



## PRESIDENT'S MESSAGE

Harvest time is upon us! Hopefully each of you have had a productive season generating amazing research data that will improve the management of those pesky weeds while our teachers and extension experts are sharing the importance of building sustainable weed management programs. Since the last newsletter, your WSSA board continues to be very active and I would

like to share a few of the team's activities.

### *Preparing for the annual meeting in Arlington, VA, Jan. 30 – Feb. 2, 2023*

Carroll Moseley, WSSA Program Chair and President Elect, and Wes Everman, NEWSS Program Chair and President Elect, are working closely with the local arrangements chairs Bill Chism and Sudeep Mathew, along with Lee Van Wychen, to build an excellent program for our joint meeting. Although many more details will be provided soon, I did want to share the exciting symposiums, tours, and keynote speaker that have been confirmed for the meeting.

#### *Symposium titles:*

1. Endangered Species Act: A workshop to determine how the WSSA can provide useful science-based information to regulators
2. Novel Technology for Weed Management: An Update on WSSA Member Activities from Around the US
3. Crop-Weed Management in a Rising CO<sub>2</sub> and Warming World
4. WSSA Research Priorities – 13 Agency Perspectives
5. The good, the bad, and the ugly – the current state of cover crops and weed management

#### *Tours:*

- Sunday, January 29, 2023, 10 AM – 12 Noon: US Botanic Garden Production Facility
- Monday, January 30, 2023, 10 AM – 12 Noon: Smithsonian Gardens Production Greenhouse

#### *Keynote Speaker:*

- Jake Li, EPA Deputy Assistant Administrator for Pesticide Programs

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**WSSA STRATEGIC PLAN  
(2022 – 2027)**  
(see page 3 for more information)

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**Summer board meeting:** During August, the board conducted its business meeting at the site of our 2023 annual meeting. While there, we had two unique opportunities to learn from others about their thoughts and challenges surrounding agriculture. First, Crop Life America shared the organizations' current priorities and challenges that they are working to overcome which was very educational; thanks to Ray McAllister and Lee Van Wychen for organizing that event. We also had an opportunity to visit in-person with the U.S. EPA's Deputy Assistant Administrator for Management, Deputy Assistant Administrator for Pesticide Programs, Director of the Office of Pesticide programs, and most Division Directors within the Office of Pesticide Programs. The EPA's willingness to host our board at their new facility and discuss the challenges they face in regulating pesticides was astounding; the slides from this meeting were shared to our entire membership. Watching our board interact with these key individuals was powerful as my hope is that we are able to build a more interactive relationship among WSSA and EPA scientists.

Also, during the meeting, we focused on updates from our regional societies, our membership survey, our newly formed Endangered Species committee, our CAST representative (Jill Schroeder), NIFA fellow (Jim Kells), and Graduate Student Organization (Sarah Kezar). The commitment of these individuals along with the activities that they organize for the WSSA is outstanding. Our EPA liaison, Mark VanGessel, has also been very busy and will share a few of his activities directly with you elsewhere in the newsletter. Also, the board made great progress approving the newly developed strategic plan (see comments from Bill Curran, page 3) as well as working to improve our social media footprint and the initiation of overhauling our website (thanks to Amy Giannotti, Sarah Lancaster, and the entire website committee).

**Webinars:** Over 260 attendees were present for our atrazine U.S. EPA-WSSA webinar held in September. As you will hopefully remember, this is following our previous joint webinar where the U.S. EPA addressed regulatory decisions for diuron, fluometuron, and DCPA. The feedback from these events has been extremely positive, with our members sharing how valuable it is to have the opportunity to hear directly from the U.S. EPA.

And finally, a *thank you* to all our WSSA members for your support and guidance, as you are what makes our society so impactful. I look forward to seeing you in Arlington for our 2023 annual meeting. Until then, please do not hesitate to reach out to me, Eric Gustafson, Lee Van Wychen, or any of the WSSA board members if you have questions, suggestions, or concerns regarding WSSA business or activities.

Regards,  
Stanley Culpepper  
WSSA President

### WSSA FUTURE MEETING SITES AND DATES

Jan. 30–Feb. 2, 2023  
WSSA-NEWSS Joint Meeting  
Arlington, Virginia  
[www.wssa.net](http://www.wssa.net) and  
[www.newss.org](http://www.newss.org)

WSSA HOME PAGE  
ACCESSED AT:  
[www.wssa.net](http://www.wssa.net)

THINK NEWSLETTER  
Deadline for January issue  
December 1, 2022

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# The WSSA has a New Strategic Plan (2022 – 2027)

