



**2012**

**67th Annual Meeting**

**North Central Weed Science Society**

---

**[www.ncwss.org](http://www.ncwss.org)**

---

**December 10 – 13, 2012**

**Hyatt Regency at the Arch**

**St. Louis, MO**

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

# President's Welcome

## ***2012 North Central Weed Science Society Meeting***

Welcome to St. Louis and the 67th annual meeting of the North Central Weed Science Society.

This event is paramount in the mission of the NCWSS to deliver research, education and training to persons responsible for weeds and their management. This conference provides professional opportunities to learn and share the latest scientific advances and research/outreach techniques for weed management as well as provide the social setting to network within the weed science community and catch up with old or new friends. Our annual goal is to provide a conference that meets your expectations for quality, content, venue, and atmosphere.

Emilio Oyarzabal and the local arrangements committee have done an excellent job of preparing the hotel for our meeting. The Hyatt Regency St. Louis will provide a spacious, high quality site and outstanding services. St. Louis is a great city for our meeting with diverse restaurants, exciting nightlife and many local attractions.

Program Chair, Dave Johnson, has put forth a yeoman's effort to develop the conference program with the symposia "Invasive potential of biofuel crops" and "Finding a career in weed science" in addition to "What's New in Industry" and the traditional oral paper and poster sections. An excellent preconference tour of Monsanto's Biotechnology Center and the Missouri Botanical Garden is a product of the combined effort of Dave and Emilio which should prove to be a tremendous activity.

The success of the NCWSS depends on your active participation through attendance and presentations as well as through your service on committees or as a NCWSS officer. Every committee of the society will meet during the conference. Please feel free to attend any committee meetings that interest you and please volunteer to serve. Committee assignments will be made shortly after this meeting, so please indicate your willingness to serve to the committee chair or to Dave Johnson. Both you and the society will benefit from your involvement.

It has been a great privilege to serve you as President of the NCWSS. I look forward to seeing you at the meeting and thank you for your continued active service and support of the NCWSS.

Bryan Young  
President

# **General Information**

## ***Conference Headquarters***

All sessions of the conference and the banquet will be held at the Hyatt Regency St. Louis at the Arch, 315 Chestnut Street, St. Louis, MO 63102; Phone 314-655-1234.

## ***Registration***

Registration is required to attend the conference. Pre-registration is **\$240** (includes banquet). Registration at the conference is **\$290**. Honorary members and Fellows pre-registration is **\$170**; registration at the conference is **\$220**.

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

Industry breakfast tickets are available to everyone for **\$30**.

## ***Registration Hours***

The registration desk (Prefunction area) will be open Monday 4 to 6:30 pm, Tuesday 7:30 am to 4 pm, Wednesday 8 to 11 am and 2 to 4 pm, and Thursday 8 to 10 am.

## ***Local Arrangements Headquarters***

Mills Studio 3

## ***Meeting Rooms***

All sessions and meetings will be on the 4<sup>th</sup> floor of the hotel. Additional meetings may be arranged any time during the conference by contacting Emilio Oyarzabal, Local Arrangements Chair.

## ***Proceedings***

2012 NCWSS Proceedings will be available following the meeting online at the NCWSS website. Hard copies of the Proceedings may be ordered from Curran Associates (<http://www.proceedings.com/>).

## ***Sustaining Members***

Sustaining members that have made prior arrangements with the Industry Chair may put up a display in the Prefunction area. 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 2012

All meetings will be on the 4<sup>th</sup> floor of the hotel.

## ***Board of Directors***

Monday, 1:00 pm	Mills Studio 6
Wednesday, 7:00 pm	Mills Studio 6

## ***Local Arrangements***

Monday, 11:00 am	Mills Studio 3
Thursday, 12:00 am (with 2013 committee)	Mills Studio 3

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

Judges breakfast, Tuesday, 7:00 am	Park View
Paper Judges, Tuesday, 7:15 am	Park View
Poster Judges, Tuesday, 7:15 am	Park View
Paper Judges, Tuesday, 5:00 pm	Mills Studio 7
Poster Judges, Tuesday, 5:00 pm	Mills Studio 8

## ***Meal Functions***

### **Breaks**

Tuesday, 7:30 - 9:30 am	Prefunction
Tuesday, 2:45– 3:30 pm	Prefunction
Wednesday, 9:30 – 10:15 am*	Prefunction
*Sponsored by Gylling Data Management	
Wednesday, 3:00 – 3:45 pm	Prefunction
Thursday, 9:45 – 10:30 am	Prefunction

### **Student Mixer and Quiz Bowl**

*Sponsored by BASF Corporation*

Monday, 6:30 pm	Park View
-----------------	-----------

### **Student Luncheon/Business Meeting**

*Sponsored by Dow AgroSciences*

Tuesday, 12:00 – 1:15 pm	Park View
--------------------------	-----------

### **Society Awards Luncheon**

*MC: Dave Ruen*

Wednesday, 11:30 am	Grand Ballroom D
---------------------	------------------

### **Society Social**

*Sponsored by Industry – Open to all attendees*

Wednesday, 5:30 – 7:00 pm	Park View
---------------------------	-----------

### **Industry Breakfast (Cost \$30)**

Thursday, 7:00 am	Park View
-------------------	-----------

# Meetings of the Society 2012

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 2014. 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 Mills Studio 6

### **Distinguished Achievement Award**

Tuesday, 12:00 pm Mills Studio 1

### **Strategic Planning**

Tuesday, 4:30 pm Mills Studio 6

### **Paper Judges**

Tuesday, 5:00 pm Mills Studio 7

### **Poster Judges**

Tuesday, 5:00 pm Mills Studio 8

### **Finance, Steering, & Policy**

Tuesday, 5:30 pm Mills Studio 1

### **Future Site Selection**

Tuesday, 5:30 pm Mills Studio 2

### **Nominating**

Tuesday, 5:30 pm Mills Studio 4

### **Resident Education, Summer Contest, and Contest Rules Joint meeting**

Wednesday, 7:00 am Mills Studio 6

### **Extension (Committee and Business Meeting)**

Wednesday, 11:00 am Grand Ballroom A

### **NCWSS Fellow**

Wednesday, 5:00 pm Mills Studio 7

### **Resolutions & Necrology**

Wednesday, 5:00 pm Mills Studio 1

### **Invasive Plants**

Wednesday, 5:15 pm Mills Studio 5

### **Industry (committee and Business Meeting)**

Thursday, 8:00 am Park View

# Meetings of the Society 2012

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

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

No meeting this year

Agronomic Crops II (Corn, Sorghum)

Wednesday, 3:00 pm

Grand Ballroom BC

Agronomic Crops III (Soybeans, Legumes)

Wednesday, 11:00 am

Grand Ballroom BC

Equipment and Application Methods

Thursday, 11:00 am

Grand Ballroom BC

Extension

Wednesday, 11:00am

Grand Ballroom A

Forestry/Industrial/Turf/Aquatics/Forage/Range

Wednesday, 3:15 pm

Grand Ballroom H

Extension

Wednesday, 11:00am

Grand Ballroom A

Herbicide Physiology

Tuesday, 4:45 pm

Grand Ballroom H

Horticulture & Ornamentals

Wednesday, 3:00 pm

Grand Ballroom A

Poster Session

Monday, 6:00 pm

Prefunction

Weed Biology, Ecology & Management

Tuesday, 4:45 pm

Grand Ballroom A

Invasive Plants

No meeting this year

## ***Special Interest Groups***

Graduate Students (at luncheon)

Tuesday, 12:00 pm

Park View

Industry (at breakfast)

Thursday, 7:00 am

Park View

## ***Symposia***

Student Symposium: Finding a Career in Weed Science

Wednesday, 8:00 – 11:30 am

Park View

Invasive Potential of Biofuels

Thursday, 8:15 – 11:45 am

Grand Ballroom A

What's New in Industry?

Wednesday, 3:30 – 5:00 pm

Grand Ballroom D

# **Condensed Program – NCWSS 2012**

## **Monday, December 10**

1:00 pm	Board of Directors Meeting	Mills Studio 6
1:00 – 9:30 pm	Poster Setup	Prefunction
6:30 pm	Student Mixer and Quiz Bowl	Park View

## **Tuesday, December 11**

8:00 – 9:45	Poster Session I	Prefunction
10:00 – 12:00	NCWSS General Session	Grand Ballroom D
12:00 – 1:15	Graduate Luncheon	Park View
1:15 – 4:45	Soybeans/Legumes	Grand Ballroom BC
1:15 – 5:00	Weed Biology & Ecology	Grand Ballroom A
1:15 – 5:00	Herbicide Physiology + Mixed Contest I	Grand Ballroom H
1:15 – 4:45	Corn/Sorghum + Mixed Contest II	Grand Ballroom FG
5:00 – 6:00	Poster Session II	Prefunction

## **Wednesday, December 12**

8:00 – 11:15	Student Symposium: Finding a Career in Weed Science	Park View
8:00 – 11:15	Soybeans/Legumes	Grand Ballroom BC
8:45 – 11:15	Extension	Grand Ballroom A
1:30 – 3:15	Corn/Sorghum	Grand Ballroom BC
1:30 – 3:30	Forestry/Industrial/Turf/ Aquatics/Forage/Range	Grand Ballroom H
1:30 – 3:15	Horticulture and Ornamentals	Grand Ballroom A
3:30 – 5:00	What's New in Industry?	Grand Ballroom D
5:30 – 7:00	Society Social-Open to all attendees	Park View
7:00 – 9:00	Board of Directors Meeting	Mills Studio 6

## **Thursday, December 13**

7:00 – 8:15	Industry Breakfast	Park View
8:15 – 11:15	Equipment and Application Methods	Grand Ballroom BC
8:25 – 11:45	Symposium: Invasive Potential of Biofuel Crops	Grand Ballroom A

## Poster Sessions

Room: Prefunction

Chairperson and Moderator: Gordon Vail

### Poster Setup

Posters can be set up between 1:00 and 9:30 pm on Monday, December 10. All posters will be on display from 8:00 am Tuesday, December 11 through 4:00 pm Wednesday December 14.

**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 11

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 4:00 and 5:00 pm on Wednesday.

### 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

**Wheat Impacts Control of Horseweed (*Conyza canadensis*) and Giant Ragweed (*Ambrosia trifida*).** James R. Martin\*, Jesse L. Gray, Dorothy L. Call; University of Kentucky, Princeton, KY (1)

**Spring Wheat Yield after Glyphosate Exposure at Emergence.** Mike J. Moechnig\*, Darrell L. Deneke, David A. Vos, Jill K. Alms; South Dakota State University, Brookings, SD (2)

**†Wheat Response to Glyphosate Drift or Contamination.** Andrew N. Fillmore\*, Kirk A. Howatt; NDSU, Fargo, ND (3)

## Corn/Sorghum Posters

**Control of HPPD-Resistant Waterhemp in Corn and Soybean.** Neha Rana\*<sup>1</sup>, Jon E. Scott<sup>1</sup>, Aaron S. Franssen<sup>2</sup>, Stevan Z. Knezevic<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Syngenta Crop Protection, Seward, NE (4)

**Control of HPPD-Resistant Waterhemp with Mesotrione and Tankmixes Applied Preemergence.** Neha Rana\*<sup>1</sup>, Jon E. Scott<sup>1</sup>, Aaron S. Franssen<sup>2</sup>, Stevan Z. Knezevic<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Syngenta Crop Protection, Seward, NE (5)

**Enlist™ Ahead.** Joe Armstrong\*<sup>1</sup>, Tami Jones-Jefferson<sup>2</sup>, Mark A. Peterson<sup>2</sup>, David E. Hillger<sup>2</sup>, Jonathan A. Huff<sup>3</sup>; <sup>1</sup>Dow AgroSciences, Davenport, IA, <sup>2</sup>Dow AgroSciences, Indianapolis, IN, <sup>3</sup>Dow AgroSciences, Herrin, IL (6)

**Agronomic Performance of Enlist™ Corn.** David M. Simpson\*<sup>1</sup>, Jim W. Bing<sup>1</sup>, Scott C. Ditmarsen<sup>2</sup>, Doug J. Spaunhorst<sup>3</sup>, Neil A. Spomer<sup>4</sup>; <sup>1</sup>Dow AgroSciences, Indianapolis, IN, <sup>2</sup>Dow AgroSciences, Madison, WI, <sup>3</sup>University of Missouri-Columbia, Columbia, MO, <sup>4</sup>Dow AgroSciences, Brookings, SD (7)

**†The Influence of 2,4-D and Drift Reduction Technologies on the Efficacy of Glyphosate or Glufosinate on Fall Panicum.** Lucas A. Harre\*, Bryan G. Young, Joseph L. Matthews, Julie M. Young; Southern Illinois University, Carbondale, IL (8)

## Corn/Sorghum Posters (cont.)

**Volunteer Soybean Competition and Control in Corn.** Jill K. Alms\*, David A. Vos, Mike J. Moechnig, Darrell L. Deneke; South Dakota State University, Brookings, SD (9)

**Dandelion Competition in Corn.** David A. Vos\*, Jill K. Alms, Mike J. Moechnig, Darrell L. Deneke; South Dakota State University, Brookings, SD (10)

**†Tolerance of Seed Corn Inbreds to Postemergence Applications of Rimsulfuron + Mesotrione + Isoxadifen-ethyl or Nicosulfuron + Isoxadifen-ethyl.** Nicholas R. Steppig\*<sup>1</sup>, Larry H. Hageman<sup>2</sup>, Helen A. Flanigan<sup>3</sup>, Patrick M. McMullan<sup>4</sup>; <sup>1</sup>DuPont Crop Protection, Rochelle, IL, <sup>2</sup>DuPont Crop Protection, Rochelle, IL, <sup>3</sup>DuPont, Greenwood, IN, <sup>4</sup>DuPont Pioneer, Johnston, IA (11)

## Soybean/Legume Posters

**†Survey of Giant Ragweed Infestation Levels in Ohio Soybean Fields.** JD Bethel\*, Mark M. Loux, Jason T. Parrish; The Ohio State University, Columbus, OH (12)

**Residual Control of Waterhemp with Dicamba.** Seth T. Logan\*<sup>1</sup>, Bryan G. Young<sup>2</sup>, Sara M. Allen<sup>3</sup>; <sup>1</sup>Monsanto Company, Pinckneyville, IL, <sup>2</sup>Southern Illinois University, Carbondale, IL, <sup>3</sup>Monsanto Company, St. Louis, MO (13)

**Perceived Likelihood for Weeds to Evolve Resistance to Dicamba.** Roberto J. Crespo<sup>1</sup>, Mark L. Bernards\*<sup>2</sup>, Robert Peterson<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>2</sup>Western Illinois University, Macomb, IL, <sup>3</sup>Montana State University, Bozeman, MT (14)

**Integration of Dicamba into Soybean (*Glycine max*) Production Systems for Control of Glyphosate-Resistant Palmer Amaranth (*Amaranthus palmeri*).** Reid J. Smeda\*<sup>1</sup>, Lawrence E. Steckel<sup>2</sup>, Simone Seifert-Higgins<sup>3</sup>; <sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>University of Tennessee, Jackson, TN, <sup>3</sup>Monsanto, St. Louis, MO (15)

## Soybean/Legume Posters (cont.)

**Dicamba Contributes Residual Weed Control to Roundup Ready® 2 Xtend Soybean Systems.** John B. Willis\*<sup>1</sup>, Christopher D. Kamienski<sup>2</sup>, Mayank S. Malik<sup>3</sup>, Simone Seifert-Higgins<sup>4</sup>; <sup>1</sup>Monsanto, Hanson, KY, <sup>2</sup>Monsanto Company, Washington, IL, <sup>3</sup>Monsanto, Lincoln, NE, <sup>4</sup>Monsanto, St. Louis, MO (16)

**Weed Control with BAS18322H in Corn and Dicamba-Tolerant Soybean.** Jon E. Scott\*<sup>1</sup>, Leo D. Charvat<sup>2</sup>, Neha Rana<sup>1</sup>, Stevan Z. Knezevic<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>BASF Corporation, Lincoln, NE (17)

**Integrated Management of Difficult to Control Weeds in Dicamba Tolerant Soybeans in Nebraska.** Jeffrey Golus\*<sup>1</sup>, Ryan S. Henry<sup>2</sup>, Lowell Sandell<sup>3</sup>, Mayank S. Malik<sup>4</sup>, Simone Seifert-Higgins<sup>5</sup>, Greg R. Kruger<sup>2</sup>; <sup>1</sup>University of Nebraska, Lincoln, North Platte, NE, <sup>2</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>4</sup>Monsanto, Lincoln, NE, <sup>5</sup>Monsanto, St. Louis, MO (18)

