Science Policy Field Tour: Balancing Pest Management and Pollinator Health

August 22 - 24, 2017

Jackson, MS & Mississippi Delta Agricultural Region

Organized by:
Entomological Society of America –
Plant-Insect Ecosystem Section (ESA-P-IE)

Locally hosted by:
Mississippi State University

Contents

‘Science Policy Field Tour’: Background and Conception

Background: In November 2015, the ESA P-IE[1] leadership team declared that pollinators and related issues would be a specific technical initiative on which to lead both internal and public education efforts. The issue around pollinators affects nearly all of the approximately 2,500 P-IE section members, many of whom have a technical background and practical understanding of pollinator biology. A goal of the new P-IE Pollinator Initiative is to provide technical educational materials to members and to leverage this knowledge to the general public, media, policymakers, and other key stakeholders.

At the P-IE Annual Business Meeting, held in conjunction with the International Congress of Entomology in Orlando, FL during 2016, a symposium was organized that aligned to the new P-IE Pollinator Initiative. In particular, P-IE Section members were especially moved and hopeful for the future of pollinators and related issues after hearing the Mississippi success story (presented by Dr. Jeff Harris, Extension Specialist in Apiculture, Mississippi State University) on "Finding Common Ground Among People with Different Perspectives of the Pesticide-Pollinator Conflict."[2]

Conception: Positive feedback about Dr. Harris’ presentation was brought forward to individual P-IE Governing Council members and at the P-IE feedback session held at the conclusion of ICE. A proposal was made for P-IE to coordinate a science policy field tour in Mississippi, and with the cooperation from P-IE Section Members from Mississippi State University. The tour would bring together P-IE Members and stakeholders, including those from government, science policy advocates, policymakers, and private and public sector scientists. The field tour would enable hands-on understanding of pollinators and the many issues on which they intersect, including: pollinator habitat, pests of pollinators, insect pests of economic importance, and row crop production (cotton, soybean, corn). The field tour would enable candid discussions with the goal of learning from a locally-executed case study in Mississippi, leveraging best practices to other agroecosystems, and developing an action plan on how policies can be shaped to balance crop production and pollinator health.

[1]The **Entomological Society of America (ESA)** is the largest organization in the world serving the professional and scientific needs of entomologists and individuals in related disciplines. Founded in 1889, ESA has more than 7,000 members affiliated with educational institutions, health agencies, private industry, and government. Members are researchers, teachers, extension service personnel, administrators, marketing representatives, research technicians, consultants, students, pest management professionals, and hobbyists. The **Plant-Insect Ecosystems (P-IE) Section** is one of 4 subject matter-oriented Sections within ESA, focusing specifically on insect interactions with plants. The P-IE Section is the largest of the 4 sections, representing approximately 1/3 of all ESA members. The section structure allows for members to network and interact with others shaping their specific interest, which for P-IE includes aspects of crop production, pollination, host-plant response, plant pathology/vector, biological control, and microbial control.

[2]Synopsis of Dr. Jeff Harris' presentation that inspired this event:

Dr. Harris described how beekeepers and agricultural producers from across Mississippi discussed ways of fostering better working dialogue, all in the spirit of coexistence and cooperation. Discussions between beekeepers and row crop farmers led to the development of a communication effort armed with a set of general operating suggestions targeting the state's beekeepers, farmers, and other pesticide applicators when bees are located in or near agricultural production areas. Thus, the Mississippi Honeybee Stewardship Program was created. The interdependence among the state's beekeeper's and row crop farmers was later highlighted and relationships were solidified among these stakeholders when the sustainable production of a key crop was threatened – and both parties found "common ground" in support of one another.

‘Science Policy Field Tour’: A Letter From ESA-P-IE Section Leadership

Dear Science Policy Field Tour Participant,

We would like to thank you for participating in this special event organized by the Entomological Society of America – Plant-Insect Ecosystem Section and in collaboration with Mississippi State University. Our Section Leadership Team believes this Field Tour will be a unique forum for fostering communication, learning, and exchanging information as compared to more traditional meeting forums. The opportunity for small-group, hands-on interactions in a field setting with integrated pest management practitioners, crop producers, and beekeepers related to technology and current practices in the local production of crops and in beekeeping, is invaluable. Furthermore, we believe the opportunity to bring ESA members together with key stakeholder groups, which in many cases do not routinely interact, provides an excellent foundation for building relationships and trust among people with differing perspectives and viewpoints. The topic for the Field Tour is timely and relevant - ‘Balancing Pest Management and Pollinator Health.’ We hope that participants learn from each other through this specific Mississippi case study and leverage the knowledge gained from the event for best practices in other locations. Mississippi State University and associated local stakeholders have prepared an outstanding “menu” of activities.

The Field Tour Planning Team is hopeful that this tour, if successful, can serve as a precedent for the development of future tours at other locations and on other topics. There are many current and emerging entomological challenges that could be well-served by learning events such as this field tour. The speed at which ESA-P-IE and Mississippi State University launched the Field Tour provides evidence that in quick fashion, ESA members have the ability and coordination to develop an event should an ‘emergency’ response be needed, such as with the arrival of a new invasive insect species or a critical change to an endangered species that requires quick ramp-up of knowledge and recommendations.

Thank you again for participating. Without your enthusiasm the event would not have been possible!

Melissa Willrich Siebert, President

Mark Wright, Vice-President

Diane Alston, Vice-President Elect

Rebecca Schmidt-Jeffris, Secretary

Patrick Moran, Treasurer

Fred Musser, Past President

Sujaya Rao, ESA Governing Board Representative

Carlos Esquivel, Student Representative

Rayda Krell, Field Tour Planning Committee

Pre-Tour Personal Preparations

Dietary Requirements, Allergies or other Special Needs: Please communicate any special requests before the meeting to Melissa Siebert (mwillrichsiebert@dow.com or 662-822-2732) to allow for accommodations.

Flight arrivals: Please provide flight arrival information to Melissa Siebert by Monday August 1, 2017 to coordinate the shuttle service from the airport to the hotel on Tuesday, August 22nd.

Airport to Hotel Shuttle Service Instructions: Upon arrival to the airport, proceed to the lower level of the terminal to baggage claim on the ground level. Melissa Siebert will be monitoring incoming flights and triggering the shuttle pick. As a backup though, please text Melissa Siebert upon landing at 662-822-2732. A field tour representative will be at baggage claim and with a visible sign to greet you. This individual will guide you to the shuttle. If any unusual circumstances arise, please call the Holiday Inn & Suites: 601-939-5238.

Water, sunscreen, and mosquito repellent: The tour organizers will have these items throughout the tour. However, if you require special sunscreen or repellent, please bring it with you.

Mississippi Weather in August: The historical low and high during late-August is 72˚F and 91˚F, respectively. The average daily low and high relative humidity is 50 and 96%, respectively.

Clothing requirements: It is recommended that you pack the following clothing and associated accessories:

- Tuesday, August 22nd reception – Casual attire, **no shorts**.
- Wednesday and Thursday will be in the field all day with high temperatures and humidity. Please pack the following:
    - Hat
    - Sunglasses
    - Cool comfortable clothing. Please wear long pants (jeans, cotton pants, etc.) and **no shorts**.
    - Closed toed shoes - field boots or athletic shoes are appropriate.
    - Consider packing an extra shirt to change during the day.

Portable Cellular Phone Chargers, Wifi, and Cellular Service: *The tour bus contains electrical plugs; however, as a back-up, consider bringing an extra cell phone charger. The bus is also expected to have Wifi, and cellular service should generally work well for most providers; however, please plan in the event these services are not accessible at all times.*

Local Arrangements & Information

Field Tour registration of $500 includes the following items:

