

# President's Welcome

## ***2009 North Central Weed Science Society Meeting***

Welcome to Kansas City and the 64<sup>th</sup> annual meeting of the North Central Weed Science Society.

The Hyatt Regency Crown Center is a great place to meet and under John Wollam's leadership, the local arrangements committee has done an excellent job of preparing the hotel for our meeting. The Hyatt chain, year after year, continues to be a congenial host. Also, if you get a chance during the meeting, try to check out some of the local Kansas City attractions.

Program chair, Chris Boerboom, has assembled an innovative and interesting program. Along with the paper and poster sessions, the program includes five special symposia. These include a statistics symposium, invasive weeds workshop, Extension discussion session, The NCWSS Learning Store, and the always popular What's New in Industry. Try to attend some of these special sessions.

Highlighting many of the society changes this year is the hiring of Phil Banks to replace Bob Schmidt as our Executive Secretary. Phil will be introduced during the Wednesday awards luncheon. We will also honor Bob Schmidt at the luncheon for his many years of service to the NCWSS. Another change is our first society wide voting for officers. Your vote is in and the results will be announced during the Wednesday awards luncheon.

On behalf of the Board of Directors, welcome again to our annual meeting. Take the time to renew old acquaintances, share information with fellow weed scientists, participate in many of the excellent sessions and make new friends. I realize that unprecedented budget constraints have prohibited some members from attending this year's meeting. We can only hope that this will change in the near future.

We need everybody's involvement to insure that our society stays strong going into the future. It is truly mutually beneficial to be involved with the NCWSS. Plan on attending your committee meetings and also talk to Chris Boerboom about committee assignments for next year.

It has been a great privilege to serve you as President of NCWSS.

Mick Holm  
President

# **General Information**

## ***Conference Headquarters***

All sessions of the conference and the banquet will be held at the Hyatt Regency Crown Center, 2345 McGee Street, Kansas City, MO 64108; Phone 816-421-1234

## ***Registration***

Registration is required to attend the conference. Pre-registration is **\$240** (includes banquet). Registration at the conference is **\$290**.

Student pre-registration is **\$120**; student registration at the conference is **\$170**.

For those attending the Wednesday Invasives paper session and workshop, pre-registration is **\$75**; conference is **\$85**.

Industry breakfast tickets are available for **\$25**.

## ***Registration Hours***

The registration desk (Empire Foyer) will be open Monday 4 to 8 pm, Tuesday 7:30 am to 5 pm, Wednesday 8 to 11 am and 2 to 5 pm, and Thursday 8 to 10 am.

## ***Local Arrangements Headquarters***

Van Horn AB

## ***Meeting Rooms***

Additional meetings may be arranged any time during the conference by contacting the Local Arrangements Chair.

## ***Proceedings***

Copies of the 2009 NCWSS Proceedings will be mailed as a CD to all registrants in February or March 2010. Additional copies of the Proceedings may be ordered at the registration desk. The CD is \$30 if purchased separately.

## ***Sustaining Members***

Sustaining members that have made prior arrangements with the Industry Chair may put up a display in Pershing Hall. No other displays are allowed.

## ***No Smoking***

Smoking is not permitted in the sessions.

## ***Program Symbols***

- \* Presenting Author
- \*\* Paper or poster in the graduate student contest
- \*\*\* Poster in the undergraduate student poster contest

# Meetings of the Society 2009

## ***Board of Directors***

Monday, 1:00 pm	Chouteau B
Wednesday, 7:00 pm	Chouteau B

## ***Local Arrangements***

Monday, 11:00 am	Van Horn AB
Thursday, 11:30 am (with 2010 committee)	Van Horn AB

## ***Contest Judges for Paper and Poster Contests***

Judges breakfast, Tuesday, 7:00 am	Chouteau A & B
Paper Judges, Tuesday, 7:15 am	Chouteau A
Poster Judges, Tuesday, 7:15 am	Chouteau B
Paper Judges, Tuesday, 6:00 pm	Chouteau A
Poster Judges, Tuesday, 6:00 pm	Chouteau B

## ***Meal Functions***

### Breaks

Tuesday, 8:00 – 9:00 am	Pershing Hall
Tuesday, 3:00 – 3:30 pm	Pershing Hall
Wednesday, 9:45 – 10:15 am	Pershing Hall
Wednesday, 3:00 – 3:30 pm	Pershing Hall
Thursday, 10:00 – 10:30 am	Ballroom Foyer

### Student Mixer

*Sponsored by BASF Corporation*

Monday, 6:30 pm	Atlanta
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### Student Luncheon/Business Meeting

*Sponsored by Dow AgroSciences*

Tuesday, 12:00 – 1:15 pm	Empire A
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### Continental Breakfast

*Sponsored by Bayer CropScience*

Wednesday, 7:30 am	Regency Foyer
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### Society Awards Luncheon

*MC: Roger Becker*

Wednesday, 11:30 am	Atlanta
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### Society Social

Wednesday, 5:30 – 7:00 pm	Atlanta
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### Industry Breakfast (*Cost \$25*)

*Speaker: To be announced*

Thursday, 7:00 am	Chouteau A & B
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# Meetings of the Society 2009

The following meetings will take place for the purpose of conducting the business of each respective committee and to elect a new Vice Chair to serve as Chair in 2010. Most meetings are open to members. Please see the committee chair or attend the committee meeting if you are interested in serving the society by being a committee member.

## ***NCWSS Committee Meetings***

### Program

Monday, 12:00 pm Van Horn AB

### Distinguished Achievement Award

Tuesday, 12:30 pm Benton A

### Long Range Planning, Organizational Affairs, and Membership

Tuesday, 4:30 pm Freemont

### Finance, Steering, & Policy

Tuesday, 4:30 pm Benton A

### Future Site Selection

Tuesday, 5:30 pm Benton A

### Nominating

Tuesday, 5:30 pm Benton B

### Resident Education, Summer Contest, and Contest

### Rules Joint meeting

Wednesday, 7:00 am Freemont

### NCWSS Fellow

Wednesday, 5:00 pm Benton A

### Resolutions & Necrology

Wednesday, 5:00 pm Benton B

# Meetings of the Society 2009

## ***Program Section Business Meetings***

Agronomic Crops I	
Thursday, 11:15 am	Chicago A
Agronomic Crops II	
Wednesday, 11:15 am	New York B
Agronomic Crops III	
Wednesday, 3:45 pm	New York B
Extension	
Wednesday, 3:45 pm	Chicago A
Herbicide Physiology	
Tuesday, 2:45 pm	Chicago B
Horticulture & Ornamentals	
Wednesday, 5:00 pm	New York B
Equipment and Application Methods	
Wednesday, 11:15 am	Chicago A
Invasive Weeds	
Wednesday, 11:15 am	Chicago B
Poster Session	
Monday, 6:00 pm	Benton A
Weed Biology, Ecology & Management	
Tuesday, 4:30 pm	Chicago A

## ***Special Interest Groups***

Graduate Students (at luncheon)	
Tuesday, 12:00 pm	Empire A
Industry (at breakfast)	
Thursday, 7:00 am	Chouteau A & B

## ***Symposia***

Extension Discussion: Opportunities and Obstacles for the Future of Applied Weed Management - A Discussion Forum	
Wednesday, 8:15 – 10:00 am	Chicago A
Making Sense of the Numbers: Statistics for Weed Science	
Wednesday, 9:30 am – 4:15 pm	Chicago C
Invasive Weed Management in the Mid-Plains	
Wednesday, 1:30 – 5:00 pm	Chicago B
What's New in Industry?	
Wednesday, 4:00 – 5:30 pm	Chouteau A & B
The NCWSS Learning Store ~ Technology Training for Successful Chemical Weed Control	
Thursday, 8:30 – 11:30 am	Chicago B

# Condensed Program – NCWSS 2009

## ***Monday, December 7***

1:00	Board of Directors Meeting	Chouteau B
1:00 – 10:00	Poster Setup	Pershing Hall
6:30	Graduate Student Mixer	Atlanta

## ***Tuesday, December 8***

8:00 – 9:45	Poster Session I	Pershing Hall
10:00 – 12:00	NCWSS General Session	Atlanta
12:00 – 1:15	Graduate Luncheon	Empire A
1:30 – 4:45	Agronomic Crops III	New York B
1:30 – 4:45	Weed Biology & Ecology	Chicago A
1:30 – 3:00	Herbicide Physiology	Chicago B
1:30 – 4:15	Agronomic Crop Contest Papers	Chicago C
3:15 – 4:30	Mixed Student Contest Papers	Chicago B
5:00 – 6:00	Poster Session II	Pershing Hall

## ***Wednesday, December 9***

8:00 – 11:15	Invasive Weeds & Rangeland	Chicago B
8:15 – 11:15	Agronomic Crops II	New York B
8:15 – 10:00	Extension Discussion	Chicago A
9:30 – 11:30	Statistics Symposium	Chicago C
10:15 – 11:15	Equipment & Application	Chicago A
11:30 – 1:15	NCWSS Awards Luncheon	Atlanta
1:30 – 4:45	Statistics Symposium	Chicago C
1:30 – 5:00	Invasive Workshop	Chicago B
1:30 – 4:00	Agronomic Crops III	New York B
1:30 – 3:45	Extension	Chicago A
4:00 – 5:30	What's New in Industry	New York A
4:00 – 5:00	Horticulture	New York B
5:30 – 7:00	Society Social	Atlanta
7:00 – 9:00	Board of Directors Meeting	Chicago A

## ***Thursday, December 10***

7:00 – 8:30	Industry Breakfast	Chouteau A & B
8:30 – 11:30	Learning Store Symposium	Chicago B
8:30 – 11:15	Agronomic Crops I	Chicago A

## Poster Sessions

Room: Pershing Hall

Chairperson and Moderator: Craig Nichols

### Poster Setup

Posters can be set up between 1:00 and 10:00 pm on Monday, December 7. All posters will be on display from 8:00 am Tuesday, December 8 through 7:30 pm Wednesday December 9.

**Students in the Poster Contest** must be with their posters during both Poster Sessions on Tuesday for judging. Students in the poster contest are ***required*** to bring letter-sized copies of your posters to hand out.

### Tuesday, December 9

8:00 – 9:45 am Poster Session I (non-contest authors present at odd numbered posters)

5:00 – 6:00 pm Poster Session II (non-contest authors present at even numbered posters)

### Poster Removal

All posters must be removed between 7:30 pm Wednesday and 8:00 am Thursday.

### Program Symbols

- \* Presenting Author
- \*\* Paper or poster in the graduate student contest
- \*\*\* Poster in the undergraduate student poster contest

## Cereal/Sugar Beet/Dry Bean Posters

### **\*\*Does Glyphosate Influence Management of Rhizoctonia Crown and Root Rot in Glyphosate-Resistant Sugarbeet?**

Kelly A. Barnett\*, Christy L. Sprague, William W. Kirk, and Linda E. Hanson, Michigan State University, East Lansing; USDA-ARS, East Lansing, MI. (1)

### **Response of Dry Bean to Preemergence and Postemergence Applications of Cloransulam-Methyl.**

Nader Soltani\*, Christy Shropshire, and Peter H. Sikkema, University of Guelph, Ridgetown Campus, Ontario. (2)

### **Impact of Tillage System and Application Timing of Postemergence Herbicides on Italian Ryegrass Control in Wheat.**

James R. Martin\*, Charles R. Tutt, and Dorothy L. Call, University of Kentucky, Princeton. (3)

### **Fallow Weed Control with Saflufenacil.**

Brian M. Jenks\*, Gary P. Willoughby, and Jordan L. Hoefing, North Dakota State University, Minot. (4)

## Corn Posters

### **\*\*Crop Tolerance and Broadleaf Weed Efficacy for Combinations of Thiencarbazone Methyl and Tembotrione Applied at Three Corn Growth Stages.**

Daniel K. Tiedemann\*, Bryan G. Young, Ronald F. Krausz and Joseph L. Matthews, Southern Illinois University, Carbondale. (5)

### **\*\*Effects of Nitrogen Rate and Weed Removal Timing on Corn Yield.**

Laura E. Bast\*, Wesley J. Everman, and Darryl D. Warncke, Michigan State University, East Lansing. (6)

### **Effect of Postemergence Herbicides on Field and Silage Corn Biomass Accumulation and Bio-energy Quality.**

Wesley J. Everman\*, Bradley J. Love, Jacob Gebhardt, and Andrew J. Chomas, Michigan State University, East Lansing. (7)

