



Western Society of Weed Science Newsletter

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SPRING 2022

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President's Report - by Joel Felix

It is an honor and privilege of a lifetime to serve as the 2022-2023 WSWS President. It is a humbling experience to be entrusted with the responsibilities of acting on behalf of the society we all love dearly. This is because WSWS is the oldest weed society in the entire United States. There have been 75 individuals between 1938 and 2022 who preceded me as president of WSWS! I want to

thank you for participating in the WSWS 75th annual meeting in Newport Beach, California, March 7-10, 2022. The final tally indicated 232 registrants for the 75th annual meeting. The meeting was a success largely because of the efforts by the Board of Directors, the Program Committee, Section chairs and chairs-elect, Committee Members, Symposium and Workshop organizers, and poster and oral presenters. Thank you!

The 2022 WSWS meeting included 150 papers (posters and oral presentations) distributed among our five projects. The tally includes presentations in one symposium on '*New Technology for Physical Weed Control*' that was organized and moderated by Steve Fennimore and co-moderator Marcelo Moretti and one workshop titled '*Weeds and Wildfires in the West*' that was organized and moderated by Matt Baur, each comprised of 7 presentations. We are grateful to Steve Fennimore and Marcelo Moretti for organizing such informative and well-attended symposium on a topic that we should be doing more of in the future. As machine learning, artificial intelligence, deep learning, machine weeding, and robotic weed control become common practice among growers, we will need to find a way to do more in those arenas. I hope this symposium created awareness and desire among members to pursue these technologies in our weed control research programs at our respective institutions. Thanks to Matt Baur for organizing the workshop that was very informative and well attended and we look forward to his participation in future WSWS annual meetings.

The general session on Tuesday, March 8, 2022 was well attended and the presentations by Vanelle Peterson (WSWS History: Building on the Past for the Future), Andrew Kniss (A Future Shaped by Our Past I: Teaching Weed Science in the West), Jane Mangold (A Future Shaped by Our Past II: Research and Extension in the West), Lee Van Wychen (DC Update), and Steven Snyder (Automated Weeding) were well received by the attendees. We are indebted to the History Ad-Hoc committee that was chaired by Vanelle Peterson for pulling together the WSWS historical information, 1938 to 2021, in one document that can be found here [WSWS HISTORY](#). Special thanks to Andrew Kniss and Jane Mangold for their informative presentations. Lee Van Wychen presentation on DC activities is always good to see and this year was no exception. We are thankful to Steven Snyder who spoke

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WSWS Annual Meeting February 27- March 2, 2023 Boise, Idaho

President's Report – CONTINUED FROM PAGE 1

on 'automated weeding' and we hope he will give follow up presentations at WSWS future meetings. The presidential address by Sandra McDonald, was a call to duty for all WSWS members. Sandra called on members to be engaged in society affairs through volunteering to serve on different committees and to take time and nominate colleagues who deserve recognition.

Congratulations to all WSWS awardees

In recognition of their accomplishments and contributions, the WSWS bestowed the Fellow honor to Andrew Kniss, University of Wyoming and Rich Zollinger, AMVAC Chemical Corporation. The honor of WSWS Honorary Member was awarded to Hugh Beckie, University of Western Australia. The Outstanding Weed Scientist Early Career award went to Charles Geddes, Agriculture and Agri-Food Canada. The Weed Manager award went to Julie Kraft, Sublette County Weed & Pest District, Wyoming. Elena Sanchez Memorial Scholarships were awarded to Ednaldo Alexandre Bargoto, Kansas State University, Jodie Crose, University of Wyoming, and Sachin Dhanda, Kansas State University. There was a thunderous standing ovation by the WSWS members to acknowledge the outstanding work by the members of the WSWS History Ad Hoc committee composed of, Vanelle Peterson - Chair, Phil Banks, Don Morishita, and Rod Lym. The Presidential Award of Merit was extended to Mithila Jugulam, Kansas State University, Todd Neel, US Forest Services, Mirella Farinelli Ortiz, Colorado State University, and Dennis Scott, FMC Corporation for their tremendous contributions as Program Committee members for the 2021 WSWS virtual meeting.

Thank you!

I would like to thank our business manager, Eric Gustafson and his team for making hotel arrangements and being there whenever their help was needed (which was most of the time and activity). Eric is such a wonderful person to work with and I look forward to working with him to conduct WSWS business in the coming year. Special thanks to our webmaster David Krueger for making sure the program admin tool and the WSWS website was running as smoothly as possible. Eric and David do all of the behind the scene magic that allows meeting registration, program building, and smooth functioning of the meeting app. Thank you!