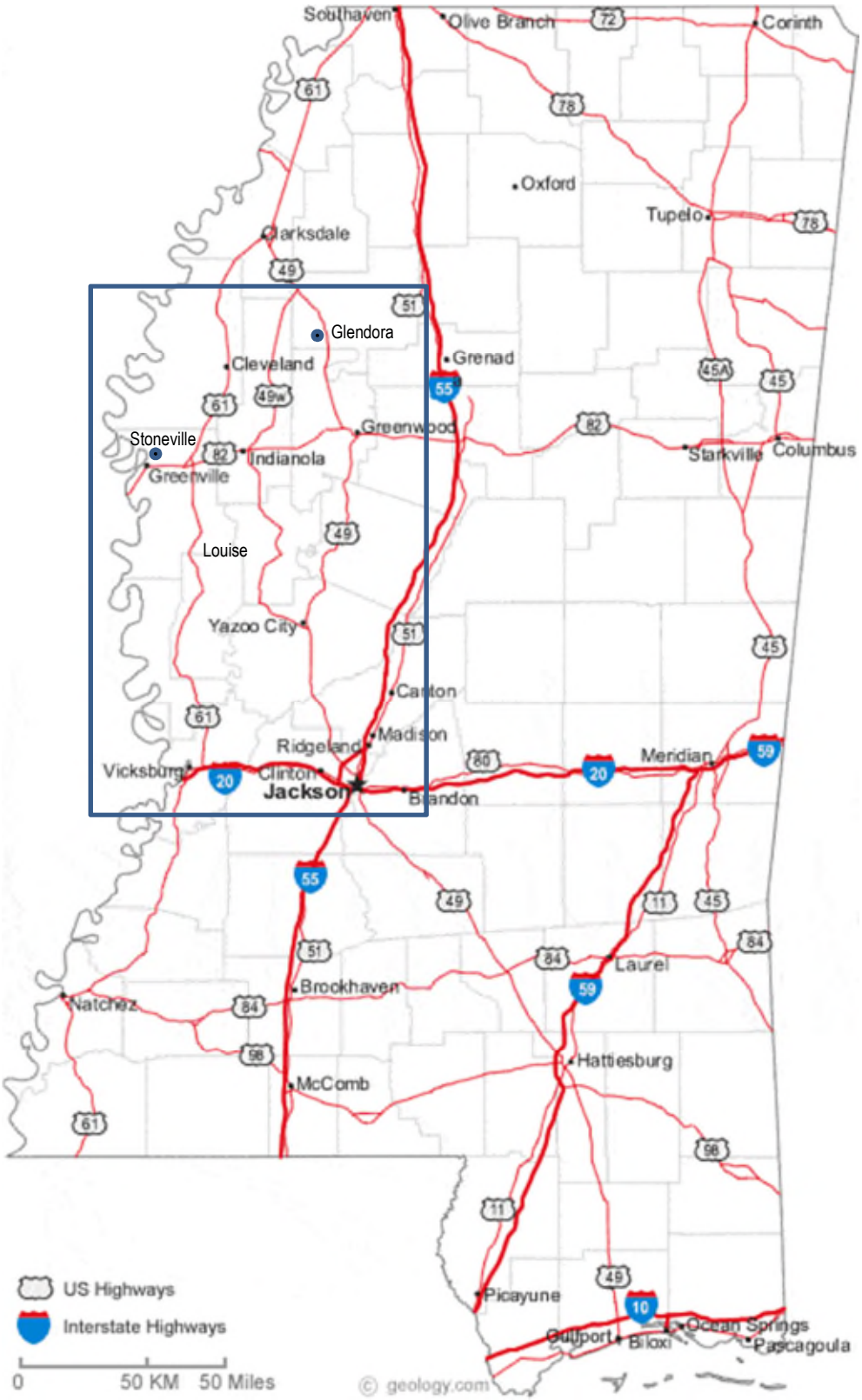
- Hotel shuttle from the airport to starting location of Holiday Inn & Suites (110 Bass Pro Drive, 601-939-5238) in Pearl, MS (coordinated according to flight arrivals).
- Hotel on Tuesday, August 22nd at the Holiday Inn & Suites, Pearl, MS.
- Hotel on Wednesday, August 23rd at the Hampton Inn (912 N. Davis Ave., 662-846-2915) or Holiday Inn Express & Suites (808 N. Davis Ave., 662-843-9300) in Cleveland, MS (hotels next door to each other).
- All meals starting at the reception on Tuesday evening and ending with lunch on Thursday.
- Snacks and water.
- Programs and handouts and/or communication materials.
- Reserved seat on the charter bus during the tour.
- Transportation to the airport on Thursday August 24th.
    - The Charter bus will take attendees to the Jackson-Medgar Wiley Evers International Airport no later than 3:00 PM for a tour wrap-up session held at the airport conference center, located on the floor just above all airline check-in desks. Departing flights can be scheduled as early as 6:00 PM.
    - At the conclusion of the wrap-up session at 5:00 PM, the charter bus will then take the remaining attendees, who choose to select a Friday airline departure, to the Holiday Inn & Suites in Pearl, MS. Attendees are responsible for making their own hotel reservations for Thursday night August 24th.
        - Note that other hotel vendors are also in this vicinity that offer complimentary shuttle service to the airport.
        - Please contact Melissa Siebert (mwillrichsiebert@dow.com) if you have any local arrangements questions.

Hotel Addresses and Phone:

- Holiday Inn & Suites, Pearl, MS, 110 Bass Pro Drive, 601-939-5238
- Hampton Inn & Suites, Cleveland, MS, 912 N. Davis Ave, 662-846-2915 **OR** Holiday Inn Express & Suites (808 N. Davis Ave., 662-843-9300)

Airport to Hotel Shuttle Service Instructions: Upon arrival to the airport, proceed to the lower level of the terminal to baggage claim on the ground level. Melissa Siebert will be monitoring incoming flights and triggering the shuttle pick. As a backup though, please text Melissa Siebert upon landing at 662-822-2732. A field tour representative will be at baggage claim and with a visible sign to greet you. This individual will guide you to the shuttle. If any unusual circumstances arise, please call the Holiday Inn & Suites: 601-939-5238.

If Arriving Early to Holiday Inn & Suites on August 22: Adjacent to the hotel and within walking distance is a Bass Pro Shop, Outlets of Mississippi, and several restaurant options.



The blue box denotes the region of Mississippi that will be traveled.

Science Policy Field Tour Planned Activities

- *Tuesday, August 22, 2017:* Arrive at your leisure to Jackson, MS (Jackson-Medgar Wiley Evers International Airport).
    - 5:30 PM Reception Opens, 6:00 PM Welcome Reception Begins at the starting hotel – Holiday Inn & Suites located 6 miles from the airport (110 Bass Pro Dr., Pearl, MS).

- *Wednesday, August 23, 2017:* Meeting hosted by Mississippi Farm Bureau at their state headquarters to discuss the development of the Mississippi Honey Bee Stewardship Program and learn how beekeepers and crop production members of Farm Bureau found common ground in the development of the program. Panel discussion and Q&A will occur.

- Travel to the Mississippi Delta Agricultural Region. Listed below are approximate travel times for your planning:

    - Jackson, MS to Greenwood, MS area: 1 hour 45 minutes
    - Greenwood, MS to Glendora, MS: 45 minutes
    - Glendora, MS to Merigold, MS: 45 minutes
    - Merigold, MS to Cleveland, MS: 15 minutes
    - Cleveland, MS to near Shaw, MS: 30 minutes
    - Shaw, MS to Stoneville, MS: 30 minutes
    - Stoneville, MS to near Louise, MS: 60 minutes
    - Louise, MS to Jackson-Megar Wiley Evers Airport: 1 hour 30 minutes

- Overview and in-field viewing of economically important insect pests of Mississippi crops and understanding of Integrated Pest Management programs developed, including in-field discussions with an agricultural consultant and a grower.

- Hands-on learning about aerial pesticide applications, innovative technology used to enable safe applications, and view an actual field aerial application.

- *Thursday, August 24, 2017:*

- View an established conservation program and overview of native pollinator biodiversity, co-hosted by Delta F.A.R.M.

- Tour Mississippi State University Delta Research and Extension Center in Stoneville, MS. View crop planter demonstration, research plots, and plots demonstrating IPM technologies (i.e., transgenic technologies, seed treatments).

- In-field interaction with a beekeeper at a site in the Mississippi Delta.

- Interactive working session in which attendees discuss key points learned from the field tour based on the practices Mississippi stakeholders employed to enable a stewardship program and IPM successes. Capture any agreed upon action items resulting from the event that could influence future research direction and/or policy recommendations. Discussion points, knowledge gained, and best practices developed from the Mississippi "case study" will be formally summarized in a report following the field tour, which will be shared with tour attendees and made available to the broad public.

- *Thursday, August 24, 2017:* Arrive at Jackson-Medgar Wiley Evers International Airport no later than 3:00 PM for a tour wrap-up session, held at the airport conference center located on floor just above all airline check in desks. The wrap-up session will conclude no later than 5:00 PM. Departing flights can be scheduled as early as 6:00 PM.
    - Any participants not departing from the airport will be transported back to the Holiday Inn & Suites at the conclusion of the wrap-up session.

"Science Policy Field Tour: Balancing Pest Management and Pollinator Health"

Day	Time	Topic
Tuesday, August 22	5:00 – 8:30 PM	Tour Registration desk open – Holiday Inn & Suites Lobby
	6:00 PM	Welcome and Tour Overview
	6:30 PM	Reception, Dinner, Networking
Wednesday, August 23	6:30 - 6:45 AM	Hotel Checkout (to-go coffee available in lobby)
	6:45 AM	Load bus
	7:00 AM	Depart Holiday Inn & Suites
	7:30 -10:00 AM	Mississippi Farm Bureau Headquarters (Breakfast, Program, Panel Discussion, Q&A on development of Mississippi Honey Bee Stewardship Program)
	10:00 AM – Noon	Travel to Greenwood vicinity
	Noon – 2:00 PM	Lunch and aerial application demonstration at Provine Helicopter Service, Inc.
	2:00 - 3:00 PM	Travel to Glendora, MS vicinity
	3:00 – 5:00 PM	Due West Farms (Topics addressed include integrated pest management for row crops, examination of economically important insect pests and sampling, crop consultant interaction).
	5:00 – 6:00 PM	Travel to Merigold
	6:00 – 8:30 PM	Dinner at Crawdad's
	9:00 PM	Hotel Check in - Cleveland
Thursday, August 24	7:00 AM	Depart Cleveland Hotels
	7:00 – 7:30 AM	Travel to near Shaw, MS
	7:30 – 8:30 AM	Pollinator conservation program
	8:30 – 9:00 AM	Travel to Stoneville, MS
	9:00 AM	Arrive to Stoneville - Mississippi State University Delta Research & Extension Center
	9:00 – 10:30 AM	Demonstration tour of IPM technologies and practices
	10:30 – 11:45 AM	Travel to near Louise. Box lunches on-board bus.
	11:45 AM – 1:15 PM	In-field beekeeper interaction
	1:15 – 2:45 PM	Travel to Jackson airport

	2:45 – 3:00 PM	Attendees unload from bus and those departing gather luggage.
	3:00 – 5:00 PM	Wrap up Session at airport conference center
	5:00 PM	Airline departures or bus ride to Holiday Inn & Suites

Meet & Greet: Field Tour Organizers and Hosts

Opening Reception:

Dr. Melissa Willrich Siebert (Organizer): Melissa is current President of the ESA-PIE Section and has been active within ESA for over 15 years. She obtained her M.S. and Ph.D. in Entomology from Louisiana State University. Melissa serves as a Research Leader for Dow AgroSciences, based in Greenville, MS. Her prior work experience at Dow AgroSciences includes serving as a field scientist and field station leader at the Southern U.S. Research Center in Greenville. In Melissa's current role, she is accountable for development of new innovative pest management technology concepts and technical/stewardship responsibility with existing products encompassing the following molecules: spinosad, spinetoram, sulfoxaflor, and methoxyfenozide. Melissa is accountable for projects across North America and MesoAndean countries.