### **Comparison of Postemergence Herbicides in Corn with Resistance to Glyphosate and Glufosinate.**

Mark M. Loux\*, Anthony F. Dobbels, William G. Johnson, Bryan G. Young, Chris Boerboom, Kevin Bradley, and Aaron Hager, The Ohio State University, Columbus; Purdue University, West Lafayette, IN; Southern Illinois University, Carbondale; University of Wisconsin, Madison; University of Missouri, Columbia; University of Illinois, Urbana. (8)

### **Interactions between Saflufenacil and Glyphosate on Selected Broadleaf Weeds.**

Stevan Z. Knezevic, Avishek Datta, Jon Scott\*, and Leo D. Charvat, University of Nebraska, Lincoln; BASF Corporation, Lincoln, NE. (9)

## Corn Posters (cont.)

**Utilization of Flumioxazin in Midwestern Minimum and No-till Corn.** Eric J. Ott\*, Dawn E. Refsell, Trevor M. Dale, and John A. Pawlak, Valent USA Corporation, Walnut Creek, CA. (10)

**Performance of Dow AgroSciences Herbicide Tolerance Trait in Corn.** Mark A. Peterson\*, David M. Simpson, Cory Cui, Eric F. Scherder, David C. Ruen, John S. Richburg, Sam M. Ferguson, Patricia L. Prasifka and Terry R. Wright, Dow AgroSciences, Indianapolis, IN. (11)

**Evaluation of the Potential for an Organophosphate Interaction in Optimum® GAT® versus Conventional Field Corn.** Kevin R. Schabacker\*, Larry H. Hageman, Charles E. Snipes and David W. Saunders. Dupont Crop Protection, Rochelle, IL. (12)

**Optimum GAT Corn in Kentucky.** Sara K. Carter\*, Charles H. Slack, and Helen A. Flanigan, University of Kentucky, Lexington; E.I. DuPont de Nemours & Co. Inc., Wilmington, DE. (13)

**Cocklebur Control in Corn.** Peter H. Sikkema, Christy Shropshire, and Nader Soltani\*, University of Guelph, Ridgetown Campus, Ontario. (14)

**Herbicide Efficacy on Field Horsetail in No-till Corn.** Bryan M. Jensen, Chris M. Boerboom\*, and Tim L. Trower, University of Wisconsin, Madison. (15)

## Soybean/Legume/Forage Posters

**\*\*Kochia Control with Selected Herbicides in Soybeans.** Brandon M. Hulse\*, Kassim Al-Khatib, Phillip W. Stahlman, Dallas E. Peterson, and Patrick W. Geier, Kansas State University, Manhattan. (16)

**Impact of Late Herbicide Applications in Soybean.** Nader Soltani\*, Robert E. Nurse, and Peter H. Sikkema, University of Guelph, Ridgetown Campus, Ontario. (17)

**Evaluation of Herbicide Programs for the Control of Volunteer Glyphosate-Resistant and Glufosinate-Resistant Corn in Glufosinate-Resistant Soybean.** Travis R. Legleiter\*, Eric B. Riley, Jimmy D. Wait, Kristin K. Payne, and Kevin W. Bradley, University of Missouri, Columbia. (18)

**\*\*Efficacy of Glufosinate Plus Fomesafen Mixtures on Giant Ragweed, Common Lambsquarters and F1 Volunteer Corn.** Chad B. Brabham\* and William G. Johnson, Purdue University, West Lafayette, IN. (19)

## **Soybean/Legume/Forage Posters**

(cont.)

**\*\*Optimal Activator Adjuvants for Glyphosate Tank-Mixtures in Soybean.** David K. Powell\*, Bryan G. Young, Doug J. Maxwell, and Gordon K. Roskamp, Southern Illinois University, Carbondale. (20)

**Performance of Dow AgroSciences Herbicide Tolerance Trait in Soybean.** David M. Simpson\*, Cory C. Cui, Sam M. Ferguson, Brian D. Olson, Patricia L. Prasifka, John R. Richburg, David C. Ruen and Eric F. Scherder, Dow AgroSciences, Indianapolis, IN. (21)

**Effect of Nozzle Type and Application Volume for Annual Weed Control in Liberty-Link Soybean with Glufosinate.** David A. Nicolai\*, University of Minnesota, St. Paul. (22)

**\*\*\*Simulated Dicamba Drift on a Low Soybean Plant Population.** Matthew J. Hardebeck\*, Andrew P. Robinson, and William G. Johnson, Purdue University, West Lafayette, IN. (23)

**Simulated Dicamba Drift on Roundup-Ready Soybean.** Andrew P. Robinson\* and William G. Johnson, Purdue University, West Lafayette, IN. (24)

**Soybean Response to Simulated Status Drift.** Damian Franzenburg\*, Micheal D.K. Owen, Jim Lux, and Dean Grossnickle, Iowa State University, Ames. (25)

**\*\*Herbicide Combinations for Weed Control in Glyphosate Resistant Alfalfa.** Alexander J. Lindsey\*, Andrew J. Chomas, Wesley J. Everman, and Steven A. Gower, Michigan State University, East Lansing; The Monsanto Company, St. Louis, MO. (26)

**Long-Term Effect of Weed Control and Cutting System on Roundup Ready Alfalfa.** Andrew J. Chomas\*, Timothy S. Dietz, James J. Kells, and Wesley J. Everman, Michigan State University, East Lansing. (27)

**Grass Control with Nicosulfuron and Metsulfuron Methyl in Bermudagrass.** Douglas E. Shoup\*, Kansas State University, Chanute. (28)

**Herbicides Tolerated by Calendula, an Industrial Oilseed Crop.** Frank Forcella\*, Sharon Papiernik, and Russ Gesch, USDA-ARS, Morris, MN. (29)

## Equipment and Application Posters

**\*\*Performance Advantages of Flaming Hood.** Chris A. Bruening\*, George Gogos, Santiago M. Ulloa, and Stevan Z. Knezevic, University of Nebraska, Lincoln and Concord. (30)

**\*\*Response of Selected Crop and Weed Species to Propane Flaming as Influenced by Leaf Water Content.** Santiago M. Ulloa\*, Avishek Datta, Stevan Z. Knezevic, Chris Bruening, George Gogos, and Timothy J. Arkebauer, University of Nebraska, Concord and Lincoln. (31)

**A Novel Water Conditioner for Use with Glyphosate.** Mark L. Bernards\*, Richard K. Zollinger, Bryan G. Young, R. Scott Tann, Howard Stridde, University of Nebraska, Lincoln; North Dakota State University, Fargo; Southern Illinois University, Carbondale; Huntsman, The Woodlands, TX. (32)

## Extension Posters

**Doctor of Plant Health: A new Inter-Disciplinary Program for Plant Health Practitioners.** Gary L. Hein\*, John Lindquist, Mark Bernards, and Lowell Sandell, University of Nebraska, Lincoln. (33)

**2009 NCWSS and NEWSS Weed Contest.** Jay Deweese and Fritz Koppatschek\*, ABG Ag Services, Sheridan, IN. (34 )

**Utilization of Sequential Herbicide Applications and Herbicide Tankmix Components to Improve Glyphosate Efficacy.** Lisa M. Behnken\*, Ryan P. Miller, Fritz R. Breitenbach, and Jeffrey L. Gunsolus, University of Minnesota, Rochester. (35)

**Comparison of Preemergence and Postemergence Herbicide Programs Utilizing Best Management Practice Rates of Atrazine or Atrazine Replacements in Field Corn at Rochester, Minnesota.** Lisa M. Behnken\*, Ryan P. Miller, Fritz R. Breitenbach, and Jeffrey L. Gunsolus, University of Minnesota, Rochester. (36)

**Convenience and Simplicity: An Illusion and Detriment to Integrated Weed Management.** Micheal D. K. Owen\*, Chris Boerboom, and Christy Sprague, Iowa State University, Ames; University of Wisconsin, Madison; Michigan State University, East Lansing. (37)

## Extension Posters (cont.)

**Benchmark Study: Perspectives on Glyphosate-Resistant Crops and the Sustainability of Chemical Weed Management.** Micheal D. K. Owen\*, Bryan G. Young, David Shaw, Robert Wilson, David Jordan, Stephen Weller, and Philip Dixon, Iowa State University, Ames; Southern Illinois University, Carbondale; Mississippi State University, Mississippi, Mississippi State; University of Nebraska, Scottsbluff; North Carolina State University, Raleigh; Purdue University, West Lafayette, IN. (38)

## Herbicide Physiology Posters

**Waterhemp Genomics for Herbicide Resistance Research.** Chance W. Riggins\*, Patrick J. Tranel, Yanhui Peng, and C. Neal Stewart Jr., University of Illinois, Urbana; University of Tennessee, Knoxville. (39)

**\*\*Introducing Quad-Stack Waterhemp: Populations Containing Individuals Resistant to Four Herbicide Modes of Action.** Michael S. Bell\*, Patrick J. Tranel, and Aaron G. Hager. University of Illinois, Urbana. (40)

**\*\*Absorption and Translocation of Glyphosate and Chlorimuron in a Tank Mix.** Rachel K. Bethke\*, Wesley J. Everman, and Donald Penner, Michigan State University, East Lansing. (41)

**\*\*Light Influence on Glyphosate Response in Arabidopsis Thaliana.** Jinshan Lin\*, Stephen C. Weller, and Burkhard Schulz, Purdue University, West Lafayette, IN. (42)

**\*\*Chlorophyll Fluorescence to Assess Glyphosate Response in Herbicide Resistant Giant Ragweed.** Renae R. Robertson\*, Burkhard Schulz, Stephen C. Weller, Purdue University, West Lafayette, IN. (43)

**In Vitro Assay for Assessment of Glyphosate Response Using a Leaf Disk System.** Renae R. Robertson, Burkhard Schulz, Stephen C. Weller\*, Purdue University, West Lafayette, IN. (44)

**\*\*Response of a Horseweed Population to Four Different Growth Regulator Herbicides.** Ryan S. Henry\*, Greg R. Kruger, Vince M. Davis, Stephen C. Weller, and William G. Johnson, Purdue University, West Lafayette, IN. (45)

**\*\*Persistence and Efficacy of Flumioxazin as Affected by Soil Organic Matter, Clay Content and Soil pH.** Calvin F. Glaspie\*, Wesley J. Everman, and Andrew J. Chomas, Michigan State University, East Lansing. (46)

## Herbicide Physiology Posters (cont.)

**Common Lambsquarters Response to Glyphosate Across Environments.** Evan C. Sivesind\*, Chris M. Boerboom, David E. Stoltenberg, and John M. Gaska, University of Wisconsin, Madison. (47)

## Horticultural Posters

**\*\*Preemergence Weed Control in Onion with Pendimethalin, Flumioxazin, Ethofumesate, Dimethenamid-p, S-metolachlor, Acetochlor, and Propachlor.** Chad M. Herrmann\* and Bernard H. Zandstra, Michigan State University, East Lansing. (48)

**Use of Fomesafen in Irrigated Potato.** Collin P. Auwarter\* and Harlene M. Hatterman-Valenti, North Dakota State University, Fargo. (49)

**Glyphosate Drift to Dryland Red Potatoes.** Harlene M. Hatterman-Valenti\* and Collin P. Auwarter, North Dakota State University, Fargo. (50)

**Tolerance of Sweet Corn to Broadcast Flaming at Different Growth Stages.** Santiago M. Ulloa, Avishek Datta\*, Stevan Z. Knezevic, Goran Malidza, and Robert Leskovsek, University of Nebraska, Concord; Institute of Field and Vegetable Crops, Novi Sad, Serbia; Agricultural Institute of Slovenia, Ljubljana. (51)

**Tolerance of Popcorn Hybrids to Mesotrione, Tembotrione and Topramezone.** Thomas T. Bauman\* and Michael D. White, Purdue University, West Lafayette, IN. (52)

## Invasive Weeds and Rangeland Posters

**\*\*Timing of Herbicide Application for Common Reed Control.** Ryan E. Rapp\* and Stevan Z. Knezevic, University of Nebraska, Concord. (53)

**Effects of Calcium Carbonate, Sodium Carbonate, and Imazapyr for Vegetation Control on Sandbars along Missouri River.** Avishek Datta\*, Stevan Z. Knezevic, Charles A. Shapiro, Jon Scott, and Mike Mainz, University of Nebraska, Concord. (54)

