**2017**

**72nd Annual Meeting**

**North Central Weed Science Society**

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**www.ncwss.org**

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**December 4 - 7, 2017**

**Hyatt Regency St. Louis, at The Arch**
**St. Louis, MO**

# President's Welcome

## 2017 North Central Weed Science Society Meeting

Welcome to the 72nd annual North Central Weed Science Society at the Hyatt Regency at the Arch in St. Louis, MO. St. Louis is called the "Gateway to the West" in tribute to its role in the westward expansion of the United States. I hope you find this meeting a gateway to great achievements in weed science. I am eager to learn the latest research, education, and outreach activities in the field of weed science. I hope you use this opportunity meet with your fellow NCWSS members to learn new technologies, share information and experiences, and visit with your friends.

Greg Elmore and the Local Arrangements Committee have been working hard with the hotel staff to prepare for our meeting. The venue is excellent and I anticipate that the staff will meet and exceed all our expectations.

Program Chair, Christy Sprague, has assembled an excellent program. The program includes some interesting symposia including: "Weed Management through Equipment and Application Technologies" on Wednesday morning, "Taking the Next Step: Preparing for your Future Career", and "An Open Dialogue on Dicamba Technology" on Wednesday afternoon. The popular **"What's New in Industry" Session will take place on Thursday morning** following the Industry breakfast. We have a full slate of poster and paper presentations and will again be using the Guidebook App to assist you in planning your schedule.

I encourage those of you that can, to attend the 4th annual "Women in Weed Science" Networking Breakfast with speaker Cheryl Dunne, Syngenta Crop Protection, sharing about her experiences as one of the Women of Acuron. Please attend this year's Industry Breakfast, which will feature Kevin Folta, Professor and Chairman of the Horticultural Sciences Department of the University of Florida, Gainsville, FL presenting "Communicating Agricultural Innovation to a Concerned Public." The Industry Breakfast is open to all attendees at the meeting, and tickets for the event can still be purchased on site.

The winners for the Graduate Student Papers and Graduate and Undergraduate Poster Contests will be announced at our Society Social on Wednesday night. Please help us congratulate our NCWSS students.

The NCWSS is a volunteer organization. I encourage you to be involved, to ensure its continued success. Your attendance, giving presentations and service on one or more of our many committees is welcome. Every committee of the society will be meet during the conference. Please feel free to attend any of the committee meetings that interest you, and please volunteer to serve.

Thank you for allowing me to serve you as President of the NCWSS. I believe that together we will make significant contributions to weed science and to the NCWSS. If you have suggestions on how NCWSS can serve you better please let me know. I look forward to seeing you in St. Louis.

Greg Dahl, President

# General Information

### *Conference Headquarters*

All sessions of the conference and the meeting events 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. Register online at *www.ncwss.org/annual-meeting/*

Pre-registration is **$275** (includes banquet). Registration after Nov. 20 or at the conference is **$325**. Honorary members and Fellows pre-registration is **$170**; registration after Nov. 20 or at the conference is **$220**.

Student pre-registration is **$130**; student registration after Nov. 20 or at the conference is **$180**.

Industry Breakfast tickets are available to everyone for **$45**.

Register for the Women in Weed Science Networking breakfast to save your seat, no cost.

### *Registration Hours*

The registration desk is at the **Grand Coatroom** on the **4th floor**, and 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.

### *Local Arrangements Headquarters: Mills 9*

### *Meeting Rooms*

All sessions and meetings will be on the 4th floor of the hotel. Additional meetings may be arranged any time during the conference by contacting Greg Elmore, Local Arrangements Chair.

### *Proceedings*

2017 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 Park View room. No other displays are allowed.

### *No Smoking in the sessions.*

### *No photographs or videos*

Do not take pictures or videos of any presentations without prior permission from the presenter. Many presentations will be available online after the conference, by those that agreed to upload pdf versions of their presentations.

## *Program Symbols*

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

# Meetings of the Society 2017

## *Board of Directors*

| | |
|---|---|
| Monday, 1:00 pm | Mills 6 |
| Wednesday, 7:00 pm | Mills 6 |

## *Local Arrangements*

| | |
|---|---|
| Monday, 11:00 am | Mills 9 |
| Thursday, 10:30 am (with 2018 committee) | Mills 9 |

## *Contest Judges for Paper and Poster Contests*

| | |
|---|---|
| Judges breakfast, Tuesday, 7:00 am | Mills 3 |
| Judges, Tuesday, 7:15 am | Mills 3 |
| Paper Judges, Wednesday, 11:30 am | Mills 3 |
| Poster Judges, Wednesday, 11:30 am | Mills 3 |

## *Meal Functions*

### Breaks

| | |
|---|---|
| Tuesday, 9:45– 10:00 am | Grand Foyer/Park View |
| Tuesday, 2:45– 3:15 pm | Grand Foyer/Park View |
| Wednesday, 9:30 – 10:00 am | Grand Foyer/Park View |
| Wednesday, 2:30 – 3:15 pm | Grand Foyer/Park View |

### Student Mixer and Quiz Bowl

*Sponsored by BASF Corporation – Open to all attendees*

Monday, 6:30 pm — Grand Ballroom AB

### Student Luncheon/Business Meeting

*Sponsored by Dow AgroSciences – Open to all students*

Tuesday, 12:00 – 1:15 pm — Grand Ballroom FG

### Women in Weed Science Networking Breakfast *– Open to all women*

Wednesday 6:30-8:00 am — Grand Ballroom H

### Society Awards Luncheon

*MC: Dawn Refsell*

Wednesday, 12:00 noon — Grand Ballroom DE

### Society Social

*Sponsored by Sustaining Members – Open to all*

Wednesday, 5:30 – 7:30 pm — Gateway East & Terrace (18th floor)

### Industry Breakfast *(Cost $45)*

Thursday, 7:00 am — Grand Ballroom E

# Meetings of the Society 2017

The following meetings will take place for conducting the business of each respective committee and to elect a new Vice Chair to serve as Chair in 2019. 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, 7:30 pm (*section moderators*) Mills 4

### Distinguished Achievement Award

Tuesday, 12:00 pm Mills 6

### Strategic Planning

Monday, 5:30 pm Mills 5

### Paper Judges

Tuesday, 7:00 am Mills 3
Wednesday, 11:30 am Mills 3

### Poster Judges

Tuesday, 7:00 am Mills 3
Wednesday, 11:30 am Mills 3

### Finance, Steering, & Policy

Tuesday, 5:15 pm Mills 5

### Future Site Selection

Tuesday, 5:15 pm Mills 8

### Nominating

Tuesday, 5:15 pm Mills 1

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

Tuesday, 5:15 pm Mills 6

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

Wednesday, 5:00 pm Grand Ballroom FG

### NCWSS Fellow

Wednesday, 5:00 pm Mills 3

### Resolutions & Necrology

Wednesday, 5:00 pm Mills 8

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

Thursday, 10:00 am Grand Ballroom AB

# Meetings of the Society 2017

## *Program Section Business Meetings*

Poster Session
Monday, 6:00 pm — Grand Foyer/Park View

Herbicide Physiology
Tuesday, 5:00 pm — Grand Ballroom A

Agronomic and Specialty Crops
Wednesday, 10:15 am — Grand Ballroom A

Invasive Weeds, Rangeland, Pastures, and Vegetation Management
Wednesday, 11:30 am — Grand Ballroom A

Agronomic Crops I (Corn)
Wednesday, 11:30 am — Grand Ballroom B

Agronomic Crops II (Soybeans)
Wednesday, 11:30 am — Grand Ballroom C

Equipment and Application Methods
Wednesday, 11:30 am — Grand Ballroom FG

Weed Biology, Ecology & Management
Wednesday, 3:30 pm — Grand Ballroom A

Extension
Wednesday, 5:00 pm — Grand Ballroom FG

## *Special Interest Groups*

Graduate Students (at luncheon)
Tuesday, 12:00 pm — Grand Ballroom FG

Women in Weed Science Networking Breakfast
Wednesday, 6:30 am — Grand Ballroom H

Industry
Thursday, 10:00 am — Grand Ballroom AB

## *Symposia*

Weed Management through Equipment and Application Technologies
Wednesday, 8:00 – 11:30 am — Grand Ballroom FG

Taking the Next Step: Preparing for your Future Career - Graduate Student Symposium
Wednesday, 1:30 – 4:15 pm — Grand Ballroom B

An Open Dialogue on Dicamba Technology
Wednesday, 1:30 – 5:00 pm — Grand Ballroom FG

What's New in Industry?
Thursday, 8:30 – 10:00 am — Grand Ballroom AB

# Condensed Program – NCWSS 2017

**Monday, December 4**

| | | |
|---|---|---|
| 1:00 – 5:00 | Board of Directors | Mills 6 |
| 1:00 – 9:30 | Poster Setup | Grand Foyer/Park View |
| 6:30 pm | Student Mixer and Quiz Bowl | Grand AB |

**Tuesday, December 5**

| | | |
|---|---|---|
| 8:00 – 9:45 | Poster Session I | Grand Foyer/Park View |
| 10:00 – 12:00 | NCWSS General Session | Grand D |
| 12:00 – 1:15 | Student Lunch | Grand FG |
| 1:15 – 5:00 | Herbicide Physiology | Grand A |
| 1:15 – 5:00 | Equipment & Application Methods | Grand B |
| 1:15 – 5:00 | Weed Biology, Ecology, and Management | Grand C |
| 1:15 – 5:00 | Agronomic Crops II - Soybean | Grand D |
| 5:30 – 6:30 | Poster Session II | Grand Foyer/Park View |

**Wednesday, December 6**

| | | |
|---|---|---|
| 6:30 – 7:45 | Women in Weed Science Networking Breakfast | Grand H |
| 8:00 – 10:30 | Agronomic & Specialty Crops | Grand A |
| 8:00 – 11:30 | Agronomic Crops I - Corn | Grand B |
| 8:00 – 11:30 | Agronomic Crops I - Soybean | Grand C |
| 8:00 – 11:30 | Weed Management through Equipment and Application Technologies (Symposium) | Grand FG |
| 10:30 – 11:30 | Invasive Weeds, Rangeland, Pasture, and Vegetation Management | Grand A |
| 12:00 – 1:30 | NCWSS Awards Luncheon | Grand DE |
| 1:30 – 3:45 | Weed Biology, Ecology, and Management | Grand A |
| 1:30 – 4:15 | Taking the Next Step: Preparing for your Future Career (Symposium) | Grand B |
| 1:30 – 5:00 | An Open Dialogue on Dicamba Technology (Symposium) | Grand FG |
| 5:30 – 7:30 | Society Social & Contest Awards (*open to all attendees*) | Gateway East (18th floor) |
| 7:00 – 9:00 | NCWSS Board of Directors | Mills 6 |

**Thursday, December 7**

| | | |
|---|---|---|
| 7:00 – 8:15 | Industry Breakfast | Grand E |
| 8:30 – 10:00 | What's New in Industry? (Symposium) | Grand AB |

# Poster Sessions

Room: Grand Foyer/Park View
Chairperson and Moderator: Paul Marquardt

**Poster Setup**
Posters can be set up between 1:00 and 9:30 pm on Monday, December 4. All NCWSS posters will be on display on Tuesday, December 5 from 8:00 am until 6:30 pm and on Wednesday, December 6 from 8:00 am until 5:00 pm. Posters must be removed by 6:30 pm on Wednesday, December 6.