Dear WSSA members,

We have a new five-year Strategic Plan, and a number of these initiatives are already underway. To summarize, a special committee was formed by then WSSA President Dr. Bill Curran, during the fall of 2020 chaired by Dr. Dawn Refsell, Corteva, former WSSA Member-at-Large. The special committee and smaller working groups included more than 25 members representing most sectors of our society. We met via Zoom during COVID over several months and discussed mission, strengths, weaknesses, opportunities, threats, and other issues affecting WSSA (SWOT analysis). The smaller working groups further prioritized strategies into achievable actions and outcomes. The final document was approved by the WSSA Board of Directors at the 2022 summer BOD meeting and is now posted on the WSSA website. There are several common themes and potential priorities that include the following:

1.) The most mentioned need by multiple smaller working groups included various ideas to improve communication within the society and with

outside stakeholders. This included expanding linkages to several organizations and seeking ways to better communicate information to affiliate organizations; formalizing partnerships with key organizations; incorporating non-technical summaries into WSSA journal articles and other venues and promoting via social media and other outlets; regularly surveying the membership for input; and one of the most mentioned needs, improving the appearance and functionality of the WSSA website. It was also suggested to establish a Communications Manager/Director to help oversee multiple communication avenues. This could also include contracting a website design and management company to carry out the necessary website improvements and management.

2.) The second most recognized need was to increase what we do outside of the WSSA and Regional/Affiliate Group annual meetings by offering more educational events such as symposia and scientific exchanges. This included developing and offering symposia in collaboration with our Regional/Affiliate Organizations as well as

offering symposia on career professional development as well as in other areas. We are already making positive progress in this area.

3.) A third common theme across the different strategies was to broaden the opportunities for leadership development and committee service. This would target more interaction between WSSA and Regional/Affiliate Organizations and would also target students and early career members.

Finally, although not implicitly recommended in the plan, several discussions centered on establishing a Strategic Planning Committee that meets annually to discuss planning and implementation progress and reviews relevancy and the need for new initiatives. If you have interest in serving on a WSSA Strategic Planning Committee, please contact our President, Dr. Stanley Culpepper (stanley@uga.edu). The Board of Directors is currently considering many of these strategies and we look forward to achieving the outcomes and products over the next several years.

Bill Curran,  
WSSA Past-Past President

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# Weed Science Society of America (WSSA) & Environmental Protection Agency (EPA) Summer Field Tour

Recap by Emily Unglesbee  
GROW Director of Outreach & Extension

**Washington, D.C., September 13, 2022** – A group of more than 40 EPA scientists participated in a field tour sponsored by WSSA and organized by WSSA-EPA Liaison Mark VanGesel, in collaboration with University of Maryland Extension. The group stopped at two farms and held a lunchtime panel discussion. The first goal of the tour was to gain an on-the-ground, regional perspective on herbicide-resistant weeds and farmers' weed management. The second was to learn about the real-world implications of EPA's new commitment to creating pesticide labels that fully comply with the Endangered Species Act.

## FIRST STOP: PERSISTENCE CREEK FARM

The first stop was Persistence Creek Farm, in Charles County, MD, where the tour group met father-son farm owners Francis and Kevin Warring, as well as Wayne Hancock, who leases and farms their cropland along with his brother David. The farm includes a cash-crop mix of corn, soybeans, sorghum and winter wheat used as a fall cover crop. The family also runs a crab-and-oyster business and manages 100 acres of timber.

In 2021, Persistence Creek Farm was the first Maryland farm to receive the Leopold Conservation Award, which recognizes farmers, ranchers and forestland owners for excellent stewardship of their land, water and wildlife habitat. "For us, doing the best for our farm comes down to four things," Kevin Warring told EPA employees. He highlighted the following: Maintaining a profitable operation, with good soil health, clean water quality and healthy wildlife. "The goal is for all four of those to work in harmony," he explained.



Kevin Warring, of Persistence Creek Farm, talks to EPA employees about his farm's conservation practices. (Photo credit: Emily Unglesbee, GROW)

Warring spoke to the group about the conservation practices his family has adopted, such as no-till farming and cover crops, which he believes help limit soil erosion and improve water quality and soil health. He also pointed out the

riparian buffers that lined the soybean field nearby, filled with trees, shrubs and plants – protection for the stream bordering the field. Warring also spoke of several acres devoted to native wildflower and grassland habitats, which help lure deer – a major pest for Maryland crop farmers – away from their cash crops.



EPA employees view a riparian buffer running alongside a maturing soybean field on Persistence Creek Farm, in Charles County, Maryland. (Photo credit: Emily Unglesbee, GROW)

Warring credited local University of Maryland (UMD) Extension county agents and his local Natural Resources and Conservation Service (NRCS) office with helping educate him and assist as his farm navigated and implemented these practices. He also highlighted the contribution of cost-share programs from the NRCS, which made these conservation practices financially feasible.

