

CROPS, SOILS, AGRONOMY

JULY 2006 V51 N07

CSA NEWS

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CLEANING UP CONTAMINATED SOIL

Brome, biosolids help remove
diesel from the ground



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FOOTPRINTS IN THE SOIL & AGRICULTURE'S ETHICAL HORIZON

FOOTPRINTS IN THE SOIL People and Ideas in Soil History

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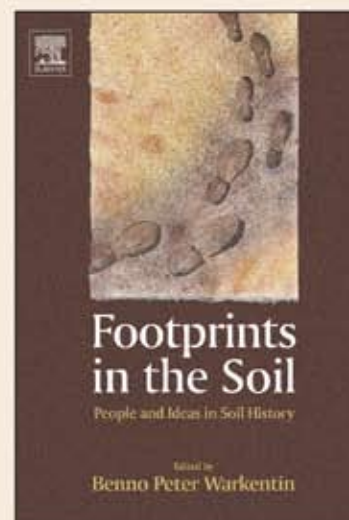
Benno P Warkentin

Oregon Water Resources Research Institute, Oregon State University, Corvallis, U.S.A.

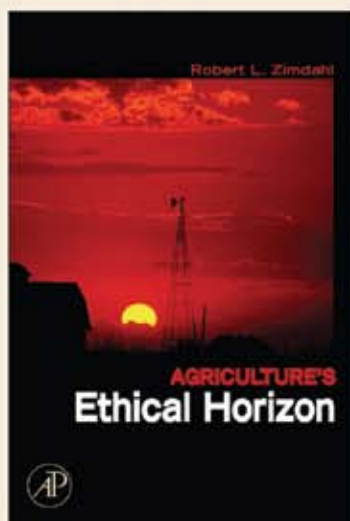
Footprints in the Soil is about the progressive "footprints" made by scientists in the soil. It contains chapters chosen from important topics in the development of soil science, and tells the story of the people and the exciting ideas that contributed to our present understanding.

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AGRICULTURE'S ETHICAL HORIZON

By

Robert L. Zimdahl

Colorado State University, Fort Collins, U.S.A.

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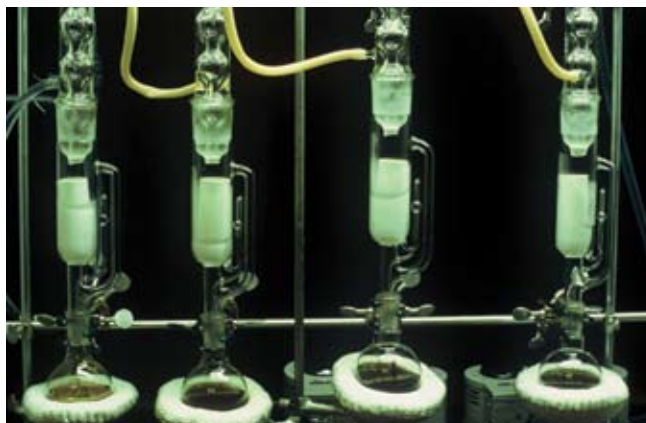
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CLEANING UP CONTAMINATED SOIL

Brome, biosolids help remove diesel from the ground

Petroleum hydrocarbons are common contaminants that can enter soils from spills of fuels and lubricants during storage, transfer, or transportation activities. Sometimes improper disposal practices result in soil contamination. Fuels and lubricants are actually mixtures of hundreds or even thousands of different kinds of hydrocarbon compounds; some of these compounds are toxic to humans and other organisms in the environment. So, cleanup of hydrocarbon-contaminated soils is a priority in North America and around the world.

Many hydrocarbon compounds are potentially biodegradable in soil if the right environmental conditions exist, the right microorganisms are present, and the hydrocarbon compounds are bioavailable to the organisms capable of breaking them down. Many naturally occurring soil microorganisms are capable of biodegrading petroleum hydrocarbons for energy and growth (of new cell biomass). Soil conditions can be managed (e.g., nutrient additions, aeration, and water management) to optimize environmental conditions for hydrocarbon degradation. Reduced bioavailability can be an issue if hydrocarbons (especially larger compounds) have had lots of

time to "age" or react with soil components. Microbial degradation of hydrocarbons can be enhanced in the root zone of plants. Plants stimulate soil microbial activity and in some cases may increase the bioavailability of hydrocarbon compounds to degrading microorganisms. The use of plants in bioremediation strategies is called phytoremediation.

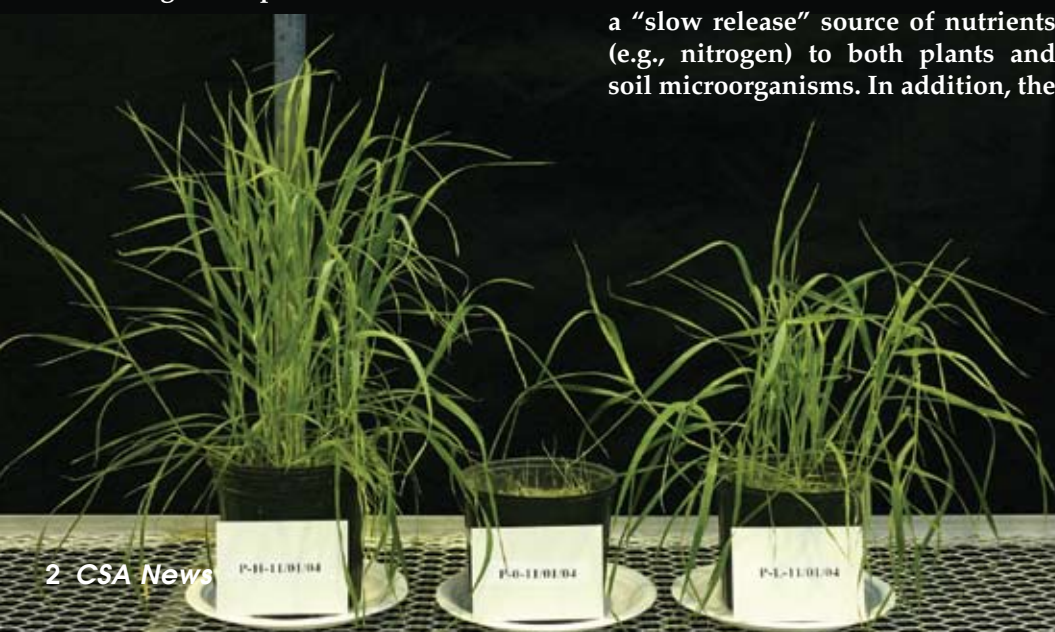
In the July–August 2006 issue of the *Journal of Environmental Quality*, Sara Dickinson and Michael Rutherford at the University of Northern British Columbia (UNBC), Canada, report on a 32-week greenhouse experiment that investigated the use of smooth brome for the phytoremediation of diesel-contaminated soil. Earlier work had shown that this plant was tolerant of hydrocarbon-contaminated soils. The soil used in the work had been contaminated over many years during diesel transfer operations (i.e., spills) at a railway terminal. Before the phytoremediation experiment, industrial managers placed the soil in a biopile for about five years, but very little diesel degradation occurred over this period. The UNBC researchers included the use of municipal biosolids (i.e., anaerobically digested sewage sludge) as a soil amendment during phytoremediation because biosolids can act as a "slow release" source of nutrients (e.g., nitrogen) to both plants and soil microorganisms. In addition, the

biosolids were expected to improve soil structural properties and reduce the slightly water-repellent nature of the diesel-contaminated soil. The addition of biosolids (1.33 and 2.67% biosolids in soil when expressed on a dry weight basis) increased the degradation rate of diesel hydrocarbons and also increased plant biomass, soil pH, soil water-holding capacity, and available soil nitrogen relative to soils that did not receive biosolids.

"Overall, the presence of plants did not increase the rate or extent of hydrocarbon degradation, relative to that in unamended, nonvegetated soils," Rutherford says. "Vegetation was, however, an important factor within biosolid-amended soils, as was observed by a greater extent of hydrocarbon degradation."

So, biosolids increased the rate of removal, but not the extent (i.e., total amount) of removal; the presence of plants helped increase the extent of hydrocarbon removal in biosolid-amended soils. The increased rate of degradation in biosolid-amended soils may be relevant in northern climates (e.g., northern British Columbia) where temperatures are cool and growing seasons are short.

Dickinson, S.J., and P.M. Rutherford. 2006. Utilization of biosolids during the phytoremediation of hydrocarbon-contaminated soil. J. Environ. Qual. 35:982–991. View the full article online at <http://jeq.sciijournals.org/content/vol35/issue4/>



Growth response (at six weeks) of smooth brome to biosolids added to diesel-contaminated soil: left plant, 2.67% (dry weight basis) biosolid addition to soil; right plant, 1.33% (dry weight basis) biosolid addition to soil; center plant, no biosolid addition.

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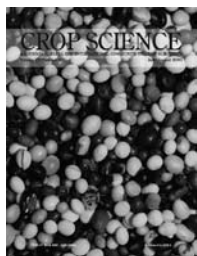
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Gene Identified for Resistance to Soybean Aphid

After arriving in North America in 2000 from Asia, the soybean aphid has rapidly spread throughout the continent and become established as a major soybean pest. Currently, the only means to combat the aphid is with the application of registered insecticides. A more economically sound and environmentally friendly means to control the aphid would be with genetic resistance.

Soon after the arrival of the aphid, scientists began screening the USDA soybean germplasm collection housed at the University of Illinois to search for genetic resistance to the aphid. A method to screen large numbers of

soybean lines efficiently was developed. Within a year, several sources of resistance were identified, and their resistance was characterized. Two kinds of tests helped reveal if the resistance was antixenosis, a type that affects the aphid's preference towards feeding on a plant, or antibiosis, a type of resistance that limits the aphid's ability to colonize plants.

The scientists began making crosses between susceptible soybean cultivars and some of the sources with a strong antibiosis type of resistance. Genetic analyses of the progeny from crosses with the resistance source, 'Dowling', an old ancestor to current soybean cultivars, revealed that a single, dominant gene controlled resistance in Dowling.

"Soybean breeders will warmly receive the news of the existence of a single dominant gene that gives soybean strong resistance to the aphid because they can use simple back crossing procedures to rapidly convert cur-



Soybean aphids on a stem.

rent soybean cultivars into aphid-resistant cultivars," says Curt Hill, lead scientist in the study appearing in the July–August issue of *Crop Science*.

According to Hill, new aphid-resistant cultivars should be available to producers sooner rather than later.

Hill, C.B., Y. Li, and G.L. Hartman. 2006. A single dominant gene for resistance to the soybean aphid in the soybean cultivar Dowling. *Crop. Sci.* 46:1601–1605. View the full article online at <http://crop.sci-journals.org/content/vol46/issue4/>



Is Irrigation with Type 1 Recycled Water Safe for the Environment?

The Edwards Aquifer is the primary source of drinking water for San Antonio, TX. Because of its high quality, no pretreatment of the aquifer water is required before distribution to the community. And because current pumping demands from the aquifer have reached the maximum sustainable rate, future development of the city and surrounding areas will depend on developing alternative water resources in combination with conservation of the available aquifer water.

Scientists from Texas A&M University, consultants from CH2M HILL, and administrators of the San Antonio Water System (SAWS) teamed up to evaluate the environmental impact of irrigation of turf in the San Antonio, TX area with Type 1 recycled water. Recycled water, also known as municipally treated wastewater, reclaimed water, or effluent water, is frequently used for irrigation of large turfgrass areas in an effort to save our higher quality surface and groundwater resources for use as potable water. Type 1 recycled water has received the highest level of tertiary treatment and is rated as being safe for incidental human contact.

In this two-year field study, from March 2002 to March 2004, 18 field plots were established and used in triplicate to evaluate three irrigation treatments and two turfgrasses. Irrigation treatments included potable water applied at a rate to replace evapotranspiration, recycled water applied at a rate to replace evapotranspiration, and recycled water applied at a rate of 1.1 times the rate of evapotranspiration to provide a leaching fraction. Leaching fractions are commonly used with recycled water to prevent excess salt accumulation in the topsoil. Turfgrasses used in this study included 'Tifway' bermudagrass and 'Jamur' zoysiagrass, both of which are commonly grown turfgrasses in the San



Test plots at the beginning of the study.



Installation of a glass block lysimeter for collection of leachate at a depth of six inches.

Antonio area. Samples of runoff water, leachate water, soil, and leaf tissue were collected monthly and tested for nine nutrients and total salts.

The study, published in the July–August issue of *Agronomy Journal*, demonstrated that both water sources were capable of producing high quality, aesthetically pleasing turf when used in conjunction with other appropriate management practices such as proper mowing and nitrogen fertilization. However, increased amounts of total salts and sodium were measured in soil samples where recycled water was applied. Thus, careful long-term salt management would be needed to prevent the accumulation of an excessive amount of total salts or sodium in the root zone. Concentrations of all other nutrients in the soil were unaffected by irrigation water sources.

Turf irrigated with recycled water demonstrated a significant increase in potassium and sodium leaf tissue concentrations. Small increases in total salts, sodium, and nitrate concentrations were measured in leachate passing a depth of 76 cm (30 in). Leachate passing this depth would presumably continue to migrate downward to the groundwater table. Therefore, according to the soil, irrigation, and management conditions of this study, irrigation with recycled water did contribute to increased loading of groundwater with total salts, sodium, and nitrate.

Runoff water from plots irrigated with recycled water exhibited a trend of increased total salts, calcium, manganese, and sodium. Despite greater concentrations of these elements in plots irrigated with recycled water than potable water, the concentrations were below the environmental thresholds known to adversely impact the health of surface water bodies.

Thomas, J.C., R.H. White, J.T. Vorheis, H.G. Harris, and K. Diehl. 2006. *Environmental impact of irrigating turf with Type I recycled water*. *Agron. J.* 98:951–961. View the full article online at <http://agron.scijournals.org/content/vol98/issue4/>

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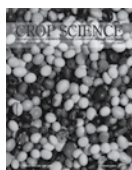
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Agronomy Journal: "Model Concepts to Express Genetic Differences in Maize Yield Components," by J.T. Ritchie and G. Alagarswamy (Vol. 95, p. 4–9). View this article online at <http://agron.scijournals.org/content/vol95/issue1/>



Journal of Environmental Quality: "Phytoextraction of Toxic Metals: A Review of Biological Mechanisms," by Mitch M. Lasat (Vol. 31, p. 109–120). View this article online at <http://jeq.scijournals.org/content/vol31/issue1/>



Crop Science: "Selection for Silage Quality in the Wisconsin Quality Synthetic and Related Maize Populations," by T.J. Frey, J.G. Coors, R.D. Shaver, J.G. Lauer, D.T. Eilert, and P.J. Flannery (Vol. 44, p. 1200–1208). View this article online at <http://crop.scijournals.org/content/vol44/issue4/>



Soil Science Society of America Journal: "Time Domain Reflectometry Measurements of Solute Transport across a Soil Layer Boundary," by H.H. Nissen, P. Moldrup, and R.G. Kachanoski (Vol. 64, p. 62–74). View this article online at <http://soil.scijournals.org/content/vol64/issue1/>



Journal of Natural Resources and Life Sciences Education: "Laboratory Exercises to Demonstrate Effects of Salts on Plants and Soils," by D.R. Clark, C.J. Green, and J.A. Gordon (Vol. 29, 41–45). View this article online at www.jnrlse.org/issues.php



Vadose Zone Journal: "Effects of pH on Metals Precipitation and Sorption: Field Bioremediation and Geochemical Modeling Approaches," by M.-K. Lee and J.A. Saunders (Vol. 2, p. 177–185). View this article online at <http://vzj.scijournals.org/content/vol2/issue2/>

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Packaging the Perfect Consulting Forester

Consulting forestry is an attractive professional specialization, and expanding employment opportunities make it a popular option for forestry students. Nearly half the forest land in the United States is owned by nonindustrial private forest landowners, and much of the forest industry land is being bought by timber investment management organizations. Both of these groups tend to employ consulting foresters.

In 2004, Association of Consulting Foresters (ACF) members were asked to rank the importance of traditional forestry and other courses in the standard accredited forestry curriculum and indicate where additional emphasis was needed and where specialization should occur. Consulting foresters work for private forest owners who have practical forestry problems and needs. What college courses would best enhance the undergraduate experience for these consultants?

The research was conducted by the Department of Forestry and Natural Resources at Clemson University in

South Carolina and was funded by the ACF's first Practicing Foresters Institute Trust endowment grant. The view of ACF members on where educational emphasis is needed was published in the 2006 issue (Volume 35) of the *Journal of Natural Resources and Life Sciences Education*.

While the questions covered the standard curriculum, additional emphasis, and specialization, the results were remarkably similar across the three areas. Communication skills are most important (technical writing and public speaking). Consultants deal with a valuable resource, so it is not surprising to see a need for economic, management, valuation, and business type courses. Consultants also spend much time growing, measuring, and harvesting trees, so technical skills related to these types of field skills also were highly ranked. Practical computer skills relate to technical needs; modern technology was stressed, with areas like global positioning and geographical information systems.

Business administration was seen as a good fit for a minor. Small business management, real estate, and appraisal were courses that were often mentioned. A capstone course in consulting forestry as a business was suggested as a major addition to the business minor. Courses that emphasize valuation issues got high marks,

from advanced forest valuation to real estate finance to taxation.

A general theme was people skills. Human resources, liberal arts to broaden perspective, and personnel management were suggested to enhance the ability to work with people.

The responses did not vary by factors such as gender, region, age, and type of firm, so the results represent national trends that do not depend on demographic factors.

"Consulting foresters expect forestry graduates to have excellent communication skills, superior technical field skills, up-to-date computer and software skills, and awareness of what it takes to work with clients," says lead investigator Tom Straka. "People skills may not be something taught in college, but consultants want employees that understand human interaction."

Straka adds that while technical and computer courses may have changed, the emphasis by consulting foresters on field forestry, operational aspects of the profession, and satisfying clients has remained a constant. This study highlights the kind of changes in forestry curriculums that are needed to produce better consulting foresters.

Straka, T.J., and C.J. Childers. 2006. Consulting Foresters' View of Professional Forestry Education. *J. Nat. Resour. Life Sci. Educ.* 35:48–52. View the full article online at www.jnrlse.org/issues.php



Field work is an important component of a forestry education, especially if the student aspires to be a consulting forester.

