



WSSA

WEED SCIENCE SOCIETY OF AMERICA

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July, 2015

Newsletter



PRESIDENT'S MESSAGE

I hope everyone's summer is going well. It has been a very challenging spring and early summer here in Kansas and in several other Midwest and Southern states due to abundant and frequent rains. The wetter than normal conditions have greatly complicated crop planting and weed control efforts. Things don't always go as planned, but you simply make adjustments and move forward as best you can.

WSSA also continues to move forward and address key weed science issues. One of the key issues that producers and the weed science community have been dealing with in recent years is herbicide resistant weeds. WSSA has been leading the charge to raise awareness of the importance of herbicide resistant weeds and best management practices to manage the problem on a local and regional scale. The Herbicide Resistance Education committee, under the leadership of David Shaw and several other members, has helped coordinate and host two herbicide resistant summits in recent years and brought together not only weed scientists, but also growers, commodity groups, crop advisors, regulatory agencies and sociologists to try and understand and develop better approaches to the widespread adoption of integrated weed management practices that help prevent the development and spread of herbicide resistance. It has been rewarding to see some of the publicity that WSSA has received in the popular press regarding these efforts.

WSSA also has developed a good working relationship with EPA, largely as a result of the efforts of Michael Barrett and the previous EPA Subject Matter Specialists. WSSA has coordinated another herbicide resistance tour, this one hosted by Mike Owen and Amy Asmus in Iowa during July. The goal of the tour is to help EPA personnel improve their understanding of the resistance problem and the challenges growers face in managing resistance in a complex agricultural production system. A full report on the tour will be available following the tour. EPA also has requested WSSA input on resistance management strategies and

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**CALL FOR PAPERS
2016 GUIDELINES**
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monitoring for resistance development as various herbicides go through the reevaluation process. We have established two working committees, one chaired by Larry Steckel and the other by Andrew Kniss, to work with Mike to address these questions and develop recommendations. The goal is to have WSSA board approved comments ready to submit to EPA during the public comment period for these reevaluations.

Donn Shilling has started in his new role as WSSA NIFA Fellow this spring by spending some time in DC establishing relationships with USDA. We feel that having Donn in this position will enhance the USDA understanding of the importance of weed science research. Donn also plays a key role as chair of the Science Policy committee.

Lee Van Wychen continues to represent WSSA on all things political in DC and keep us up to date on emerging issues. Lee works closely with the Science Policy committee and also communicates routinely with Michael Barrett and agency folks on important weed science topics. Please see Lee's Washington Report elsewhere in this newsletter to learn about the latest news in DC.

WSSA is revisiting and updating our Strategic Plan. Vanelle Peterson has chaired the Strategic Planning committee and the board hopes to adopt a new strategic plan at the summer board meeting in July. Thanks to Vanelle and the committee for their efforts to update the strategic plan.

One other business item that the WSSA board addressed this spring was to extend the contract with Allen Press for management services and meeting management through April of 2017. WSSA requested the one year extension to insure that we would continue to have the services of Joyce Lancaster as our Executive Secretary through that time frame, which coincides with the date that Joyce plans to retire. Obviously, Joyce will be hard to replace, but the board will have to start the search for a new Executive Secretary within the next year.

The 2016 WSSA annual meeting in San Juan, Puerto Rico next February will once again be a joint meeting, this time with the Southern Weed Science Society. Kevin Bradley and Peter Dotray are serving as program co-chairs for the meeting and will be presenting symposia proposals and meeting plans to a joint meeting of the WSSA and SWSS boards in July. San Juan should provide an interesting venue for our annual meeting with lots of new things to see and do while attending the meeting. I hope to see many of you at the meeting next February.

We appreciate your input on any weed science and society related issues. Please don't hesitate to contact me, Joyce Lancaster, Lee Van Wychen, or any other board members if you have any questions, suggestions, or concerns regarding WSSA business or activities.

Dallas Peterson
President, WSSA

WSSA FUTURE MEETING SITES AND DATES

2016

**56th Joint Annual Meeting
SWSS and WSSA**

San Juan Sheraton

San Juan, Puerto Rico

Kevin Bradley, Co-Chair

Email: bradleyke@missouri.edu

Phone: 573-882-4039

Peter Dotray, Co-Chair

2017

Tucson, Arizona

**WSSA HOME PAGE
ACCESSED AT:**

www.wssa.net

THINK NEWSLETTER

**Deadline for October issue
September 1, 2015**

WSSA NEWSLETTER

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CALL FOR PAPERS

2016 SWSS/WSSA MEETING

Joint Annual Meeting of the SWSS/WSSA San Juan, Puerto Rico • February 8–11, 2016

INVITATION

You are invited to submit titles and abstracts for papers and posters to be presented at the Joint Annual SWSS/WSSA Meeting in San Juan, Puerto Rico on February 8–11, 2016, Monday to Thursday. Volunteer papers may be presented orally in one of the section meetings or as a poster. An individual may personally present only one volunteer, non-poster paper. This rule will be strictly followed. In addition to the volunteer paper, an individual may present a poster, may be co-author of papers presented by other authors, and may present an invited symposium paper.

DEADLINE

Abstract Titles and Author Information must be submitted electronically by **October 1, 2015**, to be considered. Those not submitted by this deadline will not be accepted. This deadline applies to symposium papers, as well as to volunteer papers and posters. Abstract texts must be submitted by **January 15, 2016**. The program will be posted on the WSSA website (<http://www.wssa.net>) and members will be informed when it is available by "ListServe" from Joyce Lancaster.

