WEED SCIENCE SOCIETY OF AMERICA-
WESTERN SOCIETY OF WEED SCIENCE

JOINT MEETING
60th Meeting

2020 MEETING PROGRAM
Hyatt Regency
Maui, HI
March 2-5, 2020
WSSA Sustaining Members

**PRESIDENTIAL**
BASF Corporation
Bayer Crop Science
Corteva Agrisciences
FMC Corporation
Syngenta Crop Protection

**LEADERS**
Helena Chemical
Valent USA
Winfield United

**PATRONS**
NuFarm Americas, Inc.
UPL NA Inc
Growmark, Inc.
Gylling Data Management, Inc.
Marrone Bio Innovations, Inc.

**CONTRIBUTORS**
AMVAC Chemical Corp
Greenleaf Technologies
TeeJet Technologies
Nippon Soda Ltd
Oxiteno USA
Clariant Corporation
Lehigh Agri & Bio Services, Inc.
Minnesota Valley Testing Lab
R & D Sprayers
SePRO
Welcome to the 2020 joint Weed Science Society of America (WSSA) and the Western Society of Weed Science (WSWS) Annual Meeting at the Hyatt Regency Maui Resort and Spa. This venue is set upon 40 oceanfront acres on Maui’s Ka’anapali Beach offering many activities. Organized tour options include whale watching and a tour of Monsanto Hawaii seed corn operation.

At this year’s meeting, we are encouraging a more resort casual dress code; tropical/Hawaiian attire would be great! Most committee meetings will take place on Monday, March 2 in the morning or afternoon with some scattered on other days during the week. Check with your committee chairs for the exact time and location. The General Session and WSSA/WSWS Awards Ceremony will begin Monday at 4:00 PM in the Monarchy Ballroom. Our General Session will begin with a welcome and opening remarks from Dr. Samuel M. ‘Ohukani‘ihi’a Gon III, senior scientist and cultural advisor for the Nature Conservancy of Hawaii. Dr. Sam Gon is a native of Hawaii and has 40 years of experience in numerous conservation and land management projects. We are excited to have Dr. Gon join our meeting. Presidents Larry Steckel (WSSA) and Pat Clay (WSWS) will collaborate on the presidential address to the membership. The Awards Ceremony will include presentations of the WSSA and WSWS Annual Awards. Be sure to attend this session to help recognize all the awardees. Following the Awards Ceremony, WSSA/WSWS will host an awards reception beginning around 6:00 p.m. All registered attendees are welcome and encouraged to attend. Please be sure spouses and friends that accompany you have registered so that they may attend this fun event.

As in the past, we will begin Tuesday morning with the Poster Session and will again have multiple breakout sessions throughout the week with presentations addressing invasive plants in natural areas to the genetics of herbicide resistance to the latest herbicide technology. We think we have something for everyone. Also, join us for the 3rd WSSA Women in Weed Science Networking Event tentatively targeted for Tuesday at noon. All female attendees at the conference are welcome to attend the event, just sign up when you register so we have a seat for you!

We are again conducting MS and PhD student poster and oral presentation contests. However, a new oral competition event is being offered in 2020 to both WSSA and WSWS students. This will be a Three-Minute Thesis Research Communication Competition (3MT™) developed by the University of Queensland, Australia (https://threeminutethesis.uq.edu.au/). It provides students with the opportunity to profile their research and enhance communication skills. A separate document will be available describing this activity in more detail including how students will be judged and the rules for the competition. A joint WSSA/WSWS student luncheon will take place on Wednesday.
where the students will conduct business and have a facilitated session focused on some issues that students face in graduate school. And finally, the student awards ceremony will take place late Wednesday afternoon followed by an organized “Students Night Out”, so there should be plenty of opportunities for our students to contribute in the 2020 meeting.

Tuesday through Thursday, we are going to host five symposia related to important and impactful subjects that need attention in Weed Science. These include: 1) Genomics of Weedy and Invasive Species - 2025 and Beyond, 2) The Ecological and Biodiversity Impact of Invasive Grass Species and Their Management, 3) 2020 Vision for Hawaiian Invasive Plant Management, 4) The Role of Intelligent Machines in Weed Management, and 5) Toxicology and Weed Science. The WSSA and WSWS will both host separate business meetings early Thursday morning. We hope that all members will attend their respective meeting to participate in the decision-making process on societal issues and board activities. Most professional activities will end by noon on Thursday, however a very special workshop titled “Building a Community to the Wicked Problem of Herbicide Resistance” organized by Dr. David Shaw will take place from 1 to 4 pm on Thursday where experts and practitioners will present information on community organization efforts and other strategies to combat the resistance problem. Also, other committee meetings may run into Thursday afternoon, so check the schedule.

Special thanks to our Local Arrangements Chair, Dr. James Leary. Although he relocated to Florida from Hawaii last year, he has been very helpful with developing the program. In addition, thanks to Josh Atwood with the Hawaii invasive Species Council in helping to identify our Keynote speaker. We would also like to thank Drs. Darrin Dodds, Marty Schraer, and Carl Coburn for their help in organizing and conducting the student contests. Thanks also to Drs. Larry Steckel, Anita Dille, Scott Senseman, Pat Clay, and Andrew Kniss for their help and guidance in preparing the program. We had an overwhelming group of committed folks who submitted great symposia ideas this year and some we could not accommodate but hope to have back in 2021 in San Antonio. We thank all our Section Chairs for helping to organize the program and our WSSA/WSWS meeting manager and Executive Secretary, Mr. Eric Gustafson, for his commitment to ensure a successful meeting on all levels. We are excited about the great participation and the many opportunities to exchange scientific information on weed science research, education and extension. We look forward to a productive and rewarding meeting.

Bill Curran
WSSA Program Chair and President-Elect
Corey Ransom
WSWS Program Chair and President-Elect
2020 Program Committee

General Program Chairs ............ William Curran and Corey Ransom
Vice Chair ......................... Anita Dille

Agronomic Crops ................. Ryan Lins and Misha Manuchehri
Horticultural Crops ............. Matthew Cutulle and Jesse Richardson
Turf and Ornamentals .......... Anthony Witcher and Sandeep Rana
Pastures, Rangelands, .......... Mark Renz and Matthew Cutulle
Forests, Rights of Way, Wildlands and Aquatic Invasive Plants Harry Quicke

Teaching and Extension ........ Sandeep Rana and Thomas Getts
Formulation, Adjuvant, ........ Malik Mayank and Vipan Kumar
& Application Technology

Weed Biology and Ecology ...... Mohsen Mesagran and Caio Brunharo
Biocontrol of Weeds ............. James Cuda and Min Rayamajhi
Physiology ........................ Paul Tseng

Integrated Weed ................. Vijay Singh and Shilpa Singh
Management

Sustaining Member Exhibits ..... Greg Dahl
Poster Sessions ................. Thomas Mueller
Student Contest .................. Darrin Dodds and Carl Coburn

Program Booklet and Abstracts
All those registering for the annual meeting will receive a program booklet. All registrants will receive programs at the meeting registration desk. To find the time and location of specific papers, search by the author in the author index in the back of the program.

Please also download the meeting app for the most up to date schedules and information.

Posters and Sustaining Member Exhibits
All posters and Sustaining Member Exhibits will be on display from Tuesday at 7am to Thursday at 11am. The times will not be replicated daily throughout the program.
# CONDENSED PROGRAM

## WSSA COMMITTEE MEETINGS AND OTHER ACTIVITIES

### SATURDAY  FEBRUARY 29

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSSA Board of Directors</td>
<td>07:00 AM - 05:00 PM</td>
<td>Maui Suite #1</td>
</tr>
</tbody>
</table>

### SUNDAY  MARCH 1

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSSA Board of Directors Meeting</td>
<td>07:00 AM - 12:00 PM</td>
<td>Maui Suite #1</td>
</tr>
<tr>
<td>HRAC Global/ US</td>
<td>07:00 AM - 12:00 PM</td>
<td>Maui Suite #4</td>
</tr>
<tr>
<td>Whale Watching Tour</td>
<td>09:00 AM - 12:00 PM</td>
<td>Lobby</td>
</tr>
<tr>
<td>HRAC US</td>
<td>01:00 PM - 05:00 PM</td>
<td>Maui Suite #3</td>
</tr>
<tr>
<td>HRAC Global</td>
<td>01:00 PM - 05:00 PM</td>
<td>Maui Suite #4</td>
</tr>
<tr>
<td>NIFA Fellow Advisory Committee</td>
<td>01:00 PM - 03:00 PM</td>
<td>Maui Suite #1</td>
</tr>
<tr>
<td>USDA-ARS IWM Area Wide Project</td>
<td>01:00 PM - 05:00 PM</td>
<td>Monarchy #5</td>
</tr>
</tbody>
</table>

### MONDAY  MARCH 2

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board/ Committee Member Breakfast</td>
<td>06:30 AM - 08:00 AM</td>
<td>Japengo</td>
</tr>
<tr>
<td>WSSWS Board of Directors Meeting</td>
<td>07:00 AM - 04:00 PM</td>
<td>Regency Boardroom</td>
</tr>
<tr>
<td>APHIS Meeting</td>
<td>07:00 AM - 09:00 AM</td>
<td>Monarchy #7</td>
</tr>
<tr>
<td>F3 - Endowment Fund</td>
<td>08:00 AM - 09:00 AM</td>
<td>Maui Suite #2</td>
</tr>
<tr>
<td>P2 - Weed Science Editorial Board</td>
<td>08:00 AM - 09:00 AM</td>
<td>Maui Suite #3</td>
</tr>
<tr>
<td>Event</td>
<td>Time</td>
<td>Room</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>E10 - Weed Control for Specialty Crops</td>
<td>08:00 AM - 09:00 AM</td>
<td>Maui Suite #4</td>
</tr>
<tr>
<td>E2 - Science Policy</td>
<td>08:00 AM - 10:00 AM</td>
<td>Maui Suite #1</td>
</tr>
<tr>
<td>International Weed Genome Committee</td>
<td>08:00 AM - 10:00 AM</td>
<td>Monarchy #2</td>
</tr>
<tr>
<td>E6 - Research and Competitive Grants</td>
<td>08:00 AM - 10:00 AM</td>
<td>Monarchy #3</td>
</tr>
<tr>
<td>P3 - Weed Technology Editorial Board</td>
<td>09:00 AM - 10:00 AM</td>
<td>Maui Suite #3</td>
</tr>
<tr>
<td>W15 - Formulation, Adjuvant &amp; Application Technology</td>
<td>09:00 AM - 10:00 AM</td>
<td>Maui Suite #2</td>
</tr>
<tr>
<td>W10 - Constitution and Operating Procedures</td>
<td>09:00 AM - 11:00 AM</td>
<td>Maui Suite #4</td>
</tr>
<tr>
<td>Whale Watching Tour</td>
<td>09:00 AM - 12:00 PM</td>
<td>Lobby</td>
</tr>
<tr>
<td>E12b - Herbicide Resistance Education</td>
<td>10:00 AM - 12:00 PM</td>
<td>Maui Suite #1</td>
</tr>
<tr>
<td>F4 - Professional Development and Membership</td>
<td>10:00 AM - 11:00 AM</td>
<td>Maui Suite #2</td>
</tr>
<tr>
<td>P4 - Invasive Plant Science and Management Editorial Board</td>
<td>10:00 AM - 11:00 AM</td>
<td>Maui Suite #3</td>
</tr>
<tr>
<td>International Weed Genome Committee</td>
<td>10:00 AM - 11:00 AM</td>
<td>Monarchy #2</td>
</tr>
<tr>
<td>WWSW Rita Beard</td>
<td>10:00 AM - 11:00 AM</td>
<td>Monarchy #3</td>
</tr>
<tr>
<td>W11 - Extension</td>
<td>11:00 AM - 12:00 PM</td>
<td>Maui Suite #2</td>
</tr>
<tr>
<td>P1 - Publications Board</td>
<td>11:00 AM - 12:00 PM</td>
<td>Maui Suite #3</td>
</tr>
<tr>
<td>Kochia Work Group</td>
<td>11:00AM – 12:00PM</td>
<td>Monarchy #2</td>
</tr>
<tr>
<td>E11 - Weed Loss</td>
<td>11:00 AM - 01:00 PM</td>
<td>Monarchy #6</td>
</tr>
</tbody>
</table>
E12a - Herbicide Resistant Plants
12:00 PM - 02:00 PM  Monarchy #7

IWSS Board Meeting
1:00PM – 4:00PM  Monarchy #6

WERA77
02:00PM- 04:00PM  Monarchy #7

Registration
01:00 PM - 04:00 PM  Monarchy Terrace Foyer

Poster Setup
01:00 PM - 04:00 PM  Maui Suite #1-4

General Session
04:00 PM - 06:00 PM  Monarchy #1-4

Welcome Reception
06:00 PM - 08:00 PM  Halona Kai

---

**TUESDAY MARCH 3**

Student Contest Judge Breakfast
06:00 AM - 07:00 AM  Lahaina #3/4

E13 - Public Awareness
07:00 AM - 09:00 AM  Japengo

Registration
07:00 AM - 05:00 PM  Monarchy Terrace Foyer

Judges Work Room
07:00 AM - 05:00 PM  Regency Boardroom

E8 - Environmental Aspects of Weed Management
12:00 PM - 01:00 PM  Japengo

Women in Weed Science Event
12:00 PM - 02:00 PM  Lahaina #3/4

IWSS General Session
05:00 PM - 06:00 PM  Lahaina #3

E4 - Federal Noxious and Invasive Weeds
05:00 PM - 06:00 PM  Lahaina #4

What’s New in Industry
05:00 PM - 06:00 PM  Monarchy #4

BASF Sponsored Luau
06:00 PM - 08:00 PM  Halona Kai

---
### WEDNESDAY MARCH 4

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presidents Breakfast</td>
<td>06:30 AM - 08:00 AM</td>
<td>Japengo</td>
</tr>
<tr>
<td>E14 - Website</td>
<td>07:00 AM - 09:00 AM</td>
<td>Lahaina #3</td>
</tr>
<tr>
<td>F2 - Finance</td>
<td>07:00 AM - 09:00 AM</td>
<td>Lahaina #4</td>
</tr>
<tr>
<td>Judges Work Room</td>
<td>07:00 AM - 04:00 PM</td>
<td>Regency Boardroom</td>
</tr>
<tr>
<td>Registration</td>
<td>08:00 AM - 05:00 PM</td>
<td>Monarchy Terrace Foyer</td>
</tr>
<tr>
<td>WSSA Student Business Meeting</td>
<td>11:00 AM - 12:00 PM</td>
<td>Lahaina #3/4</td>
</tr>
<tr>
<td>WSSA/ WSWS Joint Student Luncheon</td>
<td>12:00 PM - 01:00 PM</td>
<td>Lahaina #3/4</td>
</tr>
<tr>
<td>WSWS Student Business Meeting</td>
<td>01:00 PM - 02:00 PM</td>
<td>Lahaina #3/4</td>
</tr>
<tr>
<td>P22 - Terminology Parent</td>
<td>12:00 PM - 01:00 PM</td>
<td>Maui Suite #5</td>
</tr>
<tr>
<td>DSC – Group</td>
<td>12:00PM – 01:00PM</td>
<td>Japengo</td>
</tr>
<tr>
<td>Seed Corn Tour</td>
<td>02:00 PM - 04:30 PM</td>
<td>Lobby</td>
</tr>
<tr>
<td>Student Awards</td>
<td>05:00 PM - 06:30 PM</td>
<td>Monarchy #4</td>
</tr>
<tr>
<td>Student Night Out</td>
<td>07:00 PM - 09:00 PM</td>
<td>Monarchy #4</td>
</tr>
</tbody>
</table>

### THURSDAY MARCH 5

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSWS Business Breakfast</td>
<td>06:30 AM - 08:00 AM</td>
<td>Lahaina #3/4</td>
</tr>
<tr>
<td>WSSA Business Breakfast</td>
<td>06:30 AM - 08:00 AM</td>
<td>Sunset Terrace</td>
</tr>
<tr>
<td>Remove Posters</td>
<td>01:00 PM - 03:00 PM</td>
<td>Maui Suite #1-4</td>
</tr>
<tr>
<td>WSWS Board of Directors Meeting</td>
<td>01:00 PM - 02:30 PM</td>
<td>Lahaina #3</td>
</tr>
<tr>
<td>WSSA Board of Directors Meeting</td>
<td>03:00 PM - 05:00 PM</td>
<td>Lahaina #4</td>
</tr>
</tbody>
</table>
SUMMARY OF 2020 PROGRAM

TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4

Authors of even numbered posters will present on March 3 and odd numbered posters will present on March 4

POSTER - 01. Agronomic Crops
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 02. Horticultural Crops
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 03. Turf and Ornamentals
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 07. Teaching and Extension/ Teaching and Technology Transfer
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 08. Formulation, Adjuvant, & Application Technology
07:00 AM - 09:00 PM
Maui Suite #1-4

POSTER - 09. Weed Biology and Ecology
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 10. Biocontrol of Weeds
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 11. Physiology
07:00 AM - 09:00 AM
Maui Suite #1-4

POSTER - 12. Soil and Environmental Aspects
07:00 AM - 09:00 AM
Maui Suite #1-4
POSTER - 13. Integrated Weed Management

TUESDAY MARCH 3

07:00 AM - 09:00 AM Maui Suite #1-4

3MT Student Oral Competition - MS
09:00 AM - 11:00 PM Monarchy #2

3MT Student Oral Competition - PhD
09:00 AM - 11:30 PM Monarchy #3

SYMPOSIUM - 4. The Ecological and Biodiversity Impact of Invasive Grass Species and Their Management
09:00 AM - 12:00 PM Monarchy #4

ORAL - 01. Agronomic Crops I
09:00 AM - 12:00 PM Monarchy #5

ORAL - 02. Horticultural Crops
09:00 AM - 12:00 PM Monarchy #1

ORAL - 09. Weed Biology and Ecology
09:00 AM - 12:00 PM Monarchy #7

ORAL - 11. Physiology
09:00 AM - 12:00 PM Monarchy #6

SYMPOSIUM - 3. Genomics of Weedy and Invasive Species - 2025 and Beyond
01:00 PM - 05:00 PM Monarchy #4

ORAL - 01. Agronomic Crops I
01:00 PM - 05:00 PM Monarchy #5

ORAL - 01. Agronomic Crops II
01:00 PM - 05:00 PM Monarchy #6

ORAL - 02. Horticultural Crops
01:00 PM - 04:30 PM Monarchy #1

ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants
01:00 PM - 05:00 PM Monarchy #2
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:00 PM - 05:00 PM</td>
<td>ORAL - 07. Teaching and Extension/Teaching and Technology Transfer</td>
<td>Monarchy #3</td>
</tr>
<tr>
<td>01:00 PM - 04:45 PM</td>
<td>ORAL - 09. Weed Biology and Ecology</td>
<td>Monarchy #7</td>
</tr>
</tbody>
</table>

**WEDNESDAY MARCH 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 AM - 12:00 PM</td>
<td>SYMPOSIUM - 1. 2020 Vision for Hawaiian Invasive Plant Management</td>
<td>Monarchy #2</td>
</tr>
<tr>
<td>09:00 AM - 11:00 AM</td>
<td>3MT Final Round</td>
<td>Monarchy #3</td>
</tr>
<tr>
<td>09:00 AM - 04:30 PM</td>
<td>SYMPOSIUM - 2. The Role of Intelligent Machines in Weed Management</td>
<td>Monarchy #4</td>
</tr>
<tr>
<td>09:00 AM - 12:00 PM</td>
<td>ORAL - 01. Agronomic Crops I</td>
<td>Monarchy #5</td>
</tr>
<tr>
<td>09:00 AM - 12:00 PM</td>
<td>ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants</td>
<td>Monarchy #1</td>
</tr>
<tr>
<td>09:00 AM - 12:00 PM</td>
<td>ORAL - 11. Physiology</td>
<td>Monarchy #6</td>
</tr>
<tr>
<td>09:00 AM - 12:00 PM</td>
<td>ORAL - 13. Integrated Weed Management</td>
<td>Monarchy #7</td>
</tr>
<tr>
<td>01:00 PM - 04:30 PM</td>
<td>ORAL - 01. Agronomic Crops I</td>
<td>Monarchy #5</td>
</tr>
<tr>
<td>01:00 PM - 04:30 PM</td>
<td>ORAL - 01. Agronomic Crops II</td>
<td>Monarchy #6</td>
</tr>
<tr>
<td>01:00 PM - 04:30 PM</td>
<td>ORAL - 03. Turf and Ornamentals</td>
<td>Monarchy #3</td>
</tr>
<tr>
<td>Time</td>
<td>Event</td>
<td>Location</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>08:30 AM</strong></td>
<td><strong>SYMPOSIUM - 5.</strong> Toxicology and Weed Science</td>
<td>Monarchy #4</td>
</tr>
<tr>
<td><strong>08:30 AM</strong></td>
<td><strong>ORAL - 01.</strong> Agronomic Crops I</td>
<td>Monarchy #5</td>
</tr>
<tr>
<td><strong>08:30 AM</strong></td>
<td><strong>ORAL - 04.</strong> Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants</td>
<td>Monarchy #1</td>
</tr>
<tr>
<td><strong>08:30 AM</strong></td>
<td><strong>ORAL - 08.</strong> Formulation, Adjuvant, &amp; Application Technology</td>
<td>Monarchy #2</td>
</tr>
<tr>
<td><strong>08:30 AM</strong></td>
<td><strong>ORAL - 09.</strong> Weed Biology and Ecology</td>
<td>Monarchy #7</td>
</tr>
<tr>
<td><strong>01:00 PM</strong></td>
<td><strong>WORKSHOP - Building a Community to Battle the Wicked Problem of Herbicide Resistance</strong></td>
<td>Monarchy #4</td>
</tr>
</tbody>
</table>
PROGRAM

MONDAY AFTERNOON  MARCH 2

General Session

LOCATION: Monarchy #1-4
TIME: 04:00 PM - 06:00 PM
MODERATOR: William S. Curran
Penn State University
University Park, PA
CO-MODERATOR: Corey V. Ransom
Utah State University
Logan, UT

*SPEAKER

04:00 PM  Introductions and Announcements. William S. Curran* and Corey V. Ransom; Penn State University, University Park, PA and Utah State University, Logan, UT

04:10 PM  IWSS Organization and Meeting Update. Nilda Roma-Burgos*; University of Arkansas, Fayetteville, AR


04:45 PM  Presidential Address. Larry Steckel*1 and Pat Clay*2; 1University of Tennessee, Jackson, TN, 2VALENT U.S.A. LLC, Fresno, CA

05:05 PM  Presentation of Awards. William S. Curran*1 and Pat Clay*2; 1Penn State University, University Park, PA, 2VALENT U.S.A. LLC, Fresno, CA

06:00 PM  Adjourn for Welcome Reception
Authors of even numbered posters will present on March 3 and odd numbered posters will present on March 4

**Agronomic Crops**

**LOCATION:** Maui Suite #1-4  
**TIME:** 07:00 AM - 09:00 AM  
**MODERATOR:** Thomas C. Mueller  
University of Tennessee  
Knoxville, TN

**PRESENTER † STUDENT CONTEST - MS**

†**Wheat Variety Tolerance to Metribuzin and Pyroxasulfone.** Lane S. Newlin*, Misha R. Manuchehri, Brett F. Carver, Amanda De Oliveira Silva, Hannah C. Lindell, Justin T. Childers; Oklahoma State University, Stillwater, OK (1)

†**Overlapping Residual Herbicides for Control of Glyphosate-Resistant Palmer Amaranth in Dicamba/Glyphosate-Resistant Soybean.** Shawn T. McDonald*¹, Prashant Jha², Amit J. Jhala¹; ¹University of Nebraska-Lincoln, Lincoln, NE, ²Iowa State University, Ames, IA (2)

†**Interference of Amaranthus palmeri in Sugar Beet.** Whitney R. Schultz*, Nevin Lawrence; University of Nebraska-Lincoln, Scottsbluff, NE (3)

†**Soybean Response to Aminopyralid, Dicamba, 2,4-D and Aminocyclopyrachlor Application.** Trey I. Clark*¹, Thomas C. Mueller¹, Larry Steckel²; ¹University of Tennessee, Knoxville, TN, ²University of Tennessee, Jackson, TN (4)

†**Meshing Soybean Weed Management with Agronomic Practices in Oklahoma.** Misha R. Manuchehri, Sarah E. Kezar*; Oklahoma State University, Stillwater, OK (5)

†**Interactions of Dicamba, Glyphosate, and Glufosinate as Tank-Mix Partners.** Adam L. Constine*, Christy Sprague; Michigan State University, East Lansing, MI (6)
†Boll Opening Efficacy as Influenced by Cotton Maturity. Cayden B. Catlin*, Bradley R. Wilson, Seth A. Byrd; Oklahoma State University, Stillwater, OK (7)

†Planting Green into Cereal Cover Crops Improves Horseweed (Erigeron canadensis) Suppression. John A. Schramski*, Christy Sprague, Karen A. Renner; Michigan State University, East Lansing, MI (8)

†Cover Crop Vs. Cash Crop: A Comparison of Two Renovation Approaches in Deteriorated Wyoming Hayfields. Tyler Z. Jones*, Brian Mealor; University of Wyoming, Laramie, WY (9)

†Control of Velvetleaf by Tank-mixing Dicamba with Fluthiacet or Glyphosate in Dicamba/Glyphosate-resistant Soybean. Jose H. de Sanctis*1, Stevan Knezevic2, Amit J. Jhala1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE (10)

†Greenhouse Herbicide Screening for Industrial Hemp. Joseph Mettler*, Kirk A. Howatt; North Dakota State University, Fargo, ND (11)

†Timing of Post-Emergence Herbicide Application Impacts Weed Control and Seed Fecundity in Wisconsin Soybean Production. Sarah V. Striegel*, Maxwel Coura Oliveira, Ryan P. DeWerff, Nicholas J. Arneson, David E. Stoltenberg, Shawn P. Conley, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (12)

Impact of Tank Mix Partner on Solution pH and Secondary Movement of Dicamba and 2,4-D. Sarah V. Striegel*, Nikola Arsenijevic, Maxwel Coura Oliveira, Ryan P. DeWerff, David E. Stoltenberg, Shawn P. Conley, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (13)

*PRESENTER † STUDENT CONTEST - PhD

†The Potential for New Residual Herbicides in Rice. Connor Webster*, Eric Webster, Benjamin M. McKnight, David C. Walker, Bradley Greer, Samer Y. Rustom; Louisiana State University, Baton Rouge, LA (14)

†Effects of Deep Seeding on Weed Management and Crop Response in California Rice Systems. Alexander R. Ceseski*, Amar Godar, Kassim Al-Khatib; University of California, Davis, CA (15)
†Evaluating Reduced Rate POST Herbicide Mixtures for Palmer Amaranth (*Amaranthus palmeri*) Control in Dry Bean. Clint W. Beiermann*, Cody F. Creech1, Amit J. Jhala2, Stevan Knezevic3, Robert Harveson1, Nevin Lawrence1; 1University of Nebraska-Lincoln, Scottsbluff, NE, 2University of Nebraska-Lincoln, Lincoln, NE, 3University of Nebraska-Lincoln, Concord, NE (16)

†Effect of Sublethal 2,4-D Rates on Quality and Value of Cotton Fiber. Bradley R. Wilson*, Misha R. Manuchehri1, Peter A. Dotray2, Wayne Keeling3, Gaylon Morgan4, Seth A. Byrd1; 1Oklahoma State University, Stillwater, OK, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3Texas A&M AgriLife Research, Lubbock, TX, 4Cotton Incorporated, Cary, NC (17)

†Options for Managing Weedy Rice in Louisiana. Bradley Greer*, Eric Webster1, Benjamin M. McKnight1, David C. Walker1, Samer Y. Rustom1, Connor Webster1, Justin B. Hensley2; 1Louisiana State University, Baton Rouge, LA, 2Arkansas Ag Specialists, LLC, Dumas, AR (18)

†Carry Over Effects of Residual Cotton Herbicides on Fall-Planted Cover Crops. Enelise Osco Helvig*, Spencer L. Samuelson2, Cleber D. de Goes Maciel1, Muthukumar V. Bagavathiannan2; 1Universidade Estadual do Centro Oeste, Guarapuava, Brazil, 2Texas A&M University, College Station, TX (19)

†Evaluation of New Rice Herbicides Applied in a Salvage Situation. Samer Y. Rustom*, Eric Webster, Benjamin M. McKnight, Connor Webster, Bradley Greer, David C. Walker; Louisiana State University, Baton Rouge, LA (20)

†Characterization of Dicamba Cross Resistance in a Multiple-Resistant Waterhemp (*Amaranthus tuberculatus*) Population from Illinois. Lucas Bobadilla*, Darci A. Giacomini, Patrick Tranel; University of Illinois, Urbana, IL (21)

†Effects of Simulated Dew on Dicamba Volatility and Soybean Sensitivity. Matthew Osterholt*, Julie M. Young2, Bryan G. Young2; 1Purdue University, West Lafayette, IN, 2Purdue University, Brookston, IN (22)

†Assessment of North Carolina Farmer's Glufosinate Use and Applications. Eric A. Jones*, Wesley Everman, Ramon G. Leon, Charlie W. Cahoon; North Carolina State University, Raleigh, NC (23)
†Using Reduced Rates of Quizalofop to Control Weedy Rice.
David C. Walker*, Eric Webster, Ronald J. Levy Jr., Benjami
n M. McKnight, Samer Y. Rustom, Lucas C. Webster, William B. Greer; 1Louisiana State University, Baton Rouge, LA, 2Louisiana State University, Rayne, LA (24)

†Cover Crops as a Summer Annual Weed Management Tool in Dryland Corn Cropping Systems of Semi-Arid Nebraska.
Alexandre T. Rosa*, Cody F. Creech, Roger Elmore, Daran Rudnick, John Lindquist, Rodrigo Werle; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Scottsbluff, NE, 3University of Wisconsin-Madison, Madison, WI (25)

Cover Crops and Wheat Stubble Management Effects on Weed Demographics and Corn Productivity in Semi-Arid Nebraska. Alexandre T. Rosa*, Cody F. Creech, Roger Elmore, Daran Rudnick, John Lindquist, Chuck Burr, Strahinja Stepanovic, Rodrigo Werle; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Scottsbluff, NE, 3University of Nebraska-Lincoln, North Platte, NE, 4University of Nebraska-Lincoln, Grant, NE, 5University of Wisconsin-Madison, Madison, WI (26)

Benzobicyclon Utility for Weedy Rice Control. Mason C. Castner*, Jason K. Norsworthy, Chad Brabham, Fidel Gonzalez Torralva; University of Arkansas, Fayetteville, AR (27)

Control of Johnsongrass (Sorghum halepense) and Foxtails with Post-emergence Herbicides in Yellow and White Popcorn Hybrids. Samantha D. Isaacson*, Amit J. Jhala, John Lindquist; University of Nebraska-Lincoln, Lincoln, NE (28)

Weed Management and Crop Response Utilizing Isoxaflutole in HPPD Tolerant Cotton. Delaney C. Foster*, Peter A. Dotray, Corey Thompson, Greg Baldwin, Frederick Moore; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3BASF, Abernathy, TX, 4BASF, Research Triangle Park, NC, 5BASF, Lubbock, TX (29)

Effect of Winter Wheat Cover Crop Termination Time on Dry Bean Production. Charles T. Hicks*, Andrew R. Kniss, David A. Claypool; 1Bayer, Fort Collins, CO, 2University of Wyoming, Laramie, WY (30)

Sphere of Influence of Palmer Amaranth (Amaranthus palmeri) in Cotton (Gossypium hirsutum). Nicholas T. Basinger*, David Weisberger, Logan M. Dyer, Ramon G. Leon; 1University of Georgia, Athens, GA, 2North Carolina State University, Raleigh, NC (31)
Using Pesticides Wisely - Georgia 2019. A Stanley Culpepper*, Jenna C. Vance¹, Thomas Gray², Laura P. Johnson³, Eric P. Prostko⁴; ¹University of Georgia, Tifton, GA, ²Georgia Department of Agriculture, Atlanta, GA, ³University of Georgia, Athens, GA (32)


Control of Canada Fleabane in Winter Wheat with Postemergence Herbicides. Nader Soltani*, Peter H. Sikkema; University of Guelph, Ridgetown, ON, Canada (34)

Glyphosate in Organic Grain: Exploring Potential Sources of Contamination Through Seed Analysis. Lilianna M. Bento*¹, Barbara Keith¹, Bruce Maxwell¹, Jona Verreth², William Dyer¹; ¹Montana State University, Bozeman, MT, ²Montana Agriculture Experiment Station Analytical Laboratory, Bozeman, MT (35)

Effective Dicamba Exposure on Enlist Soybean. Julie Reeves*, Sandy Steckel, Clay M. Perkins, Larry Steckel; University of Tennessee, Jackson, TN (36)

Effect of Herbicides Applied at First Visible Female Inflorescence on Palmer Amaranth (Amaranthus palmeri) Fecundity and Seed Viability. Eric B. Scruggs*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (37)

Soybean Response to Multiple Dicamba Exposure. Todd A. Baughman*¹, Robbie Peterson¹, Misha R. Manuchehri²; ¹Oklahoma State University, Ardmore, OK, ²Oklahoma State University, Stillwater, OK (38)

Volunteer Cotton Response to POST Herbicide Applications. Robbie Peterson*, Todd A. Baughman; Oklahoma State University, Ardmore, OK (39)

Expanding the Vision of Perennial Agriculture with IR-4 Registration in Kernza. Clair L. Keene*¹, Eugene P. Law², Jacob Jungers³, Don Wyse³, Valentin Picasso⁴, David E. Stoltenberg⁴; ¹North Dakota State University Extension, Williston, ND, ²Cornell University, Ithaca, NY, ³University of Minnesota, Saint Paul, MN, ⁴University of Wisconsin-Madison, Madison, WI (40)

Evaluation of PRE and POST Applications of Metribuzin on Weed Control Programs in Corn (Zea mays). Taghi Bararpour*, Ralph R. Hale, M. W. Ebelhar; Mississippi State University, Stoneville, MS (41)
Burndown Residual Herbicide Plus Halaxifen-methyl (Elevore) for Early Preplant Horseweed (Conyza canadensis) Control. Taghi Bararpour*1, Ralph R. Hale1, Larry C. Walton2, Henry M. Edwards1; 1Mississippi State University, Stoneville, MS, 2Corteva, Tupelo, MS (42)

Does Late Season Weed Cover Reduce Corn Silage Yield and Alfalfa Establishment in Interseeded Corn/alfalfa Systems? Jose Luiz Carvalho de Souza Dias*, Mark J. Renz; University of Wisconsin-Madison, Madison, WI (43)

Field Bindweed (Convolvulus arvensis) Management in California Cotton. Kurt J. Hembree*; University of California Cooperative Extension, Fresno, CA (44)


Roughstalk Bluegrass (Poa trivialis) Control in Winter Wheat. Gary Edward Powell*, Brian J. Stiles II, Christy Sprague; Michigan State University, East Lansing, MI (46)

Comparison of Herbicide Programs in Conventional, Glufosinate, and Glyphosate/Dicamba-Resistant Soybeans Across Nebraska. Adam Striegel*1, Stevan Knezevic2, Nevin Lawrence3, Gary Hein4, Greg R. Kruger4, Chris Proctor4, Kent Eskridge1, Amit J. Jhala1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE, 3University of Nebraska-Lincoln, Scottsbluff, NE, 4University of Nebraska-Lincoln, North Platte, NE (47)

Herbicide Resistant Italian Ryegrass (Lolium perenne Ssp. multiflorum) Survey in Northern Idaho and Eastern Washington. Traci Rauch*, Joan M. Campbell; University of Idaho, Moscow, ID (48)

