

# AGMASTERS

*Serving Agriculture and the Environment*

✕ 2013





# Welcome

It's our pleasure to welcome you to the 5th annual AGMasters Conference! We know that you have other options when it comes to educational programs and we value your participation in this conference. Our program committee has endeavored to create a slate of speakers and topics that will make your experience at this event relevant, interesting, and also translate into a productive year in 2014. Our conference will begin with a general session that features five well known speakers who will address topics directly related to agricultural production and the environment. At times, these two subjects can be divisive, particularly between urban and rural audiences. Ron Hustedde, a Professor in Community and Leadership Development at the University of Kentucky, will begin our conference by helping us take a proactive approach in bridging some of these differences. After the general session has concluded, instructors will begin with the first series of advanced workshops. The 1-hour workshops will be repeated once and are designed to promote interaction between the instructor and the students. Each of the sixteen workshops will be limited to 45 participants. At the 2013 Conference, instructors from a great diversity of universities will be featured including: Iowa State University, Michigan State University, Purdue University, The Ohio State University, University of Guelph-Ridgetown, University of Illinois, University of Kentucky, University of Minnesota, and the University of Missouri. The workshops will provide research-based information on a wide variety of timely subjects including: management of troublesome weed species, nitrogen management, cover crops, sudden death syndrome, agricultural drainage systems, Bt resistance, managing soybean insect pests, herbicide carryover, potassium management, crop rotations and profitability, glyphosate resistance, examining soil properties, and corn mycotoxins. The biggest challenge faced by this year's participants is selecting only eight of the sixteen workshops that are offered. All of the choices look very appealing. We hope that your investment in this conference is a positive one. Please let us know at any point during the next 2 days how we can improve your overall experience. Again, thanks for your participation in the 2013 AGMasters Conference.

Regards,

Dennis Bowman, Carl Bradley, Mike Gray, Aaron Hager, and Sandy Osterbur



UNIVERSITY OF ILLINOIS  
EXTENSION

# Contents

2013 Planning Committee.....	2
Schedule.....	3
Applied Bee-Nomics: Can the Honey Bee Genome Save U.S. Apiculture?.....	5
Biology and Management of the Pigweed (Amaranthus) Species.....	6
Maximizing Yield, Income, and Water Quality .....	7
Controlled Drainage, Water Table Management and Other Recent Innovations with Applications in the Midwest.....	8
Our Regulatory Future, the Best of Times or the Worst of Times? .....	8
Tactics to Managing a Soybean Pest Complex.....	9
A Proactive Approach Towards Linking Rural Farmers with Urban America .....	9
Why Cover Crops? Are They Worth Your Time and Effort? .....	10
Should Glyphosate-Resistant Horseweed Be This Difficult to Manage?.....	11
Improving Potassium Management: Using the New Moist Test and Accounting for Temporal Variability.....	11
Making Sense of the Latest Research on Sudden Death Syndrome of Soybean .....	12
The “State of the Art” of Nitrogen Management.....	13
Corn Rootworms and Bt Trait Resistance: Re-Learning Management.....	13
Mycotoxins and Their Management in Corn in the Central/Northern Corn Belt .....	14
Sensor-based N Rates: Opportunities, On-Farm Results, and Obstacles .....	15
Corn-Soybean Rotations and Profitability.....	16
Soil-Active Herbicides: Efficacy, Injury, and Carryover .....	17
Overcoming SBIs and Other Factors that Can Reduce Weed Control.....	18
Corn Fungicides: Crop Performance and Beyond .....	19
Tillage System Choices and Justifications: Separating Fact from Fiction.....	19
Soil Properties Come First!.....	20

# 2013 Planning Committee

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# Schedule

## December 2

8:00–8:05 AM	<b>Welcome Address</b>   Mike Gray
8:05–8:50 AM	<b>A Proactive Approach Towards Linking Rural Farmers With Urban America</b>   Ron Hustedde
8:50–9:35 AM	<b>Our Regulatory Future, the Best of Times or the Worst of Times?</b>   Warren Goetsch
9:35–10:20 AM	<b>Applied Bee-nomics: Can the Honey Bee Genome Save U.S. Apiculture?</b>   May Berenbaum
10:20–10:30 AM	Morning Break Period
10:30–11:15 AM	<b>Corn Fungicides: Crop Performance and Beyond</b>   Paul Vincelli
11:15–12:00 PM	<b>Maximizing Yield, Income, and Water Quality</b>   Howard Brown
12:00–12:45 PM	Lunch Break
12:45–1:45	<b>The “State of the Art” of Nitrogen Management</b>   Emerson Nafziger   <i>Alma Mater Room</i> <b>Biology and Management of the Pigweed (<i>Amaranthus</i>) Species</b>   Kevin Bradley   <i>Lincoln Room</i> <b>Tillage System Choices and Justifications: Separating Fact from Fiction</b>   Tony Vyn   <i>Tech. Room</i> <b>Why Cover Crops? Are They Worth Your Time and Effort?</b>   Hans Kok   <i>Quad Room</i>
1:50–2:50 PM	<b>The “State of the Art” of Nitrogen Management</b>   Emerson Nafziger   <i>Alma Mater Room</i> <b>Biology and Management of the Pigweed (<i>Amaranthus</i>) Species</b>   Kevin Bradley   <i>Lincoln Room</i> <b>Tillage System Choices and Justifications: Separating Fact from Fiction</b>   Tony Vyn   <i>Tech. Room</i> <b>Why Cover Crops? Are They Worth Your Time and Effort?</b>   Hans Kok   <i>Quad Room</i>
2:50–3:00 PM	Afternoon Break Period
3:00–4:00 PM	<b>Controlled Drainage, Water Table Management . . .</b>   Larry Brown   <i>Alma Mater Room</i> <b>Sensor-based N rates: Opportunities, On-Farm Results, and Obstacles</b>   Peter Scharf   <i>Lincoln Room</i> <b>Making Sense of the Latest Research on Sudden Death Syndrome of Soybean</b>   Daren Mueller   <i>Tech. Room</i> <b>Corn Rootworms and Bt Trait Resistance: Re-Learning Management</b>   Ken Ostlie   <i>Quad Room</i>