Dr. Rayda Krell (Organizer and Moderator): Rayda is an entomologist who has studied and worked in integrated pest management for 20 years. She received her M.S. and Ph.D. in Entomology from Iowa State University and her B.A. in Biology and Russian from Middlebury College, VT. She worked in Iowa soybeans and California grapes to research the epidemiology of plant diseases caused by insect-transmitted pathogens. Recently, she has been a consultant to the agricultural industry to train employees about pest management and has been an adjunct professor in Biology at Western Connecticut State University (WCSU). She currently works as a research coordinator for an integrated tick management study at WCSU. She serves on the board of the Entomological Foundation and was in the first class of Entomological Society of America Science Policy Fellows.

Dr. Jeff Gore*: Jeff is an Associate Research/Extension Professor specializing in integrated pest management (IPM) of insect pests in cotton, rice, soybean, corn, grain sorghum, and peanut. Prior to his current appointment, Jeff was a Research Entomologist with the USDA-ARS, Southern Insect Management Research Unit in Stoneville. His primary research focuses on developing and refining economic injury levels and action thresholds for multiple pest species in agronomic crops. Additionally, his research aims to evaluate cultural control practices in IPM programs and elucidate the impacts of insecticide resistance on insect management. Jeff has trained many graduate students and their research has been instrumental in developing a cultural-based IPM program for locally important insect pests. He received a B.S. degree from Auburn University in Entomology/Integrated Pest Management, and M.S. and Ph.D. degrees from Louisiana State University in Entomology.

Dr. Jeff Harris: Jeff is an assistant extension/research professor specializing in apiculture. He came to his current position after working for 15 years as a research scientist with the USDA-ARS Honey Bee Breeding Lab in Baton Rouge, LA. He is best known for selective breeding for honey bees that express high levels of Varroa Sensitive Hygienic (VSH) behavior, which is a primary mechanism of resistance to *Varroa* mites, a major parasite and killer of honey bees worldwide. His current research focuses on elucidating behavioral attributes of individual bees that contribute to the overall VSH resistance in a whole colony. As the extension specialist for beekeeping, he educates beekeepers in workshops, presentations and on-site visits about all aspects of beekeeping. He also helps beekeepers to develop sensible pest management strategies for many diseases, parasites, and pests that

minimize the use of chemical therapeutics within hives. He received his Ph.D. in Insect Physiology and a M.S. in Entomology from Louisiana State University. His B.S. was in Physical Science from Auburn University.

Mississippi Farm Bureau Headquarters:

Justin Ferguson: Justin is the National Affairs Coordinator & Commodity Policy Coordinator for Major Row Crops for the Mississippi Farm Bureau Federation, a position he has held since November 2015. His national legislative affairs responsibilities include implementation and execution of Mississippi Farm Bureau members' desires in Washington on trade and federal issues important to production agriculture. He works closely with members and staff of the Mississippi Congressional Delegation, policy staff at the American Farm Bureau Federation, and numerous other agricultural interest groups on other federal policy focus areas. Prior to his current position, Justin served as a Regional Manager & Commodity Coordinator for Mississippi Farm Bureau Federation from July 2005. Before joining Farm Bureau, he worked as a federal policy staffer for the Delta Regional Authority and served as the Delta State University Congressional Fellow in the office of U.S. Senator Thad Cochran in 2003. He earned a B.B.A. in Accounting and an MBA, both from Delta State University in 2002 and 2004, respectively.

Andy Whittington: Andy Whittington is the Environmental Programs Coordinator at Mississippi Farm Bureau Federation. Andy has been with Farm Bureau for ten years and works on a wide variety of state and federal issues affecting agriculture; primarily dealing with water quality, air quality, pesticides, and permitting. Andy is serving his fourth term as the AFBF representative on the EPA "Pesticide Policy Dialogue Committee." Previously, Andy was a Research Associate in the Department of Agricultural Economics at Mississippi State University, where he also received his B.S. and M.S. in Agricultural Economics. Andy is married to Lori, has one son, Logan and two of the best dogs anybody ever owned.

John Gordon Campbell: John, a native of Greenville, MS, was appointed Deputy Commissioner for the Mississippi Department of Agriculture and Commerce (MDA) in July 2015. Prior to John's current appointment as Deputy Commissioner, he held the position of Director and State Entomologist for the Bureau of Plant Industry. Before joining MDA in 2006, he worked for the United States Department of Agriculture at its research facility in Stoneville, MS. He received a B.S. in Agricultural Pest Management from Mississippi State University in 2001 and an MBA from Delta State University in 2004.

Patrick Swindoll: Patrick Swindoll is a farmer from Hernando, MS. He and his family farm rice, soybeans, and corn in DeSoto, Tate, and Tunica counties in northwest Mississippi. Patrick is actively involved in the Farm Bureau and has been a member of the Honeybee Stewardship committee since its inception and has numerous active bee yards from local beekeepers on their farms. Patrick received his B.S. degree in Agricultural Economics from Mississippi State University.

Johnny Thompson*: Johnny is owner of Broke-T Farms, a diversified farming operation in Neshoba County, MS consisting of four contract broiler houses, a commercial cow-calf operation, and a beekeeping operation. Beekeeping is the newest part of the operation, started 10 years ago. It currently consists of approximately 900 hives for honey production and 700 mating nucs used in the spring for queen production. Hives overwinter in Neshoba County where they build up on wildflowers and clover and produce a spring honey crop. In early June the hives are moved to the Mississippi Delta to make a summer honey crop on soybeans. Some stay in the Delta to make a fall crop while others are moved back to Neshoba County to make a fall crop. Johnny currently serves as president of the Mississippi Beekeeping Association as well as the chair of the Beekeeping Commodity Committee for Mississippi Farm Bureau Federation

Provine Airplane Hanger:

Ike Brunetti: Ike is a second-generation aerial applicator with over 45 years of industry experience. He has been in business for 38 years and has logged over 25,000 hours of agricultural flying. Ike is currently serving as President of the Mississippi Aerial Applicators Association and is owner-operator of Shelby Air Service, Inc. in Shelby, MS. Shelby Air Service operates two Air Tractor Aircraft, serving a customer base in five different Mississippi counties with diverse application services, including cotton, rice, corn, soybeans, wheat, and pecan orchards. True to his roots and when not in the cockpit, Ike also farms, producing corn and soybeans. Ike has previously owned and operated aerial and ground application businesses in South Mississippi and Louisiana. Prior to graduating flight school at C & G Aero in Greenville, MS, Ike attended Delta State University and is currently a partner in Blues Air Flight School in Cleveland, MS.

Due West Farms:

Mike Sturdivant: Mike Sturdivant III is a fifth-generation producer of cotton, corn, and soybeans who farms with two of his brothers in Tallahatchie and Leflore counties near Glendora, MS on Due West Farm. They operate a grain elevator for corn, an agricultural flying service, and a cotton gin. Mike has farmed since 1974 after receiving his MBA from Harvard Business School and a B.A. from Millsaps College in Jackson, MS. He farms with his brother, Walker, who has an undergraduate degree from Vanderbilt University, a J.D degree from University of Mississippi, and a tax degree from New York University and his brother, Sykes, who has an undergraduate degree from Mississippi State and an MBA from the University of Texas. The Sturdivant family has been farming since the 1850s.

Tucker Miller III: Tucker has been an Independent Crop Consultant in the Mississippi Delta for the past 40 years, working with farmers on insect, weed, and disease control. He also works closely with the Mississippi State University (MSU) Extension Service on research plots and variety trials. Tucker graduated with a B.S. degree in Agronomy in 1974 and his M.S. degree in Agricultural Pest Management in 1977 from MSU. Tucker is a member of the Mississippi Agricultural Consultants Association (MACA), having served two terms as president. He is also a member of the Mississippi Entomological Association, Mississippi Association of Plant Pathologists and Nematologists, and Delta Council. Tucker was selected as Syngenta's Consultant of the Year in 2004, selected to the MACA Hall of Fame in 2015, and Consultant of the Year at the National Cotton and Rice No-Till Conference.

Dr. Angus Catchot*: Angus is a Professor of Extension Entomology at Mississippi State University. He received a B.S. in Agricultural Pest Management, M.S. in Entomology, and Ph.D. in Entomology from Mississippi State University (MSU). After completion of graduate school and prior to joining MSU in 2004, Angus was employed as a technical development manager for Monsanto Company where he introduced BollGard II cotton and YieldGard Corn. Angus' responsibilities include insect pest management in cotton, corn, soybean, wheat, grain sorghum, and recently stored grain. Angus has been heavily involved in demonstrating and implementing IPM strategies in production agriculture. He has implemented timely and efficient methods to deliver information to producers and is part of a team that was one of the first in the country to transition from traditional newsletters to fully utilizing social media platforms such as blogs (mississippi-crops.com), Twitter, Facebook, etc. Angus is passionate about training students in applied entomology and has served/serves as major advisor for 20 graduate students.