MEETING SCHEDULES

Volunteer papers will be presented within a **15-minute schedule**. Concurrent sessions dictate that the time schedule be strictly followed. To allow for introduction, transition of speakers, and questions, you should plan to present your paper in 12 or 13 minutes. Papers should report the results of completed research or other substantive information. Information should not have been presented at a previous WSSA national meeting. Ideally, research reported at the WSSA Meeting should be publishable in *Invasive Plant Science and Management*, *Weed Science*, *Weed Technology*, or a similar scientific journal.

SYMPOSIUM PAPERS

Speakers participate in symposia by invitation. Deadlines and procedures for preparing and submitting abstracts of symposium papers are the same as for volunteer papers, except that the author must send a copy of the abstract to the symposium organizer.

COMPUTER AND PROJECTION EQUIPMENT

The WSSA and SWSS have adopted LCD projection for PowerPoint presentations as the standard and will be used

exclusively during the annual meeting. LCD projectors and Windows PC laptop computers will be supplied by WSSA members and coordinated by section chairs. Presenters will **NOT** be allowed to use their own computers in the sessions. If possible, computers will be located on the podium in each session. If this is not possible, an infrared remote providing forward and backward control on the PowerPoint presentation will be provided in each session. Screens, microphones, carts, and extension cords will continue to be supplied by AV services and paid for by the Society. In order to make this process go as smoothly as possible, please follow the guidelines below.

FORMAT

All presentations **MUST** be in PowerPoint (any version) for MS Windows (PC compatible). PowerPoint 2010 will be the software used. Macintosh/Apple formats will **NOT** be supported. Your presentation must be saved as a PowerPoint show file. **The section chairs have requested that ALL presentations be prepared and uploaded on the abstract submission site so that preloading prior to the meeting can be accomplished** (see Submission of Presentations). Please limit the size of presentations to less than 25 MB. No audio clips or sounds will be allowed. Video clips are discouraged unless absolutely necessary. PowerPoint animation is discouraged. Please contact the section chair or co-chair one week **PRIOR** to sending your presentation if you need to use a video clip. Limit fonts used in the presentation to basic fonts, as not all machines may have the same choice of fonts. Examples of standard fonts are Times, Arial, Courier, Tahoma, or similar equivalents. Section chairs and computer operators are not responsible for changes in fonts, bullets, and other formatting at the time of presentation. Use up-to-date virus protection software to avoid infecting the computers provided by the section chairs.

SUBMISSION OF PRESENTATIONS

Presentations must be uploaded on the submission site prior to the meeting. Section chairs must receive the presentation at least one week in advance of the meeting (**no later than February 1, 2016**). Please coordinate with your section chair if you want to preview your presentation at the meeting to ensure that the formats/fonts are all as you intended them to be. Due to the limited time and equipment, last minute editing is highly discouraged. Submission of files at the time of the presentation or at any other time during the session will **NOT** be allowed.

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Be alert to changes, modifications, and refinements to these guidelines between now and the meeting. This information will be published in the October and January issues of the WSSA Newsletter. For non-WSSA members, the WSSA Newsletter is available on the WSSA website (<http://www.wssa.net>).

SUBMISSION OF ABSTRACT

Volunteer papers, posters, and symposium papers all require abstracts to be submitted electronically. To submit abstract titles/authors and abstract texts electronically, go to the Weed Science Society of America website (<http://www.wssa.net>).

- After **September 2, 2015**, you will be able to access the Title/Abstract Submission Page from the WSSA website. Additional instructions will be provided on the Title/Abstract Submission Page.

The Program will be printed exactly as submitted, other than format and font changes for uniformity; therefore, proofread your submission very carefully. Primary contact authors will receive an email indicating their abstract was received and a later email confirming the section/day/time when and where the paper will be presented.

PREPARATION OF ABSTRACT

Following are the guidelines for the preparation and submission of an abstract. Be alert to additional instructions that may appear on the site itself.

1. **Contents** – The abstract should include a brief overview of essential aspects of experimental procedures and should highlight significant results and their interpretation. Write the abstract so it consists entirely of information. Do not include statements such as “The results of the experiments will be presented” or “The significance of these results will be discussed.”
2. **Formatting** – Typing and format instructions will be provided on the Title/Abstract Submission Page of the WSSA website. In the abstract, authors will be identified by occupational affiliation and location, not by mailing address. Therefore, please type the title, author(s), the affiliation (institution, agency or company), and location (city and state or country, but not the zip code). When authors are from different locations or affiliations, group authors by their affiliations/locations.

Capitalize the first letter of all major words in the title and end the title with a period. Include both the common and scientific names of weeds and uncommon crop plants in the title (authorship of plants is not necessary), but only the common names of herbicides and well-known crop plants. **You do not need to type the title in bold-face**; the system will do that automatically. **First names followed by initial** (period after initial) **should be typed before last names of all authors**. The site will provide a method for indicating the presenter, be sure to **specify the presenting author**. Do not include departments, divisions or zip codes. Do not abbreviate the word “University” to “Univ.”

Example 1. Role of Adjuvants on Sulfonylurea Herbicide Efficacy. D. Sanyal^{*1}, P. C. Bhowmik², ¹Monsanto Company, St. Louis, MO, ²University of Massachusetts, Amherst, MA.

Example 2. Evaluation of an In-Row Rotating Cultivar in Vegetable Crops. S. A. Fennimore^{*1}, R. F. Smith², J. Rachuy², ¹University of California, Davis, CA, ²University of California, Monterey County, CA.

Example 3. Teaching Weed Science in an Off-Campus Setting. R. E. Whitesides^{*}, C. V. Ransom; Utah State University, Logan, UT.