4:05–5:05 PM

**Controlled Drainage, Water Table Management . . .** | Larry Brown | *Alma Mater Room*

**Sensor-based N rates: Opportunities, On-Farm Results, and Obstacles** | Peter Scharf | *Lincoln Room*

**Making Sense of the Latest Research on Sudden Death Syndrome of Soybean** | Daren Mueller | *Tech. Room*

**Corn Rootworms and Bt Trait Resistance: Re-Learning Management** | Ken Ostlie | *Quad Room*

## December 3

7:30–8:30 AM

**Improving Potassium Management: Using the New Moist Test and Accounting for Temporal Variability** | Anotonio Mallarino | *Alma Mater Room*

**Soil-Active Herbicides: Efficacy, Injury, and Carryover** | Bill Simmons | *Lincoln Room*

**Tactics to Managing a Soybean Pest Complex** | Erin Hodgson | *Tech. Room*

**Corn-Soybean Rotations and Profitability** | Gary Schnitkey | *Quad Room*

8:35–9:35 AM

**Improving Potassium Management: Using the New Moist Test and Accounting for Temporal Variability** | Anotonio Mallarino | *Alma Mater Room*

**Soil-Active Herbicides: Efficacy, Injury, and Carryover** | Bill Simmons | *Lincoln Room*

**Tactics to Managing a Soybean Pest Complex** | Erin Hodgson | *Tech. Room*

**Corn-Soybean Rotations and Profitability** | Gary Schnitkey | *Quad Room*

9:35–9:45 AM

Morning Break Period

9:45–10:45 AM

**Soil Properties Come First!** | Roger Windhorn | *Alma Mater Room*

**Overcoming SBIs and Other Factors That Can Reduce Weed Control** | Christy Sprague | *Lincoln Room*

**Should Glyphosate-resistant Horseweed be this Difficult to Manage?** | Mark Loux | *Tech. Room*

**Mycotoxins and Their Management in Corn in the Central/Northern Corn Belt** | Art Schaafsma | *Quad Room*

10:50–11:50 AM

**Soil Properties Come First!** | Roger Windhorn | *Alma Mater Room*

**Overcoming SBIs and Other Factors That Can Reduce Weed Control** | Christy Sprague | *Lincoln Room*

**Should Glyphosate-resistant Horseweed be this Difficult to Manage?** | Mark Loux | *Tech. Room*

**Mycotoxins and Their Management in Corn in the Central/Northern Corn Belt** | Art Schaafsma | *Quad Room*

# Speakers



## **May Berenbaum**

Professor and Head  
Department of Entomology  
University of Illinois at  
Urbana-Champaign

## **Applied Bee-Nomics: Can the Honey Bee Genome Save U.S. Apiculture?**

The complete sequence of the honey bee genome was published in 2006 after four years of concentrated effort. The timing proved opportune in that release of the genome coincided with the first reports of unprecedented bee losses associated with the phenomenon now known as Colony Collapse Disorder (CCD). Although CCD remains challenging, the availability of the bee genome proved transformative in elucidating basic bee biology and investigating the stresses experienced by America's honey bees, providing new insights into bee biology and new tools for investigating bee health. Such tools facilitated the identification of many hitherto unreported bee pathogens and enabled the identification of predictive markers and potential molecular diagnostics for CCD. At the same time, the discovery of a universal bacterial flora revealed the existence of symbiotic gut flora that may be critical to bee health. Also facilitated was identification of the genes encoding specific enzymes responsible for metabolism of acaricides used by beekeepers to control the parasitic varroa mite and of pesticides encountered by bees as they forage for pollen and nectar and provide pollination services to U.S. agriculture. The investment in sequencing the honey bee genome was immediately justified in generating useful new knowledge and continues to provide the foundation for an ongoing revolution in honey bee science.

**May Berenbaum** has been a member of the faculty of the Department of Entomology at the University of Illinois at Urbana-Champaign since 1980, serving as head since 1992 and holding the endowed Swanlund Chair of Entomology since 1996. Dr. Berenbaum is known for her contributions to the field of chemical ecology, elucidating the chemical mediation of interactions between insects and their host plants, including detoxification of natural and synthetic chemicals; she is interested in the practical application of ecological principles toward developing sustainable management practices for natural and agricultural communities. Her research has produced over 220 refereed scientific publications and 35 book chapters. She is a member of the National Academy of Sciences and has chaired two NRC committees, the Committee on the Future of Pesticides in U.S. Agriculture and the Committee on the Status of Pollinators in North America. In addition to research and service, she is devoted to teaching and to fostering scientific literacy through both formal and informal education; she has authored numerous magazine articles, as well as six books, about insects for the general public. She graduated summa cum laude, with a B.S. degree and honors in biology, from Yale University in 1975; she received a Ph.D. in ecology and evolutionary biology from Cornell University in 1980.



**Kevin Bradley**

Associate Professor and  
State Extension Weed  
Scientist in  
Division of Plant Sciences  
University of Missouri

## Biology and Management of the Pigweed (*Amaranthus*) Species

Perhaps no other group of species has impacted agricultural production systems in the United States as much as the *Amaranthus*, or pigweed, species. Pigweeds like waterhemp, redroot pigweed, and smooth pigweed have been some of the most widespread and troublesome weeds in Midwestern cropping systems for decades. In recent years, Palmer amaranth has migrated northward and invaded many portions of the Corn Belt where it did not previously occur. All of these species are capable of producing large numbers of seeds, and causing significant corn and soybean yield losses. In this session, we will discuss some of the biological characteristics that make these weeds so successful, in addition to the characteristics of their lesser-known relatives like spiny amaranth and prostrate pigweed. Specific recommendations for the management of these species in corn and soybean production systems will also be discussed in detail.