"We have taken land out of production for these efforts, but our bottom line has improved," Warring noted. "Cost-share incentives help you get there," he added. "Maryland has been very forward-leaning with cost-share programs. Cover crops and no-till agriculture have taken off in Maryland, not only because of the Chesapeake Bay, but in part because of the ability to execute them here."



Alan Leslie (UMD Extension) talks about the herbicide-resistant weeds that cause problems for southern Maryland row crop farmers. (Photo credit: Emily Unglesbee, GROW)

Herbicide-resistant weeds are becoming a major challenge to manage in a no-till operation, said Alan Leslie, with UMD Extension.

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Herbicide-resistant Italian ryegrass is a big problem in small grain fields, and in soybean fields, herbicide-resistant Palmer amaranth is a growing threat. Some farmers are turning back to tillage to control herbicide-resistant weeds, but the Hancocks are dead set against that.

“I’ll quit farming before I go back to moldboard plowing,” Wayne Hancock told the group. The Hancocks now use the dicamba-tolerant Xtend soybean system, which enables them to spray dicamba on glyphosate-resistant Palmer amaranth. However, the June 30th cutoff date on the federal label takes that option off the table for double-crop soybeans, which are often planted as late as mid-July.



Ben Beale (left) and Wayne Hancock (right) discuss the pros and cons of weed management options available to Maryland farmers. (Photo credit: Emily Unglesbee, GROW)

The complexity of the over-the-top dicamba labels also makes applying them difficult, added UMD Extension County Agent for St. Mary’s County, Ben Beale. Keeping up with the complicated tank mix procedure and record keeping is tricky, especially for farmers in southern Maryland, who typically manage a large number of small fields, he noted. The group also discussed XtendFlex options, as well as the Enlist weed control platform, which is increasing in the state.

“Farmers need all these tools in the toolkit,” UMD Extension County Agent Dave Myers told the group. “I’m hoping that EPA will always take a look at the reality of the situation for resistance management...We can’t lose these tools.”

A final, looming threat to conservation practices such as no-till cropping and cover crop use is inflation and the soaring costs of inputs, such as herbicides and diesel fuel, Warring and Hancock noted. “Ultimately, the farmer’s bottom line is always the deciding factor,” Warring said.

### STEVE WALTER TALKS WEED CONTROL



Steve Walter, on the left, talks to EPA employees about his Hughesville, Md. farm. (Photo credit: Emily Unglesbee, GROW)

At the second farm stop, the EPA group met Steve Walter of H&S Farms, who raises a wide diversity of crops, vegetables and ornamentals in Hughesville, Maryland. Pumpkins, tomatoes, sweet corn and green beans take up a lot of the farm’s acreage, but they also grow grain crops such as soybeans and sorghum.

Walter is dealing with a number of weed issues. Glyphosate-resistant Palmer amaranth was his farm’s first introduction to herbicide-resistance, and now they also battle multi-herbicide-resistant common ragweed. It appears resistant to glyphosate and ALS herbicides, and Walter suspects atrazine – his most important herbicide tool at the moment – is starting to lose its effectiveness against it, too.



Mark VanGessel holds up common ragweed escapes from a late-planted soybean field. (Photo credit: Emily Unglesbee, GROW)

Walter uses the dicamba-tolerant Xtend soybean system to manage weeds. He said he has minimized drift problems by picking the fields he uses it on very carefully, keeping in mind his own vegetable fields and neighboring Enlist fields, which have increased in recent years. He also said he is attentive to wind speed and direction when he sprays, and stops spraying before winds hit 10 mph.



EPA employees learn about Walter's JD 4700 sprayer.  
(Photo credit: Emily Unglesbee, GROW)

When asked to name the biggest threat to his operation, Walter first mentioned soaring input prices. Glyphosate, for example, has increased from \$10 to \$15 per gallon a couple years ago to anywhere from \$50 to \$75 per gallon today. Fertilizer prices have also skyrocketed and he estimates that they cost him 200% more this year than in previous years. Nitrogen alone can cost him up to \$106 per acre.

### PANEL DISCUSSION ON HERBICIDE LABEL “PICK LISTS”

Bill Chism, a retired EPA OPP scientist and Chair of WSSA's Endangered Species Committee, led a lunchtime panel with three crop advisors from Maryland and Virginia.

They went over the “pick lists” of mitigation measures designed to mitigate runoff that have been added by EPA to the atrazine and Enlist herbicide labels, as part of the agency's ongoing effort to create ESA-compliant labels. The panel commented on the feasibility of each measure in their region. While there were a number of items on the picklist, many were not applicable for the mid-Atlantic region. Afterward, the session became an open discussion, as the crop advisors and EPA employees traded questions and answers.

