



President's Message

It is truly an honor to serve as president of the Southern Weed Science Society. I first attended an SWSS meeting in 1994 and never thought that I would serve as president one day. This society has played a very important role over the past twenty years, both professionally and personally. Our annual meetings are a great place to share results, develop ideas, foster an educational environment for our students, develop new friendships and renew old acquaintances. We have a history of successful presidents, including our most recent Past-President Brad Minton, and I will do my best to uphold this tradition.



The 2016 joint meeting between the Weed Science Society of America (56th meeting) and the Southern Weed Science Society (69th meeting) in San Juan, Puerto Rico was a great success. The program was one of the largest ever (285 oral presentations, 27 symposia presentations, and 252 poster presentations for a total of 564 presentations). Fifty-eight SWSS graduate students competed in the SWSS oral paper contest and 84 students (38 from the SWSS) competed in the WSSA poster contest. Seventy-four WSSA and SWSS society members judged these contests.

The meeting included four symposia (21st Century Challenges in Aquatic Weed Management; Weed Control in 2050: Imagining Future Strategies and the Knowledge Needed to Achieve Them; Intersection of Agricultural and Wild Areas: Management of the Non-crop Vegetation as Habitat for Pollinator, Beneficial and Iconic Species; Use of Endemic Plant Diseases and Insect Pests for Biological Control of Invasive Weeds), one graduate student workshop (WHO You Are is HOW You Lead), a pre-conference tour (El Yunque National Rain Forest), the SWSS Golf Tournament, and a second tour at Luquillo Beach.

Special thanks to Kevin Bradley, WSSA President-Elect and co-chair of this program; Joyce Lancaster, Tony Ballard, and Phil Banks, for their hard-work behind the scenes to make this joint meeting a success; Darrin Dodds and Matthew Goddard, for organizing the WSSA Poster Contest and SWSS Oral Paper Contest; to all of our section chairs and co-chairs (Alejandro Perez-Jones and Pete Eure, Agronomic Crops; Martin Williams II and Roger Batts, Horticultural Crops; Katelyn Venner and Ramon Leon, Turf and Ornamental Crops; Stephen Enloe and Andrew Skibo, Pasture, Rangeland, Forest, and Rights of Way; Mark Heilman, Wildland and Aquatic Invasive Plants; Cory Lindgren and Jerry Wells, Regulatory Aspects; Angela Post and Te-Ming Paul Tseng, Education and Extension; Rakesh Jain, Formulation, Adjuvant, and Application Technology; Erik Lehnhoff, Weed Biology and Ecology; Joseph Neal, Biocontrol of Weeds; Darci Giacomini and Theodore Webster, Physiology; Amit Jhala, Integrated Weed Management; Karen Renner and Bob Scott, Poster Session); and to James Steffel, for organizing the Sustaining Member Exhibits Session.

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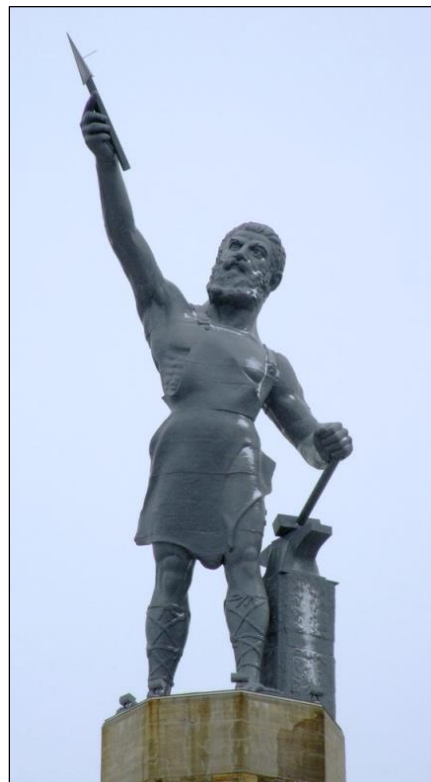
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Departing members from the SWSS Board are Scott Senseman (Immediate Past President), Scott McElroy (Member at Large – Academia), Vernon Langston (Member at Large – Industry), and Sandeep Rana (Graduate Student Rep). I would like to express my sincere appreciation for your service, dedication, and contributions to our society. New members on the Board are Bob Scott (Vice President), Angela Post (Member at Large – Academia), Matt Goddard (Member at Large – Industry), and Drake Copeland (Graduate Student Representative). Welcome to the Board!

Plans for the 2017 annual meeting in Birmingham, AL are starting to come together. Joyce Tredaway Ducar has agreed to serve as Local Arrangements Chair for this meeting at the Hyatt Regency (formerly The Winfrey Hotel). Joyce served as co-chair in 2014 and I anticipate another outstanding meeting. Many of you remember the ice storm that took place in 2014. I hope you also remember that we had an excellent meeting at this location, and their staff was second to none.

Birmingham is the largest city in the US state of Alabama. This city is the county seat of Jefferson County and according to the 2010 US Census, has a population of approximately 212,000. The census also projects that Huntsville will take the top spot within 10 years. The city of Birmingham is entirely a product of the post-Civil War period. It was established in 1871 as the anticipated intersection of the North & South and Alabama & Chattanooga railroads.



Birmingham has lots of history in its less than 150 years of existence. Do you know these 12 things about Birmingham, AL?

1. Although Hernando De Soto journeyed through Alabama in 1540, the area around Birmingham wasn't settled until about 1813. For almost 60 years, only farm towns populated the area around the railroad crossroads. In 1871, the Elyton Land Company merged several of these to create Birmingham. In the early 20th century, other surrounding towns were annexed by the city, leading to the substantial growth that inspired its nickname, "The Magic City."
2. Birmingham was named after Birmingham, UK.
3. Birmingham is the only place in the world where all three raw ingredients for steel (coal, limestone, and iron ore) occur naturally within a ten-mile radius.
4. There is a huge, half naked Roman god guarding the city. The Vulcan statue, designed by Giuseppe Moretti, has been overlooking Birmingham since the 1930s. According to visitvulcan.com, Vulcan is the Roman god of the Forge, a shop where metal is molded and hammered for various needs.
5. Downtown's Kirklin Clinic was designed by noted architect I.M. Pei, the man behind the National Gallery of Art's East Building and Paris' Grand Louvre.
6. No need to head all the way to New York City to feel like you're in the Big Apple: there's a replica of the Statue of Liberty on the city's outskirts.
7. Barber Motorsports Park, located just outside city limits, boasts the world's largest motorcycle museum. Guinness World Records made it official last year.

8. Home to Rickwood Field, the nation's oldest baseball stadium. Rickwood hosted greats such as Ty Cobb, Babe Ruth, Dizzy Dean, and Willie Mays (a native Birminghamian).
9. Baseball isn't the only game in town. The greater Birmingham area was the birthplace of a number of other athletes too, including Charles Barkley and nine-time Olympic gold medalist Carl Lewis. Other famous folks from Birmingham include Emmylou Harris, Courtney Cox, rapper Gucci Mane, authors Fannie Flagg and John Green, who lived there as a kid, and Condoleezza Rice.
10. Birmingham transplant, Mary Anderson, invented and patented the windshield wiper in 1903.
11. Morris Avenue is one of the few streets left in the city that is cobblestone. It is now home to Birmingham landmark, The Peanut Depot.
12. Budweiser isn't the only beer game in town. Birmingham is host to several brewing businesses such as Avondale Brewing Company and Good People Brewing Company.

Gary Schwarzlose is the Program Chair for the 2017 meeting. Gary is an exceptional planner, organizer, a very articulate and detail-oriented individual, and will do a tremendous job as SWSS President-Elect and Program Chair. A "Call for Awards" nominations will be coming out soon. Please take the time to nominate a colleague for one of our society awards. There are many deserving members who should be recognized for their dedication and time over the years to SWSS activities.

See <http://mentalfloss.com/article/72032/25-things-you-should-know-about-birmingham-alabama> for more information about the city of Birmingham, Alabama.

We have been working since before our meeting in Puerto Rico to select a new Business Manager for the Southern Weed Science Society. Phil Banks has served as our Business Manager since January 2010 and has done an exceptional job overseeing the business and finances of our society. Under Phil's guidance, the net worth of our society has increased over \$84,000 from May 31, 2010 to May 31, 2015. During Phil's role as Business Manager, we have not had a year when we finished in the "red". We are hoping to have a new manager identified and in place during the transition meeting in Birmingham. The original RFP for the WSSA Executive Secretary and Business Manager for the affiliated societies was posted in December. From the original 15 or so proposals, a committee met in Puerto Rico and reduced this number to 6. Additional input and a teleconference was used to reduce the candidates down to two. We are planning a face to face interview of both groups in early June prior to any Board action during our summer meeting.

I am looking forward to serving as your society president in the coming year. I welcome your thoughts and input to make our society even better. We strive for a professional society that benefits all of its members. I hope you have a productive and rewarding 2016!

Respectfully submitted,



Peter Dotray
President, SWSS



2016 Award Winners

Outstanding Educator Award

Katie M. Jennings

Katie received a B.S. degree in Horticulture from the University of Maryland, and a Master of Science and PhD in the area of weed science from North Carolina State University. In 1998 she joined American Cyanamid in Salisbury, MD as a Field Development Rep and in 2000 she moved to North Carolina as a Project Development Manager for BASF. In 2004 Katie began working at North Carolina State University in the Department of Horticultural Science in weed science in horticultural crops. She leads the research and extension program for weed management in vegetable and small fruit crops.



She maintains an active research program focused on control of Palmer amaranth, nutsedge species, and other troublesome weeds in these crops. She has published over 40 peer-reviewed scientific journal articles, 22 extension publications, 70 abstracts, and 3 book chapters.

Katie does not have a formal teaching appointment. However, she is often asked to guest lecture in courses in the Departments of Horticultural Science and Crop Science. She works with growers of over 20 vegetable and 4 small fruit crops, industries that are worth over \$650 million. Much of her work has been directly adopted by growers in North Carolina and many southern states.

Katie has mentored 10 Master of Science and 4 PhD students and has served on many graduate committees. Her students have been very successful as they have won 40 awards for oral and poster competitions at the SWSS, Weed Science Society of NC (WSSNC), National Sweetpotato Collaborators Meeting, the American Society of Horticultural Science, and the American Society of Enology and Viticulture; the SWSS Enrichment Scholarship, competitive national and international travel grants to conferences, and various awards at the SWSS and NEWSS Weed Contests, and Outstanding Graduate Student Awards at the SWSS, and WSSNC weed meetings. Her students have placed in jobs in academia, industry, and farming.

She serves as a reviewer for Weed Technology, Weed Science, HortTechnology, and HortScience. Katie has served on several committees within the SWSS including the Graduate Student Award Committee and Outstanding Educator Award Committee. She has coordinated symposiums, served as section chair, and served as a judge for graduate student contests.

A major focus of Katie's program has been on education, both graduate student and grower, a similar focus that has historically been held by SWSS.

Outstanding Young Weed Scientist-Academia

Daniel Oliver Stephenson, IV



Daniel was raised on a peanut, cotton, and cattle farm in southeast Alabama. He received his B.S. in Agronomy and Soils from Auburn University in 1998. He remained at Auburn where he earned a M.S. in Agronomy and Soils, with focus on weed science, under the direction of Dr. Mike Patterson, in 2000. In 2004, Daniel was awarded with a Ph.D. from the University of Arkansas in Crop, Soils, and Environmental Sciences with focus on weed science under the direction of Dr. Dick Oliver. After earning his Ph.D., Daniel accepted post-doctoral research associate position with the University of Florida focusing on weed control programs in peanut, cotton, soybean, and turfgrass working with Drs. Barry Brecke and Bryan

Unruh. In 2005, he accepted a position with the University of Arkansas as the cropping systems agronomist located at the Northeast Research and Extension Center in Keiser. In 2008, Daniel accepted

a position with the LSU AgCenter as a weed scientist/specialist, where his program focuses on development of weed management systems in corn, cotton, grain sorghum, soybean, and wheat and herbicide-resistant weed management. In addition, he is the Field Crops Coordinator at the LSU AgCenter Dean Lee Research and Extension Center. Daniel has authored/co-authored 36 journal articles, 128 abstracts, and 55 extension publications. He has served as major professor for three M.S. students. He is married to Melanie and they have three daughters, Bailey, Mary Beth, and Macy.

Outstanding Young Weed Scientist-Industry **Drew Ellis**

Drew Ellis grew up in middle Tennessee and received his B.S. in Natural Resources Management from University of Tennessee at Martin, M.S. in Agronomy from the University of Arkansas, and finally his Ph.D in Weed Science from University of Tennessee in 2009. Soon after finishing his Ph.D Drew began working for Dow AgroSciences at the Southern US Research Center in Greenville, MS where he led key discovery and developmental research in projects such as Enlist and the new Rinskor active ingredient. Drew transitioned from the station to covering the state of Louisiana for Dow as a Field Scientist and now is currently a Market Development Specialist. Drew has published multiple articles across journals such as *Weed Science*, *Weed Research*, and *Weed Technology*. Drew has been involved in the SWSS by presenting oral papers and posters since his first year in grad school and his service to the society has included volunteering as a judge in the summer contest, Member At Large - Industry, Vice Chair, and Chair of the Student Contest. He and his wife Stacy have two daughters Amelia and Anna Claire and currently reside in Arlington, TN.