**Performance of Commercial Track Glyphosate and Dicamba Tolerant Soybean Varieties.** Cindy L. Arnevik\*<sup>1</sup>, Mindy Devries<sup>2</sup>, Mark Lubbers<sup>3</sup>, Joe Cordes<sup>4</sup>; <sup>1</sup>Monsanto Company, St. Louis, MO, <sup>2</sup>Monsanto Company, Huxley, IA, <sup>3</sup>Monsanto Company, Wichita, KS, <sup>4</sup>Monsanto Company, Jerseyville, IL (19)

**†Weed Control in Soybean as Influenced by Residual Herbicide Use and Glyphosate Application Timing Following Different Planting Dates.** Ryan P. DeWerff\*, Shawn P. Conley, Vince M. Davis; University of Wisconsin-Madison, Madison, WI (20)

**†Glufosinate with Tank Mixtures and Application Timing.** Richard A. Weisz\*<sup>1</sup>, Rich Zollinger<sup>1</sup>, Angela J. Kazmierczak<sup>1</sup>, Devin A. Wirth<sup>2</sup>; <sup>1</sup>North Dakota State University, Fargo, ND, <sup>2</sup>NDSU, Fargo, ND (21)

**†Effectiveness of Combinations of Glyphosate and Glufosinate on Glyphosate-Resistant Horseweed.** Tyler Johnson\*, Mark M. Loux, Anthony Dobbels; The Ohio State University, Columbus, OH (22)

## Soybean/Legume Posters (cont.)

**†Effect of Early-season Weed Control on Nutrient Competition and Yield in Soybean.** Nick T. Harre\*<sup>1</sup>, Bryan G. Young<sup>1</sup>, Scott Cully<sup>2</sup>, Brett R. Miller<sup>3</sup>, Mark Kitt<sup>4</sup>; <sup>1</sup>Southern Illinois University, Carbondale, IL, <sup>2</sup>Syngenta Crop Protection, Marion, IL, <sup>3</sup>Syngenta, Minnetonka, MN, <sup>4</sup>Syngenta Crop Protection, Minnetonka, MN (23)

**†Efficacy of Preemergence Versus Postemergence Herbicides on Glyphosate-Resistant Horseweed (*Conyza canadensis*) in Soybean (*Glycine max*).** Cody D. Cornelius\*, Reid J. Smeda, Carey F. Page; University of Missouri, Columbia, MO (24)

**†A Rapid, High-Throughput Molecular Assay for the Robust Genotypic Determination of Waterhemp Resistant to Protoporphyrinogen Oxidase (PPO)-Inhibiting Herbicides.** R. Joseph Wuerffel\*<sup>1</sup>, Bryan G. Young<sup>1</sup>, David A. Lightfoot<sup>1</sup>, Patrick Tranel<sup>2</sup>, Ahmad M. Fakhoury<sup>1</sup>; <sup>1</sup>Southern Illinois University, Carbondale, IL, <sup>2</sup>University of Illinois, Urbana, IL (25)

**†Effects of Flaming and Cultivation on Weed Control and Yield in Organic Soybean as Influenced by Manure Application.** Strahinja V. Stepanovic\*<sup>1</sup>, Avishek Datta<sup>2</sup>, Neha Rana<sup>3</sup>, Brian D. Neilson<sup>4</sup>, Chris Bruening<sup>1</sup>, George Gogos<sup>1</sup>, Stevan Z. Knezevic<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska-Lincoln, Concord, NE, <sup>4</sup>University of Nebraska-Lincoln, Lincoln, NE (26)

**Glyphosate-Resistant Giant Ragweed in Ontario.** Nader Soltani\*<sup>1</sup>, Joanna Follings<sup>2</sup>, Mark Lawton<sup>3</sup>, François Tardif<sup>2</sup>, Darren E. Robinson<sup>4</sup>, Peter Sikkema<sup>5</sup>; <sup>1</sup>University of Guelph Ridgetown Campus, Ridgetown, ON, <sup>2</sup>University of Guelph, Guelph, ON, <sup>3</sup>Monsanto Canada, Guelph, ON, <sup>4</sup>University of Guelph, Ridgetown, ON, <sup>5</sup>University of Guelph - Ridgetown Campus, Ridgetown, ON (27)

**Selectivity of an HPPD-Tolerant Soybean Event.** Jayla Allen<sup>1</sup>, John Hinz\*<sup>2</sup>, Michael L. Weber<sup>3</sup>; <sup>1</sup>Bayer CropScience, Research Triangle Park, NC, <sup>2</sup>Bayer CropScience, Story City, IA, <sup>3</sup>Bayer CropScience, Indianola, IA (28)

## Soybean/Legume Posters (cont.)

**†Efficacy of PRE and POST Herbicides for Controlling Multiple-Resistant Palmer Amaranth in Michigan.** David Powell\*, Christy Sprague; Michigan State University, East Lansing, MI (29)

**Glyphosate-Resistant Canada Fleabane in Ontario.** Nader Soltani\*<sup>1</sup>, Holly P. Byker<sup>2</sup>, Mark Lawton<sup>3</sup>, Darren E. Robinson<sup>4</sup>, François Tardif<sup>5</sup>, Peter Sikkema<sup>6</sup>; <sup>1</sup>University of Guelph Ridgetown Campus, Ridgetown, ON, <sup>2</sup>University of Guelph, Ridgetown Campus, Ridgetown, ON, <sup>3</sup>Monsanto Canada, Guelph, ON, <sup>4</sup>University of Guelph, Ridgetown, ON, <sup>5</sup>University of Guelph, Guelph, ON, <sup>6</sup>University of Guelph - Ridgetown Campus, Ridgetown, ON (30)

**†Soybean Response and Yield Implications of Postemergence Tank-mixtures in Glyphosate-Resistant Soybean.** Theresa A. Reinhardt\*<sup>1</sup>, Bryan G. Young<sup>1</sup>, Joseph L. Matthews<sup>1</sup>, Julie M. Young<sup>1</sup>, Douglas J. Maxwell<sup>2</sup>, Aaron G. Hager<sup>2</sup>, Mark L. Bernards<sup>3</sup>; <sup>1</sup>Southern Illinois University, Carbondale, IL, <sup>2</sup>University of Illinois, Urbana, IL, <sup>3</sup>Western Illinois University, Macomb, IL (31)

**Preemergence Palmer Amaranth Control with Fierce™ Herbicide in US Soybean Production.** Eric J. Ott\*<sup>1</sup>, Dawn Refsell<sup>2</sup>, Trevor M. Dale<sup>3</sup>, Gary W. Kirfman<sup>4</sup>, John A. Pawlak<sup>5</sup>; <sup>1</sup>Valent USA Corporation, Greenfield, IN, <sup>2</sup>Kansas State University, Manhattan, KS, <sup>3</sup>Valent USA Corporation, Sioux Falls, SD, <sup>4</sup>Valent USA Corporation, Ada, MI, <sup>5</sup>Valent USA Corporation, Lansing, MI (32)

## Equipment and Application Posters

**A New Smartphone App for Quick Reference of Spray Quality for Ground Applications.** Ryan S. Henry\*<sup>1</sup>, William E. Bagley<sup>2</sup>, Lowell Sandell<sup>3</sup>, Greg R. Kruger<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>2</sup>Wilbur-Ellis, San Antonio, TX, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE (33)

**†Influence of Nozzle Type and Spray Volume On Herbicide Coverage At Various Heights In The Canopy Of Soybean Grown In 15" Rows.** Travis Legleiter\*, William G. Johnson; Purdue University, West Lafayette, IN (34)

## Equipment and Application Posters (cont.)

**Tank Mixture of Hydrophilic and Lipophilic Herbicides with Adjuvants.** Devin A. Wirth\*<sup>1</sup>, Rich Zollinger<sup>2</sup>, Angela J. Kazmierczak<sup>2</sup>; <sup>1</sup>NDSU, Fargo, ND, <sup>2</sup>North Dakota State University, Fargo, ND (35)

**Proposed Dicamba Application Requirements for Roundup Ready® Xtend Cropping System.** Joe Sandbrink\*<sup>1</sup>, Jeff N. Travers<sup>1</sup>, Christopher D. Kamienski<sup>2</sup>, John B. Willis<sup>3</sup>; <sup>1</sup>Monsanto, St. Louis, MO, <sup>2</sup>Monsanto Company, Washington, IL, <sup>3</sup>Monsanto, Hanson, KY (36)

**Spray Quality Effects with Glufosinate and Additives.** Angela J. Kazmierczak\*<sup>1</sup>, Rich Zollinger<sup>1</sup>, William E. Bagley<sup>2</sup>; <sup>1</sup>North Dakota State University, Fargo, ND, <sup>2</sup>Wilbur-Ellis, San Antonio, TX (37)

**Reduction in Drift and Volatility of Enlist™ Duo with Colex-D™ Technology.** David E. Hillger\*<sup>1</sup>, Kuide Qin<sup>2</sup>, David M. Simpson<sup>1</sup>, Patrick Havens<sup>1</sup>; <sup>1</sup>Dow AgroSciences, Indianapolis, IN, <sup>2</sup>Dow AgroSciences, Indianapolis, IN (38)

**†Pre and Postemergence Herbicides on Weed Suppression in a Kentucky Bluegrass (*Poa pratensis*) and Perennial Ryegrass (*Lolium perenne*) Systems with a Conventional Sprayer and an Ultra-Low Volume Sprayer.** J Connor Ferguson\*<sup>1</sup>, Roch E. Gaussoin<sup>1</sup>, John A. Eastin<sup>2</sup>, Matt D. Sousek<sup>3</sup>, Greg R. Kruger<sup>4</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>Kamterter LLC, Waverly, NE, <sup>3</sup>University of Nebraska-Lincoln, Mead, NE, <sup>4</sup>University of Nebraska-Lincoln, North Platte, NE (39)

**Weed Control and Crop Response from Nonselective Herbicides Applied with Spray Hood Technology in Corn, Year Two.** Damian D. Franzenburg\*<sup>1</sup>, Micheal D. Owen<sup>2</sup>, Dean M. Grossnickle<sup>1</sup>, James F. Lux<sup>1</sup>; <sup>1</sup>Iowa State University, Ames, IA, <sup>2</sup>ISU, Ames, IA (40)

**Flow Rates of New Ground Application Nozzles.** Annah Geyer\*<sup>1</sup>, Ryan S. Henry<sup>2</sup>, Lowell Sandell<sup>3</sup>, William E. Bagley<sup>4</sup>, Greg R. Kruger<sup>2</sup>; <sup>1</sup>University of Nebraska Lincoln, North Platte, NE, <sup>2</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>4</sup>Wilbur-Ellis, San Antonio, TX (41)

## Equipment and Application Posters (cont.)

**†Droplet Size Analysis of a Glyphosate Solution as Influenced by Carrier Volume, Nozzle, and Pressure.** Cody F. Creech\*<sup>1</sup>, Annah Geyer<sup>2</sup>, Ryan S. Henry<sup>3</sup>, Lowell Sandell<sup>4</sup>, Greg R. Kruger<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, North Platte, NE, <sup>2</sup>University of Nebraska Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>4</sup>University of Nebraska-Lincoln, Lincoln, NE (42)

## Extension Posters

**Manual for Propane-Fueled Flame Weeding in Corn, Soybean, and Sunflower.** Stevan Z. Knezevic\*<sup>1</sup>, Avishek Datta<sup>2</sup>, Chris Bruening<sup>3</sup>, George Gogos<sup>3</sup>, Jon E. Scott<sup>1</sup>, Neha Rana<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska - Lincoln, Lincoln, NE (43)

**†Training on Herbicide Mode of Action and Crop Injury Symptoms.** Jessica L. Rinderer\*<sup>1</sup>, Bryan G. Young<sup>1</sup>, Sara M. Allen<sup>2</sup>, Randy McElroy<sup>2</sup>, Carolina Medina<sup>2</sup>, Jody R. Gander<sup>2</sup>; <sup>1</sup>Southern Illinois University, Carbondale, IL, <sup>2</sup>Monsanto Company, St. Louis, MO (44)

**†Survey: Impact and Management of Glyphosate-resistant Kochia in Kansas.** Amar S. Godar\*<sup>1</sup>, Phillip W. Stahlman<sup>2</sup>; <sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>Kansas State University, Hays, KS (45)

**Remotely Piloted Aircraft Systems and High Resolution Color Infrared Imagery for Assessing Herbicide Drift and Crop Conditions.** Dallas Peterson\*, Deon van der Merwe, Kevin Price, David Burchfield, Cathy Minihan; Kansas State University, Manhattan, KS (46)

**BASF's On-Target Application Academy: Educating Growers.** Walter E. Thomas\*, Maarten Staal, Steven J. Bowe, Luke L. Bozeman, Daniel Pepitone; BASF Corporation, Research Triangle Park, NC (47)

## **Forestry/Industrial/Turf/Aquatics/ Forage/Range Posters**

**Wild Violet Control Varies with Herbicide Selection and Triclopyr Rate.** Dan V. Weisenberger\*<sup>1</sup>, Aaron J. Patton<sup>2</sup>;  
<sup>1</sup>Purdue University, Lafayette, IN, <sup>2</sup>Purdue University, W. Lafayette, IN (48)

**Efficacy of Aminocyclopyrachlor Blends on Pasture Weeds.**  
Susan K. Rick\*<sup>1</sup>, Jeff H. Meredith<sup>2</sup>; <sup>1</sup>DuPont, Waterloo, IL,  
<sup>2</sup>DuPont, Memphis, TN (49)

**†Chemical Control Of English Ivy (*Hedera helix*).** Joseph Thomas\*<sup>1</sup>, Gregory R. Armel<sup>2</sup>, James Brosnan<sup>1</sup>, Jose J. Vargas<sup>3</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>BASF, Research Triangle Park, NC, <sup>3</sup>The University of Tennessee, Knoxville, TN (50)

**Saltcedar Control on the Cimarron National Grasslands.**  
Walter H. Fick\*<sup>1</sup>, Wayne A. Geyer<sup>2</sup>; <sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>Kansas State University, Manhattan, KS (51)

**†Effect of Organic Matter on Hybrid Bermudagrass Injury with Preemergence Herbicides in Sand-Based Rootzones.**  
Patrick A. Jones\*<sup>1</sup>, James Brosnan<sup>2</sup>, Dean A. Kopsell<sup>3</sup>, Gregory K. Breeden<sup>2</sup>; <sup>1</sup>University of Tennessee Knoxville, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN, <sup>3</sup>The University of Tennessee, Knoxville, TN (52)

**Herbicide Treatments for Goosegrass and Crabgrass Control in Tropical Turf.** Greg Wiecko\*; University of Guam, Mangilao, GU (53)

**Methods to Safen Mustard Seed Meal Applications on Creeping Bentgrass (*Agrostis stolonifera* L.) Putting Greens.**  
Joseph G. Schneider\*, John B. Haguewood, Xi Xiong;  
University of Missouri, Columbia, MO (54)

**Control of Crabgrass on Creeping Bentgrass (*Agrostis stolonifera* L.) Putting Greens Using Preemergence Herbicide.** John B. Haguewood\*, Xi Xiong; University of Missouri, Columbia, MO (55)



## Forestry/Industrial/Turf/Aquatics/ Forage/Range Posters (cont.)

**†Mowing Height Effects on Preemergence Herbicide Efficacy for Smooth Crabgrass Control.** Shane M. Breeden\*<sup>1</sup>, Daniel Farnsworth<sup>2</sup>, James Brosnan<sup>2</sup>, Gregory K. Breeden<sup>2</sup>; <sup>1</sup>Maryville College, Maryville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN (56)

## Herbicide Physiology Posters

**†Non-Target-Site Resistance to ALS Inhibitors in Waterhemp.** Jiaqi Guo\*<sup>1</sup>, Chance Riggins<sup>2</sup>, Nicholas E. Hausman<sup>1</sup>, Aaron G. Hager<sup>1</sup>, Dean E. Riechers<sup>1</sup>, Patrick Tranel<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana, IL, <sup>2</sup>University of Illinois Urbana Champaign, Urbana, IL (57)