Finally, I want to thank the program committee and our immediate past president, Sandra McDonald, for being there to lend a hand at every stage of the meeting. Thank you to the WSWS members for submitting titles and making presentations that made the 75th annual meeting of the WSWS such a success. Thanks to students who participated and made presentations at the 75th annual WSWS meeting. Thank you to the WSWS Sustaining Members and event sponsors. Thank you to all who donated items or participated in the student silent auction.

If you don't know by now, WSWS is active on social media. Amy Giannotti continues to serve as our WSWS Social Media Administrator. Her email is: wsweedsci@gmail.com The society handle on Instagram and Twitter is (@wsweedsci) and on Facebook (@Western Society of Weed Science).

Our strength as a society is based on member's willingness to volunteer to serve. If you are interested in volunteering to serve on any committee, let me know joel.felix@oregonstate.edu. Thanks to all WSWS Board of Directors, committee members, and section chairs who are rotating off and we welcome all those who are joining to serve starting in 2022. There are opportunities to serve in a variety of capacities. I look forward to a rewarding year and hope to see you all in Boise, Idaho in 2023.

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Student Liaison Report – Grace Flusche Ogden

Hello WSWS Students,

What an honor it is to serve as the WSWS Student Liaison. I first attended WSWS as an undergraduate in 2017 and there is something really special about serving as student liaison years later. I have greatly admired those who have served as student liaison in years past and hope I can carry on their legacy of excellence.

To start off with updates about WSWS student affairs, I have great news on the money raised at the annual meeting. Between the silent auction and monetary donations, we were able to raise just over \$3,000! \$3,000 is our annual goal to fund the Elena Sanchez Memorial WSWS Outstanding Student Scholarship Program. A huge thank you to everyone who contributed!

Thanks to all who attended our WSWS Student Business Luncheon. We had a great turn out! Elections were held during the luncheon and Aaron Becerra-Alvarez was elected as the student-liaison elect. He will spend the next year learning the role of student liaison before stepping into the position at the conclusion of our next annual meeting. Looking forward to working with you, Aaron!

Congratulations to all of the student award winners! WSWS was able to award 4 scholarships and many poster/presentation awards this year! All of the presentations and posters I saw were excellent.

I'd like to acknowledge and thank all of those who helped make the annual meeting run so smoothly. As students, we are so lucky to have folks in our corner at the WSWS who craft a meeting that is uniquely welcoming and inclusive of students. We owe a huge thanks to Eric Gustafson, Sandra McDonald, and all of those on the board of directors who thoughtfully organized the meeting. A special thanks to Jodie Crose for carrying the student liaison torch with grace and poise. With her defense set for only a few weeks after the annual meeting, this was no small feat. Additionally, many thanks to those who participated on Student Night Out- especially the mentors. From the records I have, more than 75% of students registered attended Student Night Out. Wow! This is one of my favorite events from any conference I attend and I think it adds immense value to the WSWS annual meeting.

Lastly, please consider applying for the WSSA Travel Enrichment Experience Award. This award allows students to participate in a five day, four night educational experience with professionals in a different region. This is such a cool opportunity! Applications are due in May and students will coordinate with their host to determine when the visit will take place (usually over the summer). Students are required to present a 10-minute oral presentation about their experience at the WSSA annual meeting in 2023. You can check the WSSA website for the application- last year's application is currently up but an updated application should arrive soon.

I'm excited to serve you all as student liaison. If you think of anything that can improve the student experience in WSWS, please don't hesitate to reach out. Looking forward to the next year!

Warm regards,

Grace Flusche Ogden, Student Chair
gflusche@okstate.edu

Aaron Becerra-Alvarez, Student Chair (elect)
abecerraalvarez@ucdavis.edu

WSWS 2022 Professional Awards

The **Outstanding Weed Scientist – Early Career** award was granted to Dr. Charles Geddes, Agriculture and Agri-Food Canada, Lethbridge Research and Development Center, Lethbridge, Alberta and the **Outstanding Weed Manager** award was granted to Julie Kraft, Sublette County Weed & Pest District, Pinedale, Wyoming



Charles Geddes



Julie Kraft

Elena Sanchez Memorial Scholarship

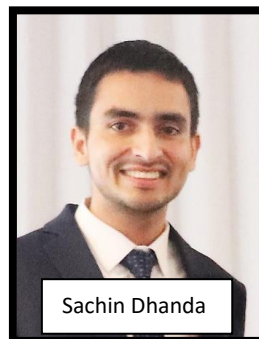
Rich Zollinger, Awards Committee Chair announced the recipients of the “WSWS Elena Sanchez Outstanding Student Scholarship Program” were Jodie Crose: 3rd year Ph. D. candidate, University of Wyoming, Dr. Brian Mealor, Ednaldo Alexandre Borgato: 4th year Ph.D candidate, Kansas State University, Dr. Mithila Jugulam and Dr. J. Anita Dille, and Sachin Dhanda: 1st year Ph.D. candidate, Kansas State University, Dr. Vipin Kumar. A big thanks to their advisors for bringing along such great promising talent for the future of weed science.