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

**Tuesday, December 12**

| | |
|---|---|
| 8:00 – 9:45 am | Poster Session I (non-contest authors present at odd numbered posters) |
| 5:30 – 6:30 pm | Poster Session II (non-contest authors present at even numbered posters) |

**Poster Removal**
All posters must be removed between 5:00 and 6:30 pm on Wednesday, December 6.

**NCWSS Sustaining Member Exhibitors**
Tuesday & Wednesday Park View
Set up Monday afternoon.

**Program Symbols**

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

# Invasive Weeds, Rangeland, Pasture, and Vegetation Management Posters

**PGR Options for Roadside Tall Fescue Management.** Joe Omielan*, Michael Barrett; University of Kentucky, Lexington, KY (1)

**Cottonwood, Buckbrush and Yellow Bluestem Control in Nebraska Pasture.** Stevan Z. Knezevic*[1], Jon E. Scott[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska, Wakefield, NE (2)

**†Common Milkweed Establishment in Existing Perennial Sod.** Sydney Lizotte-Hall*, Bob Hartzler; Iowa State University, Ames, IA (3)

**†Field Performance of a Novel 2,4-D Tolerant Red Clover .** Lucas Araujo*, Michael Barrett, Gene Olson, Linda D. Williams; University of Kentucky, Lexington, KY (4)

**Wild Parsnip Control with Herbicides and Mowing.** Kenneth Tryggestad, Mark Bernards*; Western Illinois University, Macomb, IL (5)

# Weed Biology, Ecology, and Management Posters

**Integration of Varying Plant Populations and Dicamba Rates for Palmer Amaranth Control in Irrigated Corn.** Ivan Cuvaca*[1], Randall S. Currie[2], Mithila Jugulam[1]; [1]Kansas State University, Manhattan, KS, [2]Kansas State University, Garden City, KS (6)

**Survey of Cover Crop Management in Nebraska.** Liberty Butts*[1], Rodrigo Werle[2]; [1]University of Nebraska Lincoln, North Platte, NE, [2]University of Nebraska-Lincoln, Lincoln, NE (7)

**Cover Crop Utilization Affects Weed Dynamics in Tobacco.** Erin Haramoto*, Bob Pearce; University of Kentucky, Lexington, KY (8)

**†Evaluation of Herbicide Treatments for Termination of Cereal Rye and Canola as Winter Cover Crops.** Stephanie DeSimini*, Bill Johnson; Purdue University, West Lafayette, IN (9)

# Weed Biology, Ecology, and Management Posters (continued)

**†Cereal Rye Cover Crop Supresses Winter Annual Weeds.** Samuel T. Koeshall*[1], Charles Burr[2], Humberto Blanco-Canqui[1], Rodrigo Werle[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, North Platte, NE (10)

**†Evaluating Cover Crops and Herbicides for Horseweed Management in No-till Soybean.** Dallas E. Peterson, Anita Dille, Kraig L. Roozeboom, Larry Rains*; Kansas State University, Manhattan, KS (11)

**††Effect of Cover Crop and Row Crop Cultivation on Palmer Amaranth in Grain Sorghum.** Peter P. Bergkamp*, Marshall Hay, Anita Dille, Dallas E. Peterson; Kansas State University, Manhattan, KS (12)

**Legume Intercrops for Weed Suppression in Intermediate Wheatgrass (*Thinopyrum intermedium*) Cropping Systems.** Joseph W. Zimbric*, Valentin D. Picasso, David E. Stoltenberg; University of Wisconsin-Madison, Madison, WI (13)

**††Effect of Tillage by Fertility on Weed Communities in Southern Illinois over 46 Years.** Sarah J. Dintelmann*[1], Ron Krausz[2], Karla Gage[1]; [1]Southern Illinois University, Carbondale, IL, [2]Southern Illinois University, Belleville, IL (14)

**Cropping System Diversification and Perennialization Effects on Weed Community Composition and Suppression over 27 Years.** Nathaniel M. Drewitz*, David E. Stoltenberg; University of Wisconsin-Madison, Madison, WI (15)

**†Critical Time for Weed Removal in Soybean as Influenced by PRE Herbicides.** Pavle Pavlovic*[1], Amit Jhala[2], Ethann R. Barnes[2], Clint Beiermann[3], Nevin C. Lawrence[3], Jon E. Scott[4], O. Adewale Osipitan[1], Stevan Z. Knezevic[2]; [1]University of Nebraska-Lincoln, Concord, NE, [2]University of Nebraska-Lincoln, Lincoln, NE, [3]University of Nebraska-Lincoln, Scottsbluff, NE, [4]University of Nebraska-Lincoln, Wakefield, NE (16)

# Weed Biology, Ecology, and Management Posters (continued)

**†Critical Time for Weed Removal in Corn as Influenced by PRE Herbicides.** Ayse Nur Ulusoy*[1], O. Adewale Osipitan[2], Jon E. Scott[3], Stevan Z. Knezevic[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE, [3]University of Nebraska-Lincoln, Wakefield, NE (17)

**††Allelopathic Activity of Giant Ragweed Seed.** Malynda M. O'Day*, Reid Smeda; University of Missouri, Columbia, MO (18)

**††Allelopathic Effects of Palmer Amaranth Residue on Plant Growth and Phenology.** Kayla L. Broster*, Karla Gage, Joseph Matthews; Southern Illinois University, Carbondale, IL (19)

**††Breaking Seed Dormancy in Palmer Amaranth.** Samuel N. Ramirez*, Rhett Stolte, Karla Gage; Southern Illinois University, Carbondale, IL (20)

**††Methods of Breaking Seed Dormancy in Common Waterhemp.** Dustin W. Bierbaum*, Rhett Stolte, Karla Gage; Southern Illinois University, Carbondale, IL (21)

**†Density-Dependent Johnsongrass Seed Production Under Different Cropping Systems.** Don Treptow*, Rodrigo Werle, Amit J. Jhala, Melinda Yerka, Brigitte Tenhumberg, John Lindquist; University of Nebraska - Lincoln, Lincoln, NE (22)

**†Using Seed Rain to Assess Feasibility of At-Harvest Seed Destruction for Three Troublesome Weed Species in Missouri Soybean.** Alyssa Hultgren*[1], Mandy Bish[2], Sarah Lancaster[3], Kevin W Bradley[2]; [1]University of Missouri and Missouri State University, Springfield, MO, [2]University of Missouri, Columbia, MO, [3]Missouri State University, Springfield, MO (23)

**†Effect of Degree of Water Stress on the Growth and Fecundity of Palmer Amaranth.** Parminder Chahal*, Suat Irmak, Amit Jhala; University of Nebraska-Lincoln, Lincoln, NE (24)

**††Waterhemp Seed Production and Seed Viability as Affected by Sublethal Dicamba Dose.** Allyson Rumler*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (25)

# Weed Biology, Ecology, and Management Posters (continued)

**Efficacy of Glyphosate and Dicamba on Kochia and Russian Thistle as Influenced by Drought and Dust Conditions.** Jeffrey Golus*, Kasey Schroeder, Greg R. Kruger; University of Nebraska-Lincoln, North Platte, NE (26)

**Investigating the Fitness Cost of Dicamba Resistance in Kochia.** Chenxi Wu*[1], Sherry LeClere[2], Philip Westra[3], R. Douglas Sammons[2]; [1]Monsanto Company, St Louis, MO, [2]Monsanto, Chesterfield, MO, [3]Colorado State University, Fort Collins, CO (27)

**†Investigation of Herbicide-Resistant Italian Ryegrass in Western Kentucky.** Zachary K. Perry*[1], Travis Legleiter[2]; [1]University of Kentucky, Lexington, KY, [2]University of Kentucky, Princeton, KY (28)

**†Sorting through Multiple Mechanisms of PPO-Inhibitor Resistance in Palmer Amaranth and Waterhemp.** Kathryn Lillie*[1], Darci Giacomini[1], James R Martin[2], J D Green[3], Patrick Tranel[1]; [1]University of Illinois, Urbana, IL, [2]University of Kentucky, Princeton, KY, [3]University of Kentucky, Lexington, KY (29)

**†Inheritance of Mesotrione in a Waterhemp Population from Nebraska.** Maxwel C. Oliveira*[1], Todd A. Gaines[2], Stevan Z. Knezevic[3]; [1]University of Nebraska-Lincoln, Concord, NE, [2]Colorado State University, Fort Collins, CO, [3]University of Nebraska-Lincoln, Lincoln, NE (30)

**†Frequency of Target-Site Resistance and Susceptibility to ALS-Inhibiting Herbicides in Indiana Waterhemp Populations.** Jodi E. Boe*, Haozhen Nie, Bryan G. Young; Purdue University, West Lafayette, IN (31)

**†Artificial Hybridization Between *Amaranthus tuberculatus* and *Amaranthus albus*.** Brent Murphy*, Laura A. Chatham, Patrick Tranel; University of Illinois, Urbana, IL (32)

# Herbicide Physiology Posters

**††Evaluation of ACCase-Inhibitor and Growth Regulator Herbicide Tank-Mixtures.** Bonheur Ndaysihimiye*[1], Jeffrey Golus[2], Kasey Schroeder[2], Bruno Canella Vieira[1], Andre O. Rodrigues[2], Greg R. Kruger[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, North Platte, NE (33)

**††Effects of Glyphosate, Glufosinate, and Dicamba Tank-Mixtures.** Rodger Farr*, Jeffrey Golus, Greg R. Kruger; University of Nebraska-Lincoln, North Platte, NE (34)

**††Interaction of HPPD-Inhibiting Herbicides with Glyphosate, Glufosinate, 2,4-D and Dicamba.** Vera Vukovic*[1], Jeffrey Golus[1], Kasey Schroeder[1], Greg R. Kruger[2]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska, North Platte, NE (35)

**†Resistance to Carfentrazone-ethyl in Tall Waterhemp.** Olivia A. Obenland*, Rong Ma, Sarah O'Brien, Anatoli V. Lygin, Dean E. Riechers; University of Illinois at Urbana-Champaign, Urbana, IL (36)

**†Tall Waterhemp Resistance to PPO-Inhibiting Herbicides: Does *s*-Metolachlor Reduce Selection Pressure, Decrease Overall Survivorship, or Both?** Brent C. Mansfield*, Haozhen Nie, Julie M. Young, Bryan G. Young; Purdue University, West Lafayette, IN (37)

**Rapid Metabolism Contributes to Atrazine Resistance in Common Waterhemp from Nebraska.** Amarnath R. Vennapusa*[1], Felipe Faleco[2], Bruno Vieira[2], Spencer Samuelson[3], Greg R. Kruger[2], Rodrigo Werle[3], Mithila Jugulam[1]; [1]Kansas State University, Manhattan, KS, [2]University of Nebraska-Lincoln, North Platte, NE, [3]University of Nebraska, Lincoln, NE, (38)

**†Rapid Metabolism Increases Resistance to 2,4-D in Common Waterhemp Under High Temperature.** Chandrima Shyam*[1], Junjun Ou[2], Greg R. Kruger[2], Mithila Jugulam[1]; [1]Kansas State University, Manhattan, KS, [2]University of Nebraska-Lincoln, North Platte, NE (39)

# Herbicide Physiology Posters (continued)

**Qualification of EPSPS Gene Duplication for Glyphosate Resistance in Palmer Amaranth.** Chenxi Wu*[1], Zoee Perrine[1], Brian D. Eads[1], Geliang Wang[1], R. Douglas Sammons[2]; [1]Monsanto Company, St Louis, MO, [2]Monsanto, Chesterfield, MO (40)

**††Molecular Screening of PPO and Glyphosate Resistance in Palmer Amaranth Populations from Southwest Nebraska.** Gustavo Vieira*[1], Maxwel C. Oliveira[2], Darci Giacomini[3], Nikola Arsenijevic[1], Patrick Tranel[3], Rodrigo Werle[4]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska-Lincoln, Concord, NE, [3]University of Illinois, Urbana, IL, [4]University of Nebraska-Lincoln, Lincoln, NE (41)

**Adapting a Media-Based Root Inhibition Assay to Investigate Differences in Auxin Herbicide Response in Horseweed.** Cara L. McCauley*, Bryan G. Young; Purdue University, West Lafayette, IN (42)

**Cytochrome P450-Mediated Metabolism of Mesotrione and Tembotrione in HPPD-Inhibitor-Tolerant Sorghum.** Balaji Aravindhan Pandian*, Amaranatha R. Vennapusa, Curtis R Thompson, Vara Prasad PV, Mithila Jugulam; Kansas State University, Manhattan, KS (43)

# Extension Posters

**†Horseweed Control: Fall versus Spring Herbicide Application Timing.** Josh Wehrbein*[1], Lowell Sandell[2], Christopher Proctor[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]Valent, Lincoln, NE (44)

**Digital Books for Weed Science - Now Cooking with Weeds.** Bruce Ackley*, Alyssa Lamb; The Ohio State University, Columbus, OH (45)

**Demonstrating Herbicide Programs in Current and Future Soybean Technologies.** Joe Ikley*, Bill Johnson, Bryan G. Young; Purdue University, West Lafayette, IN (46)

# Extension Posters (continued)

**An Overview of Herbicide-Resistant Weeds in Kansas.** Vipan Kumar*[1], Prashant Jha[2], Phillip Stahlman[1], Mithila Jugulam[3], Randall S. Currie[4], J. Anita Dille[3], Dallas E. Peterson[3], Curtis R. Thompson[3], Douglas E Shoup[5]; [1]Kansas State University, Hays, KS, [2]Montana State University, Huntley, MT, [3]Kansas State University, Manhattan, KS, [4]Kansas State University, Garden City, KS, [5]Kansas State University, Chanute, KS (47)

**2017 EPA Tour of Western Kansas.** Dallas E. Peterson*[1], Phillip Stahlman[2], Curtis R. Thompson[1], J. Anita Dille[1], Mithila Jugulam[1], Randall S. Currie[3], Michael Barrett[4], Jill Schroeder[5], Lee Van Wychen[6]; [1]Kansas State University, Manhattan, KS, [2]Kansas State University, Hays, KS, [3]Kansas State University, Garden City, KS, [4]University of Kentucky, Lexington, KY, [5]USDA Office of Pest Management Policy, Washington, DC, [6]WSSA, Alexandria, VA (48)

