
72nd Meeting

**WESTERN
SOCIETY
OF
WEED SCIENCE**

March 11-14, 2019

**Grand Hyatt Denver
Denver, Colorado**



**WESTERN SOCIETY OF WEED SCIENCE
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2018-2019**

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Welcome to Denver, Colorado!

Welcome to the 72nd annual WSWS meeting in Denver, Colorado. The Program Committee, Local Arrangements Committee, and the staff of the Grand Hyatt Denver have worked together to arrange what should be a great meeting. We hope you enjoy the meeting, take the opportunity to catch up with old friends, make some new friends, and come away with renewed energy and new ideas. The Program and Local Arrangements Committees wish everyone a successful and productive meeting.

LOCAL ARRANGEMENTS COMMITTEE MEMBERS

**Sandra McDonald, Chair
James Leary
Travis Bean**








Student
Contest


Breakfast


Break


Reception

WSWS 2019 PROGRAM AT A GLANCE

| Tuesday, March 12 | | | |
|---|---|---|---|
|  Poster Session 7:45 – 9:15 am Authors of Odd Numbered Posters Present Colorado B | | | |
| General Session 9:40 – 11:35 am Colorado A | | | |
| Student Luncheon 12:00 – 1:00 pm Maroon Peak | | | |
| Colorado B | Colorado A | Mt. Sopris A | Mt. Sopris B |
| Poster Room Open 7:30 am to 5:00 pm | Weeds of Agronomic Crops 1:30 pm to 5:00 pm | Weeds of Range, Forest, and Natural Areas 1:30 pm to 5:00 PM | Basic Biology and Ecology 1:30 pm to 5:00 pm |
|  BREAK – 3:00 pm to 3:30 pm Colorado Foyer | | | |
|  Student Reception 5:00 – 6:30 pm Maroon Peak | | | |
| Wednesday, March 13 | | | |
|  Poster Session 7:45 - 9:15 am Authors of Even Numbered Posters Present Colorado B | | | |
| Colorado B | Colorado A | Mt. Sopris A | Mt. Sopris B |
| Poster Room Open 7:30 am to 5:00 pm | Weeds of Agronomic Crops 9:45 am to 11:45 am | Teaching and Technology Transfer Papers and Discussion Session 9:45 am to 11:45 am | Basic Biology and Ecology Papers and Discussion Session 9:45 am to 11:45 am |
| WSWS Awards Luncheon 11:45 am - 1:30 pm Aspen Ballroom | | | |
| Colorado B | Colorado A | Mt. Sopris A | Mt. Sopris B |
| Poster Room Open 7:30 am to 5:00 pm | Weeds of Agronomic Crops 1:45 pm to 3:15 pm | <u>Symposium</u> <i>Integrated Pest Management Research in the West</i> 1:45 pm to 3:25 pm | Weeds of Horticultural Crops 1:45 pm to 3:15 pm |
|  BREAK – 3:15 pm to 3:30 pm Colorado Foyer | | | |
| <u>Please remove posters by 5:00 pm</u> | Weeds of Agronomic Crops Discussion Session 3:30 pm to 5:00 pm | Weeds of Range, Forest, and Natural Areas 3:30 pm to 5:00 PM | Weeds of Horticultural Crops 3:30 pm to 4:45 pm |
| What's New in Industry? 5:15 pm - 6:15 pm Colorado A | | | |
| Student Night Out 6:30 pm | | | |
| Thursday, March 14 | | | |
|  WSWS Business Meeting Breakfast and Student Awards 6:30 - 9:15 am Aspen Ballroom | | | |
| Colorado A | Mt. Sopris A | Mt. Sopris B | Colorado B |
| <u>Symposium</u> <i>Rights of Way – Beyond Integrated Weed Management to Integrated Habitats!</i> 9:30 am to 3:00 pm | Weeds of Range, Forest, and Natural Areas 9:30 am to 10:45 am | Weeds of Horticultural Crops Discussion Session 9:30 am to 11:00 am | Weeds of Agronomic Crops 9:30 am to 11:00 am |



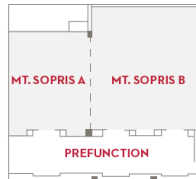
Rights-of-Way Symposium Lunch

12:00 – 1:00 pm Aspen Ballroom

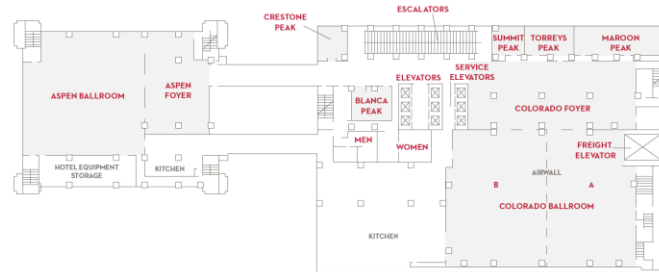
Grand Hyatt Denver
1750 Welton Street
Denver, Colorado, USA, 80202
303-295-1234

Floor Plan

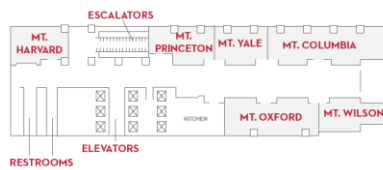
Lobby Level



Second Floor



Third Floor



WSWS SPECIAL EVENTS – MONDAY MARCH 11

| | |
|---------------------|---|
| 8:00 am to 5:00 pm | Board of Directors Meeting Maroon Peak |
| 3:00 pm to 5:30 pm | WERA-77 Meeting Mt. Harvard (3 rd Floor) |
| 4:00 pm to 6:00 pm | Registration 2 nd Floor Elevator Bank |
| 5:00 pm to 11:00 pm | Poster Display Set-Up Colorado B |
| 5:00 pm to 11:00 pm | Sustaining Members Displays Colorado Foyer |
| 5:00 pm to 11:00 pm | Presentation Practice Room Torreys Peak |
| 6:00 pm to 8:00 pm | WSWS Members Welcome Reception Aspen Ballroom <i>Y</i> Sponsored by BASF, Corteva, FMC, Valent U.S.A., and WSWS |

WSWS SPECIAL EVENTS – TUESDAY MARCH 12

| | |
|---------------------|--|
| 7:00 am to 4:00 pm | Registration 2 nd Floor Elevator Bank |
| 7:30 am to 5:00 pm | Poster Displays Colorado B |
| 7:30 am to 5:00 pm | Sustaining Members Displays Colorado Foyer |
| 7:45 am to 9:15 am | Poster Session – Authors of Odd Numbered Posters Present Colorado B ☑ <i>Sponsored by FMC</i> |
| 8:00 am to 9:30 am | Spouses Welcome Breakfast Maroon Peak ☑ <i>Sponsored by Syngenta</i> |
| 9:00 am to 9:30 am | WSWS New Member Orientation – Eric Gustafson, WSWS-Business Manager Torreys Peak |
| 9:30 am to 11:00 pm | Presentation Practice Room Torreys Peak |
| 9:40 am to 11:45 am | General Session Colorado A |
| Noon to 1:00 pm | Student Luncheon Maroon Peak <i>Sponsored by Bayer</i> |
| 3:00 pm to 3:30 pm | ☑ Break - Sponsored by Corteva |
| 5:00 pm to 6:30 pm | Student Reception Maroon Peak <i>Sponsored by Syngenta</i> |

WSWS SPECIAL EVENTS – WEDNESDAY MARCH 13

| | |
|--------------------|--|
| 7:00 am to 4:00 pm | Registration 2 nd Floor Elevator Bank |
| 7:00am to 11:00 pm | Presentation Practice Room Torreys Peak |
| 7:30 am to 5:00 pm | Poster Displays Remove Posters by 5:00 pm Colorado B |
| 7:30 am to 5:00 pm | Sustaining Members Displays Remove Between 5 and 7 pm Colorado Foyer |
| 7:45 am to 9:15 am | Poster Session – Authors of Even Numbered Posters Present Colorado B |
| 9:00 am to 9:30 am | ☛ Sponsored by Helena WSWS New Officer Orientation – Eric Gustafson, WSWS-Business Manager Maroon Peak |

**All Members are Invited to
Learn About Duties and Responsibilities**

| | |
|--------------------|--|
| 11:45 to 1:30 pm | Awards Luncheon Aspen Ballroom |
| 3:15 pm to 3:30 pm | ☛ Break – Sponsored by Gowan |
| 5:00 pm to 6:15 pm | What's New in Industry? Colorado A |
| 6:30 pm | Student Night Out |

WSWS SPECIAL EVENTS – THURSDAY MARCH 14

| | |
|---------------------|--|
| 6:30 am to 9:15 am | WSWS Business Breakfast Aspen Ballroom ☛ Sponsored by BASF and WSWS |
| 8:00 am to 10:00 am | Registration 2 nd Floor Elevator Bank |
| 11:45 am to 1:00 pm | Board of Directors Wrap-Up Meeting and Summer Meeting Planning Maroon Peak |

**Out-Going and Incoming Officers and Committee Chairs
Requested to Attend**

| | |
|---------------------|--|
| 12:00 pm to 1:00 pm | Rights-of-Way Symposium Lunch |
|---------------------|--|

PROGRAM

TUESDAY MORNING MARCH 12

Weeds of Range, Forest, and Natural Areas

*PRESENTER † STUDENT POSTER CONTEST

†**Effects of Ventenata Removal on Rangelands of Northeast Wyoming.** Marshall Hart*; University of Wyoming, Sheridan, WY (1)

†**Management of Ventenata (*Ventenata dubia*) and Other Annual Grasses with Indaziflam on Conservation Reserve Program Land.** Jared A. Beuschlein*¹, Rachel J. Zuger¹, Tim Prather², Harry Quicke³, Ian C. Burke¹; ¹Washington State University, Pullman, WA, ²University of Idaho, Moscow, ID, ³Bayer CropScience, Windsor, CO (2)

†**Rimsulfuron, Imazapic, and Indaziflam Interception and Sorption by Downy Brome Thatch.** Shannon L. Clark*¹, Paulo V. Da Silva², Derek J. Sebastian³, Scott J. Nissen¹, Rachel H. Seedorf¹; ¹Colorado State University, Fort Collins, CO, ²University of São Paulo - Luiz de Queiroz College of Agriculture (ESALQ/USP), Fort Collins, CO, ³Bayer CropScience, Fort Collins, CO (3)