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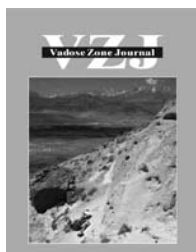
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How Compaction Affects the Soil Water Retention Curve

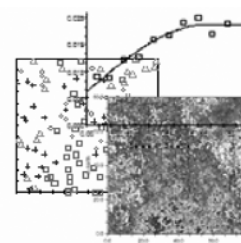
Soil bulk density, defined as the mass of an oven-dry sample of undisturbed soil per unit of bulk volume, is a basic, easy-to-measure, and generally available soil physical property, which is used as an indicator of soil porosity and compactness. An increase in soil bulk density, a common feature of agricultural soils, may influence many aspects of the soil–water–plant–atmosphere system. It is, therefore, essential to develop an ability to quantify and predict the effects of compaction on soil hydraulic properties, namely, the water retention curve (WRC) and the hydraulic conductivity function (HCF), to account for compaction in agricultural, hydrological, and environmental systems.

Based on the premise that a measurable change in bulk density will account for the major effect on the WRC, an approach is suggested that allows quantifying and predicting the effect of increases in the bulk density on the soil WRC, given that the WRC data for an initial bulk density are available. This study is reported in the May issue of *Vadose Zone Journal*. The results show a relatively good prediction of the WRC of compacted soils, which makes the approach suitable for a large number of agricultural, hydrological, and environmental applications.

Assouline, S. 2006. Modeling the relationship between soil bulk density and the water retention curve. *Vadose Zone J.* 5:554–563. View the full article online at <http://vzj.scijournals.org/content/vol5/issue2/>

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IRIS Tubes: A Simple, Robust Tool That Promotes the Identification of Reduction in Soil

The depth and duration of a seasonally high water table can be predicted based on the distribution and abundance of redoximorphic features. Among numerous others, these features include the accumulation of organic matter and concentrations and depletions of iron. When soil is saturated, microorganisms use carbon as an energy source and iron as an alternate electron acceptor. As this process occurs, the orange, oxidized iron is chemically reduced to colorless, soluble, reduced iron. This is how depleted zones are formed in wet soil environments. Alternatively, when the soil is not saturated, iron is oxidized, colored, and in the solid phase as iron concentrations.

An alternative method of identifying reduced soil conditions is measuring oxidation–reduction (redox) potential using platinum electrodes connected to reference electrodes and voltmeters. These measurements provide documentation of the soil redox potential at one point in time. In order to conclude the duration of reduction, this method requires



IRIS tubes provide a new way for soil scientists and wetland professionals to identify reduced soil conditions.

numerous measurements within the soil profile as well as numerous readings throughout the growing season.

In a study published in the July–August issue of the *Soil Science Society of America Journal*, a new method of identifying reduced soil conditions is evaluated. First developed by Jenkinson and Franzmeier at Purdue University, IRIS (indicator of reduction in soil) tubes are polyvinyl chloride (PVC) tubes coated with an iron oxide similar to that found in natural soil environments. They are prepared using a one-half inch schedule 40 PVC cut to 60-cm lengths. The tubes are then cleaned with acetone and sanded with very fine grit sandpaper so that the iron oxide will easily adhere. Iron oxide is painted onto the tubes while they are spinning on a lathe device so that the paint strokes are in concentric rings around the them. The tubes are allowed to air-dry and can be stored for a few months.

This study was conducted by researchers at the University of Maryland between 2002 and 2004 in the Piedmont physiographic province of Maryland and Delaware. A push probe was used to make a pilot hole in the soil so that the IRIS tubes were minimally abraded while maintaining good soil contact. The tubes were installed to a depth of 50 cm in the soil for an average of 20 days. Soil redox potential and pH were measured on the dates that the tubes were installed and removed.

A soil is considered reduced with respect to iron if the redox potential is below the technical standard for iron reduction based on the criteria established by the National Technical Committee for Hydric Soils. IRIS tubes were analyzed in 10-cm sections to determine the percentage of iron oxide removed from the tube surface with depth. When approximately 20% of the iron oxide was removed from a section of the tube, it was concluded with a high level of confidence that the soil was reducing at that depth based on measured redox potential. If 30% of the iron oxide was removed from a section, this study showed that essentially all of those IRIS tube sections were installed in a reduced soil environment. Study co-authors Karen Castenson and Martin Rabenhorst agree that "...IRIS tubes appear to be a promising new alternative to traditional methods used to identify reducing conditions in soil."

The use of IRIS tubes is not limited to identifying traditional hydric soils. Further study is needed to assess their usefulness in determining the function of reclaimed or created wetlands. IRIS tubes are currently being used to assist soil scientists and wetland professionals in identifying reduced conditions, especially when vegetation and/or soils are not in equilibrium with current hydrology.

Findings from this research, supported in part from the Maryland Department of the Environment and the U.S. Environmental Protection Agency, were presented at the SSSA Annual Meeting in 2002, 2003, and 2004.

Castenson, K.L., and M.C. Rabenhorst. 2006. *Indicator of Reduction in Soil (IRIS): Evaluation of a new approach for assessing reduced conditions in soil*. *Soil Sci. Soc. Am. J.* 70:1222–1226. View the full article online at <http://soil.scijournals.org/content/vol70/issue4/>

The Science of Alternative Fuels: Where Are We Now?

Energy and grain companies are increasing activity levels as the mix of technology, marketing, price, and tax policy changes in response to record levels at the pump and the problems introduced from foreign policy. The increased price of petroleum has made work in biofuels more timely. Specifically, biodiesel is defined as mono-alkyl esters of long-chain fatty acids derived from vegetable oils or animal fats that conform to the American Society for Testing and Materials (ASTM) D6751 specifications for use in diesel engines.

Biodiesel refers to the pure fuel before blending with diesel fuel. Biodiesel blends are denoted as "BXX," with "XX" representing the percentage of biodiesel contained in the blend (e.g., B20 is 20% biodiesel and 80% petroleum diesel). Biodiesel is made by transesterification of vegetable oils.

Ethanol, on the other hand, is usually converted from corn even though it can be made from other feedstock. In fact, the ethanol industry is forecast to use about 2.15 billion bushels of corn this year, an increase of 34% from last year's crop usage of 1.6 billion bushels, and some agricultural economists predict that the increased use of corn for ethanol could increase the cost of a bushel of corn by about a dollar and could increase the price of fed animals (beef and pork) slightly.

Whether alternative fuels eventually settle into one or several modes is yet to be determined. It is also unclear right now whether grain- or plant-based fuels will win over hydrogen splitting or other fuel methods. The picture has been complicated by the available technologies and cost of grain supplies, alternative technologies, and the condition of research in these arenas. But here are some current trends that are interesting to those who are involved with the research.

Chevron Corp. announced on 31 May this year that it had formed a

biofuels business to develop technology and commercial opportunities for the production and distribution of ethanol and biodiesel in the U.S. The San Ramon, CA energy company also is building a biodiesel plant in Galveston, TX. The new biofuels business will operate within Chevron Technology Ventures, a unit focused on identifying, developing, and commercializing emerging energy technologies. Chevron blends about 300 million gallons of ethanol a year in the U.S. for use in gasoline.

Rapeseed (canola, in the U.S.) is the subject of research for making methyl ester, the principle component of biodiesel fuel. Emphasizing the importance of this material, Cargill France announced recently its intent to invest more than 50 million euros in the construction of a rapeseed crush plant at its existing site at the port of Montoir in western France. The investment is a joint venture with Sofiprotéol, a financial holding company focusing on the development of oilseed production and outlets for their producers. Cargill will be the majority shareholder and assume all managerial and operational responsibilities. The investment will further support the development of biodiesel production in the country. Construction is expected to begin early next year. The plant will be equipped to supply 250,000 metric tons of rapeseed oil. The majority of this oil (up to 80%) will be transferred via pipeline to Cargill's strategic partner, Diester—a sister company of Sofiprotéol—for use in biodiesel production. The investment will allow the two companies to meet the quota allocated to them by the French government. The quota allocation followed the French government's decision in September 2005 to promote and advance the development of biofuels in the country. The government has prescribed the use of 5.75% of biofuels in fuel by 2008, with the target

rising to 7% in 2010 and 10% in 2015. The plant will produce 350,000 metric tons of rapeseed meal to be sold into the animal feed market.

Imperial Petroleum, Inc. announced on 31 May that it has signed an engagement agreement with a full-service investment financial group providing a broad range of securities-related services for raising \$12 million through a private placement of a convertible debenture. The funds will be used to (i) retire the company's remaining debt after the proposed sale and re-structuring of its current debt facility as previously announced, (ii) provide development capital for workovers of the oil and gas wells retained by the company, (iii) fund the initial requirements of the biodiesel deal with Domestic Energy Partners, and (iv) provide acquisition and working capital for additional growth opportunities in the biodiesel and traditional oil and gas sectors.

On 30 May, Iowa Governor Tom Vilsack signed two renewable fuel and infrastructure bills allowing point-of-sale dealers to take a three cent tax credit per gallon of 2% B2 or higher blend if at least half of the distributor's sales are a B2 or higher blend. The action also establishes a standard for renewable fuels, requiring that by 2020, sales of ethanol or biodiesel must equal 25% of sales. Iowa is one of many states that has enacted legislation affecting the use of biofuels. New York's tax incentive will take effect in July, and Washington State's law requires sales of 2% of biodiesel.

New Holland recently announced that all of its diesel engines can run on B20 biodiesel fuel. New Holland is the first original equipment manufacturer (OEM) to endorse B20 and has worked toward the use of renewable fuels since 2003.



Report from the Director of Science Policy

www.asa-cssa-sssa.org/public_affairs.html
www.sciencepolicyaction.org

A Tough Call for the Agriculture Community?

by Karl Glasener

In last month's Science Policy News, "Hold the Line: FY 2007 Budgetary Outlook for Ag Bleak," I wrote about the coming budget battles and the funding challenges our sciences faced given that little time remained to pass a budget resolution, a huge war-hurricane relief supplemental had yet to be passed, and the budget deficit had soared to \$8.34 trillion. Since then, Congress has gotten bogged down with immigration reform and been unable to come to an agreement. Congress has not passed either the budget resolution or supplemental.



The House has passed the first three—Agriculture, Energy, and Water and Interior—of its 10 annual spending bills with mixed results for agriculture. In a nutshell, in the House ag spending bill for fiscal year (FY) 2007, Hatch (experiment station formula funding) would increase by \$6.3 million to \$183.275 million, McIntire-Stennis would see about a \$600,000 increase, and funding for the National Research Initiative (NRI) would increase from \$181.170 million to \$189 million, an increase of \$7.83 million. While these increases are positive in a dark budgetary climate, they don't amount to much in the way of research funding opportunities for our scientists/sciences. As a comparison, consider the increases being sought for the National Science Foundation (NSF): in his 2007 budget, the president requested \$6.02 billion, a 7.9% increase. The House and Senate have yet to take up the spending bill that covers funding for NSF, so time will

tell if Congress supports his recommendation. For the Department of Energy Office of Science, the president requested through his American Competitiveness Initiative, and on 24 May the House approved, \$3.8 billion, a 15% increase in its research and development funding!

But what about agriculture? If current trends for ag research funding hold, we should not expect to make much headway with either USDA Cooperative State, Research, Education, and Extension Service (CSREES) competitive—formula funding, NRI and Integrated (Sec. 406)—or intramural—Agricultural Research Service (ARS)—accounts.

Funding Support on the Horizon?

A possible solution? On 10 May, Senators Kit Bond (R-MO), Tom Harkin (D-IA), Richard Lugar (R-IN), and Jim Talent (R-MO) introduced Senate Bill S 2782, the National Institute of Food and Agriculture Act of 2006 (NIFA) (www.asa-cssa-sssa.org/temp/061001/S2782.pdf), "a bill to establish the National Institute of Food and Agriculture, to provide funding for the support of fundamental agricultural research of the highest quality, and for other purposes." The bill was referred to the Senate Agriculture Committee, which will probably hold hearings this summer or early fall to discuss and debate the merits of establishing such an institute within the USDA. The NIFA legislation would implement the recommendations coming out of the USDA Research, Education, and Economics Task Force established in the 2002 Farm Bill. The task force found the nation's farmers to be at a competitive disadvantage from foreign competitors due to inadequate

funding of agriculture research. A key recommendation of the task force was the creation of a National Institute for Food and Agriculture that would supplement ongoing research conducted by the USDA. Implementing this recommendation, S 2782 directs the USDA to create an institute that provides agriculture researchers additional funds through a competitively awarded grant program.

The institute would be headed by a Director answerable to the USDA Secretary (thus the institute would not be managed with the USDA Research, Education, and Economics mission where CSREES and ARS reside); a Standing Council of Advisors to establish research priorities and review, judge, and maintain the relevance of programs; standing scientific committees, as needed, to ensure high quality and rigorous review of proposals and merit; an Office of Advanced Science and Application to identify national research needs; and an Office of Scientific Assessment and Liaison to monitor the effectiveness of the scientific expenditures by the institute. Under NIFA, the institute would award about 1,000 new project grants annually with the average project grant at around \$225,000 per year. Overhead for grant management would be comparable to that of NIH and NSF grants. Project grants would be provided for a maximum of five years with the average award duration of 3.5 years. For each FY of 2007 through 2010, the institute would provide 10 multidisciplinary grants. For FY 2011 and subsequent FYs, the institute would provide multidisciplinary grants to fund not fewer

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than 40 research centers. Funding for the institute would ramp up from \$245 million in FY 2007 to \$966 million in FY 2011!

Should the agriculture community support NIFA? Where do our scientists see their funding coming from in 5, 10, or 20 years? Again, given current funding trends for research supported by USDA-CSREES and ARS, how confident are we that these current funding mechanisms will provide adequate funding? For example, the NRI, which was created around 1990 and authorized at \$500 million, has reached a high in funding of only \$181 million during the past 16 years.

I believe that ASA, CSSA, and SSSA should support NIFA. These senators certainly are expecting agriculture community support. I'd like to hear your thoughts. Please join the discussion ongoing at our science policy blog site, www.asa-cssa-sssa.blogspot.com. The thread will be "National Institute of Food and Agriculture." Meanwhile, if you'd like to receive updates on the status of the various annual spending bills mentioned above and others that fund our sciences, know what issues are up before Congress and the administration, or learn what science policy activities ASA-CSSA-SSSA are involved in, subscribe to the Science Policy Report at www.asa-cssa-sssa.org/public_affairs_sspr.html.

Farewell to SSSA Science Policy Intern Laura Blazey

SSSA Science Policy Intern Laura Blazey has completed her five-month internship. During her brief but very busy stay, Laura was instrumental in getting the House Soils Caucus up and running. Between the two of us, we visited with congressional staff of more than 40 House members, educating them about the caucus and urging them to join. Laura will now spend the next three months working as a summer naturalist leading environmental education classes at the Aspen Center for Environmental Studies in Aspen, CO. We thank Laura for the contributions she's made to soil science and wish her the very best.

Science Policy Intern Report

Securing North America's Resource Future with Basic Science Research

by Caron Gala

This month in the Science Policy Office, we worked on officially forming the House Soils Caucus and supporting our membership and colleagues by helping them apply for seats on the Federal Invasive Species Advisory Committee (ISAC) and the National Resource Conservation Service Agricultural Air Quality Task Force (NRCS-AAQTF). I also attended a biofuels briefing presented by the National Coalition for Food and Agricultural Research (N-CFAR) and a presentation by ASA-SSSA member Dr. Laurie Drinkwater on agroecosystems research at the USDA Sustainable Agriculture Research and Education (SARE) offices.

I attended several coalition meetings, which addressed how to define a strategy to influence the budget process. Communicating examples of events or programs where research has proven to supply cost-effective, proactive measures of resource management to legislators and staff is one of the most effective means of promoting our sciences. Cost-benefit analysis is generally an agricultural economics tool, but fiscally conservative legislators require agency officials to supply summary documents regarding the success rate of each dollar spent. These requirements are stated in directives from legislators during testimony and also in legislation. For example, the House of Representatives Resources Committee recently passed HR 4200, the Forest Recovery and Research Act, which, among other measures, directs the U.S. Forest Service to report on the economic cost-benefit of not salvaging lumber after a disaster, while accounting for the benefits and costs that standing snags and downed wood play in providing habitat for species, replenishing soil nutrients, and/or fueling potential forest fires. While this legislation has the capacity to allow for greater awareness of the services that forest soils provide, incorporating all the benefits in a purely fiscal manner will be difficult. The heterogeneity of soil in particular provides services that are not intrinsically quantifiable in monetary terms. However, communicating the benefits of best soil management practices can be an effective method of demonstrating how cost can be averted with sound resource management planning.

Best management practices reduce costs by implementing systematic approaches that involve multiple stakeholders for successful resource management. HR 4200 requires that the U.S. Forest Service and the Bureau of Land Management provide a set of best management practices for dealing with catastrophic events on forest types and "plant association groups." In the past, this bill has been criticized by groups that oppose the construction of temporary logging roads, as construction of these roads has been used as an example of one "preapproved" best management practice. The general concept that science applications need to be used to best manage federal land is inarguable. It is our responsibility as scientists to impart our understanding of soil properties in such a way that reinforces proper management. We observe these properties through our research; we also need to communicate this understanding when we suggest applications of this research.



C. Gala, Science Policy Intern, Washington, DC; cgala@agronomy.org.



American Society of Agronomy Centennial

The Early Years of ASA: 1910–1921

by Lowell E. Moser

Editor's note: The following is one in a series of articles presenting some of the interesting details of ASA's history and heritage. On 31 Dec. 2007, ASA will be 100 years old, and periodically throughout this year and next, CSA News will run more historical articles like this one as well as provide important information on the yearlong centennial celebration, which begins in New Orleans during the 2007 Annual Meetings.

The American Society of Agronomy was off to a good start. After establishment on 31 Dec. 1907, there were 121 charter members by 1 July 1908. Proceedings for the first four Annual Meetings were published, and then in 1913, the *Journal of the American Society of Agronomy* was started as a quarterly publication. The Society held annual meetings and often cosponsored meetings with other organizations. The founders and early members believed that interaction with other agricultural societies was important and were instrumental in creating the Society for the Promotion of Agricultural Science. ASA had representation in that group, and joint sessions were frequently held. The membership of ASA grew, and by 1917, there were 652 members. State and regional chapters were established, and by 1917, there were 11 such chapters, ranging in size from 10 to 65 members: Cornell, Georgia State College, Iowa State College, Kansas State Agricultural College, Minnesota College of Agriculture, The Ohio State University, South Dakota State College, New England, Washington, DC, University of Illinois, and North Carolina A&M College.

