

2020 WSSA Committee Report

Committee Code and Name: E-12b Herbicide Resistance Education

Committee Chair: Jill Schroeder

Committee Members, 2020 (includes sub-committee members)

- Amy Asmus
- Michael Barrett
- David Ervin
- George Frisvold
- Todd Gaines
- Terry Hurley
- Raymond Jussaume
- Andrew Kniss
- Ramon Leon
- John Madsen
- Jill Schroeder
- Francois Tardif
- Lee VanWychen
- Muthu Bagavathiannan
- Greg Kruger (EPA liaison)
- Susan Koehler
- David Shaw
- Katie Dentzmann
- Chandra Aradhya (HRAC)
- Carroll Moseley (Public Awareness)
- Dan Tekiela (Extension)

Board Coordinator: Lynn Sosnoskie

Committee Members Rotating Off:

- Terry Hurley
- Greg Kruger
- Susan Koehler
- Raymond Jussaume

Recommended Replacements/Additions:

- Clint Pilcher (Entomology Society representative on subcommittee)
- EPA liaison (tbd)
- Neil Hoffman and/or Rebecca Fletcher (APHIS - Ex off)
- Lindsay Haynes (NRCS)
- Bill Chism (EPA)
- Cameron Douglass (USDA-OPMP)
- Ian Burke (lead on the PNW project)

Summary of Activities

Goals for 2020:

- Develop and execute plans for increasing stakeholder involvement.
- Establish four pilot Community-Based Herbicide Resistance Management Initiatives in the Pacific Northwest
- Expand efforts to include other pest disciplines.
- Expand the offerings from the herbicide resistance web portal.

List the committee's accomplishments (since the last annual meeting):

Planned activities: A lot of the activities discussed at WSSA 2020 annual meeting were put on hold because of the COVID 19 pandemic. In spite of the pandemic, outreach and engagement across a broad range of stakeholders, many of which were not previously familiar with resistance

issues, was broadly initiated by members of the committee. The activities that we are aware of are listed below.

- The primary outcome of the 2020 activities was to inform and engage scientists and practitioners, some for the first time, opening the door to follow up discussions and activities.

Industry Stakeholders

Crop Life-RISE

- The Crop Life/RISE 2020 conference was postponed. The conference is tentatively being re-scheduled for 2021; Dr. Clint Pilcher (Entomology Society and co-organizer of the 2019 Iowa Policy Tour) has been contacted about organizing a session on resistance for the 2021 meeting.

International Certified Crop Advisors

- Committee members had been invited to hold a listening session with ICCA board members; however, the ICCA fall meeting was held virtually. Amy Asmus recommended that we do not hold a listening session at the end of a virtual meeting - both because of meeting burnout and difficulty in engaging in a virtual listening session. We are currently in discussions to possibly hold a virtual listening session with selected, representative ICCA members in 2021. This would provide an opportunity to hear from a broader constituency than the board.

Professional Scientific organizations

Weed Science Society of America

- David Shaw moderated a workshop at the 2020 annual meeting “Building a Community to Battle the Wicked Problem of Herbicide Resistance”. Participant/presenters included Ian Burke, Mark VanGessel, Clint Pilcher, Stanley Culpepper, George Frisvold, David Ervin, Katie Dentzman, Addie Mayfield, Jesaelen Gizotti de Moraes.
Outcomes: Additional WSSA members became aware of the Herbicide Resistance Education Committee activities.

Entomology Society of America

- The Entomology Society Meeting was held virtually on November 16, 2020. Drs. Clint Pilcher (Corteva Inc) and Steve Bradbury (Iowa State University) organized a symposium “A New Vision for Managing the “Wicked Problem” of Pest Resistance”. The goal of the symposium was to highlight the outcomes of the 2019 Iowa Resistance Tour that was co-sponsored by WSSA and ESA. David Shaw, Katie Dentzman, and Amy Asmus were among the presenters.
Outcomes: The symposium was attended by 550 ESA members. One outcome was engagement with the ‘Field to Market’ initiative; the program is working on responsible pest management within their members.