†**Effect of Indaziflam on Native Species in Natural Areas and Rangeland.** Rachel H. Seedorf*¹, Shannon L. Clark¹, Derek J. Sebastian², Scott J. Nissen¹, James Sebastian³; ¹Colorado State University, Fort Collins, CO, ²Bayer CropScience, Fort Collins, CO, ³Boulder County Parks and Open Space, Longmont, CO (4)

†**Impacts of Herbicides on Invasive Annual Grasses and Desirable Plants.** Hailey L. Buell*, Corey V. Ransom, Stephen L. Young; Utah State University, Logan, UT (5)

†**Determining Potential Soil Benefits of Established Crested Wheatgrass Versus Adjacent Cheatgrass Invasion.** Emily B. Repas*, Dan R. Tekiela; University of Wyoming, Laramie, WY (6)

†**Effects of Seed Germination Variability of *Phragmites australis* on Management.** Rose Sepesy*¹, Steve Young²; ¹Utah State University, Logan, UT, ²Cornell University, Logan, UT (7)

Ecological Services of Weeds. John Vickery*; Ark Ecological Services, Arvada, CO (8)

Accuracy and Efficiency of Drone Imagery for Detecting Elongated Mustard. Corey V. Ransom*, Heather E. Olsen; Utah State University, Logan, UT (9)

Herbicide Application Timing Influences Invasive Annual Grass Control. Cody J. Beckley*, Corey V. Ransom; Utah State University, Logan, UT (10)

Weeds of Horticultural Crops

***PRESENTER † STUDENT POSTER CONTEST**

†The Use of Saturated Steam in the Management of Common Landscape Weeds. Guy G. Hernandez*¹, Cheryl Wilen²; ¹University of California Cooperative Extension, Hacienda Heights, CA, ²UC Statewide IPM Program and UCCE, San Diego, CA (11)

†Comparing Herbicide Efficacy for Sucker Control in Hazelnuts. Larissa Larocca de Souza*, Marcelo L. Moretti; Oregon State University, Corvallis, OR (12)

Postemergence Control of Italian Ryegrass in Hazelnut Orchards. Andre C. Consonni¹, Larissa Larocca de Souza², Marcelo L. Moretti*²; ¹University of Sao Paulo, Piracicaba, Brazil, ²Oregon State University, Corvallis, OR (13)

Rimsulfuron and Oxyfluorfen + Penoxsulam Combinations for Weed Control in Tree Nuts. Joe Armstrong*¹, Alistair McKay², Stephen F. Colbert³, Dave Johnson⁴; ¹Corteva Agriscience, Fresno, CA, ²Corteva Agriscience, Clovis, CA, ³Corteva Agriscience, Escalon, CA, ⁴Corteva Agriscience, Des Moines, IA (14)

Wild Carrot Control in Vineyards with Flazasulfuron. Andre C. Consonni¹, Erik N. Augerson*², Larissa Larocca de Souza², Marcelo L. Moretti²; ¹University of Sao Paulo, Piracicaba, Brazil, ²Oregon State University, Corvallis, OR (15)

Weed Management in Saffron. Mustapha A. Haidar*; American University of Beirut, Beirut, Lebanon (16)

Seaside petunia (*Calibrachoa parviflora*) Effects on Onion Yield and Responses to POST Herbicides Registered for Dry Bulb Onion in New Mexico. Brian J. Schutte*, Edward Morris; New Mexico State University, Las Cruces, NM (17)

Is That Hairy Nightshade Waving at You or Smoothly Ignoring You? *Solanum physalifolium* Leaf Margins in Southern Idaho. Celestina S. Miera*¹, Brenda C. Kendall¹, Tenika S. Trevino¹, Brent Beulter², Pamela J. Hutchinson¹; ¹University of Idaho Aberdeen R&E Center Aberdeen, ID, ²University of Idaho, American Falls, ID (18)

Interseeded Cover Crop Tolerance to Herbicides in Non-Transgenic Sweet Corn. Andrew Donaldson*, Ed Peachey; Oregon State University, Corvallis, OR (170)

Weeds of Agronomic Crops

*PRESENTER † STUDENT POSTER CONTEST

†**Palmer Amaranth Interference in Sugarbeet.** Whitney R. Schultz*, Nevin C. Lawrence; University of Nebraska-Lincoln, Scottsbluff, NE (19)

†**The Effect of Soil Active Herbicides on the Critical Timing of Weed Removal in Dry Bean.** Clint W. Beiermann*¹, Cody F. Creech¹, Amit J. Jhala², Stevan Z. Knezevic³, Robert Harveson¹, Nevin C. Lawrence¹; ¹University of Nebraska-Lincoln, Scottsbluff, NE, ²University of Nebraska-Lincoln, Lincoln, NE, ³University of Nebraska-Lincoln, Concord, NE (20)

†**Horseweed (*Erigeron canadensis*) Control in No-Till Soybean Systems.** Aaron M. Froemke*, Kirk A. Howatt; North Dakota State University, Fargo, ND (21)

†**Techniques and Economic Analysis Using Weed Sensing Sprayer Technology for Fallow Weed Control.** Jeremy R. Thompson*, Rachel J. Zuger, Ian C. Burke; Washington State University, Pullman, WA (22)

†**Broadleaf Weed Control with Pulse-Width Modulation Technology in Wheat and Soybean.** Kelly T. Satrom*, Kirk A. Howatt; North Dakota State University, Fargo, ND (23)

†**Non-Tolerant Wheat Response to Simulated Drift of Quizalofop-P-Ethyl in Central Oklahoma.** Justin T. Childers*¹, Misha R. Manuchehri¹, Vipin Kumar², Rui Liu², Jodie A. Crose¹; ¹Oklahoma State University, Stillwater, OK, ²Kansas State University, Hays, KS (24)

†**Late-Season Herbicides to Suppress Downy Brome Seed Production and Progeny Fitness in Winter Wheat.** Ramawatar Yadav*, Prashant Jha, Shane Leland; Montana State University, Huntley, MT (25)

†**Mustard Seed Meal Effects on *Palmer amaranth* Seedbanks.** Joseph B. Wood*, Brian J. Schutte, Ivette Guzman, Soum Sanogo; New Mexico State University, Las Cruces, NM (26)

†**Economics of Cultural, Mechanical, and Chemical Weed Control Practices for Herbicide-Resistant Weed Management.** Elizabeth G. Mosqueda*¹, Andrew Kniss¹, John Ritten¹, Nevin C. Lawrence², Prashant Jha³, Gustavo M. Sbatella⁴; ¹University of Wyoming, Laramie, WY, ²University of Nebraska-Lincoln, Scottsbluff, NE, ³Montana State University, Huntley, MT, ⁴University of Wyoming, Powell, WY (27)

†**Deciphering the Molecular Basis of Multiple Herbicide Resistance in Common Waterhemp by Whole Genome Sequencing.** Balaji Aravindhana Pandian*, Sanzhen Liu, Venkatesh Prasad Ranganath, Vara Prasad P.V., Mithila Jugulam; Kansas State University, Manhattan, KS (28)

†**Rapid Metabolism Increases Resistance to 2,4-D in Common Waterhemp (*Amaranthus tuberculatus*) at High-Temperature Stress.** Chandrima Shyam*¹, Amit J. Jhala², Mithila Jugulam¹, Greg Kruger²; ¹Kansas State University, Manhattan, KS, ²University of Nebraska-Lincoln, Lincoln, NE (29)

†**The Recent Scenario of Italian Ryegrass Herbicide Resistant Frequency & Ploidy Diversity in Western Oregon.** Lucas Kopecky Bobadilla*¹, Camila R. P. Lima², Pete A. Berry¹, Andrew G. Hulting¹, Carol Mallory-Smith¹; ¹Oregon State University, Corvallis, OR, ²University of Sao Paulo, Piracicaba, Brazil (30)

Weed Suppression by Warm-Season Cover Crops. Greta G. Gramig*¹, Jose G. Franco², Kenneth P. Beamer¹; ¹North Dakota State University, Fargo, ND, ²USDA-ARS, Mandan, ND (31)

Management of Rhizoctonia Root and Crown Rot Disease in Sugar Beet with Glyphosate/Fungicide Tank-Mixes to Improve Farm Efficacy. William L. Stump*, Stephan Carl Geu; University of Wyoming, Laramie, WY (32)

Evaluation of Flax Tolerance to Preemergence and Postemergence Herbicide Applications. Daniel Guimaraes Abe*¹, Brian Jenks², Caleb D. Dalley¹; ¹North Dakota State University, Hettinger, ND, ²North Dakota State University, Minot, ND (33)

Pinto Bean Response to Low Doses of Dicamba and Glyphosate. Greg J. Endres*, Mike H. Ostlie; North Dakota State University, Carrington, ND (34)

Effects of Dicamba Ultra Micro-rates on Soybean Yield – Hormesis or not? Stevan Z. Knezevic*¹, O. Adewale Osipitan², Luka G. Milosevic¹, Jon E. Scott¹; ¹University of Nebraska-Lincoln, Concord, NE, ²University of Nebraska-Lincoln, Lincoln, NE (35)

Effects of Selected Adjuvants over Two Seasons on Weed Control in Corn and Soybeans with Glufosinate-ammonium. Jim T. Daniel*¹, Tom Hoverstad², Paul O. Johnson³, Michael Owen⁴, Eric Westra⁵, Phil Westra⁵; ¹Daniel Ag Consulting, Keenesburg, CO, ²University of Minnesota Southern Research and Outreach Center, Waseca, MN, ³South Dakota State University, Brookings, SD, ⁴Iowa State University, Ames, IA, ⁵Colorado State University, Fort Collins, CO (36)

Effective Herbicide Programs for Managing Glyphosate-Resistant Palmer Amaranth in Kansas Sunflower Production. Rui Liu*¹, Vipin Kumar¹, Taylor Lambert¹, Jeanne Falk Jones²; ¹Kansas State University, Hays, KS, ²Kansas State University, Colby, KS (37)

Pyraclozil: A New Broad-Spectrum Herbicide Under Field Development for California Rice. Amar S. Godar¹, Kassim Al-Khatib*¹, Jose Gutierrez²; ¹University of California - Davis, Davis, CA, ²Nichino America, Fresno, CA (38)

Bearded Sprangletop (*Leptochloa fusca* spp. *fasicularis*) Flooding Tolerance in California Rice. Katie E. Driver*, Kassim Al-Khatib, Amar Godar; University of California - Davis, Davis, CA (39)

Evaluation of Florpyrauxifen-benzyl for Weed Control and Crop Safety in California Rice. Amar S. Godar¹, Kassim Al-Khatib*; University of California - Davis, Davis, CA (40)