# Equipment and Application Methods Posters

**††Visualization of the Penetration and Uptake of Multiple Adjuvant Systems Using Confocal Microscopy.** Savana M. Lipps*[1], Gregory K. Dahl[2], Joe V. Gednalske[2], Raymond L. Pigati[3]; [1]University of Wisconsin-Madison, Madison, WI, [2]Winfield United, River Falls, WI, [3]WinField United, Shoreview, MN (49)

**††Impact of Nozzle Selection on POST Applications of HPPD-Inhibiting Herbicides.** Vinicius Velho*, Jeffrey Golus, Kasey Schroeder, Greg R. Kruger; University of Nebraska-Lincoln, North Platte, NE (50)

**†Impact of Nozzle Selection and Tank-mixture on Weed Efficacy.** Debora O. Latorre*[1], Dan Reynolds[2], Bryan G. Young[3], Jason Norsworthy[4], Stanley Culpepper[5], Kevin Bradley[6], Ryan Rector[7], Wayne Keeling[8], David Nicolai[9], Mandy Bish[6], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]Mississippi State University, Starkville, MS, [3]Purdue University, West Lafayette, IN, [4]University of Arkansas, Fayetteville, AR, [5]University of Georgia, Tifton, GA, [6]University of Missouri, Columbia, MO, [7]Monsanto Company, St. Charles, MO, [8]Texas A&M, Lubbock, TX, [9]University of Minnesota, Farmington, MN (51)

# Equipment and Application Methods Posters (continued)

**†Effects of Solution Viscosity on Herbicide Efficacy.** Gabrielle C. Macedo*[1], Glen Obear[2], Frank Sexton[3], Jeffrey Golus[1], Kasey Schroeder[1], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska-Lincoln, Lincoln, NE, [3]Exacto, Inc., Sharon, WI (52)

**††Impact of Droplet Size on POST Applications of HPPD-Inhibiting Herbicides.** Barbara Vukoja*, Jeffrey Golus, Kasey Schroeder, Greg R. Kruger; University of Nebraska-Lincoln, North Platte, NE (53)

**††Impact of Droplet Size and Weed Size on HPPD-Inhibiting Herbicide Efficacy.** Thiago H. Vitti*, Jeffrey Golus, Kasey Schroeder, Greg R. Kruger; University of Nebraska-Lincoln, North Platte, NE (54)

**††Wheat Stubble Height and Nozzle Type Influences Spray Penetration of a Dicamba and Glyphosate Tank Mixture.** Luana M. Simao*[1], Greg R. Kruger[2], Cody Creech[1]; [1]University of Nebraska-Lincoln, Scottsbluff, NE, [2]University of Nebraska, North Platte, NE (55)

**†Influence of Agitation Systems and Sitting Time on Droplet Size with XtendiMax, Roundup Xtend, Clarity and Roundup PowerMax.** Andre O. Rodrigues*[1], Ulisses R. Antuniassi[2], Cody Creech[3], Bradley K. Fritz[4], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]UNESP, Botucatu, Brazil, [3]University of Nebraska-Lincoln, Scottsbluff, NE, [4]ARS-USDA, College Station, TX (56)

**Effectiveness of Hyperspectral Imaging Technology in Detecting Herbicide Injury.** Julie M. Young*, Haozhen Nie, William G. Johnson, Jian Jin, Bryan G. Young; Purdue University, West Lafayette, IN (57)

# Agronomic and Specialty Crops Posters

**Potential Yield Loss Due to Weeds in Dry Beans in Canada and the United States.** Nader Soltani*[1], J. Anita Dille[2], Peter H. Sikkema[1]; [1]University of Guelph, Ridgetown, ON, [2]Kansas State University, Manhattan, KS (58)

# Agronomic and Specialty Crops Posters (continued)

**†Dry Bean, Sugarbeet, Alfalfa, and Cucumber Response to Bicyclopyrone Residues.** Daniel Wilkinson*, Christy L. Sprague; Michigan State University, East Lansing, MI (59)

**Performance of Field Pea Herbicides in Western Nebraska.** Samuel T. Koeshall*[1], Rodrigo Werle[1], Cody Creech[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Scottsbluff, NE (60)

**Safflower Variety Susceptibility to Sulfentrazone Injury.** Clair L. Keene*[1], Caleb Dalley[2]; [1]North Dakota State University, Williston, ND, [2]North Dakota State University, Hettinger, ND (61)

**†Response of White and Yellow Popcorn Hybrids to Glyphosate, Enlist DUO, or XtendiMax.** Ethann R. Barnes*[1], Nevin C. Lawrence[2], Stevan Z. Knezevic[1], Amit Jhala[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Scottsbluff, NE (62)

**Grain Sorghum Response to POST Pyrasulfotole and Bromoxynil Previously Treated with PRE Herbicides Containing Mesotrione.** Seth Menzer, Curtis R. Thompson*, Mithila Jugulam; Kansas State University, Manhattan, KS (63)

**†Growth and Reproductive Response of Missouri Grapes to Dicamba.** Sarah E. Dixon*, Reid Smeda; University of Missouri, Columbia, MO (64)

**Sensitivity of Irrigated Grapes to Micro-Rates of Clarity, Engenia, and XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (65)

**Sensitivity of Irrigated Tomato to Micro-Rates of Clarity, Engenia, and XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (66)

**†Evaluation of a New Herbicide, Switchblade, for Broadleaf Weed Control.** Matthew C. Fleetwood*[1], Jeff Marvin[2], Dale Sanson[2], Xi Xiong[1]; [1]University of Missouri, Columbia, MO, [2]PBI Gordon, Kansas City, KS (67)

# Agronomic Crops I – Corn Posters

**††Residual Herbicide Activity as Influenced by Application to Soil Covered with Crop Residue.** Ethan Johnson*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (68)

**Influence of Fall Establishment and Spring Termination Timings of Annual Ryegrass on Corn Yields.** Taylor Campbell*, Joe Ikley, Bill Johnson; Purdue University, West Lafayette, IN (69)

**†Impact of Cover Crop Species Selection on Soil Moisture and Corn Development in Semi-Arid Rainfed Cropping Systems of Western Nebraska.** Alexandre T. Rosa*[1], Liberty Butts[2], Cody Creech[3], Roger Elmore[1], Daran Rudnick[2], Rodrigo Werle[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, North Platte, NE, [3]University of Nebraska-Lincoln, Scottsbluff, NE (70)

**Effects of Timing of Weed Removal and PRE Herbicides on Growth and Yield of Corn.** Ayse Nur Ulusoy*[1], O. Adewale Osipitan[2], Jon E. Scott[3], Stevan Z. Knezevic[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE, [3]University of Nebraska, Wakefield, NE (71)

**†Postemergence Herbicides for Weed Control in Organic Corn and Soybeans.** Betzy Valdez*, Reid Smeda; University of Missouri, Columbia, MO (72)

**††Weed Control Following Single-Pass PRE or POST Corn Herbicides as Affected by Planting Date.** Luke Merritt*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (73)

**†Management of Palmer Amaranth Using a Premix of Dicamba and Tembotrione in Corn.** Amy D. Hauver*[1], Parminder Chahal[1], Kevin Watteyne[3], Amit J. Jhala[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]Bayer CropScience, Lincoln, NE (74)

**†POST Corn Herbicide Options for Control of Glyphosate-Resistant Palmer Amaranth in Western Nebraska.** Clint W. Beiermann*[1], Nevin C. Lawrence[1], Stevan Z. Knezevic[2], Amit Jhala[2], Cody Creech[1]; [1]University of Nebraska-Lincoln, Scottsbluff, NE, [2]University of Nebraska-Lincoln, Lincoln, NE (75)

## Agronomic Crops I – Corn Posters

**†Corn Barrier Effect on Herbicide Drift.** Bruno Canella Vieira*[1], Thomas R. Butts[2], Andre O. Rodrigues[2], Kasey Schroeder[2], Jeffrey Golus[2], Greg R. Kruger[2]; [1]University of Nebraska, Lincoln, NE, [2]University of Nebraska-Lincoln, North Platte, NE (76)

## Agronomic Crops II – Soybean Posters

**†Optimizing a Cover Crop Program for the Control of Glyphosate-Resistant Horseweed.** Alyssa Lamb*[1], Mark Loux[2]; [1]The Ohio State University, Columbus, OH, [2]Ohio State University, Columbus, OH (77)

**††Weed Management in Soybean Intercropped with Spring Planted Rye.** Zachary Brewer*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (78)

**†Integration of Residual Herbicides and Cover Crops for Weed Control in a Soybean Production System.** Derek Whalen*, Mandy Bish, Kevin W Bradley; University of Missouri, Columbia, MO (79)

**†Combining Herbicide Programs and Cereal Rye Cover Crop for Integrated Weed Management in Soybeans.** Adam Striegel*[1], Liberty Butts[2], Nikola Arsenijevic[2], Gustavo Vieira[2], Alexandre T. Rosa[1], Christopher Proctor[1], Rodrigo Werle[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, North Platte, NE (80)

**Effects of Timing of Weed Removal and PRE Herbicides on Growth and Yield of Soybean.** Pavle Pavlovic*[1], Amit Jhala[2], Ethann R. Barnes[2], Clint Beiermann[3], Nevin C. Lawrence[3], Jon E. Scott[4], O. Adewale Osipitan[1], Stevan Z. Knezevic[2]; [1]University of Nebraska-Lincoln, Concord, NE, [2]University of Nebraska-Lincoln, Lincoln, NE, [3]University of Nebraska, Scottsbluff, NE, [4]University of Nebraska, Wakefield, NE (81)

**Influence of Late Emerging Weeds on the Yield of Glyphosate-Resistant Soybean.** Nader Soltani*[1], Amit Jhala[2], Robert E. Nurse[3], Peter H Sikkema[1]; [1]University of Guelph, Ridgetown, ON, [2]University of Nebraska-Lincoln, Lincoln, NE, [3]Agriculture Canada, Harrow, ON (82)

# Agronomic Crops II – Soybean Posters (continued)

**††Soybean Yield as Affected by Planting Date and Seed Treatment.** Kelsey Bergman*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (83)

**†Effect of Soil-Applied Sulfentrazone and Flumioxazin on Soybean Seedling Disease Severity Under Field Conditions.** Nicholas J. Arneson*, Loren J. Giesler, Rodrigo Werle; University of Nebraska-Lincoln, Lincoln, NE (84)

**†The Interactive Effects of Soybean Sensitivity to PPO-Inhibiting Hebicides, Seed Treatment, and Seeding Rate on Yield and Disease.** Rhett Stolte*, Ahmad M. Fakhoury, Jason P. Bond, Karla Gage; Southern Illinois University, Carbondale, IL (85)

**††Impact of Soil-Applied PPO and PSII Herbicides on Early Season Soybean and Palmer Amaranth Development.** Nikola Arsenijevic*[1], Matheus de-Avellar[1], Liberty Butts[1], Rodrigo Werle[2]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska-Lincoln, Lincoln, NE (86)

**†What's in Your Bird Feeder? Screening Commercial Bird Feed Mixes for Viable Weed Seed Contaminants.** Eric Oseland*, Mandy Bish, Kevin W Bradley; University of Missouri, Columbia, MO (87)

**Characterization of a Palmer Amaranth Population with Reduced Sensitivity to PPO-Inhibiting Herbicides and Lacking Known Target Site Mutations.** Hailey B. Holcomb*, Haozhen Nie, Julie M. Young, Bryan G. Young; Purdue University, West Lafayette, IN (88)

**††Confirmation of a Common Waterhemp Biotype Resistant to Protoporphyrinogen Oxidase (PPO) Inhibitors in Nebraska.** Trey Stephens*, Debalin Sarangi, Amit J. Jhala; University of Nebraska-Lincoln, Lincoln, NE (89)

**Halauxifen-methyl, 2,4-D, Dicamba, and Glyphosate Tank-Mixtures Efficacy on Broadleaf Weeds.** Marcelo Zimmer*, Bryan G. Young, Bill Johnson; Purdue University, West Lafayette, IN (90)

# Agronomic Crops II – Soybean Posters (continued)

**Fierce MTZ: A New Preemergence Soybean Herbicide.** Eric J. Ott*[1], John A. Pawlak[2], Dawn E. Refsell[3], Ron E. Estes[4], Jon R. Kohrt[5], Lowell D. Sandell[6], Trevor D. Israel[7]; [1]Valent USA LLC, Greenfield, IN, [2]Valent USA LLC, Lansing, MI, [3]Valent USA LLC, Lathrop, MO, [4]Valent USA LLC, Tolono, IL, [5]Valent USA LLC, West Des Moines, IA, [6]Valent USA LLC, Lincoln, NE, [7]Valent USA LLC, Souix Falls, SD (91)