The journal went to bimonthly publication in 1915. It went to nine issues in 1917, and 432 pages were published that year. The journal was



attracting international attention, and a number of subscriptions went to foreign countries. Within the Society, the journal was a very high priority, and most of the operating money went to support its production. Dues had stayed at \$2.00 per year, but with rising publication costs, they were raised to \$2.50 in 1918. Although the cost of producing the journal was high and membership lapses numerous, ASA had made excellent progress by 1917, with 652 members and a year-end balance of \$2,411 in the treasury. There were 609 members in the continental USA, 6 in island dependencies, 25 in Canada, and 12 in other countries. In addition to the Executive Committee, four standing committees were developed:

- Agronomy Terminology,
- Soil Classification and Mapping,
- Varietal Nomenclature, and
- Standardization of Field Experiments.

The committees were active and frequently published long reports regarding their findings and recommendations.

The Effect of the War

In 1917, the war had its effect on ASA by keeping down the numbers of new members, because of the draft, and driving up the publication costs. The next year was "the most disastrous period in the history of the Society," according to the Lyman Carrier, ASA Secretary. There was a major decrease in members. Fifty-five were identified as serving in the war effort, and their dues were waived. Membership dropped to 509 in 1918 and to 473 in 1919. The 1918 meeting was postponed to 6–7 Jan. 1919. Indeed, hard times had come to the Society. In 1920, there were only 436 members and 82 subscriptions to the journal. The 1920 journal was the smallest one

"In 1917, the war had its effect on ASA by keeping down the numbers of new members, because of the draft, and driving up the publication costs."

published since the first one in 1913, not due to a lack of contributions but to lack of funds. Despite hardships, the program continued forward. In 1920, an advisory council was formed to establish cooperative relationships with the National Research Council in Washington, DC, and a new committee entitled "Teaching Agronomy" was established. In 1920, Society members were asked if they undervalued their society. For example, the American Chemical Society had just increased their dues from \$10 to \$15 "while the ASA struggles with a few hundred members at \$2.50. Let's set the mark for 1,000 members and see how far we can go past it!" In 1920, dues were increased to \$3.00.

In 1921, things began to look better. With the help of some key members, the new ASA Secretary, P.E. Brown, took it upon himself to pursue lapsed members. This was successful, and the number of members increased to 666. Also, there were 141 journal subscriptions by Annual Meeting time. The Executive Committee decided to take some drastic action so that the journal could be better funded. The membership was surveyed to get their reaction to increasing the dues to \$5.00 annually. Although many favored the increase, the majority did not. At the Annual Meetings in New Orleans, in 1921, a motion to increase the dues to \$4.00 was put forth but was defeated. Dues remained at \$3.00 per year.

Lowell E. Moser

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Executive Vice President's Message

Effective Communication Key to Workplace Success

by Ellen Bergfeld



As a scientist without much human resources coursework to rely on, a staff of 40, and four Boards of Directors/Trustees with whom I work, I try to take advantage of business reading and training whenever possible and recently attended a workshop on Communication and Delegation Skills. I have found that typically our undergraduate/graduate work does not fully prepare us for many situations that confront us in the workplace. Therefore, I hope that by sharing some of my experiences, you may benefit and/or

look for similar training if you believe it would enhance effectiveness in your position.

In preparation for the workshop, all participants were asked to complete a DiSC profile prior to the class. DiSC is the acronym for the four behavioral dimensions that are measured: Dominance, Influence, Steadiness, and Conscientiousness. Understanding DiSC styles allows greater insight into our strengths and liabilities, as well as what we are motivated by and our communication preferences. Effective communica-

tion and understanding behavioral styles—how our personal behaviors enhance or impede effectiveness—is critical in working with others effectively. Table 1 provides an overview of the four behavior profiles.

Whether communicating with colleagues, employees, or customers, our ability to express ideas clearly and to understand others is paramount to our personal effectiveness.

Discussions throughout the workshop focused not only on crafting what you wish to communicate, but also on the audience/person receiv-

Table 1. Behavior profiles.†

	Dominance	Influence	Steadiness	Conscientiousness
Tendencies	Getting immediate results, taking action, accepting challenges, making quick decisions	Involvement with others, making a favorable impression, enthusiasm, entertaining, group participation	Calm, patient, loyal, good listeners	Attention to standards and details, analytical thinking, accuracy, diplomacy, indirect approach to conflict
Motivated by	Challenge, power and authority, direct answers, opportunities for individual accomplishments, freedom from direct control, new and varied interests	Social recognition, group activities, relationships, freedom of expression, freedom from control and detail	Infrequent change, stability, sincere appreciation, cooperation, using traditional methods	Clearly defined performance expectations and standards, quality and accuracy being valued, atmosphere is reserved and business-like
Communication preference	Clear, direct and specific information, getting to the point quickly, business-focused, outcome/result-oriented discussions	Casual, friendly, relaxed and empathetic discussions, honest communication, use of humor, putting details into writing, focusing on who vs. how/what	Clear, logical, consistent, specific and supportive information, sincerity, informal and friendly, slower pace	Clear and specific, business-focused, slower-paced, outcome/results-oriented discussions, focused on facts, tactful
Liabilities	Lack of concern for others, impatience, moving forward without considering outcomes, not a good listener	Impulsiveness, disorganization, lack of follow through	Overly willing to give, putting their needs last, lack of assertiveness, resistance to positive change	Overly critical of self and others, indecision because of desire to collect and analyze data, creatively hampered by a need to follow the rules

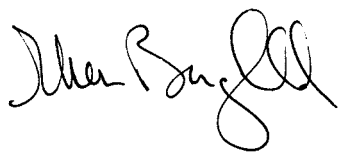
† Adapted from Russell Consulting, Inc. (2005).

ing the information. Our ultimate goal in communication is to achieve understanding. However, people hear and process information differently, and the act of communicating is rife with “noise”—whether this is the tone in which we are communicating, the mental state that our recipient is in, or our juggling too many things at once to either communicate or listen properly. We are all living with information overload, full of time pressure and personality differences. It isn’t hard to understand that we are bound to have some miscommunications along the way. What is the best way to improve? Seek first to understand and then provide feedback to the communicator. Ask questions to clarify meaning or ambiguities: “This is what I understood that you said, is it correct?”

Some take-away tips from the workshop include:

- Understand yourself and how your behavior affects others.
- Critically evaluate and understand your reactions to other people.
- Know how to adapt and/or modify your behavior to meet the needs of other people and situations.

The end result of participating in the workshop is that I am more aware of my own strengths and weaknesses, how different people communicate/receive information, and how better to ensure understanding via communications. Now the test will be to utilize what I have learned to effect improved results.



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Agronomic Science Foundation

For the Love of Soil

Wisconsin Celebrates Completion of State Soil Survey

Hundreds of individuals—including soil scientists and state and federal dignitaries—celebrated the completion of the Wisconsin soil survey with the Year of Soil event held on 16 May. As SSSA’s headquarters is in Wisconsin, SSSA was a sponsor of the event at the state capitol in Madison. SSSA hosted an informational booth, and the Smithsonian Soils Exhibit was also a featured display.

Governor Jim Doyle declared 2006 as the “Year of Soil” in Wisconsin as part of the festivities surrounding the completion of the state soil survey with the USDA Natural Resources Conservation Service (NRCS). Wisconsin is the 10th state to have complete digital soil survey coverage.

Bruce Knight, chief of the USDA-NRCS, in his speech pointed to the 24/7 internet access to the soil survey information as a boon for conservation efforts, landowners, and community planners.

“It will help farmers, developers, homeowners, and others make wise land-use decisions on where to plant a field, where to put a road, or where place a septic system,” he said.

(Continued on page 17)



The Smithsonian Soils Exhibit was on display at Wisconsin’s Year of Soil event. Development Officer Paul Kamps, right, talks with one of the soil scientists who worked on the state soil survey.

Ben Meadows, Brunton Partner for Smithsonian Exhibit

Ben Meadows Company, a distributor of professional equipment and supplies, and Brunton, a compass manufacturer, announced plans to donate a portion of catalog sales to the upcoming SOILS: Worlds Underfoot exhibit at the Smithsonian Institution’s National Museum of Natural History in Washington, DC. When consumers purchase Brunton products from Ben Meadows now through 31 Dec. 2006, a portion of the proceeds will be donated to the exhibit.

“It’s the kind of project we look for. A real educational step for our company that ties directly into our product lines,” says Brunton’s President and CEO John Smithbaker. “We’re privileged and excited to collaborate with Ben Meadows and the Soil Science Society of America on this once-in-a-lifetime opportunity to help fund a unique exhibit, at one of the most prestigious museums in the world, emphasizing the vital role soil plays in our lives and the critical importance of stewardship and sustainability of the earth as a key natural resource.”

With the help of donors across the country, the joint exhibition project of Smithsonian’s National Museum of Natural History and SSSA will open its doors to the story of soil in 2008. This 5,000-square-foot exhibit will be seen by more than six million visitors a year and occupy one entire hall of the most-visited natural history museum in the world. It will bring together scientific research in many fields and the Smithsonian’s educational outreach capabilities in a wide-reaching public-programming effort. It is being developed as part of the museum’s Forces of Change outreach program, which explores the forces that shape and sustain the world we live in. View more information on the project at: www.soils.org/smithsonian. To learn more about Ben Meadows and to view their catalog, which includes Brunton products, call 1-800-241-6401 or go to: www.benmeadows.com.

ASA, ASF Announce China Science Award

China has one-quarter of the world population, which makes sustainable development of Chinese agriculture crucial to China and to the stability of the world. Many scientists around the world have made significant contributions to Chinese agriculture. To recognize these efforts, members of the Association of Chinese Soil and Plant Scientists of North America have teamed up with the American Society of Agronomy and the Agronomic Science Foundation to offer the new China Agricultural Science Award.

ASA-CSSA-SSSA members are eligible to receive the award through their significant contributions to Chinese agriculture by:

1. Impacting Chinese agricultural education
2. Promoting applications of new research and technologies in China
3. Influencing Chinese agricultural policies that benefit farmers and the environment
4. Improving the quality of Chinese agricultural research and technology transfer

Help is still needed to permanently endow a fund through ASF that will support this award in perpetuity. An endowment of \$25,000 or more is necessary to provide enough funds for an annual \$1,000 award.

Contributions can be made online at www.a-s-f.org or by mailing your donation to: The Agronomic Science Foundation, Attention: Bonnie Lueck, 677 S. Segoe Road, Madison, WI 53711. Please specify that your donation is for the China Agricultural Science Award.

For more information, contact Bonnie Lueck at blueck@a-s-f.org or 608-268-4947.



Publications



'Build Your Own Books' with the Societies' New Custom Content Service

The Societies are pleased to launch ASA-CSSA-SSSA Custom Content, a new service that will allow members to choose journal articles and "build their own books." Today people want flexible content, and the Societies can deliver it quickly and attractively with digital content and print-on-demand technology. Some potential uses include:

- Course packs—get the quantity you need, and update them by adding new content each semester.
- Symposia—print related work before or a published symposia section after.
- Subject collections—choose from the more than 200 topics available at www.scijournals.org/collections/.
- Author compilations—assemble all your work for colleagues, employers, and review committees.



How Does Custom Content Work?

Orders must be placed online at www.asa-cssa-sssa.org/custom_content/ (or simply click on the Publications tab from any Society home page and follow the links). The web form allows customers to select articles and request a quote. One can also supply text for the inside front cover and choose from several cover options. Color articles are reproduced in color. Books larger than 60 pages feature a glued paperback binding.

Staff will verify the order and send the quote and purchasing instructions. The minimum order is 15 books. Prepayment by credit card or purchase order number is required before an order can be printed and shipped because of the custom nature of this product. Orders are filled in approximately two weeks. International shipping and glue-bound books will take a little longer. For classroom text orders, we recommend having a bookstore handle the purchasing because of the minimum order requirement. Our regular membership and bookseller discounts of 20% apply to Custom Content books.

Do you need something unique that you don't see on the web order form? Contact Lisa Al-Amoodi (lalamoodi@agronomy.org) with your request.

Godshalk Named Incoming Crop Science Editor

Brent Godshalk, Research Manager at BASF Plant Science, will be the incoming editor of *Crop Science*, beginning in January 2007. Because of the additional duties taken on by current Editor Kendall Lamkey at Iowa State University, Dr. Godshalk will be handling some of the responsibilities normally assumed by the Editor, immediately. After January, Godshalk will be overseeing major changes on the journal that were begun during Dr. Lamkey's term, including a redesign, inclusion of *The Plant Genome* supplement, and a growing volume of papers. He will also oversee changes that may come from an outside overview of the publication. He brings the unique perception of crop science of both the academic and industrial viewpoints. Godshalk has served on the *Crop Science* Editorial Board as a technical editor for three years and as an associate editor for six years.



Call for Nominations: Editor of the *Journal of Natural Resources and Life Sciences Education*

The American Society of Agronomy (ASA) is seeking nominations for the position of Editor of the *Journal of Natural Resources and Life Sciences Education* (JNRLSE), a peer-reviewed teaching journal in the life sciences, natural resources, and agriculture. The position is voluntary, and the Editor is responsible for the overall quality of the intellectual content of the journal and for the timeliness and quality of the review process. Interested persons may nominate themselves or be nominated by an active member.

Duties of the JNRLSE Editor:

1. Chairing the JNRLSE Editorial Board.
2. Considering questions of editorial practices that promote the dissemination of exceptionally high-quality scientific knowledge and the uniformity of format, style, and procedures in conjunction with the ASA Editor-in-Chief, ASA Board of Directors, Executive Committee, and as needed with the ASA Budget and Finance Committee.
3. On behalf of the ASA President, appointing the associate editors to the Editorial Board.
4. Serving as a member of the Society(s)' editorial policy committee(s).
5. Serving as a liaison to other Societies and individuals interested in education in the life sciences, natural resources, and agriculture to ensure the multidisciplinary scope of the journal content and subscription base.

Additional information about the duties of Editor can be found by going to www.asa-cssa-ssa.org/publications/pdf/ed_guide_editor.pdf.

The Editor is expected to be a visionary, as our publications are experiencing rapid change in our sciences, resources, processes, format, and delivery. In addition, there is fierce com-

petition for authors and readers. Prior editorial experience with ASA publications or similar publications is expected. The Editor is appointed by the ASA President upon confirmation by the ASA Board of Directors. He/she serves for three years with eligibility for reappointment for a second three-year term but not a third term without an intervening three-year period.

The position carries a great deal of responsibility as well as personal satisfaction. Candidates are asked to submit (1) answers to the five questions below, (2) vita including a list of previous editorial experience, and (3) a one-page vision for JNRLSE by 15 Sept. 2006 to David Sleper, ASA President, preferably by email to sleperd@missouri.edu. Applicants are encouraged to contact Dr. Sleper with questions.

Questions for JNRLSE Editor Candidates/Nominees:

Candidates/nominees are to answer these questions and provide

responses to David Sleper (sleperd@missouri.edu) by 15 Sept. 2006.

1. Why would you like to serve as the Editor of JNRLSE?
2. What steps do you plan to take to recruit subscribers and ensure continued quality submissions to JNRLSE in the next year? In the next three to five years?
3. Do you have both the time and the agreement of your superior(s) to take this position?
4. As Editor, you will also interact with the ASA Editor-in-Chief, Board of Directors, Executive Committee, and other committees, as well as serving a major role in reaching out to members of other organizations; what aspects of interacting with these groups are most and least attractive to you?
5. What aspect of being Editor will help you meet your personal goals?

Rebecca Funck Promoted to Managing Editor of SSSAJ

Tell us about yourself

I grew up in Two Rivers, WI but have lived in Madison for the past 14 years. My husband, daughter, and two Labrador retrievers keep me busy out of the office. I have served as Assistant Editor of the *Soil Science Society of America Journal* (SSSAJ) for the past five years.



What responsibilities do you have as Managing Editor of SSSAJ?

I oversee the production of SSSAJ, handling manuscripts from acceptance to publication/print. I also evaluate the publication process of the journal and make or recommend the necessary changes to ensure SSSAJ's livelihood.

Share with us one part of your resume

I have a B.S. in English (1996) and Biochemistry (2000), both from the University of Wisconsin-Madison.

What do you like to do in your free time?

I like to cook, be outside, and spend time with my family.

The Plant Genome Seeks Papers that Translate Genomic Technology into Agronomic Advancement

by The Plant Genome Editorial Board

Crop genetic research is changing. New technologies have altered the level and intensity of data acquisition and analysis at all levels of research. Today, not only can we correlate the expression level of a gene with variation in a specific trait, we can do it for tens of thousands of genes simultaneously. We can computationally sort through hundreds of thousands of transcript sequences in public databases and translate our findings into improved crop varieties.

Gene discovery is a growing business. The availability of candidate genes is growing faster than our ability to effectively evaluate them. Whole-genome sequencing projects have produced complete genome sequences for several plants, including rice, *Arabidopsis*, and poplar. Sequencing of the gene space of two legumes, *Medicago truncatula* and *Lotus japonicum* is nearly completed, and maize and soybean have just begun to be sequenced.

We are often surprised by the similarities of related genomes. Gene order and relative positions are often conserved across wide phylogenetic distances. Some comparisons of chromosomes at the sequence level have

revealed regions of hypersynteny. This has great potential for genetic improvement in crops without access to genomic resources. In many cases, it is now practical to use genetic and genomic information from one species to make genetic and genomic advances in another. Even instances where there are large dissimilarities among genomes tell us about the evolution of genomes and the consequent limitations of translating information among species.

The next hurdle for genomicists, biologists, and breeders is not acquiring data, but learning how to analyze existing data and focus experiments on acquiring data to fill the gaps in our knowledge. Already, a few laboratories are learning how to successfully tap into bioinformatics and genomics data sets and apply them to problems in crop improvement. Others are adapting the new technologies to ask old questions in new ways. These researchers are beginning the translation of genomic information into advances in our understanding of plant biology and crop improvement.

The need to provide a quality venue to disperse the results of these

types of “translational” research programs has now become critical. To respond to this need, CSSA has initiated a new quarterly companion publication to *Crop Science* called *The Plant Genome*. The first issue will come out this fall.