Glyphosate-Tolerant Soybean Yield Loss and Yield Response to Micro-Rates of 2,4-D as Influenced by Growth Stage. Ivan B. Cuvaca*1, Stevan Knezevic2, Jon Scott1, Darko Jovanovic1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE (49)

Effect of Growth Stage on Glyphosate-Tolerant Soybean Sensitivity to Micro-rates of 2,4-D. Ivan B. Cuvaca*1, Jon Scott1, Darko Jovanovic1, Stevan Knezevic2; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE (50)

Effects of Dicamba Ultra Micro-Rates on Soybean Yield - Hormesis or Not? Stevan Knezevic*; University of Nebraska-Lincoln, Concord, NE (51)
Growth and Sensitivity of Dicamba-Tolerant Soybean to Micro-Rates of 2,4-D. Stevan Knezevic¹, Jon Scott², Darko Jovanovic³, Ivan B. Cuvaca²; ¹University of Nebraska-Lincoln, Concord, NE, ²University of Nebraska-Lincoln, Lincoln, NE (52)

Weed Management Systems in Imidazolinone Tolerant Grain Sorghum in South Texas. Alvaro García⁰¹, Joshua A. McGinty², Jamie Foster³, Greta Schuster¹, Alina Umphres¹, Paul A. Baumann⁴; ¹Texas A&M University, Kingsville, TX, ²Texas A&M AgriLife Extension, Corpus Christi, TX, ³Texas A&M AgriLife Research, Corpus Christi, TX, ⁴Texas A&M AgriLife Extension, College Station, TX (53)

Herbicidal Activity of a New Pyridine Derivative M-862 on Broadleaf Weeds and Wheat. Nam-Gyu Cho⁰¹, Dae-Won Koo¹, Ki-Hwan Hwang¹, Suk-Jin Koo²; ¹Moghu Research Center, Ltd., Yuseong, Daejeon, South Korea, ²Moghu Research Center, Ltd., Daejeon, South Korea (54)

Rapid Spread of Glyphosate-resistant Kochia [Bassia scoparia (L.) A.J.Scott] in Manitoba. Charles M. Geddes⁰¹, Teandra Ostendorf¹, Robert Gulden², Tammy Jones³, Julia Leeson⁴, Scott Shirriff⁵, Shaun Sharpe⁶, Hugh J. Beckie⁷; ¹Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²University of Manitoba, Winnipeg, Canada, ³Manitoba Agriculture, Carman, MB, Canada, ⁴Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, ⁵University of Western Australia, Crawley, Australia (55)

Characterization of Dicamba- and Fluroxypyr-resistant Kochia [Bassia scoparia (L.) A.J.Scott] in Alberta. Charles M. Geddes⁰¹, Mallory Owen¹, Elise Martin², Linda Hall², Scott Shirriff³, Julia Leeson³, Hugh J. Beckie⁴; ¹Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²University of Alberta, Edmonton, AB, Canada, ³Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, ⁴University of Western Australia, Crawley, Australia (56)

A Survey of Florida Panhandle Row Crop Producers on Weeds Problem and Management Practices. Pratap Devkota⁰¹, Ethan T. Carter³, Rhoda T. Broughton³; ¹University of Florida, Jay, FL, ²University of Florida, Marianna, FL, ³University of Florida, Live Oak, FL (57)

Guayule (Parthenium argentatum) Seedling Response to Carfentrazone-ethyl. Bryan C. Pastor⁰¹, Guangyao Sam Wang², William B. McCloskey³; ¹University of Arizona, Tucson, AZ, ²Bridgestone Americas, Inc, Eloy, AZ (58)
Response of Common Louisiana Aquatic Weeds to Rice Herbicides. Benjamin M. McKnight*, Eric Webster, Samer Y. Rustom, Connor Webster, Bradley Greer, David C. Walker; Louisiana State University, Baton Rouge, LA (59)

Inzen™ Sorghum Weed Control Programs with Zest™ WDG Herbicide. David Saunders*¹, Joe Armstrong², Michael Lovelace³, Jeffrey Krumm⁴; ¹Corteva Agriscience, Dallas Center, IA, ²Corteva Agriscience, Indianapolis, IN, ³Corteva Agriscience, Lubbock, TX, ⁴Corteva Agriscience, Hastings, NE (60)

Resicore® for PRE and POST Weed Control in Corn. David Saunders*¹, Joe Armstrong², Kevin Johnson³; ¹Corteva Agriscience, Dallas Center, IA, ²Corteva Agriscience, Indianapolis, IN, ³Corteva Agriscience, Lafayette, IN (61)

Desert Cotton Responses to Low Doses of 2,4-D orDicamba. William B. McCloskey*¹, Randy Norton², Bryan C. Pastor¹; ¹University of Arizona, Tucson, AZ, ²University of Arizona, Safford, AZ (62)

Field-scale Assessment of Dicamba Off-target Movement from Soybeans in Missouri. Reid Smeda*; University of Missouri, Columbia, MO (63)

Impact of Cereal Rye Cover Crop Termination Timing on the Fate of Soil-applied Residual Herbicides in Wisconsin Corn-soybean Production Systems. Nicholas J. Arneson*, Kolby R. Grint, Nikola Arsenijevic, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (64)

Comparison of Layered Herbicide Residual Programs for Waterhemp Control in Wisconsin Soybean Production. Nicholas J. Arneson*, Ryan P. DeWerff, Daniel H. Smith, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (65)

Potential for Gibberellic Acid as a Weed Seedbank Management Tool in Eastern Washington Dryland Systems. Rachel J. Zuger*, Amber L. Hauvermale, Ian Burke; Washington State University, Pullman, WA (66)

Impact of Cover Crop Mixtures and Climate Conditions on Weed Communities. Mary E. DuPre¹, Maryse Bourgault², Darin Boss², Chris Larson¹, Fabian D. Menalled¹, Tim Seipel*¹; ¹Montana State University, Bozeman, MT, ²Montana State University -Northern Ag Research Center, Havre, MT (67)
Potential Yield Loss from Uncontrolled Weeds in Rice in North America. Sandeep S. Rana*, Wesley Everman, Anita Dille, Peter H. Sikkema, Michael L. Flessner, Ian Burke, Mark VanGessel; \( Oryza sativa \) f. spontaneae. 1Bayer Crop Science, Galena, MD, 2North Carolina State University, Raleigh, NC, 3Kansas State University, Manhattan, KS, 4University of Guelph, Ridgetown, ON, Canada, 5Virginia Tech, Blacksburg, VA, 6Washington State University, Pullman, WA, 7University of Delaware, Georgetown, DE (68)

Potential Yield Loss from Uncontrolled Weeds in Cotton in North America. Sandeep S. Rana*, Wesley Everman, Anita Dille, Peter H. Sikkema, Michael L. Flessner, Ian Burke, Mark VanGessel; \( Oryza sativa \) f. spontaneae. 1Bayer Crop Science, Galena, MD, 2North Carolina State University, Raleigh, NC, 3Kansas State University, Manhattan, KS, 4University of Guelph, Ridgetown, ON, Canada, 5Virginia Tech, Blacksburg, VA, 6Washington State University, Pullman, WA, 7University of Delaware, Georgetown, DE (69)

Evaluation of Weed Control Programs in Furrow Irrigated Rice. Leah M. Collie*, Tom Barber, Thomas R. Butts, Ryan C. Doherty, Zachary T. Hill, Aaron Ross; \( Oryza sativa \) f. spontaneae. 1University of Arkansas System Division of Agriculture, Beebe, AR, 2University of Arkansas System Division of Agriculture, Lonoke, AR, 3University of Arkansas Division of Agriculture Research & Extension, Monticello, AR, 4University of Arkansas Cooperative Extension Service, Monticello, AR, 5University of Arkansas, Lonoke, AR (70)

Cotton and Soybean Response to Selected Drift Rates of Imazapyr and Metsulfuron. Michael W. Marshall*; Clemson University Edisto Research & Education Center, Blackville, SC (71)

Large-Scale Evaluation of 2,4-D Off-Target Movement in Wisconsin Soybeans. Rodrigo Werle*, Nicholas J. Arneson, Maxwel Coura Oliveira, Ryan P. DeWerff; University of Wisconsin-Madison, Madison, WI (72)

Aerial Imagery as a Potential Tool to Evaluate Dicamba Off-Target Movement in Soybeans. Rodrigo Werle*, Randy Pearson, Josh Pristolas, Maxwel Coura Oliveira, Ryan Rector; \( Oryza sativa \) f. spontaneae. 1University of Wisconsin-Madison, Madison, WI, 2Southern Illinois University Edwardsville, Edwardsville, IL, 3Bayer Crop Science, St Louis, MO (73)

Weedy Rice \( Oryza sativa \) f. spontaneae Emergence and Growth Under Variable Irrigation Practices. Whitney Brim-DeForest*, Luis Espino; \( Oryza sativa \) f. spontaneae. 1University of California Division of Agriculture and Natural Resources, Yuba City, CA, 2University of California Division of Agriculture and Natural Resources, Oroville, CA (74)
Evaluation of Benzobicyclon and ALS-inhibiting Herbicide Combinations for Control of Northern Jointvetch (Aeschynomene virginica) and Hemp Sesbania (Sesbania herbacea) in Drill Seeded Rice (Oryza sativa). Nathan Pearrow*, Craigs Sandoski, Brad M. Davis, Thomas R. Butts; University of Arkansas, Newport, AR, Gowan, Collierville, TN, University of Arkansas System Division of Agriculture, Lonoke, AR (75)

A Multi-State Screen of Field Populations of Horseweed (Conyza canadensis) to Applications of Dicamba and Glufosinate. Nicholas R. Steppig*, Julie M. Young, Kevin W. Bradley, Jason K. Norsworthy, Karla L. Gage, Aaron Hager, Greg R. Kruger, Mark Loux, Larry Steckel, Bryan G. Young; Purdue University, Lafayette, IN, Purdue University, Brookston, IN, University of Missouri, Columbia, MO, University of Arkansas, Fayetteville, AR, Southern Illinois University Carbondale, Carbondale, IL, University of Illinois, Urbana, IL, University of Nebraska-Lincoln, North Platte, NE, Ohio State University, Columbus, OH, University of Tennessee, Jackson, TN (76)

How to Avoid Glyphosate Injury in Glyphosate-Resistant Alfalfa. Earl Creech*, Chet Loveland, Matt Yost, Corey V. Ransom, Dan Putnam; Utah State University, Logan, UT, University of California, Davis, Davis, CA (77)

Control of Palmer Amaranth (Amaranthus palmeri) with Glufosinate and S-metolachlor in Cotton Production Systems. William J. Rutland*, Darrin M. Dodds, Jacob P. McNeal, John J. Williams, Bradley J. Norris, Steven D. Hall; Mississippi State University, Starkville, MS, Mississippi State University, Mississippi State, MS (78)

The Effect of Multiple Exposure of Auxin Herbicide on Soybeans. Beau J. Varner*, Kevin W. Bradley, Aaron Hager, Karla L. Gage, Daniel B. Reynolds, Jason K. Norsworthy, Larry Steckel, Bryan G. Young; Mississippi State University, Mississippi State, MS, University of Missouri, Columbia, MO, University of Illinois, Urbana, IL, Southern Illinois University Carbondale, Carbondale, IL, University of Arkansas, Fayetteville, AR, University of Tennessee, Jackson, TN, Purdue University, Brookston, IN (79)

Low Tunnel Evaluation of Dicamba Premixes. Graham Oakley*, A Stanley Culpepper, Reid Smeda, Christy Sprague, Rodrigo Werle; Mississippi State University, Mississippi State, MS, University of Georgia, Tifton, GA, University of Missouri, Columbia, MO, Michigan State University, East Lansing, MI, University of Wisconsin-Madison, Madison, WI (80)
Impact of Dicamba+Various Postemergence Herbicide Tank-Mixes on Palmer Amaranth (*Amaranthus palmeri*) Control and Cotton Injury. Bradley J. Norris*, Darrin M. Dodds¹, Jacob P. McNeal¹, John J. Williams¹, Steven D. Hall², William J. Rutland²; ¹Mississippi State University, Mississippi State, MS, ²Mississippi State University, Starkville, MS (81)

Evaluation of *Echinochloa crus-galli* Sensitivity to Florpyrauxifen-benzyl. Grant L. Priess*, Chad Brabham, Jason K. Norsworthy; University of Arkansas, Fayetteville, AR (82)

Determining Duration of Residual Control of Soil-applied Herbicides in Cotton. Justin S. Calhoun*¹, J Connor Ferguson², Kayla L. Broster², Zachary R. Treadway², Luke H. Merritt², Michael T. Wesley Jr.²; ¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS (83)

Palmer Amaranth (*Amaranthus palmeri*) and Tarnished Plant Bug (*Lygus lineolaris*) Control with Various Dicamba + Insecticide Tank-Mixes in Cotton. Angus L. Catchot*¹, Darrin M. Dodds², Jacob P. McNeal², John J. Williams², Bradley J. Norris², Steven D. Hall¹, William J. Rutland¹; ¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS (84)

Effect of Late-Season Applied Herbicide Tank-Mixtures on Control and Seed Production of Palmer Amaranth in Postharvest Wheat Stubble. Rui Liu*, Vipan Kumar, Natalie Aquilina, Taylor Lambert; Kansas State University, Hays, KS (85)

Weed Species Identification Using Multispectral Imagery. Wesley Everman*, John Sanders; North Carolina State University, Raleigh, NC (86)

Implications of Multi-Tactic Weed Management Strategies to Deplete Glyphosate-Resistant Tall Waterhemp Seed Bank in Corn-Soybean Rotations in the Midwest. Ramawtar Yadav*, Prashant Jha, Damian D. Franzenburg, James M. Lee, Iththiphonh A. Macvilay; Iowa State University, Ames, IA (87)


Benefit of Dicamba in Early Postemergence Herbicide Tank-mixtures. Brent S. Heaton*, Mark L. Bernards; Western Illinois University, Macomb, IL (89)
TUESDAY and WEDNESDAY
MORNINGS, MARCH 3 & 4

POSTER - 02. Horticultural Crops

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Seed Treatments for Safening Herbicides in Vegetables.
Matthew A. Cutulle1, Giovanni A. Caputo*2; 1Clemson
University, Charleston, SC, 2Clemson University, Clemson, SC
(90)

†Evaluation of Growing Degree Day Based Chemigation
Treatments for Management of Branched Broomrape in
California Processing Tomato Systems. Matthew J. Fatino*1,
Mohsen B. Mesgaran1, Brad Hanson2; 1University of California,
Davis, Davis, CA, 2University of California, Davis, Winters, CA
(91)

*PRESENTER † STUDENT CONTEST – PhD

†Effect of Repeated Mechanical Tuber Removal During the
Fallow Period on Nutsedge (Cyperus spp.) Management in
Bell Pepper. Ranjeet S. Randhawa*, Peter J. Dittmar;
University of Florida, Gainesville, FL (92)

Preliminary Preemergence Herbicide Tolerance Screen for
Transplanted Industrial Hemp. Michael L. Flessner*, Kevin
W. Bamber, John H. Fike; Virginia Tech, Blacksburg, VA (93)

Reduced Rates of 2,4-D and Dicamba on Sweetpotato
Propagation Beds. Thomas Batts*1, Stephen C. Smith2, Levi D.
Moore2, Kira C. Sims3, Matthew Waldschmidt2, Sushila
Chaudhari2, Katherine M. Jennings2; 1NC Cooperative
Extension, Wilson, NC, 2North Carolina State University,
Raleigh, NC, 3North Carolina State University, Goldsboro, NC
(94)
Protecting Specialty Crops from Pests – How the Western Region IR-4 Project Helps Meet Farmer Pest Control Needs. Michael J. Horak1, Stephen Flanagan2, Mika Tolson1; 1Western Region IR-4 Project, University of California, Davis, Davis, CA, 2Western Region IR-4 Project, University of California, Davis, Eugene, OR (95)

Suppression of Hazelnut (Corylus avellana) Suckers with 1-Naphthylacetic Acid. Arnaldo Marques Caldera da Silva1, David R. King2, Richard K. Zollinger3, Marcelo L. Moretti2; 1University of São Paulo, Piracicaba, Brazil, 2Oregon State University, Corvallis, OR, 3Amvac Chemical Company, Spokane, WA (96)

Evaluation of Herbicide Programs in Dormant Stevia (Stevia rebaudiana) in North Carolina. Robert M. Welker1, Roger B. Batts2; 1North Carolina State University, Raleigh, NC, 2NCSU IR-4 Field Research Center, Fremont, NC (97)

Crabgrass Control with Tembotrione, Topramezone, and Tolpyralate in Sweet Corn. Ed Peachey; Oregon State University, Corvallis, OR (98)

Yield Loss Estimates for Vegetables in the USA and Canada. Mark VanGessel1, Nicholas T. Basinger2, Ian Burke3, Anita Dille4, Wesley Everman5, Michael L. Flessner6, Zahoor A. Ganie7, Sandeep S. Rana8, Scott Senseman9, Peter H. Sikkema10, Nader Soltani11; 1University of Delaware, Georgetown, DE, 2University of Georgia, Athens, GA, 3Washington State University, Pullman, WA, 4Kansas State University, Manhattan, KS, 5North Carolina State University, Raleigh, NC, 6Virginia Tech, Blacksburg, VA, 7FMC, Newark, DE, 8Bayer Crop Science, Galena, MD, 9The University of Tennessee, Knoxville, TN, 10University of Guelph, Ridgetown, ON, Canada (99)

IR-4 Project Update and Program Changes. Daniel Kunkel1, Roger B. Batts2, Jerry Baron3, Michael J. Braverman4; 1IR-4 Project, Rutgers University, Princeton, NJ, 2NCSU IR-4 Field Research Center, Fremont, NC, 3Affiliation Not Specified, Hillsborough, NJ, 4Rutgers University, Princeton, NJ (100)

Influence of Hemp Variety and Weed Free Period on Yield in Coastal South Carolina. Harrison T. Campbell, Matthew A. Cuttle; Clemson University, Charleston, SC (101)

Can a Sunn Hemp (Crotalaria juncea) Living Mulch Reduce Herbicide Usage in Sweet Corn? Robert E. Nurse1, Jichul Bae2, Kerry Bosveld1, Marie-Josee Simard3; 1Agriculture and Agri-Food Canada, Harrow, ON, Canada, 2Agriculture and Agri-Food Canada, Agassiz, BC, Canada, 3Agriculture and Agri-Food Canada, Saint-jean-sur-richelieu, Canada (102)
Update on Herbicide Resistance Genetic Testing. Kristen A. Obeid¹, Marie-Josee Simard², Martin Laforest³, Robert E. Nurse*¹, Eric R. Page¹, David Miville⁴; ¹Agriculture and Agri-Food Canada, Harrow, ON, Canada, ²Agriculture and Agri-Food Canada, Saint-jean-sur-richelieu, Canada, ³AAC-AAFC, St-jean-sur-richelieu, QC, Canada, ⁴MAPAQ, Quebec City, QC, Canada (103)

Grape Response to Simulated Drift of Auxin Herbicides. Steven C. Haring*¹, Junjun Ou², Kassim Al-Khatib¹, Brad Hanson³; ¹University of California, Davis, Davis, CA, ²Corteva Agriscience, Indianapolis, IN, ³University of California, Davis, Winters, CA (104)

On-Farm Evaluation of POST-Directed Flumioxazin in New Mexico Chile Pepper. Brian J. Schutte*; New Mexico State University, Las Cruces, NM (105)


LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Goosegrass (Elusine indica) Resistance to Mitotic Inhibiting Herbicides in Cool-Season Turfgrass. Katherine H. Diehl*¹, Matthew T. Elmore¹, James Brosnan², Sarah Boggess², Robert N. Trigiano²; ¹Rutgers University, New Brunswick, NJ, ²University of Tennessee, Knoxville, TN (107)

†Growth Response of Southern Landscape Ornamentals to Low Rates of 2,4-D, Dicamba, and Glyphosate Particle Drift. Ryan D. Langemeier*, Steve Li, Katilyn J. Price, Frances B. Browne; Auburn University, Auburn, AL (108)
How Can Weed Steamers Fit into a Landscape Weed Management Program? Cheryl Wilen¹, Guy G. Hernandez²; ¹University of California Division of Agriculture and Natural Resources, San Diego, CA, ²University of California Division of Agriculture and Natural Resources, Lake Forest, CA (111)

Using Drone-collected Imagery to Map Invasive Pampasgrass (Cortaderia selloana) Across a Golf Course. Maggie Reiter*; University of California Cooperative Extension, Fresno, CA (112)

Efficacy of Organic Herbicides and Other Alternatives to Glyphosate in Urban Landscapes. Maggie Reiter*, Karey Windbiel-Rojas², John A. Roncoroni³; ¹University of California Cooperative Extension, Fresno, CA, ²University of California Statewide IPM Program, Davis, CA, ³University of California Division of Agriculture and Natural Resources, Napa, CA (113)

A Survey of Herbicide Resistance Issues in Nursery Crops, Christmas Trees and Landscape Plantings. Joseph C. Neal¹, Jeffrey Derr²; ¹North Carolina State University, Raleigh, NC, ²Virginia Tech, Virginia Beach, VA (114)

Weed Control in Container-grown Tree Seedlings Using Mulches and Pre-emerge Herbicides. Anthony L. Witcher*; Tennessee State University, Mcminnville, TN (115)

Herbicide Longevity in Nursery Container Substrates. James Altland*; USDA-ARS, Wooster, OH (116)

The Safety of Conifers to Select Pyridine Herbicides. Mark A. Czarnota*; University of Georgia, Williamson, GA (117)

Post-Emergence Goosegrass (Eleusine indica) Control with SpeedZone and SpeedZone + Toprimezone Mixtures. Daniel P. Tuck*, Matthew T. Elmore; Rutgers University, New Brunswick, NJ (118)
Zoysiagrass Response to Nonselective Herbicides is More Dependent on Heat Units Than Geography. Whitnee Askew*, Jordan M. Craft, Mike Goatley, Shawn Askew; Virginia Tech, Blacksburg, VA (119)

Effect of Submersion Time on Germination of Four Weed Species. Alisha Shiffer*, Anthony V. LeBude², Joe C. Neal¹, James Altland³; ¹North Carolina State University, Raleigh, NC, ²North Carolina State University, Mills River, NC, ³USDA-ARS, Wooster, OH (120)

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Addressing Challenges of African Mustard (Brassica tournefortii) Management in Utah. Natalie L. Fronk*, Corey V. Ransom¹, Benjamin Scow², Chad Reid³; ¹Utah State University, Logan, UT, ²Utah State University Extension, Hurricane, UT, ³Utah State University Extension, Cedar City, UT (121)

†Using Unmanned Aerial Systems for Estimating Biomass of Smutgrass (Sporobolus indicus) and Management Interventions. Zachary S. Howard*, Bishwa B. Sapkota¹, Chenghai Yang², Scott A. Nolte³; ¹Texas A&M University, College Station, TX, ²USDA-ARS, College Station, TX, ³Texas A&M AgriLife Extension, College Station, TX (122)

†Ventenata (Ventenata dubia) Control and Plant Community Response to Herbicide Treatments. Hailey L. Buell*, Corey V. Ransom, Steve Young; Utah State University, Logan, UT (123)

†Tolerance of Native Perennial Grasses to Esplanade on Conservation Reserve Program Land. Jared A. Beuschlein*, Rachel J. Zuger¹, Harold Quicke², Ian Burke¹; ¹Washington State University, Pullman, WA, ²Bayer, Windsor, CO (124)
†Evaluating Historical Treatments to Clarify Optimal Herbicide Treatment Sequences for Invasive Old World Climbing Fern (Lygodium microphyllum) on Tree Islands of the Florida Everglades. Jonathan Glueckert*, Stephen F. Enloe; 1University of Florida, Boynton Beach, FL, 2University of Florida, Gainesville, FL (125)

*PRESENTER  † STUDENT CONTEST - PhD


Woody Debris Piles Facilitate Increased Douglas-fir Survival at a Scotch Broom (Cytisus scoparius) Infested Site. James Dollins*, Timothy B. Harrington; USDA FOREST SERVICE - PNW RESEARCH STATION, Olympia, WA (127)

Johnsongrass Management on Roadsides: Control, Suppression, or Selectivity? Joe Omielan*; University of Kentucky, Lexington, KY (128)

Response of Seeded Species to Three Common Herbicides Used for Downy Brome (Bromus tectorum) Control. Melissa L. Landeen, Kevin Gunnell, Steve Young; 1Utah Division of Wildlife Resources, Ephraim, UT, 2Utah Division of Wildlife Resources, Fountain Green, UT, 3Utah State University, Logan, UT (129)

Pollinator Habitat Diversity and Quantity Increases with Long-Term Cheatgrass (Bromus tectorum) Control. James Sebastian*, Steve Sauer, Shannon Clark, Derek J. Sebastian; 1Boulder County Open Space, Longmont, CO, 2Colorado State University, Fort Collins, CO, 3Bayer, Greeley, CO (130)

Integrated Management of Some Forest Invasive Weeds in B.c. Forestry, Victoria, Canada. Raj Nil Prasad*; Emeritus scientist / prof, Victoria, BC, Canada (131)

Genetic Study and Chemical Control of Vaseygrass. Renata Thaysa da Silva Santos*, Esteban Fernando Rios, Pedro Luis da Costa Aguiar Alves; 1São Paulo State University, Jaboticabal, Brazil, 2University of Florida, Gainesville, FL (132)

Dose-response Curves and Herbicides Efficacy of Pos-emergence Applications in Paspalum virgatum. Renata Thaysa da Silva Santos, Aline Brufato, Pedro Luis da Costa Aguiar Alves; São Paulo State University, Jaboticabal, Brazil (133)
Management Considerations for Milkweed (Asclepias viridis) Habitat in the Southeast. David Russell*, 1 John D. Byrd, Jr., 2 Nolan H. Thorne, 3 Maria Leticia M. Zaccaro, 4 Hayden Quick; 1Auburn University, Madison, AL, 2Mississippi State University, Mississippi State, MS, 3Mississippi State University, Mississippi State University, MS, 4University of Arkansas, Fayetteville, AR (134)

Long-term Effects of Restoration Treatments in a Wyoming Big Sagebrush Community Invaded by Annual Exotic Grasses. Becky K. Kerns*, 1 Dana Ikeda, 1 Michelle A. Day; 1US Forest Service - PNW Research Station, Corvallis, OR, 2US Forest Service - Rocky Mountain Research Station, Corvallis, OR (135)

Integrating Common Control Methods for Wild Parsnip (Pastinaca sativa) Near Roads with Imazapic + Metsulfuron for Grass Height Suppression. Leo Roth*, Mark J. Renz; University of Wisconsin-Madison, Madison, WI (136)

The Effect of Common and Novel Pasture Herbicides on Forage Grass Establishment. Wykle C. Greene*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (137)

Cutleaf Vipergrass (Scorzonera laciniata) Discovery and Management in Utah. Cody J. Beckley*, 1 Jody A. Gale, 2 Corey V. Ransom, 1 Mark Nelson; 1Utah State University, Logan, UT, 2Utah State University Extension, Richfield, UT, 3Utah State University Extension, Beaver, UT (138)

TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4

POSTER - 07. Teaching and Extension/ Teaching and Technology Transfer

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Can Trunk Paint Mitigate Herbicide Damage in Young Almond Trees? Drew A. Wolter*, 1 Danielle M. Lightle, 2 Brad Hanson; 1University of California, Davis, Sacramento, CA, 2University of California Cooperative Extension, Oroville, CA, 3University of California, Davis, Winters, CA (139)
Identifying Herbicide Injury in Potato. Andrew P. Robinson*; North Dakota State University / University of Minnesota, Fargo, ND (141)

Useful Wild Plants of Texas....A Resource for Weed Scientists That Need to Know More Than How to Kill Plants. John D. Byrd, Jr.*; Mississippi State University, Mississippi State, MS (142)

Update to the Herbicide Resistance Action Committee Classification on Mode of Action. Rex A. Liebl*1, Jeffrey Epp2, Bernd Laber3, Hubert Menne3, James Morris4, Matthias Witschel5; 1BASF Corp, Raleigh, NC, 2Corteva Agriscience, Indianapolis, IN, 3Bayer AG Crop Science, Frankfurt, Germany, 4Syngenta, Bracknell, United Kingdom, 5BASF SE, Ludwigshafen, Germany (143)

University of Tennessee Dicamba Stewardship Education Efforts. Larry Steckel, Ginger Rowsey*; University of Tennessee, Jackson, TN (144)

Montana Noxious Weed Survey: Has 25 Years of Education Been Effective? Shantell A. Frame-Martin*1, Jane Mangold2, Eric Raile2; 1Montana Noxious Weed Education Campaign, Bozeman, MT, 2Montana State University, Bozeman, MT (145)

Undergraduate Students Self-Assess Learning Gains. Karen A. Renner*; Michigan State University, East Lansing, MI (146)

Efforts in Weed Management Outreach for Urban & Community Audiences in California. Karey Windbiel-Rojas*1, Maggie Reiter2, John A. Roncoroni3; 1University of California Statewide IPM Program, Davis, CA, 2University of California Cooperative Extension, Fresno, CA, 3University of California Division of Agriculture and Natural Resources, Napa, CA (147)

The Weedy and Invasive Plant Species Community of the American Society of Agronomy: Activities and Opportunities. Anil Shrestha*1, Sharon Clay2; 1California State University, Fresno, Fresno, CA, 2South Dakota State University, Brookings, SD (148)

Unseen Flowers: Weed Macrophotography Update. Robert F. Norris*; University of California, Davis, Davis, CA (149)
National Pesticide Safety Education Center (NPSEC): Supporting Territory Pesticide Safety Education Programs (PSEPs). Kerry Richards*, Carroll Moseley‡; 1National Pesticide Safety Education Center, Port Matilda, PA, 2Syngenta, High Point, NC (150)

**TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4**

**POSTER - 08. Formulation, Adjuvant, & Application Technology**

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 PM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Efficacy and Economic Analysis of Light Activated Weed Seeking Spray Technology in Eastern Washington Fallow Systems. Lydia S. Fields*, Rachel J. Zuger, Derek Appel, Ian Burke; 1Washington State University, Pullman, WA, 2Washington State University, Davenport, WA (151)

†Evaluating Spray Nozzles at Lower Heights and Pressures for Circular Application. Haosheng Lin*, Joseph Neal, Gary Roberson, Sierra Young, Ramon G. Leon; 1North Carolina State University, Cary, NC, 2North Carolina State University, Raleigh, NC (152)

*PRESENTER † STUDENT CONTEST - PhD

†Soybean Response to Dicamba Tank Contamination, Particle Drift, and Vapor. Frances B. Browne, Steve Li, Katalyn J. Price, Ryan D. Langemeier, Greg R. Kruger; 1Auburn University, Auburn, AL, 2University of Nebraska-Lincoln, North Platte, NE (153)

A Novel Fluorescent Compound to Measure Herbicide Physical Drift. Vijay Nandula; USDA-ARS, Stoneville, MS (154)

Enlist™ Herbicides with Colex-D Technology for On-Target Applications. David M. Simpson; Corteva, Indianapolis, IN (155)
Introducing Four New Adjuvants from AgraSyst for Herbicide Use. Jim T. Daniel*, 1, Scott Parrish‡, 1Daniel Ag Consulting, Keenesburg, CO, 2AGRASYST, Spokane, WA (156)

Herbicide Influence on Bradyrhizobia Growth. Joy Amajioyi*; South Dakota State University, Brookings, SD (157)

Impact of Carrier Volume Rate on Efficacy of PRE-Emergence Herbicides in Wisconsin Cropping Systems. Ryan P. DeWerff*, Maxwel Coura Oliveira, Sarah V. Striegel, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (158)

The Utility of a Planter Mounted Pulse Width Modulation Spray System. Ryan P. DeWerff*, Nicholas J. Arneson, Rodrigo Werle; University of Wisconsin-Madison, Madison, WI (159)

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER †STUDENT CONTEST - MS

†Germination Response of Downy Brome, Wild Oat, and Italian Ryegrass to Gibberellic Acid in Palouse Silt Loam. Madisyn R. Beaudoin*, Rachel J. Zuger, Ian Burke; Washington State University, Pullman, WA (160)

†Effects of Tillage and Pesticides on Weed Seedling Emergence Over a Growing Season. Samuel A. Palmer*, 1, Benjamin Fehr‡, Richard G. Smith‡; 1University of New Hampshire, Epsom, NH, 2University of New Hampshire, Durham, NH (161)
†Using Biology to Better Inform Marestail (Conyza canadensis) Management. Ryan Collins*, Erin Haramoto, Karla L. Gage, Brent Sunderlage, Anita Dille, Reid Smeda; ¹University of Kentucky, Lexington, KY, ²Southern Illinois University Carbondale, Carbondale, IL, ³Kansas State University, Manhattan, KS, ⁴University of Missouri, Columbia, MO (162)


†Genetics of Dioecy in Amaranthus tuberculatus and A. palmeri: an Update. Jacob S. Montgomery*, Darci A. Giacomini, Patrick Tranel; University of Illinois, Urbana, IL (164)

*PRESENTER  † STUDENT CONTEST - PhD

†Confirmation of Glyphosate Resistance in a Johnsongrass (Sorghum halepense) Biotype from Missouri. Sarah E. Dixon*, Reid Smeda; University of Missouri, Columbia, MO (165)

†Germination Patterns of California Weedy Rice (Oryza sativa f. spontaneae Rosh.) at Various Temperature and Water Potential Combinations Under Controlled Conditions. Liberty B. Galvin*, Mohsen B. Mesgaran, Kassim Al-Khatib; University of California, Davis, Davis, CA (166)

†Determining the Origin of Glyphosate Resistant Amaranthus palmeri (Palmer Amaranth) in South America by Comparison of Extrachromosomal Circular DNA (eccDNA) EPSPS Replicon. Crystal D. Sparks*, Todd A. Gaines, Paul Neve, Anita Kuepper, Ganche Slavov, Martin Vila-Aiub, Alejandro Garcia, Aldo Merotto; ¹Colorado State University, Fort Collins, CO, ²Rothamsted Research, Harpenden, United Kingdom, ³Bayer Cropscience, Frankfurt, Germany, ⁴University of Buenos Aires, Buenos Aires, Argentina, ⁵INIA Uruguay, Montevideo, Uruguay, ⁶University of Rio Grande do Sul, Porto Alegre, Brazil (167)

†Population Structure of Russian-thistle (Salsola tragus L.) in the Inland Pacific Northwest. Ian Burke, Drew J. Lyon, John F. Spring, Samuel R. Revolinski; Washington State University, Pullman, WA (168)
Interspecific Gene Flow Between *Sorghum bicolor* and *S. halepense* with and without Self-Pollen Competition. Cynthia Sias*, Blake L. Young, Daniel Hathcoat, George Hodnett, William Rooney, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (169)

Evolution of Resistance to HPPD-inhibiting Herbicides in a Wild Radish (*Raphanus raphanistrum*) Population Via Enhanced Herbicide Metabolism. Huan Lu*, Qin Yu, Heping Han, Mechelle J. Owen, Stephen B. Powles; 1University of Western Australia, Crawley, Australia, 2University of Western Australia, Perth, Australia, 3University of Western Australia, Nedlands, Australia (170)

The European Project IWMPRAISE: Integrated Weed Management in Olive Orchards of Spain. Veronica Pedraza, Irache Garnica, Juan A. Lezaun, Jose L. Gonzalez-Andujar*; 1CSIC, Cordoba, Spain, 2INTIASA, Villaba, Spain, 3Instituto de Agricultura Sostenible (CSIC), Cordoba, Spain (171)

Identification of Goosegrass (*Eleusine indica*) Resistant to Dithiopyr and Dinitroaniline Herbicides. Joseph S. McElroy*, John M. Peppers, Nathan D. Hall, Elijah C. Russell, James Harris, Jinesh D. Patel; 1Auburn University, Auburn, AL, 2Virginia Tech, Blacksburg, VA (172)

