Report of the 2017 State of Arkansas Dicamba Task Force Meetings

Convened by the Arkansas Department of Agriculture

Report prepared by the Winthrop Rockefeller Institute

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Dicamba Task Force
Executive Summary

Throughout the summer of 2017, the Arkansas State Plant Board (ASPB) received a record-breaking number of complaints alleging misuse and off-target effects from the herbicide dicamba. In response to such an unprecedented number of complaints, ASPB voted to enact an emergency rule that would ban the sale and use of the herbicide dicamba in the state for 120 days. The emergency rule was reviewed by the Governor and the legislature before becoming effective on July 11, 2017. On August 1, 2017, a separate law and corresponding rules that allowed for increased civil penalties for "egregious violations" of dicamba use also went into effect.

Recognizing the need for certainty in the 2018 growing season and beyond, as well as the approaching October and November planning and purchasing period for Arkansas farmers, Gov. Hutchinson called upon ASPB and the Arkansas Agriculture Department to create a task force charged with reviewing dicamba technology, examining current problems with its use and application, and making long-term recommendations for the future. An 18-member task force representing a cross-section of those most affected by the issues surrounding dicamba use was convened.

The task force was brought to the Winthrop Rockefeller Institute to undergo a facilitated, dialogue-driven decision-making process. Institute facilitators served as impartial, independent mediators, guiding the task force through an examination of all sides of the issue, not only from the task force members themselves, but also from advisory members representing academic researchers and scientists as well as researchers from dicamba product manufacturers and Arkansas Agriculture Department conveners.

On the afternoon of Aug. 26, 2017, after two meetings, the dicamba task force came to a consensus agreement on the following recommendations around dicamba and its use in Arkansas:

- A cutoff date for the in-crop use of dicamba in Arkansas of April 15, 2018, and the need to revisit the issue for the 2019 growing season after more data and research has been collected and reviewed.
- Amend the current law (Arkansas Code § 2-16-203) allowing there to be "egregious violations" subject to enhanced penalties without the need to prove "significant off-target crop damage."
- Increased independent and university testing of new products before they come to market, with an additional stipulation that the entire technology package (seeds and herbicide) be ready for market at the same time.

The task force initially attempted to reach consensus with an 85% approval but was unable to do so. As a result, the task force unanimously agreed to lower the approval percentage to 75% in order to reach a consensus. The above recommendations were the result of a consensus decision making process that required 75% approval. In order to break a stalemate and reach the 75% approval level one task force member changed his positions from "objecting" to "supporting the decision with major reservations" that allowed the process to end. The consensus-making task force member fell on the opposing side of the April 15 cutoff, instead favoring the submission of a date range from April 15 to May 15 for the ASPB to consider and make the final determination. The question of an appropriate cutoff date was the only point of disagreement in the recommendations.

The dicamba task force recommendations are the result of an intensive look at all the available in-

formation and research from all sides of the issue, including public testimony. Beyond a traditional vote of yes or no, these recommendations were shaped by the task force over multiple sessions of dialogue. Of the many possibilities discussed, the above represent the bottom-line, group decision from some of those most affected by the issues, this year and beyond.

Dicamba Task Force
Recommendations Report

Background

According to the United States Department of Agriculture, there were over 3.5 million acres of soybeans planted in Arkansas in 2017[1]. This makes Arkansas the 11th largest soybean producing state in the nation. According to the University of Arkansas Extension Service, those acres generate approximately $1.7 billion dollars annually[2].

The vast impact soybean production has on the state of Arkansas and its residents is the reason why the number of complaints received by the Arkansas State Plant Board (ASPB) alleging misuse of the herbicide dicamba throughout the summer of 2017 is so harrowing. As of Sept. 1, 2017, there have been 963 complaints alleging dicamba misuse over 26 Arkansas counties[3], with most received through May and June. In response to such an unprecedented number of complaints, ASPB voted to enact an emergency rule that would ban the sale and use of the herbicide dicamba in the state for 120 days.

The emergency rule was reviewed by the Governor and the legislature before becoming effective on July 11, 2017. On August 1, 2017, a separate law and corresponding rules that allowed for increased civil penalties for "egregious violations" of dicamba use also went into effect. Even with record numbers of alleged misuse, the decision to implement an emergency ban was not made lightly. The off-target effects being investigated by the ASPB were weighed heavily against a growing fight with Palmer amaranth, a pervasive weed plaguing Arkansas soybean farmers.

Dicamba is one of a limited number of options for Arkansas farmers battling Palmer amaranth, more commonly known as pigweed. This is especially true in areas that have pigweed with a resistance to Protoporphyrinogen oxidase (PPO) inhibitors, a popular and widespread herbicide formulation. The caveat with dicamba use, however, is that soybeans are particularly sensitive to dicamba, meaning that farmers using dicamba need to purchase dicamba-tolerant beans and follow the label instructions closely in order to prevent off-target movement of the product.

Recognizing the need for certainty in the 2018 growing season and beyond, as well as the October and November planning and purchasing period for Arkansas farmers, Gov. Hutchinson called upon ASPB and the Arkansas Agriculture Department to create a task force. That task force was charged by Gov. Hutchinson with reviewing dicamba technology, examining current problems with its use and application, and making long-term recommendations for the future.

Given the divisive nature of the issues surrounding dicamba use in Arkansas, Secretary of Agriculture Wes Ward assembled a task force comprising members on all sides of the issues and brought in the nonprofit Winthrop Rockefeller Institute (the Institute) to serve as impartial, independent facilitators for the Dicamba Task Force meetings. The Institute employs what it terms the "Rockefeller Ethic" in its collaborative programs, a guiding mindset modeled after the convening

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[1] https://usda.mannlib.cornell.edu/usda/current/Acre/Acre-06-30-2017.pdf

[2] https://www.uaex.edu/farm-ranch/crops-commercial-horticulture/soybean/

[3] http://www.aad.arkansas.gov/arkansas-dicamba-information-updates

and problem-solving methods of Gov. Winthrop Rockefeller, for whom the Institute is named and whose legacy it perpetuates. It was Gov. Rockefeller's belief that when you bring the right minds to the table, no problem was without a solution.

The Task Force

Secretary of Agriculture Wes Ward, in conjunction with the Arkansas State Plant Board director Terry Walker, assembled an 18-member task force representing a cross-section of those most affected by the issues surrounding dicamba use[4]. By and large the members had a family history of farming and agriculture or represented agriculture associations throughout the state, oftentimes both. Task force members broadly fell into two equally represented camps: those seeking a safe way to continue using dicamba technology given the fight against Palmer amaranth; and those seeking a complete ban or pause in dicamba use given the extent of the alleged damage.

Task Force Members

Stacey Bruff, Arkansas Seed Dealers Association

Sterling Clifton, CCA, Arkansas Crop Consultants

Terry Dabbs, Arkansas Farm Bureau

Chad Duckworth, Arkansas Seed Dealers Assoc.

Blake Foust, CCA, Arkansas Crop Consultants

Dan Gladden, Arkansas Plant Food Association

Andrew Grobmyer, Agricultural Council of Arkansas[5]

A. J. Hood, Ar. Soybean Association[6]

David Hundley, Poultry Industry

Don Johnson, Arkansas Crop Protection

Brad Koen, Arkansas Crop Protection

Billy Maddox, Arkansas Seed Growers Assoc.

Joe Mencer, Southeast Arkansas Farmer

Shawn Peebles, Central Arkansas Farmer

John Petrus, Arkansas Seed Growers Association

Dale Reed, Arkansas Plant Food Association

Danny Townsend, Arkansas Green Industry

David Wildy, Northeast Arkansas Farmer

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[4] http://www.aad.arkansas.gov/Websites/aad/files/Content/6042043/Dicamba_Task_Force_Announcement,_Aug_7_2017.pdf

[5] Mr. Grobmyer was replaced by West Higginbotham, President of the Agricultural Council of Arkansas, at both task force meetings.

[6] Mr. Hood was unable to attend the second task force meeting on August 24. He was replaced by Robert Stobaugh, a farmer also representing the ARSA.

To help the task force members make the most informed decision, an advisory group was drawn together. The advisors were in place at task force meetings to present information to the task force members and answer their questions, but were not part of the task force itself. The advisors represented both product manufacturers and the University of Arkansas Division of Agriculture.

Advisory Members

Ralph Bagwell, Bayer

Ford Baldwin, Independent Consultant

Tom Barber, University of Arkansas

Tina Bhakta, Monsanto

Jeff Birk, BASF

Chet Chaney, Monsanto

Kyle Colwell, Dow Agroscience

Judy Fersch, BASF

Dennis Gardisser, Agriculture Engineer

John Hemminghaus, Monsanto

Alan Hopkins, Bayer

Rachel Hurley, Monsanto

William Johnson, Bayer

Elisha Kemp, Dow Agroscience

Warren Mayberry, Dupont

Kirby Miraglia. Bayer

Jason Norsworthy, University of Arkansas

Tom Orr, Monsanto

Wayne Schumacher, Dupont

Bob Scott, University of Arkansas

Jonathan Siebert, Dow Agroscience

Dan Westberg, BASF

Ty Whitten, Monsanto

Attending the meetings as the conveners of the task force were members of the Arkansas Agriculture Department (AAD) and the Arkansas State Plant Board (ASPB), including Sec. Ward and director Walker. The AAD and ASPB members also provided information upon request of the task force.

Convening Members

Adriane Barnes, Arkansas Agriculture Department

Annelie Browder, Arkansas Agriculture Department

West Higginbotham, Arkansas Agriculture Council

Wade Hodge, Arkansas Agriculture Department

Larry Jayroe, Arkansas State Plant Board

Susie Nichols, Arkansas Agriculture Department

Brandi Reynolds, Arkansas Agriculture Department

Terry Walker, Arkansas Agriculture Department

Wes Ward, Secretary of Agriculture

Also in attendance at the meetings on the first and second days were 22 and 26 members of the general public, respectively, with a vested interest in the final recommendations. Several public members made comments for the task force's consideration. Those comments, as well as any discussion around them, are available for viewing in Appendix A.

The Facilitation Process

"The desire to work together to make everything all right has to be in the hearts of those on both sides of the table." --Winthrop Rockefeller, A Letter to My Son

Division on the issues surrounding dicamba and the importance of the recommendations made essential the need for the task force meetings to be inclusive and for the recommendations to be supported by enough interests to be sustainable. The Institute's application of the Rockefeller Ethic is intended to help examine all sides of an issue represented and coming to a consensus decision through a facilitated and open, civil dialogue. Gov. Rockefeller encountered many complex and sometimes controversial issues during his time in office, but his process of bringing together the right people and charging them with finding a solution led to many positive outcomes for Arkansas.

Similarly, the task force members brought together by Sec. Ward under the charge of Gov. Hutchinson represented a diverse mix of viewpoints in the room to make recommendations about dicamba use in Arkansas. Per the Rockefeller Ethic, the task force represented not only those knowledgeable about agriculture issues and the impacts of dicamba's use or ban, but equal representation from both sides of the issue. A central tenant of the Rockefeller Ethic is that both sides engage in a structured dialogue surrounding the issue. For a consensus decision to be reached, it was necessary that all points of view and available knowledge from the task force be heard and considered.

As is reflected in the exploration of the meeting structure later in the report and in the appendices, the task force members were given the best available knowledge and the most opportunities possible to discuss and explore the issues around dicamba use given the available timeframe.

The Final Recommendations

On the evening of Aug. 26, 2017, the 18 members of the dicamba task force came to a consensus agreement on the following recommendations around dicamba and its use in Arkansas:

- A cutoff date for the in-crop use of dicamba in Arkansas of April 15, 2018 and the need to revisit the issue for the 2019 growing season after more data and research has been collected and reviewed.
- Amend the current law (Arkansas Code § 2-16-203) allowing there to be "egregious violations" subject to enhanced penalties without the need to prove "significant off-target crop damage."
- Increased independent and university testing of new products before they come to market, with an additional stipulation that the entire technology package (seeds and herbicide) be ready for market at the same time.

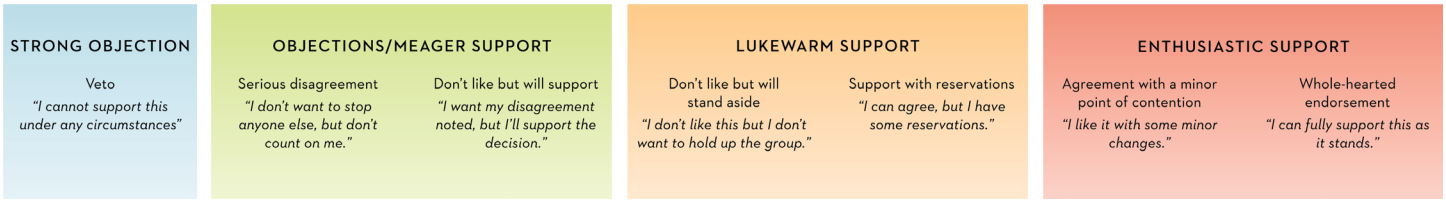
These recommendations represent common threads from small-group discussions about the issues that were then further refined by a full group discussion by the task force. The task force reached consensus on the above recommendations through an exercise know as Gradients of Agreement, a process that also helped refine the final recommendations.

Reaching Consensus

More than a simple "yes/no" vote on a matter, the Gradients exercise allows decision-makers to better understand each other's actual motivations and concerns. Participants mark their position on a graded scale, from wholly endorsing a proposal to being vehemently against it, along with their reason for taking that position. This allows for a deeper discussion on an issue, fostering a dialogue about the options.

As discussion about the issues continues, changes can be made to the proposal and the group is given the chance to change their position on the gradient, again stating their new reasoning. As the process continues, the proposal is refined and discussed until a majority of the decision-makers fall somewhere in support gradients. The final consensus decision represents not only a thoughtfully considered final proposal or recommendation, but also allows for points of contention or concern to be addressed and discussed fully. Following this process creates a dialogue-guided decision where all voices and all options are explored.

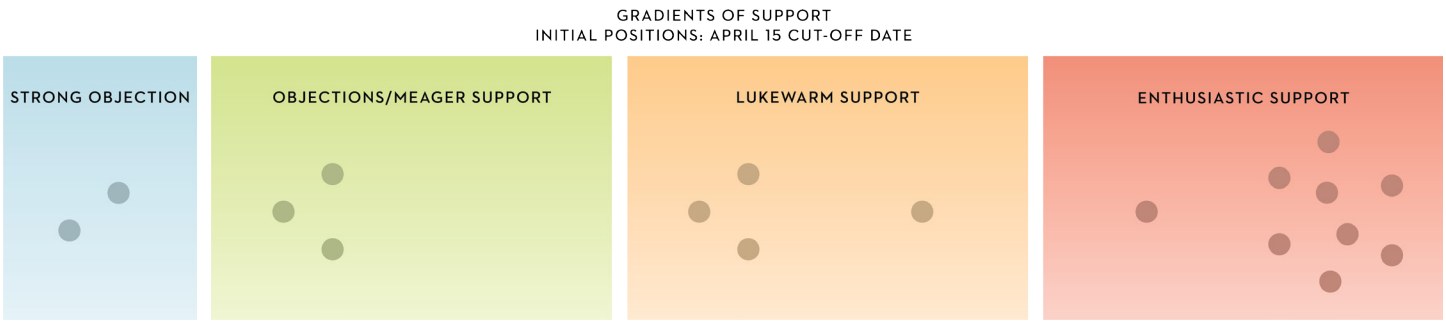
For the task force meeting, the members were presented with the following gradient, with an Institute-proposed consensus threshold of 85%, or 15 members, in the "support" gradients for the final recommendations:



The above gradient was used to work from the following starting recommendations to get to the final three. Once again, these starting recommendations were pulled from small discussion groups and then examined by the task force at large. They represent the common elements that the task force members recognized from each other's discussion groups and provided the beginning foundation of the consensus decision:

- Cutoff date of April 15 (Proposed dates ranged from April 15 to June 1, but for the beginning recommendation the task force chose a hard April 15 cutoff for consideration.)
- Fix the law to remove proof of damage. Misuse should constitute a violation.
- There needs to be more independent and university testing of products. The entire package must be ready at once.
- On-label use emphasis to follow manufacturer label recommendations for not spraying near/upwind of sensitive crops.
- Mandatory in-person applicator training. Should be available in Spanish.

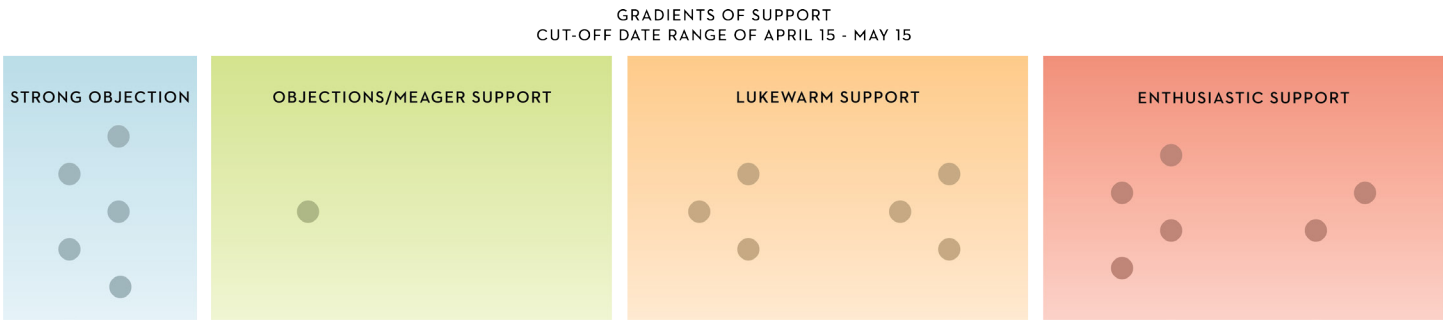
After the initial round of discussion and marking their positions based on the above starting recommendations, the task force members fell into the following positions:



This initial result ended with 13 votes either in various grades of support, not enough for the proposed consensus threshold. When examining and discussing the reasons for their positions, it became apparent that the most dividing recommendation was the cutoff date for dicamba use in Arkansas. Two differing opinions emerged within the task force, one for a strict April 15 cutoff and one in support of recommending a cutoff date range that extended into the growing season.

"Why not a date range?" - Dissenting Opinion

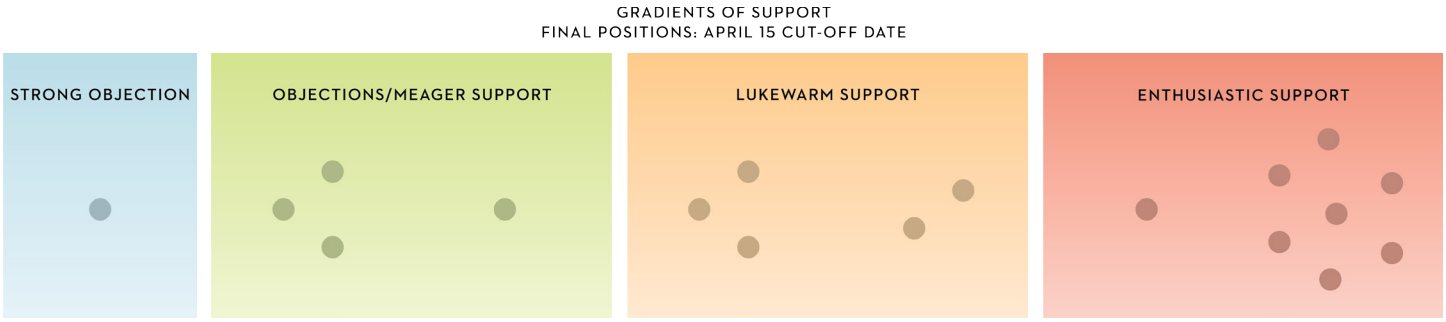
Following the Gradients exercise and in an effort to reach consensus, the recommendations were amended to represent a recommended date range for a usage cutoff that extended into the growing season to May 15. After the task force was invited to update their position and reasoning, the gradient positions were:



This lowered the ending results from 13 members in supporting gradients to only 12. At this point, the task force considered the consensus threshold. After discussion, the task force settled on a consensus threshold of 75%, or 14 members, in support of the recommendations as their goal. Members discussed what it would take to reach a consensus on the date range with little movement. As the original recommendations were closer to a consensus decision, Institute facilitators adjusted back to the starting recommendation of an April 15 cutoff date and invited task force members to restate their gradient positions.

A final round of discussions saw the additional provision to only have the April 15 cutoff date for dicamba use in 2018, allowing for more research and data to be collected before revisiting the issue for the 2019 growing season. After more discussion, calling on the advisors to answer additional questions and concerns and further consideration, the task force positions settled to needing one more member in a grade of support for the recommendations to have a consensus. Following a period of discussion, one task force member moved from objecting to supporting the decision with major reservations in favor of having a consensus to move forward.

The 14th task force member to support the recommendations noted that they disagreed with the April 15 cutoff, citing, among other concerns, the dearth of options available for farmers fighting post-emergent pigweed, the uncertainty of what caused the off-target effects this year and desire for more information, and the timing of the initial complaints to the Arkansas State Plant Board (ASPB). This task force member felt strongly that the task force should have recommended a range of dates and allowed ASPB to make the final determination. In effect a dissenting opinion, this task force member's movement to support the recommendations, even with strong objections to the cutoff date, resulted in a consensus decision with the following final positions:



The consensus decision to support the April 15 cutoff date for 2018 also affected the recommendations to emphasize on-label use regarding nearby sensitive crops and in-person applicator training. Because the April 15 cutoff date is early in the growing season, relegating dicamba use to treating pre-emergent weeds, the task force saw no need to include recommendations for in-crop applications. It should be noted, however, that before coming to a consensus on the April 15 date there were no objections to those recommendations from any task force members.

As can be seen by the Gradients exercise and process, coming to a consensus recommendation was no easy task. The decisions reached by the task force are the culmination of two, day-long sessions that provided the task force members with informational presentations from all sides of the issue, dialogue with one another, comments from the public and the chance to ask questions of the researchers and manufacturers to make the best-informed decision possible.

The Meetings

Held on Aug. 17 and 24, 2017, the two dicamba task force meetings at the Winthrop Rockefeller Institute were designed to give task force members access to experts on all sides of the issues and foster open dialogue. To that end, there were allowances for presentations from University of Arkansas weed scientists, product manufacturer researchers, requested data from the Arkansas State Plant Board and even public comments.

The University of Arkansas presented research findings at the first meeting that linked in-field dicamba use to volatilization of the product, leading to a majority of off-target symptomology. During the second meeting, manufacturers BASF, which had the only approved dicamba herbicide formulation for use in Arkansas in the 2017 growing season, and Monsanto presented their own research and test methodology suggesting that volatility was not the main issue and that physical drift and off-label usage of dicamba products were causing the glut of issues. Both sides were available at both meetings to answer questions from the task force members about both presentations. The slides from all three presentations can be found in Appendices B, C and D of this report.

Task force members also asked questions and requested further data of the Arkansas State Plant Board. The requested data included the details and dates of the complaint data related to dicamba the ASPB had received as well as the number of complaints that occurred in other states. That requested data can be found in Appendix E.

In addition to professional and academic research, the task force also heard public comments, with two public members presenting documents for the task force's consideration, one at each of the two meetings. Those materials are included in Appendix A.

This process of gathering data about an issue, considering and discussing that information and then repeating the process with new data is integral to the Rockefeller Ethic. It is time intensive, something that becomes even more apparent when dealing with such consequential issues in such a short time frame, but it is the only way to ensure that the final decision is made with the best possible foundation.

The Motion to Vote

It is important to note that the differences between the Rockefeller Ethic and traditional committee-style meetings are difficult to acclimate to, especially when the matters at hand are as divisive and personal as dicamba was to the task force members. That incongruity manifested itself at the end of the first task force meeting on Aug. 17, 2017, when there was a motion made to have an up-or-down vote on the continued use of dicamba in Arkansas.

Facilitators moved the task force away from holding a vote at the close of the first meeting as per the process outlined above, but there were some frustrations given the immediacy of the issue.

From the outside, the value of the process used by the Institute may not be readily apparent, especially when there are some decision-makers ready to come to a conclusion. It is a process, however, that focuses on participatory decision making and dialogue, two things not borne out in a standard vote. It is also a process that demands the most information be available before a decision is reached. At the close of the first meeting, when the call for a vote was made, there were many unanswered questions the task force had posed to the advisory panel, as well as data and presentations from the other side of the issue to be heard.

Frustrated or not, the entirety of the task force participated in the second meeting, taking part in each facilitated session. It was in those sessions, after hearing all of the data available from the advisory group at the time, that the task force began the discussions that eventually became the final recommendations around dicamba use in Arkansas.

Discussion Group Highlights

The final recommendations listed in this report represent much discussion and refinement. Before the lengthy group dialogue about possible recommendations and the Gradient exercise to come to consensus, the task force members met in small discussion groups composed of differing viewpoints. It was in those groups that recommendations began to form.

After hearing from UA Division of Agriculture scientists, product manufacturers Monsanto and BASF, and receiving additional data from the ASPB and hearing public comment, the Institute divided the task force into four (4) small discussion groups for a structured dialogue to answer the following questions:

1. Can Dicamba be used safely in Arkansas in the 2018 growing season? If so, under what conditions or restrictions?
2. What are the recommendations for training, education, equipment used in application, specific cutoff date for use, application hours and conditions?
3. Should restrictions be applied at a statewide level or should they be regionalized or confined to a specific geographic area?

4. If Dicamba use is suspended or banned, are there alternative solutions for farmers who need the technology? What are those alternatives, and what are the impacts to farmers?

Winthrop Rockefeller Institute facilitators worked within the small groups to foster dialogue across differences of opinion to uncover the common themes that would help inform the task force recommendations.

In addition to what became the final recommendations, however, there were also common and important topics discussed. Some highlights of the small-group discussion follow:

- Farmers need more options to control Palmer amaranth. Despite desperately needing the dicamba technology, many task force members could not get past unanswered questions related to volatility.
- Several task force members agreed that the evidence they had been presented on volatility would endanger their neighbors downwind or with sensitive crops and they didn't feel as though they could take that risk. They were all in agreement that a cutoff date needed to be considered, that the law should provide for tougher enforcement for misuse and that the language around penalties in the law should be clarified, as was reflected in the final recommendations.
- None of the groups felt it was plausible to explore a regional approach around dicamba regulations.
- Each of the groups favored more testing, as was borne out in the final recommendations. Ideas around testing included having an independent third party conduct tests, and requiring that testing occurs "where we live," i.e., in-field conditions replicating those in Arkansas.
- There are no good alternatives to dicamba where producers encounter PPO-resistant Palmer amaranth. Groups discussed the use of Liberty Link and concerns over differences in yield and cost. Other alternatives include crop rotation where possible and the use of manpower and "cold hard steel" to chop weeds.
- The sale of dicamba-tolerant seeds raised concerns over the potential to encourage misuse of the dicamba product in the future.

Conclusion

The recommendations made by the dicamba task force did not come lightly. The process they engaged in at the Winthrop Rockefeller Institute, however, allowed them to make their recommendation with the best available knowledge and ample consideration. As can be seen in the Gradients exercise and discussion group work, the consensus recommendations are the result of an ongoing dialogue about the issues. While not everyone on the task force agreed with all the recommendations, when surveyed the majority of members felt that they had the opportunity to speak, be heard and hear their fellow decision makers (Appendix F).

The task force members, people from a mix of agricultural backgrounds and on many sides of the issues surrounding dicamba use in Arkansas, put in two days of consideration and facilitated discussion to produce the recommendations in this report. This report and the task force recommendations will now be considered by the Arkansas State Plant Board. Should the State Plant Board decide to amend or adopt new regulations regarding the use of dicamba the regulations must be reviewed by the Governor and the Arkansas Legislative Council before they become effective. Although only the first step in the process, the task force members came together and laid the best

possible foundation for a decision in service of those most affected by dicamba's role in Arkansas agriculture: their family, friends and neighbors.

Appendix A

Public Comment

Who I Am:

Hello, I am Richard Coy, a native of Craighead County, Arkansas. I am presently, the Vice President of Coy's Honey Farm, Inc. Coy's Honey Farm, Inc. is a fourth generation farming operation. Along with my parents (Bobby and Anna Coy) and brother (David Coy), our family operation manages approximately 13,000 beehives for pollination and honey production, in Arkansas, Mississippi, Missouri, and California. The beehives are spread across 13 counties in Arkansas: Clay, Craighead, Crittenden, Cross, Greene, Jackson, Lee, Mississippi, Monroe, Phillips, Poinsett, St. Frances, and Woodruff.

Coy's Honey Farm, Inc. is the largest commercial beekeeping business in Arkansas and as a result we are heavily involved in the farming community. Our involvement includes not only our extensive work in the field but also active participation in policy and research pertaining to agricultural operations. During my 26 years as a commercial beekeeper, I have developed and maintained good relationships with many of the agricultural industry leaders in Arkansas and throughout the nation. Within the past several years, I have written letters of support on behalf of cotton and grain sorghum producers requesting Section 18 approval for "Transform". Additionally, I have recently met with EPA officials in Memphis and voiced my support for neonics as a seed treatment. Finally, I have worked closely with the U of A Division of Agriculture Research & Extension along with various agencies of the USDA pertaining to agricultural programs. Our farming business is a true "family farm" operation as the fourth generation of family has now entered into our business. We know the pressures and challenges that confront family farm operations. I want to now share with you a recent issue that has come to our attention that we believe merits the attention of producers and regulatory agencies.

My Observation:

In recent weeks as I have conducted field inspection of our bee yards I have observed significant damage to non-cultivated vegetation in areas where my beehives are located. In addition to the vegetative damage, I have observed below average honey production in these hives. In other locations with undamaged vegetation, honey production is average to above average. The loss of vegetative cover coupled with significant honey loss is extremely concerning to us.

After further review, I realized the damaged non-cultivated vegetation was in the same general areas of reported Dicamba drift complaints. More investigation led me to a research paper published in 2015, by the Department of Plant Science of Penn State University. The paper stated in the Abstract that Dicamba doses simulating particle drift is shown to reduce pollinator habitat and pollinator visits up to 50%. The Penn State University study concluded "because plants exposed to sub-lethal levels of Dicamba may produce fewer floral resources and be less frequently visited by pollinators, use of Dicamba or other synthetic-auxin herbicides with widespread planting of herbicide-resistant crops will need to be carefully stewarded to prevent potential disturbances of plant and beneficial insect communities in agricultural landscapes."

My Actions:

On or around July 26, 2017 I contacted, by phone, the Arkansas State Plant Board and the U of A Division of Agriculture Research & Extension as to receive clarification to my observations. Both agencies sent representatives to observe our beehives in both "damaged vegetative" areas and "non-damaged vegetative" areas.

My Concern:

My purpose today is not to speak in favor of or against the use of Dicamba, but to share with this Task Force and State Agencies what I am observing in our business. I appreciate the opportunity to make you aware of what we are encountering in our business and our family appreciates your attention to this significant issue.

Slide 01

Atmospheric Loading and In-Season, Dicamba Volatility.

Slide 02

Table 1 Estimated percentage of a county sprayed with Dicamba

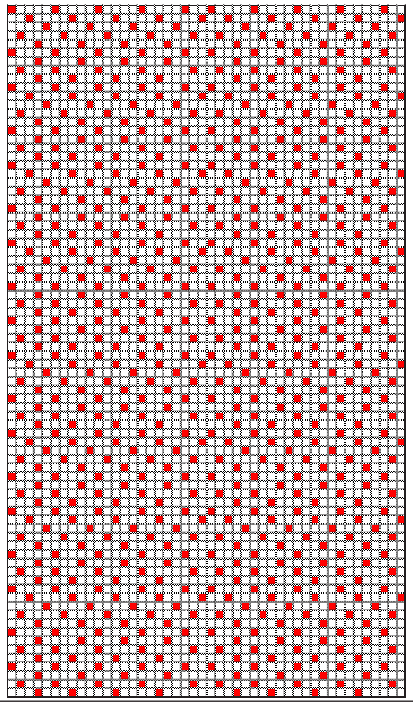
County	Area Square Miles	Area Acres	Acres Planted in Cotton	Acres Planted in Soybeans	Percent of County Planted in: Cotton	Soybeans	Soybeans + Cotton
Mississippi	920	588,678	83,550	280,513	14.2%	47.7%	61.8%
Craighead	713	456,109	65,558	107,650	14.4%	23.6%	38.0%
Pulaski	808	516,902	194	16,550	0.0%	3.2%	3.2%

	Estimated percentage of the acres sprayed with Dicamba		Estimated percentage of the county sprayed with Dicamba			Area Sprayed with Dicamba
	Cotton	Soybeans	Cotton	Soybeans	Soybeans + Cotton	Square Miles
Mississippi	70%	35%	9.9%	16.7%	26.6%	245
Craighead	70%	35%	10.1%	8.3%	18.3%	131
Pulaski	70%	35%	0.0%	1.1%	1.1%	9

2016 Planted acres

Slide 03

Illustration 1: Land mass equal to Mississippi county in 1/4 section blocks
20% of acres sprayed with Dicamba



East-West
23 miles

North-South
40 miles

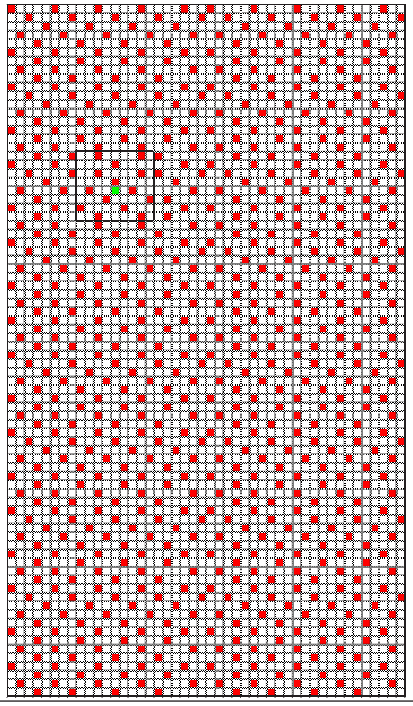
Area
920 square miles

Quarter Sections
3,680

Dicamba Applications
20% of Area
736 Quarter Sections

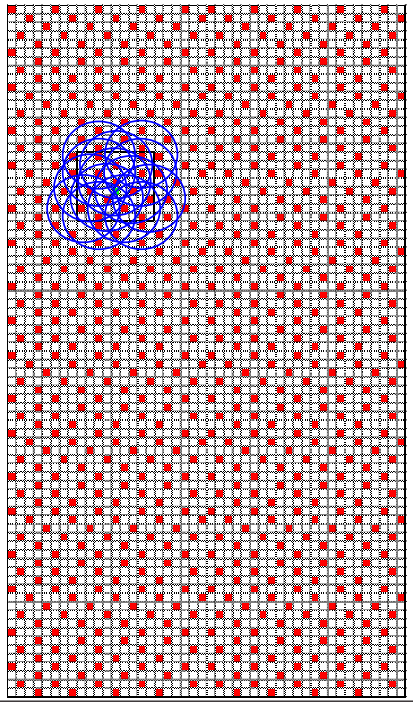
Slide 04

Illustration 2: Dicamba application within 2 miles



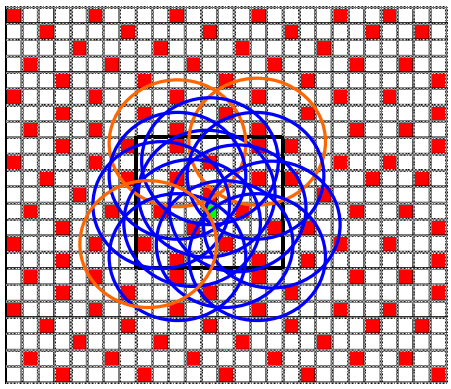
Slide 05

Illustration 3: Potential overlapping non-Traceable off-Target damage from applications of Dicamba within 2 miles



Slide 06

Illustration 4: Illustration 3 enlarged



Slide 07

Table 2 Estimated Area sprayed with Dicamba, Atmospheric Loading, and counties with Dicamba complaints

Arkansas County	Area Square Miles	Area Acres	Sprayed with Dicamba Soybeans + Cotton % Area	Area Sprayed with Dicamba Square Miles	Complaints 8/23/2017	Arkansas County	Area Square Miles	Area Acres	Sprayed with Dicamba Soybeans + Cotton % Area	Area Sprayed with Dicamba Square Miles	Complaints 8/23/2017
Mississippi	920	588,678	26.6%	245	240	Monroe	621	397,632	9.8%	61	22
Crittenden	636	407,283	20.4%	130	184	Arkansas	1,034	661,600	8.4%	87	2
Phillips	727	465,498	18.9%	137	48	Lonoke	803	513,818	7.9%	63	9
Lee	620	396,480	18.9%	117	67	Lincoln	572	366,195	8.2%	47	2
Poinsett	764	488,710	15.4%	118	89	Greene	580	370,918	6.6%	39	5
Saint Francis	643	411,206	14.8%	95	88	Lawrence	592	379,098	6.1%	36	2
Craighead	713	456,109	18.3%	131	92	Jefferson	914	584,819	5.8%	53	3
Cross	622	398,278	13.3%	83	45	Ashley	941	601,939	5.2%	49	5
Chicot	691	442,106	13.1%	90	6	Miller	638	408,096	2.8%	18	2
Clay	641	410,522	14.5%	93	15	Randolph	656	419,866	2.5%	17	1
Woodruff	594	380,166	11.2%	67	6	White	1,042	666,976	1.7%	18	2
Jackson	642	410,560	10.1%	65	2	Little River	565	361,453	1.2%	7	1
Desha	820	524,499	10.7%	88	9	Pulaski	808	516,902	1.1%	9	3

2016 Planted acres Dicamba Applied to: 70.0% of Cotton 35.0% of Soybeans

Slide 08

Table 3 Estimated Area sprayed with Dicamba, and Atmospheric Loading in 6 states

	County	Area Square Miles	Area Acres	Percentage sprayed with Dicamba Soybeans + Cotton % Area	1,238 Area Sprayed with Dicamba Square Miles
Arkansas	Mississippi	920	588,678	26.6%	245
	Crittenden	636	407,283	20.4%	130
Illinois					
Mississippi	Coahoma	583	373,216	25.6%	149
Missouri	New Madrid	697	445,805	28.5%	198
	Mississippi	429	274,406	20.7%	89
	Dunklin	547	350,195	27.9%	152
	Pemiscot	513	328,595	23.1%	118
Tennessee	Crockett	266	170,074	24.3%	64
Iowa	Worth	402	257,242	22.7%	91
Total	**9**			**Total**	**1,238**

Dicamba Applied to:
70.0% of Cotton
35.0% of Soybeans
2016 Planted acres

Slide 09

Table 4 Estimated Area sprayed with Dicamba, and Atmospheric Loading in 6 states with increased Dicamba Resistant acreage

State	County	Sprayed with Dicamba Soybeans + Cotton % Area	Area Sprayed with Dicamba Square Miles	State	County	Sprayed with Dicamba Soybeans + Cotton % Area	Area Sprayed with Dicamba Square Miles
Arkansas	Mississippi	38.5%	354	**Mississippi**	Coahoma	33.5%	195
	Crittenden	33.2%	211		Washington	30.5%	232
	Phillips	30.8%	224		Sunflower	27.6%	195
	Lee	27.4%	170		Bolivar	26.0%	236
	Poinsett	24.4%	187		Tunica	23.4%	113
	Saint Francis	23.3%	150		Leflore	22.3%	135
	Craighead	24.2%	173	**Missouri**	New Madrid	39.2%	273
	Cross	22.5%	140		Mississippi	35.6%	152
	Chicot	21.0%	145		Dunklin	35.9%	196
	Clay	21.0%	135		Pemiscot	34.5%	177
Illinois	Piatt	28.2%	124		Stoddard	27.0%	224
	Douglas	26.5%	111		Scott	22.3%	95
	Richland	26.5%	96		Audrain	20.3%	141
	Ford	24.9%	121	**Tennessee**	Crockett	33.0%	88
	Livingston	24.3%	254		Lake	28.1%	54
	Washington	24.2%	136		Dyer	26.2%	138
	Iroquois	24.1%	269		Haywood	23.7%	127
	Clay	23.9%	112		Gibson	20.7%	125
	Edgar	23.4%	146		Lauderdale	20.5%	104
	Jasper	23.0%	115	**Iowa**	Worth	39.0%	157
	McLean	22.7%	270		Winnebago	32.4%	130
	Stark	22.7%	65		Scott	25.6%	120
	White	22.6%	113		Story	25.2%	145
	Hamilton	22.1%	97		Taylor	24.7%	132
	Champaign	22.0%	220		Osceola	23.5%	94
	Lawrence	21.6%	81		Grundy	23.3%	117
	Christian	21.6%	155		O'Brien	22.6%	129
	Gallatin	21.6%	71		Buena Vista	22.2%	129
	Logan	21.5%	133		Pocahontas	21.6%	125
	Vermilion	21.3%	192		Plymouth	21.1%	183
	Woodford	21.0%	114		Clay	20.7%	119
	Wabash	20.9%	48		Cherokee	20.7%	120
	Moultrie	20.9%	72		Calhoun	20.4%	117
	De Witt	20.9%	85		Emmet	20.4%	82
	Grundy	20.9%	90		Humboldt	20.1%	88
	Wayne	20.7%	148		Benton	20.0%	143
	Crawford	20.2%	90	**Total**	**76**	**Total**	**10,972**
	Bond	20.1%	77				
	Effingham	20.1%	96		Dicamba Applied to:		
	Shelby	20.0%	154		70.0% of Cotton		
	Coles	20.0%	102		60.0% of Soybeans		

2016 Planted acres

Slide 10

Table 5 Estimated Area sprayed with Dicamba, and Atmospheric Loading in 6 states with increased Dicamba Resistant acreage 35%, 60%, and 70% of Soybeans

Arkansas, Illinois, Iowa, Mississippi, Missouri, and Tennessee

Dicamba Applied to:	Counties	9
70.0% of Cotton	Square Miles	1,238
35.0% of Soybeans		
Dicamba Applied to:	Counties	76
70.0% of Cotton	Square Miles	10,972
60.0% of Soybeans		
Dicamba Applied to:	Counties	129
70.0% of Cotton	Square Miles	18,806
70.0% of Soybeans		

Slide 11

This summer we have been running a very-large-scale, uncontrolled experiment in Atmospheric Loading in Mississippi and Crittenden counties

You have a duty to protect those that cannot protect themselves

The Arkansas Agricultural Council submitted the following public comment and suggestion for revising the penalty law (Arkansas Code § 2-16-203).

Existing Penalty wording:

(b) A violation is egregious only if significant off-target crop damage occurred as a result of the application of dicamba or an auxin-containing herbicide or any new herbicide technology released after the effective date of this act.

Suggested revision:

(b) A violation is egregious only if it 1) relates to the application of dicamba or an auxin-containing herbicide or any new herbicide technology released after the effective date of this act. 2.) Plant Board finds that the application carried the potential of causing significant off-target crop damage.

** Emergency Rule: is necessary to enact immediately so it is in place prior to the 2018 crop year.

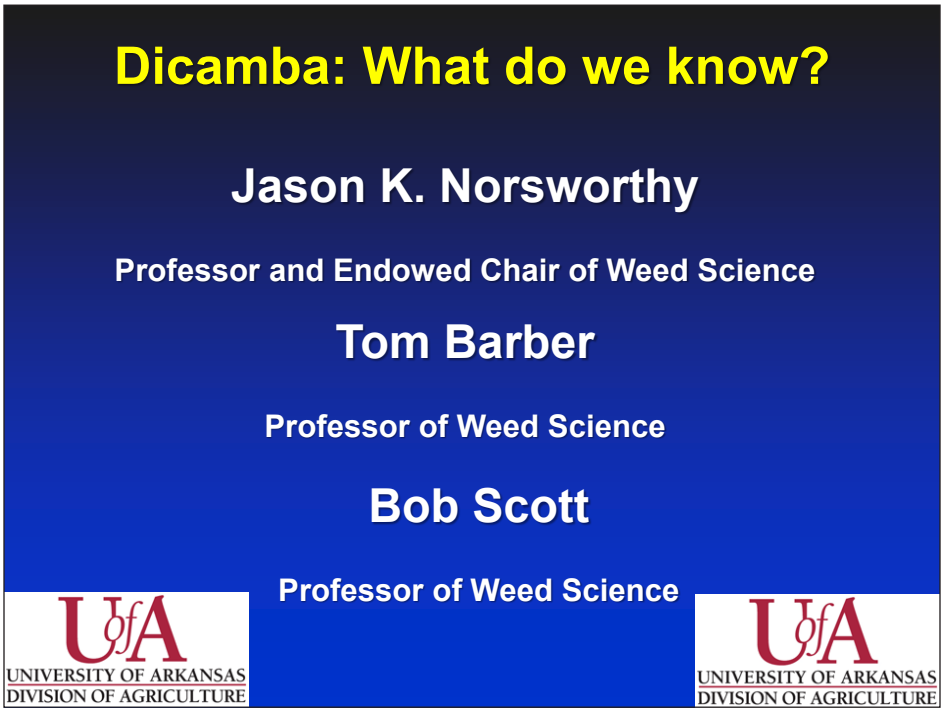
Note:

Problem with current law is the fines are not applicable until it can be proven that crop damage occurred as a result of an illegal application. The Plant Board should be able to assess fine of greater than $1K and up to $25K if it finds an application of dicamba was reckless, illegal, egregious, etc.