**Efficacy of Tavium™ Herbicide Plus VaporGrip® Technology in Dicamba-Tolerant Soybeans and Cotton.** Scott A. Payne*[1], Brett Miller[2], James C. Holloway[3], Erin M. Hitchner[4], Donald J. Porter[5]; [1]Syngenta, Slater, IA, [2]Syngenta, Minnetonka, MN, [3]Syngenta, Jackson, TN, [4]Syngenta, Elmer, NJ, [5]Syngenta, Greensboro, NC (92)

**Control of Volunteer Glyphosate-Tolerant Alfalfa in No-Till Roundup Ready Xtend Soybean.** Lisa M. Behnken*, Fritz Breitenbach, Annette Kyllo; University of Minnesota Extension, Rochester, MN (93)

**Comparisons of Weed Management Intensity Levels Utilizing Roundup Ready Xtend and LibertyLink Soybean.** Damian Franzenburg*, M.D.K. Owen, James Lee, Ithhiphonh Macvilay; Iowa State University, Ames, IA (94)

**†Efficacy of Glufosinate and Dicamba Tank-Mixtures on Common Lambsquarters, Palmer Amaranth, Corn, and Grain Sorghum.** Milos Zaric*[1], Karla A. Romero[2], Jeffrey Golus[1], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Zamorano, Zamorano, Honduras (95)

**Weed Control with Selected Dicamba Treatments in Northeast Nebraska.** Jon E. Scott*[1], Stevan Z. Knezevic[2]; [1]University of Nebraska, Wakefield, NE, [2]University of Nebraska-Lincoln, Lincoln, NE (96)

**††Scheduled Herbicide Applications and Micro-Rates for Weed Management in Dicamba-Resistant Soybean.** Nathan Hilleson*, Brent Heaton, Mark Bernards; Western Illinois University, Macomb, IL (97)

# Agronomic Crops II – Soybean Posters (continued)

**†Evaluation of Glyphosate-Resistant Palmer Amaranth Control with Two-Pass Programs in Dicamba- and Glufosinate-Tolerant Soybean Systems.** Colton P. Carmody*[1], Karla Gage[1], Ron Krausz[2]; [1]Southern Illinois University, Carbondale, IL, [2]Southern Illinois University, Belleville, IL (98)

**†Strategies for Control of Palmer Amaranth that Survived a POST Contact Herbicide.** Jesse A. Haarmann*, Bryan G. Young, William G. Johnson; Purdue University, West Lafayette, IN (99)

**†Evaluation of "Recovery" Treatments for Dicamba-Injured Soybean.** Shea Farrell*, Mandy Bish, Kevin W Bradley; University of Missouri, Columbia, MO (100)

**†Utilizing Geospatial Technology to Assess Off-target Dicamba Injury and Yield Loss in Missouri Soybean Fields.** Brian R. Dintelmann*, Shea Farrell, Kent Shannon, Mandy Bish, Kevin W Bradley; University of Missouri, Columbia, MO (101)

**†Impact of Simulated Dicamba Drift on Sensitive Soybean.** Jerri Lynn Henry*, Reid Smeda; University of Missouri, Columbia, MO (102)

**†Glyphosate-Resistant Soybean Response to Sequential Applications of Dicamba and other Postemergence Herbicides.** Nicholas C. Hayden*, William G. Johnson, Bryan G. Young; Purdue University, West Lafayette, IN (103)

**Growth and Development of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of Clarity.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (104)

**Yield of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of Clarity.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (105)

# Agronomic Crops II – Soybean Posters (continued)

**Yield of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of Clarity.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (106)

**Growth and Development of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of Clarity.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (107)

**Growth and Development of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of Engenia.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (108)

**Yield of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of Engenia.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (109)

**Growth and Development of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of Engenia.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (110)

**Yield of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of Engenia.** Stevan Z. Knezevic*[1], O. Adewale Osipitan[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (111)

**Growth and Development of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (112)

# Agronomic Crops II – Soybean Posters (continued)

**Yield of Irrigated Glyphosate-Tolerant Soybeans as Influenced by Micro-Rates of XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (113)

**Growth and Development of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (114)

**Yield of Dryland Glyphosate-Tolerant, Glufosinate-Tolerant, and Conventional Soybeans as Influenced by Micro-Rates of XtendiMax.** Stevan Z. Knezevic[1], O. Adewale Osipitan*[2]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska-Lincoln, Concord, NE (115)

## General Session

LOCATION: Grand Ballroom D
MODERATOR: Christy Sprague

**10:00** **Lewis and Clark Expedition: Soldiers as Scientists.** Erin Hilligoss-Volkmann*[1], Paul Rosewitz[2]; [1]National Park Service, St. Louis, MO, [2]National Records Administration, St. Louis, MO (116)

**10:45** **Managing Herbicide Resistance: Listening to the Perspectives of the Practitioners.** Jill Schroeder*[1], David R. Shaw[2], Michael Barrett[3], Harold Coble[4], Amy Asmus[5], Raymond Jussaume[6], David Ervin[7]; [1]USDA Office of Pest Management Policy, Washington, DC, [2]Mississippi State University, Mississippi State, MS, [3]University of Kentucky, Lexington, KY, [4]North Carolina State University Professor Emeritus, Raleigh, NC, [5]Asmus Farm Supply, Inc., Rake, IA, [6]Michigan State University, East Lansing, MI, [7]Portland State University, Portland, OR (117)

**11:15** **Washington DC Report.** Lee Van Wychen*; WSSA, Alexandria, VA (118)

**11:30** **NCWSS Presidential Address.** Gregory K. Dahl*; Winfield United, River Falls, WI (119)

**11:50** **Remembering Former NCWSS Members and Friends.** Chris Kamienski*; Monsanto Company, Washington, IL (120)

**11:55** **Announcements.** Christy L. Sprague*; Michigan State University, East Lansing, MI (121)

## Student Luncheon – Business Meeting

*Sponsored by Dow AgroSciences – Open to all students*

12:00 – 1:15 pm Grand Ballroom FG

# Herbicide Physiology

LOCATION: Grand Ballroom A
MODERATOR: Nick Harre

**1:15** **Genomic and Molecular Studies of Key Weeds.** Philip Westra*; Colorado State University, Fort Collins, CO (122)

**1:30** **†Investigation of Mechanisms and Genetic Basis of Dicamba Resistance in Kochia from Kansas and Colorado.** Junjun Ou*[1], Dean Pettinga[2], Phillip Stahlman[3], Phil Westra[2], Todd A. Gaines[2], Mithila Jugulam[1]; [1]Kansas State University, Manhattan, KS, [2]Colorado State University, Fort Collins, CO, [3]Kansas State University, Hays, KS (123)

**1:45** **Identification of the Genetic Basis for Dicamba Resistance in Kochia.** Sherry LeClere*[1], R. Douglas Sammons[1], Phil Westra[2]; [1]Monsanto, Chesterfield, MO, [2]Colorado State University, Ft Collins, CO (124)

**2:00** **†Genetics of Resistance to 2,4-D in Two Waterhemp Populations from the Midwestern United States.** Sebastian Sabate*[1], Mark Bernards[2], Greg R. Kruger[3], Aaron Hager[1], Patrick Tranel[1]; [1]University of Illinois, Urbana, IL, [2]Western Illinois University, Macomb, IL, [3]University of Nebraska, North Platte, NE (125)

**2:15** **Investigating Efficacy of Selected Very Long Chain Fatty Acid-Inhibiting Herbicides on Tall Waterhemp Populations with Evolved Multiple Herbicide Resistances.** Eric Jones*; Iowa State University, Ames, IA (126)

**2:30** **†Molecular Survey of Glyphosate and PPO-Inhibitor Resistance Mechanisms in Ohio Tall Waterhemp Populations.** Brent Murphy*[1], Alvaro S. Larran[2], Bruce Ackley[3], Mark Loux[3], Patrick Tranel[1]; [1]University of Illinois, Urbana, IL, [2]Universidad Nacional de Rosario, Zavalla, Argentina, [3]The Ohio State University, Columbus, OH (127)

# Herbicide Physiology (continued)

**2:45** **†A Multi-State Survey to Determine the Potential for Resistance to PPO-Inhibiting Herbicides in Tall Waterhemp Beyond the G210 Target Site Mutation.** Brent C. Mansfield*[1], Haozhen Nie[1], Julie M. Young[1], Kevin W. Bradley[2], Bryan G. Young[1]; [1]Purdue University, West Lafayette, IN, [2]University of Missouri, Columbia, MO (128)

**3:00** **Break**

**3:15** **†Presence of an Alternative Mechanism of Resistance to PPO-Inhibiting Herbicides in Tall Waterhemp Populations from Indiana, Illinois, Iowa, Missouri, and Minnesota.** Nicholas R. Steppig*, Brent C. Mansfield, Haozhen Nie, Julie M. Young, Bryan G. Young; Purdue University, West Lafayette, IN (129)

**3:30** **Molecular and Physiological Characterization of Multiple Herbicide Resistance in a Missouri Waterhemp Population.** Lovreet Shergill*[1], Mandy Bish[1], Mithila Jugulam[2], Kevin Bradley[1]; [1]University of Missouri, Columbia, MO, [2]Kansas State University, Manhattan, KS (130)

**3:45** **†Quantifying Resistance to Isoxaflutole and Mesotrione and Their Interaction with Metribuzin POST in Tall Waterhemp.** Sarah O'Brien*, Adam Davis, Dean E. Riechers; University of Illinois at Urbana-Champaign, Urban, IL (131)

**4:00** **Overexpression Hotspots in Herbicide-Resistant Waterhemp.** Darci Giacomini*, Patrick Tranel; University of Illinois, Urbana, IL (132)

**4:15** **†Differential Gene Expression in Horseweed in Response to Halauxifen-methyl, Dicamba, and 2,4-D.** Cara L. McCauley*, Bryan G. Young; Purdue University, West Lafayette, IN (133)

**4:30** **Differential Antioxidant Enzyme Profiles in Rapid Response Glyphosate-Resistant Giant Ragweed.** Nick T. Harre*, Haozhen Nie, Yiwei Jiang, Bryan G. Young; Purdue University, West Lafayette, IN (134)

## Herbicide Physiology (continued)

**4:45** **†Relationship Between Glufosinate Phytotoxicity, Inhibition of Glutamine Synthetase and Ammonia Accumulation.** Hudson Takano*, Phil Westra, Franck E. Dayan; Colorado State University, Fort Collins, CO (135)

**5:00** **Business Meeting**

## Equipment and Application Methods

LOCATION: Grand Ballroom B
MODERATOR: Ryan Edwards

**1:15** **Specialty Additives for Improved Residual Herbicide Efficacy.** Marc McPherson*, Justin Heuser, Ryan Stiltoner; Evonik Corporation, Richmond, VA (136)

**1:30** **The Good, the Bad and the Ugly when Spraying the New Phenoxy Herbicide Formulations in Roundup Ready Xtend and Enlist Soybeans.** Robert N. Klein*; University of Nebraska, North Platte, NE (137)

**1:45** **†Optimization of Dicamba and Glufosinate Applications using Pulse-Width Modulation.** Thomas R. Butts*[1], Chase A. Samples[2], Lucas X. Franca[2], Darrin M. Dodds[2], Dan Reynolds[2], Jason W. Adams[3], Richard Zollinger[3], Krik A. Howatt[3], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]Mississippi State University, Starkville, MS, [3]North Dakota State University, Fargo, ND (138)

**2:00** **Efficacy of Drift Reducing Adjuvants (DRA) Approved for Roundup Ready Xtend Soybean.** Richard Zollinger*[1], Mark Bernards[2], Greg R. Kruger[3], Dallas E Peterson[4], Bryan G. Young[5]; [1]North Dakota State University, Fargo, ND, [2]Western Illinois University, Macomb, IL, [3]University of Nebraska, North Platte, NE, [4]Kansas State University, Manhattan, KS, [5]Purdue University, West Lafayette, IN (139)

# Equipment and Application Methods (continued)

**2:15** **Assessment of Commercial Scale Dicamba Drift Using Drift Reducing Adjuvants.** Ryan J. Edwards*[1], Gregory K. Dahl[1], Lillian Magidow[1], Raymond L. Pigati[2], Laura Hennemann[1], David Palecek[1], Eric Spandl[2], Joe V. Gednalske[1]; [1]WinField United, River Falls, WI, [2]WinField United, Shoreview, MN (140)

**2:30** **†Effects of Solution Viscosity on Droplet Size.** Gabrielle C. Macedo*[1], Glen Obear[2], Frank Sexton[3], Jeffrey Golus[1], Jesaelen G. Moraes[1], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska-Lincoln, Lincoln, NE, [3]Exacto, Inc., Sharon, WI (141)

**2:45** **AccuDrop™ - A New Drift Control and Deposition Adjuvant.** Thomas A. Hayden*[1], Gregory K. Dahl[2], Ryan J. Edwards[2], Jo A. Gillilan[3], Eric Spandl[4], Raymond L. Pigati[4], Joe V. Gednalske[2], Lillian Magidow[2], Andrea Clark[2], Daniel C. Bissell[2]; [1]WinField United, Owensboro, KY, [2]WinField United, River Falls, WI, [3]Winfield United, Springfield, TN, [4]WinField United, Shoreview, MN (142)