Potential for Gibberellic Acid to Stimulate Hairy Nightshade Emergence in the Field. Don W. Morishita*¹, Pamela J. Hutchinson², Alexis M. Thompson¹, Rabecka L. Hendricks¹, Brent Beulter³; ¹University of Idaho, Kimberly, ID, ²University of Idaho Aberdeen R&E Center, Aberdeen, ID, ³University of Idaho, American Falls, ID (41)

Palmer Amaranth Response to Glufosinate Plus Dicamba or 2,4-D Mixtures. William B. McCloskey*; University of Arizona, Tucson, AZ (42)

An Update on Multiple Herbicide-Resistant Palmer Amaranth in Kansas. Vipin Kumar*, Rui Liu, Taylor Lambert; Kansas State University, Hays, KS (43)

Broadleaf Weed Control in Wheat with Halauxifen Plus Florasulam. Traci Rauch*, Joan Campbell; University of Idaho, Moscow, ID (44)

Pyroxasulfone Application Timing Affects Italian Ryegrass Control in Winter Wheat. Henry C. Wetzel*, Drew J. Lyon; Washington State University, Pullman, WA (45)

Is Volunteer Wheat a Serious Weed in Annual Winter Wheat Production? Judit Barroso*¹, Stewart B. Wuest²; ¹Oregon State University, Adams, OR, ²USDA-Agricultural Research Service, Adams, OR (46)

Teaching and Technology Transfer

*PRESENTER

A Short Course on Herbicide Modes of Action and Herbicide Resistance. Tom Mueller*¹, Todd A. Gaines², Dale Shaner², Franck Dayan²; ¹University of Tennessee, Knoxville, TN, ²Colorado State University, Fort Collins, CO (47)

Educating Constituents About Herbicide Injury to Non-Target Plants. Noelle Orloff*¹, Jane Mangold², Tim Seipel²; ¹Montana State University Extension, Bozeman, MT, ²Montana State University, Bozeman, MT (48)

WSSA Advocates for Weed Controls that Protect Soybean Export Value. Carroll Moseley¹, Lee Van Wychen*², Heather Curlett³, Jill Schroeder⁴, Patsy Laird¹, Shawn P. Conley⁵; ¹Syngenta, Greensboro, NC, ²WSSA - Executive Director of Science Policy, Alexandria, VA, ³USDA-APHIS, Riverdale, MD, ⁴New Mexico State University, Arlington, VA, ⁵University of Wisconsin-Madison, Madison, WI (49)

Fresh Ideas for Teaching Organic Pest Management in the Classroom. Randa Jabbour*, Makenzie E. Pellissier; University of Wyoming, Laramie, WY (50)

Basic Biology and Ecology

*PRESENTER † STUDENT POSTER CONTEST

†**Fate of Glyphosate During Production and Processing of Glyphosate-Resistant Sugar Beet (*Beta vulgaris*).** Abigail Barker*, Franck Dayan; Colorado State University, Fort Collins, CO (51)

Response of Glyphosate-Susceptible and Resistant Palmer Amaranth to Environmental Stresses During Germination and Growth. Samikshya Budhathoki¹, Lynn M. Sosnoskie*², Anil Shrestha¹; ¹California State University, Fresno, CA, ²University of California Cooperative Extension, Merced, CA (52)

Environmental Effects on Chemical Management of Junglerice (*Echinochloa colona*). Anil Shrestha*, Ryan Cox, Mala To, Samikshya Budhathoki, Katrina Steinhauer; California State University, Fresno, CA (53)

Emergence Dynamics of Palmer Amaranth Populations from the Central Great Plains. Vipin Kumar*¹, Rui Liu¹, Misha R. Manuchehri², Nevin C. Lawrence³, Muthu K. Bagavathiannan⁴, Todd A. Gaines⁵; ¹Kansas State University, Hays, KS, ²Oklahoma State University, Stillwater, OK, ³University of Nebraska-Lincoln, Scottsbluff, NE, ⁴Texas A & M University, College Station, TX, ⁵Colorado State University, Fort Collins, CO (54)

Comparing the Effects of Simulated Auxin Herbicide Drift on Winegrapes. Junjun Ou, Brad Hanson, Kassim Al-Khatib*; University of California - Davis, Davis, CA (55)

Weed Emergence Timing and Shade Avoidance Responses in Sugarbeet. Albert T. Adjesiwor*, Andrew Kniss; University of Wyoming, Laramie, WY (56)

Ecological Strategies to Manage Herbicide-Resistant Kochia Seed Bank in the Western US. Prashant Jha*¹, Andrew Kniss², Nevin C. Lawrence³, Ramawatar Yadav¹, C. A. Lim¹; ¹Montana State University, Huntley, MT, ²University of Wyoming, Laramie, WY, ³University of Nebraska-Lincoln, Scottsbluff, NE (57)

Winter Wheat Above Ground Growth Changes Due to Being a Neighbor to Different Species. Osama S. Saleh*; University of Wyoming, Laramie, WY (58)

Weed and Crop Discrimination with Hyperspectral Imaging and Machine Learning. Prashant Jha*¹, Joseph A. Shaw², Bryan J. Scherrer², Vipin Kumar³, Ramawatar Yadav¹, J Anjani¹, Shane Leland¹; ¹Montana State University, Huntley, MT, ²Montana State University, Bozeman, MT, ³Kansas State University, Hays, KS (59)

Undergraduate Posters

*PRESENTER † STUDENT POSTER CONTEST

†**Effect of Weed Presence on Sugarbeet Injury with Phenmedipham and Desmedipham.** Jacob M. Asay*, Elizabeth G. Mosqueda, Albert T. Adjesiwor, Andrew Kniss; University of Wyoming, Laramie, WY (60)

†**Evaluating Efficacy of Various Herbicides for Bulbous Bluegrass Control.** Jordan L. Skovgard*¹, Brian A. Mealor¹, Beth Fowers²; ¹University of Wyoming, Laramie, WY, ²University of Wyoming, Sheridan, WY (61)

†**Expressing an *Amaranthus palmeri* Cytochrome P450 Candidate Gene for 4-Hydroxyphenylpyruvate dioxygenase (HPPD) Inhibitor Resistance in Yeast.** Crystal Sparks*¹, Anita Kuepper², Franck Dayan¹, Todd A. Gaines¹; ¹Colorado State University, Fort Collins, CO, ²Bayer CropScience, Frankfurt am Main, Germany (62)

†**Impact of Cheatgrass Control on Pollinator-Friendly Flora: Comparison of Indaziflam Treated and Untreated Plots.** Nicholas DiMascio*, Janet Hardin, Arathi H. Seshadri; Colorado State University, Fort Collins, CO (63)

†**Invasive Mustard Management in Utah.** Lauren B. Stanko*, Corey V. Ransom; Utah State University, Logan, UT (64)

†**Modeling Patch Spread Dynamics of *Phragmites australis* in a Riparian Zone.** Steve Young¹, Chris M. Jones*²; ¹Cornell University, Logan, UT, ²Utah State University, Logan, UT (65)

†**Evaluating Native Perennial Grass Tolerance to Indaziflam Treatments.** Shannon L. Clark, Stephen R. Lunt*; Colorado State University, Fort Collins, CO (66)

†**Stressing Out: Young Seeding Recovery Patterns for Popular Restoration Species, *Elymus trachycaulus*.** Cynthia S. Brown, Magda Garbowski, KaMele E. Sanchez*; Colorado State University, Fort Collins, CO (67)

†**Herbicide and Grazing Impacts on Floral Resources and Pollinator Communities.** Samantha R. Nobes*, Makenzie E. Pellissier, Randa Jabbour; University of Wyoming, Laramie, WY (68)

TUESDAY MORNING MARCH 12

New WSWS Member Orientation

LOCATION: Maroon Peak
TIME: 9:00 AM - 9:30 AM
MODERATOR: Eric Gustafson
IMI
Eaton, CO

TUESDAY MORNING MARCH 12

General Session

LOCATION: Colorado Ballroom A
TIME: 9:40 AM - 11:35 AM
MODERATOR: Pat Clay
Valent U.S.A. LLC
Fresno, CA

***SPEAKER**

- 9:40** **Introductions and Announcements.** Pat Clay*;
Valent U.S.A. LLC, Fresno, CA
- 9:50** **Presidential Address.** Andrew Kniss*; University of
Wyoming, Laramie, WY
- 10:10** **Discovering Weed Science: Possibilities for a
More Inclusive Society.** Elizabeth G Mosqueda*,
University of Wyoming, Laramie, WY
- 10:25** **DC Update.** Lee Van Wychen*; WSSA - Executive
Director of Science Policy, Alexandria, VA
- 10:45** **Big Impacts: Why Impactful Reporting Matters
and How to do it Better.** Sarah Lupis*; Impact
Consulting, Fort Collins, CO

TUESDAY AFTERNOON MARCH 12

Weeds of Range, Forest, and Natural Areas

LOCATION: Mt. Sopris A
TIME: 1:30 PM - 5:00 PM
CHAIR & MODERATOR: Derek Sebastian
Bayer CropScience
Fort Collins, CO
CHAIR-ELECT: Harry Quicke
Bayer CropScience
Windsor, CO

***SPEAKER † STUDENT CONTEST**

- 1:30 Modeling Risk of High Cheatgrass Cover.** Helen R. Sofaer*¹, Catherine S. Jarnevich²; ¹U.S. Geological Survey, Fort Collins, CO, ²USGS, Fort Collins, CO (69)
- 1:45 †Modifying Seeding Date of *Pseudoroegneria spicata* (Bluebunch Wheatgrass) During Revegetation to Limit Re-Invasion by *Bromus tectorum* (Downy Brome).** Michelle L. Majeski*¹, Stacy Davis¹, Zach Miller², Jane Mangold¹; ¹Montana State University, Bozeman, MT, ²Montana State University, Corvallis, MT (70)
- 2:00 Data Visualization and Decision Support Tools for Invasive Species Management.** Peder S. Engelstad*; Colorado State University, Fort Collins, CO (71)
- 2:15 †Plant Distribution Data Aid Creation of Invasion Susceptibility Models in the Greater Yellowstone Ecosystem.** Christie Hubbard Guetling*; University of Idaho, Moscow, ID (72)
- 2:30 Mapping Distributions to Inform Search and Control of Priority Invasive Plants.** Catherine S. Jarnevich*, Helen Sofaer; USGS, Fort Collins, CO (73)
- 2:45 †The Good, the Bad, and the Perennial Grasses: Integrated Management of an Invasive Rangeland Perennial Using Herbicide and Targeted Grazing.** Kyle N. Race*, Daniel Tekiela, Brian A. Mealor; ¹University of Wyoming, Laramie, WY (74)
- 3:00 Break**
- 3:30 Is One Invasive Annual Grass Worse than Another?** Jane Mangold*, Stacy Davis, Lisa J. Rew; Montana State University, Bozeman, MT (75)