3. **E-mail Address** – For better communication among researchers, place the e-mail address of the senior author following the last sentence of abstract.
4. **Herbicide nomenclature** – A list of common and chemical names of herbicides approved by the WSSA is available at <http://wssa.net/Weeds/Tools/Herbicides/HerbicideNames.htm>. When the common name refers to the parent acid, salt or ester forms used in the experiments should be identified at the first mention of the common name (e.g., methyl ester of diclofop). At the first mention of an herbicide application rate, list whether the weight is acid equivalent (ae) or active ingredient (ai) (e.g., kg ai ha⁻¹). If no common name is available, use its designation (trade name or code) followed by the full chemical name. If the chemistry is confidential, identify the source (company) in parentheses after designation.
5. **Adjuvant nomenclature** – Where possible, use the WSSA *Herbicide Handbook*, 9th edition (2007), p. 421–423; *Weed Science* (1985) 33 (Suppl. 1): 22–23; or the WSSA *Monograph* (1982) *Adjuvants for Herbicides*. Otherwise, use the most complete available chemical description of the adjuvant.
6. **Weed nomenclature** – Identify weeds by common names. At first mention of a weed, whether in the title or text, follow the common name with the scientific name (underlined and in parentheses). Do not repeat the scientific name in the text if given in the title. A list of WSSA approved common and Latin names of common weed species can be found at <http://wssa.net/Weeds/ID/WeedNames/namesearch.php>. If there is no WSSA-designated common name, use common scientific names from another source such as *Hortus Third*.
7. **Crop nomenclature** – Scientific names for crop plants are optional. They are not needed for well known crops, but should be included for less common crops and whenever needed for clarity. Place scientific names, underlined and in parentheses, following first mention of the common name, whether in the title or text.
8. **Soil nomenclature** – Include the soil series with textural classification and the subgroup name using the terminology of the U.S. Dept. Agric. Natr. Res. Conserv. Serv. publication, *Soil Taxonomy*, U.S. Gov. Print-

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ing Office, Washington, D.C. 1988. For soils outside the U.S.A., use the local official terminology.

9. **Measurements** – Report all measurements in International System of units (SI). Abbreviate units of measure if preceded by a number. See *Weed Science* (2003) 51:1029–1033 for additional suggestions and *WSSA Herbicide Handbook*, 9th edition (2007), p. 431–434 for metric conversions.
10. **Abbreviations** – Use abbreviations as shown at http://www.peertrack.net/WSSA/WSSA_Dir_to_Contrib.pdf or CBE Style Manual.
11. **Numbers** – Use Arabic numerals for all numbers with two or more digits and for all measurements such as time, weight, length, area, quantity, or degree except when the number is the first word in the sentence. Spell out numbers when they are the first word in a sentence or when they are less than 10 and not measurements.
12. **Tables, figures, or literature citations** – There will be a system in place on the abstract submission site to add these.

SUBJECT INDEX

A subject index consisting of weed/crop names, herbicides, and other key words will be included in addition to the author index. Providing key words to be used in indexing will be the responsibility of the authors. Words in the title are not automatically indexed. Only key words provided by the authors will be used. The abstract submission site utilizes a new key word system. There are drop down boxes for each type of subject with a listing of choices. It is recommended that you utilize these pre-selected choices, but there is an area for authors to type in user defined key words that are not found in any of the selections.

1. A **maximum** of five key words per abstract will be indexed. Most abstracts should only require two or three words.
2. Prioritize key words based on the importance of a given subject, especially for abstracts containing more than five weeds and herbicides. Use a priority ranking of (a) weeds and/or crops, (b) herbicides, other chemicals (including adjuvants) and other types of weed control (e.g., cultural, biological), (c) additional topic words or phrases.
3. Use scientific name of weeds, without authority. Genus plus species is considered one key word.
4. Genera names may be used when more than one species in that genus is mentioned in the abstract.
5. Use common names of crops (for less common crops, use scientific names without authority).
6. Use common names of herbicides and other chemicals (including adjuvants) or code numbers for experimental compounds.

7. Chemical class names, e.g., sulfonylureas, should be used when more than one herbicide in that class is mentioned in the abstract.

POSTERS

The information presented as a poster is very similar to that presented as an oral paper, but it is presented on poster board rather than orally at the meeting. Directions for preparing a poster can be found under POSTER SESSION (see below). The difference between a poster and a commercial exhibit must be clearly understood. The commercial exhibits are presented by Sustaining Members of WSSA and consist of educational information of a promotional nature about products or services. Posters may be presented by personnel of the same sustaining member companies and may concern commercial products, but they must present results of completed research with these products rather than promotional material about them.

POSTER SESSION

There may be split sessions for presentation of posters. In addition to specifying Poster Session, authors should indicate a category from Section 1 through 14. Poster presentations will be grouped by these categories.

1. Authors are expected to be at their poster during the period reserved for viewing the poster to answer questions and to discuss their research with interested parties.
2. Participants in Section 15, the Poster Session, will meet at a location designated in the program before the Poster Session begins to elect a chair-elect of the section for 2017 (Section Chair in 2018) and discuss recommendations for improvement of the Poster Session.
3. **Poster Boards. One board 48 x 48 inches will be provided for each poster. There will be no exceptions to the rule of one board per paper. Posters should be no larger than this size.**
4. Content of Paper. Text, graphs, and tables must be easily read from a distance of 6 feet. Titles and headings should be larger and readable from a greater distance.
5. Because of cost and logistics, it will not be possible to provide electrical connections, video equipment, or other special equipment for posters.
6. Groups of authors may present more than one poster, but at least one author must be present at each poster during the time designated exclusively for viewing the poster.

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WASHINGTON REPORT

by Lee Van Wychen, Director of Science Policy

FOUNDATION FOR FOOD AND AGRICULTURE RESEARCH NAME FIRST EXECUTIVE DIRECTOR

The Foundation for Food and Agriculture Research (FFAR) named Dr. Sally Rockey as its first executive director. Dr. Rockey is currently the deputy director of extramural research at the National Institutes of Health and will bring her 19 years of experience at USDA to the Foundation starting in September, 2015.