The Plant Genome is seeking original research papers that show clear potential for translating genomic technology into agronomic advancement. The six associate editors on the Editorial Board are established world-class researchers, all of whom have demonstrated expertise in genetics, genomics, and bioinformatics. The editors seek novel reports that use innovative genomic applications that advance our understanding of plant biology and have demonstrative application to crop improvement. The publication also will include invited review articles, reports on new and emerging models and resources, and perspectives that offer insight and commentary on recent advances in genomics and their potential for agronomic improvement. More information about *The Plant Genome* and instructions for authors can be found at www.crops.org/genome.

Wisconsin Celebrates Completion of Soil Survey

(Continued from page 14)

Knight thanked the more than 300 soil scientists and the many others who contributed to the effort to map the more than 35 million acres of land and catalog the hundreds of different soil types in Wisconsin.

He presented the national Excellence in Conservation Award, NRCS's highest honor, to Paul Daigle, a grazinglands specialist in Marathon County, WI.

Students from Antigo Elementary provided a special tribute to Wisconsin's official state soil by singing “The Antigo Silt Loam Song” written by

noted soil scientist Francis Hole. The event also featured a variety of samples highlighting food grown in Wisconsin soils.

A large soil sample of Wisconsin's Antigo Silt Loam is part of a USDA-NRCS display of state soils that will be included in the 5,000-square-foot soils exhibit opening in 2008 at the Smithsonian Museum of Natural History in Washington, DC.

Visit www.wi.nrcs.usda.gov for information on Wisconsin's 2006 Year of Soil and www.soils.org/smithsonian for the Smithsonian Soils Exhibit.



SSSA President Mary Collins and USDA-NRCS Chief Bruce Knight cut the cake in celebration of the completion of the state soil survey at Wisconsin's Year of Soil event on 16 May. SSSA was a sponsor of the event.

Welcome New Members

The Societies welcome new members who joined in May 2006:

Abioye, Olakulehin, Winnipeg, MB, Canada
 Abunyewa, Akwasi, Lincoln, NE
 Acuna, Carlos, Gainesville, FL
 Adair, Elizabeth, Saint Paul, MN
 Adam, Queen, Guelph, ON, Canada
 Agharkar, Mrinalini, Gainesville, FL
 Al-Ajlouni, Zakaria, Lincoln, NE
 Allen, Travis, St. John, KS
 Alyson Bk, Dagang, Gainesville, FL
 Amusan, Idris, West Lafayette, IN
 Andreeva, Svetlana, Moscow, RUSSIA
 Antoninka, Anita, Flagstaff, AZ
 Arcand, Melissa, Guelph, ON, Canada
 Arroyo-figueroa, Gabriela, Salvatierra, Guanaju, Mexico
 Avila, Carlos, Fayetteville, AR
 Bachman, Sarah, Laramie, WY
 Barber, Summer, San Antonio, TX
 Barthold, Frauke, Potsdam, Germany
 Baugher, Leah, Moscow, ID
 Bhandari, Hem, Las Cruces, NM
 Bickel, Rita, Davis, CA
 Blount, Ann, Marianna, FL
 Boring, Tim, East Lansing, MI
 Brabant, Nichole, River Falls, WI
 Bragg, Amanda, Kerrville, TX
 Browning, III, George, Dresden, TN
 Burton, James, Raleigh, NC
 Carpenter, Debra, Knoxville, TN
 Carr, Katharine, San Luis Obispo, CA
 Casper, Nathan, River Falls, WI
 Cheesman, Alexander, Gainesville, FL
 Chemnitz, Quint, Lubbock, TX
 Cisar, Nikole, Oconto, WI
 Clements, George, Lexington, KY
 Conaghan, Patrick, Carlow, Ireland
 Cooper, Laurel, Corvallis, OR
 Crocker, Fiona, Vicksburg, MS
 Crow, Susan, West Lafayette, IN
 Curley, Joe, Urbana, IL
 Cutulle, Matthew, Knoxville, TN
 Dai, Jing, University Park, PA
 Daley, Brian, East Lansing, MI
 Denight, Michael, Champaign, IL
 Devaney, James, New Brunswick, NJ
 Devin-clarke, Dana, Seattle, WA
 Dhungel, Rama, Corvallis, OR
 Dickson, Timothy, Ames, IA
 Diedhiou, Sire, Corvallis, OR
 Dijkstra, Paul, Flagstaff, AZ
 Dilfuza, Egamberdiyeva, Tashkent, Uzbekistan
 Dossa, Ekwe, Corvallis, OR
 Draper, Kathryn, Richland, WA
 Dunifon, Shea, Davie, FL
 Earnest, Robert, Mississippi State, MS
 Elias, Patricia, Blacksburg, VA
 Epler, Michael, Manhattan, KS
 Estes, Alan, Clemson, SC
 Eusufzai, Moniruzzaman K., Iwate, Japan

Evertt, Sarah, Manhattan, KS
 Falk, Jeanne, Colby, KS
 Finnerty-rae, Eileen, Tucson, AZ
 Fissore, Cinzia, Houghton, MI
 Flores, Mario, Madison, WI
 Flynn, Ernest, Lexington, KY
 Foster, Jamie, Gainesville, FL
 Frier, Mary C., University Park, PA
 Furtado, Bruno, Athens, GA
 Gao, Xiaodong, West Lafayette, IN
 Garret, Christensen, Chamberlin, SD
 Giles, Tom, Adelaide, Australia
 Gillen, Robert, Hays, KS
 Goddard, Matt, Knoxville, TN
 Goff, Ben, Grafton, WV
 Goldsby, Anthony, Manhattan, KS
 Gustafson, Kyle, Brookings, SD
 Gutema, Zembaba, W. Lafayette, IN
 Gutierrez Rojas, Andres, College Station, TX
 Haag, Lucas, Manhattan, KS
 Han, Jie, Newark, DE
 Hansen, Matt, Vale, SD
 Harris, Britani, San Luis Obispo, CA
 Hartel, Wayne, Champaign, IL
 Haubrich, Gregory, Danube, MN
 Hebrink, Cory, Renville, MN
 Hemphill Pine, Claudia, Moscow, ID
 Holben, William, Missoula, MT
 Horvath, Jamie, Philadelphia, PA
 Huebner, Nikolaus, Brookings, SD
 Ige, Dupe, Winnipeg, MB, Canada
 Ismail, Abdelbagi, Metro Manila, Philippines
 Jacoby, Pete, Pullman, WA
 Jahnke, Louis, River Falls, WI
 Jobe, Timothy, Las Cruces, NM
 John, Christopher, Raleigh, NC
 Johnson, Jennifer, Bowling Green, KY
 Jones, Jennifer, Fort Collins, CO
 Jorgensen, Michael, Southbank, Australia
 Joslin, Aaron, Athens, GA
 Kariyapperuma A., Kumudinie, Guelph, ON, Canada
 Keeler, Bonnie, St. Paul, MN
 Kelly, Heidi, Dekalb, IL
 Khan, Bushra, West Lafayette, IN
 King, Amy, Davis, CA
 King, James, Indianapolis, IN
 Kluck, Summer, Minneapolis, MN
 Koch, Matthew, New Brunswick, NJ
 Koger, Clifford, Stoneville, MS
 Kolliker, Roland, Zurich, Switzerland
 Kpm Saminathan, Sumathi, San Antonio, TX
 Kronberg, Scott, Mandan, ND
 Kruger, Greg, West Lafayette, IN
 Kumar, Suresh, Normal, AL
 La Mantia, Jonathan, University Park, PA
 Lawles, Kyle, Hydro, OK
 Lee, Hyeonju, Manhattan, KS
 Lee, Jae E., Suwon, Korea
 Leitheiser, Adam, Bruce, SD
 Lekgari, Lekgari, Lincoln, NE
 Leshar, Jared, Pierpont, SD

Linville, Kristi, West Lafayette, IN
 Liu, Jinxia, West Lafayette, IN
 Livingston Way, Pam, Palatka, FL
 Londo, Jason, St. Louis, MO
 Lushaj, Sherif, Tirana, Albania
 Marhsall, Chris, Blacksburg, VA
 Matcha, Satya S., Mississippi State, MS
 Mattox, Joy, Lafayette, IN
 Mccauley, Ray, Clemson, SC
 McCormick, Suzanne, Coleraine, Northern Ireland
 Mccurdy, James, Dyer, TN
 Mcmillan, John, West Lafayette, IN
 Mcwhorter, Christopher, Clemson, SC
 Meason, Dean, Honolulu, HI
 Mellor, Nathan, Fort Collins, CO
 Menjoulet, Brie, Fayetteville, AR
 Merriman-parr, Shiella, Las Cruces, NM
 Mijatovic, Blazan, Lexington, KY
 Mitsch, Laura, Arcata, CA
 Mock, Valerie, West Lafayette, IN
 Moon, Jessica, University Park, PA
 Mooneyham, Nicholas, Spencer, TN
 Moore, Richard, Wooster, OH
 Morley, Deena, Sharon, OK
 Mukundan, Rajith, Athens, GA
 Myer, Robert, Marianna, FL
 Nangle, Edward, Columbus, OH
 Naz, Bibi, West Lafayette, IN
 Netthisinghe, Annesly, Lubbock, TX
 Nichols, Adam, Blacksburg, VA
 Nyinyi, Catherine, Knoxville, TN
 Olivera Melgar, Michael, Fayetteville, AR
 Pachta, Christopher, Manhattan, KS
 Parr, Sara, Hickory Corners, MI
 Pattnaik, Rosalin, Honolulu, HI
 Payne, Jay, Logan, UT
 Peter, Prince, Aba, Abia, Nigeria
 Peth, Stephan, Kiel, Germany
 Phillips, Claire, Corvallis, OR
 Pike, Adam, Lexington, KY
 Pires, J. C., Columbia, MO
 Qian, Leilei, Raleigh, NC
 Rajendran, Nandakumar, Winnipeg, MB, Canada
 Rana, Kiran, West Lafayette, IN
 Randhawa, Rupinder, University Park, PA
 Ransom, Callista, East Lansing, MI
 Rehman, Aziz U., Saskatoon, SK, Canada
 Rinehart, Kristen, West Lafayette, IN
 Roberts, Keegan, Baton Rouge, LA
 Rochefort, Sophie, Sainte-foy, QC, Canada
 Rock, Lee R., Kingsville, TX
 Rodd, A. V., Nappan, NS, Canada
 Rose, Jack, Stephenville, TX
 Ross, Arwen, San Luis Obispo, CA
 Rotundo, Jose, Ames, IA
 Russ, Andrew, Ellicott City, MD
 Rutan, Jeff, Wilmington, OH
 Sabdo, Christy, Geneva, IL
 Saini, Monika, Auburn, AL
 Sandhu, Sukhpreet, Gainesville, FL
 Sandlin, Tyler, Mississippi State, MS
 Satterwhite, Jason, Auburn, AL

Schmid, Madlaina, Zurich, Switzerland
 Schmidt, Rhonda, Seattle, WA
 Schonning, Greta, Gary, SD
 Schultz, Sarah, Urbana, IL
 Segal, Eran, Riverside, CA
 Serba, Desalegn, Lincoln, NE
 Shakya, Kabindra, San Antonio, TX
 Sheffler, Daniel, Falls Church, VA
 Shepherd, Scott, Attica, IN
 Shimizu, Masayuki, Newark, DE
 Shiono, Hiroyuki, Beltsville, MD
 Sinha, Tushar, West Lafayette, IN
 Smith, Candice, Bloomington, IN
 Smith, Kevin, Parsons, TN
 Smith, Rachel, Logan, UT
 Smith, Scott, Ithaca, NY
 Song, Wenlu, East Lansing, MI
 Sonnentag, Amy, River Falls, WI
 Sood, Shilpa, Manhattan, KS
 Souder, Christopher, College Station, TX
 Steinmetz, Alicia, Palatka, FL
 Stivers, Alisha, Fayetteville, AR
 Stone, Kathy, Miami, FL
 Stover, Daniel, Norfolk, VA
 Stuckey, Jason, University Park, PA
 Sung-taeg, Kang, Suwon, South Korea
 Suther, Bradley, Athens, GA
 Taboada-gaytan, Oswaldo, Ames, IA
 Takimoto, Asako, Gainesville, FL
 Taylor, Jessica, Seattle, WA
 Taylor, Merritt, Lane, OK
 Thoene, Chris, Fordyce, NE
 Thompson, Meiko, Normal, AL
 Titus, Erica, East Lansing, MI
 Tiwari, Rashmi, Fayetteville, AR
 Toothaker, Cody, Brookings, SD
 Totten, Frederick, Clemson, SC
 Troumbey, Jared, Rexburg, ID
 Troxell, Denise, Portland, OR
 Tufekcioglu, Mustafa, Ames, IA
 Ugarte, Carmen, Urbana, IL
 Umlauf, Ryan, Stetsonville, WI
 Van Haren, Joost, Tucson, AZ
 Van Huyssteen, Cornie, Bloemfontein, South Africa
 Vander Velde, Chet, Brookings, SD
 Vanderzaag, Andrew, Truro, NS, Canada
 Vasilakoglou, Ioannis, Larissa, Greece
 Vellek, Ben, Springfield, SD
 Vidoz, Maria, Gainesville, FL
 Waldera, Derek, Whitehall, WI
 Wall, David, Raleigh, NC
 Watson, John, Guelph, ON, Canada
 Weber, Michael, River Falls, WI
 Weicht, Thomas, Burlington, VT
 Wells, Ana, Madison, WI
 Werner, Paul, West Lafayette, IN
 Wesson, David, Normal, IL
 Westervelt, James, Champaign, IL
 Westhoven, Andrew, West Lafayette, IN
 Williams, Carol, Ames, IA
 Wilson, Teresa, College Station, TX
 Woldelessie, Mical, Logan, UT
 Wood, Jeffrey, Truro, NS, Canada
 Wu, Si H., Columbia, MO
 Wu, Xingrong, Columbia, MO
 Yee, Nathan, Newark, NJ
 Zhu, Qing, State College, PA
 Zimmermann, Beate, Golm, Germany

International Membership

Statistical Tool Fosters Plant Breeding Collaboration

by Richardson Okechukwu

A two-day international workshop on the use of statistical tools developed by ASA-CSSA members Manjit Kang and Weikai Yan was held at the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, on 17–18 May.

This workshop brought together 86 participants from the Republic of Benin, Cameroon, Ghana, Guinea, Tanzania, Uganda, Zimbabwe, and 15 states of Nigeria. The workshop's objectives were to improve the analytical minds of scientists in Africa and arm them with efficient statistical tools to handle genotype-by-environment interactions (GxE) and stability analyses in breeding and similar interactions in the field of natural science, biotechnology, microbiology, and plant pathology.

The substance of the workshop was relevant, according to IITA Director for Research Stan Blade. He said scientists need this type of information because the number of plant breeding students is decreasing worldwide. He pointed to the need for information about mega-environments to enable researchers to reduce the number of test sites when resources are limited to extrapolate for regional testing. Dr. Blade said that while there have been documented successes, people are now concerned about the future of plant breeding.

IITA's strategy is "research for development," so research must be for a purpose, according to Blade. It must focus on solving problems, having impacts for producers and consumers within the value chain. IITA plans to hold similar workshops to continue to help develop human capacities in Africa.

The workshop was taught by the authors of the book *GGE Biplot Analysis* and experts on genotype-by-environment interaction as related to crop breeding—Dr. Kang of Louisiana State University AgCenter and Dr. Yan of Agri-Food and Agriculture Canada—as well as by IITA's Dr. Richardson Okechukwu.

R. Okechukwu, r.okechukwu@cgiar.org

Scientists need this type of information because the number of plant breeding students is decreasing.

?Ask Us

Q: In the May issue, you mentioned the Societies were working on a big project to upgrade the database software—what is the status?

A: Our database conversion is on schedule, and we are beginning our busiest time of this project. We are anticipating that there will be limited access to information pulled from the old database during **20–28 July** while we migrate the data. Changes and additions to your membership record will not be able to be made during that time period. Thank you in advance for your patience and understanding as we upgrade our systems to better serve you.

The next step is to test the data, and we are also looking at our processes to see where they can be improved and where we can gain efficiencies. In addition, we are building in flexibility to the system to modify it to accommodate our members' needs.

To ask a question for this column, send an email to membernews@agronomy.org

Alabama A&M University

UDAI RAM BISHNOI of Alabama A&M University was awarded the Morrison-Evans Outstanding Scientist Award at the 14th Biennial Research Symposium on 4 Apr. 2006 in Atlanta, GA. This is the highest honor given by the Association of Research Directors. In honor of Dr. Richard D. Morrison, president emeritus of Alabama A&M University, and Congressman Frank E. Evans of Colorado, this award recognizes their leadership in seeking research and extension funds for 1890 institutions under the Second Morrill Act of 1890. The award is only given to those in the areas of research development, policies, and planning, as well as publications, mentoring of students, and public service. Dr. Bishnoi has provided national leadership in the fields of agronomy and seed technology for over three decades. His current work involves the breeding and integrated pest management on winter canola. He has published over 75 research papers and has developed standards for three triticale cultivars. Bishnoi is a Fellow of ASA and CSSA and serves on several editorial boards, including six years as an Associate Editor of *Agronomy Journal*.



Uday Bishnoi

Norwegian University of Life Sciences

In April 2006, BAL RAM SINGH, professor of soil science, received the research award for 2006 by the Department of Plant and Environmental Sciences, which recognizes the quality and productivity of scientific articles published in 2006. Dr. Singh was recognized for his nine articles in peer-reviewed international journals, book chapters in ASA Monographs and conference proceedings, and a COST Action workshop focusing on heavy metals in food crops and in soils, soil carbon sequestration, soil degradation, and nutrient losses under different land uses. He earned his M.S. from the Indian Agricultural Research Institute, New Delhi, and his Ph.D. from G.B. Pant University of Agriculture & Technology, Pantnagar, India. Singh is a Fellow of ASA and SSSA.



Bal Ram Singh

The Ohio State University

GURDEV S. KHUSH received an honorary doctor of science degree from The Ohio State University (OSU) on 19 Mar. 2006. Known as the man behind the "green revolution in rice farming," Dr. Khush is an adjunct professor at the University of California-Davis. The son of a farmer,

Khush received his B.S. from Punjab Agricultural University in Ludhiana, India, and his Ph.D. from the University of California-Davis. For 35 years, Khush served as head of the Plant Breeding, Genetics, and Biochemistry Division of the International Rice Research Institute.