**3:00** **Break**

**3:15** **†Rainfastness of XtendiMax, Roundup Xtend, Clarity and Roundup PowerMax on Weed Control.** Andre O. Rodrigues*[1], Ryan Rector[2], Ulisses R. Antuniassi[3], Cody Creech[4], Lucas X. Franca[5], Bradley K. Fritz[6], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]Monsanto Company, St. Charles, MO, [3]UNESP, Botucatu, Brazil, [4]University of Nebraska-Lincoln, Scottsbluff, NE, [5]Mississippi State University, Mississippi State, MS, [6]ARS-USDA, College Station, TX (143)

**3:30** **Relative Volatility of Auxin Herbicide Formulations.** Jerome J. Schleier*, David Ouse, James Gifford, Suresh Annangudi Palani; Dow AgroSciences, Indianapolis, IN (144)

# Equipment and Application Methods (continued)

**3:45** **The Influence of Pump Shearing on the Droplet Spectrum of Spray Mixtures Containing Dicamba, Glyphosate and Various Drift Reduction Agents.** Daniel Bissell[1], Andrea Clark[1], Raymond L. Pigati*[2], Joe V. Gednalske[1], Lillian Magidow[1], Gregory K. Dahl[1]; [1]WinField United, River Falls, WI, [2]WinField United, Shoreview, MN (145)

**4:00** **Investigation of Nozzle Erosion from Commercial Application Equipment; The Second Year.** Andrea Clark*, Lillian Magidow; WinField United, River Falls, WI (146)

**4:15** **†Nozzle Selection and Adjuvant Impact the Efficacy of Glyphosate and PPO-Inhibiting Herbicide Tank-Mixtures.** Milos Zaric*[1], Jesaelen G. Moraes[1], Andre O. Rodrigues[1], Debora O. Latorre[1], Bruno Canella Vieira[2], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]University of Nebraska, Lincoln, NE (147)

**4:30** **Selected Adjuvants Enhance Weed Control with Glufosinate-Ammonium in Colorado and South Dakota.** Jim Daniel[1], Eric Westra*[1], Paul Johnson[2], Phil Westra[1]; [1]Colorado State University, Fort Collins, CO, [2]South Dakota State University, Brookings, SD (148)

**4:45** **†Paraquat Efficacy as Influenced by Spray Droplet Size for Palmer Amaranth Control.** Marshall Hay*[1], Dallas E. Peterson[1], Greg R. Kruger[2], Thomas Butts[2]; [1]Kansas State University, Manhattan, KS, [2]University of Nebraska-Lincoln, North Platte, NE (149)

# Weed Biology, Ecology, and Management

LOCATION: Grand Ballroom C
MODERATOR: Rodrigo Werle

**1:15** **A Qualitative Assay for Detecting Palmer Amaranth and its Hybrids Amongst Pigweed Species.** Maxwel C. Oliveira*[1], Eric Patterson[2], Todd A. Gaines[2], Stevan Z. Knezevic[3]; [1]University of Nebraska-Lincoln, Concord, NE, [2]Colorado State University, Fort Collins, CO, [3]University of Nebraska-Lincoln, Lincoln, NE (150)

**1:30** **†Potential Infestation Risk of Palmer Amaranth in Iowa: Social and Behavioral Factors.** Maggie Long*[1], Leslie Decker[1], Marisa DeForest[1], Zoe Muehleip[1], Geoff Converse[1], Drew Roen[1], Jacob Bruns[1], Clint Meyer[1], John Pauley[1], Brady Spangenberg[2]; [1]Simpson College, Indianola, IA, [2]BASF, Raleigh, NC (151)

**1:45** **†Potential Infestation Risk of Palmer Amaranth in Iowa: Edaphic and Climatogological Factors.** Leslie Decker*[1], Maggie Long[1], Marisa DeForest[1], Josh Dietrich[1], Drew Roen[1], Geoff Converse[1], Zoe Muehleip[1], Jacob Bruns[1], Clint Meyer[1], John Pauley[1], Brady Spangenberg[2]; [1]Simpson College, Indianola, IA, [2]BASF, Raleigh, NC (152)

**2:00** **†The Potential Economic Impact of Palmer Amaranth Infestation in Iowa.** Jacob Bruns*[1], Drew Roen[1], Geoff Converse[1], Maggie Long[1], Leslie Decker[1], Marisa DeForest[1], Josh Dietrich[1], Zoe Muehleip[1], Clint Meyer[1], John Pauley[1], Brady Spangenberg[2]; [1]Simpson College, Indianola, IA, [2]BASF, Raleigh, NC (153)

**2:15** **†Application Timing of PPO-Inhibitor Herbicides Influences Level of Palmer Amaranth Control.** Anita Dille, Dallas E. Peterson, Larry Rains*; Kansas State University, Manhattan, KS (154)

# Weed Biology, Ecology, and Management (continued)

**2:30** **†Soybean Photosynthesis as Affected by Water Stress and Multispecies Interference of Common Ragweed and Common Waterhemp.** Badou Jeremie Kouame*, Amit J. Jhala, Stevan Z. Knezevic, Timothy Arkebauer, John Lindquist; University of Nebraska-Lincoln, Lincoln, NE (155)

**2:45** **†One in a Million? Empirical Determination of Mutation Frequency for Herbicide Resistance.** Federico Casale*, Patrick Tranel; University of Illinois, Urbana, IL (156)

**3:00** **Break**

**3:15** **†Critical Period of Grass Weed Control in Grain Sorghum.** Jeffrey Albers*, Dallas E. Peterson, Marshall Hay, Anita Dille; Kansas State University, Manhattan, KS (157)

**3:30** **†Modeling Emergence Pattern of Common Ragweed Influenced by Spring Tillage in Nebraska.** Ethann R. Barnes*[1], Rodrigo Werle[1], Lowell Sandell[2], John Lindquist[1], Stevan Z. Knezevic[1], Peter H. Sikkema[3], Amit Jhala[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]Valent, Lincoln, NE, [3]University of Guelph, Ridgetown, ON (158)

**3:45** **†Post-Dispersal Seed Fate and Time of Emergence of Johnsongrass in Nebraska.** Don Treptow*, Rodrigo Werle, Amit J. Jhala, Melinda Yerka, Brigitte Tenhumberg, John Lindquist; University of Nebraska-Lincoln, Lincoln, NE (159)

**4:00** **†Interseeding Cover Crops to Suppress Weeds in Kentucky Corn-Soybean Rotations.** Tori Stanton*, Erin Haramoto, Tim Phillips; University of Kentucky, Lexington, KY (160)

**4:15** **†Effects of Failed Cover Crop Termination and Winter Annual Weed Suppression in the Eastern Cornbelt.** Stephanie DeSimini*, Bill Johnson; Purdue University, West Lafayette, IN (161)

## Weed Biology, Ecology, and Management (continued)

**4:30** **†Weed Exposure to Sublethal Rates of Herbicides as a Result of Pesticide Drift.** Bruno Canella Vieira*[1], Scott Ludwig[2], Joe D. Luck[1], Keenan L. Amundsen[1], Todd A. Gaines[3], Rodrigo Werle[1], Greg R. Kruger[4]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]Nichino America, Arp, TX, [3]Colorado State University, Fort Collins, CO, [5]University of Nebraska, North Platte, NE (162)

**4:45** **†Common Milkweed Injury due to Fomesafen Exposure and its Impact on Monarch Utilization.** Sydney Lizotte-Hall*, Bob Hartzler; Iowa State University, Ames, IA (163)

## Agronomic Crops II - Soybeans

LOCATION: Grand Ballroom D
MODERATOR: Mike Weber

**1:15** **Evaluation of 'Planting Green': Impacts of Delayed Cereal Rye Termination on Weed Emergence and Soybean Production.** Erin C. Hill*; Michigan State University, East Lansing, MI (164)

**1:30** **†Evaluation of Cover Crop Sensitivity to Residual Soybean Herbicide Treatments.** Derek Whalen*[1], Mandy Bish[1], Shawn Conley[2], Aaron Hager[3], Jason Norsworthy[4], Dan Reynolds[5], Larry Steckel[6], Bryan G. Young[7], Kevin W. Bradley[1]; [1]University of Missouri, Columbia, MO, [2]University of Wisconsin, Madison, WI, [3]University of Illinois, Urbana, IL, [4]University of Arkansas, Fayetteville, AR, [5]Mississippi State University, Starkville, MS, [6]University of Tennessee, Knoxville, TN, [7]Purdue University, West Lafayette, IN (165)

**1:45** **Managing Cover Crop Termination for Control of Palmer amaranth in Roundup Ready Xtend Soybeans.** Drake Copeland*, Larry Steckel; University of Tennessee, Jackson, TN (166)

# Agronomic Crops II – Soybeans (continued)

**2:00** **†Strategies for Control of Waterhemp that Survived a POST Contact Herbicide.** Jesse A. Haarmann*, Bryan G. Young, William G. Johnson; Purdue University, West Lafayette, IN (167)

**2:15** **Weed Control and Crop Safety in Bolt Soybean.** Zahoor A. Ganie*, Amit J. Jhala; University of Nebraska-Lincoln, Lincoln, NE (168)

**2:30** **†Methods to Control Ragweed Populations Following Survival of a POST Herbicide Treatment.** Wyatt S. Petersen*, Jesse A. Haarmann, Bryan G. Young, William G. Johnson; Purdue University, West Lafayette, IN (169)

**2:45** **†Efficacy of Halauxifen-methyl Based Herbicide Programs for Management of Glyphosate-Resistant Horseweed in Soybean and Evaluation of Preplant Intervals for Crop Safety.** Marcelo Zimmer*, Bryan G. Young, Bill Johnson; Purdue University, West Lafayette, IN (170)

**3:00** **Break**

**3:15** **†Managing Glyphosate-Resistant Horseweed and Summer Annuals in No-Till Enlist Soybeans.** Connor L. Hodgskiss*[1], Mark Loux[2], William G. Johnson[1]; [1]Purdue University, West Lafayette, IN, [2]Ohio State University, Columbus, OH (171)

**3:30** **Making Metribuzin Better with a New Formulation.** Gregory K. Dahl*[1], Ryan J. Edwards[1], Thomas A. Hayden[2], Jo A. Gillilan[3], Danny M. Brown[1], Eric Spandl[5], Joe V. Gednalske[1], Raymond L. Pigati[5]; [1]WinField United, River Falls, WI, [2]Winfield United, Owensboro, KY, [3]Winfield United, Springfield, TN, [5]WinField United, Shoreview, MN (172)

**3:45** **†Comparison of Horseweed Control in Glyphosate-, Glufosinate-, and Dicamba-Resistant Soybean in Kentucky.** Zachary K. Perry*[1], Travis Legleiter[2], Nick Fleitz[1], J D Green[1]; [1]University of Kentucky, Lexington, KY, [2]University of Kentucky, Princeton, KY (173)

# Agronomic Crops II – Soybeans (continued)

**4:00** **Survey of Palmer Amaranth for Resistance to Fomesafen, Dicamba, and Glufosinate in Mississippi and Arkansas.** Paul Feng*[1], Chenxi Wu[2], Alejandro Perez-Jones[1]; [1]Monsanto Company, Chesterfield, MO, [2]Monsanto Company, St. Louis, MO (174)

**4:15** **†Dicamba and 2,4-D Efficacy on Palmer Amaranth and Common Waterhemp.** Nathaniel R. Thompson*, Dallas E. Peterson; Kansas State University, Manhattan, KS (175)

**4:30** **Comparison of Single and Multiple Sites of Herbicide Activity on Two Populations of Herbicide-Resistant Palmer Amaranth.** Nick Fleitz*[1], J D Green[1], Patrick Tranel[2]; [1]University of Kentucky, Lexington, KY, [2]University of Illinois, Urbana, IL (176)

**4:45** **†Comparisons of Soybean Traits and Herbicide Programs for the Control of Multiple-Resistant Waterhemp and Other Common Weed Species.** Eric Oseland*, Mandy Bish, Kevin W. Bradley; University of Missouri, Columbia, MO (177)

# Agronomic and Specialty Crops

LOCATION: Grand Ballroom A
MODERATOR: Colin Phillippo

**8:00** **Bicyclopyrone as Part of an Integrated Weed Management Program in Vegetable Crops.** Colin Phillippo*, Bernard H. Zandstra; Michigan State University, East Lansing, MI (178)

**8:15** **†Delayed Cultivation to Supplement Chloroacetamide Herbicides in Sugarbeet.** Nathan H. Haugrud*, Thomas J. Peters; North Dakota State University, Fargo, ND (179)