**Inheritance of Phenoxy Resistance in Wild Radish (*Raphanus sativus*).** Mithila Jugulam\*<sup>1</sup>, Natalie DiMeo<sup>2</sup>, Michael Walsh<sup>3</sup>, J. Christopher Hall<sup>2</sup>; <sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>University of Guelph, Guelph, ON, <sup>3</sup>University of Western Australia, Perth, Australia (58)

**Increasing Saflufenacil Efficacy by Altering Spray Solution pH.** Jared M. Roskamp\*, William G. Johnson; Purdue University, West Lafayette, IN (59)

**†Association of EPSPS Gene Amplification with Glyphosate Resistance in Waterhemp.** Laura A. Chatham\*<sup>1</sup>, Chance Riggins<sup>1</sup>, Micheal D. Owen<sup>2</sup>, Patrick Tranel<sup>3</sup>; <sup>1</sup>University of Illinois Urbana Champaign, Urbana, IL, <sup>2</sup>ISU, Ames, IA, <sup>3</sup>University of Illinois, Urbana, IL (60)

**Investigating the Vacuole Pump in Glyphosate-Resistant Horseweed with <sup>31</sup>P NMR.** Xia Ge\*<sup>1</sup>, Dana A. d'Avignon<sup>1</sup>, Elizabeth Ostrander<sup>2</sup>, Joseph J. Ackerman<sup>1</sup>, Doug Sammons<sup>3</sup>; <sup>1</sup>Washington University in St Louis, St Louis, MO, <sup>2</sup>Monsanto, St Louis, MO, <sup>3</sup>Monsanto, St. Louis, MO (61)

## Herbicide Physiology Posters (cont.)

**Reduced Translocation is Associated with Common Lambsquarters Tolerance to Glyphosate.** Melinda K. Yerka<sup>1</sup>, Andrew Wiersma<sup>2</sup>, Bradley Lindenmayer<sup>3</sup>, Philip Westra<sup>3</sup>, Natalia de Leon<sup>1</sup>, David E. Stoltenberg\*<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison, Madison, WI, <sup>2</sup>Colorado State University, Ft. Collins, CO, <sup>3</sup>Colorado State University, Fort Collins, CO (62)

**Applications of Shikimate Coupled Assay for Field and Laboratory.** Keith Kretzmer\*<sup>1</sup>, Doug Sammons<sup>2</sup>, Dale Shaner<sup>3</sup>, David Rumeal<sup>4</sup>, Robert DeJarnette<sup>5</sup>; <sup>1</sup>Monsanto Company, St Louis, MO, <sup>2</sup>Monsanto, St. Louis, MO, <sup>3</sup>USDA, Fort Collins, CO, <sup>4</sup>USDA, St Louis, MO, <sup>5</sup>Monsanto, St Louis, MO (63)

**†Fitness of Glyphosate Resistant Giant Ragweed (*Ambrosia trifida* L.).** Kabelo Segobye\*, Burkhard Schulz, William G. Johnson, Stephen C. Weller; Purdue University, West Lafayette, IN (64)

**Comparison of DuPont's Transgenic Herbicide Tolerant Canola and Conventional Herbicide Resistant Canola Out-crossing Rates.** Tim J. Johnson\*; Pioneer, Ankeny, IA (65)

## Horticulture and Ornamentals Posters

**Fine Tuning Microrates for Early Season Broadleaf Weed Control in Onion.** Collin Auwarter\*<sup>1</sup>, Harlene M. Hatterman-Valenti<sup>2</sup>; <sup>1</sup>NDSU, Fargo, ND, <sup>2</sup>North Dakota State University, Fargo, ND (66)

**Benefits and Drawbacks of Adding PRE Applications of Fomesafen to Existing Herbicide Treatments for Weed Control in Vine Crops.** Darren E. Robinson\*, Dave Bilyea; University of Guelph, Ridgetown, ON (67)

**†Tolerance of Various Landscape Ornamentals to Postemergence Applications of Amicarbazone and Flucarbazone.** Tyler Campbell\*<sup>1</sup>, James Brosnan<sup>1</sup>, Jose J. Vargas<sup>2</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>The University of Tennessee, Knoxville, TN (68)

## Invasive Plants Posters

**Long-Term Yellow Toadflax Control in Rangeland with Aminocyclopyrachlor.** Brian M. Jenks\*, Tiffany D. Walter; North Dakota State University, Minot, ND (69)

**Evaluating the Wet-Blade Herbicide Application System for the Management of Canada Thistle (*Cirsium arvense*) Along Roadside Right-of-Ways.** Kevyn Juneau, Catherine S. Tarasoff\*; Michigan Technological University, Houghton, MI (70)

## Weed Biology/Ecology/Management Posters

**Reproductive Potential of Summer Annual Weeds Based on Termination Method and Timing.** Erin C. Taylor\*, Karen A. Renner, Christy Sprague; Michigan State University, East Lansing, MI (71)

**†Fitness of Sorghum, Shattercane and their F2 Hybrid.** Jared J. Schmidt\*<sup>1</sup>, Scott E. Sattler<sup>2</sup>, Aaron J. Lorenz<sup>3</sup>, Jeff F. Pedersen<sup>4</sup>, John L. Lindquist<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>USDA-ARS, University of Nebraska-Lincoln, Lincoln, NE, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>4</sup>USDA-ARS; University of Nebraska-Lincoln, Lincoln, NE (72)

**†Crop Canopy Effects on Kochia Seed Production.** Rutendo P. Nyamusamba\*, Mike J. Moechnig, David A. Vos, Jill K. Alms, Darrell L. Deneke; South Dakota State University, Brookings, SD (73)

**†Crop Canopy Effects on *Kochia scoparia* in Kansas.** Andrew Esser\*; Kansas State University, Manhattan, KS (74)

**DuPont's Perspectives on Managing Weed Resistance in North Central States.** David Saunders\*<sup>1</sup>, Larry H. Hageman<sup>2</sup>, Helen A. Flanigan<sup>3</sup>; <sup>1</sup>DuPont Crop Protection, Johnston, IA, <sup>2</sup>DuPont Crop Protection, Rochelle, IL, <sup>3</sup>DuPont, Greenwood, IN (75)

## Weed Biology/Ecology/Management Posters (cont.)

### **†Should Atrazine at Reduced Rates be Applied PRE or POST in Tank-mix Combinations to Improve Giant Ragweed Control in Corn?**

Ross A. Recker\*<sup>1</sup>, Vince M. Davis<sup>2</sup>;

<sup>1</sup>University of Wisconsin-Madison, Madison, WI, <sup>2</sup>University of Wisconsin-Madison, Madison, WI (76)

### **Giant Ragweed Control with Saflufenacil and Dicamba.**

Stevan Z. Knezevic\*<sup>1</sup>, Dejan Nedeljkovic<sup>2</sup>, Jon E. Scott<sup>1</sup>, Avishek Datta<sup>3</sup>, Neha Rana<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>University of Belgrade, Belgrade, Serbia, <sup>3</sup>Asian Institute of Technology, Bangkok, Thailand (77)

### **Giant Ragweed Resistance to Glyphosate in Nebraska.**

Stevan Z. Knezevic\*<sup>1</sup>, Dejan Nedeljkovic<sup>2</sup>, Jon E. Scott<sup>1</sup>, Avishek Datta<sup>3</sup>, Neha Rana<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>University of Belgrade, Belgrade, Serbia, <sup>3</sup>Asian Institute of Technology, Bangkok, Thailand (78)

### **†Giant Ragweed Resistance to Glyphosate in Wisconsin.**

Courtney E. Glettner\*<sup>1</sup>, Melinda K. Yerka<sup>1</sup>, James K. Stute<sup>2</sup>, Timothy L. Trower<sup>1</sup>, David E. Stoltenberg<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison, Madison, WI, <sup>2</sup>University of Wisconsin-Madison, Janesville, WI (79)

### **Common Sunflower and Giant Ragweed Emergence Profiles in Kansas.**

Anita Dille\*<sup>1</sup>, Analiza H. Ramirez<sup>2</sup>; <sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>University of Florida, Lake Alfred, FL (80)

### **Response of Giant Ragweed Biotypes to Soil Microbial**

**Pathogens.** Jessica R. Schafer\*<sup>1</sup>, Steven G. Hallett<sup>2</sup>, William G. Johnson<sup>2</sup>; <sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Purdue University, West Lafayette, IN (81)

### **Evaluation of a Putative HPPD-Resistant Palmer Amaranth (*Amaranthus palmeri*) Population in Nebraska.**

Lowell Sandell\*<sup>1</sup>, Amit Jhala<sup>1</sup>, Greg R. Kruger<sup>2</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>University of Nebraska-Lincoln, North Platte, NE (82)

## **Weed Biology/Ecology/Management Posters (cont.)**

**Glyphosate Applications Using Different Rates of UAN as a Carrier.** Turner J. Dorr\*<sup>1</sup>, Jeffrey Golus<sup>2</sup>, Greg R. Kruger<sup>3</sup>, Lowell Sandell<sup>4</sup>, Mark L. Bernards<sup>5</sup>, Stevan Z. Knezevic<sup>6</sup>;

<sup>1</sup>University of Nebraska Lincoln WCREC, North Platte, NE,

<sup>2</sup>University of Nebraska, Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>4</sup>University of

Nebraska-Lincoln, Lincoln, NE, <sup>5</sup>Western Illinois University, Macomb, IL, <sup>6</sup>University of Nebraska-Lincoln, Concord, NE

(83)

**Nitrogen Rate and the Effect on Western Corn Rootworm Emergence and Damage to Volunteer Corn.** Paul T.

Marquardt\*, Christian Krupke, William G. Johnson; Purdue University, West Lafayette, IN (84)

**Wheat Row Spacing and Seeding Rate Effect on Weed Emergence and Wheat Yield.** Douglas E. Shoup\*; Kansas State University, Chanute, KS (85)

## General Session

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

Room: Grand Ballroom D

Moderator: Dave Johnson

- 10:00 Cahokia Mounds: An Ancient City Made Possible by Grasses and Weeds.** Bill Iseminger\*; Cahokia Mounds State Historic Site, Collinsville, IL (86)
- 10:25 Where Has Weed Science Been and Where is it Going? Perspective of a "Mature" Weed Scientist.** Dale Shaner\*; USDA, Fort Collins, CO (87)
- 10:55 Washington Report.** Lee Van Wychen\*; WSSA, Washington, DC (88)
- 11:15 CAST Report.** Duane Rathmann\*; BASF Corp., Waseca, MN (89)
- 11:25 NCWSS Presidential Address.** Bryan G. Young\*; Southern Illinois University, Carbondale, IL (90)
- 11:40 Necrology Report.** Aaron G. Hager\*; University of Illinois, Urbana, IL (91)
- 11:45 Announcements.** Dave Johnson\*; DuPont Pioneer, Johnston, IA (92)

# Weed Biology, Ecology, and Management Papers

Room: Grand Ballroom A

Moderator: Marty Williams

- 1:15      †Results from a Two Year Survey of Stem-boring Insects Found in Missouri Waterhemp Populations.** Brock S. Waggoner\*, Kevin W. Bradley, Wayne C. Bailey; University of Missouri, Columbia, MO (93)
- 1:30      †When is the Best Time for Emergence: Flowering Phenology, Seed Production and Seed Characteristics of Natural Common Waterhemp (*Amaranthus tuberculatus* (Moq) Sauer) cohorts.** Chenxi Wu\*<sup>1</sup>, Micheal D. Owen<sup>2</sup>; <sup>1</sup>University of Illinois at Champaign-Urbana, Urbana, IL, <sup>2</sup>ISU, Ames, IA (94)
- 1:45      The Effect of Nitrogen Rate on Volunteer Corn Bt Protein Expression.** Paul T. Marquardt\*, Christian Krupke, William G. Johnson; Purdue University, West Lafayette, IN (95)
- 2:00      †Environmental Triggers of Winter Annual Weed Emergence.** Rodrigo Werle\*<sup>1</sup>, Andrew J. Tyre<sup>1</sup>, Mark L. Bernards<sup>2</sup>, Timothy J. Arkebauer<sup>1</sup>, John L. Lindquist<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>Western Illinois University, Macomb, IL (96)
- 2:15      †Pollen Viability of *Amaranthus* Species In Vitro.** Tye C. Shauck\*, Reid J. Smeda; University of Missouri, Columbia, MO (97)
- 2:30      Waterhemp Resistance to Post-Emergent Application of HPPD Herbicides.** Neha Rana\*<sup>1</sup>, Jon E. Scott<sup>1</sup>, Aaron S. Franssen<sup>2</sup>, Vinod K. Shivrain<sup>3</sup>, Stevan Z. Knezevic<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Syngenta Crop Protection, Seward, NE, <sup>3</sup>Syngenta Crop Protection, Vero Beach, FL (98)
- 2:45      †Presence and Characterization of Glyphosate Resistant Common Waterhemp and Palmer Amaranth in Kansas.** Josh A. Putman\*; Kansas State University, Manhattan, KS (99)
- 3:00      Break**

## Weed Biology, Ecology, and Management Papers (cont.)

- 3:15      †Sensitivity of Glyphosate-Resistant *Amaranthus* to Glyphosate is Altered by Soil Applied Nitrogen.** Jon R. Kohrt\*, Bryan G. Young, Joseph L. Matthews, Julie M. Young; Southern Illinois University, Carbondale, IL (100)
- 3:30      Interactions Between Glyphosate, *Fusarium* Infection of Waterhemp, and Soil Microorganisms.** Kristin K. Rosenbaum\*, Lee Miller, Robert Kremer, Kevin W. Bradley; University of Missouri, Columbia, MO (101)
- 3:45      †Emergence and Control of Putative Herbicide-Resistant Waterhemp.** Lacy J. Valentine\*<sup>1</sup>, Greg R. Kruger<sup>2</sup>, Lowell Sandell<sup>3</sup>, Zac J. Reicher<sup>1</sup>, Patrick Tranel<sup>4</sup>; <sup>1</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>2</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>4</sup>University of Illinois, Urbana, IL (102)
- 4:00      †Weed Hosts of *Clavibacter michiganensis* subsp. *nebraskensis*, Causal Agent of Goss's Bacterial Wilt and Leaf Blight.** Joseph T. Ikley\*, William G. Johnson, Kiersten A. Wise; Purdue University, West Lafayette, IN (103)
- 4:15      Integrated Weed Management using Row Spacing, Cover Crops, and Soybean Varieties.** Amanda M. Flipp\*<sup>1</sup>, Gregg Johnson<sup>2</sup>, Jeffrey Gunsolus<sup>3</sup>, Donald Wyse<sup>2</sup>; <sup>1</sup>University of Minnesota - Twin Cities, St. Paul, MN, <sup>2</sup>University of Minnesota, St. Paul, MN, <sup>3</sup>University of Minnesota, St. Paul, MN (104)
- 4:30      †Allelopathy of Sudangrass Cover Crop on Green Foxtail.** Jared J. Schmidt\*<sup>1</sup>, Sam E. Wortman<sup>2</sup>, John L. Lindquist<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>University of Illinois Urbana-Champaign, Urbana, IL (105)
- 4:45      Section Business Meeting**



## Soybeans and Legumes Papers

Room: Grand Ballroom BC

Moderator: Mike Weber

- 1:15 †Programs for the Management of Glyphosate-Resistant Waterhemp and Giant Ragweed in Dicamba-Resistant Soybean.** Doug J. Spaunhorst<sup>\*1</sup>, Simone Seifert-Higgins<sup>2</sup>, Christopher M. Mayo<sup>3</sup>, Eric B. Riley<sup>4</sup>, Kevin W. Bradley<sup>4</sup>; <sup>1</sup>University of Missouri-Columbia, Columbia, MO, <sup>2</sup>Monsanto Company, St. Louis, MO, <sup>3</sup>Monsanto Company, Gardner, KS, <sup>4</sup>University of Missouri, Columbia, MO (106)
- 1:30 †Impact of Plant Height on *Amaranthus* spp. Response to Dicamba.** Ashley A. Schlichenmayer<sup>\*1</sup>, Reid J. Smeda<sup>2</sup>; <sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>University of Missouri, Columbia, MO (107)
- 1:45 Soybean Tolerance to Single and Multiple Flaming.** Stevan Z. Knezevic<sup>\*1</sup>, Avishek Datta<sup>2</sup>, Strahinja V. Stepanovic<sup>3</sup>, Dejan Nedeljkovic<sup>4</sup>, Nihat Tursun<sup>5</sup>, Neha Rana<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>4</sup>University of Belgrade, Belgrade, Serbia, <sup>5</sup>Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkmenistan (108)
- 2:00 †Investigations of Weed Management Programs for Use in Soybeans with Resistance to HPPD-Inhibiting Herbicides.** John Schultz<sup>\*1</sup>, Michael L. Weber<sup>2</sup>, Jayla Allen<sup>3</sup>, Kevin W. Bradley<sup>1</sup>; <sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>Bayer CropScience, Indianola, IA, <sup>3</sup>Bayer CropScience, Research Triangle Park, NC (109)
- 2:15 †Control and Distribution of Glyphosate Resistant Giant Ragweed in Ontario.** Joanna Follings<sup>\*1</sup>, Peter Sikkema<sup>2</sup>, François Tardif<sup>1</sup>, Darren E. Robinson<sup>3</sup>, Mark Lawton<sup>4</sup>; <sup>1</sup>University of Guelph, Guelph, ON, <sup>2</sup>University of Guelph - Ridgetown Campus, Ridgetown, ON, <sup>3</sup>University of Guelph, Ridgetown, ON, <sup>4</sup>Monsanto Canada, Guelph, ON (110)
- 2:30 Comparison of Herbicide Programs in Glyphosate- and Glufosinate-Resistant Soybean.** Jeff M. Stachler<sup>\*</sup>; NDSU and U. of MN, Fargo, ND (111)