Through him, high-yielding rice varieties with superior grain quality and resistance were developed. With these improvements, production rose from 257 to 600 million tons between 1967-2000, allowing most rice-growing nations to achieve self-sufficiency in food production. With outstanding contributions to world food security, Khush has received the Japan Prize (1987), World Food Prize (1996), and the Wolf Prize (2001). In addition, Khush is a member of the Scientific Advisory Committee to the Department of Biotechnology, Government of India, and a member of the Science Council, an advisory body to the Chinese Academy of Agricultural Sciences.



Gurdev Khush receives an honorary doctor of science degree from President Karen Holbrook, The Ohio State University.

Oklahoma State University

CLARENCE E. WATSON is the new associate director of the Oklahoma Agricultural Experiment Station at Oklahoma State University. He earned his Ph.D. in crop science from Oregon State University in 1976 and his B.S. and M.S. degrees in agronomy from New Mexico State University in 1972 and 1974, respectively.

Savannah State University

KENNETH SAJWAN received the 2006 Outstanding Undergraduate Science Teacher Award. Dr. Sajwan was honored with this award during the National Science Teachers Association's 54th National Conference on Science Education in Anaheim, CA on 6-9 Apr. 2006. He is a Regents' Distinguished Professor and Director of the Environmental Science Program at Savannah State University. This national award is given annually to an extraordinary science teacher.



Kenneth Sajwan

University of Florida

The Alexander von Humboldt Foundation in Bonn, Germany has selected P.K. NAIR, distinguished professor of agroforestry at the University of Florida's Institute of Food and Agricultural Sciences, to receive the Humboldt Research Award. Known as the Humboldt Prize, the award is Germany's highest recognition for international senior scientists and carries a cash award of about \$60,000. Award winners are invited to develop research projects of their own choice in Germany in cooperation with colleagues for periods between six months and one year. Dr. Nair has received numerous prestigious recognitions including honorary doctorate degrees from the universities of Kyoto, Japan (2002); Kumasi, Ghana (2005); and Guelph, Ontario, Canada (2006).



P.K. Nair

University of Minnesota

The Fourth Annual WILLIAM E. LARSON and RAYMOND R. ALLMARAS Lecture was held on 19 Apr. 2006 at the University of Minnesota.

"Defining a Future Bioeconomy" included speakers Bruce Dale, Michigan State University, and RICHARD CRUSE, Iowa State University.

Dr. Dale presented, "Biomass Supply and Biofuels: Some Perspectives," and Dr. Cruse presented, "Future Bioeconomy and its Impacts on Soil and Water Resources." This series, begun in 2003, highlights soil and water expertise in the department and recognizes Dr. Larson's and Dr. Allmaras' contributions. For information on the lecture series, contact Dr. SATISH GUPTA, sgupta@umn.edu or 612-625-1241. View the proceedings at: <https://breze5umn.edu/emergingissueslecture>.



Bill Larson



Ray Allmaras

University of Nebraska

MARTIN MASSENGALE was honored in receiving a Wagonmaster Award at the 2006 Statehood Dinner, sponsored by the NEBRASKA Land Foundation and presented by the governor. The Wagonmaster Award is presented to Nebraskans who have set an example for others to follow and have distinguished themselves as leaders by their involvement in causes that benefit Nebraska and the nation. Dr. Massengale currently serves as the chair of the Agronomic Science Foundation Board of Trustees.



Martin Massengale

Award Announcements

A-4 Extension Division Educational Awards

Members are encouraged to submit educational materials for consideration for the A-4 Extension Education Division Certificates of Excellence Awards. This program provides members with an opportunity to share creative and useful educational materials and programs with colleagues, while receiving recognition for their achievements. A certificate will be awarded for each entry that demonstrates overall superior quality and will be presented at the A-4 Business Meeting during the Annual Meetings in Indianapolis. In addition, entries will be on display at the meetings.

Entries will be evaluated for their content, organization, creativity, relevancy, appearance, and clarity in seven categories: (1) Publications, less than 16 pages; (2) Publications, 16 pages or more; (3) Audio-visuals, slide sets, video, and displays; (4) Newsletters; (5) Computer software programs; (6) internet web pages; and (7) Posters. Entries are due by **30 Aug. 2006**, and entry forms are located on the A-4 Extension Education web site at: www.agronomy.org/divs/a4.

National Academy of Sciences

The National Academy of Sciences announces several awards to honor outstanding scientific achievements, including the John J. Carty Award for the Advancement of Science, scheduled for presentation in 2007 in the field of plant science. The awards will be presented at a ceremony during the National Academy's 144th annual meeting in Washington, DC. Nominations are due by **11 Sept. 2006**. For more information on the John J. Carty Award or the other awards available, including the nomination form, go to: www.nasonline.org/site/PageServer?pagename=AWARDS_main.

Stapledon Memorial Trust

The Stapledon Memorial Trust was established in 1962 to commemorate Sir George Stapledon, a grassland scientist who had a profound impact in Britain and throughout the world during the mid part of the 20th century. This trust is to fund travelling fellowships to develop studies on any aspect of grasslands. The fellowships are available worldwide but must either be taken in the United Kingdom or involve a UK applicant visiting another country. Four fellowships were awarded in 2006. The fellowship focuses on scientists and grassland workers from postdoctoral to midcareer level. Applications for 2007 are due by **31 Oct. 2006**. For more information, visit www.iger.bbsrc.ac.uk/SMT or contact the trust secretary at jessica.buss@britishgrassland.com.

ASA-CSSA-SSSA International Annual Meetings

2006

12–16 November, Indianapolis, IN;
www.acsmeetings.org

Online registration and
housing open 1 August

2007

4–8 November, New Orleans, LA; New Orleans
Convention & Visitors Bureau;
www.neworleanscvb.com



2008

5–9 October, Houston, TX (Joint Meeting with the Geological
Society of America)

2009

1–5 November, Pittsburgh, PA

Chapter and Branch Meetings

2006

11 July, ASA-CSSA-SSSA Northeastern Branch Meeting, Phil-
adelphia, PA; www.asa-cssa-sssa.org/branch/ne/

Society-Sponsored Symposia and Conferences

2006

9–15 July, **World Congress of Soil Science**, Philadelphia, PA;
www.18wcscs.org

18–20 September, **Managing Drought and Water Scarcity
in Vulnerable Environments**: Creating a Roadmap for
Change in the United States, Boulder, CO; www.geosociety.
org/meetings/06drought/ or dnelson@geosociety.org

*14–18 October, **6th National New Crops and New Uses Sym-
posium**: Creating Markets for Economic Development of
New Crops and New Uses, San Diego, CA; www.aaic.org
or www.hort.purdue.edu/newcrop

Other Meetings

USA/Territories

2006

11–14 July, **Annual Meeting of the American Peanut Research
and Education Society**, Savannah, GA; nickeli@provalue.net

14–21 July, **XXVI International Workshop/Symposium on Rap-
id Methods and Automation in Microbiology**, Manhattan,
KS; www.dce.ksu.edu/dce/cl/rapidmethods/2006 or dfung@
ksu.edu

16–21 July, **Zeolite '06: 7th International Conference on the Oc-
currence, Properties, and Utilization of Natural Zeolites**,
Socorro, NM; www.ees.nmt.edu/Zeolite06

22–26 July, **Soil and Water Conservation Society's 2006 An-
nual Conference**, Keystone, CO; www.swcs.org/en/swcs_
international_conferences/2006_international_conference/

23–26 July, **American Agricultural Economics Association
(AAEA) Annual Meeting**, Long Beach, CA; www.aaea.org or
info@aaea.org

23–26 July, **8th International Conference on Precision Agri-
culture**, Minneapolis, MN; www.precision.agri.umn.edu/
Conference/

23–27 July, **Solanaceae 2006**, Madison, WI; www.hort.wisc.edu/
PAA-Solanaceae/

24–26 July, **4th World Congress of Computers in Agriculture**,
Orlando, FL; www.wcca2006.org/index.htm or mcknight@
asabe.org

31 July–2 August, **Modeling Phosphorus Transport in Agroeco-
systems**: Joining Users, Developers, and Scientists, Ithaca, NY;
www.sera17.ext.vt.edu/P_Modeling/ or nonelson@ksu.edu

7–9 August, **International Conference on the Future of Agri-
culture**: Science, Stewardship, and Sustainability, Sacramen-

to, CA; www.dce.ksu.edu/dce/conf/ag&environment/ or
ellen@ksu.edu

10–13 August, **69th Annual Meeting of the Rural Sociological
Society**: Perils and Promises of Globalization: Difference, Re-
sistance, and Possibility, Louisville, KY; http://ruralsociology.
org/

15–17 August, **2006 SARE National Conference**, Oconomowoc,
WI; www.sare2006.org/

*11–13 September, **Assessment of Field and Laboratory Tech-
niques for Sediment Source Identification at Watershed
Scales**, Tucson, AZ; www.ars.usda.gov/main/site_main.
htm?modecode=64080000

17–21 September, **Cucurbitaceae 2006**, Asheville, NC; www.ncsu.
edu/cucurbit2006 or gerald_holmes@ncsu.edu

24–28 September, **14th National Nonpoint Source Monitoring
Workshop**: Measuring Project and Program Effectiveness,
Minneapolis, MN; taylor@ctic.purdue.edu

10–12 October, **26th Annual Central States Forest Soils Work-
shop**, Poplar Bluff, MO; www.mo.nrcs.usda.gov/forest_soils_
wrkshp.html

*11–13 October, **Managing Agricultural Landscapes for En-
vironmental Quality**: Strengthening the Science Base,
Kansas City, MO; www.swcs.org/en/swcs_international_
conferences/managing_agricultural_landscapes/

16–19 October, **22nd Annual International Conference on Soils,
Sediments, and Water**, Amherst, MA; www.umasssoils.com

*18–20 October, **2006 World Food Prize International Sympo-
sium**, Des Moines, IA; www.worldfoodprize.org/

27–28 October, **Plant Health Care, Inc. 2006 Plant Biology Work-
shop**, Frogmore, SC; www.planthealthcare.com or smarx@
planthealthcare.com

5–7 November, **28th International Irrigation Show**, San Anto-
nio, TX; www.irrigation.org/show

*New listing this month.

*10–13 December, **3rd National Conference on Grazing Lands**, St. Louis, MO; www.glici.org

2007

8–9 February, **National Workshop on Sustaining Plant Breeding as a Vital National Capacity for the Future of U.S. Agriculture**, Raleigh, NC; www.csrees.usda.gov/newsroom/events/pdfs/pbgg_02.pdf or athro@csrees.usda.gov

*24–28 June, **9th International Pollination Symposium**, Iowa State University, Ames, IA; www.ucs.iastate.edu/mnet/plantbee/home.html

9–13 July, **Information Agriculture Conference (InfoAg 2007)**, Springfield, IL; www.infoag.org

International

2006

24–28 July, **6th International Conference on Aeolian Research (ICAR VI)**, Guelph, ON, Canada; www.uoguelph.ca/icarvi/index.cfm

29 July–2 August, **Joint Annual Meeting of the American Phytopathological Society, Canadian Phytopathological Society, and the Mycological Society of America**, Quebec City, QC, Canada; <http://meeting.apsnet.org>

1–4 August, **Halifax 2006 Annual Conference: A Joint Colloquium of the Canadian Societies of Animal Science, Agronomy, and Horticultural Science**, Halifax, NS, Canada; www.nsac.ns.ca/pas/conferences/default.asp

20–26 August, **International Plant Breeding Symposium**, Mexico City, Mexico; www.intlplantbreeding.com

28 August–3 September, **Sustainability—Its Impact on Soil Management and Environment**, Kiel, Germany; www.istro.org or www.soils.uni-kel.de/istro.htm

4–6 September, **IX European Society of Agronomy Congress**, Warsaw, Poland; www.esagr.org/structure/

4–7 September, **Agroenviron 2006: Fifth International Symposium on the Agricultural Environment**, Ghent, Belgium; <http://users.ugent.be/~jvdestee/agroenviron/index.html> or joke.vandesteene@Ugent.be

10–14 September, **13th Australian Agronomy Conference**, Perth, Western Australia; www.agronomy.org.au

12–15 September, **International ESSC Conference on Soil and Water Conservation under Changing Land Use**, Lleida, Spain; www.udl.es/serveis/sedai/sigtel/ESSC2006.html

18–19 September, **Conference on Damage in Composite Materials: Simulation and Non-Destructive Testing (CDCM 06)**, Stuttgart, Germany; www.cdcm06.de

*18–20 September, **International Cotton Genome Initiative (ICGI) 2006 Research Conference**, Brasilia DF, Brazil; <http://icgi.tamu.edu/meeting/2006/>

19–22 September, **XX Argentinean Congress of Soil Science**, Salta, Argentina; www.suelos.org.ar or fgarcia@inpfos.org

24–27 October, **4th Latin American Congress of Agroforestry for Sustainable Livestock Production**, Varadero, Cuba; www.umcc.cu/agroforest/ or agroforesteria2006@indio.atenas.inf.cu

25–27 October, **International Workshop on Agrometeorological Risk Management Challenges and Opportunities**, New Delhi, India; www.iwarmindia.com

28–30 October, **1st IWA International Symposium on Water and Wastewater Technologies in Ancient Civilizations**, Iraklio, Greece; www.nagref.gr/Symposium/index.htm

29 October–2 November, **HortiModel 2006: Models for Plant Growth, Environmental Control, and Farm Management in Protected Cultivation**, Wageningen, the Netherlands; www.hortimodel2006.nl

4–9 November, **International and Interdisciplinary Workshop on Preferential Flow and Transport Processes in Soil**, Monte Verità, Ascona, Switzerland; www.ito.ethz.ch/conferences/preferential-flow/

6–11 November, **X National Peruvian and II International Soil Congress**, Lima, Peru; www.lamolina.edu.pe/suelos/

11–15 November, **First International Symposium on Cassava Breeding, Biotechnology, and Ecology**, Brasilia Brazil; www.geneconserve.pro.br/meeting2

13–17 November, **Cereal Science and Technology for Feeding Ten Billion People: Genomics Era and Beyond**, Lleida, Spain; www.eucarpia.com or jose Luis.molina@irta.es

27–30 November, **International Conference on Post-Harvest Technology and Value Addition in Cereals, Pulses and Oilseeds (ICPHT-2006)**, Kanpur, India; pskendurkar@yahoo.co.in or www.indianbiochemists.blogspot.com

4–8 December, **Granular Matter Workshop**, Canberra, Australia; <http://www.rsfphysse.anu.edu.au/granularmatter/>

11–15 December, **International Workshop on Climate and Land Degradation**, Arusha, Tanzania; msivakumar@wmo.int or nndiangui@unccd.int

2007

7–13 January, **4th International Conference of the African Soil Science Society: Impacts of Climate Change, Global Trade, Urbanization, and Biotechnology on Land Use in Africa**, Accra, Ghana; soils_intconf@yahoo.co.uk

*11–14 March, **Dahlia Greidinger Symposium 2007: Advanced Technologies for Monitoring Nutrient and Water Availability to Plants**, Technion, Haifa, Israel; <http://gwri-ic.technion.ac.il> or rsconf@yahoo.com

12–14 March, **North American Wheat Workers' Workshop**, Saskatoon, SK, Canada; www.wheatworkers.ca

24–26 May, **Zinc Crops 2007—Improving Crop Production and Human Health**, Istanbul, Turkey; www.zinc-crops.org

25–30 June, **5th International Congress of the European Society for Soil Conservation**, Palermo, Italy; dazzi@unipa.it

15–19 July, **The Third International Conference on Enzymes in the Environment: Activity, Ecology, and Applications**, Viterbo, Italy; www.unitus.it/ or Richard.Dick@snr.osu.edu

*15–19 July, **9th International Conference on the Biogeochemistry of Trace Elements**, Beijing, China; www.conference.ac.cn/icobte.htm or icobte@rcees.ac.cn

2008

13–18 April, **5th International Crop Science Congress**, Jeju, Korea; www.cropscience2008.com

18–22 September, **5th International Conference on Land Degradation**, Valenzano, Bari, Italy; www.iamb.it/5ICLD or pandi@iamb.it

Jim Adams

James "Jim" F. Adams, 53, died unexpectedly of heart failure at home on 8 May 2006. He was born 12 Jan. 1953 in Beirut, Lebanon.

Dr. Adams grew up in Auburn, AL and graduated from Auburn High School. He spent three years in the U.S. Air Force and then went on to receive a B.S. in agriculture and M.S. in soil chemistry from Auburn University. While an undergraduate studying agronomy and soils at Auburn, he was a member of the National Championship Soil-Judging Team. After completing his Ph.D. in soil chemistry from Kansas State University, he joined the faculty at Auburn's Department of Agronomy and Soils in 1985 where he taught undergraduate and graduate courses, teaching over 800 students Introductory Soil Science during his 20-year career. He had numerous graduate students and authored many publications in the areas of soil chemistry and fertility, with an emphasis on peanut production and peanut fertility. He was the lead author of the widely used publication, *Soil Test Fertilizer Recommendations for Alabama Crops* and was responsible for developing many of the soil test calibrations and procedures used in the soil test laboratory.

Later in his career, Adams used his soils expertise to provide industries with scientific guidance in environmental-related issues. He was an avid boatsman and led numerous expeditions down the Chattahoochee River to the Florida coast.

He is survived by his daughter, Sarah Ann Adams of Auburn; parents, Dr. and Mrs. Fred Adams of Auburn; sister, Marilyn Blanton (Bill) of Auburn; and two nieces and a nephew. He was preceded in death by a sister, Janet Kathleen Adams. Those wishing to leave a message for his relatives may sign the guest book online at www.oanow.com.

Elizabeth Guertal, Auburn, AL

Don Duvick

Donald N. Duvick, 81, retired senior vice president of research at Pioneer Hi-Bred International and affiliated agronomy professor at Iowa State University, died of a brain tumor on 23 May 2006.

Dr. Duvick was born 18 Dec. 1924 in Sandwich, IL and grew up there on a dairy farm. After serving in World War II, he received a B.S. in agriculture from the University of Illinois (1948) and a Ph.D. in botany from Washington University, St. Louis (1951). Duvick then went to work for Pioneer as a plant breeder and retired as senior vice president of research in 1990. Duvick's professional and personal interests were plant breeding and genetics, preservation and use of genetic diversity, conservation of natural resources, vocal music performance, field botany, natural history, and archaeology.

He was elected to the National Academy of Sciences and was a charter member of CSSA and a member of ASA, the Iowa Academy of Science, American Association for the Advancement of Science, New York Academy of Science, and the Council for Agricultural Science and Technology (CAST). In addition, Duvick was involved with the Iowa Chapter of the Nature Conservancy and the Des Moines Choral Society.