Light Quality and Weed Seed Germination: What We Have Learnt and the Practical Application Potential. Albert T. Adjesiwor*, Andrew R. Kniss; University of Wyoming, Laramie, WY (173)


Multiple Resistance to ACCase, ALS and EPSPS Inhibiting Herbicides in the Genus *Lolium*. Jose G. Vázquez García, Ricardo Alcántara-de la Cruz, Candelario Palma-Bautista, Hugo Enrique Cruz-Hipolito, Joel Torra, Antonia M. Rojano-Delgado, Rafael De Prado; 1University of Cordoba, Cordoba, Spain, 2Universidade Federal de São Carlos, São Carlos, Brazil, 3Universitat de Lleida, Lleida, Spain (175)
Multiple Herbicide Resistance in *Parthenium hysterophorus* from Central America. Candelario Palma Bautista*, Jose G. Vázquez-García, Hugo Enrique Cruz-Hipolito, Guido Plaza, Verónica Hoyos, Joel Torra, Antonia M. Rojano-Delgado, Rafael De Prado; ¹University of Cordoba, Cordoba, Spain, ²Universidad Nacional de Colombia, Bogotá, Colombia, ³Universidad del Magdalena, Santa Marta, Colombia, ⁴Universitat de Lleida, Lleida, Spain (176)

Relationship Between Glyphosate Resistance and Root Fluorescence in Italian Ryegrass (*Lolium perenne* L. spp. *multiflorum*) Populations from Oregon. Andréia Kazumi Suzukawa*, Carol Mallory-Smith, Andrew G. Hulting, Caio A. Brunharo; Oregon State University, Corvallis, OR (177)

*Chloris radiata* Resistant to EPSPS and ALS Inhibitors from Colombia. Veronica Hoyos, Jose G. Vázquez García, Candelario Palma-Bautista, Antonia M. Rojano-Delgado, Rafael De Prado; ¹Universidad del Magdalena, Santa Marta, Colombia, ²Universidad Nacional de Colombia, Bogotá, Colombia, ³University of Cordoba, Cordoba, Spain (178)

Characterization of Bromus Species Using SSR Markers. José G. Vázquez García, Patricia Castro, Teresa Millan, Rafael De Prado; ¹University of Cordoba, Córdoba, Spain, ²University of Cordoba, Cordoba, Spain (179)

Using Canopy Hyperspectral Reflectance Data to Distinguish Six Pigweeds. Reginald S. Fletcher; Affiliation Not Specified, Greenville, MS (180)

Management of Downy Brome (*Bromus tectorum* L.) in Fallow Systems with Indaziflam. Tara L. Burke*, Derek Appel, Rachel J. Zuger, Ian Burke; ¹Washington State University, Albion, WA, ²Washington State University, Davenport, WA, ³Washington State University, Pullman, WA (181)

The International Weed Genomics Consortium: a Resource for Weed Genomics. Sarah Morran*, Paul Neve, Eric L. Patterson, Scott McElroy, Roland S. Beffa, Todd A. Gaines; ¹Colorado State University, Fort Collins, CO, ²Rothamsted Research, Harpenden, United Kingdom, ³Michigan State University, East Lansing, MI, ⁴Auburn University, Auburn, AL, ⁵Bayer AG, CropScience Division, Frankfurt, Germany (182)

Genotyping *Echinochloa* for Species Identification and Resistance. Sarah Morran, Todd A. Gaines; Colorado State University, Fort Collins, CO (183)
Characterization of F1 Hybrid Progenies Originating from Grain Sorghum (Sorghum bicolor) x Johnsongrass (S. halepense) Crosses. Nithya K. Subramanian*, Cynthia Sias1, Usha Rani Pedireddi1, Sara Ohadi2, Daniel Hathcoat1, George Hodnett1, William Rooney1, Muthukumar V. Bagavathiannan1; 1Texas A&M University, College Station, TX, 2University of California, Davis, Davis, CA (184)

Understanding Gene Flow from Grain Sorghum (Sorghum bicolor) to Johnsongrass (S. halepense). Nithya K. Subramanian*, Daniel Lavy, Cynthia Sias, George Hodnett, William Rooney, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (185)

Predictive Habitat Modeling for Ventenata dubia (Ventenata). Stacey N. Robbins*, Lisa J. Rew, Nicholas Fox; Montana State University, Bozeman, MT (186)

Waterhemp (Amaranthus tuberculatus) Seed Production and Seed Viability Following Injury from Sublethal Dicamba Dose. Mark L. Bernards*, Faith Duke, Allyson M. Rumler, Alexis L. Meadows, Brent S. Heaton; Western Illinois University, Macomb, IL (187)

---

**TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4**

---

**POSTER - 10. Biocontrol of Weeds**

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Evaluation of Biofumigants in California Strawberry Nurseries. Nelly Guerra*; University of California, Davis, Davis, CA (188)
TUESDAY and WEDNESDAY MORNINGs, MARCH 3 & 4

POSTER - 11. Physiology

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - PhD

†Recent Recurrence with Fenoxaprop Decrease Echinochloa crus-galli (Barnyardgrass) Control by Quinclorac. Carlos Alberto Gonsiorwikewicz Rigon*1, Luan Cutti2, Guilherme Menegol Turra2, Enrico Zilch Ferreira2, Todd A. Gaines1, Franck E. Dayan1, Aldo Merotto Jr2; 1Colorado State University, Fort Collins, CO, 2Federal University of Rio Grande do Sul, Porto Alegre, Brazil (189)

†The Physiological Basis of Differential Resistance to PPO-Inhibiting Herbicides Used Pre- and Post-Emergent. Abigail Barker*, Franck E. Dayan; Colorado State University, Fort Collins, CO (190)

Altered Target Site-Based Resistance to Mesosulfuron, an ALS Inhibitor, in Italian Ryegrass from Mississippi. Vijay Nandula*1, Darci A. Giacomini2, Jason A. Bond1; 1USDA-ARS, Stoneville, MS, 2University of Illinois, Urbana, IL, 3Mississippi State University, Stoneville, MS (191)

Defining the Locoweed-Fungal Endophyte Complex: A Common Garden Study Comparing Locoweed Stress Responses with and without its Fungal Endophyte. Barbara Keith*1, Megan Hofland1, Sarah Ward2, David K. Weaver1, Tracy M. Sterling3; 1Montana State University, Bozeman, MT, 2Colorado State University, Fort Collins, CO, 3Affiliation Not Specified, Bozeman, MT (192)

Inhibitions of Goosegrass (Eleusine indica L. Gaertn.) and Soybean [Glycine max (L.) Merr.] Germination, Growth, and Development by Cover Crop Residues. Avat Shekoofa*1, Larry Steckel1, Clay M. Perkins1, Virginia Sykes2; 1University of Tennessee, Jackson, TN, 2University of Tennessee, Knoxville, TN (193)
Identification of Candidate Genes on Wheat Group 5 Chromosomes Associated with Halauxifen-Methyl Tolerance. Olivia A. Obenland, Brendan V. Jamison, Dean E. Riechers*; University of Illinois, Urbana, IL (194)

Root System Architecture and Genes Associated with Allelopathy in Weedy Rice. Brooklyn C. Schumaker¹, Swati Shrestha², Shandrea D. Stallworth², Auriana P. Tucker², Teng (Paul) Tseng*²; ¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS (195)

Herbicide Physiology Online: A Multi-Institutional Course Spanning a Decade. Tracy M. Sterling*, William Dyer², Sarah Ward³, Lynn Igegneri⁴, Erin E. Burns⁵, Fabian D. Menalled², Deana Namuth-Covert⁶, Mithila Jugulam⁷; ¹Affiliation Not Specified, Bozeman, MT, ²Montana State University, Bozeman, MT, ³Colorado State University, Fort Collins, CO, ⁴Oregon State University, Corvallis, OR, ⁵Michigan State University, East Lansing, MI, ⁶Ohio State University, Columbus, OH, ⁷Kansas State University, Manhattan, KS (196)

A Genetic Map for Amaranthus tuberculatus. Brent P. Murphy*, Darci A. Giacomini, Jacob S. Montgomery, Patrick Tranel; University of Illinois, Urbana, IL (197)

EPSPS Gene Copy Number of Glyphosate-Resistant Common Waterhemp Biotypes from Eastern Nebraska Counties. Rachana A. Jhala*, Todd A. Gaines², Crystal D. Sparks², Stevan Knezevic³, Amit J. Jhala¹; ¹University of Nebraska-Lincoln, Lincoln, NE, ²Colorado State University, Fort Collins, CO, ³University of Nebraska-Lincoln, Concord, NE (198)

---

TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4

---

POSTER - 12. Soil and Environmental Aspects

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - PhD
†Seasonal Fluctuations of 2,4-D and Dicamba Concentrations in Bulk Deposition Samples Collected Throughout Missouri in 2019. Eric Oseland*,1, Robert Lerch2, Mandy Bish1, Kevin W. Bradley1; 1University of Missouri, Columbia, MO, 2USDA-ARS, Columbia, MO (199)

†Effects of Repeated Herbicide Applications on Soil Microbial Communities: an Analysis of Microbial Fitness. Katie Martin*,1, Brad Hanson2; 1University of California, Davis, Davis, CA, 2University of California, Davis, Winters, CA (200)

Optimizing Chemical Analysis of Dicamba Residues from Polyurethane Foam (PUF) Samples. Shelby E. Lanz*, Thomas C. Mueller; University of Tennessee, Knoxville, TN (201)

Role of Bonechar in Indaziflam Efficiency on Weed Control. Kassio F. Mendes*,1, Ivan F. Furtado1, Kamila C. Mielke1, Alessandro C. Lima1, Larissa M. Mota1, Rodrigo N. Sousa2; 1Universidade Federal de Viçosa, Viçosa, Brazil, 2ESALQ/USP, Piracicaba, Brazil (202)

Transport of 14C-Mesotrione Through Soil Columns Under Different Physical-Chemical Properties. Rodrigo N. Sousa*,1, Kassio F. Mendes2, Alessandro C. Lima2, Kamila C. Mielke2, Valdemar L. Tornisielo3; 1ESALQ/USP, Piracicaba, Brazil, 2Universidade Federal de Viçosa, Viçosa, Brazil, 3CENA/USP, Piracicaba, Brazil (203)

---

**TUESDAY and WEDNESDAY MORNINGS, MARCH 3 & 4**

**POSTER - 13. Integrated Weed Management**

LOCATION: Maui Suite #1-4
TIME: 07:00 AM - 09:00 AM
MODERATOR: Thomas C. Mueller
University of Tennessee
Knoxville, TN

*PRESENTER † STUDENT CONTEST - MS

†Rapid Detection of Herbicide-resistant Annual Ryegrass (*Lolium rigidum*). Martina Badano Perez*, Danica Goggin, Roberto Busi, Hugh J. Beckie; University of Western Australia, Crawley, Australia (204)

†Impacts of Winter Cover Crops on Weeds in Southwest Irrigated Agriculture. Prashasti Agarwal*, Erik A. Lehnhoff; New Mexico State University, Las Cruces, NM (205)
†Winter Wheat Variety, Planting Date, and Herbicide Selection: Effects on Rescuegrass (Bromus catharticus) Management. Hannah C. Lindell*, Misha R. Manuchehri, Todd A. Baughman, Emi Kimura, Brett F. Carver, Lane S. Newlin, Justin T. Childers; 1Oklahoma State University, Stillwater, OK, 2Oklahoma State University, Ardmore, OK, 3Texas A&M AgriLife, College Station, TX (206)

†Ecological and Economic Implications of Integrated Palmer Amaranth (Amaranthus palmeri) Management Strategies in Cotton. Rodger B. Farr, Jason K. Norsworthy, Tom Barber, Grant L. Priess, Mason C. Castner; 1University of Arkansas, Fayetteville, AR, 2University of Arkansas System Division of Agriculture, Lonoke, AR (207)

*PRESENTER † STUDENT CONTEST - PhD

†Efficacy of Cotton and Peanut Residual Herbicides in High Residue Cover Crop System. Katilyn J. Price*, Steve Li, Frances B. Browne, Ryan D. Langemeier; Auburn University, Auburn, AL (208)

†Impact of Harvest-time and Post-harvest Seedbank Management Tactics for Italian Ryegrass (Lolium multiflorum) in South-Central US Wheat Production. Aniruddha Maity, Blake L. Young, Lauren M. Lazaro, Nicholas Korres, Jason K. Norsworthy, Muthukumar V. Bagavathiannan; 1Texas A&M University, College Station, TX, 2Louisiana State University AgCenter, Baton Rouge, LA, 3USDA-ARS, Urbana, IL, 4University of Arkansas, Fayetteville, AR (209)

†Weed-Microbial Competition for Nitrogen in Soils Amended with Carbon: A New Soil Modification Tool for Weed Management? Maria A. Gannett; Cornell University, Ithaca, NY (210)

†The Search for Herbicidal Natural Products from the Plants of Hawai‘i. Joey Ooka, Sherry-Ann Hara, Daniel K. Owens; University of Hawaii, Manoa, Honolulu, HI (211)

†Population Dynamics of Common Waterhemp (Amaranthus rudis) Under Short-term Versus Diversified Cropping Systems, a Matrix Modeling Approach. Matt Liebman, Huong Nguyen; Iowa State University, Ames, IA (212)

†Evaluation of PtxD-phosphite as a Weed Control System in Cotton. Shilpa Singh, Devendra Pandeya, Keerti Rathore, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (213)
First Report of Multiple Herbicide Resistance in Ragweed Parthenium (Parthenium hysterophorus L.) from Texas. Shilpa Singh¹, Vijay Singh², Joshua A. McGinty³, Muthukumar V. Bagavathiannan¹; ¹Texas A&M University, College Station, TX, ²Virginia Tech, Painter, VA, ³Texas A&M AgriLife Extension Service, Corpus Christi, TX (214)

†Effect of Four Summer Cover Crop Species and Planting Timing on Weed Suppression, Soil Moisture Dynamics, and Yield in Corn. Spencer L. Samuelson*, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (215)

Evaluation of Non-chemical Tactics for Managing Johnsongrass (Sorghum halepense). Spencer L. Samuelson*, Leonard Herndon, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (216)

†Synthesizing Images for Semantic Segmentation of Weed Species in an Airborne RGB Imagery. Chengsong Hu*, Bishwa B. Sapkota¹, Steven B. Mirsky², Muthukumar V. Bagavathiannan¹; ¹Texas A&M University, College Station, TX, ²USDA-ARS, Beltsville, MD (217)

Virtual Agriculture: Modeling 3D Structure and Phenological Developments of Crops and Weeds. Chengsong Hu*, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (218)

Dry Bean Responses to 2,4-D Ester Applied Preplant and Preemergence. Nader Soltani*, Peter H. Sikkema; University of Guelph, Ridgetown, ON, Canada (219)

Getting Rid of Weeds Through Integrated Weed Management. Claudio G. Rubione*, Mark VanGessel¹, Lauren M. Lazaro², Michael L. Flesner³, Kara Pittman³, Muthukumar V. Bagavathiannan⁴, Lovreet S. Shergill³, Steven B. Mirsky⁴, Victoria Ackroyd⁵; ¹University of Delaware, Georgetown, DE, ²Louisiana State University AgCenter, Baton Rouge, LA, ³Virginia Tech, Blacksburg, VA, ⁴Texas A&M University, College Station, TX, ⁵USDA-ARS & University of Delaware, Beltsville, MD, ⁶USDA-ARS, Beltsville, MD, ⁷USDA, Beltsville, MD (220)

Harvest Weed Seed Control in Wheat Production Systems of the PNW. Judit Barroso*, Carolina San Martin Hernandez², Jennifer A. Gourlie¹, Stewart B. Wuest¹, Mark Thorne⁴, Kyle Roerig⁵, Andrew G. Hulting⁵; ¹Oregon State University, Adams, OR, ²Oregon State University, Pendleton, OR, ³USDA-ARS, Adams, OR, ⁴Washington State University, Pullman, WA, ⁵Oregon State University, Corvallis, OR (221)
Evaluation of Herbicides for Potential Use in an Integrated Release Method of *Trichogramma ostriniae*. Jeffrey D. Cluver1, Robert Wright2, Nevin Lawrence1, Jeff Bradshaw*1; 1University of Nebraska-Lincoln, Scottsbluff, NE, 2University of Nebraska-Lincoln, Lincoln, NE (222)

Control Alternatives in *Carduus acanthoides* Resistant to 2,4-D and Glyphosate. Candelario Palma-Bautista*1, Pablo Belluccini2, Valentin Gentiletti3, Jose G. Vazquez Garcia1, Antonia M. Rojano-Delgado1, Rafael De Prado1; 1University of Cordoba, Cordoba, Spain, 2INTA Marcos Juarez, Cordoba, Argentina, 3ETS Ingenieros Agronomos, Camilo Aldao, Argentina (223)

Efficacy of Indaziflam on Downy Brome Control in Northern Nevada. Charlie D. Clements*; USDA-ARS, Reno, NV (224)

Total Weed and Nutseed Populations in Fall Vs. Spring Planted Crops Following Different Cultivation Types and Frequency During the Fallow Period. Peter J. Dittmar*, Danielle D. Treadwell; University of Florida, Gainesville, FL (225)

Broadleaf Weed Population and Diversity Following Different Cultivation Types and Frequency Before Fall or Spring Vegetable Crops. Peter J. Dittmar*, Danielle D. Treadwell; University of Florida, Gainesville, FL (226)

Using Unmanned Aerial Systems for Early Prediction of Competitive Interactions Between Italian Ryegrass (*Lolium perenne* ssp. *multiflorum*) and Wheat. Bishwa B. Sapkota*1, Vijay Singh2, Clark Neely3, Muthukumar V. Bagavathiannan1; 1Texas A&M university, College Station, TX, 2Virginia Tech, Painter, VA, 3Washington State University, Pullman, WA (227)

Advanced Machine Learning Approaches for Evaluation of Herbicide Drift Injury in Cotton. Bishwa B. Sapkota*, Muthukumar V. Bagavathiannan; Texas A&M university, College Station, TX (228)

Weed Classification Using Unmanned Aerial Systems-based Imagery. Vijay Singh*1, Chi Zhaohui2, Michael Bishop2, Anthony Filippi2, Muthukumar V. Bagavathiannan2; 1Virginia Tech, Painter, VA, 2Texas A&M University, College Station, TX (229)

Efficacy of Unmanned Aerial System-based Herbicide Applications. Vijay Singh*1, Daniel Martin2, Mohamed Latheef2, Bishwa B. Sapkota3, Muthukumar V. Bagavathiannan3; 1Virginia Tech, Painter, VA, 2United States Department of Agriculture, College Station, TX, 3Texas A&M university, College Station, TX (230)
Nozzle Type Effect on Coverage, Canopy Penetration, and Weed Control Using Enlist One and Liberty in Enlist E3 Soybeans. Ashley N. McCormick¹, Troy W. Dillon², Brad M. Davis², Thomas R. Butts², Collie M. Leah²; ¹University of Arkansas System Division of Agriculture, Newport, AR, ²University of Arkansas System Division of Agriculture, Lonoke, AR (231)

Reimagining the Use of Electricity to Kill Weeds. Erik A. Lehnhoff*, Donovan Bailey, Paul Neher; New Mexico State University, Las Cruces, NM (232)

Yield Loss to Cirsium arvense in Montana's Organic Cropping Systems. Daniel Chichinsky¹, Tim Seipel*¹, Perry Miller¹, Fabian D. Menalled¹, Patrick Carr²; ¹Montana State University, Bozeman, MT, ²Montana State University - Central Ag Research Center, Moccasin, MT (233)

Integration of Cultural Practices and Herbicides for Weed Control in Grain Sorghum and Soybean. Vipan Kumar*¹, Rui Liu¹, Natalie Aquilina¹, Taylor Lambert¹, Ramsamy Perumal¹, Troy Ostmeyer¹, Andrew Tucker²; ¹Kansas State University, Hays, KS, ²Fort Hays State University, Hays, KS (234)

Common Waterhemp (Amaranthus tuberculatus): Directed Energy Manangement of Weed Seed Bank in Corn. Cadance A. Lowell*, Marcus Nagle¹, Deng Cao¹, Jon Jackson²; ¹Central state university, Wilberforce, OH, ²Global Neighbor, Inc., Centerville, OH (235)

Impact of Cotton Desiccants on Seed Viability of Palmer Amaranth (Amaranthus palmeri). Debalin Sarangi*¹, Kaisa M. Werner², Bojana Pilipovic², Peter A. Dotray³, Muthukumar V. Bagavathiannan²; ¹University of Wyoming, Powell, WY, ²Texas A&M University, College Station, TX, ³Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX (236)

TUESDAY MORNING  MARCH 3

3MT Student Oral Competition - MS

LOCATION: Monarchy #2
TIME: 09:00 AM - 11:00 PM
MODERATOR: Darrin M. Dodds
Mississippi State University
Mississippi State, MS

CO-MODERATOR: Marty Schraer
Meridian, ID
09:00 AM  †Halauxifen-methyl: a Tool for Managing Glyphosate-resistant Weeds. Jessica E. Quinn*¹, Nader Soltani¹, Jamshid Ashigh², David C. Hooker¹, Darren E. Robinson¹, Peter H. Sikkema¹; ¹University of Guelph, Ridgetown, ON, Canada, ²Corteva Agriscience, London, ON, Canada (237)

09:05 AM  †Diurnal Response to Dicamba and Glyphosate Applications on Broad-leaf Weed Species in Cotton. Jacob R. Kalina*¹, Timothy L. Grey¹, Christopher B. Corkern², Donn G. Shilling³, Nicholas T. Basinger³; ¹University of Georgia, Tifton, GA, ²Bayer Crop Sciences, Tifton, GA, ³University of Georgia, Athens, GA (238)

09:10 AM  †Evaluation of Active Ingredient and Application Timing on Chinese Tallow (Triadica sebifera) and Callery Pear (Pyrus calleryana) by Hack-and-squirt. Hayden Quick*¹, John D. Byrd, Jr.¹, David Russell²; ¹Mississippi State University, Mississippi State, MS, ²Auburn University, Madison, AL (239)

09:15 AM  †Glyphosate Plus Dicamba Efficacy as Influenced by Spray Nozzle Design and Weed Density. Madison D. Kramer*¹, Travis Legleiter², Zach Perry³; ¹University of Kentucky, Lynn, IN, ²University of Kentucky, Princeton, KY, ³University of Kentucky, Paducah, KY (240)

09:20 AM  †Mechanism of the Exclusive Reliance on ALS₁ and ALS₃ in the Evolution of Herbicide Resistance in Monochoria (Monochoria vaginalis). Shinji Tanigaki*; Kyoto University, Kyoto, Japan (241)

09:25 AM  †The Influence of Adjuvants on Tolpyralate Efficacy. Nicole M. Langdon*¹, Peter H. Sikkema¹, Darren E. Robinson¹, Alan J. Raedar², David C. Hooker¹; ¹University of Guelph, Ridgetown, ON, Canada, ²ISK Biosciences Inc., Concord, OH (242)

09:30 AM  †Overwinter Survival of Johnsongrass (Sorghum halepense) Rhizomes in Nebraska and Kansas. Samantha D. Isaacson*, Amit J. Jhala, John Lindquist; University of Nebraska-Lincoln, Lincoln, NE (243)
†Unraveling Glyphosate Resistance Mechanisms in Horseweed (*Conyza canadensis* (L.) Cronq.). Francois Tardif¹, Emily L. Priester², Clarence Swanton³, Eric R. Page¹; ¹University of Guelph, Guelph, ON, Canada, ²University of Guelph, Tillsonburg, ON, Canada, ³University of Guelph, Guelph, AZ, Canada, ⁴Agriculture and Agri-Food Canada, Harrow, ON, Canada (244)

†Cucumber Tolerance to Glufosinate At-planting. Taylor M. Randell*, Jenna C. Vance, A Stanley Culpepper; University of Georgia, Tifton, GA (245)

†Impacts of Glyphosate on Citrus Health and Productivity. Biwek Gairhe*, Ramdas Kanissery; University of Florida, Immokalee, FL (246)

†Young Peanut Physiological Response to Flumioxazin Applications Across Multiple Planting Dates and Seed Vigers. Nicholas L. Hurdle¹, Timothy L. Grey², Eric P. Prostko², Walter S. Monfort², Cristiane Pilon²; ¹University of Georgia, Collierville, TN, ²University of Georgia, GA (247)

†Impact of Droplet Size and Carrier Volume on Soybean (*Glycine max*) Harvest Aid Efficacy. Steven D. Hall¹, Darrin M. Dodds², Greg R. Kruger¹, Jon T. Irby², Jacob P. McNeal², Lucas X. Franca², John J. Williams², Bradley J. Norris², William J. Rutland¹; ¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS, ³University of Nebraska-Lincoln, North Platte, NE (248)

†Effect of Herbicides Applied at First Visible Female Inflorescence on Palmer Amaranth (*Amaranthus palmeri*) Fecundity and Seed Viability. Eric B. Scruggs*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (249)

†Utility of Potassium Borate as a Volatility Reduction Agent and its Impact on Weed Control in Xtend™ Crops. Mason C. Castner*, Jason K. Norsworthy, Trenton L. Roberts; University of Arkansas, Fayetteville, AR (250)
10:10 AM †HPPD Tolerant Cotton Response, Weed Management, and Tank Mix Partners with Isoxaflutole. Delaney C. Foster*, Peter A. Dotray2, Corey Thompson3, Greg Baldwin4, Frederick Moore5; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3BASF, Abernathy, TX, 4BASF, Research Triangle Park, NC, 5BASF, Lubbock, TX (251)

10:15 AM †Control of Glyphosate/ Glufosinate-Resistant Volunteer Corn in Corn Resistant to Aryloxyphenoxypropionates. Adam Striegel*, Stevan Knezevic2, Nevin Lawrence3, Jeffrey Krumm4, Gary Hein1, Amit J. Jhala1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE, 3University of Nebraska-Lincoln, Scottsbluff, NE, 4Corteva Agriscience, Hastings, NE (252)

10:20 AM †Understanding Interspecific Hybridization Between *Sorghum bicolor* and its Weedy Congener *S. halepense*. Cynthia Sias*, Blake L. Young, Daniel Hathcoat, George Hodnett, William Rooney, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (253)
†A Target Site Mutation Confers Protoporphyrinogen Oxidase (PPO)-resistance in Wild Poinsettia (Euphorbia heterophylla L.). Rafael R. Mendes*,1, Hudson K. Takano2, Fernando Storniolo Adegas3, Rubem S. Oliveira Jr.1, Todd A. Gaines2, Franck E. Dayan2; 1Marina State University, Marina, Brazil, 2Colorado State University, Fort Collins, CO, 3Embrapa Soybean, Londrina, Brazil (254)

†Shedding Light on the Power of Plant Competition. Nicole Berardi*,1, Clarence Swanton2; 1University of Guelph, Guelph, ON, Canada, 2University of Guelph, Guelph, AZ, Canada (255)

†Evolved Resistance to Herbicides in Palmer Amaranth Accessions Collected in the North Carolina Coastal Plain. Denis J. Mahoney*; North Carolina State University, Clayton, NC (256)

†Sweetpotato Tolerance to Indaziflam. Stephen C. Smith*,1, Katherine M. Jennings2, David W. Monks1, Michael R. Schwarz2, David L. Jordan1, Chris Reberg-Horton1; 1North Carolina State University, Raleigh, NC, 2Affiliation Not Specified, Raleigh, NC (257)

†Exploring the Impacts of Weeds in Perennial Grain Crops. Eugene P. Law*,1, Matthew R. Ryan1, Antonio DiTommaso2; 1Cornell University, Ithaca, NY, 2Cornell University, Dryden, NY (259)

†Cover Crops for Suppressing Weeds in Citrus (Citrus sinensis) Row-Middles. Ramdas Kanissery1, Miurel T. Brewer*,2, Davie M. Kadyampakeni3; 1University of Florida, Immokalee, FL, 2University of Florida, Arcadia, FL, 3University of Florida, Lake Alfred, FL (260)

†Understanding Herbicide Resistance Through the Lens of Epigenetics. Gourav Sharma*, Jacob Barney, Shawn Askew, James Westwood, David Haak, Liqing Zhang, Suzanne Laliberte; Virginia Tech, Blacksburg, VA (261)
09:40 AM †Quantifying 2,4-D and Dicamba Dissipation from Plastic Mulch Using Analytical and Bioassay Techniques. Lavesta C. Hand*, Kayla M. Eason, Taylor M. Randell, Timothy L. Grey, A Stanley Culpepper; University of Georgia, Tifton, GA (262)

09:45 AM †Fine Tuning Goosegrass (Eleusine indica) Control for Northern Bermudagrass. John Brewer*, Jordan M. Craft, Shawn Askew; Virginia Tech, Blacksburg, VA (263)


09:55 AM †The Effect of Low-Dose Dicamba Applications on Snap Bean (Phaseolus vulgaris), Lima Bean (Phaseolus lunatus) and Southern Cowpea (Vigna unguiculata). Hannah E. Wright*, Thomas Gray, John Shugart, A Stanley Culpepper; 1University of Georgia, Athens, GA, 2Georgia Department of Agriculture, Atlanta, GA, 3Georgia Department of Agriculture, Tifton, GA, 4University of Georgia, Tifton, GA (265)

10:00 AM †Using Linuron to Improve Sweetpotato Production. Levi D. Moore*, Katherine M. Jennings, David W. Monks, Michael D. Boyette, David L. Jordan, Ramon G. Leon; North Carolina State University, Raleigh, NC (266)

10:05 AM †Adapting Integrated Pest Management for Weeds in Almonds. Steven C. Haring*; University of California, Davis, Davis, CA (267)

10:10 AM †Characterization of Trifludimoxazin, a New Herbicide for Use in Soybean Production Systems. Nicholas R. Steppig*, Bryan G. Young; 1Purdue University, Lafayette, IN, 2Purdue University, Brookston, IN (268)

10:15 AM Break

10:30 AM †Advanced Image Analysis for Weed Species Segmentation in Cotton. Bishwa B. Sapkota*, Muthukumar V. Bagavathiannan; Texas A&M university, College Station, TX (269)
10:35 AM †Cotton (*Gossypium hirsutum*) Defoliation as Affected by Carrier Volume and Droplet Size. Jacob P. McNeal*, Darrin M. Dodds, Greg R. Kruger, John J. Williams, Bradley J. Norris, Steven D. Hall, William J. Rutland, Mississippi State University, Mississippi State, MS, University of Nebraska-Lincoln, North Platte, NE; Mississippi State University, Starkville, MS (270)

10:40 AM †Effect of Herbicide Program, Spray Droplet Size, and Drift Reduction Agent on Glufosinate Efficacy. John J. Williams*, Darrin M. Dodds, Jacob P. McNeal, Steven D. Hall, Bradley J. Norris, William J. Rutland, Mississippi State University, Mississippi State, MS, Mississippi State University, Starkville, MS (271)

10:45 AM †The Genetic Diversity of *Amaranthus tuberculatus*: a Success Story in the American Midwest. Brent P. Murphy*, Patrick Tranel; University of Illinois, Urbana, IL (272)

10:50 AM †Chromatography: the Key to Quantifying Herbicide Dissipation. Kayla M. Eason*, Timothy L. Grey, A Stanley Culpepper; University of Georgia, Tifton, GA (273)

10:55 AM †Making a Better Glufosinate: Alleviating Environmental Parameters and Improving Efficacy. Grant L. Priess*, Jason K. Norsworthy; University of Arkansas, Fayetteville, AR (274)

11:00 AM †Spray Away the Herbicide Antagonism. Justin S. Calhoun*, J Connor Ferguson, Luke H. Merritt, Kayla L. Broster, Zachary R. Treadway, Michael T. Wesley Jr., Mississippi State University, Starkville, MS, Mississippi State University, Starkville, MS (275)

11:05 AM †Ecological Management of Kochia in Irrigated Western Cropping Systems. Ramawatar Yadav, Prashant Jha, Andrew R. Kniss, Nevin Lawrence, Gustavo Sbatella, Iowa State University, Ames, IA; University of Wyoming, Laramie, WY; University of Nebraska-Lincoln, Scottsbluff, NE (276)

11:10 AM †Microbial Contributions to Weed Suppression in Conventional and Organic Farm Soils. Liang Cheng, Jenny Kao-Kniffin, Antonio DiTommaso, Cornell University, Ithaca, NY, Cornell University, Dryden, NY (277)
SYMPOSIUM - 4. The Ecological and Biodiversity Impact of Invasive Grass Species and Their Management

LOCATION: Monarchy #4
TIME: 09:00 AM - 12:00 PM
MODERATOR: Lisa J. Rew
           Montana State University
           Bozeman, MT
CO-MODERATOR: Timothy S. Prather
               University of Idaho
               Moscow, ID

*SPEAKER

09:00 AM  Introduction to Symposium. Lisa J. Rew*;
           Montana State University, Bozeman, MT (278)

09:00 AM  Lehmann Lovegrass (Eragrostis lehmanniana) Ecological Impacts and Management Opportunities. Erik A. Lehnhoff*, Sherri Buerdsell, Andrew Dominguez, Nicole Pietrasiak; New Mexico State University, Las Cruces, NM (279)

09:20 AM  Reducing Invasive Grass Populations in Garry Oak Ecosystems Over the Long-term Via Mowing or Grazer Exclusion. David R. Clements*, Joy Marconato, Virginia Oeggerli, Vanessa L. Jones, Jessica Brouwer; Trinity Western University, Langley, BC, Canada (280)

09:40 AM  Plant Community Response Following Invasive Annual Grass Control in the Intermountain West. Corey V. Ransom*; Utah State University, Logan, UT (281)

t1University of Wyoming, Sheridan, WY, 2University of Wyoming, Laramie, WY (282)

10:20 AM  Break
10:35 AM  The Impacts of Downy Brome (*Bromus tectorum*) on Pasture Forage Quality and Quantity in Colorado. Jacob Courkamp*; Colorado State University, Fort Collins, CO (283)

10:55 AM  Perspectives on the Ecological Impacts of Annual Grasses Across the Great Divide. Lisa J. Rew¹, Timothy S. Prather*²; ¹Montana State University, Bozeman, MT, ²University of Idaho, Moscow, ID (284)

11:15 AM  Bring Back Bees: Controlling Invasive Annual Grasses Restores Native Flowering Plants and Their Pollinators. Arathi Seshadri*; USDA ARS/WRRC/ISPH, Davis, CA (285)

11:35 AM  Quail in the Grass: Controlling Cheatgrass to Enhance Nesting and Brood-rearing Habitat for Bobwhite Quail and Other Grassland Birds. Noe Marymor*; USDA-NRCS, Greeley, CO (286)

11:55 AM  Facilitated Discussion. Lisa J. Rew*; Montana State University, Bozeman, MT (287)

---

**TUESDAY MORNING  MARCH 3**

---

**ORAL - 01. Agronomic Crops I**

LOCATION:  Monarchy #5
TIME:  09:00 AM - 12:00 PM
MODERATOR:  Ryan D. Lins
Syngenta Crop Protection, LLC
Rochester, MN
CO-MODERATOR:  Misha R. Manuchehri
Oklahoma State University
Stillwater, OK

*SPEAKER  † STUDENT CONTEST

09:00 AM  Glyphosate and AMPA Persistence and Distribution in Soils Under Field Conditions in the Midwestern USA. Robert J. Kremer*; University of Missouri, Columbia, MO (288)