**8:30** **Ethofumesate Applied Postemergence in Sugarbeet: Repurposing a 1960s Herbicide.** Thomas J. Peters*[1], Alexa L. Lystad[1], Christy L. Sprague[2]; [1]North Dakota State University, Fargo, ND, [2]Michigan State University, East Lansing, MI (180)

**8:45** **†Response of Sugarbeet to Low-Dose Tank-Contamination with Dicamba and 2,4-D.** Michael Probst*, Christy L. Sprague; Michigan State University, East Lansing, MI (181)

**9:00** **Investigations of the Sensitivity of Various Tree and Ornamental Species to Driftable Fractions of 2,4-D and Dicamba.** Brian R. Dintelmann*, Gatlin E. Bunton, Michele Warmund, Mandy Bish, Kevin W. Bradley; University of Missouri, Columbia, MO (182)

**9:15** **†Sensitivity of Two Classes of Dry Edible Beans to Plant Growth Regulator Herbicides.** Scott R. Bales*, Christy L. Sprague; Michigan State University, East Lansing, MI (183)

**9:30** **Break**

## Agronomic and Specialty Crops (continued)

**9:45** **Inzen™ Sorghum Weed Control Programs With DuPont™ Zest™ WDG Herbicide.** Dave Johnson*[1], Bruce Steward[2], Jeffrey Krumm[3], Eric Castner[4], Richard Edmund[5], Robert Rupp[6], Victoria Kleczewski[7], Clifton Brister[8], Stan Royal[9], Bob Williams[10], Dan Smith[11], Kenneth Carlson[12]; [1]DuPont, Des Moines, IA, [2]DuPont Crop Protection, Overland Park, KS, [3]DuPont, Hatings, NE, [4]DuPont, Wetherford, TX, [5]DuPont, Little Rock, AR, [6]DuPont, Edmond, OK, [7]DuPont, Chesterton, MD, [8]DuPont, Donna, TX, [9]DuPont, Girard, GA, [10]DuPont, Raleigh, NC, [11]DuPont, Madison, MS, [12]DuPont Crop Protection, Ankeny, IA (184)

**10:00** **The Value of Salvage Weed Control in Grain Sorghum.** Curtis R Thompson*, Dallas E Peterson; Kansas State University, Manhattan, KS (185)

**10:15** **Business Meeting**

## Invasive Weeds, Rangeland, Pasture, and Vegetation Management

LOCATION: Grand Ballroom A
MODERATOR: Mark Renz

**10:30** **Rangeland Invasive Species in Kansas.** Walter H Fick*; Kansas State University, Manhattan, KS (186)

**10:45** **†Feed or Foe? Forage Quality of Common Weeds Found in Missouri Pastures.** Gatlin E. Bunton*, Kevin Bradley; University of Missouri, Columbia, MO (187)

**11:00** **Optimizing Japanese Knotweed Control and Estimating Costs to Eradicate Populations.** Mark Renz*, Chris Bloomingdale; University of Wisconsin-Madison, Madison, WI (188)

## Invasive Weeds, Rangeland, Pasture, and Vegetation Management (continued)

**11:15** **†Targeted Sequencing of SSR Markers and ALS-Herbicide Resistance Alleles in Grain Sorghum and Weedy Relatives.** Jake Ziggafoos*, Rodrigo Werle, John Lindquist, Amit J. Jhala, David L. Hyten, Melinda Yerka; University of Nebraska-Lincoln, Lincoln, NE (189)

**11:30** **Business Meeting**

## Agronomic Crops I - Corn

LOCATION: Grand Ballroom B
MODERATOR: Mark Waddington

**8:00** **†Herbicide Options in Corn Interseeded with Cover Crops.** Aaron Brooker*, Christy L. Sprague, Karen Renner; Michigan State University, East Lansing, MI (190)

**8:15** **Crop Tolerance and Weed Suppression from PRE and POST Herbicides in Interseeded Corn and Alfalfa.** Mark Renz*[1], Chris Bloomingdale[1], William Osterholz[1], John Grabber[2]; [1]University of Wisconsin-Madison, Madison, WI, [2]USDA-ARS Dairy Forage, Madison, WI (191)

**8:30** **†Impact of Cover Crop Planting and Termination Time on Corn Production in Semi-Arid Rainfed Cropping Systems of Western Nebraska.** Alexandre T. Rosa*[1], Liberty Butts[2], Cody Creech[3], Roger Elmore[1], Daran Rudnick[2], Rodrigo Werle[1]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska Lincoln, North Platte, NE, [3]University of Nebraska-Lincoln, Scottsbluff, NE (192)

**8:45** **A Statewide Survey of Stakeholders to Assess the Problem Weeds and Management Practices in Nebraska Row Crops.** Debalin Sarangi*, Amit J. Jhala; University of Nebraska-Lincoln, Lincoln, NE (193)

# Agronomic Crops I – Corn (continued)

**9:00** **†Differential Response of a Multiple Herbicide-Resistant Population of Waterhemp to Chloroacetamide Herbicides.** Seth Strom*, Lisa Gonzini, Charlie Mitsdarfer, Adam Davis, Dean E. Riechers, Aaron Hager; University of Illinois, Urbana, IL (194)

**9:15** **Glyphosate-Resistant Common Waterhemp Control with Soil-Applied and Postemergence Herbicides in Corn.** Lauren Benoit*[1], Peter H. Sikkema[1], Darren Robinson[1], Dave C. Hooker[2]; [1]University of Guelph, Ridgetown, ON, [2]University of Guelph, Guelph, ON (195)

**9:30** **Break**

**9:45** **†Herbicide Programs and Economics of Control of Atrazine- and HPPD Inhibitor-Resistant Palmer Amaranth in Glufosinate-Resistant Corn.** Parminder Chahal*, Amit Jhala; University of Nebraska-Lincoln, Lincoln, NE (196)

**10:00** **Just What Does Bicyclopyrone Bring to the Party?** Ryan Lins*[1], Gordon Vail[2], Thomas H. Beckett[2]; [1]Syngenta Crop Protection, Rochester, MN, [2]Syngenta Crop Protection, Greensboro, NC (197)

**10:15** **†Biologically-Effective Dose of Tolpyralate Applied Postemergence for Annual Weed Control in Corn.** Brendan A. Metzger*[1], Peter H Sikkema[1], Darren Robinson[1], Dave C. Hooker[2]; [1]University of Guelph, Ridgetown, ON, [2]University of Guelph, Guelph, ON (198)

**10:30** **Comparisons of the Weed Control of Atrazine or Terbuthylazine Alone and in Standard Atrazine Tank-Mixes in Irrigated Corn.** Randall S Currie*, Patrick Geier; Kansas State University, Garden City, KS (199)

**10:45** **†Implementation of Variable Rate Herbicide Applications Based on Soil Physical Properties.** Garrison J. Gundy*, J. Anita Dille, Antonio R. Asebedo; Kansas State University, Manhattan, KS (200)

## Agronomic Crops I – Corn (continued)

**11:00** **Harness MAX Herbicide: A New Product for Weed Management in Corn.** Eric Riley*[1], Greg Elmore[1], Bob Montgomery[2]; [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Union City, TN (201)

**11:15** **Enlist Duo Launch Experience in 2017.** David Simpson*[1], Jonathan Siebert[2], Jerome J. Schleier[3], David C. Ruen[4]; [1]Dow AgroSciences, Zionsville, IN, [2]Dow AgroSciences, VO US, MS, [3]Dow AgroSciences, Indianapolis, IN, [4]Dow AgroSciences, Lanesboro, MN (202)

**11:30** **Business Meeting**

## Agronomic Crops II - Soybeans

LOCATION: Grand Ballroom C
MODERATOR: Mike Weber

**8:00** **†Control of Glyphosate-Resistant Waterhemp in Ontario with the Roundup Ready 2 Xtend Crop System.** Brittany Hedges*[1], Peter H. Sikkema[1], Darren Robinson[1], Dave C. Hooker[2]; [1]University of Guelph, Ridgetown, ON, [2]University of Guelph, Guelph, ON (203)

**8:15** **Glyphosate-Resistant Waterhemp Control in Glufosinate, Glyphosate/Dicamba, Glyphosate/2,4-D and Mesotrione/Glufosinate/Isoxaflutole-Resistant Soybean in Ontario.** Peter H Sikkema*, Mike G. Schryver, Nader Soltani; University of Guelph, Ridgetown, ON (204)

**8:30** **†Evaluation of Weed Management and Grain Yield in Six Soybean Systems.** Matthew C. Geiger*[1], Ron Krausz[2], Karla Gage[1]; [1]Southern Illinois University, Carbondale, IL, [2]Southern Illinois University, Belleville, IL (205)

**8:45** **XtendiMax[R] Herbicide with VaporGrip[R] Technology Update.** Jeffrey E. Herrmann*; Monsanto, St. Charles, MO (206)

# Agronomic Crops II – Soybeans (continued)

**9:00** **Weed Control with XtendiMax® Herbicide with VaporGrip® Technology in Roundup Ready® Xtend Crop System.** Neha Rana*; Monsanto Company, St Louis, MO (207)

**9:15** **†Simulated Tank Contamination with 2,4-D and Dicamba on Dicamba- and Glyphosate-Resistant Soybean Varieties.** Nicholas C. Hayden*[1], Julie M. Young[1], William G. Johnson[1], Aaron Hager[2], Shawn Conley[3], Kevin Bradley[4], Lawrence Steckel[5], Dan Reynolds[6], Jason Norsworthy[7], Greg R. Kruger[8], Bryan G. Young[1]; [1]Purdue University, West Lafayette, IN, [2]University of Illinois, Urbana, IL, [3]University of Wisconsin, Madison, WI, [4]University of Missouri, Columbia, MO, [5]University of Tennessee, Jackson, TN, [6]Mississippi State University, Starkville, MS, [7]University of Arkansas, Fayetteville, AR, [8]University of Nebraska, North Platte, NE (208)

**9:30** **Break**

**9:45** **Launching Roundup Ready Xtend Soybean in a Wet and Windy Year: Perspectives from Indiana.** Joe Ikley*, Bill Johnson; Purdue University, West Lafayette, IN (209)

**10:00** **Survey of Nebraska Soybean Producers on Dicamba Use During the 2017 Growing Season.** Rodrigo Werle*[1], Amit Jhala[1], Robert N. Klein[2], Christopher Proctor[1], Jenny Rees[3]; [1]University of Nebraska-Lincoln, Lincoln, NE, [2]University of Nebraska, North Platte, NE, [3]University of Nebraska-Lincoln, York, NE (210)

**10:15** **Investigations of the Role that Weather and Environmental Conditions Played in Off-Target Movement of Dicamba in 2017.** Mandy Bish*, Kevin Bradley; University of Missouri, Columbia, MO (211)

**10:30** **†Influence of Application Timing, Surface Temperature Inversions, and New Formulations on Dicamba Air Concentrations Following Treatment.** Shea Farrell*, Brian R. Dintelmann, Eric Oseland, Mandy Bish, Robert N. Lerch, Kevin W Bradley; University of Missouri, Columbia, MO (212)

## Agronomic Crops II – Soybeans (continued)

**10:45** **Evaluation of Volatility of Dicamba Formulations in Soybean Crop.** Debora O. Latorre*[1], Dan Reynolds[2], Bryan G. Young[3], Jason Norsworthy[4], Stanley Culpepper[5], Kevin Bradley[6], Ryan Rector[7], Wayne Keeling[8], David Nicolai[9], Mandy Bish[6], Greg R. Kruger[1]; [1]University of Nebraska-Lincoln, North Platte, NE, [2]Mississippi State University, Starkville, MS, [3]Purdue University, West Lafayette, IN, [4]University of Arkansas, Fayetteville, AR, [5]University of Georgia, Tifton, GA, [6]University of Missouri, Columbia, MO, [7]Monsanto Company, St. Charles, MO, [8]Texas A&M, Lubbock, TX, [9]University of Minnesota, Farmington, MN (213)

**11:00** **Dicamba Volatilization from Field Surfaces.** Thomas Mueller*; University of Tennessee, Knoxville, TN (214)

**11:15** **Salient Features of Dicamba Volatility from Soil.** Donald Penner*, Jan Michael; Michigan State University, East Lansing, MI (215)

**11:30** **Business Meeting**

## Weed Management through Equipment and Application Technologies - Symposium

LOCATION: Grand Ballroom FG
MODERATOR: Ryan Edwards

**8:00** **Amaranth, Algorithms, and You.** Joel Wipperfurth*; Winfield United, , United States (216)

**8:20** **The Importance of Technology and Scouting when Managing Weeds on 60,000 Acres - A Grower's Perspective.** Brian Vulgamore*; Vulgamore Family Farms, Scott City, KS (217)

**8:40** **Growing Good Neighbors through Communication: Overview of FieldWatch.** Stephanie Ragagnon*; DriftWatch, West Lafayette, IN (218)