2016 Outstanding Graduate Student Award (MS) **Chris Meyer**



Chris Meyer graduated from Iowa State University with a B.S. in Agronomy in 2012. He completed his M.S. in Weed Science from University of Arkansas in 2015, and is currently working on his Ph.D. at the same institution, under the direction of Dr. Jason Norsworthy. Chris' thesis research evaluated the effects of nozzle selection and other aspects of application technology on herbicide efficacy in soybean. At the SWSS Weed Contest, Chris placed as High individual in 2013, 2014, and placed 4th overall in 2015. While pursuing his M.S., Chris has been recognized for his academic and extracurricular achievements with awards such as the 2014 Arkansas Soybean Promotion Board M.S. Fellowship and the 2015 Bumpers College of Agricultural, Food, and Life Sciences Distinguished M.S. Student Award. Chris has authored six *Weed Technology* articles, one article in *Crop, Forage, and Turfgrass Management*, two Arkansas research series papers, and 13 abstracts for professional meetings. Of those abstracts, Chris has placed first in the SWSS M.S. oral paper contest and

has received awards in various other speaking contests as well. His Ph.D. research will be focused on the stewardship of lufosinate herbicide in current and future crop technologies.

2016 Outstanding Graduate Student Award (PhD)

Reiofeli Algodon Salas

Reiofeli A. Salas was born and raised in Leyte, Philippines. She graduated *Magna Cum Laude* from Leyte State University, Leyte, Philippines in 2004 with a B.S. in Agricultural Chemistry. After college graduation, she passed the Philippines chemistry licensure examination and worked as a research assistant and a college instructor at the University of the Philippines-Los Baños, Laguna, Philippines. In 2009, she decided to pursue M.S. in Crop, Soil, and Environmental Sciences with concentration in Weed Science at the University of Arkansas, Fayetteville under the guidance and direction of Dr. Nilda Burgos and Dr. Robert “Bob” Scott. Her research focused on herbicide resistance mechanism in Italian ryegrass populations in the southern United States. After completing her MS degree in 2012, she began her PhD program in Weed Science at the same university. Her dissertation is centered on non-target site-based tolerance to herbicides in Palmer amaranth. She was a member of the University of Arkansas weed team which ranked first place in the 2011, 2013 and 2014 SWSS weed contests. She has won several awards including 2nd place overall individual and 1st place in Weed Identification at the 2013 and 2014 SWSS weed contest, 2014 Spooner Scholar Award, 2013 Talbert Weed Science Scholar Award, 2012 IWSS graduate travel award, 2012 CSES outstanding MS student, and 9 awards for poster and paper presentations. She served as a laboratory



teaching assistant in two courses at the University of Arkansas and as a resource speaker in edamame and sustainability field day. During her MS and PhD endeavors, she authored 3 and co-authored 4 articles in peer-reviewed journals, authored and co-authored 5 non-refereed publications, and 38 abstracts in conference proceedings.

Endowment Committee Report

Twelve applications were received for the Endowment Enrichment Scholarship! All applicants were very much deserving of the Scholarship, but as you know, only 3 can win. The winners for the 2016 Endowment Scholarship experience are:

Student	Place	Experience Host
Ryan Miller - U of A	1st	Dr. Jeff Elis, Dow AgroServices
Nick Basinger - NCSU	2nd	Dr. Darrin Dodds, Mississippi State University.
Rachel Atwell - NCSU	3rd	Drs. Eric Prostko and Stanley Culpepper, University of Georgia.

A special thanks to all the graduate students who put in an application as well as a special thanks to all the host that volunteer to spend a week with our winners.

I encourage all graduate students to seriously consider putting in an application for the 2017 Endowment Scholarship Experience. This is an excellent opportunity for students to interact with individuals outside their normal job description. If you missed your chance to put in an application, I encourage you to set yourself a reminder for the 2017 calendar year. Even though the deadline for the 2017 applications have not been set as of yet, it will be sometime around the first week of April, 2017. **You will not regret it!!!**

Respectively Submitted,
James Holloway

Directory of Officers, Executive Board Members Committees and Committee Members

January 31, 2016 - January 31, 2017

Note: Duties of each Committee are detailed in the Manual of Operating Procedures, which is posted on the SWSS web site at <http://www.swss.ws>

100. SOUTHERN WEED SCIENCE SOCIETY OFFICERS AND EXECUTIVE BOARD

100a. OFFICERS President - Peter Dotray - 2017

President Elect - Gary Schwarzlose - 2018

Vice-President - Bob Scott - 2019

Secretary-Treasurer - Daniel Stephenson - 2017

Editor - Nilda Burgos - 2017

Immediate Past President - Brad Minton - 2017

100b. ADDITIONAL EXECUTIVE BOARD MEMBERS

Member-at-Large - Academia - Joyce Tredaway Ducar - 2017

Member-at-Large - Academia - Angela Post - 2018

Member-at-Large - Industry - James Holloway - 2017

Member-at-Large- Industry - Matt Goddard - 2018

Representative to WSSA - Eric Palmer - 2017

100c. EX-OFFICIO BOARD MEMBERS

Constitution and Operating Procedures – Carroll Johnson 2019

Business Manager - Phil Banks

Student Representative - Drake Copeland

Web Master – David Kruger

Newsletter Editor - Bob Scott

101. SWSS ENDOWMENT FOUNDATION

101a. BOARD OF TRUSTEES - ELECTED

James Holloway - President 2017

Brent Sellers - Secretary 2018

Darrin Dodds 2019

Donnie Miller 2020

Hunter Perry 2021

Zachary Lancaster, Grad Rep 2018

101b. BOARD OF TRUSTEES - EX-OFFICIO

Renee Keese (Past President of Endowment Foundation Board of Trustees)

Phil Banks (SWSS Business Manager)

102. AWARDS COMMITTEE PARENT (STANDING) - The Parent Awards Committee shall consist of the immediate Past President as Chairperson and each Chair of the Award Subcommittees.

Brad Minton** 2017

Tim Grey* 2017

Vinod Shivrain* 2017

Tom Mueller* 2017

Shawn Askew* 2017

The Awards Subcommittees shall consist of six members including the Chair, serving staggered three-year terms with two rotating off each year.

102a. SWSS Fellow Award Subcommittee

Dan Reynolds 2017	John Byrd 2018	Doug Worsham 2019
Tom Mueller* 2017	Robert Nichols 2018	Ken Smith 2019

102b. Outstanding Educator Award Subcommittee

Peter Dotray 2017	Tim Grey* 2018	Jim Brosnan 2019
James Griffin 2017	Greg MacDonald 2018	Charlie Cahoon 2019

102c. Outstanding Young Weed Scientist Award Subcommittee

Eric Palmer 2017	Eric Prostko 2018	Jay Ferrell 2019
Shawn Askew* 2017	Bob Hayes 2018	Todd Baughman 2019

102d. Outstanding Graduate Student Award Subcommittee

Vinod Shivrain* 2017	Wayne Keeling 2018	Matt Goddard 2019
Neha Rana 2017	David Jordon 2018	Joyce Ducar 2019

103. COMPUTER APPLICATION COMMITTEE (STANDING) A vote to dissolve this committee will take place at the 2016 summer BOD meeting

104. CONSTITUTION AND OPERATING PROCEDURES COMMITTEE (STANDING)

W. Carroll Johnson* 2019

105. FINANCE COMMITTEE (STANDING) - Shall consist of the Vice President as Chair and President-Elect, Secretary-Treasurer, Chair of Sustaining Membership Committee, and others as the President so chooses, with the Editor serving as ex-officio member.

Bob Scott* 2018	Gary Schwarzlose 2017	Daniel Stephenson 2017
John Richburg 2018	Nilda Burgos (ex-officio)	

106. GRADUATE STUDENT ORGANIZATION

President	Drake Copeland (NC State)
Vice President	John Brewer (Virginia Tech)
Secretary	Ranjeet Randhawa (Virginia Tech)
Student Program Committee Rep.	Ralph `Tripp` Hale (Arkansas)
Endowment Committee Rep.	Zachary Lancaster (Arkansas)
Herbicide Resistance &Tech. Committee Rep.	Chris Rouse (Arkansas)

107. WEED RESISTANCE AND TECHNOLOGY STEWARDSHIP (STANDING)

Eric Prostko** - GA	Andy Kendig - MO	Hunter Perry* - MS
Larry Steckel - TN	Peter Dotray - TX	Daniel Stephenson - LA
Chris Rouse - Student Rep	Frank Carey - MS	Jason Bond - MS
Jason Norsworthy - AR	Carroll Johnson - GA	James Holloway - TN
Joyce Tredaway Ducar - AL	Ramon Leon - FL	Ned French - AR
Anthony Mills - TN	David Spak - NC	Todd Baughman - OK
Michael Horak - MO		

108. HISTORICAL COMMITTEE (STANDING)

John Byrd* 2017	Andy Kendig 2019
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109. LEGISLATIVE AND REGULATORY COMMITTEE (STANDING)

Bob Nichols** 2017

Lee Van Wychen (ad hoc) Director of Science Policy 2017

Donn Shilling (ad hoc) Chair of the WSSA Science Policy Committee 2017 .

Mike Barrett (ad hoc), EPA liaison 2017

Bill Vencill 2017

Joyce Tredaway Ducar - At Large member of the Executive Board 2017

Angela Post* - At Large Member of the Executive Board 2018

James Holloway - At Large Member of Executive Board 2017

Matt Goddard - At Large Member of the Executive Board 2018

110. LOCAL ARRANGEMENTS COMMITTEE - 2017 MEETING (STANDING) Joyce Tredaway Ducar

111. LONG-RANGE PLANNING COMMITTEE (STANDING) - Shall consist of the Past-Past President (chair), Past-President, President, and President-Elect.

Scott Senseman* 2017

Peter Dotray 2019

Brad Minton 2018

Gary Schwarzlose 2020

112. MEETING SITE SELECTION COMMITTEE (STANDING) - Shall consist of six members and the SWSS Business Manager. The members will be appointed by the President on a rotating basis with one member appointed each year and members shall serve six-year terms. The Chairmanship will rotate to the senior committee member from the geographical area where the meeting will be held.

John Byrd* 2017

Eric Webster 2019

Angela Post 2021

Tim Grey 2018

James Holloway 2020

Luke Etheredge 2022

P. Banks - Business Mgr. (Ex-officio)

113. NOMINATING COMMITTEE (STANDING) - Shall be composed of the Past President as Chair.

Brad Minton* - 2017

114. PROGRAM COMMITTEE - 2017 MEETING (STANDING) Gary Schwarzlose - 2017

115. PROGRAM COMMITTEE - 2018 MEETING (STANDING) Bob Scott – 2018

116. RESEARCH COMMITTEE (STANDING)

Bob Scott* - 2017

Alabama – Joyce Tredaway Ducar

North Carolina – Wes Everman

Arkansas – Bob Scott

Oklahoma – Todd Baughman

Florida – Ramon Leon

South Carolina – Mike Marshall

Georgia – Eric Prostko

Tennessee – Larry Steckel

Louisiana – Donnie Miller

Texas – Peter Dotray

Mississippi – John Byrd

Virginia – Shawn Askew

Missouri – Kevin Bradley

117. RESOLUTIONS AND NECROLOGY COMMITTEE (STANDING)

David Black* 2017

Ryan Edwards 2019

Michael Flessner 2019

118. SOUTHERN WEED CONTEST COMMITTEE (STANDING) open to all SWSS members

Virginia - S. Askew

Mississippi - D. Dodd*

Mississippi - D. Reynolds

Arkansas - N. Burgos

Florida - G. MacDonald

Georgia - W. Vencill

Texas - P. Dotray

N. Carolina - W. Everman**

Louisiana - E. Webster

Tennessee - T. Mueller

Alabama - J. Tredaway Ducar

119. STUDENT PROGRAM COMMITTEE (STANDING)

Hunter Perry* 2017

Darrin Dodds 2018

Charlie Cahoon 2019

120. SUSTAINING MEMBERSHIP COMMITTEE (STANDING)

John Richburg * 2018

Peter Eure 2018

Kelly Barnett 2019

Larry Steckel 2018

Jacob Reed 2019

Tom Barber 2019

121. CONTINUING EDUCATION UNITS COMMITTEE (SPECIAL)

TN Drew Ellis 2017

TX Jacob Reed 2017

VA Charlie Cahoon 2017

GA Scott Tubbs 2017

OK Todd Baughman 2017

AL Steve Li 2017

MS Te-Ming Paul Tseng 2017

FL Calvin Otero 2017

SC Alan Estes 2017

AR Tom Barber 2017

NC Katie Jennings 2017

LA Jeff Ellis 2017

KY Mike Harrell 2017

NC Bobby Walls* 2017

122. MEMBERSHIP COMMITTEE (SPECIAL) A vote to dissolve this committee will take place at the 2016 summer BOD meeting

Useful References

As weed scientists, our occupation is to help kill plants that are not where they are supposed to be. But, how often do we wish we knew more about a particular species? How did it arrive in North America? Why did the early settlers bring it here? Does it have any redeeming value? While SWSS and WSSA have developed outstanding books on weed identification, Useful Wild Plants, Inc. in Austin, Texas <http://02a99e5.netsolhost.com/wordpress1/encyclopedia-project/> is developing a series of books that provide in addition to great color pictures, a comprehensive review of known uses of plants. These clothbound books printed on acid-free paper cover food uses by Native Americans, fiber, ornamental uses, landscaping potential, dye production, wildlife habitat, medicinal uses, plant toxicity, etc. within genera. Also provided is the distribution of species throughout Texas, the southeastern and southwestern U. S., southern Plains, and northern Mexico.