09:15 AM  Developing a Predictive Yield Loss Model for Sensitive Soybeans Exposed toDicamba. Jerri Lynn Henry*¹, Reid Smeda¹, Jason Weirich²; ¹University of Missouri, Columbia, MO, ²Affiliation Not Specified, Columbia, MO (289)
09:30 AM  Implications of Dicamba and 2,4-D Tank Contamination Across Enlist and Xtend Soybean Varieties. Bryan G. Young*, N. Cade Hayden, Matthew Osterholt, Mandy Bish, Kevin W. Bradley, Shawn P. Conley, William G. Johnson, Greg R. Kruger, Jason K. Norsworthy, Daniel B. Reynolds, Larry Steckel; 1Purdue University, Brookston, IN, 2Purdue University, West Lafayette, IN, 3University of Missouri, Columbia, MO, 4University of Wisconsin-Madison, Madison, WI, 5University of Nebraska-Lincoln, North Platte, NE, 6University of Arkansas, Fayetteville, AR, 7Mississippi State University, Mississippi State, MS, 8University of Tennessee, Jackson, TN (290)

09:45 AM  Dicamba Rate Influences on Fruiting in Sensitive Cotton. Kyle R. Russell, Peter A. Dotray, Irish L. B. Pabuayon, Glen L. Ritchie; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX (291)

10:00 AM  Influence of Carrier Water Characteristics and Adjuvants on Dicamba Volatilization in a Controlled Environment. Matthew Osterholt*, Julie M. Young, Manoj S. Ghaste, William G. Johnson, Joshua R. Widhalm, Bryan G. Young; 1Purdue University, West Lafayette, IN, 2Purdue University, Brookston, IN (292)

10:15 AM  Break

10:30 AM  Dicamba Research Update. Thomas C. Mueller*, Larry Steckel; 1University of Tennessee, Knoxville, TN, 2University of Tennessee, Jackson, TN (293)

10:45 AM  Influence of pH Buffers on Volatility of Dicamba Tank Mixtures. Ryan D. Langemeier*, Steve Li, Katilyn J. Price, Frances B. Browne; Auburn University, Auburn, AL (294)
11:00 AM  Greenhouse Evaluation of Suspected Resistance to XtendiMax® Herbicide with VaporGrip® Technology as Part of the Conditions of Registration. Daljit Singh*1, Sean Evans2, Jeffrey E. Herrmann3, Chandrashekar Aradhya1; 1Bayer Crop Science, Chesterfield, MO, 2Bayer Crop Science, Jacksonville, IL, 3Bayer Crop Science, Creve Coeur, MO (295)

11:15 AM  Engenia Herbicide for 2020. Tracy Rowlandson*; BASF, Raleigh, NC (296)

11:30 AM  Enlist E3™ Soybean Weed Control and Crop Tolerance. David M. Simpson*; Corteva, Indianapolis, IN (297)

11:45 AM  PPO-resistant Amaranthus Species Control in XtendFlex® Soybeans. Neha Rana1, Blake Barlow2, Ryan E. Rapp1, Rod Stevenson4; 1Bayer Crop Science, St Louis, MO, 2Bayer Crop Science, Hallsville, MO, 3Bayer CropScience, Mitchell, SD, 4Bayer Crop Science, Lansing, MI (298)

---

**TUESDAY MORNING  MARCH 3**

**ORAL - 02. Horticultural Crops**

LOCATION: Monarchy #1
TIME: 09:00 AM - 12:00 PM
MODERATOR: Matthew A. Cutulle
Clemson University
Charleston, SC

CO-MODERATOR: Jesse M. Richardson
Corteva Agriscience
Mesa, AZ

*SPEAKER  † STUDENT CONTEST

09:00 AM  Pyroxasulfone for Faba Bean and Safflower Production. Harlene M. Hatterman-Valenti*, Johnson M. Burton, Auwarter M. Collin, Kutay Yilmaz; North Dakota State University, Fargo, ND (299)

09:15 AM  Strawberry Tolerance and Flumioxazin Persistence Under Plastic Mulch in Florida Strawberry. Nathan Boyd*1, Ramdas Kanissery2; 1University of Florida, Balm, FL, 2University of Florida, Immokalee, FL (300)
09:30 AM Weed Control in Organic Highbush Blueberries. Marcelo L. Moretti*; Oregon State University, Corvallis, OR (301)

09:45 AM Screening of Herbicides for Selective Weed Control in Brassicaceous Crops. Ed Peachey*; Oregon State University, Corvallis, OR (302)

10:00 AM Don't be a Wet Blanket - Hit the Bullseye in Potatoes with Targeted Tank Mixes. Pamela J.s. Hutchinson*; University of Idaho, Aberdeen, ID (303)

10:15 AM Two Chipping Potato Cultivar Plant Back Responses When Mother Plants Received Sub-lethal Dicamba And/or Glyphosate Rates. Matthew Brooke, Collin M. Auwarter, Harlene M. Hatterman-Valenti*; North Dakota State University, Fargo, ND (304)

10:30 AM Break

10:45 AM Marking of Vegetable Crop Plants to Ensure Recognition by Automated Weeder. HannahJoy Kennedy¹, Steve Fennimore*¹, David Slaughter²; ¹University of California, Davis, Salinas, CA, ²University of California, Davis, Davis, CA (305)

11:00 AM †Inter-row Cultivation Integrated with Residual Herbicide Programs in Sugarbeet. Nathan H. Haugrud*¹, Thomas J. Peters²; ¹North Dakota State University, Fargo, ND, ²North Dakota State University / University of Minnesota, Fargo, ND (306)

11:15 AM Better Bunch: Evaluating the Impact of Sweetpotato Growth Habit on Yield and Weed Competition. Matthew A. Cutulle*¹, Phillip Wadl²; ¹Clemson University, Charleston, SC, ²USDA-ARS, Charleston, SC (307)

11:30 AM Yellow Nutsedge (Cyperus esculentus) Interference in Simulated Sweetpotato (Ipomoea batatas) Plant Beds. Stephen L. Meyers*¹, T. Casey Barickman², Jeffrey L. Main³; ¹Purdue University, West Lafayette, IN, ²Mississippi State University, Verona, MS, ³Mississippi State University, Pontotoc, MS (308)

12:00 PM  The Effect of 2,4-D on Hazelnut Abscission. Larissa Larocca De Souza, Marcelo L. Moretti*; Oregon State University, Corvallis, OR (310)

TUESDAY MORNING  MARCH 3

ORAL - 09. Weed Biology and Ecology

LOCATION:  Monarchy #7
TIME:  09:00 AM - 12:00 PM
MODERATOR:  Caio A. Brunharo
Oregon State University
Corvallis, OR
CO-MODERATOR:  O. Adewale Osipitan
University of California-Davis
Davis, CA

*SPEAKER  † STUDENT CONTEST

09:00 AM  †Predict Invasive Potential of a Weed Likely to Increase with Climate Change. Hannah Duff*, Bruce Maxwell; Montana State University, Bozeman, MT (311)

09:15 AM  The Evolutionary Genomics of Herbicide-Resistant Weeds. Bridgit W. Vasiljevic*, Ulrich Lutz, Ilja Bezrukov, Detlef Weigel; Max Planck Institute for Developmental Biology, Tübingen, Germany (312)

09:30 AM  †Do Certain Nutrients and Plant-Soil Feedbacks Affect Ventenata dubia (Ventralata) Seedling Growth? Michelle L. Majeski*, Catherine Zabinski, Lisa J. Rew, Jane Mangold; Montana State University, Bozeman, MT (313)

09:45 AM  Developing Growing Degree Day Models to Manage Annual Polygonum Species in Western Washington. Steven S. Seefeldt*,1 Chris Benedict2, Brian Maupin1; 1Washington State University, Mount Vernon, WA, 2Washington State University, Bellingham, WA (314)
†EPSPS Gene Amplification Confers Glyphosate Resistance in *Bromus tectorum* (Downy Brome). Pragya Asthana*, Rachel J. Zuger, Rhoda Brew-Appiah, Karen Sanguinet, Ian Burke; Washington State University, Pullman, WA (315)

10:15 AM Break

†Escaping Proteolysis: A 27 Base Pair Deletion in AUX/IAA2 Degron Tail Confers Resistance to Auxinic Herbicides in *Sisymbrium orientale*. Marcelo Figueirêdo*1, Anita Küpper2, Christopher Preston3, Jenna Malone4, Tijana Petrovic4, Anireddy Reddy1, Kasavajhala Prasad1, Todd A. Gaines1; 1Colorado State University, Fort Collins, CO, 2Bayer, Frankfurt, Germany, 3University of Adelaide, Glen Osmond, Australia, 4University of Adelaide, Adelaide, Australia (316)

10:45 AM Acetolactate Synthase Inhibitor Resistance in Ontario Populations of *Chenopodium album* L. Clement Mo*1, Francois Tardif2; 1University of Guelph, Markham, ON, Canada, 2University of Guelph, Guelph, ON, Canada (317)


11:15 AM Horseweed (*Erigeron canadensis*) Emergence Time and Over-winter Mortality. Erin Haramoto*, Ryan Collins1, Anita Dille2, Karla L. Gage3, Reid Smeda4, Brent Sunderlage3; 1University of Kentucky, Lexington, KY, 2Kansas State University, Manhattan, KS, 3Southern Illinois University Carbondale, Carbondale, IL, 4University of Missouri, Columbia, MO (319)


11:45 AM Exploring the Dynamics of EPSPS and Abiotic Stress Genes in Kochia. Philip Westra*, Andrew D. Effertz1, Todd A. Gaines1, Crystal D. Sparks1, Eric L. Patterson2; 1Colorado State University, Fort Collins, CO, 2Michigan State University, East Lansing, MI (321)
TUESDAY MORNING MARCH 3

ORAL - 11. Physiology

LOCATION: Monarchy #6
TIME: 09:00 AM - 12:00 PM
MODERATOR: Te-Ming (Paul) Tseng
Mississippi State University
Mississippi State, MS
CO-MODERATOR: Chenxi Wu
Bayer CropScience
St Louis, MO

*SPEAKER † STUDENT CONTEST

09:00 AM Target Site-Based Resistance to ALS Inhibitors, Glyphosate, and PPO Inhibitors in a Palmer Amaranth Accession from Mississippi. Vijay Nandula*, Darci A. Giacomini†, William T. Molin‡; †USDA-ARS, Stoneville, MS, ‡University of Illinois, Urbana, IL (322)

09:15 AM †A Safener Does Influence Pacific Northwest Winter Wheat Varietal Response to Very-Long-Chain Fatty Acid-Inhibiting Herbicides. Damilola A. Raiyemo*, William J. Price†, Traci Rauch†, Joan M. Campbell†, Fangming Xiao†, Rong Ma‡, Timothy S. Prather†; †University of Idaho, Moscow, ID, ‡Bayer CropScience, Chesterfield, MO (323)

09:30 AM Cyperus difformis ALS Cross-resistance Levels and Target-site Characterization. Alexander R. Ceseski*, Kassim Al-Khatib; University of California, Davis, Davis, CA (324)

09:45 AM †Simultaneous Overexpression of Three Cytochrome P450s is Involved in High Level Resistance to Diclofop-methyl in Multiple-herbicide Resistant Late Watergrass (Echinochloa phyllopogon). Hiroe Suda*, Yusuke Yoshimoto†, Kohei Kurata†, Keisuke Tanaka‡, Satoru Tanaka‡, Takuya Yamaguchi§, Masahiro Miyashita†, Tohru Tominaga†, Satoshi Iwakami§; †Kyoto University, Kyoto, Japan, §Tokyo University of Agriculture, Tokyo, Japan, §University of Tsukuba, Tsukuba, Japan (325)
10:00 AM  Herbicide-Resistance In Waterhemp (*Amaranthus tuberculatus*) Identified in Israel is Due to a Long Distance Gene Transfer. Inon Yadid, Zvi Peleg, Baruch Rubin*; The Hebrew University of Jerusalem, Rehovot, Israel (326)

10:15 AM  Break

10:30 AM  †Candidate Mutations for Fluroxypyr Resistance in Kochia (*Bassia Scoparia*). Olivia E. Todd*, Todd A. Gaines; Colorado State University, Fort Collins, CO (327)

10:45 AM  A Non-destructive Leaf Disc Assay for Rapid Diagnosis of Weed Resistance to Multiple Herbicide Modes of Action. Chenxi Wu*, Vijaya Varanasi1, Alejandro Perez-Jones2; 1Bayer CropScience, St Louis, MO, 2Bayer Crop Science, Chesterfield, MO (328)

11:00 AM  †Investigation of Physiological Mechanism of 2,4-D Resistance in Palmer Amaranth (*Amaranthus palmeri*). Chandrima Shyam*, Dallas E. Peterson, Mithila Jugulam; Kansas State University, Manhattan, KS (329)

11:15 AM  Investigating Metabolic Resistance to S-Metolachlor in Two Illinois Waterhemp (*Amaranthus tuberculatus*) Populations. Seth A. Strom*1, Aaron Hager1, Nicholas J. Seiter1, Adam Davis1, Shiv S. Kaundun2, Dean E. Riechers1; 1University of Illinois, Urbana, IL, 2Syngenta, Bracknell, United Kingdom (330)

11:30 AM  A New Understanding on the Mechanism of Action of Glufosinate. Franck E. Dayan*1, Hudson K. Takano1, Christopher Preston2, Philip Westra1, Roland S. Beffa3; 1Colorado State University, Fort Collins, CO, 2University of Adelaide, Glen Osmond, Australia, 3Bayer AG, CropScience Division, Frankfurt, Germany (331)

11:45 AM  A Biochemical Approach to Improve the Efficacy of Glufosinate. Hudson K. Takano*1, Roland S. Beffa2, Christopher Preston3, Philip Westra1, Franck E. Dayan1; 1Colorado State University, Fort Collins, CO, 2Bayer AG, CropScience Division, Frankfurt, Germany, 3University of Adelaide, Glen Osmond, Australia (332)
TUESDAY AFTERNOON  MARCH 3

SYMPOSIUM - 3. Genomics of Weedy and Invasive Species - 2025 and Beyond

LOCATION: Monarchy #4
TIME: 01:00 PM - 05:00 PM
MODERATOR: Mithila Jugulam
Kansas State University
Manhattan, KS

*SPEAKER

01:00 PM Introduction to Symposium. Mithila Jugulam*; Kansas State University, Manhattan, KS (333)

01:00 PM The International Weed Genomics Consortium: A Resource for Weed Genomics. Todd A. Gaines*1, Sarah Morran1, Paul Neve2, Eric L. Patterson3, Joseph S. McElroy4, Roland S. Beffa5, Mithila Jugulam6, Patrick Tranel7; 1Colorado State University, Fort Collins, CO, 2Rothamsted Research, Harpenden, United Kingdom, 3Michigan State University, East Lansing, MI, 4Auburn University, Auburn, AL, 5Bayer AG, CropScience Division, Frankfurt, Germany, 6Kansas State University, Manhattan, KS, 7University of Illinois, Urbana, IL (334)

01:10 PM Systems Biology and Synthetic Biology Unite: Towards Elucidation of Non-target Herbicide Resistance Mechanism in Conyza. Charles Neal Stewart*, Cristiano Piasecki, Yongil Neal Yang, Bryce Trull, Reginald Millwood; University of Tennessee, Knoxville, TN (335)

01:30 PM New Tools to Investigate and Manipulate Black-grass (Alopecurus myosuroides). Dana R. MacGregor*; Rothamsted Research, Harpenden, United Kingdom (336)

01:50 PM Using Genomics to Investigate Dioecy in Amaranthus Species. Patrick Tranel*; University of Illinois, Urbana, IL (337)

02:10 PM Molecular Cytogenetic Analysis of Herbicide-resistant Weeds. Dal-Hoe Koo*, Mithila Jugulam, Bernd Friebe, Bikram S. Gill; Kansas State University, Manhattan, KS (338)
02:30 PM  Break
02:45 PM  The eccDNA Replicon, Adaptive Potential, and Functional Genomics in Amaranthus Palmeri. Christopher A. Saski\textsuperscript{*1}, William T. Molin\textsuperscript{2};  \textsuperscript{1}Clemson University, Clemson, SC, \textsuperscript{2}USDA-ARS, Stoneville, MS (339)

03:05 PM  The Genome of Kochia scoparia: A Story of Evolution in Action. Eric L. Patterson\textsuperscript{*1}, Todd A. Gaines\textsuperscript{2}, Christopher A. Sasaki\textsuperscript{3}, Philip Westra\textsuperscript{2}, Crystal D. Sparks\textsuperscript{2}; \textsuperscript{1}Michigan State University, East Lansing, MI, \textsuperscript{2}Colorado State University, Fort Collins, CO, \textsuperscript{3}Clemson University, Clemson, SC (340)

03:25 PM  Canada Fleabane Genome Sequence. Martin Laforest\textsuperscript{*1}, Sara L. Martin\textsuperscript{2}, Eric R. Page\textsuperscript{3}; \textsuperscript{1}AAC-AAFC, St-jean-sur-richelieu, QC, Canada, \textsuperscript{2}AAC-AAFC, Ottawa, ON, Canada, \textsuperscript{3}Agriculture and Agri-Food Canada, Harrow, ON, Canada (341)

03:45 PM  Symposium Discussion. Mithila Jugulam\textsuperscript{*}; Kansas State University, Manhattan, KS (342)

\textbf{LOCATION:} Monarchy #5  
\textbf{TIME:} 01:00 PM - 05:00 PM  
\textbf{MODERATOR:} Alejandro Perez-Jones  
Bayer Crop Science  
Chesterfield, MO  
\textbf{CO-MODERATOR:} Ryan D. Lins  
Syngenta Crop Protection, LLC  
Rochester, MN  

\textbf{*SPEAKER}  \textbf{† STUDENT CONTEST}  
01:00 PM  Control of Multiple-herbicide-resistant Waterhemp in Corn. Christian A. Willemse\textsuperscript{*1}, Peter H. Sikkema\textsuperscript{1}, Amit J. Jhala\textsuperscript{2}, Darren E. Robinson\textsuperscript{1}, David C. Hooker\textsuperscript{1}; \textsuperscript{1}University of Guelph, Ridgetown, ON, Canada, \textsuperscript{2}University of Nebraska-Lincoln, Lincoln, NE (343)
01:15 PM †Does Amplification of the EPSPS Gene Alone Confer Glyphosate Resistance in Common Waterhemp. Balaji Aravindhan Pandian*, Sanzhen Liu, P.V. Var Prasad, Tesfaye Tesso, Mithila Jugulam; Kansas State University, Manhattan, KS (344)

01:30 PM Control of Glyphosate-Resistant Canada Fleabane with Three-Way Tankmixes in Soybean. Peter H. Sikkema*, Nader Soltani; University of Guelph, Ridgetown, ON, Canada (345)

01:45 PM †Horseweed (Erigeron canadensis) Growth Stage Response to Herbicide Technologies. Aaron Froemke*, Kirk A. Howatt; ¹North Dakota State University, Lisbon, ND, ²North Dakota State University, Fargo, ND (346)

02:00 PM A Kochia Population with Possible Field Resistance toDicamba, Fluroxypr and Glyphosate. Randall S. Currie¹, Patrick Geier¹, Chandrima Shyam², Mithila Jugulam²; ¹Kansas State University, Garden City, KS, ²Kansas State University, Manhattan, KS (347)

02:15 PM Characterizing Response of Glyphosate-, Dicamba-, and Fluroxypyr-Resistant Kochia to Atrazine and Metribuzin. Rui Liu*, Vipan Kumar¹, Randall S. Currie², Patrick Geier², Taylor Lambert¹, Phillip W. Stahlman¹; ¹Kansas State University, Hays, KS, ²Kansas State University, Garden City, KS (348)

02:30 PM Break

02:45 PM Heat Stress and Recurrent Herbicide Application May Speed the Evolution of Junglerice Tolerant to Florpyrauxifen-benzyl. Lariza Benedetti¹, Nilda Roma-Burgos², Luis A. Avila*¹; ¹Universidade Federal de Pelotas, Pelotas, Brazil, ²University of Arkansas, Fayetteville, AR (349)

03:00 PM Evaluation of Herbicide Resistance in Diverse Palmer Amaranth and Waterhemp Populations in the USA. Alejandro Perez-Jones*, Rong Ma¹, Chenxi Wu², Chandrashekar Aradhya¹; ¹Bayer Crop Science, Chesterfield, MO, ²Bayer CropScience, St Louis, MO (350)
03:15 PM  Investigation of Herbicide-resistant Redroot Pigweed (*Amaranthus retroflexus*) Populations in North Carolina. Eric A. Jones*, Wesley Everman, Ramon G. Leon; North Carolina State University, Raleigh, NC (351)

03:30 PM  Synthetic Auxins and Glufosinate Applied Sequentially for Control of Palmer Amaranth and Associated Physiological Response. Frances B. Browne*, Steve Li, Kaitlyn J. Price, Ryan D. Langemeier; Auburn University, Auburn, AL (352)

03:45 PM  Waterhemp (*Amaranthus tuberculatus*) and Palmer Amaranth (*Amaranthus palmeri*) Control in a Glyphosate, Glufosinate, and Dicamba Resistant Soybean Variety. Travis Legleiter*1, J. D. Green2; 1University of Kentucky, Princeton, KY, 2University of Kentucky, Lexington, KY (353)

04:00 PM  The Importance of Glufosinate for Managing Palmer Amaranth (*Amaranthus palmeri*) in Auxin-Based Herbicide Systems. Grace F. Flusche Ogden*1, Peter A. Dotray2, John Everitt3; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3Bayer - US Crop Science, Shallowater, TX (354)

04:15 PM  Discussion

---

**TUESDAY AFTERNOON  MARCH 3**

**ORAL - 01. Agronomic Crops II**

LOCATION:  Monarchy #6
TIME:  01:00 PM - 05:00 PM
MODERATOR:  Misha R. Manuchehri
Oklahoma State University
Stillwater, OK
CO-MODERATOR:  Joseph T. Ikley
North Dakota State University
Fargo, ND

*SPEAKER  † STUDENT CONTEST*
01:00 PM  Efficacy of a New Fluroxypyr + Arylex Active Weed Control Product in Wheat. Mike Moechnig*, Jeffery Krumm2, Joe Yenish3, Bruce Steward4, Patti Prasifka5, Dave Johnson6, Michael Lovelace7; 1Corteva Agriscience, Brookings, SD, 2Corteva Agriscience, Hastings, NE, 3Corteva Agriscience, Billings, MT, 4Corteva, Oklahoma City, OK, 5Corteva Agriscience, West Fargo, ND, 6Corteva Agriscience, Eagan, MN, 7Corteva Agriscience, Lubbock, TX (355)

01:15 PM  Assessment of Potential Allelopathic Effects of Pacific Northwest Winter Wheat Cultivars on Annual Weeds. Haifeng Xing1, Steve Young*2; 1Inner Mongolia Agricultural University, Hohhot City, China, 2Utah State University, Logan, UT (356)

01:30 PM  Efficacy and Crop Safety of a New Broadleaf Herbicide for Northern Plains Cereals Containing, Clopyralid, Halaxifen-methyl, and Fluroxypyr. Joe Yenish*1, Patti Prasifka2, Dave Johnson3, Mike Moechnig4; 1Corteva Agriscience, Billings, MT, 2Corteva Agriscience, West Fargo, ND, 3Corteva Agriscience, Eagan, MN, 4Corteva Agriscience, Brookings, SD (357)

01:45 PM  Feral Rye (Secale cereale) Control and Economics with ACCCase Tolerant Wheat Production System in Colorado. Eric P. Westra*, Todd A. Gaines; Colorado State University, Fort Collins, CO (358)

02:00 PM  Four Seasons of Italian Ryegrass (Lolium perenne Ssp. multiflorum) Management in Oklahoma Winter Wheat. Misha R. Manuchehri*, Justin T. Childers, Hannah C. Lindell, Lane S. Newlin; Oklahoma State University, Stillwater, OK (359)

02:15 PM  Is Dichlorprop-p Less Antagonistic Than 2,4-D to Group 1 Herbicides in Wheat? Kirk A. Howatt*, Joseph Mettler1, Paul O. Johnson2, Bob Bruss3; 1North Dakota State University, Fargo, ND, 2South Dakota State University, Brookings, SD, 3Nufarm Americas, Morrisville, NC (360)

02:30 PM  Break
02:45 PM  The Extent of Herbicide Resistance in Key Weeds of the Southeastern Australian Grain Production Region. Christopher Preston*1, John C. Broster2, Peter Boutsalis1, Gurjeet S. Gill3; 1University of Adelaide, Glen Osmond, Australia, 2Charles Sturt University, Wagga Wagga, Australia, 3University of Adelaide, Adelaide, Australia (361)

03:00 PM  †Herbicide Metabolism Affects Quizalofop Tolerance of CoAXium Wheat. Raven A. Bough*, Franck E. Dayan, Todd A. Gaines; Colorado State University, Fort Collins, CO (362)

03:15 PM  Voraxor: a New Novel Herbicide for Grass and Broadleaf Weed Control in Australian Winter Cereals. Ian Francis*1, Marco Montagna2, Russell Ison1, Gavin Heard3; 1BASF Australia, Tamworth, Australia, 2BASF Australia, Bannockburn, Australia, 3BASF Australia, Melbourne, Australia (363)

03:30 PM  †Non-Tolerant Wheat Response to Quizalofop-P-ethyl in Central Oklahoma. Justin T. Childers*1, Misha R. Manuchehri1, Vipan Kumar2, Tyson Ochsner1, Rui Liu3, Hannah C. Lindell1, Lane S. Newlin1; 1Oklahoma State University, Stillwater, OK, 2Kansas State University, Hays, KS (364)

03:45 PM  Dichlorprop-p Combinations with Auxin Herbicides for Weed Control in Chemical Fallow. Philip Westra*1, Kirk A. Howatt2, Greg R. Kruger3, Peter A. Dotray4, Misha R. Manuchehri5, Vipan Kumar6, Bob Bruss3; 1Colorado State University, Fort Collins, CO, 2North Dakota State University, Fargo, ND, 3University of Nebraska-Lincoln, North Platte, NE, 4Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 5Oklahoma State University, Stillwater, OK, 6Kansas State University, Hays, KS, 7Nufarm Americas, Morrisville, NC (365)

04:00 PM  †Dicotyledonous Weed Control with Pulse-Width Modulation (PWM) Technology. Kelly T. Satrom*, Kirk A. Howatt; North Dakota State University, Fargo, ND (366)

04:15 PM  Discussion
TUESDAY AFTERNOON  MARCH 3

ORAL - 02. Horticultural Crops

LOCATION:  Monarchy #1
TIME:  01:00 PM - 04:30 PM
MODERATOR:  Jesse M. Richardson
Corteva Agriscience
Mesa, AZ
CO-MODERATOR:  Matthew A. Cutulle
Clemson University
Charleston, SC

*SPEAKER  † STUDENT CONTEST

01:00 PM  Overlapping S-Metolachlor Treatments for Weed Control in Lima Bean. Kurt M. Vollmer*1, Mark VanGessel2, Quintin R. Johnson2, Barbara A. Scott2; 1University of Maryland, Queenstown, MD, 2University of Delaware, Georgetown, DE (367)

01:15 PM  Investigating the Genetic Basis of Herbicide Tolerance in Snap Bean. Martin Williams*1, Alvaro Garzon2, Phillip Miklas2, James Myers3, Ed Peachey3; 1USDA-ARS, Urbana, IL, 2USDA-ARS, Prosser, WA, 3Oregon State University, Corvallis, OR (368)

01:30 PM  Using Rimsulfuron Tank Mixes to Extend Residual Control of Pindar GT in Southeast Orchards. Christopher Holmberg*, Wayne E. Mitchem; North Carolina State University, Mills River, NC (369)

01:45 PM  Penoxsulam+Oxyfluorfen For Residual Weed Management in Western Pecans. Jesse M. Richardson*1, William B. McCloskey2; 1Corteva Agriscience, Mesa, AZ, 2University of Arizona, Tucson, AZ (370)

02:00 PM  Efficacy of Preemergent Herbicides in Watermelon Production on Bareground Vs. a Cereal Rye Cover. Matthew B. Bertucci*1, Amanda McWhirt1, Alden Hotz2, Lesley B. Smith2; 1University of Arkansas, Fayetteville, AR, 2University of Arkansas, Alma, AR (371)
02:15 PM  Novel Weed Management Tools for Horticulture Production in Florida. Ramdas Kanissery*; University of Florida, Immokalee, FL (372)

02:30 PM  Break

02:45 PM  Growth and Reproductive Response of Vidal Blanc Grapes to Dicamba. Sarah E. Dixon*, Reid Smeda; University of Missouri, Columbia, MO (373)

03:00 PM  Invasions of a New Species, Alkaliweed (Crussa truxillensis) in Orchards of California. Anil Shrestha*, James Schaeffer¹, Kurt J. Hembree²; ¹California State University, Fresno, Fresno, CA, ²University of California Cooperative Extension, Fresno, CA (374)

03:15 PM  Grape (Vitis vinifera) Response to 2,4-D Choline Applied as a Directed Spray in Vineyards. Wayne E. Mitchem*, Kira C. Sims², Christopher Holmberg¹, Katherine M. Jennings³; ¹North Carolina State University, Mills River, NC, ²North Carolina State University, Goldsboro, NC, ³North Carolina State University, Raleigh, NC (375)

03:30 PM  Effective Management of Yellow Nutsedge in Onion Depends on Herbicides Used in Preceding Crop Rotations. Joel Felix*; Oregon State University, Ontario, OR (376)

03:45 PM  Discussion

———

TUESDAY AFTERNOON  MARCH 3

———

ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants

LOCATION:  Monarchy #2
TIME:  01:00 PM - 05:00 PM
MODERATOR:  Harold Quicke
Bayer
Windsor, CO
CO-MODERATOR:  Shannon Clark
Colorado State Univ.
Fort Collins, CO

*SPEAKER  † STUDENT CONTEST
01:00 PM Scotch Broom (Cytisus scoparius) Seed Germination Responses to Light. Timothy B. Harrington*; USDA Forest Service - PNW Research Station, Olympia, WA (377)

01:15 PM †Revitalizing the Use of Crested Wheatgrass (Agropyron cristatum) for the Management of Annual Invasive Grasses. Emily B. Repas*, Daniel R. Tekiela; University of Wyoming, Laramie, WY (378)

01:30 PM Management Scale Application of Aminopyralid to Sterilize Medusahead (Taeniatherum caput-medusae) Seed on Rangeland. Jeremy James*1, Matthew J. Rinella2, Josh Davy3, Larry Forero4; 1University of California Division of Agriculture and Natural Resources, Browns Valley, CA, 2USDA-ARS, Miles City, MT, 3University of California Division of Agriculture and Natural Resources, Red Bluff, CA, 4University of California Division of Agriculture and Natural Resources, Redding, CA (379)

01:45 PM †Impact of Relative Early Emergence and Growth Rates of Cool-season Bunchgrasses on Priority Effects with Invasive Grasses. Jaycie N. Arndt*1, Brian Mealor2; 1University of Wyoming, Arvada, WY, 2University of Wyoming, Laramie, WY (380)

02:00 PM Perennial Pepperweed: Does the Drizzle Method of Herbicide Application Work? Thomas J. Getts*; University of California Cooperative Extension, Susanville, CA (381)

02:15 PM †Plant Community Data May Improve Susceptibility Modeling for Two Hieracium Species in the Greater Yellowstone Ecosystem. Christie Hubbard Guetling*1, Lisa C. Jones1, Don W. Morishita2, Eva K. Strand1, Julia L. Piaskowski1, Timothy S. Prather1; 1University of Idaho, Moscow, ID, 2University of Idaho, Kimberly, ID (382)

02:30 PM Break

02:45 PM †Evaluating Native Plant Community Response to Prescribed Burning and Indaziflam. Rachel H. Seedorf*, Shannon Clark, Scott J. Nissen; Colorado State University, Fort Collins, CO (383)
03:00 PM  Invader or Not? Utilizing Drone Remote Sensing to Identify Dalmatian Toadflax (*Linaria dalmatica*) in Rangelands. Chloe M. Mattilio*, Daniel R. Tekiela; University of Wyoming, Laramie, WY (384)

03:15 PM  †Integrated Management of Leafy Spurge (*Euphorbia esula*) Seed Production in a Riparian Ecosystem. Hannah A. D. Kuhns*, Daniel R. Tekiela; University of Wyoming, Laramie, WY (385)

03:30 PM  Western Salsify (*Tragopogon dubius*) and Cutleaf Vipergrass (*Scorzonera laciniata*) Response to Selective Herbicides. Shannon Clark*¹, Rachel H. Seedorf¹, Derek J. Sebastian², Scott J. Nissen¹; ¹Colorado State University, Fort Collins, CO, ²Bayer, Greeley, CO (386)

03:45 PM  †Evaluating the Efficacy of Herbicide to Manage Cheatgrass (*Bromus tectorum*) in High Elevation Sagebrush Steppe. Colter Mumford*, Jane Mangold, John Winnie, Catherine Zabinski, Lisa J. Rew; Montana State University, Bozeman, MT (387)

04:00 PM  Could Plant - Soil Feedback Play a Role in *Ventenata dubia*’s Invasion of the Inland Pacific Northwest? Lisa C. Jones*, Brenda Schroeder, Timothy S. Prather; University of Idaho, Moscow, ID (388)

04:15 PM  Discussion

---

**TUESDAY AFTERNOON  MARCH 3**

**ORAL - 07. Teaching and Extension/Teaching and Technology Transfer**

LOCATION:  Monarchy #3
TIME:  01:00 PM - 05:00 PM
MODERATOR:  Sandeep S. Rana
            Bayer Crop Science
            Galena, MD
CO-MODERATOR:  Thomas J. Getts
               UCCE
               Susanville, CA
01:00 PM  Herbicide Diversity Calculator: Interactive Web App That Estimates the Risk of Herbicide Resistance. Andrew R. Kniss¹, Albert T. Adjesiwor*¹, Nevin Lawrence²; ¹University of Wyoming, Laramie, WY, ²University of Nebraska-Lincoln, Scottsbluff, NE (389)

01:15 PM  Glyphosate and Seed Germination, is the Jury Still Out ? William T. Cobb*; Cobb Consulting Services, Kennewick, WA (390)

01:30 PM  Lessons Learned: Implementing Ventenata and Medusahead EDRR on a Mixed Ownership Landscape. Andrew C. Cassiday*¹, Brian Mealor², Luke Sander³; ¹USDA NRCS, Sheridan, WY, ²University of Wyoming, Laramie, WY, ³Sheridan County Weed and Pest, Sheridan, WY (391)

01:45 PM  Machine Vision: A Promising Tool for Smart Farming. Aman Rana*, Jeffrey Derr; Virginia Tech, Virginia Beach, VA (392)

02:00 PM  Winfield® United Clinics: Show and Tell for 21st Century Agriculture. Gregory K. Dahl*¹, Ryan J. Edwards², Lillian C. Magidow², Annie Makepeace², Genevieve M. Mrnak²; ¹WinField United, Eagan, MN, ²WinField United, River Falls, WI (393)


02:30 PM  Break

02:45 PM  The History and Future of Adjuvant Research and Education. Joe V. Gednalske¹, Gary Halvorson*²; ¹Council of Producers & Distributors of Agrotechnology, Washington, DC, ²Council of Producers and Distributors of Agrotechnology, Washington, DC (395)

03:00 PM  Using Plot Demonstrations to Improve Herbicide Decisions for Waterhemp in Iowa. Meaghan Anderson*¹, Angie Rieck-Hinz²; ¹Iowa State University, Nevada, IA, ²Iowa State University, Clarion, IA (396)
03:15 PM  Survey of Rice Growing Practices in California Identifies Perceptions and Management of Weeds and Weedy Rice. Elizabeth Karn¹, Serena Bhagirath¹, Luis Espino², Whitney Brim-DeForest*¹; ¹University of California Division of Agriculture and Natural Resources, Yuba City, CA, ²University of California Division of Agriculture and Natural Resources, Oroville, CA (397)

03:30 PM  An Update on Herbicide-Resistant Kochia and Palmer Amaranth in Western Kansas. Vipan Kumar*¹, Rui Liu¹, Taylor Lambert¹, Randall S. Currie², Phillip W. Stahlman¹; ¹Kansas State University, Hays, KS, ²Kansas State University, Garden City, KS (398)