He was active in ASA and CSSA, holding a number of offices, including CSSA president (1987) and ASA president (1992). In 1980, he was named a Fellow of both ASA and SSSA. Prior to his death, CSSA President Steve Fales presented Duvick with the 2006 CSSA Presidential Award.

He is survived by his wife, Selma, and his children, Daniel, Jonathan, and Randa. Condolences may be sent to his family at 6837 NW Beaver Dr., Johnston, IA 50131.



Ted Johnston

T.H. "Ted" Johnston died 20 May 2006 in Fayetteville, AR after an extended illness. He was born in Antelope County, NE on 3 May 1917.

Dr. Johnston received his B.S. and M.S. degrees in 1940 and 1942 from the University of Nebraska-Lincoln. He served in World War II before joining the faculty of Oklahoma State University-Stillwater in 1946 as an assistant agronomist in small-grains research. He received a Ph.D. in crop breeding from Iowa State University in 1953.

Johnston then moved to Stuttgart, AR, where he was a USDA-ARS research agronomist, leading the Rice Research and Extension Center for 30 years. During this time, 12 improved rice varieties were developed, including Starbonnet, which added millions of dollars in value to rice crops.

Johnston was a member of ASA and a charter member of CSSA. He was a Fellow of ASA, CSSA, and the American Association for the Advancement of Science. He received numerous awards for his contributions to the rice industry and represented the U.S. State Department and the USDA at numerous international rice conferences. After retiring, Johnston spent four years as a consultant, rejuvenating the USDA World Rice Collection. He then moved to Fayetteville, AR in 1987 and served as an adjunct professor at the University of Arkansas, where he helped edit the *Rice Research Report*.

He is survived by his wife of 63 years, Marian Swanson Johnston; two sons, Keith Johnston, Berkeley, CA and Wayne Johnston, Conway, AR and their wives; three grandchildren; two brothers; and one sister. Memorials may be made to American Parkinson's Disease Association, Parkinsons Plaza, 136 Parkinsons Ave., Staten Island, New York, NY 10305-1425.



Understanding the Needs of 'Really Early' Members

by Palle Pedersen



I would without a doubt define myself as an early career member of the Societies; however, meeting recently with three undergraduate students at Iowa State University (ISU) made me rethink my self-proclaimed status (after all, I have been involved with research for 15 years!). In an effort to understand the needs of our “really early” members, I met with Wade Kent, Landon Ries, and Jeff Chalstrom, all undergraduate ISU seniors majoring in agronomy. All three grew up on farms, and their parents are still farming in Iowa. They have all been active in the ISU’s Agronomy Club, including organizing fundraising and social events. And in 2005, they attended their first Annual Meetings in Salt Lake City, UT. I thought it would be a good exercise to hear what they have in mind for their future and their opinion on how the Societies can help them achieve those goals.

The correlation of “getting hooked” as a member, staying a member, and the payment of dues: The issue of dues often comes up in conversations with young members of our Societies. Wade, Landon, and Jeff all agreed that they were members because of their involvement in the agronomy club. Not everybody majoring in agronomy is a member of the Societies, but the club has been the major driver for their involvement since its dues include membership in the Societies.

In the case of many graduate students, their first dues and registration to the Annual Meetings may be paid by their advisors. But the real question is what benefits have these ISU undergraduate students received and will receive in exchange for their dues? Their membership to the Societies has helped them to make connections to see what kind of research other universities are doing, find out about different graduate programs, and meet students and faculty from other institutions.

Undergraduates’ view of the Annual Meetings: Most of the member benefits listed by the interviewees center around attending the Annual Meetings. It seems to me, however, that undergraduate and graduate students have a completely different picture of what goes on during the Annual Meetings. When asked about their recent meeting experience, Wade, Landon, and Jeff were stunned to learn about the program that goes on during the week. They are all involved with the Students of Agronomy, Soils, and Environmental Sciences (SASES), and none of them was really aware of what happens in other sessions and events of the meetings. SASES traditionally meets from Saturday to Monday to minimize the number of days students are missing class time, but these ISU students feel that a major component missing is to get graduate and undergraduate students more integrated and also to learn more about programs at other universities that they may

want to attend for graduate school. Many undergraduates could learn from graduate students about life in graduate school. Two of the three students that I interviewed are seriously thinking about graduate school next year but still have a lot of questions.

The Early Career Member Committee recognized this issue last year, and we have made changes for this year’s Annual Meetings to get undergraduates more integrated and more involved. We will for the first time have a joint program Monday afternoon in Indianapolis, IN for Early Career Members and SASES—more details on that event will follow in an upcoming column. All three ISU students were pleased to hear this since they would like to get more involved and participate at the Annual Meetings. We hope others will also find these changes beneficial!

Preparing for the future and looking outside of the box: One of the last things that we talked about during our interview was their interest in international agriculture. With their farm background, they all knew about the competition from overseas, especially South America and East Europe, and how this may influence their farm in the future. They would like to get more international experience and suggested that the Societies could set up some kind of an exchange program with the European Society of Agronomy where students from Europe and the U.S. could go and participate at each others’ meetings.

Meeting with Wade, Landon, and Jeff corroborated my thoughts about how fully aware our future generations are regarding U.S. agriculture, the society, and education at land-grant universities. These generations have ideas in mind of what they would like for their future and what their needs are. They are interested in meeting and networking with graduates from around the country and around the world, both to seek for graduate programs and to find jobs. And, they want our Societies to provide them with easier means of communication with societies from around the world. And above all, they want a clear reason why to remain members of the Societies and pay for their own dues. Our challenge and our mission in the following years as Early Career Committee Members will be to bring your thoughts and ideas to other committees, strengthening the early career members’ voice and our participation in the Societies. I really enjoyed meeting with these students, and I look forward to meet other undergraduates at our joint session in Indianapolis. Together with the Early Career Members, you are the ones that will carry the society in the future, so please attend and share your thoughts with us!

P. Pedersen, Chair, Early Career Member Committee; palle@iastate.edu

The deadline for job listings is the first of the month preceding publication (e.g., 1 September for the October issue). To submit a listing online, go to: https://secure.asa-cssa-sssa.org/joblisting_submission.php or email copy to jobs@agronomy.org. The listing will be posted online within three business days. The charge for personnel ads is \$200 for the first 700 characters and \$100 per 475 characters thereafter. Graduate assistantships and postdoctoral positions (full listings) are \$100 for the first 700 characters and \$100 per 475 characters thereafter; or, if abbreviated (job title, name, address, phone/fax/email), they are \$50. Members receive one ad free (up to 1400 characters) in the "Positions Wanted" category per year; nonmembers are charged \$7.50 per month.

For questions regarding job listings, email jobs@agronomy.org or call 608-268-4972; For display ads, email advertising@agronomy.org or call 608-273-8080. Our online Career/Placement Center (www.careerplacement.org) provides a searchable job and resume database. Contact Leann Malison, 608-268-4949 or lmalison@agronomy.org.



Bachelors/Equivalent Required

Illinois—Technical Manager. Ball FloraPlant, a breeder and producer of vegetatively propagated plants, has an excellent opportunity at our corporate headquarters in West Chicago, IL for a Technical Manager. This diverse position will be responsible for providing technical support to production sites including on-site culture review, production and post-harvest research to help achieve quality and service goals of the company. The ideal candidate will have a BS in Horticulture or related field and a minimum of 5 years experience in production research, extension or similar field. M.S. or Ph.D. will be highly considered; demonstrated exceptional communication, organization and analytical skills; must be willing to travel 40-50% of time; bilingual English/Spanish desirable but not required. Interested candidates should submit their resume with salary requirements to: Ball Horticultural Company, 622 Town Road, West Chicago, IL 60185. Fax: 630-231-3592. email: slaubent@ballhort.com or careers@ballhort.com.

Various—Research Associate/Research Technician. Opportunity for growth in seed industry. Syngenta, a world-leading agribusiness committed to sustainable agriculture through technology, is committed to a vision of better food for a better world. Our innovative research supports the development of Garst, Golden Harvest, GreenLeaf Genetics, and NK brand seeds. We currently have openings in several of our research and development locations including Stanton, MN; Slater, IA; Janesville, WI; Bloomington, IL; Clinton, IL; Kauai, HI; Brookings, SD; Bay, AK; and Puerto Rico. We're looking for individuals to fill a wide array of Corn and Soybean Product Development Research Associate and Technician positions. Successful candidates should have education and/or experience in areas such as Agricultural Systems Technology, Agronomy, Plant Breeding, Farm Operations, Biology, Entomology, Molecular Biology, Plant Pathology, Plant Physiology, or Soil Sciences. Individuals should have strong work ethic, be well-organized, and work well as part of a team. Roles are available in laboratory and field research & development programs. Farm background with experience driving and maintaining farm equipment is

preferred for field research roles. A bachelor's or associate's of science degree is preferred for Associate positions, but not required for Technical positions. We offer a competitive salary and benefits package including health and dental insurance, 401(k), paid time off and tuition reimbursement, and relocation assistance. Submit resume, cover letter and your top three location choices via e-mail at jobs.seedsnafta@syngenta.com. Please use job reference number or job title, and or specify location preferences in cover letter. We're an equal opportunity employer.

Masters/Equivalent Required

Colorado—Agronomist/Irrigation Consultant. Exp'd sought by Agro Engineering specializing in the transfer of sustainable agricultural & water resource technologies through its consulting services & training prgms. Respond by resume to Attn. HR, 0210 Road 2 South, Alamosa, CO 81101 or email resume to keith@agro.com.

Hawaii—MSP Lead. Company Information: Imagine Growing Together: You and Monsanto. Imagine Ideas Growing Through Creativity and Teamwork. The people of Monsanto are creating breakthroughs in science to improve both crop and animal agriculture around the world. Responsibilities: In this position, the successful candidate will provide oversight for all Multi-Season Program operations on the Hawaiian islands. The lead will work closely with customers in the Breeding, Breeding Technology, and Biotechnology organizations as well as the crop leads. The lead will take primary responsibility for the regulatory compliance of the site, materials grown on the islands, and shipment of materials to and from the islands. The lead will be responsible for securing people, equipment, facilities, and supplies based on forecasts to meet nursery and screening demands. This position will provide the communication and planning link between the crop leads and on-site management. The lead will also be responsible for developing resource forecasts that allow the site staff to appropriately meet demands. Additionally, the lead will be challenged to develop new and improved methods of managing all aspects of multi-season nursery and screening operations. Requirements: M.S. in plant breeding, genetics, or agriculture related field with three years of relevant experience and expertise in nursery operations, field evaluations, crop production, and project management is required. Must be a self-motivated individual with proven ability to achieve results in a cross-functional or team environment as well as the ability to manage and complete multiple concurrent projects on time. Must possess good verbal and written communication skills, great customer focus and attention to detail with an ability to recruit and develop local talent to adequately fill the personnel pipeline. Contact Information: To view a more complete and detailed job description of this exciting position, please visit our website at www.monsanto.com and respond online. We offer very competitive salaries and an extensive benefits package. Monsanto values diversity and is an equal opportunity employer. M/F/D/V.

Minnesota—Maize Product Development Head. Syngenta is a world-leading agribusiness company committed to sustain-

able agriculture through innovative research and technology. The company is a leader in crop protection and ranks third in the high-volume commercial seeds market. We currently have the following position open in our Golden Valley, MN Headquarters: Maize Product Development Head Reporting to the Head, Global Corn and Soybean Product Development, the Maize Product Development Head will coordinate and lead the activities of Maize PD managers, scientists and support staff, with the objective of developing high-performing maize products that deliver on short-term and long-term business objectives of our brands and business strategies. Candidates must have a PhD, Masters, or extensive experience in breeding and/or project management, supplemented by at least five years of successful experience as a manager and leader of a large breeding team. You must have comprehensive knowledge of breeding theory (genetics, statistics, genetic gain theory, and field plot technique) and maize germplasm, as well as in-depth familiarity with marker applications to breeding. An understanding of NAFTA and global maize markets is required, as are budgeting and project management skills. Excellent communication skills, influencing, and the ability to participate on strategic required teams within Product Development are an expectation. The position will require a significant amount of national and international travel. We offer a very competitive compensation package. Send cover letter, including salary history and resume along with the job number to: Syngenta Seeds, Inc., via email at jobs.seedsnafta@syngenta.com or Fax: Attn-Human Resources 763-593-7828. EOE.

New Jersey—R&D Department Manager. Aquatrols Corporation of America, Inc., a leading manufacturer and supplier of soil surfactants for use in the Green Industries is seeking an experienced candidate to lead a small scientific team involved with product research, development and support. Selected candidate will interact with all departments to develop and implement strategies, including R&D staffing and resource management, to meet project goals and deliver effective on time high quality work. Candidates must have at least a Masters degree in an area of soils, crop science or chemistry and 10+ years of managerial experience in an industrial setting. Candidates must have proven track record of technical and scientific accomplishments, proven scientific and managerial team leadership skills, and experience handling chemistry and agronomic/horticulture related issues. Excellent written and oral communication skills required. Please email resumes to the attention of Tracy Jarman, CEO tracy.jarman@aquatrols.com.

North Carolina—Assistant Professor: Biogeochemistry. A 12-month, tenure track appointment (80% research, 20% teaching) is available in the Dep. of Soil Science at NC State University in Raleigh beginning October 31, 2006. The successful candidate will develop a nationally recognized research program in characterization of microbial-mediated chemical processes at soil interfaces that are relevant to the speciation, distribution, and transport of nutrients and environmental contaminants. Potential research areas include both spectroscopic and microscopic studies, as well as new modeling approaches that aim to elucidate physicochemical processes that result from interactions between microorganisms or microbial metabolites/exudates and mineral surfaces. The incumbent is expected to develop a successful grant-funded research program, to write and publish scholarly research work, collaborate with faculty

engaged in laboratory- or field-scale research, and possibly assist in the preparation of extension materials and presentations. Applicants should have significant expertise in Soil Science, Geochemistry, Geomicrobiology, Biogeochemistry, or related field with training in both chemical and microbiological techniques. The successful candidate must have effective oral and written communication skills as well as a strong interest in teaching, including distance education. Applications will be accepted until August 1, 2006 or until a suitable applicant is identified. Applicants should apply online at <http://jobs.ncsu.edu> attaching the following: a statement of career goals, CV/resume, list of references and other application materials. Original transcripts and three letters of reference should be mailed to: Dr. Michael Waggoner, Head, Soil Science Dep., Box 7619, NC State University, Raleigh, NC 27695-7619; Telephone: 919-513-0812; Email: michael_waggoner@ncsu.edu. NC State is an equal opportunity institution and prohibits discrimination in employment or services based on race, creed, color, sex, religion, national origin, age, disability, or veteran status. Persons with disabilities requiring accommodations in the application and interview process please call 919-515-3148.

Doctorate/Equivalent Required

Kentucky—Chair: Dept of Agricultural & Human Sciences. Morehead State University invites applications for the position of Chair. Located in the foothills of the Appalachian Mountains of eastern Kentucky, the Chair will oversee a 325 acre teaching farm, a greenhouse complex, and a faculty and staff of 21. The Chair must be a demonstrated leader and effective



RESEARCH SCIENTIST

Pioneer Hi-Bred International, Inc, a DuPont company, is the world leader in the discovery, development and delivery of elite crop genetics. We are looking for a Research Scientist at our Princeton, IL location. This individual will be responsible for planning and conducting a comprehensive maize genetics and breeding program for the Central Corn Belt. Responsibilities will also include establishing science plans for molecular breeding projects, creating product opportunities with a team of scientists, implementing research plans, and summarizing results. PhD in plant science with an emphasis in plant breeding as well as demonstrated field research expertise, organizational skills, ability to manage people and processes, and excellent computer and communications skills required.

Req ID for this position is 3665BR. To apply, go to www.pioneer.com/employment. EOE

communicator who will guide faculty and staff to achieve a shared vision for the department and can provide strong leadership in teaching, basic and applied research, and service. Other responsibilities include; administration of academic programs, models and encourages professional development; management of budget; fosters strategic planning activities; recruits and advises students; responds to directives from the Dean and other administrative offices; effectively represents interests of the Department to the administration and university community; communicates important information to the faculty; serves as a liaison for the Department with state agencies, and fulfills half-time teaching expectations. The Chair is a 12-month, tenure-track position beginning January 1, 2007. Qualifications: Earned doctorate in agriculture-related field, demonstrated administrative ability, professional experience to support appointment as Chair, strong oral, written, and interpersonal communicative skills, meets the requirements for tenure at the rank of professor or associate professor, and a record of excellence in professional and scholarly achievements, teaching, and service. Prior experiences in consensus building, strategic planning and implementation, and administrative success with budgeting and personnel are expected. Review of applications will begin September 1, 2006 and will continue until position is filled. To apply on-line, visit: <http://www.moreheadstate.edu/prospects/jobapp.html> and attach the required materials or forward a letter of application addressing the qualifications stated above, curriculum vita, and three letters of recommendations to: Office of Human Resources, Attn: Chair AHS, Morehead State University, HM 101, Morehead, KY 40351. MSU is an EO/AA employer.

Oklahoma—Assistant Scientist. The Forage Improvement Division of the Samuel Roberts Noble Foundation, Inc., Ardmore, Oklahoma, is seeking an Assistant Scientist to develop a molecular breeding and genetics research program. The main focus of the position is development of improved forage legume cultivars adapted to the southern Great Plains. The successful candidate will also conduct research to optimize the use genomic and transgenic technologies in practical cultivar development. A Ph.D. degree in plant breeding, with training or experience in the application of genomic or transgenic technologies to cultivar development, is required. Training or experience in forage crop production and management is also desirable. Salary is commensurate with education and experience. Applicants must apply online by filling out the application and submitting a resume, copy(s) of college transcripts, contact information for three references (excluding relatives), and a cover letter explaining interest in the position and career goals. If applicant does not have the ability to upload the additional documents they can be faxed to (580) 224-6240 (please include position number) but the application must be filled out and submitted online. Position Number: FB-S010-121 Website: www.noble.org.