Volumes 1 covers 267 species in 78 genera *Abronia* through *Arundo*; Volume 2 provides detailed information on 254 species in the 79 genera *Asclepias* through *Canavalia*; Volume 3 covers 129 species in the 23 genera *Canna* through *Celtis*; and Volume 4 covers 175 species in the 66 genera *Cenchrus* through *Convolvulus*. These volumes of the Encyclopedia are priced at \$140 and provide a wealth of information on uses of plants we often view as weedy. They can be valuable references for students developing papers for classes and graduate students preparing a thesis or dissertation in addition to helping increase our general knowledge of a species.

John Byrd

Weed Survey

The 2016 survey of the most common and troublesome weeds in the U.S. and Canada has been launched. This year's survey will focus on weeds in broadleaf cropping systems (i.e. alfalfa, canola, cotton, etc.), fruit & nut crops, and vegetables. The survey is open to ALL members of weed science societies in the U.S. and Canada.

Survey link:

<https://www.surveymonkey.com/r/2016weeds>

We hope to use the data to make informed policy decisions and control strategies, promote awareness of emerging threats, and monitor trends and progress over time. To view last year's results, please go to:

<http://wssa.net/wssa/weed/surveys/>

Lee Van Wychen,
Science Policy Director
National and Regional Weed
Science Societies

Changes Announced in the AFRI Foundation Program

The FY 2016 AFRI Foundational Program RFA's were released on May 13 and I want to let you know about changes in the Plant Health and Production and Plant Products (PHPPP) program area that provide new opportunities for weed scientists; the RFA is available at <https://nifa.usda.gov/funding-opportunity/agriculture-and-food-research-initiative-foundational-program>.

The major changes are:

1) Plant-Associated Insects and Nematodes & Controlling Weedy and Invasive Plants were combined into a single program area priority titled "Pests and Beneficial Species in Agricultural Production Systems"; and 2) Growth and Development, Composition and Stress Tolerance & Photosynthesis and Nutrient Use in Agricultural Plants were combined into a single program area priority titled "Physiology of Agricultural Plants".

For more information contact:
Michael S. Fitzner
Director, Plant Protection Division
Institute of Food Production and
Sustainability
National Institute of Food and
Agriculture
U.S. Department of Agriculture
office: 202 401-4939 email:
mfitzner@nifa.usda.gov

In FY 2016, three of the four PHPPP program area priorities include objectives that are relevant to weed scientists (I've added red highlighting for emphasis):

1. Pests and Beneficial Species in Agricultural Production Systems: supports research to elucidate the fundamental ecological, molecular, biological and/or chemical processes affecting the abundance and spread of plant-associated pests (insects, nematodes, pathogens and **weeds**) and healthy populations of beneficial species (pollinators and biological control agents) in agricultural production systems (including croplands, managed forests and rangelands).

- Studies involving **invasive** and newly emerging pests as well as established pest species are encouraged.
- Understanding movement or dispersal dynamics of pests or beneficial organisms, including . . . the influence of agronomic practices on **weed populations**, and research on fundamental aspects of **weed biology** that impact reproductive biology, seedbank dynamics, and other aspects of population dynamics.
- Mechanisms of resistance to pesticides (fungicides, **herbicides**, insecticides, etc.) and/or strategies to mitigate resistance.
- Elucidation of individual or interacting factors that affect pollinator populations . . . this includes research on the interplay of **weedy flora** and pollinator health.

2. Foundational Knowledge of Agricultural Production Systems: supports research advancing our understanding of cropland, managed forest, and rangeland production systems. Research supported by this priority will address critical or **process-limiting dynamics** that occur among and within the **various management components of the production system**.

3. Physiology of Agricultural Plants: supports research that uses molecular, biochemical, whole-plant, agronomic or eco-physiological approaches to improve plant productivity or performance.

- Primary and secondary metabolism in agriculturally-important plants and associated **weeds**, with particular relevance to nutritional quality of food and feed and economically-important traits including traits with potential benefits in **weed control**.

Please help us inform the weed science research community that the AFRI Foundational Program RFA has been restructured and that it solicits a broader range of scientific inquiry important to the management of weeds. We would also like your help in alerting them to other NIFA grants programs that may be potential sources of funding for their work; the NIFA weed science webpage (<https://nifa.usda.gov/program/weed-science>) provides links to programs that may be relevant.

Please let me know if you have any questions about the new funding opportunities for weed science research included in the FY 2016 AFRI Foundational Program RFA. I hope that the priorities identified in the RFA reflect the research needs that were identified by the weed science community over the past several months. We think the renewed focus on agricultural production systems is well aligned with the core concerns within the weed science community.

NIFA Open Funding Requests for Applications with Opportunities for Weed Scientists

Crop Protection and Pest Management Program, Applied Research and Development Program Area.

1) We are soliciting applications for the Crop Protection and Pest Management Competitive Grants Program. This year we are competitively soliciting only Applied Research and Development Program Area (ARDP) applications with approximately \$4 million available for grants.

In this RFA, NIFA is soliciting applications for Applied Research and Development Program Area (ARDP) projects:

- a. Project Period – Two to four years.
- b. Budget – Budgets may not exceed \$325,000 total per project for (1) applications with Project Directors (PDs) from more than one state/territory or (2) applications that address a significant crop/commodity that is predominately produced in one state/territory and where multistate collaboration is not practical. Budgets may not exceed \$200,000 for all other applications with PDs from one state/territory.
- c. Depending on the size of project budget requests, NIFA anticipates making in the range of 12 to 20 awards.
- d. Purpose – To enhance the development, adoption, and implementation of innovative, ecologically-based, sustainable IPM tactics and strategies that address regional and/or national IPM priorities concerning pests (including insects, nematodes, pathogens, weeds, and other pests). Proposals can be in agricultural, recreational, suburban, and urban ecosystems.
- e. Proposals can be for research (single-function), research-led, or extension-led projects.

Herbert T. Bolton, Ph.D., B.C.E.
National Program Leader, Division of
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Washington, DC 20024

<http://www.nifa.usda.gov>

This program area started in 2014 and NIFA has funded projects on integrated pest management of weeds.

There are links to view the RFA and to apply for a grant on our NIFA website funding opportunity page at <https://nifa.usda.gov/funding-opportunity/crop-protection-and-pest-management>

Integrated Research, Education, and Extension Competitive Grants Program - Methyl Bromide Transition

1.) We are soliciting applications for the Integrated Research, Education, and Extension Competitive Grants Program - Methyl Bromide Transition. Approximately \$2 million is available for grants.

- a. Project Period – Up to three years.
- b. Budget – Budgets may not exceed \$500,000 total per project.
- c. Depending on the size of project budget requests, NIFA anticipates making in the range of 5 awards.
- d. Purpose – To support the discovery and implementation of practical pest management alternatives to methyl bromide.
- e. Proposals can be for integrated (research and extension), extension-only, and state of the commodity projects.

NIFA has had this program for a number of years and has funded projects on integrated pest management of weeds in the context of projects covering the entire spectrum of pests (weeds, pathogens, and nematodes) that impact commodities where methyl bromide was once used as a control agent, i.e. tomatoes, strawberries, etc.

There are links to view the RFA and to apply for a grant on our NIFA website funding opportunity page at <https://nifa.usda.gov/funding-opportunity/methyl-bromide-transition>.

I would be happy to talk to any interested applicants about these two programs.

Register now for ISAA 2016 at www.isaa2016.org!

13-17 June at the Hyatt Regency Monterey Hotel and Spa on Del Monte Golf Course

Keynote speakers include Paul Hodges (International eChem), Glenda Humiston (University of California), and John Hamer (Monsanto Growth Ventures). Session topics include Spray drift and droplet fate, Biological performance, Use and application, Mode of action, Formulation and adjuvant technology, Biopesticide adjuvants, Precision agriculture trends, and the Regulatory environment in the Western US.



Join us and our great sponsors and speakers in Monterey in 2016

Tiered sponsorships, as well as these opportunities (and more) for sponsorship are still available: Coffee breaks, breakfasts, lunches, welcome reception, poster session, the proceedings publication, symposium app, and an interesting array of ag field trips.

For further information on ISAA 2016, contact
Solito Sumulong, ISAA 2016 Organizing Chair, Loveland Products, Crop Production
Services, Loveland, CO, USA, +1 970-685-3579, solito.sumulong@cpsagu.com
www.isaa2016.org

Aquatic Weed School 2016

Registration is open for the Aquatic Weed School 2016 (Sept. 7-8, 2016 at the Bowley Plant Science Teaching Center on the UC Davis campus.)

This Aquatic Weed School 2016 is an intensive **two-day course** focusing on issues associated with developing weed management strategies in a variety of aquatic ecosystems.

The course provides a rare opportunity for professionals to efficiently update their understanding of aquatic weeds and interact with experts in this field.



The Aquatic Weed School is designed for those involved in consulting, research, and management of aquatic weed systems throughout the western United States.

The registration fee is \$455.00 if received by 8/7/2016 and \$555 if received after 8/7/2016.

For more information or to register, visit the course website
(http://wric.ucdavis.edu/events/aquatic_weed_school_2016.htm.)

In Memoriam

Memorial services for Harold Ray Hurst, 80, of Leland, Miss., will be at 2 p.m. Thursday at Boone Funeral Home, Leland. He died surrounded by his family Sunday March 20, 2016. Burial will be at 2 p.m. Friday at Hess Cemetery, near Coal Hill, Ark.

Harold, the son of a Coal Hill, Ark. small farmer, started working with his father at age 9. He was the first one in his family to earn a college degree, going on get his Master's degree at the University of Arkansas (Fayetteville) and his Ph.D. at Kansas State University. During his career as a weed scientist/plant physiologist, Dr. Hurst worked first for the University of Arkansas Cooperative Extension Service. He then worked for 29 years for Mississippi State University as head of the state weed control research program and assistant superintendent of the Delta Branch Experiment Station (MAFES). Despite his success, Harold never forgot his roots and remained a humble man throughout his life. He was a member of the Church of Christ.

Harold was preceded in death by his parents, Everett and Emma Hurst; three brothers, Vernon, Bill and Joe Lee Hurst; one sister, Reba Lou Hurst Odom; one nephew, Robert W. Stevenson III.

Harold is survived by his devoted wife of 56 years Ann Milam Hurst; four children, Michelle Hurst of Ft. Worth, TX, Melanie Bilyeu, of Brookshire, Texas, Michael Hurst of Mabon, and Melissa Hurst, of Kaufman, Texas; six grandchildren, Jessica, Hunter, Jolie, Recardo, Luke, and Jacob; one sister, Anice Hurst Stevenson of Hernando; and five nephews, Mitchell, Kevin, Thom, Clark, and Jon.

In Memoriam



Dr. Theodore "Ted" M. Webster passed away on Tuesday, February 16, 2016. Ted was a Research Agronomist with USDA-ARS in Tifton, GA. Additionally, Ted was Research Leader of the Crop Protection and Management Research Unit. Ted was one of the agency's newest Research Leaders having accepted the position in July of 2015. Ted was born in 1969 in Pensacola, Florida, and grew up in Mentor, Ohio, where he was an avid fan of Cleveland Indians.

Ted earned his B.S. in Agronomy in 1991 and M.S. in Agronomy in 1993 from Ohio State University and his Ph.D. in Crop Science in 1996 from North Carolina State University under the direction of Dr. Harold Coble. Dr. Webster joined USDA-ARS in 1998 as a Research Agronomist with Crop Protection and Management Research Unit. His research focused on the biology and management of difficult to control and/or herbicide-resistant weeds (e.g. Palmer amaranth, Benghal dayflower, and purple nutsedge). Additionally, Ted was instrumental in research that developed cost-effective alternatives to methyl bromide fumigation in vegetable crop production. Recently, Ted was involved in the evaluation of potential biofuel crops for the southeastern coastal plain.

Ted's research was the foundation on which many the cost-effective and ecologically responsible management systems for these troublesome weeds are based. Simply stated, Ted was the research force behind the efforts to manage these troublesome weeds in the southeastern U. S. This research gave Ted international stature and recognition for his expertise as a weed ecologist. Dr. Webster was a prolific and gifted writer on these topics. As a M.S. student, his article published in WEED TECHNOLOGY was chosen as the outstanding article for that journal in 1994. Ted was invited to present his findings at meetings of the 9th Brazilian Cotton Congress, Caribbean Food Crops Society, and National Alliance of Independent Crop Consultants. His research has attracted numerous international visitors, including a delegation of the U.N. Methyl Bromide Technical Options Committee and scientists from Australia, Brazil, China, Denmark, England, and Germany.

Ted was an active member of the Southern Weed Science Society (SWSS) and the Weed Science Society of America (WSSA), generously volunteering service in numerous capacities for many years. Ted was elected to serve as Editor of the SWSS Proceedings and during his service he converted publication of the Proceedings to on-line access, which included archiving earlier volumes. Dr. Webster provided an invaluable service to the weed science discipline by coordinating and publishing SWSS Weed Survey annually for 18 years. This survey provided irrefutable documentation of changes in weed species diversity, including the development of Palmer amaranth as the most troublesome weed in multiple cropping systems throughout the southern region. The WSSA benefitted from Dr. Webster's dedication by his long-time service as Associate Editor of the journals WEED SCIENCE and WEED TECHNOLOGY.