Appendix B

University of Arkansas Presentation by Dr. Jason Norsworthy

Slide 01



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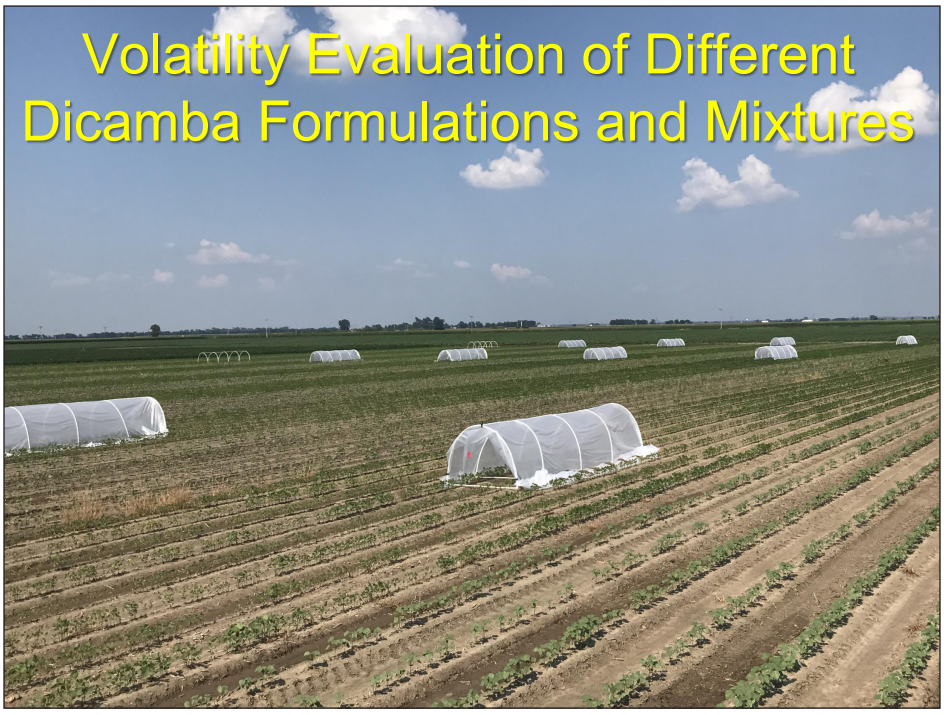

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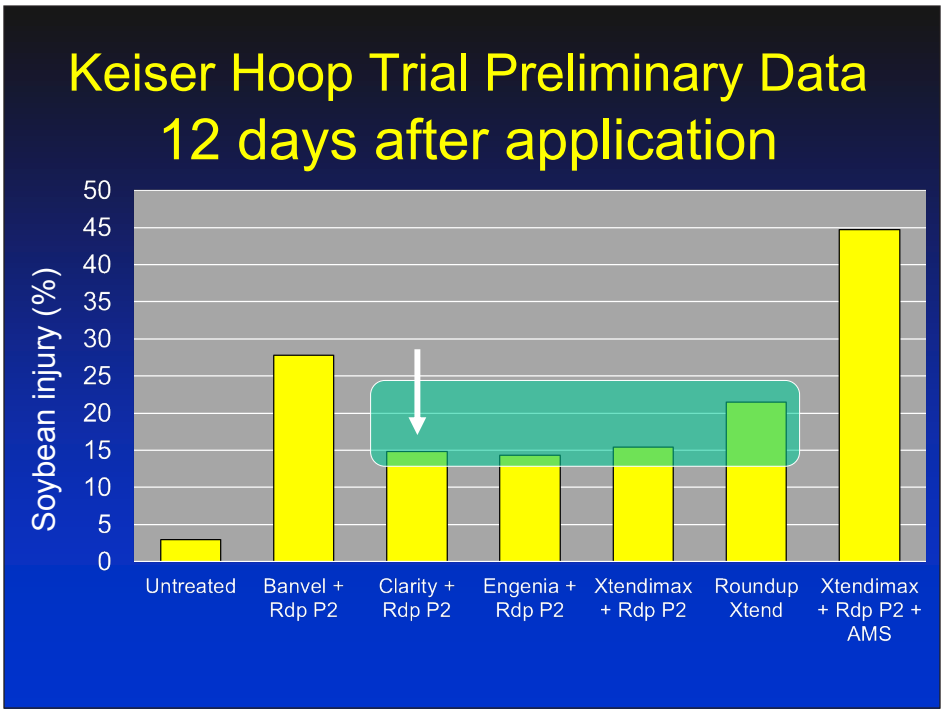

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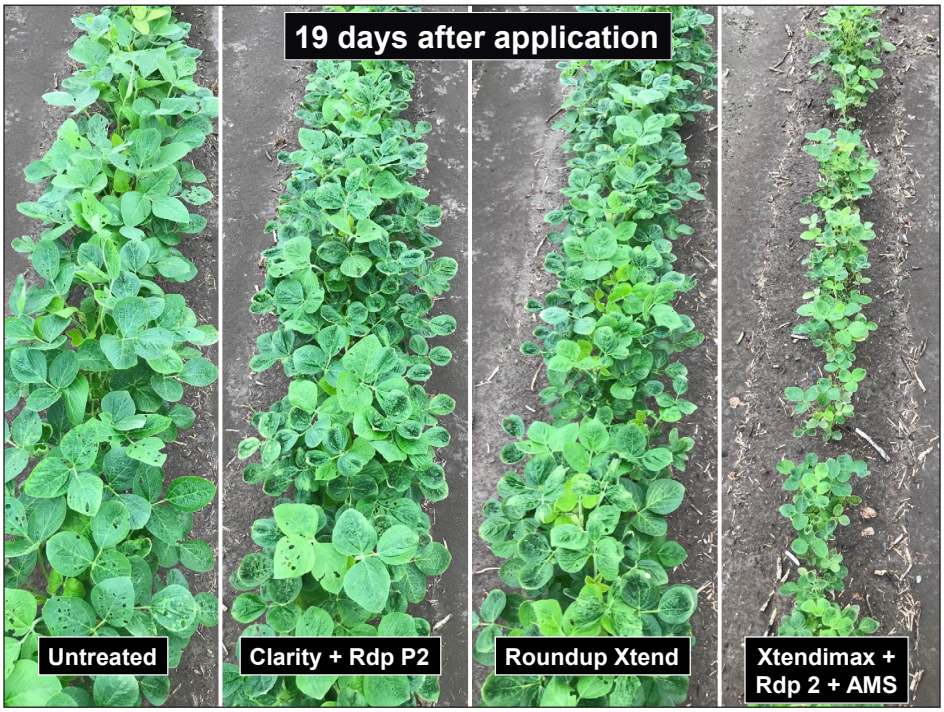

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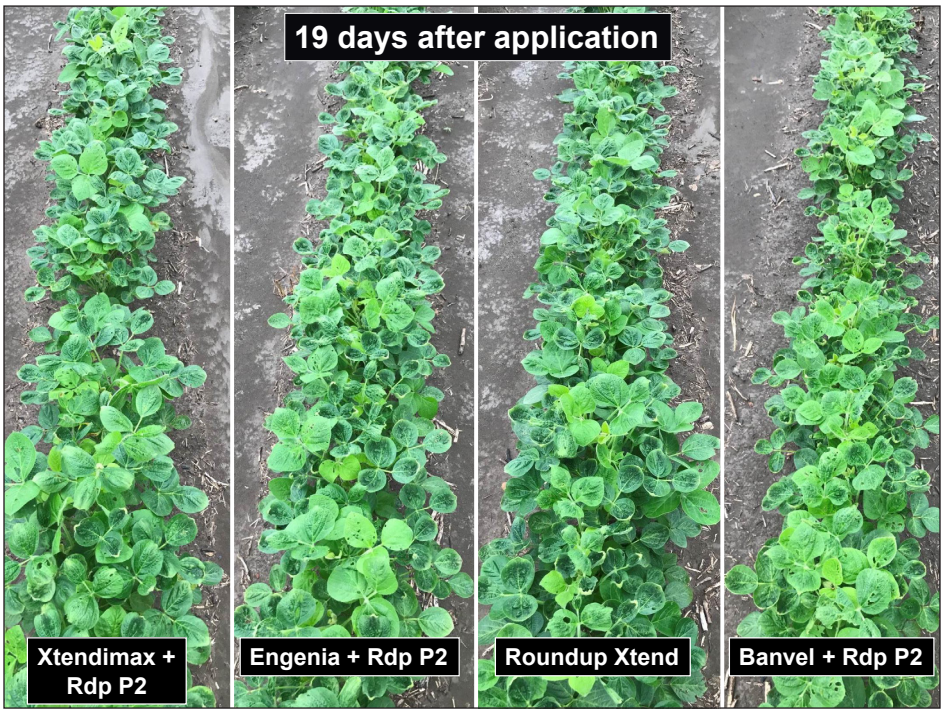

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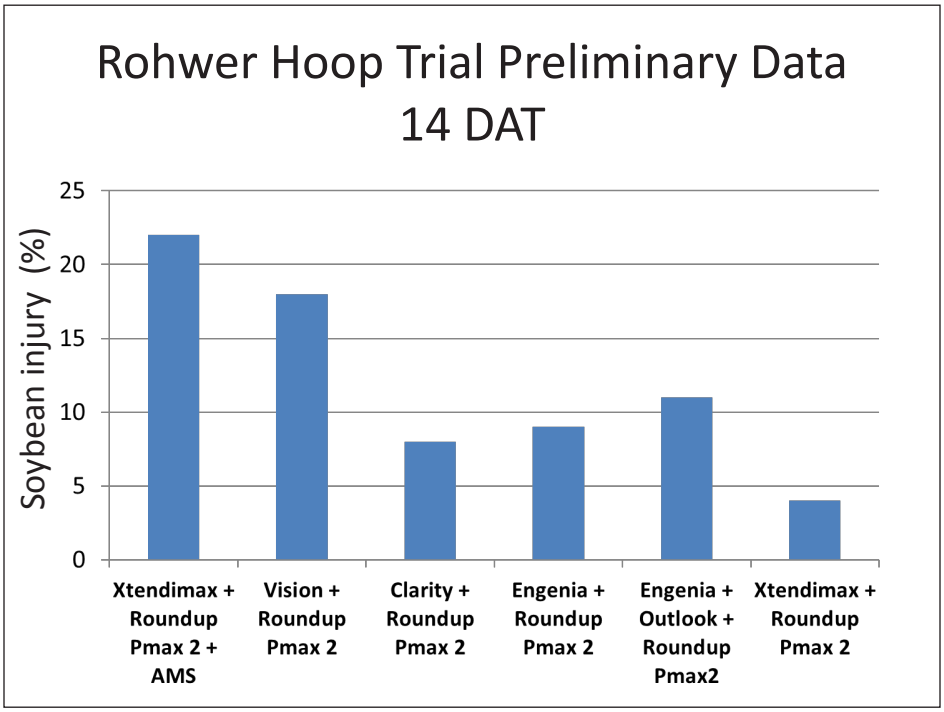

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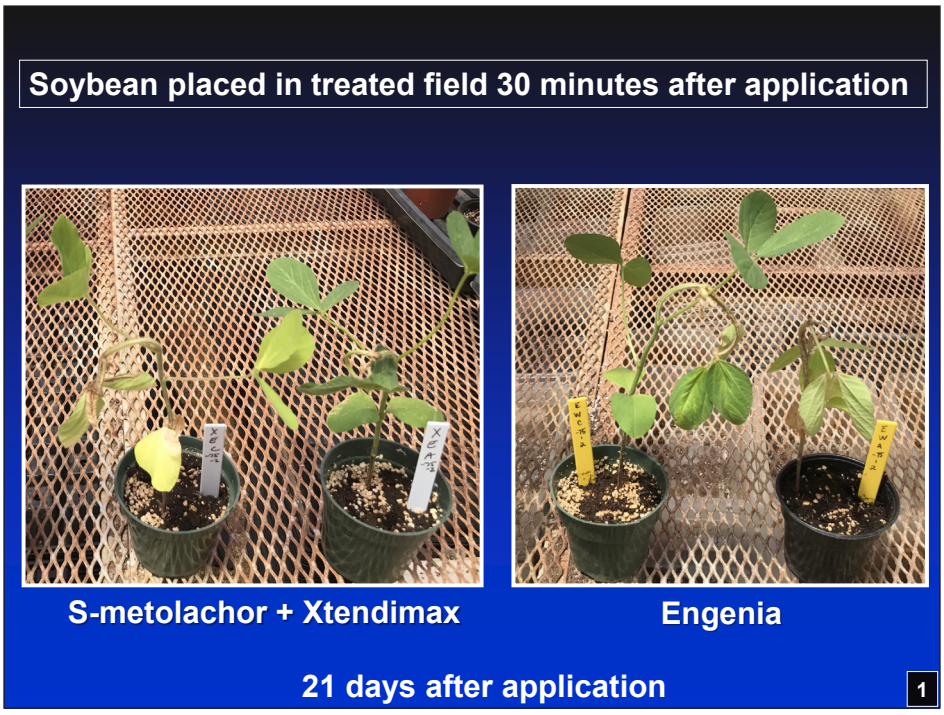

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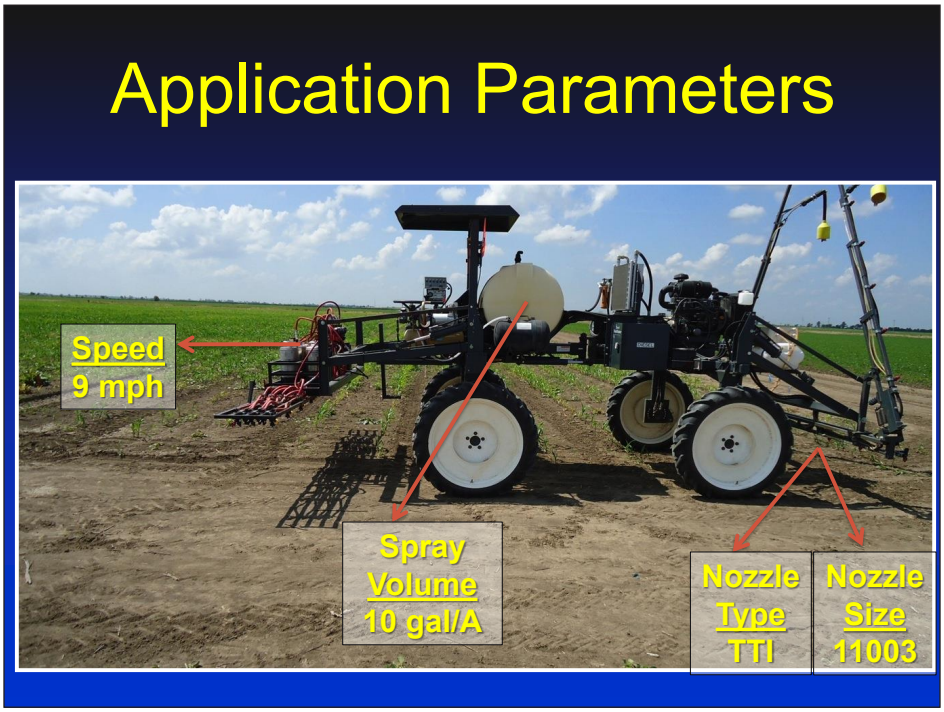

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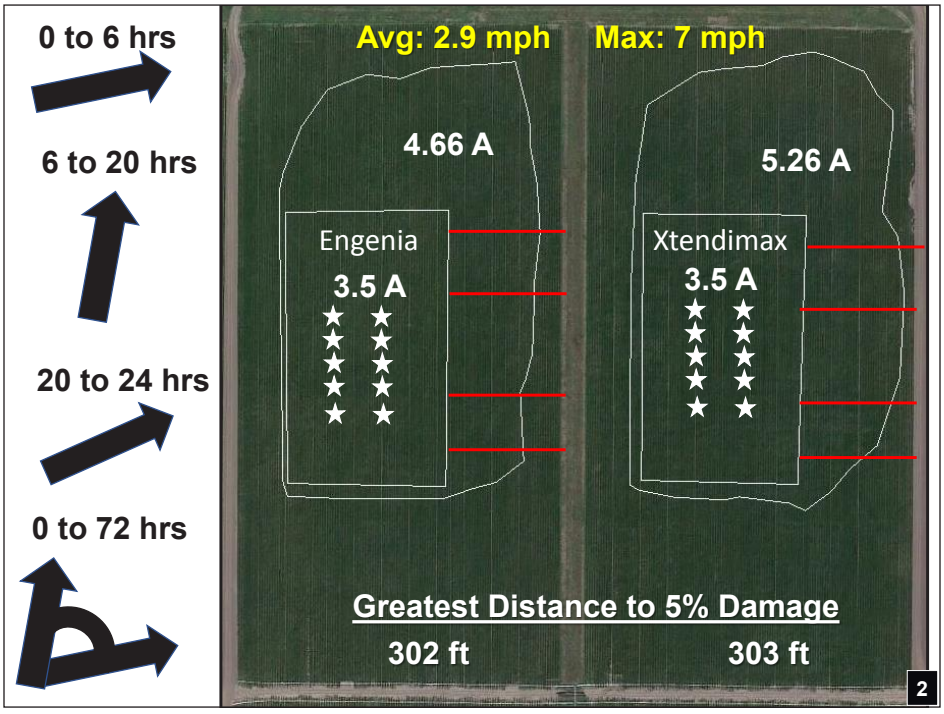

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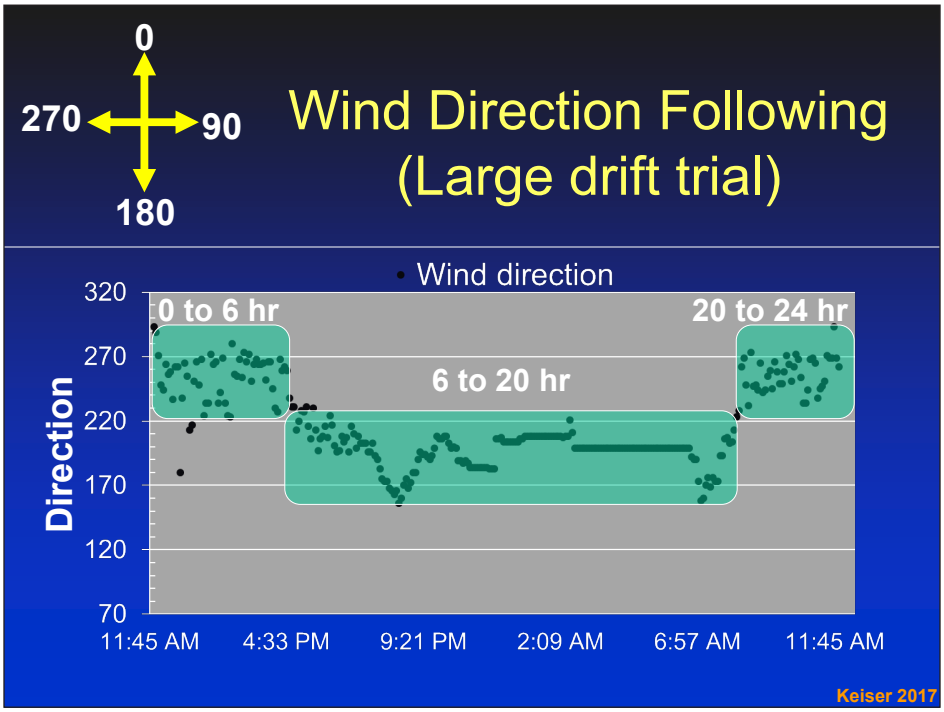

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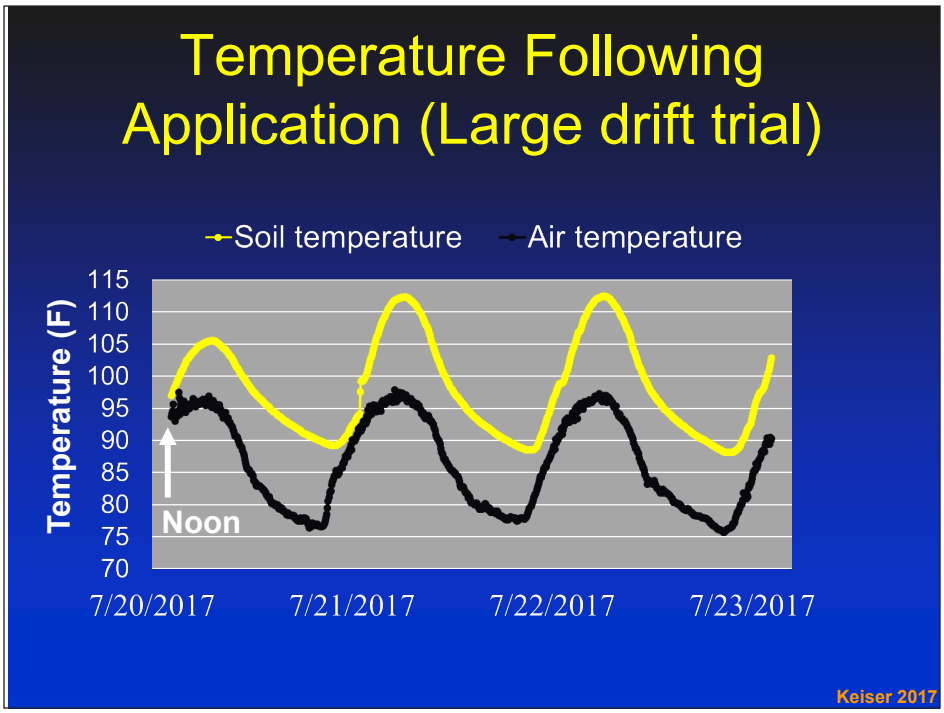

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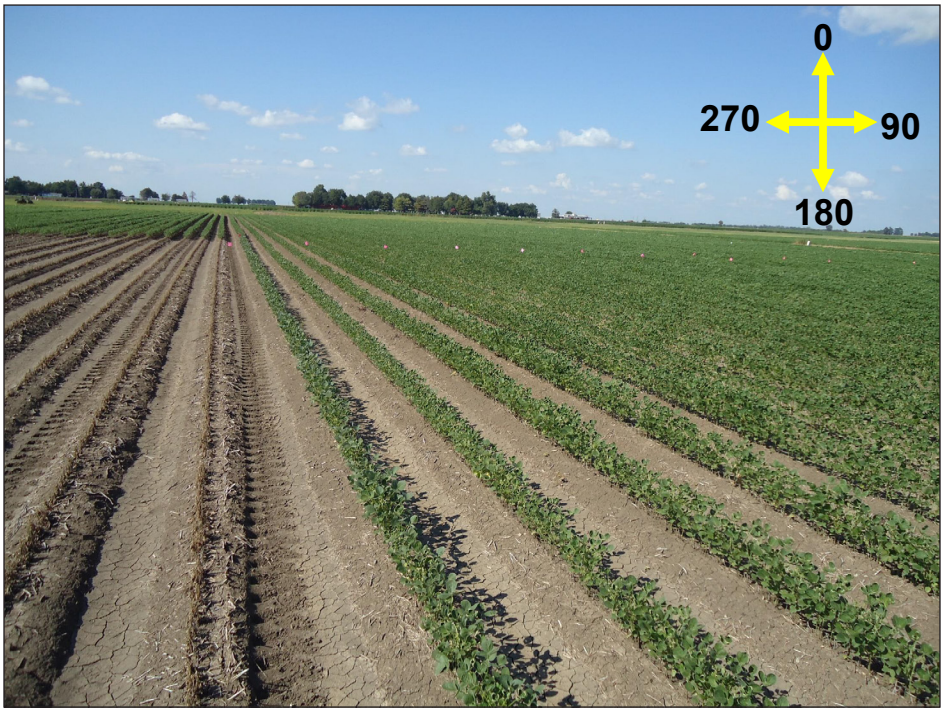

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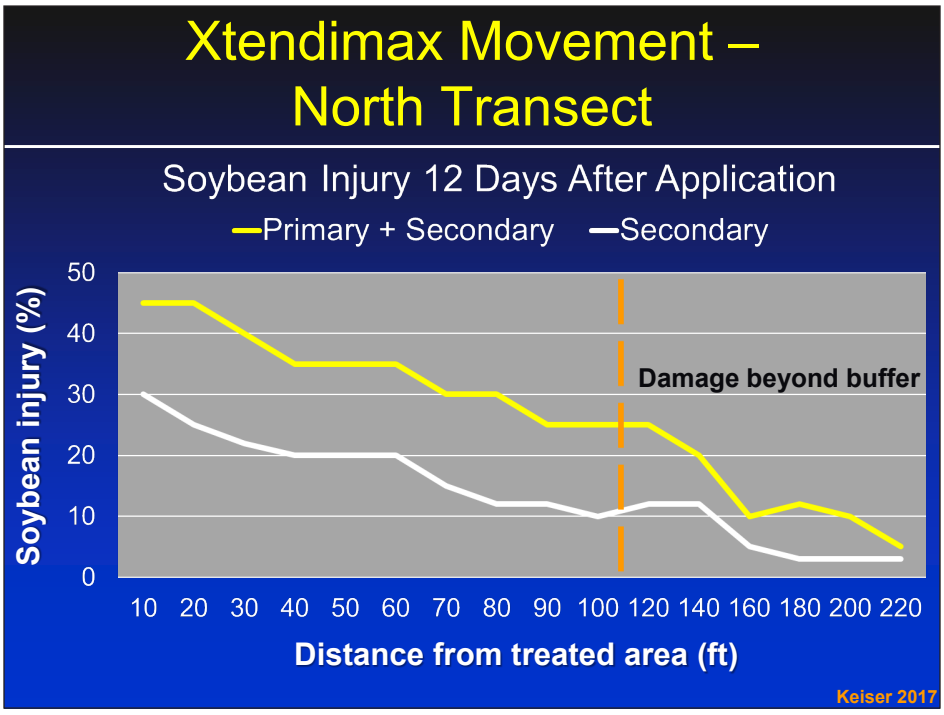

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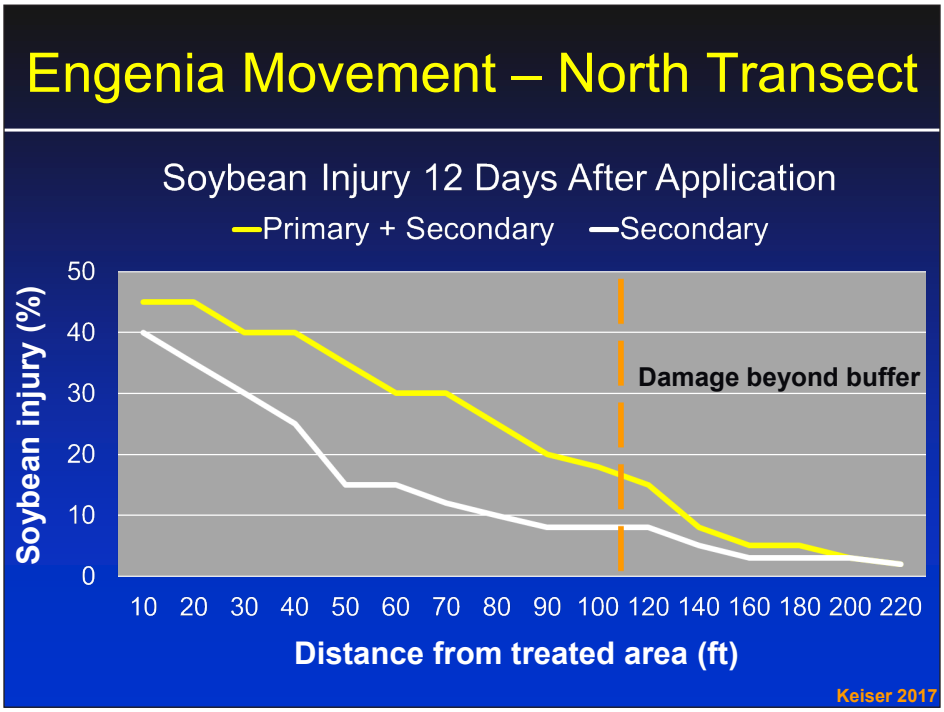

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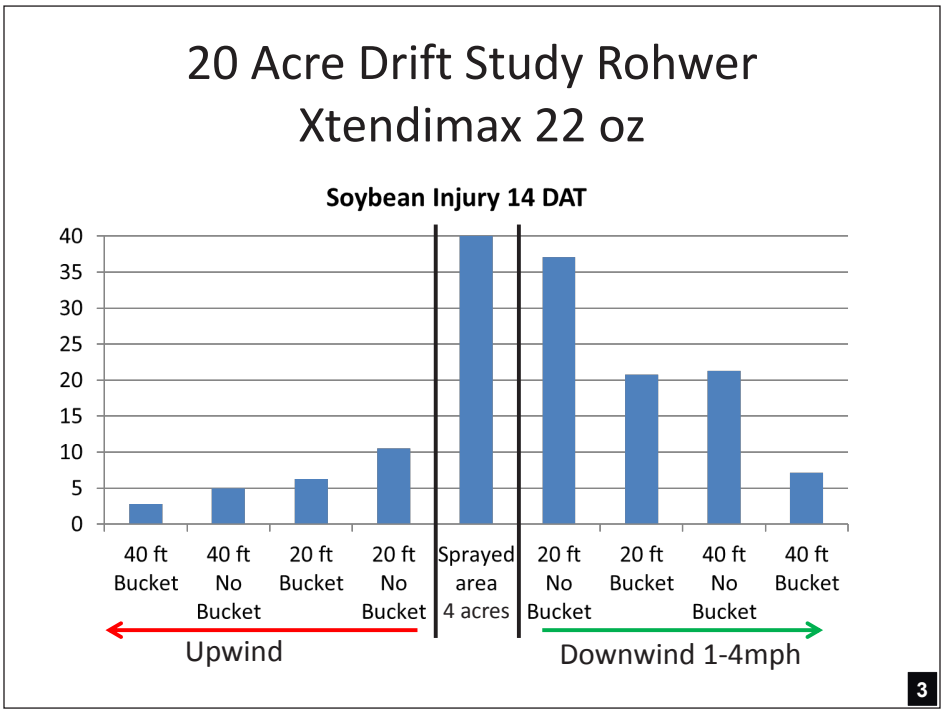

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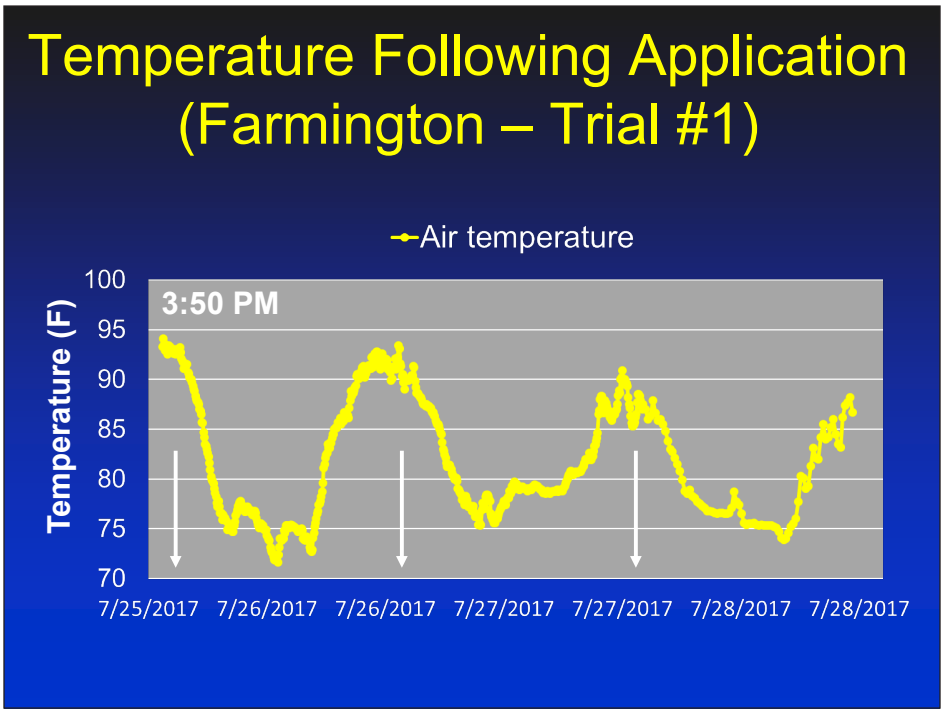
Slide 20



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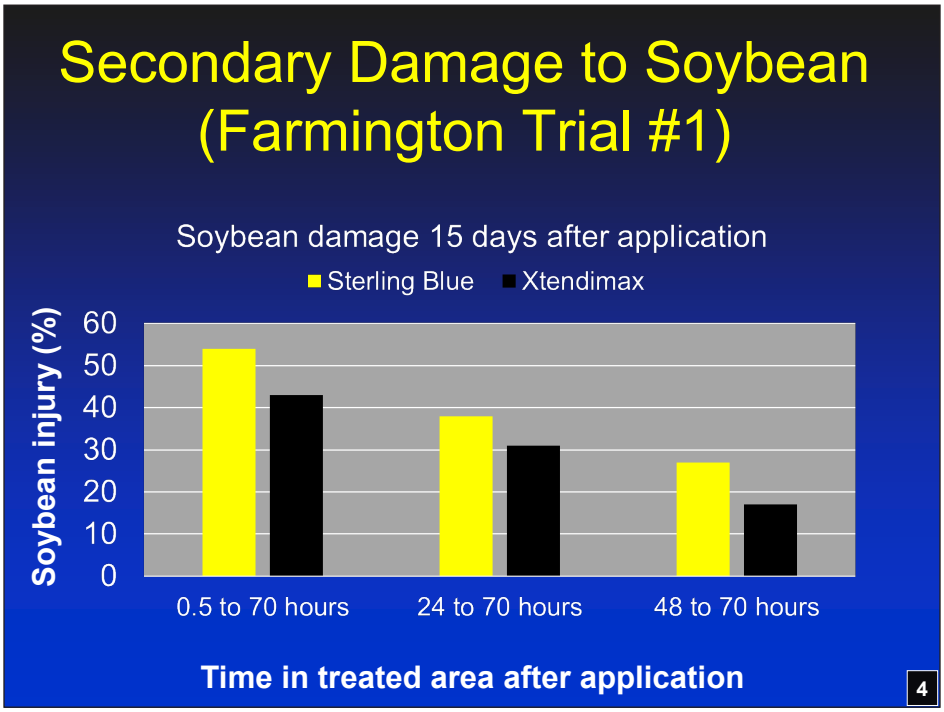

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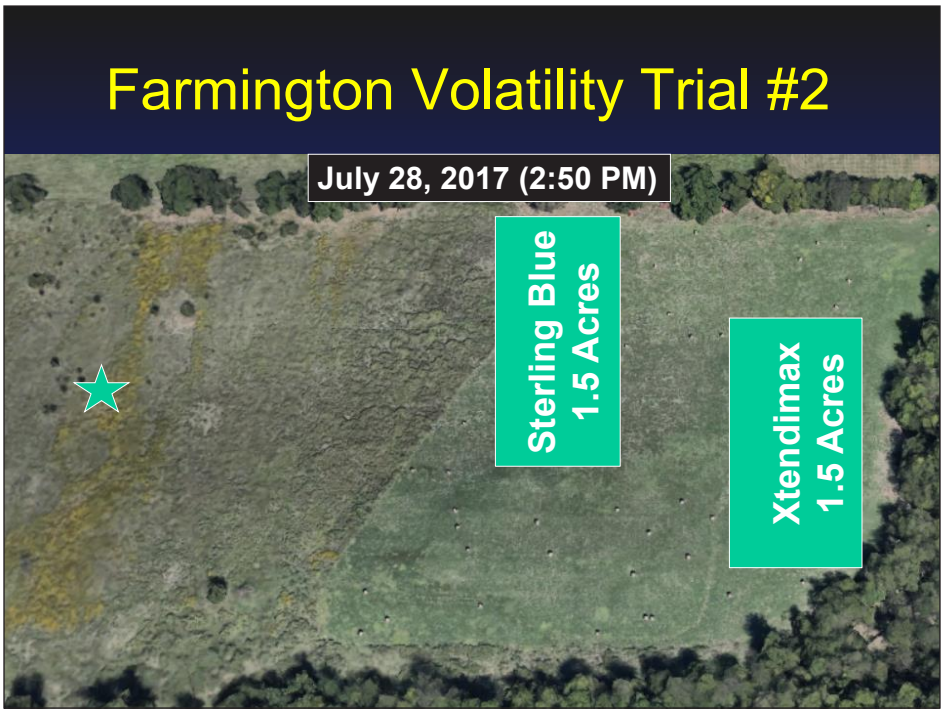

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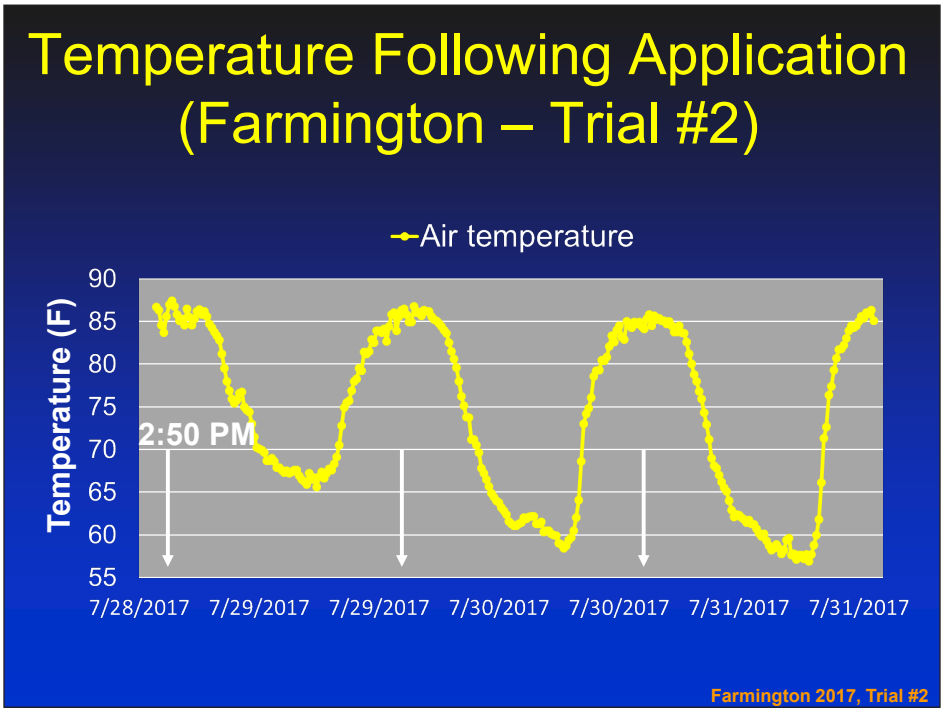

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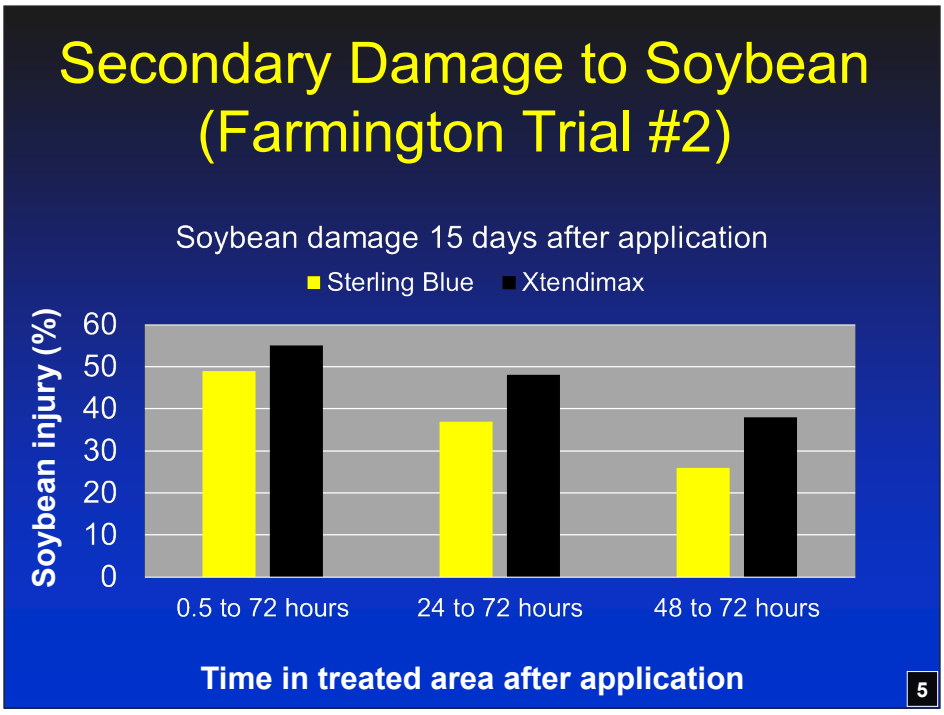

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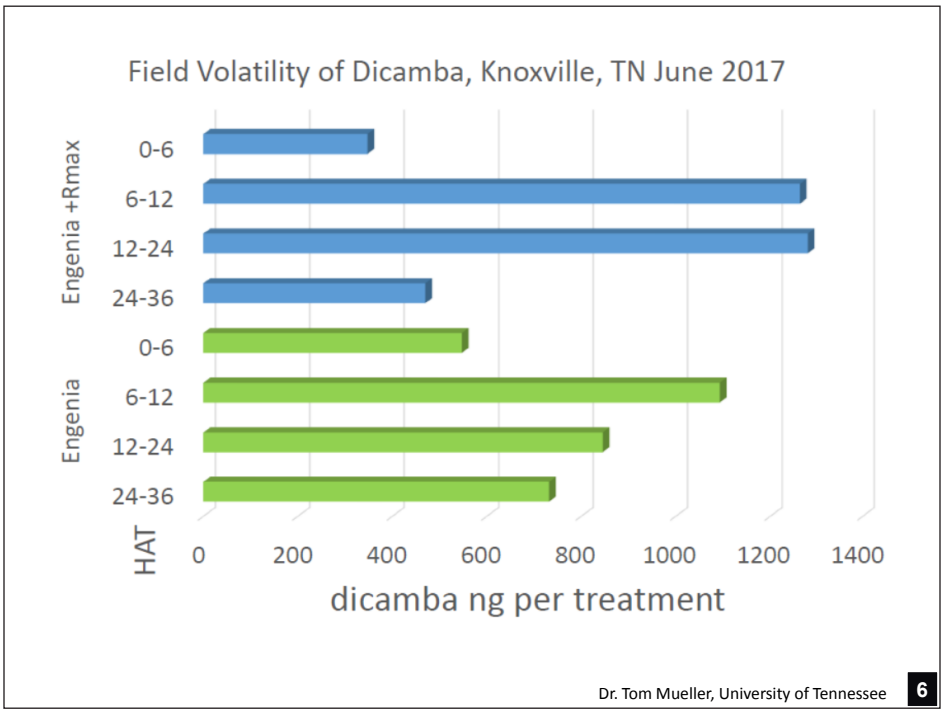

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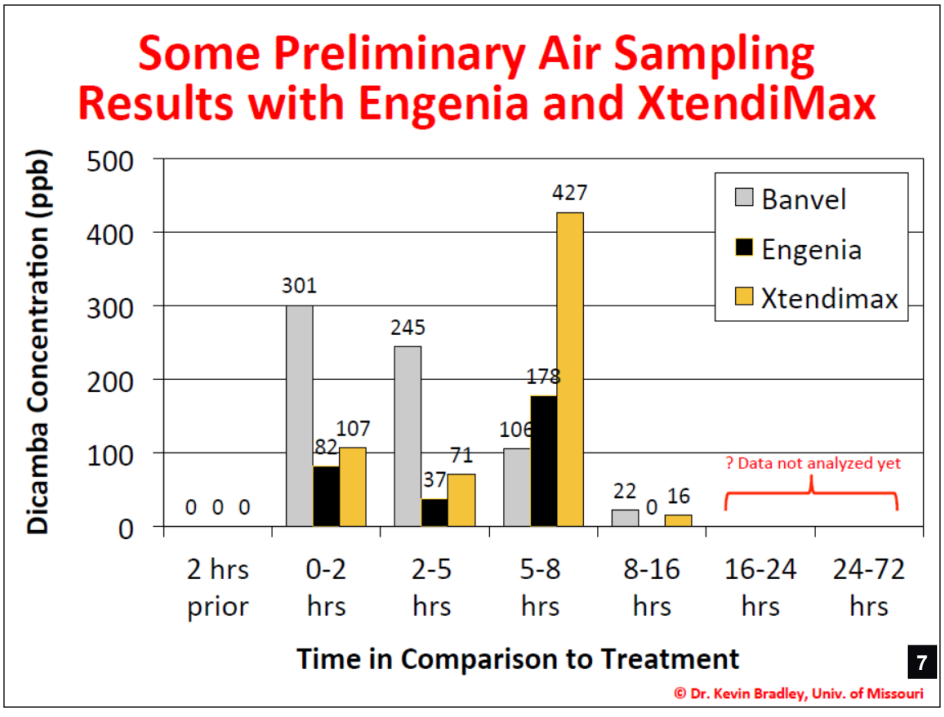

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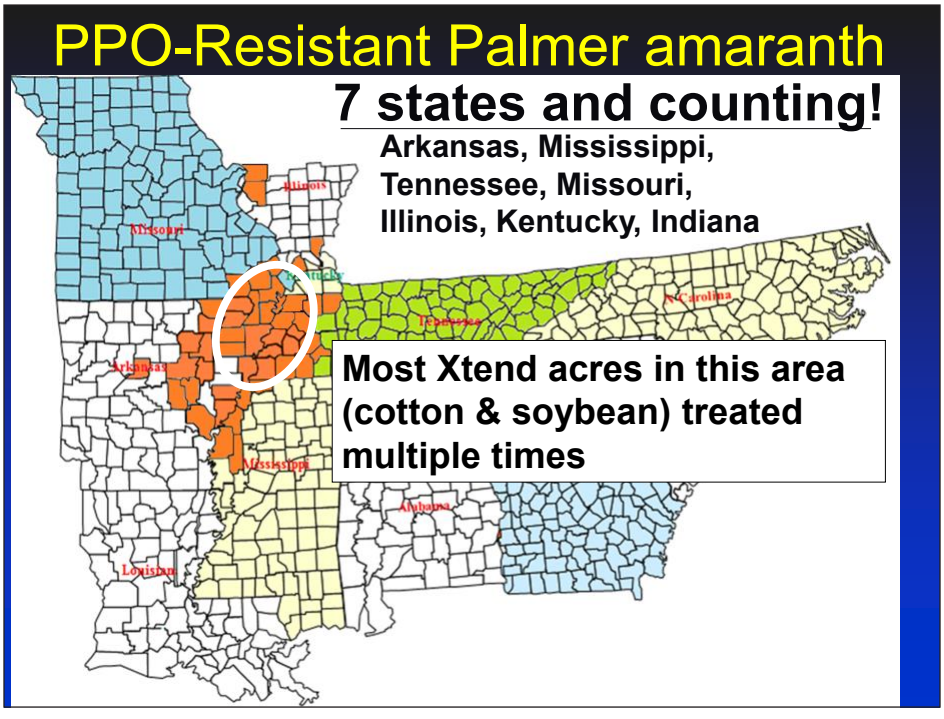

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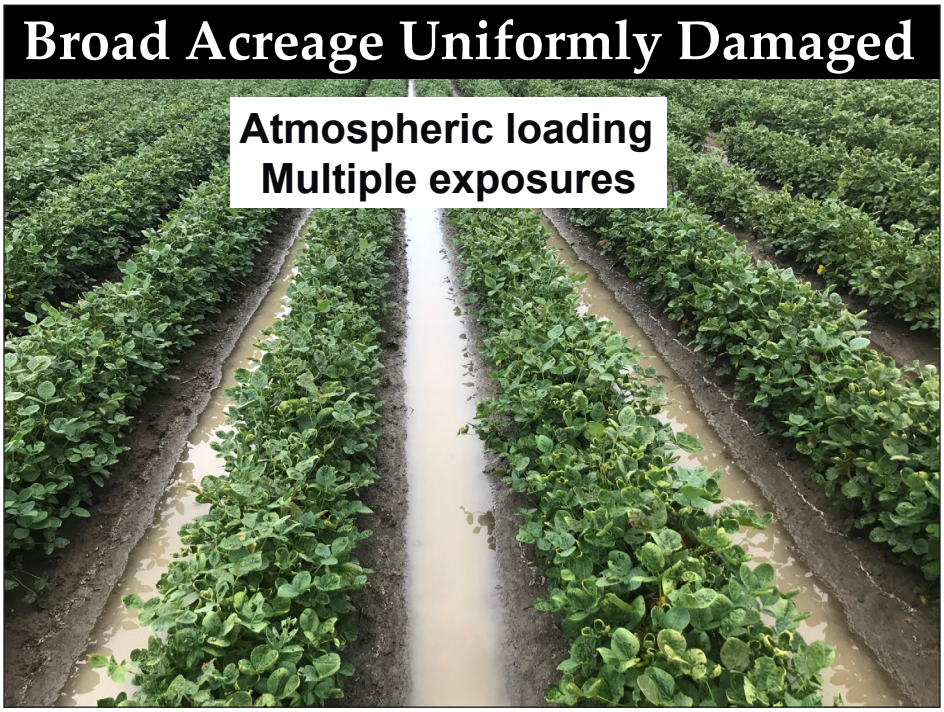

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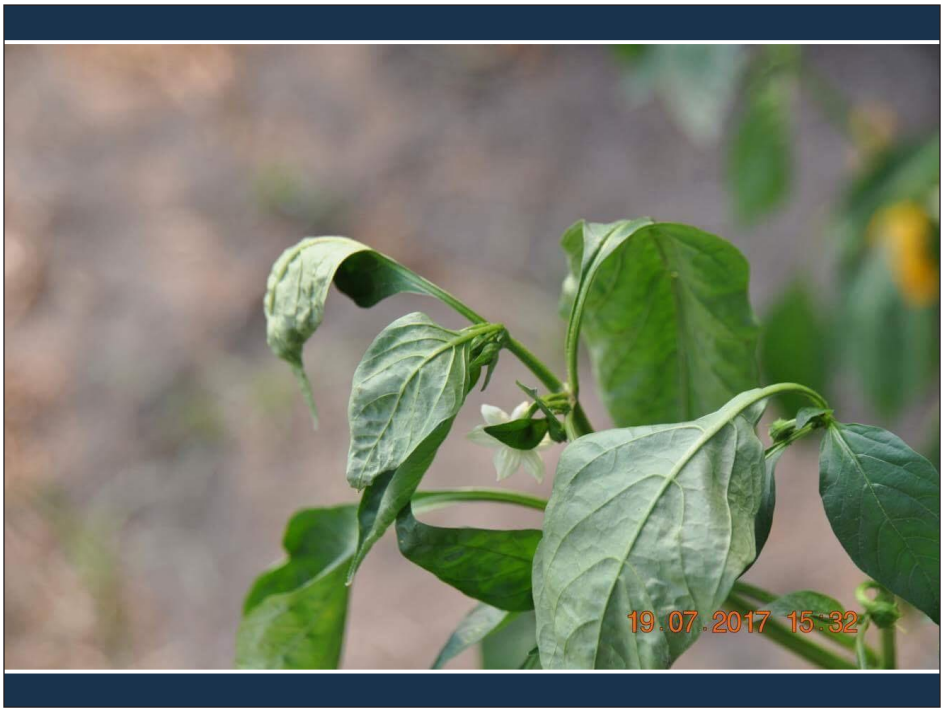

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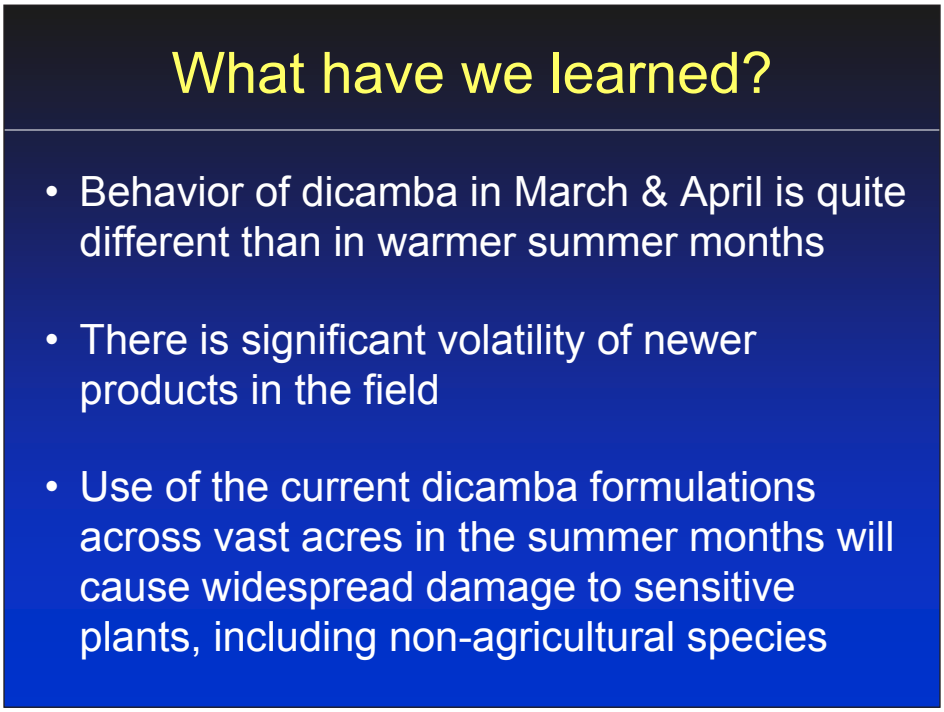