While farmers in the Mid-Atlantic region are very familiar with practices to stop nutrients from leaving the field, the panel again stressed how hard it is to switch practices, field by field and herbicide by herbicide, especially given the relatively small field size in the region.

EPA stressed that the choice is between limiting runoff with these “pick lists” of mitigation measures or using simpler, but more restrictive options, such as cutting labeled use rates or banning entire counties from using a herbicide, due to endangered species risks.

The panel of crop advisors said this helped clarify the issue at hand for them, and that this trade-off had not been communicated to the farming community yet – and should be. “Do you want to record that?” one panel member asked. “Because when things are put that way and a farmer can hear it, that makes a lot of sense to them. They're just looking at it as more regulations, unfortunately.”

EPA employees emphasized they are in the early stages of developing the pick list for atrazine, and it is a crucial time

for the farming community to make comments and suggestions. Farmers and applicators should be aware that pesticide labels are unlikely to get simpler, they added.

Another EPA employee noted that there is a third party at play here, the agrochemical industry, which doesn't always supply the research and data needed to support alternative label measures, especially those that would help smaller farmers or farmers in marginal parts of the Farm Belt. As for-profit companies, they need to focus on what their largest farmer customers need. Enforcement of the proposed litigations was also discussed

During the discussion, the panel said most farmers don't have much knowledge of the Endangered Species Act, and few know that these label changes are in the pipeline. Ways to improve communication were discussed. The number of required trainings for pesticide application has increased but the quality of some have been declining. Including these trainings during the pesticide recertification or nutrient management process was one option mentioned.

In a final point, the panel suggested that more discussions like this, in different regions, would be wise.

### DRIVE-BY OF HERBICIDE-RESISTANT PALMER AMARANTH TROUBLE SPOTS

After lunch, the bus did a drive-by tour, directed by Ben Beale, of several fields in southern Maryland. The goal was to showcase how herbicide-resistant Palmer amaranth infestations can occur and be managed – or not.

The first drive-by was a field that had the dubious honor of being the first place herbicide-resistant Palmer amaranth was found in Maryland, in 2014. The field had been in long-term continuous soybeans, and had been sprayed with glyphosate five times that year alone.

In a demonstration of how intensive management can rescue badly infested fields, the field was now a fairly weedless patch of soybeans. Careful herbicide management, tillage and hand-pulling had been key parts of cleaning it up, Beale said.

The bus then drove past a soybean field, with one half entirely clean and the other infested with blooming Palmer amaranth. The difference? Hand-pulling crews had, at great expense, moved through the first half of the field in previous days.

Another set of fields showed EPA how multiple herbicide passes and new herbicide-tolerant technology can help farmers address these infestations. On one side of the road, Palmer amaranth weed escapes towered over a Roundup Ready soybean field, where weather had forced the farmer to miss his postemergence application of glyphosate. Across the road, a comparatively clean Enlist soybean field was on display, where the farmer had been able to apply preemer-

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## WSSA & EPA SUMMER FIELD TOUR CONTINUED from pg 6

gence herbicide applications and a postemergence application of glyphosate and Enlist.



EPA employees view a Roundup-Ready soybean field, infested with herbicide-resistant Palmer amaranth. (Photo credit: Emily Unglesbee, GROW)

Beale noted that, as several weed-free Enlist soybean fields showed, herbicide resistance to either dicamba or 2,4-D didn't have a foothold in southern Maryland yet.



Through an evaluation, participants said the tour moderately to significantly increased their understanding of herbicide resistance and mitigation options for herbicide use. Almost 90% of them were likely or extremely likely to use this information in their jobs. The participants also provided input on future tours and trainings.



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# WSSA Graduate Student Organization Update



The conference season is inherently an exciting time to catch up with peers and mentors, share our research findings, and gain insight from others'

research—but this WSSA Annual Meeting will be particularly memorable. Some graduate students will finally experience their first in-person WSSA meeting while others will have their final student presentations, but we all are certainly thankful to have the time to learn together again. I'm sincerely looking forward to catching up with folks and hope that many of the WSSA professional and student body will be able to attend and be refreshed in Arlington.