Jodie Crose



Ednaldo Alexandre Bargato



Sachin Dhanda

Presidential Award of Merit

Mithila Jugulam, Kansas State University, Todd Neel, US Forest Services, Mirella Farinelli Ortiz, Colorado State University, and Dennis Scott, FMC Corporation received the WSWS **Presidential Award of Merit** from Sandra McDonald for their tremendous contributions as Program Committee members for the 2021 WSWS virtual meeting.

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Publications

WSWS ONLINE

EDUCATION

WSWS Journals Website
Online

CALENDAR OF EVENTS

Aquatic Plant Management
Society Annual Meeting
July 18 – 21, 2022
Greenville, South Carolina
www.apms.org

Canadian Weed Science
Society and Canadian
Society of Agronomy Joint
Annual Meeting
Nov. 13 - 19, 2022
Halifax, Nova Scotia
www.weedscience.ca
www.agronomycanada.com

North Central Weed
Science Society Annual
Meeting
Dec. 5 – 8, 2022
St. Louis, Missouri
www.ncwss.org

Southern Weed Science
Society Annual Meeting
Jan. 23 - 26, 2023
Baton Rouge, Louisiana
www.swss.ws

Weed Science Society of
America
and
Northeastern Weed
Science Society Joint
Annual Meeting
Jan. 30 – Feb. 2, 2023
Arlington, Virginia
www.wssa.net
www.newss.org

Western Society of Weed
Science and Western
Aquatic Plant Management
Society Joint Annual
Meeting
Feb. 27 – Mar. 2, 2023
Boise, Idaho
www.wsweedscience.org
www.wapms.org

Thanks, from the WSWS ad hoc History Committee

As you are all aware, our committee completed an update of the original history of WSWS by Dr. Arnold Appleby. *The Western Society of Weed Science 1938 – 2021* is available to download from the WSWS website. It includes a scanned copy of Dr. Appleby's book, summaries of meetings 1993 to 2021 with information on the Fellows honored at each meeting, awards, histories of parts of the society, and other pertinent information (see below for Table of Contents (TOC)). The TOC contains links to each item/section plus the document is searchable in the PDF using 'Edit' then 'Find'. The final document is 374 pages with 184 pages from Arnold's history and 190 pages of updated information.

We want to thank everyone who contributed to the history by writing a section, answered our many questions during the year, reviewed the document before it was posted on the website, and those who offered advice and stories.

If you have any factual changes that should be made, please send an email to me (I am listed in the WSWS Directory) as soon as possible. My apologies for any names misspelled or Board positions misrepresented or other errors. These can easily be changed. I will be making changes through April 20, 2022.

As chair, I want to give another big thank you to the other members of the committee Phil, Rod, and Don who all gave much of their time and more. They were great, engaged, and committed committee members.

Vanelle Peterson
Chair, ad hoc WSWS History committee



Fellow & Honorary Awards – Drew Lyon

The WSWs Fellows and Honorary Member Committee is pleased to announce the Fellow Awards for 2022 were presented to Andrew Kniss, University of Wyoming and Rich Zollinger, AMVAC Chemical Corporation. The Honorary Member Award was presented to Hugh Beckie, University of Western Australia. The 2022 committee members were Drew Lyon (Chair), Jesse Richardson, and Ed Peachey. Ed will assume the role of committee chair for 2022.



2022-2023 WSWs Officers and Executive Committee



The 2022-2023 WSWs Board of Directors are: (back row, left to right) **Harlene Hatterman-Valenti**-Research Section Chair, **George Newberry**-Local Arrangements, **Gregory Dahl**-CAST Representative, **Marcelo Moretti**-Research Section Chair Elect, **Aaron Becerra-Alvarez**-Student Liaison Chair-Elect, **Grace Ogden**-Student Liaison Chair; (front row, left to right) **Curtis Rainbolt**-President-Elect, **Joel Felix**-President, **Sandra McDonald**-Past President, **Phil Banks**-Treasurer, **Jane Mangold**-Education and Regulatory Section Chair,. Not Pictured: **Alan Helm**-WSSA Liaison, **Lee Van Wychen**-Executive Director of Science Policy, **Joe Vassios**-Secretary, **D. Chad Cummings**-Constitution and Operating Procedures, **Eric Gustafson**-Business Manager, **Sonia Rios** (Public) & **Clarke Alder** (Private) Members-At-Large, and **Misha Manuchehri**-Education and Regulatory Section Chair-Elect. Their contact information can be found in the sidebar sections of the newsletter.