To view this presentation and the question and answer session, visit:
https://youtu.be/cFjw-iKRtvc?t=7m56s

Appendix C

Monsanto Presentation

Slide 01

Slide 02

Slide 03

ROUNDUP READY XTEND CROP SYSTEM

What Have We Learned from Volatility Research

XTENDIMAX With VaporGrip Technology

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MONSANTO

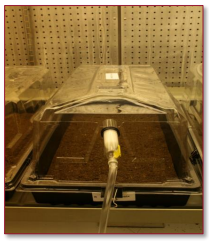
Slide 04

ROUNDUP READY XTEND CROP SYSTEM

Confidence in XtendiMax® with VaporGrip® Technology

What Have We Learned from Volatility Research

- **Monsanto has conducted extensive volatility testing since 2009**
  - 1200+ controlled tests and field studies
    - Controlled tests in various laboratory environments (humidome & hoophouse)
    - Field studies that were representative of multiple field conditions including varying geographies, environmental conditions (e.g. heat, humidity) & surfaces (e.g. soil, foliage)
- **Based on Monsanto's extensive testing and field observations thus far**
  - Confident the symptomology in the fields is not attributable to volatility when applying XtendiMax with VaporGrip Technology and following all label requirements
  - Volatility is the least likely cause of damage when compared to physical drift
    - Volatility is less severe than spray drift due to miniscule dose compared to drift
    - Supporting on-going volatility demonstration trials by academic researchers in multiple states (results expected early fall)



Humidome Studies

Field Studies

Monsanto Company Confidential

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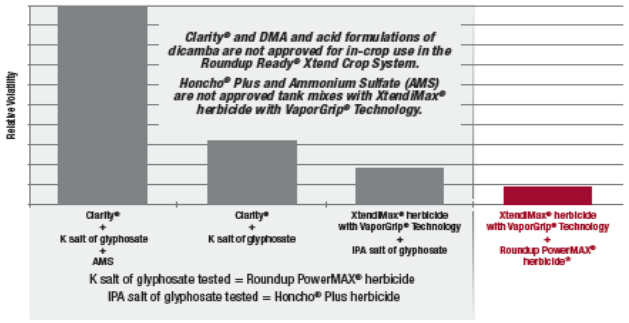
Slide 05

Monsanto is committed to enabling growers with the lowest volatility options

Relative Volatility of Dicamba + Glyphosate Combinations
(Based on published ASTM humidome methodology)



*Specific drift reducing adjuvants (DRAs) are required when tank mixing XtendiMax® herbicide with VaporGrip® Technology with Roundup PowerMAX® herbicide. Approved tank-mix products and nozzles for XtendiMax® with VaporGrip® Technology are listed on: XtendiMaxApplicationRequirements.com

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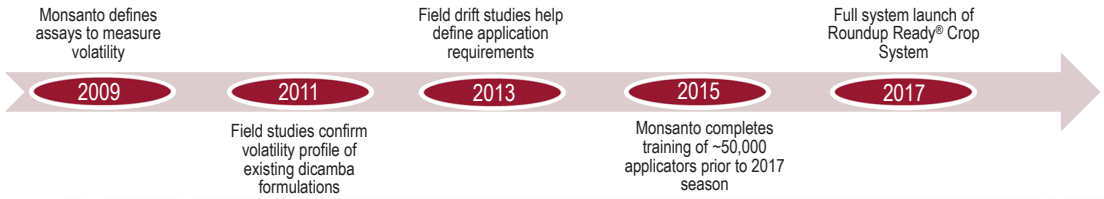
Slide 06

Existing data does not support dicamba volatility as the cause of whole field symptomology observed in some fields

- Monsanto began defining methodology to quantify and test dicamba volatility in 2009
  - Field studies conducted with Banvel and Clarity in 2009 - 2011 confirmed the profile of dicamba volatility (peer reviewed and published in Journal of Weed Science)
  - Humidome developed to test different formulations, conditions and tank mixtures
  - Regulatory data set built on field volatility and field deposition studies for XtendiMax with VaporGrip™ Technology confirms prior field studies



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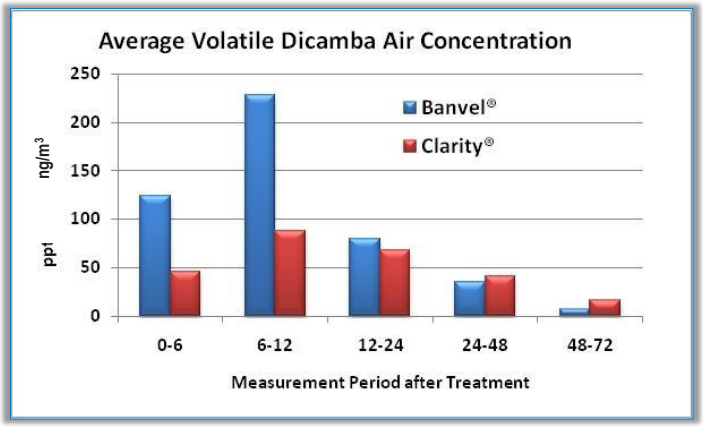
Slide 07

2009 Field Volatility Results Suggest Majority of Volatility Occurs within 24 hours of Application after Spraying



- 1 lb/A ae (32 oz/A) Application Rate
- On No Till RR Soy
- Calm winds at application
- Temp 60 – 95 °F
- Detection in the Center of 50 X 50 plot

Average Results from Three Trials

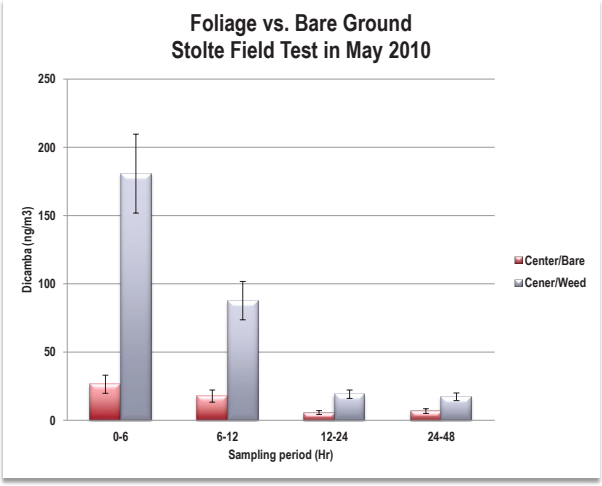
Y-axis is ng/m^3

Thomas C. Mueller, Daniel R. Wright, and Kirk M. Remund (*2013*) Effect of Formulation and Application Time of Day on Detecting Dicamba in the Air under Field Conditions. Weed Science: October-December 2013, Vol. 61, No. 4, pp. 586-593

Slide 08

Dicamba volatility from sprayed foliage or bareground does not significantly impact amount detected outside sprayed area

- 50' X 50' Plot
- 1lb/A Clarity + .75 lb Roundup PowerMAX
- Temp. 70 – 93 °F
- Test 48 hours
- Results
  - Four samplers 10' outside the sprayed area detected low levels during 48 hour period
    - Canopy <15% total outside plot than detected in center
    - Bare ground <3% total outside the plot than detected in center



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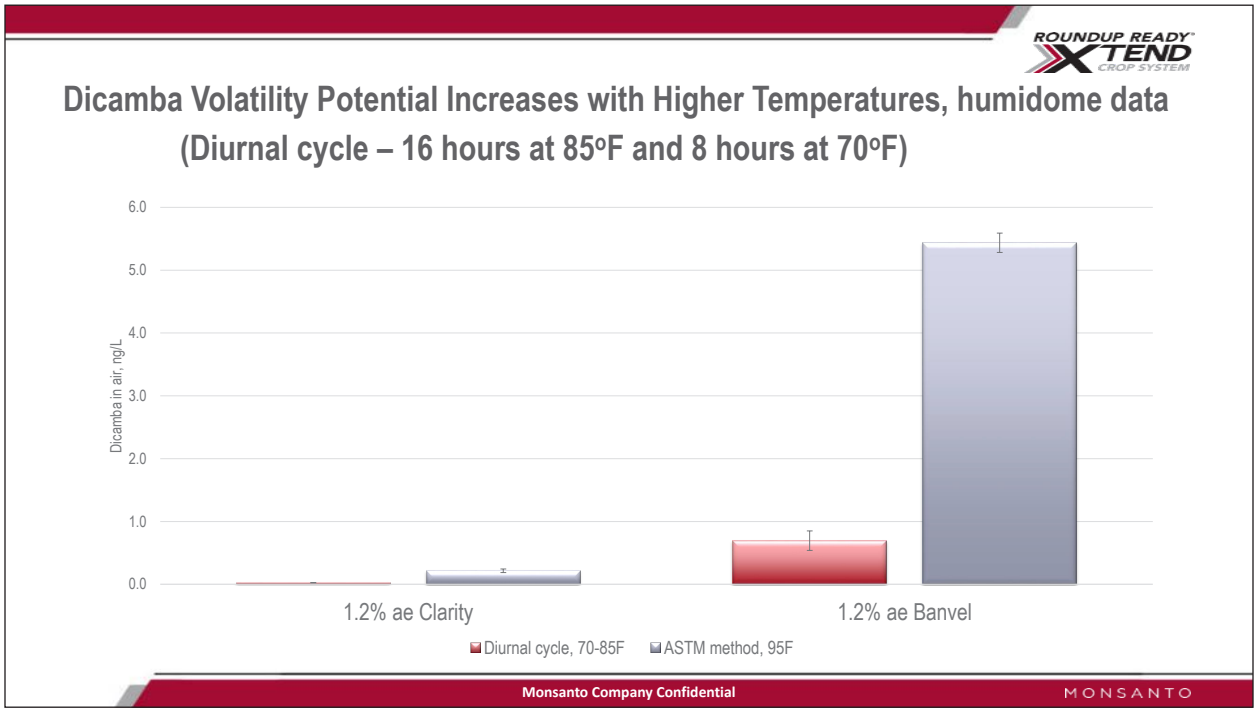

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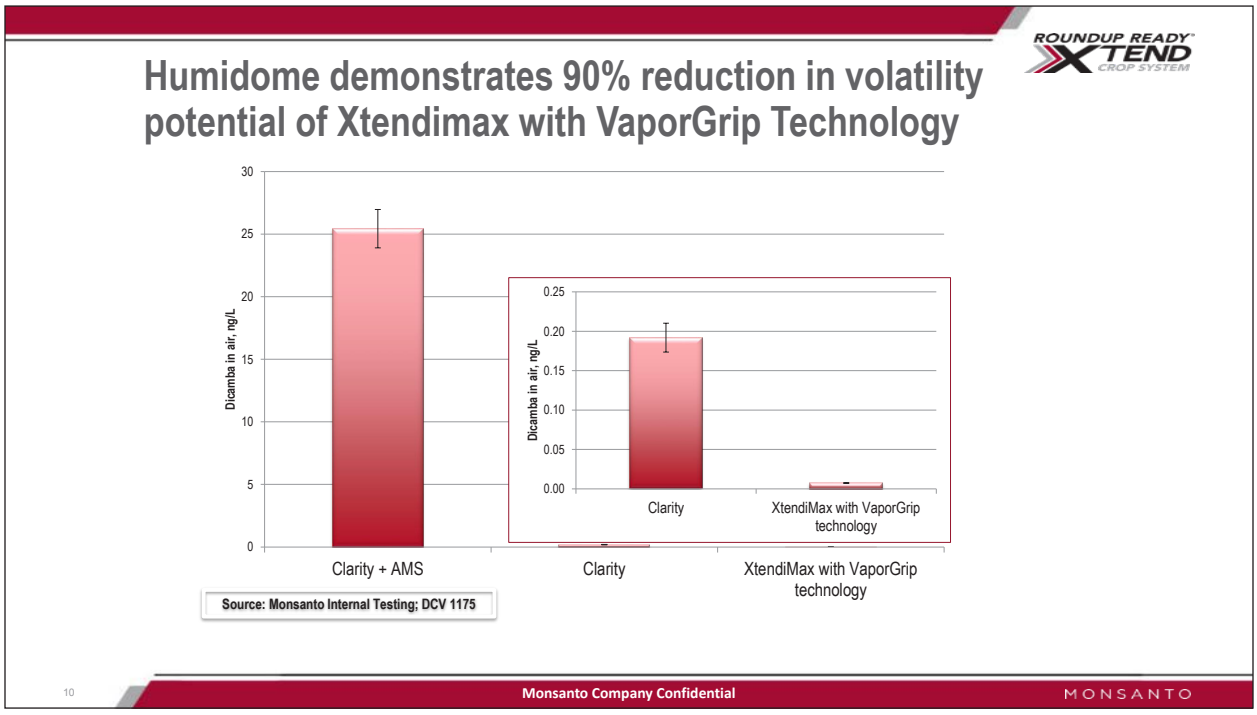
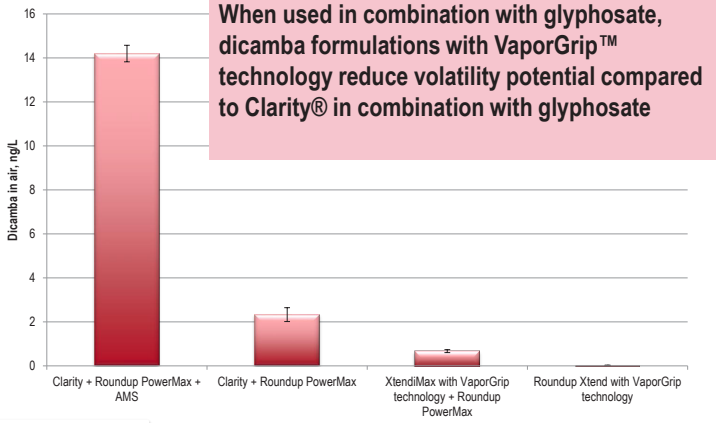


Slide 11

Humidome allows for relative volatility comparisons across tank mixtures



Source: Monsanto Internal Testing; DCV 1173

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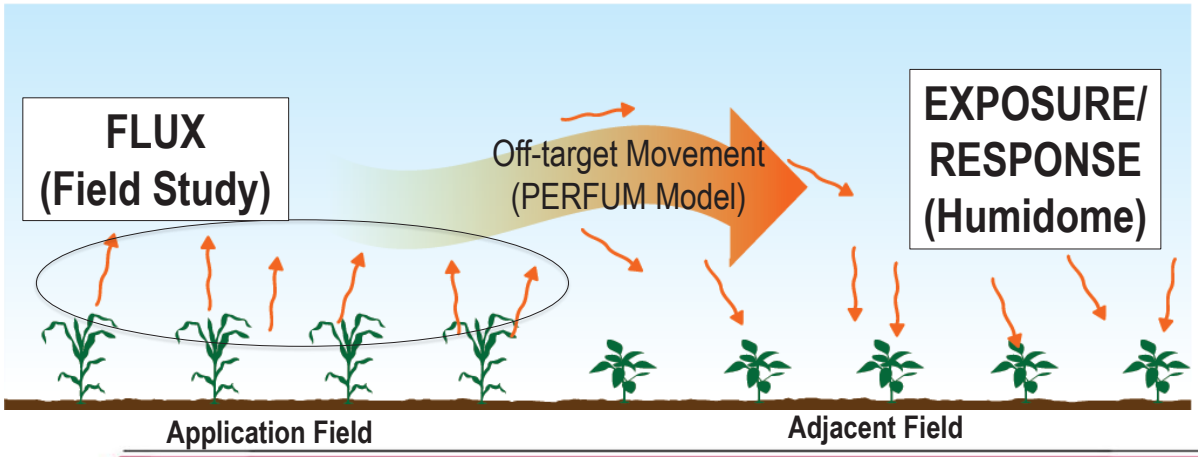
Slide 12

Field studies and mathematical models can be used to estimate off-target movement potential and crop symptomology due to dicamba volatility



12

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Slide 13

ROUNDUP READY XTEND CROP SYSTEM

Field studies measure the amount of vapor volatilizing off of a field

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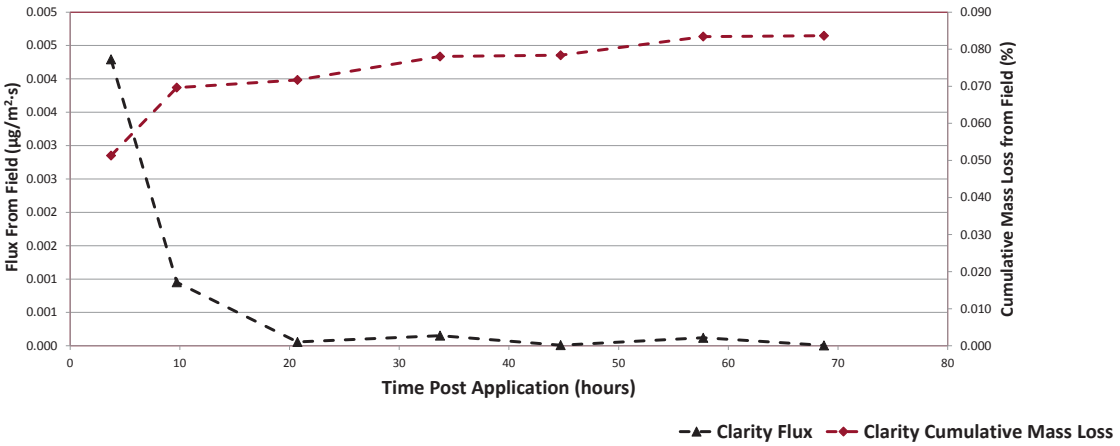
Slide 14

ROUNDUP READY XTEND CROP SYSTEM

Field Volatility Studies Measure Flux over 72 Hour Period



14

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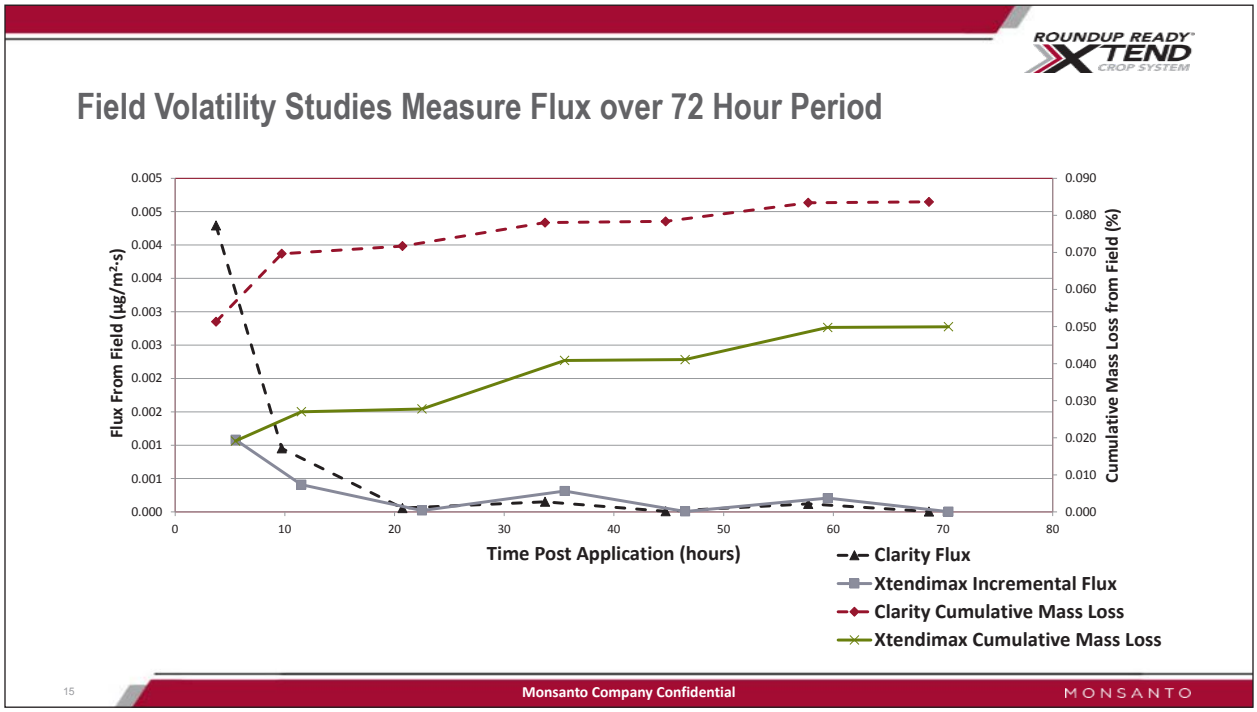
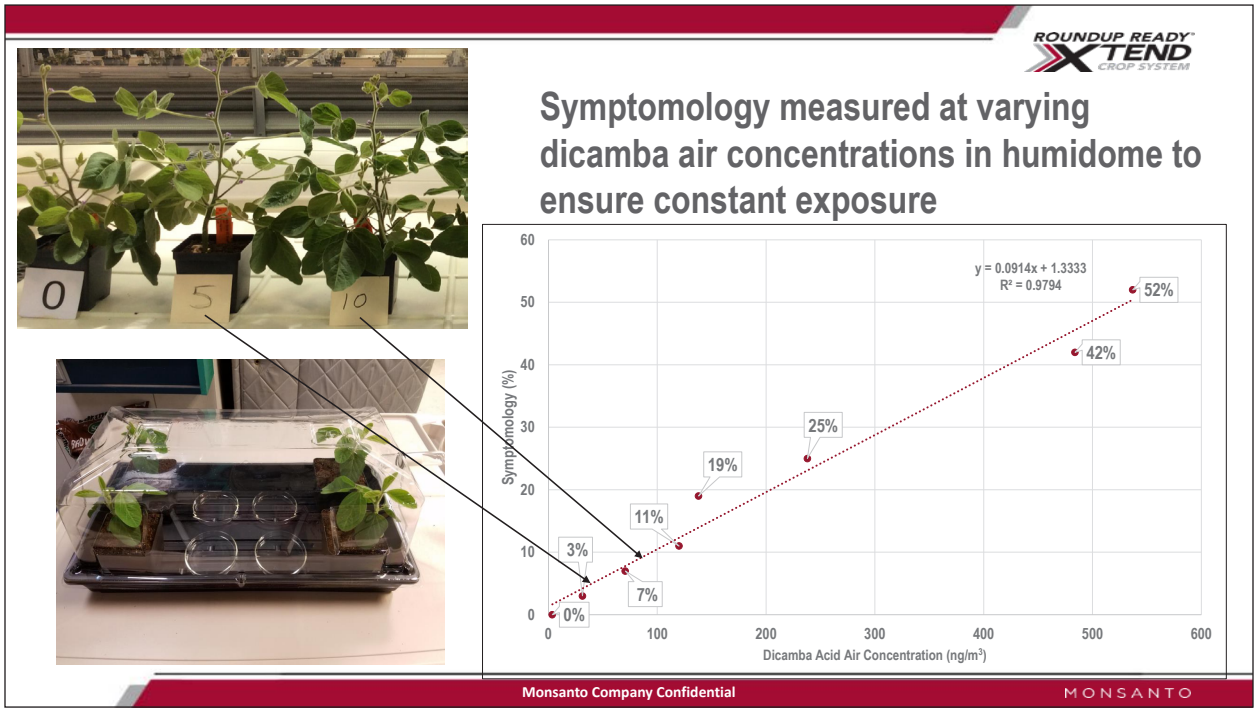
Slide 15



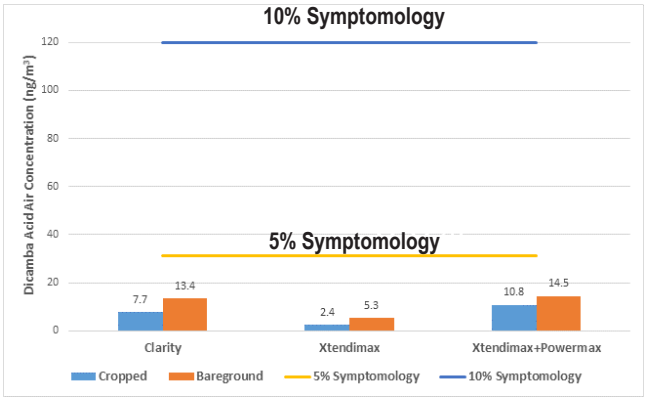
Slide 16



Slide 17

PERFUM model does not predict levels that would produce symptomology 5 meters outside of the treated fields

- Test locations were representative of typical growing areas
- Compared applications to bare ground and in-crop to plant tissue
- Data generated at the highest testing standards (GLP)
- Modeled air concentration was calculated 5 meters from edge of field
- Dicamba air concentrations outside of the treated field did not demonstrate levels that would produce a visual response



Slide 18

Research on XtendiMax with VaporGrip Technology has shown:

- **XtendiMax with VaporGrip Technology is a low volatility formulation, not a no volatility formulation**
  - Volatilized dicamba concentrations however are extremely low on fields treated with XtendiMax with VaporGrip Technology and is not sufficient to cause the level of symptomology reported, regardless of the size of the application area
  - Of the small amount that volatilizes, 90% of the potential volatility with XtendiMax with VaporGrip Technology occurs within the first 24 hours
- **Under typical environmental conditions volatile dicamba dissipates and does not build up concentration in the atmosphere**
  - Therefore, after application of XtendiMax with VaporGrip Technology, dicamba air concentrations outside of the treated field does not demonstrate levels that would produce a visual response to the level being reported
- **Certain types of tank mix additives can increase volatility potential of dicamba products**
  - For example, ammonium sulfate (AMS) can significantly increase volatility potential of dicamba formulations including XtendiMax with VaporGrip Technology and therefore not an approved tank-mix partner

Slide 19

ROUNDUP READY® XTEND CROP SYSTEM

Preliminary Look at 2017 Academic Trials

XTENDIMAX® With VaporGrip® Technology

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Slide 20

ROUNDUP READY® XTEND CROP SYSTEM

2017 Field Studies with Academics

- Working with 5 academics across multiple states to support drift and volatility trials with XtendiMax® with VaporGrip® Technology for 2017 season
  - Larry Steckel – University of Tennessee
  - Dan Reynolds – Mississippi State University
  - Jason Norsworthy – University of Arkansas
  - Bryan Young – Purdue University
  - Greg Kruger – University of Nebraska
- Other academics also conducting trials (MO & TN)
- Plans to reconvene this fall to review findings and plan additional trials for 2018

Volatility (Low Tunnel)	Large Plot Drift & Volatility	Small Plot Drift (Nozzle and Boom Height)
AR	AR	AR
MS	MS	MS
NE	NE	NE
IN	IN	IN
LA	TN	-
-	MO	-

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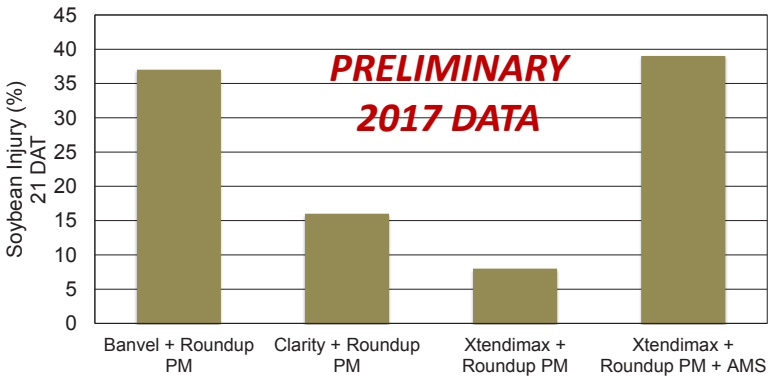
Slide 21

Dicamba Volatility by Herbicide
Field Low Tunnel Experiment

PURDUE WEED SCIENCE

Methods: Sprayed 3 flats with bare soil for each treatment and placed in the center of 2 soybean rows. Injury rating is for soybean plants immediately adjacent to the flats.



Data provided by Bryan Young at Purdue

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Slide 22

Summary of Monsanto Findings and Preliminary Academic Data

- Monsanto field studies confirm XtendiMax® with VaporGrip® Technology as a low volatility formulation
- Volatilized dicamba concentrations are extremely low on fields treated with XtendiMax with VaporGrip Technology and is not sufficient to cause the level of symptomology reported, regardless of the size of the application area
- Use of low volatility formulations, such as XtendiMax® with VaporGrip® Technology, are an essential part of application requirements
- Small and large scale drift studies support nozzle and boom height components of application requirements

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Slide 23

ROUNDUP READY® XTEND CROP SYSTEM

Learnings from 2017 Season

XTENDIMAX® With VaporGrip® Technology

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Slide 24

ROUNDUP READY® XTEND CROP SYSTEM

Roundup Ready® Xtend Crop System

2017 Late-Season Update

- **Strong demand in 2017**
  - ~20M acres planted of Roundup Ready 2 Xtend® soybeans
  - ~5M acres planted of cotton with XtendFlex® technology
- **Farmers experiencing success with XtendiMax® with VaporGrip® Technology**
  - Effective tool to combat tough-to-control weeds as part of overall weed management program
  - Successful on-target application when following application requirements
- **Reports of leaf cupping in non-Roundup Ready 2 Xtend® soybean fields**
  - If a customer has experienced symptomology or weed control issues, contact us as soon as possible at 1–844-RRXTEND
  - Monsanto representative will contact the customer to arrange a time to meet at their field to review the symptomology together
    - What caused the leaf cupping symptoms may not always be clear as many factors can cause this type of symptomology
    - Timing and level of symptoms are key factors in determining potential yield response

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Slide 25

XtendiMax® with VaporGrip® Technology

Learnings from 2017 Season - Off Target Movement

- **Responded to over 1,000 inquiries to our call center relating to concerns regarding possible off-target movement from applicators applying XtendiMax® with VaporGrip® Technology**
  - No calls from Arkansas where our product was not approved for in-season in-crop use
  - Based on our early evaluation, in most cases where XtendiMax® with VaporGrip® Technology was used the factors that are leading to off-target movement are readily identifiable
  - Illegal use of non-approved dicamba products and possible contamination are important factors not reflected in our evaluation
- **Majority of the cases drift (not volatility) appears to be the cause of off-target movement**
  - Identifiable factors that contributed to drift are controllable and can be readily addressed through education, training and following the product label for successful application of XtendiMax® with VaporGrip® Technology

Opportunity to ensure that applicators continue to have access to robust training so they can have success with the system in 2018

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Slide 26

Applicator OTM Inquiries – National (as of 8/18/17)

- **Monsanto is collaborating with applicators who have contacted us at 1-(844)-RRXTEND to evaluate concerns regarding potential OTM of Xtendimax® with Vapogrip® Technology**
- **Initial site visit by independent Field Engagement Specialists contracted by Monsanto**
- **Evaluating compliance with 10 key label requirements based on applicator self-reported data including:**

✓ Required Buffer	✓ Boom Height
✓ Approved Nozzle	✓ Wind Speed
✓ Application Rate	✓ Approved Tank Mixes & Use of DRAs
✓ Application Volume	✓ Nozzle Pressure
✓ Ground Speed	✓ No Sensitive Crops Downwind

- **Applicators routinely manage to BMPs with similar requirements with other pesticides**
- **Validating environmental conditions and analyzing publicly available weather data with support from the Climate Corporation**
- **Evaluating other possible factors**

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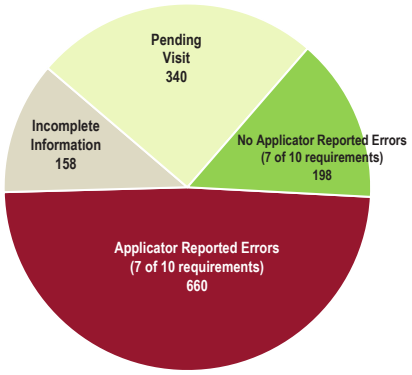
Slide 27

Applicator OTM Inquiries - National (as of 8/18/17)

Inquiries by Applicators of Xtendimax® with VaporGrip® Technology regarding possible off-target movement

- 1,356 Applicator inquiries to date
- 1,016 site visits thus far
- 858 applicators supplied sufficient data for review of first 7 of 10 key label requirements being evaluated
- In 77% of the cases evaluated to date (660 of 858), applicators have self-reported errors from one or more of first 7 of 10 key label requirements checked that could have contributed to OTM
  - Still evaluating remaining key label requirements and environmental & weather data
  - Inversions, contamination and proximity to fields where unapproved products may have been utilized may also be factors in some cases

Applicator OTM Inquiries (National)
(as of 8/18/17)



Slide 28

Applicator OTM Inquiries - National (as of 8/18/17)

Application Requirement	Applicator Reported Deficiencies
Required Buffer*	513
Approved Nozzle	143
Boom Height	135
Application Rate	44
Wind Speed	32
Application Volume	9
Ground Speed	8

*Includes no/inadequate buffer and applicator reported sensitive crop downwind

All are factors that are addressable through training and education

- Most commonly self-reported deficiency is Inadequate Buffer in 60% of cases
- Unapproved Nozzles a factor in 17% of cases
- Wrong Boom Height a factor in 16% of cases
- Some applicators self-reported multiple application deficiencies
- Still evaluating 3 of 10 key label requirements:
  - Nozzle Pressure
  - Approved Tank Mix Information
  - Downwind presence of sensitive crops
- Also evaluating:
  - Climate Corp's environmental & weather data on wind speed, direction and inversion potential
  - Supporting applicators concerned about possible contamination through testing
- Inversions and proximity to fields where other unapproved products may be been utilized may be a factor in some cases

Slide 29

Roundup Ready® Xtend Crop System

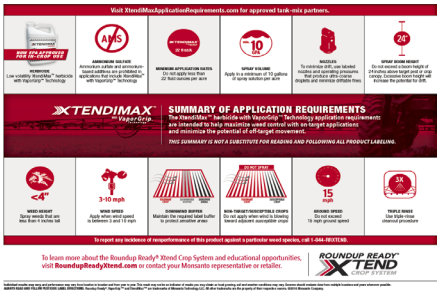
What Can You Expect for 2018

- Our aim is to build upon the positive experience of the vast majority of applicators utilizing Roundup Ready Xtend Crop System in 2017 as we know it offers important weed management options that growers want and need
- We are committed to helping our customers and the industry continue to learn how best to use the Roundup Ready Xtend Crop System
  - Continue to collaborate with farmers, retailers, state regulators and industry associations to gain valuable insights and ensure that all applicators continue to have access to robust training as we prepare for the 2018 season
  - Continue to work with academics to support on-going volatility, drift and application requirement demonstration trials in multiple states
  - Engage with our Climate Corporation team to help growers better identify weather and inversion conditions, among other efforts
  - Monsanto and states are communication with EPA for 2018

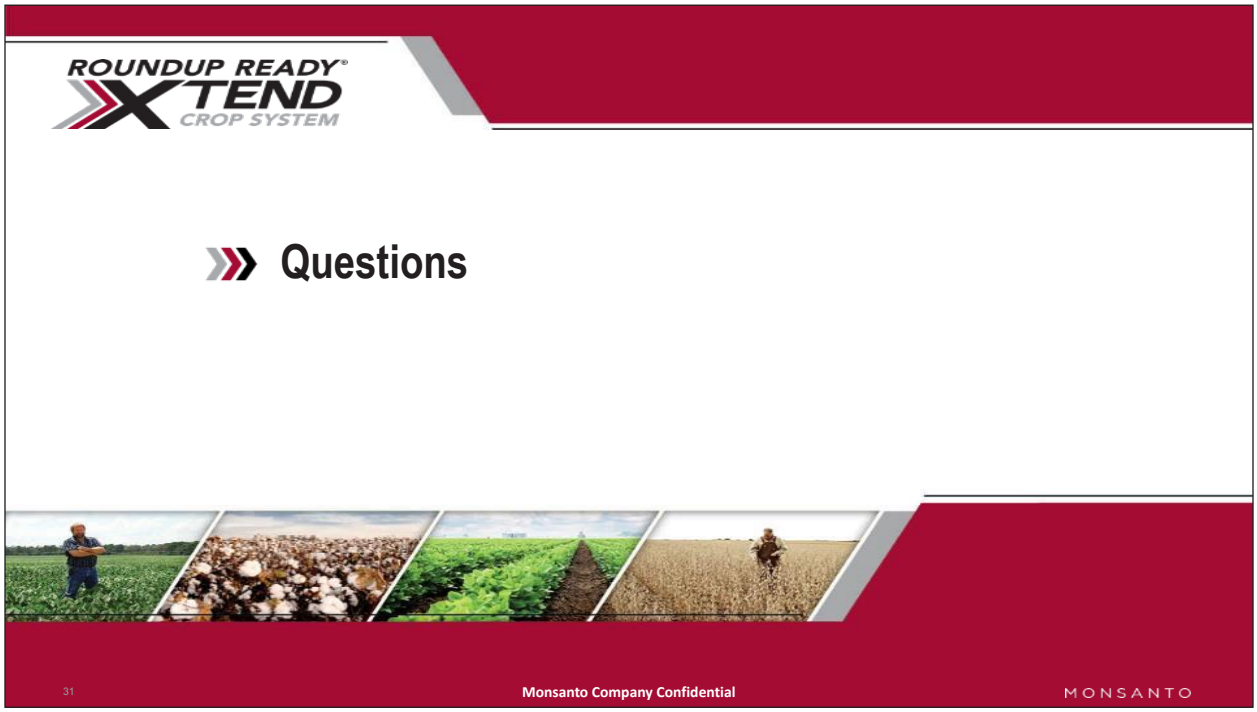
Slide 30

Tools & Resources

- **Available agronomic documents for support**
  - Diagnosing Leaf Cupping in Soybeans
  - Air Temperature Inversion Effects on Herbicide Spray Drift
  - Preparing to Apply XtendiMax with VaporGrip Technology
- **Educational Materials**
  - XtendiMax with VaporGrip Technology Technical Sheet
  - Volatility Flier
  - Applications Requirements Flier
- **Websites**
  - www.roundupreadyxtend.com
  - www.xtendimaxapplicationsrequirements.com
- **Additional Considerations**
  - Expansion of Flag the Technology promotional offer
  - Potential nozzle promotion



Slide 31



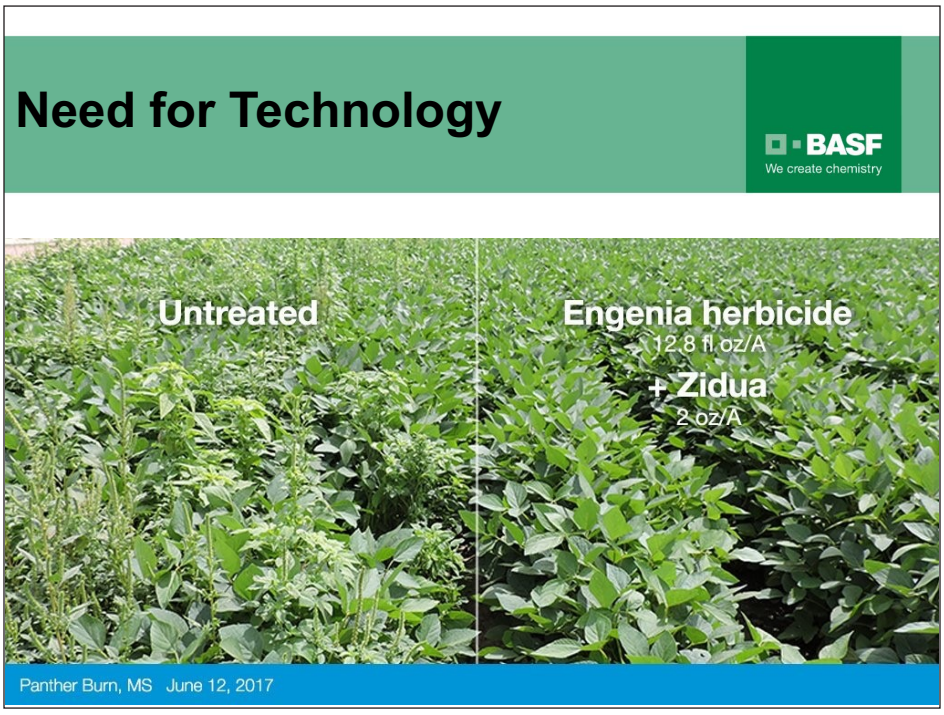
To view this presentation and the question and answer session, visit:
https://youtu.be/40CjfmOmyYw?t=1m11s

Appendix D

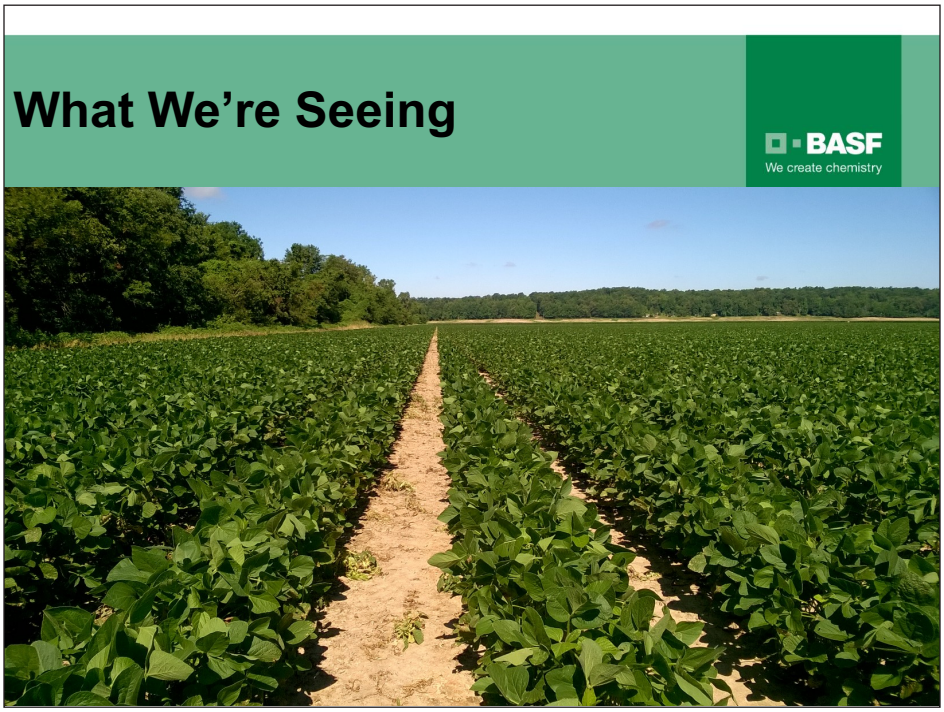
BASF Presentation

Slide 01

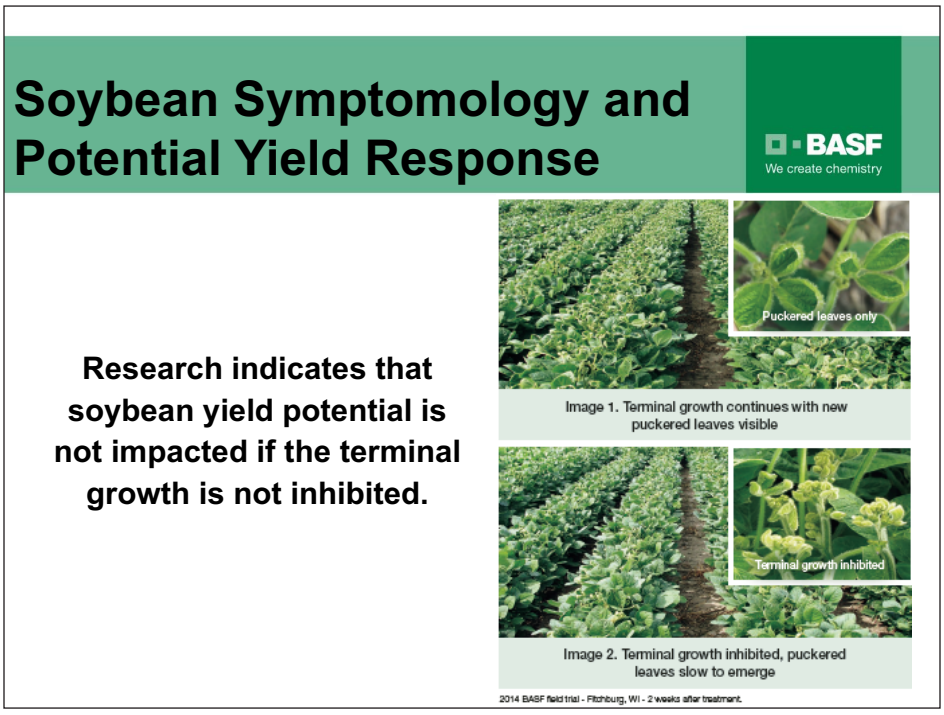
Slide 02



Slide 03



Slide 04



Slide 05

Research

BASF
We create chemistry

50 years experience

- **Lab, research and on-farm trials**
- **Evaluated by Universities and Regulatory Agencies**
- **Worked with EPA and Stakeholders to develop best practices and label requirements**

Engenia Herbicide Weed Control

Glyphosate Only

Engenia Herbicide in a Layered Residual Program

BASF Trial Story City, IA 2014.