# Weed Management through Equipment and Application Technologies – Symposium (continued)

**9:00** **Pocket Spray Smart: Providing Field-Specific Spraying Conditions, Current Wind Speed and Direction, and Temperature Inversion Potential for Your Current Location.** Jason Little*; Agrible, Champaign, IL (219)

**9:20** **Smart Machines for Weed Control.** William L. Patzoldt*, Mac Keely, Erik Ehn, Ben Chostner; Blue River Technology, Sunnyvale, CA (220)

**9:40** **Break**

**9:50** **Application Timing Decision Tools and Advanced Spray System Technology.** Yancy Wright*; John Deere, Kansas City, MO (221)

**10:10** **What and Why: PWM and Pulsing Nozzles.** Brian Finstrom*; CapstanAG, , United States (222)

**10:30** **Drone-Enabled Precision Agriculture - Field Lessons and Trends.** Orlando Saez*; Aker Company, Chicago, IL (223)

**10:50** **Evaluating the Effectiveness of a Redball Hooded Sprayer to Mitigate Drift.** Dan Reynolds*[1], Greg R. Kruger[2], Trae Foster[3], Steve Claussen[4]; [1]Mississippi State University, Starkville, MS, [2]University of Nebraska, North Platte, NE, [3]Winfield United, Shoreview, MN, [4]Wilmar Manufacturing, Benson, MN (224)

**11:10** **Redball-Hooded Sprayers Reduce Drift - An Overview of University Drift Testing and Other Benefits of Spraying with Redball Hoods.** Steve Claussen*; Wilmar Manufacturing, Benson, MN (225)

**11:30** **Business Meeting**

## NCWSS Awards Luncheon

*Distinguished Achievement and Fellow Awards*

12:00 – 1:30 pm Grand Ballroom DE

# Weed Biology, Ecology, and Management

LOCATION: Grand Ballroom A
MODERATOR: Rodrigo Werle

**1:30** **Extent of Early-Season Weed Control with Cover Crops: A Meta-Analysis.** Anita Dille*[1], O. Adewale Osipitan[2], Stevan Z. Knezevic[3]; [1]Kansas State University, Manhattan, KS, [2]University of Nebraska-Lincoln, Concord, NE, [3]University of Nebraska-Lincoln, Lincoln, NE (226)

**1:45** **Controlling Horseweed with Cover Crop and Herbicide Combinations.** Austin D. Sherman*, Erin Haramoto, J D Green; University of Kentucky, Lexington, KY (227)

**2:00** **Interaction of Application Timing, Herbicide Active Ingredient, and Specific Target-Site Mutation on the Selection of ALS-Inhibitor Resistant Horseweed and Tall Waterhemp.** Jodi E. Boe*, Haozhen Nie, Bryan G. Young; Purdue University, West Lafayette, IN (228)

**2:15** **Confirmation and Management of ALS-Resistant Downy Brome in Wheat Production Systems of the U.S. Great Plains.** Vipan Kumar*[1], Prashant Jha[2], Phillip Stahlman[1], Anjani Jha[2]; [1]Kansas State University, Hays, KS, [2]Montana State University, Huntley, MT (229)

**2:30** **Break**

**2:45** **Generate Real-Time Weed Classification Systems with Improved Calibration of Multispectral Images.** Antonio R. Asebedo*, J. Anita Dille, Garrison J. Gundy; Kansas State University, Manhattan, KS (230)

**3:00** **Genetics of Dioecy in *Amaranthus*.** Ahmed Sadeque, Patrick Brown, Patrick Tranel*; University of Illinois, Urbana, IL (231)

## Weed Biology, Ecology, and Management (continued)

**3:15** **Genome-Wide Analysis of Copy Number Variation in Kochia.** Todd A. Gaines*[1], Eric Patterson[1], Philip Westra[1], Dan Sloan[1], Patrick Tranel[2], Chris Saski[3]; [1]Colorado State University, Fort Collins, CO, [2]University of Illinois, Urbana, IL, [3]Clemson University, Clemson, SC (232)

**3:30** **Business Meeting**

## Taking the Next Step: Preparing for your Future Career - Graduate Student Symposium

LOCATION: Grand Ballroom B
MODERATOR: Thomas Butts

**1:30** **Applying, Interviewing, and Negotiating Academic Positions in Weed Science.** James J Kells*; Michigan State University, East Lansing, MI (233)

**2:00** **What You Didn't Know About Getting a Job in Industry.** Cynthia Sanderson*; Monsanto Company, St. Louis, MO (234)

**2:30** **Break**

**2:45** **Careers for Weed Scientists: Which Path(s) Do I Take?** Dave Johnson*; DuPont, Des Moines, IA (235)

**3:15** **Context is Everything: Crafting Professional Documents That Work.** Christopher Schott*; University of Missouri-St. Louis, St. Louis, MO (236)

**3:45** **Panel Discussion**

# An Open Dialogue on Dicamba Technology - Symposium

LOCATION: Grand Ballroom FG
MODERATOR: Christopher Proctor

**1:30** **A Historical Perspective on Dicamba.** Bob Hartzler*; Iowa State University, Ames, IA (237)

**1:45** **A Review of XtendiMax with VaporGrip Technology in 2017.** Ty K. Witten*; Monsanto Company, St. Louis, MO (238)

**2:00** **Engenia Herbicide Stewardship for 2018.** Gary Schmitz*; BASF Corporation, Mahomet, IL (239)

**2:15** **Observations of Midwest Weed Extension Scientists.** Aaron Hager*; University of Illinois, Urbana, IL (240)

**2:30** **The Good the Bad and the Ugly: Dicamba Observations of Southern Weed Extension Scientists.** Larry Steckel*[1], Jason Bond[2], Joyce Ducar[3], Alan York[4], Bob Scott[5], Peter Dotray[6], Tom Barber[5], Kevin Bradley[7]; [1]University of Tennessee, Knoxville, TN, [2]Mississippi State University, Stoneville, MS, [3]University of Auburn, Auburn, AL, [4]North Carolina State University, Raleigh, NC, [5]University of Arkansas, Lonoke, AR, [6]Texas A&M University, Lubbock, TX, [7]University of Missouri, Columbia, MO (241)

**2:45** **State Regulatory Office on Dicamba.** Darryl R. Slade*; Missouri Department of Agriculture, Jefferson City, MO (242)

**3:00** **Break**

**3:15** **Towards a climatology of temperature inversions in northern Mississippi and implications for Dicamba drift.** Richard Grant*; Purdue University, West Lafayette, IN (243)

# An Open Dialogue on Dicamba Technology – Symposium (continued)

**3:40** **University Research on Dicamba Volatility.** Bryan G. Young*[1], Shea Farrell[2], Kevin W Bradley[2], Debora O. Latorre[3], Greg R. Kruger[3], Tom Barber[4], Jason K. Norsworthy[5], Bob Scott[5], Dan Reynolds[6], Lawrence Steckel[7]; [1]Purdue University, West Lafayette, IN, [2]University of Missouri, Columbia, MO, [3]University of Nebraska-Lincoln, North Platte, NE, [4]University of Arkansas, Lonoke, AR, [5]University of Arkansas, Fayetteville, AR, [6]Mississippi State University, Starkville, MS, [7]University of Tennessee, Jackson, TN (244)

**4:00** **Large Scale Volatility Testing: What is Involved.** Jerome J. Schleier*, Pat Havens; Dow AgroSciences, Indianapolis, IN (245)

**4:20** **How to Proceed in 2018: A University Perspective.** Kevin W Bradley*; University of Missouri, Columbia, MO (246)

**4:40** **Science Communication and Off-Target Movement of Dicamba.** Kevin Folta*; University of Florida, Gainesville, FL (247)

**5:00** **Extension Business Meeting**

## NCWSS Society Social

*Sponsored by Sustaining Members – Open to all attendees*

Graduate and Undergraduate Paper and Poster Awards

5:30 – 7:30 pm Gateway East & Terrace *(18th floor)*

## Industry Breakfast (Tickets required)

7:00 – 8:15 am Grand Ballroom E

Presentation: **Communicating Agricultural Innovation to a Concerned Public.** Dr. Kevin Folta, Professor and Chairmen of the Horticultural Sciences Department, University of Florida, Gainesville, FL (248)

## What is New in Industry? - Symposium

LOCATION: Grand Ballroom AB
MODERATOR: R. Joseph Wuerffel

TIME: 8:30 – 10:00 am

**10:00 Industry Business Meeting**

# 2017 Officers/Executive Committee

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**Executive Secretary**

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| Brady Kappler | Western (2017)<br>402-432-1469<br>brady.kappler@basf.com |

## NCWSS Interest Group Committees

**Extension**

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**Graduate Student Committee**

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| Stott Howard | | 515-222-4809 | stott.howard@syngenta.com |
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| Ryan Wolf | | 507-438-3369 | rrwolf@landolakes.com |

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| Gary Schmitz | 217-897-1939 | gary.schmitz@basf.com |
| John Hinz | 515-733-9250 | john.hinz@bayer.com |
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| Alan Miller | 608-845-7993 | amagstat@td.net' |
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**Resident Education**

| | | | |
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| Neha Rana | 1nd Vice Chair | 636-288-2609 | neha.rana@monsanto.com |
| Daniela Ribeiro | 2nd Vice Chair | 662-347-5060 | daniela.n.ribeiro@monsanto.com |
| Mark Bernards | Past Chair | 309-298-1569 | ML-Bernards@wiu.edu |
| Doug Nord | | 620-285-3380 | dwnord@gbta.net |
| Warren Pierson | 2017 Contest Host | 515-509-8308 | wpierson@iastate.edu |
| Bill Johnson | 2016 Contest Host | 765-494-4656 | wgj@purdue.edu |
| Bruce Ackley | | 740-225-2014 | ackley.19@osu.edu |
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| Jatinder Aulakh | | 334-332-8036 | Jatinder.Aulakh@ct.gov |
| Vijay Varanasi | | 785-477-1162 | varanasi@ksu.edu |

**Resident Education-Contest Rules Subcommittee**

| | | | |
|---|---|---|---|
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| Daniela Ribeiro | 2nd Vice Chair | 662-347-5060 | daniela.n.ribeiro@monsanto.com |
| Bill Johnson | 2016 Contest Host | 765-494-4656 | wgj@purdue.edu |

**Strategic Planning**

| | | | |
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| *Central Region* | | | |
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| Mike Weber | | | Michael.weber3@bayer.com |
| Mark Bernards | | 309-298-1569 | ML-Bernards@wiu.edu |
| Dave Ruen | | 507-259-7095 | DCRUEN@dow.com |
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| *Eastern Region* | | | |
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| Nader Soltani | | | soltanin@uoguelph.ca |
| Erin Haramoto | | 859-218-0745 | erin.haramoto@uky.edu |
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**Summer Contest Subcommittee of Resident Education**

| | | | |
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## NCWSS Standing Committees

**Distinguished Achievement Award**

| | | | |
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| Anita Dille | Chair | 785-532-7240 | dieleman@ksu.edu |
| Greg Dahl | Vice-Chair | 651-261-1817 | gkdahl@landolakes.com |
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| Larry Hageman | | 815-562-7570 | larry.h.hageman@dupont.com |

**Distinguished Achievement Awards, Graduate Student subcommittee**

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**Fellow Committee**

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**Finance Steering and Policy Committee**

| | | | |
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**Future Site Selection Committee**

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**Invasive Plants Committee**

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**Presentation Recording**

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***Section Program Chairs***

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| | | | |
|---|---|---|---|
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**Graduate Student Paper Awards**

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**Graduate Student Poster Awards**

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**Undergraduate Student Poster Awards**

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**Agronomic Crops I (Corn)**

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# North Central Weed Science Society Information

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# Honorary Members/Fellows

Honorary Members

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

**Fellows**[1]

| | |
|---|---|
| 1995 | Charles R. Fenster |
| | Leon J. Wrage |
| 1996 | Thomas T. Bauman * |
| | Earl W. Chamberlain |
| | Richard S. Fawcett |
| | William E. Lueschen |
| 1997 | Stephen D. Miller |
| | M.D.K. Owen |
| | Fred W. Roeth |
| 1998 | Paul J. Ogg * |
| | James P. Worthington |
| 1999 | Michael Barrett |
| | Norman J. Probst |
| 2000 | Douglas D. Buhler |
| | Bill Miller |
| | Philip L. Orwick |
| | Stephen C. Weller |
| 2001 | LeRoy R. Cobia |
| 2002 | James J. Kells |
| 2003 | Karen Ann Renner |
| | Charles Slack |
| | Phillip Stahlman |