Since the annual meeting in February, the GSO student body has been able to stay "virtually" connected thanks to the GSO newsletter and social media outreach. Our previous officer team initiated the GSO newsletter as an effort to highlight the outstanding M.S and Ph.D. students across the country and interview WSSA GSO Alumni sharing their ca-

reer paths and advice for current graduate students. Be on the lookout for our quarterly newsletter issues being sent to WSSA, and please contact the upcoming President, Pâmela Carvalho-Moore, with your student and alumni nominations! Our officers Pâmela Carvalho-Moore, Andrew Osburn, and Lily Woitaszewski have dedicated much time and efforts to publish these newsletters and corresponding social media posts to improve how we serve the WSSA. Additionally, in Arlington, we will be hosting a student-only special event regarding "Overcoming Hurdles in Graduate School" which will entail panelists sharing their experiences and advice on a variety of topics. By identifying common struggles in graduate school and relating to others' experiences, we can perhaps bolster the sense of community amongst our student peers, future collaborators, and future leaders in our weed science community.

The 2022 Travel Enrichment Experience (TEE) Award winners were recently announced by the society and should certainly also be highlighted. This award allows one student from

each of the WSSA regions to explore and broaden their scope of weed science careers during a week-long experience with weed science professionals. Congratulations to Emily Duenk (University of Guelph), Sachin Dhanda (Kansas State University), Estefania G. Polli (N.C. State University), Joshua Miranda (Oregon State University), and Sarah Kezar (Texas A&M University)! I look forward to hearing about all of these students' experiences at the 2023 annual meeting and am personally excited to share about visiting with USDA and ARS scientists in Washington, D.C. Many thanks to WSSA for making these impactful opportunities available to students!

I hope you all have a great conclusion to the fall semester, happy holidays, and safe travels to society meetings and Arlington thereafter. This time to resume our sharing of research in-person and building our weed science community will be one to remember!

All the best,  
Sarah Kezar  
WSSA GSO President

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# WASHINGTON REPORT

by Lee Van Wychen, Director of Science Policy

## 2022 SCIENCE POLICY FELLOW: NAVDEEP GODARA



The Science Policy Fellowship is a unique opportunity for graduate students to assist me in my role as Executive Director of Science Policy for WSSA while gaining experience dealing with a broad array of weed science policy issues. Our second Science Policy Fellow for 2022 is Navdeep Godara at Virginia Tech.

Navdeep is a first-year Ph.D. student at Virginia Tech, pursuing his doctorate degree with Dr. Shawn Askew. Navdeep's dissertation project is focused on evaluating the effects of herbicides and other crop protection chemicals on pollinator foraging behavior, ultraviolet floral reflection, and floral nectar production in common weeds of managed turfgrass systems. In this project, he strives to develop best management practices for mitigating risk of pollinator exposure to harmful pesticides as an alternative to pesticide bans. Prior to his Ph.D., he completed his M.S. degree in Crop, Soil, and Environmental Science from the University of Arkansas under the direction of Dr. Jason Norsworthy. He received a B.S. in Agriculture from CCS Haryana Agricultural University, India. Navdeep's family is comprised predominately of farmers and distributors of crop production products. He witnessed firsthand how technology and knowledge can make the difference between success and failure in agriculture systems of Northwestern India. Navdeep wants to hone his research and communication skills in a manner that will allow him to significantly contribute to the field of Weed Science for ensuring food security on a global scale. The Science Policy Fel-

lowship exposes him to the complex nature of science policies as he seeks his doctorate. Navdeep will be able to leverage this knowledge to improve his impact on agricultural systems throughout his career. Navdeep is thankful to the WSSA and Science Policy Committee for selecting him for this opportunity.

## WSSA COMMENTS ON ATRAZINE INTERIM REGISTRATION DECISION

The WSSA submitted [comments](#) on October 7, 2022 addressing EPA's proposed revisions for its interim registration review of atrazine. Among the various mitigation measures, the Agency's proposal calls for prohibiting applications in saturated fields, limiting annual application rates and requiring growers in watersheds with atrazine levels above 3.4 ppb to choose from a "picklist" of practices to mitigate runoff. It is estimated that the proposed changes would impact over 65 million acres of corn, sorghum and sugarcane.

The WSSA remains committed to cooperating with EPA to address the concern of off-field atrazine movement, and identifying practical but effective practices that are sustainable, economical, and achievable for the many growers who utilize atrazine around the country.

The WSSA would also like EPA to schedule a FIFRA Science Advisory Panel (SAP) to seek external peer review of atrazine's risks to aquatic plant communities, including the 3.4 ppb level of concern (LOC) since past ecological and scientific reviews have concluded higher LOC's for atrazine.

A huge thank you goes out to WSSA President Stanley Culpepper and Science Policy Fellow Taylor Randell for pulling together the comments and the literature review, as well as edits

and reviews by Bill Chism, Anita Dille and Bill Curran. Thanks also goes to the WSSA Extension Committee members for their input.

## FY 2023 APPROPRIATIONS UPDATE

The House passed a continuing resolution (CR) on Sep. 30, following passage by the Senate a day earlier, that will fund the federal government at FY 2022 levels through December 16. The federal fiscal year begins on Oct. 1.