2022 Student Paper and Post Contest

2022 Committee: Dennis Scott, Josh Adkins, Clint Beiermann, and Prashasti Agarwal

There was a total of 53 oral and poster presentations entered into the student contest. These were divided among five oral sections and five poster sections. Due to its large size, the Agronomic Crops oral section was split into M.S. and Ph.D. participants. Forty-two members of the WSWs volunteered to judge the contest:

Kirk Sager	Stacey Swanson	Jafe Weems	Quincy Law
Brian Schutte	Vipan Kumar	Connor Ferguson	Byron Sleugh
Marty Schraer	Rachel Zuger	Steve Fennimore	John Madsen
Caleb Dalley	Rachel Seedorf	Greg Endres	Cody Zesigner
Mirella Ortiz	Shannon Clark	Kirk Howatt	Tom Getts
Lovreet Shergill	Joe Yenish	John Roncoroni	Earl Creech
Rui Liu	Dan Beran	Kelly Backscheider	Clint Beiermann
Ed Peachey	Kai Umeda	Lisa Rew	Alix Whitener
Clarke Alder	Rich Zollinger	Caio Brunharo	Josh Adkins
Elizabeth Mosqueda	Rafael Pedroso	Erik Lehnhoff	
Albert Adjesiwor	Jacob Fischer	Ed Silva	

First, second, and third place was awarded to sections with 9+ participants. First and second place was awarded to sections with 5-8 participants. First place only was awarded to sections with 1-4 participants. The winners from each section were announced at the Business Breakfast and presented with their award check. First place winners also received a copy of *Aquatic and Riparian Weeds of the West* donated by Carol Mallory-Smith and Caio Brunharo. Plaques will be mailed to the winners at a later date. Contest winners for each section are listed below.

Oral Presentations:

Agronomic Crops (M.S.)

1st place- Tyler Hicks, University of Wyoming

Effect of Winter Wheat Cover Crop Termination Time on Dry Bean Production

2nd place- Ryan Johnson, University of Wyoming

Cover Crop and Herbicide Combinations for Season-Long Weed Control in Dry Beans

Agronomic Crops (Ph.D.)

1st place- Grace Ogden, Oklahoma State University

Sweep Tillage Impact on Tumble Windmill Grass

2nd place- Liberty Galvin, University of California

*Utilization of Pre-emergent Oxyfluorfen to Control Weedy (Red) Rice (*Oryza sativa Spontanea*), an Emerging Chemical Control Option for California Rice Producers*

Basic Biology and Ecology

1st place- Joe Ballenger, University of Wyoming

Shade Avoidance Alters the Root Architecture of Sugar Beets

2nd place- Albert Kwarteng, University of Idaho

Transgenerational Effect of Weed Competition on Wheat

Horticultural Crops

1st place- Deniz Inci, University of California

Simulated Off-Target Drift of Florpyrauxifen-benzyl in Orchards and Vineyards

Range, Forestry, and Natural Areas

1st place- Chloe Mattilio, University of Wyoming

Multispectral Satellite Remote Sensing for Leafy Spurge Mapping in Northwestern Colorado

2nd place- Jodie Crose, University of Wyoming

Relative Tolerance of Newly-Seeded Grasses, Forbs, and Shrubs to Indaziflam in Northeast Wyoming

Poster Presentations:

Agronomic Crops

1st place- Sachin Dhanda, Kansas State University

Multiple Herbicide-Resistant Kochia in the Southcentral Great Plains: Field Survey and Management

2nd place- Milos Zaric, University of Nebraska-Lincoln

Industrial Hemp Biomass Negatively Affected by Herbicide Drift from Corn and Soybean Herbicides

3rd place- Victor Ribeiro, Oregon State University

Herbicide Resistance in Downy Brome from Fescue Fields in Oregon

Basic Biology and Ecology

1st place- Crystal Sparks, Colorado State University

Glyphosate Induced Phytohormone Response in Rapid Necrosis Biotype of Giant Ragweed

Horticultural Crops

1st place- Andres Contreras, University of California

Use of Preemergence Herbicides in California Orchard and Vineyard Systems

Range, Forestry, and Natural Areas

1st place- Jodie Crose, University of Wyoming

Sagebrush Tolerance at Various Growth Stages to Four Annual Grass Herbicides

2nd place- Mariana Amaral, Washington State University

Genome Wide Scan for ALS Resistance in Bromus tectorum

Undergraduate

1st place- Felipe Bagnara, Colorado State University

Cross-resistance of Conyza spp. to Auxinic Herbicides

WASHINGTON REPORT

March 18, 2022
Lee Van Wychen

Congress Finalizes FY 2022 Appropriations

Nearly 6 months overdue, the House and Senate passed a much-awaited FY 2022 omnibus spending package on March 9 and March 10, respectively. President Biden signed the Consolidated Appropriations Act of 2022 (H.R. 2471) into law on March 15. The \$1.5 trillion legislative package combines all twelve FY 2022 appropriations bills and includes \$13.6 billion in military and humanitarian aid for Ukraine.