- 3:45 †Extending the Duration of Biennial and Perennial Weed Seedling Control with Indaziflam Tank-Mixes.** Shannon L. Clark*¹, James Sebastian², Derek J. Sebastian³, Scott J. Nissen¹; ¹Colorado State University, Fort Collins, CO, ²Boulder County Parks and Open Space, Longmont, CO, ³Bayer CropScience, Fort Collins, CO, (76)
- 4:00 Restoration of Western Natural Areas and Rangeland - Depleting the Invasive Annual Grass Seed Bank.** Harry Quicke*¹, Derek J. Sebastian²; ¹Bayer CropScience, Windsor, CO, ²Bayer CropScience, Fort Collins, CO (77)
- 4:15 Response of Wildlife Browse Species to Invasive Winter Annual Grass Control with Indaziflam.** James Sebastian*¹, Joseph K. Swanson², Steve Sauer¹, Derek J. Sebastian³; ¹Boulder County Parks and Open Space, Longmont, CO, ²Boulder County Parks and Open Space, Erie, CO, ³Bayer CropScience, Fort Collins, CO (78)
- 4:30 Large Scale Control of Invasive Weeds and Response of Native Species Using Indaziflam on Boulder County Open Space Properties.** Steve Sauer*¹, James Sebastian¹, Joseph K. Swanson², Derek J. Sebastian³; ¹Boulder County Parks and Open Space, Longmont, CO, ²Boulder County Parks and Open Space, Erie, CO, ³Bayer CropScience, Fort Collins, CO (79)
- 4:45 Indaziflam Effects on Seed Production of Established Perennial Grasses.** Beth Fowers*¹, Brian A. Meador²; ¹University of Wyoming, Sheridan, WY, ²University of Wyoming, Laramie, WY (80)

TUESDAY AFTERNOON MARCH 12

Weeds of Agronomic Crops

LOCATION: Colorado Ballroom A
TIME: 1:30 PM - 5:00 PM
CHAIR & Vipan Kumar
MODERATOR: Kansas State University
Hays, KS
CHAIR-ELECT: Misha Manuchehri
Oklahoma State University
Stillwater, OK

***SPEAKER † STUDENT CONTEST**

- 1:30 Tolerance of Spring Planted Tall Fescue Grown for Seed to Fall Applications of Two Pyroxasulfone Herbicide Products.** Dan W. Curtis*, Kyle C. Roerig, Andrew G. Hulting, Carol Mallory-Smith; Oregon State University, Corvallis, OR (81)
- 1:45 Impact of Adding Thiencarbazono to Mesosulfuron on Rattail Fescue Efficacy and Overall Weed Management in the Pacific Northwest.** Monte D. Anderson*; Bayer CropScience, Sprangle, WA (82)
- 2:00 Advances in Broadleaf Weed Management in Clover Grown for Seed in Oregon.** Andrew G. Hulting*, Kyle C. Roerig, Dan W. Curtis, Carol Mallory-Smith; Oregon State University, Corvallis, OR (83)
- 2:15 Economic Implications of Herbicide Resistant Weed Management in Glyphosate-Resistant Sugarbeet.** Albert T. Adjesiwor*¹, Nevin C. Lawrence², Prashant Jha³, Todd A. Gaines⁴, Eric Westra⁴, Andrew Kniss¹; ¹University of Wyoming, Laramie, WY, ²University of Nebraska-Lincoln, Scottsbluff, NE, ³Montana State University, Huntley, MT, ⁴Colorado State University, Fort Collins, CO (84)
- 2:30 Herbicides for Sainfoin Stand Removal and Methods of Evaluation.** David A. Claypool*¹, Andrew Kniss¹, Gustavo M. Sbatella²; ¹University of Wyoming, Laramie, WY, ²University of Wyoming, Powell, WY (85)
- 2:45 Antagonism of Volunteer Corn Control by Dicamba and 2,4-D.** Joseph E. Mettler*, Kirk A. Howatt; North Dakota State University, Fargo, ND (86)
- 3:00 Break**

- 3:30 Soybean Yield, Seed Germination, and Leaf Tissue Analysis as a Result of Simulated Dicamba Drift.** Mike H. Ostlie*¹, Joao Paulo Flores¹, Kirk A. Howatt², Greg J. Endres¹, Rich Zollinger³, Devin Wirth²; ¹North Dakota State University, Carrington, ND, ²North Dakota State University, Fargo, ND, ³Amvac Chemical Company, Spokane, WA (87)
- 3:45 Improving Herbicide Effectiveness and Minimizing Impacts with Research, Analysis, Visualization and Demonstration.** Gregory K. Dahl*¹, Ryan J. Edwards¹, Eric Spandl¹, Joshua J. Skelton¹, Annie D. Makepeace², Lillian C. Magidow¹; ¹Winfield United, River Falls, WI, ²Winfield United, Arden Hills, MN (88)
- 4:00 Introducing a New NPE Free Non Ionic Surfactant.** Ryan J. Edwards*¹, Gregory K. Dahl¹, Tom A. Hayden², Jo A. Gillilan³, Joe Gednalske¹, Eric Spandl¹; ¹Winfield United, River Falls, WI, ²WinField United, Owensborro, KY, ³WinField United, Springfield, TN (89)
- 4:15 †Dicamba and Gyphosate Drift on Chipping Potato.** Matthew J. Brooke*, Harlene M. Hatterman-Valenti; North Dakota State University, Fargo, ND (90)
- 4:30 Efficacy of Haulaxifen-methyl Plus Florasulam on *Amaranthus* Species.** Joe Yenish*¹, Patti Prasifka², Mike J. Moechnig³; ¹Corteva Agriscience, Billings, MT, ²Corteva AgriScience, West Fargo, ND, ³Corteva Agriscience, Toronto, SD (91)
- 4:45 †Evaluation of Microrate POST Programs in Dry Edible Bean.** Clint W. Beiermann*¹, Rich K. Zollinger², Andrew Kniss³, Prashant Jha⁴, Nevin C. Lawrence¹; ¹University of Nebraska-Lincoln, Scottsbluff, NE, ²Amvac Chemical Company, Spokane Valley, WA, ³University of Wyoming, Laramie, WY, ⁴Montana State University, Huntley, MT (92)

TUESDAY AFTERNOON MARCH 12

Basic Biology and Ecology

LOCATION: Mt. Sopris B
TIME: 1:30 PM - 5:00 PM
CHAIR & MODERATOR: Albert Adjesiwor
University of Wyoming
Laramie, WY
CHAIR-ELECT: Ciao Brunharo
Oregon State University
Corvallis, OR

***SPEAKER † STUDENT CONTEST**

- 1:30 Comparison of EPSPS Tandem Duplication Sequence Across Glyphosate-Resistant *Kochia scoparia* Populations.** Todd A. Gaines*¹, Eric Patterson², Andrea Dixon³, Crystal Sparks¹, Karl Ravet¹, Anita Kuepper⁴, Phil Westra¹, Joel Felix⁵, Don W. Morishita⁶, Prashant Jha⁷, Andrew Kniss⁸;
¹Colorado State University, Fort Collins, CO, ²Clemson University, Clemson, SC, ³Rothamsted Research, Harpenden, England, ⁴Bayer CropScience, Frankfurt am Main, Germany, ⁵Oregon State University, Ontario, OR, ⁶University of Idaho, Kimberly, ID, ⁷Montana State University, Huntley, MT, ⁸University of Wyoming, Laramie, WY (93)
- 1:45 †Regional Differences in *Kochia* Germination from the US Great Plains: Effect of Temperature.** Ramawatar Yadav*¹, Prashant Jha¹, Andrew Kniss², Nevin C. Lawrence³, Gustavo M. Sbatella⁴;
¹Montana State University, Huntley, MT, ²University of Wyoming, Laramie, WY, ³University of Nebraska-Lincoln, Scottsbluff, NE, ⁴University of Wyoming, Powell, WY (94)
- 2:00 Multiple Mechanisms of Dicamba Resistance in *Kochia* (*Kochia scoparia*).** Mithila Jugulam*¹, Junjun Ou², Sushila Chaudhari¹, Hugh J. Beckie³;
¹Kansas State University, Manhattan, KS, ²University of California-Davis, Davis, CA, ³University of Western Australia, Perth, Australia (95)
- 2:15 †Integrating Crop Diversity, Cover Crops, and Targeted Grazing to Manage Wild Oat and *Kochia*.** Mei Ling Wong*¹, Fabian Menalled¹, Larson Christian¹, Patrick Carr², Tim Seipel¹;
¹Montana State University, Bozeman, MT, ²Montana State University, Moccasin, MT (96)

- 2:30 Integrating Kochia and Palmer Amaranth Biology, Molecular, and Biochemical Findings into Management Strategies.** Phil Westra*¹, Todd A. Gaines¹, Eric Patterson², Andrew D. Effertz¹; ¹Colorado State University, Fort Collins, CO, ²Clemson University, Clemson, SC (97)
- 2:45 †Novel Dicamba Resistance Mechanism in *Kochia scoparia*.** Neeta Soni*¹, Eric Patterson², Cristiana T. Argueso¹, Todd A. Gaines¹; ¹Colorado State University, Fort Collins, CO, ²Clemson University, Clemson, SC (98)
- 3:00 Break**
- 3:30 †Efficacy of Cultural, Mechanical, and Chemical Weed Control for Proactive Herbicide Resistant Weed Management.** Elizabeth G. Mosqueda*¹, Andrew Kniss¹, Nevin C. Lawrence², Prashant Jha³, Gustavo M. Sbatella⁴; ¹University of Wyoming, Laramie, WY, ²University of Nebraska-Lincoln, Scottsbluff, NE, ³Montana State University, Huntley, MT, ⁴University of Wyoming, Powell, WY (99)
- 3:45 Establishment of Pollinator-Friendly Flora Following Cheatgrass Control.** Nicholas DiMascio, Janet Hardin, Arathi H. Seshadri*; Colorado State University, Fort Collins, CO (100)
- 4:00 †Rhizomatous Bud Response to Growth Regulator Applications in Field Bindweed (*Convolvulus arvensis* L.).** Jeremy R. Thompson*¹, Lynn M. Sosnoskie², Ian C. Burke¹; ¹Washington State University, Pullman, WA, ²University of California Cooperative Extension, Merced, CA (101)
- 4:15 Role of Glutamine Synthetase Isoforms and Herbicide Metabolism in the Mechanism of Resistance to Glufosinate in Italian Ryegrass Biotypes from Oregon.** Caio Augusto Brunharo*¹, Hudson K. Takano², Carol Mallory-Smith³, Franck Dayan², Brad Hanson¹; ¹University of California - Davis, Davis, CA, ²Colorado State University, Fort Collins, CO, ³Oregon State University, Corvallis, OR (102)
- 4:30 †The Influence of Light Reflected from Three *Amaranthaceae* Species on Growth and Development of Winter Wheat.** Osama S. Saleh*; University of Wyoming, Laramie, WY (103)
- 4:45 †Physiological Basis for the Contact Activity of Glufosinate.** Hudson K. Takano*¹, Roland Beffa², Phil Westra¹, Franck Dayan¹; ¹Colorado State University, Fort Collins, CO, ²Bayer, Frankfurt, Germany (104)