**Emergence Pattern of Cut-leaved Teasel.** George O. Kegode\*, Northwest Missouri State University, Maryville. (55)

## **Invasive Weeds and Rangeland**

### **Posters (cont.)**

**Chemical Control of Saltcedar in Southwest Kansas.** Walter H. Fick\* and Wayne A. Geyer, Kansas State University, Manhattan. (56)

**Absinth Wormwood Control Programs that Include Mowing, Fertilization, or Herbicides.** Michael J. Moechnig\*, Darrell L. Deneke, Jill K. Alms, and David A. Vos, South Dakota State University, Brookings. (57)

**Leafy Spurge Control with Tank-mixes of Imazapic and Saflufenacil Applied in Fall.** Stevan Z. Knezevic, Avishek Datta, Ryan E. Rapp, Jon Scott, Leo D. Charvat\*, and Joseph Zawierucha, University of Nebraska, Concord; BASF Corporation, Lincoln, NE and RTP, NC. (58)

**Leafy Spurge Control with Tank-mixes of Imazapic and Saflufenacil Applied in Spring.** Stevan Z. Knezevic\*, Avishek Datta, Ryan E. Rapp, Jon Scott, Leo D. Charvat, and Joseph Zawierucha, University of Nebraska, Concord; BASF Corporation, Lincoln, NE and RTP, NC. (59)

## **Weed Biology and Ecology Posters**

**\*\*Weedy Transgenic Volunteer Corn in Corn and the Effect on Corn Root Damage by Western Corn Rootworm.** Paul T. Marquardt\*, Christian H. Krupke, and William G. Johnson, Purdue University, West Lafayette, IN. (60)

**\*\*Rate of in situ Shattercane x Sorghum Hybridization.** Jared J. Schmidt\*, John L. Lindquist, Mark L. Bernards, and Jeff F. Pedersen, University of Nebraska, Lincoln; USDA-ARS, Lincoln, NE. (61)

**Investigating the Dissemination of Herbicide Resistance in Waterhemp.** Jianyang Liu\*, Patrick J. Tranel, and Adam S. Davis, University of Illinois, Urbana; USDA-ARS, Urbana, IL. (62)

**Relative Tolerance of Unique Horseweed Populations to 2,4-D.** Melissa M. Kruger, Greg R. Kruger, Vince M. Davis, Stephen C. Weller, and William G. Johnson, Purdue University, West Lafayette, IN; University of Illinois, Urbana. (63)

**\*\*Kochia Differential Response to Glyphosate.** Jason Waite\* and Kassim Al-Khatib, Kansas State University, Manhattan. (64)

## **Weed Biology and Ecology Posters**

**(cont.)**

**Multitactic Weed Management in Organic Soybean Production Systems.** Emily R. Bernstein, David E. Stoltenberg\*, Joshua L. Posner, and Janet L. Hedtcke, University of Wisconsin, Madison. (65)

**Cover Crop Roller-Crimper Contributes to Weed Management in No-Till Soybean.** Adam S. Davis\*, USDA-ARS, Urbana, IL. (66)

**Increasing Cover Crop Diversity and Weed Suppressiveness of Soils in Organic Cropping Systems.** Sam E. Wortman\*, John L. Lindquist, Rhae A. Drijber, Mark L. Bernards and Charles A. Francis, University of Nebraska, Lincoln. (67)

**Temporal Seed Rain and Dormancy of Field Pennycress and Common Chickweed.** Erin C. Taylor\*, Karen A. Renner, and Christy L. Sprague, Michigan State University, East Lansing. (68)

## General Session

### 64<sup>th</sup> NCWSS Annual Meeting

Room: Atlanta

Chairperson and Moderator: Chris Boerboom

Time: Tuesday, 10:00 am

- 10:10 Welcome to Kansas City.** Dallas Peterson, Kansas State University, Manhattan
- 10:20 Washington Report.** Lee Van Wychen, WSSA Science Policy Director, Washington, DC. (69)
- 10:40 Building a Sustainable Biofuels Future.** Chris Kucharik, University of Wisconsin, Madison. (70)
- 11:25 NCWSS Presidential Address.** Mick Holm, DuPont Crop Protection, Waunakee, WI. (71)
- 11:40 Necrology Report.** Pat Tranel, University of Illinois, Champaign.
- 11:45 Announcements.** Chris Boerboom, Program Chair, University of Wisconsin, Madison.

## Soybean/Legume/Grass Papers

Room: New York B

Moderator: David Simpson

- 1:30 \*\*Pulse Crop Tolerance to Pyroxasulfone.** Ryan L. Hunt\* and Richard K. Zollinger, North Dakota State University, Fargo. (72)
- 1:45 \*\*Effectiveness and Consistency of Tank-mix Partners with Glyphosate for Postemergence Applications in Soybean.** David K. Powell\*, Bryan G. Young, Doug J. Maxwell, and Gordon K. Roskamp, Southern Illinois University, Carbondale. (73)
- 2:00 \*\*Optimum GAT Soybean: Herbicide Combinations for Pre-plant Burndown and Residual Weed Control.** Nicholas V. Hustedde\*, Bryan G. Young, and Joseph L. Matthews, Southern Illinois University, Carbondale. (74)
- 2:15 \*\*Yield of Herbicide-Resistant Soybean Under Various Weed Control Systems.** Molly M. Buckham\* and Christy L. Sprague, Michigan State University, East Lansing. (75)
- 2:30 \*\*Effect of Glyphosate and Fungicides on Soybean Yield Under Weed-Free Conditions.** Ryan S. Henry\*, Kiersten A. Wise, and William G. Johnson, Purdue University, West Lafayette, IN. (76)
- 2:45 \*\*Competition of Transgenic Volunteer Corn with Soybean and the Implications for Weed and Insect Resistance Management.** Paul T. Marquardt\*, Christian H. Krupke, and William G. Johnson, Purdue University, West Lafayette, IN. (77)
- 3:00 \*\*Simulated 2,4-D Drift on Roundup-Ready Soybean.** Andrew P. Robinson\*, William G. Johnson, Jerry W. Keaton, and David M. Simpson. Purdue University, West Lafayette, IN; Dow AgroSciences, Indianapolis, IN. (78)
- 3:15 Break**
- 3:30 \*\*Integrated Management Strategies to Reduce Weed Populations in Pastures.** Josh A. Tolson\*, J.D. Green, and William W. Witt, University of Kentucky, Lexington. (79)
- 3:45 \*\*Response of Spiny Amaranth to Timing of Herbicide Applications in Pastures.** Meghan E. Edwards\*, J.D. Green, and William W. Witt, University of Kentucky, Lexington. (80)

## Soybean/Legume/Grass Papers (cont.)

- 4:00 \*\*Tolerance of Miscanthus to Pre- and Post-emergence Herbicides.** Alexander J. Lindsey\*, Wesley J. Everman, Calvin F. Glaspie, Michigan State University, East Lansing. (81)
- 4:15 V-10233 Performance in Midwest Soybean Fields.** Dawn E. Refsell\*, Eric J. Ott, Trevor M. Dale, and John A. Pawlak, Valent USA Corporation, Walnut Creek, CA. (82)
- 4:30 Enhancing Saflufenacil with Adjuvants and Tank-mix Partners.** Angela J. Kazmierczak\*, Richard K. Zollinger, and Jerry L. Ries, North Dakota State University, Fargo. (83)

## Weed Biology & Ecology Papers

Room: Chicago A

Moderator: John Lindquist

- 1:30 \*\*Phylogenetic Analysis of the Chenopodium Complex.** Sukhvinder Singh\* and Patrick J. Tranel, University of Illinois, Urbana, IL. (84)
- 1:45 \*\*Asiatic Dayflower Seedling Emergence Pattern in Artificial Seed Banks.** José M. Gómez\*, and Micheal D.K. Owen, Iowa State University, Ames. (85)
- 2:00 \*\*Comparison of Five Common Waterhemp Cohorts: Plant Population Density, Flowering Date, and Contribution to the Soil Seedbank.** Chenxi Wu\* and Micheal D.K. Owen, Iowa State University, Ames. (86)
- 2:15 \*\*Growth Analysis of Glyphosate-Resistant Giant Ragweed Biotypes.** Chad B. Brabham\* and William G. Johnson, Purdue University, West Lafayette, IN. (87)
- 2:30 \*\*Role of Developmental Factors on the Expression of Glyphosate Resistance in Giant Ragweed.** Renae R. Robertson\*, Burkhard Schulz, and Stephen C. Weller, Purdue University, West Lafayette, IN. (88)
- 2:45 \*\*Determination of Water Use Coefficients of Seven Weed Species as Affected by Fraction Transpirable Soil Water Level and Growth Stage.** Venkatarao Mannam\*, Mark L. Bernards, John L. Lindquist, and Timothy J. Arkebauer, University of Nebraska, Lincoln. (89)

## Weed Biology & Ecology Papers (cont.)

3:00 Break

3:15 **\*\*Nitrogen Consumption in Weed Species as Influenced by Application Rate and Weed Removal Timing.** Laura E. Bast\*, Wesley J. Everman, and Darryl D. Warncke, Michigan State University, East Lansing. (90)

3:30 **\*\*Competitive Effects of Volunteer Corn in Corn.** Tye C. Shauck\*, and Reid J. Smeda, University of Missouri, Columbia. (91)

3:45 **\*\*Weed Growth in Conventional and Low-Input Crop Rotations.** Rachel B. Halbach\* and Robert G. Hartzler, Iowa State University, Ames. (92)

4:00 **\*\*Estimated Economic Losses from Early Weed Competition in Wisconsin Corn and Soybean Fields.** Nathanael D. Fickett\*, Clarissa M. Hammond, David E. Stoltenberg, and Chris M. Boerboom, University of Wisconsin, Madison; Wisconsin Department of Agriculture, Trade, and Consumer Protection, Madison. (93)

4:15 **Impact of Tillage Induced Multiple Season Degradation of Wolf spiders (Araneae: Lycosidae) Habitat.** Randall S. Currie\*, Holly N. Davis, Lawrent L. Buschman, and B. Wade French, Kansas State University, Garden City; USDA, Brookings, SD. (94)

4:30 **Impact of Agricultural Practice on Fungal Associated Seed Decay of Giant Ragweed in Soil.** Xianhui Fu\*, Joanne Chee-Sanford, Martin M. Williams II, and Adam S. Davis, University of Illinois, Urbana; USDA-ARS, Urbana, IL. (95)

4:45 **Weed Biology and Ecology Business Meeting**

## Herbicide Physiology Papers

Room: Chicago B

Moderator: Greg Kruger

1:30 **\*\*Preponderance of the Protoporphyrinogen Oxidase Glycine Deletion in Waterhemp Resistant to PPO-Inhibitors.** Kate A. Thinglum\*, Chance W. Riggins, Patrick J. Tranel, Kevin W. Bradley, and Kassim Al-Khatib, University of Illinois, Urbana; University of Missouri, Columbia; Kansas State University, Manhattan. (96)

## Herbicide Physiology Papers (cont.)

- 1:45 Molecular Modeling and Biochemical Effects of a Glycine Deletion in Waterhemp Protoporphyrinogen Oxidase.** Patrick J. Tranel\*, Franck E. Dayan, Pankaj R. Daga, Stephen O. Duke, Ryan M. Lee, and Robert J. Doerksen, University of Illinois, Urbana; USDA-ARS, University, MS; University of Mississippi, University. (97)
- 2:00 \*\*An Alternative to the Glycine Deletion: Why R98L was Selected in Common Ragweed Protoporphyrinogen Oxidase.** Stephanie L. Rousonelos\*, Ryan M. Lee, and Patrick J. Tranel, University of Illinois, Urbana. (98)
- 2:15 \*\*Analysis of Herbicide Interactions Using Fluorescence Measurements.** Rachel K. Bethke\*, Donald Penner, William T. Molin, Michigan State University, East Lansing; USDA-ARS, Stoneville, MS. (99)
- 2:30 \*\*Glyphosate Resistance in Waterhemp: Inheritance and EPSPS Copy Number.** Michael S. Bell\*, Patrick J. Tranel, and Chance W. Riggins, University of Illinois, Urbana. (100)
- 2:45 \*\*Managing Glyphosate-Resistant Horseweed with Postemergence Applications of Glyphosate and 2,4-D.** Greg R. Kruger\*, Vince M. Davis, Stephen C. Weller, and William G. Johnson, Purdue University, West Lafayette, IN; University of Illinois, Urbana. (101)
- 3:00 Herbicide Physiology Business Meeting**
- 3:15 Break**

