowa. *Photo courtesy of Bob Elbert.*

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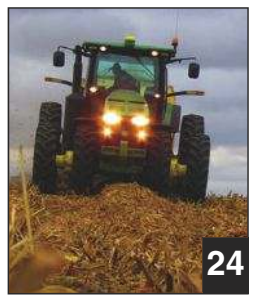
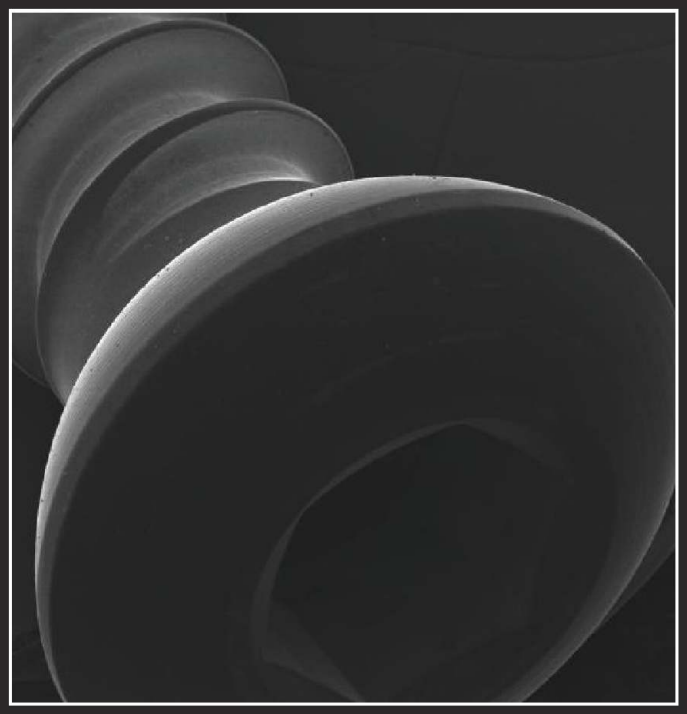
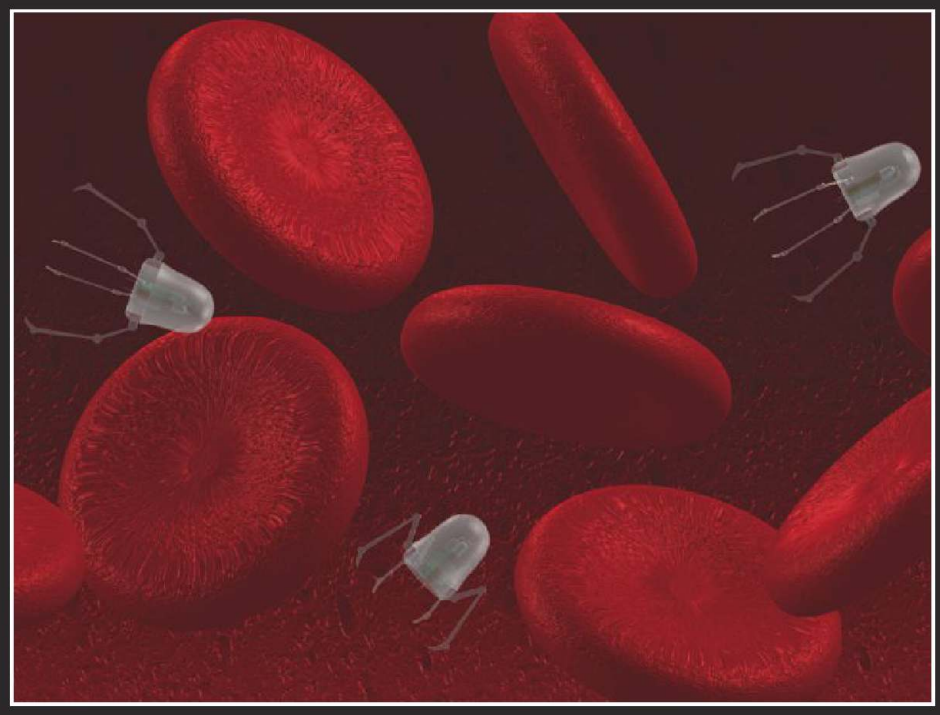
FEATURES