For FY 2022, USDA-ARS funding increased \$141 million to \$1.63 billion while USDA-NIFA funding increased \$67 million to \$1.64 billion. The Agriculture and Food Research Initiative (AFRI) competitive grants program increased by \$10 million for the fourth year in a row to \$445 million in FY 2022. Noteworthy highlights include a \$5 million increase in **Smith Lever** funding for Extension and a \$2.5 million increase for the **IR-4 Minor Crop Pest Management** program, its first increase in over a decade. Every dollar invested in the IR-4 Project generates \$524 in economic activity for the US.

There is also language in the FY 2022 omnibus that supports the creation of a regionally focused **Herbicide Resistance Initiative** for the Pacific Northwest to identify and overcome herbicide resistance associated with the crop production pathway, reducing production losses and reducing or eliminating pressure on trade limits due to contamination. It directs \$2 million to support research to address weed management strongly affecting the long-term economic sustainability of food systems in collaboration with ARS, research institutions, and stakeholder support.

For aquatic plant management, the Army Corps of Engineers received \$8 million for its Aquatic Plant Control Research program, its second \$1 million increase in a row. Of the \$8 million, \$1 million is designated for activities for monitoring, surveys, and control of **flowering rush** and **hydrilla** and \$7 million is for nationwide research and development to address invasive aquatic plants. The appropriations language also encourages the Army Corps to support cost-shared aquatic plant management programs, and in particular, to evaluate and address prevention of new infestations of **hydrilla** in the Connecticut River Basin.

Overall funding for the Department of the Interior (DOI) increased \$776 million to \$14.1 billion in FY 2022, with \$1.4 billion (+8 percent) directed to the Bureau of Land Management (BLM); \$3.3 billion (+5 percent) to the National Park Service (NPS); \$1.65 billion (+4 percent) to the Fish and Wildlife Service (FWS), and \$1.4 billion (+6 percent) to the US Geological Survey (USGS), which includes at least \$2.75 million for research on **harmful algal blooms**.

Within specific DOI programs important for invasive species management, BLM's Rangeland Management account received a \$3 million increase to \$109 million after being held level in FY

2021. The FWS’s Wildlife and Habitat Management account under its National Wildlife Refuge System received a \$10 million increase to \$250 million in FY 2022. The appropriation language directs \$15.9 million from this account to focus on high priority invasive species including nutria, **buffelgrass**, and **cheatgrass**. In addition, this account helps fund the FWS’s invasive species strike teams. Finally, the National Park Service’s (NPS) Resource Stewardship account received a \$20 million increase to \$382 million, which helps fund the NPS’s invasive plant management teams.

The table below includes final appropriations for FY 2019 – FY 2022 for various Federal programs important to weed and invasive plant research and management in terrestrial and aquatic ecosystems.

	FY 2019	FY 2020	FY 2021	FY 2022
	-----\$ millions-----			
USDA-ARS	\$1,303	\$1,414	\$1,492	\$1,633
USDA-NIFA	\$1,471	\$1,527	\$1,570	\$1,637
-AFRI Competitive Grants	\$415	\$425	\$435	\$445
-Hatch Act (Exp. stations)	\$259	\$259	\$259	\$260
-Smith Lever (Extension)	\$315	\$315	\$315	\$320
-IR-4 Program	\$12	\$12	\$12	\$14.5
-Crop Protection and Pest Management	\$20	\$20	\$20	\$20
-SARE: Sustainable Ag Research & Educ.	\$37	\$37	\$40	\$45
-McIntire-Stennis Forestry Research	\$36	\$36	\$36	\$36
USDA-APHIS: Cogongrass eradication	n/a	n/a	\$3	\$3
Army Corps- Aquatic Plant Control research	\$6	\$6	\$7	\$8
EPA - Great Lakes Restoration Initiative	\$300	\$320	\$330	\$348
NOAA - National Sea Grant College Program	\$68	\$74	\$75	\$76
DOI - BLM: Rangeland Management	\$104	\$106	\$106	\$109
DOI - FWS: National Wildlife Refuge System: Wildlife and Habitat Management	\$234	\$239	\$240	\$250
DOI - NPS: Resource Stewardship	\$334	\$342	\$362	\$382
DOI - Wildland Fire: Fuels Management	\$189	\$194	\$220	\$227

Wilkes Confirmed as USDA Undersecretary for Natural Resources and Environment



Homer Wilkes was sworn in on Feb. 11, 2022 to serve as Undersecretary for Natural Resources and Environment at USDA. His nomination was confirmed by the Senate by a voice vote. Wilkes is expected to work closely between USDA NRCS and the Forest Service on land restoration projects, including the 10-year wildfire mitigation plan.