Slide 06

Research

BASF
We create chemistry

- **Optimizing weed control**
- **Weed resistance mitigation**
- **Maximizing on-target application**

Slide 07

Research

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We create chemistry

- Optimizing weed control
- Weed resistance mitigation
- **Maximizing on-target application**
  - **Primary: Spray particle drift**
  - **Secondary: Volatility, soil movement and runoff**

Slide 08

Research

BASF
We create chemistry

Secondary Loss Studies (incl volatility)

- **Thermo Gravimetric Analysis**
- **Incubator Analysis**
- **14C Contained System Analysis**
- **Humidome Bioassay Analysis**
- **Field Studies**
  - **Air sampling**
  - **Soybean field bioassay (+/- covered plant)**

Slide 09

How We're Responding

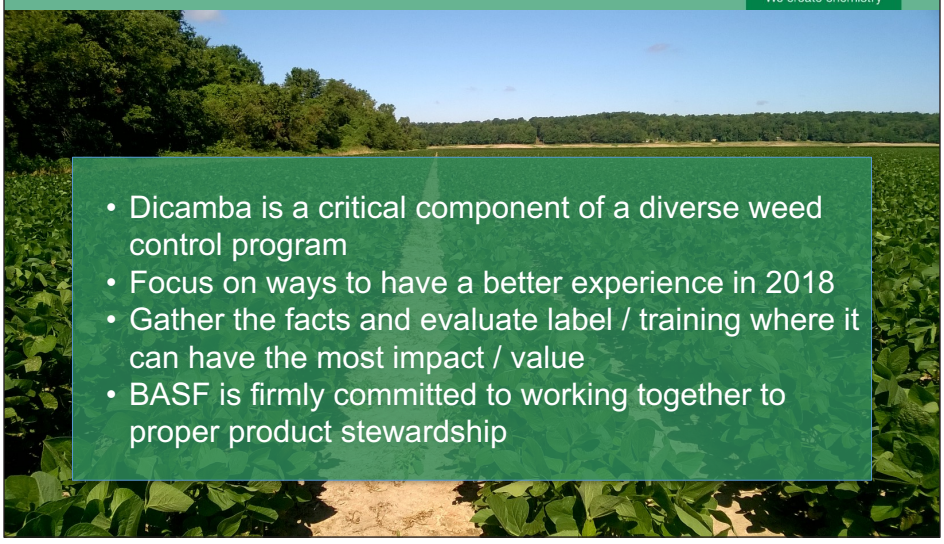
BASF
We create chemistry

- 400 Field Reps
  - 11 in Arkansas and Bootheel
- Answered every call
  - Walked every field
- Actively engaged with University Extension, Consultants, Growers, State Reg, etc. to train, investigate, and evaluate issues

Slide 10

Working Together

BASF
We create chemistry



To view this presentation and the question and answer session, visit: https://youtu.be/5Ov8yoStlUg and https://youtu.be/lSxePjLr2Yc

Appendix E

Plant Board Complaint Data and Day 2 Presentation

Case File Status for files received by office staff as of August 22, 2017

Case File	Status	Violations Issued	Notes
17-0016	Closed	Record Keeping and Off Label Use (Veg. Management used for Ag Use)	Burndown app
17-0026	Closed	Drift*	*NOT DICAMBA Drift of 2,4-D and Glyphosate
17-0027	Waiting on additional records		
17-0038	Closed	Drift and Buffer*	Buffer was for Glyphosate Product not Dicamba
17-0098	Discontinued		
17-0107	Closed	13-Including Drift, Records, Buffer (State), Tank Mix, Label Rate	Includes 2 Private App, 1 Comm. App, and 1 Comm.Firm
17-0108	Closed	See CF17-0107	
17-0117	Under Review by Agri Program Mgr		
17-0127	Pending Staff Review		
17-0131	Pending Staff Review		
17-0132	Pending Staff Review		
17-0133	Pending Staff Review		
17-0135	Pending Staff Review		
17-0141	Closed	Record Keeping and Buffer (State)	
17-0149	Pending Staff Review		
17-0157	Pending Staff Review		
17-0159	Pending Staff Review		
17-0168	Pending Staff Review		
17-0194	Pending Staff Review		
17-0208	Pending Staff Review		
17-0213	Pending Staff Review		
17-0214	Pending Staff Review		
17-0215	Discontinued		
17-0217	Pending Staff Review		
17-0220	Pending Staff Review		
17-0226	Discontinued		
17-0247	Pending Staff Review		
17-0258	Pending Staff Review		
17-0264	Discontinued		
17-0272	Closed	Symptoms Present - No Violations Identified	
17-0315	Discontinued		
17-0320	Pending Staff Review		
17-0359	Pending Staff Review		
17-0374	Waiting on additional records		
17-0425	Pending Staff Review		
17-0426	Pending Staff Review		
17-0434	Pending Staff Review		
17-0435	Pending Staff Review		
17-0436	Pending Staff Review		
17-0437	Pending Staff Review		
17-0438	Pending Staff Review		
17-0439	Waiting on additional records		
17-0440	Pending Staff Review		
17-0441	Pending Staff Review		
17-0460	Pending Staff Review		
17-0511	Discontinued		
17-0529	Waiting on additional records		
17-0587	Pending Staff Review		
17-0588	Pending Staff Review		

Case File Status for files received by office staff as of August 22, 2017

Case File	Status	Violations Issued	Notes
17-0589	Waiting on additional records		
17-0590	Pending Staff Review		
17-0611	Pending Staff Review		
17-0684	Discontinued		
17-0691	Pending Staff Review		
17-0692	Pending Staff Review		
17-0693	Waiting on additional records		
17-0711	Under Review by Ag Specialist		
17-0729	Waiting on additional records		
17-0798	Pending Staff Review		
17-0807	Waiting on additional records		
17-0822	Pending Staff Review		
17-0834	Under Review by Ag Specialist		
17-0921	Dismissed		
17-0927	Discontinued		
17-1046	Waiting on additional records		
17-1047	Waiting on additional records		
17-1048	Waiting on additional records		
17-1086	Discontinued		
17-1144	Pending Staff Review		
17-1145	Pending Staff Review		
17-1146	Waiting on additional records		
17-1147	Waiting on additional records		
17-1148	Waiting on additional records		
17-1149	Waiting on additional records		
17-1150	Pending Staff Review		
17-1151	Pending Staff Review		
17-1152	Pending Staff Review		
17-1153	Waiting on additional records		
17-1154	Waiting on additional records		
17-1155	Waiting on additional records		
17-1156	Pending Staff Review		
17-1157	Pending Staff Review		
17-1158	Waiting on additional records		
17-1159	Waiting on additional records		
17-1160	Waiting on additional records		
17-1161	Pending Staff Review		
17-1162	Waiting on additional records		
17-1163	Waiting on additional records		
17-1164	Pending Staff Review		
17-1165	Pending Staff Review		
17-1166	Pending Staff Review		
17-1167	Waiting on additional records		
17-1168	Waiting on additional records		
17-1201	Dismissed		

AUGUST 24, 2017

DICAMBA TASK FORCE

DICAMBA CASE FILE STATUS

AS OF AUGUST 22, 2017:

TOTAL ALLEGED DICAMBA COMPLAINTS = 950 (1202 TOTAL COMPLAINTS) IN 26 COUNTIES.

93 OF THE 950 DICAMBA CASE FILES RECEIVED BACK IN THE OFFICE

DISCONTINUED/DISMISSED = 11

CLOSED = 7

CASE FILES RECEIVED BUT WAITING ON ADDITIONAL RECORDS = 25

CASE FILES UNDER STAFF REVIEW = 4

PENDING STAFF REVIEW = 47

Totals:
Arkansas 2
Ashley 5
Chicot 6
Clay 15
Craighead 92
Crittenden 184
Cross 45
Desha 9
Greene 5
Jackson 2
Jefferson 3
Lawrence 2
Lee 67
Lincoln 2
Little River 1
Lonoke 9
Miller 2
Mississippi 240
Monroe 22
Phillips 48
Poinsett 89
Pulaski 3
Randolph 1
St. Francis 88
White 2
Woodruff 6

	CASEFILE #	DATE	Crop Affected	Suspected Pesticide
1	17-0016	3/24/17	N/A	Dicamba
2	17-0026	4/3/17	Greenhouse	Dicamba
3	17-0027	4/3/17	Peaches, grapes, blackberries	2,4-D/Dicamba
4	17-0098	5/11/17	Soybeans	Dicamba
5	17-0107	5/16/17	Oak trees, crepe myrtle	Dicamba
6	17-0108	5/16/17	Oak Trees	Dicamba/2,4-D
7	17-0117	5/17/17	Soybeans	Dicamba
8	17-0127	5/23/17	Soybeans	Dicamba or 2,4-D
9	17-0131	5/25/17	Roundup Soybeans	Dicamba
10	17-0132	5/25/17	Soybeans	Dicamba
11	17-0133	5/26/17	Soybeans	Dicamba
12	17-0135	5/30/17	Soybeans	Dicamba
13	17-0136	5/30/17	Roundup Ready Soybeans	Dicamba
14	17-0141	5/30/17	Soybeans	Dicamba
15	17-0147	5/31/17	Soybeans	Dicamba
16	17-0149	6/1/17	Roundup Ready Soybeans	Dicamba
17	17-0150	6/1/17	Soybeans	Dicamba, 2,4-D
18	17-0153	6/2/17	Soybeans	Dicamba
19	17-0155	6/5/17	Soybeans	Dicamba
20	17-0157	6/6/17	Soybeans	Dicamba
21	17-0159	6/6/17	Soybeans	Dicamba
22	17-0161	6/7/17	Soybeans	Dicamba
23	17-0162	6/7/17	Soybeans	Dicamba
24	17-0167	6/8/17	Soybeans	Dicamba
25	17-0168	6/9/17	Soybeans	Dicamba
26	17-0169	6/9/17	Soybeans	Dicamba
27	17-0170	6/9/17	Tomatoes and trees	Dicamba, Quinclorac
28	17-0171	6/12/17	Soybeans	Dicamba
29	17-0172	6/12/17	Soybeans	Dicamba
30	17-0174	6/12/17	Soybeans	Dicamba
31	17-0175	6/12/17	Soybeans	Dicamba
32	17-0176	6/12/17	Soybeans	Dicamba
33	17-0181	6/12/17	Soybeans	Dicamba
34	17-0182	6/12/17	Soybean-RoundupReady &Liberty	Dicamba
35	17-0184	6/12/17	Soybeans	Dicamba

36	17-0186	6/12/17	Soybeans	Dicamba
37	17-0187	6/12/17	Soybeans	Dicamba
38	17-0188	6/12/17	Soybeans	Dicamba
39	17-0189	6/12/17	Soybeans	Dicamba
40	17-0191	6/12/17	Soybeans	Dicamba
41	17-0194	6/12/17	Soybeans	Dicamba
42	17-0195	6/13/17	Soybeans	Dicamba
43	17-0196	6/13/17	Soybeans	Dicamba
44	17-0197	6/13/17	Soybeans	Dicamba
45	17-0198	6/13/17	Soybeans	Dicamba
46	17-0199	6/13/17	Soybeans	Dicamba
47	17-0202	6/13/17	Soybeans	Dicamba
48	17-0203	6/13/17	Soybeans	Dicamba
49	17-0204	6/13/17	Soybeans	Dicamba
50	17-0205	6/13/17	Soybeans	Dicamba
51	17-0207	6/14/17	Soybeans(200 acres of LL)	Dicamba
52	17-0208	6/14/17	Soybeans	Dicamba
53	17-0209	6/14/17	Flowers, Squash, Cucumbers	Dicamba
54	17-0210	6/14/17	Soybeans	Dicamba
55	17-0211	6/14/17	Soybeans	Dicamba
56	17-0213	6/14/17	Soybeans	Dicamba
57	17-0214	6/14/17	Soybeans	Dicamba
58	17-0215	6/14/17	Soybeans	2,4-D, Dicamba
59	17-0217	6/14/17	Soybeans	Dicamba
60	17-0218	6/15/17	Soybeans	Dicamba
61	17-0219	6/15/17	Soybeans	Dicamba
62	17-0220	6/15/17	Soybeans	Dicamba
63	17-0221	6/15/17	Soybeans	Dicamba
64	17-0222	6/15/17	Soybeans	Dicamba
65	17-0223	6/15/17	Soybeans	Dicamba
66	17-0224	6/15/17	Soybeans	Dicamba
67	17-0225	6/15/17	Soybeans	Dicamba
68	17-0226	6/15/17	Soybeans	Dicamba
69	17-0227	6/15/17	Soybeans	Dicamba
70	17-0228	6/15/17	Soybeans	Dicamba
71	17-0229	6/15/17	Soybeans	Dicamba

72	17-0230	6/15/17	Soybeans	Dicamba
73	17-0232	6/15/17	Soybeans	Dicamba
74	17-0233	6/15/17	Soybeans	Dicamba
75	17-0234	6/16/17	Soybeans, Peanuts	Dicamba
76	17-0235	6/16/17	Soybeans	Dicamba
77	17-0236	6/16/17	Soybeans	Dicamba
78	17-0237	6/16/17	Soybeans	Dicamba
79	17-0240	6/16/17	Soybeans	Dicamba
80	17-0241	6/16/17	Soybeans	Dicamba
81	17-0242	6/16/17	Soybeans	Dicamba
82	17-0244	6/16/17	Soybeans(300 RR)	Dicamba
83	17-0246	6/16/17	Soybeans	Dicamba
84	17-0247	6/16/17	Soybeans	Dicamba
85	17-0248	6/16/17	Soybeans	Dicamba
86	17-0249	6/16/17	Trees	Dicamba
87	17-0250	6/16/17	Soybeans	Dicamba
88	17-0251	6/17/17	N/A	Dicamba,Metolachlor, Glyfos Xtra
89	17-0252	6/19/17	Soybeans	Dicamba
90	17-0253	6/19/17	Soybeans	Dicamba
91	17-0254	6/19/17	Soybeans	Dicamba
92	17-0255	6/19/17	Soybeans	Dicamba
93	17-0257	6/19/17	Soybeans	Dicamba
94	17-0258	6/19/17	Soybeans	Dicamba
95	17-0259	6/19/17	Soybeans	Dicamba
96	17-0260	6/19/17	Tomato,Cantaloupe,Watermelons	Dicamba
97	17-0261	6/19/17	Soybeans	Dicamba
98	17-0262	6/19/17	Soybeans	Dicamba
99	17-0263	6/19/17	Soybeans	Dicamba
100	17-0264	6/19/17	Soybeans	Dicamba
101	17-0266	6/19/17	Soybeans	Dicamba
102	17-0267	6/19/17	Soybeans	Dicamba
103	17-0268	6/19/17	Soybeans	Dicamba
104	17-0269	6/19/17	Soybeans	Dicamba
105	17-0270	6/19/17	Soybeans	Dicamba
106	17-0272	6/19/17	Soybeans	Dicamba
107	17-0274	6/19/17	Soybeans	Dicamba

108	17-0275	6/19/17	Tree	Dicamba
109	17-0276	6/19/17	Soybeans	Dicamba
110	17-0277	6/19/17	Soybeans	Dicamba
111	17-0278	6/19/17	Soybeans	Dicamba
112	17-0279	6/19/17	Soybeans	Dicamba
113	17-0281	6/19/17	Cotton	Dicamba
114	17-0282	6/19/17	Soybeans	Dicamba
115	17-0283	6/19/17	Soybeans	Dicamba
116	17-0284	6/19/17	Soybeans	Dicamba
117	17-0285	6/19/17	Tomatoes	Dicamba
118	17-0287	6/20/17	Garden	Dicamba
119	17-0288	6/20/17	Soybeans	Dicamba
120	17-0289	6/20/17	Soybeans	Dicamba
121	17-0290	6/20/17	Soybeans	Dicamba
122	17-0292	6/20/17	Soybeans	Dicamba
123	17-0293	6/20/17	Soybeans	Dicamba
124	17-0294	6/20/17	Soybeans	Dicamba
125	17-0295	6/20/17	Soybeans	Dicamba
126	17-0296	6/20/17	Soybeans	Dicamba
127	17-0297	6/20/17	Soybeans	Dicamba
128	17-0298	6/20/17	Soybeans	Dicamba
129	17-0299	6/20/17	Soybeans	Dicamba
130	17-0300	6/20/17	Soybeans	Dicamba
131	17-0301	6/20/17	Soybeans	Dicamba
132	17-0302	6/20/17	Soybeans	Dicamba
133	17-0303	6/20/17	Soybeans	Dicamba
134	17-0304	6/20/17	Soybeans	Dicamba
135	17-0305	6/20/17	Soybeans	Dicamba
136	17-0306	6/20/17	Soybeans	Dicamba
137	17-0307	6/20/17	Soybeans	Dicamba
138	17-0308	6/20/17	Soybeans	Dicamba
139	17-0309	6/20/17	Soybeans	Dicamba
140	17-0310	6/20/17	Soybeans	Dicamba
141	17-0311	6/20/17	Soybeans	Dicamba
142	17-0313	6/20/17	Soybeans	Dicamba
143	17-0314	6/21/17	Soybeans	Dicamba

144	17-0315	6/21/17	Soybeans	Dicamba
145	17-0317	6/21/17	Soybeans	Dicamba
146	17-0318	6/21/17	Soybeans	Dicamba
147	17-0319	6/21/17	Soybeans	Dicamba
148	17-0320	6/21/17	Soybeans	Dicamba
149	17-0321	6/21/17	Soybeans	Dicamba
150	17-0322	6/21/17	Soybeans	Dicamba
151	17-0323	6/21/17	Soybeans	Dicamba
152	17-0324	6/21/17	Soybeans	Dicamba
153	17-0325	6/21/17	Soybeans	Dicamba
154	17-0326	6/21/17	Soybeans	Dicamba
155	17-0327	6/21/17	Soybeans	Dicamba
156	17-0329	6/21/17	Soybeans	Dicamba
157	17-0330	6/21/17	Soybeans	Dicamba
158	17-0331	6/21/17	Soybeans	Dicamba
159	17-0332	6/21/17	Soybeans	Dicamba
160	17-0333	6/21/17	Soybeans	Dicamba
161	17-0334	6/21/17	Soybeans	Dicamba
162	17-0335	6/21/17	Soybeans	Dicamba
163	17-0336	6/21/17	Soybeans	Dicamba
164	17-0337	6/21/17	Soybeans	Dicamba
165	17-0338	6/21/17	Soybeans	Dicamba
166	17-0339	6/21/17	Soybeans	Dicamba
167	17-0340	6/21/17	Soybeans	Dicamba
168	17-0341	6/21/17	Soybeans	Dicamba
169	17-0342	6/21/17	Soybeans	Dicamba
170	17-0343	6/21/17	Soybeans	Dicamba
171	17-0344	6/21/17	Soybeans	Dicamba
172	17-0345	6/21/17	Soybeans	Dicamba
173	17-0346	6/21/17	Soybeans	Dicamba
174	17-0347	6/21/17	Soybeans	Dicamba
175	17-0348	6/21/17	Soybeans	Dicamba
176	17-0349	6/21/17	Soybeans	Dicamba
177	17-0350	6/21/17	Soybeans	Dicamba
178	17-0351	6/21/17	Soybeans	Dicamba
179	17-0352	6/21/17	Soybeans	Dicamba

180	17-0353	6/21/17	Soybeans	Dicamba
181	17-0354	6/21/17	Soybeans	Dicamba
182	17-0355	6/21/17	Soybeans	Dicamba
183	17-0356	6/21/17	Soybeans	Dicamba
184	17-0357	6/21/17	Tomato Plants	Dicamba
185	17-0358	6/21/17	Soybeans	Dicamba
186	17-0359	6/21/17	Liberty Soybeans	Dicamba
187	17-0360	6/21/17	Soybeans	Dicamba
188	17-0361	6/21/17	Soybeans	Dicamba
189	17-0362	6/21/17	Soybeans	Dicamba
190	17-0363	6/21/17	Soybeans	Dicamba
191	17-0364	6/21/17	Soybeans	Dicamba
192	17-0365	6/21/17	Soybeans	Dicamba
193	17-0366	6/21/17	Soybeans	Dicamba
194	17-0367	6/21/17	Soybeans	Dicamba
195	17-0368	6/21/17	Soybeans	Dicamba
196	17-0369	6/21/17	Soybeans	Dicamba
197	17-0370	6/21/17	Soybeans	Dicamba
198	17-0371	6/21/17	Soybeans	Dicamba
199	17-0372	6/21/17	Soybeans	Dicamba
200	17-0373	6/21/17	Trees	Dicamba
201	17-0374	6/21/17	Soybeans	Dicamba
202	17-0375	6/21/17	Soybeans	Dicamba
203	17-0376	6/21/17	Soybeans	Dicamba
204	17-0377	6/21/17	Peas, Tomatoes	Dicamba
205	17-0378	6/21/17	Soybeans	Dicamba
206	17-0379	6/21/17	Soybeans	Dicamba
207	17-0381	6/22/17	Tomatoes, Bell Peppers	Dicamba
208	17-0382	6/22/17	Peanuts	Dicamba
209	17-0383	6/22/17	Soybeans	Dicamba
210	17-0384	6/22/17	Soybeans	Dicamba
211	17-0385	6/22/17	Soybeans	Dicamba
212	17-0387	6/22/17	Soybeans	Dicamba
213	17-0388	6/22/17	Soybeans	Dicamba
214	17-0389	6/22/17	Soybeans	Dicamba
215	17-0390	6/22/17	Soybeans	Dicamba

216	17-0391	6/22/17	Soybeans	Dicamba
217	17-0395	6/22/17	Soybeans	Dicamba
218	17-0396	6/22/17	Soybeans	Dicamba
219	17-0397	6/22/17	Soybeans	Dicamba
220	17-0398	6/22/17	Soybeans	Dicamba
221	17-0399	6/22/17	Soybeans	Dicamba
222	17-0400	6/22/17	Soybeans	Dicamba
223	17-0401	6/22/17	Soybeans	Dicamba
224	17-0402	6/22/17	Soybeans	Dicamba
225	17-0403	6/22/17	Soybeans	Dicamba
226	17-0404	6/22/17	Soybeans	Dicamba
227	17-0405	6/22/17	Soybeans	Dicamba
228	17-0406	6/22/17	Soybeans	Dicamba
229	17-0407	6/22/17	Soybeans	Dicamba
230	17-0408	6/22/17	Soybeans	Dicamba
231	17-0409	6/22/17	Soybeans	Dicamba
232	17-0410	6/22/17	Cotton	Dicamba
233	17-0411	6/22/17	Soybeans	Dicamba
234	17-0412	6/22/17	Soybeans	Dicamba
235	17-0413	6/22/17	Soybeans	Dicamba
236	17-0414	6/22/17	Soybeans	Dicamba
237	17-0415	6/22/17	Soybeans	Dicamba
238	17-0416	6/22/17	Soybeans	Dicamba
239	17-0418	6/22/17	Soybeans	Dicamba
240	17-0419	6/22/17	Soybeans	Dicamba
241	17-0420	6/23/17	Soybeans	Dicamba
242	17-0421	6/23/17	Soybeans	Dicamba
243	17-0422	6/23/17	Soybeans	Dicamba
244	17-0424	6/23/17	Soybeans	Dicamba
245	17-0425	6/23/17	Soybeans	Dicamba
246	17-0426	6/23/17	Soybeans	Dicamba
247	17-0427	6/23/17	Peanuts	Dicamba
248	17-0428	6/23/17	Soybeans	Dicamba
249	17-0429	6/23/17	Soybeans	Dicamba
250	17-0430	6/23/17	Soybeans	Dicamba
251	17-0431	6/23/17	Soybeans	Dicamba

252	17-0432	6/23/17	Soybeans	Dicamba
253	17-0433	6/23/17	Soybeans	Dicamba
254	17-0434	6/23/17	Soybeans	Dicamba
255	17-0435	6/23/17	Soybeans	Dicamba
256	17-0436	6/23/17	Soybeans	Dicamba
257	17-0437	6/23/17	Soybeans	Dicamba
258	17-0438	6/23/17	Soybeans	Dicamba
259	17-0439	6/23/17	Soybeans	Dicamba
260	17-0440	6/23/17	Soybeans	Dicamba
261	17-0441	6/23/17	Soybeans	Dicamba
262	17-0442	6/23/17	Tomatoes and Bell Peppers	Dicamba
263	17-0443	6/23/17	Soybeans	Dicamba
264	17-0444	6/23/17	Soybeans	Dicamba
265	17-0445	6/23/17	Soybeans	Dicamba
266	17-0446	6/23/17	Soybeans	Dicamba
267	17-0447	6/23/17	Soybeans	Dicamba
268	17-0448	6/23/17	Soybeans	Dicamba
269	17-0450	6/23/17	Soybeans	Dicamba
270	17-0451	6/26/17	Soybeans	Dicamba
271	17-0452	6/26/17	Soybeans	Dicamba
272	17-0453	6/26/17	Soybeans	Dicamba
273	17-0454	6/26/17	Soybeans	Dicamba
274	17-0455	6/26/17	Soybeans	Dicamba
275	17-0456	6/26/17	Soybeans	Dicamba
276	17-0457	6/26/17	Soybeans	Dicamba
277	17-0458	6/26/17	Soybeans	Dicamba
278	17-0459	6/26/17	Soybeans	Dicamba
279	17-0460	6/26/17	Soybeans	Dicamba
280	17-0461	6/26/17	Soybeans	Dicamba
281	17-0462	6/26/17	Soybeans	Dicamba
282	17-0463	6/26/17	Soybeans	Dicamba
283	17-0464	6/26/17	Soybeans	Dicamba
284	17-0465	6/26/17	Soybeans	Dicamba
285	17-0466	6/26/17	Soybeans	Dicamba
286	17-0467	6/26/17	Soybeans	Dicamba
287	17-0468	6/26/17	Soybeans	Dicamba

288	17-0469	6/26/17	Soybeans	Dicamba
289	17-0470	6/26/17	Soybeans	Dicamba
290	17-0471	6/26/17	Soybeans and Cotton	Dicamba
291	17-0472	6/26/17	Soybeans	Dicamba
292	17-0473	6/26/17	Soybeans	Dicamba
293	17-0474	6/26/17	Soybeans	Dicamba
294	17-0475	6/26/17	Soybeans	Dicamba
295	17-0476	6/26/17	Soybeans	Dicamba
296	17-0477	6/26/17	Soybeans	Dicamba
297	17-0478	6/26/17	Soybeans	Dicamba
298	17-0479	6/26/17	Roundup Soybeans	Dicamba
299	17-0480	6/26/17	Shrubs and Tomatoes	Dicamba
300	17-0481	6/26/17	Soybeans	Dicamba
301	17-0482	6/26/17	Soybeans	Dicamba
302	17-0483	6/26/17	Soybeans	Dicamba
303	17-0484	6/26/17	Soybeans	Dicamba
304	17-0486	6/26/17	Soybeans	Dicamba
305	17-0487	6/26/17	Soybeans	Dicamba
306	17-0488	6/26/17	Soybeans	Dicamba
307	17-0489	6/26/17	Soybeans	Dicamba
308	17-0490	6/26/17	Soybeans	Dicamba
309	17-0491	6/26/17	Soybeans	Dicamba
310	17-0492	6/26/17	Soybeans	Dicamba
311	17-0493	6/26/17	Soybeans	Dicamba
312	17-0494	6/26/17	RR Soybeans	Dicamba
313	17-0495	6/26/17	RR Soybeans	Dicamba
314	17-0496	6/26/17	RR Soybeans	Dicamba
315	17-0497	6/26/17	Soybeans	Dicamba
316	17-0498	6/26/17	Soybeans	Dicamba
317	17-0499	6/26/17	Soybeans	Dicamba
318	17-0500	6/26/17	Soybeans	Dicamba
319	17-0501	6/26/17	Soybeans	Dicamba
320	17-0502	6/26/17	Soybeans	Dicamba
321	17-0503	6/26/17	Soybeans	Dicamba
322	17-0504	6/26/17	Soybeans	Dicamba
323	17-0505	6/26/17	Soybeans	Dicamba

324	17-0506	6/26/17	Soybeans	Dicamba
325	17-0507	6/26/17	Soybeans	Dicamba
326	17-0508	6/26/17	Soybeans	Dicamba
327	17-0509	6/26/17	Soybeans	Dicamba
328	17-0510	6/26/17	Soybeans	Dicamba
329	17-0511	6/26/17	Soybeans	Dicamba
330	17-0512	6/26/17	Soybeans	Dicamba
331	17-0513	6/26/17	Soybeans	Dicamba
332	17-0514	6/26/17	Soybeans	Dicamba
333	17-0515	6/26/17	Soybeans	Dicamba
334	17-0516	6/26/17	Soybeans	Dicamba
335	17-0517	6/26/17	Soybeans	Dicamba
336	17-0518	6/26/17	Soybeans	Dicamba
337	17-0519	6/26/17	Soybeans	Dicamba
338	17-0520	6/26/17	Soybeans	Dicamba
339	17-0521	6/26/17	Soybeans	Dicamba
340	17-0522	6/26/17	Soybeans	Dicamba
341	17-0523	6/26/17	Soybeans	Dicamba
342	17-0524	6/26/17	Soybeans	Dicamba
343	17-0525	6/26/17	Soybeans	Dicamba
344	17-0526	6/26/17	Soybeans	Dicamba
345	17-0527	6/26/17	Soybeans	Dicamba
346	17-0528	6/27/17	Soybeans	Dicamba
347	17-0529	6/27/17	Soybeans	Dicamba
348	17-0530	6/27/17	Soybeans	Dicamba
349	17-0531	6/27/17	Soybeans and Fruit Trees	Dicamba
350	17-0532	6/27/17	Soybeans	Dicamba
351	17-0533	6/27/17	Soybeans	Dicamba
352	17-0534	6/27/17	Soybeans	Dicamba
353	17-0535	6/27/17	Soybeans	Dicamba
354	17-0536	6/27/17	Soybeans	Dicamba
355	17-0537	6/27/17	Soybeans	Dicamba
356	17-0538	6/27/17	Soybeans	Dicamba
357	17-0539	6/27/17	Soybeans	Dicamba
358	17-0540	6/27/17	Soybeans	Dicamba
359	17-0541	6/27/17	Soybeans	Dicamba

360	17-0542	6/27/17	Soybeans	Dicamba
361	17-0543	6/27/17	Soybeans	Dicamba
362	17-0544	6/27/17	Soybeans	Dicamba
363	17-0545	6/27/17	Soybeans	Dicamba
364	17-0546	6/27/17	Soybeans	Dicamba
365	17-0547	6/27/17	Soybeans	Dicamba
366	17-0548	6/27/17	Soybeans	Dicamba
367	17-0549	6/27/17	Soybeans	Dicamba
368	17-0550	6/27/17	Soybeans	Dicamba
369	17-0551	6/27/17	Soybeans	Dicamba
370	17-0552	6/27/17	Soybeans	Dicamba
371	17-0553	6/27/17	Soybeans	Dicamba
372	17-0554	6/27/17	Soybeans	Dicamba
373	17-0555	6/27/17	Soybeans	Dicamba
374	17-0556	6/27/17	Soybeans	Dicamba
375	17-0557	6/27/17	Soybeans	Dicamba
376	17-0558	6/27/17	Soybeans	Dicamba
377	17-0559	6/27/17	Soybeans	Dicamba
378	17-0560	6/27/17	Soybeans	Dicamba
379	17-0561	6/27/17	Soybeans	Dicamba
380	17-0562	6/27/17	Soybeans	Dicamba
381	17-0563	6/27/17	Soybeans	Dicamba
382	17-0564	6/27/17	Soybeans	Dicamba
383	17-0565	6/27/17	Soybeans	Dicamba
384	17-0566	6/27/17	Soybeans	Dicamba
385	17-0567	6/27/17	Soybeans	Dicamba
386	17-0568	6/27/17	Soybeans	Dicamba
387	17-0569	6/27/17	Soybeans	Dicamba
388	17-0570	6/27/17	Soybeans	Dicamba
389	17-0571	6/27/17	Soybeans	Dicamba
390	17-0572	6/27/17	Soybeans	Dicamba
391	17-0573	6/27/17	Soybeans	Dicamba
392	17-0574	6/27/17	Soybeans	Dicamba
393	17-0575	6/27/17	Soybeans	Dicamba
394	17-0576	6/27/17	Soybeans	Dicamba
395	17-0577	6/27/17	Soybeans	Dicamba

396	17-0578	6/27/17	Soybeans	Dicamba
397	17-0579	6/27/17	Soybeans	Dicamba
398	17-0580	6/27/17	Soybeans	Dicamba
399	17-0581	6/27/17	Soybeans	Dicamba
400	17-0582	6/27/17	Soybeans	Dicamba
401	17-0583	6/27/17	Soybeans	Dicamba
402	17-0584	6/27/17	Soybeans	Dicamba
403	17-0585	6/27/17	Soybeans	Dicamba
404	17-0586	6/27/17	Soybeans	Dicamba
405	17-0587	6/27/17	Soybeans	Dicamba
406	17-0588	6/27/17	Soybeans	Dicamba
407	17-0589	6/27/17	Soybeans	Dicamba
408	17-0590	6/27/17	Soybeans	Dicamba
409	17-0591	6/28/17	Soybeans	Dicamba
410	17-0592	6/28/17	Soybeans	Dicamba
411	17-0593	6/28/17	Soybeans	Dicamba
412	17-0594	6/28/17	Soybeans	Dicamba
413	17-0595	6/28/17	Soybeans	Dicamba
414	17-0596	6/28/17	Soybeans	Dicamba
415	17-0597	6/28/17	Soybeans	Dicamba
416	17-0598	6/28/17	Soybeans	Dicamba
417	17-0599	6/28/17	Soybeans	Dicamba
418	17-0602	6/28/17	Soybeans	Dicamba
419	17-0603	6/28/17	Soybeans	Dicamba
420	17-0605	6/28/17	Soybeans	Dicamba
421	17-0606	6/28/17	Soybeans	Dicamba
422	17-0607	6/28/17	Soybeans	Dicamba
423	17-0608	6/28/17	Soybeans	Dicamba
424	17-0609	6/28/17	Soybeans	Dicamba
425	17-0610	6/28/17	Soybeans	Dicamba
426	17-0611	6/28/17	Soybeans	Dicamba
427	17-0612	6/28/17	Soybeans	Dicamba
428	17-0613	6/28/17	Soybeans	Dicamba
429	17-0614	6/28/17	Soybeans	Dicamba
430	17-0615	6/28/17	Soybeans	Dicamba
431	17-0616	6/28/17	Soybeans	Dicamba

432	17-0617	6/28/17	Soybeans	Dicamba
433	17-0618	6/28/17	Soybeans	Dicamba
434	17-0619	6/28/17	Soybeans	Dicamba
435	17-0621	6/28/17	Soybeans	Dicamba
436	17-0622	6/28/17	Soybeans	Dicamba
437	17-0623	6/29/17	Soybeans	Dicamba
438	17-0624	6/29/17	Soybeans	Dicamba
439	17-0625	6/29/17	Soybeans	Dicamba
440	17-0626	6/29/17	Soybeans	Dicamba
441	17-0627	6/29/17	Soybeans	Dicamba
442	17-0628	6/29/17	Soybeans	Dicamba
443	17-0629	6/29/17	Soybeans	Dicamba
444	17-0630	6/29/17	Soybeans	Dicamba
445	17-0631	6/29/17	Soybeans	Dicamba
446	17-0632	6/29/17	Soybeans	Dicamba
447	17-0633	6/29/17	Soybeans	Dicamba
448	17-0634	6/29/17	Soybeans	Dicamba
449	17-0635	6/29/17	Soybeans	Dicamba
450	17-0636	6/29/17	Soybeans	Dicamba
451	17-0637	6/29/17	Soybeans	Dicamba
452	17-0638	6/29/17	Soybeans	Dicamba
453	17-0639	6/29/17	Soybeans	Dicamba
454	17-0640	6/29/17	Soybeans	Dicamba
455	17-0641	6/29/17	Soybeans	Dicamba
456	17-0642	6/29/17	Soybeans	Dicamba
457	17-0643	6/29/17	Soybeans	Dicamba
458	17-0644	6/29/17	Soybeans	Dicamba
459	17-0645	6/29/17	Soybeans	Dicamba
460	17-0646	6/29/17	Trees	Dicamba, Glufosinate
461	17-0647	6/29/17	Soybeans	Dicamba
462	17-0648	6/29/17	Soybeans	Dicamba
463	17-0649	6/29/17	Soybeans	Dicamba
464	17-0650	6/29/17	Soybeans	Dicamba
465	17-0651	6/29/17	Soybeans	Dicamba
466	17-0652	6/29/17	Soybeans	Dicamba
467	17-0653	6/29/17	Soybeans	Dicamba

468	17-0654	6/29/17	Soybeans	Dicamba
469	17-0655	6/29/17	Soybeans	Dicamba
470	17-0656	6/29/17	Soybeans	Dicamba
471	17-0657	6/29/17	Soybeans	Dicamba
472	17-0658	6/29/17	Soybeans	Dicamba
473	17-0659	6/29/17	Soybeans	Dicamba
474	17-0660	6/29/17	Soybeans	Dicamba
475	17-0661	6/29/17	Soybeans	Dicamba
476	17-0662	6/29/17	Soybeans	Dicamba
477	17-0663	6/29/17	Soybeans	Dicamba
478	17-0664	6/29/17	Shrubs and Flowers	Dicamba
479	17-0665	6/29/17	Garden	Dicamba
480	17-0666	6/29/17	Soybeans	Dicamba
481	17-0667	6/29/17	Soybeans	Dicamba
482	17-0668	6/29/17	Soybeans	Dicamba
483	17-0669	6/29/17	Soybeans	Dicamba
484	17-0670	6/29/17	Soybeans	Dicamba
485	17-0671	6/29/17	Soybeans	Dicamba
486	17-0672	6/29/17	Soybeans	Dicamba
487	17-0673	6/29/17	Soybeans	Dicamba
488	17-0674	6/29/17	Soybeans	Dicamba
489	17-0675	6/29/17	Soybeans	Dicamba
490	17-0676	6/29/17	Soybeans	Dicamba
491	17-0677	6/29/17	Soybeans	Dicamba
492	17-0678	6/29/17	Soybeans	Dicamba
493	17-0681	6/29/17	Soybeans	Dicamba
494	17-0682	6/29/17	Soybeans	Dicamba
495	17-0683	6/30/17	Soybeans	Dicamba
496	17-0684	6/30/17	Soybeans	Dicamba
497	17-0685	6/30/17	Soybeans	Dicamba
498	17-0686	6/30/17	Soybeans	Dicamba
499	17-0687	6/30/17	Soybeans	Dicamba
500	17-0688	6/30/17	Soybeans	Dicamba
501	17-0689	6/30/17	Soybeans	Dicamba
502	17-0690	6/30/17	Soybeans	Dicamba
503	17-0691	6/30/17	Soybeans	Dicamba

504	17-0692	6/30/17	Soybeans	Dicamba
505	17-0693	6/30/17	Soybeans	Dicamba
506	17-0694	6/30/17	Tomatoes, Peach Trees, Persimm	Dicamba
507	17-0698	6/30/17	Soybeans	Dicamba
508	17-0699	6/30/17	Soybeans	Dicamba
509	17-0700	6/30/17	Soybeans	Dicamba
510	17-0701	6/30/17	Soybeans	Dicamba
511	17-0702	6/30/17	Soybeans	Dicamba
512	17-0703	6/30/17	Weeping Cheery Tree, Redbud Pa	Dicamba
513	17-0704	6/30/17	Soybeans	Dicamba
514	17-0705	6/30/17	Soybeans	Dicamba
515	17-0706	6/30/17	Soybeans	Dicamba
516	17-0707	6/30/17	Soybeans	Dicamba
517	17-0708	6/30/17	Soybeans	Dicamba
518	17-0711	6/30/17	Soybeans	Dicamba
519	17-0712	6/30/17	Soybeans	Dicamba
520	17-0713	6/30/17	Bushes, lawn, trees	Dicamba
521	17-0714	6/30/17	Soybeans	Dicamba
522	17-0715	6/30/17	Soybeans	Dicamba
523	17-0716	6/30/17	Soybeans	Dicamba
524	17-0717	6/30/17	Soybeans	Dicamba
525	17-0718	6/30/17	Soybeans	Dicamba
526	17-0719	6/30/17	Soybeans	Dicamba
527	17-0720	6/30/17	Soybeans	Dicamba
528	17-0722	6/30/17	Soybeans	Dicamba
529	17-0723	6/30/17	Garden	Dicamba
530	17-0724	6/30/17	Soybeans	Dicamba
531	17-0726	6/30/17	Soybeans	Dicamba
532	17-0727	7/3/17	Soybeans	Dicamba
533	17-0728	7/3/17	Soybeans	Dicamba
534	17-0729	7/3/17	Soybeans	Dicamba
535	17-0730	7/3/17	Soybeans	Dicamba
536	17-0731	7/3/17	Soybeans	Dicamba
537	17-0732	7/3/17	Soybeans	Dicamba
538	17-0733	7/3/17	Soybeans	Dicamba
539	17-0734	7/3/17	Soybeans	Dicamba

540	17-0735	7/3/17	Soybeans	Dicamba
541	17-0736	7/3/17	Soybeans	Dicamba
542	17-0738	7/3/17	Soybeans	Dicamba
543	17-0739	7/3/17	azaleas, crepe myrtles	Dicamba
544	17-0740	7/5/17	Soybeans	Dicamba
545	17-0742	7/5/17	Soybeans	Dicamba
546	17-0744	7/5/17	Soybeans	Dicamba
547	17-0745	7/5/17	Soybeans	Dicamba
548	17-0746	7/5/17	Soybeans	Dicamba
549	17-0747	7/5/17	Soybeans	Dicamba
550	17-0751	7/5/17	Trees	Dicamba
551	17-0752	7/5/17	Soybeans	Dicamba
552	17-0753	7/5/17	Soybeans	Dicamba
553	17-0754	7/5/17	Soybeans	Dicamba
554	17-0755	7/5/17	Soybeans	Dicamba
555	17-0756	7/5/17	Soybeans	Dicamba
556	17-0757	7/5/17	Soybeans	Dicamba
557	17-0758	7/6/17	Soybeans	Dicamba
558	17-0759	7/6/17	Soybeans	Dicamba
559	17-0760	7/6/17	Soybeans	Dicamba
560	17-0761	7/6/17	Soybeans	Dicamba
561	17-0762	7/6/17	Soybeans	Dicamba
562	17-0764	7/6/17	Soybeans	Dicamba
563	17-0765	7/6/17	Soybeans	Dicamba
564	17-0766	7/6/17	Soybeans	Dicamba
565	17-0767	7/6/17	Soybeans	Dicamba
566	17-0768	7/6/17	Soybeans	Dicamba
567	17-0769	7/6/17	Soybeans	Dicamba
568	17-0772	7/6/17	Lawn, Trees	Dicamba
569	17-0773	7/6/17	Soybeans	Dicamba
570	17-0774	7/6/17	Soybeans	Dicamba
571	17-0775	7/6/17	Soybeans	Dicamba
572	17-0776	7/6/17	Soybeans	Dicamba
573	17-0777	7/6/17	Soybeans	Dicamba
574	17-0778	7/6/17	Soybeans	Dicamba
575	17-0779	7/6/17	Soybeans	Dicamba

576	17-0780	7/6/17	Soybeans	Dicamba
577	17-0781	7/6/17	Soybeans	Dicamba
578	17-0782	7/6/17	Soybeans	Dicamba
579	17-0783	7/6/17	Soybeans	Dicamba
580	17-0784	7/6/17	Soybeans	Dicamba
581	17-0785	7/6/17	Soybeans	Dicamba
582	17-0786	7/6/17	Soybeans	Dicamba
583	17-0787	7/6/17	Soybeans	Dicamba
584	17-0788	7/6/17	Soybeans	Dicamba
585	17-0789	7/6/17	Soybeans	Dicamba
586	17-0790	7/6/17	Soybeans	Dicamba
587	17-0791	7/6/17	Soybeans	Dicamba
588	17-0792	7/6/17	Soybeans	Dicamba
589	17-0793	7/6/17	Soybeans	Dicamba
590	17-0794	7/6/17	Soybeans	Dicamba
591	17-0795	7/6/17	Soybeans	Dicamba
592	17-0796	7/6/17	Soybeans	Dicamba
593	17-0797	7/6/17	Soybeans	Dicamba
594	17-0798	7/6/17	Soybeans	Dicamba
595	17-0799	7/6/17	Soybeans	Dicamba
596	17-0801	7/7/17	Soybeans	Dicamba
597	17-0802	7/7/17	Soybeans	Dicamba
598	17-0803	7/7/17	Soybeans	Dicamba
599	17-0804	7/7/17	Soybeans	Dicamba
600	17-0805	7/7/17	Soybeans	Dicamba
601	17-0807	7/7/17	Soybeans	Dicamba
602	17-0808	7/7/17	Soybeans	Dicamba
603	17-0809	7/7/17	Soybeans	Dicamba
604	17-0810	7/7/17	Soybeans	Dicamba
605	17-0812	7/7/17	Soybeans	Dicamba
606	17-0813	7/7/17	Soybeans	Dicamba
607	17-0814	7/7/17	Soybeans	Dicamba
608	17-0815	7/7/17	Soybeans	Dicamba
609	17-0816	7/7/17	Soybeans	Dicamba
610	17-0817	7/7/17	Soybeans	Dicamba
611	17-0818	7/7/17	Soybeans	Dicamba

612	17-0819	7/7/17	Soybeans	Dicamba
613	17-0820	7/7/17	Soybeans	Dicamba
614	17-0821	7/7/17	Trees	Dicamba
615	17-0822	7/10/17	Soybeans	Dicamba
616	17-0823	7/10/17	Soybeans and Cotton	Dicamba
617	17-0827	7/10/17	Soybeans	Dicamba
618	17-0828	7/10/17	Tomatoes, Fruit Trees, flowers	Dicamba
619	17-0829	7/10/17	Bushes	Dicamba
620	17-0830	7/10/17	Soybeans	Dicamba
621	17-0831	7/10/17	Soybeans	Dicamba
622	17-0832	7/10/17	Peaches	Dicamba
623	17-0833	7/10/17	Soybeans	Dicamba
624	17-0834	7/10/17	Soybeans	Dicamba
625	17-0835	7/10/17	Soybeans	Dicamba
626	17-0836	7/10/17	Soybeans	Dicamba
627	17-0837	7/10/17	Trees, and Japanese Maples	Dicamba
628	17-0838	7/10/17	Soybeans	Dicamba
629	17-0841	7/11/17	Soybeans	Dicamba
630	17-0842	7/11/17	Soybeans	Dicamba
631	17-0843	7/11/17	Soybeans	Dicamba
632	17-0845	7/11/17	Soybeans	Dicamba
633	17-0846	7/11/17	Soybeans	Dicamba
634	17-0848	7/11/17	Soybeans	Dicamba
635	17-0849	7/11/17	Soybeans	Dicamba
636	17-0850	7/11/17	Soybeans	Dicamba
637	17-0851	7/11/17	Soybeans	Dicamba
638	17-0852	7/11/17	Soybeans	Dicamba
639	17-0853	7/11/17	Fruit Trees and Garden	Dicamba
640	17-0854	7/11/17	Soybeans	Dicamba
641	17-0855	7/11/17	Soybeans	Dicamba
642	17-0858	7/12/17	Soybeans	Dicamba
643	17-0859	7/12/17	Soybeans	Dicamba
644	17-0860	7/12/17	Soybeans	Dicamba
645	17-0861	7/12/17	Soybeans	Dicamba
646	17-0862	7/12/17	Soybeans	Dicamba
647	17-0863	7/12/17	Soybeans	Dicamba

648	17-0864	7/12/17	Soybeans	Dicamba
649	17-0865	7/12/17	Soybeans	Dicamba
650	17-0866	7/12/17	Oak Trees	Dicamba
651	17-0867	7/12/17	Soybeans	Dicamba
652	17-0868	7/12/17	Soybeans	Dicamba
653	17-0869	7/12/17	Soybeans	Dicamba
654	17-0870	7/12/17	Soybeans	Dicamba
655	17-0871	7/12/17	Soybeans	Dicamba
656	17-0872	7/13/17	Oak, Bushes	Dicamba
657	17-0873	7/13/17	Soybeans	Dicamba
658	17-0874	7/13/17	Soybeans	Dicamba
659	17-0875	7/13/17	Soybeans	Dicamba
660	17-0876	7/13/17	Soybeans	Dicamba
661	17-0877	7/13/17	Soybeans	Dicamba
662	17-0878	7/13/17	Soybeans	Dicamba
663	17-0879	7/13/17	Soybeans	Dicamba
664	17-0880	7/13/17	Soybeans	Dicamba
665	17-0881	7/13/17	Soybeans	Dicamba
666	17-0882	7/13/17	Soybeans	Dicamba
667	17-0883	7/13/17	Soybeans	Dicamba
668	17-0884	7/13/17	Soybeans	Dicamba
669	17-0885	7/13/17	Soybeans	Dicamba
670	17-0886	7/13/17	Soybeans	Dicamba
671	17-0887	7/13/17	Soybeans	Dicamba
672	17-0888	7/13/17	Soybeans	Dicamba
673	17-0889	7/13/17	Soybeans	Dicamba
674	17-0890	7/13/17	Soybeans	Dicamba
675	17-0891	7/13/17	Soybeans	Dicamba
676	17-0892	7/13/17	Soybeans	Dicamba
677	17-0893	7/13/17	Soybeans	Dicamba
678	17-0894	7/13/17	Soybeans	Dicamba
679	17-0895	7/13/17	Soybeans	Dicamba
680	17-0896	7/13/17	Soybeans	Dicamba
681	17-0897	7/13/17	Soybeans	Dicamba
682	17-0898	7/14/17	Soybeans	Dicamba
683	17-0899	7/14/17	Soybeans	Dicamba

684	17-0900	7/14/17	Soybeans	Dicamba
685	17-0901	7/14/17	Tomatoes,Squash,Pepper Plant	Dicamba
686	17-0902	7/14/17	Soybeans	Dicamba
687	17-0906	7/17/17	Soybeans	Dicamba
688	17-0908	7/17/17	Soybeans	Dicamba
689	17-0909	7/17/17	Soybeans	Dicamba
690	17-0910	7/17/17	Soybeans	Dicamba
691	17-0911	7/17/17	Soybeans	Dicamba
692	17-0912	7/17/17	Soybeans	Dicamba
693	17-0913	7/17/17	Soybeans	Dicamba
694	17-0915	7/17/17	Soybeans	Dicamba
695	17-0916	7/17/17	Soybeans	Dicamba
696	17-0917	7/17/17	Soybeans	Dicamba
697	17-0918	7/17/17	Soybeans	Dicamba
698	17-0919	7/17/17	Soybeans	Dicamba
699	17-0920	7/17/17	Soybeans	Dicamba
700	17-0921	7/17/17	N/A	Dicamba
701	17-0922	7/17/17	Soybeans	Dicamba
702	17-0923	7/17/17	Soybeans	Dicamba
703	17-0924	7/17/17	Soybeans	Dicamba
704	17-0925	7/17/17	Tomatoes, Pear Tree	Dicamba
705	17-0926	7/17/17	Soybeans	Dicamba
706	17-0927	7/17/17	Soybeans	Dicamba
707	17-0928	7/18/17	Soybeans	Dicamba
708	17-0930	7/18/17	Soybeans	Dicamba
709	17-0931	7/18/17	Soybeans	Dicamba
710	17-0932	7/18/17	Soybeans	Dicamba
711	17-0935	7/18/17	Soybeans	Dicamba
712	17-0936	7/19/17	Soybeans	Dicamba
713	17-0937	7/19/17	Soybeans	Dicamba
714	17-0938	7/19/17	Pine, Pecan, Nectarine, and Do	Paraquat/Dicamba/Glufosinate
715	17-0940	7/19/17	Soybeans	Dicamba
716	17-0941	7/19/17	Soybeans	Dicamba
717	17-0942	7/19/17	Soybeans	Dicamba
718	17-0943	7/19/17	Soybeans	Dicamba
719	17-0944	7/19/17	Soybeans	Dicamba