## Mixed Student Contest Papers

Room: Chicago B

Moderator: Greg Kruger

- 3:30 \*\*Effect of Growth Media on Common Lambsquarters and Giant Ragweed Biotypes Response to Glyphosate.** Jessica R. Schafer\*, Andrew M. Westhoven, Greg R. Kruger, Vince M. Davis, Steven G. Hallett, and William G. Johnson, Purdue University, West Lafayette, IN. (102)
- 3:45 \*\*Eradication Studies in *Miscanthus x giganteus*.** Eric K. Anderson\*, Aaron G. Hager, Thomas B. Voigt, German A. Bollero, University of Illinois, Urbana. (103)
- 4:00 \*\*Integrated Management of Common Reed along the Platte River.** Ryan E. Rapp\* and Stevan Z. Knezevic, University of Nebraska, Concord. (104)

## Mixed Student Contest Papers (cont.)

- 4:15 \*\*Field Performance of Flaming Hood vs Open Torch.** Chris A. Bruening\*, George Gogos, Robert Leskovsek, Santiago M. Ulloa, and Stevan Z. Knezevic, University of Nebraska, Lincoln and Concord; Agricultural Institute of Slovenia, Ljubljana. (105)
- 4:30 \*\*Christmas Tree and Weed Response to Herbicide Applications in First and Second Year Frasier Fir.** Ling Long Wei\* and Bernard H. Zandstra, Michigan State University, East Lansing. (106)

## Agronomic Crop Student Contest Papers

Room: Chicago C

Moderator: Curtis Thompson

- 1:30 \*\*Effect of Adjuvant, Spray Volume, and Rate on Dry Bean Desiccation with Saflufenacil.** Jordan L. Hoefing\*, Brian M. Jenks, Gary P. Willoughby, Richard K. Zollinger, Jerry L. Ries, and Robert G. Wilson, North Dakota State University, Minot and Fargo; University of Nebraska, Scottsbluff. (107)
- 1:45 \*\*Interaction Between Soil Nitrogen and Imazamox on Palmer Amaranth Control in Sunflower.** Amar S. Godar\*, Phillip W. Stahlman, and J. Anita Dille, Kansas State University, Manhattan and Hays. (108)
- 2:00 \*\*Management of Glyphosate-Resistant Giant Ragweed.** Jason M. Fisher\*, Jeff M. Stachler, and John L. Luecke, North Dakota State University and University of Minnesota, Fargo. (109)
- 2:15 \*\*A Computer-Guided Flamer for Postemergence Weed Control in Carrot and Snap Bean.** Chad M. Herrmann\* and Bernard H. Zandstra, Michigan State University, East Lansing. (110)
- 2:30 \*\*Tolerance of Potato Mini-Tubers to Pre and Post Herbicide Applications.** Calvin F. Glaspie\*, Wesley J. Everman, Christopher M. Long, and Andrew J. Chomas, Michigan State University, East Lansing. (111)

# Agronomic Crop Student Contest

## Papers (cont.)

- 2:45 \*\*Field Corn Tolerance to Broadcast Flaming.** Santiago M. Ulloa\*, Avishek Datta, Stevan Z. Knezevic, Chris Bruening, George Gogos, Goran Malidza, and Robert Leskovsek, University of Nebraska, Concord and Lincoln; Institute of Field and Vegetable Crops, Novi Sad, Serbia. (112)
- 3:00 \*\*Control of Glyphosate-Resistant Corn in a Corn Replant Situation.** Ryan M. Terry\*, Paul T. Marquardt, William G. Johnson and Mark Loux, Purdue University, West Lafayette, IN; The Ohio State University, Columbus. (113)
- 3:15 Break**
- 3:30 \*\*Grass Efficacy with Thiencarbazone Methyl and Combinations with Tembotrione as Influenced by Application Timing.** Dan K. Tiedemann\*, Bryan G. Young, Ronald F. Krausz, and Joseph L. Matthews, Southern Illinois University, Carbondale. (114)
- 3:45 \*\*University Research in Optimum GAT Corn.** David Carruth\*, Richard Zollinger, Chris Boerboom, Michael Moechnig, and Tom Hoverstad, North Dakota State University, Fargo; University of Wisconsin, Madison; South Dakota State University, Brookings; University of Minnesota, Waseca. (115)
- 4:00 \*\*Quizalofop Efficacy on Acetyl-Coenzyme A Carboxylase Resistant Grain Sorghum as Affected by Application Rate and Timing.** M. Joy M. Abit\*, Kassim Al-Khatib, Phillip W. Stahlman, and Patrick W. Geier, Kansas State University, Manhattan and Hays. (116)

## Corn/Sorghum Papers

Room: New York B

Moderator: Jeff Taylor

- 8:15 Benchmark Study: Seedbank Emergence Patterns in Best Management Practices Fields Versus Grower Practices.** Robert G. Wilson\*, Stephen C. Weller, Bryan G. Young, David L. Jordan, Micheal D.K. Owen, Philip Dixon, David R. Shaw, University of Nebraska, Scottsbluff; Purdue University, West Lafayette; Southern Illinois University, Carbondale; North Carolina State University, Raleigh; Iowa State University, Ames; Mississippi State University, Mississippi State. (117)
- 8:30 Callisto Xtra Herbicide for Postemergence Broadleaf Weed Control in Corn.** Ryan D. Lins\*, Gordon D. Vail, and Carroll M. Moseley, Syngenta Crop Protection, Greensboro, NC. (118)
- 8:45 Isoxaflutole + Cyprosulfamide, Thien carbazole + Isoxaflutole + Cyrosulfamide: Performance in University Corn Trials.** Kevin K. Watteyne\*, Tate Castillo, John R. Hinz, Brent Philbrook, and James R. Bloomberg, Bayer CropScience, Research Triangle Park, NC. (119)
- 9:00 Control of Glyphosate-Resistant and Susceptible Weeds with 2,4-D Alone or in Tank Mixes with Glyphosate.** Eric F. Scherder\*, Marvin E. Schultz, Mark A. Peterson, Jeffrey M. Ellis, Scott C. Ditmarsen, Kevin W. Bradley, Reid J. Smeda, and William G. Johnson, Dow AgroSciences, Indianapolis, IN; University of Missouri, Columbia, Purdue University, West Lafayette, IN. (120)
- 9:15 Effect of Weed Size on Control of Weeds with 2,4-D and Glyphosate Tank Mixes in Corn.** David E. Hillger\*, Marvin E. Schultz, Dave C. Ruen, Bruce E. Maddy, A. Stanley Culpepper, Mark M. Loux, and Bryan G. Young; Dow AgroSciences, Indianapolis, IN; University of Georgia, Tifton; The Ohio State University, Columbus; Southern Illinois University, Carbondale. (121)
- 9:30 Thien carbazole-Methyl + Tembotrione + Isoxadifen-Ethyl: A New Herbicide for Grass and Broadleaf Weed Control in Corn.** George S. Simkins\*, David Lamore, Jerry Hora, Brent Philbrook and James R. Bloomberg, Bayer CropScience, Research Triangle Park, NC. (122)
- 9:45 Break**

## **Corn/Sorghum Papers (cont.)**

- 10:00 Evaluation of Herbicides in Optimum GAT Corn.** Dean M. Grossnickle\*, Micheal D.K. Owen, James F. Lux, and Damian D. Franzenburg, Iowa State University, Ames. (123)
- 10:15 Optimum® GAT® Corn Herbicide Programs for the North Central States.** Kevin L. Hahn\*, Keith D. Johnson, Larry H. Hageman and David W. Saunders. DuPont Crop Protection, Johnston, IA. (124)
- 10:30 Pyrasulfotole and Bromoxynil, Potentially a New Herbicide for Weed Control in Grain Sorghum.** Curtis R. Thompson\*, Brian L.S. Olson, Randal S. Currie, Pat W. Geier, Phil W. Stahlman, Nathan G. Lally and Alan Schlegel, Kansas State University, Manhattan and Hays. (125)
- 10:45 Sulfonylurea and Quizalofop Tolerance Traits in Sorghum - New Weed Management Tool for Sorghum Production.** Robert N. Rupp\*, Douglas J. Meadows. David W. Saunders, Wayne J. Schumacher, DuPont Crop Protection, Johnston, IA. (126)
- 11:00 Tolerance of Three Millet Types to Saflufenacil.** Phillip W. Stahlman\*, Patrick W. Geier, and Leo D. Charvat, Kansas State University, Hays; BASF Corporation, Lincoln, NE. (127)
- 11:15 Agronomic Crops II (Corn and Sorghum) Business Meeting**
- 11:30 NCWSS Awards Luncheon**

## **Invasive Weeds & Rangeland Papers**

Room: Chicago B

Moderator: Jim Harbour

- 8:00 Aminocyclopyrachlor Development and Registration Update.** Jon S. Claus\*, Ronnie G. Turner, Jeff H. Meredith, C. Stephen Williams, and Mark J. Holliday; Dupont Crop Protection Company, Wilmington, DE. (128)
- 8:15 Aminocyclopyrachlor Blend Products for Brush and Weed Control on Roadside and Utility Rights-of-Way.** Susan K. Rick\*, Ronnie G. Turner, Jerry R. Pitts, Edison Hidalgo, and Jon C. Claus, DuPont Crop Protection Company, Wilmington, DE. (129)
- 8:30 Aminocyclopyrachlor Blend Products for Vegetation Management on Railroad and Industrial Sites.** Ronnie G. Turner\*, Donald D. Ganske, Michael L. Link, Edison Hidalgo, and Jon C. Claus, DuPont Crop Protection Company, Wilmington, DE. (130)
- 8:45 Invasive Weed Management with Aminopyralid.** Byron B. Sleugh\*, Mary B. Halstvedt, Daniel C. Cummings, Pat L. Burch, William N. Kline, Vernon B. Langston, David Hillger, Vanelle F. Peterson, Dow AgroSciences, Indianapolis, IN. (131)
- 9:00 Control of Giant Hogweed with Aminopyralid and Triclopyr.** David E. Hillger\* and Melissa A. Bravo, Dow AgroSciences, Indianapolis, IN; Pennsylvania Department of Agriculture, Harrisburg. (132)
- 9:15 Efficacy of Aminopyralid and Metsulfuron on Selected Range and Pasture Weeds and Brush.** Byron B. Sleugh\*, Mary B. Halstvedt, Pat L. Burch, Vernon B. Langston, Daniel C. Cummings, David E. Hillger, William N. Kline, Robert G. Wilson, Dow AgroSciences, Indianapolis, IN; University of Nebraska, Scottsbluff; Mark Renz, University of Wisconsin, Madison; Kevin Bradley, University of Missouri, Columbia. (133)
- 9:30 Can Reduced Herbicide Rates and Fall Timings Control Canada Thistle and Maintain Forb Cover in Establishing Prairies?** Brendon Panke\* and Mark Renz, University of Wisconsin, Madison. (134)
- 9:45 Break**
- 10:00 Evaluation of Fall and Spring Control Methods on Garlic Mustard.** Mark Renz\*, University of Wisconsin, Madison. (135)

## **Invasive Weeds & Rangeland Papers (cont.)**

- 10:15 Scouringrush in Nebraska.** Eric E. Frasure and Mark L. Bernards\*, University of Nebraska, Lincoln. (136)
- 10:30 Community Outreach Working with Groups in Weed Control.** Ed Fields\*, Crawford County Noxious Weed Department, Girard, KS. (137)
- 10:45 NAWMA--A Tool for on the Ground Weed Managers.** Riley Walters\*, Butler County Noxious Weed Department, El Dorado, KS. (138)
- 11:00 Cooperating to Control Hydrilla in Kansas.** Jeffrey W. Vogel\*, Kansas Department of Agriculture, Topeka. (139)
- 11:15 Invasive Weeds Business Meeting**
- 11:30 NCWSS Awards Luncheon**

## Extension Discussion

Room: Chicago A

Moderators: Micheal Owen and Lowell Sandell

**8:15 Opportunities and Obstacles for the Future of Applied Weed Management: A Discussion Forum.** Micheal Owen and Lowell Sandell, Iowa State University, Ames; University of Nebraska, Lincoln.

**Introduction** - Micheal Owen.

**Panelist Perspectives** (~10 minutes/panelist)

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**Administrative** - Beverly Durgan, University of Minnesota, St. Paul.

**Extension Specialist** - Christy Sprague, Michigan State University, East Lansing.

**Industry** - Doug Rushing, Monsanto, St. Louis.

**Grower** - Jim Legvold, PMV, Inc., Vincent, IA.

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**Facilitated Discussion** - moderated by Micheal Owen.