**Kevin Bradley** is an Associate Professor and State Extension Weed Scientist in the Division of Plant Sciences at the University of Missouri. Kevin is a native of Virginia and received a B. S. degree in Agriculture from Ferrum College and a Ph.D. in Weed Science from Virginia Tech. Kevin's faculty appointment includes extension and research responsibilities in the area of applied weed management in corn, soybean, wheat, pastures, and forages. He also teaches a graduate level class in herbicide mechanism of action. In addition to evaluating new herbicides and weed management techniques, Dr. Bradley's applied research program focuses on the development of programs for the prevention and management of herbicide-resistant weeds, on the interaction of herbicides and weeds with other agrochemicals and pests in the agroecosystem, and on the effects of common pasture weeds on forage yield, quality, and grazing preference. By far, the largest percentage of Dr. Bradley's research and extension efforts are directed towards the development of strategies for the management of glyphosate- and multiple herbicide-resistant weed biotypes. Specifically, he has conducted numerous surveys to characterize the prevalence of herbicide resistance in weeds like waterhemp, and to determine the effectiveness of future herbicide-tolerant crop technologies for the management of these troublesome species.





**Howard Brown**  
Manager of Agronomy  
Services  
Growmark, Inc

## Maximizing Yield, Income, and Water Quality

Those involved with Midwest production agriculture are aware that applications of nitrogen fertilizer can have unintended consequences upon water quality. It is our focus to minimize the potential of such environmental risks by working together to optimize harvest yields, and to maximize nitrogen utilization through the use of science-based initiatives, such as development of nitrogen management systems and N-WATCH.

Sustainability of voluntary efforts to minimize the environmental impact of nitrogen applications must occur through both accountability and profitability. It will not be through a focus on reduction, but by a focus on **Minimizing** environmental impact by **Optimizing** harvest yield and **Maximizing** input utilization. Focusing on **M.O.M** provides us all a united message and keeps us focused on what is important.

**Howard Brown** is the Manager of Agronomy Services for GROWMARK, Inc. He and his team are responsible for agronomic training and technical support to over 400 crop specialists for the GROWMARK System in Illinois, Wisconsin, Iowa and southern Ontario, Canada. He is currently serving as the Interim Director of Nutrient Utilization and Research Projects for the Illinois Council for Best Management Practices (CBMP).

Dr. Brown received his B.S. Degree from Southern Illinois University (Carbondale, IL), his M.S. Degree from Purdue University (Lafayette, IN), and his Ph.D. from the University of Illinois (Urbana, IL). He has served the retail farm input industry for eight years as a salesperson/plant manager (1980-1988), the seed industry as a field sales agronomist for ten years (1988-1998), and his current position as Manager of Agronomy Services for the past 15 years. He is an Adjunct Assistant Professor at the University of Illinois instructing *Soil Fertility in Cropping Systems* and *Nutrient Management and Environmental Stewardship* in the Off-Campus Masters Program. Dr. Brown is a Past Chair of the International Certified Crop Adviser Board and serves on many other advisory groups and committees involved in agriculture production.

**Larry Brown**

Professor and Extension  
Agricultural Engineer  
Department of Food,  
Agricultural and Biological  
Engineering  
The Ohio State University

## Controlled Drainage, Water Table Management and Other Recent Innovations with Applications in the Midwest

Dr. Brown will present an overview of controlled drainage (Drainage Water Management) applications and research results in the Midwest, and recent work with crop yields and drainage, bioreactors, P-filters, subirrigation and two-stage channels.

**Larry Brown** is a Professor and Extension Agricultural Engineer, and has been on the faculty of The Ohio State University since 1988. He is a native of Tennessee, where he worked as a public health environmentalist and soils specialist before pursuing his engineering degrees.

Larry's primary research, extension, and teaching activities at Ohio State are in agricultural water management, which includes: drainage, controlled drainage, subirrigation, micro-irrigation, erosion and sediment control, agricultural impacts on water resource quality and quantity, agricultural constructed wetlands, and water resources education. He leads the internationally known Overholt Drainage Education and Research Program, the annual Overholt Drainage School, and serves as the Executive Director of the International Program for Water Management in Agriculture. Larry also has conducted water management project work in Uganda, East Africa, in South Africa, and in India, and has a number of on-going projects in China.

**Warren Goetsch**

Bureau Chief,  
Environmental Programs  
Illinois Department of  
Agriculture

## Our Regulatory Future, the Best of Times or the Worst of Times?

The ag input industry continues to face serious challenges from the federal government, from well-funded advocacy groups and from citizens to reduce nutrient losses, minimize pesticide drift and protect pollinators. Ag retailers and certified crop advisors must be in the forefront to address these issues in proactive and meaningful ways in order to mitigate what will surely be a wave of new regulatory proposals that could impact every aspect of fertilizer and crop protection application. The Illinois Department of Agriculture is the state lead agency charged with working directly with the ag industry on these issues; the IDA regularly presents information about the industry to federal agencies, legislators and to other interest groups who consistently inquire and press for more regulation. As Bureau Chief of Environmental Programs, Warren will share the tremendous challenges facing IDA in its mission to support a robust and responsible ag industry, and define what CCAs and the industry can and must do on a daily basis in their role as advisors and applicators to mitigate the potential for onerous regulations upon the ag input industry.

**Warren Goetsch** was raised on a small grain and livestock farm in Montgomery County, Illinois. He attended the University of Illinois where he received both his B. S. and M. S. Degrees in Agricultural Engineering. After graduation, he served 9½ years as an Area Extension Engineer with the University of Illinois Cooperative Extension Service before joining the Illinois Department of Agriculture in 1989. He currently serves as the Bureau Chief of Environmental Programs and is responsible for the administration of the states' pesticide regulations, nursery industry regulations, agrichemical storage and handling requirements, and the siting and construction of livestock management and waste handling facilities.