FFAR was established in the 2014 Farm Bill. Congress provided \$200 million for the Foundation that must be matched by non-federal funds as the Foundation identifies and approves research projects. The Foundation operates as a non-profit entity seeking to address problems of national and international significance. For more background on FFAR, as well Dr. Rockey's bio, please visit: <http://www.far.foundation/first-executive-director.html>

MILKWEED, MONARCHS, AND POLLINATOR PROTECTION

The issues of milkweed, monarchs, and pollinator protection continues to be a hot topic in Washington, D.C. In mid-May, the White House, through the Office of Science and Technology Policy, issued the Pollinator Research Action Plan. The plan focuses on increasing honeybee and monarch butterfly numbers through the creation and maintenance of pollinator habitat. In conjunction with this effort, the EPA has also issued a Proposal to Protect Bees from Acutely Toxic Pesticides. These regulations would prohibit the application of pesticides that are acutely toxic to bees during bloom in crops where honey bee pollination services are contracted. The

comment period on these regulations will remain open until July 29.

On June 24, the EPA also published a document in the federal register titled "Risk Management Approach to Identifying Options for Protecting the Monarch Butterfly." This document is the start of the process which will depend upon "(i) input from a diverse group of stakeholders to identify and integrate information with respect to influences on the population dynamics of the monarch butterfly and the milkweed plant; and, (ii) cooperation and collaboration from these diverse stakeholders to identify activities that will balance weed management needs across varied landscapes with conservation of the milkweed plant." The 30 day comment period ends July 24.

As a bit of good news regarding pollinator protection, the Senate Environment and Public Works committee marked up a six yr transportation bill (DRIVE Act, S. 1647) that included an amendment from Sen. Gillibrand (D-NY) that WSSA supported which encourages pollinator habitat along transportation right-of-ways. This is the first time a provision like this was included in the Senate to encourage pollinator habitat on transportation right-of-ways. Some of the provisions in the amendment include: 1) conduct or encourage integrated vegetation management practices on roadsides and other transportation right-of-way, including reduced mowing; 2) enhance the development of habitat and forage for Monarch butterflies, other native pollinators, and honey bees through plantings of native forbs and grasses, including noninvasive, native milkweed species that can serve as migratory way stations for butterflies and facilitate migrations of

other pollinators; 3) encourage leveraging through partnerships and coordination with stakeholders in support of pollinators and plantings of native forbs and grasses, such as environmental groups, research institutions, other agencies, businesses, and community organizations; and 4) conduct or facilitate research and demonstration projects on the economic and environmental benefits and best practices for integrated vegetation management, reduced mowing, and plantings of native forbs and grasses for pollinator habitat, forage, and migratory way stations for Monarch butterflies and other migrating pollinators.

EPA RESPONSES TO IARC REPORTS FOR GLYPHOSATE AND 2,4-D

Glyphosate: In 1991 EPA concluded that glyphosate should be classified as a Group E (evidence of non-carcinogenicity for humans) based on a lack of convincing carcinogenicity evidence and considering the criteria in EPA Guidelines for classifying a carcinogen. Since then, EPA has monitored emerging research on the carcinogenicity of glyphosate.

In 2014, EPA reviewed over 55 epidemiological studies conducted on the possible cancer and non-cancer effects of glyphosate. Our review concluded that this body of research does not provide evidence to show that glyphosate causes cancer, and it does not warrant any change in EPA's cancer classification for glyphosate. This is the same conclusion reached in 2004 by the United Nations' Food and Agriculture Organization and affirmed this year by Germany's pesticide reg-

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ulatory officials. In a few months, EPA will be releasing for public comment our preliminary human health risk assessment for glyphosate as part of our program to reevaluate all pesticides periodically. EPA is aware of the recent International Agency for Research on Cancer (IARC) report and will address it in detail in the preliminary risk assessment. Additional information regarding glyphosate and EPA's ongoing registration review can be found at:

http://iaspub.epa.gov/apex/pesticides/f?p=CHEMICAL_SEARCH:31:0::NO:1,3,31,7,12,25:P3_XCHEMICAL_ID:2477

2,4-D: On June 23rd, the IARC released a scientific assessment which retains the group's previous classification of 2,4-D as a "2B carcinogen" (possibly carcinogenic to humans). This resulted from the June 3rd, 2015 United Nations World Health Organization's International Agency for Research on Cancer (IARC) meeting to review the carcinogenic potential of 2,4-D.

EPA reviewed 2,4-D in 2014 as part of its decision to register Enlist Duo and found that the data do not support a cause and effect relationship between exposure to 2,4-D and non-Hodgkin's lymphoma. This is the same conclusion reached by an earlier review of the issue by the FIFRA Scientific Advisory Panel.

2,4-D is currently undergoing registration review, EPA's periodic review of pesticide registrations to ensure that each pesticide continues to satisfy the statutory safety standard for registration; that is, the pesticide can perform its intended function with reasonable certainty of no harm to people from residues in food and water and that it will not cause unreasonable adverse effects on the environment when used according to the product label.

Through this program, EPA is ensuring that each pesticide's registration is based on current scientific and other knowledge, including its effects on human health and the environment.

The scope of the registration review process is to evaluate previously conducted human health risk assessments using the most recent scientific information, agency policies, and risk assessment methodologies in order to identify data deficiencies and future actions/work needed for the pesticide. The risk assessments and toxicology for 2,4-D will be revisited during this process and will include IARC's assessment after publication of Volume 113 of the IARC Monographs. EPA will determine whether any risk mitigation is needed to address unreasonable risks to humans.

Currently, we expect to release for public comment the draft human health risk assessment for 2,4-D in March 2016.