## Soybeans and Legumes Papers (cont.)

- 2:45      †Systems for Management of Glyphosate-Resistant Horseweed in Soybeans.** Bryan Reeb\*, Mark M. Loux, Anthony Dobbels; The Ohio State University, Columbus, OH (112)
- 3:00      Break**
- 3:15      †Glyphosate Resistant Canada Fleabane (*Conyza canadensis*) in Ontario: Distribution and Control in Soybean (*Glycine max* L.).** Holly P. Byker\*<sup>1</sup>, Peter Sikkema<sup>2</sup>, François Tardif<sup>3</sup>, Darren E. Robinson<sup>4</sup>, Mark Lawton<sup>5</sup>; <sup>1</sup>University of Guelph, Ridgetown Campus, Ridgetown, ON, <sup>2</sup>University of Guelph - Ridgetown Campus, Ridgetown, ON, <sup>3</sup>University of Guelph, Guelph, ON, <sup>4</sup>University of Guelph, Ridgetown, ON, <sup>5</sup>Monsanto Canada, Guelph, ON (113)
- 3:30      †Comparing Farmer and University Practices for Controlling Giant Ragweed.** JD Bethel\*<sup>1</sup>, Mark M. Loux<sup>1</sup>, Steve Prochaska<sup>2</sup>; <sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>The Ohio State University, Marion, OH (114)
- 3:45      Costs and Benefits of Establishing Alfalfa with Glyphosate Across Seven Production Fields in Wisconsin.** Mark J. Renz\*; University of Wisconsin Madison, Madison, WI (115)
- 4:00      †Fall Weed Management to Limit SCN Population Build-up.** Rodrigo Werle\*<sup>1</sup>, Mark L. Bernards<sup>2</sup>, Loren J. Giesler<sup>1</sup>, John L. Lindquist<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>Western Illinois University, Macomb, IL (116)
- 4:15      †Can Soil-Residual Protoporphyrinogen Oxidase (PPO)-Inhibiting Herbicides Influence the Frequency of PPO-Resistant Waterhemp?** R. Joseph Wuerffel\*, Bryan G. Young, Julie M. Young, Joseph L. Matthews; Southern Illinois University, Carbondale, IL (117)

## Soybeans and Legumes Papers (cont.)

- 4:30 New Preemergence Residual Weed Management Systems for Glyphosate Tolerant Soybeans to Address Resistance Management.** James Whitehead\*<sup>1</sup>, Dave Feist<sup>2</sup>, Gerald Wiley<sup>3</sup>, Keith Miller<sup>4</sup>, Dave Downing<sup>5</sup>, Brian Ahrens<sup>6</sup>; <sup>1</sup>MANA, Oxford, MS, <sup>2</sup>MANA, Fort Collins, CO, <sup>3</sup>Wiley Ag Consulting, Columbus, IN, <sup>4</sup>MANA, Troy, IL, <sup>5</sup>MANA, Raleigh, NC, <sup>6</sup>MANA, Coralville, IA (118)
- 4:45 Preemergence and Postemergence Control of Amaranthus Species with Lactofen Alone and in Combination with V-10206.** Trevor M. Dale\*<sup>1</sup>, Eric J. Ott<sup>2</sup>, John A. Pawlak<sup>3</sup>, Dawn Refsell<sup>4</sup>; <sup>1</sup>Valent USA Corporation, Sioux Falls, SD, <sup>2</sup>Valent USA Corporation, Greenfield, IN, <sup>3</sup>Valent USA Corporation, Lansing, MI, <sup>4</sup>Kansas State University, Manhattan, KS (119)

## Herbicide Physiology and Mixed Contest I Papers

Room: Grand Ballroom H

Moderator: Kirk Howatt

- 1:15 †Response of Amur honeysuckle (*Lonicera maackii*) to Postemergence Herbicides.** Spencer A. Riley\*, Reid J. Smeda; University of Missouri, Columbia, MO (120)
- 1:30 †Competitive Effects of an Invasive Amaranthaceae (*Achyranthes japonica*) on Soybean Compared with *Amaranthus palmeri* and *A. rudis*.** Lauren M. Schwartz\*<sup>1</sup>, Bryan G. Young<sup>1</sup>, David J. Gibson<sup>2</sup>; <sup>1</sup>Southern Illinois University, Carbondale, IL, <sup>2</sup>Southern Illinois University, Carbondale, IL (121)
- 1:45 Three Years of Testing Illinois Waterhemp Populations for Multiple Resistance to Glyphosate, PPO Inhibitors, and ALS Inhibitors.** Chance Riggins\*<sup>1</sup>, Aaron G. Hager<sup>2</sup>, Patrick Tranel<sup>2</sup>; <sup>1</sup>University of Illinois Urbana Champaign, Urbana, IL, <sup>2</sup>University of Illinois, Urbana, IL (122)

## Herbicide Physiology and Mixed Contest I Papers (cont.)

- 2:00**      **†Influence of Nitrogen Application Timing on the Activity of Mesotrione Applied for Large Crabgrass Control.** Quincy D. Law\*<sup>1</sup>, Dan V. Weisenberger<sup>2</sup>, Aaron J. Patton<sup>1</sup>; <sup>1</sup>Purdue University, W. Lafayette, IN, <sup>2</sup>Purdue University, Lafayette, IN (123)
- 2:15**      **†Preemergence Herbicides Affect Hybrid Bermudagrass Nutrient Content.** Patrick A. Jones\*<sup>1</sup>, James Brosnan<sup>2</sup>, Dean A. Kopsell<sup>3</sup>, Gregory K. Breeden<sup>2</sup>; <sup>1</sup>University of Tennessee Knoxville, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN, <sup>3</sup>The University of Tennessee, Knoxville, TN (124)
- 2:30**      **Root Colonization of Glyphosate-Treated Weed Biotypes by Soil Microbes.** Jessica R. Schafer\*<sup>1</sup>, Steven G. Hallett<sup>2</sup>, William G. Johnson<sup>2</sup>; <sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Purdue University, West Lafayette, IN (125)
- 2:45**      **†Effects of Herbicide Application Timing and Overseeding On Dallisgrass (*Paspalum dilatatum*) Control In Tall Fescue (*Festuca arundinacea*).** Matthew T. Elmore\*, James Brosnan, Gregory K. Breeden; University of Tennessee, Knoxville, TN (126)
- 3:00**      **Break**
- 3:15**      **†Volunteer Corn Reduces Yield in Sugarbeet.** Christy Sprague, Amanda C. Harden\*; Michigan State University, East Lansing, MI (127)
- 3:30**      **Transfer of Dicamba Resistance from Wild Mustard into Canola.** Mithila Jugulam\*<sup>1</sup>, J. Christopher Hall<sup>2</sup>; <sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>University of Guelph, Guelph, ON (128)

## Herbicide Physiology and Mixed Contest I Papers (cont.)

- 3:45**     **†Investigations into *Ambrosia artemisiifolia* (Common Ragweed) Glyphosate Resistance Mechanisms.** Jason T. Parrish<sup>\*1</sup>, Mark M. Loux<sup>1</sup>, Philip Westra<sup>2</sup>, Andrew Wiersma<sup>3</sup>, Christopher Van Horn<sup>3</sup>, David Mackey<sup>1</sup>, Leah McHale<sup>1</sup>; <sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Colorado State University, Fort Collins, CO, <sup>3</sup>Colorado State University, Ft. Collins, CO (129)
- 4:00**     **Differential Root and Shoot Uptake of Flumioxazin and Pyroxasulfone in Three Plant Species.** Dawn Refsell\*, Anita Dille; Kansas State University, Manhattan, KS (130)
- 4:15**     **Cellular Uptake and Compartmentalization of Glyphosate: A <sup>31</sup>P NMR Survey of Weedy Species.** Xia Ge<sup>1</sup>, Dana A. d'Avignon<sup>\*1</sup>, Joseph J. Ackerman<sup>1</sup>, Doug Sammons<sup>2</sup>, Elizabeth Ostrander<sup>3</sup>; <sup>1</sup>Washington University in St Louis, St Louis, MO, <sup>2</sup>Monsanto, St. Louis, MO, <sup>3</sup>Monsanto, St Louis, MO (131)
- 4:30**     **The Influence of Cations and Foliar Fertilizers on 2,4-D Amine and Dicamba Efficacy.** Jared M. Roskamp\*, Gurinderbir S. Chahal, William G. Johnson; Purdue University, West Lafayette, IN (132)
- 4:45**     **Section Business Meeting**

## Corn/Sorghum and Mixed Contest II Papers

Room: Grand Ballroom FG

Moderator: Walter Thomas

- 1:15**     **Regional Whole Plant and Molecular Response of Kochia to Glyphosate.** Philip Westra<sup>\*1</sup>, Jan Leach<sup>1</sup>, A.S.N. Reddy<sup>1</sup>, Dale Shaner<sup>2</sup>, Andrew Wiersma<sup>3</sup>; <sup>1</sup>Colorado State University, Fort Collins, CO, <sup>2</sup>USDA, Fort Collins, CO, <sup>3</sup>Colorado State University, Ft. Collins, CO (133)

## Corn/Sorghum and Mixed Contest II Papers

Room: Grand Ballroom FG

Moderator: Walter Thomas

- 1:30 †Tolerance of Selected Weed Species to Broadcast Flaming.** Strahinja V. Stepanovic\*<sup>1</sup>, Avishek Datta<sup>2</sup>, Neha Rana<sup>3</sup>, Stevan Z. Knezevic<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska-Lincoln, Concord, NE (134)
- 1:45 †Controlling Glyphosate-Resistant Palmer Amaranth Using Atrazine Tank Mixes in Corn.** Matthew S. Wiggins\*, Kelly A. Barnett, Lawrence E. Steckel; University of Tennessee, Jackson, TN (135)
- 2:00 Corn Tolerance to Single and Multiple Flaming.** Stevan Z. Knezevic\*<sup>1</sup>, Avishek Datta<sup>2</sup>, Strahinja V. Stepanovic<sup>3</sup>, Dejan Nedeljkovic<sup>4</sup>, Neha Rana<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, Concord, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>4</sup>University of Belgrade, Belgrade, Serbia (136)
- 2:15 †Investigations of Early-Season Herbicide and Fungicide Co-Applications in Corn.** Craig B. Solomon\*, Jimmy D. Wait, Kevin W. Bradley; University of Missouri, Columbia, MO (137)
- 2:30 †The Effect of Volunteer Corn Growing in Corn on Grain Quality and Mycotoxin Contamination.** Vanessa L. Garner\*, William G. Johnson, Paul T. Marquardt, Kiersten A. Wise; Purdue University, West Lafayette, IN (138)
- 2:45 Two-Pass Weed Control in Glyphosate-Resistant Corn - Efficacy, Environmental Impact, Yield and Profitability.** Peter Sikkema\*<sup>1</sup>, Robert E. Nurse<sup>2</sup>, Chris Gillard<sup>3</sup>, Nader Soltani<sup>3</sup>; <sup>1</sup>University of Guelph - Ridgetown Campus, Ridgetown, ON, <sup>2</sup>Agriculture and Agri-Food Canada, Harrow, ON, <sup>3</sup>University of Guelph Ridgetown Campus, Ridgetown, ON (139)
- 3:00 Break**

## **Corn/Sorghum and Mixed Contest II Papers (cont.)**

- 3:15      Sethoxydim Dose Response Curves for Volunteer Corn Control and Corn Injury After an Immediate Replant.** Randall S. Currie\*; Kansas State Univ., Garden City, KS (140)
- 3:30      †Carrier Volume Influence on the Efficacy of Four Soybean Herbicides.** Cody F. Creech\*<sup>1</sup>, Lowell Sandell<sup>2</sup>, Greg R. Kruger<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, North Platte, NE, <sup>2</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>3</sup>University of Nebraska-Lincoln, North Platte, NE (141)
- 3:45      †Effect of Application Carrier Volume on Herbicide Efficacy with Ten Herbicides Using a Conventional Sprayer and an Ultra-Low Volume Sprayer.** J Connor Ferguson\*<sup>1</sup>, Roch E. Gaussoin<sup>1</sup>, John A. Eastin<sup>2</sup>, Greg R. Kruger<sup>3</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>Kamterter LLC, Waverly, NE, <sup>3</sup>University of Nebraska-Lincoln, North Platte, NE (142)
- 4:00      Real World Exposure and Biomonitoring are Not Part of the Alarmist Agenda.** Larry E. Hammond\*; 2,4-D Task Force, Carmel, IN (143)
- 4:15      †Evaluation of Tolerance and Root Quality on Azalea and Hydrangea Treated with Dimethenamid-P and Pendimethalin Alone and in Mixtures.** Jose J. Vargas\*<sup>1</sup>, James Brosnan<sup>2</sup>; <sup>1</sup>The University of Tennessee, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN (144)
- 4:30      Effects of Flaming and Cultivation on Weed Control and Yield in Organic Corn as Influenced by Manure Application.** Strahinja V. Stepanovic\*<sup>1</sup>, Avishek Datta<sup>2</sup>, Neha Rana<sup>3</sup>, Brian D. Neilson<sup>4</sup>, Chris Bruening<sup>1</sup>, George Gogos<sup>1</sup>, Stevan Z. Knezevic<sup>3</sup>; <sup>1</sup>University of Nebraska - Lincoln, Lincoln, NE, <sup>2</sup>Asian Institute of Technology, Bangkok, Thailand, <sup>3</sup>University of Nebraska-Lincoln, Concord, NE, <sup>4</sup>University of Nebraska-Lincoln, Lincoln, NE (145)

## **Student Symposium: Finding a Career in Weed Science**

Room: Park View

Organizers: Connor Ferguson and Ashley Schlichenmayer

Moderator: Connor Ferguson

- 8:00 Symposium Introduction.** J Connor Ferguson\*; University of Nebraska-Lincoln, Lincoln, NE (146)
- 8:05 Graduate Education in Weed Science – In With The New and Out With the Old?** Philip Westra\*; Colorado State University, Fort Collins, CO (147)
- 8:30 Networking or Not Working.** Arlene Taich\*; Washington University-St. Louis, St. Louis, MO (148)
- 9:00 Resume/CV and Interview Skills.** Carlos Gomez\*; Monsanto Company, Chesterfield, MO (149)
- 9:30 Salary Savvy: Negotiation Tips and Tactics.** Dallas Ford\*; Syngenta, Kansas City, MO (150)
- 10:00 Break (Sponsored by Gylling Data Management)**
- 10:15 Want to be a Weed Scientist with University or Industry?** Amit Jhala\*<sup>1</sup>, Vince M. Davis\*<sup>2</sup>, Joe Armstrong\*<sup>3</sup>, Lillian C. Magidow\*<sup>4</sup>; <sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>University of Wisconsin-Madison, Madison, WI, <sup>3</sup>Dow AgroSciences, Davenport, IA, <sup>4</sup>Winfield Solutions, St. Paul, MN (151)
- 10:45 Panel Discussion.** All speakers (152)
- 11:30 NCWSS Awards Luncheon**