WEDNESDAY MORNING MARCH 13

New WSWs Officer Orientation

LOCATION: Maroon Peak
TIME: 9:00 AM - 9:30 AM
MODERATOR: Eric Gustafson
IMI
Eaton, CO

WEDNESDAY MORNING MARCH 13

Weeds of Agronomic Crops

LOCATION: Colorado Ballroom A
TIME: 9:30 AM - 11:45 AM
CHAIR & Vipan Kumar
MODERATOR: Kansas State University
Hays, KS
CHAIR-ELECT: Misha Manuchehri
Oklahoma State University
Stillwater, OK

***SPEAKER † STUDENT CONTEST**

- 9:30 Paraquat Plus S-Metolachlor: A New Option for Burndown and Residual Control.** Stephen M. Schaer*¹, Ryan D. Lins², Dane Bowers³; ¹Syngenta, Meridian, ID, ²Syngenta, Byron, MN, ³Syngenta, Greensboro, NC (105)
- 9:45 †Weed Emergence Timing in California Rice.** Katie E. Driver*, Kassim Al-Khatib; University of California - Davis, Davis, CA (106)
- 10:00 Topramezone Plus Atrazine - An Applied Review.** Rich Zollinger*¹, Rich Porter², Peter Porpiglia³; ¹Amvac Chemical Company, Spokane, WA, ²Amvac Chemical Company, Des Moines, IA, ³Amvac Chemical Company, Newport Beach, CA (107)
- 10:15 †Comparing Biological Characteristics and Control Methods of Kochia and Palmer Amaranth.** Andrew D. Effertz*, Phil Westra, Todd A. Gaines; Colorado State University, Fort Collins, CO (108)

- 10:30 Triple-Resistant Kochia in Western Canada: Management Tools and New Research.** Charles M. Geddes*¹, Linda M. Hall², Hugh J. Beckie³; ¹Agriculture and Agri-Food Canada, Lethbridge, AB, ²University of Alberta, Edmonton, AB, ³University of Western Australia, Perth, Australia (109)
- 10:45 †Genetic Basis of Multiple Herbicide Resistance in Palmer Amaranth (*Amaranthus palmeri* L.).** Chandrima Shyam*¹, Sridevi Nakka¹, Karthik Putta¹, Ivan Cuvaca¹, Randall Currie², Mithila Jugulam¹; ¹Kansas State University, Manhattan, KS, ²Kansas State University, Garden City, KS (110)
- 11:00 Site-Specific Weed Management in Corn: From UAV to Application.** Joao Paulo Flores, Mike H. Ostlie*; North Dakota State University, Carrington, ND (111)
- 11:15 †Deciphering the Molecular Basis of Mesotrione Tolerance in Grain Sorghum.** Balaji Aravindhan Pandian*, Vara Prasad P.V., Sanzhen Liu, Tesfaye Tesso, Mithila Jugulam; Kansas State University, Manhattan, KS (112)
- 11:30 Characterization and Management of Multiple Herbicide-Resistant Kochia in Western Kansas.** Vipin Kumar*¹, Rui Liu¹, Randall Currie², Prashant Jha³, Taylor Lambert¹; ¹Kansas State University, Hays, KS, ²Kansas State University, Garden City, KS, ³Montana State University, Huntley, MT (113)

WEDNESDAY MORNING MARCH 13

Teaching and Technology Transfer

LOCATION: Mt. Sopris A
 TIME: 9:30 AM - 10:00 AM
 CHAIR & MODERATOR: Kirk Howatt
 North Dakota State University
 Fargo, ND
 CHAIR-ELECT: Thomas Getts
 UC Cooperative Extension
 Susanville, CA

***SPEAKER**

- 9:30 Philosophy and Weed Management.** Joe G. Ballenger*, Andrew Kniss; University of Wyoming, Laramie, WY (114)
- 9:45 What Works and Doesn't Work in Managing Herbicide Drift.** Robert Klein*; University of Nebraska, North Platte, NE (115)

Teaching and Technology Transfer
Discussion Session

LOCATION: Mt. Sopris A
TIME: 10:00 AM - 11:30 AM
CHAIR & MODERATOR: Kirk Howatt
North Dakota State University
Fargo, ND
CHAIR-ELECT: Thomas Getts
UC Cooperative Extension
Susanville, CA

“It’s a bird. It’s a plane. It’s a quadcopter?”

WEDNESDAY MORNING MARCH 13

Basic Biology and Ecology

LOCATION: Mt. Sopris B
TIME: 9:30 AM - 10:15 AM
CHAIR & MODERATOR: Albert Adjewor
University of Wyoming
Laramie, WY
CHAIR-ELECT: Ciao Brunharo
Oregon State University
Corvallis, OR

***SPEAKER † STUDENT CONTEST**

- 9:30 †The Effects of Elevated Temperature and CO₂ on *Ventenata dubia* and *Bromus tectorum* Seedling Growth.** Audrey J. Harvey*¹, Jane Mangold¹, Lisa J. Rew¹, Tim Prather²; ¹Montana State University, Bozeman, MT, ²University of Idaho, Moscow, ID (116)
- 9:45 The Effects of Management System on Weed Communities During a Transition to Organic Farming.** Larson Christian, Fabian Menalled, Tim Seipel*; Montana State University, Bozeman, MT (117)
- 10:00 †Drones for IDing Drift - Comparing Visible Injury and Spectral Response of a Simulated Drift Experiment.** Chloe M. Mattilio*, Daniel Tekiela, Elizabeth G. Mosqueda; University of Wyoming, Laramie, WY (118)

Basic Biology and Ecology
Discussion Session

LOCATION: Mt. Sopris B
TIME: 10:15 AM - 11:45 AM
CHAIR & Albert Adjesiwor
MODERATOR: University of Wyoming
Laramie, WY
CHAIR-ELECT: Ciao Brunharo
Oregon State University
Corvallis, OR

**“Incorporating Ecological Principles into Weed
Management Decisions”**

WEDNESDAY MORNING MARCH 13

Awards Luncheon

LOCATION: Aspen Ballroom
TIME: 11:45 AM - 1:30 AM
MODERATOR: Andrew Kniss
University of Wyoming
Laramie, WY

WEDNESDAY AFTERNOON MARCH 13

Weeds of Agronomic Crops

LOCATION: Colorado Ballroom A
TIME: 1:45 PM - 3:15 PM
CHAIR & Vipan Kumar
MODERATOR: Kansas State University
Hays, KS
CHAIR-ELECT: Misha Manuchehri
Oklahoma State University
Stillwater, OK

***SPEAKER † STUDENT CONTEST**

- 1:45 Response of Kansas Feral Rye Populations to Imazamox and Quizalofop-p-ethyl.** Rui Liu*¹, Vipan Kumar¹, Taylor Lambert¹, Misha R. Manuchehri²; ¹Kansas State University, Hays, KS, ²Oklahoma State University, Stillwater, OK (119)
- 2:00 †Investigating Cross-Resistance to the Synthetic Auxins Fluroxypyr and Dicamba in *Kochia scoparia*.** Olivia E. Todd*, Todd A. Gaines, Eric Westra, Phil Westra; Colorado State University, Fort Collins, CO (120)
- 2:15 Herbicide Resistance in Downy Brome.** Ian C. Burke*, Rachel J. Zuger; Washington State University, Pullman, WA (121)
- 2:30 †IAA2 Candidate Resistance Allele on 2,4-D Resistance Mechanism in Indian Hedge Mustard (*Sisymbrium orientale*).** Anita Kuepper¹, Marcelo Figueiredo*², Christopher Preston³, Anireddy Reddy², Phil Westra², Todd A. Gaines²; ¹Bayer CropScience, Frankfurt am Main, Germany, ²Colorado State University, Fort Collins, CO, ³University of Adelaide, Adelaide, Australia (122)
- 2:45 Measuring Combine Facilitated Transport of Italian Ryegrass [*Lolium perenne* L. ssp. *multiflorum* (Lam.) Husnot] Seed During Wheat Harvest.** Kyle C. Roerig*, Andrew G. Hulting, Dan W. Curtis; Oregon State University, Corvallis, OR (123)
- 3:00 †Confirmation and Management of ALS Resistant Horseweed (*Conyza canadensis* L.) in Oklahoma Winter Wheat.** Jodie A. Crose*¹, Misha R. Manuchehri¹, Todd A. Baughman², Vipan Kumar³, Justin T. Childers¹; ¹Oklahoma State University, Stillwater, OK, ²Oklahoma State University, Ardmore, OK, ³Kansas State University, Hays, KS (124)

WEDNESDAY AFTERNOON MARCH 13

**Symposium: “Integrated Pest Management
Research in the West”**

LOCATION: Mt. Sopris A
TIME: 1:45 PM - 3:25 PM
MODERATOR: Kassim Al-Khatib
University of California - Davis
Davis, CA