**10:00 Break**

## Equipment and Application Methods Papers

Room: Chicago A

Moderator: Gregory Dahl

**10:15 Evaluation of New Venturi Nozzle Designs for Improving Herbicide Efficacy.** Robert E. Wolf\* and Dallas E. Peterson, Kansas State University, Manhattan. (140)

**10:30 Factors Affecting Spray Distribution and Coverage.** Gregory K. Dahl\*, Joe V. Gednalske, Eric Spandl, Winfield Solutions LLC, St. Paul, MN. (141)

**10:45 High Surfactant Oil Concentrate Adjuvants - The Rest of the Story.** Richard K. Zollinger\*, North Dakota State University, Fargo. (142)

**11:00 Using Clickers to Teach Calibration of Sprayers.** Robert N. Klein\*, University of Nebraska, North Platte, NE. (143)

**11:15 Equipment and Application Methods Business Meeting**

**11:30 NCWSS Awards Luncheon**

## **Making Sense of the Numbers: Statistics for Weed Science**

A “hands-on” workshop; no computer, hardware, or software is needed; downloading ppt handouts prior to the meeting from the NCWSS web site is recommended.

Room: Chicago C

Moderator: Greg Kruger

**9:30 It’s a Sure Thing . . . Probably: The Influence of Variability on Trial Planning, Design and Analysis.** Leslie Fuquay\*, Syngenta, Research Triangle Park, NC. (144)

**10:30 Traditions and Conventions in the Use of Repeated Measures Analysis, Contrasts, and Pairwise Comparisons.** Chris Reburg-Horton\*, North Carolina State University, Raleigh. (145)

**11:30 NCWSS Awards Luncheon**

**1:30 Squeezing More Information Out of Your Data.** Adam Davis\*, USDA-ARS, Champaign, IL. (146)

**2:00 A “Hands-on” Workshop - Statistical Cross-Training: Trial Design, Blocking and Sampling.** Leslie Fuquay\*, Syngenta, Research Triangle Park, NC. (147)

**3:00 Break**

**3:15 Determination of Tank-Mixture Efficacy.** Stott Howard\*, Syngenta, Des Moines, IA. (148)

## **Invasive Weed Management in the Mid-Plains**

Room: Chicago B

Moderators: Anita Dille and Jeff Vogel

**1:30 Hydrilla and Other Aquatic Invasive Plants.** William T. Haller\*, University of Florida, Gainesville. (149)

**2:15 Purple Loosestrife: Biology and Management Options.** Stevan Z. Knezevic\*, University of Nebraska, Concord. (150)

**3:00 Discussion and Break**

**3:30 Sericea Lespedeza: Biology and Management Options.** Walter H. Fick\*, Kansas State University, Manhattan (151)

**4:15 Spotted Knapweed and Others: Biology, Distribution, and Management.** Celestine A. Duncan\*, Weed Management Services, Helena, MT. (152)

**5:00 Discussion and Wrap-up**

## Soybean/Grass Papers

Room: New York B

Moderator: David Simpson

- 1:30 Evaluating the Utility of Glufosinate for Weed Management in Burndown Applications.** Mark A. Waddington\*, Jayla R. Allen, Michael Weber, Bayer CropScience, Research Triangle Park, NC 27709 (153)
- 1:45 Evaluation of Programs for the Management of Palmer Amaranth and Common Waterhemp in Conventional, Glyphosate-Resistant, and Glufosinate-Resistant Soybeans.** Kristin K. Payne\*, Eric B. Riley, Travis R. Legleiter, Jim D. Wait, and Kevin W. Bradley, University of Missouri, Columbia. (154)
- 2:00 Optimum® GAT® Crops Herbicide Programs with Burndown plus Residual Activity for No-till Cropping Systems.** David W. Saunders\*, Susan K. Rick, Marsha J. Martin, and Richard M. Edmund, DuPont Crop Protection, Dallas Center, IA. (155)
- 2:15 Optimum® GAT® Soybeans Herbicide Programs for the North Central States.** Mick F. Holm\*, James D. Harbour, Helen A. Flanigan, and David W. Saunders. DuPont Crop Protection, Johnston, IA. (156)
- 2:30 Regional Summary of Optimum GAT Soybean Research.** Angela J. Kazmierczak\*, Richard K. Zollinger, Chris M. Boerboom, Michael Moechnig, and Jeff Gunsolus, North Dakota State University, Fargo; University of Wisconsin, Madison; South Dakota State University, Brookings; University of Minnesota, St. Paul. (157)
- 2:45 Comparison of Yield with Herbicide Tolerant Trait Systems in Soybeans.** Michael Weber\* and Jayla Allen, Bayer CropScience, Research Triangle Park, NC. (158)
- 3:00 Break**
- 3:15 Establishment of Switchgrass for Biofuel Production in Wisconsin.** Mark Renz\*, University of Wisconsin, Madison. (159)
- 3:30 Tolerance of Switchgrass to Pre- and Postemergence Herbicides.** Wesley J. Everman\*, Calvin F. Glaspie, Demitria Gavit, Jan Michael, and Donald Penner. Michigan State University, East Lansing. (160)
- 3:45 Agronomic Crops III (Soybean, Legume, Forage, Range) Business Meeting**

## Horticultural Papers

Room: New York B

Moderator: Eric Ott

- 4:00 A Comparison of Full-, Split- and Micro-Rate Herbicide Treatments for Weed Management in Red Beet.** Darren E. Robinson\*, University of Guelph, Ridgetown, ON. (161)
- 4:15 Effect of Glyphosate Drift Droplet Concentration to Irrigated Potatoes.** Harlene M. Hatterman-Valenti\* and Collin P. Auwarter, North Dakota State University, Fargo. (162)
- 4:30 Season-Long Weed Control in Tree Fruit with Preemergence and Postemergence Herbicides.** Rodney V. Tocco\* and Bernard H. Zandstra, Michigan State University, East Lansing. (163)
- 4:45 Introduction of Indaziflam for Weed Control in Fruit, Nut, and Grape Crops.** Mark D. Parrish\*, R. Darren Unland, and William J. Bertges, Bayer CropScience, Research Triangle Park, NC. (164)
- 5:00 Horticulture and Ornamentals Business Meeting**

## Extension Papers

Room: Chicago A

Moderator: Lowell Sandell

- 1:30 Benchmark Study: Variation in Weed Management Tactics Implemented in Glyphosate-Resistant Cropping Systems.** Bryan G. Young\*, Joseph L. Matthews, David L. Jordan, Micheal D.K. Owen, David R. Shaw, Stephen C. Weller, Robert G. Wilson, and William G. Johnson, Southern Illinois University, Carbondale; North Carolina State University, Raleigh; Iowa State University, Ames; Mississippi State University, Mississippi State; Purdue University, West Lafayette, IN; University of Nebraska, Scottsbluff. (165)
- 1:45 Benchmark Study: Impact of Glyphosate-Resistant Crops on Weed Population Density.** Stephen C. Weller\*, Micheal D.K. Owen, Bryan G. Young, David R. Shaw, Robert G. Wilson, David L. Jordan, and Philip Dixon, Purdue University, West Lafayette, IN; Iowa State University, Ames; Southern Illinois University, Carbondale; Mississippi State University, Mississippi State; University of Nebraska, Scottsbluff; North Carolina State University, Raleigh. (166)
- 2:00 Suspected Glyphosate-Resistant Giant Ragweed in Ontario.** Peter H. Sikkema\*, Francois J. Tardif, Christy Shropshire, and Nader Soltani, University of Guelph, Ridgetown, ON. (167)
- 2:15 Results from a 2008 Survey to Determine the Distribution of Glyphosate-Resistant Weeds in Missouri.** Kevin W. Bradley\*, K. K. Payne, Eric B. Riley, Travis R. Legleiter, and Jimmy D. Wait, University of Missouri, Columbia. (168)
- 2:30 Changes in the Occurrence of Common Milkweed in Iowa Crop Fields in the Past Decade.** Bob Hartzler\*, Iowa State University, Ames. (169)
- 2:45 Role of Research and Extension in the Adoption of No-till Wheat in Kentucky.** Lloyd W. Murdock, James H. Herbek, and James R. Martin\*, University of Kentucky, Princeton. (170)
- 3:00 Break**

## Extension Papers (cont.)

**3:15 Challenges of Conducting Weed Science Research in an Atrazine Prohibition Area.** Tim L. Trower\*, Chris M. Boerboom, Dave E. Stoltenberg, Ken R. Bradbury, and Richard C. Graham, University of Wisconsin, Madison; Wisconsin Department of Agriculture, Trade and Consumer Protection, Madison. (171)

**3:30 Spring Wheat Injury Associated with Glyphosate Contamination of ALS-Inhibiting Herbicides.** Michael J. Moechnig\*, David A. Vos, Jill K. Alms, and Darrell L. Deneke, South Dakota State University, Brookings. (172)

**3:45 Extension Business and Committee Meeting**

## What's New in Industry

Room: Chateau A & B

Moderator: Terry Carmody

4:00-5:30

Bayer CropScience

Mike Weber

Winfield Solutions LLC

Greg Dahl

Monsanto Company

Leslie Lloyd

BASF Corporation

Brady Kappler

Syngenta Crop Protection

Chuck Foresman

DuPont Crop Protection

Jim Harbour

Dow AgroSciences

Jeffrey Ellis

Valent USA

Trevor Dale

## The NCWSS Learning Store: Technology Training for Successful Chemical Weed Control

This symposium is designed for students and professionals to increase their knowledge of new chemical and application technologies and to answer the “why” questions that you have related to herbicide performance.

Room: Chicago B

Moderator: Don Penner

- 8:30 Water Conditioners, pH, and Water Hardness.** Fred Whitford\* and Bill Johnson, Purdue University, West Lafayette, IN. (173)
- 9:15 Adjuvants for Weakly Acidic Herbicides.** Don Penner\*, Michigan State University, East Lansing. (174)
- 9:45 Methylated and Ethylated Seed Oils.** Richard Zollinger\*, North Dakota State University, Fargo. (175)
- 10:15 Break**
- 10:30 “When the Game Slows Down” – Using High Speed Video to Understand Application Technology.** Gregory K. Dahl\*, Joe V. Gednalske, Eric Spandl, Winfield Solutions LLC, St. Paul, MN. (176)
- 11:00 Saflufenacil: Discovery and Mode of Action of a New Broadleaf Herbicide.** Rex Liebl\*, Dan Westberg, and Steve Bowe, BASF, Research Triangle Park, NC. (177)

**11:30 Discussion**

## Cereals/Sugar Beet Papers

Room: Chicago A

Moderator: Kathrin Schirmacher

- 8:30 Management of Glyphosate-Resistant Common Ragweed.** Jeff M. Stachler\*, John L. Luecke, and Jason M. Fisher, North Dakota State University and University of Minnesota, Fargo. (178)
- 8:45 Effect of Planting Date on Weed Control in Glyphosate-Resistant Sugarbeet.** Andrew R. Kniss\*, University of Wyoming, Laramie. (179)
- 9:00 Influence and Control of Volunteer Corn in Sugarbeet.** Robert G. Wilson\*, Gustavo M. Sbatella, and Andrew R. Kniss, University of Nebraska, Scottsbluff; University of Wyoming, Laramie. (180)