Oklahoma—Research Hydrologist. The Grazinglands Research Laboratory, El Reno, OK, is seeking a permanent full-time Research Hydrologist (GS-11/12/13, \$51,972-\$96,292) who will conduct research to improve understanding and quantify interactive effects of land use, management, and climate variability on surface hydrological processes at a watershed scale. Duties include field and simulation research, validation and application of spatially-distributed models to elucidate key processes or management alternatives that impact water

resources. US Citizenship is required. Must meet all requirements in the announcement: <http://www.afm.ars.usda.gov/divisions/hrd/vacancy/X6S-0144.pdf>. Announcement closes July 20, 2006. The USDA is an equal opportunity provider and employer.

Mali—Coordinator: Sub-Regional Office. AVRDC-The World Vegetable Center is a nonprofit, autonomous international agricultural research center with headquarters in Taiwan and regional offices around the globe. AVRDC conducts research and development programs that contribute to improved incomes and diets in the developing world. AVRDC's Sub-Regional Office for West and Central Africa in Bamako, Mali, promotes vegetable production and consumption to improve income and nutrition in West Africa by conducting vegetable research and training and providing information services for the benefit of our partners, the national agricultural research and extension systems (NARES) in West Africa. Activities include: *Multi-location variety trials *Coordination of disease sampling activities in West and Central Africa *On-farm demonstration plots with promising varieties and selections *Identification of pathways to improve the local vegetable seed sector *Training workshops and information dissemination *Networking with national and regional partners. The Sub-Regional Office consists of a coordinator, a plant pathologist, one administrative/logistical officer, a driver, two technicians, one field observer and field laborers. Job responsibilities: AVRDC seeks a highly motivated person for its Sub-Regional Office in Bamako, Mali. The Coordinator will take direct responsibility for the day-to-day management and further development of the Sub-Regional Office. Working under the supervision of the Director of AVRDC's Regional Center for Africa in Arusha, Tanzania, and in close collaboration with AVRDC's other offices and Headquarters, the Coordinator will: *Provide leadership for, and effective management of, the Sub-Regional Office's operations. *Oversee management of AVRDC's sub-regional finances, human resources, farm operations and research activities at the Samanko research station. *Develop a detailed workplan and execute activities specified in the approved projects managed by the Sub-Regional Office in West Africa. *Strengthen the capacities of national partners in West and Central Africa to produce and market vegetable crops. *Establish and maintain close relationship with sub-regional and regional organizations and NARES in West and Central Africa. *Collaborate closely with AVRDC's relevant activities to ensure that the Sub-Regional Office's work is closely integrated with AVRDC's overall strategy. *Expedite the transfer of AVRDC's improved varieties and cropping technologies to West and Central Africa. *Collaborate with AVRDC scientists to develop improved varieties and cropping technologies that are adoptable in West and Central Africa. *Maintain a close relationship with host institutions in Mali, namely ICRISAT-Mali and Institut d'Economie Rurale du Mali. *Mobilize new financial resources and develop externally funded projects to sustain the Sub-Regional Office in close consultation with AVRDC scientists and management. *Report to the Director of AVRDC's Regional Center for Africa in Arusha, Tanzania and Deputy Director General for Research at AVRDC HQ. *Maintain fiscal accountability under supervision of the Comptroller's Office and Internal Auditor at AVRDC's HQ. Requirements: *PhD degree in Horticulture or related discipline with at least 5 years of working experience in Africa. *Excellent project management skills. *Proficiency in

French and English. *Creativity and ability to work with minimal supervision. *Good interpersonal communication skills, writing ability and administrative skills; and ability to work in multidisciplinary teams. *Ability to travel as necessary. Review of applications will begin 15 July 2006. Please send an application letter, a detailed resume and names and addresses of 3 referees (including e-mail address and fax numbers) by email to: Dr. Thomas A. Lumpkin, Director General, AVRDC—The World Vegetable Center, email: lumpkin@avrdc.org. Only applications from short listed candidates will be acknowledged. AVRDC—The World Vegetable Center is the principal international research center dedicated to vegetable research and development. Its mission is to improve nutrition and reduce poverty in the developing world through improved production, quality, processing, marketing and consumption of safe vegetables. For more information on AVRDC—The World Vegetable Center, please go to our website: www.avrdc.org.tw AVRDC is an equal opportunity and affirmative action employer.

Postdoctoral Positions

California—Post Doc: Pesticide Chemistry. UC Riverside. The individual will work on environmental fate and transport of pesticides related to non-point source runoff and to develop/evaluate mitigation practice. Tasks include (1) laboratory research on fate and transport of pyrethroid insecticides, (2) overseeing field projects, and (3) chemical analysis and data interpretation. This is a full-time, 2-year position. Annual salary starts at \$33,012 commensurate with experience. Applicants must (1) hold a Ph.D. in Environmental Chemistry, Environmental Toxicology, or Soil/Water Sciences, (2) have previous experience working with pesticides, and (3) have a strong interest in applied research. To apply, please send an application letter, curriculum vitae, and the contact information of three references via e-mail to Dr. Jay Gan (jgan@ucr.edu).

Assistantships

Delaware—MS or PhD Assistantship. Univ. of Delaware. Contact: Dr. S. Inamdar, Email: inamdar@udel.edu; Phone: 302-831-8877; <http://udel.edu/~inamdar/>.

Certification

Evaluating the Future of the Certified Professional Agronomist Program

by Luther Smith



The Certified Professional Agronomist (CPAg) program has been part of the American Society of Agronomy (ASA) since the mid-1970s. It was one of the original certifications in the ARCPACS (American Registry of Certified Professionals in Agronomy, Crops, and Soils) structure.

Today there are 680 CPAGs practicing agronomy as consultants, teachers, and researchers and working in private industry, at universities, and with the government. We conducted a survey earlier this year to determine what their background was and to evaluate some potential future directions for the program.

The survey was done electronically and sent to all 680 CPAGs. We received 280 completed surveys for a 41% return rate. That was a great response, and we thank all of you who took the time to respond.

Survey Results

We learned that 74% of CPAGs have been certified for 10 or more

years with 30% at 20+ years. We have a mature population with 71% being 41 years of age or older and 38% 51+ years. Looking at employment, 23% identified with being a self-employed agronomist while 19% identified with being a technical support agronomist; the third highest category was a research agronomist.

The overwhelming reason for becoming and maintaining their certification was "certification demonstrates a level of education and competence." "Certification establishes a minimum code of ethics one agrees to follow while conducting business" and "professional ranking provides association with other professionals" were the second and third most selected options, respectively.

We asked a question related to licensing for agronomists. There was an

(Continued on page 32)

L. Smith, Executive Director of Certification Programs; lsmith@agronomy.org or 608-268-4977.

Certification Exams

CCA/Agronomy Exam

4 Aug. 2006 (registration closed). See www.agronomy.org/certification

Certified Professional Soil Scientist Exams

20 Oct. 2006 (registration is currently open, and the deadline to register is 8 Sept. 2006). See www.soils.org/csse/

Newly Certified

Associate Professional Agronomist

Jeffrey T. Osterhaug, Schaumburg, IL

Certified Crop Adviser

Heath Kuntz, Fort Morgan, CO

Certified Professional Agronomist

Florian Diekmann, Columbus, OH

Certified Professional Soil Classifier

Darian E. Landolt, Cary, IL

Certified Professional Soil Scientist

Charles T. Herrmann, Oshkosh, WI
Michael D. Warrick, Perkasie, PA

Certified Professional Soil Scientist/ Associate Professional Soil Classifier

Daniel R. Ufnar, Olympia, WA



The Two Faces of **ETHYLENE SENSITIVITY** in Soy

A soybean variety's sensitivity to the plant hormone ethylene can either help or hinder it depending on a number of factors. **LEFT:** Healthy, mature soybean. Photo courtesy of USDA-NRCS. **RIGHT:** Soybean affected by white mold.



The plant hormone ethylene controls a variety of plant processes, including plant senescence, ripening, defoliation, abiotic stress, and response to plant pathogens. However, soybean varieties have been developed that are insensitive to the hormone, which can be a help or hindrance, depending on precisely what the soybean is expected to be best at. Ethylene expression has been manipulated by breeding and by engineering, but recently, better understanding of just how ethylene works has been outlined in *Arabidopsis thaliana*, the model organism used by many plant researchers. By working with the molecular mechanisms of this little plant, researchers have learned much—what produces ethylene, how to increase ethylene production, and how to reduce its synthesis. By working with a number of plant mutations, the mechanisms by which the hormone works is also better described.

Ethylene sensitivity has been a subject of much work by plant engineers, much of it centering around tomatoes. An early version, the Flav'r Sav'r tomato controlled ethylene activity, keeping the tomato firm until it reached supermarket distribution areas where the ethylene was activated. Many other producers of crops have tried to use the ethylene response; florists wrap apples into the wrappings of colorful bromeliads to increase rebloom, which enhances sales of these tropical plants.

But there are additional reasons to know and understand how to manipulate ethylene response in plants. By understanding ethylene response, certain plants may be more resistant to diseases. However, ethylene can promote both disease susceptibility and disease resistance, depending on the pathogen.

Because ethylene promotes tissue senescence, some plant scientists thought that reduction of the plant's ethylene response might improve disease tolerance. Tests of the effect of ethylene production in whole plant-whole pathogens provided support for this possibility. Bacterial infection in mutant varieties of *Arabidopsis* such as *Arabidopsis ein2* was enhanced. Other mutant varieties including *Arabidopsis etr1* did not show enhanced disease tolerance; possibly the *etr1* lines had residual ethylene responsiveness. Ethylene-insensitive lines of tomato, tobacco, and soybean have subsequently been demonstrated to be disease tolerant—for at least some pathogens. Importantly, in the *Arabidopsis* research, *R*-gene-mediated resistance was not perturbed by ethylene insensitivity, and systemic acquired resistance also remained effective. Further research on disease resistance in *Arabidopsis* has indicated that ethylene signaling activates induced systemic resistance but not systemic acquired resistance. Ethylene signaling does appear to be responsible for part of the resistance expressed against some pathogens.

From *Arabidopsis* to soybean is a long step, but in this case, the model plant suggested some of the findings in

Earn 1 CEU in Crop Management by reading this article and completing the exam at the end. CCAs may earn 20 CEUs per two-year cycle as board-approved self-study articles that include articles from several sources. The CCA logo above identifies pre-approved material. Fill out the attached questionnaire and mail it with a \$10 check (or provide credit card information) to the American Society of Agronomy.

ethylene-insensitive soybean. Ethylene signaling is partly responsible for the inactivation of some resistance expressed against some fungi but not other types. Ethylene-insensitive soybeans have enhanced tolerance to *Pseudomonas syringae* pv. *glycinea*, which causes bacterial blight. But in lab studies, these soybeans also demonstrated slightly increased susceptibility to fungal pathogens *Septoria glycines* and *Rhizoctonia solani*. The ethylene-insensitive soybeans were nodulated normally when infected by the nitrogen-fixing symbiont *Bradyrhizobium japonicum*. In lab and greenhouse work with tobacco, researchers found that converting tobacco plants to ethylene insensitive increased susceptibility to *Phythium sylvaticum*, which usually isn't a problem in tobacco, and to *Collectotrichum destructivum*, which is a particularly destructive fungus. It seems that ethylene insensitivity can make some plants more sensitive to disease and resistant to others.

R-gene-mediated resistance was also affected by ethylene in variable ways—depending on which R gene is conferring defense. R gene mediation against *Pseudomonas syringae* pv *glycinea* remained effective in soy lines that are ethylene insensitive and in tobacco infested with tobacco mosaic virus. R-gene-mediated resistance of soybean against *Phytophthora sojae* was also successful for some R genes. But *Rps1-k*, one of the commercially most important R genes in U.S. agriculture, only worked against some *P. sojae* isolates and no longer worked against others when the soy plant was ethylene insensitive. These lab studies suggest overall that reducing ethylene responsiveness may be beneficial in preventing some plant diseases while making plants more susceptible to other plant pathogens.

Testing the Hypothesis

It is clear both that altered ethylene response alters disease resistance to a variety of phytodiseases and that ethylene responses also affect other traits, including ripening and senescence controls for cut flowers and other products. While these traits are not relevant to soy, altered ethylene production may alter traits such as seedling emergence, stress responses, plant structure, leaf aging, timing of maturity, seed protein, and oil composition, in addition to seed yield. In the model plant, *Arabidopsis*, it has been seen that certain ethylene-insensitive mutations do develop larger leaves and “bolt” (send up a flowering stalk) later. Ethylene is a major plant hormone, yet despite all the laboratory research and the work with chemicals that alter plant ethylene responses, researchers of any crop had not conducted and published field-based research on plants genetically modified to have an altered ethylene response. Plant trials with ethylene-insensitive soybean were therefore designed to try to answer some of these questions about plant growth in field conditions. Additional field tests used white mold (caused by *Sclerotinia sclerotiorum*) as a model disease. This disease has appeared and disappeared frequently during recent years. When the environment is right, areas that are infested sustain major crop loss. Genetic disease resistance is only partially effective against white mold.

Plant Trial Results

Trials that compared Hobbit 87 and Hobbit 87 *etrl-1* line (formerly called T124N38) were conducted to determine which diseases were affected by the ethylene status of plants, and whether there were significant differences in the plant morphology and growth habit. The following differences were noted:

- In two trial years, the ethylene-insensitive line Hobbit *etrl-1* was significantly more susceptible to white mold than the isogenic parent Hobbit 87 line. For a second ethylene-insensitive line, the difference was significant in both years at the $P = 0.10$ level but not at $P = 0.05$ (which means that there is good but not iron-clad support for the finding that ethylene insensitivity makes soybeans more susceptible to white mold).
- *Septoria glycines* is the organism that causes Septoria brown spot disease, which defoliates soybean plants, typically starting at the bottom of the plant and working upward. The disease may cause withering of leaves, especially in wet growing seasons. The fungus that causes the disease overwinters and may become established in a field in July. The test plots were inoculated with *Septoria glycines* by foliar misting on cool evenings. The ethylene insensitivity lines did not show much difference in resistance to the brown spot, possibly because of monitoring the disease progress late in the season.
- The roots of soybean Hobbit 87 and Hobbit 87 *etrl-1* were exposed to soybean cyst nematode isolate. In two independent trials, the *etrl-1* soybean developed significantly fewer female nematodes on their roots after a month after inoculation. The morphology of the infected roots was quite similar.

It's More than Disease Resistance

The morphology of field-grown ethylene-resistant soybean plants showed subtle differences. The ethylene-insensitive plants had a different leaf shape compared with the sensitive plants. The petioles of Hobbit 87 were longer, and the leaves on the upper canopy of Hobbit 87 were more upright than the mutant line. The petioles of *etrl-1* extended in a horizontal fashion, providing a flatter shape to the canopy, and the upper leaves fell sideways as they matured because the upper canopy was thin over the center of the stems. The canopy difference was noted in a variety of sites and in multiple years. The difference didn't appear to trigger any difference in flowering date or plant lodging.

However, ethylene responsiveness did alter the maturity date. Maturity (the date on which pods/seeds had dried to maturity) was generally a few days later for Hobbit 87. These trials did not receive any pathogen inoculation treatments. Maturity date is a complex trait that can be affected by shortening daylength and is important to growers.

Seed protein and oil concentration were measured for the trials tested for maturity date. The Hobbit 87 soy pro-

duced slightly less protein, and slightly more oil, but the differences were not significant.

The most important issue for growers of soy is seed yield. At first, when the initial generations of soy were greenhouse grown and in early field propagation, the ethylene-insensitive mutants appeared to grow in ways quite similar to the ethylene-sensitive, regular plants. However, after seed increase had been accomplished, multiyear field trials showed that the ethylene-insensitive plants showed yield depression in certain environments. Stand establishment appeared to be a part of the problem, with reduced stands causing fewer producing plants, and thus, fewer seeds. But in other environments, stand count was identical, but the individual ethylene-insensitive plants did not deliver the volume of seed that was found in the ethylene-sensitive plants.

Soybean Ethylene Response a Mixed Plate

The trials sought to look at differences in plant growth, yield, and disease resistance. By using ethylene-insensitive mutants, the studies did not have to rely on external ethylene response activators or inhibitors that would have been applied on some constant basis to measure the response.

The ethylene-insensitive mutants allow studies that would not be possible, as plants that carry a constitutive, systemic loss of ethylene responsiveness may fail to grow in a normal fashion before pathogen infection occurs.

In plants other than soybeans, it has been found that ethylene-insensitive plants like tomato (*Lycopersicon esculentum*) and petunia (*Petunia x hybrida*) may develop more belowground root mass while exhibiting fewer aboveground adventitious roots. Work at the University of Florida reported that auxin (indole-3-butyric acid) increased adventitious root formation on vegetative cuttings of wild-type plants but did not do so on NR (Never-ripe, an ethylene-insensitive tomato) plants. These researchers found that the particular ethylene-insensitive tomato developed elongated tap roots, shortened hypocotyls, and sometimes fail to penetrate rooting mediums. "These data indicate that ethylene has a critical role in various responses of roots to environmental stimuli."

A patent claiming inventorship of a mutated form of the EIN6 gene, resulting in an insensitive plant, is disclosed in U.S. Application published as 2003-0166197-A1. According to the patent application, "The gaseous plant hormone ethylene modulates a diverse array of biological processes

Future of the CPAg Program

(Continued from page 29)

interesting relationship between the question about supporting licensing efforts for agronomists and the comments. The direct question whether or not CPAg should pursue state licensing as a goal received a favorable response while the comments overall did not support licensing. The comments supported keeping with the private sector approach to handling the certification process and to not have the government get more involved. State licensing acts are government run and administered while certification programs are typically run by not-for-profit private organizations and voluntary.

Relationship between the CPAg and CCA Programs

Another aspect of the survey was to determine what the relationship should be between the CPAg program and the Certified Crop Adviser (CCA) program. The survey indicated that there is a strong, overall need to maintain both the CPAg and CCA programs as separate and distinct certification programs. Some of the written

comments talked about distinguishing CPAg more from CCA. Currently, CPAg requires the International CCA Exam as part of the credentialing process, and CPAg requires at least a B.S. degree while CCA does not. CPAg is looked at or thought of as the "higher" level certification and shows recognition for having at least a B.S. degree in agronomy or a very closely related field according to the survey. Promoting and communicating more about the CPAg program was also a consistently strong comment.

The CPAg and CCA programs are distinct and separate programs though they have some similarities as was mentioned. Their primary target audience is practicing agronomists. CPAg provides a broader scope for agronomists who may travel across state boundaries, do research and teaching, or are in management roles in addition to consulting with growers. CCA's primary focus is on agronomists who spend the majority of their time advising growers in a defined geography.