Wilkes is a native of Port Gibson, Mississippi. He earned a B.S. in business finance, an M.B.A. and Ph.D. in urban higher education from Jackson State University. From 1984 to 2007, Wilkes served as a supply officer in the United States Navy Reserve. During his career, Wilkes has served within the NRCS as acting CFO, acting associate agency chief, and as Mississippi's state conservationist. Since 2013, Wilkes has worked as the director of the Gulf Coast Ecosystem Restoration Task Force.

Williams Confirmed as USFWS Director



On February 17, 2022, the U.S. Senate confirmed Martha Williams by voice vote to serve as the next Director of the U.S. Fish and Wildlife Service (USFWS), a position that has been vacant since January 2021. Williams has been leading the agency since January as Principal Deputy Director. Prior to that Williams served as Director of the Montana Department of Fish, Wildlife and Parks from 2017 to 2020. She previously served as an Assistant Professor of Law at the Blewett School of Law at the University of Montana and co-directed the university's Land Use and Natural Resources Clinic. Williams earned her bachelor's degree from the University of Virginia and her Juris Doctor degree from the University of Montana School of Law.

USDA-NIFA Director Named to Lead University of Tennessee Institute of Agriculture



The director of the USDA National Institute of Food and Agriculture (NIFA), Carrie Castille, has been selected to serve as the next senior vice chancellor/senior vice president for the University of Tennessee (UT) Institute of Agriculture. This role oversees and leads the Herbert College of Agriculture, the College of Veterinary Medicine, UT AgResearch, and UT Extension, while also serving as the university's chief advocate on issues of agricultural policy in support of the state.

Dr. Castille will conclude her service at USDA in April and assume this new role July 1, 2022, pending approval of the UT Board of Trustees Executive Committee. In the interim, USDA and NIFA leaders are working closely together to plan for the agency's leadership transition and ensure operations continue seamlessly to best serve the mission and stakeholders.

EPA Updates Endangered Species Protection Bulletins

The EPA has released an improved version of Bulletins Live! Two (BLT), an online application for Endangered Species Protection Bulletins. BLT describes geographically specific pesticide use limitations to protect threatened and endangered species and their designated critical habitat.

Pesticide applicators are required to reference the Bulletins Live! Two (BLT) website (<https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins>) when directed by a product label. If the pesticide label directs you to this website, you are required to follow the pesticide use limitations(s) found in the Bulletin for your intended application area, pesticide active ingredient or product and application month.

EPA's Bulletins contain the following information:

- A map of the user-defined intended application area.
- The user-selected active ingredient and/or pesticide product to be applied.
- Pesticide use limitations(s).
- The month for which the Bulletin is valid.

Important Notes about Bulletins

- Bulletins may be accessed up to six months before pesticide application. Be sure that you follow the correct Bulletin for the month of your pesticide application.

- When referenced on a pesticide label, Bulletins are enforceable use limitations under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).
- The pesticide use limitations found in Bulletins Live! Two are part of EPA's federal program to protect listed species. Your state may have pesticide use limitations beyond those found in your Bulletin. Bulletins are not intended to replace or override any restrictions that your state may impose. You need to be aware of and follow pesticide limitations according to both the state AND federal requirements.

For more information: <https://www.epa.gov/endangered-species/endangered-species-protection-bulletins>

Organic Weed Management Remains #1 Priority of Organic Industry

In March, the Organic Farming Research Foundation (OFRF) and Organic Seed Alliance (OSA) released the National Organic Research Agenda (NORA) and State of Organic Seed (SOS). The two reports are published every five years to examine organic farming challenges across the U.S., identify research needs, and better understand the organic seed needs of producers. Those reports were based on survey data from over 1,100 certified organic and 71 transitioning organic farmers and ranchers across North America.