Council for Agricultural Science and Technology

- The Council for Agricultural Science and Technology just published an issue paper "Stewardship Challenges for New Pest Management Technologies in Agriculture". The task force was chaired by Dr. David Shaw. The publication can be found at <https://www.cast-science.org/publication/the-need-and-challenge-for-effective-stewardship-of-new-pest-management-technologies-in-agriculture/>. Authors were David Ervin, George Frisvold, Raymond A. Jussaume, Jr., Gregory A. Sword. Reviewers were Amy Asmus, Terrance M. Hurley, Clinton D. Pilcher, Jill Schroeder.
Outcomes: A national webinar hosted by CAST on the report was presented by David Shaw on May 18, 2020 with authors participating in a Q&A panel. One hundred and ninety-three participants logged on to the webinar. The impact report can be found at https://www.cast-science.org/wp-content/uploads/2020/05/QTA2020-2_Stewardship-Impact-Report_6-months.pdf

Tri-Societies of America

- Amy Asmus recruited the authors of the CAST publication "Stewardship Challenges for New Pest Management Technologies in Agriculture" to participate in a session of the Virtual 2020 Sustainable Agronomy Conference in late August. The audience for this conference was primarily Certified Crop Advisors and others in the sustainable agricultural community.
Outcomes: A number of individuals in the crop advising community became familiar with the concepts discussed in the publication.

AAAS

- David Ervin was organizer and moderator of a session "Catalyzing transdisciplinary science to address the herbicide resistance epidemic in weeds," at the American Association for the Advancement of Science annual meeting, February 14, 2020, Seattle WA, USA. Presenters included Drs. Katie Dentzman, David Shaw, George Frisvold, and Muthu Bagavathiannan.
Outcomes: National press organizations were present at the symposium. The audience was introduced to agricultural resistance as a concern comparable to antibiotic resistance in medicine. Plans are underway to propose another AAAS session on pest resistance management in 2021.

National Academies of Science

- George Frisvold made a webinar presentation and participated in the Chemical Sciences Roundtable on "The Future of Sustainable Agrochemistry" on November 12, 2020.
Outcomes: The audience and other presenters were not aware of the fact that no new herbicide MOA has been introduced in over 30 years.

Federal Agencies

EPA

- Amy Asmus (sponsored by WSSA) and David Shaw are currently members of the Pesticide Program Dialogue Committee (PPDC), a FACA advisory group. One of the activities of the PPDC is to propose workgroups to develop strategies on issues of

concern to the agency. Amy and David spearheaded the creation of a resistance management committee at EPA PPDC in 2020. The focus of the working group has yet to be finalized; David is one of the chairs of this working group.

USDA

- David Shaw and Jill Schroeder had productive virtual conversations with Lindsay Haynes, USDA-NRCS, and Neil Hoffman and Rebecca Fletcher, USDA-APHIS, during the fall of 2020. We discussed issues related to resistance management and expressed that representative WSSA committee members would be interested in visiting further with USDA agencies and learning more about agency goals so that weed scientists could understand how herbicide resistance may impact the goals and objectives of each agency.

Funded projects

- David Shaw is the PI on an USDA-APHIS grant awarded to WSSA to address community engagement in resistance management. We received a one-year no-cost-extension for the APHIS grant due to COVID-19. Based on COVID restrictions and promising initiatives that were ongoing, WSSA adjusted the budget to provide more support for the PNW work to build communities to address herbicide resistance in the Pacific Northwest is ongoing - led by Ian Burke and Drew Lyon. Dr. Katie Dentzman, Rural Sociologist, was funded through the USDA-APHIS grant to work with the communities. Her work has led to a number of outcomes listed here:
 1. In the PNW four Community Herbicide Resistance Management Initiatives have been established:
 - One each in...
 - The Palouse (WA and ID)
 - Camas Prairie (ID)
 - Douglas County, WA
 - Morrow County,
 - 5-15 people committed in each community
 - Each has met at least once; the Palouse group has met twice
 - All have begun filling out the Community Herbicide Resistance Management Toolkit
 2. Two reports on PNW listening sessions have been posted to the WSSA website under the heading “**PNW Efforts to Support Community-based HR Management**”. The link is: <http://wssa.net/wssa/weed/resistance/>.
 3. A manuscript is in preparation for the special issue of *Sustainability special issue “Innovating Sustainable Pest Resistance Management,” 2020-2021* Co-editors are David Ervin, David Shaw and Sonia Graham (Australia). The tentative title at this point is "Herbicide Resistance, Tillage, and Community Management in the Pacific Northwest".
 4. An article was published in *Outlooks on Pest Management* Dentzman, Katherine, Clinton Pilcher, Muthukumar Bagavathiannan, Michael Barrett, and Ian Burke. 2020. “Lessons in building community capacity for managing agricultural pests: A Science Policy experience in Iowa.” *Outlooks on Pest Management* 31(6); 249–256.