Conservation Program:

Trey Cooke: Trey is the Executive Director of Delta F.A.R.M. and Delta Wildlife. Both organizations are non-profit conservation organizations operating in the 18 delta and part-delta counties of Northwest Mississippi committed to working with landowners, land managers, and farmers to address natural resource concerns in the region while ensuring a more economic and environmentally sustainable future for the region. Trey works with

the volunteer boards of each organization to oversee accredited professional staff who manage programs and projects designed to accomplish the missions of each organization. Among the many programs and projects includes one dedicated to the creation and maintenance of native pollinator habitats in the ag landscape of the region. Before working for Delta F.A.R.M. and Delta Wildlife, Trey worked for the Mississippi State University Entomology Unit, the U.S. Fish and Wildlife Service, and Bayer Crop Science. He earned a B.S. from Delta State University in Environmental Science and Chemistry and a M.S. from Sam Houston State University in Biology with a concentration in Microbial Physiology.

Timothy Huggins: Tim is a Natural Resource Specialist with Delta Wildlife and Delta F.A.R.M. Among the other programs and projects that Tim works on, one of the programs includes Operation Pollinator and is dedicated to the creation and maintenance of native pollinator habitats in the ag landscape of the region. Before working for Delta F.A.R.M. and Delta Wildlife, Tim worked for USDA ARS in the Southern Weed Science Lab, the US Forest Service, and the Center for Interdisciplinary Geospatial Information at Delta State University. He earned a B.S. from Delta State University in Environmental Science with a concentration in Geospatial Information Systems.

Michael Muzzi: Born and raised in Shaw, Mississippi, Michael Muzzi owns and operates TKT Farms with his wife, Doreen. The Sunflower County farm produces corn, soybeans and rice using both minimal tillage and no-till production methods, as well as other conservation farming practices. Muzzi was educated at Indianola Academy, Mississippi Delta Community College, and Delta State University. When not farming, he can often be found coaching youth baseball, softball, basketball and football.

Dr. Katherine Parys: Katherine is a Research Entomologist at the USDA-ARS Southern Insect Management Research Unit. Her research is split between two major projects. The first is developing ecologically sound alternative management strategies for tarnished plant bugs prior to causing economic damage in cotton. She also is working towards documenting pollinator biodiversity and community structure of bees that visit and utilize various economically important plants that are commercially cultivated in the Mid-South. She received a B.A. In Biology from the University of Rhode Island, a M.S. in Environmental Biology from Clarion University of Pennsylvania, and a Ph.D. degree from Louisiana State University in Entomology.

Delta Research & Extension Center:

Dr. Don Cook*:* Don is a research entomologist specializing in integrated pest management (IPM) of insect pests in corn, soybean, cotton, rice, grain sorghum, and peanut. Prior to his current appointment, Don was an extension crops entomologist with Mississippi State University located in northeast Mississippi. His primary research focuses on developing and refining economic injury levels and action thresholds for multiple pest species in agronomic crops. Don has trained several graduate students and their research has been instrumental in developing/refining economic thresholds and damage potentials for locally important insect pests to improve IPM programs. He received a B.S. degree from Northeast Louisiana University in General Agriculture, and M.S. and Ph.D. degrees from Louisiana State University in Agronomy and Entomology, respectively.

*Individuals with presence at multiple tour stops.

Field Tour Topic Themes

The agenda will provide for learning across many subject areas that intersect – crop production, insect pests of economic importance, pollinators, and pollinator habitat. Listed are themes and associated questions that the field tour organizers and hosts would like participants to consider. Wrap-up discussions will address these themes and any new themes that develop during the field tour.

Crop Production	
Gain understanding of row crop production problems, integrated pest programs implemented, and pesticide application techniques for southern U.S.	What new learnings or perspectives have been developed?
	What tactics have row crop producers implemented to mitigate risks to pollinators while still effectively producing their crop?
Mississippi Honey Bee Stewardship Program	
Assess the development of the Mississippi Honey Bee Stewardship Program	What tactics worked well and what tactics did not toward developing the program? In hindsight, what could have been executed differently?
Assess challenges encountered between beekeepers and row crop farmers and how they found common ground.	What elements of what was learned through this case study could be leveraged to other specific geographies? Elements include Stewardship Plan details, "techniques" used or implemented to enable stakeholders to find common ground, etc.
	What did Mississippi leaders do to enhance communication between potentially polarized groups. And how to keep communication lines open?
Beekeeping	
Assess how four main stressors affect Mississippi beekeepers (parasites, pathogens, pesticides, and poor nutrition).	What tactics does a beekeeper use to mitigate these stressors?
Understand the process used by a beekeeper to select a field site.	Are particular landscapes more suitable than others? What are key attributes of a site within a landscape that a beekeeper is choosing among?

Conservation Programs	
Assess conservation programs established for pollinators in Mississippi.	Are conservation programs providing impact and value? Are there challenges to implementing conservation programs? Are there other methods to consider for broad pollinator protection?
"Pollinator Friendly Integrated Pest Management" is a contemporary phrase used.	Define "Pollinator Friendly Integrated Pest Management". Is integrated pest management for row crops compatible with conserving pollinators?
Actions Moving Forth	
Field tour participants find common ground and develop a cornerstone "key takeaways" from the event. **(See table below)**	What action items or points of agreement can be developed from this "field tour" that could be leveraged to 1) other geographies implementing stewardship and integrated pest management programs, 2) state and federal regulating agencies, and 3) policymakers?
"Field Tour" Value	
Using a "hands-on field tour" to deliver an educational opportunity to ESA members and non-ESA stakeholders, unique from standard meeting formats with presentations.	Was a "Field Tour" a productive format for learning about a problem, a case study, and local agriculture?
	Gather feedback on replicating the event? Frequency, location, topics, attendee number?
	Gather feedback on developing a summary article of the event and options for publication venue.

Consensus-Based "Cornerstone Takeaways" to Share Broadly*

Crop production, beekeeping, and conservation are themes that will be addressed during the field tour. Takeways can be organized into four approaches: program development, education, research needs/knowledge gaps, and regulatory. Takeaways are not necessarily complex but simple points of group consensus.

	Crop Production	Beekeeping	Conservation Programs
Status of Program Development			
Stakeholder Education			
Regulatory Status			
Research Needs or Knowledge Gaps			

*** This chart will be discussed as a group during the Wrap-Up Session. Takeaways do not have to be specific for Mississippi. However the Mississippi case study should be used to facilitate the discussion and the development of broader recommendations.**

Notes

Meeting Participants (alphabetical order)

Name	Affiliation	State
Jacquelyn Albert	Michigan State University Entomological Society of America	MI
Neil Anderson	Environmental Protection Agency	DC
Tom Anderson	Entoniche Consulting, LLC Entomological Society of America	NC
James Austin	U.S. Fish and Wildlife Service	MS
Joe Bischoff	Cornerstone Government Affairs	DC
Natalia Bjorklund	University of Nebraska – Lincoln Entomological Society of America	NE
Joseph Black	University of Arkansas Entomological Society of America	AR
Ike Brunetti	Shelby Air Service Mississippi Aerial Applicators Association	MS
John Gordon Campbell	Mississippi Department of Agriculture and Commerce	MS
Angus Catchot	Mississippi State University Entomological Society of America	MS
Keri Carstens	DuPont Pioneer Entomological Society of America	IA
Theresa Cira	University of Minnesota Entomological Society of America	MN
Larry Clemens	The Nature Conservancy	IN

Aimée Code	The Xerces Society for Invertebrate Conservation	OR
Don Cook	Mississippi State University Entomological Society of America	MS
Trey Cooke	Delta F.A.R.M. Delta Wildlife	MS
Steven Coy	Coy Bee Company, LLC American Honey Producers Association	MS
Kable Bo Davis	Environmental Protection Agency	DC
Keith Delaplane	University of Georgia Entomological Society of America	GA
Jane DeMarchi	American Seed Trade Association (ASTA)	VA
David Epstein	USDA Office of Pest Management Policy	DC
Mike Evans	Georgia Department of Agriculture	GA
Justin Ferguson	Mississippi Farm Bureau Federation	MS
Nathan Fields	National Corn Growers Association	MO
Timothy Fredricks	Monsanto	MO
Henry L. Giclas	Western Growers	CA
Jeff Gore	Mississippi State University Entomological Society of America	MS
Chip Graham	Bayer CropScience Entomological Society of America	MS

Tom Green	IPM Institute Entomological Society of America	MI
Joan Gunter	Gunter Hunter, Inc. American Beekeeping Federation The Foundation for the Preservation of Honey Bees Honey Bee Health Coalition	ND
Jeff Harris	Mississippi State University Entomological Society of America	MS
Dudley Hoskins	National Association of State Departments of Agriculture	VA
Anna Howell	University of California Extension - Ventura Entomological Society of America	CA
Timothy Huggins	Delta F.A.R.M. Delta Wildlife	MS
Ian Kaplan	Purdue University Entomological Society of America	IN
David Kee	Minnesota Soybean Growers Association	MN
Robert Koch	University of Minnesota Entomological Society of America	MN
Rayda Krell	Western Connecticut State University Entomological Society of America	CT
Whit Lewis	U.S. Fish & Wildlife Service	TN
Ray McAllister	CropLife America	DC
Tucker Miller	Miller Entomological Services, Inc.	MS
Chrissy Mogren	Louisiana State University AgCenter Entomological Society of America	LA