The House has passed all 12 of their FY 2023 appropriations bills out of committee and six of 12 have passed the House in a minibus bill on July 20. However, the Senate has not passed any of their 12 appropriations bills out of committee, but the text of the bills is available. (See table on page 10.)

We continue to advocate for these programs through various means including coalitions and congressional visits and are pleased to see potential increases in the IR-4 Program and the Crop Protection and Pest Management (CPPM) program.

There is appropriations report language in both the House and Senate for a regionally focused **Herbicide Resistance Initiative** for the Pacific Northwest. In FY 2022, \$2 million was allocated to "support research to address weed management strongly affecting the long-term economic sustainability of food systems in collaboration with USDA-ARS, research institutions, and stakeholder support." For FY 2023, we support the \$2.5 million recommended by the House appropriations committee.

There is also appropriations report language in both the House and Senate stating their concern over the rapid spread of **cogongrass** and its impact on forest productivity, wildlife habitat,

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and private landowners. Both the House and Senate provide \$3 million in FY 2023 “for APHIS to partner with State departments of agriculture and forestry commissions in States considered to be the epicenter of infestations to assist with the control and treatment of cogongrass.”

There is also two pieces of appropriations support language in the House directing APHIS for *Arundo donax* (giant reed, Carrizo cane) management, but no similar provisions in the Senate. Specifically, the House appropriations committee provides \$5 million “for APHIS to continue to coordinate with ARS, CBP, Department of the Interior, the International Boundary and Water Commission, the Texas State Soil and Water Conservation Board, and other stakeholders on control efforts.”

On the aquatics side, the Aquatic Plant Management Society continues to advocate for the **aquatic plant control research program** in the Army Corps of Engineers. We are pleased to see increases recommended for that

program in both the House and Senate. In particular, we strongly support the Senate provision that recommends \$6 million in additional funding “for *hydrilla* control, research, and demonstration work in the Connecticut River basin.”

**NEW HEAD OF USDA-APHIS PPQ**

Dr. Mark Davidson was appointed Deputy Administrator for APHIS Plant Protection and Quarantine (PPQ) in May 2022. APHIS PPQ’s primary role is to



safeguard U.S. agriculture and natural resources against the entry, establishment, and spread of economically and environmentally significant pests and diseases and facilitates the safe global trade of agricultural products.

Before joining APHIS in 1998, Davidson spent two years with USDA’s Food Safety and Inspection Service. Then, after joining APHIS, he spent 19 years with Veterinary Services

(VS) in various positions in the field, their regional office in Fort Collins, CO, and in Riverdale, MD. Davidson has a D.V.M. and master’s degree in veterinary pathology from Auburn University and a B.S. in agriculture from Western Kentucky University.

**2023 FARM BILL UPDATE**

While there is a long way to go, work is progressing on development of the 2023 Farm Bill with hearings and listening sessions taking place in Washington, DC, and around the country. Members of Congress are scheduling listening sessions in their states or districts to receive input directly from their producers and the public on priorities for the farm bill. [Recordings](#) of some of the sessions are available on the House Agriculture Committee website.

We are working with the National Coalition for Food and Agricultural Research (NCFAR) and the Supporters of Ag Research (SoAR) on talking points for use in support of ag research in the Farm Bill. Collectively, we are recommending an increase of \$5 billion allocated to agricultural research in the 2023 Farm Bill.

We have also worked with the North American Invasive Species Management Association (NAISMA) to advance four invasive species policies for the 2023 Farm Bill. See: [https://naisma.org/wp-content/uploads/2022/03/2022NISAW\\_positionpaper\\_FarmBill.pdf](https://naisma.org/wp-content/uploads/2022/03/2022NISAW_positionpaper_FarmBill.pdf)

Our top recommendation is to update the definition of plant pest to include all noxious weeds, not just parasitic plants. Currently, under 7 USC 104 Section 7702: the term “plant pest” means any living stage of any of the following that can directly or indirectly injure, cause damage to, or cause disease in any plant or plant product:

- (A) A protozoan.
- (B) A nonhuman animal.
- (C) A ~~parasitic plant~~ **noxious weed**.

The table below includes the House and Senate appropriations for FY 2023, as well as the final appropriations for FY 2021 and FY 2022 for various Federal programs important to weed and invasive plant research and management. If there is a difference between the House and the Senate in FY 2023, the higher amount is highlighted.