ILLINOIS FARM DATA INDICATES MIXING MOA'S MORE EFFECTIVE THAN ROTATING THEM

A recently published study by weed scientists at the University of Illinois and USDA-ARS, looking at glyphosate-resistant waterhemp, is providing valuable evidence that points to management practices as the driving force behind herbicide resistance, and that herbicide mixing, as opposed to herbicide rotation, is the most effective tool in managing resistance.

Pat Tranel said this is not the first time researchers have presented evidence that herbicide rotation is not the best resistance management strategy. "This paper is valuable because these conclusions were obtained doing our experiment in a more 'real-life' fashion," Tranel said. "This study confirmed previous conclusions that farmers should use herbicide mixing rather than rotation."

During the study, they evaluated glyphosate-resistance incidences, as well as landscape, soil, weed, and farm-management data from 105 central Illinois grain farms, including almost 500 site-years of herbicide application records. Having this data, collected between 2004 and 2010, helped the researchers identify relationships between past herbicide use and current glyphosate-resistance occurrences.

Tranel said when glyphosate-resistant waterhemp was first reported in Illinois in 2006, researchers working at the site saw some fields that were infested with waterhemp, but adjacent fields that were free of the weed.

"We asked, 'what is different between these two fields? Is it what the farmers are doing?' We asked a retail applicator to let us review all the management practices data from 100 fields—50 that have resistant waterhemp and 50 that don't," Tranel said.

"We took the results of what farmers have already done, and asked what is different in the fields that have resistance versus the ones that don't," he added.

After collecting the management data, sampling waterhemp from the fields, and screening seeds from the field for resistance back in their greenhouses, the researchers analyzed that data for management factors most associated with resistance. Overall the researchers examined 66 variables related to environment, soil, landscape, weed community, and weed management.

"We looked at every factor we could think of in terms of management and landscape," Tranel said. "We found that it was management factors that are the most important. It doesn't matter whether you're next to a water course that might bring in new seed, what the waterhemp density of your

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field is, etc. It's what you did in your field that matters.

"That's what's encouraging," he added. "It's not inevitable that if your field is next to a water course, for example, you will have resistance."

Aaron Hager, a co-author on the study, explained that the occurrence of glyphosate-resistant waterhemp was greatest in fields where glyphosate had been used in over 75 percent of the seasons included in the analysis, where fewer MOAs were used each year, and where herbicide rotation occurred annually. "Simply rotating herbicide MOAs actually increased the frequency of resistance," he said.

On the other hand, Tranel said that the farmers who were using multiple herbicides per application were least likely to have resistance. "When using an average of 2.5 MOAs per application, you are 83 times less likely to have resistance compared to if you used only 1.5 MOAs per application," he explained.

"That's pretty amazing that adding one additional mode of action in your tank reduces your chances of resistance by that much," Tranel added.

Hager pointed out that this strategy will work only if each component of the tank mixture is effective against the target species. "Effective, long-term weed management will require even more diverse management practices," he added.

Another piece of good news for farmers is that the researchers did not find an association of proximity between neighboring fields and resistance. "The good thing is not only does management matter, it's what you do in your own field that matters. Even if a neighbor's resistance moves, it's at a small frequency. If you're doing the right thing it will stay at a small frequency," Tranel said.

Although there may be some concerns with herbicide mixing, Tranel

said it is still the best tool to manage resistance. One concern is the greater expense and environmental load of using multiple herbicides.

Another concern is using the correct mix of herbicides in the tank. Particularly as waterhemp becomes resistant to other herbicides, such as PPO inhibitors, mixing glyphosate and a PPO inhibitor, is not going to be a good management strategy if there is already resistance to a PPO inhibitor, Tranel explained.

"As we have new tools coming like 2,4-D and dicamba-tolerant soybeans, some people may think 'I'll throw in 2,4-D with glyphosate, because that's using two modes of actions,' but if you already have glyphosate resistance then you are not really using two effective modes of action," he added.

"We don't say that mixing is the end-all solution. What we saw from this study if success for farmers is measured by lack of resistance or lower frequency, then successful farmers use multiple herbicides per application."

USDA RELEASES FEDERAL NOXIOUS WEED DISSEMINULES ID TOOL

The [Federal Noxious Weed Disseminules of the U.S.](#) (FNWD) was developed by the USDA APHIS Identification Technology Program (ITP) in collaboration with the California Department of Agriculture (CDFA). Most of the content in FNWD is a work of the U.S. Government and is in the public domain. The ID tool was developed to enable accurate identification of federal noxious weeds (FNW) disseminules and to assemble a set of high-quality images of the disseminules of all the FNW taxa. The ID tool and its identification keys were designed to be used by officials at U.S. ports responsible for identification of plant pests. It may also be a useful

resource for seed professionals and anyone else with an interest in, or a need to know about, the U.S. federal noxious weeds and what their disseminules look like.

The ID tool provides photographs, text, and keys that aid in determining whether or not an unknown disseminule (e.g., seed, fruit) found as a contaminant in imported botanicals and agricultural products is a FNW and is therefore actionable. The total list of 114 FNW taxa is broken down into smaller groupings, first by Disseminule type—Spores vs. Vegetative vs. Fruits & Seeds. This page describes the various types of disseminules represented within the tool. Taxa with spore and vegetative disseminules are described in fact sheets. The taxa with fruit and seed disseminules (further broken down into three groupings: Poaceae, Fabaceae, and Other Families) can be separated using one of the three associated keys. A Key to Keys assists the user in deciding which of these three keys is appropriate to use for taxon identification. Fact sheets for each FNW taxon pull together relevant descriptions, including distinguishing characteristics and photographs. See: <http://idtools.org/id/fnw/>

USDA-ERS REPORT ON THE ECONOMICS OF GLYPHOSATE RESISTANCE MANAGEMENT

Data obtained by USDA's Agricultural and Resources Management Survey (ARMS), conducted every year targeting about 5000 fields and 30,000 farms, along with data from the Benchmark study (Shaw et al., 2011) show that weed-management choices that account for the yield and cost effects of glyphosate resistance and maximize returns over time differ from those that ignore the effects of glyphosate resistance by: 1) using glyphosate during fewer years; 2) often combining

CONTINUED on pg 10 >>>

glyphosate with one or more alternative herbicides; and 3) most importantly, not applying glyphosate during consecutive growing seasons. As a result, glyphosate resistance is managed more cost effectively and the cumulative impact of returns is higher after about two years of managing resistance instead of ignoring it.