Phil Mulder	Oklahoma State University Entomological Society of America	OK
Michael Muzzi	TKT Farms	MS
Matt O'Neal	Iowa State University Entomological Society of America	IA
Don Parker	National Cotton Council Entomological Society of America	TN
Katherine Parys	USDA-ARS (Stoneville, MS) Entomological Society of America	MS
Anita Pease	Environmental Protection Agency	VA
Jacob Pecenka	Purdue University Entomological Society of America	IN
Bob Peterson	Montana State University Entomological Society of America	MT
Stephen Ricks	U.S. Fish and Wildlife Service	MS
Caydee Savinelli	Syngenta Crop Protection, LLC Entomological Society of America	NC
Kate Schaffner	World Wildlife Fund	DC
Melissa Willrich Siebert	Dow AgroSciences, LLC Entomological Society of America	MS
Ashley St. Clair	Iowa State University Entomological Society of America	IA
Scott Stewart	The University of Tennessee Entomological Society of America	TN

Bill Striegel	Bayer CropScience Entomological Society of America	NC
Mike Sturdivant	Due West Farm	MS
Iris Strzyzewski	University of Florida Entomological Society of America	FL
Patrick Swindoll	TPC Farms	MS
Jamey Thomas	Dow AgroSciences, LLC Entomological Society of America	IN
Johnny Thompson	Broke-T Farms Mississippi Beekeeping Association	MS
Tim Tucker	Tuckerbee's Honey American Beekeeping Federation	KS
Doug Walsh	Washington State University Entomological Society of America	WA
Carter Westerhold	University of Nebraska – Lincoln Entomological Society of America	NE
Andy Whittington	Mississippi Farm Bureau Federation	MS
James Wilson	Virginia Tech University Entomological Society of America	VA
Judy Wu-Smart	University of Nebraska – Lincoln Entomological Society of America	NE

Participant Biographical Sketches

Jacquelyn Albert: Jacquelyn is a graduate student working towards her M.S. in entomology. Her research quantifies the field-level exposure of honey bees to pesticides during orchard bloom in Michigan. Her career goal is to work as an extension educator with growers, and to use her knowledge of pollinator-friendly pest

management to help boost both yields and pollinator health. She feels this Field Tour will be particularly valuable to gain insight on how successful IPM programs have been implemented, and how current challenges between beekeepers and growers are being resolved. She is also a hobbyist-beekeeper.

***Neil Anderson*:** Neil is a branch chief in the Pesticide Re-evaluation Division in the Office of Pesticide Programs at the Environmental Protection Agency (EPA). His group manages the registration review process for approximately 100 pesticide cases including the neonicotinoids imidacloprid, clothianidin, and thiamethoxam as well as other notable chemicals including glyphosate, dimethoate, dicrotophos, acephate, abamectin, the rodenticides and others. Neil has worked at EPA for over 26 years with the first half of that time as an agronomist in the Biological and Economic Analysis Division and the second half in pesticide risk management in the Pesticide Re-evaluation Division.

Dr. Tom Anderson: Tom is an ESA Science Policy Fellow, a member of the P-IE Pollinator Health Committee, a counselor of the Entomological Foundation, and a beekeeper. He is a 40+ year member of the ESA, and has worked in private industry R&D for most of this time. He owns a consulting company (Entoniche Consulting LLC) that advises private clients and government regarding new product R&D, and other insect-based issues. Tom hopes that this tour will establish consensus recommendations that can drive effective policy advocacy efforts that he can promote in his home state of North Carolina and nationally.

***James Austin*:** James is a Private Lands Biologist in the Mississippi Field Office for the U.S. Fish and Wildlife Service. Through the Partners for Fish and Wildlife Program, he provides technical and financial assistance to private landowners interested in improving wildlife habitat on their properties. Before going to work for the U.S. Fish and Wildlife Service, James spent five years as a District Conservationist with the Natural Resources Conservation Service in Richmond Hill, GA, where he also worked extensively with private landowners, delivering Farm Bill programs. He also has served as a Regional Biologist for the National Wild Turkey Federation and as Turkey Program Coordinator for the Mississippi Department of Wildlife, Fisheries, and Parks. James is a graduate of the Department of Wildlife, Fisheries, and Aquaculture at Mississippi State University, receiving his B.S. degree in 1998 and his M.S. in 2002.

Dr. Joe Bischoff: Joe joined the agriculture team at Cornerstone Government Affairs following his work in government and regulatory affairs for the horticulture industry where he focused on the intersection of federal programs and science-based solutions to plant health and crop production challenges. Joe has served on a number of scientific committees and review panels including the National Invasive Species Council's Invasive Species Advisory Committee (ISAC), National Clean Plant Network (NCPN), and the National Institute of Food and Agriculture (USDA-NIFA). Previously, Joe was with the USDA's Animal Plant Health Inspection Service (APHIS) where he was National Mycologist and Lead Scientist on the APHIS Intercepted Plant Pathogen Sequence Initiative (IPPSI). Following the completion of his doctoral degree from Rutgers University, Joe was the Fungal Taxonomist with GenBank, the National Institutes of Health's (NIH) genetic sequence database. He has authored over 30 peer-reviewed publications and in 2011 was awarded the USDA-APHIS's Deputy Administrator's Safeguarding Award, for his "exceptional work in safeguarding America's agricultural and natural resources."

Natalia Bjorklund: Natalia is a Ph.D. student at the University of Nebraska – Lincoln and is a full-time horticulture Extension Educator for the University. Her research focuses on native bees in urban landscapes. In her work, she is finding many native bees associated with prairie landscapes and is interested in the effects of expanding agriculture and urbanization on bee habitat. Natalia has a strong background in working with small acreage owners and urban dwellers, but also works with row crop producers. She is familiar with the challenges

related to bridging the gap between crop production and conservation and she looks forward to learning more and contributing to the tour.

Joseph Black: Joseph is pursuing an M.S. in Entomology at the University of Arkansas. His is currently researching a viral biopesticide and the potential vectors that help in creating and sustaining an epizootic event for pest management. Recently, he has been involved in projects involving neonicotinoids and their potential impact on honeybees in an agronomic setting. He brings an interesting perspective to the tour because he understands the pest management needs of growers, but is interested in biopesticides, which have not been sufficiently explored as pest management tools. Joseph is interested in learning more about pest management considerations to protect native pollinators on the tour.

Dr. Keri Carstens: Keri is Senior Manager for Integrated Product Research & Stewardship for DuPont Pioneer's Seed Treatment Enterprise, where she leads global strategies for pollinator health and best management practices for seed treatments. She also serves as DuPont's representative on the Honey Bee Health Coalition, where she is Co-Lead of one of the Coalition's working teams. Keri has a background in pesticide risk assessment and grew up on a farm near Grinnell, IA. She is looking forward to learning in the field because real world examples are the best way to solidify new ideas. She will apply her experience from the tour directly to her many roles and in her work with DuPont Pioneer customers.

Dr. Theresa Cira: Theresa is a postdoctoral associate at the University of Minnesota. Currently, she is working with the Minnesota Extension Integrated Pest Management (IPM) center on its "IPM for pollinator health" priorities. This fall she will also begin research on remote scouting of soybean aphid using unmanned aerial systems (UAS) imaging and field-level biotic and abiotic variables. She received her Ph.D. from the University of Minnesota with an Entomology major and Science, Technology, and Environmental Policy minor. Her Ph.D. research investigated the effects of cold tolerance, insecticides, and linguistic uncertainty on management of brown marmorated stink bug.

Larry Clemens: As the North America Agriculture Program Director of the Nature Conservancy, Larry guides the organization's comprehensive approach to agriculture and conservation by advancing legislative policy such as the Farm Bill, developing partnerships with like-minded NGOs, agencies, universities and businesses, and scaling up adoption of practices like cover crops, conservation tillage, and nutrient management. Prior to his current role, Larry served as the Indiana chapter's Upper St. Joseph River Director, the Agricultural Team Lead for the U.S. Central Region, and most recently as Indiana's Assistant State Director of Conservation. Larry received a B.S. in Biology from Huntington College and celebrated 25 years with The Nature Conservancy in June 2017.

Aimée Code: Aimée is the Pesticide Program Director at the Xerces Society for Invertebrate Conservation. She works in both urban and agricultural settings to design and implement pollinator-friendly pest management practices. Within this work she reviews pest management practices and recommends actions to reduce and/or mitigate risks to native pollinators and other beneficial insects. She also helps craft policy at the local, state and federal level to protect pollinators. Aimée received her master's degree in Environmental Health with a minor in Toxicology from Oregon State University.

Steven Coy: Steven is a second-generation commercial beekeeper from Northeast Arkansas and has served as an Executive Board member of the American Honey Producers Association since 2010. He was President of the Russian Honeybee Breeders Association from 2012 - 2016, is the former Secretary/Treasurer of the Pollinator Stewardship Council, and served as the U.S. Beekeeping representative on the EPA Pesticide Program Dialogue Committee for the past two years. He has participated in the PPDC's Pollinator Protection Work Groups. Steven earned a B.S. in Plant Science and an M.S. in Biology from Arkansas State University. As a student and research

assistant, he studied the effects of tarnished plant bug on cotton. He later spent two years as a research technician at the USDA Biological Control Research Unit in Stoneville, MS. In 2014, Steven and his wife started Coy Bee Company, LLC in Wiggins, MS. Their operation sells Russian queens, nucs, and produces honey made across the Mississippi Gulf Coast and Black Prairie region.