**Erin Hodgson**

Associate Professor and  
Extension Entomologist  
Iowa State University

## Tactics to Managing a Soybean Pest Complex

In the north-central region, a few persistent and many occasional insects occur in soybean. A potential mix of pests is likely to happen every year, but the severity is not easily predicted each growing season. Even though pest abundance is erratic in soybean, there has been a steady adoption of insecticidal seed and foliar treatments over the last decade. This discussion will center on the management of usual suspects in soybean, including Japanese beetle, bean leaf beetle, twospotted spider mite and soybean aphid. Integrated Pest Management, or IPM, is an ideal way to manage a pest complex by providing a toolbox of control strategies. Examples of IPM in soybean include genetic and cultural control; identification and sampling; and knowledge of crop economics. A proactive IPM program will help make cost effective treatment decisions. Data on insecticide efficacy for soybean aphid, Japanese beetle and spider mites will be presented.

**Erin Hodgson** is originally from North Dakota and received her B.S. (Biology) and M.S. (Entomology) from North Dakota State University in Fargo. She got her Ph.D. (Entomology) in 2005 from the University of Minnesota in St. Paul. Erin worked as an extension entomologist for three years at Utah State University before starting at Iowa State University in 2009. Currently she is an extension entomologist and associate professor at ISU, with an interest in field crop insects. Erin has a general background in IPM (Integrated Pest Management), where she develops tactics to improve corn and soybean production in the midwest. Her extension and research programs are focused on improving profitability, sustainability and environmental stewardship of agriculture.



**Ron Hustedde**

Professor of Community &  
Leadership Development  
University of Kentucky

## A Proactive Approach Towards Linking Rural Farmers with Urban America

“Rural America, with its shrinking population, is becoming less and less relevant,” asserted U.S. Secretary of Agriculture, Tom Vilsack in December 2012. He calls for a new thought process and an adult conversation with rural America.

The purpose of this wake-up presentation is two-fold: 1) to identify the reasons why farmers and rural America are viewed as less relevant for urban Americans; 2) to build on common ground and cutting-edge approaches to stimulate the imagination about what can be done to strengthen ties between farmers and urban dwellers.

Urban food production may seem contradictory. However, it is estimated that 15% of the world’s food supply is produced in urban settings. We will look at six fresh major urban approaches towards agriculture and food systems: 1) economic development; 2) addressing poverty and social justice; 3) as educational venues in which agriculture “becomes the professor”; 4) health and environmental issues; 5) as spirituality and beauty; 6) as a venue for building shared understanding and a greater sense of community. There is significant common ground in these approaches that can provide fresh dialogue and alliances between rural and urban America.

The speaker will suggest bold and provocative approaches that can strengthen AgMasters and other farm organizations’ relevance with urban dwellers and organizations.



**Ron Hustedde** is a rural sociologist in the University of Kentucky College of Agriculture, Food and Environment. He is working in the areas of urban agriculture, public conflict analysis and resolution, rural leadership development and rural entrepreneurship. He is past president of the Community Development Society and has received numerous national and regional awards for his ‘cutting-edge work’ with the Cooperative Extension Service. Hustedde grew up on a hog and grain farm in Carlyle, Illinois. He was a non-commissioned officer with the U.S. Army and also served as a Peace Corps Volunteer in Central America. He received his doctorate in sociology from the University of Wisconsin-Madison. He has four other degrees in the fields of rural sociology, agricultural economics, community development and journalism.

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**Hans Kok**  
Coordinator of Indiana  
Conservation Cropping  
Systems Initiative (CCSI)  
Indiana Conservation  
Partnership

## Why Cover Crops? Are They Worth Your Time and Effort?

Cover crops are extensively used in the Chesapeake Bay, and North Dakota, and now Indiana has nearly one million acres of cover crops, and we even see some in Illinois. What is the hype? What is a cover crop, and why would a farmer consider cover crops? They take time to plant, cost money, and they interact with the corn and soybean crop, so there better be a benefit. Dr. Hans Kok, Coordinator of the Indiana Conservation Cropping Systems Initiative, has worked with cover crops for several years, and will discuss the why, how, what, and the benefits, but also the cautions for beginning cover crop users. Experiences from both farmers and university researchers will be highlighted. Be ready for an interactive presentation, and come with questions.

**Hans Kok** is the coordinator of the Indiana Conservation Cropping Systems Initiative (CCSI), a program sponsored by the Indiana Conservation Partnership. The CCSI promotes a continuous, systematic approach to production agriculture, resulting in improved profitability, soil quality, and water quality on Indiana cropland by focusing on continuous no-till/strip-till, cover crops, precision farming, and nutrient and pest management.

From 2004 to 2009, Hans was an associate professor at both Washington State University and the University of Idaho, covering Extension programming for conservation tillage and bio-energy for both Idaho and Washington. Prior to this Extension role, he worked as conservation tillage specialist for Monsanto for 7 years. From 1990 to 1998 he was the state specialist for soil and water conservation for the Kansas State Cooperative Extension Service. Hans has published over 30 extension publications, several articles in scientific journals, and received numerous professional awards. Dr. Kok received Bachelors and Masters in Science degrees from the Agricultural University in The Netherlands, and a Ph.D. in Agricultural Engineering from the University of Idaho. A native of the Netherlands, he has worked on erosion protection projects in Spain and Israel, and worked for the USDA-ARS in the state of Washington.

**Mark Loux**

Professor and Extension  
Specialist  
Department of Horticulture  
and Crop Science  
The Ohio State University

## Should Glyphosate-Resistant Horseweed Be This Difficult to Manage?

Glyphosate-resistant horseweed (marestail) developed in the Midwest starting in 2002, and is now a common problem for no-till soybean growers. The extended emergence and development of populations with resistance to several sites of action have resulted in the need for a multiple-application, preplant approach to horseweed management that employs diversity in herbicide use. The results of recent research on horseweed management will be presented, along with recommended strategies to help ensure consistently effective control.

**Mark M. Loux** is a Professor and Extension Specialist in weed science in the Department of Horticulture and Crop Science at The Ohio State University. Dr. Loux received his B.S. in Plant Science from the University of Delaware in 1981. He obtained his M.S. and Ph.D. in Agronomy from the University of Illinois in 1985 and 1988, respectively. Dr. Loux is responsible for weed science research and extension programs in soybeans, corn, wheat, and forages in Ohio. His research program at OSU focuses on herbicide resistance, management of herbicide-tolerant crops, and management of weeds in reduced-tillage systems. Dr. Loux developed and is currently a co-author of the OSU/Purdue extension publication, Weed Control Guide for Ohio and Indiana, and is a frequent contributor to the C.O.R.N. newsletter ([corn.osu.edu](http://corn.osu.edu)), a primary information delivery tool for the OSU Agronomic Crops Team.