The findings of the USDA Economic Research Service (ERS) study suggest that education about the negative consequences of glyphosate resistance and the economic benefits of managing resistance, as well as the common-pool-resource nature of weed susceptibility to glyphosate and the potential benefits of cooperation, could promote resistance-management practices, encourage neighboring farmers to collaborate in managing glyphosate resistance, and increase long-term returns to corn and soybean production.

The USDA-ERS report "The Economics of Glyphosate Resistance Management in Corn and Soybean Production" can be found at:

<http://www.ers.usda.gov/media/1832877/err184.pdf>

WOTUS RULE FINALIZED, 18 STATES SUE

On June 29, the Waters Of The U.S. (WOTUS) rule was officially published in the Federal Register, and subsequently, 18 states filed lawsuits in three separate federal courts seeking to block the administration's expansion of which waters are covered under the jurisdiction of the Clean Water Act (CWA). The rule will take effect Aug. 25, but for judicial review purposes, the rule would be considered final on July 13.

Texas, Louisiana, and Mississippi filed a joint lawsuit in Houston asserting that the EPA's final rule is "an unconstitutional and impermissible expansion of federal power over the

states and their citizens and property owners." While the EPA has the authority to regulate water quality, the suit says Congress has not granted the EPA the power to regulate water and land use.

Similarly, Ohio and Michigan filed a joint complaint in an Ohio federal court, while the following 13 states: Alaska, Arizona, Arkansas, Colorado, Idaho, Missouri, Montana, Nebraska, New Mexico, Nevada, North Dakota, South Dakota, and Wyoming are seeking to have the rule overturned in a North Dakota federal court.

The EPA and Army Corps of Engineers first proposed the WOTUS rule in April 2014 and finalized it in May 2015. The rule will reportedly add some two million acres of streams and 20 million acres of wetlands under the jurisdiction of the CWA.

There is also legislation in both the House (H.R. 1732) and Senate (S. 1140) that would repeal the WOTUS rule and require the administration to develop an alternative rule in consultation with state and local governments. In May, the House voted 261-155 to pass its bill. The Senate version was passed by the Environment and Public Works Committee in June, but is awaiting a vote from the full Senate. The Administration said it would likely veto the House and Senate bills, so a two-thirds majority would be needed in both chambers.

U.S. IS 22,500 COLLEGE GRADUATES SHORT FOR AGRICULTURAL JOBS

A report from USDA's National Institute of Food and Agriculture (NIFA) and Purdue University, released in May, has found tremendous demand for recent college graduates with a degree in agricultural programs. An estimated 57,900 high-skilled job openings are available annually in the food, agriculture,

renewable natural resources, and environment fields, the report found, but there are only about 35,400 new U.S. graduates with a bachelor's degree or higher in agriculture related fields, 22,500 short of the jobs available annually.

College graduates with a degree in "Plant science" can expect to see a very strong job market. Read the report on agriculture jobs in the U.S. at:

["Employment Opportunities for College Graduates in Food, Agriculture, Renewable Natural Resources, and the Environment, United States, 2015-2020."](#)

GMO LABELING BILL GETS A LOT OF ATTENTION

The Safe and Accurate Food Labeling Act of 2015 (H.R. 1599) would require the FDA to regulate the distribution and labeling related to bioengineered foods. The bill was introduced in March and has had hearings in both the House Agriculture and the House Energy and Commerce Committees. H.R. 1599 defines the term "bioengineered organism" as an organism that meets the following three conditions: (a) the organism is a plant (or a seed, a fruit, or any other part thereof), (b) the organism contains genetic material that has been modified through in vitro recombinant DNA techniques; and (c) the modification could not otherwise be obtained using conventional breeding techniques.

H.R. 1599 would require food producers to notify FDA of any bioengineered foods intended to be sold interstate and would prevent the sale of any bioengineered foods not deemed safe by FDA. The bill would prevent FDA from requiring the labeling of bioengineered foods only on the grounds that the foods are bioengineered, however, the FDA could require that alterations of nutritional

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WASHINGTON REPORT CONTINUED from pg 10

properties, allergens, or other characteristics of food be listed on food labeling.

The second title of H.R. 1588 directs FDA to define the term "natural" for its use on food and beverage products. The third part of the legislation directs FDA to establish federal standards for food producers who choose to voluntarily label their product for the absence or presence of bioengineered organisms. Finally, H.R. 1599 deals with the issue of preemption (the doctrine that federal law takes precedence over state

law) by affirming FDA as the nation's authority for the use and labeling of bioengineered food ingredients and would prevent states from issuing their own food labeling requirements. Although there appears strong support for the measure in the House, its path is unclear in the Senate and beyond.

**WSSA HOME PAGE
ACCESSED AT:
www.wssa.net**

WSSA SURVEY OF MOST COMMON AND TROUBLESOME WEEDS

The winner of the \$100 drawing for completing the survey of the most common and troublesome weeds was WSWS member, John Vickery, Member, Education & Outreach Committee, Colorado Native Plant Society. Congratulations, John!

