

Message

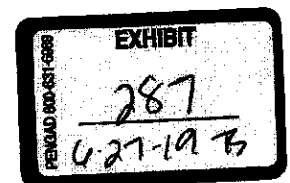
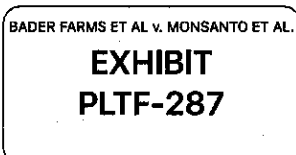
From: COLE, RICHARD M [AG/1000] [/O=MONSANTO/OU=NA-1000-01/CN=RECIPIENTS/CN=225729]
Sent: 4/9/2015 6:33:39 PM
To: VAUGHN, TY T [AG/1000] [ty.t.vaughn@monsanto.com]; MARTINO-CATT, SUSAN J [AG/1000] [susan.j.martino-catt@monsanto.com]; BHAKTA, TINA [AG/1000] [tina.bhakta@monsanto.com]; PARIS, MIRIAM K [AG/1000] [miriam.k.paris@monsanto.com]; CHAMBERS, JOHN A [AG/1000] [john.a.chambers@monsanto.com]; MURDOCK, SHEA W [AG/1000] [shea.w.murdock@monsanto.com]
Subject: Mtg on Culpepper visit
Attachments: Agenda and Discussion Topics georgia.docx; A Scientific and Simple Method to Better Understand Volatility of Dicamb....docx; Carryover Concern of Dicamba.docx; Weeds other than Palmer amaranth.docx

Sorry for the late note, but I wanted to get the attached in front of you prior to the meeting tomorrow. This is similar to the framework we used with Norsworthy, except we are focused on Stanley's issues.

I have also attached two studies he has proposed to do. I would like you to entertain the possibility that we supply him with Xtendimax for the trails, as I believe there is little risk to our addressing of the drift and volatility issues. His third requested study on drift and volatility is different. Also consider offering him the opportunity to engage in our volatility studies at Southeastern Ag, and potentially review the data.

If we could get alignment on this Friday, it would go a long way to getting this in a good spot with him.
Thanks

Rick Cole
Technology Development Crop Protection Lead
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Confidential

MON0306753

Agenda and Discussion Topics – University of Georgia Visit

- Introductory remarks – Why we wanted to visit – why we have visited other academics and will see more
 - We share the same concerns as everyone else on off-site movement
 - Need to make sure this is a durable trait that continues to give growers options
 - M1691 needs to be registered for all formulations of dicamba to be registered
 - We have had some specific requests from the EPA and we have used what we know from public records to address EPA concerns
- Stanley's concerns and issues – (quotes from his email):
 - *I will not budge on my thoughts for the need of aggressive educational trainings prior to every single person spraying dicamba in your technology; same thought with 2,4-D.*
 - *I will not budge on my idea and the idea of every other scientist that there is a need for field volatility work to be done with new auxin formulations. I have made this statement multiple times and will continue to say that I would like to cooperate with Monsanto scientists (only scientists) on this project but, if not, I will conduct the research by myself or maybe with GDA using older formulations in 2015 and will conduct the work with newer formulations as soon as the new formulations can be purchased.*
 - *I will in no way be told (again) what I should and should not do regarding my relationships with regulatory agencies and more importantly my friends.*
 - *I have no issues at all with St. Louis if they do not want me to work with their technologies and I sure don't care a thing about support; there is no need to waste time if this is the message as an email will work just fine.*
- Status of our petitions at the EPA and how Xtendimax fits into this
 - Slides from Alison to make sure we are talking about the right formulations
- How the EPA views TES and the need for GLP data – Stanley has already talked about these issues

- Label changes that impact off-target movement
- Review of key questions from EPA – let him know what we are dealing with
- Review of Study proposals
 - A Scientific and Simple Approach to Better Understand Volatility and Drift of Dicamba with Vapor Grip Technology
 - Carryover Concerns of Dicamba
 - Weeds other than Palmer Amaranth
- What can we do going forward



The University of Georgia

A Scientific and Simple Approach to Better Understand Volatility and Drift of Dicamba with Vapor Grip Technology

Background: Lab and small-plot research confirms dicamba volatility with vapor grip technology is lower than previously commercialized formulations. However, this data also shows that dicamba with Vapor Grip technology has vapor loss through volatility. It is critical that scientists better understand if this low level of volatility poses a threat to nearby crops when treating large acreages. Additionally, a better understanding of how soil temperature influences dicamba volatility is critical especially in the South.

Objective: To determine the concern of dicamba damage (volatility/drift) to neighboring crops when cotton or soybean fields are treated in the South; values from a few neighboring crops are provided below.

Location: A field or area already designated to be planted with dicamba-tolerant soybean in the Camilla, GA vicinity during 2015.

Application: Made by grower using grower equipment.