## Honorary Members/Fellows (continued)

| | |
|---|---|
| 2004 | Duane Rathman |
| | David Regehr |
| 2005 | Dallas E. Peterson |
| 2006 | James R. Martin |
| | Bernard H. Zandstra |
| 2007 | Chris M. Boerboom |
| | Michael J. Horak |
| 2008 | Thomas J. Peters |
| | Jeffrey Gunsolus |
| | Kassim Al-Khatib |
| 2009 | J.D. Green |
| | Thomas B. Threewitt |
| | Robert N. Klein |
| 2010 | No nominations |
| 2011 | Bill Johnson |
| | Harlene Hatterman-Valenti |
| | Gordon K. Roskamp |
| 2012 | Peter H. Sikkema |
| | Bob Hartzler |
| | Roger Becker |
| 2013 | Bryan Young |
| 2014 | Adrian Moses |
| | David Stoltenberg |
| 2015 | Dave Johnson |
| | Mark Wrucke |
| 2016 | David Simpson |
| | Curtis Thompson |

* Deceased

[1]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 |
| 1945 | Yost, Ted F. * |
| 1946 | Yost, Ted F. * |
| 1947 | Hanson, Noel S. * |
| 1948 | Willard, Charles J. * |
| 1949 | Dunham, R. S. * |
| 1950 | Worzella, W. W. * |
| 1951 | Sylwester, Erhardt P. * |
| 1952 | Buchholtz, Kenneth P. * |
| 1953 | Gilbert, C. J. * |
| 1954 | Lee, Oliver C. * |
| 1955 | Grigsby, Buford H. * |
| 1956 | Helgeson, Earl A. * |
| 1957 | Slife, Fred W. * |
| 1958 | Derscheid, Lyle A. |
| 1959 | Foster, J. Roe * |
| 1960 | Holm, Leroy G. * |
| 1961 | Alban, E. K. * |
| 1962 | Bjerken Sig. * |
| 1963 | Hemphill, Delbert D. * |
| 1964 | Hemphill, Delbert D. * |
| 1965 | Furrer, John D. * |
| 1966 | Furrer, John D. * |
| 1967 | Warden, Robert L. * |
| 1968 | Fletchall, O. Hale * |
| 1969 | Beck, Thomas V. |
| 1970 | Hannah, Lawrence H. |
| 1971 | Knake, Ellery * |
| 1972 | Williams, Jr., James L. * |
| 1973 | Meggitt, William |
| 1974 | Bradfield, Kenneth W. |
| 1975 | Burnside, Orvin C. |
| 1976 | Fink, Rodney J. |
| 1977 | Carpenter, Will D. |
| 1978 | Doersch, Ronald E. |
| 1979 | Nalewaja, John D. |
| 1980 | Stroube, Edward W. |

* Deceased

| | |
|---|---|
| 1980 | Stroube, Edward W. |
| 1981 | Herron, James W. * |
| 1982 | Benson, Robert L. |
| 1983 | DiVall, James W. |
| 1984 | Miller, Gerald R. |
| 1985 | Messersmith, Calvin G. |
| 1986 | Wax, Lloyd M. |
| 1987 | Chamberlain, Earl |
| 1988 | Harvey, R. Gordon * |
| 1989 | Worthington, James P. |
| 1990 | Martin, Alex R. |
| 1991 | Taylor, T. Don |
| 1992 | Stoller, Edward W. |
| 1993 | Warfield, Ted R. |
| 1994 | Bauman, Thomas T. |
| 1995 | Cobia, LeRoy R. |
| 1996 | Dexter, Alan G. |
| 1997 | Miller, Bill |
| 1998 | Buhler, Douglas D. |
| 1999 | Orwick, Philip L. |
| 2000 | Kells, James J. |
| 2001 | Rathmann, Duane P. |
| 2002 | Peterson, Dallas E. |
| 2003 | Horak, Michael J. |
| 2004 | Doll, Jerry D. |
| 2005 | Peters, Tom |
| 2006 | Miller, Stephen D. |
| 2007 | Moses, Adrian |
| 2008 | Johnson, William G. |
| 2009 | Holm, Mick |
| 2010 | Boerboom, Chris |
| 2011 | Wrucke, Mark |
| 2012 | Young, Bryan |
| 2013 | Johnson, Dave |
| 2014 | Green, J.D. |
| 2015 | Hinz, John |
| 2016 | Anita Dille |
| 2017 | Gregory Dahl |

## Distinguished Achievement Awards

| | |
|---|---|
| 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 |
| | M.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 Scientist |
| 2003 | Mark Loux - Education |
| | Kenneth Carlson - Industry |
| | Daniel E. Schroeder - Industry |
| | Andrew Chomas - Professional Staff |
| | Jeffrey Stachler - Professional Staff |

## Distinguished Achievement Awards (continued)

| | |
|---|---|
| 2004 | Gordon Roskamp - Education |
| | Robert N. Klein - Education |
| | David Stoltenberg - Research |
| | Robert E. Wolf - Service |
| | Patrick J. Tranel - Young 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 |
| | Chad Brabham - Graduate Student |
| 2012 | Dain Bruns - Industry |
| | Fritz Breitenbach - Professional Staff |
| | Timothy Trower - Professional Staff |
| | Erin Taylor-Hill - Professional Staff |
| | Paul Marquardt-Graduate Student |
| 2013 | Kirk Howatt – Education |
| | Mark Renz – Education |
| | Patrick Tranel – Research |
| | Stevan Knezevic – Research |
| | Christy Sprague - Service |
| | Rodrigo Werle – Graduate Student |
| 2014 | Greg Kruger – Young Scientist |
| | Ryan Lins – Young Scientist |
| | Dawn Refsell – Industry |
| | Jeff Golus – Professional Staff |
| | Collin Auwarter – Professional Staff |
| | Jessica Bugg – Graduate Student |
| 2015 | Brian Jenks – Service |
| | Doug Nord – Service |
| | Marvin Schultz – Industry |
| | Bruce Ackley – Professional Staff |

## Distinguished Achievement Awards (continued)

| | |
|---|---|
| 2015 | Darren Robinson – Research |
| | Cody F. Creech – Graduate Student |
| 2016 | Richard Cole- Industry |
| | Mark Peterson- Industry |
| | Larry Hageman- Industry |
| | Stott Howard- Service |
| | Amit Jhala- Young Scientist |

## North Central Weed Science Contest Locations

| YEAR | Company | Location |
|---|---|---|
| 1981 | Agri-Growth | Hollandale, MN |
| 1982 | Agri-Growth | Hollandale, MN |
| 1983 | Lilly Research Lab | Leshara, NE |
| 1984 | Dow Chemical Research | Geneseo, IL |
| 1985 | Bayer (Mobay) | Stilwell, KS |
| 1986 | Union Carbide | Newton, IA |
| 1987 | Monsanto | Monmouth, IL |
| 1988 | Agri-Growth | Hollandale, MN |
| 1989 | FMC | Champaign, IL |
| 1990 | DowElanco | Greenfield, IN |
| 1991 | CibaGeigy | Champaign, IL |
| 1992 | Cenex Land o Lakes | Iowa |
| 1993 | Zeneca | Champaign, IL |
| 1994 | Bayer (Miles) | Stilwell, KS |
| 1995 | Amcy | Seymour, IL |
| 1996 | Monsanto | Monmouth, IL |
| 1997 | Land o Lakes | Webster City, IA |
| 1998 | Valent | Champaign, IL |
| 1999 | Agri-Growth | Hollandale, MN |
| 2000 | Bayer | West Lafayette, IN |
| 2001 | Monsanto | Monmouth, IL |
| 2002 | Dow AgroSciences | Fowler, IN |
| 2003 | Syngenta | Champaign, IL |
| 2004 | University of Minnesota-Southern Research & Outreach Ctr. | Waseca, MN |
| 2005 | Kansas State University | Manhattan, KS |
| 2006 | Midwest Research Inc. | York, NE |
| 2007 | Bennett Ag. Research Corp | Richland, IA |
| 2008 | SGS Alvey Ag Research | Carlyle, IL |
| 2009 | joint NC/NE – ABG Ag Services | Indianapolis, IN |
| 2010 | no contest | |
| 2011 | Weed Olympics, University of Tennessee | Knoxville, TN |
| 2012 | Diamond Ag Research Inc. | Larned, KS |
| 2013 | joint NC/NE - Monsanto | Monmouth, IL |
| 2014 | DuPont Pioneer | Johnston, IA |
| 2015 | Weed Olympics, The Ohio State University | Columbus, OH |
| 2016 | Purdue University | West Lafayette, IN |
| 2017 | Iowa State University FEEL | Ames, IA |

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# NCWSS Sustaining Members

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

# Notes

# Notes

# Notes

# Notes

**Future NCWSS Annual Meeting Sites**

2018 – December 3-6 in Milwaukee, WI
2019 – December 9-12 in Columbus, OH

**Time Schedule**

Mark papers and meetings in the appropriate space.

| Time | Tuesday | Wednesday | Thursday |
|---|---|---|---|
| 8:00 | Poster Session I | | |
| 8:15 | | | |
| 8:30 | | | What's New In Industry |
| 8:45 | | | |
| 9:00 | | | |
| 9:15 | | | |
| 9:30 | | | |
| 9:45 | | | |
| 10:00 | General Session | | |
| 10:15 | | | |
| 10:30 | | | |
| 10:45 | | | |
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| 12:00 | Student Luncheon | NCWSS Awards Luncheon | |
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| 5:30 | Poster Session II | Society Social | |
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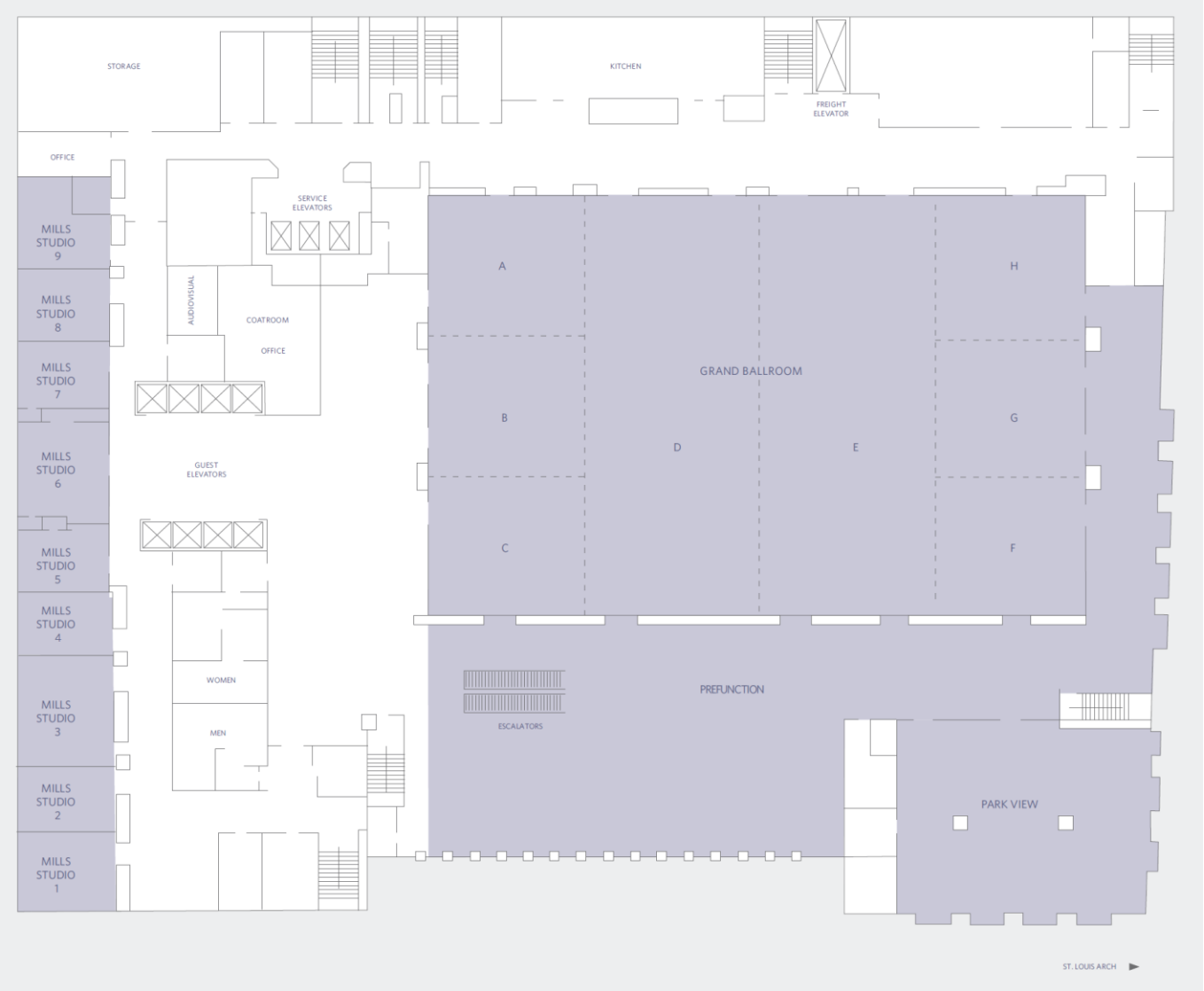
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