CPAg's participants have been declining steadily over the last 10 years. In 1996, there were 856 CPAGs, and now there are 680. This can be attrib-

uted to various reasons, including industry, university, and government consolidations and changes in the agricultural industry as a whole.

Listening Session

A listening session was held to discuss the results of the survey and the trends that were mentioned. Some of the comments from the listening session were centered on promoting the CPAg program more to students in agronomy programs and to employers of agronomists. It was also identified that there is a need to better define and articulate who a CPAg is and what they do so that benefits to the end user can be discussed. There was consensus to determine the audience potential for CPAg and from that develop a promotional plan for the future.

Overall, the survey and subsequent listening session provided some good background information about the program and its participants. This type of fact gathering had not been done with CPAg in recent history, but it helped to get the process started. The CPAg board will need to discuss it further to determine any future next steps.

in plants including cell elongation, senescence, abscission of leaves and flowers, fruit ripening, and responses to a wide variety of biotic and abiotic stresses. The ability to genetically manipulate ethylene production will provide agriculture with new tools to prevent detrimental effects (senescence) or provide the beneficial properties of ethylene responsiveness, such as controlling fruit ripening. The invention describes a mutated form of the EIN6 gene (*ein6*) that results in an altered response to ethylene including an ethylene-insensitive root (EIR) phenotype. A double mutant consisting of the mutant EIN6 gene and a mutated form of the *etr1-1* gene results in ethylene insensitivity throughout the plant in contrast to the EIR phenotype found in the *ein6* single mutant. The application is assigned to the Salk Institute.

Other methods of increasing ethylene insensitivity include genetic engineering, in which a selected gene or portion is inserted into the genetic structure of the plant or specific transcription factors are manipulated.

The studies described in this article showed that many traits were not obviously changed by reduced ethylene responsiveness, including seed protein oil concentrations, flowering date, plant height, leaf chlorophyll, and late-season leaf senescence (specific oil components were not

measured). However, root structure was changed, and the leaf canopy appeared altered. Still, this study agrees with others that have held that targeted expression of ethylene insensitivity may be the most productive route for future research toward the development of improved soybean varieties. This is the key take-home message: plant ethylene responses can be altered by breeders or biotechnologists, but it is important to alter ethylene responses only in specific plant tissues or development stages or in response to specific pathogens. In this way, undesirable aspects of plant ethylene responses can be manipulated without altering all of the other carefully balanced ethylene responses that play such an important role in overall plant growth and productivity.

This article was adapted from:

Bent, A.F., T.K. Hoffman, J.S. Schmidt, G.L. Hartman, D.D. Hoffman, P. Xue, and M.L. Tucker. 2006. Disease- and performance-related traits of ethylene-insensitive soybean. *Crop Sci.* 46:893–901.

Clark, D.G., E.K. Gubrium, J.E. Barrett, T.A. Nell, and H.J. Klee. 1999. Root formation in ethylene-insensitive plants. *Plant Physiol.* 121:53–60.

July 2006 CEU Exam

The Two Faces of Ethylene Sensitivity in Soy (no. SS 02630)

1. The use of ethylene-insensitive plants is likely to reduce:

- ☐ a. The susceptibility of white mold infection.
- ☐ b. Formation of cysts via soybean cyst nematode.
- ☐ c. Leaf drop in early growing season.
- ☐ d. Root development.

2. How can ethylene resistance be used in soybeans?

- ☐ a. Only through the mutant varieties.
- ☐ b. Only through genetically engineered products.
- ☐ c. There are several methods, including enhanced specific transcription factors.
- ☐ d. Only by spraying on liquid ethylene.

3. How does ethylene sensitivity affect seed yield in soybean?

- ☐ a. It increases yield.
- ☐ b. It decreases yield.
- ☐ c. It has no effect on yield.
- ☐ d. Yield is undependable—it may be larger or smaller than the nonmutant version.

4. What is the major change that occurs when an ethylene-insensitive plant is grown?

- ☐ a. The canopy looks different.
- ☐ b. The plant density is better.
- ☐ c. Flowering occurs earlier.
- ☐ d. Flowering occurs later.

This exam is worth **1 CEU in Crop Management**. A score of 70% or higher will earn CEU credit. The International CCA program has approved self-study CEUs for 20 of the 40 CEUs required in the two-year cycle. An electronic version of this test is also available at www.certifiedcropadviser.org. Click on "Continuing Education" and then "Self-Study CEUs."

DIRECTIONS

1. After carefully reading the article, answer each question by clearly marking an "X" in the box next to the best answer.
2. Complete the CEU exam registration form on the back of this page.
3. Clip out this page, fold, place in envelope with a \$10.00 check made payable to the American Society of Agronomy (or, if paying with credit card, provide your card information on the form), and mail to: ASA c/o CCA Self-Study Exam, 677 S. Segoe Road, Madison, WI 53711.

5. Some traits are not affected by the inclusion of the mutant gene for ethylene sensitivity. Which trait is affected?

- ☐ a. Overall seed protein concentration.
- ☐ b. Overall oil concentration.
- ☐ c. Flowering date.
- ☐ d. Seed yield.

Exam Continues

Next Page

6. How does a nonmutated soybean in healthy stands look compared with a mutated soybean of a similar background?

- ☐ a. They look exactly alike.
- ☐ b. The nonmutant soybean is taller.
- ☐ c. The canopy is more upright, providing a smoothly arching canopy.
- ☐ d. The nonmutant soy is flatter.

7. How is ethylene insensitivity measured when working with plants?

- ☐ a. By exposing healthy leaves to gaseous ethylene.
- ☐ b. They look different.
- ☐ c. By measuring the root balls.
- ☐ d. Using RFLP.

8. Ethylene insensitivity has some effects on final users of soy. They are:

- ☐ a. Maturity dates may be earlier in certain locations.
- ☐ b. Leaf senescence will be extremely uneven.

- ☐ c. Soybeans that include the ethylene-insensitivity mutation may drop pods and lose seed prior to harvest.
- ☐ d. There will be more "down" plants at harvest time.

9. Stand counts of soybean plants that are ethylene insensitive via a mutant gene are likely to be:

- ☐ a. Always less, but not significantly.
- ☐ b. Significantly larger.
- ☐ c. Significantly lower.
- ☐ d. Sometimes larger, sometimes smaller.

10. Why are scientists looking at the mutant ethylene-insensitive soybean? Which is NOT a factor?

- ☐ a. Because of the suggestion that they may be more resistant to disease.
- ☐ b. Because the mutant gene allows more information gathering in planning future improvements.
- ☐ c. Because the mutant form is a better, more robust variety.
- ☐ d. Yield does not appear to always be much reduced.

CEU EXAM REGISTRATION FORM

Name: _____

Address: _____ City: _____

State/province: _____ Zip: _____ CCA certification no.: _____

☐ \$10 check payable to the American Society of Agronomy enclosed. ☐ Please charge my credit card (see below)

Credit card no.: _____ Name on card: _____

Type of card: ☐ Mastercard ☐ Visa ☐ Discover ☐ Am. Express Expiration date: _____

Signature as it appears on the Code of Ethics: _____

I certify that I alone completed this CEU exam and recognize that an ethics violation may revoke my CCA status.

This exam issued July 2006 expires July 2009

CEU EXAM EVALUATION FORM

Rating Scale: 1 = Poor 5 = Excellent

Information presented will be useful in my daily crop-advising activities: 1 2 3 4 5

Information was organized and logical: 1 2 3 4 5

Graphics/tables (if applicable) were appropriate and enhanced my learning: 1 2 3 4 5

I was stimulated to think how to use and apply the information presented: 1 2 3 4 5

This article addressed the stated competency area and performance objective(s): 1 2 3 4 5

Briefly explain any "1" ratings: _____

Topics you would like to see addressed in future self-study materials: _____

DETACH HERE

Student & Career Activities

SASES News

Wisconsin Year of Soil Attended by UWSP Chapter

Three students and their advisor from the University of Wisconsin–Stevens Point Soil and Water Conservation Chapter, hosted an exhibit during the “2006—Year of Soil in Wisconsin” event on 16 May. The exhibit featured the Horicon Marsh Nutrient Mapping Research project, which is evaluating the soils of this central Wisconsin area. The event, held at the state capitol in Madison, was in celebration of the completion of the entire soil survey for the state of Wisconsin.

Mentoring Activities Scheduled for Indianapolis

A new and exciting program will match undergraduate students with Society professionals during the 2006 Indianapolis, IN Annual Meetings. Mentors can provide students with a wealth of information such as career advice, professional networking, and the best ways to navigate the Annual Meetings. Students will also benefit from their scientific expertise and contacts in the field.

The program, Golden Opportunity Scholars Institute, was developed by CSSA as part of its 50th Anniversary and will encourage and inspire promising undergraduate students from all regions of the U.S. and the world. Interested students should contact Leann Malison at lmalison@agronomy.org or 608-268-4949.

Dixon Soil Mineralogy Awards

Two competitive annual awards will be made to graduate students making presentations (oral and poster) on topics central to soil mineralogy at the SSSA Annual Meeting in Indianapolis, IN in November.

The first award will recognize the best Division S-9 graduate student presentation. Graduate students presenting an oral or poster paper in Division S-9 and who are first author are eligible for the \$500 award. Selection will be based on the quality of the presentation and contribution of research to advancing the state of knowledge of soil mineralogy.



Martha and Joe Dixon

The second award will be a travel grant of \$500 to a student from a developing country, with a preference to Mexico and other South and Central American countries. Selection of the award will be based primarily on need. The deadline to apply is **25 Aug. 2006**.

For more information on both awards and applica-

tion procedures for the travel grant, go to www.soils.org/divs/s9/index.html. SSSA Division S-9, Soil Mineralogy, has established the Joe B. and Martha J. Dixon Soil Mineralogy Endowment through the Agronomic Science Foundation in recognition of Dr. Dixon's contributions to soil mineralogy. Last year's winners were Amy Brock and Alexandre Anastacio—they received their awards at the 2005 Annual Meetings in Salt Lake City, UT.



SASES Chapter Representatives from left to right: University of Wisconsin–Stevens Point Soil and Water Conservation Chapter Advisor Ron Hensler and students Frank Fischer, Marie Schmidt, and Byron Evers at the “2006—Year of Soil in Wisconsin” celebration on 16 May in Madison, WI.

Amy Brock received the **Best Graduate Student Presentation Award** for her paper, “Diapir-Derived Evaporate Paleosols in the Eocene Carroza Formation of the La Popa Basin, Mexico, and Their Implications for Syn-depositional Exposure of Diapiric Evaporate.” Brock received a B.S. degree in Geology at Oklahoma State University, a M.S. degree in Geoscience at University of Nevada Las Vegas (UNLV), and she is currently pursuing her Ph.D. at UNLV in Geoscience with a focus in Soil Science. Under the direction of Dr. Brenda Buck, she works mainly on arid/semiarid soil problems, including the genesis of Stage II calcium carbonate pendants (master's research), depleted uranium movement in arid soils, Cu salts derived from landscaping material, and gypsic and natric Eocene paleosols to decipher the movement of a salt dome in Mexico. For her dissertation, she is examining Stages V and VI calcium carbonate soils (using geomorphic and micromorphic techniques) and their features to fully understand their genesis.



Amy Brock

Alexandre Anastacio received the **Student Travel Grant Award** for his paper, “Characterization of Redox-



Alexandre
Anastacio

Modified Clay Minerals with Respect to Their Suitability as Barrier Materials for Radioactive Waste Confinement.” Anastacio was born in Juiz de Fora, State of Minas Gerais, Brazil, but moved to Sao Joao del-Rei, a colonial city from the Golden Cycle in Minas Gerais. He received his undergraduate degree in Chemistry from the Federal University of Sao Joao del-Rei (UFSJ) and master’s

degree in Agronomy from the Federal University of Lavras (UFLA), which focused on interaction of pesticides with clays and clay minerals. His Ph.D. research involves environmental implications of iron redox processes in clays and clay minerals in soils using mainly Mössbauer spectroscopy. The thesis is sponsored by CNPq (in Brazil) and by a Sandwich fellowship funded by CAPES under the direction of Professor Jose Domingos Fabris, advisor, and Professor Joseph W. Stucki, co-advisor, at the University of Illinois in Urbana-Champaign.

USDA Web Soil Survey Embraced by Clemson University Professors, Students

by Elena Mikhailova, Chris Post, and Amy Maxwell

Clemson University students recently enjoyed a hands-on experience with USDA’s Web Soil Survey. Sixty-seven students, majoring in various fields such as horticulture, forestry, agricultural mechanization, and agricultural education, used the application in Crop and Soil Environmental Science 202, the introductory soil science course led by Clemson faculty Dr. Elena Mikhailova, Assistant Professor of Soil Science, and Dr. Christopher Post, Assistant Professor of Environmental Information Science. Mikhailova and Post required the students to use the online tool in their coursework.

Last summer, USDA announced the launch of the Web Soil Survey site, which provides public access to the national soils information system.

“The site is a simple yet powerful way to access and analyze soils data that contribute to every aspect of public and private land use and development,” explains USDA-Natural Resources Conservation Service

(NRCS) South Carolina State Conservationist Walt Douglas.

Clemson University students conducted two laboratory exercises utilizing the tool created by USDA-NRCS. The assignments were using the NRCS Web Soil Survey to evaluate soil physical properties, septic suitability, and basement suitability and using it to evaluate soil chemical properties. The course assignments can be viewed at www.gis.clemson.edu/elena/SoilsandEnvironLab.htm.

Student responses to the laboratory exercises were positive.

“I liked using the website to explore the concept of soil science,” says student Andrea Koppenheffer. “The tool is very useful because we learned how to judge if a soil is good for a septic system or a basement. I liked that we could actually use this information in our daily lives.”

The tool has even led some students, like John Hollis, to envision how the Web Soil Survey will assist them in their careers.

“When I graduate, I plan to open a lawn-maintenance and landscaping business,” Hollis says. “I’ll use the Web Soil Survey to check soil properties and make necessary adjustments to my landscape plans. This will give me an advantage over my competitors in understanding the way water moves into and through soil, which



Opening screen of USDA’s Web Soil Survey, which can be accessed by going to <http://websoilsurvey.nrcs.usda.gov/app>.

will then assist me in making good management decisions.”

Prior to the launch of the Web Soil Survey, maps were printed and bound into soil survey books that were free to the public at local NRCS offices. These will be phased out with the creation of the new site.

“Currently, NRCS has soils maps and data available online for more than 95% of the nation’s counties and should have 100% very soon,” says Douglas. “We are excited that Clemson University students and professors are using this innovative tool in the classroom, and that they are seeing first-hand how useful it can be in real-life situations.”

Visit the Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov/app>.



Clemson University students use the USDA’s Web Soil Survey as part of an introductory soil science course.

E. Mikhailova, Assistant Professor of Soil Science, and C. Post, Assistant Professor of Environmental Information Science, Clemson University, Clemson, SC; and A. Maxwell, USDA-NRCS South Carolina Public Affairs Specialist, Columbia, SC.

ASA/CSSA/SSSA Science Policy: A Voice for Our Sciences



Above: Bob Hoeft, 2003 ASA President and Senator Hagel, (R-NE) Right: John Havlin 2005 SSSA President and Senator Dole, (R-NC)



The ASA-CSSA-SSSA Science Policy Office in Washington DC serves as an important link between the federal government and the agricultural, natural resources, and environmental communities. The Science Policy Office:

- ◆ Empowers Citizen Scientists
- ◆ Secures Funding
- ◆ Connects Science and Policy
- ◆ Sets National Priorities
- ◆ Ensures Science-based Legislation

Decisions made in Congress directly and indirectly impact our sciences and the professions. Your awareness and involvement in science policy is crucial for funding efforts and legislation.

Visit the Science Policy Office at www.asa-cssa-sssa.org/public_affairs.html and access two exciting tools available at your fingertips:

Science Policy Action Center www.sciencepolicyaction.org

Become a constituent scientist and:

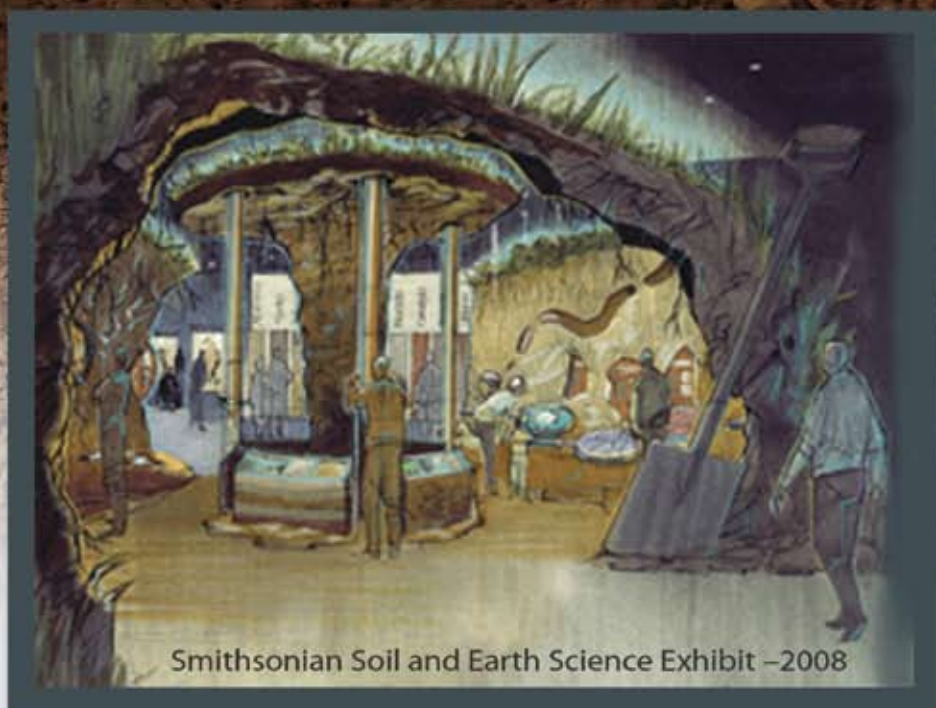
- ◆ Track legislation
- ◆ Communicate with your Congressional Delegation
- ◆ Influence policy

Science Policy Blog www.asa-cssa-sssa.blogspot.com

Take part in a discussion of science policy issues. Current topics include:

- ◆ National Institute of Food and Agriculture
- ◆ FY 2007 Farm Bill
- ◆ FY 2007 agriculture budget

www.asa-cssa-sssa.org/public_affairs.html



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