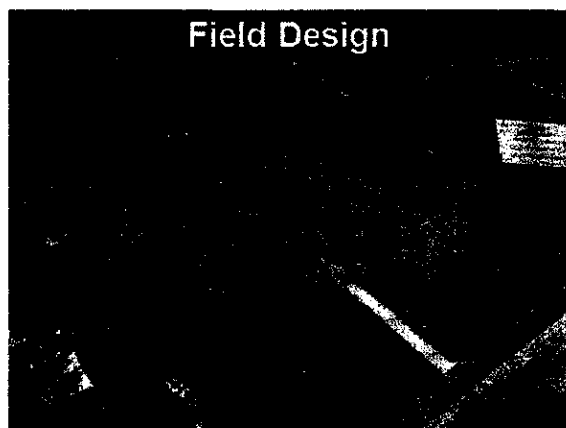
Methods:

1. **Drift:** Prior to herbicide application, four greenhouse pots with soybean plants will be placed along transects oriented in each of the four cardinal (N, E, S, W) and ordinal (NE, SE, SW, NW) directions at distances of 5, 25, 50, 75, 100, 150, 200, 300, 400, 600, 800, and 1000 feet (distances will have to be adjusted based on field location). Pots will be removed from field within one hour of application. Design diagram provided below. Visual plant injury and biomasses will be recorded.

2. **Volatility:** Following herbicide applications (within 1 hr of treatment, but allowing for the dispersal of spray droplets), four greenhouse pots with soybeans will be placed along transects oriented in each of the four cardinal (N, E, S, W) and ordinal (NE, SE, SW, NW) directions at distances of 5, 25, 50, 75, 100, 150, 200, 300, 400, 600, 800, and 1000 feet (distances will have to be adjusted based on field location). Pots will be removed 48 hours later and returned to the greenhouse for observation. Design diagram provided below. Visual plant injury and biomasses will be recorded.

Partnership: UGA and Monsanto personnel will be needed to move plants in and out rapidly. Georgia Department of Agriculture is also supportive and will likely communicate directly with Monsanto regarding their support.

Dicamba formulation: Dicamba with Vapor Grip technology required.



A Few Specialty Crop Values

(Retail Value Per Acre 2014)

1. Watermelon (small bed mulch): \$9000
2. Watermelon (large bed mulch): \$14,400
3. Cantaloupe (small bed mulch): \$8666
4. Snap beans: \$2800
5. Pepper (raised mulch): \$22,400
6. Tomato (raised mulch): \$33,600
7. Blueberry (high bush): \$10,000 (20K re-plant)
8. Pecan: \$3000



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Defining the Potential for Dicamba to Carryover to Fall or Early Spring Vegetable Crops.

Background: One of the benefits from dicamba-tolerant technology will be allowing growers to “soften” their weed management program by reducing the use of herbicides that have long-term carryover potential and are currently needed for managing Palmer amaranth. This “softened” system may allow growers to plant more vegetables immediately after the cotton crop. Although literature suggests carryover of dicamba from a preplant application at 0.25 lb ai/A to cotton is not a huge concern, the potential dicamba use rates in cotton and soybean crops could increase to at least 1.5 lb ai/A along with applications being made later in the season or closer to vegetable plantings. It is unknown if multiple applications of dicamba at 0.5 lb/A spread throughout the cotton season would negatively influence high value vegetable crops being grown after cotton.

Objective: Determining the potential carryover of dicamba to cole crops, snap beans, cucurbits, and fruiting vegetables.

Location: UGA Ponder Farm.

Methods: Five treatments including 0, 1, 2, 3, or 4 applications of dicamba at 0.5 lb/A would be applied to dicamba-cotton grown during 2015. Immediately after cotton harvest, cabbage or broccoli, squash, snap beans, and tomato or pepper would be planted into the plot areas to determine the level of dicamba present in the soil available to cause crop injury; crops will be grown using drip irrigation. If injury is detected with fall evaluations, crops will be planted once again in the same plots during the following March.

Dicamba formulation: Dicamba with Vapor Grip technology required.



The University of Georgia

Weed Response to Systems Utilizing Dicamba with Vapor Grip Technology

Background: Dicamba-based weed management systems have been studied in depth for the management of Palmer amaranth; however, more knowledge is needed regarding many other commonly present weed species. Value of this technology would likely be enhanced if there was a better understanding of sensitivity of other broadleaf weeds to proseed dicamba use rates and systems.

Objective: Broaden the knowledge of broadleaf weed response to dicamba when applied at 0.5 ai/A alone or in systems developed for tolerant cotton.

Locations: Several locations across the state.

Methods: Studies focusing on numerous morningglory species, spiderwort, starbur, and pusley would be implemented to determine sensitivity levels.

1. Non-treated
2. RU + dicamba POST 1
3. RU + dicamba POST 1; RU + dicamba POST 2
4. RU + dicamba POST 1; RU + dicamba POST 2; Direx + MSMA layby
5. Warrant 32 oz/A PRE; RU + dicamba POST 1
6. Warrant 32 oz/A PRE; RU + dicamba POST 1; RU + dicamba POST 2
7. Warrant 32 oz/A PRE; RU + dicamba POST 1; RU + dicamba POST 2; Direx + MSMA layby
8. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba POST 1
9. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba POST 1; RU + dicamba POST 2
10. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba POST 1; RU + dicamba POST 2; Direx + MSMA layby
11. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba + Warrant 32 oz/A POST 1
12. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba + Warrant 32 oz/A POST 1; RU + dicamba POST 2
13. Warrant 32 oz/A + Reflex 10 oz/A PRE; RU + dicamba + Warrant 32 oz/A POST 1; RU + dicamba POST 2; Direx + MSMA layby
14. Non-treated

Dicamba formulation: Dicamba with Vapor Grip technology required.