**Antonio Mallarino**

Professor of Agronomy,  
Nutrient Management  
Research and Extension  
Specialist  
Department of Agronomy  
Iowa State University

## Improving Potassium Management: Using the New Moist Test and Accounting for Temporal Variability

This presentation will discuss how to improve potassium (K) management for crops by focusing mainly on two issues. One is how to interpret and use the new moist test for potassium. The other is to explain sources of high temporal variability for soil-test K and how the information can be used to improve the interpretation of test results and K fertilization decisions.

**Antonio Mallarino** is Professor of Agronomy, Nutrient Management Research and Extension Specialist, at Iowa State University. His programs focus on the agronomic and environmental issues of nutrient management with emphasis on phosphorus, potassium, lime, and micronutrients. Issues addressed include soil and plant-tissue sampling and testing, fertilizer and manure placement methods, use of variable-rate technology, and phosphorus management impacts on water quality. He has calibrated several soil-test methods now being used in Iowa and pioneered the use of precision agriculture technology for nutrient management and on-farm research. He is member of the advisory committee of the Iowa State University Soil and Plant Analysis Laboratory, represents the Iowa Experiment Station at the regional or national committees Soil Testing and Plant Analysis for the North Central Region (NCERA-13) and Minimizing P Losses From Agriculture (SERA-17/IEG); and has served in the oversight committee for the North American Proficiency Testing Program of the Soil Science Society of Agronomy and as Associate Editor of both Agronomy Journal and Soil Science Society of America Journal. He is Fellow of both the American Society of Agronomy (ASA) and the Soil Science Society of America (SSSA), and among other awards received the W.L.

Nelson Award for Diagnosis of Yield-Limiting Factors (ASA) and the SSSA Applied Research Award. He has published 62 peer-reviewed scientific articles and more than 300 technical or extension articles, and has mentored 38 graduate students.

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**Daren Mueller**

Assistant Professor and  
Extension Plant Pathologist  
Iowa State University

## **Making Sense of the Latest Research on Sudden Death Syndrome of Soybean**

Sudden death syndrome (SDS) on soybean is not a new disease in the Midwest, but there is still a lot that remains unknown about the disease. Soybean yield losses due to SDS vary from year to year. A widespread SDS epidemic in 2010 resulted in significant yield losses and raised numerous concerns by farmers and agronomists regarding the potential for future outbreaks. This epidemic certainly highlighted the need for more effective management options. Local SDS outbreaks are reported every year, including several reports across Illinois in 2013. This presentation will highlight some of the latest research on the biology of SDS, which will hopefully lead to making better management decisions. Highlighted research will include better understanding the interaction between SDS and soybean cyst nematode (SCN), climatic conditions affecting SDS, the latest findings on seed treatments, and other management options such as extended rotations.

**Daren Mueller** is an Assistant Professor and Extension Plant Pathologist at Iowa State University (ISU). He is also the coordinator of the ISU Integrated Pest Management (IPM) Program. Daren received his B.S. in Animal Science from the University of Wisconsin- Madison in 1996 and his M.S. and Ph.D. in Plant Pathology from the University of Illinois- Urbana in 1999 and 2001. Daren's main research interests involve understanding the biology and management of soybean diseases. The ISU IPM program, among other things, develops several publications about field crops pests, leads the ISU Field Extension Farm, and is involved in several STEM education projects.



**Emerson Nafziger**

Ainsworth Professor and  
Extension Agronomist  
Department of Crop  
Sciences  
University of Illinois at  
Urbana-Champaign

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## The “State of the Art” of Nitrogen Management

Nitrogen management for corn continues to evolve in practice, with new fertilizer products and additives, sensing technology to determine (variable) rates, and a host of advisors ready to describe for producers the current “best management practices” for N. In this discussion we’ll return to some of the basic principles of N management, including a review of how much N the crop needs, how we use N response data to determine rates, and what we might realistically expect from changing N management practices.

**Emerson Nafziger** is the Ainsworth Professor of Crop Production and Extension Agronomist in the Crop Sciences Department at the University of Illinois. For more than 30 years he has been studying effects of weather and management—and their interaction—on Illinois crops. He has degrees in Agronomy from The Ohio State University, Purdue University, and the University of Illinois. He and his wife Cynthia have two grown sons and one grandson.

**Ken Ostlie**

Professor and Extension  
Entomologist  
Department of Entomology  
University of Minnesota

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## Corn Rootworms and Bt Trait Resistance: Re-Learning Management

The development of resistance to Bt traits has created some painful reminders of corn rootworm capabilities just when farmers were getting used to the simplicity of managing rootworm injury with traits. The rapid selection for resistance creates tremendous management challenges. In this presentation I’ll review the development of resistance and its status. Then we’ll focus on resistance implications for corn rootworm management. Along the way, I’ll share some lessons from Minnesota experience with corn rootworms and Bt trait resistance.

**Ken Ostlie** is a Professor and Extension Entomologist in the Department of Entomology at the University of Minnesota where since 1984 his focus has been on the ecology and management of corn and soybean insects. It’s tough to know where he went astray. He started out as an innocent farm boy on the prairies of western Minnesota where his family had a cash grain farm near Montevideo. May be it was involvement in 4-H, an interest in ecology, or the desire to do something related to farming. Whatever the reason, his pursuit of knowledge took him through a B.A. in biology and mathematics at Luther College in Decorah, IA and a M.S. in ecology at Utah State in Logan, UT. Eventually the dark side of entomology lured him to Iowa State where he completed a Ph.D. in 1984. The family was proud when he became an extension / research entomologist at the University of Minnesota. At least he was doing something related to farming and the family occasionally saw his name in a magazine or heard his voice on the radio. Over the last 27 years, Ken has focused his extension and research efforts on the ecology and management of corn and soybean insects including European corn borer, corn rootworms, soil insects, bean leaf beetles, and soybean aphid. Transgenic

insect traits in corn claim his recent interest. Through the 1990s, he investigated European corn borer traits and, in the 2000s, corn rootworm traits. Corn insects are always presenting new management challenges, such as resistance to Bt traits, that demand creative investigation, on-farm research, and crafting management solutions with farmers, their agricultural advisors, and their suppliers in mind. His achievements were recently recognized when Minnesota Extension named him as their Outstanding Extension Faculty member in 2011.