03:45 PM  Weeds Week: Using Social Media to Teach About Weed Control. Jeanne S. Falk Jones*; Kansas State University, Colby, KS (399)

04:00 PM  Discussion

---

TUESDAY AFTERNOON  MARCH 3

ORAL - 09. Weed Biology and Ecology

LOCATION:  Monarchy #7
TIME:  01:00 PM - 04:45 PM
MODERATOR:  Caio A. Brunharo
Oregon State University
Corvallis, OR

CO-MODERATOR:  O. Adewale Osipitan
University of California-Davis
Davis, CA

*SPEAKER  † STUDENT CONTEST

01:00 PM  Kochia (Bassia scoparia) Biology and Ecology Provide Insight into Optimal Management Scenarios. Charles M. Geddes*; Agriculture and Agri-Food Canada, Lethbridge, AB, Canada (401)
01:15 PM  A Multi-state Examination of Weed Phenology and its Drivers. Lauren M. Lazaroo, Lovreet S. Shergill, Jeffrey Evans, Muthukumar V. Bagavathiannan, Mandy Bish, Jason A. Bond, Kevin W. Bradley, William S. Curran, Adam Davis, Wesley Everman, Michael L. Flessner, Nicholas Jordan, John Lindquist, Jason K. Norsworthy, Larry Steckel, Mark VanGessel, Steven B. Mirsky; Louisiana State University AgCenter, Baton Rouge, LA, USDA-ARS & University of Delaware, Beltsville, MD, Farmscape Analytics, Concord, NH, Texas A&M University, College Station, TX, University of Missouri, Columbia, MO, Mississippi State University, Stoneville, MS, Penn State University, University Park, PA, University of Illinois, Urbana, IL, North Carolina State University, Raleigh, NC, Virginia Tech, Blacksburg, VA, University of Minnesota, Saint Paul, MN, University of Nebraska-Lincoln, Lincoln, NE, University of Arkansas, Fayetteville, AR, University of Tennessee, Jackson, TN, University of Delaware, Georgetown, DE, USDA-ARS, Beltsville, MD (402)

01:30 PM  How is Dicamba Doing on Palmer Amaranth (Amaranthus palmeri) in the US Mid-South? Nilda Roma-Burgos, Matheus Machado Noguera, Larry Steckel, James W. Heiser, Taghi Bararpour, Robert L. Nichols; University of Arkansas, Fayetteville, AR, University of Tennessee, Jackson, TN, University of Missouri, Portageville, MO, Mississippi State University, Stoneville, MS, Cotton Incorporated, Cary, NC (403)

01:45 PM  Impact of Elevated Temperature, CO₂, and Soil Moisture Stress on Seed and Plant Morphological Traits of Italian Ryegrass (Lolium multiflorum). Aniruddha Maity, Zorica Vasic, Victor Cieza, Gerald Ray Smith, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX, Texas A&M University, Overton, TX (404)

02:00 PM  The Effects of Desiccation on Broad-leaved Dock (Rumex obtusifolius) and Curled Dock (Rumex crispus) Root Fragment Regeneration. Khalid S. Alshallash; Shaqra University / Saudi Arabia, Riyadh, Saudi Arabia (405)
02:15 PM Ethical Considerations for Predicting Future Distribution of Weeds. Bruce Maxwell*; Montana State University, Bozeman, MT (406)
Break

02:30 PM

02:45 PM A Model for Simulating Crop-Weed Competition for Light, Soil Water and Nitrogen. John Lindquist*1, Lammert Bastiaans2, Xinyou Yin2; 1University of Nebraska-Lincoln, Lincoln, NE, 2Wageningen University and Research, Wageningen, Netherlands (407)

03:00 PM Climate-Mediated Weed Species Composition Shifts in a Rainfed Corn System. Erin E. Burns*; Michigan State University, East Lansing, MI (408)

03:15 PM Development of a Novel Derived Polymorphic Amplified Cleaved Sequence (dPACS) Assay for the Identification of the Resistance-Causing D210 PPO Codon Deletion in Amaranthus and Ambrosia Species. Shiv S. Kaundun*, Sarah-Jane Hutchings, Elisabetta Marchegiani, Ruben Rauser, Lucy V. Jackson; Syngenta, Bracknell, United Kingdom (409)

03:30 PM An IAA16 Mutation Endowing Dicamba Resistance in Kochia (Bassia scoparia) Also Alters Plant Architecture, Vegetative and Reproductive Development, and Reduces Plant Competitiveness. Chenxi Wu*1, Marta Paciorek1, Sherry LeClere1, Kang Liu1, Alejandro Perez-Jones2, Philip Westra1, Doug Sammons4; 1Bayer CropScience, St Louis, MO, 2Bayer Crop Science, Chesterfield, MO, 3Colorado State University, Fort Collins, CO, 4Sammons BFC LLC, St Louis, MO (410)

03:45 PM Common Sowthistle (Sonchus oleraceus) and Prickly Lettuce (Lactuca serriola) in Lentil (Lens culinaris) Crops of Southern Australia: Managing Herbicide Resistance and Highly Mobile Resistance Genes. Alicia B. Merriam*1, Jenna Malone1, Gurjeet S. Gill1, Christopher Preston2; 1University of Adelaide, Adelaide, Australia, 2University of Adelaide, Glen Osmond, Australia (411)

04:00 PM Discussion
3MT Student Oral Competition – Final Round

LOCATION: Monarchy #3
TIME: 09:00 AM - 11:00 AM
MODERATOR: Darrin M. Dodds
Mississippi State University
Mississippi State, MS
CO-MODERATOR: Marty Schraer
Meridian, ID

SYMPOSIUM - 1. 2020 Vision for Hawaiian Invasive Plant Management

LOCATION: Monarchy #2
TIME: 09:00 AM - 12:00 PM
MODERATOR: David R. Clements
Trinity Western University
Langley, BC, Canada
CO-MODERATOR: Curtis Daehler
University of Hawaii at Manoa
Waipahu, HI

*SPEAKER

09:00 AM Introduction to Symposium. David R. Clements*, 1 Curtis Daehler*, 1 Trinity Western University, Langley, BC, Canada, 2 University of Hawaii at Manoa, Waipahu, HI (412)

09:10 AM Invasive Plant Establishment and Spread in the Hawaiian Islands: History, Current Trends, and Strategies for Prevention. Curtis Daehler*, 1 Kelsey Brock*, 1 University of Hawaii at Manoa, Waipahu, HI, 2 University of Hawaii at Manoa, Honolulu, HI (413)
09:30 AM The Risk and Resources for Mitigating an Incipient Miconia Invasion. David Lewis*, James Leary, Kimberly Burnett, Chris Wada, Brooke Mahnken; 1University of Hawaii at Manoa- Department of Natural Resources and Environmental Management, Honolulu, HI, 2University of Florida, Gainesville, FL, 3University of Hawaii at Manoa- University of Hawaii Office of Economic Research, Honolulu, HI, 4University of Hawaii at Manoa- Maui Invasive Species Committee, Makawao, HI (414)

09:50 AM Synergies Between Nonnative Ungulate and Plant Invasions in Hawai’i – Can the Tide be Turned? Creighton M. Litton*, Rebecca J. Cole, Jed P. Sparks, Christian P. Giardina, Amanda Knauf; 1University of Hawaii at Manoa, Honolulu, HI, 2Osa Conservation, Puerto Jiménez, Costa Rica, 3Cornell University, Ithaca, NY, 4Institute of Pacific Islands Forestry, USDA Forest Service, Hilo, HI (415)

10:10 AM Break

10:30 AM Challenges for Restoration of Invaded Hawaiian Landscapes: Why We Need the Hybrid Ecosystem Concept. Rebecca Ostertag*, Nicole DiManno, Susan Cordell, Amanda Uowolo; 1University of Hawaii at Hilo, Hilo, HI, 2Institute of Pacific Islands Forestry, USDA Forest Service, Hilo, HI (416)

10:50 AM Challenges for Restoration of Invaded Hawaiian Wet Forest Ecosystems. Christy Martin*; UH PCSU/Coordinating Group on Alien Pest Species, Honolulu, HI (417)

11:10 AM Challenges for Restoration of Invaded Hawaiian Dry Forest Ecosystems. Susan Cordell*; Institute of Pacific Islands Forestry, USDA Forest Service, Hilo, HI (418)

11:30 AM Hawaiian Invasions as a Call for Help for Invasions Throughout the Pacific Islands – What Hope is There for the Future of Island Ecosystems? David R. Clements*; Trinity Western University, Langley, BC, Canada (419)

11:50 AM Discussion. David R. Clements*, Curtis Daehler; 1Trinity Western University, Langley, BC, Canada, 2University of Hawaii at Manoa, Waipahu, HI (420)
SYMPOSIUM - 2. The Role of Intelligent Machines in Weed Management

LOCATION: Monarchy #4
TIME: 09:00 AM - 04:30 PM
MODERATOR: Steve Fennimore
University of California - Davis
Salinas, CA
CO-MODERATOR: Sharon Clay
SDSU
Brookings, SD

*SPEAKER

09:00 AM  Introduction to Symposium. Sharon Clay*; South Dakota State University, Brookings, SD (421)

09:15 AM  Deep Learning and Weed Management - from Data Acquisition to Control of Herbicide-Resistant Weeds. William L. Patzoldt*; Blue River Technology, Sunnyvale, CA (422)

09:45 AM  Weed 4.0—A Data-Driven Weed Science and Technology. Mohsen B. Mesgaran*; University of California, Davis, Davis, CA (423)

10:15 AM  Break

10:30 AM  Tackling the Herbicide Resistant Weed Crisis with Teams of Mechanical Agbots. Girish Chowdhary*; University of Illinois, Champaign, IL (424)

11:00 AM  Autonomous Weeding in Vegetable Crops. Thomas Palomares*; FarmWise, San Francisco, CA (425)

11:30 AM  Economic Considerations for Automated Weed Management in Vegetable Crops. Laura Tourte*; University of California Cooperative Extension, Watsonville, CA (426)

12:00 PM  Lunch
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:00 PM</td>
<td>Linkage Between Workforce Development and Precision Agriculture Diffusion. Scott Fausti*, Sumadhur Shakya¹, Sharon Clay², David Clay², Bruce Erickson³; ¹California State Univ. Monterey Bay, Marina, CA, ²South Dakota State University, Brookings, SD, ³Purdue University, West Lafayette, IN (427)</td>
</tr>
<tr>
<td>01:30 PM</td>
<td>2D And 3D Vision Techniques for Crop Plant Detection in Mechanical Intra-row Weed Control. Lie Tang*; Iowa State University, Ames, IA (428)</td>
</tr>
<tr>
<td>02:00 PM</td>
<td>Machine Vision Systems for Automated Weeding – Current Technologies and Future Directions. Mark C. Siemens*; University of Arizona, Yuma, AZ (429)</td>
</tr>
<tr>
<td>02:30 PM</td>
<td>Break</td>
</tr>
<tr>
<td>02:45 PM</td>
<td>Precision Crop Protection: Soil Management Zones for Optimizing Weed Control Efficacy. Anita Dille*, Garrison J. Gundy²; ¹Kansas State University, Manhattan, KS, ²Valent U.S.A LLC, Seymour, IL (430)</td>
</tr>
<tr>
<td>03:15 PM</td>
<td>The Advent of Autonomous Solutions in the Management of Weeds, and its Impact on the Use of Chemicals for Precision Agriculture. Wade Robey*; Raven Industries, Sioux Falls, SD (431)</td>
</tr>
<tr>
<td>03:45 PM</td>
<td>Panel and Open Discussion. Steve Fennimore*; University of California, Davis, Salinas, CA (432)</td>
</tr>
</tbody>
</table>

**WEDNESDAY MORNING MARCH 4**

**ORAL - 01. Agronomic Crops I**

**LOCATION:** Monarchy #5  
**TIME:** 09:00 AM - 12:00 PM  
**MODERATOR:** Vipan Kumar  
Kansas State University  
Hays, KS  
**CO-MODERATOR:** Misha R. Manuchehri  
Oklahoma State University  
Stillwater, OK
09:00 AM  †Herbicides for Industrial Hemp Grain Production. Joseph Mettler*, Kirk A. Howatt; North Dakota State University, Fargo, ND (433)

09:15 AM  Common Ragweed (Ambrosia artemisiifolia) and Palmer Amaranth (Amaranthus palmeri) Control and Fecundity from POST Herbicides at Various Growth Stages with and without Fomesafen. Eric B. Scruggs*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (434)

09:30 AM  †Herbicide Potential for Palmer Amaranth (Amaranthus palmeri) Control in Sugarbeet, Selectivity of Desmedipham and Phenmedipham. Clint W. Beiermann*, Cody F. Creech1, Amit J. Jhala2, Stevan Knezevic3, Robert Harveson1, Nevin Lawrence1; 1University of Nebraska-Lincoln, Scottsbluff, NE, 2University of Nebraska-Lincoln, Lincoln, NE, 3University of Nebraska-Lincoln, Concord, NE (435)

09:45 AM  Comparing Weed Communities of Perennial and Annual Small Grain Cropping Systems. Eugene P. Law*, Matthew P. Spoth1, Sandra Wayman1, Christopher J. Pelzer1, Matthew R. Ryan1, Antonio DiTommaso2; 1Cornell University, Ithaca, NY, 2Cornell University, Dryden, NY (436)

10:00 AM  †Herbicide Efficacy on Threespike Goosegrass (Eleusine tristachya) in California Orchards. Drew A. Wolter*, Brad Hanson2; 1University of California, Davis, Sacramento, CA, 2University of California, Davis, Winters, CA (437)

10:15 AM  Break

10:30 AM  Trials and Tribulations with the Integrated Harrington Seed Destructor in Arkansas. Tom Barber*, Thomas R. Butts1, Jason K. Norsworthy2; 1University of Arkansas System Division of Agriculture, Lonoke, AR, 2University of Arkansas, Fayetteville, AR (438)

10:45 AM  Initial Impressions of the Seed Terminator™ as a Harvest Weed Seed Control Tool After One Season of Evaluation in Missouri. Kevin W. Bradley*; University of Missouri, Columbia, MO (439)
11:00 AM  Man vs. Machine: Using Drone Aerial Imagery to Accurately Quantify Herbicide Tolerance. Eric N. Johnson, Christian J. Willenborg, Steve Shirtliffe*, Hemma Duddu; University of Saskatchewan, Saskatoon, SK, Canada (440)

11:15 AM  The Role of Unintelligent Machines in Weed Management. Eric N. Johnson*, Steven J. Shirtliffe; University of Saskatchewan, Saskatoon, SK, Canada (441)

11:30 AM  Integrating Gene Editing and Synthetic Biology to Develop Next-Generation Herbicide Resistant Crops. Lucas Lieber*; BIOHEURIS, St. Louis, MO (442)

11:45 AM  Value of Weed Maps at Harvest in Wheat Cropping Systems of the PNW. Judit Barroso*, Carolina San Martin Hernandez, John D. McCallum, Dan S. Long; Oregon State University, Adams, OR, USDA-ARS, Adams, OR (443)

WEDNESDAY MORNING  MARCH 4

ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants

LOCATION: Monarchy #1
TIME: 09:00 AM - 12:00 PM
MODERATOR: Glenn Nice
University of Wisconsin
Madison
Madison, WV
CO-MODERATOR: Mark J. Renz
University of Wisconsin
Madison
Madison, WV

*SPEAKER  † STUDENT CONTEST

09:00 AM  †Impacts of Indaziflam on Biodiversity of Intact Sage-brush Steppe Plant Communities. Jordan Meyer-Morey*, Lisa J. Rew, Jane Mangold; Montana State University, Bozeman, MT (444)
Management of Red Bromegrass (*Bromus rubens*) with Indaziflam and Other Pre-Emergent Herbicides. John H. Brock*; Arizona State University, Tempe, AZ (445)

†Influence of Seeding Depth on Native Species Establishment in the Presence of Indaziflam. Jodie A. Crose*1, Brian Mealor2; 1University of Wyoming, Sheridan, WY, 2University of Wyoming, Laramie, WY (446)


†Florpyrauxifen-benzyl: A Novel Auxin Herbicide for Aquatic Plant Management. Mirella F. Ortiz*, Franck E. Dayan; Colorado State University, Fort Collins, CO (448)

‡Management of Ventenata (*Ventenata dubia*) with Indaziflam at Different Preemergent Timings on Conservation Reserve Program Land. Jared A. Beuschlein*1, Rachel J. Zuger1, Timothy S. Prather2, Harold Quicke3, Ian Burke1; 1Washington State University, Pullman, WA, 2University of Idaho, Moscow, ID, 3Bayer, Windsor, CO (449)

Changes in Botanical Canopy Cover and Seasonal Forage Production with Herbicide Impregnated Dry Fertilizer. Scott Flynn*1, Byron B. Sleugh2, D Chad Cummings3, William L. Hatler4, David E. Hillger5; 1Corteva Agriscience, Lee's Summit, MO, 2Corteva Agriscience, Carmel, IN, 3Corteva Agriscience, Bonham, TX, 4Corteva Agriscience, Meridian, ID, 5Corteva Agriscience, Thorntown, IN (450)

†The Effect of Common and Novel Pasture Herbicides on Forage Grass Establishment. Wykle C. Greene*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (451)

11:15 AM Growth Regulator Effects on Ventenata (*Ventenata dubia*) Seed Viability Under Field Conditions. Beth Fowers*1, Brian Mealor2, William L. Hatler3; 1University of Wyoming, Sheridan, WY, 2University of Wyoming, Laramie, WY, 3Corteva Agriscience, Meridian, ID (452)
11:30 AM †Impacts of Simulated Trampling on Nonstructural Carbohydrates in Yellow-Flag Iris (*Iris pseudacorus*). Alexandra L. Stoneburner*; Colorado State University, Fort Collins, CO (453)

11:45 AM Long-term Outcome of Integrating Herbicide and Seeding in Leafy Spurge (*Euphorbia esula*)-Invaded Rangeland. Matthew J. Rinella¹, Alan D. Knudsen², Jim S. Jacobs³, Jane Mangold*⁴; ¹USDA-ARS, Miles City, MT, ²Missoula County Weed District, Missoula, MT, ³NRCS, retired, Bozeman, MT, ⁴Montana State University, Bozeman, MT (454)

---

**WEDNESDAY MORNING MARCH 4**

**ORAL - 11. Physiology**

LOCATION: Monarchy #6
TIME: 09:00 AM - 12:00 PM
MODERATOR: Te-Ming (Paul) Tseng Mississippi State University
CO-MODERATOR: Chenxi Wu Bayer CropScience

*SPEAKER † STUDENT CONTEST

09:00 AM Role of Epigenetics Modifications in the Development of Herbicide Resistance. Gourav Sharma*, Jacob Barney, Shawn Askew, James Westwood, David Haak, Suzanne Laliberte, Liqing Zhang; Virginia Tech, Blacksburg, VA (455)

09:15 AM A Characterization of Tissue Specific Alpha-Tubulin Gene Expression Two Grass Species, Annual Bluegrass (*Poa annua*) and Finger Millet (*Eleusine coracana*). Nathan D. Hall*, Jinesh D. Patel, Elijah C. Russell, James Harris, Leslie R. Goertzen, Joseph S. McElroy; Auburn University, Auburn, AL (456)
09:30 AM  Establishing a Basis for 2,4-D Tolerance in Red Clover (Trifolium pratense): RNA-seq Analysis of Susceptible and Tolerant Cultivars Following 2,4-D Application. Lucas Araujo*1, Michael Barrett1, Randy Dinkins2, Linda D. Williams1, Troy Bass2; 1University of Kentucky, Lexington, KY, 2USDA/FAPRU, Lexington, KY (457)

09:45 AM  Mechanisms of 2,4-D Resistance in Palmer Amaranth. Wendy A. Peer*; University of Maryland, College Park, MD (458)

10:00 AM  Investigation of Lactofen Resistance in a Population of Amaranthus palmeri. Jacob S. Montgomery*, Darci A. Giacomini, Patrick Tranel; University of Illinois, Urbana, IL (459)

10:15 AM  Break

10:30 AM  Integrating UPLC-qTOF-MS and UPLC-MS/MS to Characterize Resistance to Bentazon in Chenopodium album L. Populations from Oregon. Lucas Baiocchi Riboldi*, Ed Peachey, Andrew G. Hulting, Caio A. Brunharo; Oregon State University, Corvallis, OR (460)

10:45 AM  QTL Discovery for Resistance to HPPD Inhibitors in Amaranthus tuberculatus. Brent P. Murphy*, Patrick Tranel; University of Illinois, Urbana, IL (461)

11:00 AM  Modes of Action of Two Natural Herbicides in the Bioherbicide MBI-014. Stephen O. Duke*1, Franck E. Dayan2, Louis G. Boddy3, Zhiqiang Pan4, Joanna Basja-Hirschel4; 1University of Mississippi, Oxford, MS, 2Colorado State University, Fort Collins, CO, 3Marrone Bio Innovations, Davis, CA, 4USDA-ARS, Oxford, MS (462)

11:15 AM  Resistance to a Non-Selective HPPD-Inhibiting Herbicide in Multiple-Resistant Waterhemp (Amaranthus tuberculatus) Populations. Jeanaflor Crystal Concepcion1, Sarah-Jane Hutchings2, James Morris2, Shiv S. Kaundun2, Anatoli V. Lygin1, Dean E. Riechers*1; 1University of Illinois, Urbana, IL, 2Syngenta, Bracknell, United Kingdom (463)
11:30 AM  The Transcriptional Landscape of Glyphosate Resistance in Palmer Amaranth (Amaranthus palmeri): More Than EPSPS Gene Amplification. William T. Molin*,1, Christopher A. Saski2; 1USDA-ARS, Stoneville, MS, 2Clemson University, Clemson, SC (464)

11:45 AM  Progress in the Characterization of CYPs and GSTs Involved in Weed Resistance to Herbicides. Functional Validation. Roland S. Beffa*; Bayer AG, CropScience Division, Frankfurt, Germany (465)

WEDNESDAY MORNING  MARCH 4

ORAL - 13. Integrated Weed Management

LOCATION:  Monarchy #7
TIME:  09:00 AM - 12:00 PM
MODERATOR:  Vijay Singh
Virginia Tech
Painter, VA
CO-MODERATOR:  Shilpa Singh
Texas A&M University
College Station, TX

*SPEAKER  † STUDENT CONTEST

09:00 AM  Multiple Modes of Selection Prove Successful in Managing Horseweed (Conyza canadensis (L.) Cronq.). Theodore R. Vanhie*,1, Michael Cowbrough2, Clarence Swanton3, Francois Tardif1; 1University of Guelph, Guelph, ON, Canada, 2Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, ON, Canada, 3University of Guelph, Guelph, AZ, Canada (466)

09:15 AM  Pollen Swamping Population Management Possibilities for Waterhemp (Amaranthus tuberculatus) Simulated in silico. Brendan C. Alexander*, Patrick Tranel, Aaron Hager, Nicolas F. Martin, Adam Davis; University of Illinois, Urbana, IL (467)
09:30 AM  Unexpected Resistance Evolution to a Carotenoid Biosynthesis Inhibiting Herbicide in Field Selected Cross-Resistant Rigid Ryegrass (Lolium rigidum) Populations from Australia. David J. Brunton*; University of Adelaide, Adelaide, Australia (468)

09:45 AM  Present Status and Future Strategies for the Management of Herbicide Resistant Weeds of Wheat in India. Samunder Singh*; CCS HAU Hisar, Hisar, India (469)

10:00 AM  Long-term Multi-tactic Herbicide Resistance Weed Management. Steven B. Mirsky*, Lovreet S. Shergill, Mark VanGessel, Jason K. Norsworthy, Adam Davis; USDA-ARS, Beltsville, MD, USDA-ARS & University of Delaware, Beltsville, MD, University of Delaware, Georgetown, DE, University of Arkansas, Fayetteville, AR, University of Illinois, Urbana, IL (470)

10:15 AM  Break

10:30 AM  The Western IPM Kochia Work Group: Update and Next Steps. Todd A. Gaines*, Charles M. Geddes, Philip Westra, Kelly Bennett, Cody F. Creech, Rory Degenhardt, Mithila Jugulam, Rand Merchant, Sarah Morran, Olivia E. Todd; Colorado State University, Fort Collins, CO, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, Corteva Agriscience Canada, Calgary, AB, Canada, University of Nebraska-Lincoln, Scottsbluff, NE, Affiliation Not Specified, Edmonton, AB, Canada, Kansas State University, Manhattan, KS, BASF, Greeley, CO (471)

10:45 AM  Efficacy of Cotton and Peanut Residual Herbicides in High Residue Cover Crop System. Katilyn J. Price*, Steve Li, Frances B. Browne, Ryan D. Langemeier; Auburn University, Auburn, AL (472)

11:00 AM  Impact of Four Winter Cover Crop Species and Termination Timing on Weed Suppression, Soil Moisture Dynamics, and Yield in Cotton. Spencer L. Samuelson, Muthukumar V. Bagavathiannan; Texas A&M University, College Station, TX (473)
11:15 AM  Using Living Mulch in Reduced Tillage Sweet Corn. Alan W. Leslie*, Veronica Yurchak, Cerruti R. Hooks; University of Maryland, College Park, MD (474)

11:30 AM  Cover Crop-based Weed Management in Soybean Across mid-Atlantic, North-central, and South-central United States. Lovreet S. Shergill*1, Mark VanGessel2, Michael L. Flessner3, Muthukumar V. Bagavathiannan4, Kevin W. Bradley5, John Lindquist6, Jason A. Bond7, Lauren M. Lazar08, Adam Davis9, Jason K. Norsworthy10, William S. Curran11, Wesley Everman12, George Frisvold13, Nicholas Jordan14, Larry Steckel15, Steven B. Mirsky16; 1USDA-ARS & University of Delaware, Beltsville, MD, 2University of Delaware, Georgetown, DE, 3Virginia Tech, Blacksburg, VA, 4Texas A&M University, College Station, TX, 5University of Missouri, Columbia, MO, 6University of Nebraska-Lincoln, Lincoln, NE, 7Mississippi State University, Stoneville, MS, 8Louisiana State University AgCenter, Baton Rouge, LA, 9University of Illinois, Urbana, IL, 10University of Arkansas, Fayetteville, AR, 11Penn State University, University Park, PA, 12North Carolina State University, Raleigh, NC, 13University of Arizona, Tucson, AZ, 14University of Minnesota, Saint Paul, MN, 15University of Tennessee, Jackson, TN, 16USDA-ARS, Beltsville, MD (475)

11:45 AM  †Evaluation of Post Emergence Applications of Mustard Seed Meal in Chile Pepper. Asmita Nagila*, Brian J. Schutte, Soum Sanogo, John Idowu; New Mexico state university, Las Cruces, NM (476)

WEDNESDAY AFTERNOON MARCH 4

ORAL - 01. Agronomic Crops I

LOCATION:  Monarchy #5
TIME:  01:00 PM - 04:30 PM
MODERATOR:  Ryan D. Lins
Syngenta Crop Protection, LLC
Rochester, MN
CO-MODERATOR:  Alejandro Perez-Jones
Bayer Crop Science
Chesterfield, MO

86
*SPEAKER

01:00 PM  Sustaining the Utility of Herbicides in U.S. Agriculture: What Have We Learned and What is the Path Forward? Jason K. Norsworthy*¹, Muthukumar V. Bagavathiannan²; ¹University of Arkansas, Fayetteville, AR, ²Texas A&M University, College Station, TX (477)

01:15 PM  Presence of Neighbouring Weeds Alters the Response of Maize to Thiamethoxam. Megan House¹, Sasan Amirsadeghi², Clarence Swanton*³, Lewis Lukens²; ¹University of Saskatchewan, Saskatoon, SK, Canada, ²University of Guelph, Guelph, ON, Canada, ³University of Guelph, Guelph, AZ, Canada (478)

01:30 PM  Italian Ryegrass (Lolium perenne Ssp. multiflorum) Timing of Removal Effects on Corn Growth and Yield in Mississippi. Michael T. Wesley Jr.¹, J Connor Ferguson*¹, Jason A. Bond², Daniel B. Reynolds¹, Erick J. Larson¹; ¹Mississippi State University, Mississippi State, MS, ²Mississippi State University, Stoneville, MS (479)

01:45 PM  Optimizing the Use of Pyroxasulfone for Grass Weed Control in Cool-Season Grasses Grown for Seed. Andrew G. Hulting*, Kyle Roerig, Caio A. Brunharo, Carol Mallory-Smith; Oregon State University, Corvallis, OR (480)

02:00 PM  Effect of Cereal Residual Herbicides on Faba Bean Planted the Following Season. Sid A. Darras*, Eric N. Johnson, Christian J. Willenborg; University of Saskatchewan, Saskatoon, SK, Canada (481)

02:15 PM  Intercropping Winter Wheat into Forage Radish (Raphanus sativus). Michael L. Flessner*¹, Kara Pittman¹, Mark S. Reiter², Eric B. Scruggs¹, Kevin W. Bamber¹; ¹Virginia Tech, Blacksburg, VA, ²Virginia Tech, Painter, VA (482)

02:30 PM  Break

02:45 PM  Helping Glufosinate Work in the West: Adjuvants, Rates, and Timings. Andrew R. Kniss*; University of Wyoming, Laramie, WY (483)
03:00 PM  Preplant Burndown Weed Control with Elevore® Herbicide with Arylex™ Active. Joe Armstrong*1, Kristin Rosenbaum2, David Saunders3; 1Corteva Agriscience, Indianapolis, IN, 2Corteva Agriscience, Coffey, MO, 3Corteva Agriscience, Dallas Center, IA (484)

03:15 PM  Introduction and Overview of MON 301107: A New Glyphosate Formulation. Christopher M. Mayo*1, Ross A. Recker2, David J. Mayonado3, Neha Rana4; 1Bayer, Gardner, KS, 2Bayer, Smithton, IL, 3Bayer, Hebron, MD, 4Bayer Crop Science, St Louis, MO (485)

03:30 PM  The Bicyclopyrone Weed Control Advantage in a New Premix Product Concept for Corn. Ryan D. Lins*1, Thomas H. Beckett2, Scott E. Cully3, Gordon D. Vail2, Dane L. Bowers2; 1Syngenta, Rochester, MN, 2Syngenta, Greensboro, NC, 3Syngenta, Marion, IL (486)

03:45 PM  Triazine Benefits in Corn and Sorghum. Carroll Moseley*1, David Bridges2, Patricia D. Laird3; 1Syngenta, High Point, NC, 2Abraham Baldwin University, Tifton, GA, 3Syngenta Crop Protection, Greensboro, NC (487)

04:00 PM  Dimetric Charged: A New Option for Burndown and Residual Weed Control. Ryan J. Edwards*1, Gregory K. Dahl2; 1WinField United, River Falls, WI, 2WinField United, Eagan, MN (488)

04:15 PM  Impact of Pre-Harvest Glyphosate on Oat (Avena sativa). Christian J. Willenborg*1, Eric N. Johnson1, Nancy Ames2; 1University of Saskatchewan, Saskatoon, SK, Canada, 2Agriculture and Agri-Food Canada, Winnipeg, MB, Canada (489)
ORAL - 01. Agronomic Crops II

LOCATION: Monarchy #6
TIME: 01:00 PM - 04:30 PM
MODERATOR: Joseph T. Ikley
North Dakota State University
Fargo, ND
CO-MODERATOR: Misha R. Manuchehri
Oklahoma State University
Stillwater, OK

*SPEAKER

01:00 PM  Future of Academic Weed Science from Hemp to Students to Cancer. David D. Baltensperger*; Texas A&M University, College Station, TX (490)

01:15 PM  Weed Management in Cotton as Influenced by Cover Crop and Herbicide Program. Pratap Devkota*, Ruby Tiwari, Prasanna Kharel, Michael J. Mulvaney; University of Florida, Jay, FL (491)

01:30 PM  Florpyrauxifen-benzyl Sensitivity in Gossypium hirsutum, as Influenced by Application Placement. Ryan C. Doherty*, Tom Barber2, Leah M. Collie3, Zachary T. Hill4; 1University of Arkansas Division of Agriculture Research Extension, Monticello, AR, 2University of Arkansas System Division of Agriculture, Lonoke, AR, 3University of Arkansas System Division of Agriculture, Beebe, AR, 4University of Arkansas Cooperative Extension Service, Monticello, AR (492)

01:45 PM  Kochia (Bassia scoparia) Control in Enlist™ Cotton (Gossypium hirsutum) Following Different Preplant Herbicide Options in the Texas High Plains. Ubaldo Torres41, Peter A. Dotray2, Kyle R. Russell1, Michael Lovelace3; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3Corteva Agriscience, Lubbock, TX (493)
Use of Isoxaflutole as an Alternative Herbicide Site of Action in Cotton. Rodger B. Farr*1, Jason K. Norsworthy1, Tom Barber2, Grant L. Priess1, Mason C. Castner1; 1University of Arkansas, Fayetteville, AR, 2University of Arkansas System Division of Agriculture, Lonoke, AR (494)

Evaluating Tank Mix Partners with Isoxaflutole Across the Cotton Belt. Delaney C. Foster*1, Peter A. Dotray2, Seth A. Byrd3, A Stanley Culpepper4, Darrin M. Dodds5, Steven D. Hall6, Bradley J. Norris3, Reagan L. Noland7, Scott A. Nolte8, Mason T. House9, Jason K. Norsworthy10, Rodger B. Farr10, Larry Steckel11, Corey Thompson12; 1Texas Tech University, Lubbock, TX, 2Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX, 3Oklahoma State University, Stillwater, OK, 4University of Georgia, Tifton, GA, 5Mississippi State University, Mississippi State, MS, 6Mississippi State University, Starkville, MS, 7Texas A&M Agrilife Extension Service, San Angelo, TX, 8Texas A&M AgriLife Extension, College Station, TX, 9Texas A&M University, College Station, TX, 10University of Arkansas, Fayetteville, AR, 11University of Tennessee, Jackson, TN, 12BASF, Abernathy, TX (495)

Break

Safety of Pre- and Early-post Herbicides to Hemp for Seed Production. Angela R. Post*; North Carolina State University, Raleigh, NC (496)

Challenges and Opportunities for Weed Control in Popcorn. Ethann R. Barnes*1, Stevan Knezevic2, Nevin Lawrence3, Amit J. Jhala1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Concord, NE, 3University of Nebraska-Lincoln, Scottsbluff, NE (497)

Utility of Two New Premix Concepts Containing Rinskor Active for Improved Efficacy and Weed Spectrum in MidSouth Rice Production. Drew Ellis*1, Larry C. Walton2, Hunter Perry3, Chris J. Meyer3, Jeff Ellis4, Mauricio Morell5; 1Corteva Agriscience, Arlington, TN, 2Corteva, Tupelo, MS, 3Corteva agriscience, Leland, MS, 4Dow AgroSciences, Sterlington, LA, 5Corteva Agriscience, Indianapolis, IN (498)
03:30 PM  Efficacy and Crop Safety of Rinskor™ Active (Florpyrauxifen-benzyl) in California Rice. Stephen F. Colbert*¹, Mauricio Morelli²; ¹Corteva Agriscience, Escalon, CA, ²Corteva Agriscience, Indianapolis, IN (499)

03:45 PM  Rice Production in Canada and Challenges of Weed Management. Kalidas Subedi*; Agriculture and Agri-Food Canada, Ottawa, ON, Canada (500)

04:00 PM  Efficacy of Metamitron Applied PRE in the High Plains Sugar Beet Production Region. Andrew R. Kniss*; University of Wyoming, Laramie, WY (501)

04:15 PM  Volunteer Corn Management with Fluazifop + Dicamba Tank Mixtures in Dicamba Tolerant Soybean. Marty Schraer*¹, Peter Eure², Thomas H. Beckett², Marshall Hay³, Sudeep Matthew⁴, Ethan T. Parker⁵; ¹Syngenta, Meridian, ID, ²Syngenta, Greensboro, NC, ³Syngenta, Vero Beach, FL (502)