## Soybean/Legume Papers

Room: Grand Ballroom BC

Moderator: Mike Weber

- 8:00 Weed Control in Dicamba Tolerant Soybean.** Pratap Devkota\*<sup>1</sup>, William G. Johnson<sup>1</sup>, John B. Willis<sup>2</sup>; <sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Monsanto, Hanson, KY (153)
- 8:15 Weed Management with Roundup Ready®2 Xtend Soybean in Iowa.** Dean M. Grossnickle\*<sup>1</sup>, Micheal D. Owen<sup>2</sup>, Damian D. Franzenburg<sup>1</sup>, James F. Lux<sup>1</sup>, Justin M. Pollard<sup>3</sup>; <sup>1</sup>Iowa State University, Ames, IA, <sup>2</sup>ISU, Ames, IA, <sup>3</sup>The Monsanto Company, St. Louis, MO (154)
- 8:30 Weed Management Recommendations for Roundup Ready®2 Xtend soybeans.** Simone Seifert-Higgins\*<sup>1</sup>, John B. Willis<sup>2</sup>; <sup>1</sup>Monsanto Company, St. Louis, MO, <sup>2</sup>Monsanto, Hanson, KY (155)
- 8:45 Weed Management in Dicamba Tolerant Crops with Engenia™.** Troy D. Klingaman\*<sup>1</sup>, John Frihauf<sup>2</sup>, Steven J. Bowe<sup>3</sup>, Terrance M. Cannan<sup>2</sup>, Luke L. Bozeman<sup>3</sup>; <sup>1</sup>BASF Corporation, Seymour, IL, <sup>2</sup>BASF Corporation, Raleigh, NC, <sup>3</sup>BASF Corporation, Research Triangle Park, NC (156)
- 9:00 Influence of Nozzle Selection on Drift Potential and Efficacy of Engenia™.** Leo D. Charvat\*<sup>1</sup>, Walter E. Thomas<sup>2</sup>, John Frihauf<sup>3</sup>, Steven J. Bowe<sup>2</sup>, Greg R. Kruger<sup>4</sup>; <sup>1</sup>BASF Corporation, Lincoln, NE, <sup>2</sup>BASF Corporation, Research Triangle Park, NC, <sup>3</sup>BASF Corporation, Raleigh, NC, <sup>4</sup>University of Nebraska-Lincoln, North Platte, NE (157)
- 9:15 Enlist™ Soybean Tolerance to Applications from Emergence to the R2 Growth Stage.** Eric F. Scherder\*<sup>1</sup>, David C. Ruen<sup>2</sup>, Jeff M. Ellis<sup>3</sup>, Ralph B. Lassiter<sup>4</sup>, Hunter Perry<sup>5</sup>; <sup>1</sup>Dow AgroSciences, Huxley, IA, <sup>2</sup>Dow AgroSciences, Lanesboro, MN, <sup>3</sup>Dow AgroSciences, Smithville, MO, <sup>4</sup>Dow AgroSciences, Little Rock, AR, <sup>5</sup>Dow AgroSciences, Greenville, MS (158)

## Soybean/Legume Papers (cont.)

- 9:30 Weed Control Options in Enlist™ Soybean.** Jeff M. Ellis\*<sup>1</sup>, Ralph B. Lassiter<sup>2</sup>, Bradley W. Hopkins<sup>3</sup>, Fikru F. Haile<sup>4</sup>, Deane K. Zahn<sup>5</sup>; <sup>1</sup>Dow AgroSciences, Smithville, MO, <sup>2</sup>Dow AgroSciences, Little Rock, AR, <sup>3</sup>Dow AgroSciences, Westerville, OH, <sup>4</sup>Dow AgroSciences, Indianapolis, IN, <sup>5</sup>Dow AgroSciences, Lincoln, NE (159)
- 9:45 Break (Sponsored by Gylling Data Management)**
- 10:00 A New Mesotrione, Glufosinate and Isoxaflutole Tolerant Trait for Soybean Weed Management.** Brett R. Miller\*<sup>1</sup>, Rakesh Jain<sup>2</sup>, Brian Erdahl<sup>3</sup>, Aron Silverstone<sup>4</sup>, Gordon D. Vail<sup>5</sup>, Jayla Allen<sup>6</sup>, Jon Fischer<sup>7</sup>, Sally Van Wert<sup>8</sup>; <sup>1</sup>Syngenta, Minnetonka, MN, <sup>2</sup>Syngenta, Vero Beach, FL, <sup>3</sup>Syngenta, Clinton, IL, <sup>4</sup>Syngenta, Research Triangle Park, NC, <sup>5</sup>Syngenta, Greensboro, NC, <sup>6</sup>Bayer CropScience, Research Triangle Park, NC, <sup>7</sup>Bayer CropScience, Middleton, WI, <sup>8</sup>Bayer CropScience, Monheim, Germany (160)
- 10:15 Weed Management Programs Utilizing Mesotrione in Herbicide Tolerant Soybeans.** Ryan D. Lins\*<sup>1</sup>, Dain Bruns<sup>2</sup>, Thomas H. Beckett<sup>3</sup>, Gordon D. Vail<sup>3</sup>; <sup>1</sup>Syngenta, Byron, MN, <sup>2</sup>Syngenta, Marysville, OH, <sup>3</sup>Syngenta, Greensboro, NC (161)
- 10:30 University Evaluation of Isoxaflutole Weed Management Programs in HPPD Tolerant Soybean System.** Michael L. Weber\*<sup>1</sup>, Jayla Allen<sup>2</sup>; <sup>1</sup>Bayer CropScience, Indianola, IA, <sup>2</sup>Bayer CropScience, Research Triangle Park, NC (162)
- 10:45 Glyphosate-Resistant Giant Ragweed Control with Future Weed Control Technologies.** Kelly A. Barnett\*<sup>1</sup>, Thomas C. Mueller<sup>2</sup>, Lawrence E. Steckel<sup>1</sup>; <sup>1</sup>University of Tennessee, Jackson, TN, <sup>2</sup>University of Tennessee, Knoxville, TN (163)
- 11:00 Section Business Meeting**
- 11:30 NCWSS Awards Luncheon**

## Extension Papers

Room: Grand Ballroom A

Moderator: Doug Shoup

- 8:45      An Unconventional Approach to Herbicide Resistance Management.** John E. Kaufmann\*; Kaufmann AgKnowledge, Okemos, MI (164)
- 9:00      Herbicide Resistances in Common Waterhemp.** Micheal D. Owen\*; ISU, Ames, IA (165)
- 9:15      Increasing Concerns Over Distribution Patterns of Glyphosate Resistant Weeds in Kentucky.** James R. Martin<sup>\*1</sup>, JD Green<sup>2</sup>, William W. Witt<sup>1</sup>; <sup>1</sup>University of Kentucky, Princeton, KY, <sup>2</sup>University of Kentucky, Lexington, KY (166)
- 9:30      Glyphosate-Resistant Kochia Confirmation in North Dakota.** Kirk A. Howatt\*, Andrew N. Fillmore; NDSU, Fargo, ND (167)
- 9:45      Break (Sponsored by Gylling Data Management)**
- 10:00     Can Growers Manage Glyphosate Resistant Kochia?** Curtis R. Thompson\*, Dallas Peterson; Kansas State University, Manhattan, KS (168)
- 10:15     Adjuvants Affect Kochia Control with Glyphosate.** Phillip W. Stahlman<sup>\*1</sup>, Patrick W. Geier<sup>2</sup>; <sup>1</sup>Kansas State University, Hays, KS, <sup>2</sup>Kansas State university, Hays, KS (169)
- 10:30     Common Lambsquarters Control: Chapter 3 - Adjuvants.** Rich Zollinger\*; North Dakota State University, Fargo, ND (170)
- 10:45     Most Common Weeds Identified in Grain Crops, Forages, and Turf Through University of Kentucky's Weed Identification Clinic.** JD Green<sup>\*1</sup>, James R. Martin<sup>2</sup>, Aaron Laurent<sup>1</sup>; <sup>1</sup>University of Kentucky, Lexington, KY, <sup>2</sup>University of Kentucky, Princeton, KY (171)
- 11:00     Section Business Meeting**
- 11:30     NCWSS Awards Luncheon**

## Horticulture and Ornamental Papers

Room: Grand Ballroom A

Moderator: Darren Robinson

- 1:30 Tolerance and Selectivity to Clopyralid Herbicide on Red Raspberries var. “Encore”.** Constanza Echaiz\*; The Ohio State University, Wooster, OH (172)
- 1:45 Pyroxasulfone for Weed Control in Vegetable Crops.** Bernard H. Zandstra\*<sup>1</sup>, Jarrod J. Morrice<sup>2</sup>; <sup>1</sup>Michigan State University, East Lansing, MI, <sup>2</sup>Michigan State University, Lansing, MI (173)
- 2:00 Weed Control in Apple with Old and New Herbicides.** Jarrod J. Morrice\*<sup>1</sup>, Bernard H. Zandstra<sup>2</sup>; <sup>1</sup>Michigan State University, Lansing, MI, <sup>2</sup>Michigan State University, East Lansing, MI (174)
- 2:15 Impact of Simulated Synthetic Auxin Herbicide drift on Vegetable Crops.** Jed Colquhoun\*, Daniel Heider, Richard Rittmeyer; University of Wisconsin, Madison, WI (175)
- 2:30 Interactions Between Chloracetamide and Protoporphyrinogen Oxidase-Inhibiting Herbicides in Cole Crops.** Darren E. Robinson\*, Kristen E. McNaughton; University of Guelph, Ridgetown, ON (176)
- 2:45 Effect of Simulated Glyphosate Drift to Four Potato Processing Cultivars.** Harlene M. Hatterman-Valenti\*; North Dakota State University, Fargo, ND (177)
- 3:00 Section Business Meeting**
- 3:15 Break**

## Forestry/Industrial/Turf/Aquatics/ Forage/Range Papers

Room: Grand Ballroom H

Moderator: Reid Smeda

- 1:30 Soil Type and Rooting Depth Effects on Creeping Bentgrass Tolerance to Amicarbazone and Methiozolin.** James Brosnan\*, Gregory K. Breeden, Sara Calvache, John C. Sorochan; University of Tennessee, Knoxville, TN (178)
- 1:45 Annual Grassy Weed Control in Cool-Season Turf with Topramezone.** Gregory K. Breeden\*<sup>1</sup>, James Brosnan<sup>1</sup>, Aaron J. Patton<sup>2</sup>, Dan V. Weisenberger<sup>3</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>Purdue University, W. Lafayette, IN, <sup>3</sup>Purdue University, Lafayette, IN (179)
- 2:00 Creeping Bentgrass (*Agrostis stolonifera*) Tolerance to Topramezone in Combination With Various Herbicide Safeners.** Matthew T. Elmore\*<sup>1</sup>, James Brosnan<sup>1</sup>, Gregory R. Armel<sup>2</sup>, Michael Barrett<sup>3</sup>, Gregory K. Breeden<sup>1</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>BASF, Research Triangle Park, NC, <sup>3</sup>University of Kentucky, Lexington, KY (180)
- 2:15 Zoysiagrass Seedhead Suppression with Imazamox.** James Brosnan\*<sup>1</sup>, Gregory K. Breeden<sup>1</sup>, Aaron J. Patton<sup>2</sup>, Dan V. Weisenberger<sup>3</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>Purdue University, W. Lafayette, IN, <sup>3</sup>Purdue University, Lafayette, IN (181)
- 2:30 Safety of Labeled Herbicides for Broadleaf Weed Control in Creeping Bentgrass Putting Greens.** Aaron J. Patton\*<sup>1</sup>, Dan V. Weisenberger<sup>2</sup>, Gregory K. Breeden<sup>3</sup>, James Brosnan<sup>3</sup>; <sup>1</sup>Purdue University, W. Lafayette, IN, <sup>2</sup>Purdue University, Lafayette, IN, <sup>3</sup>University of Tennessee, Knoxville, TN (182)
- 2:45 Common Honeylocust Control in Kansas.** Walter H. Fick\*; Kansas State University, Manhattan, KS (183)

## **Forestry/Industrial/Turf/Aquatics/ Forage/Range Papers (cont.)**

- 3:00 Effect of Canada Thistle Management Strategies on Forage Availability and Utilization in Rotationally Grazed Pastures.** Mark J. Renz\*<sup>1</sup>, Anders Gurda<sup>2</sup>;  
<sup>1</sup>University of Wisconsin Madison, Madison, WI,  
<sup>2</sup>University of Wisconsin-Madison, Madison, WI  
(184)
- 3:15 Section Business Meeting**
- 3:30 Break**

## **Corn/Sorghum Papers**

Room: Grand Ballroom BC  
Moderator: John Frihauf

- 1:30 HPPD Resistance Testing in the Midwest-Preliminary Laboratory Results.** Thomas Kleven\*<sup>1</sup>, Roland Beffa<sup>2</sup>, Bernd Laber<sup>2</sup>, Thomas Wilde<sup>2</sup>, Hubert Menne<sup>2</sup>, Brent Philbrook<sup>3</sup>, Harry J. Streck<sup>2</sup>; <sup>1</sup>Bayer CropScience, Sabin, MN, <sup>2</sup>Bayer CropScience, Frankfurt, Germany, <sup>3</sup>Bayer CropScience, White Heath, IL (185)
- 1:45 HPPD Resistance Testing in the Midwest-Preliminary Field Bioassay Results.** Brent Philbrook\*<sup>1</sup>, Thomas Wilde<sup>2</sup>, Roland Beffa<sup>2</sup>, Thomas Kleven<sup>3</sup>, Harry J. Streck<sup>2</sup>; <sup>1</sup>Bayer CropScience, White Heath, IL, <sup>2</sup>Bayer CropScience, Frankfurt, Germany, <sup>3</sup>Bayer CropScience, Sabin, MN (186)
- 2:00 U.S. University Herbicide Efficacy Studies Analysis: Corn and Sorghum Yield with Atrazine Versus Atrazine Alternatives: 2006-2010.** Richard S. Fawcett\*; Fawcett Consulting, Huxley, IA (187)
- 2:15 Burndown and Preemergence Weed Control with Rimsulfuron and Mesotrione.** Helen A. Flanigan\*<sup>1</sup>, Kevin L. Hahn<sup>2</sup>; <sup>1</sup>DuPont, Greenwood, IN, <sup>2</sup>DuPont, Bloomington, IL (188)

## Corn/Sorghum Papers (cont.)

- 2:30 Enlist™ Corn Tolerance to Enlist™ Duo Applied from V3 Through V7 Growth Stages.** Neil A. Spomer<sup>1</sup>, David C. Ruen\*<sup>2</sup>, Bradley W. Hopkins<sup>3</sup>, Kevin D. Johnson<sup>4</sup>, Brian D. Olson<sup>5</sup>; <sup>1</sup>Dow AgroSciences, Brookings, SD, <sup>2</sup>Dow AgroSciences, Lanesboro, MN, <sup>3</sup>Dow AgroSciences, Westerville, OH, <sup>4</sup>Dow AgroSciences, Danville, IL, <sup>5</sup>Dow AgroSciences, Geneva, NY (189)
- 2:45 Weed Control Programs in Enlist™ Corn.** Joe Armstrong\*<sup>1</sup>, Scott C. Ditmarsen<sup>1</sup>, Fikru F. Haile<sup>2</sup>, Jeff M. Ellis<sup>3</sup>, Jonathan A. Huff<sup>4</sup>, Eric F. Scherder<sup>5</sup>; <sup>1</sup>Dow AgroSciences, Madison, WI, <sup>2</sup>Dow AgroSciences, Indianapolis, IN, <sup>3</sup>Dow AgroSciences, Smithville, MO, <sup>4</sup>Dow AgroSciences, Herrin, IL, <sup>5</sup>Dow AgroSciences, Huxley, IA (190)
- 3:00 Section Business Meeting**
- 3:15 Break**

## What's New in Industry?

Room: Grand Ballroom D

Organizer and Moderator: Dawn Refsell

3:30-5:00pm

Dow AgroSciences

Valent

FMC

Growmark

Winfield Solutions

BASF

Helena

DuPont

Gylling Data Management

Monsanto

Syngenta

Bayer

## Industry Breakfast (cost \$30)

Room: Park View

Moderator: Dawn Refsell

**7:00      Ionomics: Elemental Profiling Identifies the Genetic and Physiological Mechanisms of Environmental Adaptation.** Ivan Baxter\*; USDA-ARS, Danforth Plant Science Center, St. Louis, MO (192)