While Ted's accomplishments and impact as a researcher were stellar, he was civic minded and contributed much to the Tifton community. Ted was Scoutmaster for Troop 62 in Tifton where he had great camaraderie with his scouts and fellow leaders. In fact, Ted led a group of his scouts to Philmont Scout Ranch the summer of 2015. Ted volunteered time as a local Election Poll Worker. Ted was an active member of New Life Presbyterian Church.

Ted was dedicated to his family who, to the delight of all employees, were frequent visitors to his office. In addition to his parents, Dr. Webster is survived by his wife, Lisa Marie Darragh Webster of Tifton; two daughters, Maegan E. Webster and Mary Ellen I. Webster, and two sons, Jonathan T. Webster and Benjamin V. Webster; one sister and one brother-in-law, Wendy and Brian Yeary of Mentor, Ohio; and two nephews.

Funeral services will be held at 3:00 P.M., Friday, February 19, 2016, at New Life Presbyterian Church. Private interment will be held at a later date. The family will receive friends on Friday, February 19, 2016, from 1:00 P.M. until 2:30 P.M. at New Life Church and Boy Scout Troop 62 will serve as his Honor Guard. You may sign the online guest registry at www.albrittonfuneral.com.

Friends,

As you may or may not know, I retired from LSU on December 1, 2015 with over 36 years of service. My career in Louisiana started at the Rice Research Station in 1979 and after 8 years there I moved to the Baton Rouge campus. I have had the opportunity to interact with around a thousand students through teaching activities and have had the privilege of guiding the research and training of 51 graduate students as major professor or co-major professor. Through the hard work and commitment of my graduate students and student workers, I was able to build a respectable weed research program in sugarcane, soybeans, and corn. I was able also to share research results with county agents, growers, consultants, and ag-chemical representatives through parish grower meetings, extension agent training meetings, and field days. I have been truly blessed to have been given the opportunities by LSU and the LSU AgCenter to serve the agricultural industry in Louisiana.

For the last few months I have continued to come in the office to help Josh Copes get his thesis written and defended and to help Matt Foster complete a paper from his research and finalize his degree program. I was recently approved for Emeritus Professor status which means that I will be able to

retain membership on the graduate faculty. I plan to continue my service on several graduate committees which will allow me to slowly ease out of academia.

My home here in Baton Rouge is on the market and plans are to make a permanent move to Mississippi once the home is sold. Carol and I were fortunate to purchase a home and 35 acres outside of Batesville, MS. Batesville is located on I55 about an hour south of Memphis. Our place is less than a half mile from my daughter, son-in-law, and two grandsons. I have several projects underway that will keep me busy and two boys who will need my attention. My contact information will be:

Jim Griffin, 266A Sullivant Road, Batesville, MS 38606, jgriffin@agcenter.lsu.edu, (225) 281-9370
In closing, I thank you for your friendship and support. It has been a great ride. Feel free to contact me if I can be of help or if you just need to visit. Also feel free to stop by if you in the area.

Jim Griffin

WASHINGTON REPORT

May 1, 2016

Lee Van Wychen

National Weed Survey

Last year, the National and Regional Weed Science Societies conducted a survey of the most common and troublesome weeds in 26 different cropping systems and natural areas across the U.S. and Canada. **Common** weeds refer to those weeds you most frequently see, while **troublesome** weeds are those that are most difficult to control (but may not be widespread). There were nearly 700 responses from 49 states, Puerto Rico, and eight Canadian provinces. The entire data set for 2015 is available for download at: http://wssa.net/wp-content/uploads/2015-Weed-Survey_final.xlsx

Specific to the states that comprise the SWSS membership, I have included the top 5 most common and troublesome weeds in agronomic cropping systems (top) and natural areas (bottom). "Times Listed" is the number of survey respondents who listed that weed as one of their top five species for that particular cropping system or natural area.

Top 5 Weeds in SWSS Agronomic Cropping Systems*					
Rank	Most COMMON	Times Listed	Rank	Most TROUBLESOME	Times Listed
1	Palmer amaranth	61	1	Palmer amaranth	58
2	morningglory spp.	53	2	morningglory spp.	54
3	crabgrass spp.	29	3	Johnsongrass	18
4	barnyardgrass	15	4	horseweed (maretail)	16
5	horseweed (maretail)	15	5	nutsedge spp.	15

*Agronomic cropping systems included alfalfa, corn, cotton, fruits & nuts, peanut, pulses, rice, sorghum, and soybean.

Top 5 Weeds in SWSS Natural Areas**					
Rank	Most COMMON	Times Listed	Rank	Most TROUBLESOME	Times Listed
1	cogongrass	7	1	cogongrass	13
t2	Chinese tallowtree	6	2	Chinese tallowtree	9
t2	privet spp.	6	3	privet spp.	7
t2	croton spp.	6	4	Brazilian peppertree	6
t5	kudzu	5	t5	kudzu	4
t5	Brazilian peppertree	5	t5	horsenettle	4

** Natural areas included forests, parks, wildlife refuges, pastures, and right-of-ways

Going forward, the National and Regional Weed Science Societies will conduct this survey every year, but split it into a 3-year rotation. The 2016 survey will cover the most common and troublesome weeds in broadleaf crops (i.e alfalfa, canola, pulse crops, etc...), fruit & nut crops, and vegetables. **The 2016 survey is currently open and available at:** <https://www.surveymonkey.com/r/2016weeds>. In 2017, the survey will cover weeds in grass crops/pasture/turf. In the 3rd year of the rotation, 2018, the survey will cover weeds in aquatic/non-crop/natural areas.

EPA Seeks Comments on Decision to Register Dicamba-Tolerant Crops

On April 1, EPA proposed to register new uses of the diglycolamine (DGA) salt formulation of dicamba (M1691) for pre- and post-emergence applications in dicamba-tolerant cotton and soybeans. Monsanto's M1691 is already registered and contains 58.1% a.i. dicamba DGA salt.

The initial comment period of 30 days was extended for another 30 days and now closes **May 31, 2016**. After the comment period closes, EPA will review all of the comments and reach a final decision, which they expect to issue in late summer or early fall. In other words, **dicamba will NOT be registered for use on dicamba-tolerant varieties in the 2016 growing season**. While growers have been able to purchase dicamba-tolerant cotton and soybean varieties since January 20, 2015 when USDA-APHIS announced its determinations for nonregulated status, it is **still illegal** to apply any formulation of dicamba for post-emergence weed control in those cotton and soybean varieties. Any private applicator who knowingly violates any provision of FIFRA is subject to a fine of not more than \$1,000 and/or imprisonment not to exceed 30 days.

EPA's proposed registration outlines a **Resistance Management Plan (RMP)** to ensure that use of dicamba on dicamba-tolerant cotton and soybeans successfully manages weed resistance problems. The proposed RMP is a creative and comprehensive plan to deal with herbicide resistance and is a logical outcome from the comments made by EPA's Director of the Office of Pesticide Programs, Jack Housenger, during his presentation at the 2nd Herbicide Resistance Summit. However, the **proposed RMP also represents a significant change in how weed resistance is monitored, mitigated and communicated**. As such, it is troubling that the proposal was included as part of the proposed dicamba registration and not as a separate Pesticide Registration (PR) notice by itself. The policy implications of the RMP proposal are significant enough to warrant this action; therefore the National and Regional Weed Science Societies are urging EPA to follow with a PR notice solely on the herbicide resistance management plan.

EPA's human health risk assessment showed no exceedance of levels of concern for human health, resulting in a determination that dicamba's use, as approved, will not cause health risks to people living near treated fields, even at the edge of those fields. However, there are concerns about off-site movement to non-target plants, so EPA has proposed the following application restrictions for M1691 to aid in spray drift management:

- No applications from aircraft.
- **Only one nozzle**, the Tee Jet® TTI11004, can be used
- No applications when wind speed is over 15 mph.
- Do not exceed a boom height of 24 inches above target pest or crop.
- A **within-field buffer that ranges from 110 to 220 feet in all directions**, depending on application rate
- Applications should not occur during a local, low level temperature inversion because drift potential is high.
- Do not apply when the wind is blowing towards adjacent commercially grown sensitive crops such as tomatoes, cucurbits, and grapes.

One concern we do have is EPA's proposed **prohibition on tank mixes** with M1691 due to the possible unknown synergistic effects on non-target plants including endangered species. However, research has shown that herbicide mixtures utilizing two or more different mechanisms-of-action

(MOA's) applied at the same time are more effective at preventing weed resistance than a rotation of herbicide MOA's where only one MOA is applied at a time. In the proposed registration, EPA states *"at this time, the topic of **synergy** and multiple stressors is an **uncertainty** in assessing risk to non-target plants including endangered species. Therefore, EPA is proposing a **tank mix prohibition** on the M1691 label to address this uncertainty"*. Given the above spray drift management restrictions already required, especially the minimum 110 foot buffer, I would argue that the benefits of being able to tank mix two MOA's for resistance management far outweighs any possible unknown synergism on an endangered species.

EPA is proposing a time limited registration that would **expire in five years**. At the end of five years, EPA can work to address any unexpected weed resistance issues that may result from the proposed uses before granting an extension or allow the registration to terminate if necessary.

EPA's proposed registration is for **34 states**: Alabama, Arkansas, Arizona, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, West Virginia, and Wisconsin. **States NOT** on the proposed label are in the west: AK, HI, WA, OR, CA, NV, ID, MT, WY, UT; and the northeast: CT, RI, MA, VT, NH, and ME. Additional states may be added to the labeling once an endangered species assessment is completed and demonstrates that a no effects determination is appropriate for any such state.

Public comments on EPA's proposed regulatory decision must be submitted no later than **May 31, 2016**. Comments may be submitted to the EPA docket [EPA-HQ-OPP-2016-0187](https://www.regulations.gov) at www.regulations.gov.

For more details: <https://www.epa.gov/ingredients-used-pesticide-products/epa-seeks-comment-proposed-decision-register-herbicide-dicamba>

EPA Inspector General Investigating Herbicide Resistance

The EPA's Office of Inspector General (OIG) has launched an evaluation of how effective the agency is at delaying or preventing the spread of herbicide resistance weeds. While this evaluation was not part of [EPA OIG's original FY 2016 annual work plan](#), my understanding is that it is a logical offshoot of an EPA-OIG evaluation of the Office of Pesticide Programs' Genetically Engineered Corn Insect Resistance Management Program which they expect to finish up this summer. I had a very pleasant interview with the EPA OIG team conducting the herbicide resistance evaluation on March 29. The overall objective of the meeting was to obtain external perspectives on federal work to address herbicide resistance, particularly as it pertains to emerging issues and potential opportunities for improvement. The OIG team asked many excellent questions about herbicide resistance, including:

- Please discuss your perspective on federal regulation of GE crops and herbicides.
 - Do you have any opinion on or knowledge of the coordination and interactions between FDA, USDA, and the EPA on GE crops?
 - How well do you feel federal regulators work with and incorporate the perspectives of outside organizations?
 - How well does the regulatory system work to allow farmers and manufacturers to be nimble in adapting to herbicide resistance?
- In your opinion, does the federal community do a good job of managing GE crops and protecting against herbicide resistance?
- What is the extent of the problem of herbicide resistant weeds in agriculture? Please quantify this in financial terms, if possible.
- What are the issues facing in the agricultural community in conveying issues of resistance to federal regulators?
- Please discuss what you see as the greatest challenges facing the agricultural community in herbicide resistance. Are there any instances of resistance emerging in the past about which you can talk, specifically how farmers were affected, how herbicide manufacturers addressed resistance, and what, if any, federal actions were taken in response?

- Please discuss your thoughts on the registration and then withdrawal of Enlist Duo. What were the problems in the registration process? What is the impact of this on farmers?
- What are the areas where more work is needed or missed opportunities that the federal government should encourage?
- How well do you feel issues of risk are communicated by the federal government when it comes to GE crops and herbicide resistance?

The weed science community has been dealing with many of these herbicide resistance issues for several decades and I would encourage you to share your expertise with the EPA OIG herbicide resistance team if they reach out to you.

EPA Proposes New Paraquat Restrictions

EPA has proposed new restrictions and mitigation measures for paraquat, which is currently undergoing registration review. Paraquat is an important option for non-selective weed control. It is widely used in non-crop areas and fallow and as a defoliant for crops like cotton and potatoes. We also know that paraquat is toxic in mammalian systems and can be lethal if ingested in small amounts. Since 2000, there have been 17 deaths caused by accidental ingestion of paraquat. These cases have resulted from paraquat being illegally transferred to beverage containers like Gatorade bottles and coffee cups, and later mistaken for a drink and consumed. EPA is proposing the following changes:

1. New closed-system packaging designed to make it impossible to transfer or remove the pesticide except directly into the proper application equipment;
2. Special training for certified applicators who use paraquat to emphasize that the chemical must not be transferred to or stored in improper containers;
3. Changes to the pesticide label and warning materials to highlight the toxicity and risks associated with paraquat.
4. Prohibiting application from hand-held and backpack equipment; and,
5. Restricting the use to certified pesticide applicators only (individuals working under the supervision of a certified applicator would be prohibited from using paraquat).