***SPEAKER**

- 1:45 Low-Cost IPM for Medusahead and a Cost-Benefit Framework to Support Adoption.** Jeremy J. James*; University of California Cooperative Extension, Browns Valley, CA (125)
- 2:05 An Integrated Weed Management Approach for Controlling Kochia in Wheat Using Physical and Cultural Tactics.** Stephen L. Young*; Utah State University, Logan, UT (126)
- 2:25 Enhanced Implementation of the Online Soil Solarization Forecasting Model.** Carol Mallory-Smith*; Oregon State University, Corvallis, OR (127)
- 2:45 Testing Community Functional Composition of Vegetation Buffers to Improve Post-Fire Invasion Resistance of Coastal Sage Scrub.** Travis Bean*; University of California - Riverside, Riverside, CA (128)
- 3:05 Integrating Mechanical or Chemical Control with Biological Control for Improved Saltcedar Management at Southwestern Reservoirs.** Erik A. Lehnhoff*, Leeland Murray, Carol A. Sutherland, Amy Ganguli, Brian J. Schutte, Leslie Beck; New Mexico State University, Las Cruces, NM (129)

WEDNESDAY AFTERNOON MARCH 13

Weeds of Horticultural Crops

LOCATION: Mt. Sopris B
TIME: 1:45 PM - 4:45 PM
CHAIR & Marcelo Moretti
MODERATOR: Oregon State University
Corvallis, OR
CHAIR-ELECT: Jesse Richardson
Corteva Agriscience
Mesa, AZ

*SPEAKER † STUDENT CONTEST

- 1:45 Herbicide Management in *Solanum sisymbriifolium* a Trap Crop for Pale Cyst Nematode in Potato Systems.** Pamela J. Hutchinson*¹, Brent Beulter², Celestina S. Miera¹, Brenda C. Kendall¹, Tenika S. Trevino¹; ¹University of Idaho Aberdeen R&E Center, Aberdeen, ID, ²University of Idaho, American Falls, ID (130)
- 2:00 †Evaluation of Thermal, Mechanical, and Chemical Weed Control in Organic Northern Highbush Blueberries (*Vaccinium corymbosum*) in Oregon.** Erik N. Augerson*, Marcelo L. Moretti; Oregon State University, Corvallis, OR (131)
- 2:15 Weed Control Strategies for Interseeding of Cover Crops in Non-Transgenic Sweet Corn.** Ed Peachey*, Andrew Donaldson; Oregon State University, Corvallis, OR (132)
- 2:30 †Mulches for Weed Control on Non-Irrigated Hop (*Humulus lupulus*) in North Dakota.** Nick Theisen*, Collin Auwarter, John Stenger, Harlene M. Hatterman-Valenti; North Dakota State University, Fargo, ND (133)
- 2:45 Testing Bicyclopyrone for Crop Tolerance and Weed Efficacy in Cole Crops.** Steven S. Seefeldt*, Tim W. Miller; Washington State University, Mount Vernon, WA (134)
- 3:00 Optimizing Performance of Pronamide Applied by Sprinkler Chemigation in Lettuce.** Jesse M. Richardson*¹, Barry Tickes²; ¹Corteva Agriscience, Mesa, AZ, ²University of Arizona, Parker, AZ (135)
- 3:15 Break**

- 3:30 Use of Pyroxasulfone in Potato Weed Management.** Andy Robinson*; North Dakota State University / University of Minnesota, Fargo, ND (136)
- 3:45 Weed Management Options for Seeded Onion in North Dakota.** Harlene M. Hatterman-Valenti*, Collin Auwarter; North Dakota State University, Fargo, ND (137)
- 4:00 Weed Management Options in Cold Hardy Grapes.** John Stenger, Harlene M. Hatterman-Valenti*; North Dakota State University, Fargo, ND (138)
- 4:15 Effects of 2,4-D on Hazelnut Quality and Maturity.** Larissa Larocca de Souza*, Marcelo L. Moretti; Oregon State University, Corvallis, OR (139)
- 4:30 Defining Amicarbazone Rates and Timing of Application for *Poa annua* Control on Golf Course Fairways.** Kai Umeda*; University of Arizona, Phoenix, AZ (140)

WEDNESDAY AFTERNOON MARCH 13

Weeds of Range, Forest, and Natural Areas

LOCATION: Mt. Sopris A
 TIME: 3:30 PM - 5:00 PM
 CHAIR & MODERATOR: Derek Sebastian
 Bayer CropScience
 Fort Collins, CO
 CHAIR-ELECT Harry Quicke
 Bayer CropScience
 Windsor, CO

***SPEAKER † STUDENT CONTEST**

- 3:30 GF-3850, a New Herbicide for Use in Rangeland, Pastures and Other Non-Crop Sites.** William Hatler*¹, Byron Sleugh², Pat Burch³, Scott Flynn⁴, Daniel C. Cummings⁵, Charles Hart⁶; ¹Corteva Agriscience, Meridian, ID, ²Corteva Agriscience, Indianapolis, IN, ³Corteva Agriscience, Christianburg, VA, ⁴Corteva Agriscience, Lees Summit, MO, ⁵Corteva Agriscience, Bonham, TX, ⁶Corteva Agriscience, Abilene, TX (141)

- 3:45 GF-3886, a New Herbicide for Use in Non-Crop Sites, Rangeland and Pastures.** Daniel C. Cummings*¹, Byron Sleugh², Pat Burch³, Scott Flynn⁴, William Hatler⁵, Charles Hart⁶; ¹Corteva Agriscience, Bonham, TX, ²Corteva Agriscience, Indianapolis, IN, ³Corteva Agriscience, Christianburg, VA, ⁴Corteva Agriscience, Lees Summit, MO, ⁵Corteva Agriscience, Meridian, ID, ⁶Corteva Agriscience, Abilene, TX (142)
- 4:00 Total Vegetation Management: A Comprehensive Summary of Herbicides, Application Timings, and Resistance Management Options.** Scott J. Nissen*¹, Derek J. Sebastian², Shannon L. Clark¹, Dwight K. Lauer³; ¹Colorado State University, Fort Collins, CO, ²Bayer CropScience, Fort Collins, CO, ³Silvics Analytic, Wingate, NC (143)
- 4:15 Presence of *Cytisus scoparius* Modifies Short-Term Productivity of Glacial Outwash Soils in Western Washington.** Timothy B. Harrington*¹, Robert A. Slesak², Anthony W. Damato³; ¹USDA Forest Service, Olympia, WA, ²University of Minnesota, Minneapolis, MN, ³University of Vermont, Burlington, VT (144)
- 4:30 Biotic and Abiotic Indicators of *Ventenata dubia* in Canyon Grasslands.** Lisa C. Jones*, Tim Prather; University of Idaho, Moscow, ID (145)
- 4:45 Herbicide Trials with Brazilian *Egeria (Egeria densa)* for Management in the Sacramento/San Joaquin River Delta.** John D. Madsen*; USDA-ARS, Davis, CA (146)

WEDNESDAY AFTERNOON MARCH 13

Weeds of Agronomic Crops
Discussion Session

LOCATION: Colorado Ballroom A
 TIME: 3:30 PM - 5:00 PM
 CHAIR & MODERATOR: Vipin Kumar
 Kansas State University
 Hays, KS
 CHAIR-ELECT: Misha Manuchehri
 Oklahoma State University
 Stillwater, OK

“Herbicide-Resistant Weeds in the West: Current Status and Path Forward”

WEDNESDAY AFTERNOON MARCH 13

What's New In Industry?

LOCATION: Colorado Ballroom A
TIME: 5:15 PM - 6:15 PM
MODERATOR: Charlie Hicks
Bayer CropScience
Fort Collins, CO

THURSDAY MORNING MARCH 14

Business Breakfast

LOCATION: Aspen Ballroom
TIME: 6:30 AM - 9:15 AM
MODERATOR: Andrew Kniss
University of Wyoming
Laramie, WY

THURSDAY MORNING MARCH 14

Weeds of Range, Forest, and Natural Areas

LOCATION: Mt. Sopris A
TIME: 9:30 AM - 10:45 AM
CHAIR & DEREK SEBASTIAN
MODERATOR: Bayer CropScience
Fort Collins, CO
CHAIR-ELECT HARRY QUICKE
Bayer CropScience
Windsor, CO

***SPEAKER**

- 9:30 Spring and Fall Herbicide Applications to Scotch Thistle Rosettes.** Thomas J. Getts*; UCCE, Susanville, CA (147)
- 9:45 Aminopyralid + Picloram + Fluroxypyr for Pricklypear Control and Oak Tolerance when Applied by Ground and Aerial Broadcast.** James R. Jackson*¹, Robert Lyons², Charles Hart³; ¹Texas A&M AgriLife Extension, Stephenville, TX, ²Texas A&M AgriLife Extension, Uvalde, TX, ³Corteva Agriscience, Abilene, TX (148)
- 10:00 Florpyrauxifen: a New Arylpicolinate Herbicide for Weed Management in Pastures, Rangeland and Other Non-Crop Sites.** Byron Sleugh*¹, Pat Burch², Scott Flynn³, Daniel C. Cummings⁴, William Hatler⁵, Charles Hart⁶; ¹Corteva Agriscience, Indianapolis, IN, ²Corteva Agriscience, Christianburg, VA, ³Corteva Agriscience, Lees Summit, MO, ⁴Corteva Agriscience, Bonham, TX, ⁵Corteva Agriscience, Meridian, ID, ⁶Corteva Agriscience, Abilene, TX (149)
- 10:15 Unavoidable Collateral Damage, the Reality of Invasive Plant Management.** Dan R. Tekiela*; University of Wyoming, Laramie, WY (150)
- 10:30 Non-target Impacts from Basal Bark Treatments of *Prunus padus*.** Gino Graziano*¹, Steven S. Seefeldt², Patrick Tomco³, Mingchu Zhang⁴, Christa Mulder⁴; ¹University of Alaska Fairbanks, Anchorage, AK, ²Washington State University, Mount Vernon, WA, ³University of Alaska Anchorage, Anchorage, AK, ⁴University of Alaska Fairbanks, Fairbanks, AK (151)

THURSDAY MORNING MARCH 14

Weeds of Agronomic Crops

LOCATION: Colorado Ballroom B
TIME: 9:30 AM - 11:00 AM
CHAIR & Vipan Kumar
MODERATOR: Kansas State University
Hays, KS
CHAIR-ELECT Misha Manuchehri
Oklahoma State University
Stillwater, OK