720	17-0945	7/19/17	Soybeans	Dicamba
721	17-0949	7/21/17	Soybeans	Dicamba
722	17-0950	7/21/17	Soybeans	Dicamba
723	17-0951	7/21/17	Soybeans	Dicamba
724	17-0953	7/21/17	Soybeans	Dicamba
725	17-0954	7/21/17	Soybeans	Dicamba
726	17-0955	7/21/17	Soybeans	Dicamba
727	17-0956	7/21/17	Soybeans	Dicamba
728	17-0957	7/21/17	Soybeans	Dicamba
729	17-0958	7/21/17	Soybeans	Dicamba
730	17-0959	7/21/17	Soybeans	Dicamba
731	17-0960	7/21/17	Soybeans	Dicamba
732	17-0961	7/21/17	Cotton	Dicamba
733	17-0962	7/21/17	Cotton	Dicamba
734	17-0963	7/21/17	Cotton	Dicamba
735	17-0964	7/21/17	Cotton	Dicamba
736	17-0965	7/21/17	Cotton	Dicamba
737	17-0966	7/21/17	Cotton	Dicamba
738	17-0968	7/21/17	Soybeans	Dicamba
739	17-0969	7/21/17	Soybeans	Dicamba
740	17-0970	7/21/17	Cotton, Soybeans	Dicamba
741	17-0971	7/24/17	Soybeans	Dicamba
742	17-0972	7/24/17	Pumpkins	Dicamba
743	17-0973	7/24/17	Soybeans	Dicamba
744	17-0974	7/24/17	Soybeans	Dicamba
745	17-0975	7/24/17	Soybeans	Dicamba
746	17-0977	7/24/17	soybeans	Dicamba
747	17-0978	7/24/17	soybeans	Dicamba
748	17-0979	7/24/17	soybeans	Dicamba
749	17-0980	7/24/17	soybeans	Dicamba
750	17-0981	7/24/17	soybeans	Dicamba
751	17-0983	7/25/17	soybeans	Dicamba
752	17-0984	7/25/17	soybeans	Dicamba
753	17-0985	7/25/17	soybeans	Dicamba
754	17-0986	7/25/17	soybeans	Dicamba
755	17-0987	7/25/17	soybeans	Dicamba

756	17-0988	7/25/17	soybeans	Dicamba
757	17-0989	7/25/17	soybeans	Dicamba
758	17-0990	7/25/17	Roundup Ready Soybeans	Dicamba
759	17-0991	7/25/17	soybeans	Dicamba
760	17-0992	7/25/17	soybeans	Dicamba
761	17-0993	7/25/17	soybeans	Dicamba
762	17-0994	7/25/17	Soybeans	Dicamba
763	17-0995	7/25/17	soybeans	Dicamba
764	17-0996	7/25/17	soybeans	Dicamba
765	17-0997	7/25/17	fruit trees, bradford pears	Dicamba
766	17-0998	7/25/17	Woods	Dicamba
767	17-0999	7/25/17	Woods	Dicamba
768	17-1000	7/25/17	peanuts	Dicamba
769	17-1002	7/26/17	soybeans	Dicamba
770	17-1003	7/26/17	N/A	Dicamba
771	17-1004	7/26/17	soybeans	Dicamba
772	17-1005	7/26/17	soybeans	Dicamba
773	17-1006	7/26/17	soybeans	Dicamba
774	17-1007	7/26/17	soybeans	Dicamba
775	17-1008	7/26/17	soybeans	Dicamba
776	17-1009	7/26/17	soybeans	Dicamba
777	17-1010	7/26/17	pecan orchard	Dicamba
778	17-1011	7/26/17	N/A	Dicamba
779	17-1012	7/27/17	soybeans	Dicamba
780	17-1013	7/27/17	soybeans	Dicamba
781	17-1014	7/27/17	soybeans	Dicamba
782	17-1015	7/27/17	soybeans	Dicamba
783	17-1016	7/27/17	soybeans	Dicamba
784	17-1017	7/27/17	soybeans	Dicamba
785	17-1018	7/27/17	soybeans	Dicamba
786	17-1019	7/27/17	soybeans	Dicamba
787	17-1020	7/27/17	soybeans	Dicamba
788	17-1022	7/27/17	soybeans	Dicamba
789	17-1023	7/27/17	soybeans	Dicamba
790	17-1024	7/27/17	soybeans	Dicamba
791	17-1025	7/27/17	soybeans	Dicamba

792	17-1026	7/27/17	soybeans	Dicamba
793	17-1027	7/27/17	soybeans	Dicamba
794	17-1028	7/27/17	soybeans	Dicamba
795	17-1029	7/27/17	soybeans	Dicamba
796	17-1030	7/27/17	soybeans	Dicamba
797	17-1031	7/27/17	soybeans	Dicamba
798	17-1032	7/27/17	soybeans	Dicamba
799	17-1033	7/28/17	N/A	Dicamba and Triclopyr
800	17-1034	7/28/17	fruit trees	Dicamba, Atrazine, Glyphosate
801	17-1035	7/27/17	soybeans	Dicamba
802	17-1036	7/28/17	Soybeans	Dicamba
803	17-1038	7/28/17	Soybeans	Dicamba
804	17-1039	7/28/17	Soybeans	Dicamba
805	17-1042	7/31/17	Soybeans	Dicamba
806	17-1043	7/31/17	Soybeans	Dicamba
807	17-1045	7/31/17	Soybeans	Dicamba
808	17-1046	7/31/17	N/A	Dicamba and Glufosinate
809	17-1047	7/31/17	N/A	Dicamba and Glufosinate
810	17-1048	7/31/17	N/A	Dicamba and Glufosinate
811	17-1049	7/31/17	Soybeans	Dicamba
812	17-1050	8/1/17	Soybeans	Dicamba
813	17-1051	8/1/17	Soybeans	Dicamba
814	17-1052	8/1/17	Soybeans	Dicamba
815	17-1053	8/1/17	Soybeans	Dicamba
816	17-1054	8/1/17	Soybeans	Dicamba
817	17-1055	8/1/17	Soybeans	Dicamba
818	17-1056	8/1/17	Soybeans	Dicamba
819	17-1057	8/1/17	Soybeans	Dicamba
820	17-1058	8/1/17	Soybeans	Dicamba
821	17-1059	8/1/17	Soybeans	Dicamba
822	17-1061	8/7/17	Soybeans	Dicamba
823	17-1062	8/1/17	Soybeans	Dicamba
824	17-1063	8/1/17	Soybeans	Dicamba
825	17-1064	8/1/17	Soybeans	Dicamba
826	17-1065	8/1/17	Soybeans	Dicamba
827	17-1066	8/1/17	Soybeans	Dicamba

828	17-1067	8/2/17	Soybeans	Dicamba
829	17-1068	8/2/17	Soybeans	Dicamba
830	17-1069	8/2/17	Soybeans	Dicamba
831	17-1070	8/2/17	Soybeans	Dicamba
832	17-1071	8/2/17	Soybeans	Dicamba
833	17-1072	8/2/17	Soybeans	Dicamba
834	17-1073	8/2/17	Soybeans	Dicamba
835	17-1074	8/2/17	Soybeans	Dicamba
836	17-1075	8/2/17	Soybeans	Dicamba
837	17-1076	8/2/17	Soybeans	Dicamba
838	17-1077	8/2/17	Soybeans	Dicamba
839	17-1078	8/2/17	Soybeans	Dicamba
840	17-1079	8/2/17	Soybeans	Dicamba
841	17-1080	8/2/17	Soybeans	Dicamba
842	17-1081	8/2/17	Soybeans	Dicamba
843	17-1082	8/2/17	Soybeans	Dicamba
844	17-1083	8/2/17	Soybeans	Dicamba
845	17-1084	8/2/17	Soybeans	Dicamba
846	17-1086	8/3/17	Pine Trees, Fruit Trees, Fig T	Dicamba
847	17-1087	8/3/17	Soybeans	Dicamba
848	17-1088	8/5/17	Soybeans	Dicamba
849	17-1089	8/4/17	Soybeans	Dicamba
850	17-1090	8/4/17	Soybeans	Dicamba
851	17-1091	8/5/17	Soybeans	Dicamba
852	17-1092	8/7/17	Soybeans	Dicamba
853	17-1093	8/7/17	Soybeans	Dicamba
854	17-1094	8/7/17	Soybeans	Dicamba
855	17-1095	8/7/17	Soybeans	Dicamba
856	17-1096	8/7/17	Soybeans	Dicamba
857	17-1097	8/7/17	Soybeans	Dicamba
858	17-1098	8/7/17	Soybeans	Dicamba
859	17-1099	8/7/17	Soybeans	Dicamba
860	17-1100	8/7/17	Soybeans	Dicamba
861	17-1101	8/7/17	Soybeans	Dicamba
862	17-1102	8/7/17	Soybeans	Dicamba
863	17-1103	8/7/17	Trees	Dicamba

864	17-1104	8/7/17	Soybeans	Dicamba
865	17-1105	8/8/17	Soybeans	Dicamba
866	17-1106	8/8/17	Soybeans	Dicamba
867	17-1107	8/8/17	Soybeans	Dicamba
868	17-1108	8/8/17	Soybeans	Dicamba
869	17-1109	8/8/17	Produce Farm	Dicamba
870	17-1110	8/8/17	Blueberries	Dicamba
871	17-1112	8/9/17	Soybeans	Dicamba
872	17-1113	8/9/17	Soybeans	Dicamba
873	17-1114	8/9/17	Soybeans	Dicamba
874	17-1115	8/9/17	Soybeans	Dicamba
875	17-1116	8/9/17	Soybeans	Dicamba
876	17-1117	8/9/17	Tree	Dicamba
877	17-1119	8/10/17	Soybeans	Dicamba
878	17-1120	8/11/17	Soybeans	Dicamba
879	17-1121	8/11/17	Soybeans	Dicamba
880	17-1122	8/11/17	Soybeans	Dicamba
881	17-1123	8/11/17	Soybeans	Dicamba
882	17-1124	8/11/17	Soybeans	Dicamba
883	17-1125	8/11/17	N/A	Dicamba
884	17-1126	8/14/17	Soybeans	Dicamba
885	17-1127	8/17/17	Shrubbery	Dicamba
886	17-1130	8/14/17	Trees	Dicamba
887	17-1131	8/15/17	Garden	Dicamba
888	17-1132	8/15/17	Trees and Shrubs	Dicamba
889	17-1133	8/15/17	Peach Trees, Garden	Dicamba
890	17-1135	8/15/17	Soybeans-Research Plot	Dicamba
891	17-1136	8/15/17	Trees in front yard & Shrubs b	Dicamba
892	17-1138	8/16/17	Soybeans	Dicamba
893	17-1139	8/16/17	Soybeans	Dicamba
894	17-1140	8/16/17	Soybeans	Dicamba
895	17-1141	8/16/17	Soybeans	Dicamba
896	17-1142	8/16/17	Soybeans	Dicamba
897	17-1144	8/17/17	Soybeans	Dicamba
898	17-1145	8/17/17	Soybeans	Dicamba
899	17-1146	8/17/17	Soybeans	Dicamba

900	17-1147	8/17/17	Soybeans	Dicamba
901	17-1148	8/17/17	Soybeans	Dicamba
902	17-1149	8/17/17	Soybeans	Dicamba
903	17-1150	8/17/17	Soybeans	Dicamba
904	17-1151	8/17/17	Soybeans	Dicamba
905	17-1152	8/17/17	Soybeans	Dicamba
906	17-1153	8/17/17	Soybeans	Dicamba
907	17-1154	8/17/17	Soybeans	Dicamba
908	17-1155	8/17/17	Soybeans	Dicamba
909	17-1156	8/17/17	Liberty Soybeans	Dicamba
910	17-1157	8/17/17	Liberty Soybeans	Dicamba
911	17-1158	8/17/17	Soybeans	Dicamba
912	17-1159	8/17/17	Soybeans	Dicamba
913	17-1160	8/17/17	Soybeans	Dicamba
914	17-1161	8/17/17	Liberty Soybeans	Dicamba
915	17-1162	8/17/17	Soybeans	Dicamba
916	17-1163	8/17/17	Soybeans	Dicamba
917	17-1164	8/17/17	Soybeans	Dicamba
918	17-1165	8/17/17	Soybeans	Dicamba
919	17-1166	8/17/17	Soybeans	Dicamba
920	17-1167	8/17/17	Soybeans	Dicamba
921	17-1168	8/17/17	Soybeans	Dicamba
922	17-1169	8/17/17	Soybeans	Dicamba
923	17-1170	8/17/17	Soybeans	Dicamba
924	17-1172	8/17/17	Soybeans	Dicamba
925	17-1173	8/18/17	Lawn	Dicamba
926	17-1174	8/17/17	Soybeans	Dicamba
927	17-1175	8/18/17	Soybeans	Dicamba
928	17-1176	8/21/17	Soybeans	Dicamba
929	17-1177	8/21/17	Soybeans	Dicamba
930	17-1178	8/21/17	Soybeans	Dicamba
931	17-1179	8/21/17	Soybeans	Dicamba
932	17-1180	8/21/17	Soybeans	Dicamba
933	17-1181	8/21/17	Tree, Lawn	Dicamba

Status Summary of Dicamba Cases by District

Southeast District

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	45
Number of Case Files "Confirmed Dicamba"	42
Number of Case Files "Still Under Investigation"	0
Number of Case Files "Other Pesticide"	3
Number of Case Files "Discontinued"	0
Number of Case Files "No Pesticide Symptoms"	0

Western District:

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	3
Number of Case Files "Confirmed Dicamba"	1
Number of Case Files "Still Under Investigation"	0
Number of Case Files "Other Pesticide"	0
Number of Case Files "Discontinued"	2
Number of Case Files "No Pesticide Symptoms"	0

East Central District:

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	477
Number of Case Files "Confirmed Dicamba"	437
Number of Case Files "Still Under Investigation"	13
Number of Case Files "Other Pesticide"	7
Number of Case Files "Discontinued"	20
Number of Case Files "No Pesticide Symptoms"	0

Northeast District (Note: Due to time constraints, we were not able to obtain all information from the NE district. We will continue to work and finalize this information).

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	438
Number of Case Files "Confirmed Dicamba"	330
Number of Case Files "Still Under Investigation"	10
Number of Case Files "Other Pesticide"	4
Number of Case Files "Discontinued"	13
Number of Case Files "No Pesticide Symptoms"	1

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	**963**
Number of Case Files "Confirmed Dicamba"	**810**
Number of Case Files "Still Under Investigation"	**23**
Number of Case Files "Other Pesticide"	**14**
Number of Case Files "Discontinued"	**35**
Number of Case Files "No Pesticide Symptoms"	**1**

Total Number of Case Files with suspected and/or confirmed Dicamba symptoms	438
Number of Case Files "Confirmed Dicamba"	330
Number of Case Files "Still Under Investigation"	10
Number of Case Files "Other Pesticide"	4
Number of Case Files "Discontinued"	13
Number of Case Files "No Pesticide Symptoms"	1
Note: Due to time constrains we were not able to obtain all information from the NE District.	

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	No Pesticide Symptoms
Dicamba or Banvil	Dicamba	Banks	Other Pesticide
2,4-D/Dicamba	2,4-D/Dicamba	Banks	Confirmed Dicamba
Roundup	Glyphosate	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba/2,4-D	Dicamba/2,4-D	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Gramoxone, 2,4-D	Paraquat, 2,4-D	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba, 2,4-D	Dicamba, 2,4-D	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba, Facet	Dicamba, Quinclorac	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Liberty	Glufosinate	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Engenia, Me-too-lachlor, Glyfos Xtra	Dicamba,Metolachlor, Glyfos Xtra	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
None Named	None Named	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
None Named	None Named	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Other Pesticide
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Discontinued
Dicamba	Dicamba	Banks	Discontinued
Dicamba, Liberty	Dicamba, Glufosinate	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Discontinued
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Gramaxone or Roundup	Paraquat or Glyphosate	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Discontinued
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Discontinued
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None Named	None Named	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Gramoxone/Dicamba/Liberty	Paraquat/Dicamba/Glufosinate	Banks	
Dicamba	Dicamba	Banks	
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None Named	None Named	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
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Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Still Under Investigation
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba, Atrazine, Roundup	Dicamba, Atrazine, Glyphosate	Banks	Other Pesticide
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba

SUSPECTED PESTICIDE	Susp Pesticid Common Name	SUPERVISOR	Confirmed Dicamba Symptomology
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
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Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Confirmed Dicamba
Dicamba	Dicamba	Banks	Still Under Investigation
Dicamba	Dicamba	Banks	Other Pesticide
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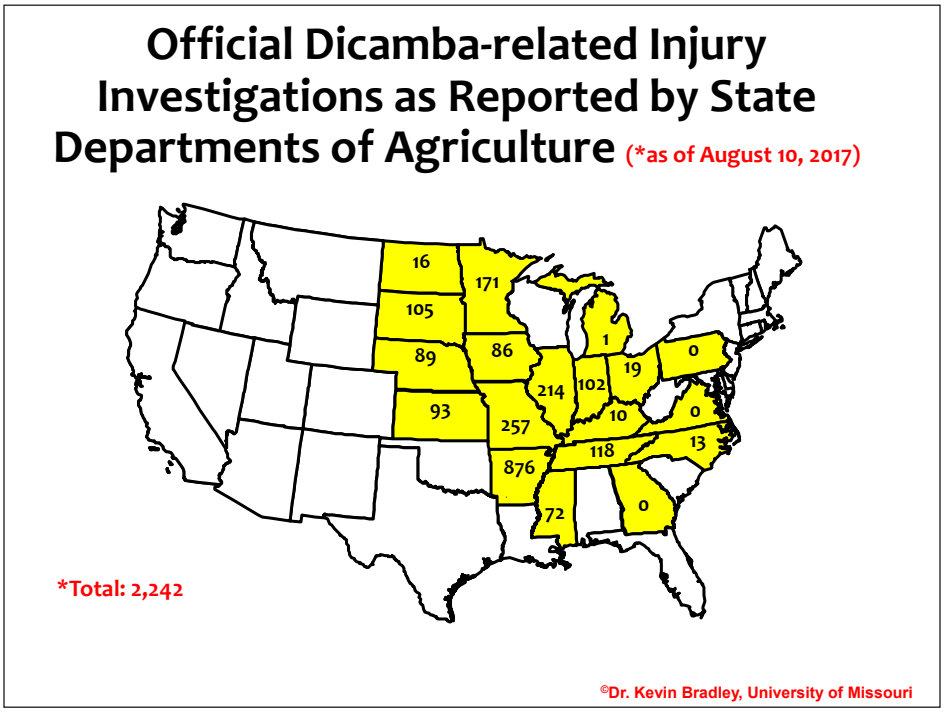
Dicamba	Dicamba	Banks	Confirmed Dicamba

Slide 01



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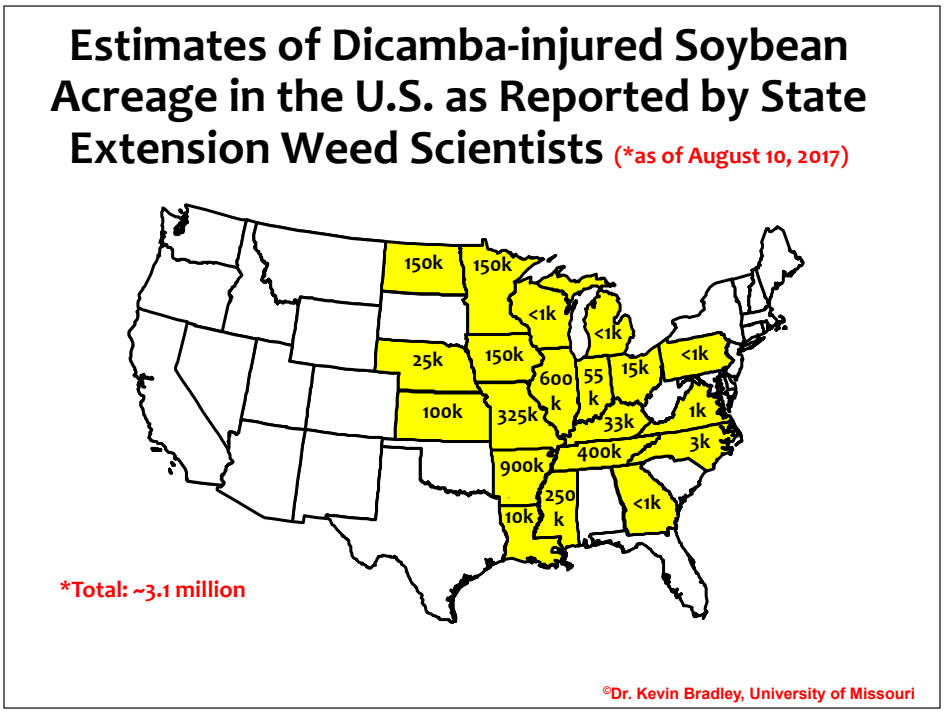

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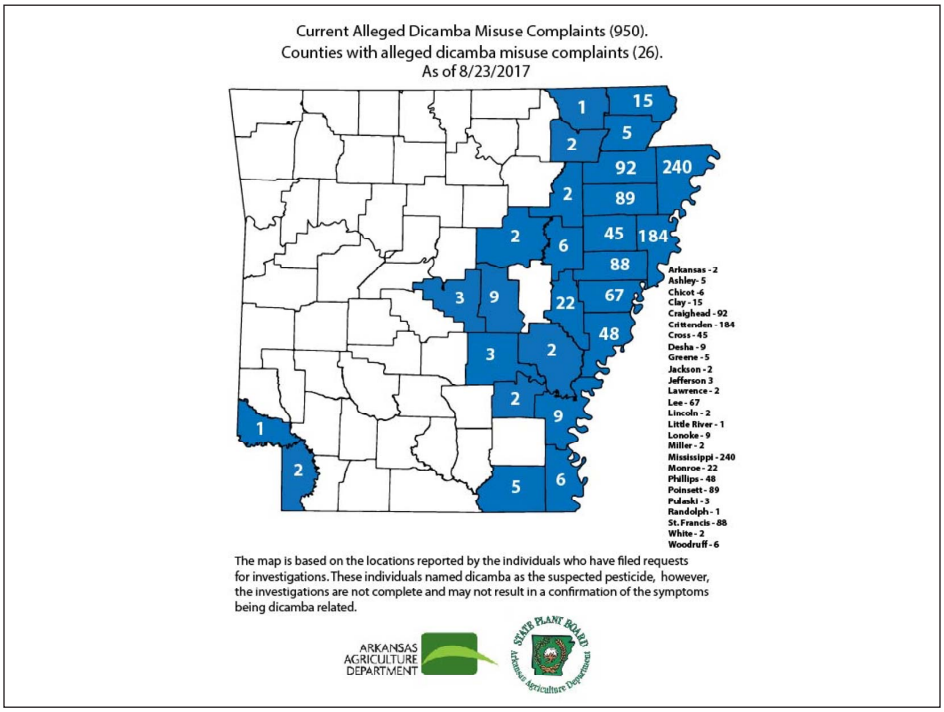

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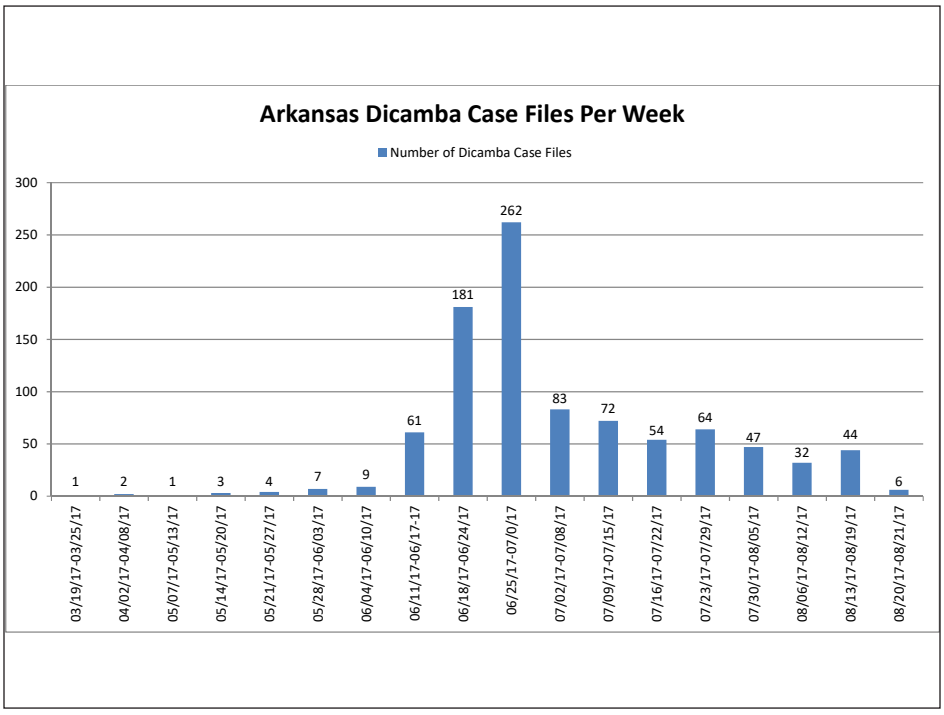

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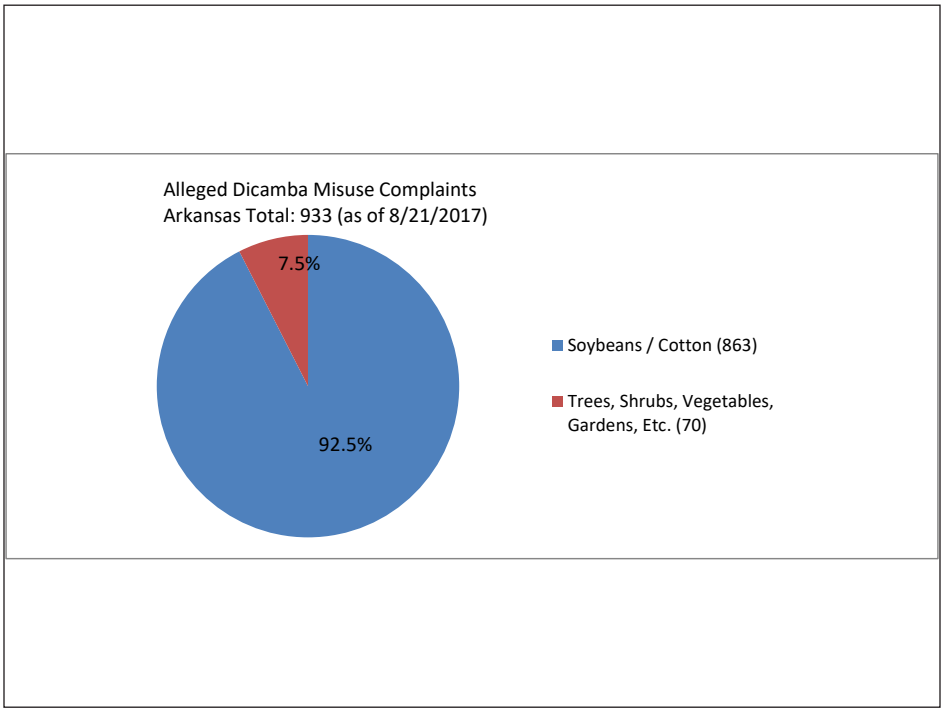

Alleged Dicamba Misuse Complaints
Arkansas Total: 933 (as of 8/21/2017)
7.5%
92.5%
Soybeans / Cotton (863)
Trees, Shrubs, Vegetables, Gardens, Etc. (70)

Appendix F

Survey Results

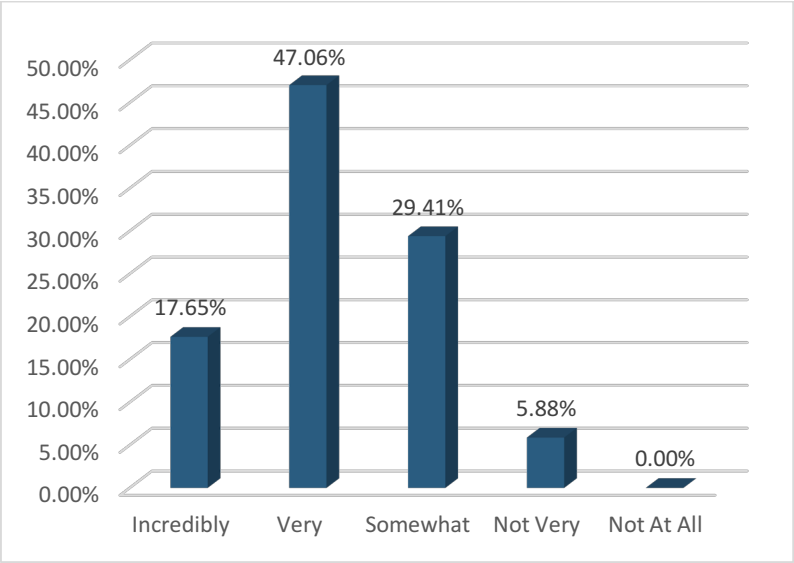
Survey Results

At the conclusion of the meetings, task force members were surveyed to discover whether or not the collaborative dialogue process accomplished the goals of reviewing dicamba technology, examining current problems with its use and application, and making long term recommendations for the future in a way that allowed all points of views to be heard and discussed. The results of the survey follow below.

Question 1

How much do you agree with the following statement?

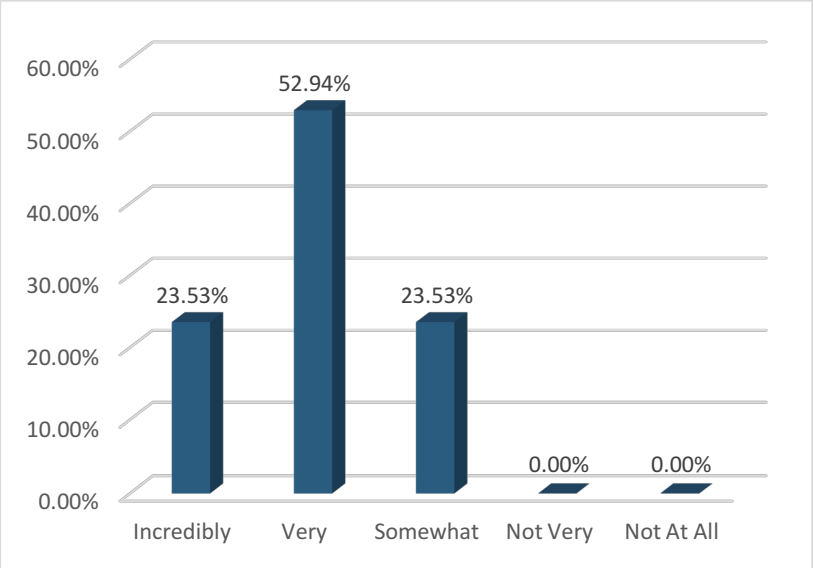
"I felt comfortable voicing my position."



Question 2

How much do you agree with the following statement?

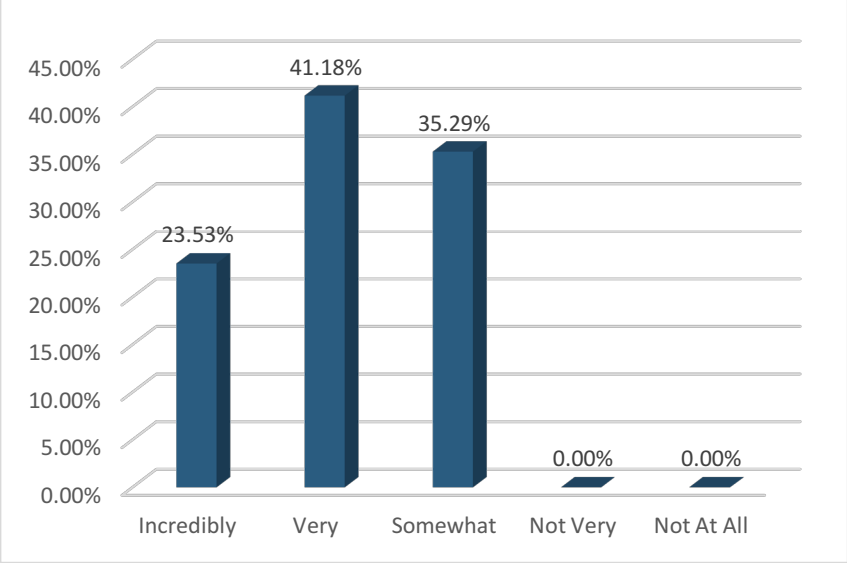
"I am confident that other task force members understood my position."



Question 3

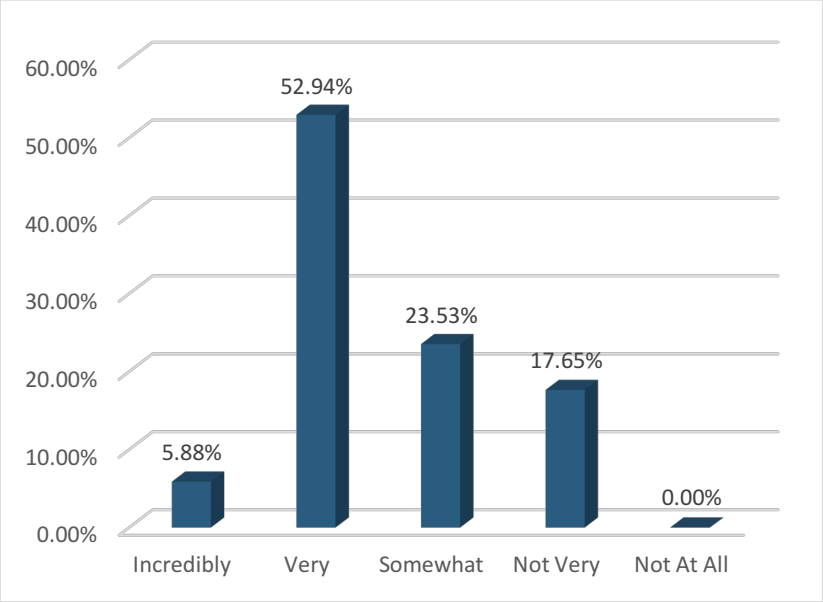
How much do you agree with the following statement?

"I am confident that I understand the positions of my fellow task force members."



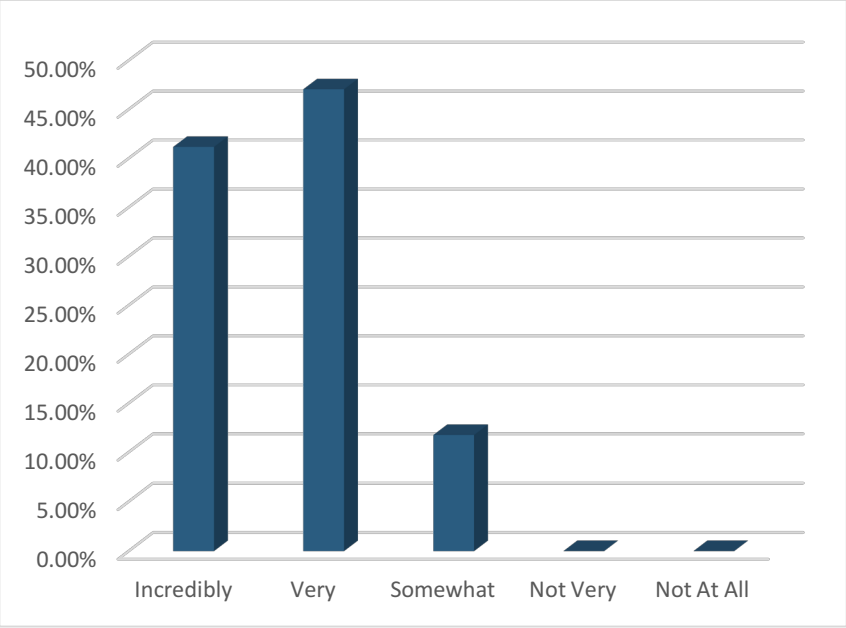
Question 4

How satisfied are you with the investment of your time in the meeting?



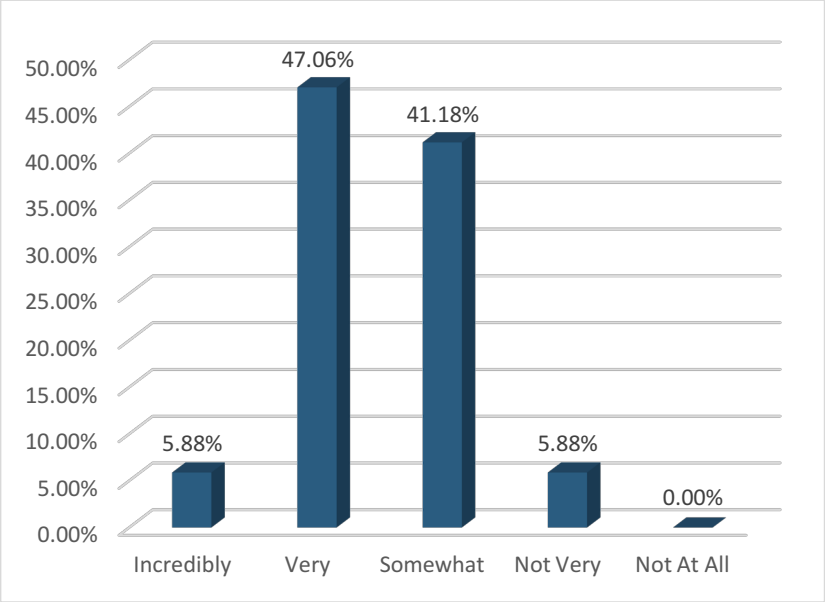
Question 5

How satisfied are you that you were able to participate and be heard



Question 6

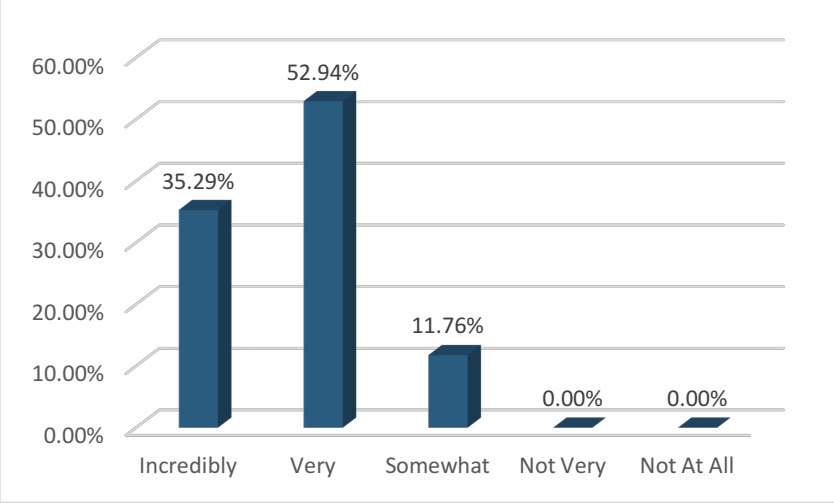
How satisfied are you with the examination of the issues around dicamba at this meeting?



Question 7

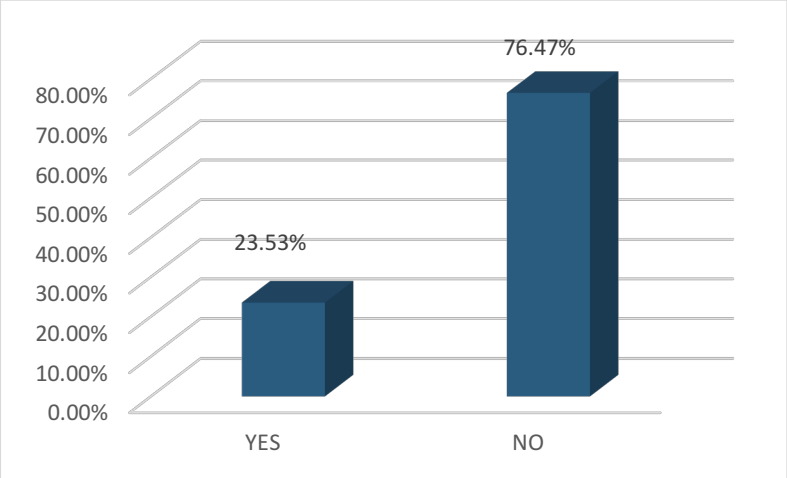
How much do you agree with the following statement?

"Discussions were well-facilitated and ensured all participants had an equal voice, were focused and productive."



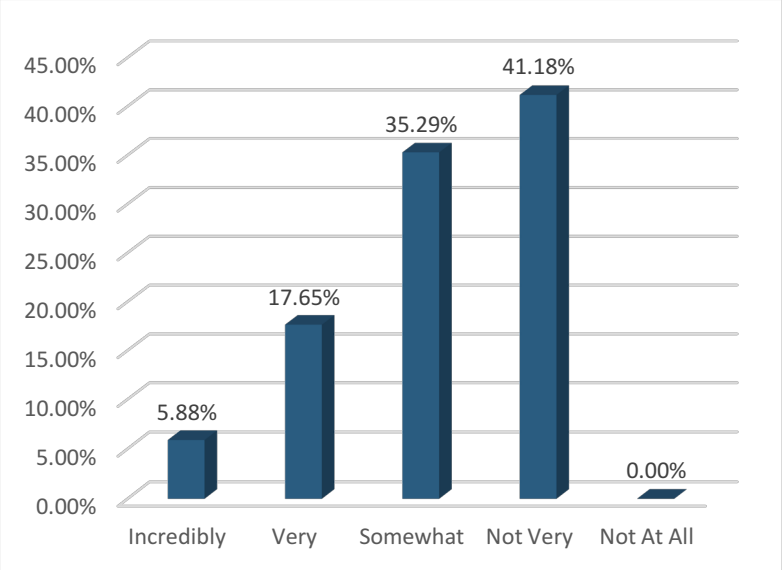
Question 8

Did information shared at the dicamba task force meeting change your opinion or stand on any issues?



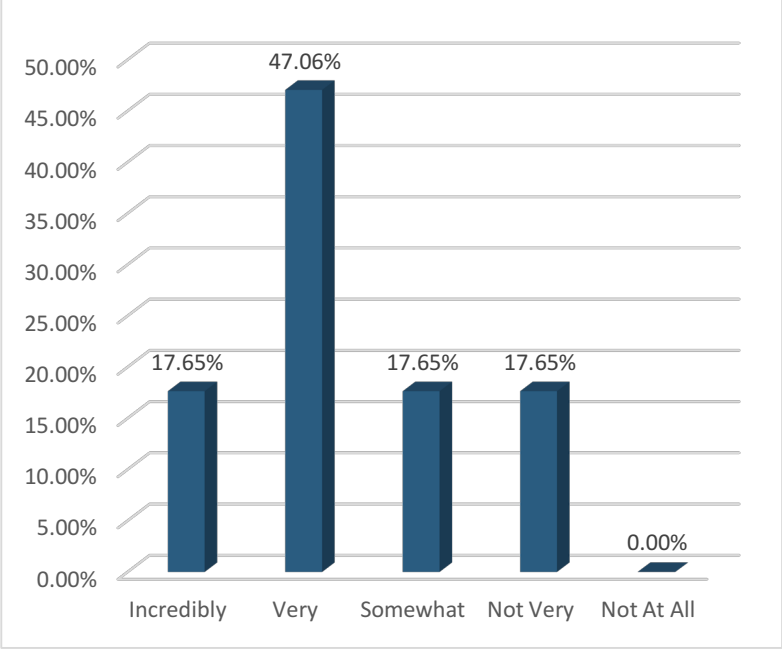
Question 9

How satisfied are you that your recommendations account for the views of all task force members?



Question 10

How satisfied are you that your recommendations represent a fair and thorough examination of the issues?



Addendum

Dicamba Task Force Day 1
First set of Presentations (Dr. Jason Norsworthy)
(Transcript for video 121809[7])

JN: Dr. Jason Norsworthy - Professor and Endowed Chair of Weed Science, University of Arkansas

TB: Tom Barber - Professor of Weed Science, University of Arkansas

BS: Bob Scott - Professor of Weed Science, University of Arkansas

JN: Okay. I appreciate the opportunity to come and to speak to you today. Just out of curiosity, how many of you actually attended one of the field days? The one that was a week ago this Tuesday or this... okay, so we have about ⅔s of you had an opportunity to come out and see the plots. I'm going to talk today really about what we've been doing from a research stand point. When I'm a scientist… I'm a weed scientist, trained as a scientist. And with me, it is all about science and trying to understand what really happened and being able to describe what happened. I'm going to talk about facts today, facts associated with research and what we've observed in those plots that you guys have had an opportunity to come and see it. I want to appreciate the… the opportunity to speak. And thank Tom Barber and thank Bob Scott for the collaboration that we have in terms of trying to address issues like what we have here. It's an issue as Mr. Wildy said. It's an unfortunate issue. I've been doing this for almost 20 years now. And I have never in my time as a weed scientist seen an issue that has divided, not only the agricultural community, but the agriculture versus the non-agriculture community like we have with this issue. And with that… Again, we need to be able to look, to take a step back, look at the issues and really try to understand what is the path forward. What does the science say, what does the data say, as we look at this issue. One thing is for certain, never have we seen the number of complaints, the number of off target issues like we have this past year. And while folks look at Arkansas and say… You know, this is really just an Arkansas issue. No, this is a national issue. We're now at 3.2 million acres in the US, soybean acres in the US, that are damaged. We are over 2200 official complaints, those are official complaints, with this herbicide. I'm going to tell you that I've spent the majority of my career, almost all of my career, working in herbicide resistance and we need new tools. We need tools like dicamba. We need things that are coming in the pipeline. And you guys have talked about this some this morning. But we've also got to make sure that we've got products that are well tested and stay put. And we are going to talk about some of the research associated with that. 2012 I started my first work on dicamba, looking on the off target movement of dicamba, and at that time we were really working on physical drift. And if I say anything today that an individual doesn't understand. If we don't understand physical drift and I'm assuming that everyone here in the agricultural community, we understand what physical drift is. We started with physical drift. Ways to stop physical drift. We were looking at nozzles. Looking at ways to increase droplet size. We've done a lot of work looking at boom heights. We know how to correct a physical drift problem. That is something… That is something we in academia and the industry can easily fix. But when we come to other issues such as secondary movement. And I've talked about secondary movement. And we're going to talk about volatility. A herbicide converting over to a gas. Or possibly herbicides blowing in on dust. We talked about some of that, we've looked at some of that in the past. That's what we are going to focus on today as we look at the research. That is

[7] For the accompanying video to this and other presentations, visit: https://youtu.be/cFjw-iKRtvc?t=7m56s

something that cannot be addressed by the academia. So with that… This past year, and based on the issues that occurred in 2016, we had some volatility work we did in 16. But I'm going to tell you today folks, it was limited. It was limited. And there's various reasons it was limited. But in 2017, with registration of these products, we've gone and we've conducted a good bit of work at this stand point. By trying to understand the volatility of these different forms of dicamba. And on thing I'm going to say and I'm going to say it repeatedly today… This is not something that Jason Norsworthy, weed scientist with the University of Arkansas, was the only one to do this. There's colleagues across the US that I'm going to point to today that are doing similar work. And we're going to talk about similar findings.

Here is what we call a hoop trial or tunnel trial. For those of you that were at the research station at Kaiser, we set up a tunnel. This is an artificial system in the field. And we placed trays of soil under it. This is my actual plots. This is what I had at the time of establishing this study. And I want everybody to also understand today. It takes a tremendous amount of effort to pull this off. We were at a meeting the other day and an individual looked and said… Why aren't you testing hundreds of combinations? Why don't you test this? Why don't you test that? This trial right here we looked at 7 herbicides, 7 herbicide combinations. 130 man hours to pull this trial off. These are trials that takes a lot of time and effort and we have to have a real good idea of what we want to test. We can't just test any and every option in terms of volatility. So this is how the trials are set up. We've got small plants out here we put these hoops over. We try to set up… we try to set up an artificial system where we can see volatility. In these trials we take trays of soil. These trays of soil are about a quarter of a mile from where they were placed in the field. We make an application of the herbicide to the soil. We take those trays of soil then and we take them to these tunnels and we place 2 trays of soil in the center of the tunnel. Folks, there is no way that we sprayed… we are not spraying these plants, here we have soybeans in this one that I'm showing you has cotton, the one that I'm going to present on today has 2 rows of soybeans. We have soil that is treated. We are not treating these soybeans. We place those under there and we leave those trays under there for 48 hours. After 48 hours, we take the tunnel, we take the trays and we take them out of the field. They are gone. Now the only thing we are evaluating there is the potential for that herbicide to gas off. To gas off and damage those crops. It gives us an opportunity to look at differences in formulations. We know about the factors of older formulations. There is a lot of talk about newer formulations, Xtendimax, Engenia, and FeXapan. Those are newer formulations. So it gives us an opportunity to assess whether those newer formulations truly reduce the volatility of a product.