Paraquat is already a Restricted Use Pesticide for use only by certified applicators or persons under their direct supervision. We support increased education and enhanced warning materials for paraquat, but have concerns about application prohibitions or restrictions. EPA's proposed restrictions on paraquat will be available for comment until **May 19, 2016**. If you have specific concerns or suggestions, please contact me. EPA will consider all public comments before finalizing these proposed actions later this year. For more details: <http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OPP-2011-0855>

FY 2017 Ag Appropriations

The House Agriculture Appropriations Subcommittee released its budget in April and many of the USDA agencies that receive funding for weed research and management received modest increases. Agencies that the House proposed for increases include: APHIS, ARS, NIFA, and NRCS. Within NIFA, the AFRI Competitive Grants program saw a proposed increase of \$25 million over the FY 2016 appropriation of \$350 million. However, most of the other NIFA line items relevant to weed science were held constant to the FY 2016 levels. This included Hatch Act, McIntire-Stennis, Smith Lever b & c, IR-4, SARE, and Crop Protection and Pest Management.

There are also various instructions and recommendations included in the House Ag Appropriations bill related to weed science and pest management in general. Here are six areas that were mentioned:

- **USDA and EPA Cooperation.**—Interagency Consultation.—The Department (USDA) has a robust history of collecting and analyzing data related to agricultural economics and the environmental impact of farming practices upon the environment, including crop protection and pest management. Although several provisions in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) require USDA and US EPA to consult and coordinate together, there has been a recent notable disconnect. Given the Department's expertise, the Committee directs the

Secretary to ensure USDA experts consult with the US EPA on regulatory decisions impacting America's farmers.

- **Office of Pest Management Policy.**—The Committee commends the Office of Pest Management Policy for its work providing the Department, federal agencies, producers, and other interested stakeholders scientifically sound analysis of pest management issues important to agriculture, especially methyl bromide transition, **pesticide resistance management**, and the development of antimicrobials to combat citrus greening. The Committee encourages the Under Secretary to better utilize this office and directs ARS to continue to support its vital work.
- **Invasive Species.**—The Committee recognizes the threats posed by invasive plant species and the need to protect, restore, and enhance native plants, including those that are endangered or threatened. The Committee encourages ARS, the Natural Resources Conservation Service (NRCS), and NIFA to support the research, education, and conservation of native plants.
- **Cheat Grass Eradication.**—The Committee encourages NRCS to continue to assist farmers and ranchers to eradicate, control, and reduce the fuel loads associated with cheat grass and to collaborate with ARS, as appropriate, on research related to cheat grass.
- **Herbicide Resistance.**—The Committee reminds NRCS of the challenges many producers are facing due to the spread of herbicide-resistant weeds and encourages it to ensure agency staff, partners, and producers are aware of conservation practice standards, conservation activity plans to address herbicide-resistant weeds, and financial assistance available through conservation programs to assist producers in their efforts to control these weeds.
- **Milkweed.**—The Committee is concerned about the rapid decline in milkweed for monarch butterfly habitat. The Committee encourages NRCS consider the increased benefits of restoring milkweed for monarch habitat in fiscal year 2017.

Cornell Study- Lack of Milkweed is Unlikely to be Driving Monarch Decline

The *Oikos Journal* published a Cornell study online on April 27 titled "[Linking the continental migratory cycle of the monarch butterfly to understand its population decline](#)". **Abstract:** Threats to several of the world's great animal migrations necessitate a research agenda focused on identifying drivers of their population dynamics. The monarch butterfly is an iconic species whose continental migratory population in eastern North America has been declining precipitously. Recent analyses have linked the monarch decline to reduced abundance of milkweed host plants in the USA caused by increased use of genetically modified herbicide-resistant crops. To identify the most sensitive stages in the monarch's annual multi-generational migration, and to test the milkweed limitation hypothesis, we analyzed 22 years of citizen science records from four monitoring programs across North America. We analyzed the relationships between butterfly population indices at successive stages of the annual migratory cycle to assess demographic connections and to address the roles of migrant population size versus temporal trends that reflect changes in habitat or resource quality. We find a sharp annual population decline in the first breeding generation in the southern USA, driven by the progressively smaller numbers of spring migrants from the overwintering grounds in Mexico. Monarch populations then build regionally during the summer generations. **Contrary to the milkweed limitation hypothesis, we did not find statistically significant temporal trends in stage-to-stage population relationships in the mid-western or northeastern USA. In contrast, there are statistically significant negative temporal trends at the overwintering grounds in Mexico**, suggesting that monarch success during the fall migration and re-establishment strongly contributes to the butterfly decline. Lack of milkweed, the only host plant for monarch butterfly caterpillars, is unlikely to be driving the monarch's population decline. Conservation efforts therefore require additional focus on the later phases in the monarch's annual migratory cycle. We hypothesize that lack of nectar sources, habitat fragmentation, continued degradation at the overwintering sites, or other threats to successful fall migration are critical limiting factors for declining monarchs.

Overwintering Monarch Butterfly Numbers Triple, Then Hit with March Snowstorm

On February 27, the World Wildlife Fund and the Mexican National Commission of Protected Natural Areas reported that the total forest area in central Mexico occupied by overwintering monarch colonies was 4.01 hectares. This is up from last year's number of 1.13 hectares and 0.67 hectares the year before that. This year's reported population is estimated to be 200 million monarchs compared to the long-term average of 300 million. The National Strategy to Promote the Health of Honey Bees and Other Pollinators has set a

short-term target of 225 million monarchs overwintering in Mexico (approximately six hectares of covered forest) by 2020 through national/international actions and public/private partnerships.

Many anti-GMO groups have been plastering the internet with all kinds of misinformation about the impact of herbicide tolerant crops on milkweed numbers, and thus on monarch numbers. But the fact remains that milkweed spp. have never been a dominant “driver” weed species in farm fields across the Midwest. Farmers have been effectively managing milkweed patches in their fields with tillage and/or herbicides long before the advent of genetically-engineered crops. When I was a crop scout and research assistant in college, the places where I always saw the most milkweed species was in the road ditches, right-of-ways, and other non-tilled, non-farmed areas.

To me, the major factors dominating monarch butterfly population fluctuations are the loss of overwintering habitat in Mexico (the oyamel fir forest is reportedly only 2% of once it once was) and the weather. The Cornell study just mentioned in the preceding story supports those thoughts. Furthermore, only 2 weeks after the overwintering monarch population numbers were announced in February, a March 11 snowstorm with subfreezing temps and 50 mph wind gusts hit Mexico's overwintering grounds for the monarch. Only time will tell how many monarchs perished, but the estimates range from 3 – 50% of the reported overwintering population of 200 million.

Weed scientists can advocate steps to promote habitats where pollinators or iconic insects such as the monarch butterfly can flourish, beginning with the adoption of a prudent approach to weed management. While it is crucial that we control invasive, noxious, and herbicide-resistant weeds that can overtake crops and native plants, other weeds such as common milkweed might be left to grow in areas where it is likely to do no harm. The key is to exercise good judgment about which weeds to control, when and where. Let's hope that science and facts prevail in people's decisions for promoting monarch butterfly habitat.



National Invasive Species Awareness Week (NISAW) was February 21-27, 2016.

Invasive weeds alone represent a multibillion dollar annual drain on our economy, so it's important that we educate ourselves, become mindful of invasive species and use what we know to guide our

actions throughout the year. Here are some tips for staying informed and making wise decisions:

- Learn about invasive species, especially those found in your region. Your [county extension office](#) and the [National Invasive Species Information Center](#) are both trusted resources.
- Fully comply with all U.S. government regulations regarding the [transport of agricultural products](#) into the country through U.S. Customs.
- If you camp, don't bring firewood along. Instead, buy wood where you'll burn it, or gather it on site when permitted.
- Clean hiking boots, waders, boats and trailers, off-road vehicles, and other gear to stop invasive species from hitching a ride to a new location.

The following webinars were recorded during NISAW and are available at www.NISAW.org

- “Let's Take a Hack at ‘Hack and Squirt’ Individual Plant Treatments”
- “Volunteers Make a Difference in an Early Detection Rapid Response Citizen Science Program”
- “Protecting the Sierra Nevada from Invasive Plants: Incorporating Climate Adaptation into Wildland Weed Management”
- “Treating Firewood is a Hot Topic: Seasoning, Solarizing, Kiln Drying and Heat Treatment”
- “Weed Wrangle: A Template for Engaging Local Communities through Citywide Invasive Plant Events”

In addition to those webinars, February 22 was "rollout day" in Washington, D.C., for the CAST Commentary: [A Life-cycle Approach to Low-invasion Potential Bioenergy Production](#). With the assistance of the National Coalition for Food and Ag Research (NC-FAR), CAST presented the timely

paper to a morning session of Senate staffers and then at a lunch gathering of House staffers where I served as moderator. In the afternoon, CAST and the Environmental Law Institute co-hosted a presentation regarding bioenergy and invasive species where CAST EVP Kent Schescke served as moderator. Jacob Barney (Virginia Tech) and Read Porter (Environmental Law Institute) presented key information from the new commentary and commenters included Aviva Glaser (National Wildlife Federation), Anthony Koop (USDA/APHIS), and Jonathan Jones (USDA/APHIS). The webinar was recorded and is available [HERE](#).

National Invasive Species Awareness Week concluded with a Congressional Reception and Fair on Capitol Hill where many of the Federal Agencies presented information and educational materials on their invasive species activities. Welcoming remarks were given by Congressional Invasive Species Caucus Co-Chairs, Reps. Dan Benishek (R-MI) and Mike Thompson (D-CA), in addition to remarks by Rep. Cynthia Lummis (R-WY). The keynote address was given by the Administrator of USDA-APHIS, Kevin Shea.

Perfect Herbicide? Don't Expect Help From New Chemistry and This is Why

By Stanley Culpepper and William Vencill, University of Georgia (reprinted with permission).

Ever wonder why weed scientists are so aggressive about protecting herbicide chemistry? Growers are constantly being told to protect the chemistry available today because who knows when, or if, they will get anymore. But why is that? In short, any new chemistry would have to be 'the perfect herbicide.'

But let's say we want to try to bring new chemistry to the farm today and make that perfect herbicide. What do we need to do?

To get our new herbicide chemistry venture started, we need at least \$250 million. After Brad Haire (reporter for Southeast Farm Press) donates the money, we will begin our research and development of the perfect herbicide. Brad needs to understand he will have to wait 10-15 years to begin getting any of his investment back and then only has 14 years before others can start selling the same product. Let's say by some miracle Brad coughs up the \$250 million. What do we need to do next to get to growers new herbicide chemistry?

Environmentally friendly is a requirement for our new product. It cannot pose a threat to surface waters, ground waters, wildlife, fish and most every other critter on earth. And for sure, it cannot pose any risk to endangered species: to plants as well as animals that eat plants. Persistence of the herbicide also must be understood early in development, or in other words we need the herbicide to last just long enough to help growers, but then we need the herbicide to break down into friendly natural compounds that will not harm the environment or people. The herbicide certainly can't pose any carryover risk to the crops our growers rotate into either! Additionally, we have to:

- 1) Make sure the product does not cause unacceptable crop injury under a million different environmental conditions and grower production practices.
- 2) Make sure the product has an extended shelf life for storage, so it doesn't go bad in a few years or separate out in the tank.
- 3) Understand how soil/water pH, as well as other water and soil characteristic, influence the activity or life of our product.

We need to focus on making sure our new herbicide chemistry does not have any potential for an unfriendly odor or be prone to volatilization or drift. And, of course, we have to check every potential tank mix partner for compatibility and impact on spray droplet size. If a mixture influences droplet size by just the tiniest amount, we may have the EPA increasing our buffers as well as restricting our use pattern, which could threaten a grower's ability to implement a sound weed management program.

As our product is nearing commercialization, we will need to develop a resistance management plan and strategically figure out the most effective use patterns to maximize weed control, minimize crop injury and prevent resistance development. We have to make sure we can produce the appropriate amount of the product and have perfect, timely distribution across the world, because we'll need access to the global market if we hope at all to get our initial investment back.

We're almost there. We almost have the perfect herbicide. But wait, there's one more hurdle and it can come out of the blue at any time: We better be prepared for various groups to challenge our label in the Ninth U.S. Circuit Court of Appeals of California in attempts to delay or prevent our new tool getting to the growers who desperately need it as they strive to feed the world.

"Hmmm.....maybe those weed science guys are on to something. Seems pretty smart to protect the herbicide chemistry we have today by making wise decisions, implementing diversified herbicide modes of action into an integrated program that uses cover crops, tillage and/or hand weeding." At least we hope this is what you are thinking now if you haven't thought something similar already. Of course, we still need to be concerned that even if our growers do all the right things to protect current herbicide chemistries in the field today, will the products we do have now survive the current rigorous regulatory processes.

As you can see, to develop and then bring to market a new herbicide chemistry is nothing short of miraculous, which is why we haven't had any new chemistry in more than two decades. A new chemistry today would have to be perfect. And very few things are perfect. If agriculture and those who like to eat can't come together to support the development of new effective tools that are friendly within sound-science reason to the consumer, the environment or for our growers, wonder who really will feed our kids and grandkids..... They'll have to do it 'perfectly.'

\$286 Million- Cost to Bring a New Crop Protection Product to Market

CropLife America (CLA) recently helped the market research firm, Phillips McDougall, develop a study that shows the overall cost to discover and advance a new crop protection product averages \$286 million – up 21% over the previous 5 years. (Link to CLA statement with imbedded report available here: <http://www.croplifeamerica.org/cost-of-crop-protection-innovation-increases-to-286-million-per-product/>) The biggest driver in that cost increase appears to be regulatory compliance. That statistic demonstrates why it is so important to be sure that US regulatory requirements are assessments of real science and safety advancements, not simply reactions to non-scientific political ideologies.

Lee Van Wychen, Ph.D.