Kable Bo Davis: Since 2014, Kable Davis has been a team leader within the Invertebrate-Vertebrate Branch 1 (IVB1) in the Registration Division of EPA's Office of Pesticide Programs and is currently on detail as Branch Chief within the same branch. Prior to working in IVB1, Kable was a team leader within the Herbicide Branch for 4 years and started his career with the EPA as an efficacy reviewer and product registration team member in the Insecticide-Rodenticide Branch. Kable's current responsibilities include: pyrethroids, repellents, fipronil and cyclaniliprole. Kable has a M.S. in Entomology from Texas A&M University and a B.S. in Biology from McMurry University.

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Dr. Keith Delaplane: Keith is the Honey Bee Research and Extension Specialist at the University of Georgia and is co-author of Georgia's pollinator protection plan. His extension clientele includes beekeepers, bee conservators, and growers of pollinator-dependent crops. He is the author of Crop Pollination by Bees (2000), and will produce a second edition in 2018. He recently contributed the "Methods for Pollination Research" chapter in the European COLOSS "Bee Book," a digest of world standards for routine pollinator research methods. He primarily interacts with beekeepers and is looking forward to learning more about pest management concerns of crop producers.

Nathan Fields: Nathan has been with the National Corn Growers Association (NCGA) since 2004 and currently is the Director of Biotechnology and Crop Inputs. He is responsible for the Biotechnology, Economic Analysis, and Crop Protection programs within the organization. NCGA's Biotechnology and Crop Input programs focus on responsible stewardship of new and existing products in the corn industry. Prior to his employment with NCGA, Nathan worked in the Bio-Pharmaceutical industry managing Research and Development, Production and Process Development of pharmaceuticals, pharmaceutical excipients, custom bulk molecule synthesis, and protein/DNA extraction and purification. His post-undergraduate work included involvement with the private sector effort on sequencing the human genome. Nathan graduated from the University of Illinois with a B.S. in Biology from the University of Illinois and completed his MBA at Southern Illinois University in Edwardsville.

Jane DeMarchi: Jane B. DeMarchi has spent more than a decade working in Washington, DC on agriculture and food policy focusing on technology, research, and food safety. She is Vice President, Government and Regulatory Affairs for the American Seed Trade Association (ASTA). At ASTA, she advocates on a wide range of issues with federal agencies and Congress on behalf of 700 members in the seed industry. Her portfolio includes biotechnology, seed treatment, and conservation. Prior to ASTA, Ms. DeMarchi worked at the National Association of Wheat Growers and the North American Millers' Association. Earlier in her career, she assisted U.S. companies while working in Hong Kong and Shanghai. Ms. DeMarchi has a B.A. from Dartmouth College.

Dr. David Epstein: David Epstein is a Senior Entomologist for the USDA Office of Pest Management Policy (OPMP). The OPMP works with EPA on pesticide registration review issues resulting from implementation of the 1996 Food Quality Protection Act (FQPA). Dr. Epstein provides leadership support on the issue of honey bee health, providing scientific and science policy support on the implications of EPA risk assessment and risk mitigation proposals as they may impact crop production, agricultural pest control, agricultural workers, and the agricultural community in general. Dr. Epstein served for 12 years as the IPM Specialist for tree fruit crops for the Michigan State University Integrated Pest Management Program.

Mike Evans: Mike is Program Director for the Plant Protection/Apiary section of the Georgia Department of Agriculture. He oversees Georgia's Apiary Inspection program and served on Georgia's committee to develop and publish a statewide Pollinator Protection Plan. Georgia is among the top 3 states in producing honey bees and queen bees for sale and is 15th in the country for honey production. Mike has 23 years of experience working with diverse agricultural sectors and beekeepers and can share his perspective on balancing diverse interests. Mike is looking forward to learning how Integrated Pest Management programs can be adopted and implemented that balance farm stewardship with protecting all pollinators that are important to agriculture in Georgia and nationally.

Dr. Timothy Fredricks: Dr. Timothy Fredricks is a Senior Ecotoxicologist with Monsanto Company. His background is in terrestrial ecotoxicology specializing in avian toxicology and environmental field studies. For the past 8 years, Tim has worked in the agriculture industry for Bayer CropScience and Monsanto conducting environmental risk assessments supporting global chemical registrations. During that time, he has also developed additional expertise in apiculture. Specifically, Tim co-founded the Monsanto Bee Club, contributes to the ongoing Monsanto honeybee health research, actively participates in his local bee club, and for fun maintains 10-20 beehives primarily for queen, honey, and nucleus colony production.

Henry Giclas: Henry L. (Hank) Giclas has worked for Western Growers (WG) since 1990 concentrating on the science and technology issues facing agriculture. Science and Technology addresses food safety programs, pesticide and chemical registration, policy issues and environmental programs including water and air quality issues. Under Hank's leadership WG works to ensure that sound science and useful technology drives industry advancement, solutions and government policy. Since August 2003, Hank has directed strategic planning for the Association. Today, Hank serves as Senior Vice President Strategic Planning, Science and Technology for Western Growers and is actively developing association leadership in the areas of sustainability, food safety, food security, crop production and protection, as well as assisting in the implementation of the Association's strategic plan.

Chip Graham: Chip is a Principal Scientist for Bayer CropScience with Seed Treatment Tech Service and Development responsibilities for the Mid-South. For the last 28 years, his primary role has been working with University Extension and Research Entomologists and Plant Pathologists establishing seed treatment insecticide, fungicide, and nematicide protocols on cotton, corn, soybeans, and wheat. He has also served as a Bee Ambassador for Bayer CropScience for the last 5 years. Chip received his B.S. in Seed Technology and his M.S. in Agronomy from Mississippi State University.

Dr. Thomas Green: Tom is president and co-founder of the IPM Institute of North America, a non-profit working on market-based initiatives to improve outcomes in agriculture and communities through IPM and other sustainable practices. His clients include private foundations, government, food companies, pest management service providers, schools, and health care organizations. Their programs reach over 10,000 farms each year. His major food company clients are very interested in responding to customer, shareholder, and advocate requests to protect pollinators. Tom has served on the Minnesota Pollinator Health and Crop Production Task Force and the Wisconsin Pollinator Protection Plan Stakeholder Committee. He is interested to talk with others about how to build public support for intelligent policy on pollinator health.

Joan Gunter: Joan was raised in rural North Dakota on the family farm. She attended college and earned a degree in education and business. After graduating, she taught school on all levels for 10 years while raising 2 boys with husband Dwight. Joan and Dwight of Towner, North Dakota have been Commercial Migratory beekeepers for over 30 years traveling to Mississippi, Texas, and California. The family-owned company is primarily engaged in honey production, queen rearing, pollination, and sales of bees. Joan is involved with the

American Beekeeping Federation (ABF), The Foundation for Preservation of Honey Bees, the National Honey Board, and The Honey Bee Health Coalition. She is also active in several state organizations in North Dakota, Mississippi, and Texas. Joan currently serves on the ABF Executive Board and is involved with several committees within ABF, and has recently been elected to the National Honey Board.

Anna Howell: Anna is staff research associate & entomologist at the University of California Cooperative Extension Office in Ventura County, CA. Anna's research interests have focused on pollinators, particularly native bees, and she gives presentations to professional agricultural groups such as pesticide applicators on how to increase pollinators and mitigate pesticide effects in agricultural fields and urban landscapes. She also gives pollinator presentations to home gardeners and youth. She works with diverse stakeholders including pest control advisors, government, industry, non-profits, and beekeepers. Anna works in a unique region with an ag-urban interface and she is looking forward to learning about the work in Mississippi to communicate amongst diverse groups.

Dudley Hoskins: Dudley Hoskins joined the National Association of State Departments of Agriculture (NASDA) as Public Policy Counsel in November 2013. Prior to joining NASDA, Hoskins worked as the Director of Health and Regulatory Affairs for the American Horse Council and as Manager of Regulatory Policy for RISE (Responsible Industry for a Sound Environment). Hoskins earned his undergraduate degree from Tulane University and a J.D. from Texas A&M University School of Law. Hoskins is licensed to practice law in the state of Texas. NASDA is a nonpartisan, nonprofit association that represents the elected and appointed commissioners, secretaries, and directors of the departments of agriculture in all fifty states and four U.S. territories.

Dr. Ian Kaplan: Ian is an Associate Professor in Entomology at Purdue University. He is a primary research faculty with general interests in insect ecology. His lab works on specialty crop systems with strong interests in conservation of beneficial insects, including pollinators and predators. He is in the first year of a five-year USDA grant aimed at understanding how using neonicotinoid insecticides in cucurbits affects managed and native pollinators and pests such as cucumber beetles. He is very curious to see how issues of crop production and pollinator health are being addressed in the South and thinking about how he could apply that experience to issues in the Midwest.

Dr. David Kee: David is director of research for Minnesota Soybean Growers Association. He was raised on an eastern Texas cow/calf farm and worked his way through college by cowboying, picking peas, welding trailers, being a pump jockey at a local gas station, and working as a derrick hand in the east Texas oil field. Kee graduated with his Ph.D., from Auburn University in Crop Management and his M.S. in Soil Science from Texas A&M University (TAMU). While working to complete his M.S., he was a research fellow working in strip mine revegetation/reforestation. After completing his M.S. degree, David was a full-time research associate in the forage management program and part-time student while completing his doctorate at Auburn University. He has previously served as an extension agronomist for TAMU, industrial agronomist for El Dorado Chemical, Ad Interim Assistant Professor at TAMU-Commerce, research scientist at McNeese State University working in forage production, row crop (corn and soybean) management, and native prairie restoration, and director of research at Southern Minnesota Sugar Beet Co-op.