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THINK NEWSLETTER

**Deadline for October issue
September 1, 2015**

REPORTS SUPPORT INCREASED FUNDING

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recommendations endorsed by a group of business, scientific, and civil society leaders chaired by former Congressmen Doug Bereuter and former USDA Secretary Dan Glickman. The recommendations in the report include:

- Using US research facilities and universities to train the next generation of food, agriculture and nutrition leaders in the US and abroad;
- Joining government and industry initiatives together to support technologies to reduce food waste and enhance food safety; and
- Convening a bipartisan commission to address tackling nutrition challenges globally.

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Recent Reports Support Increased Funding for Food and Ag Research

Riley Foundation's "Pursuing a Unifying Message: A University Perspective"

The Charles Valentine Riley Memorial Foundation released the [proceedings](#) of one day meeting on April 6 of university leaders and representatives of the Association of American Universities, the Association of Public and Land Grant Universities, and the Non-land-grant Agriculture and Renewable Resources Universities. Highlights from the meeting were:

- **Federal Investments.** There was a shared recognition that an alarming lack of federal investment in food, agricultural and natural resources research exists in the United States.
- **Societal Needs.** A key element of a unifying message must be how food, agricultural and natural resources research addresses societal needs for the common good. Because it encompasses essential societal needs, it could be defined as "the people's research."
- **Multiple Federal Agencies.** A unifying message should emphasize expanding the total funding portfolio across multiple federal agencies, including U.S. Department of Agriculture, National Science Foundation, National Institutes of Health, U.S. Geological Survey and others.
- **A Solution Supply Chain.** Research investment fuels the solution supply chain needed to address issues that people are passionate about. A deficit of agricultural research leads to a deficit of innovation. In turn, a deficit of innovation leads to a deficit of solutions.
- **Jobs.** Adequate research investment should also be framed in terms of employment opportunities, job creation and risks to jobs associated with emerging threats to food and agriculture.
- **Educated Workforce.** Federally funded research helps universities mentor and prepare the next generation of scientists and specialists in food, agriculture and natural resources. Industry, as well as public institutions, depend on this educated workforce to fill innovation jobs.
- **Target Policymakers.** Although communicating with the broad American public is important, the unifying message should initially be targeted towards policymakers.
- **Collective Efforts.** As efforts continue on pursuing a unifying message, these words from Benjamin Franklin are particularly pertinent: "We must all hang together or assuredly we shall all hang separately."

USDA's Annual Technology Transfer Report

On Wednesday, June 24, USDA Secretary Vilsack announced the release of the [2014 Annual Report on Technology Transfer](#) which details research innovations and discoveries that have resulted in inventions and patents that have the potential to benefit the American public. The report included improved products, processes, technologies, and services that may benefit U.S. agriculture and the public at large. During Fiscal Year 2014, USDA filed 119

patent applications and disclosed another 117 inventions. The following discoveries were highlighted by USDA:

- Processes to eliminate up to 98-percent of the allergens from peanuts without compromising their flavor;
- A portable method for identifying harmful bacteria in food that could improve the response to foodborne illness outbreaks;
- A new method for mosquito control that specifically silences genes in the mosquito so it does not pose a danger to other insects, including pollinators; and
- A soil nitrogen test that quickly and inexpensively determines the total plant-available amount of nitrogen in the soil, which environmentally and economically beneficial.

AGree's "Research & Innovation: Strengthening Agricultural Research"

AGree released a [report and set of recommendations on agricultural research](#) on June 24. The report focuses on the mechanisms and funding of federal agricultural research more so than the substance. The AGree co-chairs stressed that Congress has not seriously reviewed the structure of farm and food research and funding in decades and suggested a serious conversation about those issues now, in advance of the 2018 Farm Bill. In addition to increased congressional oversight, other recommendations made by AGree include:

- Making data and findings from publicly funded research more accessible;
- Increasing the integration between research, education, and extension;
- Reviewing research priorities via transparent processes involving stakeholders and end users;
- Re-integrating independent technology assessment into the research priority review process;
- Targeting public research to areas unlikely to be addressed by private industry;
- Increasing competitive grant funding for the Agriculture and Food Research Initiative, Sustainable Agriculture and Education Program, Organic Agriculture Research and Extension Initiative, Specialty Crop Research Initiative, and Crop Protection and Pest Management Grants Program; and
- Making competitive grant funding available to researchers outside of the land grant college and university system and eliminate the 2014 Farm Bill's matching grant requirement for non-land grant institutions and organizations.

Chicago Council's Healthy Food for a Healthy World Report

The Chicago Council on Global Affairs released the report [Healthy Food for a Healthy World: Leveraging Agriculture and Food to Improve Global Nutrition](#), a set of