Lee.VanWychen@wssa.net cell: 202-746-4686

Douglas Worsham Weed Science Lecture Series

The newly organized Weed Science Program in CALS will implement a lecture series designed to enhance collaboration among weed scientists and aligned disciplines at North Carolina State University. The lecture series will be open to anyone involved in the theory and practice of understanding and managing weeds, both within and external to the university. The series is named in honor of Dr. Douglas Worsham. Dr. Worsham had a distinguished career in weed science at North Carolina State University for many years. He had a positive influence on many students at both undergraduate and graduate levels. Dr. Worsham also served many groups in North Carolina as well as groups at national and international levels through his generosity in sharing his knowledge and expertise in weed science. Dr. Worsham has long been considered a unifying figure among weed scientists at North Carolina State University. The series will include 2 to 4 lectures each year on a broad range of weed science-related topics.

Position Vacancy Announcements

Efficacy Director needed in southern Louisiana @ an established research farm. Master's degree is required. Please send resumes to PO Box 1087 Washington, LA 70589
Please let us know if you can help or if you have any questions.

Contact:
Kim Bourgeois PFI/GLP Coordinator
R&D Research Farm, Inc.
7033 Hwy 103
Washington, LA 70589
337-585-7455 office
337-418-0159 cell

**National Invasive Species Council(NISC)-
Interdepartmental Coordinator**

Office of the Secretary of Interior,
Washington DC.

Salary Range:

\$108,887.00 to \$160,300.00 / Per Year

CLOSES: Monday, MAY 2, 2016

Details at:

<https://www.usajobs.gov/GetJob/ViewDetails/436926500/>

Assistant/Associate Professor Small Grains Extension Specialist

Department of Plant and Soil Sciences Division of Agricultural Sciences and Natural Resources
Oklahoma State University – Stillwater, Oklahoma

POSITION DESCRIPTION: The Small Grains Extension Specialist is an 11-month, tenure track position. The position will be filled at either the Assistant or Associate Professor Level, and applications at each rank are encouraged. This position has 75% Extension and 25% research responsibilities and is located on the main campus in Stillwater, OK. Responsibilities include leadership for a nationally recognized, statewide extension and research program focused on wheat and other small grains. The successful candidate will develop an externally funded, applied research and demonstration program to improve the agronomic and economic viability of Oklahoma wheat production and oversee the Oklahoma Small Grains Variety Performance Tests. Focus areas can include, but are not limited to, dual-purpose wheat production, physiological responses to management, cultivar development, pest management, tillage systems, intensive wheat management, and strategies to avoid or ameliorate environmental stresses such as drought. Extension efforts will include web-based and innovative information delivery methods, and periodic impact assessment of extension activities is expected. Collaboration with the OSU Wheat Improvement Team, Plant and Soil Sciences faculty, industry partners, and county, area, and state Extension personnel is essential.

OKLAHOMA WHEAT INDUSTRY: Oklahoma produces approximately 5.3 million acres of wheat annually and wheat is the primary grain crop for the state. In addition, stocker cattle graze approximately 30 to 50% of acres during winter months, making wheat pasture an integral part of the \$3.4 billion Oklahoma cattle industry. Industry and stakeholder support is strong for this position.

OSU WHEAT IMPROVEMENT TEAM: The OSU Wheat Improvement Team was developed as a crosscutting collection of scientists who work collaboratively to develop, test, and distribute improved wheat cultivars for the southern Great Plains. Wheat varieties released by the Wheat Improvement Team now occupy almost half of Oklahoma wheat acres, 15% (3.2 million) of southern Great Plains wheat acres, and approximately 6% of the entire US wheat acreage. The Small Grains Extension Specialist serves as the information exchange lead for the Wheat Improvement Team and is an integral part of determining area of adaptation and best management strategies for candidate cultivars.

QUALIFICATIONS: Minimum qualifications include: i) PhD in Crop Science, Agronomy, or closely related field with major emphasis on crop production, ii) strong communication skills with the ability to effectively communicate to scientific and non-scientific audiences orally and in writing, iii) ability to work effectively and collaboratively with Wheat Improvement Team members, extension personnel, and industry partners, and iv) ability to develop proposals for external funding of extension and research programs. Preferred qualifications include: i) previous experience in Extension and/or outreach activities, ii) evidence of ability to secure external funding, iii) experience with effective use of electronic media in extension programming, iv) evidence of the ability to publish refereed journal articles and extension publications.

SALARY Competitive and commensurate with education and experience. Hiring contingent upon available funding.

APPLICATION DEADLINE September 8, 2015, or until a suitable candidate is identified.

DATE POSITION AVAILABLE November 2, 2015

INFORMATION For more information about this position, contact Dr. Jeff Edwards, Department Head at 405.744.6130, jeff.edwards@okstate.edu or Dr. Brett Carver, Wheat Breeder and Search and Screen Committee Chair, at 405.744.9580, brett.carver@okstate.edu

APPLICATION PROCEDURE

Apply online at:

<https://okstate.csod.com/ats/careersite/search.aspx?site=8&c=okstate>.

Applications should include a letter of interest that includes vision for the position and associated extension and research activities. A separate extension philosophy should be included as part of the application materials. If assistance is needed, contact DASNR Human Resources at (405) 744-5523. Position is open until filled, and review of applications will continue until a successful applicant is identified. Contingent upon available funding.

It's Time to begin preparations for the SWSS Weed Contest

I would like to mention a couple of points as the deadline to enter teams to the weed contest draws near. First, we will not count participation at the Weed Olympics last year against a student's eligibility. Second, we would like to encourage schools to enter more than one team into the contest if interest is high enough. If you have any questions please feel free to contact Darrin Dodds or Wesley Everman.

SWSS WEED CONTEST

Monsanto's Scott Learning Center, One Cotton Row, Scott, MS 38772

Primary contact: Darrin Dodds, dmd76@pss.msstate.edu

August 2-3, 2016

RULES, REGULATIONS, AND GUIDELINES

Purpose:

The purpose of the Southern Weed Contest is to provide an educational experience from which undergraduate and graduate students in Southern Universities can broaden their applied skills in Weed Science. The contest provides an opportunity for Weed Science students be exposed to weed scientists from other universities and industry, apply what they have learned using a contest to measure their capabilities, as well as to socialize. It is hopeful that the contest will increase the visibility of Weed Science and intensify the interest level of those participating in the discipline of Weed Science.

Eligibility:

Any undergraduate or graduate student currently enrolled and pursuing a B.S., M.S., or Ph.D. degree is eligible to participate. Each graduate team will consist of three or four members, composed of (a) graduate, (b) undergraduate, or (c) a combination of graduate and undergraduate students. If undergraduates are part of a graduate team, those students are subject to the same guidelines as the graduate students. If a university does not have sufficient students for a team, up to two students may enter as individuals. Universities are allowed to enter multiple teams. All students will compete using the same contest material. A team may also bring three alternates. Alternate scores will only count toward individual awards. Team scores will be determined from averaging the individual scores from each team member; unless a three-person team is entered. Then the three highest individuals will be averaged. A maximum of two coaches per team can attend the contest. Students will be allowed to participate in the contest five times as a team member or alternate; however, the student can only participate as a team member three times. Undergraduate participation will not count against the five-time rule. **All teams must enter the contest by May 1, 2016.** Names of team members and alternates must be provided by July 1, 2016. Primary contact: **Darrin Dodds, dmd76@pss.msstate.edu**

Awards:

TEAM-The highest average team score from all events will determine the overall contest winner.

A traveling "**Broken Hoe**" trophy will be presented to the overall winner and will rotate yearly. The first place team will receive a check for \$500 and each member and coach will receive an engraved plaque. The second and third place teams will receive checks of \$300 and \$200, respectively. Each will also receive an engraved plaque as described above.

INDIVIDUAL-The highest combined score from all events, except team sprayer calibration, will determine the overall-winning individual. The top 10 individuals will be recognized and awarded a plaque. The winning individual will receive a check for \$400. Individuals finishing second, third, fourth, and fifth will receive checks from \$250, \$100, \$75, and \$50, respectively. The high individual in Weed Identification, Crop Response to Herbicides, Sprayer Calibration Problem Set, and Crop/Weed Situation and Recommendations will be recognized and awarded a plaque. If at least four undergraduate students participate in the contest, the top three individual scores will be recognized with first, second, and third place plaques and checks for \$200, \$100, and \$50, respectively.

Events:

The contest will consist of four major events plus a mystery event. Inclement weather may delay the contest; however, it will continue as soon as conditions permit.

While contestants are briefed on contest details during breakfast, coaches will be taken to the contest site to review all aspects of the contest. Coaches will review the six phases of the contest: weed identification, herbicide identification, sprayer and written calibration, field problem solving, and mystery event. The coaches will then be taken to a neutral site for breakfast. No contact, electronic or otherwise, with contestants will be allowed until all events have been completed. A committee meeting will also be conducted, if needed, either the day before the contest or on the day of the contest.

1. Weed Identification (100 points)

From the contest weed identification list of 100 weeds and weed seeds/tubers, the host will pick a total of 50 weeds and/or weed seeds to be identified. Plants will be grown in a field weed nursery or pots and may be in any stage of growth or development within reason. A complete weed identification list is provided with the correct spelling of each species (Table 1). Students will be responsible for the correct WSSA common and scientific name and spelling (Weed Science Composite List of Weeds - 2011). **Undergraduate students will only use the common names.** The fall preceding the contest the host should evaluate its weed seed supply and obtain additional seeds/tubers if needed so that an excellent representation of the weed species can be selected for identification. **It is important to utilize as many plant species as possible.** The plants will be grown in sufficient numbers so that adequate samples are available so that 30 to 70 contestants can have specimens for identification. The contestants will be allowed ample time to identify each specimen. The percentage of samples will range from 50 to 80% weeds and from 50 to 20% seeds. Uncontaminated weed seed and plant samples are essential for effective identification. **Pure samples are essential.** The contestant's score will be figured as follows: 2 points for each correctly identified species (1 point for common name and 1 point for scientific name with 0.5 points for Genus and 0.5 points for species) $\times 50 = 100$ points. **If names are not spelled correctly or capitalized correctly, they are wrong. Likewise, answers must be in the correct column.** Teams will not be supplied weed seed for study, but rather rely on their own training resources. However, teams are encouraged to expand/improve their training resources through contacts with other weed scientists. This approach may better reflect individual and team preparation for the contest.

2. Calibration (100 points)

This event consists of two sections: an individual written test worth 50 points and a team sprayer calibration event worth 50 points.

The individual written test will cover problems and factual information about sprayer and seed treatment calibration of all types; the written portion will be scored as an individual and team event (50 points per person). The host should take particular

care to insure all banded application and skip-row calibration problems are stated clearly. Individual team members and alternates will be given a maximum of 1 hour to complete the written exam. **The host will not provide calculators and students will be required to bring their own. Any make or model is acceptable, but programmable calculators are not allowed.** The three or four individual team member scores will be added and divided by the number of individuals on the team to give the number of points out of 50 for the team score. In the team section, the host will provide a hands-on calibration activity that focuses on team, rather than individual performance. Students should have practical calibration knowledge for air blast sprayers, tractor sprayers, backpack sprayers, granular applicators, greenhouse spray chambers, etc. **Differences in time for the competition will count no more than 40% of the overall score. Accuracy of calibration is critical.**

To determine final team score for the calibration event, the number of points scored out of 50 obtained in the team event will be added to the average score of the three or four high team members from the individual calibration problems for a maximum possible of 100 points.

Reference material for the individual problems will be Chapter 23 of Applied Weed Science by Ross and Lembi (2009); Circular 1192 - Equipment and Calibration; Low-Pressure Sprayers, and Circular 1240 - Equipment and Calibration: Granular Applicators, both by Bode and Pearson (University of Illinois); Roth, L.O. and H.L. Fields, eds. 1991. Introduction to Agricultural Engineering: A Problem Solving Approach, Second Edition, New York: Chapman and Hall; Aerial Application Handbook for Applicators by Dennis K. Kuhlman, Kansas State University; Research Methods in Weed Science, 3rd ed. SWSS 1986; Physiology of Herbicide Action. M.D. Devine, S. O. Duke, and C. Fedtke, 1993; Herbicide Handbook. WSSA 9th ed. 2007, and various unit conversions.