Dr. Robert Koch: Robert is an Assistant Professor & Extension Entomologist in Entomology at the University of Minnesota. His research and extension programming focuses on pest management in soybeans. In Minnesota, soybean aphid is a persistent pest, and seed-applied and foliar insecticides are commonly used for management, but these pesticides are under increasing scrutiny for impacts on pollinator health. He was recently selected to serve on the Governor's Committee on Pollinator Protection in Minnesota. He is looking forward to applying what he learns on the tour directly to his work on the Committee and developing relationships with those from other states to leverage their knowledge for improved actions on pollinator protection.

Whit Lewis: Whit works for the U.S. Fish and Wildlife Service and is the Regional IPM/Farming Coordinator for the Southeast Region. Whit's duty station is Hatchie National Wildlife Refuge in West Tennessee, which is part of the West Tennessee Refuge Complex. Whit has worked with the U.S. Fish and Wildlife Service for 28 years, much of which has been spent reviewing pesticides and their use on National Wildlife Refuges and Fish Hatcheries across the Region. In his early years with the Service, he worked as a Refuge Manager in conjunction with reviewing pesticides. He received a double B.S. degree from Austin Peay State University in Biology and Agriculture.

Dr. Ray S. McAllister: Ray S. McAllister is the Senior Director of Regulatory Policy for CropLife America in Washington, DC, the U.S. national trade association representing manufacturers, formulators, and distributors of crop protection products. His primary areas of responsibility include development, refinement, and implementation of regulations and guidelines for premarket approval and continued product support of crop protection product uses, through interaction with the Environmental Protection Agency and other government agencies, agricultural industry organizations, scientific societies, and public interest groups. Dr. McAllister joined the National Agricultural Chemicals Association in 1989 and has served through two organizational name changes. Previously he worked for the Dynamac Corporation in Maryland on EPA contracts for pesticide residue data review, and was on the faculty of Iowa State University at Ames, Iowa in the Department of Plant Pathology, Seed & Weed Sciences.

Dr. Chrissy Mogren: Chrissy is a postdoctoral entomologist at Louisiana State University focusing on how biodiversity may be used to reduce pesticide risks to pollinators in agricultural systems. In her research, she has explored how interdisciplinary techniques can be successfully deployed to improve pollinator health, particularly as it relates to sublethal stressors. She advocates for farming for profit as opposed to farming for yield, which ultimately can reduce harmful inputs. She looks forward to interact with other pollinator biologists and beekeepers/stakeholders in an intimate setting to brainstorm ideas for how best to proceed with outlining a pollinator stewardship program in Louisiana.

Dr. Phil Mulder: Phil is Professor and Head of the Department of Entomology and Plant Pathology at Oklahoma State University. He has extension and research responsibilities for fruit and nut crops. Because the department does not currently have an apiculturist, he is often called on to answer bee-related questions. He is also past-President of the ESA and has advocated for science policy at the national level. He is hopeful that seeing how Mississippi has successfully approached this complex issue could stimulate ideas for his own state. He would like to develop some collaborative relationships that can result in team building to tackle this and other important issues.

Dr. Matt O'Neal: Matt is an Associate Professor in Entomology at Iowa State University, with research and teaching responsibilities related to pest management with a focus on soybean production. His lab has studied the biology and management practices for the soybean aphid. Currently, Matt is collaborating with several scientists at ISU to determine the impact of IPM and conservation practices on pollinators that use soybean as a forage. The field tour will help communicate these findings, and learn from others on how best to disseminate findings such that all stakeholders can benefit. Additionally, Matt would like input from participants on what future questions need to be addressed to ensure pollinator protection and annual crop production.

Dr. Don Parker: C.D. "Don" Parker, Jr., has more than 20 years in the field of insect pest and resistance management. Currently, Dr. Parker is serving his tenth year as Manager of Integrated Pest Management for the National Cotton Council of America. In that role, he works closely with producers and researchers across the 17 cotton-producing states to address pest management issues facing cotton production, as well as the development of educational material to aid dissemination of research findings. Additionally, he is the Council's

lead scientist in the area of crop protection based on field-relevant sound science. Prior to joining the Council, Dr. Parker served as an Entomologist at Mississippi State University where his duties included teaching, research, and extension. While there, his research predominantly focused on row crop Insect Pest Management and Insect Resistance Management in Bt Crops. His extension responsibilities included entomology support for the southern half of Mississippi and serving as statewide corn entomology specialist. Dr. Parker has published more than 67 research papers and given numerous presentations.

Anita Pease: Anita joined the Environmental Protection Agency (EPA) in 2004 as a staff biologist, served as a senior scientist in the Environmental Fate and Effects Division (EFED) from 2006–2010, and has been the EFED Associate Director from 2011–2017. Since June of 2017, she joined the Biological and Economic Analysis Division as the Acting Deputy Director. During her tenure as EFED Associate Director, Anita has been OPP's lead on endangered species (ES)-related activities. This included oversight of EPA's ES-litigation commitments and most recently the collaborative work with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Department of Agriculture to develop new scientific methods, based on recommendations from the National Academy of Science report on assessing ES-risk from pesticides. In addition, Anita has been involved in efforts to advance EPA's new harmonized quantitative risk assessment methodology for pollinators. She served on the Federal Pollinator Task Force and helped develop EPA's commitments as part of the National Strategy to Promote the Health of Honey Bees and Other Pollinators. Prior to joining EPA, Anita was employed as a Senior Scientist with 15 years of experience in the environmental consulting industry.

Jacob Pecenka: Jacob is a graduate student who recently completed his M.S. at South Dakota State University and will begin a Ph.D. program at Purdue University in the fall. He has done research on the risk of neonicotinoids on monarch butterflies and will join a large research project at Purdue University observing the effects that neonicotinoids have on pollinators and pest species in cucurbit farming systems. Jacob's long-term goal is to continue a career in academia; conducting research and providing education to students and growers about insects, ecology and agriculture.

Dr. Bob Peterson: Bob is professor of entomology at Montana State University where he leads the research, teaching, and outreach program on Agricultural and Biological Risk Assessment. A major research emphasis of his program is pesticide risk assessment, including insecticide risks to non-target insects. He conducts research on insecticide risks to honey bees and alfalfa leafcutting bees. Bob is vice president-elect of the Entomological Society of America and on behalf of ESA Central is able to help bridge risk assessment, regulations, and policy influence for the Society. He plans to use the information from the tour to refine risk assessment considerations for bee population management and conservation.

Stephen Ricks: Stephen is the Field Supervisor of the United States Fish and Wildlife Service, Mississippi Ecological Service Office. Stephen has served in this capacity for 7 years. Prior to his assignment with the Service, Stephen worked for the Department of Defense.

Dr. Caydee Savinelli: Caydee has worked in agricultural pest management for over 30 years and is the Pollinator and IPM Stewardship Lead at Syngenta. She also leads Syngenta's Operation Pollinator program, which seeks to increase pollinator forage and habitat in golf courses and agricultural landscapes. She is also a member of P-IE's pollinator committee and is currently on the steering committee of The Bee & Butterfly Habitat Fund, which was formed by a large beekeeper and two NGO's for the purpose of introducing better forage into the agricultural landscape. This collaboration is based on the work via the Honey Bee Health Coalition. She hopes the field tour will increase her network and allow her to hear perspectives from the farming community in Mississippi on best management practices.

Kate Schaffner: Kate Schaffner is a Senior Program Officer on the Markets and Food team at World Wildlife Fund's (WWF) office in Washington, D.C., providing technical guidance for sustainability initiatives related to agriculture and commodity crop supply chains in the United States. She also sits on the WWF network soy working group. She is a member of both the Metrics Committee at Field to Market: The Alliance for Sustainable Agriculture and the steering committee of the Midwest Row Crop Collaborative. She received her M.S. in Agriculture, Food, and Environment from Tufts University's Friedman School of Nutrition Science, and Policy, and her B.S. in Molecular, Cell, and Developmental Biology from the University of California, Santa Cruz.

Ashley St. Clair: Ashley is a Ph.D. student at Iowa State University investigating how surrounding landscapes and insecticide use in cultivated crops influence the forage availability, community, and health of honey bees and wild bees, and potential benefits bees may contribute to crop yield. She is interested to determine if IPM practices in crops combined with moving honey bees to prairies after crop bloom can rescue bees from negative impacts of agricultural intensification. She is looking forward to learning about how a different region in the U.S. has managed the needs of crop production and pollinator health and new information about pollinator pests and predators.

Dr. Scott Stewart: Scott is the Extension IPM Coordinator and Professor of Entomology at the University of Tennessee. He is located at the West Tennessee Research and Education Center in Jackson. His expertise is in row crops entomology with emphasis on cotton, corn, soybean, sorghum and wheat. Before his current position, Scott had research, teaching, and extension responsibilities in row crops IPM at Mississippi State University. He received his bachelor's degree in biology from the University of Northern Iowa. He completed his M.S. and Ph.D. in entomology from Texas A&M and Auburn University, respectively. Scott develops and presents educational programs related to row crops IPM and also performs applied research including the evaluation of insecticide efficacy, GMO technologies, and other IPM tactics. More recently Scott has devoted considerable effort to better understanding the effects of agriculture on pollinators, especially honey bees.

Bill Striegel: Bill is a Seed Growth Product Development Manager for Bayer CropScience, participates on Bayer's Bee Team, and leads the seed treatment stewardship efforts. He also manages the technical aspects of the Clothianidin Asset Team and supports the Regulatory Affairs group to maintain seed treatment registrations and freedom to operate. He has 33 years of industry experience and comes from a Midwest farm background. He plans to use information from the tour within teams at Bayer CropScience to improve recommendations and decision-making.