	Final FY 2021	Final FY 2022	House FY 2023	Senate FY 2023
----- \$ Millions -----				
<b>USDA - ARS</b>	\$1,492	\$1,633	\$1,736	\$1,756
-Herbicide resistance initiative	n/a	\$2	\$2.5	\$1
<b>USDA - NIFA</b>	\$1,570	\$1,637	\$1,768	\$1,691
-AFRI Competitive Grants	\$435	\$445	\$500	\$455
-Hatch Act (Exp. stations)	\$259	\$260	\$265	\$265
-Smith Lever (Extension)	\$315	\$320	\$330	\$325
-IR-4 Program	\$11.9	\$14.5	\$15	\$14.5
-Crop Protection & Pest Management	\$20	\$20	\$20	\$22
-SARE: Sustainable Ag Research & Educ.	\$40	\$45	\$50	\$50
<b>USDA - APHIS: Cogongrass management</b>	\$3	\$3	\$3	\$3
<b>Army Corps - Aquatic Plant Control Research</b>	\$7	\$8	\$11	\$14
<b>EPA - Great Lakes Restoration Initiative</b>	\$330	\$348	\$368	\$358
<b>NOAA - National Sea Grant College Program</b>	\$75	\$76	\$82	\$90
<b>DOI - BLM: Rangeland Management</b>	\$106	\$109	\$113	\$110
<b>DOI - FWS: National Wildlife Refuge System</b>	\$240	\$250	\$282	\$261

CONTINUED on pg 11 >>>

- (D) A bacterium.
- (E) A fungus.
- (F) A virus or viroid.
- (G) An infectious agent or other pathogen.
- (H) Any article similar to or allied with any of the articles specified in the preceding subparagraphs.

In addition to hearings and listening sessions, House Agriculture Committee Chairman David Scott and Ranking Member Glenn “GT” Thompson have offered the opportunity for members of the public to submit their feedback and ideas for the 2023 Farm Bill through an online form available [here](#).

### **EPA WITHDRAWS GLYPHOSATE INTERIM DECISION**

At the end of September, the EPA announced withdrawal of the Interim Registration Review Decision for glyphosate because the Agency was not able to meet the Ninth Circuit Court of Appeals deadline of October 1 to complete an Endangered Species Act (ESA) review and conduct a new health-assessment analysis.

EPA’s underlying scientific findings regarding glyphosate, including its finding that glyphosate is not likely to be carcinogenic to humans, remain the same. Herbicide products containing glyphosate can continue to remain on the market and be used according to the product label and are unaffected by this action.

EPA has determined that withdrawal of the Interim Registration Review Decision for glyphosate is appropriate in consideration of the Ninth Circuit’s June 17, 2022, decision. EPA is unable to finalize a new ecological portion in a registration review decision for glyphosate by the court-imposed Oct. 1, 2022 deadline because of the time needed to address the issues for which EPA sought remand of for the ecological portion and satisfy ESA requirements. EPA initiated formal ESA consultation with the U.S. Fish and Wildlife Service and the National

Marine Fisheries Service for glyphosate in November 2021, and consultation is ongoing. Moreover, before issuing any decision, EPA must first prepare a proposed decision, publish for a 60-day public comment period, and consider any comments received. EPA could not complete these processes by the court-imposed deadline.

A copy of the *Withdrawal of the Glyphosate Interim Registration Review Decision* is posted to the glyphosate registration review docket at [EPA-HQ-OPP-2009-0361](#).

### **IR-4 COMPLETES HORTICULTURAL CROP SAFETY SUMMARIES FOR FOUR HERBICIDES**

IR-4 research examined whether over-the-top applications of dimethenamid-p, indaziflam, oxadiazon and s-metolachlor caused injury to various environmental horticulture crops when applied for pre-emergent weed management. Close to 1,700 individual research trials are represented in the summaries, which span experiments from 1972 to 2022.

This research has resulted in numerous crops being added to these labels. Some of the commonly tested crops include rose, hydrangea, evergreens (such as junipers), young trees, and herbaceous perennials (like hosta).

To view and download these summaries, please visit: <https://www.ir4project.org/ehc/environmental-horticulture-research-summaries/>

### **NISAW: FEBRUARY 20-26, 2023**

National Invasive Species Awareness Week (NISAW) will be digital again in 2023. If you have topics or issues of concern, or would like to help plan next year’s NISAW, please let me know. [Lee.VanWyche@wssa.net](mailto:Lee.VanWyche@wssa.net)

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## **THINK NEWSLETTER**

**Deadline for January issue  
December 1, 2022**

### **Send Newsletter material to:**

**Carl Libbey**

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## **Resistance to glufosinate in Palmer amaranth involves changes in GS2 copies, expression level, protein production, and more**

*Amaranthus palmeri* (Palmer amaranth) is, undoubtedly, one of the most troublesome weeds nowadays in many parts of the world. This species harbors strong weedy traits, most notably its high growth rate, voluminous biomass, and copious seed production. High genetic diversity certainly has contributed to its remarkable plasticity and adaptability. The evolution of various patterns of multiple herbicide-resistance traits in Palmer amaranth attests to that.