## **Cereals/Sugar Beet Papers (cont.)**

- 9:15 Interaction of Ethofumesate and Glyphosate for Weed Control in Glyphosate-Resistant Sugarbeet.** Dennis C. Odera\* and Andrew R. Kniss, University of Wyoming, Laramie. (181)
- 9:30 Influence of Herbicide Application Timing on Winter Annual Grass Control in Winter Wheat.** Dallas E. Peterson\*, Mark M. Claassen, Patrick W. Geier, and Phillip W. Stahlman, Kansas State University, Manhattan. (182)
- 9:45 Management of Difficult to Control Grass Species with Mesosulfuron-methyl plus Propoxycarbazone in Wheat Grown in the Northern Plains.** Steven King\*, Mary Paulsgrove, Kevin Thorsness, Dean Maruska, Brad Ruden, and Charlie Hicks, Bayer CropScience, Billings, MT; Research Triangle Park, NC; Fargo, ND; Warren, MN; Bruce, SD; and Livermore, CO. (183)
- 10:00 Break**
- 10:15 Performance of Pulsar Herbicide on Broadleaf Weeds in Wheat and Barley.** Kathrin Schirmacher\*, Scott B. Clewis, Peter C. Forster, Donald J. Porter, and Stephen M. Schraer, Syngenta Crop Protection, Greensboro, NC. (184)
- 10:30 Pyrasulfotole and Bromoxynil for Efficacy and Crop Response in Winter Wheat.** Patrick W. Geier\*, Phillip W. Stahlman, and Dallas E. Peterson, Kansas State University, Hays and Manhattan. (185)
- 10:45 WolverineM Herbicide Overview of Performance in Northern Plains Cereals.** Kevin B. Thorsness\*, Steven R. King, Dean W. Maruska, Mary D. Paulsgrove, Bradley E. Ruden, Michael C. Smith, George S. Simkins, and Mark A. Wrucke, Bayer CropScience, Research Triangle Park, NC. (186)
- 11:00 Soybean Double Crop Response to Spring Applied Pyroxsulam in Winter Wheat.** Gary A. Finn\*, D. Chad Cummings, Monte R. Weimer, Jeffrey M. Ellis, Roger E. Gast, Steve P. Nolting, Patrick W. Geier, Douglas E. Shoup, Thomas F. Peeper, and Phil Westra, Dow AgroSciences, Indianapolis, IN; Kansas State University, Hays and Chanute; Oklahoma State University, Stillwater; Colorado State University, Ft. Collins. (187)
- 11:15 Agronomic Crops I (Cereals, Sugar Beet, Dry Beans) Business Meeting**

## 2008 Officers/Executive Committee

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### Editor, NCWSS Proceedings

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515-294-1923  
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### Editor, NCWSS Communications

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### WSSA Representative

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### CAST Representative

Karen Renner Michigan State University  
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### Executive Secretary

Robert Schmidt 217-352-4212  
raschwssa@aol.com

### Director of Science Policy

Lee Van Wychen 202-746-4686  
Lee.VanWychen@wssa.net

# North Central Weed Science Society Information

## Directors at Large

Lowell Sandell	Extension	402-472-1527	lsandell2@unl.edu
Justin Petrosino	Graduate Students	419-681-3427	jspetro@ksu.edu
Leslie Lloyd	Industry	641-792-3009	leslie.lloyd@monsanto.com
John Hinz	Resident Education	515-733-9250	john.hinz@bayercropscience.com
Bryan Young	Long Range Planning	618-453-7679	bgyoung@siu.edu
Reid Smeda	Central (2009)	573-882-1329	smedar@missouri.edu
Dain Bruns	Eastern (2010)	614-767-0236	dain.bruns@syngenta.com
Terence Carmody	Western (2009)	605-371-9683	terence.carmody@syngenta.com

## NCWSS Interest Group Committees

### Long Range Planning, Organizational Affairs and Membership

Bryan Young	Chair	618-453-7679	bgyoung@siu.edu
Mike Owen	Vice Chair	515-294-5936	mdowen@iastate.edu
Phil Westra	Colorado (2009)	970-491-5219	philip.westra@colostate.edu
David Thomas	Illinois (2011)	217-722-3916	dave.thomas@syngenta.com
Bruce Maddy	Indiana (2009)	317-877-3100	bemaddy@dow.com
Dean Grossnickle	Iowa (2011)	515-294-7060	deang@iastate.edu
Patrick Geier	Kansas (2010)	785-625-3425	pgeier@ksu.edu
J.D. Green	Kentucky (2009)	859-257-4898	jdgreen@uky.edu
Andy Chomas	Michigan (2010)	517-355-0271	chomas@msu.edu
Liz Stahl	Minnesota (2011)	507-372-3912	stah0012@umn.edu
Reid Smeda	Missouri (2009)	573-882-1329	smedar@missouri.edu
Mark Bernards	Nebraska (2010)	402-472-1534	mbernards2@unl.edu
Brian Jenks	North Dakota (2011)	701-857-7677	brian.jenks@ndsu.edu
Dain Bruns	Ohio (2010)	614-767-0236	dain.bruns@syngenta.com
Nader Soltani	Ontario (2011)	519-674-1604	nsoltani@ridgetownc.uoguelph.ca
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Jed Colquhoun	Wisconsin (2010)	608-890-0980	colquhoun@wisc.edu
Calvin Odero	Wyoming (2011)	307-766-3112	odero@uwyo.edu

### Extension

Lowell Sandell	Chair	402-472-1527	lsandell2@unl.edu
Mark Bernards	Vice Chair	402-472-1534	mbernards2@unl.edu
Jeff Stachler		701-231-8131	jeff.stachler@ndsu.edu
Mike Moechnig	Past Chair	605-688-4591	michael.moechnig@sdstate.edu

### Graduate Students

Justin Petrosino	Chair	419-681-3427	jspetro@ksu.edu
Calvin Glaspie	Vice Chair	248-770-0550	glaspie1@msu.edu
Rachel Bethke		517-410-5481	bethkera@msu.edu
Molly Buckham		269-501-8835	buckham@msu.edu
Kelly Barnett		317-627-4033	barnett5@msu.edu
Kate Thinglum		708-717-2505	kthinglum@gmail.com
Dan Tiedemann		618-410-7688	dtied@siu.edu
Andy Robinson		765-496-6690	arobinson@purdue.edu
Valerie Mock	Past Chair	574-453-4969	vmock@purdue.edu

# North Central Weed Science Society Information

## NCWSS Interest Group Committees (cont.)

### Industry

Leslie Lloyd	Chair	641-792-3009	leslie.lloyd@monsanto.com
Ryan Tichich	Vice Chair	636-737-6807	ryan.p.tichich@monsanto.com
Mike DeFelice		515-334-6705	michael.defelice@pioneer.com
Mark Peterson		765-463-7788	mapeterson@dow.com
Kip Sander		612-239-1916	ks.cointegrity@charte.com
Mark Bredehoeft		320-905-1181	MarkBredehoeft@smbssc.com
Fritz Koppatschek		317-415-0553	fkoppatschek@abgaservices.com
Brent Petersen		320-230-4081	brentpetersen@charter.net
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Mike Leetch	Past Chair	515-360-0192	mike.leetch@syngenta.com

### Resident Education

John Hinz	Chair	515-733-9250	john.hinz@bayercropscience.com
John Lindquist	1st Vice Chair	402-472-2771	jlindquist1@unl.edu
Brady Kappler	2nd Vice Chair	402-432-1469	brady.kappler@basf.com
Anita Dille		785-532-7240	dieleman@ksu.edu
Eric Scherder		515-597-2660	efscherder@dow.com
Liz Stahl		507-372-3912	stah0012@umn.edu
Tate Castillo		319-456-3516	barc_tate@iowatelecom.net
Jess Spotanski	Past Chair	402-366-9230	jess_spotanski@mainstaycomm.net

### Contest Rules Subcommittee of Resident Education

Anita Dille	Chair	785-532-7240	dieleman@ksu.edu
John Hinz	Chair, Res. Ed.	515-733-9250	john.hinz@bayercropscience.com
John Lindquist	1st Vice Chair	402-472-2771	jlindquist1@unl.edu
Brady Kappler	2nd Vice Chair	402-432-1469	brady.kappler@basf.com
Jess Spotanski	Past Chair	402-366-9230	jess_spotanski@mainstaycomm.net

### Summer Contest Subcommittee of Resident Education

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Brady Kappler	Vice Chair, Res. Ed.	402-432-1469	brady.kappler@basf.com
Greg Steckel	Past Host	618-920-3145	greg.steckel@alveyagriculturalresearch.com
Tate Castillo	Past Host	641-456-3516	barc_tate@iowatelecom.net
Jess Spotanski	Past Host	402-366-9230	jess_spotanski@mainstaycomm.net
Leslie Lloyd	Industry	641-792-3009	leslie.lloyd@monsanto.com
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Kirk Howatt		701-231-7209	kirk.howatt@ndsu.edu
Gordon Roskamp		309-298-1569	GK-Roskamp@wiu.edu
Doug Nord		620-285-3380	diamondag@gbta.net
Dave Nicolai		320-583-3182	nico0071@umn.edu
Helen Flanigan		317-862-0578	helen.a.flanigan@usa.dupont.com

## NCWSS Standing Committees

### Distinguished Achievement Award

Bill Johnson	Chair	765-494-4656	wgj@purdue.edu
Reid Smeda		573-882-1329	smedar@missouri.edu
Dane Bowers		765-452-2797	dane.bowers@syngenta.com
Mike Owen		515-294-5936	mdowen@iastate.edu
Jeff Gunsolus		612-625-8130	gunso001@umn.edu
Jan Michael		517-655-6219	michae42@msu.edu
Steve Weller		765-494-1333	weller@purdue.edu
Adrian Moses	Past Chair	515-689-7451	adrian.moses@syngenta.com

### Electronic Communications Committee

Glenn Nice	Chair	765-496-2121	gnice@purdue.edu
Harlene Hatterman-Valenti	Vice Chair	701-231-8536	h.hatterman.valenti@ndsu.edu
Eric Spandl		651-490-4292	epspandl@landolakes.com
Dain Bruns		614-767-0236	dain.bruns@syngenta.com
Jed Colquhoun		608-890-0980	colquhoun@wisc.edu
Mark Bernards		402-472-1534	mbernards2@unl.edu
Lowell Sandell		402-472-1527	lsandell2@unl.edu

### Fellow Committee

Phil Stahlman	Chair	785-625-3425	stahlman@ksu.edu
Mike Owen	Vice Chair	515-294-5936	mdowen@iastate.edu
Kassim Al-Khatib		785-532-5155	khatib@ksu.edu
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Michael Horak		314-694-3476	michael.j.horak@monsanto.com
Duane Rathmann		507-835-2580	duane.rathmann@basf.com
Phil Orwick		317-919-5509	phil.orwick@sgs.com
Mark Wrucke		651-463-3365	mark.wrucke@bayercropscience.com
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# North Central Weed Science Society Information

## NCWSS Standing Committees (cont.)

### Finance Steering and Policy Committee

Christy Sprague	Chair	517-353-0271	sprague1@msu.edu
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Robert Schmidt	Executive Office	217-352-4212	raschwssa@aol.com

### Future Site Selection Committee

Charles Slack	Chair	859-259-1914	cslack@uky.edu
Bill Johnson	Past President	765-494-4656	wgj@purdue.edu
John Wollam	Kansas City LAC	816-880-3820	john.wollam@bayercropsscience.com
Adrian Moses		515-689-7451	adrian.moses@syngenta.com
Kirk Howatt		701-231-7209	kirk.howatt@ndsu.edu

### Local Arrangements: 2009 Hyatt Hotel, Kansas City

John Wollam	Kansas City Chair	816-242-0361	john.wollam@bayercropsscience.com
Bill Johnson	Past Chair	765-494-4656	wgj@purdue.edu
Chris Boerboom	Program Chair	608-262-1392	boerboom@facstaff.wisc.edu
Charlie Slack	Future Site Selection	859-257-5020	cslack@uky.edu
Robert Schmidt	Executive Secretary	217-352-4212	raschwssa@aol.com

### Nominating Committee

Dallas Peterson	Chair	785-532-0405	dpeterso@ksu.edu
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Bryan Young		618-453-7679	bgyoung@siu.edu
Stott Howard		515-222-4809	stott.howard@syngenta.com
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Jan Michael		517-655-6219	michea42@msu.edu
Greg Dahl	Past Chair	651-490-4246	gkdahl@landolakes.com

### Program Committee

Chris Boerboom	Chair	608-262-1392	boerboom@wisc.edu
Mark Wrucke	Vice Chair	651-463-3365	mark.wrucke@bayercropsscience.com
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Kevin Bradley		573-882-4039	bradleyke@missouri.edu
Greg Kruger		765-496-6690	gkruger@purdue.edu
Mick Holm	President (ex officio)	608-231-9961	mick.f.holm@usa.dupont.com

### Resolutions and Necrology Committee

Pat Tranel	Chair	217-333-15 31	tranel@uiuc.edu
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### Invasives Plants Committee

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Bob Masters		317-337-4281	ramasters@dow.com

# North Central Weed Science Society Information

## Section Program Chairs (Vice chairs elected at section business meeting)

### General Program

Chris Boerboom Program Chair 608-262-1392 boerboom@wisc.edu

### Poster Session

Craig Nichols Chair 913-541-8895 craig.nichols@syngenta.com  
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Brian Canaday 573-522-4115 brian.canaday@mdc.mo.gov  
Jeff Stachler 701-231-8131 jeff.stachler@ndsu.edu