5. A commentary was published in the regional magazine Capital Press: https://www.capitalpress.com/opinion/columns/commentary-herbicide-resistance-and-the-covid-19-pandemic/article_59a5b5ca-af1c-11ea-989d-f3e084ebc8f1.html
6. A podcast episode (WSU's Wheat Beat) in which Dr. Dentzman was interviewed: <http://smallgrains.wsu.edu/wsu-wheat-beat-episode-74/>

What information was posted on the WSSA website?

- Results of the listening sessions in the PNW
- The portal is still under development
- Information on the Iowa Science Policy Experience
- CAST paper on ‘Stewardship Challenges for New Pest Management Technologies in Agriculture’, chaired by Dr. David Shaw
- Lessons in Building Community Capacity for Managing Agricultural Pests: A Science Policy Experience in Iowa (Dentzman et al. 2020, Outlooks on Pest Management 31(6):249-256).

What amount of funds were requested? How much was spent?

- \$90,000 grant received from USDA-APHIS is ongoing due to COVID-19
- WSSA funding in the amount of \$10,000 was requested to cover additional expenses not allowed under the APHIS grant in 2020; the funds were not spent due to COVID-19 travel restrictions.

What was the impact of the committee activities/accomplishments on the following: membership, publication, policy, legislation, and/or education?

- Herbicide resistance has received substantial attention from a number of federal agencies, as well as Capitol Hill. WSSA has been placed in a prominent leadership role because of our efforts.
- Educational products have been used extensively for training purposes. We have partnered with a number of commodity groups to extend our reach.
- Many members have been involved in committee and subcommittee activities and have engaged with new groups of stakeholders. The activities have engaged audiences (examples include AAAS and NAS) that were not aware of resistance as an issue comparable to the antibiotic resistance that has been an issue of great concern to these scientists. A number of additional members have been involved in 2020.
- EPA and USDA-APHIS continue to look to WSSA as the authoritative source for technical information and education in regards to herbicide resistance management strategies.
- The Entomology Society of America was engaged as a partner to host the Iowa Science Policy Experience in 2019. This partnership resulted in an invitation to WSSA members to participate in an ESA symposium in 2020 and opened opportunities for continued collaboration and partnership.
- The PNW has been working with local NRCS reps to brainstorm outreach and education, as well as designing a herbicide resistance program for integration into their current Conservation Activity Plan program.

What is the current state of the committee's projects and activities?

- Stakeholder involvement efforts are being planned. Members plan to continue to engage the groups reached in 2020 to identify future opportunities for engagement with these stakeholder groups as well as expanding our outreach to additional stakeholders.
- The PNW project will be continuing. Unfortunately (for our committee efforts), Dr. Dentzman has accepted a position with USDA-NIFA and will not be able to continue on the PNW project. Arrangements are being made to continue the project once Dr. Dentzman leaves the PNW.
- The web portal committee needs to complete its activities.

2021 Plan for Committee Activities

Goals for 2021:

- Develop and execute plans for continuing ongoing efforts to increase stakeholder involvement.
- Expand efforts to include other pest disciplines.
- Expand the offerings from the herbicide resistance web portal once the portal is active.
- Continue the work in the PNW once funding is secured for a postdoc at University of Idaho under Chloe Wardropper, Assistant Professor of Human Dimensions of Ecosystem Management.

Recommendations for Board/Society Action:

Funds requested for 2021:

- We will continue to expend funds from the current \$90,000 APHIS grant that was continued in 2021 due to COVID-19.
- The committee requests \$10,000 to support activities that could not be undertaken due to COVID-19 in 2020. The activities may include a tour of the PNW projects for USDA and EPA staff, listening sessions for CCA members, or travel for other outreach activities. The board will be kept apprised of proposed activities with requests for approval if restrictions due to COVID-19 allow planning to go forward.

Other requests for the Board:

- Consider developing additional mechanisms to remain in a leadership position addressing and articulating the complex issues impacting agriculture and natural resources because of pest? resistance.
- Feedback on directions the committee is taking, on partnerships being developed, and on the published material we have developed.