***SPEAKER**

- 9:30 Efficacy and Crop Safety of New Broadleaf Herbicide, Haulaxifen-methyl Plus Fluroxypyr, in Northern Plains Spring Cereals.** Patti Prasifka*¹, Joe Yenish², Mike J. Moechnig³; ¹Corteva Agriscience, West Fargo, ND, ²Corteva Agriscience, Billings, MT, ³Corteva Agriscience, Toronto, SD (152)
- 9:45 Effects of a Wheat Cover Crop on Weed Control in Corn with Increasing Levels of Irrigation.** Randall Currie*, Patrick W. Geier; Kansas State University, Garden City, KS (153)
- 10:00 Winter Annual Grass Control with ACCase Tolerant Wheat Production System in Colorado.** Eric Westra*¹, Todd A. Gaines¹, Phil Westra¹, Chad Shelton²; ¹Colorado State University, Fort Collins, CO, ²Albaugh, Rosalia, WA (154)
- 10:15 Pinoxaden Plus Fenoxaprop-p-ethyl: The Next Step Up for Grass Control in Wheat and Barley.** Pete C. Forster*¹, Brett Miller², Donald J. Porter³, Monika Saini³; ¹Syngenta Crop Protection, Eaton, CO, ²Syngenta Crop Protection, Minnetonka, MN, ³Syngenta Crop Protection, Greensboro, NC (155)
- 10:30 Dichlorprop-p Use in Herbicide Programs for Wheat.** Kirk A. Howatt*¹, Joseph E. Mettler¹, Bob Bruss²; ¹North Dakota State University, Fargo, ND, ²Nufarm Americas, Morrisville, NC (156)
- 10:45 Clopyralid Alternatives for Postemergence Mayweed Chamomile (*Anthemis cotula* L.) Control in Wheat.** Rachel J. Zuger*, Ian C. Burke; Washington State University, Pullman, WA (157)

THURSDAY MORNING MARCH 14

Weeds of Horticultural Crops
Discussion Session

LOCATION: Mt. Sopris B
TIME: 9:30 AM - 11:00 AM
CHAIR & Marcelo Moretti
MODERATOR: Oregon State University
Corvallis, OR
CHAIR-ELECT: Jesse Richardson
Corteva Agriscience
Mesa, AZ

**“Can the Academic Entrepreneurial Spirit Spur Novel
Weed Control Methods? How Weed Scientist Can Help
Shape the Future of Weed Control in Horticulture Crops”**

THURSDAY MORNING MARCH 14

**Symposium: “Rights-of-Way – Beyond
Integrated Vegetation Management to
Integrated Habitats!”**

LOCATION: Colorado Ballroom A
TIME: 9:30 AM - 12:00 PM
MODERATOR: Sandra McDonald
Mountain West Pesticide
Education & Safety Training
Fort Collins, CO

***SPEAKER**

- 9:30 The Vision "Beyond IVM to Integrated Habitat".**
Sandra K. McDonald*; Mountain West Pesticide
Education & Safety Training, Fort Collins, CO (158)
- 9:40 Integrated Management to Enhance Pollinator
Habitat, Wildlife Habitat and Desirable Species
Composition.** Rick Johnstone*; Integrated
Vegetation Management Partners, Newark, DE (159)
- 10:25 What's the "Ideal World" for Pollinators - What
Do They Need to Survive/Thrive.** Arathi H.
Seshadri*; Colorado State University, Fort Collins,
CO (160)

- 10:45 "Real World" Needs and Purpose(s) of the Rights-of-Way.** Liza Rossi*; Colorado Parks and Wildlife, Steamboat Springs, CO (161)
- 11:00 Various Purposes of Rights-of-Way Provide Constraints and Opportunities.** Lindy Garner*; US Fish and Wildlife Service, Denver, CO (162)
- 11:15 Managing Right-of-Way with Vehicles from all Across the County in a National Park Highly Susceptible to Invasion.** Sue Mills*; National Park Service, Yellowstone National Park, WY (163)
- 11:30 Noxious Weeds in Rights-of-Way Habitat – A Regulatory Perspective.** Slade Franklin*; Wyoming Department of Agriculture, Cheyenne, WY (164)
- 11:45 Discussion – Management Issues, Opportunities, and Constraints**

THURSDAY AFTERNOON MARCH 14

Rights-of-Way Symposium Lunch

LOCATION: Aspen Ballroom
 TIME: 12:00 PM - 1:00 PM

THURSDAY AFTERNOON MARCH 14

Symposium: “Rights-of-Way – Beyond Integrated Vegetation Management to Integrated Habitats!”

LOCATION: Colorado Ballroom A
 TIME: 1:00 PM - 3:00 PM
 MODERATOR: Sandra McDonald
 Mountain West Pesticide
 Education & Safety Training
 Fort Collins, CO

***SPEAKER**

- 1:00 Interstate Highway 76 is the "Colorado Pollinator Highway".** Michael Banovich*; Colorado Department of Transportation, Denver, CO (165)

- 1:20 Plants Appropriate for Rights-of-Way.** Irene Shonle*; Colorado State University, Black Hawk, CO (166)
- 1:40 Reclamation and Seed Mixes Post Highway Disturbance.** Michael Banovich*; Colorado Department of Transportation, Denver, CO (167)
- 2:00 Using Herbicides to Release Native Species for Rights-of-Way Habitat.** Shannon L. Clark*¹, Scott J. Nissen²; ¹Colorado State University, Fort Collins, CO, ²Colorado State University, Ft Collins, CO (168)
- 2:20 Rights-of-Way Herbicide Applicator Issues.** Daniel C. Cummings*; Corteva Agriscience, Bonham, TX (169)
- 2:40 Symposium Wrap-up – Discussion – Where do we go from here?**
- 3:00 Adjourn**

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WSWS PAST PRESIDENTS

| | | | |
|------|--------------------|------|-----------------------|
| 1938 | H. L. Spence, Jr. | 1983 | J. Wayne Whitworth |
| 1940 | G. R. Hyslop | 1984 | Gary Massey |
| 1941 | C. L. Corkins | 1985 | E. Stanley Heathman |
| 1942 | W. W. Robbins | 1986 | Harvey D. Tripple |
| 1944 | E. Hutchings | 1987 | John O. Evans |
| 1945 | Lee M. Burge | 1988 | Larry W. Mitich |
| 1946 | B. E. Kuhns | 1989 | Donn C. Thill |
| 1947 | H. E. Morris | 1990 | Sheldon E. Blank |
| 1948 | Virgil H. Freed | 1991 | Peter K. Fay |
| 1949 | Bruce J. Thornton | 1992 | Paul J. Ogg |
| 1950 | E. W. Whitman | 1993 | Stephen D. Miller |
| 1952 | W. W. Robbins | 1994 | Doug K. Ryerson |
| 1954 | Clarence I. Seely | 1995 | Tom D. Whitson |
| 1956 | Walter S. Ball | 1996 | Gus Foster |
| 1958 | H. Wolfe | 1997 | Charlotte V. Eberlein |
| 1960 | Richard A. Fosse | 1998 | Barbra Mullin |
| 1962 | William R. Furtick | 1999 | Rodney G. Lym |
| 1963 | P. Eugene Heikes | 2000 | Jeffrey M. Tichota |
| 1965 | Jesse M. Hodgson | 2001 | Don Morishita |
| 1967 | Louis A. Jensen | 2002 | Robert Parker |
| 1968 | S. Strew | 2003 | Jill Schroeder |
| 1969 | K. C. Hamilton | 2004 | Gilbert Cook |
| 1970 | Harold P. Alley | 2005 | Phil Stahlman |
| 1971 | Kenneth W. Dunster | 2006 | Phil Banks |
| 1972 | Arnold P. Appleby | 2007 | Kassim Al-Khatib |
| 1973 | David E. Bayer | 2008 | Ron Crockett |
| 1974 | D. Burgoyne | 2009 | Dan Ball |
| 1975 | Gary A. Lee | 2010 | Jesse Richardson |
| 1976 | William L. Anliker | 2011 | Joe DiTomaso |
| 1977 | Clyde L. Elmore | 2012 | Vanelle Peterson |
| 1978 | Lowell S. Jordon | 2013 | Kai Umeda |
| 1979 | Richard D. Comes | 2014 | Roger Gast |
| 1980 | Larry C. Burrill | 2015 | Drew Lyon |
| 1981 | L.E. "Jack" Warren | 2016 | Joe Yenish |
| 1982 | Alex G. Ogg, Jr. | 2017 | Kirk Howatt |
| | | 2018 | Monte Anderson |

HONORARY MEMBERS

| | |
|-------|-----------------------------|
| 1976 | Dick Beeler |
| 1978 | Dale W. Bohmont |
| 19821 | R. Phillip Upchurch |
| 1983 | Virgil H. Freed |
| 1984 | Warren C. Shaw |
| 1987 | Norman B. Akesson |
| 1988 | Logan A. Norris |
| 1989 | Gary A. Lee |
| 1990 | Earl Spurrier |
| 1992 | Bruce Ames |
| 1993 | Jerry Caulder |
| 1994 | Will D. Carpenter |
| 1995 | K. James Fornstrom |
| 1997 | F. Dan Hess |
| 2001 | Darrell Hanavan |
| 2002 | Senator Larry Craig - Idaho |
| 2003 | Roy Nishimoto |
| 2004 | Doug Schmale |
| 2006 | Wanda Graves |
| 2007 | Rob Hedberg |
| 2008 | Robert Zemetra |
| 2009 | Tom Brokaw |
| 2010 | Harry Cline |
| 2011 | A. G. Kawamura |
| 2014 | David Armstrong |