### Graduate Student Paper Awards

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John Hinz Past Chair 515-733-9250 john.hinz@bayercropscience.com

### Graduate Student Poster Awards

Brady Kappler Chair 402-432-1469 brady.kappler@basf.com  
John Lindquist Past Chair 402-472-2771 jlindquist1@unl.edu

### Agronomic Crops I (Cereals, Sugar Beets, Dry Beans)

Kathrin Schirmacher Acting Chair kathrin.schirmacher@syngenta.com  
Rick Schmenk Chair 734-828-7048 rick.schmenk@agresearchassociates.com  
Peter Forster Vice Chair 970-454-5478 pete.forster@syngenta.com

### Aronomics Crops II (Corn , Sorghum)

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### Agronomic Crops III (Soybeans , Legumes, Forage and Range)

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Susan Rick Vice Chair 618-939-0263 susan.k.rick@usa.dupont.com

### Equipment and Application Methods

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### Extension

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Mark Bernards Vice Chair 402-472-1534 mbernards2@unlnotes.unl.edu

### Herbicide Physiology

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Rena Robertson Vice Chair 308-289-5340 robert37@purdue.edu

### Invasive Weeds

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Byron Sleugh Vice Chair 515-226-2165 bbsleugh@dow.com

### Forestry, Industrial, Turf and Aquatics

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Steve Sanborn Vice Chair 608-235-3667 stephen.sanborn@syngenta.com

### Horticulture and Ornamentals

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### Weed Biology, Ecology and Management

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# North Central Weed Science Society Information

## Honorary Members/Fellows

Honorary Members	1984	Edward W. Stroube *
1948 L.W. Dephart *		Oliver E. Strand *
1949 A.H. Larson *		Gail A. Wicks *
1950 J.W. Zahnley *	1985	Robert Hiltibran *
1951 R.W. Fuelleman	1986	Elroy J. Peters
(posthumous citation)		Deane W. Finnerty *
T.R. Yost		Oliver G. Russ
(posthumous citation)	1987	Ralph Althaus *
1952 Henry E. Wood *		William M. Phillips
1953 George Briggs *		Gerald R. Miller
Walter C. Dutton *	1988	Robert Benson
1954 A.L. Bakke *		Calvin Messersmith
1955 C.J. Willard *		Edward Stoller
1956 R.S. Dunham *	1989	Loyd M. Wax
1957 P.J. Olson *		Alan R. Putman
1958 L.W. Melander	1990	Alan G. Dexter
T.K. Pavlychenko		Russel L. Nash
(posthumous citation)	1991	George Kapusta *
1959 E.A. Helgeson *		Marshall McGlamery
1960 Oliver C. Lee *		Russell Moomaw
1962 Sig Bjerken *		Don Penner
1964 K.P. Buchholtz *	1992	R. Gordon Harvey, Jr. *
E.P. Sylwester *		Larry K. Binning
1966 Robert C. Beatty *		Alex R. Martin
Clare Buskirk *		Don Taylor
1967 J.K. Freeman	1993	Merrill A. Ross, Jr.
1968 E.K. Alban *		Robert G. Wilson
H.A. Friesen *		Jerry D. Doll
1969 Lawrence Southwick	1994	Ted R. Warfield
David W. Staniforth *		William W. Witt
1970 Delbert D. Hemphill *	<b>Fellows<sup>1</sup></b>	
George Frederick Warren *	1995	Charles R. Fenster
1971 Fred W. Slife *		Leon J. Wrage
1972 Thomas Victor Beck	1996	Thomas T. Bauman
O. Hale Fletchall *		Earl W. Chamberlain
1973 Richard Behrens		Richard S. Fawcett
Lawrence H. Hannah		William E. Lueschen
1974 William Lobay	1997	Stephen D. Miller
1975 John D. Furrer		Micheal D.K. Owen
1976 Lyle A. Derscheid *		Fred W. Roeth
LeRoy G. Holm *	1998	Paul J. Ogg
1977 James W. Divall		James P. Worthington
James L. Williams, Jr. *	1999	Michael Barrett
1978 Melwin K. McCarty *		Norman J. Probst
Robert E. Nylund	2000	Douglas D. Buhler
1979 Ellery L. Knake *		Bill Miller
Kenneth W. Bradfield *		Philip L. Orwick
1980 John D. Nalewaja		Stephen C. Weller
O.C. Burnside	2001	LeRoy R. Cobia
1981 Rodney J. Fink	2002	James J. Kells
Juett C. Hogancamp *	2003	Karen Ann Renner
Larry W. Mitich *		Charles Slack
1982 W.D. Warpenter		Phillip Stahlman
James W. Herron *	2004	Duane Rathman
William F. Meggitt		David Regehr
1983 Robert N. Andersen	2005	Dallas E. Peterson
Dale E. Bush	2006	James R. Martin
Ronald E. Doersch		Bernard H. Zandstra

## North Central Weed Science Society Information

### Honorary Members/Fellows (continued)

2007	Chris M. Boerboom Michael J. Horak	2008	Thomas J. Peters Jeffrey Gunsolus Kassim Al-Khatib
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\* Deceased

<sup>1</sup>Society members being honored were originally referred to as Honorary Members. Beginning in 1995, the award was changed to Fellow.

### North Central Weed Science Society Presidents

1944	No President	1977	Carpenter, Will D.
1945	Yost, T. F. *	1978	Doersch, Ronald E.
1946	Yost, T. F. *	1979	Nalewaja, John D.
1947	Hanson, Noel S. *	1980	Stroube, Edward W.
1948	Willard, C. J. *	1981	Herron, James W. *
1949	Dunham, R. S. *	1982	Benson, Robert L.
1950	Worzella, W. W. *	1983	DiVall, James W.
1951	Sylwester, E. P. *	1984	Miller, Gerald R.
1952	Buchholtz, K. P. *	1985	Messersmith, Calvin G.
1953	Gilbert, C. J. *	1986	Wax, Loyd M.
1954	Lee, O. C. *	1987	Chamberlain, Earl
1955	Grigsby, Buford H. *	1988	Harvey, R. Gordon *
1956	Helgeson, Earl A. *	1989	Worthington, James P.
1957	Slife, Fred W. *	1990	Martin, Alex R.
1958	Derscheid, Lyle A.	1991	Taylor, T. Don
1959	Foster, J. Roe *	1992	Stoller, Edward W.
1960	Holm, L. G. *	1993	Warfield, Ted R.
1961	Alban, E. K. *	1994	Bauman, Thomas T.
1962	Bjerken Sig. *	1995	Cobia, LeRoy R.
1963	Hemphill, D. D. *	1996	Dexter, Alan G.
1964	Hemphill, D. D. *	1997	Miller, Bill
1965	Furrer, John D.	1998	Buhler, Douglas
1966	Furrer, John D.	1999	Orwick, Philip L.
1967	Warden, Robert L. *	2000	Kells, James J.
1968	Flecthall, O. Hale *	2001	Rathmann, Duane P.
1969	Beck, T. V.	2002	Peterson, Dallas E.
1970	Hannah, L. H.	2003	Horak, Michael J.
1971	Knake, Ellery *	2004	Doll, Jerry D.
1972	Williams, Jr., J. L. *	2005	Peters, Tom
1973	Meggitt, William	2006	Miller, Stephen
1974	Bradfield, Kenneth W.	2007	Moses, Adrian
1975	Burnside, Orvin C.	2008	Johnson, William G.
1976	Fink, Rodney J.	2009	Holm, Mick

\* Deceased

## Distinguished Achievement Award

1990	Gerald W. Gogan – Education Gail A. Wicks - Service Robert G. Wilson - Research Jeffrey L. Gunsolus - Young Scientist
1991	F. Strizke - Education Paul G. Mayland - Industry Patrick J. Shea - Research
1992	William W. Witt - Education James P. Worthington - Education Rex A. Liebl - Research Jerry D. Doll - Service
1993	Robert G. Hartzler - Education Douglas D. Buhler - Research Karen A. Renner - Young Scientist
1994	David L. Regehr - Education Deane W. Finnerty - Industry Robert N. Andersen - Service David A. Mortensen - Young Scientist
1995	Will D. Carpenter - Industry Phillip W. Stahlman - Research Micheal D.K. Owen - Service
1996	Beverly R. Durgan - Education Charles L. Kern - Industry E. James Retzinger - Industry Michael J. Horak - Young Scientist
1997	Roger Becker - Education Joseph G. Vollmer - Industry Charles H. Slack - Research Richard Zollinger - Service David E. Stoltenberg - Young Scientist
1998	Randy W. Lloyd - Industry Ronald F. Krausz - Research James R. Martin - Service
1999	Thomas R. Hoverstad - Professional Staff Robert J. Kremer - Research J. D. Green - Service Chris M. Boerboom - Young Scientist Reid J. Smeda - Young Scientist
2000	Harlan P. Palm - Industry James F. Lux - Professional Staff Gary E. Powell - Professional Staff David A. Vox - Professional Staff William G. Johnson - Young Scientist
2001	John B. Masiunas - Education Bernard H. Zandstra - Education Patrick W. Geier - Professional Staff Douglas J. Maxwell - Professional Staff Kassin Al-Khatib - Research
2002	Paul L. Sprankle - Industry Thomas B. Threewitt - Industry Monica Elmes - Professional Staff John L. Luecke - Professional Staff Bryan Young - Young Weed Scientist
2003	Mark Loux - Education Kenneth Carlson - Industry Daniel E. Schroeder - Industry Andrew Chomas - Professional Staff Jeffrey Stachler - Professional Staff

## North Central Weed Science Society Information

### **Distinguished Achievement Award (continued)**

2004	Gordon Roskamp - Education Robert N. Klein - Education David Stoltenberg - Research Robert E. Wolf - Service Patrick J. Tranel - Young Weed Scientist
2005	Chris Boerboom - Education Dennis Belcher - Industry Anthony F. Dobbels - Professional Staff Curtis R. Thompson - Service Christy Sprague - Young Scientist
2006	Richard K. Zollinger - Education John R. Hinz - Industry Christy Shropshire - Professional Staff Glenn Nice - Service Dean E. Riechers - Young Scientist
2007	Douglas Doohan - Education Kevin Gibson - Young Scientist Martin M. Williams II - Young Scientist
2008	Frank Forcella - Research Anita Dille - Young Scientist Damian Franzenburg - Professional Staff Joseph Matthews - Professional Staff

## Herbicide Index

Common Name	Trade Name(s)	Manufacturer
2,4-D	Several	Several
2,4-D + triclopyr	Crossbow	Dow
2,4-DB	Butyrac	Albaugh
Acetochlor	Harness, Surpass, etc.	Monsanto, Dow
Acetochlor + atrazine	Harness Xtra, Keystone, etc	Monsanto, Dow
Acetochlor + flumetsulam + clopyralid	SureStart	Dow
Acifluorfen	Ultra Blazer	United Phosphorus
Acifluorfen + bentazon	Storm	United Phosphorus
Alachlor	Intrro, Micro-Tech	Monsanto
Ametryn	Evik	Syngenta
Aminocyclopyrachlor	None	DuPont
Aminopyralid	Milestone	Dow
Aminopyralid + 2,4-D	Forefront	Dow
Atrazine	Several	Several
Atrazine + s-metolachlor	Bicep II Magnum, etc.	Syngenta, etc.
Benfen	Balan	Loveland
Bensulide	Prefar	Gowan
Bentazon	Basagran	Arysta
Bromacil	Hyvar	DuPont
Bromacil + diuron	Krovar I	DuPont
Bromoxynil	Buctril	Bayer
Bromoxynil + MCPA	Bronate Advanced	Bayer
Carfentrazone-ethyl	Aim	FMC
Chlorimuron-ethyl	Classic	DuPont
Chlorimuron + metribuzin	Canopy	DuPont
Chlorimuron + thifensulfuron	Synchrony XP	DuPont
Chlorimuron + tribenuron	Canopy EX	DuPont
Chlorsulfuron	Glean, Telar	DuPont
Chlorsulfuron + metsulfuron	Finesse	DuPont
Chlorsulfuron + flucarbazone	Finesse Grass & Broadleaf	DuPont
chlorsulfuron + sulfometuron + sulfentrazone	Throttle	DuPont
Clethodim	SelectMax	Valent
Clodinafop	Discover	Syngenta
Clomazone	Command	FMC
Clopyralid	Stinger	Dow
Clopyralid + 2,4-D	Curtail, Commando	Dow, Albaugh
Clopyralid + MCPA	Cutback M	Dow
Cloransulam-methyl	FirstRate	Dow
Cloransulam-methyl + flumetsulam	Frontrow	Dow
Cycloate	Ro-Neet	Helm Agro
DCPA	Dacthal	Amvac
Desmedipham	Betanex	Bayer
desmedipham + phenmedipham + ethofumesate	Progress	Bayer
Dicamba	Banvel, etc.	Micro Flo
Dicamba + atrazine	Rifle Plus	Loveland
Dicamba + diflufenzopyr	Distinct, Overdrive, Status	BASF
Dichlobenil	Casoron	Chemtura
Dichlorprop (2,4-DP)	Several	Several
Diclosulam	Strongarm	Dow
Diflufenzopyr	BAS 654	BASF
Dimethenamid-P	Outlook	BASF
Dimethenamid-P + atrazine	Guardsman Max, Gmax Lite	BASF
Dimethipin	Harvade	Chemtura
Diquat	Reglone	Syngenta
Dithiopyr	Dimension	Dow
Diuron	Karmex, Direx	Several
Endothall	Several	Elf Atochem
EPTC	Eptam, Eradicane	Gowan
Ethalfuralin	Curbit	Loveland
Ethalfuralin + clomazone	Strategy	Loveland
Ethametsulfuron	Muster	DuPont
Ethofumesate	Nortron	Bayer
Fenoxaprop	Acclaim, Puma, Whip	Bayer
Florasulam + MCPA-Ester	Orion	Syngenta
Fluazifop-P	Fusilade DX	Syngenta
Fluazifop-P + fenoxaprop	Fusion	Syngenta
Flucarbazone	Everest	Bayer
Flufenacet	Define	Bayer
Flumetsulam	Python	Dow
Flumetsulam + clopyralid	Hornet	Dow
Flumeturon	Cotoran	Syngenta
Flumiclorac	Resource	Valent
Flumioxazin	Valor	Valent