**8:00      Section Business Meeting**

## Symposium: Invasive Potential of Biofuel Crops

Room: Grand Ballroom A

Organizer and Moderator: Scott Flynn

**8:25      Introductory Comments.** Scott Flynn\*; Dow AgroSciences, Ankeny, IA (193)

**8:30      Historical View of Introduced Plants that have Become Invasive.** Bill Witt\*; University of Kentucky, Lexington, KY (194)

**9:00      Role of *Miscanthus* spp. in the Biofuel Industry and their Potential Invasiveness.** Emily Heaton\*<sup>1</sup>, Allison Snow<sup>2</sup>, Miriti Maria<sup>2</sup>; <sup>1</sup>Iowa State University, Ames, IA, <sup>2</sup>Ohio State University, Columbus, OH (195)

**9:30      The Pros and Cons of Using Native Perennial Grasses for Biofuel Feedstocks.** Rob Mitchell\*; USDA-ARS, Lincoln, NE (196)

**10:00      Break**

**10:15      Invasive Trees as an Energy Crop: What Should We Expect?** Scott Flynn\*<sup>1</sup>, Pat Burch<sup>2</sup>, Vanelle Peterson<sup>3</sup>; <sup>1</sup>Dow AgroSciences, Ankeny, IA, <sup>2</sup>Dow AgroSciences, Christiansburg, VA, <sup>3</sup>Dow AgroSciences, Mulino, OR (197)

**10:45      Introduction of New Biofuel Crops.** Michael Brown\*; USDA-ARS, Jefferson City, MO (198)

**11:15      Panel Discussion.** All speakers (199)



## Equipment and Application Methods Papers

Room: Grand Ballroom BC

Moderator: Greg Kruger

- 8:15 Various Formulations and Adjuvants Influence Spray Droplet Spectra.** Lillian C. Magidow\*, Gregory K. Dahl, Stephanie Wedryk, Eric P. Spandl, Joe V. Gednalske; Winfield Solutions, St. Paul, MN (200)
- 8:30 Nonionic Surfactant Adjuvant with Optimized Physical and Biological Properties for Herbicide Tank Mixtures.** Gregory J. Lindner\*<sup>1</sup>, Kevin Penfield<sup>1</sup>, Bryan G. Young<sup>2</sup>; <sup>1</sup>Croda Inc, New Castle, DE, <sup>2</sup>Southern Illinois University, Carbondale, IL (201)
- 8:45 Effect of Droplet Size on Weed Control with Dicamba and Glyphosate Tank-Mixtures Applied with Commercial Sprayers.** Christopher D. Kamienski\*<sup>1</sup>, Brian Olson<sup>2</sup>, Joe Sandbrink<sup>3</sup>, Kirk Remund<sup>4</sup>, Jeff N. Travers<sup>3</sup>; <sup>1</sup>Monsanto Company, Washington, IL, <sup>2</sup>Monsanto Company, Colby, KS, <sup>3</sup>Monsanto, St. Louis, MO, <sup>4</sup>Monsanto Company, St. Louis, MO (202)
- 9:00 Drift Reduction Technologies for Applying Glyphosate-Dicamba.** Scott M. Bretthauer\*; University of Illinois, Urbana, IL (203)
- 9:15 Impact of Spray Nozzle Technology on Enlist™ Duo Weed Control and Crop Tolerance.** Jonathan A. Huff\*<sup>1</sup>, David C. Ruen<sup>2</sup>, Larry Walton<sup>3</sup>, John Richburg<sup>4</sup>; <sup>1</sup>Dow AgroSciences, Herrin, IL, <sup>2</sup>Dow AgroSciences, Lanesboro, MN, <sup>3</sup>Dow AgroSciences, Tupelo, MS, <sup>4</sup>Dow AgroSciences, Headland, AL (204)
- 9:30 A Comparison of Droplet Spectra from 10 Types of Ground Nozzles.** Ryan S. Henry\*<sup>1</sup>, Annah Geyer<sup>2</sup>, Lowell Sandell<sup>3</sup>, Wesley C. Hoffmann<sup>4</sup>, Bradley K. Fritz<sup>4</sup>, William E. Bagley<sup>5</sup>, Greg R. Kruger<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln, North Platte, NE, <sup>2</sup>University of Nebraska Lincoln, North Platte, NE, <sup>3</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>4</sup>USDA-ARS, College Station, TX, <sup>5</sup>Wilbur-Ellis, San Antonio, TX (205)

## **Equipment and Application Methods Papers (cont.)**

- 9:45 Will Dual Outlet Venturi Nozzles Have an Impact on Weed Control?** Robert E. Wolf<sup>\*1</sup>, Scott M. Bretthauer<sup>2</sup>; <sup>1</sup>Wolf Consulting & Research LLC, Mahomet, IL, <sup>2</sup>University of Illinois, Urbana, IL (206)
- 10:00 Break**
- 10:15 Application Technology Update...Equipment, Nozzles, and More.** Robert E. Wolf<sup>\*</sup>; Wolf Consulting & Research LLC, Mahomet, IL (207)
- 10:30 Forty Years of Sprayer Evaluations.** Robert N. Klein<sup>\*</sup>; University of Nebraska, North Platte, NE (208)
- 10:45 Development and Evaluation of a Cryogenic Spray System for Weed Control.** Matthew A. Cutulle<sup>\*1</sup>, Gregory R. Armel<sup>2</sup>, James Brosnan<sup>1</sup>, Jose J. Vargas<sup>3</sup>, William Hart<sup>1</sup>, Dean A. Kopsell<sup>3</sup>; <sup>1</sup>University of Tennessee, Knoxville, TN, <sup>2</sup>BASF, Research Triangle Park, NC, <sup>3</sup>The University of Tennessee, Knoxville, TN (209)
- 11:00 Section Business Meeting**

## **2012 Officers/Executive Committee**

### **President**

Bryan Young      Southern Illinois University  
618-453-7679  
bgyoung@siu.edu

### **President Elect**

Dave Johnson      DuPont Pioneer  
515-535-7234  
david.h.johnson@pioneer.com

### **Vice President**

J.D. Green      University of Kentucky  
859-257-4898  
jdgreen@uky.edu

### **Past President**

Mark Wrucke      Bayer CropScience  
651-463-3365  
mark.wrucke@bayer.com

### **Secretary/Treasurer**

Christy Sprague      Michigan State University  
517-355-0271  
sprague1@msu.edu

### **Editor, NCWSS Proceedings**

Robert Hartzler      Iowa State University  
515-294-1923  
hartzler@iastate.edu

### **Editor, NCWSS Communications**

Harlene Hatterman-Valenti  
North Dakota State University  
701-231-8536  
h.hatterman.valenti@ndsu.edu

### **WSSA Representative**

Mark Bernards      Western Illinois University  
309-298-1569  
ML-Bernards@wiu.edu

### **CAST Representative**

Duane Rathmann      BASF Corporation  
507-835-2580  
Duane.rathmann@basf.com

### **Executive Secretary**

Phil Banks      575-527-1888  
ncwss@marathonag.com

### **Director of Science Policy**

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

# North Central Weed Science Society Information

## Directors at Large

Doug Shoup	Extension 620-431-1530 dshoup@ksu.edu
Connor Ferguson	Graduate Students 405-401-4008 connor.ferguson@huskers.unl.edu
Dawn Refsell	Industry 816-528-3919 dawn.refsell@valent.com
Fritz Koppatschek	Resident Education 317-431-3295 fkoppatschek@abgagservices.com
Brian Jenks	Strategic Planning 701-857-7677 brian.jenks@ndsu.edu
David Thomas	Central (2012) 217-762-9030 dave.thomas@syngenta.com
Glen Murphy	Eastern (2013) 502-460-0106 glen.p.murphy@monsanto.com
Lowell Sandell	Western (2014) 402-472-1527 lsandell2@unl.edu

## NCWSS Interest Group Committees

### Strategic Planning

Brian Jenks	Chair - ND (2014)	701-857-7677	brian.jenks@ndsu.edu
Bruce Ackley	Vice Chair - OH (2013)	614-292-1399	ackley.19@osu.edu
Dale Shaner	Colorado (2012)	970-492-7414	dale.shaner@ars.usda.gov
Aaron Hager	Illinois (2014)	217-333-4424	hager@illinois.edu
David Hillger	Indiana (2012)	614-633-7069	dehillger@dow.com
Mark Vogt	Iowa (2014)	515-535-2261	mark.vogt@pioneer.com
Tate Castillo	Kansas (2013)	785-213-8979	tate.castillo@bayer.com
Glen Murphy	Kentucky (2012)	502-365-4888	glen.p.murphy@monsanto.com
Andrew Chomas	Michigan (2013)	517-355-2287	chomas@msu.edu
Kent Woodall	Missouri (2012)	816-781-9191	tkwoodall@riw2000.com
Eric Spandl	Minnesota (2014)	651-490-4292	epspandl@landolakes.com
Lowell Sandell	Nebraska (2013)	402-472-1527	lsandell2@unl.edu
Darren Robinson	Ontario (2014)	519-674-1500	drobinso@ridgetownnc.uoguelph.ca
Trevor Dale	South Dakota (2012)	605-929-9753	trevor.dale@valent.com
Alan B. Miller	Wisconsin (2013)	608-271-1100	amagstat@tds.net
Vacant	Wyoming (2014)		

### Graduate Student

Connor Ferguson	Chair	405-401-4008	connor.ferguson@huskers.unl.edu
Ashley Schlichenmayer	Vice Chair	573-999-0898	aaskv9@mizzou.edu
Jason Parrish		440-225-4831	parrish.174@osu.edu
Laura Bast		614-905-1039	astlaur@msu.edu
Sam Wortman		402-981-8037	sam.wortman@huskers.unl.edu
Chad Brabham		618-610-2723	cbrabham@purdue.edu
Chenxi Wu		515-203-1761	chxwu@iastate.edu
Roberto Crespo		402-472-6779	rcrespo@huskers.unl.edu
Tye Shauck		573-692-0432	tcsm5@mail.missouri.edu
Alicia Spangler		570-768-1315	spangl24@msu.edu
Rachel Berry		931-243-4958	berry.436@osu.edu
Alexandra Williams		270-799-5086	apwi222@uky.edu
Blake Patton		618-534-1270	b.patton@uky.edu
Rodrigo Werle		402-937-2887	rwerle@huskers.unl.edu
Chengchou Han		417-574-0942	chengchouhan@huskers.unl.edu
Jared Roskamp	Past Chair	765-496-6690	jroskamp@purdue.edu

# North Central Weed Science Society Information

## NCWSS Interest Group Committees (continued)

### Extension

Doug Shoup	Chair	620-212-2399	dshoup@ksu.edu
Vince Davis	Vice Chair	608-262-1392	vmdavis@wisc.edu
Mike Moechnig		605-688-4591	michael.moechnig@sdstate.edu
Chris Boerboom		701-231-7171	chris.boerboom@ndsu.edu
Christy Sprague		517-355-0271	sprague1@msu.edu
Jeff Gunsolus		612-625-8130	gunso001@umn.edu
Kevin Bradley		573-882-4039	bradleyke@missouri.edu
Robert Hartzler		515-294-1923	hartzler@iastate.edu
Mike Owen		515-294-5936	mdowen@iastate.edu
Bill Johnson		765-494-4656	wgj@purdue.edu
Justin Petrosino		937-548-5215	petrosino.3@osu.edu
Lowell Sandell		402-472-1527	lsandell2@unl.edu
Jeff Stachler	Past Chair	701-231-8131	jeff.stachler@ndsu.edu

### Industry

Dawn Refsell	Chair	816-206-3919	dawn.refsell@valent.com
Chris Kamienski	Vice Chair	309-532-4405	Christopher.d.Kamienski@monsanto.com
Brent Petersen		320-230-4081	brentpetersen@charter.net
Mark Peterson		765-463-7788	mapeterson@dow.com
Dave Johnson		515-535-7234	david.h.johnson@pioneer.com
Aaron Waltz		608-758-3468	aaron.waltz@pioneer.com
Nick Vandervort		563-547-2886	nvandervort@wilburellis.com
Greg Dahl		651-490-4246	gkdahl@landolakes.com
Stott Howard		515-222-4809	stott.howard@syngenta.com
Gary Schmitz		217-897-1939	gary.schmitz@basf.com
John Hinz		515-733-9250	john.hinz@bayer.com
Helen Flanigan		317-862-0578	helen.a.flanigan@usa.dupont.com
Jeff Ellis		816-343-2997	jmellis2@dow.com
Brent Neuberger		515-250-2566	Brent.Neuberger@fmc.com
Brady Kappler		402-432-1469	brady.kappler@basf.com
Alan Miller		608-845-7993	amagstat@td.net
Dave Saunders	Past Chair	515-480-1218	david.w.saunders@usa.dupont.com

### Resident Education

Fritz Koppatschek	Chair	317-413-3295	fkoppatschek@abgagservices.com
Cheryl Dunne	1st Vice Chair	772-794-7146	cheryl.dunne@syngenta.com
Tate Castillo	2nd Vice Chair	785-213-8979	tate.castillo@bayer.com
Anita Dille		785-532-7240	dieleman@ksu.edu
Eric Scherder		515-597-2660	efscherder@dow.com
Doug Nord		620-285-3380	dwnord@gbta.net
Jeff Stachler		701-231-8131	jeff.stachler@ndsu.edu
Jess Spotanski		402-366-9230	jess_spotanski@mainstaycomm.net
Helen Flanigan		317-862-0578	helen.a.flanigan@usa.dupont.com
Andrew Robinson		765-496-6690	arobinson@purdue.edu
Jason Parrish		440-225-4831	parrish.174@osu.edu
John Hinz		515-733-9250	john.hinz@bayer.com
Brady Kappler	Past Chair	402-432-1469	brady.kappler@basf.com

### Contest Rules Subcommittee of Resident Education

Fritz Koppatschek	Chair/Past Host	317-431-3295	fkoppatschek@abgagservices.com
Cheryl Dunne	1st Vice Chair	772-794-7146	cheryl.dunne@syngenta.com
Tate Castillo	2nd Vice Chair	785-213-8979	tate.castillo@bayer.com
Doug Nord	Host	620-285-3380	dwnord@gbta.net
Jess Spotanski		402-366-9230	jess_spotanski@mainstaycomm.net
Brady Kappler	Past Chair	402-432-1469	brady.kappler@basf.com

### Summer Contest Subcommittee of Resident Education

Doug Nord	Chair and Host	620-285-3380	dwnord@bta.net
Fritz Koppatschek	Chr Res. Ed./Past Host	317-431-3295	fkoppatschek@abgagservices.com
Cheryl Dunne	1st Vice Chair	772-794-7146	cheryl.dunne@syngenta.com
Tate Castillo	2nd Vice Chair	785-213-8979	tate.castillo@bayer.com
Andrew Robinson		765-496-6690	arobinson@purdue.edu
Mark Renz		608-263-7437	mrrenz@wisc.edu
Anita Dille		785-532-7240	dieleman@ksu.edu
Gregory Armel		865-974-8829	garmel@utk.edu
Jeff Stachler		701- 231-8131	jeff.stachler@ndsu.edu
Bruce Ackley		614-292-1399	ackley.19@osu.edu
Brady Kappler	Past Chair	402-432-1469	brady.kappler@basf.com

### Essay Contest Subcommittee of Resident Education

Jeff Stachler	Chair	701- 231-8131	jeff.stachler@ndsu.edu
George Kegode		660-562-1155	gkegode@nwmissouri.edu
Jason Parrish		440-225-4831	parrish.174@osu.edu
Andrew Robinson		765-496-6690	arobinson@purdue.edu
Anita Dille		785-532-7240	dieleman@ksu.edu

# North Central Weed Science Society Information

## NCWSS Standing Committees

### Distinguished Achievement Award

Mark Wrucke	Chair	651-463-3365	mark.wrucke@bayer.com
Bryan Young	Vice Chair	618-453-7679	bgyoung@siu.edu
Ryan Tichich		636-737-6807	ryan.p.tichich@monsanto.com
Jan Michael		517-655-6219	michae42@msu.edu
Dennis Belcher		573-814-3331	dennis.belcher@basf.com
Roger Becker		612-625-5753	becke003@umn.edu
Bill Witt		859-333-3131	wwitt@uky.edu
Larry Hageman		815-562-7570	larry.h.hageman@usa.dupont.com
Chris Boerboom	Past Chair	701-231-7171	chris.boerboom@ndsu.edu