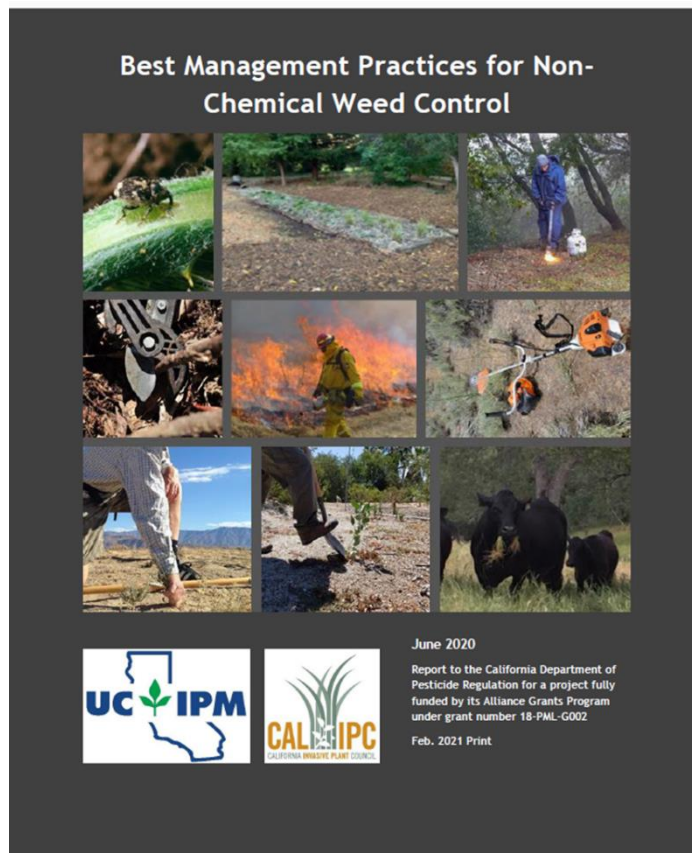
Certified organic survey participants identified the following production challenges:

1. **Controlling weeds – 67% of respondents**
2. Managing production costs – 59%
3. Maintaining adequate yields – 48%
4. Managing soil fertility and crop nutrition – 43%
5. Controlling insect pests – 41%
6. Finding appropriate organic crop varieties and seeds – 38%
7. Controlling disease pressure – 36%
8. Adapting to climate change – 36%

Controlling weeds clearly emerged as the most pressing production challenge, and the broader topic of “soil health” was second only to weeds in response to the open-ended survey question. **Focus group participants discussed difficulties managing weeds without degrading soil health, which underscores the need for additional research in organic weed management strategies that require less cultivation.** In addition, focus group discussions revealed that climate disruptions can accentuate other challenges in managing weeds, pests, soil, and water resources. These challenges appeared especially intense for Southern organic farmers, while producers in the moisture-limited Great Plains and Mountains found cover crops and other organic soil management practices more challenging than producers elsewhere. Survey details: https://ofrf.org/wp-content/uploads/2022/03/OFRF_National-Organic-Research-Agenda-NORA_2022.pdf

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Weed Biological Control included in California Invasive Plant Council manual “Best Management Practices for Non-Chemical Weed Control”



The California Invasive Plant Council (Cal-IPC) has compiled an illustrated manual of best management practices (BMPs) for non-chemical methods to control weeds that includes weed biological control, manual removal, grubbing, hoeing, cutting, mowing, stump grinding, flaming, steaming, girdling, mulching, tarping, solarizing, burning, grazing, tillage, and competitive planting. General methods and tools are described, and references for additional information are provided. The California Department of Pesticide Regulation (DPR) funded the project through its Alliance Grant program with the California Invasive Plant Council (Cal-IPC) and the University of California’s IPM Program.

The section on biological control covers agents for 23 species of target weeds.

Authors of each chapter have compiled recent research and practical applied knowledge of experts on tools and methods of application, as well as on efficacy of the techniques under various environmental conditions and across different classes of invasive plants. Environmental, cultural, and human safety risks are highlighted to help support safe and effective use of techniques. This manual is designed to be a practical resource for practitioners who want to complement use of herbicides with other non-chemical techniques or are interested in using only nonherbicidal methods. Although the manual focuses on California, it will be informative to users in many other states.

This manual is available as a free pdf download (291 pp., 21.5 MB) at: <https://www.cal-ipc.org/resources/library/publications/non-chem/>

This information in this manual has been used to populate a decision support tool called WeedCUT. The tool allows users to enter the characteristics of a target weed and the site to help find the most effective practices. It is available online at: <https://weedcut.ipm.ucanr.edu/>

by Lincoln Smith, USDA-Agricultural Research Service (retired), Albany, CA

Note from the Business Office – Eric Gustafson

The 2022 WSWS Annual Meeting was held on March 7-10, 2022 and it was the first in person meeting since WSWS met jointly with WSSA in March of 2020, the breakout days of the COVID-19 Pandemic. It was a celebration of 75 meetings of the WSWS and the 75th theme permeated the event. There were historical posters, presentations, updates and even attendee gifts to commemorate the occasion.

The meeting was held in Newport Beach, California and was a great success thanks to the numerous volunteers that graciously give their time and energy to the Society and all its endeavors. President McDonald and Program Chair Felix did a fantastic job of navigating all the hurdles of hosting the event and the inclusion of a Wildfire Workshop offered virtually facilitated participation from those that were unable to join in person.

Attendance was very strong, bypassing the last in person meeting in California significantly and offering attendees a valuable opportunity to network, present, and learn and re-connect after a long hiatus. It's difficult to quantify the value of these in person events and I think we all see the value

of virtual meetings and the opportunity it has provided during the pandemic to continue to move forward. The energy of face-to-face meetings is far better, in my opinion, and I hope we never have to go back to virtual only.