---

**WEDNESDAY AFTERNOON  MARCH 4**

**ORAL - 03. Turf and Ornamentals**

LOCATION:  Monarchy #3
TIME:  01:00 PM - 04:30 PM
MODERATOR:  Anthony L. Witcher
Tennessee State University
McMinnville, TN
CO-MODERATOR:  Sandeep S. Rana
Bayer Crop Science
Galena, MD

*SPEAKER

01:00 PM  Crew Specialty Herbicide (Dithiopyr + Isoxaben): A New Herbicide for Broad-Spectrum Weed Control in Turf and Ornamentals. David E. Hillger*¹, Amy L. Agi², Paul Marquardt³; ¹Corteva Agriscience, Thorntown, IN, ²Corteva Agriscience, Brooks, GA, ³Corteva Agriscience, Des Moines, IA (503)
Moisture Status Affects Efficacy of Foramsulfuron for Postemergence Goosegrass (Eleusine indica) Control. James Brosnan*1, Avat Shekoofa2, Matthew T. Elmore3, Jose J. Vargas1, Dan Tuck3, Greg Breeden1, Joaquin Simon2; 1University of Tennessee, Knoxville, TN, 2University of Tennessee, Jackson, TN, 3Rutgers University, New Brunswick, NJ (504)

Efficacy of Pinoxaden for Grass Control. Jeffrey Derr*; Virginia Tech, Virginia Beach, VA (505)

Frequent, Low-Dose Treatments for Weed Control on Putting Greens. John M. Peppers*, John Brewer, Shawn Askew; Virginia Tech, Blacksburg, VA (506)

Mitigating Creeping Bentgrass Phytotoxicity from Topramezone. Clebson G. Goncalves*1, John Brewer1, Joseph S. McElroy2, Shawn Askew1; 1Virginia Tech, Blacksburg, VA, 2Auburn University, Auburn, AL (507)

NativeKlean™ Herbicide (Aminopyralid + 2,4-D): A New Herbicide for Native Grass Roughs on Golf Courses. David E. Hillger*1, Amy L. Agi2, Paul Marquardt3; 1Corteva Agriscience, Thorntown, IN, 2Corteva Agriscience, Brooks, GA, 3Corteva Agriscience, Des Moines, IA (508)

Winter Slicing and Herbicides Affect Bermudagrass (Cynodon dactylon) Control in Creeping Bentgrass. Shawn Askew*, Jordan M. Craft, John Brewer; Virginia Tech, Blacksburg, VA (509)

Control of Bermudagrass (Cynodon dactylon) with Dazomet, Glyphosate, and Glyphosate Alternatives. Fred Yelverton*1, Patrick E. McCullough2, Travis Gannon1; 1North Carolina State University, Raleigh, NC, 2University of Georgia, Griffin, GA (510)

Consistent Efficacy and Defining the Use of ALS-Inhibiting Herbicides for Purple Nutsedge (Cyperus rotundus) Control in Turf. Kai Umeda*; University of Arizona, Phoenix, AZ (511)
03:45 PM  Weed Management in Carbon Seeded Kentucky Bluegrass and Perennial Ryegrass. Raul Arroyo Rosas¹, Tara L. Burke*, Rachel J. Zuger¹, Ian Burke¹; ¹Washington State University, Pullman, WA, ²Washington State University, Albion, WA (512)

04:00 PM  Improving Tolerance of Pollinator-Serving Plants to Herbicides Using Band-Applied Charcoal. Shawn Askew*, Jordan M. Craft, Morgan Shock; Virginia Tech, Blacksburg, VA (513)

04:15 PM  Evaluating Preemergent Herbicides for Use in Tropical Plants. Nathan Boyd¹, Shawn T. Steed*²; ¹University of Florida, Balm, FL, ²University of Florida, Seffner, FL (514)

WEDNESDAY AFTERNOON  MARCH 4

ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants

LOCATION:  Monarchy #1
TIME:  01:00 PM - 04:30 PM
MODERATOR:  Mark J. Renz
University of Wisconsin
Madison
Madison, WV
CO-MODERATOR:  Glenn Nice
University of Wisconsin
Madison
Madison, WV

*SPEAKER  †STUDENT CONTEST

01:00 PM  †Long-term Downy Brome (Bromus tectorum) Seedling Reduction with Indaziflam in Sagebrush-Grassland Plant Communities in Sublette County, WY US. Jake Courkamp*; Colorado State University, Fort Collins, CO (515)
01:15 PM  Ecosystem Response to Thirteen Operational Indaziflam Cheatgrass (Bromus tectorum) Treatments. James Sebastian*, Steve Sauer¹, Shannon Clark², Derek J. Sebastian³; ¹Boulder County Open Space, Longmont, CO, ²Colorado State University, Fort Collins, CO, ³Bayer, Greeley, CO (516)

01:30 PM  †Evaluating the Efficacy of Various Herbicides for Bulbous Bluegrass (Poa bulbosa) Control. Jordan L. Skovgard*; University of Wyoming, Laramie, WY (517)

01:45 PM  Restoration of Invasive Annual Grass Degraded Landscapes: Overview of the Indaziflam Field Trial Program. Harold Quicke*, John H. Brock², Ian Burke³, Shannon Clark⁴, Thomas J. Getts⁵, Jane Mangold⁶, Brian Mealor⁷, Scott J. Nissen⁴, Timothy S. Prather⁸, Corey V. Ransom⁹, Derek J. Sebastian¹⁰, Stephen M. Van Vleet¹¹; ¹Bayer, Windsor, CO, ²Arizona State University, Tempe, AZ, ³Washington State University, Pullman, WA, ⁴Colorado State University, Fort Collins, CO, ⁵University of California Cooperative Extension, Davis, CA, ⁶Montana State University, Bozeman, MT, ⁷University of Wyoming, Laramie, WY, ⁸University of Idaho, Moscow, ID, ⁹Utah State University, Logan, UT, ¹⁰Bayer, Greeley, CO, ¹¹Washington State University, Colfax, WA (518)

02:00 PM  Developing Chemical Control Strategies for the Invasive Weed Oblong Spurge, Euphorbia oblongata. Scott Oneto*; University of California Cooperative Extension, Jackson, CA (519)

02:15 PM  Southern Sandbur (Cenchrus echinatus) Control in Bermudagrass Pasture with Rezilon™. Jason Belcher*, Tyler Monday²; ¹Bayer, Auburn, AL, ²Auburn University, Auburn, AL (520)

02:30 PM  Break

02:45 PM  Collaboratively Addressing the Wilding Invasive Pine Issue Across East Maui - Part 1. Alison C. Cohan*¹, Jeffrey Mallinson²; ¹The Nature Conservancy of Hawaii, Makawao, HI, ²Haleakala National Park, Makawao, HI (521)

03:00 PM  Collaboratively Addressing the Wilding Invasive Pine Issue Across East Maui - Part 2. Alison C. Cohan¹, Jeffrey Mallinson²; ¹The Nature Conservancy of Hawaii, Makawao, HI, ²Haleakala National Park, Makawao, HI (522)
03:15 PM  Automatic Detection of Invasive Weeds in Hawaii Using High Resolution Imagery and Machine Learning. Ryan L. Perroy*, David Benitez²; ¹University of Hawaii at Hilo, Hilo, HI, ²National Park Service, Volcano, HI (523)

03:30 PM  Herbicide Trials with Brazilian Egeria (Egeria densa) for Management in the Sacramento / San Joaquin River Delta. John D. Madsen*; USDA-ARS, Davis, CA (524)

03:45 PM  Use of Machine Learning to Automate Aquatic Plant Identification from Sensing Technologies. Robert J. Richardson*¹, Maharshi Patel¹, Andrew Howell², Shaphan Jernigan¹, Scott Ferguson¹, Greg Buckner¹; ¹North Carolina State University, Raleigh, NC, ²North Carolina State University, Sanford, NC (525)

04:00 PM  Economics and Efficacy of Japanese Stiltgrass (Microstegium vimineum) Control After Nine Years of Treatments in a Forest Understory. John Brewer*¹, Becky Fletcher¹, Daniel R. Tekiela², Angela R. Post³, Gourav Sharma¹, Vasiliiy Lakoba¹, Jacob Barney¹, Shawn Askew¹; ¹Virginia Tech, Blacksburg, VA, ²University of Wyoming, Laramie, WY, ³North Carolina State University, Raleigh, NC (526)

04:15 PM  Effect of Spatial Extent on the Performance of Six Forest Invasive Plant Habitat Suitability Models in Wisconsin. Niels A. Jorgensen, Mark J. Renz*; University of Wisconsin-Madison, Madison, WI (527)

WEDNESDAY AFTERNOON  MARCH 4
01:00 PM  Impacts of Weed Biocontrol in Hawaii. M Tracy Johnson*; USDA Forest Service, Volcano, HI (528)

01:15 PM  Mechanisms of Weed Seed Predation and its Potential Role in Weed Biocontrol. Khaldoun Ali*; University of Saskatchewan, Saskatoon, SK, Canada (529)

01:30 PM  Identification of a Potential Allelopathic Substance Involved in Allelopathic Activity of False Mangosteen (Garcinia xanthochymus). Md Mahfuzur Rob1*, Keitaro Iwasaki2, Arihiro Iwasaki2, Kiyotake Suenaga2, Hisashi Kato-Noguchi1; 1Kagawa University, Miki, Japan, 2Keio University, Yokohama, Japan (530)

01:45 PM  Inhibiting Herbicide Resistant Amaranthus by Suppressing Reproduction. Efrat Lidor Nili1, Ido Shwartz1, Herve Huet1, Miriam Aminia1, Micheal D. Owen2, Jonathan Gressel3, Orly Noivirt-Brik*1; 1WeedOUT Ltd., Ness Ziona, Israel, 2Iowa State University, Ames, IA, 3Affiliation Not Specified, Rehovot, Israel (531)

02:00 PM  Penology of Dioscorea bulbifera and its Co-evolved Natural-enemy Lilioceris cheni: Implication in Biological Control Efficacy in Florida. Min B. Rayamajhi*; USDA/ARS Invasive Plant Res Lab, Fort Lauderdale, FL (532)

02:15 PM  Developing a Microbial Herbicide to Control Amaranthus Weeds. Louis G. Boddy*, Tim Johnson; Marrone Bio Innovations, Davis, CA (533)

02:30 PM  Progress on Classical Biological Control of Cogongrass (Imperata cylindrica) in the Southeastern United States. James P. Cuda*1, Purnama Hidayat2, Izza A. Putri2; 1University of Florida, Gainesville, FL, 2Bogor Agricultural University, Bogor, Indonesia (534)
**ORAL - 13. Integrated Weed Management**

**LOCATION:** Monarchy #7  
**TIME:** 01:00 PM - 04:30 PM  
**MODERATOR:** Vijay Singh  
Virginia Tech  
Painter, VA  
**CO-MODERATOR:** Shilpa Singh  
Texas A&M University  
College Station, TX

*SPEAKER*

**01:00 PM**  
Manipulating Cropping Systems to Create a Better Harvest Weed Seed Control Target in Wild Oat (*Avena fatua*). Breanne D. Tidemann*,1 Larry Michielsen1, Patty Reid1, Jennifer Zuidhof1, Elizabeth Sroka1, Hiroshi Kubota1, K. Neil Harker2, Robert Gulden3, Rebecca Dueck4, Alick Mulenga5, Cindy Gampe5, Greg Semach6; 1Agriculture and Agri-Food Canada, Lacombe, AB, Canada, 2Agriculture and Agri-Food Canada (retired), Lacombe, AB, Canada, 3University of Manitoba, Winnipeg, Canada, 4University of Manitoba, Winnipeg, MB, Canada, 5Agriculture and Agri-Food Canada, Scott, SK, Canada, 6Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada (535)

**01:15 PM**  
The Weed Chipper: a Site-Specific Non-Chemical Weed Control Option for Conservation Cropping Systems. Andrew L. Guzzomi*,1 Michael J. Walsh2; 1University of Western Australia, Crawley, Australia, 2University of Sydney, Sydney, Australia (536)

**01:30 PM**  
Nozzle Type and Arrangement Effect on Spray Coverage. Ashley N. McCormick*,1 Landon G. Smith1, Troy W. Dillon2, Thomas R. Butts2, Brad M. Davis2, Leah M. Collie3; 1University of Arkansas System Division of Agriculture, Newport, AR, 2University of Arkansas System Division of Agriculture, Lonoke, AR, 3University of Arkansas System Division of Agriculture, Beebe, AR (537)
01:45 PM  Continuing Evolution of Impact Mill Systems for Harvest Weed Seed Control. Michael J. Walsh*, John C. Broster; 1University of Sydney, Sydney, Australia, 2Charles Sturt University, Wagga Wagga, Australia (538)

02:00 PM  Weed-Sensing Technology Reworks Fallow Management of Rush Skeletonweed (Chondrilla juncea L.). Jacob W. Fischer*, Mark Thorne, Drew J. Lyon; Washington State University, Pullman, WA (539)

02:15 PM  Advances in Precision Weed Management 2020. Vijay Singh*, Daniel Martin, Mohamed Latheef, Bishwa B. Sapkota, Muthukumar V. Bagavathiannan; 1Virginia Tech, Painter, VA, 2United States Department of Agriculture, College Station, TX, 3Texas A&M university, College Station, TX (540)

02:30 PM  Break

02:45 PM  Effects of Cover Crops on Nutrient Dynamics and Weed Communities. Karla L. Gage*, Rachel Cook, Randy McElroy, Gurbir Singh; Jon Schoonover, Karl Williard; 1Southern Illinois University Carbondale, Carbondale, IL, 2North Carolina State University, Raleigh, NC, 3Bayer Crop Science, Farina, IL (541)

03:00 PM  Cover Crop Planting Date and Weed Emergence in Almond Orchards. Steven C. Haring*, Brad Hanson; 1University of California, Davis, Davis, CA, 2University of California, Davis, Winters, CA (542)

03:15 PM  Seasonal Variability in Pre-harvest Seed-dispersal in Hordeum glaucum (Smooth Barley) and Bromus diandrus (Ripgut Brome) – Implications for Harvest Weed Seed Control. Daniel Petersen, Gurjeet S. Gill; University of Adelaide, Adelaide, Australia (543)

03:30 PM  Evaluation of Rate and Timing of Herbicide Application During the Establishment of a Living White Clover (Trifolium repens) Mulch for Field Corn Production. Nicholas T. Basinger*, Nicholas S. Hill; University of Georgia, Athens, GA (544)
03:45 PM Soybean Response to Sublethal Dosages of Dicamba Particle Drift Vs. Vapor. Frances B. Browne¹, Steve Li¹, Katilyn J. Price¹, Ryan D. Langemeier¹, Greg R. Kruger²; ¹Auburn University, Auburn, AL, ²University of Nebraska-Lincoln, North Platte, NE (545)

04:00 PM Driver Weeds and the Balance of Control Option Space. Anita Kuepper*¹, Frank Rothweiler², Tracy Klingaman², Hubert Menne³, Philipp Welte³, Catherine de Vulder¹; ¹Bayer Cropscience, Frankfurt, Germany, ²Bayer AG, St. Louis, MO, ³Bayer AG Crop Science, Frankfurt, Germany, ⁴Bayer AG, Monheim, Germany (546)

04:15 PM Annual Bluegrass Management in Cool-Season Grasses Grown for Seed in Oregon: A Meta-Analysis of Multiple Years of Internal Data. Seth Bernard E. Abugho*, Caio A. Brunharo, Andrew G. Hulting; Oregon State University, Corvallis, OR (547)

WEDNESDAY AFTERNOON MARCH 4

ORAL - 14. Travel Enrichment Experience

LOCATION: Monarchy #2
TIME: 03:00 PM - 04:00 PM
MODERATOR: Nicholas R. Steppig Purdue University Lafayette, IN
CO-MODERATOR: Wykle C. Greene Virginia Tech Blacksburg, VA

*SPEAKER

03:00 PM Tackling Toadflax in Montana. Jessica E. Quinn*; University of Guelph, Ridgetown, ON, Canada (548)

03:10 PM From Inception to Market: Learning the Herbicide Registration Cycle with Syngenta. John A. Schramski*¹, Carroll Moseley², Janis E. McFarland³; ¹Michigan State University, East Lansing, MI, ²Syngenta, High Point, NC, ³Affiliation Not Specified, Chapel Hill, NC (549)
03:20 PM  A Week in the West - My 2019 Travel Enrichment Experience with Syngenta. Nicholas R. Steppig*; Purdue University, Lafayette, IN (550)

03:30 PM  Agriculture Beyond Borders: Tifton to Saskatoon. Kayla M. Eason*; University of Georgia, Tifton, GA (551)

03:40 PM  Specialty Weeds at Commodity Scale; California's Central Valley. Samuel A. Palmer*; University of New Hampshire, Epsom, NH (552)

03:50 PM  The Intersection of Weed Science and Politics: What I Learned During My Fellowship in DC. Haleigh Summers1, John A. Schramski2, Lee Van Wychen3; 1Weed Science Society of America, Ames, IA, 2Michigan State University, East Lansing, MI, 3Weed Science Society of America, Alexandria, VA (553)

WEDNESDAY AFTERNOON  MARCH 4

Student Awards
LOCATION:  Monarchy #4
TIME:  05:00 PM - 06:30 PM
MODERATOR:  Darrin M. Dodds
Mississippi State University
Mississippi State, MS
CO-MODERATOR:  Carl W. Coburn
Gothenburg, NE

THURSDAY MORNING  MARCH 5

SYMPOSIUM - 5. Toxicology and Weed Science
LOCATION:  Monarchy #4
TIME:  08:30 AM - 12:00 PM
MODERATOR:  Scott Senseman
The University of Tennessee
Knoxville, TN

*SPEAKER
08:30 AM  Introduction to Symposium. Scott Senseman*; The University of Tennessee, Knoxville, TN (554)

08:30 AM  Risk Assessment and Management Review. Michael A. Hayoun*; University of California, Davis, Sacramento, CA (555)

09:00 AM  Data and Discernment: Glyphosate as a Case Study. Bernalyn McGaughey*; Compliance Services International, Lakewood, WA (556)

09:30 AM  The Glyphosate Issue: a Poor Man's Toxicology Viewpoint. Scott Senseman*; The University of Tennessee, Knoxville, TN (557)

10:00 AM  Break

10:15 AM  How the Court System Handles Scientific Data and How an Expert Witness Presents Data in Court. Philip A. Banks*; Marathon-Agricultural & Environmental Consulting, Inc., Las Cruces, NM (558)

10:45 AM  Getting and Staying Out of the Weeds When it Comes to Effectively Communicating Science. Norman Hammitt*; South College, Knoxville, TN (559)

11:15 AM  Media Training Demonstration and Discussion. Scott Senseman*; The University of Tennessee, Knoxville, TN (560)

11:40 AM  Group Panel Discussion. Scott Senseman*; The University of Tennessee, Knoxville, TN (561)

THURSDAY MORNING   MARCH 5

ORAL - 01. Agronomic Crops I

LOCATION:  Monarchy #5
TIME:  08:30 AM - 12:00 PM
MODERATOR:  Misha R. Manuchehri
             Oklahoma State University
             Stillwater, OK
CO-MODERATOR:  Ryan D. Lins
                Syngenta Crop Protection, LLC
                Rochester, MN
08:30 AM Tirexor (Trifludimoxazin): Next Generation Burndown Update - US. Douglas Findley*1, Cletus C. Youmans2, Steven Bowe3; 1BASF, Rolesville, NC, 2BASF, Dyersburg, TN, 3BASF, Research Triangle Park, NC (562)

08:45 AM Tirexor® a New (PPO) Herbicide to Manage Weed Resistance in Argentina. Teofilo Bustingorri*; BASF Argentina SA, Buenos Aires, Argentina (563)

09:00 AM Tirexor Herbicide: Tirexor + Kixor for Pre-seed Burndown Weed Control in Cereals and Pulse Crops in Western Canada. Mark Oostlander*1, Ethan Bertholet2, Lyle Drew2, Brittany Hedges1, Brendan Metzger3; 1BASF, Calgary, AB, Canada, 2BASF, Saskatoon, SK, Canada, 3BASF, Winkler, MB, Canada (564)

09:15 AM Luximo – A Soil Active Residual Herbicide as a Novel Resistance Management Tool. Helmut Kraus*1, Stuart J. Kevis2, Giuseppe Allegretta3, Laurent Picard3, Ulrike Anders3, Sascha Schlaefer3, Sudhakar Kandru4, Andreas Landes3, Gerd Kraemer3, Bernd Sievernich3, Ruth Campe3, Ian Francis6; 1BASF Corporation, Durham, NC, 2BASF Plc, Bury St. Edmunds, United Kingdom, 3BASF SE, Limburgerhof, Germany, 4BASF South East Asia Pte. Ltd., Singapore, Singapore, 5BASF SE, Limburgerhof, Germany, 6BASF Australia, Tamworth, Australia (565)

09:30 AM Introducing Luximo - A New Dawn for Blackgrass Control in the UK. Stuart J. Kevis*; BASF Plc, Bury St. Edmunds, United Kingdom (566)

09:45 AM Luximo: A New Mode of Action (MOA) Pre-emergence Herbicide for the Control of Annual Ryegrass (Lolium rigidum Gaud.) and Other Monocotyledon Weeds in Cereals in Australia. Ian Francis*; BASF Australia, Tamworth, Australia (567)

10:00 AM Break

10:15 AM Weed Control in Dicamba-Tolerant Soybean in Southwest North Dakota. Caleb D. Dalley*3, Daniel Guimaraes Abe; North Dakota State University, Hettinger, ND (568)
10:30 AM Evaluating Weed Control and Crop Safety of a Premix of Dicamba and Pyroxasulfone in Dicamba-resistant Soybean in Nebraska. Ethann R. Barnes*1, Brady Kappler2, Amit J. Jhala1; 1University of Nebraska-Lincoln, Lincoln, NE, 2BASF, Eagle, NE (569)

10:45 AM Guayule (Parthenium argentatum) Response to Preemergence Herbicides. William B. McCloskey*1, Guangyao Sam Wang2, Bryan C. Pastor1; 1University of Arizona, Tucson, AZ, 2Bridgestone Americas, Inc, Eloy, AZ (570)

11:00 AM Field Assessment of Flax Tolerance to Preemergence and Postemergence Herbicides. Caleb D. Dalley1, Brian Jenks2, Daniel Guimaraes Abe*1; 1North Dakota State University, Hettinger, ND, 2North Dakota State University, Minot, ND (571)

11:15 AM Plantain (Plantago lanceolata L.), in Red Clover (Trifolium pratense L.) Grown for Seed. Kyle Roerig*, Andrew G. Hulting; Oregon State University, Corvallis, OR (572)

THURSDAY MORNING  MARCH 5

ORAL - 04. Pasture, Range, Forest, Rights of ways, Wildland, and Aquatic Invasive Plants

LOCATION:  Monarchy #1
TIME:  08:30 AM - 12:00 AM
MODERATOR:  Mark J. Renz
University of Wisconsin
Madison
Madison, WV

CO-MODERATOR:  Glenn Nice
University of Wisconsin
Madison
Madison, WV

*SPEAKER
08:30 AM MezaVue Herbicide: Pricklypear Control and Beyond. D Chad Cummings*, Byron B. Sleugh**, William L. Hatler*, Scott Flynn*, Charles Hart*, James R. Jackson**; ¹Corteva Agriscience, Bonham, TX; ²Corteva Agriscience, Carmel, IN; ³Corteva Agriscience, Meridian, ID; ⁴Corteva Agriscience, Lee's Summit, MO; ⁵Dow AgroSciences, Stephenville, TX; ⁶Texas A&M AgriLife Extension, Stephenville, TX (573)

08:45 AM Rinksor + Aminopyralid (TerraVue): A New Herbicide for Noncrop Land Management. Byron B. Sleugh*, William L. Hatler**, Scott Flynn*, D Chad Cummings*, ¹Corteva AgriScience, Carmel, IN; ²Corteva Agriscience, Meridian, ID; ³Corteva Agriscience, Lee's Summit, MO; ⁴Corteva Agriscience, Bonham, TX (574)

09:00 AM Can I Keep My Clover? Rinskor Active: A New Herbicide Enabling Selective Broadleaf Weed Control in White Clover-Grass Pastures. Byron B. Sleugh*, Scott Flynn*, D Chad Cummings*, William L. Hatler*, David E. Hillger**; ¹Corteva Agriscience, Carmel, IN; ²Corteva Agriscience, Lee's Summit, MO; ³Corteva Agriscience, Bonham, TX; ⁴Corteva Agriscience, Meridian, ID; ⁵Corteva Agriscience, Thornontown, IN (575)

09:15 AM Rinksor + Aminopyralid (Duracor) - A New Herbicide for Control of Weeds in Rangeland and Pastures. Scott Flynn*, Byron B. Sleugh*, William L. Hatler*, D Chad Cummings*, David E. Hillger**; ¹Corteva Agriscience, Lee's Summit, MO; ²Corteva Agriscience, Carmel, IN; ³Corteva Agriscience, Meridian, ID; ⁴Corteva Agriscience, Bonham, TX; ⁵Corteva Agriscience, Thornton, IN (576)

09:30 AM Control of Key Rangeland Noxious and Invasive Weeds with Rinksor + Aminopyralid in the Western U.S. William L. Hatler*, Scott Flynn*, Byron B. Sleugh*, D Chad Cummings*, David E. Hillger**; ¹Corteva Agriscience, Meridian, ID; ²Corteva Agriscience, Lee's Summit, MO; ³Corteva Agriscience, Carmel, IN; ⁴Corteva Agriscience, Bonham, TX; ⁵Corteva Agriscience, Thorntown, IN (577)
Desirable Forb Tolerance to Applications of Rinskor Containing Herbicides in Rangeland and Pastures. D Chad Cummings*, Byron B. Sleugh**, William L. Hatler***; ¹Corteva Agriscience, Bonham, TX, ²Corteva Agriscience, Carmel, IN, ³Corteva Agriscience, Meridian, ID (578)

10:00 AM Break

Weed Control Spectrum of a Novel Herbicide, Florpyrauxifen-benzyl, for Pastures and Hayfields. Wykle C. Greene*, Michael L. Flessner; Virginia Tech, Blacksburg, VA (579)

Documenting the Impact of Training Municipalities to Control Invasive Plants on Wisconsin Roads. Mark J. Renz*, Leo Roth, Anne Pearce; University of Wisconsin-Madison, Madison, WI (580)

Evaluating the Effectiveness of Hexazinone on Brunswickgrass in Bahiagrass Seed Production Fields. Clay T. Cooper*, Brent A. Sellers**; ¹University of Florida Extension, Lecanto, FL, ²University of Florida, Ona, FL (581)

Smutgrass Response to Hexazinone Using Different Application Techniques. Brent A. Sellers*, José Luiz Carvalho de Souza Dias**; ¹University of Florida, Ona, FL, ²University of Wisconsin-Madison, Madison, WI (582)

THURSDAY MORNING MARCH 5

ORAL - 08. Formulation, Adjuvant, & Application Technology

LOCATION: Monarchy #2
TIME: 08:30 AM - 12:00 PM
MODERATOR: Mayank S. Malik
Bayer Crop Science
Chesterfield, MO

CO-MODERATOR: Vipan Kumar
Kansas State University
Hays, KS

*SPEAKER
08:30 AM Assessment of Commercial Scale Dicamba and 2,4-D Drift Using drift Reducing Adjuvants. Ryan J. Edwards*1, Lillian C. Magidow1, Steven A. Fredricks1, Gregory K. Dahl2; 1WinField United, River Falls, WI, 2WinField United, Eagan, MN (583)

08:45 AM Survey of Commercial Sprayers in Alabama for Dicamba Residue Retention Following Triple Rinse with Water. Frances B. Browne*, Steve Li, Katilyn J. Price; Auburn University, Auburn, AL (584)

09:00 AM Fatty Acid Methyl Ester Ethoxylates: A New Surfactant and Adjuvant for Crop Protection. Dean Oester*1, Timothy H. Anderson2; 1BASF, Cincinnati, OH, 2BASF Corporation, Cincinnati, OH (585)

09:15 AM Evaluating Weed Control Efficacy of Dicamba and Dicamba/tembotrione with and without Ammonium Sulfate in Corn in the Midwest. Ethann R. Barnes1, Brian Dintelmann2, Kevin W. Bradley2, Aaron Hager3, Amit J. Jhala*1; 1University of Nebraska-Lincoln, Lincoln, NE, 2University of Missouri, Columbia, MO, 3University of Illinois, Urbana, IL (586)

09:30 AM Efficacy of Three New Adjuvant Formulations on Herbicide Performance Across the Mid-Western United States. Jim T. Daniel*1, Tom Hoverstad2, Paul O. Johnson3, Scott Parrish4, Bruce Potter3, Prashant Jha6, Philip Westra7; 1Daniel Ag Consulting, Keenesburg, CO, 2University of Minnesota Southern Research and Outreach Center, Waseca, MN, 3South Dakota State University, Brookings, SD, 4AGRASYST, Spokane, WA, 5University of Minnesota Southwest Research and Outreach Center, Lamberton, MN, 6Iowa State University, Ames, IA, 7Colorado State University, Fort Collins, CO (587)

09:45 AM Plant Macro- and Micronutrients Formulated as Effective Environmentally Benign Postemergence Herbicides. David A. Cobb*; Belvedere Foliar LLC, Belvedere, CA (588)

10:00 AM Break

106
10:15 AM  Quizalofop-P-Ethyl: Adjuvants, Nitrogen Fertilizer, and Tank-mixtures - the Rest of the Story. Richard K. Zollinger*, Peter J. Porpiglia1, Mark L. Bernards3, Jerry M. Green2, Kirk A. Howatt3, Prashant Jha6, Greg R. Kruger4, Christy Sprague8, Mark VanGessel9, Bryan G. Young10; 1Amvac Chemical Company, Spokane, WA, 2Amvac Chemical Company, Newport Beach, CA, 3Western Illinois University, Macomb, IL, 4Green Ways Consulting LLC, Landenberg, PA, 5North Dakota State University, Fargo, ND, 6Iowa State University, Ames, IA, 7University of Nebraska-Lincoln, North Platte, NE, 8Michigan State University, East Lansing, MI, 9University of Delaware, Georgetown, DE, 10Purdue University, Brookston, IN (589)

10:30 AM  Shear Stabilization of High Molecular Weight Drift Control Polymers. Timothy H. Anderson*, Dean Oester2, Melvin Long1; 1BASF Corporation, Cincinnati, OH, 2BASF, Cincinnati, OH (590)

10:45 AM  Mirror, Mirror on the Wall: What's the Best Adjuvant of Them All. Joe V. Gednalske1, Gary Halvorson*2; 1Council of Producers & Distributors of Agrotechnology, Washington, DC, 2Council of Producers and Distributors of Agrotechnology, Washington, DC (591)

11:00 AM  The Influence of Adjuvants and Tank-Mix Products on the Performance of New Dicamba and 2,4-D Herbicides. Gregory K. Dahl*1, Ryan J. Edwards2, Lillian C. Magidow2, Annie Makepeace2, Joshua J. Skelton3, Steven A. Fredericks2, Andrea C. Clark2; 1WinField United, Eagan, MN, 2WinField United, River Falls, WI, 3WinField United, Saint Paul, MN (592)

11:15 AM  Optimizing the Oxford P15 for Droplet Spectrum Measurement and Spray Analysis in the Field and Laboratory. J Connor Ferguson*, Justin S. Calhoun2, Kayla L. Broster1, Zachary R. Treadway1, Zaim Uglicic1; 1Mississippi State University, Mississippi State, MS, 2Mississippi State University, Starkville, MS (593)
11:30 AM  The Effect of pH Modifying Adjuvants on Efficacy of Glyphosate + Dicamba Tank-Mixes. Joseph T. Ikley*, 1, Mike Ostlie2, Nathan H. Haugrud1, Nicholas R. Steppig3, Bryan G. Young4; 1North Dakota State University, Fargo, ND, 2North Dakota State University, Carrington, ND, 3Purdue University, Lafayette, IN, 4Purdue University, Brookston, IN (594)

11:45 AM  On-Farm Evaluations of Auxin Nozzles for Peanut Pest Management - Year 2. Eric P. Prostko*, 1, Mark R. Abney1, Robert C. Kemerial1, Glen C. Rains1, D. Scott Carlso1n2, James L. Jacobs3, D. Bryce Sutherland2, William G. Tyson4; 1University of Georgia, Tifton, GA, 2University of Georgia Extension, Sylvester, GA, 3University of Georgia Extension, Blackshear, GA, 4University of Georgia Extension, Statesboro, GA (595)

09:00 AM Efficacy of Crop Rotation, Tillage and Herbicide for Long-Term Herbicide-Resistant Kochia (*Bassia scoparia*) Management. Elizabeth G. Mosqueda*, Andrew R. Kniss, Nevin Lawrence, Prashant Jha, Charlemagne A. Lim; 1California State University-Monterey Bay, Marina, CA, 2University of Wyoming, Laramie, WY, 3University of Nebraska-Lincoln, Scottsbluff, NE, 4Iowa State University, Ames, IA, 5Montana State University, Huntley, MT (598)


09:30 AM Herbicide Resistance Survey in Winter Wheat Cropping Systems Identifies the First *Secale cereale* Imazamox-Resistant Population. Neeta Soni*, Eric P. Westra, Philip Westra, Todd A. Gaines; Colorado State University, Fort Collins, CO (600)

09:45 AM Weed Biology Insights to Improve Management of *Chloris virgata*. Bhagirath S. Chauhan*; University of Queensland, Gatton, Australia (601)

10:00 AM Break

10:15 AM Maternal Water Stress Influences Progeny Characteristics and Management in Palmer Amaranth. O. Adewale Osipitan, Maor Matzrafi, Sara Ohadi, Mohsen B. Mesgaran; 1University of California, Davis, Davis, CA, 2Newe Ya'ar Research Center, Department of Weed Research and Plant Pathology, Agricultural Research Organization, Ramat Yishai, Israel (602)
10:30 AM Salt Stress and Recurrent Herbicide Application May Speed the Evolution of Jungle Rice Resistant to Imidazolinones. Lariza Benedetti¹, Nilda Roma-Burgos², Luis A. Avila³, Gustavo M. Souza¹; ¹Universidade Federal de Pelotas, Pelotas, Brazil, ²University of Arkansas, Fayetteville, AR (603)

10:45 AM Burial Depth and Flooding Effects on Emergence of Five California Weedy Rice (Oryza sativa f. spontaneae Rosh.) Accessions. Liberty B. Galvin¹, Mohsen B. Mesgaran¹, Whitney Brim-DeForest², Kassim Al-Khatib¹; ¹University of California, Davis, Davis, CA, ²University of California Division of Agriculture and Natural Resources, Yuba City, CA (604)

11:00 AM Exposure to Dicamba Influences Sex-Ratio in Palmer Amaranth (Amaranthus palmeri). Debaliin Sarangi¹, Aniruddha Maity², Nithya K. Subramanian², Muthukumar V. Bagavathiannan²; ¹University of Wyoming, Powell, WY, ²Texas A&M University, College Station, TX (605)

11:15 AM High Trait Variations Within and Among the Transcontinental Populations of a Global Invader: Anthemis cotula L. (Mayweed Chamomile). Subodh Adhikari¹, Ian Burke², Sanford Eigenbrode¹; ¹University of Idaho, Moscow, ID, ²Washington State University, Pullman, WA (606)

11:30 AM Impacts of Drought and Native Grass Competition on Buffelgrass (Pennisetum ciliare): Opportunities for Active Restoration. Hannah Lucia Farrell*, Elise S. Gornish; University of Arizona, Tucson, AZ (607)

11:45 AM Structural Characterization of Phytotoxic Compounds from Lantana camara. Dr. Tauseef Anwar⁴, Huma Qureshi; Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan (608)
WORKSHOP - Building a Community to Battle the Wicked Problem of Herbicide Resistance

LOCATION: Monarchy #4
TIME: 01:00 PM - 04:00 PM
MODERATOR: David R. Shaw
Mississippi State University
Mississippi State, MS

*SPEAKER

01:00 PM Building Communities to Battle the Wicked Problem of Herbicide Resistance. David R. Shaw*, Jill Schroeder, Michael Barrett, David E. Ervin, George Frisvold, Amy Asmus, Susan M. Koehler, Ian Burke, Mark VanGessel, Clint D. Pilcher, A Stanley Culpepper, Katherine Dentzman, Addie Mayfield, Jesaelyn Gizotti de Moraes, Mississippi State University, Mississippi State, MS, New Mexico State University, Las Cruces, NM, University of Kentucky, Lexington, KY, Portland State University, Portland, OR, University of Arizona, Tucson, AZ, Asmus Farm Supply, Inc, Rake, IA, USDA-APHIS, Columbia, MD, Washington State University, Pullman, WA, University of Delaware, Georgetown, DE, Corteva AgriScience, Johnston City, IA, University of Georgia, Tifton, GA, University of Idaho, Moscow, ID, University of Nebraska-Lincoln, West Platte, NE (609)

- Introductory Comments: David Shaw
- Panel on Community Organization Efforts: Moderator Amy Asmus
  1. Ian Burke: Pacific Northwest
  2. Mark VanGessel: Northeast
  3. Clint Pilcher: North Central
  4. Stanley Culpeper: Southeast
  5. George Frisvold: Pink Bollworm
  6. Dave Ervin: Other examples
- Open discussion with panel.