**Art Schaafsma**

Professor of Field Crop  
Protection  
Department of Plant  
Agriculture  
University of Guelph at  
Ridgetown, Ontario

## **Mycotoxins and Their Management in Corn in the Central/ Northern Corn Belt**

This session will focus mainly on *Gibberella* ear rot and its metabolites deoxynivalenol and zearalenone; and *Fusarium* kernel and ear rot and fumonisins. We will touch on a possible new explanation for T-2 toxin. The identification and epidemiology of these pathogens and conditions leading to mycotoxin-contaminated grain will be discussed. The implications of the co-occurrence of mycotoxins in the same grain (from the same ear) will also be covered. We will cover the importance of these mycotoxins in the value chain, and then shift to a discussion on recent developments in management of these mycotoxins in corn production. New developments in agronomic management factors, epidemic forecasting, hybrid selection, insect control via transgenic corn as compared with insecticides, and the use of fungicides will be explored.

**Art Schaafsma** is a Professor of Field Crop Protection in the Department of Plant Agriculture at the University of Guelph in Ridgetown, Ontario and Co-founder of CARES (Centre for Agricultural Renewable Energy and Sustainability).

[www.ridgetownc.uoguelph.ca/research/cares\\_index.cfm](http://www.ridgetownc.uoguelph.ca/research/cares_index.cfm)

He has been an invited speaker at numerous national and international scientific meetings and past consultant to the FAO of the UN on mycotoxins.

Dr. Schaafsma's key research focus is working on integrated farm to fork strategies to manage mycotoxins in grains: agronomics, plant breeding, forecasting, grain harvest, storage, handling and grading; integrated management of emerging and invasive field crop insect pests; and stewardship and deployment of transgenic crop pest resistance.

His professional interests include leading the campus and assisting the region to engage in the applied aspects of the bioeconomy and renewable energy, with a primary focus on stimulating the rural economy at the farm gate; biomass, biogas, closing the nutrient/bioenergy loop between urban and rural sectors; turning municipal waste into an agricultural resource agricultural extension/assistance in developing countries.

**Peter Scharf**

Professor in Division of  
Plant Sciences  
Extension Nutrient  
Management Specialist  
University of Missouri

## Sensor-based N Rates: Opportunities, On-Farm Results, and Obstacles

Research has shown that economically optimal N rate for corn varies widely in most fields. There is an opportunity for accurate variable-rate N applications to improve profitability and system performance. Optical sensors potentially offer the best combination of accuracy and convenience in guiding variable-rate N applications. Compared to N rates chosen by producers, sensor-based N rates increased yield by 2 bushels, reduced N use by 14 lb N/acre, and increased partial profit by \$17/acre averaged over 55 replicated on-farm demonstrations in Missouri. Timing of sensor-based N has also provided a large yield advantage during the recent series of wet springs, which resulted in loss of preplant N. Some obstacles remain to successful deployment—the biggest is that different interpretation systems give very different N rates from the same sensor values. In my opinion, OptRx sensors over-apply N with current interpretations. Increased timing risk is another obstacle, since sensors can't be used until the corn is a foot tall—if N applications are delayed beyond tractor clearance, high-clearance or aerial application is needed, but impact on yield potential is minimal. A third obstacle is changes in sensor values with conditions—all sensors are sensitive to leaf wetness, and Greenseeker sensors have seemed to have problems with temperature sensitivity. I believe that the obstacles to sensor-based variable-rate N can be overcome and that sensors will contribute to better performance of corn production systems in the future.

**Peter Scharf** is a Professor in the Division of Plant Sciences at the University of Missouri and an Extension Nutrient Management Specialist.

His program covers all aspects of nutrient management for agronomic crops, with a focus on nitrogen management. Specific areas of emphasis include diagnosing optimal N fertilizer rate for corn, cotton, and wheat; advanced technologies including crop reflectance sensors and remote sensing to diagnose optimal N fertilizer rate; on-farm demonstrations of real-time variable-rate N fertilizer applications using crop reflectance sensors; diagnosis of N loss and need for rescue N using remote sensing; evaluation of N loss risk as a function of source and timing; and quantifying water quality, greenhouse gas mitigation, and climate adaptation benefits of advanced N management approaches.

A great deal of his research has been conducted on working farms, with over 400 on-farm experiments and demonstrations. Soil erosion, soil carbon, cover crops, and tillage are areas that he has recently added to his program. Professor Scharf is currently chair-elect of the Soil Fertility and Plant Nutrition division of the Soil Science Society of America.



**Gary Schnitkey**

Professor and Farm  
Management Specialist  
Department of Agricultural  
and Consumer Economics  
University of Illinois at  
Urbana-Champaign

## Corn-Soybean Rotations and Profitability

In recent years, Illinois farmers have been shifting acres between corn and soybeans. Throughout much of the early 2000s, corn acres increased while soybean acres were simultaneously decreased. Since 2010, acres have shifted from corn to soybeans. During this session, the economics of corn and soybean rotations will be examined, with a specific emphasis on describing why we have seen shifts in acres between corn and soybeans. Three specific topics will be covered.

First, actual returns to corn and soybean acres will be examined from the 2005 until 2012. This examination shows that corn has been more profitable than soybeans in most years. Relative profitability between corn and soybeans is heavily influenced by yields.