The planning has started for the 2023 meeting in Boise, Idaho – the planned location of the 2021 meeting – and we are anticipating a very successful event there as well. The 2023 meeting will be a joint meeting with WAPMS and we are excited to bring the groups together again. Please add February 27 to March 2, 2023, to your calendar for the WSWS/WAPMS joint meeting at the Boise Center and Grove Hotel.

We are working on updating the current WSWS website and we will send an email out when that work is complete so everyone can update their profiles and explore the changes.

If you were not able to attend the Annual Meeting or need to update your membership, please log in to your account and pay your dues for 2022. We are available in the office to assist as well – (303) 327-8016. To send a check, simply fill out the Membership Form at the end of the newsletter and send that in with the check for \$30.00.

Publications Available from the WSWS

The following books or DVDs can be purchased from the WSWS:

Aquatic and Riparian Weeds of the West
Weeds of California and Other Western States
Interactive Encyclopedia of North American Weeds DVD
Weed Bingo

All publications can be ordered online at [WSWS Bookstore](#). Contact the Business Manager (Eric Gustafson) at (303) 327-8016 for bulk order prices.

2022 Membership Renewal Form

To pay by credit card, please go to www.wswedscience.org and login to your account

IF YOU DID NOT ATTEND THE ANNUAL MEETING BUT WANT TO REMAIN A MEMBER, FILL IN THE INFORMATION BELOW AND SEND \$30.00 FOR DUES TO THE ADDRESS PROVIDED.

Last name	First name	Affiliation	
Mailing address		City	State Zip code
Phone # w/area code		e-mail address	

Classification: Student ___ University ___ Federal Agency ___ State Agency ___
 Private Industry (manufacturing and sales) ___ Private Industry (consulting) ___
 Unemployed ___ Retired ___ other (specify) _____

**Send to: WSWS/IMI,
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Questions? info@wswedscience.org or (303) 327-8016

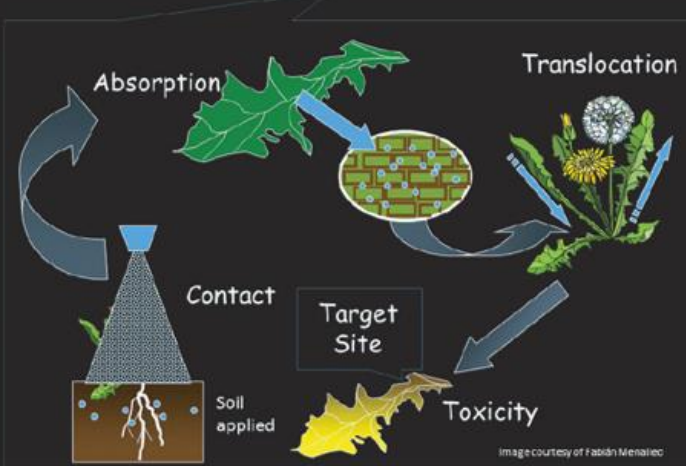
Online course: Herbicide Physiology (PSPP 546) • Aug. 24–Dec. 15, 2022

- Explore the fundamental physiology, biochemistry, and molecular biology of **herbicides and their effects on plants.**
- Understand how **herbicide resistance** evolves and its physiological mechanisms, and
- Learn about practical **herbicide resistance** management strategies.


3 graduate credits • See web for pre-requisites, tuition and admission guidelines.

Instructors include:
William Dyer (lead)
 Plant Sciences & Plant Pathology, Montana State University
Erin Burns
 Crop & Soil Sciences, Michigan State University
Dean Riechers
 Agronomy, University of Illinois
Tracy Sterling
 Land Resources & Environmental Sciences, Montana State University
Sarah Ward
 Soil & Crop Sciences, Colorado State University

Herbicide Mode of Action



The diagram illustrates the herbicide mode of action in a plant. It starts with 'Soil applied' at the bottom, leading to 'Contact' with the plant's root system. From there, 'Absorption' occurs, moving the herbicide into the plant's vascular system. This is followed by 'Translocation' to other parts of the plant. The herbicide then reaches the 'Target Site', which leads to 'Toxicity' and ultimately the death of the plant (shown as a yellowed leaf).



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 Learn more at <https://tinyurl.com/HerbPhys>

WSWS Objectives

- ❖ To foster and encourage education and research in weed science.
- ❖ To foster cooperation among state, federal and private agencies in matters of weed science.
- ❖ To aid and support commercial, private and public agencies in the solution of weed problems.
- ❖ To support legislation governing weed control programs and weed research and education programs.
- ❖ To support the Weed Science Society of America and foster state and regional organizations and agencies interested in weed control.



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