So here is the data. I set it up. If we take a look at soybean injury in the trial that I conducted in Kaiser this year that many of you saw. My Kaiser Hoop trial at 12 days after application. I'm looking at the damage to soybeans. And I will tell you we had some background damage and show you that in a moment. If you know anything about Mississippi County and Crittenden County, there was a lot of damage up there this year. Actually, I had to replant my soybeans, about 100 to 120 acres of soybeans just due to the damage that we saw. Because you can't conduct volatility drift work when you have tremendous damage across these acres. So, we had some background damage 3 percent. And then you've got your older form of dicamba. You've got Banvel. Banvel is what we call a dimethylamine salt. You have your diglycolamine salt. What's interesting when you look at this is, is actually BASF says that Clarity is 50 percent less volatile than Banvel. That's well document. When you look at our data, our data says BASF is correct, it is 50 percent less volatile. Now when we look at Clarity and begin to compare Clarity to the other newer forms of dicamba… Engenia, Xtendimax… this Roundup Xtend is actually a pre-mix that is not available today of glyphosate and dicamba, should be somewhat comparable to Xtendimax with Roundup PowerMAX, the P2 is Roundup PowerMAX. So when

you look at these, in addition to seeing the 50 percent reduction, you really notice for the most part there is not a lot of differences here. Actually, numerically, these are almost identical. Engenia, the newer form. Xtendimax, the newer form in this study. If you take Xtendimax, as the label does say, if you take Xtendimax and you add AMS to it, you do increase the volatility of the product. That is stated on the label. And that is correct. But what you see here is, at least in this trial and this is only one trial in the field, but it is a field trial that says Engenia and Xtendimax are comparable to Clarity in terms of volatility.

Now, I want to show you some plots. We can't walk the field today so here are the photographs. I will tell you as you look at these again, we've got some background damage. You see the cupping here? That's dicamba on that leaf. There's dicamba on that leaf. When we rated that, we said the background dicamba was 3 percent. Look at the far right. What we see on the far right is Xtendimax plus Roundup PowerMAX plus AMS. You look at the middle 2 rows. I would contend that those look pretty comparable. The one on the left is actually Clarity and the one on the right is the Roundup Xtend. So, it's got the Vapor Grip technology in it. Now what about some other slides? Look at the left, look at those. Are those different? Which ones better? Which ones better, Don? The middle 2? Okay, the middle 2. We've got Xtendimax here, Engenia, Roundup Xtend, and Banvel. The differences are pretty subtle. Let's look at some more data. Tom Barber is with us. Tom conducted a similar trial at Rohwer. He had a few treatments that were slightly different. He had Xtendimax plus Roundup PowerMAX plus AMS. Here is his data where he has Vision. Vision is the free acid form of dicamba. So you have Vision plus Roundup PowerMAX. Clarity. Look at Clarity. Look at Engenia. Here is Engenia plus Outlook plus Roundup PowerMAX. Here we do see a slight reduction with the Xtendimax in this trial. Now, from there, I want to take you, and we are going to talk about doing larger field trials where you actually spray products and look at products moving. So we sprayed a field… 2 separate fields. And we made a simultaneous application of Engenia and we sprayed S-metolachor plus Xtendimax. We sprayed those and 30 minutes we come back to the field and we inserted these plants and we kept them out there for up to 24 hours. So, 23.5 hours. And here is what we observed when we brought those back to the greenhouse, set them in the greenhouse 21 days after application. Is that physical drift? Shouldn't be. So we have damage, and we have damage to plants that were placed in the field following application. That's what the data says. That was the first time this summer that I had an opportunity to see what I'm going to call today, volatility. First time right here, I'm marking it as number 1. Back on July the 20th… On July the 20th we took a sprayer, we took 2 sprayers and we sprayed 3 .5 acres in the center of 2 20 acre fields. Those of you that have come to Kaiser have had an opportunity to see this. We sprayed at 9 miles per hour, 10 gallons per acre, a TTI11003 Nozzle. That is a labeled application according to the Xtendimax label and the Engenia label. So, we are making these applications simultaneously. We actually came into the field here and we started spraying with an 8 row sprayer, a Mudmaster. Many of you are familiar with the Mudmaster here. We are spraying Engenia in one field and Xtendimax in another field. And we started spraying that day at 11:56… 11:56 we start spraying and we exit the field… We exit the field at 12:19. 23 minutes to make the spray. When we were spraying, the average wind speed was 2.9 miles per hour. We had a weather station here on the North, Northeast corner of the field. Weather station that's recording the wind. 2.9 miles per hour, we had a maximum wind speed of 7 miles per hour. That's what the weather station said, a gust. Is that a labeled application? Yeah, that's a label application. With that, the wind was blowing out of… the wind was blowing out of the west. So the wind is coming across this field and we are expecting to see… we are expecting to see damage on the east side of the field. But does everyone also notice that we have damage on the north side? We had damage on the north side of the field that day. And

what I am showing you here this white… the white is 12 days after making that application, we walked the 5 percent damage line where we saw 5 percent damage. We walked that and when we calculated the area, we came up with 4.66 acres with Engenia. Sprayed 3.5 acres and had damage to 4.66. Xtendimax we sprayed 3.5 acres damage… damage to 5.26. Now I am not standing here today telling you that Engenia is any different than Xtendimax in terms of volatility. I don't think that is what the data says there. But what it does say is that we've got product here moving and we've got product moving in 2 directions here. Wind starts off 0 to 6 hours, it's blowing out of the west. Then at 6:30 that day, 6 hours after treatment it shifts and starts coming out of the south. I'm going to actually show you some data on that. Actual data. It comes out of the south… it's coming out of the south. But should there be physical spray particles 6 hours after spraying, moving in this northerly direction here? 20 to 24 hours later we've got wind that's coming back out of the west, it's moving across this field… that is what the data says. And lastly, if we look from 0 to 72 hours it either came out of the south or it came out of the west. We did not have wind coming out of the North. We did not have wing coming out of the east. That is why we did not damage on the left hand… on the west side or the southern portion of this. If you take a look at the labels… the label, and I understand that Arkansas guidelines are slightly different, if you look at the label, the label says there is a 110 foot buffer in a down wind direction. So you would have a buffer, based on the endangered species act you have a buffer of 110 feet here. You don't have a 110 foot buffer here, you have no buffer here, you have no buffer. There is no buffer. That is what the label says. So when we measured the distance what we saw was 302 feet… 302 feet from the edge of the field to these corners up here. This distance here 302 feet. 302 feet for Engenia and 303 feet for Xtendimax. Really no difference. Now I want to point to these white stars. There's 10 white stars in the center of this and 10 white stars in the center of this field. At 30 minutes after application, we brought soybeans in, and we placed 2 soybeans beside each white star, each white flag that we had in the field. 30 minutes after application. Did that for Engenia and Xtendimax. Also at the time of application we had 4 transects running across this field and at every 10 feet we had a bucket that was physically sitting over the soybeans. Is it possible to get physical drift on a soybean that is covered by a bucket? It shouldn't be, not for 30 minutes. We removed those buckets after 30 minutes and then we came back and we monitored the amount of damage that we had along these transects. Not only to what's adjacent to where the buckets where but also under the bucket. This is the second field study… large field study that we conducted. Now here is the result in terms of the wind data. 270 degrees is west so the wind is coming out of the west, not quite due west, but west. It shifts, coming almost out of the south direction, and it shifts back 20-24 hours. That is the actual data recorded by the weather station sitting there in the field.

Now what is the soil temperature doing? What is the air temperature doing? At noon, I told you 11:56 we started spraying, 93 to 94 degrees when we started spraying on July the 20th. The air temperature gets up to about 96 to 97 degrees. You see it falls to about 76 degrees. That is the air temperature. But what about soil temp? Soil temp the second day, we reached a maximum temp of 113 degrees. There is some data my colleague Brain Young has, as well as other data in the literature, that says the volatility off of a plant surface is greater than volatility off of soil. So the volatility off of a soybean is greater than off of the soil, however, those are 38 inch rows that were V3 at the time of application. A V3 soybean on a 38 inch row is not going to intercept a lot of dicamba. Very little dicamba. Most of it is on the soil surface. Now, when I say that the volatility on soybeans is greater that soil, that is at equal temperatures. But here what we have is soil… On the soil we have 113 degrees. Now let's go and take a look at the where the buckets were. You see damage to plants under the bucket. Here is the

transect coming across the field, you see this is the east side of the field. Here is what we see. The leaf cupping associated with that experiment. The east side of the field, here you see the damage. We also have damage… you can kind of look and see where it moved coming out or the north direction. And here is the damage along that transect. Here is where we had plants introduced. We introduced these plants after half an hour. We also introduced plants 24 hours after spraying. I have those plants right here, we are going to look at those plants in a moment. Here is the data. So, on the northern most transect on the east side of the field, I have a primary and secondary drift. That is physical drift, secondary drifts going to be made up of volatility and any other off target movement that you could have beyond the primary. So the combination of those, we are at 45 percent damage 10 feet in. You get out to 110 feet and we are still at 25 percent damage. And at the edge of the field we're at 220 feet, we are still at about 5 percent damage. If you look at the secondary movement, what's coming off of that field after we sprayed. This is under the bucket, we remove the bucket after 30 minutes. You've got 30 percent damage that begins to dissipate and we still have damage. It dissipates as it gets to the end of the field. That is Xtendimax. Engenia looks somewhat similar. It was numerically a little bit less. We start out at 45 percent damage, we're down here at 18 percent for physical drift and primary and secondary movement. For the other we are down here at 18 percent. Both of them are volatizing. Both of them are moving. So, that was trial number 2.

Trial number 3, Tom Barber conducted. Tom conducted this trial down at Rohwer. Tom only sprayed Xtendimax and he sprayed a label rated Xtendimax and he sprayed it on 4 acres in the center of a 20 acre soybean field. Tom covered a portion of the soybeans in the center of that field with a tarp. No way they could have been sprayed. He removed that tarp 30 minutes after spraying and what your seeing is 40 percent damage to those plants that were under the tarp. He also had buckets 20 feet in a down wind direction with a 4 mile an hour wind. Those buckets were removed 30 minutes after spraying. And at 40 feet, he removed those 30 minutes after spraying. 20 percent damage and 7 percent damage. That is what was under the buckets. The wind also shifted at some point and he's got some damage. He recorded damage in the up wind direction at some point 20 feet under the bucket. He is recording less damage but he has 6-7 percent damage. He is even recording some damage out to 40 feet. This is material that would be coming off of that field, under the bucket. Once he removes the bucket, these plants are damaged. Trial number 3.

So with that I loaded my equipment and went to Northwest Arkansas. And this research was actually conducted on my place on Northwest Arkansas. On July the 25th at 3:50pm we made an application of both Xtendimax and Sterling Blue. Sterling Blue is just straight DGA dicamba. Similar to Clarity. Just a DGA dicamba. So, I've got Xtendimax with Vapor Grip. Acre and a half… acre and a half that is sprayed. We sprayed those and 30 minutes later we introduced 12 soybean plants in the center of this, from the greenhouse. 12 plants here. We also brought and placed some plants on the other end of the field. Just as a control to make sure that we are not getting contamination through here. Now, let's look at the results. Here is the weather data. At time of application we are about 93 degrees at 3:50. You can see it cools off. It was about 5 to 7 degrees cooler than what we saw at Kaiser. Cooler conditions, We introduced plants 30 minutes after application, 24 hours after application, and this time we introduced plants into the field 48 hours after application. Hoping that we would not see any damage to those plants. Hopefully those materials would be gone at that point. We removed those plants at 70 hours after the initial spray. Now let's look at the data. What we saw was with Sterling Blue, we had volatility half an hour to 70 hours… those plants that were in the field, you see the damage. Soybean damage- 0 to 100 is the rating. 0 is no damage, 100 is a dead plant. Dead plants at 100. So we have damage here. We've got damage here with Sterling Blue, we have damage

with Xtendimax. And let's go out to 48 hours. 48 hours when we introduced plants, we are still getting damage. Damage from Xtendimax, damage from Sterling Blue. So we went back and conducted the study again. And on July the 28, 2017 at 2:50 pm we spray a different area. Sterling Blue, Xtendimax. We spray a different area, put an untreated check out here 30 minutes later. Repeat that study and what do we have. We've got temperatures of 85 to 86 degrees, we have a lot cooler temperatures. And we are seeing night fall temperatures approaching 57-58 degrees. Cooler conditions. Now the reason I was looking for cooler conditions, if you talk about the volatility of a product here, as the temperature decreases the volatility should likewise decrease. And at some point you get to a cool enough temperature that hopefully you can really minimize volatility. We introduced plants 30 minutes, 24 hours, and 48 hours. We took them out at 72. Let's look at the data. So when we come back and rated those, and I had a student that rated those at 15 days after application, we are still getting damage. In the second study that we did, actually this is study number 5 in terms of field studies, we've get damage. Sterling Blue and Xtendimax. 48 hours and we a still getting these products coming off and these products are still damaging soybeans 48 hours after the spray. Now, are we the only ones that see that? Tom Barber had a study, I have had studies, are we the only ones that have observed the materials coming off of a field? Tom Mueller with the University of Tennessee, and I'm going to call the number 6… Tom Mueller with the University of Tennessee sprayed Engenia with Roundup. He sprayed Engenia by itself. He went back out to those fields and placed what we call air samplers in there to measure the amount of dicamba. And what Tom saw 0 to 6 hours, 6 to 12 hours, 12 hours to 24 hours, 24 to 36 hours, Tom Mueller… What did he find, he found dicamba. He found dicamba where he sprayed it by itself or when Engenia with roundup was sprayed. So it is coming off or it is at least in the air there. This is field trial number 6.

If we go to Columbia, Missouri Keven Bradley a colleague at the University of Missouri. He went to the field and sprayed Banvel which is the DMA, the old form of dicamba. He sprayed Engenia. He sprayed Xtendimax. And he also measured the amount of dicamba that was coming off. And what he found was, numerically, there was more Banvel initially coming off than he did Engenia and Xtendimax. But Engenia and Xtendimax are still coming off. 2 to 5 hours later you are seeing that this one is staring to go down. He is still finding a lot of it. And some Xtendimax and Engenia. But watch this. The grey bars start going down and as we progress in the day, the Xtendimax and Engenia start coming off. So, these are starting to come off and he is starting to detect these in the air. That is volatility. Xtendimax and Engenia. And then we turn and move into cooler temps at night and with that we have little or no volatility. Kevin, I was just told a few minutes ago, I believe today is going to release the data. The data on this portion here 16 to 72 hours and the amount of material that was found there. But we're seeing material coming off this following the application. That is number 7.

Number 8 I don't have a slide for. Number 8 I haven't seen the data but I have spoken to him. Larry Steckel did a trial identical to the ones at Kaiser. You saw the set up here. He did one identical to what I did at Kaiser. Spoke to him the other day, spoke to him again this morning. Larry Steckel said that when he removed buckets from his trial, he said he had a 3 to 5 mile an hour wind. When he removed buckets from that trial and rated them, he said he had damage underneath the buckets. He also said, similar to my trial (he saw my trial a week ago), he said 2 hours after application the wind shifted and when the wind shifted, he had damage in another direction of the field. And he said the damage was comparable to what he saw in the direction the wind was initially blowing. And he said that would indicate to him that he was seeing volatilization and he had Xtendimax and Engenia in that trial. So, if we have a product that is coming off of the soil or coming off of plant tissue, there has been a lot of talk about

inversions. A lot of talk about inversions and spraying into an inversion. If you have a material that is coming off and it is coming off 6 hours later, 12 hours later, 24 hours later, you have a material that can come off and regardless of when the applicator sprays it… The applicator can spray it and do things correctly, the material can gas off and at that point it can become hung in an inversion. This is a photograph taken in Marianna back about a month ago. I took this. And the material could come off and be dispersed with in an inversion. Once you have a material that gases off and becomes in that inversion, it is really a function of the number of acres that are sprayed. The more acres you spray, the more material you have that is in that layer. With wind, you begin to have movement. Once you have warmer temperatures the next day, you are going to have dissipation of this inversion. And the material is going to sit down at that point and when it sits down its going to sit down over vast acres and that is when you are able to walk across a field and you are able to see damage from one side of the field to the other side of the field. And the damage is quite uniform. And anyone that's walked fields this year in Arkansas, you've seen a lot of uniform damage. My colleagues are telling that they've seen the same thing in other states. Tom and Bob and I has spoken and they say that when they walk across in other states they see uniform damage from one side of the field to the other. Which would be indicative of what I am describing here. With that, you have volatility from earlier applications and one thing I want everyone to understand here today. I've had conversations with Kevin Bradley and with Larry Steckel, there was an article that actually came out yesterday. A 9 o'clock and 4 o'clock spray period does not fix a volatility issue. A 9 o'clock to 4 o'clock spray will fix an issue where it's getting hung up in an inversion. Actual physical spray in an inversion. You can fix this. The number of complaints in Missouri when they enacted the 9 to 4 spray, doubled. The number of complaints has doubled. Larry Steckel in Tennessee tells me that he is confident that the number of complaints in Tennessee had doubled with their 9 to 4 spray. And the reason being is because, again, you are not going to fix a physical spray problem with a 9 to 4 restriction. So why and how do we have all of this damage in Northeast Arkansas? I'm going to tell you here today that I believe it is a function of the number of acres sprayed. And it is not only Northeast Arkansas, it is the boot hill of Missouri and west Tennessee. This is my map on PPO resistant pigweed. Any of you from Northeast Arkansas are familiar with PPO resistant pigweed. Now when that shows the map, in reality, I can circle this are here and if you live in this area here. The likelihood you have PPO resistant pigweed in your field is 50 percent or greater. If you have pigweed, there is a high likelihood that you have PPO resistant pigweed. And with that, once the dicamba resistant technology was planted, these grows had to use dicamba to kill pigweed. That is the only option. Once pigweed emerged, there was no chemical option to control pigweed in those fields. I talked to an individual the other week. Said he has planted 9,000 acres with no intent of spraying but once pigweed came up, he had 2 options. Chop or spray. Those were the options. And he said he chose to spray. With that, most of our Xtend acres in this region, cotton and soybeans, where treated at least once if not multiple times. And with that you begin to have what I'm calling atmospheric loading. Because you have material that is volatilizing off, you are spraying a lot of acres. And now you begin to get this uniform damage across these acres. That's what we saw at the farm at Kaiser. I don't care which side of the farm you were on, it was uniform damage in field after field that we walked. It was a uniform damage. This is a farmer's field with uniform damage across this field. Broad acre damage. Here is a field in Mississippi County, I don't care if you are on this corner of the field or that corner of the field, uniform damage. That is a crop that he is going to harvest in 10 to 14 days. That is an irrigated soybean field. We have a wealth of single exposures. This person here was hit multiple, multiple times this past growing season. Not only is there a yield loss, this individual chopped and chopped and chopped to try to prevent seed production of pigweed. Trying to prevent taking a

step back we talk about zero tolerance, we talk about seed bank management, trying to prevent losing control of the seed bank in this field. Here is another field, uniform damage across this field. The beans haven't canopied. This field, and I'm going to look at these fields in a second, this field here was in corn last year. Any of you in production know, that when you follow corn, you expect to get a yield increase. In 2015, this field right here cut 72.1 bushels soybeans… 72.1. And this what the grower is confronted with, uniform damage across this and you can travel half a mile across this and this is what we see. That is not physical drift. As pointed out earlier, this is also not just an agricultural issue. There is plenty of plants like this. This is a Magnolia Tree. Damage to a Magnolia tree. Oaks. Sycamore. Weeping Cherry or that may be a weeping Mulberry. There is a tomato. Peppers. Before we look at plants I just want to give you some thoughts here. What have we learned this year? What have we learned as we have looked at these 8 trials? Myself and my colleagues we definitely know the behavior of dicamba in March and April when we have typically used it as a burn down material it behaves as completely deferent then when we see it used in these warmer summer months. Greater potential for volatility. We also know there is significant volatility of these newer products. There is no doubt in my mind based on the data that we have on this point. We know we have volatility of these products. Use of these currant dicamba formulations across vast acres in the summer months will lead, did lead to wide spread damage of sensitive plants and those sensitive plants move well beyond soybeans. I told you tomatoes, peppers, peanuts, non-agriculture species. This is what we observe, we saw in walking, in looking at these fields this year and what we saw in our research. Now what I want to do. I want to show you some plants. I want everyone to look at some plants here. This is an Xtend 4.6 soybean. This was grown on the Northwest research station in Kaiser. It's a normal looking soybean, a good-looking soybean. The station there typical cuts around 75 bushel. That is what we average on what we call our filler beans, production beans. Good looking bean. This bean right here was 5 feet from it. I should tell you also that this bean, by the way, was not sprayed with dicamba. It had a pre-emergence herbicide, came back over the top with Roundup and Prefix. That is what we use to control the weeds in this. A row over, this is a Liberty Link soybean planted the same date, planted mid-May. Same day Liberty Link soybean. Folks, look at the damage. That is damage that the growers in Mississippi County, Crittenden County… this is damage that was experienced, right adjacent. Look at the fruit load, look at the pod load. This plant we have done a wealth of work, R1 stage, this plant had dicamba on R1 soybeans. And here is where we are. Now, I am going to show you some other beans. This is the photograph I was just showing you. This is the 4.6 soybean. 4.6 soybean that was planted April 15. This is the field that was rated 71.2 bushel beans 2 years ago. Here is the last field I was showing. That is a 3.8 soybean. 3.8 soybeans planted April the 15th. Does everyone notice all of the blanks? See the brown pods? The blanks? This thing is full of blanks. That is what you can experience when we have dicamba on a soybean. The other thing we… Tom and I have done a wealth of work… you notice the curvature here? The curvature in that pod. If you get dicamba on a soybean during reproductive development or R3, R4, R5, it can actually cause damage to the progeny. So if this a seed production field, this field is abandoned. It's gone. No one's going to get paid a premium. There is talk now of whether or not here is going to be enough seed available next year because of this right here. This is what's happened this year. This is what the data… when we look at the data. That is the research that has been conducted. The last thing I will leave you with right here is the actual trials that we looked at. The trials that we sprayed 3.5 acres. 3.5 acres. We came back and a half an hour after spraying. We actually took a flat. We took flats and soybeans and placed them in flats. Half hour after spraying and kept them out there for up to 36 hours. And this is the symptoms we saw on those soybeans. So that is an half an hour. So what happens with, and that was Xtendimax, what happens if we are out to 24 hours? These

beans here look a little better. But we still have damage. I'm not going to show you Engenia. Eugenia's back there. Xtendimax and Engenia, I'll be honest with you, there wasn't any difference. They both exhibited symptoms. I'm going to tell you right now again, 20 years of working in the area of herbicide resistance, we need tools. Folks, we need tools. I will tell you this as we get ready to close. I was talking at… I was speaking at a meeting with the EPA… the EPA and myself met with the American Soybean Association on December the 5, 2015. December 5, 2015. Eric Mopen and I did not know Eric at the time. Eric farms in west Tennessee. And I spoke about the resistance issues, the resistance issues that we are dealing with. And Eric Mopen walked to the front of the room after I finished speaking and he grabbed the microphone. He said if you are farming in the state of Iowa, Illinois, Indiana, Nebraska, you listen to what I am about to tell you. He said on my farm in West Tennessee, I am one herbicide away from not being able to farm soybeans. Folks, I want, just like Erik every tool we can put in the toolbox. We need every tool. But also, we can be killing Oak trees. This is a product, I can tell you this right now as a weed scientist, I cannot tell you how to fix this product. I can't fix it. So, that is what we've seen, that is what our research says. With that, I am going to open the floor to questions from the task force. If there are any questions here about what I just covered, I would be more than happy to answer those.

TF: Can dicamba damage in the studies be attributed to physical drift or volatilization?

JN: No, not… there was some physical drift. If it's blowing toward the east side of the field then there is some physical drift. But when I have buckets and when I remove those buckets and there is stuff underneath them… There are eight studies right here. Those eight studies say there is volatilization. Now, does a product move with physical drift? Absolutely. Absolutely. I can fix a physical drift problem. I can't fix a volatilization problem.

TF: Jason, you mentioned earlier there was limited volatility research for various reasons. What are some of those reasons?

JN: Well, and again I mean it's been well known. We did, we did some humidome studies on Engenia. And in those humidome studies, we did one, actually it was a demo for the Arkansas state plant board, and. In the demo it appeared to be slightly better than Clarity. We did a field volatility study in 2015 or we tried to and it rained (with Engenia). 2016 we did one. We sprayed a third of an acre and the product volatilized. The data said it volatilized and it said it moved. It was one of those bucket trials similar, but we only sprayed a third of an acre. The Clarity volatilized and moved a little further. Based on that data, the AR State Plant Board allowed the registration of Engenia. That was all the data that we had access to here in the State of AR. In terms of Xtendimax, the first time that I've ever touched Xtendimax from a volatility standpoint was this year because we weren't given the opportunity to evaluate it. We were given the opportunity to evaluate the efficacy of it, I mean that's been stated numerous times, I think Monsanto stated that in an AR State Plant Board meeting. That decision had been made and with that, this was the first opportunity I'd had, not only myself, but Kevin Bradley, Bryan Young, Tom Mueller, Larry Stuckel, it was our first opportunity to see Xtendimax.

TF: I want to make sure I'm clear on this. With volatility being our number one problem, we had a ⅓ of an acre tested for Engenia and zero on Xtendimax prior to this year?

JN: We tried to conduct two. 2015 we had rain and in 2016 we successfully conducted one, and that was where we were here in the state of Arkansas.

TF: Jason, I've entered into this saying I was going to be open minded and objective. And several farmers in our county got together some that were for dicamba and told me they couldn't farm without it. They told me they'd go out of business without dicamba. All level-headed farmers got together and we spent about 2 ½ to 3 hours visiting about this situation. Our goal was to try to come up with some solutions so that we could all co-mingle and make this work. We came up with 6 or 8 different ideas that we thought was very practical ideas that would make this work. That was before we attended the field day at NEREC. We attended the field Day at NEREC and all of us were there but one. After that field day was over, there was a different attitude from those people. Actually the person that was there the last day when the taskforce was there that morning who was adamant about keeping this technology later came to me, after seeing your presentation and said I owe you an apology. He said I'd hoped we could make this work. And he said I hope that we can figure out something, I hope industry can go back and could get their arms around this and make this work, but he said it doesn't look like it will right now. The other individual sent me a text, and I want to read it, and this is the same individual who said I farm inside the levee with PPO resistant pigweed, I'll go out of business if we don't have this technology; and this is what he said:

"I've done a lot of thinking since our meeting yesterday. There's no way I can support widespread in-crop applications of dicamba next year. If scientists can come up with a cutoff date that they feel is safe, then I'm on board. But if they stop at April 15, I won't object. I'd rather work harder and have weeds and a clear conscience than see a repeat of this year. One of the recommendations that came out of our meeting was to divide the county. Let some spray it and ban it in other areas. I do not think dividing the county or the state is a good idea."

So, I guess with that, all farmers when they saw your presentation changed their minds. But in their behalf, even driving down here I called some more farmers, and I had calls this morning people that are adamantly for keeping this technology. I'm a farmer I have resistant pigweed, I need the technology, I want the technology. I need the technology. But if I can't keep it on target it's not technology we can use. It's got to be fixed before we can move forward with this. What I'm asking you in defense of those farmers who say they need it and can't farm without it, even today I had calls telling me that, in your professional opinion, is there some way that we can use this technology and not damage our neighbors and non Xtend crops in Arkansas? Is there some way we can do it without a formulation change or a technology change?

JN: Mr. Wildy, if you take a look at this product, and again it's not only based on my work, it's based on Tom Barber's work, Kevin Bradley's work, Larry Stuckel's work, Tom Mueller's work, it says that this is a product that is broken. It's not a product we are going to be able put on the acre in the summer months and keep it where we're applying it. That's what the data says, and as I said a moment ago, as a weed scientist, that's a problem I can't fix. I can fix physical drift. I cannot fix a volatility issue. So, it, um, that's where we are. And I back up at this point and at this point it's out of my hands and there's nothing I can do moving forward, nothing that I can do to address this issue in its current form that I'm aware of.

TF: One of the farmers that called me this morning was very adamant that we could increase regulations, that we can increase buffer zones, that we can make sure our training was done properly, he thinks the that it was misuse, it was applied at night, those sorts of things. Are any of those things going to solve the issues we see here?

JN: You know, the question was asked of me the other day along those same lines in terms of buffers. Do you take and go to a quarter mile on all four sides, should it be a half mile? Should it be a mile? Should it be a two mile? I was on farms this year, two miles, three miles from the

nearest Xtend and you observed symptoms, and quite uniform symptoms. And when you have a product that picks up and moves, no, it's… I can't set a buffer. I could not tell you what a buffer distance would need to be to prevent off target movement of a product like that. Can't do it.

TF: I didn't realize that you'd found volatility in your third of an acre. You know, we had guys that applied 8,000 acres down there with absolutely no movement. So how can it volatize in one area and not in another?

JN: It's not that it's not…. When you take a look at volatility, it's really a function of what it's around. [Refers to presentation] First of all, my first response to that is I think it's a function of environmental conditions. Environmental conditions has some influence on the amount of material coming off. The data would fully support that. I think also when you take a look, it's really just a function of what you're around. And I'm gonna come to this [Refers to presentation slide] I mean, here, I have and I am still going to contend that I have a product that is volatilizing and moving. How else… so here's my question. How else do you describe that? How else do you describe the damage that is on the north side of that field? I can't describe it any other way. I tell you when you say, well if it's volatile, well, it's not being volatile here, it's not moving here. Well it's not moving here because of the wind. Well let's say you have wind and you have wind for 48 hours and it's coming out of the west. And you've got a proper buffer here. Well, you never would see volatility. Let's say you have corn over here. You wouldn't see volatility. Also I think the problem you get into when you talk about volatility here it comes back to the sheer number of acres that are sprayed. The more that you spray and the more material that you get in the environment the more that you have. And it's a sensitivity issue here along those lines. When you come back there's data. The National Geological Society has data on Glyphosate. 2014 they pulled air samples out of the state of Mississippi. Glyphosate is a non-volatile product but they were able to find trace amounts of glyphosate. If you take a look at a product like dicamba for which we have volatility here (that's the only way I can explain this) it becomes a sensitivity issue. So the more that you have out there, the more that you increase the concentration within an environment, the more that you're going to have a response. That's where I am.

TF: I know the UA Weed Scientists get together every year to make a recommendation. If this technology is available next year, how will you recommend its use?

JN: Tom and Bob and I have met, of course we've been together this week and had a good opportunity to talk and we've talked about NP44 and the recommendations and at this point we can't. How do you recommend a product that, based on what was observed in '17, that does not stay where it was sprayed? You cannot recommend that product. That's where we are.

[PAUSE for further questions from the advisory members or other task force members]

TF: Are all row crop products tested prior to release?

JN: I'm not gonna say they are tested for volatility but in terms of testing, typically yes. We evaluate all products prior to release. Now we don't necessarily evaluate volatility every time if you have a product that doesn't exhibit volatility. If you take a look at products like dicamba… 2,4-D is a good example. 2,4-D is a product for which we've had issues in the past. 2012 we tested Enlist Duo 2012, 2013, 2014 we actually tested the volatility of the Enlist Duo product. We've also done a tremendous amount of physical drift work with that product to try to have some understanding of that product. I'm not going to sit here today and tell you we have all the answers but we have a pretty good understanding of how that product behaves.

TF: What is the average time for testing?

JN: Typically we are going to test a product for at least two (2) years, a minimum of two year prior to launch. That's pretty standard across the industry.

TF: It sounds like to me what little research y'all got, we didn't get a very good look at it (on the dicamba).

JN: Well, again, we did and we probably should have done a little bit more with Engenia than what we did, I'll be the first to admit that, and I think there is other folks that would say that, and then the other product we had no option. I mean we weren't given the opportunity.

TF: How many different ways can dicamba be off target?

JN: If you could take a look at how dicamba could move off target, I think you'd probably be talking six or seven. I mean, when you talk about off target applications, of course tank contamination would be one. Spraying, physically spraying and hanging a material in an inversion would be one. But I would contend that if you're going to have mass damage with that, you're probably gonna have to put it out of an airplane rather than just spraying a field to get it hung in an inversion. In terms of, you're going to have to spray vast acres. It'd be easier to put that in an airplane and get it hung up and cause damage than you would putting it out of a sprayer, that's what I'm saying there. Um… So tank contamination, physical drift, inversions, you could have, we looked at dust this year, dust, there's actually some data on 2,4-D back in the 1970's looking at dust. I don't think dust is a major contributor to what we saw this year because folks it was wet in Northeast Arkansas. But that is one we've been able to go back and simulate. We had about a seven day, eight day period that we uh, we did have some dry conditions and were able to simulate. You could have, the label even says in terms of moving it in water, I mean, dicamba is a herbicide that is highly soluble in water, it has a low KOc meaning it is not tightly bound to soil. So with that you potentially could move it. There are several ways but there's, with those, those ways I just named you don't get landscape damage. And we've looked at all of those. And what's interesting, when you mention that, Stacy, is when we first started seeing the damage, the first damage that we would see, we could actually go and you could trace it more often than not. I mean, it was physical drift. Maybe an individual used the wrong nozzle or had the wrong boom height. But you could trace it. But when you start talking about physical drift, generally physical drift is not something for which you have landscape damage. And that's what, at least Northeast Arkansas, when I say Northeast I'm talking Phillips County, Lee County, Crittenden County, there's about eight counties, it was landscape damage. It was turnrow to turnrow, that type of damage was. And the, what I was just telling you, even the tank contamination, I saw a tank contamination. What's interesting on a tank contamination, generally speaking individual's gonna miss a foot or two foot of row. When he comes in the field he may miss a foot here and miss a foot there. And you could actually pick out the tank contamination based on what he missed. So those are easily recognizable and we're able to diagnose those when we go in the field. But, yes, I mean there are other ways to have off target movement.

TF: [Unintelligible] You think there's a pattern difference between those two?

JN: Well, a pattern difference between an inversion… ? Inversion, inversion gen… No. I think in inversion what's going to happen is an inversion's going to pick up and inversion's going to move over. But I come back to the fact why I say it's not inversion, so if its an inversion, I'm talking inversion, spraying into an inversion. If it's spraying into an inversion you saw that with a 9:00-4:00 spray.

TF: I guess what I'm getting at, is when we look at the damage that was in Northeast Arkansas, what evidence do we have that it's all volatility?

JN: No, no, no, I'm not saying that at all. No, no, no, absolutely not. I agree with you 100%. I'm not saying and never have said it's all volatility.

TF: So, what's the value, what's the extent of volatility damage?

JN: So what we say, based on walking and looking at these, what I say is based on what I have seen is I believe the majority of it is volatility based on the uniform and based on, I'm going on that based on the data. The data, the data that's presented, and I have yet to find anyone that presented any data, I'm talking University data, that would be different than this, the eight trials that I have seen or am aware of, they would point to volatility. And with that, if you have a volatile product, it would have the same symptoms across vast acres. Now again I come back. I'm not saying there isn't other damage and yes, I think there was potentially other damage but I still contend the majority of what we saw, the majority of what we saw, was volatility.

TF: Hey Jason, you mentioned that there's 3.2 million acres now with damage. When you say damage, are you saying that's damage to yield or is that symptomology?

JN: No, that's symptom. We don't… I mean, we're not able to assess… First of all, I tell folks, if anyone… now I can probably take those beans right there and I can give you a pretty good estimate of the yield loss. But anyone that walks into a field, especially a V5, V6 soybean early on in the year and looks at you and tells you that he has, he has yield loss or starts telling you how much yield loss, they don't know what they are talking about. Because we have been unable… the only time that we… what we can tell you now we cannot look at symptoms and tell you the amount of yield loss. There's a wealth of data out there that says you can't do that. But what there is also a wealth of data that says, when you walk into a field and you see a height reduction, if you have height reduction, in other words if you have an area of the field in which they are shorter than they should be then yes, you will have yield loss. So yes you have symptoms out there. And I think with that we have no idea what the yield loss is going to be. But if you take… in Mississippi County, and I spent most of my summer, myself and Tom Barber spent most of our summer in Mississippi and Crittenden County, I can assure you there is considerable loss in those counties. I think the other thing, if you look at those LL, those Liberty Link, those 4.6 soybeans right beside those Xtend soybeans, there's a false sense of security out there right now. On July the 11 when most of the spraying stopped, should have stopped, those soybeans on the station, at the Northeast Research Extension Center, there was severe damage across that entire station. And then following that, about two weeks ago these beans started to recover. And they actually give the appearance, if you look at that bean, and I want to grab that bean again, [referring to exhibits]. Because I had, I had several… we had a field day a week ago this past Tuesday, and I had several folks drive by this field of beans. And they said, "Man, those are some good looking beans. They've almost canopied." Good looking beans." There wasn't a lot of symptoms. I had a graduate student. I was there when she actually pulled the leaves off of this. There was two or three cupped up leaves on these plants. Now I'm gonna also tell you there's some damaged fields, there's some damaged fields that I don't think there's gonna be yield loss. And there's some damaged fields… there's no need of even putting a combine in the field here [refers to exhibit of damaged plant]. I will assure you today this field here's not gonna average five bushel. So, it's all over the place, and no one, no one has attempted… when they say 3.2 million acres, I'm not aware of any weed scientist, university

weed scientist, in the U.S. today that has looked at anyone and has tried to predict the number of, the, the, the yield loss across the U.S. No. Now there has been asked, we have been asked to try to make some predictions roughly within a region and I'll tell you right now, I mean it's, it's a rough guess. It's a rough guess because partly, the other thing that we run into is that there's not a soul that I'm aware of today that has any data on multiple hits. And I'll assure you of this. Anyone that's been in Northeast Arkansas, it wasn't one hit, it wasn't two, it was multiple hits, three, four, hits. The other thing, when you take a look at yield loss, yield loss is a function of when you got hit. It's a function of how many times you got hit. It's a function of what rate you got hit with. And it's a function of environmental conditions following that exposure. Now we have been very, very fortunate in this state. We have a good looking bean crop. We have a good looking bean crop because we've had very favorable environmental conditions this year. And we should, we SHOULD break a soybean yield, or soybean state yield record this year according to our… We should have, now I'm not for sure we will. But based on the environmental conditions that we've had for the soybean crop this year, according to our soybean specialist, he says that we should break a soybean yield record. We'll see if that happens.

TF: Jason, I've got another question, uh, about a different product, uh, Command. Now you remember when we had a few years… To solve that product, problem, you encapsulated it. Can that be done to this product and would that work on this?

JN: You know, I'm not so… and I've had folks that ask this, can you encapsulate it? That's something that I think BASF, Monsanto will have to answer. I will take a stab at it, I don't think… my answer to that would probably be no, and the reason I say that encapsulation would be unlikely to work is that encapsulation, when you take a look at encapsulation, also the encapsulation basically dictates the rate of release of that material from that capsule. It's a diffusion process. And with that, with a foliar applied herbicide, I'm not aware of any microencapsulated formulations that are foliar applied. If you take a look at all the ME's [microencapsulations] that I'm aware of they're are all soil applied. I also contend, and this is the other thing, this is a herbicide that is 60 years old and BASF I'm assuming they thought of microencapsulation and have probably even tested that, surely by this point, as to whether that would be an option.

TF: Well, if I could present that to some of the advisors, can you tell me if there's been any work on that? From Monsanto or BASF or Dow?

Advisors: Yes, over the years we've looked at encapsulation but it's post-product with foliar activity. Yes, we can have some soil activity. We have looked at encapsulation as a way to create more of a soil residual product and have been unsuccessful in that just because it's, it's primarily a foliar material. So if you encapsulate it, it won't be taken up by the plant. That's kind of the simple way to put it.

TF: [to advisors] Are there any other technologies that could be done, used, to reduce revolatilization?

Advisor: We have continued to innovate with dicamba over the years. You know, Banvel was one of the first, Clarity was the second, the introduction of Distinct, followed by Status and then also with Engenia, with the brand new salt. Um, I will maybe get a chance to comment on this later, and I've talked to Jason, I've talked to other guys here, um I, at this point I think it's premature to attribute everything that we have seen to volatility. Um, I don't know if it's the time to go into that, we can touch it later. I don't know what the process is. Alright so, there is

certainly an intensity of us in the Northeast part of Arkansas, in the Boot-heel of Missouri, I will admit that. And we'll ultimately, we will have all the information on that as the sales data is completed, but that does not mean that we are not treating other areas of the country at a significant level. There are certainly some differences in crop patterns and use patterns and environmental conditions and things like that, but if volatility was the prime driver for what we have seen in this North Delta area, then we would see this on a broad scale basis everywhere. Um, probably the closest analogy that we would have to this area, and it wouldn't be 100%, would be in North Carolina. There is a significant mix of soybeans and cotton there, dicamba tolerant and non-dicamba tolerant. I don't have those numbers right now, but there will be an intensity of use right there that will not be insignificant. My personal observations, and I have spent a lot of time in the North Delta because of what we've seen here. I've worked 27 years with dicamba - my entire professional career. I have never seen anything like this. There's something unique that's gone on. And right now I could not attribute… the way it's occurring right now, all this to volatility. Can't do it.

JN: And Dan, I don't either…

Advisor: That is not the message that was sent to us…

JN: What I said is, this is volatile, it is volatile. And I'm not saying… I do think the majority of what we are dealing with, and I'm gonna still hold with this, that majority is volatile. But yes, we have physical drift, yes we have dust, we have all… Stacy what we just talked about. I do believe all of those are contributing. But what I am saying is, I AM convinced, based on the data, there is volatilization, and what I cannot do, Mr. Wildy, is I cannot solve a volatility issue. I can fix some of these others. I can fix a physical drift issue. I can fix a nozzle issue, I can fix a boom height issue. I cannot fix a volatility issue. What percentage of it is out there, I don't know, but I cannot fix a volatility issue

Advisor: I'll just close my comments by saying that we have a lot of information that we are still trying to collect and gather that I think will shed light and more clarity on what has transpired here. And I hope we are given the chance to review that and have an exchange, a fair exchange of ideas and information. That is my sincere hope. With that, I guess that's all I have. Oh, I did say, one other thing I wanted to ask is that one key pieces of information that we need to have is that we need to have some results from the investigations the Plant Board had. What have they found? I can tell you from what I've seen of our investigations right now we are going to have a good number of them that are incomplete. An applicator may not share their information with us. We have no avenue to compel that information. So before we make some really concrete decisions on the path forward, we should have a sound understanding of what was observed and what was found in all of the investigations that took place. And right now, well, cart is well ahead of the horse. Maybe that's a personal opinion of mine, but I don't think we've, I don't think we've looked at everything yet. With that I'll…

TF: [to advisor] I had a question. You say you've got information to collect. When will that information be available? I know a lot of these growers buy their seed in October and that's kind of not very far off right now.

Advisor: I understand, I understand that. We are, first off, all of our complaint, my understanding is that all of our complaint information should be in by, I think it's the end of next week. It will take a couple of weeks to go through all of that, but as I said, I don't know how complete it will

be. But it will give us an indication. We are also, I mentioned the intensity of use data, and I could be wrong, I believe that we will have all of that sales data, and when I talk about sales data its point of sales data where we can actually pinpoint I think down to the county where its actually sold. So that will give us a real accurate read. I don't think that'll be complete until the end of September. And obviously that, there's an issue with the timing of decisions on seed, and I fully understand

TF: How long have you been working with dicamba? 26 years?

Advisor: 27

TF: [to advisors] [unintelligible]

Advisor: I will not stand here and say that Engenia is not volatile. But based upon what I've seen it's a minor contribution to that. And some of that, some of the data that was shown here, will show you that it is temperature sensitive. Alright? And I think Bradley's data, as soon as we get the rest of it might show this I hope…

JN: Absolutely [unintelligible]

Advisor: …is once you get into the nighttime, it's essentially nil. And so that's when, though, an inversion is going to set in, is in that late evening and night time. So there's a little bit of conflict here that if volatility's gone to nothing then how are we loading that inversion layer? And I don't think it's from the daytime applications. And I'm still, and we're working with some people to understand more the mechanics and physics of that, so I have a better understanding myself, I wouldn't consider myself an expert, but it's not doubt in my mind that that inversion layer got loaded up here. Some how, some way, and I'm not sure how that's done yet.

TF: I had a two part question… [unintelligible]

JN: Atmospheric loading?

TF: [unintelligible]… with glyphosate over the last 20 years, or at least the Plant Board says, in 20 years of glyphosate use they've had 300 complaints. In one year of dicamba use, they've had almost 900 complaints. Why did we all of a sudden forget how to apply [unintelligible].

JN: Mr. Wildy, I don't think anyone did forget how to apply. There has also been some talk about training. Individuals here in Arkansas went through training prior to spraying this technology and again, as I said earlier, were there some individuals out there probably using the wrong nozzles? Absolutely. There is no doubt in our mind that that was the case. But you don't put the wrong nozzle in, you don't put the wrong boom height up and all of a sudden see vast damage, uniform damage, across 900,000 acres. You just don't see that. And back to use. We've already commented about use. I believe, I know… and I 'm sure there some but I have yet to find a grower in Mississippi County and Crittenden County that planted the technology and hadn't sprayed. Now I'm confident there are some, and someone now is going to come forward, and I will find one tomorrow. But when I go to South Arkansas and Central Arkansas that was pretty common to plant it. And individuals planted it and said… and they will say today, they planted it purely out of defense or they just liked the genetics. There's been individuals that said… You know what, I wanted to plant an As Grow soybean and the genetics now in the Xtend. And I wanted to go there but you know, I don't have PPO resistant Pigweed. So, for that reason I

can still work with the Roundup Ready program. We can use a glyphosate with a Flexstar or a Prefix or put down a PPO planting and still have success. That is what I saw that was coming out of the field. Yes?

TF: In your opinion, is there any two combinations for a plant that is more sensitive than dicamba and beans?

JN: No. If you go back…

TF: [unintelligible] … cotton?

JN: So Bob and I… I would have told you that actually prior to this year. We had some trials this year. I didn't present those. But we had some trials where we had Weedar underneath a tunnel. And we had Xtendimax, Engenia underneath the tunnel. And we saw just as much damage to soybeans as we did with the Xtendimax and the Engenia as we did to cotton, with the Weedar. Now Bob Hartzler actually just summarized some data, the data that was out there in the literature. And he came to the conclusion, and I would have to go back and look at it… the actual data. He has a figure that I have seen that says that cotton is slightly, slightly more tolerant to 2,4 D than soybean is to dicamba. That's not volatility… has nothing to do with volatility. That is just strictly sensitivity. At the end of the day… and you've been around cotton. Cotton and 2,4 D just don't mix. If we were sitting here today and we had cotton growers here. I mean cotton, cotton and 2,4 D is an issue that no one wants to deal with and we understand the sensitivity associated with that.

TF: I have another question. I'd like to know from Monsanto or BASF if they've looked at any new approaches [unintelligible] the two companies to work together [unintelligible]

BASF: As we have done in the past 50 years of working with, innovating upon various formulations of dicamba, we will continue to do so. I know that we have some things that in the wings that we are looking at. I don't know where they stand as far as being ready for market or that type of thing yet. But we are certainly continuing to identify ways to deliver the best possible and safest product to our customer. And that indeed is our goal and our passion, my passion, to provide that needed solution to the grower. I truly believe that without dicamba, without Engenia, or Xtendimax as a solution. As a tool for growers to use, we are going to have sole reliance on Liberty. Which is a great product for control of pigweed. And without having the ability to use dicamba in rotation with that, I venture to guess… I saw some questionable control this year on pigweed, that we will have resistance to Liberty. It's just... It's a fact of life. If you rely on one chemistry too much, you will have resistance. And so, depending on how this goes, the decisions that are made, it could significantly our long term ability to control palmer amaranth in the mid-south.

TB: Hello, I'm Tina Baktor from Monsanto. And so, thanks for all of the conversation. Just getting to hear all of the issues going on. We haven't been selling product in Arkansas so I can't speak for Arkansas. But at least some of the things we've been seeing across some of the states. We have seen challenges but we've also seen some success stories. So I think going back to the comment on volatility. The things that we are seeing… are data is still not complete yet but I think it will be available probably sometime next month. Our hope is that we can bring the information that we do have together to all of the different stake holders. So in an Academic Summit setting type thing, to the different Ag Extensions. So we can… I think the critical thing is to figure out what are the issues. If we can't figure out what the issues is, it's going to be

really difficult to figure out what are the solutions that we can put in place that can help some of those issues. I think some of the things that we have been seeing is volatility, and I think it was mention earlier, isn't the major contributor. To some of the things, we have walked a lot of fields across many of the different states. It seems as though pieces of the label, physical drift I believe was the major challenge that we faced. And so we truly believe that training and education is going to be key here. We've heard as we have done our outreach to the different states… What more can we do for 2018. That is what we have been focusing on. 2017 is pretty much over now so what can we do for 2018. So I think we are reaching out to all of the stake holders. Collaborating. We are willing to listen to any of their ideas that they can have. I think we are going to be focusing on training and education. What are learnings from 2017 that we can now apply over? I think that the content around physical drift. The things that are critical on the label. I think will be key. We had temperature inversions a few times. We have been working on… with our climate corps so we have IT based systems that we can use that could potentially put tools together in the future to be able to predict inversions. Whether that is available in 2018, we are going to be pushing hard to see what we can make available. I think Jason… waiting for a lot of the other data that is going to be coming back from experts like yourself. We did test Xtendimax. And there is a lot of weed scientist that we have made out product available too this year. I think what we would like to do is bring that together. And I think we have tested our product from the volatility stand point. We've done it from a field testing stand point, we've done it through regulatory studies that we have had to submit to the EPA, we of done it in a controlled environment, we've done it under humidome settings and I think what we are seeing is very consistent patterns. And our data does suggest that it does have low volatility potential compared to the older formulations. And so, I think would be good would be to bring the entire data set so all of the data set that we have available, Jason the new data that you presented today, some of the new data that will be available but when it is in more of a final form. Hoping that we could all pull it together sometime at the end of the month.