Break
• Facilitated Panel Discussion: What do weed scientists and others need to help build these communities? Katie Dentzman, Addie Mayfield, Jesaelen Gizotti de Moraes
• Open discussion with panel.

Adjourn
<table>
<thead>
<tr>
<th>Author Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhagirath, Serena</td>
<td>397</td>
</tr>
<tr>
<td>Brewer, John</td>
<td>507</td>
</tr>
<tr>
<td>Garcia, Alejandro</td>
<td>167</td>
</tr>
<tr>
<td>Merotto, Aldo</td>
<td>167</td>
</tr>
<tr>
<td>Rooney, William</td>
<td>184</td>
</tr>
<tr>
<td>Abney, Mark R.</td>
<td>595</td>
</tr>
<tr>
<td>Abugho, Seth Bernard E.</td>
<td>547</td>
</tr>
<tr>
<td>Ackroyd, Victoria</td>
<td>220</td>
</tr>
<tr>
<td>Adegas, Fernando Storniolo</td>
<td>254</td>
</tr>
<tr>
<td>Adhikari, Subodh</td>
<td>606</td>
</tr>
<tr>
<td>Adjesiwor, Albert T.</td>
<td>173, 317, 389</td>
</tr>
<tr>
<td>Agarwal, Prashasti</td>
<td>205</td>
</tr>
<tr>
<td>Agi, Amy L.</td>
<td>503, 508</td>
</tr>
<tr>
<td>Alcántara-de la Cruz, Ricardo</td>
<td>175</td>
</tr>
<tr>
<td>Alexander, Brendan C.</td>
<td>467</td>
</tr>
<tr>
<td>Ali, Khaldoun</td>
<td>529</td>
</tr>
<tr>
<td>Al-Khatib, Kassim</td>
<td>15, 104, 166, 323, 604</td>
</tr>
<tr>
<td>Allegretta, Giuseppe</td>
<td>565</td>
</tr>
<tr>
<td>Alshallax, Khalid S.</td>
<td>405</td>
</tr>
<tr>
<td>Altland, James</td>
<td>116, 120</td>
</tr>
<tr>
<td>Alves, Pedro Luis da Costa</td>
<td>132, 133</td>
</tr>
<tr>
<td>Aguiar</td>
<td></td>
</tr>
<tr>
<td>Amajioyi, Joy</td>
<td>157</td>
</tr>
<tr>
<td>Ames, Nancy</td>
<td>489</td>
</tr>
<tr>
<td>Aminia, Miriam</td>
<td>531</td>
</tr>
<tr>
<td>Amirsadeghi, Sasan</td>
<td>478</td>
</tr>
<tr>
<td>Anders, Ulrike</td>
<td>565</td>
</tr>
<tr>
<td>Anderson, Meaghan</td>
<td>396</td>
</tr>
<tr>
<td>Anderson, Timothy H.</td>
<td>585, 590</td>
</tr>
<tr>
<td>Anwar, Dr. Tauseef</td>
<td>608</td>
</tr>
<tr>
<td>Appel, Derek</td>
<td>151, 181</td>
</tr>
<tr>
<td>Aquilina, Natalie</td>
<td>85, 234</td>
</tr>
<tr>
<td>Aradhya, Chandrashekar</td>
<td>295, 349</td>
</tr>
<tr>
<td>Araujo, Lucas</td>
<td>457</td>
</tr>
<tr>
<td>Armstrong, Joe</td>
<td>60, 61, 484</td>
</tr>
<tr>
<td>Arndt, Jaycie N.</td>
<td>380</td>
</tr>
</tbody>
</table>
Batts, Thomas 94
Baughman, Todd A. 38, 39, 206
Baumann, Paul A. 53
Beaudoin, Madisyn R. 160
Beckett, Thomas H. 486, 502
Beckie, Hugh J. 55, 56, 204
Beckley, Cody J. 138
Beffa, Roland S. 182, 330, 331, 333, 465
Beiermann, Clint W. 16, 435
Belcher, Jason 520
Belluccini, Pablo 223
Benedetti, Lariza 348, 603
Benedict, Chris 313
Benitez, David 523
Bennett, Avery J. 88
Bennett, Kelly 471
Bento, Lilianna M. 35
Berardi, Nicole 255
Bernards, Mark L. 89, 187, 589
Bertholet, Ethan 564
Bertucci, Matthew B. 371
Beuschlein, Jared A. 124, 449
Beutler, Brent R. 106
Bezrukov, Ilja 311
Bish, Mandy 199, 290, 402
Bishop, Michael 229
Bobadilla, Lucas 21
Boddy, Louis G. 462, 533
Boggess, Sarah 107
Bond, Jason A. 191, 402, 475, 479
Boss, Darin 67
Bosveld, Kerry 102
Bough, Raven A. 361
Bourgault, Maryse 67
Boutsalis, Peter 360
Bowe, Steven 562
Bowers, Dane L. 486
Boyd, Nathan 300, 514
Boyette, Michael D. 266
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brabham, Chad</td>
<td>27, 82</td>
</tr>
<tr>
<td>Bradley, Kevin W.</td>
<td>76, 79, 199, 290, 402, 439, 475, 586</td>
</tr>
<tr>
<td>Bradshaw, Jeff</td>
<td>222</td>
</tr>
<tr>
<td>Braverman, Michael J.</td>
<td>100</td>
</tr>
<tr>
<td>Breeden, Greg</td>
<td>504</td>
</tr>
<tr>
<td>Brew-Appiah, Rhoda</td>
<td>314</td>
</tr>
<tr>
<td>Brewer, John</td>
<td>263, 506, 509, 526</td>
</tr>
<tr>
<td>Brewer, Miurel T.</td>
<td>260</td>
</tr>
<tr>
<td>Bridges, David</td>
<td>487</td>
</tr>
<tr>
<td>Brim-DeForest, Whitney</td>
<td>74, 397, 604</td>
</tr>
<tr>
<td>Brock, John H.</td>
<td>445, 518</td>
</tr>
<tr>
<td>Brock, Kelsey</td>
<td>413</td>
</tr>
<tr>
<td>Brooke, Matthew</td>
<td>304</td>
</tr>
<tr>
<td>Brosnan, James</td>
<td>504, 107</td>
</tr>
<tr>
<td>Broster, John C.</td>
<td>360, 538</td>
</tr>
<tr>
<td>Broster, Kayla L.</td>
<td>83, 275, 593</td>
</tr>
<tr>
<td>Broughton, Rhoda T.</td>
<td>57</td>
</tr>
<tr>
<td>Bruwer, Jessica</td>
<td>280</td>
</tr>
<tr>
<td>Browne, Frances B.</td>
<td>108, 153, 208, 294, 351, 472, 545, 584</td>
</tr>
<tr>
<td>Brufato, Aline</td>
<td>133</td>
</tr>
<tr>
<td>Brunharo, Caio A.</td>
<td>177, 460, 480, 547, 599</td>
</tr>
<tr>
<td>Brunton, David J.</td>
<td>468</td>
</tr>
<tr>
<td>Bruss, Bob</td>
<td>359, 364</td>
</tr>
<tr>
<td>Buckner, Greg</td>
<td>525</td>
</tr>
<tr>
<td>Buell, Hailey L.</td>
<td>123</td>
</tr>
<tr>
<td>Buerdsell, Sherri</td>
<td>279</td>
</tr>
<tr>
<td>Burke, Tara L.</td>
<td>181, 512</td>
</tr>
<tr>
<td>Burnett, Kimberly</td>
<td>414</td>
</tr>
<tr>
<td>Burns, Erin E.</td>
<td>196, 408</td>
</tr>
<tr>
<td>Burr, Chuck</td>
<td>26</td>
</tr>
<tr>
<td>Burton, Johnson M.</td>
<td>299</td>
</tr>
<tr>
<td>Busi, Roberto</td>
<td>204</td>
</tr>
<tr>
<td>Bustingorri, Teofilo</td>
<td>563</td>
</tr>
<tr>
<td>Butts, Thomas R.</td>
<td>70, 75, 231, 438, 537</td>
</tr>
<tr>
<td>Byrd, Seth A.</td>
<td>7, 17, 495</td>
</tr>
</tbody>
</table>
Byrd, Jr., John D. 134, 142, 239
Cahoon, Charlie W. 23
Calhoun, Justin S. 83, 275, 593
Campbell, Harrison T. 101
Campbell, Joan M. 48, 322
Campe, Ruth 565
Cao, Deng 235
Caputo, Giovanni A. 90
Carlson, D. Scott 595
Carr, Patrick 233
Carter, Ethan T. 57
Carvalho de Souza Dias, José Luiz 43, 582
Carver, Brett F. 1, 206
Cassiday, Andrew C. 391
Castner, Mason C. 27, 207, 250, 494
Castro, Patricia 179
Catchot, Angus L. 84
Catlin, Cayden B. 7
Ceseski, Alexander R. 15, 323
Chaudhari, Sushila 94, 596
Chauhan, Bhagirath S. 601
Cheng, Liang 277
Chichinsky, Daniel 233
Childers, Justin T. 1, 206, 358, 363
Cho, Nam-Gyu 54
Chowdhary, Girish 424
Cieza, Victor 404
Clark, Andrea C. 592
Clark, Shannon 130, 383, 516, 518, 386
Clark, Trey I. 4
Clay, David 427
Clay, Sharon 148, 421, 427
Claypool, David A. 30, 317
Clements, Charlie D. 224
Clements, David R. 280, 412, 419, 420
Cluever, Jeffrey D. 222
Cobb, David A. 588
Cobb, William T. 390
<table>
<thead>
<tr>
<th>Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohan, Alison C.</td>
<td>521, 522</td>
</tr>
<tr>
<td>Colbert, Stephen F.</td>
<td>499</td>
</tr>
<tr>
<td>Cole, Rebecca J.</td>
<td>415</td>
</tr>
<tr>
<td>Collie, Leah M.</td>
<td>70, 492, 537</td>
</tr>
<tr>
<td>Collin, Auwarter M.</td>
<td>299</td>
</tr>
<tr>
<td>Collins, Ryan</td>
<td>162, 318</td>
</tr>
<tr>
<td>Concepcion, Jeanaflor Crystal</td>
<td>463</td>
</tr>
<tr>
<td>Conley, Shawn P.</td>
<td>12, 13, 290</td>
</tr>
<tr>
<td>Constine, Adam L.</td>
<td>6</td>
</tr>
<tr>
<td>Cook, Rachel</td>
<td>541</td>
</tr>
<tr>
<td>Cooper, Clay T.</td>
<td>581</td>
</tr>
<tr>
<td>Cordell, Susan</td>
<td>416, 418</td>
</tr>
<tr>
<td>Corkern, Christopher B.</td>
<td>238</td>
</tr>
<tr>
<td>Coura Oliveira, Maxwel</td>
<td>12, 13, 72, 73, 158</td>
</tr>
<tr>
<td>Courkamp, Jacob</td>
<td>283</td>
</tr>
<tr>
<td>Courkamp, Jake</td>
<td>515</td>
</tr>
<tr>
<td>Cowbrough, Michael</td>
<td>466</td>
</tr>
<tr>
<td>Craft, Jordan M.</td>
<td>119, 263, 509, 513</td>
</tr>
<tr>
<td>Creech, Cody F.</td>
<td>16, 25, 26, 435, 471</td>
</tr>
<tr>
<td>Creech, Earl</td>
<td>77</td>
</tr>
<tr>
<td>Crose, Jodie A.</td>
<td>446</td>
</tr>
<tr>
<td>Cruz-Hipolito, Hugo Enrique</td>
<td>175, 176</td>
</tr>
<tr>
<td>Cuda, James P.</td>
<td>534</td>
</tr>
<tr>
<td>Cully, Scott E.</td>
<td>486</td>
</tr>
<tr>
<td>Culpepper, A Stanley</td>
<td>32, 495, 609, 80, 245, 262, 265, 273</td>
</tr>
<tr>
<td>Cummings, D Chad</td>
<td>573, 574, 575, 577, 578, 450, 576</td>
</tr>
<tr>
<td>Curran, William S.</td>
<td>402, 475</td>
</tr>
<tr>
<td>Currie, Randall S.</td>
<td>346, 347, 398</td>
</tr>
<tr>
<td>Cutti, Luan</td>
<td>189</td>
</tr>
<tr>
<td>Cutulle, Matthew A.</td>
<td>90, 101, 307</td>
</tr>
<tr>
<td>Cuvaca, Ivan B.</td>
<td>49, 50, 52</td>
</tr>
<tr>
<td>Czarnota, Mark A.</td>
<td>117</td>
</tr>
<tr>
<td>Daehler, Curtis</td>
<td>412, 413, 420</td>
</tr>
<tr>
<td>Dahl, Gregory K.</td>
<td>393, 488, 583, 592</td>
</tr>
<tr>
<td>Dalley, Caleb D.</td>
<td>568, 571</td>
</tr>
<tr>
<td>Daniel, Jim T.</td>
<td>156, 587</td>
</tr>
<tr>
<td>Darras, Sid A.</td>
<td>481</td>
</tr>
</tbody>
</table>
Davis, Adam 329, 402, 467, 470, 475
Davis, Brad M. 75, 231, 537
Davy, Josh 379
Day, Michelle A. 135, 597
Dayan, Franck E. 189, 190, 254, 330, 331, 361, 448, 462
de Goes Maciel, Cleber D. 19
de Moraes, Jesaelyn Gizotti 609
De Oliveira Silva, Amanda 1
De Prado, Rafael 175, 176, 178, 179, 223
de Sanctis, Jose H. 10
de Vulder, Catherine 546
Dearden, Edward S. 88
Degenhardt, Rory 471
Dentzman, Katherine 609
Derr, Jeffrey 114, 392, 505
Devkota, Pratap 57, 491
DeWerff, Ryan P. 12, 13, 65, 72, 158, 159
Diehl, Katherine H. 107
Dille, Anita 430, 68, 69, 99, 162, 318
Dillon, Troy W. 231, 537
DiManno, Nicole 416
Dinkins, Randy 457
Dintelmann, Brian 586
DiTommaso, Antonio 259, 277, 436
Dittmar, Peter J. 92, 225, 226
Dixon, Sarah E. 165, 373
Dodds, Darrin M. 78, 81, 84, 248, 270, 271, 495
Doherty, Ryan C. 70, 492
Dollins, James 127
Dominguez, Andrew 279
Dotray, Peter A. 17, 29, 236, 251, 291, 353, 364, 493, 495
Drew, Lyle 564
Drost, Dirk C. 366
Duddu, Hemma 440
Dueck, Rebecca 535
Duff, Hannah 310
Duke, Faith 187
Duke, Stephen O. 462
DuPre, Mary E. 67
Dyer, Logan M. 31
Dyer, William 35, 196
Eason, Kayla M. 262, 273, 551
Ebelhar, M. W. 41
Edwards, Henry M. 42
Edwards, Ryan J. 393, 488, 583, 592
Effertz, Andrew D. 319, 320
Eigenbrode, Sanford 606
Ellis, Drew 498
Ellis, Jeff 498
Elmore, Matthew T. 107, 118, 504
Elmore, Roger 25, 26
Enloe, Stephen F. 125
Epp, Jeffrey 143
Erickson, Bruce 427
Ervin, David E. 609
Eskridge, Kent 47
Espino, Luis 74, 397
Eure, Peter 502
Evans, Jeffrey 402
Evans, Sean 295
Everitt, John 353
Everman, Wesley 68, 69, 99, 402, 475, 23, 86, 350
Falk Jones, Jeanne S. 399
Farr, Rodger B. 207, 494, 495
Farrell, Hannah Lucia 607
Fatino, Matthew J. 91
Fausti, Scott 427
Fehr, Benjamin 161
Felix, Joel 376
Fennimore, Steve 305, 432
Ferguson, J Connor 83, 275, 479, 593
Ferguson, Scott 525
Ferreira, Enrico Zilch 189
Fields, Lydia S. 151
<table>
<thead>
<tr>
<th>Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figueiredo, Marcelo</td>
<td>315</td>
</tr>
<tr>
<td>Fike, John H.</td>
<td>93</td>
</tr>
<tr>
<td>Filippi, Anthony</td>
<td>229</td>
</tr>
<tr>
<td>Findley, Douglas</td>
<td>562</td>
</tr>
<tr>
<td>Fischer, Jacob W.</td>
<td>539</td>
</tr>
<tr>
<td>Flanagan, Stephen</td>
<td>95</td>
</tr>
<tr>
<td>Flessner, Michael L.</td>
<td>37, 68, 69, 93, 99, 137, 220, 249, 402, 434, 451, 475, 482, 579</td>
</tr>
<tr>
<td>Fletcher, Becky</td>
<td>526</td>
</tr>
<tr>
<td>Fletcher, Reginald S.</td>
<td>180</td>
</tr>
<tr>
<td>Flusche Ogden, Grace F.</td>
<td>353</td>
</tr>
<tr>
<td>Flynn, Scott</td>
<td>450, 573, 574, 575, 576, 577</td>
</tr>
<tr>
<td>Forero, Larry</td>
<td>379</td>
</tr>
<tr>
<td>Foster, Delaney C.</td>
<td>29, 251, 495</td>
</tr>
<tr>
<td>Foster, Jamie</td>
<td>53</td>
</tr>
<tr>
<td>Fowers, Beth</td>
<td>452</td>
</tr>
<tr>
<td>Fox, Nicholas</td>
<td>186</td>
</tr>
<tr>
<td>Frame-Martin, Shantell A.</td>
<td>145</td>
</tr>
<tr>
<td>Franca, Lucas X.</td>
<td>248</td>
</tr>
<tr>
<td>Francis, Ian</td>
<td>362, 565, 567</td>
</tr>
<tr>
<td>Franzenburg, Damian D.</td>
<td>87, 88</td>
</tr>
<tr>
<td>Fredericks, Steven A.</td>
<td>592</td>
</tr>
<tr>
<td>Fredricks, Steven A.</td>
<td>583</td>
</tr>
<tr>
<td>Freund, Daniel</td>
<td>109</td>
</tr>
<tr>
<td>Friebe, Bernd</td>
<td>337, 596</td>
</tr>
<tr>
<td>Frisvold, George</td>
<td>475, 609</td>
</tr>
<tr>
<td>Froemke, Aaron</td>
<td>345</td>
</tr>
<tr>
<td>Fronk, Natalie L.</td>
<td>121</td>
</tr>
<tr>
<td>Furtado, Ivan F.</td>
<td>202</td>
</tr>
<tr>
<td>Gage, Karla L.</td>
<td>76, 79, 162, 318, 541</td>
</tr>
<tr>
<td>Gaines, Todd A.</td>
<td>126, 167, 182, 183, 189, 198, 254, 315, 320, 326, 333, 339, 357, 361, 471, 600</td>
</tr>
<tr>
<td>Gairhe, Biwek</td>
<td>246</td>
</tr>
<tr>
<td>Gale, Jody A.</td>
<td>138</td>
</tr>
<tr>
<td>Gallandt, Eric</td>
<td>140</td>
</tr>
<tr>
<td>Galvin, Liberty B.</td>
<td>166, 604</td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Gampe, Cindy</td>
<td>535</td>
</tr>
<tr>
<td>Ganie, Zahoor A.</td>
<td>99</td>
</tr>
<tr>
<td>Gannett, Maria A.</td>
<td>210</td>
</tr>
<tr>
<td>Gannon, Travis</td>
<td>109, 510</td>
</tr>
<tr>
<td>Garcia, Alvaro</td>
<td>53</td>
</tr>
<tr>
<td>Garnica, Irache</td>
<td>171</td>
</tr>
<tr>
<td>Garzon, Alvaro</td>
<td>368</td>
</tr>
<tr>
<td>Geddes, Charles M.</td>
<td>55, 56, 401, 471</td>
</tr>
<tr>
<td>Gednalske, Joe V.</td>
<td>395, 591</td>
</tr>
<tr>
<td>Geier, Patrick</td>
<td>346, 347</td>
</tr>
<tr>
<td>Gentiletti, Valentin</td>
<td>223</td>
</tr>
<tr>
<td>Getts, Thomas J.</td>
<td>381, 518</td>
</tr>
<tr>
<td>Ghaste, Manoj S.</td>
<td>292</td>
</tr>
<tr>
<td>Giacomin, Darci A.</td>
<td>21, 164, 191, 197, 321, 459</td>
</tr>
<tr>
<td>Giardina, Christian P.</td>
<td>415</td>
</tr>
<tr>
<td>Gill, Bikram S.</td>
<td>337, 596</td>
</tr>
<tr>
<td>Gill, Gurjeet S.</td>
<td>360, 411, 543</td>
</tr>
<tr>
<td>Glueckert, Jonathan</td>
<td>125</td>
</tr>
<tr>
<td>Goatley, Mike</td>
<td>119</td>
</tr>
<tr>
<td>Godar, Amar</td>
<td>15</td>
</tr>
<tr>
<td>Goertzen, Leslie R.</td>
<td>456</td>
</tr>
<tr>
<td>Goggin, Danica</td>
<td>204</td>
</tr>
<tr>
<td>Goncalves, Clebson G.</td>
<td>507</td>
</tr>
<tr>
<td>Gonzalez Torralva, Fidel</td>
<td>27</td>
</tr>
<tr>
<td>Gonzalez-Andujar, Jose L.</td>
<td>171</td>
</tr>
<tr>
<td>Gornish, Elise S.</td>
<td>607</td>
</tr>
<tr>
<td>Gourlie, Jennifer A.</td>
<td>221</td>
</tr>
<tr>
<td>Gray, Thomas</td>
<td>32, 265</td>
</tr>
<tr>
<td>Green, J. D.</td>
<td>352</td>
</tr>
<tr>
<td>Green, Jerry M.</td>
<td>589</td>
</tr>
<tr>
<td>Greene, Wykle C.</td>
<td>137, 451, 579</td>
</tr>
<tr>
<td>Greer, Bradley</td>
<td>14, 18, 20, 59</td>
</tr>
<tr>
<td>Greer, William B.</td>
<td>24</td>
</tr>
<tr>
<td>Gressel, Jonathan</td>
<td>531</td>
</tr>
<tr>
<td>Grey, Timothy L.</td>
<td>238, 247, 262, 273</td>
</tr>
<tr>
<td>Grint, Kolby R.</td>
<td>64</td>
</tr>
<tr>
<td>Grubbs, Becky</td>
<td>110</td>
</tr>
<tr>
<td>Guerra, Nelly</td>
<td>188</td>
</tr>
</tbody>
</table>
Guimaraes Abe, Daniel 568, 571
Gulden, Robert 55, 535
Gundy, Garrison J. 430
Gunnell, Kevin 129
Guzzomi, Andrew L. 536
Haak, David 261, 455
Hager, Aaron 76, 79, 329, 467, 586
Hale, Ralph R. 41, 42
Hall, Linda 56
Hall, Nathan D. 172, 456
Hall, Steven D. 78, 81, 84, 248, 270, 271, 495
Halvorson, Gary 395, 591
Hamberg, Ryan C. 88
Hammitt, Norman 559
Han, Heping 170
Hand, Lavesta C. 262
Hanson, Brad 91, 104, 139, 200, 437, 542
Hara, Sherry-Ann 211
Haramoto, Erin 162, 318
Haring, Steven C. 104, 267, 542
Harker, K. Neil 535
Harrington, Timothy B. 127, 377
Harris, James 172, 456
Hart, Charles 573
Hart, Marshall 264, 282
Harveson, Robert 16, 435
Hathcoat, Daniel 169, 184, 253
Hatler, William L. 450, 452, 573, 574, 575, 576, 577, 578
Hatterman-Valenti, Harlene M. 299, 304
Haugrud, Nathan H. 306, 594
Hauvermale, Amber L. 66
Hay, Marshall 258, 502
Hayden, N. Cade 290, 292
Hayoun, Michael A. 555
Heard, Gavin 362
Heaton, Brent S. 89, 187
Hedges, Brittany  564
Hein, Gary  47, 252
Heiser, James W.  403
Hembree, Kurt J.  44, 374
Henry, Jerri Lynn  289
Hensley, Justin B.  18
Hernandez, Guy G.  111
Herndon, Leonard  216
Herrmann, Jeffrey E.  295
Hicks, Charles T.  30
Hidayat, Purnama  534
Hill, Nicholas S.  544
Hill, Zachary T.  70, 492
Hillger, David E.  450, 503, 508, 575, 576, 577
Hodnett, George  184, 169, 185, 253
Hofland, Megan  192
Holmberg, Christopher  369, 375
Hooker, David C.  237, 242, 342
Hooks, Cerruti R.  474
Horak, Michael J.  95
Hotz, Alden  371
House, Mason T.  495
House, Megan  478
Hoverstad, Tom  587
Howard, Zachary S.  122
Howatt, Kirk A.  11, 345, 359, 364, 365, 433, 589
Howell, Andrew  525
Hoyos, Veronica  178
Hoyos, Verónica  176
Hu, Chengsong  217, 218
Hubbard Guetling, Christie  382
Huet, Herve  531
Hulting, Andrew G.  177, 221, 460, 480, 547, 572, 599
Hurdle, Nicholas L.  247
Hutchings, Sarah-Jane  409, 463
Hutchinson, Pamela J.S.  106, 303
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hwang, Ki-Hwan</td>
<td>54</td>
</tr>
<tr>
<td>Idowu, John</td>
<td>476</td>
</tr>
<tr>
<td>Jegneri, Lynn</td>
<td>196</td>
</tr>
<tr>
<td>Ikeda, Dana</td>
<td>135</td>
</tr>
<tr>
<td>Ikley, Joseph T.</td>
<td>594</td>
</tr>
<tr>
<td>Irby, Jon T.</td>
<td>248</td>
</tr>
<tr>
<td>Irmak, Suat</td>
<td>163</td>
</tr>
<tr>
<td>Isaacson, Samantha D.</td>
<td>28, 243</td>
</tr>
<tr>
<td>Ison, Russell</td>
<td>362</td>
</tr>
<tr>
<td>Iwakami, Satoshi</td>
<td>324</td>
</tr>
<tr>
<td>Iwasaki, Arihiro</td>
<td>530</td>
</tr>
<tr>
<td>Iwasaki, Keitaro</td>
<td>530</td>
</tr>
<tr>
<td>Jackson, James R.</td>
<td>573</td>
</tr>
<tr>
<td>Jackson, Jon</td>
<td>235</td>
</tr>
<tr>
<td>Jackson, Lucy V.</td>
<td>409</td>
</tr>
<tr>
<td>Jacobs, James L.</td>
<td>595</td>
</tr>
<tr>
<td>Jacobs, Jim S.</td>
<td>454</td>
</tr>
<tr>
<td>James, Jeremy</td>
<td>379</td>
</tr>
<tr>
<td>Jamison, Brendan V.</td>
<td>194</td>
</tr>
<tr>
<td>Jenks, Brian</td>
<td>571</td>
</tr>
<tr>
<td>Jennings, Katherine M.</td>
<td>94, 257, 266, 375</td>
</tr>
<tr>
<td>Jernigan, Shapan</td>
<td>525</td>
</tr>
<tr>
<td>Jha, Prashant</td>
<td>2, 87, 276, 589, 88, 587, 598</td>
</tr>
<tr>
<td>Jhala, Amit J.</td>
<td>2, 10, 16, 28, 47, 163, 174, 198, 243, 252, 342, 435, 497, 569, 586</td>
</tr>
<tr>
<td>Jhala, Rachana A.</td>
<td>198</td>
</tr>
<tr>
<td>Johnson, Dave</td>
<td>354, 356</td>
</tr>
<tr>
<td>Johnson, Eric N.</td>
<td>440, 441, 481, 489</td>
</tr>
<tr>
<td>Johnson, Kevin</td>
<td>61</td>
</tr>
<tr>
<td>Johnson, Laura P.</td>
<td>32</td>
</tr>
<tr>
<td>Johnson, M Tracy</td>
<td>528</td>
</tr>
<tr>
<td>Johnson, Paul O.</td>
<td>359, 587</td>
</tr>
<tr>
<td>Johnson, Quintin R.</td>
<td>367</td>
</tr>
<tr>
<td>Johnson, Tim</td>
<td>533</td>
</tr>
<tr>
<td>Johnson, William G.</td>
<td>290, 292</td>
</tr>
<tr>
<td>Jones, Eric A.</td>
<td>23, 350</td>
</tr>
<tr>
<td>Jones, Lisa C.</td>
<td>382, 388</td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Jones, Tammy</td>
<td>55</td>
</tr>
<tr>
<td>Jones, Tyler Z.</td>
<td>9</td>
</tr>
<tr>
<td>Jones, Vanessa L.</td>
<td>280</td>
</tr>
<tr>
<td>Jordan, David L.</td>
<td>257, 266</td>
</tr>
<tr>
<td>Jordan, Nicholas</td>
<td>402, 475</td>
</tr>
<tr>
<td>Jorgensen, Niels A.</td>
<td>527</td>
</tr>
<tr>
<td>Jovanovic, Darko</td>
<td>49, 50, 52</td>
</tr>
<tr>
<td>Jugulam, Mithila</td>
<td>333, 346, 471, 196, 328, 332, 337, 341, 343, 596</td>
</tr>
<tr>
<td>Jungers, Jacob</td>
<td>40</td>
</tr>
<tr>
<td>Kadyampakeni, Davie M.</td>
<td>260</td>
</tr>
<tr>
<td>Kalina, Jacob R.</td>
<td>238</td>
</tr>
<tr>
<td>Kandru, Sudhakar</td>
<td>565</td>
</tr>
<tr>
<td>Kanissery, Ramdas</td>
<td>300, 246, 260, 372</td>
</tr>
<tr>
<td>Kao-Kniffin, Jenny</td>
<td>277</td>
</tr>
<tr>
<td>Kappler, Brady</td>
<td>569</td>
</tr>
<tr>
<td>Karn, Elizabeth</td>
<td>397</td>
</tr>
<tr>
<td>Kato-Noguchi, Hisashi</td>
<td>530</td>
</tr>
<tr>
<td>Kaundun, Shiv S.</td>
<td>329, 409, 463</td>
</tr>
<tr>
<td>Keeling, Wayne</td>
<td>17</td>
</tr>
<tr>
<td>Keene, Clair L.</td>
<td>40</td>
</tr>
<tr>
<td>Keith, Barbara</td>
<td>35, 192</td>
</tr>
<tr>
<td>Kemerait, Robert C.</td>
<td>595</td>
</tr>
<tr>
<td>Kendall, Brenda C.</td>
<td>106</td>
</tr>
<tr>
<td>Kennedy, Hannah Joy</td>
<td>305</td>
</tr>
<tr>
<td>Kerns, Becky K.</td>
<td>135, 400, 597</td>
</tr>
<tr>
<td>Kerns, James</td>
<td>109</td>
</tr>
<tr>
<td>Kevis, Stuart J.</td>
<td>565, 566</td>
</tr>
<tr>
<td>Kezar, Sarah E.</td>
<td>5</td>
</tr>
<tr>
<td>Kharel, Prasanna</td>
<td>491</td>
</tr>
<tr>
<td>Kim, John</td>
<td>597</td>
</tr>
<tr>
<td>Kimura, Emi</td>
<td>206</td>
</tr>
<tr>
<td>King, David R.</td>
<td>96</td>
</tr>
<tr>
<td>Klingaman, Tracy</td>
<td>546</td>
</tr>
<tr>
<td>Knauf, Amanda</td>
<td>415</td>
</tr>
<tr>
<td>Knezevic, Stevan</td>
<td>10, 16, 47, 49, 50, 51, 52, 198, 252, 435, 497</td>
</tr>
<tr>
<td>Kniss, Andrew R.</td>
<td>30, 173, 276, 317, 389, 483, 501, 598</td>
</tr>
</tbody>
</table>
Knudsen, Alan D. 454
Koehler, Susan M. 609
Koo, Dae-Won 54
Koo, Dal-Hoe 337, 596
Koo, Suk-Jin 54
Korres, Nicholas 209
Kraemer, Gerd 565
Kramer, Madison D. 240
Kraus, Helmut 565
Krawchuk, Meg 597
Kremer, Robert J. 288
Kruger, Greg R. 47, 76, 153, 248, 270, 290, 364, 545, 589
Krumm, Jeffrey 60, 252, 354
Kubota, Hiroshi 535
Kuepper, Anita 167, 546
Kuhns, Hannah A. D. 385
Kumar, Vipan 363, 85, 234, 347, 364, 398
Kunkel, Daniel 100
Küpper, Anita 315
Kurata, Kohei 324
Laber, Bernd 143
Laforest, Martin 340, 103, 596
Laird, Patricia D. 487
Lakoba, Vasily 526
Laliberte, Suzanne 261, 455
Lambert, Taylor 85, 234, 347, 398
Landeen, Melissa L. 129
Landes, Andreas 565
Langdon, Nicole M. 242
Langemeier, Ryan D. 108, 153, 208, 294, 351, 472, 545
Lanz, Shelby E. 201
Larocca De Souza, Larissa 309
Larson, Chris 67
Larson, Erick J. 479
Latheef, Mohamed 230, 540
Lavy, Daniel 185
Law, Eugene P. 40, 259, 436
Lawrence, Nevin 3, 222, 389, 16, 47, 252, 276, 435, 497, 598
Lazar, Lauren M. 209, 220, 402, 475
Leah, Collie M. 231
Leary, James 414
LeBude, Anthony V. 120
LeClere, Sherry 410
Lee, James M. 87, 88
Leeson, Julia 55, 56
Legleiter, Travis 240, 352
Lehnhoff, Erik A. 205, 232, 279
Leon, Ramon G. 23, 31, 152, 266, 350
Lerch, Robert 199
Leslie, Alan W. 474
Levy Jr., Ronald J. 24
Lewis, David 414
Lezaun, Juan A. 171
Li, Steve 108, 153, 208, 294, 351, 472, 545, 584
Lidor Nili, Efrat 531
Lieber, Lucas 442
Liebl, Rex A. 143
Liebman, Matt 212
Lightle, Danielle M. 139
Lim, Charlemagne A. 598
Lima, Alessandro C. 202, 203
Lin, Haosheng 152
Lindell, Hannah C. 1, 206, 358, 363
Lindquist, John 402, 25, 26, 28, 163, 174, 243, 407, 475
Lins, Ryan D. 486
Litton, Creighton M. 415
Liu, Kang 410
Liu, Rui 234, 398, 85, 347, 363
Liu, Sanzhen 343
Long, Dan S. 443
Long, Melvin 590
Loux, Mark 76
Lovelace, Michael 60, 354, 493
Loveland, Chet 77
Lowell, Cadance A. 235
Lu, Huan 170
Lukens, Lewis 478
Lutz, Ulrich 311
Lygin, Anatoli V. 463
Lyon, Drew J. 168, 539
Ma, Rong 322, 349
MacGregor, Dana R. 335
Machado Noguera, Matheus 403
Macvilay, Iththiphonh A. 87, 88
Madsen, John D. 524
Magidow, Lillian C. 393, 583, 592
Mahnken, Brooke 414
Mahoney, Denis J. 256
Main, Jeffrey L. 308
Maity, Aniruddha 209, 404, 605
Majeski, Michelle L. 312
Makepeace, Annie 393, 592
Mallinson, Jeffrey 521, 522
Mallory-Smith, Carol 177, 480
Malone, Jenna 315, 411
Mangold, Jane 454, 145, 312, 387, 444, 518
Manuchehri, Misha R. 1, 5, 17, 38, 206, 358, 363, 364
Marchegiani, Elisabetta 409
Marconato, Joy 280
Marquardt, Paul 503, 508
Marques Caldera da Silva, Arnaldo 96
Marshall, Michael W. 71
Martin, Christy 417
Martin, Daniel 230, 540
Martin, Elise 56
Martin, Katie 200
Martin, Nicolas F. 467
Martin, Sara L. 340
Marymor, Noe 286
Matthew, Sudeep 502
Mattilio, Chloe M. 384
Matzrafi, Maor 602
Maupin, Brian 313
Mausbach, Jasmine M. 163
Maxwell, Bruce 35, 310, 406
Mayfield, Addie 609
Mayo, Christopher M. 485
Mayonado, David J. 485
McCallum, John D. 443
McCloskey, William B. 58, 62, 370, 570
McCormick, Ashley N. 231, 537
McCullough, Patrick E. 510
McDonald, Shawn T. 2
McElroy, Joseph S. 172, 333, 456, 507
McElroy, Randy 541
McElroy, Scott 182
McFarland, Janis E. 549
McGaughey, Bernalyn 556
McGinty, Joshua A. 53, 214
McKnight, Benjamin M. 14, 18, 20, 24, 59
McNeal, Jacob P. 78, 81, 84, 248, 270, 271
McWhirt, Amanda 371
Meadows, Alexis L. 187
Mealor, Brian 9, 264, 282, 380, 391, 446, 452, 518
Menalled, Fabian D. 67, 196, 233
Mendes, Kassio F. 202, 203
Mendes, Rafael R. 254
Menne, Hubert 143, 546
Merchant, Rand 471
Merotto Jr, Aldo 189
Merriam, Alicia B. 411
Merritt, Luke H. 83, 275
Mesgaran, Mohsen B. 91, 166, 423, 602, 604
Mettler, Joseph 11, 359, 433
Metzger, Brendan 564
Meyer, Chris J. 498
Meyer-Morey, Jordan 444
Meyers, Stephen L. 308
Michielsen, Larry 535
Mielke, Kamila C. 202, 203
Miera, Celestina S. 106
Miklas, Phillip 368
Millan, Teresa 179
Miller, Perry 233
Millwood, Reginald 334
Mirsky, Steven B. 217, 220, 402, 470, 475
Mitchem, Wayne E. 369, 375
Miville, David 103
Miyashita, Masahiro 324
Mo, Clement 316
Moechnig, Mike 354, 356
Molin, William T. 321, 338, 464
Monday, Tyler 520
Monfort, Walter S. 247
Monks, David W. 257, 266
Montagna, Marco 362
Montgomery, Jacob S. 164, 197, 459
Moore, Frederick 29, 251
Moore, Levi D. 94, 266
Morell, Mauricio 498, 499
Moretti, Marcelo L. 96, 301, 309
Morgan, Gaylon 17
Morishita, Don W. 382
Morran, Sarah 182, 183, 333, 471
Morris, James 143, 463
Moseley, Carroll 150, 487, 549
Mosqueda, Elizabeth G. 598
Mota, Larissa M. 202
Mrnak, Genevieve M. 393
Mueller, Thomas C. 4, 201, 258, 293
Mulenga, Alick 535
Mulvaney, Michael J. 491
Mumford, Colter 387
Murphy, Brent P. 197, 272, 461

