2016 DICAMBA COMPLAINTS

• 130 – Total Dicamba complaints for 2016

• June 22, 2016 - Received first Dicamba complaint
2017 DICAMBA COMPLAINTS

• 134 – Dicamba complaints received (as of 1:00 pm 7/6/2017)

• June 13, 2017 - Received first Dicamba complaint
2017 DICAMBA COMPLAINTS

Crops damaged as identified by complainants:

- 59,862 acres of soybeans
- 6,400 tomato plants
- 73 acres of watermelons
- 18 acres of cantaloupes
- 5 acres of a vineyard
- 2 acres of pumpkins
- 24 acres of certified organic vegetables
- Several residential gardens, trees and shrubs
2017 Dicamba Complaints

- 1 Complaint
- 2 Complaints
- 6 Complaints
- 10 Complaints
- 15 Complaints
- 17 Complaints
- 19 Complaints
- 34 Complaints
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Agriculture.Mo.Gov
Estimates of Soybean Acreage Injured by Dicamba in Missouri (July 7, 2017)

*Acreage estimates provided by University of Missouri Extension regional agronomists and/or through direct calls and/or field visits with affected farmers

Total: 203,045

Numbers are increasing daily.
Industry Response?

• These are “unsubstantiated” claims.
• This is just like the introduction of RR or LL.
• Dicamba is being blamed when it’s really just metolachlor injury.
• “Investigate don’t speculate. Leaf cupping being observed in soybean fields never exposed to dicamba.”
• Injury is cosmetic and not going to cause yield loss.
• Most of the problems are coming from grower vs. retailer applications.
• And a host of others...
In 2017, off-site movement of dicamba has occurred due to:

• Physical drift
• Nighttime spraying
• Tank contamination
• Use of generics
• Improper sprayer set up
• Etc.
In 2017, off-site movement of dicamba has also occurred with:

- Engenia, FeXapan, and XtendiMax
- Daytime spraying
- Proper sprayer set up

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At this point does it really matter? What’s an acceptable number of damaged acres? What’s your threshold for action?

- Depends on your perspective
Personal Observations:

The majority of fields I’ve been in are injured from one end to the other with no discernable difference in soybean symptomology. This suggests problems with off-site movement through volatility.
Dr. Chen’s soybean breeding plots at Fisher Delta Research Center in Portageville. Similar situations have occurred at research stations in AR, MS, TN.
Personal Observations:

More of this...
Personal Observations:

People are starting to notice what’s happening to the trees.
Personal Observations:

Once again, this issue is hurting our rural communities and neighbor relationships.
So what’s the difference between the bootheel (i.e., AR, MS, TN) and the rest of Missouri (i.e., the Midwest)?
So what’s the difference between the bootheel (i.e., AR, MS, TN) and the rest of Missouri (i.e., the Midwest)?

300,000 acres cotton
- ~80% Xtend (almost all sprayed w/dicamba)
- How many dicamba applications in-crop?

875,000 acres soybean
- ~65% Xtend (almost all sprayed w/dicamba)
  = 306,000 acres non-Xtend soybean
- 195,000 acres estimated to be injured with dicamba = 64% of the total non-Xtend soybean; 22% of the total soybean grown in the bootheel

We are not close to these percentages in the rest of Missouri (i.e., the Midwest). What will happen if/when we reach these levels?
Can LL, RR, and conventional soybean co-exist in a world with Xtend?
Our Efforts to Understand the Role of Formulations & Temperature Inversions in the Off-site Movement of Dicamba

2 separate experiments running in June, July, August:

• Experiment 1: Banvel, Engenia, and Xtendimax sprayed in geographically separate areas. Air samples taken and indicator plants placed at regular intervals after treatment.

• Experiment 2: Xtendimax sprayed in one area in mid-afternoon, and then once an inversion sets in a separate area during the evening/night. Air samples taken and indicator plants placed at regular intervals after treatment.
Our Efforts to Understand the Role of Formulations & Temperature Inversions in the Off-site Movement of Dicamba

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Evaluation of Soybean “Indicator Plant” Injury Following Application of 3 Dicamba Formulations

<table>
<thead>
<tr>
<th>Time After Treatment</th>
<th>Banvel</th>
<th>Engenia</th>
<th>Xtendimax</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 hours</td>
<td>20</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>2-8 hours</td>
<td>21</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>8-16 hours</td>
<td>17</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>16-24 hours</td>
<td>16</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>24-72 hours</td>
<td>22</td>
<td>11</td>
<td>18</td>
</tr>
</tbody>
</table>
Some Preliminary Air Sampling Results with Engenia and XtendiMax

Dicamba Concentration (ppb)

<table>
<thead>
<tr>
<th>Time in Comparison to Treatment</th>
<th>Engenia</th>
<th>XtendiMax</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 hrs prior</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0-2 hrs</td>
<td>82</td>
<td>107</td>
</tr>
<tr>
<td>2-5 hrs</td>
<td>37</td>
<td>71</td>
</tr>
<tr>
<td>5-8 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-16 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td>24-72 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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? more results coming soon
Soybean “Indicator Plant” Response following Application of Banvel

*Photos taken 21 days after application

© Dr. Kevin Bradley, University of Missouri
Soybean “Indicator Plant” Response following Application of Engenia

*Photos taken 21 days after application
Soybean “Indicator Plant” Response following Application of Xtendimax

*Photos taken 21 days after application

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Our Efforts to Understand the Role of Formulations & Temperature Inversions in the Off-site Movement of Dicamba

Our very preliminary results suggest:

**Formulations** = Will be interesting to see how Engenia and XtendiMax compare to Banvel, but initial results w/ air samples and indicator plants suggest that both can be detected in air after application.

**Volatility** = Much more to see with the remaining time points and air samples. Indicator plants suggest volatilization is still occurring at least 24 hours after treatment.
A Call to Action

All Companies (seed, chemical):
• This cannot be dismissed as a non-issue. Share your data: complaint #s, amount of product sold/sprayed, # acres planted, etc.

Farmers:
• Communicate with your neighbors about your intentions and theirs.

All Applicators:
• Continue to follow the application parameters of these products the best you can.

MDA, UM Extension, Me
• ???????
Website: weedscience.missouri.edu

App: ID Weeds (free download)

Facebook: Mizzou Weed Science

Twitter: @ShowMeWeeds