Second, budgets for the following crop combinations will be examined: corn-after-soybeans, corn-after-corn, continuous corn, soybeans-after-corn, soybeans-after-two-years-corn. These budgets illustrate the crucial role yield drags on corn-after-corn and continuous corn plays in determining the most profitable rotation. Given typical yield drags, a corn-corn-soybeans rotation often is the most profitable rotation. If yield drags do not exist, continuous corn tends to be the most profitable rotation given typical price and cost scenarios.

Third, actual farm-level results will be examined for farms that raise a different proportion of their acres in corn and soybeans. This examination will show that there has been little difference in profitability of farms that have different proportion of their acres in corn. One reason this occurs is because per acre machinery costs have risen dramatically for those farms with a higher proportion of their acres in corn.

**Gary Schnitkey** is a professor and farm management specialist in the Department of Agricultural and Consumer Economics, University of Illinois. His activities focus on farm management and risk management. Farm management work has focused on examination of issues impacting the profitability of grain farms including corn-soybean rotations, machinery economics, and factors separating profitable from unprofitable farms. Examples of work are available in the publication *Illinois Farm Economics: Facts and Opinions* available on *farmdoc*. This work has led to the development of *FAST*, a series of Microsoft Excel spreadsheets that aid farmers in decision-making.

Risk management activities focus on crop insurance evaluation, farmland rental evaluation, and farm policy evaluation. Activities have focused on aiding farmers in understanding the risk and return tradeoffs of different policy alternatives. Dr. Schnitkey is a co-developer of several on-line and spreadsheet tools. Many use the Microsoft Excel based *Crop Insurance Decision Tool* to evaluate alternatives. Web-based tools include the *Ifarm Premium Calculator* (a web-based tool that provides side by side comparisons of insurance premium and *Ifarm Insurance Evaluator* (a web-based tool that provides risk-return evaluations of insurance products).

Dr. Schnitkey grew up on a grain and hog farm in northwest Ohio. He received a Bachelor of Science degree from The Ohio State University and a Masters and Ph.D. from the University of Illinois. From 1987 through 1998, he was on faculty at The Ohio State University where he held a dairy farm management position. Since 1998, he has been employed at the University of Illinois.

**Bill Simmons**

Professor and Assistant  
Dean for Academic  
Programs  
College of Agricultural,  
Consumer and  
Environmental Sciences  
University of Illinois at  
Urbana-Champaign

## Soil-Active Herbicides: Efficacy, Injury, and Carryover

This presentation will include a review of herbicide behavior in the soil environment and a thorough discussion of the potential for carryover to rotational crops as well as in-season efficacy and crop injury potential. Herbicide chemistry, time of application, rainfall frequency and amount, soil pH and soil temperature, all are important factors that affect herbicide performance and carryover potential.

Prior to the nearly complete adoption of Roundup Ready crops there was abundant use of soil-active herbicides, applied at both PRE and POST timings within weed-control systems. Producers and herbicide applicators were generally well versed in the environmental and soil conditions associated with potential herbicide carryover. Over a 10-15 year period, soil-applied herbicide use dropped, particularly in soybeans as reliance on glyphosate alone became common. Increasing populations of glyphosate-resistant weed biotypes has brought soil-applied herbicides back into focus. Increased use of a number of herbicide families coupled with droughty conditions has raised concerns that follow-crop injury may occur in some situations.

The historical context of herbicide carryover and crop injury within Illinois crop rotations will be revisited. Recent greenhouse and field studies from the involving a variety of corn and soybean herbicides will be discussed. Do winter rains help? Is timing of rainfall important to herbicide degradation in the soil? Does any form of tillage help lower chances of carryover? Participants will evaluate climatic scenarios and assess the potential for herbicide carryover.

**Bill Simmons** is Professor and Assistant Dean for Academic Programs in the College of ACES. His responsibilities include course and curriculum development, admissions, and other duties in the Office of Academic Programs. He currently teaches the ACES 101 Introductory course to approximately 500 freshmen and serves as the Colleges Honors Dean. Dr. Simmons started a research and extension career at the University of Illinois in 1987 following completion of his Ph.D. at North Carolina State University. Dr Simmons research has focused on environmental behavior of herbicides and nitrogen in agronomic systems. He has also been extensively involved in training certified crop advisers (CCA) across the Midwest. His teaching and presentation honors include the College of ACES, College Faculty Award for Excellence in Extension, the Mid-America Croplife Association (MACA), Educator of the Year, and the College of ACES, John Clyde and Henrietta Downey Spitler Teaching Award. He is also a NACTA Teaching Fellow.



**Christy Sprague**

Associate Professor and  
Extension Specialist in  
Weed Science  
Department of Plant, Soil  
and Microbial Sciences  
Michigan State University

## Overcoming SBIs and Other Factors that Can Reduce Weed Control

Weed control continues to be a challenge in corn and soybean fields around the Midwest. While the development of herbicide resistance, especially glyphosate- and multiple-resistant weed species, is one of the major factors that have led to poor weed control. This does not account for all weed control failures in Midwest corn and soybean fields. Giant ragweed and common lambsquarters are two weeds that are frequently found at harvest above the soybean canopy and hidden among corn. Stem-boring insects (SBIs) and evidence of insect tunneling are often found inside the stems of giant ragweed and common lambsquarters plants. Surveys conducted in Michigan and Indiana identified two insect species, the beet petiole borer (*Cosmobaris americana*) and an unidentified leafminer fly larvae inside common lambsquarters stems. Insect larvae from six different families: Languriidae, Notuidae, Pyralidae, Tortricidae, Cerambycidae, and Curculionidae were found inside giant ragweed stems. The appearance of these stem-boring insects was temporal and in many cases certain insect species were not found in weed stems prior to timely postemergence herbicide applications. However, some of these species were found prior to a typical glyphosate application suggesting that control with glyphosate may be compromised by the presence of the stem-boring insects. Research in the field and greenhouse was conducted to determine the impact of stem-boring insects on common lambsquarters and giant ragweed control with glyphosate. From this research the presence of stem-boring insects may only have a minor impact on control of these weeds. There are several factors that may potentially influence control. This session will focus on identifying factors and potential strategies to provide more consistent management of common lambsquarters and giant ragweed in Midwest corn and soybean fields.