132
Myers, James 368
Nagila, Asmita 476
Nagle, Marcus 235
Namuth-Covert, Deana 196
Nandula, Vijay 154, 191, 321
Naylor, Bridgett 597
Neal, Joseph C. 114, 120, 152
Neely, Clark 227
Neher, Paul 232
Nelson, Mark 138
Neve, Paul 167, 182, 333
Newlin, Lane S. 1, 206, 358, 363
Nguyen, Huong 212
Nichols, Robert L. 403
Nietupski, Ty C. 597
Nissen, Scott J. 383, 386, 518
Noivirt-Brik, Orly 531
Noland, Reagan L. 495
Nolte, Scott A. 122, 495
Norris, Bradley J. 78, 81, 84, 248, 270, 271, 495
Norris, Robert F. 149
Norsworthy, Jason K. 27, 76, 79, 82, 207, 209, 250, 274, 290, 402, 438, 470, 475, 477, 494, 495
Norton, Randy 62
Nurse, Robert E. 102, 103
Oakley, Graham 80
Obeid, Kristen A. 103
Obenland, Olivia A. 194
Ochsner, Tyson 363
Oeggerli, Virginia 280
Oester, Dean 585, 590
Ohadi, Sara 184, 602
Oliveira Jr., Rubem S. 254
Omielan, Joe 128
Oneto, Scott 519
Ooka, Joey 211
Oostlander, Mark 564
Ortiz, Mirella F. 448
Osburn, Andrew W. 110
Oasco Helvig, Enelise 19
Osland, Eric 199
O sipitan, O. Adewale 602
Ostendorf, Teandra 55
Osterholt, Matthew 22, 290, 292
Ostertag, Rebecca 416
Ostlie, Mike 594
Ostmeyer, Troy 234
Ou, Junjun 104
Owen, Mallory 56
Owen, Mechelle J. 170
Owen, Micheal D. 531
Owens, Daniel K. 211
Pabuayon, Irish L. B. 291
Paciorek, Marta 410
Page, Eric R. 103, 244, 340
Palma-Bautista, Candelario 175, 176, 178, 223
Palmer, Samuel A. 161, 552
Palomares, Thomas 425
Pan, Zhiqiang 462
Pandeya, Devendra 213
Pandian, Balaji Aravindhan 343
Parker, Ethan T. 258, 502
Parrish, Scott 156, 587
Pastor, Bryan C. 58, 62, 570
Patel, Jinesh D. 172, 456
Patel, Mahshar 525
Patterson, Eric L. 126, 182, 320, 333, 339
Patzoldt, William L. 422
Peachey, Ed 98, 302, 368, 460
Pearce, Anne 580
Pearrow, Nathan 73
Pearson, Randy 73
Pedireddi, Usha Rani 184
Pedraza, Veronica 171
Peer, Wendy A. 458
Peleg, Zvi 325
Pelzer, Christopher J. 436
Peppers, John M. 172, 506
Perez-Jones, Alejandro 327, 349, 410
Perkins, Clay M. 36, 193, 258
Perroy, Ryan L. 523
Perry, Hunter 498
Perry, Zach 240
Perumal, Ramsamy 234
Peters, Thomas J. 306
Petersen, Daniel 543
Peterson, Dallas E. 328
Peterson, Robbie 38, 39
Petrovic, Tijana 315
Piasecki, Cristiano 334
Piaskowski, Julia L. 382
Picard, Laurent 565
Picasso, Valentin 40
Pietrasiak, Nicole 279
Pilcher, Clint D. 609
Pilipovic, Bojana 236
Pilon, Cristiane 247
Pittman, Kara 220, 482
Plaza, Guido 176, 178
Porpiglia, Peter J. 589
Post, Angela R. 496, 526
Potter, Bruce 587
Powell, Gary Edward 46
Pound, Stephen B. 170
Prasad, Kasavajhala 315
Prasad, P.V. Vara 343
Prasad, Raj Nil 131
Prasifka, Patti 354, 356
Prather, Timothy S. 284, 322, 382, 388, 449, 518
Preston, Christopher 411, 315, 330, 331, 360
Price, Katilyn J. 108, 153, 208, 294, 351, 472, 545, 584
Price, William J. 322
Priess, Grant L. 82, 207, 274, 494
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priester, Emily L.</td>
<td>244</td>
<td></td>
</tr>
<tr>
<td>Pristolas, Josh</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Proctor, Chris</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Prosko, Eric P.</td>
<td>32, 247, 595</td>
<td></td>
</tr>
<tr>
<td>Putnam, Dan</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>Putri, Izza A.</td>
<td>534</td>
<td></td>
</tr>
<tr>
<td>Quick, Hayden</td>
<td>239, 134</td>
<td></td>
</tr>
<tr>
<td>Quicke, Harold</td>
<td>124, 449, 518</td>
<td></td>
</tr>
<tr>
<td>Quinn, Jessica E.</td>
<td>237, 548</td>
<td></td>
</tr>
<tr>
<td>Qureshi, Huma</td>
<td>608</td>
<td></td>
</tr>
<tr>
<td>Raedar, Alan J.</td>
<td>242</td>
<td></td>
</tr>
<tr>
<td>Raile, Eric</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>Rains, Glen C.</td>
<td>595</td>
<td></td>
</tr>
<tr>
<td>Raiyemo, Damilola A.</td>
<td>322</td>
<td></td>
</tr>
<tr>
<td>Rana, Aman</td>
<td>392</td>
<td></td>
</tr>
<tr>
<td>Rana, Neha</td>
<td>298, 485</td>
<td></td>
</tr>
<tr>
<td>Rana, Sandeep S.</td>
<td>68, 69, 99</td>
<td></td>
</tr>
<tr>
<td>Randell, Taylor M.</td>
<td>245, 262</td>
<td></td>
</tr>
<tr>
<td>Randhawa, Ranjeet S.</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>Ransom, Corey V.</td>
<td>77, 121, 123, 138, 281, 518</td>
<td></td>
</tr>
<tr>
<td>Rapp, Ryan E.</td>
<td>298</td>
<td></td>
</tr>
<tr>
<td>Rathore, Keerti</td>
<td>213</td>
<td></td>
</tr>
<tr>
<td>Rauch, Traci</td>
<td>322, 48</td>
<td></td>
</tr>
<tr>
<td>Rauser, Ruben</td>
<td>409</td>
<td></td>
</tr>
<tr>
<td>Rayamajhi, Min B.</td>
<td>532</td>
<td></td>
</tr>
<tr>
<td>Reberg-Horton, Chris</td>
<td>257</td>
<td></td>
</tr>
<tr>
<td>Recker, Ross A.</td>
<td>485</td>
<td></td>
</tr>
<tr>
<td>Rector, Ryan</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Reddy, Anireddy</td>
<td>315</td>
<td></td>
</tr>
<tr>
<td>Reeves, Julie</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Reid, Chad</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>Reid, Patty</td>
<td>535</td>
<td></td>
</tr>
<tr>
<td>Reiter, Maggie</td>
<td>112, 113, 147</td>
<td></td>
</tr>
<tr>
<td>Reiter, Mark S.</td>
<td>482</td>
<td></td>
</tr>
<tr>
<td>Renner, Karen A.</td>
<td>8, 146</td>
<td></td>
</tr>
<tr>
<td>Renz, Mark J.</td>
<td>43, 136, 527, 580</td>
<td></td>
</tr>
<tr>
<td>Repas, Emily B.</td>
<td>378</td>
<td></td>
</tr>
<tr>
<td>Revolinski, Samuel R.</td>
<td>168</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Rew, Lisa J.</td>
<td>186, 278, 284, 287, 312, 387, 444</td>
<td></td>
</tr>
<tr>
<td>Reynolds, Daniel B.</td>
<td>79, 80, 290, 479</td>
<td></td>
</tr>
<tr>
<td>Riboldi, Lucas Baiochi</td>
<td>460</td>
<td></td>
</tr>
<tr>
<td>Richards, Kerry</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Richardson, Jesse M.</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Richardson, Robert J.</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Riechers, Dean E.</td>
<td>194, 329, 463</td>
<td></td>
</tr>
<tr>
<td>Rieck-Hinz, Angie</td>
<td>396</td>
<td></td>
</tr>
<tr>
<td>Rigon, Carlos Alberto</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Gonsiorjkiewicz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rinella, Matthew J.</td>
<td>379, 454</td>
<td></td>
</tr>
<tr>
<td>Rios, Esteban Fernando</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Ritchie, Glen L.</td>
<td>291</td>
<td></td>
</tr>
<tr>
<td>Rob, Md Mahfuzur</td>
<td>530</td>
<td></td>
</tr>
<tr>
<td>Robbins, Stacey N.</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>Roberson, Gary</td>
<td>152</td>
<td></td>
</tr>
<tr>
<td>Roberts, Trenton L.</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Robey, Wade</td>
<td>431</td>
<td></td>
</tr>
<tr>
<td>Robinson, Andrew P.</td>
<td>141</td>
<td></td>
</tr>
<tr>
<td>Robinson, Darren E.</td>
<td>237, 242, 342</td>
<td></td>
</tr>
<tr>
<td>Roerig, Kyle</td>
<td>221, 480, 572</td>
<td></td>
</tr>
<tr>
<td>Rojano-Delgado, Antonia M.</td>
<td>175, 176, 178, 223</td>
<td></td>
</tr>
<tr>
<td>Roma-Burgos, Nilda</td>
<td>348, 403, 603</td>
<td></td>
</tr>
<tr>
<td>Roncoroni, John A.</td>
<td>113, 147</td>
<td></td>
</tr>
<tr>
<td>Rooney, William</td>
<td>169, 185, 253</td>
<td></td>
</tr>
<tr>
<td>Rosa, Alexandre T.</td>
<td>25, 26</td>
<td></td>
</tr>
<tr>
<td>Rosenbaum, Kristin</td>
<td>484</td>
<td></td>
</tr>
<tr>
<td>Ross, Aaron</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Roth, Leo</td>
<td>136, 580</td>
<td></td>
</tr>
<tr>
<td>Rothweiler, Frank</td>
<td>546</td>
<td></td>
</tr>
<tr>
<td>Rowlandson, Tracy</td>
<td>296</td>
<td></td>
</tr>
<tr>
<td>Rowsey, Ginger</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>Rubin, Baruch</td>
<td>325</td>
<td></td>
</tr>
<tr>
<td>Rubione, Claudio G.</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>Rudnick, Daran</td>
<td>25, 26</td>
<td></td>
</tr>
<tr>
<td>Rumler, Allyson M.</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Russell, David</td>
<td>239, 134</td>
<td></td>
</tr>
<tr>
<td>Russell, Elijah C.</td>
<td>172, 456</td>
<td></td>
</tr>
</tbody>
</table>
Russell, Kyle R. 291, 493
Rustom, Samer Y. 14, 18, 20, 24, 59
Rutland, William J. 78, 81, 84, 248, 270, 271
Ryan, Matthew R. 259, 436
Sammons, Doug 410
Samuelson, Spencer L. 19, 215, 216, 473
San Martin Hernandez, Carolina 221, 443
Sander, Luke 391
Sanders, John 86
Sandoski, Craigs 75
Sanguinet, Karen 314
Sanogo, Soum 476
Santos, Renata Thaysa da Silva 132, 133
Sapkota, Bishwa B. 122, 217, 227, 228, 230, 269, 540
Sarangi, Debalin 163, 236, 605
Saski, Christopher A. 338, 339, 464
Satrom, Kelly T. 365
Sauer, Steve 130, 516
Saunders, David 60, 61, 484
Sbatella, Gustavo 276
Schaeffer, James 374
Schlaefer, Sascha 565
Schoonover, Jon 541
Schraer, Marty 502
Schramski, John A. 8, 549, 553
Schroeder, Brenda 388
Schroeder, Jill 609
Schultz, Whitney R. 3
Schumaker, Brooklyn C. 195
Schuster, Greta 53
Schutte, Brian J. 105, 476
Schwarz, Michael R. 257
Scott, Barbara A. 367
Scott, Jon 49, 50, 52
Scow, Benjamin 121
Scruggs, Eric B. 37, 249, 434, 482
Sebastian, Derek J. 130, 386, 516, 518
<table>
<thead>
<tr>
<th>Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sebastian, James</td>
<td>130, 516</td>
</tr>
<tr>
<td>Seedorf, Rachel H.</td>
<td>383, 386</td>
</tr>
<tr>
<td>Seefeldt, Steven S.</td>
<td>313</td>
</tr>
<tr>
<td>Seipel, Tim</td>
<td>67, 233</td>
</tr>
<tr>
<td>Seiter, Nicholas J.</td>
<td>329</td>
</tr>
<tr>
<td>Sellers, Brent A.</td>
<td>581, 582</td>
</tr>
<tr>
<td>Semach, Greg</td>
<td>535</td>
</tr>
<tr>
<td>Senseman, Scott</td>
<td>99, 554, 557, 560, 561</td>
</tr>
<tr>
<td>Seshadri, Arathi</td>
<td>285</td>
</tr>
<tr>
<td>Sexton, Ruth</td>
<td>140</td>
</tr>
<tr>
<td>Shakya, Sumadhur</td>
<td>427</td>
</tr>
<tr>
<td>Sharma, Gourav</td>
<td>261, 455, 526</td>
</tr>
<tr>
<td>Sharpe, Shaun</td>
<td>55</td>
</tr>
<tr>
<td>Shaw, David R.</td>
<td>609</td>
</tr>
<tr>
<td>Shekoofa, Avat</td>
<td>193, 504</td>
</tr>
<tr>
<td>Shergill, Lovreet S.</td>
<td>220, 402, 470, 475</td>
</tr>
<tr>
<td>Shiffer, Alisha</td>
<td>120</td>
</tr>
<tr>
<td>Shilling, Donn G.</td>
<td>238</td>
</tr>
<tr>
<td>Shirriff, Scott</td>
<td>55, 56</td>
</tr>
<tr>
<td>Shirtliffe, Steve</td>
<td>440</td>
</tr>
<tr>
<td>Shirtliffe, Steven J.</td>
<td>441</td>
</tr>
<tr>
<td>Shock, Morgan</td>
<td>513</td>
</tr>
<tr>
<td>Shrestha, Anil</td>
<td>148, 374</td>
</tr>
<tr>
<td>Shrestha, Swati</td>
<td>195</td>
</tr>
<tr>
<td>Shugart, John</td>
<td>265</td>
</tr>
<tr>
<td>Shwartz, Ido</td>
<td>531</td>
</tr>
<tr>
<td>Shyam, Chandrima</td>
<td>346, 328</td>
</tr>
<tr>
<td>Sias, Cynthia</td>
<td>169, 184, 185, 253</td>
</tr>
<tr>
<td>Siemens, Mark C.</td>
<td>429</td>
</tr>
<tr>
<td>Sievernich, Bernd</td>
<td>565</td>
</tr>
<tr>
<td>Sikkema, Peter H.</td>
<td>34, 68, 69, 99, 219, 237, 242, 342, 344</td>
</tr>
<tr>
<td>Simard, Marie-Josee</td>
<td>102, 103</td>
</tr>
<tr>
<td>Simon, Joaquin</td>
<td>504</td>
</tr>
<tr>
<td>Simpson, David M.</td>
<td>155, 297</td>
</tr>
<tr>
<td>Sims, Kira C.</td>
<td>94, 375</td>
</tr>
<tr>
<td>Singh, Daljit</td>
<td>295</td>
</tr>
<tr>
<td>Singh, Gurbir</td>
<td>541</td>
</tr>
<tr>
<td>Singh, Gurbir</td>
<td>469</td>
</tr>
</tbody>
</table>

139
Singh, Shilpa 213, 214
Singh, Vijay 214, 227, 229, 230, 540
Skelton, Joshua J. 592
Skovgard, Jordan L. 517
Slaughter, David 305
Slavov, Gancho 167
Sleigh, Byron B. 450, 573, 574, 575, 576, 577, 578
Smeda, Reid 63, 80, 162, 165, 289, 318, 373
Smith, Daniel H. 65
Smith, Gerald Ray 404
Smith, Landon G. 537
Smith, Lesley B. 371
Smith, Richard G. 161
Smith, Stephen C. 94, 257
Soltani, Nader 34, 219, 237, 344, 99
Soni, Neeta 126, 600
Soufiane, Brahim 596
Sousa, Rodrigo N. 202, 203
Souza, Gustavo M. 603
Sparks, Crystal D. 167, 198, 320, 339
Sparks, Jed P. 415
Spaunhorst, Douglas J. 33
Sпотh, Matthew P. 436
Sprague, Christy 6, 8, 45, 46, 80, 589
Spring, John F. 168
Sroka, Elizabeth 535
Stahlman, Phillip W. 347, 398
Stallworth, Shandrea D. 195
Steckel, Larry 4, 36, 144, 293, 402, 495, 76, 79, 193, 258, 290, 403, 475
Steckel, Sandy 36
Steed, Shawn T. 514
Stepanovic, Strahinja 26
Stephens, Cameron 109
Steppig, Nicholas R. 76, 268, 550, 594
Sterling, Tracy M. 192, 196
Stevenson, Rod 298
Steward, Bruce 354
Stewart, Charles Neal 334
Stiles II, Brian J. 45, 46
Stoltenberg, David E. 12, 13, 40
Stoneburner, Alexandra L. 453
Strand, Eva K. 382
Striegel, Adam 47, 252
Striegel, Sarah V. 12, 13, 158
Strom, Seth A. 329
Subedi, Kalidas 500
Subramanian, Nithya K. 184, 185, 605
Suda, Hiroe 324
Suenaga, Kiyotake 530
Summers, Haleigh 553
Sunderlage, Brent 162, 318
Sutherland, D. Bryce 595
Suzukawa, Andrée Kazumi 177
Swanton, Clarence 255, 478, 244, 466
Sykes, Virginia 193
Takano, Hudson K. 254, 330, 331
Tanaka, Keisuke 324
Tanaka, Satoru 324
Tang, Lie 428
Tanigaki, Shinji 241
Tardif, Francois 316, 244, 466
Tekiela, Daniel R. 378, 384, 385, 447, 526
Tembrock, Luke 126
Tenhumberg, Brigitte 174
Tesso, Tesfaye 343
Thompson, Corey 251, 495, 29
Thorne, Mark 221, 539
Thorne, Nolan H. 134
Tidemann, Breanne D. 535
Tiwari, Ruby 491
Todd, Olivia E. 326, 471
Tolson, Mika 95
Tominaga, Tohru 324
Tornisielo, Valdemar L. 203
Torra, Joel 175, 176
<table>
<thead>
<tr>
<th>Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torres, Ubaldo</td>
<td>493</td>
</tr>
<tr>
<td>Tortorelli, Claire</td>
<td>597</td>
</tr>
<tr>
<td>Tourte, Laura</td>
<td>426</td>
</tr>
<tr>
<td>Tranel, Patrick</td>
<td>333, 336, 21, 164, 197, 272, 459, 461, 467</td>
</tr>
<tr>
<td>Treadway, Zachary R.</td>
<td>83, 275, 593</td>
</tr>
<tr>
<td>Treadwell, Danielle D.</td>
<td>225, 226</td>
</tr>
<tr>
<td>Trevino, Tenika</td>
<td>106</td>
</tr>
<tr>
<td>Trigiano, Robert N.</td>
<td>107</td>
</tr>
<tr>
<td>Trull, Bryce</td>
<td>334</td>
</tr>
<tr>
<td>Tseng, Te-Ming (Paul)</td>
<td>195</td>
</tr>
<tr>
<td>Tuck, Dan</td>
<td>504</td>
</tr>
<tr>
<td>Tuck, Daniel P.</td>
<td>118</td>
</tr>
<tr>
<td>Tucker, Andrew</td>
<td>234</td>
</tr>
<tr>
<td>Tucker, Auriana P.</td>
<td>195</td>
</tr>
<tr>
<td>Turra, Guilherme Menegol</td>
<td>189</td>
</tr>
<tr>
<td>Tyson, William G.</td>
<td>595</td>
</tr>
<tr>
<td>Ugljic, Zaim</td>
<td>593</td>
</tr>
<tr>
<td>Umeda, Kai</td>
<td>511</td>
</tr>
<tr>
<td>Umphres, Alinna</td>
<td>53</td>
</tr>
<tr>
<td>Uowolo, Amanda</td>
<td>416</td>
</tr>
<tr>
<td>Vail, Gordon D.</td>
<td>486</td>
</tr>
<tr>
<td>Van Vleet, Stephen M.</td>
<td>518</td>
</tr>
<tr>
<td>Van Wychen, Lee</td>
<td>394, 553</td>
</tr>
<tr>
<td>Vance, Jenna C.</td>
<td>32, 245</td>
</tr>
<tr>
<td>VanGessel, Mark</td>
<td>220, 367, 402, 589, 609, 68, 69, 99, 470, 475</td>
</tr>
<tr>
<td>Vanhie, Theodore R.</td>
<td>466</td>
</tr>
<tr>
<td>Varanasi, Vijaya</td>
<td>327</td>
</tr>
<tr>
<td>Vargas, Jose J.</td>
<td>504</td>
</tr>
<tr>
<td>Varner, Beau J.</td>
<td>79</td>
</tr>
<tr>
<td>Vasic, Zorica</td>
<td>404</td>
</tr>
<tr>
<td>Vasiljevic, Bridgit W.</td>
<td>311</td>
</tr>
<tr>
<td>Vázquez García, José G.</td>
<td>175, 176, 178, 179, 223</td>
</tr>
<tr>
<td>Verreth, Jona</td>
<td>35</td>
</tr>
<tr>
<td>Vila-Aiub, Martin</td>
<td>167</td>
</tr>
<tr>
<td>Vollmer, Kurt M.</td>
<td>367</td>
</tr>
<tr>
<td>Wada, Chris</td>
<td>414</td>
</tr>
<tr>
<td>Wadl, Phillip</td>
<td>307</td>
</tr>
</tbody>
</table>
Waldschmidt, Matthew  94
Walker, David C.  14, 18, 20, 24, 59
Walsh, Michael J.  536, 538
Walton, Larry C.  42, 498
Wang, Guangyao Sam  58, 570
Ward, Sarah  192, 196
Wayman, Sandra  436
Weaver, David K.  192
Webster, Connor  14, 18, 20, 59
Webster, Eric  14, 24, 18, 20, 59
Webster, Lucas C.  24
Weigel, Detlef  311
Weirich, Jason  289
Weisberger, David  31
Welker, Robert M.  97
Welter, Philipp  546
Werle, Rodrigo  25, 26, 64, 65, 174, 12, 13, 72, 73, 80, 158, 159
Werner, Kaisa M.  236
Wesley Jr., Michael T.  83, 275, 479
Westra, Eric P.  319, 357, 600
Westra, Philip  319, 330, 331, 339, 410, 471, 600, 320, 364, 587
Westwood, James  261, 455
Widhalm, Joshua R.  292
Wilen, Cheryl  111
Willemsen, Christian A.  342
Willenborg, Christian J.  440, 481, 489
Williams, John J.  78, 81, 84, 248, 270, 271
Williams, Linda D.  457
Williams, Martin  368
Williard, Karl  541
Wilson, Bradley R.  7, 17
Windbiel-Rojas, Karey  113, 147
Winnie, John  387
Witcher, Anthony L.  115
Witschel, Matthias  143
Wolter, Drew A.  139, 437

143
Wright, Hannah E.  
Wright, Robert  
Wu, Chenxi  
Wuest, Stewart B.  
Wyse, Don  
Xiao, Fangming  
Xing, Haifeng  
Yadav, Ramawat  
Yadid, Inon  
Yamaguchi, Takuya  
Yang, Chenghai  
Yang, Yongil Neal  
Yelverton, Fred  
Yenish, Joe  
Yerka, Melinda  
Yilmaz, Kutay  
Yin, Xinyou  
Yoshimoto, Yusuke  
Yost, Matt  
Yomans, Cletus C.  
Young, Blake L.  
Young, Bryan G.  
Young, Julie M.  
Young, Sierra  
Young, Steve  
Yu, Qin  
Yurchak, Veronica  
Zabinski, Catherine  
Zaccaro, Maria Leticia M.  
Zhang, Liqing  
Zhaohui, Chi  
Zollinger, Richard K.  
Zuger, Rachel J.  
Zuidhof, Jennifer
2019-2020 Weed Science Society of America
Board of Directors

President, Larry Steckel, University of Tennessee
President-Elect, Bill Curran, Penn State University
Vice-President, Anita Dille, Kansas State University
Past-President, Scott Senseman, University of Tennessee
Secretary, Darrin Dodds, Mississippi State University
Treasurer, Phil Banks, Marathon Ag
Director of Publications, Sarah Ward, Colorado State University
Chair, Constitution and Operating Procedures, Mark Bernards, Western Illinois University
Member-at-Large, Dawn Refsell, Valent USA
Member-at-Large, Bryan Young, Purdue University
Graduate Student Member, Nicholas Steppig, Purdue University
Executive Director of Science Policy, Lee Van Wychen, (Ex-off and non-voting), Washington DC
Aquatic Plant Management Society, Rob Richardson, NC State
Canadian Weed Science Society: Francois Tardif, University of Guelph
North Central Weed Science Society, Greg Elmore, Bayer Crop Science
Northeastern Weed Science Society, Rakesh Chandran, West Virginia University
Southern Weed Science Society, John Byrd, Mississippi State University
Western Society of Weed Science, Marty Schraer, Syngenta
Executive Secretary (ex-off and non-voting), Eric Gustafson, Interactive Management, Inc.
2019-2020 Western Society of Weed Science Officers and Executive Committee

President, Pat Clay Valent USA, Fresno, CA
President-Elect, Corey Ransom, Utah State University
Immediate Past President, Andrew Kniss, University of Wyoming
Secretary, D. Chad Cummings, Corteva Agriscience
WSSA Representative, Marty Schraer, Syngenta Crop Protection
Research Section Chair, Brian Mealor, University of Wyoming
Education & Regulatory Section Chair, Joel Felix, Oregon State University
Member-At-Large Private Sector, Ryan Rapp, Bayer Crop Science
Member-At-Large Public Sector, Julie Kraft, Sublette County Wyoming Weed and Pest District
Research Section Chair-Elect, Mithila Jugulam, Kansas State University
Education & Regulatory Section Chair-Elect, Todd Neel, US Forestry Service
CAST Representative, Greg Dahl, Winfield United
Constitution and Operating Procedures, Vacant
Webmaster, David Krueger, Apex WebStudio
Student Liaison (Chair), Lucas Bobadilla, Oregon State University
Student Liaison (Chair – Elect), Mirella Ortiz, Colorado State University
Treasurer-Business Manager, Eric Gustafson, Interactive Management, Inc.
Meeting Conduct Reminder

The WSSA Code of Ethics defines professional conduct binding on all members of the Society. Members should recognize that this code of ethics and conduct signifies a voluntary assumption of the obligation of self-discipline and members should strive to uphold and maintain the honor and dignity of the Society. The following rules and standards of conduct have been developed for the safe and efficient operation of the WSSA and for the benefit and protection of the rights and safety of all. WSSA members are expected to observe the highest standards of professional conduct at all times, while at work or engaged in Society business.

1. Obey all laws, rules and regulations governing our business. The WSSA is subject to applicable federal laws in the state or country of the meeting or event. It is the policy of the WSSA that all laws, rules and regulations are complied with fully and completely. If it is unclear whether an action or activity is a legal or ethical violation, contact the WSSA President and/or Executive Secretary immediately for advice. Any incident or situation that violates the law or this policy should be immediately reported to the President and/or Executive Secretary; in person or via this contact information: info@wssa.net or 720-445-4789.

2. Be honest, truthful, fair and trustworthy in all WSSA activities and relationships. The WSSA expects each member to treat other members with respect and honesty. This includes providing information that is accurate, complete, objective, timely, relevant, and understandable.

3. Respect and protect WSSA assets. Assets are anything of value owned by the WSSA. All WSSA members are expected to be custodians of those assets. Members are responsible to maintain Society assets in good condition and to protect them from loss. This includes, but is not limited to, real assets and equipment as well as “soft assets” such as intellectual property, member lists, and other confidential information owned by the Society. WSSA assets of any kind should not be used for personal benefit.

4. Avoid all conflicts of interest between Society business and personal affairs. All WSSA members are expected to act with total objectivity regarding WSSA business. Accordingly, it is improper for a WSSA member to be in a position where their personal interests’ conflict, or appears to conflict, with WSSA interests. WSSA members should not use their position within the WSSA to influence WSSA members or others for their personal benefit. If a member believes that a conflict of interest has developed or may develop, it should be promptly reported to the WSSA President and/or Executive Secretary. The Society’s Conflict of Interest Policy is outlined in 5.8.
5. **Promote a culture of respect for all WSSA members.** The WSSA supports and adheres to laws and regulations dealing with fair member practices. Membership discrimination in our Society based on sex, race, age, religion, national origin, or sexual preference will not be tolerated. Sexual harassment will not be tolerated. Sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature that explicitly or implicitly affects an individual’s membership in the society, unreasonably interferes with an individual’s activities within the society, or creates an intimidating, hostile or offensive society environment. This also includes inappropriate use of nudity and/or sexual images in public spaces (including within visual presentations, Twitter, and other online media); deliberate intimidation, stalking, or unwelcome following; harassing photography or recording; and sustained disruption of talks or other events.

6. **Use your best efforts to maintain a safe environment and protect the Society.** The WSSA believes in and supports the laws designated to keep our Society safe and designed to protect the environment. If you believe that an unsafe condition exists in our Society, bring it immediately to the attention of the President, a member of the Board, or Executive Secretary. If an accident takes place, report it pursuant to policy and immediately take action to address the problem. Any incident or situation that violates the law or this policy should be immediately reported to the President and/or Executive Secretary; in person or via this contact information: info@wssa.net or 720-445-4789.

7. **Promote an ethical culture for all WSSA members.** The WSSA always expects all of its members to conduct themselves ethically and to encourage and support that behavior in their fellow members. Members exercise integrity in scientific research activities and in the reporting of results.

8. **Relation of professionals to the public.** They shall not knowingly permit the publication of reports or other documents for any unsound or illegitimate undertaking.

9. **Respect fellow WSSA members.** Members shall freely give credit for work done by others to whom the credit is due and shall refrain from plagiarism in oral and written communication, and not knowingly accept credit rightfully due to another person.
10. **Reporting alleged violations.** Violation of the WSSA Code of Ethics and Conduct may subject a member to disciplinary action up to and including membership revocation. At the annual conference, when “Safe WSSA” members become aware of a complaint, they will seek out the alleged victim(s) and offender(s) separately and gather facts. Immediate responses at the conference may range from warning a harasser to cease his or her behavior immediately, to ending a speaker’s talk early if the speaker uses inappropriate language or images, to requiring a harasser to leave the conference immediately with no refund, to banning a harasser from future events “either indefinitely or for a certain time period.” Law enforcement may be engaged if circumstances require.
<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:00</td>
<td></td>
<td>General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:30</td>
<td></td>
<td>Session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00</td>
<td></td>
<td>And</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:15</td>
<td></td>
<td>Awards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:30</td>
<td></td>
<td>Awards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00</td>
<td></td>
<td>Reception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:30</td>
<td></td>
<td>BASF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:00</td>
<td></td>
<td>Sponsored</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Luau</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WSSA
2021 Annual Meeting
February 15-18, 2021
San Antonio, TX

2022 Annual Meeting
February 21-24, 2022
Vancouver, Canada

2023 Annual Meeting
January 30 – February 02, 2023
Arlington, VA

WSWS
2021 Annual Meeting
March 01-04, 2021
Boise, ID

2022 Annual Meeting
March 07-10, 2022
Newport Beach, CA