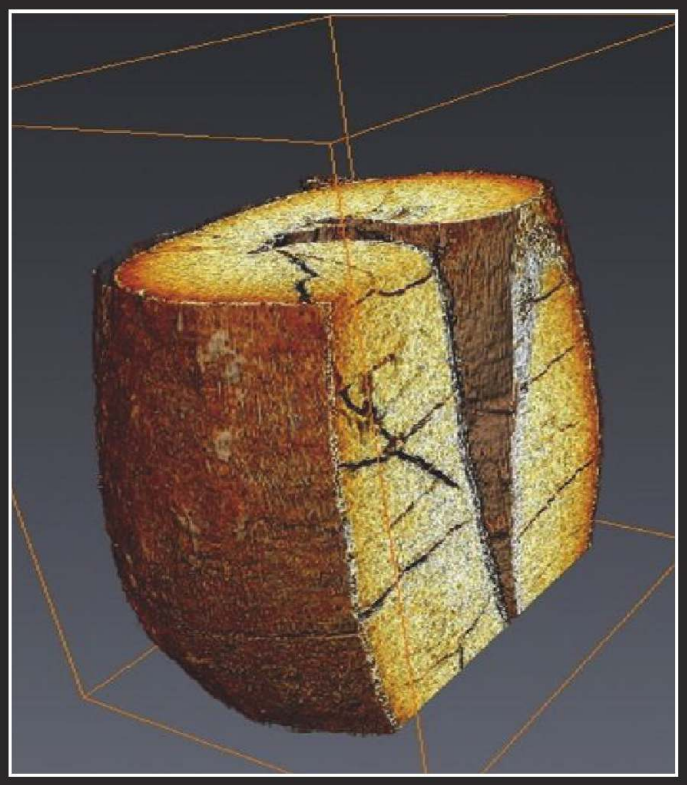


DEPARTMENTS

ERRATUM In "Energy Security: Let's Get it Right" by Gale A. Buchanan and James R. Fischer (*Resource*, March/April 2012, pp. 14-15), the GDP and energy consumption figures were incorrect. The U.S. GDP is about $48,000 per capita, with about 300 million BTUs of energy consumed per person. China's GDP is about $8,000 per capita, with over 64 million BTUs of energy consumed of per person. Our thanks to ASABE Fellow Howard P. Johnson for suggesting these up-to-date corrections. We regret the errors.







Lab Trio: Today's Research, Tomorrow's Reality

Photographers: Matthew DiCicco/Suresh Neethirajan
Graduate Student/Assistant Professor,
BioNano Laboratory, University of Guelph, Canada

Top left "Seemingly Spotless Surgical Screw Studied Up-Close"
Stainless steel screw, used in canine orthopedic surgery, at scale 1.5 millimeters.

Illustrator: Mark Fletcher, Concept: Suresh Neethirajan
Undergraduate Student/Assistant Professor,
BioNano Laboratory, University of Guelph, Canada

Top right "Exploring the Great Red Sea"
Computer-assisted illustration of bionanorobots maneuvering through the blood stream in search of tumors.

Tomographers: Anup Suresh/Suresh Neethirajan
Undergraduate Student/Assistant Professor,
BioNano Laboratory, University of Guelph, Canada

Immediate left "3D Grain Kernel"
Real-time three-dimensional visualization of fissures and cracks Inside insect-infested durum wheat kernel using X-ray micro-computed tomography.

Illustrators:
Stephen L. Young
Weed Ecologist, University of Nebraska-Lincoln, North Platte, USA

Michael Heller
Graphic Artist, University of Nebraska-Lincoln, North Platte, USA

"The Future of Weed Control"

Robotic weed control will be an essential element of tomorrow's more targeted, integrated weed management in cropping systems. Researchers at UNL's West Central Research and Extension Center are looking at what these systems would need and how they could integrate the latest technologies in weed identification, biology, engineering, and control into a single platform.