Iris Strzyzewski: Iris completed her M.S. at the University of Florida and is a biological scientist at the North Florida Research and Education Center in Quincy, FL. Her research focuses on characterizing thrips injury for Florida strawberry cultivars. This year, she began her future doctoral research evaluating companion planting with native wildflowers as attractants for pollinators and predators of thrips in strawberry. She works closely with the Florida Strawberry Growers Association and several growers. She looks forward to learning more about balancing pest management and pollinator health from the experiences in Mississippi first-hand and she hopes to meet new colleagues and potential future collaborators.

Dr. Jamey Thomas: Jamey is responsible for leading the regulatory activities and label development for a portfolio of crop protection products in the U.S. at Dow AgroSciences. His work requires an understanding of current pollinator issues, data requirements, study protocols, and challenges in conducting the studies. He has 20+ years experience at all levels of R&D in the crop protection industry including designing pesticide labels that are clear to users and protective of non-target organisms. He hopes to gain a better understanding of how diverse stakeholders have worked together to communicate their interests and activities, balance their needs

successfully and use this understanding to find consensus among stakeholders in other geographic areas and with policy makers at the national level.

Tim Tucker: Tim has been keeping bees since 1990 when he was an exterminator who removed bees from buildings and homes as part of his business, beginning with two hives that were rescued from extractions. Tim has been a commercial beekeeper since 1996, running as many as 800 colonies. He has served as president of the Kansas Honey Producers Association (KHPA) and was editor of the newsletter for the KHPA for 8 years. He is past president of the American Beekeeping Federation (ABF) and editor of the E-Buzz, which is the ABF's monthly electronic newsletter.

Dr. Douglas B. Walsh: Doug is the IPM Coordinator and Professor of Entomology at Washington State University. He is the 2017 Chair of the National IPM Coordinating Committee and the Pacific Branch Representative on the on the Entomological Society of America's Governing Board. In regards to pollinators, he conducts research on the key pollinators of alfalfa produced for seed and other seed crops grown in the western US including leafcutting, alkali, and honey bees. He has played a key role in work to register pesticides for pest control that have a minimum impact on bees. Doug helped draft the ESA policy statement on pollinators. He looks forward to interacting with the many stakeholders on the tour as everyone learns together about balancing the needs of pollinators and pest management.

Carter Westerhold: Carter is a graduate research assistant at the University of Nebraska, pursuing an M.S. thesis focused on pollinator conservation. His research aligns to his interests - entomology, horticulture, ecology, and conservation. The objective of Carter's thesis is to compare common ornamental plants, sold in Nebraska and other midwestern states, for their attractiveness to pollinating bees and bee preferences for native and non-native ornamental plants. He works with the Nebraska Environmental Trust's community habitat initiative, which creates habitat and forage for pollinators in communities across the state as well as engaging with local home and landowners on how to create landscapes that better serve ecological purposes for pollinators. Carter believes the field tour will be an excellent professional development opportunity to further his understanding on pollinator health and conservation.

Dr. James Wilson: Dr. James Wilson joined the Virginia Tech University faculty in January 2017 as the new Extension Apiculturist. His duties include Extension efforts throughout the Commonwealth of Virginia and teaching the Bees and Beekeeping class and Insects and Human Society class on campus in Blacksburg, VA. His dissertation research focused on pest and beneficial insect interactions as well as the qualification of pesticide exposure risk to honey bees. James maintains Virginia Tech's research and teaching apiaries and is looking forward to expanding the impact of Apiculture Extension throughout Virginia and surrounding states. He hopes to incorporate the successes and learn from the challenges faced in the Mississippi case study into his Extension work with growers, beekeepers, and policymakers in Virginia. For more information on Apiculture Extension in Virginia please visit blogs.ext.vt.edu/bees .

Dr. Judy Wu-Smart: Judy is an Assistant Professor and Extension Specialist for the University of Nebraska-Lincoln. Her focus is on pollinator health and the impact of biotic stressors (e.g., mites and pathogens) and abiotic stressors (e.g., pesticides and nutrition) on managed honey bees and wild bees. She is co-leading conservation efforts to establish a Beneficial Insect Protection Plan (BIPP) in collaboration with 20+ other UNL faculty and extension educators as well as numerous stakeholder partners. She hopes the field tour experience, will enable her to better guide conversations regarding the BIPP in a more balanced manner and facilitate efficient and impactful behavioral changes to safeguard economic success, improve pollinator health, and encourage sustainable land stewardship practices.

The Mississippi Delta:
Agricultural, Historical, and Cultural Facts

Mississippi River Delta: The Mississippi River Delta is the distinctive northwest section of the state of Mississippi, which lies between the Mississippi and Yazoo Rivers. The Delta was built by sediments deposited by the Mississippi River over thousands of years at the mercy of the river's path. Prior to the modern levee system, the river regularly changed course, moving the supply of sediments from one place to another. As some areas gained land, other areas were cut off from the river and gradually compacted, sunk, and eroded, eventually forming the bayou, lakes, and bays that now comprise the largest coastal wetland in the United States. The Mississippi Delta in Mississippi is 200 miles long and 70 miles across at its widest point, encompassing approximately 4,415,000 acres, or, some 7,000 square miles of alluvial floodplain. Originally covered in hardwood forest across the bottomlands, it was developed as one of the richest agricultural production areas in the nation. Walt Grayson, a local television personality has a short YouTube video produced.

Stoneville, Agriculture Research Center: The small town of Stoneville is home to some of the most important agricultural research facilities in the world, including Mississippi State University's Delta Research and Extension Center, USDA-ARS Jamie Whitten Research Center, USDA-Animal Plant Health & Inspection Service, USDA Cotton Ginning Laboratory, USDA National Biological Control Laboratory, Thad Cochran National Warmwater Aquaculture Center, and US Forest Service Center for Bottomland Hardwood Research.

Great Flood of 1927: The Greenville area is the location of one of the greatest natural disasters the country has ever known. On Thursday, April 21, 1927 at 7:45 AM, a swollen Mississippi River broke through the Mounds Landing levee, eight miles north of Greenville, creating the greatest crevasse in the river's history. *Suggested reading: "Rising Tide: The Great Mississippi Flood of 1927 and How it Changed America", by John. M. Barry & "Lanterns on the Levee: Recollection of a Planter's Son", by William Alexander Percy. http://www.visitmississippi.org/events-and-points-of-interest/the-flood-of-1927-museum-26813*

Holt Collier: Born a slave in 1846, Collier served as a Confederate sharpshooter and cavalryman. Famed as a bear hunter, he guided President Theodore Roosevelt on a bear hunt in Onward, Mississippi in 1902. When Roosevelt refused to shoot a bear Collier had roped, cartoonists coined the term "Teddy Bear," and the rest is history. *Suggested reading: "Holt Collier: His Life, His Roosevelt Hunts, and The Origin of the Teddy Bear", by Minor Ferris Buchanan.*

Mississippi Blues: The roots of the blues are embedded deep within the Mississippi Delta. The Delta has been the backdrop to many key individuals and events that make up the history of the blues. Follow the Blues Trails to visit the hometowns of dozens of notable musicians – B.B. King, Muddy Waters, Howlin' Wolf, James Cotton, and many others. Tap into musical revelry with visits to the Delta Blues Museum (http://www.deltabluesmuseum.org/), B.B. King Museum, and Delta Interpretive Center (http://bbkingmuseum.org/) and new **GRAMMY Museum Mississippi**

(http://www.grammymuseum.org/explore/grammy-museum-mississippi).

Writers From the Delta: The region figures in the works of William Faulkner, Eudora Welty, and a host of other Mississippi-born writers. Greenville in particular prides itself on its homegrown literary talent: William Alexander Percy, his nephew Walker Percy, Shelby Foote, Hodding Carter, David Cohn, Angela Jackson, Ellen Douglas, and Julia Reed. Willie Morris was raised in Yazoo City and Tennessee Williams spent a significant portion of his childhood in Clarksdale, where a Tennessee Williams Festival is held each year.

Winterville Indian Mounds Park: Located six miles north of Greenville, you will see one of the best examples of advanced prehistoric civilization. The Winterville Mounds Park and Museum consists of flat-topped rectangular mounds of various sizes, arranged around a 43-acre plaza. At the center is the 55-foot-high Temple Mound, the largest at the site. According to the National Park Service, "this mound group remains one of the largest and best-preserved in the southeastern United States".
(http://www.mdah.ms.gov/new/visit/winterville-mounds/)

Birthplace of Kermit the Frog: Kermit's creator, Jim Henson, combined his imagination with memories of his early childhood on the banks of Deer Creek in Leland, Mississippi to create a host of some of the most loved characters in American history – Kermit and the Muppets of Sesame Street. Jim's father ironically was an agronomist for the nearby USDA research center. (http://www.birthplaceofthefrog.org/)

Doe's Eat Place: Established in 1941, it's an unassuming little steakhouse located inside a shotgun-style home and storefront in Greenville, gaining national acclaim over the years. It has been featured in Southern Living Magazine, Garden & Gun, CNN, and Food Network, and just ask some of Doe's biggest fans such as former President Bill Clinton, George Clooney, or Willie Nelson about the rustic ambiance.

Stein Mart: Russian immigrant Sam Stein arrived in Greenville by riverboat in 1905. In Greenville, he founded a retail enterprise that would remain in his family for generations. Later in 1964, his son, Jake, opened the first Stein Mart store in Greenville. By the 1980's, Jake had developed Stein Mart into a national department store chain with 250 stores today.

Notes

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