### Fellow Committee

Mike Owen	Chair	515-294-5936	mdowen@iastate.edu
Dain Bruns	Vice Chair	614-767-0236	dain.bruns@syngenta.com
J.D. Green		859-257-4898	jdgreen@uky.edu
Duane Rathmann		507-835-2580	duane.rathmann@basf.com
Richard Zollinger		701-231-8157	r.zollinger@ndsu.edu
Adrian Moses		515-689-7451	adrian.moses@syngenta.com

### Finance Steering and Policy Committee

Christy Sprague	Chair	517-355-0271	sprague1@msu.edu
Harlene Hatterman-Valenti	Vice Chair	701-231-8536	h.hatterman.valenti@ndsu.edu
Kelly Nelson		660-739-4410	nelsonke@missouri.edu
Bill Johnson		765-494-4656	wgj@purdue.edu
Greg Kruger		308-696-6715	gkruger2@unl.edu
Eric Spandl		651-490-4292	epsandl@landolakes.com
Phil Banks	Executive Secretary	575-527-1888	ncwss@marathonag.com

### Future Site Selection Committee

Charles Slack	Chair	859-227-3355	cslack@uky.edu
Mark Wrucke	Past President	651-463-3365	mark.wrucke@bayer.com
Mick Holm		608-231-9961	mick.f.holm@usa.dupont.com
John Wollam		816-880-3820	john.wollam@bayer.com
Kirk Howatt		701-231-7209	kirk.howatt@ndsu.edu
David Simpson		317-337-3959	dmsimpson@dow.com
Sara Carter		859-259-1914	sara.carter@uky.edu

### Local Arrangements: 2012 Hyatt Regency, St. Louis

Emilio Oyarzabal	Chair	314-610-4805	emilio.s.oyarzabal@monsanto.com
Mick Holm	Past Chair	608-231-9961	mick.f.holm@usa.dupont.com
Dave Johnson	Program Chair	515-535-7234	david.h.johnson@pioneer.com
Phil Banks	Executive Secretary	575-527-1888	ncwss@marathonag.com

### Nominating Committee

Gary Finn	Chair	317-337-4781	gafinn@dow.com
Bernie Zandstra	Vice Chair	517-353-6637	zandstra@msu.edu
Peter Sikkema		519-674-1500	psikkema@ridgetownc.uoguelph.ca
Stott Howard		515-222-4809	stott.howard@syngenta.com
Karen Renner		517-355-0271	renner@msu.edu
Brent Neuberger		515-250-2566	brent.neuberger@fmc.com
Dallas Peterson		785-532-0405	dpeterso@ksu.edu

### Program Committee

Dave Johnson	Chair	515-535-7234	david.h.johnson@pioneer.com
J.D. Green	Vice Chair	859-257-4898	jdgreen@uky.edu
Emilio Oyarzabal	LAC	314-610-4805	emilio.s.oyarzabal@monsanto.com
Christy Sprague	Secretary/Treasurer	517-355-0271	sprague1@msu.edu
Robert Hartzler	Editor - Proceedings	515-294-1923	hartzler@iastate.edu
Duane Rathmann	CAST	507-835-2580	duane.rathmann@basf.com
Fritz Koppatschek	Resident Education	317-431-3295	fkoppatschek@abgagservices.com
Doug Shoup	Extension	620-212-2399	dshoup@ksu.edu
Conner Ferguson	Graduate Students	405-401-4008	conner.ferguson@huskers.unl.edu
Dawn Refsell	Industry	816-206-3919	dawn.refsell@valent.com
Steve Young	Invasive Plants	308-696-6712	syong4@unl.edu
Mark Bernards	WSSA	309-298-1569	ML-Bernards@wiu.edu
Bryan Young	President (ex officio)	618-453-7679	bgyoung@siu.edu

### Resolutions and Necrology Committee

Aaron Hager	Chair	217-333-4424	hager@illinois.edu
Kirk Howatt	Vice Chair	701-231-7209	kirk.howatt@ndsu.edu
Tom Bauman		765-494-4625	tbauman@purdue.edu
Donald Penner		517-355-0271	pennerd@msu.edu
Pat Tranel		217-333-1531	tranel@illinois.edu

# North Central Weed Science Society Information

## NCWSS Standing Committees (continued)

### Invasive Plants Committee

Steve Young	Chair	308-696-6712	syoung4@unl.edu
Catherine Tarasoff	Vice Chair	906-487-2396	ctarasof@mtu.edu
Jim Harbour		402-219-3863	james.d.harbour@usa.dupont.com
Kevin Gibson		765-496-2161	kgibson@purdue.edu
Roger Becker		612-625-5753	becke003@umn.edu
Bob Masters		317-337-4281	ramasters@dow.com
Mark Renz		608-263-7437	mrrenz@wisc.edu
Walt Fick		785-532-7223	whfick@ksu.edu
Joe Omielan		859-967-6205	joe.omielan@uky.edu
Reid Smeda	Past Chair	573-882-1329	smedar@missouri.edu

### Section Program Chairs

#### General Program

Dave Johnson	Program Chair	515-535-7234	david.h.johnson@pioneer.com
--------------	---------------	--------------	-----------------------------

#### Poster Session

Gordon Vail	Chair	336-632-5596	gordon.vail@syngenta.com
Dave Ruen	Vice Chair	507-467-2375	dcruen@dow.com
Helen Flanigan		317-862-0578	helen.a.flanigan@usa.dupont.com
Jeff Stachler		701-231-8131	jeff.stachler@ndsu.edu
Jerry Hora	Past Chair	563-662-5013	jerry.hora@bayer.com

### Graduate Student Paper Awards

Cheryl Dunne	Chair	772-794-7146	cheryl.dunne@syngenta.com
Fritz Koppatschek	Past Chair	317-431-3295	fkoppatschek@abgaservices.com

### Graduate Student Poster Awards

Tate Castillo	Chair	785-213-8979	tate.castillo@bayer.com
Cheryl Dunne	Past Chair	772-794-7146	cheryl.dunne@syngenta.com

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

Aaron Franssen	Chair	402-643-9252	aaron.franssen@syngenta.com
Aaron Waltz	Vice Chair	608-756-4030	aaron.waltz@pioneer.com

### Agronomic Crops II (Corn, Sorghum)

Walter Thomas	Chair	919-547-2549	walter.e.thomas@basf.com
Ryan Lins	Vice Chair	507-251-5524	ryan.lins@syngenta.com

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

Mike Weber	Chair	515-962-9214	michael.weber@bayer.com
Mark Waddington	Vice Chair	618-334-6789	mark.waddington@bayer.com

### Equipment and Application Methods

Greg Kruger	Chair	308-696-6715	gkruger2@unl.edu
Lillian Magidow	Vice Chair	651-600-1028	lcmagidow@landolakes.com

### Extension

Doug Shoup	Chair	620-212-2399	dshoup@ksu.edu
Vince Davis	Vice Chair	608-262-1392	vmdavis@wisc.edu

### Herbicide Physiology

Andy Robinson	Chair	765-414-6615	arobins@purdue.edu
Ryan Lee	Vice Chair	812-855-0848	ryanlee@indiana.edu

### Invasive Weeds

Steve Young	Chair	308-696-6712	syoung4@unl.edu
Catherine Tarasoff	Vice Chair	906-487-2396	ctarasof@mtu.edu

### Forestry, Industrial, Turf, Aquatics, Forage and Range

Reid Smeda	Chair	573-882-1329	smedar@missouri.edu
Scott Flynn	Vice Chair	515-964-7641	flynn@dow.com

### Horticulture and Ornamentals

Darren Robinson	Chair	519-674-1604	drobinso@ridgetownc.uoguelph.ca
Collin Auwarter	Vice Chair	701-231-8471	collin.auwarter@ndsu.edu

### Weed Biology, Ecology and Management

Marty Williams	Chair	217-244-5476	mmwillms@illinois.edu
Kris Mahoney	Vice Chair	608-342-1363	mahoneykr@uwplatt.edu

# North Central Weed Science Society Information

## Honorary Members/Fellows

### Honorary Members

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



# North Central Weed Science Society Information

## Honorary Members/Fellows (continued)

2004	Duane Rathman		Kassim Al-Khatib
	David Regehr	2009	Jonathan D. Green
2005	Dallas E. Peterson		Thomas B. Threewitt
2006	James R. Martin		Robert N. Klein
	Bernard H. Zandstra	2010	No nominations
2007	Chris M. Boerboom	2011	Bill Johnson
	Michael J. Horak		Harlene Hatterman-Valenti
2008	Thomas J. Peters		Gordon K. Roskamp
	Jeffrey Gunsolus		

\* 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	1979	Nalewaja, John D.
1945	Yost, Ted F. *	1980	Stroube, Edward W.
1946	Yost, Ted F. *	1981	Herron, James W. *
1947	Hanson, Noel S. *	1982	Benson, Robert L.
1948	Willard, Charles J. *	1983	DiVall, James W.
1949	Dunham, R. S. *	1984	Miller, Gerald R.
1950	Worzella, W. W. *	1985	Messersmith, Calvin G.
1951	Sylwester, Erhardt P. *	1986	Wax, Lloyd M.
1952	Buchholtz, Kenneth P. *	1987	Chamberlain, Earl
1953	Gilbert, C. J. *	1988	Harvey, R. Gordon *
1954	Lee, Oliver C. *	1989	Worthington, James P.
1955	Grigsby, Buford H. *	1990	Martin, Alex R.
1956	Helgeson, Earl A. *	1991	Taylor, T. Don
1957	Slife, Fred W. *	1992	Stoller, Edward W.
1958	Derscheid, Lyle A.	1993	Warfield, Ted R.
1959	Foster, J. Roe *	1994	Bauman, Thomas T.
1960	Holm, Leroy G. *	1995	Cobia, LeRoy R.
1961	Alban, E. K. *	1996	Dexter, Alan G.
1962	Bjerken Sig. *	1997	Miller, Bill
1963	Hemphill, Delbert D. *	1998	Buhler, Douglas D.
1964	Hemphill, Delbert D. *	1999	Orwick, Philip L.
1965	Furrer, John D.	2000	Kells, James J.
1966	Furrer, John D.	2001	Rathmann, Duane P.
1967	Warden, Robert L. *	2002	Peterson, Dallas E.
1968	Fletchall, O. Hale *	2003	Horak, Michael J.
1969	Beck, Thomas V.	2004	Doll, Jerry D.
1970	Hannah, Lawrence H.	2005	Peters, Tom
1971	Knake, Ellery *	2006	Miller, Stephen D.
1972	Williams, Jr., James L. *	2007	Moses, Adrian
1973	Meggitt, William	2008	Johnson, William G.
1974	Bradfield, Kenneth W.	2009	Holm, Mick
1975	Burnside, Orvin C.	2010	Boerboom, Chris
1976	Fink, Rodney J.	2011	Wrucke, Mark
1977	Carpenter, Will D.	2012	Bryan Young
1978	Doersch, Ronald E.		

\* Deceased

# North Central Weed Science Society Information

## 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 Michael 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 Kassim 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

# North Central Weed Science Society Information

## Distinguished Achievement Award (continued)

2003	Mark Loux - Education
	Kenneth Carlson - Industry
	Daniel E. Schroeder - Industry
	Andrew Chomas - Professional Staff
	Jeffrey Stachler - Professional Staff
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
2009	Kevin W. Bradley – Young Scientist
	Adam S. Davis – Young Scientist
	Reid J. Smeda – Education
	Adrian J. Moses – Industry
	James L. Moody – Professional Staff
2010	Darren Robinson – Young Scientist
	Aaron Hager – Education
	Jon Scott – Professional Staff
	Peter Sikkema - Research
2011	Anita Dille-Education
	Walter Fick-Education
	Terry Wright-Industry
	Greg Dahl-Industry
	Nader Soltani-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	Imprelis	DuPont
Aminopyralid	Milestone	Dow
Aminopyralid + 2,4-D	Forefront	Dow
Atrazine	Several	Several
Atrazine + s-metolachlor	Bicep II Magnum, etc.	Syngenta, etc.
Benefin	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
Fenoxaprop + pyrasulfotole + bromoxynil	Wolverine	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

# Herbicide Index

Common Name	Trade Name(s)	Manufacturer
Flumiclorac	Resource	Valent
Flumioxazin	Valor	Valent
Flumioxazin + chlorimuron	Valor XLT	Valent
Flumioxazin + cloransulam-methyl	Gangster	Valent
Flumioxazin + pyroxasulfone	Fierce	Valent
Flumioxazin + pyroxasulfone + chlorimuron	Fierce XLT	Valent
Fluthiacet-ethyl	Cadet	FMC
Fluthiacet-ethyl + pyroxasulfone	Anthem	FMC
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
Indaziflam	Alion	Bayer
Iodosulfuron	Autumn	Bayer
Isoxaben	Gallery	Dow
Isoxaflutole	Balance Flexx	Bayer
Isoxaflutole + thiencazabone-methyl	Corvus	Bayer
Lactofen	Cobra, Phoenix	Valent
Linuron	Lorox, Linex	Tessenderlo Kerley
MCPA	Several	Several
MCPB	Thistrol	NuFarm
Mecoprop (MCPP)	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

# Herbicide Index

Common Name	Trade Name(s)	Manufacturer
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
Propoxycarbazone	Olympus	Bayer
Prosulfuron	Peak	Syngenta
Pyraflufen	Vida	Gowan
Pyrasulfotole + bromoxynil	Huskie	Bayer
Pyrazon	Pyramin	Arysta
Pyrithiobac sodium	Staple	DuPont
Pyroxasulfone	KIH-485, Zidua	Kumiai, BASF
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, Treevix	BASF
Saflufenacil + dimethenamid-P	Verdict	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 + chlorimuron	Authority XL	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 + thienencarbazone-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
Triflursulfuron-methyl	UpBeet	DuPont

## Author Index

Ackerman, Joseph J.	61, 131
Ahrens, Brian	118
Allen, Jayla	28, 109, 160, 162
Allen, Sara M.	13, 44
Alms, Jill K.	2, 9, 10, 73
Arkebauer, Timothy J.	96
Armel, Gregory R.	50, 180, 209
Armstrong, Joe	6, 151, 190
Arnevik, Cindy L.	19
Auwarter, Collin	66
Bagley, William E.	33, 37, 41, 205
Bailey, Wayne C.	93
Barnett, Kelly A.	135, 163
Barrett, Michael	180
Baxter, Ivan	192
Beckett, Thomas H.	161
Beffa, Roland	185, 186
Bernards, Mark L.	14, 31, 83, 96, 116
Bethel, JD	12, 114
Bilyea, Dave	67
Bing, Jim W.	7
Bowe, Steven J.	47, 156, 157
Bozeman, Luke L.	47, 156
Bradley, Kevin W.	93, 101, 106, 109, 137
Breeden, Gregory K.	52, 56, 124, 126, 178, 179, 180, 181, 182
Breeden, Shane M.	56
Bretthauer, Scott M.	203, 206
Brosnan, James	50, 52, 56, 68, 124, 126, 144, 178, 179, 180, 181, 182, 209
Brown, Michael	198
Bruening, Chris	26, 43, 145
Bruns, Dain	161
Burch, Pat	197
Burchfield, David	46
Byker, Holly P.	30, 113
Call, Dorothy L.	1
Calvache, Sara	178
Campbell, Tyler	68

## Author Index

Cannan, Terrance M.	156
Chahal, Gurinderbir S.	132
Charvat, Leo D.	17, 157
Chatham, Laura A.	60
Colquhoun, Jed	175
Conley, Shawn P.	20
Cordes, Joe	19
Cornelius, Cody D.	24
Creech, Cody F.	42, 141
Crespo, Roberto J.	14
Cully, Scott	23
Currie, Randall S.	140
Cutulle, Matthew A.	209
d'Avignon, Dana A.	61, 131
Dahl, Gregory K.	200
Dale, Trevor M.	32, 119
Datta, Avishek	26, 43, 77, 78, 108, 134, 136, 145
Davis, Vince M.	20, 76, 151
de Leon, Natalia	62
DeJarnette, Robert	63
Deneke, Darrell L.	2, 9, 10, 73
Devkota, Pratap	153
Devries, Mindy	19
DeWerff, Ryan P.	20
Dille, Anita	80, 130
DiMeo, Natalie	58
Ditmarsen, Scott C.	7, 190
Dobbels, Anthony	22, 112
Dorr, Turner J.	83
Downing, Dave	118
Eastin, John A.	39, 142
Echaiz, Constanza	172
Ellis, Jeff M.	158, 159, 190
Elmore, Matthew T.	126, 180
Erdahl, Brian	160
Esser, Andrew	74
Fakhoury, Ahmad M.	25