WSWS FELLOWS

| | | | |
|------|--|------|---|
| 1968 | Robert B. Balcom Walter S. Ball Alden S. Crafts F.L. Timmons D.C. Tingey | 1994 | Sheldon E. Blank Gus J. Foster |
| 1969 | Lambert C. Erickson Jesse M. Hodgson | 1995 | Stephen D. Miller John T. Schlesselman |
| 1970 | Lee M. Burge Bruce Thornton | 1996 | Don Colbert Robert Parker |
| 1971 | Virgil H. Freed W.A. Harvey | 1997 | Steven A. Dewey Mike Newton |
| 1972 | H. Fred Arle Boysie E. Day | 1998 | Doug K. Ryerson Tom D. Whitson |
| 1973 | Harold P. Alley K.C. Hamilton | 1999 | Charlotte V. Eberlein John E. Orr |
| 1974 | William R. Furtick Oliver A. Leonard | 2000 | Rodney G. Lym Frank L. Young |
| 1975 | Richard A. Fosse Clarence I. Seely | 2001 | Barbra Mullin Jill Schroeder |
| 1976 | Arnold P. Appleby | 2002 | Jeff Tichota Philip Westra |
| 1977 | J. LaMar Anderson Arthur H. Lange | 2003 | Vanelle Peterson Carol Mallory-Smith |
| 1978 | David E. Bayer Kenneth W. Dunster | 2004 | Don Morishita Phil Banks |
| 1979 | Louis A. Jensen Gary A. Lee | 2005 | Nelroy Jackson Roland Shirman |
| 1980 | W.L. Anliker | 2006 | Celestine Duncan Joan Campbell |
| 1981 | P. Eugene Heikes J. Wayne Whitworth | 2007 | Bill Cobb Phil Stahlman |
| 1982 | Bert L. Bohmont Lowell S. Jordan | 2008 | K. George Beck Rick Boydston |
| 1983 | Richard D. Comes Clyde L. Elmore | 2009 | Kassim Al-Khatib Scott Nissen |
| 1984 | Larry C. Burrill | 2010 | Tracy Sterling Rick Arnold |
| 1985 | L.E. "Jack" Warren | 2011 | Daniel A. Ball Roger Gast |
| 1986 | Dwight V. Peabody Robert L. Zimdahl | 2012 | Jodie Holt Lars Anderson |
| 1987 | Alex G. Ogg, Jr. Jean H. Dawson | 2013 | Tim Miller Tom Lanini |
| 1988 | Harvey D. Tripple E. Stan Heathman | 2014 | Robert Stougaard Robert Norris |
| 1989 | John O. Evans W.B. "Jim" McHenry | 2015 | Pete Forster Gilbert Cook |
| 1990 | Harry S. Agamalian Bart A. Brinkman | 2016 | Jesse Richardson Joseph DiTomaso |
| 1991 | Larry W. Mitich Edward E. Schweizer | 2017 | Ralph Whitesides Ed Peachey |
| 1992 | Donald C. Thill Harold M. Kempen | 2018 | Phillip Munger Kai Umeda |
| 1993 | Paul J. Ogg Peter K. Fay | | |

OUTSTANDING WEED SCIENTISTS

| | | | |
|------|----------------------------------|------|--------------------------------|
| 1989 | Jean H. Dawson | 2005 | Kassim Al-Khatib |
| 1990 | Arnold P. Appleby | | Kelly Luff |
| 1991 | Stephen D. Miller | 2006 | Rick Arnold |
| | Harvey D. Tripple | 2007 | John Fenderson |
| 1992 | Alex G. Ogg, Jr. | | Rod Lym |
| | Kenneth W. Dunster | 2008 | Robert G. Wilson |
| 1993 | Edward E. Schweizer | | Leo Charvat |
| | Sheldon E. Blank | | Pat Clay [‡] |
| 1994 | Larry C. Burrill | 2009 | Carol Mallory-Smith |
| 1995 | Larry W. Mitich | | Pete Forster |
| | Paul J. Ogg | | Alan Helm [‡] |
| 1996 | Donald C. Thill | 2010 | Drew Lyon |
| | Neal R. Hageman | | Ian Burke [‡] |
| 1997 | Jeff Tichota | 2011 | Monte D. Anderson |
| | Harry S. Agamalian | | Bradley D. Hanson [‡] |
| 1998 | Donald R. Colbert | 2012 | Brett Oemichen |
| | Clyde L. Elmore | | Andrew Kniss [‡] |
| 1999 | Gus J. Foster | 2013 | Mary Halstvedt |
| | Philip Westra | | Jane Mangold [‡] |
| 2000 | Bart Brinkman | 2014 | Charlie Hicks |
| | K. George Beck | 2015 | Brian Mealor [‡] |
| 2001 | John E. Orr | 2016 | Prashant Jha [‡] |
| | Phillip W. Stahlman | 2017 | Erik Lehnhoff [‡] |
| 2002 | Doug Ryerson | 2018 | Rick Boydston |
| | Tom Whitson | | Brian Schutte [‡] |
| 2003 | Frank Young | | |
| 2004 | Ron P. Crockett | | |
| | Joe DiTomaso | | |
| | Jim Vandecoeveering [‡] | | |

[‡]Early Career

OUTSTANDING ACHIEVEMENT AWARDS

| | | |
|------|-----------------|--------------------|
| 2003 | Bill Brewster | Professional Staff |
| 2005 | Guy Kyser | Professional Staff |
| | Eric Lane | Weed Manager |
| 2006 | Ed Peachy | Professional Staff |
| 2007 | Jim Freeman | Weed Manager |
| | Carl Libbey | Professional Staff |
| 2008 | Lars Baker | Weed Manager |
| | Lori Howlett | Professional Staff |
| 2009 | April Fletcher | Weed Manager |
| | Gary Willoughby | Professional Staff |
| 2010 | Cheryl Fiore | Professional Staff |
| 2011 | Robert Higgins | Professional Staff |
| 2012 | James Sebastian | Professional Staff |
| | Jerry Asher | Weed Manager |
| 2013 | Joan Campbell | Professional Staff |
| | Tim D'Amato | Weed Manager |
| 2014 | Ed Davis | Professional Staff |
| | Rita Beard | Weed Manager |
| 2015 | Brent Beutler | Professional Staff |

PRESIDENTIAL AWARD OF MERIT

| | |
|------|---------------------|
| 1994 | Rodney G. Lym |
| 1995 | John E. Orr |
| 1996 | Steven A. Dewey |
| 1997 | Jill Schroeder |
| 1999 | Celestine Duncan |
| 2000 | Gus Foster |
| 2001 | Jack Schlesselman |
| 2002 | Tom Whitson |
| 2003 | Nelroy Jackson |
| 2004 | Joan Campbell |
| 2005 | Tony White |
| 2006 | Janet Clark |
| 2007 | Tim Miller |
| 2009 | Mike Edwards |
| 2010 | Phil Motooka |
| 2011 | Kai Umeda |
| 2012 | Tim Miller |
| 2013 | Phil Banks |
| 2014 | Carl Libbey |
| 2015 | Carol Mallory-Smith |
| 2016 | Roland Schirman |
| 2017 | Phil Stahlman |
| 2018 | Roger Gast |

WSWS Committees 2018-19

Board contact *italicized*. (Year to rotate off of committee in parenthesis)

| | |
|---|--|
| <p>Awards <i>President</i> Roger Gast (2019) Prashant Jha, Chair (2020) Lesley Beckworth (2021)</p> | <p>Legislative <i>WSSA Representative</i> Patti Prasifka (2019) Stephen Valenti, Chair (2020) <i>Vacant</i> (2021) Lee Van Wychen, Ex-officio</p> |
| <p>Fellows and Honorary Membership <i>Past President</i> Bill Cobb (2019) Joan Campbell, Chair (2020) Jill Schroeder (2021)</p> | <p>Local Arrangements <i>President-Elect</i> Travis Bean (2019) Sandra McDonald, Chair (2020) James Leary (2021)</p> |
| <p>Finance <i>Member-at-Large Public</i> Josh Adkins (2019) Phil Banks, Chair (2020) Tim Seipel (2021)</p> | <p>Necrology <i>Secretary</i> John Frihauf (2019) Harlene Hatterman, Chair (2020) Earl Creech (2021)</p> |
| <p>Herbicide Resistant Plants <i>Member-at-Large Private</i> Joan Campbell (2019) Drew Lyon, Chair (2020) Vipin Kumar (2021) Tara Burke (student rep)</p> | <p>Nominations <i>Past President</i> Ryan Rapp (2019) Kai Umeda, Chair (2020) Jane Mangold (2021) Monte Anderson (Past-President)</p> |
| <p>Program <i>President-Elect</i> Pat Clay, Chair (2019) Brad Hanson (2019) Brian Schutte (2019)</p> | <p>Poster <i>President-Elect</i> Alan Helm (2019) Misha Manuchehri, Chair (2020) Craig Alford (2021)</p> |
| <p>Publications <i>President-Elect</i> Pat Clay, Chair Carl Libbey, Proceedings & Newsletter Traci Rauch, Research Prog. Report Kala Travis, Website Editor</p> | <p>Public Relations <i>Ed. & Reg. Section Chair</i> Kai Umeda (2019) Pat Clay (2019) Richard Zollinger, Co-Chair (2020) Joe Armstrong, Co-Chair (2020)</p> |
| <p>Student Paper Judging <i>President-Elect</i> Ryan Edwards (2019) Ed Peachey, Chair (2020) Carl Coburn (2021) Larissa Larocca de Souza (student rep)</p> | <p>Site Selection <i>Ed. & Reg. Section Chair</i> Steve Eskelson (2019) Pete Forster, Chair (2020) Erik Lehnhoff (2021)</p> |
| <p>Sustaining Membership <i>Past President</i> Ryan Rector (2019) Charlie Hicks, Chair (2020) Kirk Sager (2021)</p> | |

NOTES

NOTES

THANK YOU!

The WSWS members thank the Sustaining Members of the WSWS for their support. We would also like to thank the industry sponsors listed below for providing refreshments for the retiree reception and meeting breaks and for hosting the graduate student, spouses, and business breakfasts. Please thank the sustaining members and sponsors for their generosity and support of the society. The Program and Local Arrangements Committees would like to **thank Pete Forster** for making the arrangements for all of the sponsored activities.

BASF Corporation

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FMC Ag. Solutions

Gowan Company

Helena Agri-Enterprises

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Valent U.S.A.

2019 WSWS Sustaining Members

Alligare LLC

AMVAC Chemical Corp.

Arysta LifeScience

BASF Corporation

Bayer CropScience

Campbell Scientific

Corteva Agriscience

FMC

Gowan Company

Gylling Data Management

Syngenta

Valent U.S.A. LLC

Wilbur-Ellis Company

Winfield Solutions LLC



FUTURE MEETING DATES AND SITES

March 2-5, 2020
Hyatt Regency Maui
Maui, HI
(Joint meeting with WSSA)

| TIME | TUESDAY | WEDNESDAY | THURSDAY |
|-------|---|--|--|
| 6:30 | | | WSWS Business Breakfast and Student Awards Aspen Ballroom |
| 6:45 | | | |
| 7:00 | | | |
| 7:30 | | | |
| 7:45 | Poster Session Odd # Authors Present Colorado B | Poster Session Even # Authors Present Colorado B | |
| 8:00 | | | |
| 8:15 | | | |
| 8:30 | | | |
| 8:45 | | | |
| 9:00 | | | |
| 9:15 | | | |
| 9:30 | General Session Colorado A | | |
| 9:45 | | | |
| 10:00 | | | |
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| 10:30 | | | |
| 10:45 | | | |
| 11:00 | | | |
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| 11:45 | | | WSWS Awards Luncheon Aspen Ballroom |
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| 5:00 | | What's New in Industry? Colorado A | |
| 5:15 | | | |
| 5:30 | | | |
| 5:45 | | | |
| 6:00 | | | |