## Herbicide Index

Common Name	Trade Name(s)	Manufacturer
Flumioxazin + chlorimuron	Valor XLT	Valent
Flumioxazin + cloransulam-methyl	Gangster	Valent
Fluroxypyr	Starane, etc.	Dow
Fluroxypyr + aminopyralid	CleanWave	Dow
Fluroxypyr + bromoxynil	Starane NXT	Dow
Fluroxypyr + clopyralid	WideMatch	Dow
Fomesafen	Flexstar, Reflex	Syngenta
Fomesafen + glyphosate	Flexstar GT	Syngenta
Foramsulfuron	Option	Bayer
Foramsulfuron + iodosulfuron	Equip	Bayer
Fosamine	Krenite	DuPont
Glufosinate	Ignite, Finale, Rely	Bayer
Glyphosate	Several	Several
Glyphosate + 2,4-D	Landmaster BW	Monsanto
Halosulfuron	Permit, Manage, Sempra	Gowan
Halosulfuron + dicamba	Yukon	Gowan
Hexazinone	Velpar	DuPont
Hexazinone + diuron	Velpar Alfamax	DuPont
Hexazinone + sulfometuron	Westar	DuPont
Imazamethabenz	Assert	Nufarm
Imazamox	Raptor, Beyond	BASF
Imazapic	Plateau	BASF
Imazapyr	Arsenal, Chopper, Habitat	BASF
Imazapyr + imazethapyr	Lightning	BASF
Imazapyr + sulfometuron + metsulfuron	Lineage HWC, Lineage Prep	DuPont
Imazapyr + metsulfuron	Lineage, Clearstand	DuPont
Imazaquin	Scepter, Image	BASF
Imazethapyr	Pursuit	BASF
Imazethapyr + glyphosate	Extreme	BASF
Iodosulfuron	Autumn	Bayer
Isoxaben	Gallery	Dow
Isoxaflutole	Balance Pro	Bayer
Isoxaflutole + thiencazabone-methyl	Corvus	Bayer
Lactofen	Cobra, Phoenix	Valent
Linuron	Lorox, Linex	DuPont
MCPA	Several	Several
MCPB	Thistrol	NuFarm
Mecoprop (MCP)	Several	Several
Mesosulfuron	Osprey, Silverado	Bayer
Mesosulfuron + propoxycarbazone	Olympus Flex	Bayer
Mesosulfuron-methyl	Osprey, Silverado	Bayer
Mesotrione	Callisto, Tenacity	Syngenta
Mesotrione + s-metolachlor	Camix	Syngenta
Mesotrione + s-metolachlor + atrazine	Lexar, Lumax	Syngenta
Mesotrione + s-metolachlor + glyphosate	Halex GT	Syngenta
Metribuzin	Several	Several
Metsulfuron	Ally, Escort, Cimarron	DuPont
Metsulfuron + chlorsulfuron	Cimarron Plus, Cimarron X'tra	DuPont
Metsulfuron + 2,4-D + dicamba	Cimarron Max	DuPont
Metsulfuron + tribenuron + thifensulfuron	Ally Extra	DuPont
Molinate	Ordram	Syngenta
MSMA	Several	Several
Napropamide	Devrinol	United Phosphorus
Naptalam	Alanap	Chemtura
Nicosulfuron	Accent	DuPont
Nicosulfuron + thifensulfuron	Stout	DuPont
Norflurazon	Solicam	Syngenta
Oryzalin	Surflan	Dow
Oxadiazon	Ronstar	Bayer
Oxyfluorfen	Goal	Dow
Paraquat	Gramoxone Inteon	Syngenta
Pendimethalin	Prowl, etc.	BASF
Phenmedipham	Spin-aid	Bayer
phenmedipham + desmedipham	Betamix	Bayer
Picloram	Tordon, etc.	Dow
Pinoxaden	Axial XL	Syngenta
Primisulfuron	Beacon	Syngenta
primisulfuron + dicamba	NorthStar	Syngenta
primisulfuron + prosulfuron	Exceed, Spirit	Syngenta
Prodiamine	Barricade	Syngenta
Prometon	Pramitol	Syngenta
Prometryn	Caparol	Syngenta
Pronamide	Kerb	Dow
Propanil	Stam, Strel, Stampede	Dow

## Herbicide Index

Common Name	Trade Name(s)	Manufacturer
Propoxycarbazone	Olympus	Bayer
Prosulfuron	Peak	Syngenta
Pyraflufen	Vida	Gowan
Pyrasulfotole + bromoxynil	Huskie	Bayer
Pyrazon	Pyramin	Arysta
pyrithiobac sodium	Staple	DuPont
Pyroxasulfone	KIH-485	Kumiai
Pyroxulam	Powerflex	Dow
Quinclorac	Facet, Drive, Paramount	BASF
Quizalofop	Assure II, Targa	DuPont, Gowan
Rimsulfuron	Matrix, Titus, Resolve	DuPont
rimsulfuron + nicosulfuron	Steadfast	DuPont
rimsulfuron + thifensulfuron	Basis, Resolve Q	DuPont
Saflufenacil	Sharpen	BASF
Saflufenacil + dimethenamid-P	Integrity	BASF
Saflufenacil + imazethapyr	Optill	BASF
Sethoxydim	Poast, Poast Plus	BASF
sethoxydim + bentazon	Clearmax	BASF
Siduron	Tupersan	Gowan
Simazine	Princep	Syngenta
s-metolachlor	Dual II Magnum, etc.	Syngenta, etc.
s-metolachlor + metribuzin	Boundary	Syngenta
Sulfentrazone	Spartan	FMC
sulfentrazone + cloransulam-methyl	Sonic, Authority First	Dow, FMC
sulfentrazone + imazethapyr	Authority Assist	FMC
sulfentrazone + metribuzin	Authority MTZ	FMC
sulfometuron-methyl	Oust	DuPont
sulfometuron + chlorsulfuron	Landmark XP	DuPont
sulfometuron + metsulfuron	Oust Extra	DuPont
sulfometuron + hexazinone	Oustar	DuPont
Sulfosulfuron	Maverick, Outrider	Monsanto
Tebuthiuron	Spike	Dow
Tembotrione	Laudis	Bayer
Tembotrione + thiencazabone-methyl	Capreno	Bayer
Terbacil	Sinbar	Tessenderlo Kerley
Thiazopyr	Visor, Mandate	Dow
Thidiazuron	Dropp	Bayer
thifensulfuron-methyl	Harmony SG	DuPont
thifensulfuron-methyl + tribenuron	Harmony Extra, Affinity Broadspec, etc.	DuPont
Thifensulfuron + tribenuron + metsulfuron + dicamba	Agility SG	DuPont
Thiobencarb	Bolero	Valent
Topramezone	Impact	Amvac
Tralkoxydim	Achieve	Syngenta
Triallate	Far-Go	Gowan
Triasulfuron	Amber	Syngenta
triasulfuron + dicamba	Rave	Syngenta
tribenuron-methyl	Express	DuPont
Triclopyr	Garlon, Remedy, etc.	Dow
triclopyr + fluroxypyr	PastureGard	Dow
Trifloxysulfuron	Envoke, Monument	Syngenta
Trifluralin	Treflan, etc.	Dow
triflusaluron-methyl	UpBeet	DuPont

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**2009**

**64th Annual Meeting**

**North Central Weed Science Society**

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**December 7 – 10, 2009**

**Hyatt Regency Crown Center**

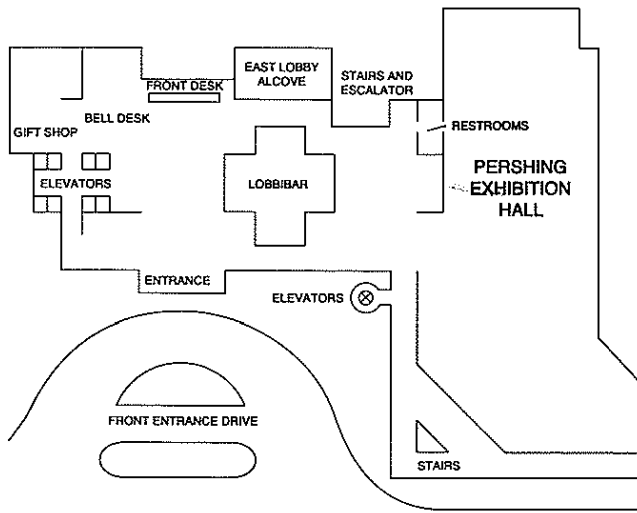
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**\*Please bring this program to the conference\***

## Time Schedule

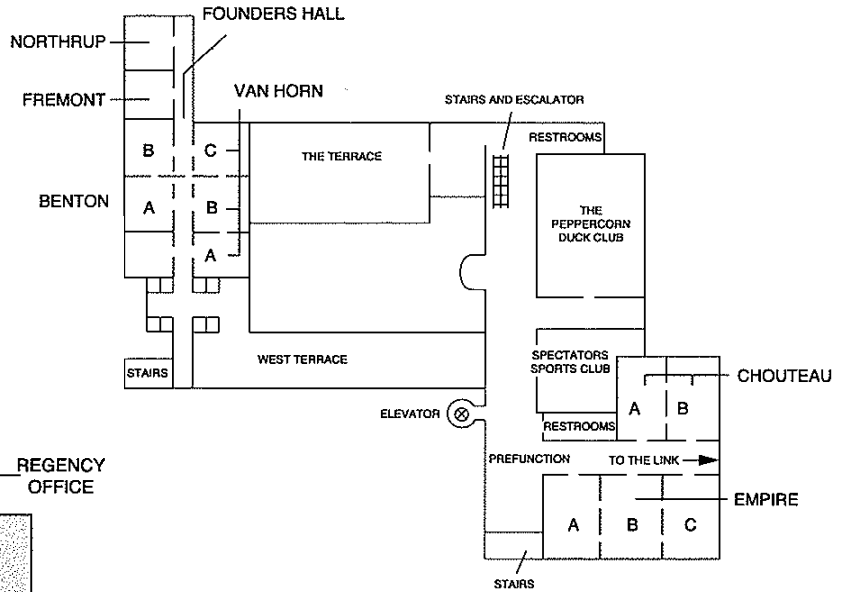
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Time	Tuesday	Wednesday	Thursday
8:00	Poster Session I		
8:15			
8:30			
8:45			
9:00			
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9:30			
9:45			
10:00	General Session		
10:15			
10:30			
10:45			
11:00			
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12:00			Conference End
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5:00	Poster Session II		
5:15			
5:30		Industry Mixer	
5:45			



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