Twelve years after the first report of target-site overproduction as a mechanism for herbicide resistance to glyphosate in Palmer amaranth, this rare mechanism was recently identified in a glufosinate-resistant Palmer amaranth population from the bootheel Missouri, USA, in a project led by the Weed Physiology Laboratory at the University of Arkansas, in collaboration with the University of Missouri, Mississippi State University and BASF SE. In the same period, glufosinate resistance was also reported in Arkansas.

The target site for glufosinate is glutamine synthetase 2 (GS2). Resistance to glufosinate involves not only increased copy of GS2 but also increased GS2 expression. The work is published recently in *Planta*, entitled “Involvement of glutamine synthetase 2 (GS2) amplification and overexpression in *Amaranthus palmeri* resistance to glufosinate” (<https://doi.org/10.1007/s00425-022-03968-2>). At a frequency of about 20% resistant plants, these mechanisms endowed 4-fold resistance to the field population, increasing to 6-fold resistance in the F1 progeny. The role of GS2 overexpression in glufosinate resistance was validated in *Nicotiana benthamiana*. The absence of resistance-endowing mutations in GS2 in the population was confirmed by sequence analysis of three GS isoforms from 17 glufosinate survivors. An-

other set of resistant plants were analyzed for number of GS2 gene copy, expression level, and protein level.

GS2 is highly conserved across species and is 100% conserved in all glufosinate-resistant Palmer amaranth analyzed, which conforms with the critical role of this enzyme in N assimilation in plants. GS2 was overexpressed up to 190-fold in resistant plants compared to plants from a sensitive population. The correlation between fold-change in copy number and in expression was not significant. Furthermore, the fold-change in GS2 protein levels did not correlate with the fold-change in GS2 expression. A small proportion of resistant plants harbor different resistance mechanism(s) given that not all resistant plants exhibit GS2 amplification or overexpression.

The basis for resistance to glufosinate is complex at the plant level and more so at the population level. Post-transcriptional and post-translational regulation and epigenetic factors are being investigated. The history of Palmer amaranth adaptation to herbicide selection pressure shows that its management must not rely solely on the chemical approach. A diversified management strategy must be practiced, integrating cultural, chemical, and mechanical methods. Optimizing sequences and mixtures of herbicides with different modes of action is necessary. This work allowed us to define precise stewardship guidelines in order to mitigate glufosinate resistance, to preserve its efficacy.

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### **2023 Funding Opportunity Available from the North Central IPM Center**

The two annual requests for application (RFA) are now available from the North Central IPM Center. The Center funds efforts that support integrated pest management (IPM), including Critical Issue (research) projects and Working Group team-building projects.

Further information can be found at:

[The North Central IPM Center Announces Request for Applications – North Central IPM Center \(ncipmc.org\)](https://ncipmc.org)

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# CALENDAR OF UPCOMING EVENTS

DATE	EVENT	LOCATION	CONTACT
November 13–19, 2022	Canadian Weed Science Society (CWSS) and Canadian Society of Agronomy (CSA) Joint Annual Meeting	Halifax, Nova Scotia	<a href="http://www.weedscience.ca">www.weedscience.ca</a> and <a href="http://www.agronomycanada.com">www.agronomycanada.com</a>
December 5–8, 2022	North Central Weed Science Society (NCWSS) Annual Meeting	St. Louis, Missouri	<a href="http://www.ncwss.org">www.ncwss.org</a>
January 23–26, 2023	Southern Weed Science Society (SWSS)	Baton Rouge, Louisiana	<a href="http://www.swss.ws">www.swss.ws</a>
January 30–February 2, 2023	Weed Science Society of America (WSSA) and Northeastern Weed Science Society (NEWSS) Joint Annual Meeting	Arlington, Virginia	<a href="http://www.wssa.net">www.wssa.net</a> and <a href="http://www.newss.org">www.newss.org</a>
February 27–March 2, 2023	Western Society of Weed Science (WSWS) and Western Aquatic Plant Management Society (WAPMS) Joint Annual Meeting	Boise, Idaho	<a href="http://www.wsweedscience.org">www.wsweedscience.org</a> and <a href="http://www.wapms.org">www.wapms.org</a>
July 24–27, 2023	Aquatic Plant Management Society (APMS) Annual Meeting	Indianapolis, Indiana	<a href="http://www.apms.org">www.apms.org</a>

Additional Weed Science Meetings and Events can be found at <http://wssa.net/meeting/calendar-of-meetings/>

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