3. Crop Response to Herbicides (100 points)

This is an area of extreme difficulty for the students. **Thus, the host must have available a sprinkler irrigation system so that residual herbicides may be activated and weeds and crops maintained in an active growth stage for postemergence treatments.** A list of possible crops and herbicides with rate and method of application are provided in Table 2. The test must contain at least 6 crops and 6 weeds and will be planted and treated with a wide range of preemergence and postemergence herbicides from the list. Each herbicide plot will contain a 1X rate of the unknown herbicide. It is suggested that the test be planted 4 to 5 weeks prior to the contest, with postemergence herbicides being applied 10 to 14 days prior to the contest. Each contestant will be required to identify the unknown herbicides by WSSA-approved chemical family and common name by observation of crop and weed responses. Both names will be given equal credit; in other words missing family or common name will be half right. Put the letter for the correct family listed above, and follow it with the correctly spelled common name. For the aryloxyphenoxy or cyclohexane family, the host may choose the specific product. There should be from 10 to 15 plots. Herbicide plots may be duplicated and check plots can be utilized. It would be of great benefit to the students if they could be led back through the plots following the event. **Students will not be allowed to pull any portion of the plants in the plots. If plants are pulled, the student will lose the points for that plot.**

4. Crop/weed Situation and Recommendations (100 points)

Contestants will be required within 15 minutes to determine and evaluate a crop/weed situation and recommend the most effective legal remedy to the problem. **Each contestant will have two field problems to solve.** Recommendations must comply with the label of each herbicide recommended. Students should give consideration to such factors as stage of growth, crop tolerance, climatological factors, agricultural spraying procedures, weed control, economics, and impact upon the environment. The host will determine the best answer considering all alternatives for a situation, although several possible answers may be correct. The latest Federal (Section 3) or State (Section 24C) labels of the product constitutes legal control. The event will be conducted as a "role-play" situation and the potential problem will be in one of the crops on the problem-solving sheet. Also, the potential herbicide and weed problem will involve only the listed herbicides and weeds on the

predetermined problem-solving sheet. The contestant will be asked to assume the role of a chemical company representative, state extension specialist, or independent crop consultant when dealing with the farmer and scored as follows:

- 5 points - proper approach to farmer
- 20 points - understanding and solving problem
- 12.5 points - recommendations for this year's crop
- 12.5 points - recommendations for next year's crop

Each team will be divided at random into two groups in order to handle one of two different problem situations. Following completion of the first problem, the groups will switch problems and repeat the procedure. **Each participant will evaluate the same two problems.** Alternates and other individuals will be equally divided between the two groups. The assigned judge and farmer will independently score each participant from a predetermined scoring sheet with assigned points for each statement, compare scores, and adjust if necessary. **Prior to the contest, judges and farmers will be tested to ensure that the scorers will give equivalent scores within each individual field problem.** Each field problem will be worth 50 points and to obtain the participants score, the two scores will be added for a maximum of 100 points.

5. Mystery Event (15 to 20 points)

This team or individual event will be an agronomic related problem and the contestants will not be advised of the area to study prior to the contest. The mystery event will count toward the team score and individual scores.

Scoring

Overall team ranking of each respective school should be provided to the team coach the night of the banquet following the event. Individual score sheets including their respective ranking against all other competitors should be distributed back to the contestants or their coach at the end of the banquet. An answer key should also be distributed to the team coach.

Scores should be tabulated using a scoring format as listed in the examples below. Each phase of the contest will be scored equally (100 pts. each) except for the mystery event (15 or 20 pts) for a total of 415 or 420 points per team. Examples are:

A. All teams with four individuals.

Events											
		Field Problems				Calibration					
Super University	ID	Crop/Weed Response	1	2	Avg.	Team	Ind.	Myst.	Score	Ind.	Team Placing
John Doe	86	60	25	19	44	--	45	5	240	9	
Bill Smith	80	65	47	31	78	--	35	5	263	5	
Jane Doe	95	75	35	25	60	--	45	0	275	1	
Roy James	63	50	43	43	86	--	45	3	247	7	
Total	324.0	250.0	--	--	268	--	170	13			
Team Avg.	81.0	62.5	--	--	67	40	42.5	3.25			
Team Total											3
	296.25										
Alternates											
Pat Ray	80	60	31	201	51	--	45	5	241	8	
Jim Jones	65	45	27	18	45	--	50	0	205	20	

B. Mixed three and four individual teams (if teams with three individuals attend).

		Events									
		Field Problem				Calibration					
Super University	ID	Crop/Weed	1	2	Avg.	Team	Ind.	Myst.	Score	Ind.	Team Placing
John Doe	--	--	--	--	--	--	--	--	240	9	
Bill Smith	80	65	47	31	78	--	35	5	263	5	
Jane Doe	95	75	35	25	60	--	45	0	275	1	
Roy James	63	50	43	43	86	--	45	3	247	7	
Total	238.0	190.0	--	--	224	--	125	8			
Team	79.33	63.33	--	--	74.6	40	41.67	2.67			
Avg.											
Team											
Total	301.67										3
Alternates											
Pat Ray	80	60	31	20	51	--	45	5	241	8	
Jim Jones	65	45	27	18	45	--	50	0	205	20	

Alternates and low individuals of four member teams will not be scored as part of a team, but can win individual prizes.

Contest Committee:

All coaches and individuals within academia, research, and industry, as well as potential contest hosts are invited to serve on the committee. On the morning of the contest, prior to contestants entering the events, individuals from the host location and all committee members will review each event and last minute corrections will be made and be the authority for all questions relating to the contest. If questions arise that cannot be resolved through interpretation of the standing rules or cannot be resolved through communication with the committee chairman or members of the committee, the contest host has the authority to make the final decision in the best interest of the contest.

Expenses:

Each university will provide its own transportation to and from the contest and cover all expenses incurred during travel. The host will provide meals the evening before and the day of the contest. The weed contest committee will provide the prize money and the plaques.

Location:

The Southern Weed Contest will be held at any facility within the Southern Weed Science Region with the capability of providing all the designated events.

Dishonesty:

All coaches are charged with ensuring that teams abide by rules of the contest, and that no team gains an unfair advantage. This includes, but is not limited to, cheating. Cheating is defined as a dishonest violation of rules as determined by the coaches attending the contest. A committee made up of all coaches attending the contest will deal with acts related to cheating. A team and/or individual that does not abide by the rules of the contest will be disqualified and will automatically receive last place at the contest. Teams are not allowed to visit contest site 30 days prior to contest without permission of host. All contestants' cell phones, iPad's, or computers will be collected by team coaches and bagged by individual name when arriving at the contest site on the morning of the event.

Table 1. 2016 SWSS WEED CONTEST WEED LIST

Common name	Genus	Species
velvetleaf	<i>Abutilon</i>	<i>theophrasti</i>
hophornbeam copperleaf	<i>Acalypha</i>	<i>ostriifolia</i>
northern jointvetch	<i>Aeschynomene</i>	<i>virginica</i>
alligatorweed	<i>Alternanthera</i>	<i>philoxeroides</i>
Palmer amaranth	<i>Amaranthus</i>	<i>palmeri</i>
redroot pigweed	<i>Amaranthus</i>	<i>retroflexus</i>
spiny amaranth	<i>Amaranthus</i>	<i>spinosus</i>
tall waterhemp	<i>Amaranthus</i>	<i>tuberculatus</i>
common ragweed	<i>Ambrosia</i>	<i>artemisiifolia</i>
giant ragweed	<i>Ambrosia</i>	<i>trifida</i>
purple ammannia	<i>Ammannia</i>	<i>robusta</i>
broomsedge	<i>Andropogon</i>	<i>virginicus</i>
trumpetcreeper	<i>Campsis</i>	<i>radicans</i>
musk thistle	<i>Carduus</i>	<i>nutans</i>
smellmelon	<i>Cucumis</i>	<i>melo</i>
southern sandbur	<i>Cenchrus</i>	<i>echinatus</i>
prostrate spurge	<i>Chamaesyce</i>	<i>humistrata</i>
spotted spurge	<i>Chamaesyce</i>	<i>maculata</i>
common lambsquarters	<i>Chenopodium</i>	<i>album</i>
bull thistle	<i>Cirsium</i>	<i>vulgare</i>
Benghal dayflower	<i>Commelina</i>	<i>benghalensis</i>
spreading dayflower	<i>Commelina</i>	<i>diffusa</i>
field bindweed	<i>Convolvulus</i>	<i>arvensis</i>
horseweed	<i>Conyza</i>	<i>canadensis</i>
showy crotalaria	<i>Crotalaria</i>	<i>spectabilis</i>
woolly croton	<i>Croton</i>	<i>capitatus</i>
tropic croton	<i>Croton</i>	<i>glandulosus</i> var. <i>septentrionalis</i>
bermudagrass	<i>Cynodon</i>	<i>dactylon</i>
yellow nutsedge	<i>Cyperus</i>	<i>esculentus</i>
purple nutsedge	<i>Cyperus</i>	<i>rotundus</i>
rice flatsedge	<i>Cyperus</i>	<i>iria</i>
crowfootgrass	<i>Dactyloctenium</i>	<i>aegyptium</i>
jimsonweed	<i>Datura</i>	<i>stramonium</i>

Florida beggarweed	<i>Desmodium</i>	<i>tortuosum</i>
smooth crabgrass	<i>Digitaria</i>	<i>ischaemum</i>
large crabgrass	<i>Digitaria</i>	<i>sanguinalis</i>
Virginia buttonweed	<i>Diodia</i>	<i>virginiana</i>
junclerice	<i>Echinochloa</i>	<i>colona</i>
barnyardgrass	<i>Echinochloa</i>	<i>crus-galli</i>
eclipta	<i>Eclipta</i>	<i>prostrata</i>
goosegrass	<i>Eleusine</i>	<i>indica</i>
southwestern cupgrass	<i>Eriochloa</i>	<i>acuminata</i>
wild poinsettia	<i>Euphorbia</i>	<i>heterophylla</i>
Carolina geranium	<i>Geranium</i>	<i>carolinianum</i>
ground ivy	<i>Glechoma</i>	<i>hederacea</i>
common sunflower	<i>Helianthus</i>	<i>annuus</i>
ducksalad	<i>Heteranthera</i>	<i>limosa</i>
hydrilla	<i>Hydrilla</i>	<i>verticillata</i>
cogongrass	<i>Imperata</i>	<i>cylindrica</i>
red morningglory	<i>Ipomoea</i>	<i>coccinea</i>
ivy leaf morningglory	<i>Ipomoea</i>	<i>hederacea</i>
pitted morningglory	<i>Ipomoea</i>	<i>lacunosa</i>
bigroot morningglory	<i>Ipomoea</i>	<i>pandurata</i>
tall morningglory	<i>Ipomoea</i>	<i>purpurea</i>
palm leaf morningglory	<i>Ipomoea</i>	<i>wrightii</i>
small flower morningglory	<i>Jacquemontia</i>	<i>tamnifolia</i>
green kyllinga	<i>Kyllinga</i>	<i>brevifolia</i>
henbit	<i>Lamium</i>	<i>amplexicaule</i>
Amazon sprangletop	<i>Leptochloa</i>	<i>panicoides</i>
bearded sprangletop	<i>Leptochloa</i>	<i>fusca</i> var. <i>fascicularis</i>
tall fescue	<i>Lolium</i>	<i>arundinaceum</i>
Italian ryegrass	<i>Lolium</i>	<i>perenne</i> ssp. <i>multiflorum</i>
carpetweed	<i>Mollugo</i>	<i>verticillata</i>
cut leaf evening-primrose	<i>Oenothera</i>	<i>laciniata</i>
red rice	<i>Oryza</i>	<i>sativa</i>
yellow woodsorrel	<i>Oxalis</i>	<i>stricta</i>
fall panicum	<i>Panicum</i>	<i>dichotomiflorum</i>
torpedograss	<i>Panicum</i>	<i>repens</i>

Dallisgrass	<i>Paspalum</i>	<i>dilatatum</i>
cutleaf groundcherry	<i>Physalis</i>	<i>angulata</i>
clammy groundcherry	<i>Physalis</i>	<i>heterophylla</i>
buckhorn plantain	<i>Plantago</i>	<i>lanceolata</i>
annual bluegrass	<i>Poa</i>	<i>annua</i>
prostrate knotweed	<i>Polygonum</i>	<i>aviculare</i>
Pennsylvania smartweed	<i>Polygonum</i>	<i>pensylvanicum</i>
ladysthumb	<i>Polygonum</i>	<i>persicaria</i>
common purslane	<i>Portulaca</i>	<i>oleracea</i>
wild radish	<i>Raphanus</i>	<i>raphanistrum</i>
Florida pusley	<i>Richardia</i>	<i>scabra</i>
curly dock	<i>Rumex</i>	<i>crispus</i>
sicklepod	<i>Senna</i>	<i>obtusifolia</i>
coffee senna	<i>Senna</i>	<i>occidentalis</i>
hemp sesbania	<i>Sesbania</i>	<i>herbacea</i>
giant foxtail	<i>Setaria</i>	<i>faberi</i>
yellow foxtail	<i>Setaria</i>	<i>pumila</i>
green foxtail	<i>Setaria</i>	<i>viridis</i>
arrowleaf sida	<i>Sida</i>	<i>rhombifolia</i>
prickly sida	<i>Sida</i>	<i>spinosa</i>
horsenettle	<i>Solanum</i>	<i>carolinense</i>
silverleaf nightshade	<i>Solanum</i>	<i>elaeagnifolium</i>
eastern black nightshade	<i>Solanum</i>	<i>ptychanthum</i>
lawn burweed	<i>Soliva</i>	<i>sessilis</i>
johnsongrass	<i>Sorghum</i>	<i>halepense</i>
common chickweed	<i>Stellaria</i>	<i>media</i>
dandelion	<i>Taraxacum</i>	<i>officinale</i>
puncturevine	<i>Tribulus</i>	<i>terrestris</i>
broadleaf signalgrass	<i>Urochloa</i>	<i>platyphylla</i>
Texas millet	<i>Urochloa</i>	<i>texana</i>
common cocklebur	<i>Xanthium</i>	<i>strumarium</i>

* **Bold -- plants only**

**Table 2. 2016 SOUTHERN WEED
CONTEST CROP AND WEED RESPONSE
TO HERBICIDES**

Crops*		Weeds	
1. cotton	6. southern pea	1. broadleaf signalgrass	7. Palmer amaranth
2. field corn	7. soybean	2. ivyleaf morningglory	8. pitted morningglory
3. grain sorghum	8. sunflower	3. fall panicum	9. prickly sida
4. peanut	9. squash/zucchini	4. hemp sesbania	10. seedling johnsongrass
5. rice	10. sweet potato	5. large crabgrass	11. velvetleaf
		6. barnyardgrass	12. sicklepod