TF: Is Dr. Baldwin still in the room? I am going to ask this question because in to other question you made comment to being in other parts of the United States. And there being problems in other parts of the United States with this chemistry.

Dr. Baldwin: I mean, I've been in other parts, I'm aware that there's problems in other parts, but how much of that is caused by physical drift and how much of that is caused by volatility in other parts of the country, I cannot tell you. I can tell you this, I've probably, over 43 years, looked into [unintelligible] herbicide damage as probably anybody, more than I would like too. And I have looked at several landscape type auxin herbicide effects. Mainly 2,4 D in cotton. And any time you get a landscape effect where you are uniformly effected over a large area and that's going to happen in stable air or in temperature inversions. You can't blow it and move it in a uniform way. When you are getting a uniform affect, you are getting a uniform dose across a large area. And in 2,4 D, most of that has always been with aerial application, from rice effecting cotton. If you go back and look, 2006 when we had a major landscape effect, we had a drift pattern that was probably 30 miles wide and 80 miles long. The nearest cotton fields to the nearest rice fields were about 10 miles away. But what you had was a whole bunch of airplanes working in the same temperature inversion on the west side of Crowley's Ridge and moving it over. And when you get that you can get a lot of those smoke, fog types of spray particles that aren't affected by gravity that go up and collect in that inversion layer. The problem that I have got with this, with ground application spraying with course nozzles or even if you were cheating on the nozzles a little bit, I simply don't believe you could get enough physical spray particles in the air with ground application while those temperature inversions last to cause the

type of major landscape affect we have seen for west Tennessee to the boot hill of Missouri. So to me before they ever did that research, common logic told me, it's got to be an inversion and the only way you are going to get enough stuff in the inversion to do that is through volatility.

TF: (unintelligible)… is it possible there was generic liberty contamination [unintelligible]

JN: The question was… Generic Liberty. I have no idea. I have not seen. I am not aware of any generic Liberty. I know that was said. I think Monsanto has put that out and I have not tested any at all. I am not aware if any. I know Monsanto has said that. If that were the case… If that were the case would all of that generic Liberty be sold in Northeast Arkansas? I'm just asking. I'm asking that question. I mean, I'm not saying… I mean, I am just sitting here trying to think, would all of that generic Liberty be east of the ridge? Because when we talk about the damage and I'm not just talking about the damage here. A majority of the damage in Northeast Arkansas… It was isolated to Northeast Arkansas. There was damage to other areas of the state. But there's 8 counties that had the majority of the damage. And I know there has been contamination of products in the past. But to sit here and say yea or nea on that, I have no idea. I don't test products. That is not what I do.

TB: Just to add to that comment. So we have tested some generic glyphosate products so we have found detectable levels of dicamba. I'm not suggestion that that's the major cause here. It certainly isn't. But I think that we should probably consider it as a factor here as well. And to the bigger scale of things as well.

RH: It has been sent to the Arkansas Plant Board and has been through some of the testing protocols there and sent on for further… I think they said the EPA function in the state because they have more intense testing equipment. So that is in the works. Not only here but in a couple other states.

JN: Terry, Randy are those results back yet? I'm asking somebody… Terry or Randy… It's, I don't have the answer to that yet.

Dr. Baldwin: The results are not back yet. I haven't seen anything yet. I know the samples came in to the lab and they were getting geared up to do it. Obviously there is a flow of material going to the labs and when they get to the point when they get those samples run, then we will have the data available.

JN: Could we have access to those? I'm asking that to Monsanto as well as to the Arkansas State Plant board.

Dr. Baldwin: To the data?

JN: No, to the samples.

Dr. Baldwin: I don't know why not. We… we…

JN: I would like access to the samples. I'm not a Chemist but it is pretty easy to test if they have dicamba in them or not. What do you think Stacy? It's pretty sensitive. It ought to show up quick. So, I'd like… I'd like access to those samples.

Dr. Baldwin: Whichever, I don't care. Let me check to see what kind of quantity we took of samples.

But we will get back to you.

TB: Yeah, that was going to be my comment as well. I'm not quite sure what volumes we actually stored. But we can certainly take that back.

TF: Well that should be a simple fix. There's lot numbers on every chemical made, so all you have to do is provide the lot number.

JN: So, any other questions? Yes?

TF: When what I call the dicamba bomb went off in Lee County, was that a function of the wet weather we had compressing our spray days so that everybody was spraying on the same day? Do you think that was part of the problem with loading the atmosphere or what?

JN: If there were a lot of applications being made over a short period of time, I am convinced that the more you spray over a short period of time, the more opportunity you have to load the atmosphere. If you have inversion like conditions that are close to those applications. And I am talking about 24 to 48 hours beyond those applications. Yes, I think the likelihood, based on what I've seen, the likelihood exists there. As you begin to spread this out and you have less applications within it, you begin to reduce the likelihood to load the atmosphere. The concentration… I mean the response. The response is a function of concentration. The more you have, the more likely you are to see a response and the degree of response. We do a lot of rate titration work. We will look at a 1/30th X rate all the way down to 1/100,000th X rate. And the response is a function of dose just like with any other herbicide. The difference with dicamba on soybeans is it doesn't take a lot to elicit the response.

TF: Jason, the… Everyone knows that AMS is a no-no. Is there anything else out there, especially maybe cotton wise that could be causing this stuff to be more extreme? We are seeing it more in the higher cotton areas.

JN: You know, I don't know. I mean, we… The only thing I will tell you. First of all, in terms of testing as I said just a second ago, there has been mention of humidome. And I think that humidome data has value when you start wanting to test combinations. 130 man hours for me to look at just seven treatments in the field. So, my response back to that is, we are not really able to evaluate a lot. We have evaluated some glufosinate. We do see a slight, not like the AMS, but we do see a slight increase in volatility when we tank mix glufosinate. But now glufosinate in not a labeled tank mix. Outside of that, you've got what's interesting is, you've got all those nutritionals. The labels have all those nutritionals on there. Has anyone tested those nutritionals from a volatility stand point and maybe Monsanto has in a humidome. And one thing I am going to come back and say about humidomes, based on the data that I see here, the humidome data we have seen up to this point is not correlated well with what we have seen in the field. I think the humidome data may give you an opportunity to probably narrow down on some… kick some things out and say this isn't going to work, this isn't going to work. Now we've got some candidates. Let's go to the field. And that's typically how research is conducted. You go to the lab research. You knock out a hundred. You knock out two hundred. You go to the field, you test those and you find out whether those are going to truly preform on the field. I… I agree with you. I understand in terms of cotton and the cotton acres there. But the… there's other areas of the US that have heavy cotton use. And, I don't want to throw rocks. There's nothing that is giving me a reason to throw stones at a cotton grower at this point and think that cotton is the cause of this. Is it possible? One thing that… anything that you add to the tank… anything that you add to a tank has the

potential, the potential I believe, to influence the volatility. I will be the first to tell you that. Now who is going to test that? I don't know. But I'll tell you, if we are going to test that here in the state of Arkansas, somebody had better start building some additional experiment stations and we had better start hiring some folks. Because we can't do it with what we have now.

TF: I have another follow-up question here. The number of growers in Lee County that actually apply dicamba would be very few. I mean, you could probably name 7. And a lot of that went out under hoods. And it was right after that, in one particular incidence, that's when the bomb went off, so that wasn't…

JN: Well a hood… so again, I will come back and say, a hood, from a volatility stand point a hood… and Tom walked some of those down there where they were underneath a hood. They were underneath a hood and it was moving in various directions. A hood, that's what folks need to realize, a hood does not correct a volatility issue. A hood… The material hits the ground. It's on the soil surface. It comes off of the soil surface. A hood is not going to solve that. And yes, I was told in Lee County… Tom was the one that said. I spent a lot of time in Crittenden and I was down in Lee County but most of my summer has been spent in Crittenden and Mississippi County. A hood will not correct a volatility problem.

Dr. Baldwin: I would like to follow up on some of our earlier discussions. We will be testing additional Liberty products. When this topic came up we got interested, obviously, and started going out and taking samples. Subsequently we were contacted and in some cases by manufactures, saying, we want to send you some of our product for you to run through the lab. So we will be following up not only with the suspect samples but with several other samples also. So we will have additional information on that topic later.

(Taking questions from the public)

Day 2 Dicamba Task Force
First Set of Presentations (Monsanto)
(Transcript for video 102209[8])

TW: Ty Witten- 15 years working with Monsanto. North American Crop Protection Business & Technology Development

TM: Tom Moore- Regulatory Field Scientist. Dissipation Movement

JH: John Hemminghaus- Formulations expert

TF: Task Force

-What have we learned from Field Volatility Research?

TW: Thank you for giving us this opportunity. My name is Ty Witten. I have been with Monsanto now for about 15 years. Some of you may know me. Some of you may have seen me before. I don't hail from Missouri nor rural Arkansas so I appreciate seeing a nice pretty spot of it. I am from West Texas. I grew up on a cotton farm. Primarily corn, wheat, milo, those kind of things. For me, I remember dicamba early because I put Banvel to spike my spot sprayer for Roundup that my dad had me driving all up and down the cotton rows spot spraying weeds. So that is kind of early exposure where we are at. The next real exposure for me on dicamba was around 2005 and 6 as part of the team that had the opportunity to look on the strategy for movement of the biotech product, specifically in cotton, and then follow that through a regulatory submission globally and following that approval from a biotech perspective. Currently I a lead North American Crop Protection Business and Technology Development for Monsanto Companies. So that is the capacity that I am here today under. And I appreciate the opportunity to have and come back and review some of the pieces we have. We have about an hour here. I would like to kinda move through some information on this presentation but provide a little bit of basis for that and leave time for questions. But before I get started I would like to introduce some of the folks in the room. I couldn't answer some of these questions the best without having some of the experts. So I have Tom Moore with us and he will speak on a couple of slides here. He is our Regulatory Field Scientist that understands dissipation movement or volatility pieces submitted to the regulatory agencies. And I have John Hemminghaus, he is our Formulations Expert. He can have some good practical stories and understanding really of the development of what Extedimax was and is and where we started with Clarity based type formulation. Obviously yawl know Tina Bodka and Rachel Hurley in the back room as well as Chet Chaney in the room. So, we appreciate your time and will try to answer your questions to the best of our ability. If we need to stop in the middle, we can do that. If that is where we get. So to start with, we want to briefly talk about what we learn on our volatility research. I think, you know we have some challenges on where do we want to start with this, about what we've seen outside of Arkansas. Obviously, Xtendimax was not approved in Arkansas. So, some of the information we are going to share on our off target learnings this year on the inspections we have been on is not going to be based on any Arkansas data. Also, where we are on basic academic trials. I believe Jason had the opportunity and Tom talked about some of the trials that went out this summer in recent field days and those pieces. Who else around the US is conducting those same type of trials

[8] For the accompanying video to this and other presentations, visit:
https://www.youtube.com/playlist?list=PLT1_0w-7FibJHcjyRPWfF3rUk51msHCVB

as well, a little bit where they are, and their data. Again, I want to be clear that it is their data. Those were their trials, that they have generating collectively as a group and we will talk about that. Anything from yawl before we get started, gentlemen? Anything from the audience? Again, yawl can hear me from the back? Good, appreciate it.

So we look at… Before we get started, overall what we have seen since 2009 and really the development of chemistry alongside where we had the biotech product in cotton and beans, there has been a little over 1200 trials. All different types of trials. We have been talking about laboratory, field research, field applications on… on the chemistry, what would happen, how do we understand volatility. Those have been done in controlled environment as well as in field settings through the iterative process. And we want to reset some of what yawl have heard in the past. What that iterative process looks like, what it started with in 2009 and 10 as we move through that early base formulation and then what we ended up in Xtendimax formulations on the market today. Also, I would say that even through our field investigations of the research, as well as what we have seen in the field. The things that I would say is that the symptomology thats been exhibited on a broad scale outside of Arkansas, that I have looked at and the team has looked at, is not indicative of a mass movement of volatility. You have some movement that is resulting in symptomology but the indicators that say it is volatility is the driving behind it, doesn't exhibit that with the information that we have had in our inspections. Is volatility happening, is it a component? Absolutely. There is some of that that is going to be occurring. I believe we are going to show that there is not zero volatility and anybody that tells you otherwise, it's not the case. But it is not the driving force that we see for off target movement. So, we still believe we have information here to show as well as collaborative across the board that it is the least likely cause of damage for Xtendimax and other low volatile formulations when used with the product label in accordance with that label. So, with that John, you want to start off with a little bit of history here?

JH: Got it. Good morning. So what I am going to do, my intent this morning is to give you a little bit of the perspective that Monsanto's developed over the last 8 years as we have been working with dicamba formulations in an effort to develop products for use on the Xtend crop system. So we will start here. So, this is a slide that has been in a lot of our marketing materials and I don't want to spend too much time here, except to make the point that we have been paying special attention to volatility since the time we started looking at dicamba in 2008-2009. I will show you some field data that we have for 2009 and 2010 trials and then Tom is going to talk a little bit about some of the more recent data that we have on the existing Xtendimax formulation. Essentially, we have taken care though our humidome system to measure the volatility of dicamba. And this is not just the Xtendimax system, but this is Xtendimax with Roundup, and Xtendimax with other herbicides. We have tested each of these tank mixes that's on our approved list to ensure that they have a volatility range that is on par here with our Xtendimax plus Roundup. So, you can see here that we have eliminated things from the system that we feel are important to maintaining low volatility applications. The first one here is ammonium sulfate. So, additives or tank adjuvants that contain ammonium sulfate can increase the volatility of dicamba. We will talk about that a little bit more as we move forward, but that has been a key piece of our system as we set this up. The second piece is that we have eliminated IPA salts of glyphosate from our recommendations. We think IPA salts of glyphosate are effective and they work well, but in our volatility studies they have increased the volatility beyond the level at which we are comfortable with. So that was something that we have not enabled or not approved any of IPA salts of glyphosates to be with Xtendimax. Yes?

TF: What is the unit of measure? It say relative volatility, is that…

JH: This is just a relative. So in this test we set Clarity at one. And zero to one hundred percent. So we set Clarity plus potassium glyphosate plus ammonium sulfate as 100 percent and then these are the relative volatility rankings of that measurement. We have some slides in the future that will show the air concentrations. I just wanted to point this out as where our testing has been focused and the things we have eliminated in the system because of how they increase volatility in our testing.

TF: Where was this test conducted?

JH: This test was all conducted in our laboratories in St. Louis. So this is controlled environment testing from our humidome method.

TF: What was the temperature?

JH: 95 degrees Fahrenheit. So our humidome, just to give a little bit of an example about that. I can probably go back here. So this is a picture of the humidome. So a humidome is a lab test, we've conducted over a thousand humidome studies over the course of the last 8 years. The way we set these tests up is that we have these plastic tubes here and we put soil in the middle of the test. We can put plants, we can put other substrates, but soil is the thing we use the most because we are able to get a nice consistent source of soil. We monitor the soil moisture to be between 13 to 18 percent and we found that that's because that gives us a nice consistent volatility result throughout the study. We pull air through this piece of polyurethane foam right here and we pull it through at 2 liters per minute for 24 hours. And because we know how much air we pulled through here and we can take this polyurethane foam puff out and extract the dicamba off of it. With those two pieces of information, the concentration of dicamba that is on that puff and the amount of air that pulled through, we can calculate the concentration of dicamba that is in the head space of that exact humidome. So the benefit here is that it enables us to test tank mixtures and to test multiple products in a quick way. And I know, I read some of the remarks that Jason had made last week and some of the remarks as we have been working through field volatility testing ourselves, it takes a lot of time, energy and resources in order to conduct field volatility studies. So, it has really been important for us to have a lab based method that can rank formulations and really kind of tell us at the basic level what is happening with dicamba volatility. So this has been a really, it has been a workhorse of an assay for us.

So, just to talk a little bit about the story of when we've been able to… of what we have been doing with dicamba. So, I think this perspective will help give you the idea of where Monsanto is, where we started, some of the key learnings we made over the course of our development and why we have confidence in the volatility performance of vapor grip technology. So, we began defining this methodology to measure volatility when we started working in 2008. That was one of the biggest challenges. How can you measure dicamba volatility consistently across different situations? We developed the humidome method in 2009 and you will see some data in a few slides here from field studies that we also developed in 2009 in accordance or in cooperation with Tom Mueller from the University of Tennessee. By 2011 we had conducted over 25 field studies of Banvel and Clarity formulations to really define the profile and magnitude of dicamba volatility. So, we will talk about that a little bit going forward. 2013 we started to focus on drift studies. So we conducted large scale drift studies to look at drift from dicamba applications because from that first couple years of dicamba research, it became apparent to us that volatility was really not the main contributing factor to off target movement. That actually drift control and the application requirements we were going to put into place around drift, like boom height and nozzle selection, were really going to be the key aspects of keeping dicamba on target.

2015, at that point we had actually conducted training of 50,000 applicators. Employees of Monsanto did a "train the trainers" sort of approach through our experience sites and some one on one training and exercises that we conducted. We tried to get out as much as we could and train as many people as we could about the key aspects of the technology. And then in 2017, of course, we had the full launch of the Roundup ready Xtend crop system where we had all the approved chemistry as well as the traits. So, we will go back now and look at some of the field data. So what I have here is a summary of the three trials we conducted along with Tom Mueller at the University of Tennessee. And this study is important because what it does is it shows the profile of dicamba as it volatilizes across a 72 hour period. And you can see that dicamba does volatilize. Most of the volatility occurs within the first 24 hours. The number as you dig into this data is about 90 percent of that volatile dicamba, it comes off the field in the first 24 hours. You do see additional volatility beyond that in the 24 to 48 hour period and the 48 to 72 hour period. But that level, or that rate of dicamba volatility, drops as time passes. And this gave us confidence that dicamba applied fields, they are not an infinite source of dicamba to volatilize. There is an amount that is going to volatilize. It is going to volatilize the most in the first 24 hours and that volatility is likely going to occur in the heat of the day. So temperature is the key factor when it comes to dicamba volatility.

TF: So basically you are seeing the same thing as our scientists saw?

JH: The results that we have, in terms of the profile of volatility, is similar yes.

TF: If you applied on a large acreage you may very well see the effects on adjacent acreage that we've seen this summer.

JH: We can talk to that. I think the difference in what we are seeing is that the dissipation from this sprayed field is much faster than, than what we would see. So, you can see here concentrations of dicamba in the 200 to 250 Nano grams at 12 hours. So that is an air concentration of dicamba. As the air comes across that field, that concentration drops rapidly as those volatile dicamba fractions deposit on to surfaces. So, that is heavier than air and it will deposit as it leaves the treated field. So, if you think about a field and you think about air blowing across it. It is going to pick up a concentration of dicamba until it gets to the end of that field and then that concentration of dicamba is going to drop, and it is going to drop pretty rapidly. And we have some slides here that actually monitor around the outside just to show how quickly that does actually dissipate. Yes?

TF: What is the vapor pressure?

JH: Of dicamba?

TF: Well, of your formulation, of the Extendimax formulation.

JH: Okay. Yeah, so there is no… there is no. The vapor pressure is really of dicamba itself. So, salts don't have vapor pressure. The formulations don't necessarily have a vapor pressure. So, the vapor pressure of dicamba is the vapor pressure of dicamba and it doesn't particularly matter what the formulation is.

TF: (unintelligible)

JH: Uh, one, it depends on what you want. I, I can get that number for you but I don't have it right off the top of my head. Yes?

TF: (unintelligible). This is an average with a temperature range. Are these slides broken out relative to temperature? (unintelligible)

JH: These slides are not broken out to a specific temperature. But what you can see, this was a morning application. So, lower temperatures in the 0 to 6 and the higher temperatures here in the 6 to 12 as we approach the middle part of the day. That, that is when we started to approach this 95 degree temperature. So, the temperature range is 60 to 95 degrees. 60 degrees is typically in the evenings and 95 degrees were the average for the day time temperature. And that is typically the profile that you see with dicamba. You will see the majority of dicamba volatility occurring within the heat of the day on that first day of application.

TF: Where do Dan Wright and Kirk Remund live? Where's their research at?

JH: So, Dan Wright is a Monsanto employee with the formulations group and Kirk Remund is a statistician that works at Monsanto as well. So, this test was done in collaboration with Tom Mueller, Dan Wright, and Kirk Remund. This study is actually, is published in the Weed Science Journal and all this data is available there. It is a really nice journal article that shows the profile of dicamba volatility.

So, as we go forward I will show now a slide from… from some studies that we performed in 2010. And, these are now internal studies. We worked Tom and we defined a field system or field assay that we felt really helped us quantify the level of dicamba volatility and I think that it's important to note that the most effective way we found to do field volatility is through actual air sampling. So, soybean response time studies, they are good. They give you information. But these air sampling studies are actually what we feel is the most critical aspect of defining the, the amount of dicamba that is volatilizing and then where it's going. And so we used air sampling in both of those two studies. In this case we actually have a tank mix of Clarity and Roundup PowerMax. The temperature again, range between 70 and 93 degrees Fahrenheit. This tough test was carried out in Maryland Heights, Missouri which is actually near the Monsanto campus in the Missouri river bottom, there in Maryland Heights. You can see what we did here is we tested two different sprayed areas. We tested what we called a bare ground sprayed area (this is just pure soil) and then we tested more of a foliage type aspect. So, we actually took a weedy field, mowed it down and used that as our source of the uh, to spray the product on. We have five air samplers in this test. We had a center mast to detect the concentration of volatilization that was there in the center. And then we had four air samplers around the different sides of this, this rectangular sprayed area that we are measuring the concentration 10 feet out of that sprayed area. So, you can see the maximum concentration of dicamba at that center mass was 300 Nano grams per meter cubed. As we move ten feet out of that sample area, if you just focus on the maximum, we saw that 15 percent of what we had measure in the center ten feet outside of that square. And so, dicamba rapidly dissipates as it moves from that treated area. The concentration in the air drops… drops pretty quickly and Tom is going to talk a little bit about some of the modelling data and some of the other data that we have as we go forward. And this, this learning on the deposition or the dissipation of dicamba in the atmosphere is something that really our modelling study supports as well. So this a piece of data where we actually measured concentration and it also then supports what we have seen in the later stages of development. Yes?

TF: Say again what you said. Was that raw soil that it was applied on? (unintelligible)

JH: There is two, there is two. The red is applied to… the red is actually applied to raw soil and the

green is applied to a mowed pasture. Are any other questions on this slide?

So the concentration if you… if you play with the percentages. So the concentration starts around 300 and it is around 45 Nano grams per meter cubed 10 feet outside. So, you can see the magnitude of drop in dicamba concentration as it leaves the field. Ah, this is just another way to show this. Just to say that this study, these studies that we did in 2010 also supported the studies that we did in 2009 relative to the profile of dicamba volatility. This test only goes out to 48 hours but you can see the rapid… in this case we have more volatility in the 0 to 6 hours than we did in the 6 to 12 hours. But you can see that by 48 hours the amount of dicamba, the rate of dicamba coming up off the sprayed surface, was considerably lower than it was within the first 12 to 24 hours. That continues to tell us that these fields are not an infinite sources of dicamba. There is a finite amount of material that is going to volatize. It typically happens in the first 12 to 24 hours after the application.

So, now I am going to move on to some of our humidome data. So I made the point earlier when I was talking about the humidome, that it has given us the opportunity to test multiple tank mixtures and multiple products without having to go to the field every time we wanted to test one of these… one of these situations. And you can see here some of the formulations of, in tank mix with Roundup and the relative volatility of dicamba. And actually… this actually this gives you an air concentration of the dicamba that was… that was detected. Okay. So this is Clarity plus Roundup PowerMax plus Ammonium Sulfate. You can see the Ammonium Sulfate increase. I think Jason's data did showed this and a lot of the other data we have seen in many other areas have shown this increase with Ammonium Sulfate. As an aside, one of the things that I think is really important is getting that Ammonium Sulfate message out there. I think in my experience, a lot of people are using Ammonium Sulfate and don't necessarily think they are using Ammonium Sulfate. Some of the new adjuvant compendiums that are out there are actually clearly calling out Ammonium Sulfate as a component now that the dicamba systems are out in the market place. But in the past, you would have a product that was a water conditioner or deposition aide and it wasn't necessarily clearly marked on there that the product contained Ammonium Sulfate. So, I think that this is a big education piece. As we have looked at dicamba volatility, Ammonium Sulfate is the one thing that increases volatility to a level that we are concerned about. And that is why we made the decision to remove Ammonium Sulfate from the label and that is why we have really been communicating that. It's actually part of our application requirements.

You can see the volatility here from a Clarity/PowerMax formulation and then the humidome measurement of our Xtendimax with Vapor Grip technology and I also included our Roundup Xtend with Vapor Grip technology here so you can see how our humidome study shows the relative formulation of those two products. So, in our testing of Roundup/Xtend, the premix is actually the lower volatility formulation in terms of what we see here.

TF: How long after application were those taken.

JH: So, this an air concentration after 24 hours in the humidome. So, we spray that soil surface, close those containers, attach the foam plug in the hose, and then go in that 95 degree Fahrenheit growth chamber that is set at 40 percent relative humidity. And that is the standard condition for… for that humidome method.

Okay, so that's… that's the end of my slides here. So, what I wanted to do here today was give you a feeling for what we did in 2009 and 2010. To show what we learned about the profile of dicamba volatility and what we were able to measure in terms of the dissipation of dicamba

from a treated area. And now I am going to turn it over to Tom who is going to tell you about some of our regulatory steps. Yup…yeah?

TF: Did you conduct larger lot studies, like acreage, instead of small (unintelligible).

JH: Tom is going to tell you about the larger scale trials that we have done. Yup.

TF: Yawls initial numbers were at 40 percent relative humidity…

JH: Yes.

TF: And that test was 80 percent, or (unitelligible).

JH: We uh… when we were doing method development, we played around with humidity quite a bit. One of the problems we get in that system, is that if you get the humidity level up to high, water condenses in that hose and then you get dilution and problems with your results. So, we have locked in 40 percent because it because it's… it is not too dry, but it also provides a humidity that doesn't cause condensation in hoses. So, it's more a function the way that the assay runs than anything else. Yes?

TF: With what you just said, do you have any idea how often the humidity is 40 percent in Arkansas?

JH: I would imagine it is a lot more humid than 40 percent in Arkansas.

TF: Almost never. But, I mean, I question how effective the humidome tests are to field applications in our environment.

JH: I think the environmental conditions in the field are going to be different than they are in the humidome, for sure. And we don't always see the same… I mean we don't always see the same concentrations of dicamba, we don't detect the same concentrations of dicamba in the humidome as we do in the field. What I would say is the humidome is not by any means a replacement for field work, but what it does is, we always get the same typical rank. So it tends to give us this the same ranking of the formulations and that has really been the usefulness of the humidome. We could test with AMS versus no AMS and we could see the difference. We can test, you know, Reflex or Flexstar with Roundup and see the difference. So, really, even as we were putting together that website, the Xtendimax website that had the approved tank mixtures on that website, it allows us to go through and really see are there anyone of these tank mixes that is going to cause an increase in volatility. And we set that limit in terms of what we were comfortable with in terms of Xtendimax with Vapor Grip and that is where we wanted to keep that. So that is where the humidome has been really helpful for us. Not necessarily as a segregate for the field.

TF: So you look at relative humidity component, you think that the rankings are going to be similar to what you got. Whether its 40 or 80?

JH: I think the rankings are going to stay the same. I think the magnitude of what you measure is going to be… is going to be different. I've seen... I've seen presentations both ways that say relative humidity can increase volatility and I've presentations that say it can decrease volatility. I think relative humidity is certainly a factor, but a think there are other factors. I think… when we went through all of our temperature data from all of our trials. In the field or in controlled

environment. The single number one factor is temperature. And you can… And we can talk about humidity, we can talk about other things. But we should really be focusing on temperature I think as we get there.

TF: You think humidity is a lower factor on volatility?

JH: I believe, yeah. Okay. I will turn it over to Tom. Thanks a lot.

TM: Good morning. Since the 6 years that I started with Monsanto, there hasn't been a day that's gone by that I haven't thought about dicamba in some aspect. So I am really excited to come here and talk about some of the science that we have done and get it out there and get you all familiar with the rigor that went into this work that we did. And so, what I've got here behind me is a graph or a picture that shows how we do this assessment to estimate the potential effects of dicamba vapor to none target plants. This process follows EPA methods and it is a little bit complicated, so I hope you can bear with me through this. There are three main steps that I want you guys to focus on. First step is a field study where we measure the… (Handed a new microphone). Thank you. Alright, is that better? Thank you. Alright. So the first step is a field study. The purpose of that field study is to measure Flux. You can think of the Flux as the rate of the amount of dicamba that is coming off of the field after application. The second step is to use the EPA model called PERFUM to estimate air concentrations that could be present off target. And lastly, we examine the relationships between air concentrations and plant symptomology so that we can understand what sorts of off target air concentrations could elicit soybean visual response. Yeah, sorry (Adjusting microphone. Switching microphones again). Is that better? Alright! Very good. So, I will just rehash those points one more time in case you were not able to hear because of the mic issues. The EPA process, a little bit complicated, three main steps. So let's focus on those three main steps. Measure dicamba in the field after application to determine the amount of dicamba coming off the field. And then take that information, use the EPA model PERFUM to estimate air concentrations off target following application. And then we determine the air concentrations that are associated with visual symptomology in soybeans. So, one of the questions I get often is, well… "Why do you need such a complicated approach? Why can't you just put beans in the field and measure the effects there?" That is a great question. That's a great way to do it. You get exposure, you get effects and it all happens right there in the field. And Monsanto has done several of those studies. It's a perfectly good way to do that. The downside is, the results of those studies capture the conditions of that particular field on that particular day. So, in order to understand the range of potential symptoms that you can see in a range of conditions, you have to do a large number of those studies to really understand what is going on. We know these studies are hard to do, take a lot of time, a lot of resources. The benefits of this approach is that we can measure flux under ideal conditions that are most conducive to volatility. Then combine that information with EPA model which incorporates weather data from all across the country and estimate air concentrations for a much larger geographical area. Not something we could do readily with field studies. And lastly, compare those air concentrations that we are estimating with the model to measure data that we determine in a laboratory for air concentrations and symptomology. With any modeling exercise there is always going to be uncertainty in there, because we are, we are making estimates. The way we deal with that uncertainty is to increase the conservativism of the assessment. So, we want to make sure that we are over shooting rather than under shooting potential exposure and effects. And so, for each step of this process we are… we are incorporating a level of conservatism. So for the Flux study we conduct these studies in Georgia and Texas where it gets nice and warm. We apply it to sandy soils where dicamba is more prone to volatilize. These are near ideal conditions in

terms of heat and the soil matrix for measuring volatility. So we have got worst case scenarios there. So when we move into the modeling step, we know that we are not underestimating the amount of dicamba coming off of the field. For the modeling, we use weather data from a number of different geographies. So, for the data I am going to present today, we looked at Raleigh, North Carolina; Lubbock, Texas; Phoenix, Arizona and also Peoria, Illinois to cover the soybean growing region. Of those four scenarios and the data that I am going to present, we pick the scenario that gave us the highest estimated off target air concentrations. That would happen to be from Raleigh, North Carolina.

TF: (unintelligible) …question on the field sites in Georgia and Texas. Do you know the soil types for those?

TM: Yeah, the Georgia was almost beach sand. It was 88 percent sand, it was white coastal sand, and in Texas it was clay soil. And then for the exposure symptomology scenario, I will talk about this in more detail later, we take soybeans and expose them to vapor in a sealed humidome environment, so similar to what John presented earlier. So this is more conservative than what we have seen in the field because those… the vapors in that scenario aren't being dispersed by turbulence or wind or what not, they are essentially in a closed environment with that vapor. So, although there is some uncertainty in this assessment, there are so many levels of conservatism that the results that I am going to show really cover a range of other conditions that could occur… in the soy and cotton growing region.

So, this is a typical layout of a field study. And again, the purpose of this study is to measure Flux, so we don't want to have any plants or anything located here. We just want to spray dicamba and calculate how much is coming off. So, we've got 28 of these different types of plots that we sprayed throughout the country. So in addition to Texas and Georgia, we also looked at Indiana and Nebraska. And so there's two main points that I want you to focus on here. Well, let me back up. So we did two types of applications. We did a bare ground application, which is represented by the brown area here so that is about 4 acres. We also do an over the top application. We did it with cotton and soy and that is about 10 acres. So, we need a bigger area for the over the top application because those plants increase surface roughness. So we have to have to have a… a bigger area to get a good measure of dicamba coming off. Each plot has a weather station. We record a number of environmental parameters. Most importantly wind speed and direction. We also have center mass located in the middle of each spot and that's what is shown here. And what we do with that, we measure dicamba air concentrations at 5 different heights. So, those puff samplers that John was talking about earlier, located right here. So it is a standard matrix for collecting dicamba. So 1, 2, 3, 4, 5. And so as we go up in that center mass the dicamba air concentrations that we collect become less. And so that relationship between height and air concentration is critical for determining the amount of Flux coming off the field. So these are the results for a Clarity application conducted in Georgia. So this is a one pound rate, 88 percent sandy soils. So, we got two Y axis here. We will start on the X axis we have time. So we collect samples up to three days after application. The black line here represents the amount of Flux, so that is the amount of dicamba coming off of the field. And so, similar to what John presented earlier, these results show that the maximum amount of dicamba coming off the field occurs in the first 24 hours. So this represents a 0 to 6 hour time point, this represents a 6 to 12 hour time point and this is a 12 to 24 hour time point. The red line represents the cumulative mass being lost. So this is the amount coming off of the field.

TF: Say that again, now. What was the red line?

TM: This is the, so there is some amount of dicamba coming off of the field. This represents the cumulative mass over time of how much is coming off. So these represent… these represent the Flux for each given period. This represents the cumulative loss. So over the three days that we measured dicamba concentrations, we saw that less than 0.1 percent of the dicamba applied volatilized from the site.

TF: You said 0.1 percent volatilized?

TM: 0.1 percent of the mass applied and this is a one acre, a pound per acre application.

TF: Within 24 hours?

TM: Total over the course of three days.

TF: What was the percentage was in 24 hours?

TM: Umm, that corresponds to this time point here. So, over… about .07. So, it is the majority.

So this is with Clarity. When we add the Xtendimax results to that, we can see that the amount coming off the Xtendimax field is even less relative to the Clarity. So again, a majority of the dicamba vapor comes off within the first 24 hours. But when we look at the cumulative mass over the three days it is about .05 percent. So obviously, very small amounts of dicamba that are coming off of the field following application.

So we have got a good measurement of the amount of dicamba coming off field. The next step is to estimate air concentrations from this data for a range different locations and then understand how those concentrations correlate with soybean plant symptomology. And so, in order to do that, we developed this relationship between air concentrations of dicamba vapor and soybean plant symptomology. And the way we did that was in a humidome study. And so, this a humidome, similar to the one John showed you earlier. Key difference being here is that we've introduced plants. John sprayed soil. It is a great standard way for making relative comparisons. In this case, we wanted to know what the dicamba air concentrations were that correspond to a level of symptomology. So, the way we did that was we incorporated… we sprayed dicamba on these petri dishes here. Placed those inside the humidome along with four plants. Sealed them up for 24 hours. Placed them in a growth chamber where we could control temperature, humidity, things like that. During a 24 hour period we pulled the air through a puff sampler so that we could determine the amount of dicamba vapor that those plants were exposed to. After these plants were place in the humidome and the growth chamber for 24 hours, we moved them to the green house and they were grown out for 21 days. At 14 and 21 days, we measured plant height and assessed visual symptomology. And so, as you can see from this relationship here, we have got a strong linear correlation between the amounts of dicamba acid in the air and the symptomology associated with it. And so we saw anywhere from 3 percent up to 52 percent symptomology. I'm going to call out a couple specific levels here because they are relevant for the next slide. Is 5 percent, so that's the level where you might see some waviness in the new leaves. 10 percent where there could be some slight crinkling of the terminal leaves. This corresponded to concentrations of 120 Nano grams per cubic meter and 31.2 Nano grams per cubic meter.

TF: Can you explain to me what's in the petri dishes?

TM: Sure. We took those petri dishes and put them in a track sprayer and sprayed various amounts of dicamba on top of those. So, we used that as a way to introduce dicamba into the test system.

TF: Why would you not use soil?

TM: Yeah. So in this case… so we use soil for making relative comparisons. For this case we don't want anything that would bind to the dicamba and introduce more variability into our system, so we have an inert material like glass, everything that is sprayed there could potentially volatilize. So, we had to work really hard to get the right mix of dicamba on these and so sometimes we put 2 plates on and sometimes we put 4 plates on and sometimes we put 6 plates on so that we could get this nice range of concentrations.

TF: So you totally eliminate any environmental variability. Is that what you are saying?

TM: Yeah. This gives us a more controlled system. Because again we are just interested in getting that air concentration.

TF: And the air concentration is what?

TM: So the air concentration? So for 5 percent visual response is 31.2 Nano grams per cubic meter. For 10 percent is 120 Nano grams per cubic meter.

TF: Now, how does that compare with your field studies you had earlier? Like, as far as the amount in the field?

TM: Yeah, it's coming.

JH: So, the one comment I… I mentioned… get this turned on… I mentioned that concentration of dicamba that was outside of that treated area. So, we had 300 Nano grams in the center of that plot. 10 feet outside of that plot we had 45 Nano grams and as you move away from that plot, the level of dicamba decreases from there.

TM: So now that we understand this relationship. We know how much dicamba air vapor corresponds to symptomology. We can compare that to the air concentration we estimated using the EPA model.

TF: Back up a slide a minute, if you don't mind.

TM: Sure.

TF: For the 52 percent up there, do you have a slide of the injury from that?

TM: No… I don't have a picture of that.

TF: Alright, so make sure I got this right. So, outside of your studies you found 45 Nano grams in the field studies?

JH: 10 feet.

TF: 10 feet from the source, you found 45?

JH: That is correct.

TF: In your example here its 31 and (unintelligible)

TM: 120.

TF: (unintelligible) Okay, I've got my ranges.

JH: And the other thing to point out is, that the initial study where we found the 45, was actually from the Clarity plus Roundup PowerMAX. So the 45 Nano grams was not from the Xtendimax plus Roundup treatments, it was from the Clarity plus Roundup treatments.

Advisory member: Also, that was a 1 pound application.

JH: That is exactly right… you are right, it was a 1 pound application.

TM: Okay, so taking that information, we've got… Do you have another question?

TF: On your 4 acre bare ground plot a you had, and the 10 acre bare ground, do you measure the level of dicamba outside of those areas?

TM: The primary measurements come from the center mast cause we… again, it's the relationship between height and concentration that's really critical for measuring Flux. We do it… we do have air samplers located outside and those are only running during the application period. So those…

TF: (unintelligible) …is the level in the center… (unintelligible)

TM: Yeah. So the level in the center, the air concentrations are used to calculate the rate that comes off.

TF: Do you have that number?

TM: So they vary over time and by distance. So there's a lot of numbers. But the take away is that it's not necessarily the concentrations that we detect. It's how they decrease off the center mass that we're really interested in for Flux calculations.

TF: You don't have those numbers?

TM: Yeah, I do have the numbers but there's a lot. So…

TF: What was the average you would say, just off the top of your head?

TM: I would hesitate to guess without having them in front of me. So…

TF: I'm just a producer and I have trouble following all these Nano grams and all this. I'm not as concerned with what you are seeing with the rates as I am with what you are going to do with my crop. The damage is going to occur and I don't care what the concentration is. The damage is there and if it damages me what are we going to do about that?

TM: Yeah, I understand. And that is what we are building to. And so, on the next slide I hope I can answer that question for you.

TF: Thank you.

TM: Holler at me if I don't. Alright. So, I am going to draw your attention to these vertical lines, the horizontal lines here, excuse me. So this 120 Nano grams per meter. So that comes from the previous slide. That represents 10 percent symptomology. 31.2 Nano grams per meter. That represents 5 percent symptomology. So, remember when I told you we build in a lot of conservativism into those. So, we look at Flux that comes from our crop scenarios. From our bare ground scenarios. And we calculate Flux a couple of different ways and pick the one that gives us the highest. And incorporate that into our PERFUM model. We measured it for Raleigh, and Lubbock, and Phoenix, and Peoria. Raleigh always gives us the highest. That is what I'm showing here.

TF: Where did you get that data from? The 13.4 on the (unintelligible)?

TM: 13.4. So these are the air concentrations that we estimated from the model at 5 meters, so 16.4 feet downwind of the application area. Yes?

TF: It is not real data, it's just model data?

TM: It is the model data based on the Flux information… the Flux that we measured in the field and weather conditions from those four locations. These are estimates but again we shoot high so that we're not underestimating.

TF: So you don't have any real data, other than models?

TM: So we have the dicamba that we measured in the field. We have the… we have the weather data from these different locations. We put them together to estimate an offsite concentration. We calculate a range of concentrations. What I am showing here is the 95th percentile. So, it's a number that is higher than all but 5 percent of all the possible estimates. So again, this over shooting.

JH: The really important measured data is the Flux. So the Flux is the concentration of dicamba that is coming off of the field per square meter of field that is treated. So that tells you how much dicamba is really coming up. And that is why it is really hard to get to a single… a single air concentration number. Because that Flux really tells you, okay, if you spray this acre, this number of acreage, this is the rate of dicamba that is coming up. So this is the amount of acre that you sprayed. So this is the amount of dicamba then that you would calculate if you assumed that that rate was consistent across the four acre sprayed area that you had or not. So there is real data. The data is based on the air that is actually… the dicamba that is captured in the center of the plot and then that data is then modeled based on weather data for how it would move outside of the plot. And what it really shows is dissipation. So it shows that you have concentrations of dicamba in the center of the field. It shows that the peak of that volatility occurs within the first 24 hours. Volatility remains low throughout the 72 hours. You can detect some dicamba. And then it says as you move outside of that treated field, just like those initial field studies, where we showed that dissipation from the center to outside the sprayed area, that the dicamba is behaving the same way. At least as these models would predicted it to be.

TM: So we have good agreement between what I am showing here and what John showed earlier from his field studies.

TF: My point is, that data you are showing on the screen is not field data, its modeled data.

TM: Yeah, it is estimated.

JH: Correct, correct.

TF: Can you show us, since you can model this, then surely you have modeled what affects you would see if you sprayed this over thousands of acres, instead of just a few acres. Can you show us that?

TM: Yeah. So that's not… that's not something that we've modeled.

JH: Yeah, we have the capability to do that and we are actually looking into that now. So we did scale… What is the acreage scaled up to Tom?

TM: This represents an 80 acre application area.

JH: That's why flux is so important because it gives you the rate of dicamba and you can do these on 10 acres and scale them up to 80. We are going to take a look scaling them up even higher than that. The important part here is the dissipation that occurs from that sprayed field. We think that that is the critical thing. So the rate of dicamba… that's why we go back to volatility, we do not believe is a main contributing factor here because you can measure some volatility but it dissipates very rapidly as it leaves that treated area. Yes?

TF: What's the largest area that you have measured Flux on?

TM: For measuring Flux, the largest are is 10 acres. But then using the model, we model offsite exposure for up to an 80 acre application.

So, a couple points I want to leave here you with is that these are high end estimates of potential exposure. We are comparing them to high exposure scenarios from the humidome study. For those soybeans that were enclosed for 24 hours with dicamba vapor. When we look at the 95th percentile concentration here. So, highest estimated… one of the highest estimated concentrations we have. We see that they are well below levels that would result in visual symptomology. And again, as John pointed out, these results are in line with what was presented earlier from the earlier field studies conducted in 2009 time frame.

TF: What year? Did you say 2009?

TM: Yeah, the (unintelligible) study was 2009.

JH: The studies that we did in the field between 2009 and 2011. Those studies correspond with the results we got here and this study was conducted in what? '16?

TM: 2015. Well I appreciate your… the opportunity to talk with you today. Thank you.

TW: Anymore questions for Tom?

Advisory Member: It looks like your company spent a lot of money looking at volatility prior to the release of this product, and so when we started having so many acreage issues, did you take the opportunity to put any measurements out in any large scale field areas so we could see what's going on? (unintelligible)… looks like that would have been cheaper and easier to know what the volatility is, to get these larger areas and do some studies.

TW: Great question. So for those of you that didn't hear. He said, hey what about… what are we doing for measuring volatility now and how it gets used versus what we had for laboratory studies. There is a couple of distinctions I want to give and the reasons these gentlemen got up and talked about is… is the absolute understanding of what could volatilize. We felt it was very important versus some of the practical pieces. What does it do for seed production? What does it do when I spray it on my farm in West Texas, or in Arkansas, or in Illinois? What's going on and what do we need to understand for environmental safety, as well as grower safety. I think and there is two different things there that we need to be clear about. And so, as we understand that environmental safety assessment versus what happens if I'm spraying next to Lloyd that's my neighbor. What happens to his field? There is a couple of things we needed to consider with this product. And I would say that one that is very important in all of this, is, use of a buffer. And where does that come at. And we will talk about that briefly before we go to the next slide is… is if you read closely, things that are called sensitive crops or susceptible crops. One of those is soybeans. And it says, if it is down wind do you spray? And is a buffer good enough? No it is not. And the comment is, you don't spray. Because physical drip, regardless of the volatility, is still going to be the primary factor of that off target movement to that field that is close. So is a 110 foot, because that's what the folks say. Hey, if I got 110 foot it should be okay with my neighbor if it is down wind. Our comment is, no it is not, because the label says don't spray. The 110 foot buffer is not meant to protect your neighbor. If you want to protect your neighbor, then don't spray when a susceptible crop is down wind. And so, the field tests, the things that go out, is where we have thousands of acres of seed production and other pieces in development of this from 2013. And those pieces corroborate the information that we have here that says, what's the visual symptomology when we've had off target movement and what we've experienced in the field of the product and product development. Does it result in the symptomology that we having being reported across some areas of the US that say I have blanket fields, I've got coverage, it's wall-to-wall, it's got to be volatility cause hey, I saw my neighbor spraying three days ago and it's here. A couple other things is, understanding that it happens 14 to 21 days and that drift rate. What happens with environmental conditions with potential inversion or spraying into an inversion with a small droplet size? Some of those things can be really important even if you're using an approved product. And when you are not using an approved product that even continues to exacerbate those issues. So real quickly, I am going to move on. Briefly, where we are here is we still… we still have information and believe volatility is still not the primary driver of the symptomology we are seeing across the mass… mass movement here. Know that volatility does occur. Absolutely occurs. But the amount that would occur is going to happen very quickly within 24 hours, you could detect it out to 72. But again dissipation or the movement from that field as it moves across, Dicamba is heavier than air, it is going to fall out over time. And where it does is going to be fairly quickly after that sprayed field of whatever will volatilize within a 24 hour period.

TF: And that distance would be?

TW: So, distance is going to be… by the information they have here let's say it could be, let's say, 40 foot, could be 100 foot, you know, but it is not going to be a half mile or ten miles from the mass and what would happen across that. Now, could you get captured in an inversion? Would you spray in an inversion? I think that those things are different comments. But, from the true volatile fraction of what would happen, provided low volatile formulation without AMS or other pieces, the amount of magnitude that would come off and move is not going to, from yawls perspective, is not going to be the driving force of some symptomologies that occur outside of your label of a quarter mile of a downwind susceptible crop being sprayed.

JH: Tye. If I could just jump in real quick. From all of the studies that we have done, we have never seen volatility go beyond the drift field. We have never seen it go further than the spray drift. Typically the level of symptomology we'll see from a study when we have plants in the field. We will see symptomology at 30 feet. We will see some symptomology at 15 ft. You get out beyond 40 to 50 feet, and the amount of symptomology you see is incredibly low, if you see any. So it is really in that 50 foot area around a field where we do still see some symptomology do to volatility. That is because it dissipates and deposits very rapidly as it leaves the treated area.

TW: I think the… I think the piece with that is… in a field situation it takes, unless you have a cover up, as Jason explained earlier with buckets, plants, sheets, whatever it is. Be able to detect that. That's one level of methodology to do it. The other one would be is if you have a prevailing wind or low variable winds outside that wind that would be opposite at some point in time maybe that would be a way you would have some detection of that volatile fraction. So in other words, I am spraying in prevailing winds moving North by Northwest. That's where you are going to see drift symptomology. Volatility is going to be a component of that. But does it exceed that drift plume? I would say it would not. But, hey did volatility occur? You want to go back and say, okay when the wind… did it go down to zero or did it change direction, do I have symptomology up field? Those are ways you detect and see if you have volatile fractions occurring. So, if it's still staying within a prevailing wind movement then of course it is going to be within that drift plume. So again, you need coverage as we talked about earlier or something to isolate those plants or bring in surrogates within those areas.