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POSITION ANNOUNCEMENTS

MISSISSIPPI STATE UNIVERSITY

Position Title	Assistant Professor or Associate Professor
Number of Positions	1
Internal/External Posting:	External
Area of Specialization	Weed Science
Department	Plant & Soil Sciences
Department Profile	
Position Function	The incumbent will develop a nationally recognized scholarly research and teaching program supported by external funding sources that addresses critical applied weed management issues in Mississippi within various agronomic cropping systems. The incumbent will work as part of a multidisciplinary team using precision agriculture in research, instruction and outreach.
Essential Duties and Responsibilities	<p>Research Expectations: Focus will be on an appropriate combination of applied weed biology/ecology, herbicide physiology, weed resistance to herbicides, plant (crop/weed) responses to biotic and abiotic stresses, identifying genetic inheritance of herbicide resistance in weed biotypes, and/or investigating physiological response of weed population/biotypes to herbicides. The incumbent will work closely with fellow Plant and Soil Science faculty within and external to Mississippi State University in a multidisciplinary, collaborative approach, as well as with faculty in Agricultural and Biological Engineering, Agricultural Economics, and Biochemistry, Molecular Biology, Entomology and Plant Pathology. The incumbent will also be expected to secure extramural funding to support research activities, publish research findings in appropriate professional research journals, make presentations at professional meetings, advise and direct graduate and undergraduate students, teach in areas of specialty, and actively participate in professional societies (membership, presentations, committee involvement, officer roles, etc.); these will be mandatory for promotion. The incumbent will be expected to support graduate student training and contribute to collaborative teaching in off-campus and campus-based educational programs in weed management. Additionally, the incumbent will participate in research, outreach and education programs in weed science/weed management related to precision agriculture.</p> <p>This can be a 9-month or a 12-month position, negotiable upon offer, and is a tenure-track position in the Department of Plant and Soil Sciences. Level of appointment (Assistant or Associate) is commensurate with qualifications and experience. Anticipated appointment would be 65% Research and 35% Teaching/Instructional (CALS/PSS); negotiable upon offer.</p>
Minimum Qualifications	An earned Ph.D. (or A.B.D.) in agronomy, weed science, plant physiology, molecular biology, or a related field from an accredited institution of higher learning is required.

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POSITION ANNOUNCEMENTS CONTINUED from pg 13

	Acceptable candidate must have outstanding English verbal and written communication skills, experience in weed management, herbicide mode of action, plant physiology, statistics, experimental design, and/or the current molecular techniques required to conduct research. The candidate should be familiar with methodologies, tools, techniques, and/or concepts related to the application and use of precision agriculture in their discipline and related fields.
Will ABD's (all but dissertation) be considered?	Yes
Preferred Qualifications	Experience in teaching and/or research focused on weed science with a strong background or emphasis in precision agriculture is preferred. Postdoctoral experience and a demonstrated record of peer-reviewed publications, and a willingness to address critical issues as a team member in collaboration with other scientists. Preference will be given to candidates with an established teaching and research record (including a substantial record of peer-reviewed publications, demonstrated ability to secure external funding, and an instructional portfolio), however recent graduates with exceptional academic credentials are also encouraged to apply.
Knowledge, Skills and Abilities	
Working Conditions and Physical Effort	
Instructions for Applying	All applicants MUST complete the online Personal Data Information Form located at https://www.jobs.msstate.edu . Application must include: 1) Letter of research and teaching interest 2) a complete curriculum vitae 3) names, addresses, and contact information of at least three professional references to: Dr. Scott Willard, Associate Dean, College of Agriculture and Life Sciences; Mississippi State University; Bost Extension Center, Room 201, Box 9760; Mississippi State, MS 39761
Departmental Contact	Dr. Scott Willard
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Position Open Date	05-29-2015
Position Close Date	Open Until Filled
Position Category	Faculty
Tenure Track Status	Tenure-Track
Position Type	Regular
Full-Time/Part-Time	Full-Time
PARF Number	8939



NECROLOGY

JAMES RALPH HANSEN **1922 – 2015**

James Ralph Hansen, born on January 1, 1922, died peacefully on May 11, 2015. He was born on a cattle ranch in northern Arizona, the youngest of four children born to Sena and James Hansen. He graduated from Holbrook High School in 1939, continuing his education at the University of Arizona where he was a member of the horse cavalry ROTC.

World War II interrupted his education. He enlisted in the Army Air Force and was stationed in the Aleutian Islands in Alaska. During the war, he met his future wife Evelyn Knezik at a USO dance held at Chanute Field in Illinois. He became a corporal and was attending the officer candidate school at Ft. Benning when the war ended.

After marrying Evelyn, they returned to Tucson where Ralph graduated with a Bachelor and Master of Science on the same day in 1948 from University of Arizona. He then received his PhD in Plant Physiology from the University of Wisconsin, Madison in 1951. After teaching a year at the University of Kentucky, Ralph and Evelyn moved to Wilmington in 1952 where Ralph began his career with Hercules Powder Company. He worked for Hercules for almost four decades, starting as an agricultural researcher and later becoming the international sales manager and operations manager for the agricultural chemical division. In these positions, Ralph travelled throughout the world.

Ralph served as President of the Northeast Weed Society and served as a deacon and elder for First and Central Presbyterian Church.

Upon retiring, Evelyn and Ralph spent many happy years as volunteers and staff at Longwood Gardens.

Ralph was pre-deceased by Evelyn in 2014. He is survived by his children, Janet Hansen and husband Bruce Drouin of Yarmouth, Maine, Eric Hansen and wife Nina of Lincoln University, Pennsylvania and Karen Hansen and her husband Robert Schneider of Brooktondale, New York. He is also survived by four grandchildren, Christopher, Sarah and Jonathan Drouin and April Hansen.



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CALENDAR OF UPCOMING EVENTS

DATE	EVENT	LOCATION	CONTACT
July 12–15, 2015	APMS Annual Meeting	Myrtle Beach, South Carolina	www.apms.org
November 23–27, 2015	Canadian Weed Science Society/ Société canadienne de malherbiologie (CWSS-SCM) Annual Meeting	Westin Hotel Edmonton, Alberta Canada	www.weedscience.ca
December 7–10, 2015	NCWSS Annual Meeting	Indianapolis, Indiana	www.ncwss.org
February 8–11, 2016	Joint WSSA and Southern Weed Science Society Annual Meeting	San Juan Sheraton San Juan, Puerto Rico	www.wssa.net
March 7–10, 2016	WSWS Annual Meeting	Albuquerque, New Mexico	www.wsweedscience.org
June 19–25, 2016	7th IWSC Annual Conference	Prague, Czech Republic	
2017	Weed Science Society of America Annual Meeting	Tucson, Arizona	www.wssa.net

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