*At least 6 crops and 6 weeds must be included

Potential Herbicide Families and Herbicides	
Amide 1. propanil (4.0 lb ai/A POST)	Isoxazoline 12. pyroxasulfone (0.106 lb ai/A PRE)
Sulfonanilide 2. cloransulam-methyl (0.0394 lb ai/A PRE)	Phenoxy 13. 2,4-D (0.5 lb ae/A POST)
Benzoic acid 3. dicamba (0.25 lb ai/A POST)	N-Phenylphthalimide 14. flumioxazin (0.064 lb ai/A PRE)
Bipyridylum 4. paraquat (0.5 lb ai/A POST) + NIS	Phosphinic acid 15. glufosinate (0.54 lb ai/A POST) + NIS
Chloroacetamide 5. S-metolachlor (1.25 lb ai/A PRE)	Pyrimidinedione 16. saflufenacil (0.0223 lb ai/A POST) + MSO
Cyclohexanedione 6. sethoxydim (0.191 lb ai/A POST) + COC	Quinoline carboxylic acid 17. quinclorac (0.5 lb ai/A POST) + MSO
Dinitroaniline 7. pendimethalin (1.0 lb ai/A PRE)	Substituted urea 18. diuron (0.5 lb ai/A PRE) 19. fluometuron (1.0 lb ai/A PRE)
Diphenylether 8. fomesafen (0.25 lb ai/A POST) + COC	Sulfonylurea 20. chlorimuron (0.0156 lb ai/A PRE) 21. trifloxysulfuron (0.007 lb ai/A POST) + NIS
Glycine 9. glyphosate (0.77 lb ae/A POST) + NIS	Triazine 22. atrazine (1.5 lb ai/A POST) + COC 23. metribuzin (0.375 lb ai/A PRE)
Imidazolinone 10. imazethapyr (0.063 lb ai/A POST) + NIS	Triazolinones 24. carfentrazone (0.023 lb ai/A POST) + COC
Isoxazolidinone 11. clomazone (0.375 lb ai/A PRE)	Triketone 25. mesotrione (0.094 lb ai/A POST) + MSO

**COC = crop oil concentrate at 1% (v/v); NIS = nonionic surfactant at 0.25% (v/v); MSO = methylated seed oil at 1% v/v. Some herbicide formulations may include an adjuvant system and do not require additional adjuvants. Label rates should be followed and adjusted based on soil type. The soil types will range from a silt loam to silty clay loam (0.7-1.1% O.M., CEC of 12-18, pH of 5.9-6.8).

PROBLEM SOLVING AND RECOMMENDATIONS

Potential Crops (6):

Cotton Field corn
Grain sorghum
Soybean Sunflower
Tomatoes

Weeds:

Any weed from the 2016 weed identification list.

Herbicides:

Any herbicide labeled in the crops listed above.

Scoring:

The ‘farmer’ and a judge will independently score each contestant from predetermined scoring sheet.

Role:

Each contestant will be assuming the role of a chemical company representative, independent crop consultant, or state extension specialist.

Herbicide Resistant Weeds in the Southern Region

Jason Bond

State	Year	Weed	WSSA Mechanism of Action
Alabama	1980	annual bluegrass (<i>Poa annua</i>)	5
	1987	goosegrass (<i>Eleusine indica</i>)	3
	1988	common cocklebur (<i>Xanthium strumarium</i>)	17
	2008	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2012	annual bluegrass (<i>Poa annua</i>)	2
	2012	annual bluegrass (<i>Poa annua</i>)	3
	2013	horseweed (<i>Conyza candensis</i>)	9
	2013	common ragweed (<i>Ambrosia artemisiifolia</i>)	9
	2015	annual sedge (<i>Cyperus compressus</i>)	2
Arkansas	1989	goosegrass (<i>Eleusine Indica</i>)	3
	1989	common cocklebur (<i>Xanthium strumarium</i>)	17
	1990	barnyardgrass (<i>Echinochloa crus-galli</i> var. <i>crus-galli</i>)	7
	1994	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	1995	common cocklebur (<i>Xanthium strumarium</i>)	2
	1995	redroot pigweed (<i>Amaranthus retroflexus</i>)	2
	1995	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1&2
	1999	barnyardgrass (<i>Echinochloa crus-galli</i> var. <i>crus-galli</i>)	4&7
	2003	horseweed (<i>Conyza candensis</i>)	9
	2003	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	2
	2004	common ragweed (<i>Ambrosia artemisiifolia</i>)	9
	2005	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1
	2005	giant ragweed (<i>Ambrosia trifida</i>)	9
	2006	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2007	johnsongrass (<i>Sorghum halepense</i>)	9
	2008	barnyardgrass (<i>Echinochloa crus-galli</i> var. <i>crus-galli</i>)	13
	2008	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	9
	2010	rice flatsedge (<i>Cyperus iria</i>)	2
	2010	smallflower umbrella sedge (<i>Cyperus difformis</i>)	2
	2013	yellow nutsedge (<i>Cyperus esculentus</i>)	2
	2015	tall waterhemp (<i>Amaranthus tuberculatus</i>)	9
Florida	1985	American black nightshade (<i>Solanum americanum</i>)	22
	1996	goosegrass (<i>Eleusine indica</i>)	22
	2001	dotted duckweed (<i>Landoltia punctata</i>)	22
	2002	hydrilla (<i>Hydrilla verticillata</i>)	12
	2008	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	2013	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2013	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&9
	2014	ragweed parthenium (<i>Parthenium hysterophorus</i>)	9

State	Year	Weed	WSSA Mechanism of Action
Georgia	1992	goosegrass (<i>Eleusine indica</i>)	3
	1993	prickly sida (<i>Sida spinosa</i>)	2
	1995	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	1
	2000	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	2005	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2008	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&9
	2008	Palmer amaranth (<i>Amaranthus palmeri</i>)	5
	2008	large crabgrass (<i>Digitaria sanguinalis</i>)	1
	2009	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	1&2
	2010	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&5&9
Kentucky	1987	smooth pigweed (<i>Amaranthus hybridus</i>)	5
	1991	johnsongrass (<i>Sorghum halepense</i>)	1
	1992	smooth pigweed (<i>Amaranthus hybridus</i>)	2
	2001	horseweed (<i>Conyza canadensis</i>)	9
	2004	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	1
	2005	giant ragweed (<i>Ambrosia trifida</i>)	9
	2006	common ragweed (<i>Ambrosia artemisiifolia</i>)	9
	2006	johnsongrass (<i>Sorghum halepense</i>)	2
	2010	tall waterhemp (<i>Amaranthus tuberculatus</i>)	9
	2010	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
Louisiana	2013	common chickweed (<i>Stellaria media</i>)	2
	2013	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	2
	1992	common cocklebur (<i>Xanthium strumarium</i>)	17
	1995	barnyardgrass (<i>Echinochloa crus-galli var. crus-galli</i>)	7
	1997	itchgrass (<i>Rottboellia cochinchinensis</i>)	1
	1997	johnsongrass (<i>Sorghum halepense</i>)	1
	1998	barnyardgrass (<i>Echinochloa crus-galli var. crus-galli</i>)	4
	2009	Amazon sprangletop (<i>Leptochloa panicoides</i>)	1
	2010	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2010	johnsongrass (<i>Sorghum halepense</i>)	9
Mississippi	2013	rice flatsedge (<i>Cyperus iria</i>)	2
	2013	barnyardgrass (<i>Echinochloa crus-galli var. crus-galli</i>)	2
	2014	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	9
	2015	tall waterhemp (<i>Amaranthus tuberculatus</i>)	9
	1989	common cocklebur (<i>Xanthium strumarium</i>)	2
	1991	johnsongrass (<i>Sorghum halepense</i>)	1
	1992	johnsongrass (<i>Sorghum halepense</i>)	3
	1994	common cocklebur (<i>Xanthium strumarium</i>)	17
	1994	goosegrass (<i>Eleusine indica</i>)	3
	1994	horseweed (<i>Conyza canadensis</i>)	22
	1995	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	2
	1996	annual bluegrass (<i>Poa annua</i>)	5
	2003	horseweed (<i>Conyza canadensis</i>)	9
	2005	Italian ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	9
	2007	horseweed (<i>Conyza canadensis</i>)	9&22
	2008	johnsongrass (<i>Sorghum halepense</i>)	9
	2008	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&9
	2010	tall waterhemp (<i>Amaranthus tuberculatus</i>)	9

State	Year	Weed	WSSA Mechanism of Action
Mississippi	2010	goosegrass (<i>Eleusine indica</i>)	9
	2010	giant ragweed (<i>Ambrosia trifida</i>)	9
	2011	barnyardgrass (<i>Echinochloa crus-galli</i> var. <i>crus-galli</i>)	1,2,7,&26
	2012	spiny amaranth (<i>Amaranthus spinosus</i>)	9
	2014	common ragweed (<i>Ambrosia artemisiifolia</i>)	9
North Carolina	2014	annual bluegrass (<i>Poa annua</i>)	2
	1973	goosegrass (<i>Eleusine indica</i>)	3
	1980	common Lambsquarters (<i>Chenopodium album</i>)	5
	1980	smooth Pigweed (<i>Amaranthus hybridus</i>)	5
	1990	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1
	1994	common cocklebur (<i>Xanthium strumarium</i>)	17
	1995	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	1995	annual bluegrass (<i>Poa annua</i>)	5
	1997	annual bluegrass (<i>Poa annua</i>)	3
	1999	common cocklebur (<i>Xanthium strumarium</i>)	2
	2003	horseweed (<i>Conyza canadensis</i>)	9
	2005	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2006	common ragweed (<i>Ambrosia artemisiifolia</i>)	2
	2006	common ragweed (<i>Ambrosia artemisiifolia</i>)	9
	2007	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	2
	2007	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1&2
	2009	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	9
Oklahoma	1992	kochia (<i>Kochia scoparia</i>)	2
	1996	common cocklebur (<i>Xanthium strumarium</i>)	2
	2002	tall waterhemp (<i>Amaranthus tuberculatus</i> A. <i>rudis</i>)	2
	2009	cheat (<i>Bromus secalinus</i>)	2
	2009	horseweed (<i>Conyza canadensis</i>)	9
	2011	tall waterhemp (<i>Amaranthus tuberculatus</i> A. <i>rudis</i>)	9
	2013	kochia (<i>Kochia scoparia</i>)	9
South Carolina	1974	goosegrass (<i>Eleusine Indica</i>)	3
	1985	common cocklebur (<i>Xanthium strumarium</i>)	17
	1989	Palmer amaranth (<i>Amaranthus palmeri</i>)	3
	1990	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1
	1997	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	2006	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2010	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&9
	2010	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1&2

State	Year	Weed	WSSA Mechanism of Action
Tennessee	1988	goosegrass (<i>Eleusine indica</i>)	3
	1991	common cocklebur (<i>Xanthium strumarium</i>)	17
	1992	common cocklebur (<i>Xanthium strumarium</i>)	2
	1994	Palmer amaranth (<i>Amaranthus palmeri</i>)	2
	1995	johnsongrass (<i>Sorghum halepense</i>)	1
	1998	common lambsquarters (<i>Chenopodium album</i>)	5
	1998	Palmer amaranth (<i>Amaranthus palmeri</i>)	3
	2001	horseweed (<i>Conyza canadensis</i>)	9
	2006	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>Multiflorum</i>)	1
	2006	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
	2007	annual bluegrass (<i>Poa annua</i>)	3
	2007	giant ragweed (<i>Ambrosia trifida</i>)	9
	2007	tall waterhemp (<i>Amaranthus tuberculatus</i>)	2
	2009	Palmer amaranth (<i>Amaranthus palmeri</i>)	2&9
	2011	tall waterhemp (<i>Amaranthus tuberculatus</i>)	9
	2011	annual bluegrass (<i>Poa annua</i>)	9
	2011	goosegrass (<i>Eleusine indica</i>)	9
	2012	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	9
	2013	annual bluegrass (<i>Poa annua</i>)	2&5
Texas	1989	perennial ryegrass (<i>Lolium perenne</i>)	2
	1991	barnyardgrass (<i>Echinochloa crus-galli</i> var. <i>crus-galli</i>)	7
	1993	Palmer amaranth (<i>Amaranthus palmeri</i>)	5
	1998	kochia (<i>Kochia scoparia</i>)	2
	2000	johnsongrass (<i>Sorghum halepense</i>)	2
	2006	tall waterhemp (<i>Amaranthus tuberculatus</i> A. <i>rudis</i>)	9
	2011	Palmer amaranth (<i>Amaranthus palmeri</i>)	9
Virginia	1976	smooth pigweed (<i>Amaranthus hybridus</i>)	5
	1979	common lambsquarters (<i>Chenopodium album</i>)	5
	1993	Italian ryegrass (<i>Lolium perenne</i> ssp. <i>multiflorum</i>)	1
	1993	redroot pigweed (<i>Amaranthus retroflexus</i>)	5
	1994	smooth pigweed (<i>Amaranthus hybridus</i>)	2
	1995	johnsongrass (<i>Sorghum halepense</i>)	1
	2001	annual bluegrass (<i>Poa annua</i>)	5
	2003	shattercane (<i>Sorghum bicolor</i>)	2
	2005	horseweed (<i>Conyza canadensis</i>)	9
	2008	common chickweed (<i>Stellaria media</i>)	2
	2011	Palmer amaranth (<i>Amaranthus palmeri</i>)	9