Advisory member: I've got a question, what was the relative humidity range with your field trials?

TW: The field trials and regulatory studies… I think there was a variable range for relative humidity from Georgia to Texas to the North.

TM: Yeah, so… is this on… so it got up to 90 percent in both cases. So, it is higher in the morning and goes down over the course of the day to maybe 60 percent.

TF: You were saying that the volatility wouldn't do much more than the drift plume might be. But how do you explain in my situation where 100's and 100's of acres were sprayed and I see symptomology from every square corner of my fields and I can't see anything but the same symptomology across… and I can even see it as far as 2.5 miles. That is not a drift plume.

TW: No. I would say…

TF: So are you saying I'm just seeing something else?

TW: David, I can't answer your question. I've walked east of the ridge and up into Tennessee, and in the Boot Hill of Missouri and some of these acres that we've seen in these fields and I will tell you some of them you would say… hey there is some prevailing movement or some patternization coming out from those fields. But some of those fields I would say is… could be tank contamination that is not, maybe you have some old dicamba within the tank. Some of it I can't tell you or give you an answer or say I can absolutely point to that investigation that would happen. There's a lot of things that have gone on. I don't know if it was Xtendimax in, it wasn't in Arkansas I will tell you that. Was it used with the appropriate methods in and around all the surrounding areas? I don't know if you are able… will be able to get into what happened within that. But, I can tell you from what we know from this product and what we've seen in multiple states. 33 states across the US on 25 million acres. On issues and calls we've been on, and I will

get into some of the ones we have been on, as well as the success of what's going on. So again, I think there's some questions that this group as well as the academic community has, within Arkansas, to continue to investigate and to understand, is there something unique here that we don't have information for right know or can point to?

TF: Earlier we talked about humidity may not be as big of a factor as temperature. You never got into what that temperature… where you think it really starts to be a problem.

JH: So, the vapor pressure of dicamba is related directly to the temperature. And you can look at studies on how temperature impacts vapor pressure. If you look at those curves, temperature really has no effect on vapor pressure below 30 degrees C which is, you know, 90 degrees Fahrenheit… high 80's Fahrenheit. So, you will start to see some impacts. On our studies… we've conducted all of our studies around 95 degrees Fahrenheit. So, all the studies that you have seen in a controlled environment have been conducted around 95. We are confident in the volatility performance of Xtendimax in those high 90s. We have tested up to 105 degrees and looked at that volatility difference. You will see higher volatility as temperature increases but then it gets down to actually determining… it's going to dissipate quickly when it leaves the field. So, what's that relevant temperature that you really want to get to? 95 degrees is a relevant temperature, I'd say, for dicamba volatility.

TW: Okay. So real quickly, we will go through some of the pieces that we had. We had the opportunity to bring together… we appreciate the involvement of 5 of the Universities meet earlier in the year to say… Hey, what would we need to look at? What would be the bioassay for a field trial? And I think for this group, I believe some of yawl were out last week or early this week, no last week with Jason and some of his trials outside of Keiser and those are represented here. His peers also conducted this with the University of Tennessee, Mississippi State, Purdue, and University of Nebraska. These are different trials that are ongoing at this time that Monsanto had the opportunity to help support. But these were their trials that they came together as a group with their assay development and be able to detect in a field situation. And so, I absolutely support their information coming out of them. Real quickly, they have the low tunnel volatility trial, the hoop huts… the small in field hoop houses that you have that I believe yawl saw, that had PVC pipe. You had 4 pounds, in this case, of dicamba on flats put in there and you have volatile fraction coming out and exposing those plant rows immediately adjacent. We have a large plot drift in volatility, where you had the buckets to show that drift plume and what volatility components would be associated with there. Then we had some small plots drift with nozzles and boom height to show the effect of application requirements and how important those are. And those trials are ongoing and we feel very confident in the information coming out of those trials and we appreciate the folks and their interest in doing it. This is coming out of Purdue. This is preliminary data that Dr. Brian Young sent out of Purdue University of his low tunnel volatility trial. And I think that what we are going to see across all these, in my estimation, is you are going to see some differences whether it's the performance of a Xtendimax or an Engenia or all those that you have low volatile products are going to be relatively low or together. They shift and go back and forth depending on where you are at. But all those will be of the 4 pound rate, the lowest amount that would occur immediately adjacent to that hoop house and exposure and quickly dissipate across that field. One of the key things that we want to show is that again the Banvel piece is absolutely higher immediately outside house and AMS can take away any benefit you have there. And so, we appreciate Brian sending this to us as an example of what goes on and where the injury symptoms was immediately adjacent to the flats. And again, it can… quickly dissipated

out beyond the first and second row. And so, that's an important piece of this. Is if you put in a 4 pound rate under a hoop house, have increased that humidity at a high rate, increase temperature, all that dicamba is being volatilized there, pushed out along that hood. What does it look like and what are that soybean injury at the time immediately adjacent to that field exposure. So, these are some of the data that are going to be ongoing that you will see from these Universities as we had on the previous slide.

TF: How long was it out there?

TW: It is 24 hours.

TF: 24 hours.

TW: Yeah

Advisory Member: 48

TW: Yeah, 48 sorry. So they kept that out there. Anything else Jason? You want to make any comments?

JN: It's two pounds, not four. 88oz of Xtendimax, that's 2 pounds.

TW: Yeah, 2 pounds 4x rate. Sorry. Thank you. Any other comments? Okay.

So, where are we in 2017? Briefly, I'll level where we stand, where we think, on seed product throughout the US. About 25 million acres this year that got planted whether you are talking about cotton and beans across 34 states basically. We've had good reports. Good success across a lot of the areas. Obviously in this tristate, specifically in Arkansas, had some questions on that. Again, Xtendimax was not part of the program in Arkansas but obviously the trait was. I feel like the… obviously the gen x and pieces that we are not talking about are not in question, but I feel very confident in the products that we have. I want to stop here a little bit and say that introduction of the product to the market place brought some challenging results: One, on how it came to market was unique. On having a one tip and no tank mixes starting off the season. And some of the other things I will talk about here is kind of to give you a story about that, of adding tips to that Xtendimaxapplicationrequirements.com or Engenia had the same piece as well as tank mix partners. We made the comment earlier that one of the things that we felt was important for our tank mix partners to take an additional step other than understanding just movement and drift, to get a tip or product approved, understanding those tank mixes. We went ahead and said… Hey, we want to make sure those herbicides that we have on our website goes through a volatility test as well. That we want that extra step, just to make sure that we are giving that lowest volatility option. One of the pieces we had was the use of a DRA to measure particle size and physical movement. That DRA brought in some questions. So, the primary thing on our label that we had as a new requirement was to monitor for weed resistance. I think that is still one of the overruling things that we have here is we have resistant… glyphosate resistant weeds that growers are looking for opportunities to control. So that's still was a primary piece that we had starting the season. So, with that conditions of registration we had a product here… we have a phone number here that we had to have published that said… Hey, if you have any issues on weeds, call this number and we will come out and understand the potential for weed resistance, sample and ah… determine whether it is or is not. That was the basis for that primarily. So,

we had initial calls on use of DRAs and coverage and some other pieces, but as we went into the season saying we could use this number to continue to support product inquiries and understand and gather information, the same questions yawl have. If growers or applicators are having issues, call this number and we will come out and get a field engagement specialist in there. Collect some basic information data, to gather continued information on education, product improvement, whatever we need to do. We've been doing that. And we've been doing that very actively. And so, when somebody calls in, they get a number in St. Louis… a real person does answer and a grower gets a phone call back within 48 hours and tries to schedule a field visit. That has been our process all season long. So, to date we responded to over a thousand inquires specifically on applicators who've sprayed Xtendimax. So, I want to make that clear, because this is not the total mass of calls we've received. This is a caller that says… Hey, I bought the product or I applied the product, Xtendimax, I have a question. And so, this is not the entire population. And these are the people that have self-disclosed, self-called, and said… Hey, I want some help, I need something to do. So, obviously, no calls from the state of Arkansas done on this. But one of the things we have is our early evaluation where Xtendimax was used, factors leading to off target movement are readily identifiable. Is that we have somethings that we can talk about and point to that says the label may not have been followed. The use of illegal dicamba products and other contamination or other issues- sprayer hygiene, whatever else, are factors not reflected in this information. We haven't got that piece yet, we haven't gone down, and we may not go to see what was all surrounding the field in question. Right? We don't have the ability to walk on your piece of ground just as well as you don't have one to walk on mine. So, obviously we are going to the site of the caller that says, this is the piece of ground that I have a question on, we are going to inspect and go there. So that's where we are at.

The majority of the cases also, volatility does not appear to be the cause of off target movement. I will get into some specifics here real quickly. So out of those over a thousand investigated through that phone number, of individuals who sprayed Xtendimax, and they have self-disclosed and called us. By our field engagement specialist… so when we started this season to support this we brought on about one hundred-thirty people on to Monsanto associated throughout 33 states across the US to help support these field calls, so we could fast respond. We could also use these folks to make sure they were familiar with agriculture. A lot of them are retired extension service folks, company folks that have careers in agriculture that know what they are looking at as they go into these farms. So that was the important piece too, and we appreciated the staff that has really helped us throughout the year. What we've done is… we have evaluated compliance on the data provided us from the applicator. These are the factors that are still driving some of the pieces on the label for the off target movement that has been reported. Some of the things that we have continued to look at is, the approved tank mixes. In doing that, as you can imagine, that data set gets quite large. You've got 130 people entering in all the tank mixes. We're trying to look at those permutations and understand what was approved and what wasn't. Understand the calculation of information we're given on nozzle pressure, gallons per acre, tip, ground speed, as those things jive together in terms of what we were being told. And understanding the sensitive crops downwind and what was surrounding those individuals on label compliance as well. So, obviously, there's some other things that could be included. And again, we don't necessarily know what the neighbors were doing. We don't know if off label products where used. Again we're testing for weather factors, on inversion and those pieces.

This is the data that we have to date, specifically as of the 18th, I believe, is what we had on here for this trial. We have had 1,356 calls come into the call center in St. Louis. We've been

on a little over a thousand of those so far across the US. 858 of those applicators, with their information they provided, we had sufficient data to review those first 7 of 10 that I talked about. Not including tank mixes, not understanding fully what's sensitive around them and the buffer pieces. What we have today is of the 77 percent of the cases evaluated, about 660 of those, they self-reported errors with one or more of the factors that we had. And I will go to those details here in a minute. We are still evaluating key requirements for environmental and weather data. There has been lots of reports, I think, by Missouri and Tennessee of inversions. Other pieces. We want to double check some of those things where a test wasn't conducted in the field at the time of application. Are those factors? Or other things that may have been associated within the neighbors on that. On these 158 that we have that are incomplete information, we are going back to those applicators, asking them for more detailed notes and information if they have it. 340 are in process today throughout the US and in the northern territories as we move out. And again we still have the pieces on the ones that look like, okay are there other environmental factors and other issues around surrounding neighbors that may have been involved? But out of the 660 were clearly identifiable factors that could have contributed to that volatility… or not volatility for off target symptomology, excuse me. So, when we look at off target movement, what's our highest number here? Really, it's this required buffer and whether they used a buffer, didn't use a buffer, or should have not have applied. That still continues to be one of the primary factors we see out of the folks we have investigated on. About half of those there indicated that the required buffer was in question. To use one as well as do not apply. Again, we have some issues with approved nozzles, boom height and all the way down to ground speed being below speed. So, one of the things that we have here is training continues to be an important component of this versus what you might be used to or folks have been used to up front. We feel like that is important. One of these pieces that we will continue to come out with is understanding of environmental conditions. What can we provide in tools, education efforts, and other pieces that can active, real-time assessment before you flip the switch in the field as some of those may have been doing that? We will continue using some of the resources that we have around climate and other things to really understand the weather impact. Some of the questions you gentlemen have posed here about humidity, other things to correlate data to come back and say was there an overriding factor on the information we gathered on these calls that we actually have quantitative data from now. We have time of application, we have date of application, we have conditions of application and can go back and say okay… is there any correlation between those? And again, what was going on with the proximity of fields, and other inversion conditions, in some of these other situations.

Facilitator: (Call for two minutes remaining)

TF: Is Monsanto ready for, if someone approves and uses a non-registered product, is Monsanto willing to take their technology agreement away?

TW: That is a great question. So the question was, "Is Monsanto ready to remove a technology agreement if somebody doesn't use right technology?" I will tell you this formally, we absolutely support the State's interest in having, you know, more substantial fines for egregious acts and issues. If the States, through their adjudication and their conformation of that grower behaving in an inappropriate way. If we can evaluate that and understand that to remove a license. We would absolutely, strongly support the State's recommendation to do that and go through those possibility. So if the State can help identify and shows adjudication and cause to that person, supplies that information to Monsanto, we absolutely will strongly take that under advisement

to have that as potential acts to remove a license, yes. Any other questions? Really, I'm done here for the most part. We can talk about our intentions for 2018 on training and other pieces. One with our actions with EPA, we might can address that and questions. For the most part are a couple of slides that may have been left. I will leave it for one or two questions. We do appreciate your time today. We know you have a lot of things to evaluate and whether there is more time in the future or what not. We have a lot of information on weather and other things we will have in year-end review as we move throughout the remaining weeks of the season. Especially with our complete analysis of where we are for off target movement, calls and folks that were non applicators.

Break for lunch

Dicamba Task Force Day 2
Second set of Presentations (BASF)
(Transcript for video LIVE0030, 115732 and 112314[9])

JB: Jeff Birk - PhD in Weed Science, Regulatory Manager for BASF

RB: Ryan Bane- Innovation Specialist for BASF

SB: Steve Bow- Manager Biology/Herbicide Group for BASF

[LIVE0030 Transcript]

JB: Thank you for the time to come up here today and represent BASF and try and answer some of your questions and give you a little perspective on what we've seen over the last year and some of our experiences. My name is Jeff Birk, and I'm actually the regulatory manager for our dicamba products, including Engenia [Video Live0030 end, 115732 video picks up]. A little bit about myself. I have a background… I am a PhD Weed Scientist, 30 years in the industry. Started out in research and product development and then spent the last 15 years or so in regulatory. So, I have a pretty wide perspective on a lot of different angles but not necessarily an expert on any one. So, in a supporting capacity, I have two other individuals from BASF. I have Ryan Bane, who is our Innovation Specialist here from Jonesboro, Arkansas. So, he is very familiar with what you have experienced this last year. And then also Steve Bow and he manages our Biology/Herbicide Group out of RTP. So, I'm out of Raleigh, North Carolina as well as Steve and then Ryan is local. Okay. So, I think in general terms what we would like to do… um… I think this is a good setup, the way this is organized just by chance. I think Monsanto did an excellent job doing some heavy lifting and trying to explain some of the more technical aspects of what we look at and how we develop and research products for this new technology. It makes my brain hurt and I work on this every day. So, I appreciate the questions you have and I am sure as we get into this if there are still remaining questions or some confusion over details, we can all work together to try to make sure you have a fuller understanding of that, okay. What I would like to do is a little bit lighter. Just go through and talk a little bit about our experience. We've worked with dicamba for over 50 years. We are the primary registrant for dicamba. And we have got experience with improvements in the technology over the years as we have worked our way up to use in dicamba tolerant crops. I will give you a perspective of what we have seen in the field. And give you a little overview about, you know, what we are seeing, what could be some possible explanations for what we are seeing. And just go through those as well. So, I don't think I really to remind anybody the need for the technology. Obviously with glyphosate resistant weeds and the prevalence for them in the mid-south. There are new tools that are needed. And obviously, dicamba is a tool that is very effective. I don't think that anyone would actually doubt the effectiveness of dicamba for the control of those broadleaf weeds. Just a picture of a clean field with the amaranth response. So our experience has been, when used as directed on the label, the product is highly effective for the control of these resistant weed species. And it adds a very good additional level of mode of action. Particularly when combined with pre-emergent residual products. Followed by a post emergent application. And I think that is probably the core value of this system is the earlier timing. And I think that is one thing we probably need to all appreciate and try to preserve. That is where you are going to get the biggest bang for the buck. And it is clearly the

[9] For the accompanying video to this and other presentations, visit: https://youtu.be/5Ov8yoStlUg and https://youtu.be/lSxePjLr2Yc

strong point of the technology is… are those early applications. Yes, there could be value in some of the later applications, but it may be that those are some that were perhaps less likely to try and manage in some way. So, early application highly effective. And certainly valuable technology for the control of glyphosate resistant weeds. A little bit of looking at we have been seeing this year. And I know we have heard this all before. But I would like to reiterate that there's really no plant species that we know of that is more sensitive to dicamba than soybeans, conventional soybeans. And it is the… it is the canary in the coal mine for dicamba if you will. Okay, if dicamba is anywhere near, the faintest whiff, they will show you a visual response. Okay. And it doesn't take much. But they have a certain capacity to respond back and recover from that, particularly with early exposure. So, it's not doubt that when someone goes out and finds the curled leaf, the cupped leaf, that it is an emotional issue for you. I understand that and the injury is there, but we have to understand that in many cases it is just that canary in a coal mine, giving you an indication that dicamba has been there. Not that necessarily that the canary is going to die. That it is really just a visual indication. And it is an amazing tool, really, to think about studying pesticide movement. Not just dicamba but any pesticide that is applied. Because a lot of this is attributed to physical drift and you can apply that to anything that is sprayed. So, if you think about using dicamba in soybeans as a tool to understand physical drift, it would perhaps give you a greater appreciation for anything and everything you spray. Knowing that the same thing is happening with a fungicide, or an insecticide, and other herbicides that are less visual in their response on non-targets. So, I think it's probably a good lesson for all of us to step back and appreciate that when we are out there making applications, we need to be careful no matter what we are applying. So, I eluded to before that BASF has over 50 years of experience with dicamba. And we went through a fairly lengthy process of developing the new technology in the form of Engenia, a lower volatility formulation of dicamba for use in DT crops. We evaluated that internally and additionally took it to Universities. And on top of that the additional regulatory requirements that we've had to put forward to the EPA to get the technology approved. I can tell you as the regulatory manger that in basic terms, Engenia is just a new formulation of dicamba. But the amount of work that we had to do to support that through EPA's evaluation was closer to a new active ingredient. So this is a… it's a unique herbicide registration for a new use. And it received a lot of additional regulatory scrutiny, part of which were the field flux [Video 115732 end, LIVE0030 video picks up] studies that Monsanto explained to you a little bit before lunch. So we've done a lot to work with the EPA, states and local grower groups, commodity groups, to try and present this technology prior to its commercial launch this last year in preparation for the proper stewardship and success of that new technology. So in doing so [unintelligible] was optimize for weed control. I think that's obvious, no one's trying to dispute the fact that dicamba is highly effective. Weed resistance mitigation is something we can't forget about because obviously it is an effective tool. But as we know with overuse and without the combination of additional modes of action we can very quickly develop a resistance and lose the value of dicamba, so something that we also need to keep in mind as we move forward. And then of course maximizing the on-target application is critical importance, particularly with the sensitivity of soybeans and other sensitive crops that might be in the area. So what have we done to look at this? The primary focus, along with the development of Engenia as a low volatility form of dicamba, has been to try to optimize the on-target performance with regards to physical drift. And with that you obviously see label restrictions around nozzles as a primary tool, with the other supporting the evidence for lower wind speeds, lower travel speeds, boom height and those types of things, which just made common sense for trying to improve the on-target application. Trying to address volatility, similar to what Monsanto outlined in much more detail, we went through a series of studies to try and identify what type of dicamba could perform better with regard to volatility knowing that there's been a historical concern for volatility and given the earlier forms

of dicamba, particularly in the forms of DMA salts like Banvel, there was a history of volatility-type exposures that we were concerned with so we knew that this needed to be addressed. Although we believe that the volatility loss with dicamba in the newer forms is relatively small, we wanted to take every effort possible to try and improve upon that to the best degree we could, and we think we did that with the Engenia formulation. So going through a number of different studies, again these are basically aggregated studies that would look at higher temperatures just to try and determine relative differences, trying to look for those improvements to identify a lead, and then move forward with those as best we can to develop a commercial product. So any number of things is basically looking at volatility losses and incubator heights studies and higher temperatures, grade of label material as well to look at losses. And we've also utilized the humidome bioassay analysis as well. Some of you criticized some of these methods as not being relative to the real world, but I think keep it in perspective of using it as a tool for comparison purposes to identify where we've made improvements and then we can focus on developing those improved formulations for applications in the real world. Field studies, we've got active air sampler studies, which could be similar to the field flux studies or they could be less sophisticated, they are also an invaluable tool, and then also field bioassay. The field flux studies that was presented to you before lunch is a valuable [unintelligible], it is a tool that the EPA requires us to do for these new forms because obviously the EPA is concerned about off-target movement, and they are trying to protect sensitive species. And the question in their mind is does the volatility component from these dicamba products contribute to off-target injury. They have established the spray buffer to give you protection from physical drift, and in the EPA's perspective they are looking at what they would basically call…it's not… I wouldn't say a low effect level, but it is in terms of fresh weight or dry weight. So they're looking at in this case soybean is the most sensitive species in the study that we evaluate, and they are looking for decreases in fresh weight or dry weight, or, sorry, dry weight or height. So that doesn't mean that you wouldn't possibly have a visual response at that rate or lower, okay? So I think that's part of the… frustration, if you will, with the way the product is approved and evaluated, it gets us to the marketplace, in a regulatory sense, versus what you may actually experience in the field, is that the EPA requirement is based on a more meaningful response in terms of plant health, that being height or dry weight, so its actual ability to continue to grow in a normal fashion, versus a cosmetic symptomology that you see in a leaf curl or pucker. So that I'm sure leads to some of the frustration. The field flux study is a measure of the loss of the product from the field, as you heard, but it doesn't define in complete totality what the experience is in that field. And one of the components that it doesn't really account for is true vertical distribution. But vertical distribution really only leads to additional dilution. It predicts a flux value which is kind of hard to grapple with, but I like to look at it as, think of it as a water hose versus a firehose, the garden hose versus the firehose. It defines the volume and the pressure of release of that vaporous phase of dicamba from that treated acre. So that way you are determining the rate at which it is being released into the environment, and think of it as the output of a hose versus a firehose or something like that. But the vertical component is one that is not that well defined, but doesn't contribute to additional dilution downwind. So it's another factor to look at to capture near the field, but realizing that there's actually further dilution that is also accounting for what you could lose from larger acreages. So to scale the whole process up to larger acreages doesn't necessarily mean that you've got additional volume being deposited downfield because you've still got vertical dilution as well. And the criteria the EPA uses is basically not seeing any contribution from volatility outside the treated area. And again it goes back to their definition of effect based on plant height value or fresh weight or dry weight, so it's their criteria for determining that no-effect level.

So what has been our experience this year? We have got a dozen reps in Arkansas and the boothheel region out of 400 nationwide that are representing BASF in the field, sales reps and innovation specialists, and we have, as always, are committed to following up on any of the calls that come in from any of our growers, okay. But I think, appreciate the fact that, you know, BASF is a provider of engenia herbicide, we're not necessarily going to get the call from the neighbor that is effected. You know, we'll probably get the call from our customer that's perhaps being questioned about he did or she did, and go out to investigate. So our ability to follow up on some of the claims are limited by who is calling us in the first place, so you'll see a fairly large discrepancy between the number of calls that we get versus what might come in to the department of Ag, but I think that's just to be expected by our relationships. But we are very much engaged with University Extension consultants, the growers in the state, state regulatory and other groups in trying to train and evaluate the issues that we are seeing. I'd say in general, our experience in what we've seen in walking these fields, similar to what I think Monsanto showed before lunch, is that we can attribute a fairly large percentage of what we are seeing to some factor that's contributing to increased physical drift. One of the things that has been mentioned last week and again this week are the unlabeled products for use with DT crops. And its not, or its more than just a case of someone using a product that is not labeled, but realizing that when someone uses a product that isn't labeled, that don't have a label to give them the proper use directions. So its one thing to try and get a product that may be less expensive or easier…more easy to acquire, but in doing so they don't have the benefit of the use directions, for the one to make them aware of potentially the hazards they are dealing with and the risks they are taking if they don't [unintelligible], they are not even given the proper use directions. And I think a point in fact is to look back at what happened in Arkansas last year. Those were, there was no branded products available for use in DT, so these were growers and applicators using what they could obtain, by whatever means, an applying it. And I think the circumstance, there's still an element of that ongoing. And when you consider that it takes very little to increase the physical drift and the potential risk to neighboring sensitive crops, that is a significant contributing factor to what we are seeing. It's not everything, but I think its potentially significant. Alright?

So, I think, I'll summarize myself, and if we have any other comments, and then we can probably go to questions. You know, I think it's critical to maintain dicamba for the control of glyphosate-resistant weeds. I can understand the frustration and the concerns, particularly in Arkansas with the damage you have seen, but my concern is, if you step back, you potentially could lose the technology for years to come. Because there's no silver bullet that I'm aware of in the pipeline anywhere that's going to potentially be able march in here tomorrow and give you a hundred percent confidence that you are not going to have any off target concerns. It is the history of dicamba, we've lived with that, we've experienced it with other crops, in corn and pasture and other conventional uses, and it can be expected. But the bottom line is, it can be managed and it can be controlled. I think the learning curve as we've moved into areas of the country that may have less experience with dicamba, in their initial uses with dicamba tolerant crops is part of that steep learning curve, and now Arkansas has one year of basically uninstructed experience with that and one year instructed through the labeling, but obviously there's growing pains involved. But if you stop now, you stop progress in trying to improve on that. So I think there's still an opportunity to improve and maintain the value and the opportunity to use the technology where it's needed, but perhaps tweak things so that you've got a little better control over it, and hopefully build awareness through education to try and improve that situation going forward. So we'll continue to try and gather facts. As I said, our ability to do so is somewhat limited. We're still highly reliant upon what the state can provide to us with their ongoing investigations but I think we need to look at those and try and maintain

our steadfast commitment to education, to grower experiences and trying to improve their awareness. Hopefully the media and the attention that the situation this year has produced is a wakeup call and can allow people to, to basically sit up and take responsibility for what they are doing and their actions, realizing that if they don't there are implications. Okay? So, I think… Steve, Ryan, do you have anything else to contribute at this time? Alright, I'll go ahead and take questions.

TF: Yes, with your experience with dicamba, and BASF's position, what is a safe downwind buffer tfor the use of Engenia in our crops? If a friend of mine that has susceptible crops all around this field that I'm treating, is it a mile? Two miles? Five miles?

JB: So I have to go back to the way the product is labeled. If you do everything according to the label, I'm confident that, in a meaningful way, the 110 foot buffer is effective. It's not to say that you won't see symptomology on conventional soybeans downwind, and that goes back to the label that will say if you've got sensitive crops downwind at the time you want to make an application, don't make the application. So that would then essentially take soybeans out of that equation. So, again, you go back to the sensitive crop downwind limitation, that's the most overriding, but in general terms, 110 foot will get you pretty close to where you need to be.

TF: If we go through another year next year like we had this year, or even worse, don't you think we're more likely, then, to lose the technology forever?

JB: There is that possibility. We are working with EPA and certainly EPA has concerns, but I think we need to continue and make progress moving forward rather than try and stop. And I think that what we've seen in Arkansas and the bootheel area in general, is a little bit different than the experience with the rest of the country, so it's difficult to try and single out one region and try and impose significant restrictions differences there that don't potentially put a black eye on the rest of the country. So I think we need to continue to show progress in good faith and working with the EPA to hopefully build their confidence that they can maintain this technology going forward.

TF: I want to clarify, I didn't quite understand what you said there. You said the 110 feet upwind?

JB: 110 foot downwind is the actual buffer outside of Arkansas. There's a quarter mile here at the last time we used it. And in gen… the rest of the country, a 110 buffer downwind is the requirement.

TF: I think I think I heard Monsanto say that there was no safe distance downwind.

JB: Well, there is a certain point at which you would not have seen symptomology. On soybean being as sensitive as it is, and as I explained with the requirements that are imposed behind the 110 foot buffer, based upon plant height or dry weight, it doesn't say you won't see some visual symptomology, but for the most part that is going to be cosmetic. So if you are trying to avoid all visual response, best thing to do is do not apply if you've got neighboring conventional soybeans downwind.

TF: I've seen some severe damage at least, probably, three fourths of a mile to a mile from fields treated, so.

JB: It, it's a very complex situation, and the difficulty is, many times it is difficult to understand where it actually came from. Because, with the latent response, so seeing symptomology two

weeks or so after an application… many times when we go out and try to evaluate what happened, it's difficult to actually find out where it came from and when, because you're looking back in history.

TF: So as a weed scientist at BASF, what would you consider a safe downwind distance?

JB: The safe downwind distance, so, it's simple, if you've got sensitive species downwind and you are concerned about them, don't spray. Wait until the wind shifts another direct and then come back and finish up that direction of the field. Its additional work, but it's the proven thing to do. And for applicators and growers that have done that, I think that they can testify that they've had good success with that.

JB: Did you have a question?

TF: Yes. In talking, most of the applications, it appears, have went out as a tank mix with glyphosate. Would you say that's a fair assumption?

JB: I think that's a good assumption.

TF: Well, I've heard you and Monsanto both say that this is not a volatility issue, it's that it is a physical drift issue. Why are we not seeing any glyphosate damage on, you know, Liberty Link beans and non-GMO beans, but we're seeing symptomology? You know, if it's physical drift, that solution's together, so…?

JB: Right, right. So, and I'll invite Monsanto to chime in, but I'll take a first stab at it. One thing is the response on most crops are not going to come anything close to the response of soybeans to dicamba. Like I said, this is the canary in the coal mine. You're not going to find a system that's any better at telling you where a spray drift has moved, okay. Glyphosate being a much higher use rate product, and soybeans and other non-targets not being quite as sensitive as they are to dicamba, you are not going to see that symptomology as readily. And you have to go out there and specifically look for it and the form is not as easily recognized as cupping or curling. And the other thing I'll add is this, appreciate the fact that the technology and limitations we've put into place, with the nozzles, with the evaluation of tank mixtures, we have significantly cut the amount of physical drift that you can get out of this system, even with glyphosate in the tank. That's a requirement of the EPA, to look at the disruption of that limitation by anything that goes into the tank with the dicamba. So you're getting the added benefit of not only reducing the physical drift of dicamba, but you are reducing the physical drift of anything that's in the tank with it. So that goes back to your reduction in any potential off-target injury symptoms from the glyphosate.

TF: I still, I didn't hear, why are we not seeing glyphosate. I mean, if it is physical drift, as both companies have said in their presentations, why is there not glyphosate damage, if most of the tank mix applications went out that way?

JB: I don't know if anyone wants to comment. I mean, I don't know if there's physical drift within close proximity to these fields where you can see glyphosate symptomology, but you've got, well, you've got Roundup ready. Unless you've got non-Roundup ready beans, you're not going to see that, so, with the vast majority of beans being Roundup ready, at least, without being DT.

TF: Well, I think that's what he's talking about, that there wasn't any Roundup ready there, just [unintelligible]

[crosstalk]

TF: We've got Liberty Link beans with dicamba damage, we've got non-GMO beans with dicamba damage, and y'all are both saying its physical drift, but we're not getting, nobody is seeing glyphosate damage, and most all the applications were tank mixes.

JB: I'll go back to this deal about reduction and what's actually going on in the field. And I'll just have to suffice to say that you are not getting sufficient quantity of glyphosate in that physical drift to give you symptomology. But they have to recognize that the difference is orders of magnitude.

TF: We'll it's a solution, are you saying the solution changes as it drifts?

JB: No, no, the sensitivity of the target crop that you are looking for injury in is orders of magnitude different…

[Video LIVE0030 end, 122314 video picks up].

TF: It's a rate of glyphosate that would damage Liberty Link and non-GMO

JB: It is a rate in the tank, correct. But if you look at the small percentage of it that is actually hitting the non-target, you are at a rate potentially low enough to actually elicit less of… much of a response. It is not going to hit you in the face…

TF: So it's not physical drift, its half of physical drift?

JB: No, it has to do with the amount of physical drift that's actually occurring.

TF: I mean, I'm struggling here…

JB: Yeah, you are correct.

TF: It's not physical drift, it's just part of physical drift?

JB: No, it's… if the concentration is the same, but if you reduce the amount that moves, you are effectively exposing the non-target plant to less. Correct?

TF: No.

JB: Yes.

TF: I don't agree with that.

JB: No, it is.

TF: (unintelligible)

JB: Yes, that's an easy point. Look at… look at direct spray versus physical drift.

RB: Look at corn, corn sensitivity to paraquat, I mean you can see that across multiple acres. And tbased on what I have seen out in the field this year and I have had the same question brought up by growers. You know, I sprayed next to non GMO corn. Up in North East Arkansas we've got

quite a bit of non GMO corn which in that scenario, you are not going to see the dicamba in the corn. But, that's what they were saying. Why was it not indicated? A lot of times when we are looking at these fields, we see things on the leaves that we can't explain what it is. And what he's alluding to, the higher concentration, it takes much more for glyphosate to show a response that it does for dicamba to show the response. And I have had that question many, many times.

TF: If it's physical drift, I myself had a sprayer that went half a mile beside a rice field spraying burn down with (unintelligible) and we had a gust of wind drifted that (unintelligible) across that rice. And you could very easily see exactly where the physical drift was on my neighbor's rice. When my neighbor sprayed Engenia on his cotton and it supposedly, you say, physically drifted on my soybean field that was a ¼ of a mile wide and 3/4 of a mile long. From every single corner, it looked exactly the same. You could not see any drift pattern whatsoever.

RB: I've actually, I don't know if you knew it or not, I've actually walked some fields on your farm with your consultant and some of our tech group. We walked 4 fields and I don't know the names of the fields. It was north of your shop, down the gravel road, there's a big canal. There was… it was peanuts on the west side and it would have been soybeans on the right side. And I have actually used this as an example. That field that I walked, the soybean field, from the south side to the north side. I agree. I mean, it looked like it was pretty uniform all the way across the field. It looked like it was getting less on the north end. The symptomology we saw on that field is one of the most severe symptomologies that I had saw to that date. There was actually some chili peppering looks of the leaves, I mean beans themselves. So, we all came to the consensus on that field that we don't think that it could have been caused by volatility or anything else. You had to have a high enough concentration of dicamba to go across that field. Yes I know it was a long way. But those fields, I mean, that was one up to that date the most severe symptomology that I had saw in the field.

TF: How do we correct that? How is that fixed?

RB: Well, we still stand that that was physical drift. I mean, it looked like it came from a certain direction. We just don't know what all happened with the field that got sprayed next to you yours. We don't know it was wrong nozzles that might have been used. We don't know if it was the wrong formulations, boom heights, wind speeds, ground speeds, a lot of this plays into that. But I know and… do you know which field I am actually talking about?

TF: (unintelligible)

RB: Yeah. Yeah. Yeah. Yeah. But… and I will say, that the four that we walked, it was our tech rep. Our DRI rep had come out and walked your fields first and our tech rep got involved and we had some guys down from Raleigh, North Carolina and we all went and looked at them again. And the peanuts seemed to recover pretty quick. And that was just right across the road. Which it turns out that they are not as sensitive as what the soybeans are.

JB: Go ahead.

TF: Well, I would like to acknowledge that all herbicides… you know, we've seen Gramoxone drift when I was doing it in the field. We've seen herbicide drift as being a problem. However, I think today, if you look at the data that was presented at the last meeting by Jason Norsworthy and Monsanto today. I think that we need to acknowledge that volatility is an issue with dicamba and just not physical drip. From what I have seen, it contributes… to me it looks like it contributes as much as physical drift does to the damage that we have had in Arkansas.

JB: I think I would just counter that by saying… if that were the case, than you would see this nationwide, wall to wall, and going back 50 years. Especially with the older formulations. And that is not the case. So, if it were contributing on the same level as physical drift, dicamba would have been gone 45 years ago. Okay. So… so there's something different and I won't… I won't disagree that there is a contribution potentially from volatility. But I still maintain that it's relatively small.

TF: One thing that is different, and I think, is that in the past in Arkansas it's been primarily used as a burn down up through probably April 15th, somewhere in that range. Whereas this last year, it was used in the middle of the summer or early summer… July, I think the cutoff was July the 11th. But it's been wide spread in this country and in our state and if you look at other areas, we have a different meteorological situation in Northeast Arkansas.

JB: Yeah, I think there is something unique. What that is exactly, I'm not sure. But, the overall level of injury that we have experienced over the years, particularly in corn… So now you've got a situation that's not exactly the same as later applications in soybeans but you got an in season use over the top with potentially sensitive soybeans growing nearby. There has been some off target injury. But, I would say that without a doubt that is almost 100 percent attributable to physical drift. And, we had a new product that we launched back in I think probably 2004, something like that, for use in corn. And it had a safener in there. And I think some of the growers took a little additional confidence in that product. And it was unwarranted for that reason, for physical drift. It was more for the corn safety. And they got a little bit careless and we had quite a few increases in complaints that initial year. But we went out with a program for new nozzles, not exactly as buttoned up as we have for the use of dicamba in this case, but it made a vast improvement. And with that knowledge and education and distribution of nozzles for those growers using the product in corn, we saw a dramatic decrease in off target injury. And again, it was strictly all from physical drift. Yes sir?

TF: I'm struggling too with the insinuation that the growers in Northeast Arkansas do not know how to spray because it is probably one of the most diverse areas. I mean, we've got people growing Roundup Ready crops next to rice, we've got people growing Roundup Ready next to sweet potatoes and I'm mean I'm having a hard time understanding how you can put this all on the… a few producers. I mean… I just don't understand that.

JB: Right, and that is not what I'm trying to say. What I'm trying to say is that if you don't do things right. And it only takes a handful of people, right? So, appreciate the fact that a single application that goes wrong can affect how many neighboring fields? Tens, twenty, I mean… right. So it only take a couple of bad actors to cause a fairly wide spread problem. Because they are going to affect multiple fields around their property if they sprayed over a period of a week. And as long as they are doing something inherently wrong that increases the physical drift and off target movement, they are going to increase that in multiples every time they make an application. So, that's I think one of the possible explanations is, it only takes a handful. And with the diversity, and that potentially plays right into that, is you might not have a grower that has the experience specifically with soybeans and dicamba. So, it… Yes sir?

TF: The question I've got is how close can you spray to sensitive crops? You said, not at all.

JB: If you want to be safe… If I want to be absolutely right and 100 percent positive, than that is the only answer I can give you.

TF: If I got soybeans, or in my particular case edamame, which if it gets the cupping is not sellable.

Period. I'm looking at three counties that have damage, showing symptoms here. I'm in all three counties. You telling me that nobody in those three counties needs to be spraying this?

JB: I'm not saying that within the county but if there are… if they can see your edamame fields down field and they have concerns about possibly drifting onto those when the wind is blowing in that direction, they should not make the application. That is the only way to be 100 percent safe. Anything else right now? Good, thank you for your attention.

Day 2 Dicamba Task Force
Second Set of Presentations (Department of Agriculture, Plant Board)
(Transcript for video 122314 [10])

Terry: The first thing that I want to do is to back up to the last meeting and give you an update on some information that we've received and then I'm going to turn this over to Suzy so she can relay some information about the data that you have in your packets. You will recall at the last meeting that there was a young fella, Richard Coy that presented some concerns of his dealing with his bee keeping operation. And, when he first brought that to our attention we immediately put in motion a plan to go out and take some samples and to observe the situation as he presented it to us. So we sent our program manager and an Apiarian Inspector out there with Richard to look at the situation. You will recall he had a bee yard located in the area where there was high dicamba usage. His honey flow was about half of a crop. Our guys went out, took samples… swab samples, wax samples, pollen samples, honey samples, and I don't know what else. Everything that they could see to sample, they took a sample of that and brought it back to the lab. The lab ran it through the chem lab, the chem lab did not find any dicamba product in the hive or on the hive. As a matter of fact Mr. Coy made the comment that he didn't think in his own mind, without any actual proof, that the product was causing any problem with his bees. He and our folks and there was an extension specialist involve with that group also. They observed that areas where food crops were that the bees would have normally been feeding on and in that area there was a ditch, I believe a drainage ditch that the hives were located on, the vegetation in that area, the… the flowers were missing or misshapen. And I'm told, and I'm no bee expert, I'm told that misshapen flowers will discourage the bees from feeding. So, it was a pretty wide spread area there in the area where the hives were located where the food plants were unattractive to the bees and so his populations were down, the honey flow was down, and the bees were not acting like they were healthy. They then went to the other area which happened to be in Crittenden County where there was not as much dicamba used and there was a totally opposite situation. The bees were healthy, the honey flow was much greater and the food plants that the bees were feeding on were in much better shape. And so, his concern as a bee keeper was that… his bees were actually starving, that is what it amounted too. So, I just wanted to bring you up to date on that. In no case did we find any product in or on the hives. So it has to be the environmental conditions and the food that the bees were able to get too in their normal foraging activities. This is not a scientific study. There was one location of each situation. Both locations had about the same number of hives. But there were drastic differences in health of the bees and the honey flow. So, for what it is worth, that is what we were able to find after he brought that to our attention. Now to go over the data you have in your packets. Suzy, I'm going to turn this over to you since you and your crew were much more involved in putting this information together. As you know, there are over 900 and some complaints. This data is a summary of that information. And Suzy's been chewing on this data all year long so we will let her give you some information. You have a question Don?

TF: No, just a comment. I have worked with honey bees all my life off and on and I agree with you that bees are very picky about the flower that they visit. If you notice these dicamba beans, the pods are crooked and hooked… J hooked and it is very possible that it could affect the flowers the same way where its structure, the morphological structure would not be conducive to a honey bee visiting it. Their little proboscis is pretty short and they have to get it down in there to

[10] For the accompanying video to this and other presentations, visit:
https://www.youtube.com/playlist?list=PLT1_0w-7FibJHcjyRPWfF3rUk51msHCVB

pull out the nectar. And if you look at honey bees, they really love soybeans and they will make a lot of honey off of them. Where if you go to an area where there is not, they won't make honey. So it is very possible to happen.

Suzy: I am going to apologize. I didn't know I was going to be speaking until I walked in this morning, so I have no PowerPoint. Last night, I believe the Task Force received a lot of information via email. A lot of it spreadsheets and maps the pesticide division put together. I'm going to start off with, and I talk quickly, so if you need to slow down just raise your hand and stop me. The process of the case files. We get the call in. Somebody alleges misuse. We have to investigate it in accordance with EPA guidance… and our agreement with the EPA. Once we go out there, we do confirm if it is a pesticide misuse or not. If we confirm… Hey, we've got a problem, then we continue the investigation. If there is no problem, that case is normally back in our office within a week. I know everybody is wanting to know, what you have found. Is it drift? Is it volatility? Do you have buffer zone violations? Nozzles? We do not know yet. What we do know is this right here. I am going to go through this information as quickly as I can. Right now we have 950 alleged dicamba complaints. I say alleged until somebody is found guilty. Just think of it that way. That's 26 counties. We have 93 of those 950 dicamba case files back in the office. 11 of those are discontinued. That means we got out there and we didn't see anything and the farmer wanted it called off before we even got to the field. Seven of those are closed. I would like to stress that of those 7, none of those deal with over the top applications. Its early season applications. For example, one of them was a right of way instance. Somebody sprayed dicamba, that dicamba product was not labeled for right of way use. So, of those 7, I am just going to tell you to discard them because they are not the bulk of dicamba misuse we are seeing now. We received several in the office last Friday. Our staff sat down and went through those cases with our inspectors. Out of those, we are sending them back for a few additional records, about 25 of those. 4 of them we're currently reviewing. I've got staff in the office right now reviewing them and pulling additional records, compiling all of the information. Pending staff review, there is 47 of them. That means me, myself… not myself, sorry. That means me, Terry Walker and Lee still have to review them. We also gave yawl a list of counties. We are in 26 counties right now. Again, I apologize that there is no PowerPoint for this. I'm going to give you an example of some of the violations we are currently reviewing. They are ranging from drift and buffer zone, symptoms not present, record keeping. Again, we do not have very many in yet. What we did do is poll all the inspectors to see how many of the current case files they are investigating have they confirmed dicamba symptomology in field.

We have a total of 96 case files, 810 of those we have confirmed dicamba symptomology. 23 are still under investigation. That means they have been called in but we haven't made it out to the field yet. 14 of those we have confirmed that is was another pesticide, not dicamba. And 35 of those have been discontinued. And one of them there was no pesticide symptomology. Now, I would like to note we heard from everybody except our northeast district… we did hear from the northeast district and we have most of their case files. There was a few I didn't get a status update on. That is where we are right now.

TF: What is the closest event in the past 14 years that compares to what you see now?

Suzy: The closest we had was in 2006. We had 116 2, 4-D complaints. That is the closest we had. And we weren't able to track any of those.

We normally get 250 case files a year. We are over 1000 combined this year.

TF: Would you say that your inspectors are able to tell the difference between physical drift and volatility?

Suzy: No. In some cases yes, but in a lot of them no.

TF: What kind of training do you give your inspectors every year?

Suzy: We have been doing symptomology training with the University of Arkansas and Arkansas State University for 20 years now. We are one of the only states that I know of that has this training.

TF: In any of your investigations did you find out they were using the wrong tips?

Suzy: I don't know yet. I have not got that information back from the inspectors yet. Let's just be frank here. People can write down anything they want. Unless we were actually there and caught them using the incorrect tips, we will never 100 percent know. We do do random inspections and monitoring of pesticide uses all year.

TF: Are you seeing a difference with all these dicamba claims. I mean, when you go out in years past with Roundup or Gramoxone or something and you see drift and you can tell where it came from, do you see a difference in a dicamba complaint over a Roundup or Gramoxone complaint?

Suzy: The difference is, right now… a lot of times we are able to track symptomology and tell you a source. There are going to be a higher percentage of these than other pesticides that we are not going to be able to track because there's so much symptomology out there.

TF: To me, that says that it's something whatever it is whether it's drift, volatilization, whatever it is, there is something different going on with dicamba than we have seen with other herbicides or pesticides that we apply.

Suzy: I can tell you several inspectors have called me and said, I have never… I have never had to investigate anything like this. It is bothering some of them that they can't track it.

TF: (unintelligible)

Suzy: You can't. You are correct, that is a good point. In the cases we can't track it we are still going to… anybody who says we put out Engenia, we are going to get the farmers records, and we are going to follow that up with dealer's records. Even if we can't track it we are reading through that label. We are looking at rates, date of application, time intervals, buffer zone. I can tell you in some cases it didn't drift but we were able to determine buffer zone violations cause we could see where they cut off and maybe there was a ditch that was in violation of the EPA label. We are still looking at other violations. It may not be a drift violation though.

TF: If significant off target injury has occurred and you find somebody sprayed Clarity. The Plant Board can only still assess a fine of 1000 dollars max until you can prove that that act caused injury correct?

Suzy: I think that is how that reads, Andrew. That in so new I don't know it off the top of my head. I think that is the standard we set or the Board did. Those definitions still have to be approved. Don't think it is going to be an issue getting those approved. But unless that happen after August 1, it is still the 1000 dollar fine.

TF: But even the language of the law say significant off target crop injury must have occurred.

Suzy: Yes, and I also believe it went on to define… do you know that Terry? I don't remember what that is… Significant off target… we defined that to have a way to asses a penalty

Terry: The statute says: Significant off target damage… in our regulation we define significant as visual symptomology. It doesn't have to be yield reduction. So, if there is a visual symptomology… a symptom that you can identify, then that is going to be a significant damage.

TF: But still Suzy and Terry, they violated the law by putting Clarity out after April 15th. That should be a 25,000 dollar fine.

Suzy: I will tell yawl this, just for the 25,000 dollar fine, unless the act happened after August 1, it is just 1000. And also, staff will not have the authority to assess the 25,000 dollar fine. We will recommend our normal fine in a warning letter. The Board and Pesticide Committee then will decide if it is egregious, then up the fine. We put that in their hands and taken it out of staff's hands.

Terry: The law addresses it differently. In our regulation- egregious violation is significant off target crop damage occurring as a result of application of dicamba… blah, blah, blah… outside target area, any symptomology of an off label application. That is off label. So that would be off label. Off target damage from an off label application. Damage is the symptomology associated with exposure to a herbicide on a plant for purposes of determining a regulatory response. Damage does not indicate any level of economic loss, whether exposer to a chemical that results in expression of a physical change in the exposed plant including but not limited to necrotic spot, cupping of leaves, or necrotic plants.

TF: Whether there is damage or not, they should get the big penalty for using the wrong product.

Terry: As long as we can tie it to an application. (Unintelligible)

TF: But you can pull sales and find out date of sale of the product and tie it back to that person.

Andrew: Still, if it is volatility issue or atmospheric issue, it is very difficult to prove that that act was the cause of the injury. That is the problem with the law. So there needs to be a change to the language so that the illegal or off label use carried the risk of off target injury rather than saying caused significant off target injury. If there is no meaningful deterrent available to use, then you might have issues with enforcing them. It appears by the language of the law that in order to assess a fine greater than a thousand you have to prove not just the act but the result.

Suzy: Any other questions? And if this Task Force at any point in time needs any answers about investigations, feel free to email me or call me. I can normally get you the information you need fairly quickly. Alright, thank yawl.

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