## Author Index

Farnsworth, Daniel	56
Fawcett, Richard S.	187
Feist, Dave	118
Ferguson, J Connor	39, 142, 146
Fick, Walter H.	51, 183
Fillmore, Andrew N.	3, 167
Fischer, Jon	160
Flanigan, Helen A.	11, 75, 188
Flipp, Amanda M.	104
Flynn, Scott	193, 197
Follings, Joanna	27, 110
Ford, Dallas	150
Franssen, Aaron S.	4, 5, 98
Franzenburg, Damian	40, 154
Frihauf, John	156, 157
Fritz, Bradley K.	205
Gander, Jody R.	44
Garner, Vanessa L.	138
Gaussoin, Roch E.	39, 142
Ge, Xia	61, 131
Gednalske, Joe V.	200
Geier, Patrick W.	169
Geyer, Annah	41, 42, 205
Geyer, Wayne A.	51
Gibson, David J.	121
Giesler, Loren J.	116
Gillard, Chris	139
Glettner, Courtney E.	79
Godar, Amar S.	45
Gogos, George	26, 43, 145
Golus, Jeffrey	18, 83
Gomez, Carlos	149
Gray, Jesse L.	1
Green, JD	166, 171
Grossnickle, Dean M.	40, 154
Gunsolus, Jeffrey	104
Guo, Jiaqi	57
Gurda, Anders	184

## Author Index

Hageman, Larry H.	11, 75
Hager, Aaron G.	31, 57, 91, 122
Haguewood, John B.	54, 55
Hahn, Kevin L.	188
Haile, Fikru F.	159, 190
Hall, J. Christopher	58, 128
Hallett, Steven G.	81, 125
Hammond, Larry E.	143
Harden, Amanda C.	127
Harre, Lucas A.	8
Harre, Nick T.	23
Hart, William	209
Hatterman-Valenti, Harlene M.	66, 177
Hausman, Nicholas E.	57
Havens, Patrick	38
Heaton, Emily	195
Heider, Daniel	175
Henry, Ryan S.	18, 33, 41, 42, 205
Hillger, David E.	6, 38
Hinz, John	28
Hoffmann, Wesley C.	205
Hopkins, Bradley W.	159, 189
Howatt, Kirk A.	3, 167
Huff, Jonathan A.	6, 190, 204
Ikley, Joseph T.	103
Iseminger, Bill	86
Jain, Rakesh	160
Jenks, Brian M.	69
Jhala, Amit	82, 151
Johnson, Dave	92
Johnson, Gregg	104
Johnson, Kevin D.	189
Johnson, Tim J.	65
Johnson, Tyler	22
Johnson, William G.	34, 59, 64, 81, 84, 95, 103, 125, 132, 138, 153
Jones, Patrick A.	52, 124
Jones-Jefferson, Tami	6

## Author Index

Jugulam, Mithila	58, 128
Juneau, Kevyn	70
Kamienski, Christopher	16, 36, 202
Kaufmann, John E.	164
Kazmierczak, Angela J.	21, 35, 37
Kirfman, Gary W.	32
Kitt, Mark	23
Klein, Robert N.	208
Kleven, Thomas	185, 186
Klingaman, Troy D.	156
Knezevic, Stevan Z.	4, 5, 17, 26, 43, 77, 78, 83, 98, 108, 134, 136, 145
Kohrt, Jon R.	100
Kopsell, Dean A.	52, 124, 209
Kremer, Robert	101
Kretzmer, Keith	63
Kruger, Greg R.	18, 33, 39, 41, 42, 82, 83, 102, 141, 142, 157, 205
Krupke, Christian	84, 95
Laber, Bernd	185
Lassiter, Ralph B.	158, 159
Laurent, Aaron	171
Law, Quincy D.	123
Lawton, Mark	27, 30, 110, 113
Leach, Jan	133
Legleiter, Travis	34
Lightfoot, David A.	25
Lindenmayer, Bradley	62
Lindner, Gregory J.	201
Lindquist, John L.	72, 96, 105, 116
Lins, Ryan D.	161
Logan, Seth T.	13
Lorenz, Aaron J.	72
Loux, Mark M.	12, 22, 112, 114, 129
Lubbers, Mark	19
Lux, James F.	40, 154
Mackey, David	129
Magidow, Lillian C.	151, 200
Malik, Mayank S.	16, 18

## Author Index

Maria, Miriti	195
Marquardt, Paul T.	84, 95, 138
Martin, James R.	1, 166, 171
Matthews, Joseph L.	8, 31, 100, 117
Maxwell, Douglas J.	31
Mayo, Christopher M.	106
McElroy, Randy	44
McHale, Leah	129
McMullan, Patrick M.	11
McNaughton, Kristen	176
Medina, Carolina	44
Menne, Hubert	185
Meredith, Jeff H.	49
Miller, Brett R.	23, 160
Miller, Keith	118
Miller, Lee	101
Minihan, Cathy	46
Mitchell, Rob	196
Moechnig, Mike J.	2, 9, 10, 73
Morrice, Jarrod J.	173, 174
Mueller, Thomas C.	163
Nedeljkovic, Dejan	77, 78, 108, 136
Neilson, Brian D.	26, 145
Nurse, Robert E.	139
Nyamusamba, Rutendo	73
Olson, Brian	202
Olson, Brian D.	189
Ostrander, Elizabeth	61, 131
Ott, Eric J.	32, 119
Owen, Micheal D.	40, 60, 94, 154, 165
Page, Carey F.	24
Parrish, Jason T.	12, 129
Patton, Aaron J.	48, 123, 179, 181, 182
Pawlak, John A.	32, 119
Pedersen, Jeff F.	72
Penfield, Kevin	201
Pepitone, Daniel	47
Perry, Hunter	158

## Author Index

Peterson, Dallas	46, 168
Peterson, Mark A.	6
Peterson, Robert	14
Peterson, Vanelle	197
Philbrook, Brent	185, 186
Pollard, Justin M.	154
Powell, David	29
Price, Kevin	46
Prochaska, Steve	114
Putman, Josh A.	99
Qin, Kuide	38
Ramirez, Analiza H.	80
Rana, Neha	4, 5, 17, 26, 43, 77, 78, 98, 108, 134, 136, 145
Rathmann, Duane	89
Recker, Ross A.	76
Reddy, A.S.N.	133
Reeb, Bryan	112
Refsell, Dawn	32, 119, 130
Reicher, Zac J.	102
Reinhardt, Theresa A.	31
Remund, Kirk	202
Renner, Karen A.	71
Renz, Mark J.	115, 184
Richburg, John	204
Rick, Susan K.	49
Riechers, Dean E.	57
Riggins, Chance	57, 60, 122
Riley, Eric B.	106
Riley, Spencer A.	120
Rinderer, Jessica L.	44
Rittmeyer, Richard	175
Robinson, Darren E.	27, 30, 67, 110, 113, 176
Rosenbaum, Kristin K.	101
Roskamp, Jared M.	59, 132
Ruen, David C.	158, 189, 204
Rumecal, David	63
Sammons, Doug	61, 63, 131

## Author Index

Sandbrink, Joe	36, 202
Sandell, Lowell	18, 33, 41, 42, 82, 83, 102, 141, 205
Sattler, Scott E.	72
Saunders, David	75
Schafer, Jessica R.	81, 125
Scherder, Eric F.	158, 190
Schlichenmayer, Ashley	107
Schmidt, Jared J.	72, 105
Schneider, Joseph G.	54
Schultz, John	109
Schulz, Burkhard	64
Schwartz, Lauren M.	121
Scott, Jon E.	4, 5, 17, 43, 77, 78, 98
Segoby, Kabelo	64
Seifert-Higgins, Simone	15, 16, 18, 106, 155
Shaner, Dale	63, 87, 133
Shauck, Tye C.	97
Shivrain, Vinod K.	98
Shoup, Douglas E.	85
Sikkema, Peter	27, 30, 110, 113, 139
Silverstone, Aron	160
Simpson, David M.	7, 38
Smeda, Reid J.	15, 24, 97, 107, 120
Snow, Allison	195
Solomon, Craig B.	137
Soltani, Nader	27, 30, 139
SoroChan, John C.	178
Sousek, Matt D.	39
Spandl, Eric P.	200
Spaunhorst, Doug J.	7, 106
Spomer, Neil A.	7, 189
Sprague, Christy	29, 71, 127
Staal, Maarten	47
Stachler, Jeff M.	111
Stahlman, Phillip W.	45, 169
Steckel, Lawrence E.	15, 135, 163
Stepanovic, Strahinja V.	26, 108, 134, 136, 145

## Author Index

Steppig, Nicholas R.	11
Stoltenberg, David E.	62, 79
Strek, Harry J.	185, 186
Stute, James K.	79
Taich, Arlene	148
Tarasoff, Catherine S.	70
Tardif, François	27, 30, 110, 113
Taylor, Erin C.	71
Thomas, Joseph	50
Thomas, Walter E.	47, 157
Thompson, Curtis R.	168
Tranel, Patrick	25, 57, 60, 102, 122
Travers, Jeff N.	36, 202
Trower, Timothy L.	79
Tursun, Nihat	108
Tyre, Andrew J.	96
Vail, Gordon D.	160, 161
Valentine, Lacy J.	102
van der Merwe, Deon	46
Van Horn, Christopher	129
Van Wert, Sally	160
Van Wychen, Lee	88
Vargas, Jose J.	50, 68, 144, 209
Vos, David A.	2, 9, 10, 73
Waggoner, Brock S.	93
Wait, Jimmy D.	137
Walsh, Michael	58
Walter, Tiffany D.	69
Walton, Larry	204
Weber, Michael L.	28, 109, 162
Wedryk, Stephanie	200
Weisenberger, Dan V.	48, 123, 179, 181, 182
Weisz, Richard A.	21
Weller, Stephen C.	64
Werle, Rodrigo	96, 116
Westra, Philip	62, 129, 133, 147
Whitehead, James	118
Wiecko, Greg	53

## Author Index

Wiersma, Andrew	62, 129, 133
Wiggins, Matthew S.	135
Wilde, Thomas	185, 186
Wiley, Gerald	118
Willis, John B.	16, 36, 153, 155
Wirth, Devin A.	21, 35
Wise, Kiersten A.	103, 138
Witt, William W.	166, 194
Wolf, Robert E.	206, 207
Wortman, Sam E.	105
Wu, Chenxi	94
Wuerffel, R. Joseph	25, 117
Wyse, Donald	104
Xiong, Xi	54, 55
Yerka, Melinda K.	62, 79
Young, Bryan G.	8, 13, 23, 25, 31, 44, 90, 100, 117, 121, 201
Young, Julie M.	8, 31, 100, 117
Zahn, Deane K.	159
Zandstra, Bernard H.	173, 174
Zollinger, Rich	21, 35, 37, 170



## **Sustaining Members**

We are grateful for the support of the following Sustaining Members:

ABG Ag Services

AMVAC Chemical Corporation

BASF Corporation

Bayer CropScience

Bellspray Inc. dba R&D Sprayers

Chemorse

Dow AgroSciences

DuPont Crop Protection

FMC Corporation

Growmark Inc.

Gylling Data Management Inc.

Heartland Technologies Inc.

Helena Chemical Company

Huntsman

Kumiai America

Monsanto Company

Precision Laboratories, Inc.

Syngenta Crop Protection

TKI NovaSource

Valent USA Corporation

Winfield Solutions LLC

## Notes

## Notes

[illegible]

## Notes

[illegible]

## Notes

[illegible]

## Future NCWSS Annual Meeting Sites

2013 – Dec. 9<sup>th</sup> – 12<sup>th</sup> in Columbus, OH

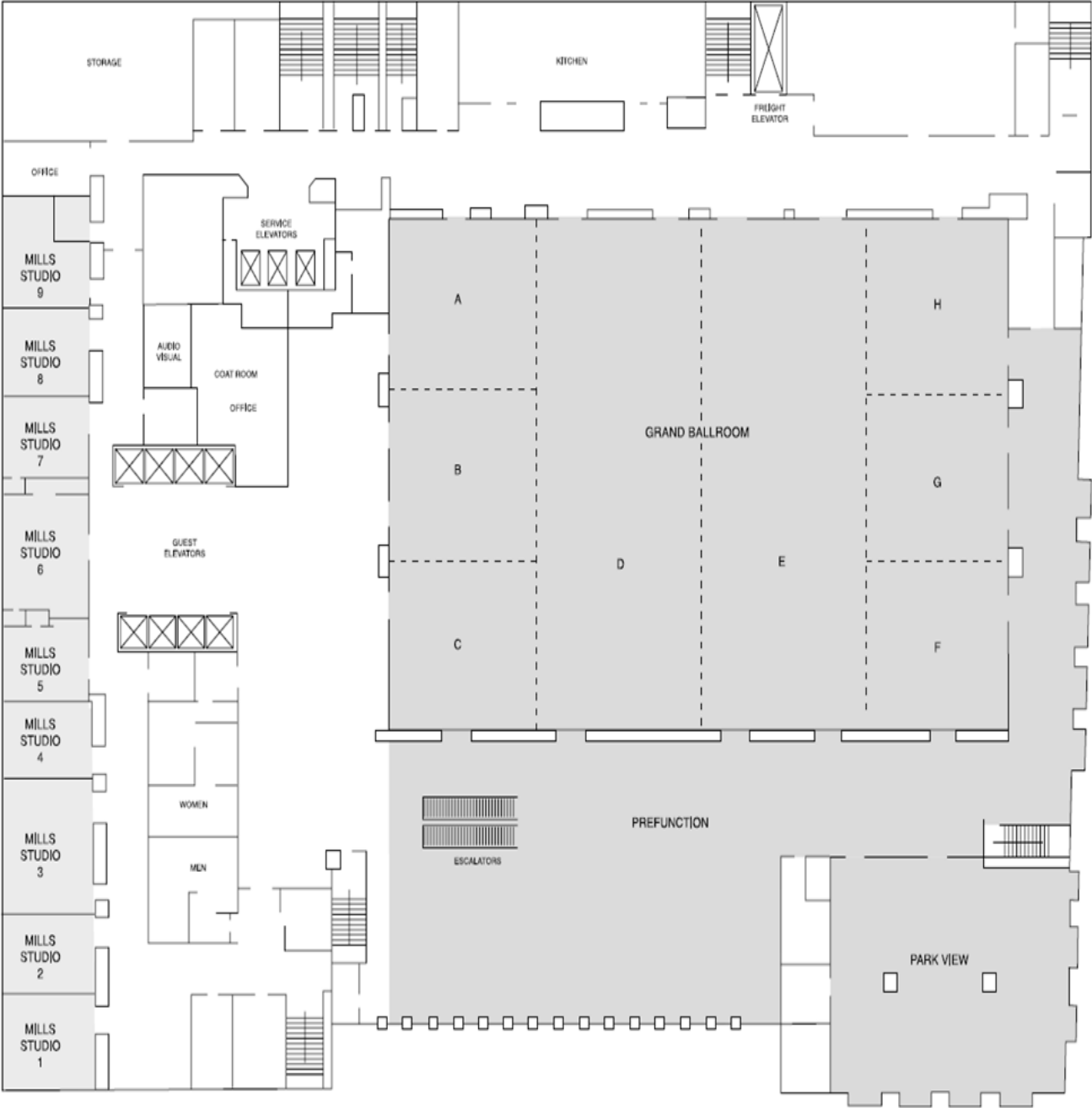
2014 – Dec. 1st – 4th in Minneapolis, MN

## Time Schedule

Mark papers and meetings in the appropriate space.

Time	Tuesday	Wednesday	Thursday
8:00	Poster Session I		
8:15			
8:30			
8:45			
9:00			
9:15			
9:30			
9:45			
10:00	General Session		
10:15			
10:30			
10:45			
11:00			
11:15			
11:30		NCWSS Awards Luncheon	
11:45			
12:00			Conference End
12:15			
12:30			
12:45			
1:00			
1:15			
1:30			
1:45			
2:00			
2:15			
2:30			
2:45			
3:00			
3:15			
3:30			
3:45			
4:00			
4:15			
4:30			
4:45			
5:00	Poster Session II		
5:15			
5:30		Society Social	
5:45			

FOURTH FLOOR



Hyatt Regency St. Louis at the Arch