**Christy Sprague** is a Weed Science Extension Specialist and Associate Professor in the Department of Plant, Soil and Microbial Sciences at Michigan State University. She has been employed at Michigan State since September of 2003. Prior to Christy's appointment at Michigan State she was an Assistant Professor and Extension Specialist at the University of Illinois. She received her B.S. degree from Michigan State University in Crop and Soil Sciences, her M.S. from the University of Illinois in Agronomy, and her Ph.D. from Michigan State University in Weed Science in 1999. Christy was awarded the Young Scientist Award from the North Central Weed Science Society in 2005 and the Outstanding Early Career Weed Scientist Award from the Weed Science Society of America in 2009. Christy's research focuses on weed management strategies in agronomic crops including: soybean, corn, sugarbeets, dry beans, and small grains.





### Paul Vincelli

Extension Professor and  
Provost's Distinguished  
Service Professor  
Department of Plant  
Pathology  
College of Agriculture, Food  
and Environment  
University of Kentucky

## Corn Fungicides: Crop Performance and Beyond

Many (though not all) corn producers seeking high grain yields perceive significant benefits from the application of foliar fungicides for “plant health”. Yet it has been surprisingly difficult to resolve important questions on fungicide use through public research. Thus, many public scientists continue to consider important questions relating to this topic, such as, Do fungicides consistently provide agronomic benefits? What factors increase the chance of seeing a beneficial response? Do agronomic benefits from fungicides show up more readily in large-plot trials than small-plot trials? Does large-scale fungicide use promote fungicide resistance? Are there broader impacts to the environment? My goal is to provide an objective, research-based perspective on each of these questions.

**Vincelli's** responsibilities at UK include pathology of turfgrasses, forages, and corn with specializations in molecular diagnostics, crop biosecurity, agroecology, climate change, and international agriculture. He received the M. Whiteker Award for Excellence in Extension in 2012 and the Provost's Award for Outstanding Teaching in 2011.

Dr Vincelli published over 35 refereed research papers (over 75% as first author), four refereed teaching publications (all as first author), several review papers, approx. 30 trade journal articles, and well over 100 reports in *Plant Disease Management Reports* (and the predecessor journals, *F&N Tests* and *B&C Tests*). He has delivered over 100 out-of-state invited presentations, including climate change and agriculture. He served as a Peace Corp Volunteer in Nicaragua and Colombia, 1977-1980.



### Tony Vyn

Professor and Cropping  
Systems Extension  
Agronomist  
Department of Agronomy  
Purdue University

## Tillage System Choices and Justifications: Separating Fact from Fiction

When and where is tillage needed in high yield crop production with modern varieties and high-precision planting equipment? When some soil disturbance is valid, how much is needed and at what depth and intensity? Can our present tillage system(s) be justified by real crop responses? Individual farmer decisions about tillage system choice are often more motivated by perceptions, traditions, prior experiences and what their neighbors are using than they are by reliable research. Sadly, there is just too little tillage research underway at land grant universities in the US Midwest because of lack of funding. Nevertheless, in this session, I will attempt to separate fact from fiction in the justification for no-till, strip-till and vertical tillage system choices (while not neglecting some implications for optimum nutrient management).

**Tony J. Vyn** is a Professor and Cropping Systems Extension Agronomist in the Department of Agronomy at Purdue University. Tony grew up on a hog and cash crop farm near Chatham in Southwestern Ontario, Canada. He earned his degrees from the University of Guelph, (in Guelph, Ontario) and was a faculty member in the Crop Science Department at the same university from 1987 until he left for Purdue University in 1998. Dr. Vyn advises several graduate students in research focused on understanding the interactions of tillage, crop rotation, plant density, and (or) nutrient placement systems with crop response and soil properties. His current investigations include corn hybrid and plant density comparisons at multiple N rates, tillage

comparisons (like no-till and vertical tillage versus strip tillage), RTK automatic guidance for strip tillage and nutrient banding, plant-to-plant variability in corn, nitrogen rate and nitrification inhibitor impacts on greenhouse gas emissions, and crop response to micronutrient applications. He has served as Extension Coordinator for the Agronomy Department at Purdue and as Associate Editor for Agronomy Journal, Crop Science and Soil and Tillage Research. Tony has enjoyed being Co-Chair of the Indiana Crop Advisor Conference since 2003. In his spare time, he particularly enjoyed cash-crop farming with his own family from 1980 to 1998.



**Roger Windhorn**  
Resource Soil Scientist and  
NRCS Geologist  
USDA-NRCS  
Champaign, Illinois

## Soil Properties Come First!

Soil health is a popular topic right now for a variety of reasons. In most cases, farmers/landowners all want to have better soils....more consistent yields, more resilience to weather conditions, less likely to leach nitrates and other good nutrients to the water table, and more chance of receiving good nutrients from the organic matter in their soil. Problem is that our high-tech, large equipment world continues to put a lot of stress on our soils that make these goals difficult to reach. **Knowing about the physical, chemical, and biological properties** of the soil can help us make some adjustments in techniques that allow for improvement! We will view and discuss some of these properties and see how they can be applied to our farming efforts!

**Roger Windorn** received his BS degree from the University of Illinois (U of I) in Agricultural Science in 1972. He worked a few years and then returned to the U of I and received his MS degree in Agronomy (Soils) in 1977. He has worked for USDA NRCS (formerly SCS) since 1972. Much of his career has been spent soil mapping throughout the state and serving as Survey Leader for the Knox, DeWitt, and McLean County progressive soil surveys. Roger currently serves a dual position as a Resource Soil Scientist and NRCS Geologist out of the Champaign State Office. He has state-wide responsibilities in Soils, Soil Technology, Geologic Investigations, and Watershed Erosion and Sedimentation.

Roger is a Certified Professional Soil Classifier with Illinois Soil Classifiers Association and a Certified Professional Soil Scientist with American Registry of Certified Professionals in Agronomy, Crops, and Soils. (ASA-SSSA). He's also a Member of numerous professional scientific organizations.





