AAPCO
71st Annual Meeting

Lessons Learned- Dicamba Panel

Observations of a Midwestern Pesticide State Lead Agency

-Dave Scott-
Office of the Indiana State Chemist
Focus Areas

• Number of investigations

• Causal factors

• Cost to the state
Number of Official Complaints & Investigations

2017 was a challenging year for off-target pesticide movement complaint response, with or without adding dicamba complaints into the mix.
What Happened in 2017?
Need to Set the Stage for Soybean Production
2016 Soybean Acreage and States
Official Dicamba-related Injury Investigations as Reported by State Departments of Agriculture (*as of October 15, 2017)

*Total: 2,708
Indiana experienced state record # of total drift complaints in 2017.
## Recent Indiana Drift & Dicamba Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Drift</th>
<th>Dicamba</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>92</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>2014</td>
<td>83</td>
<td>5</td>
<td>6%</td>
</tr>
<tr>
<td>2015</td>
<td>81</td>
<td>8</td>
<td>10%</td>
</tr>
<tr>
<td>2016</td>
<td>74</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>2017</td>
<td>257</td>
<td>129</td>
<td>50%</td>
</tr>
</tbody>
</table>

OISC 2017 DRIFT CASES

- Non Dicamba
- Dicamba

12/04/2017
Dicamba over doubled the demand for sample analysis by our state laboratory

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>67</td>
</tr>
<tr>
<td>2001</td>
<td>46</td>
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<tr>
<td>2015</td>
<td>1028</td>
</tr>
<tr>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2577</td>
</tr>
</tbody>
</table>
Causal Factors

• A weather shortened & compacted spray season impacted overall drift #s.

• How we investigated off-target movement (drift) complaints changed some in 2017 and will undoubtedly change even more in 2018.
2017
Indiana Dicamba Complaint
Investigations Processed

Note: Highlighted counties with no number indicate cases still being processed.
2017 Investigation Objectives

• Were symptoms caused by dicamba or some other stressor?
  • This has remained relatively unchanged over the years.

• Who was the source of the dicamba exposure?
  • Historically, it was the adjacent field, but symptom-causing dicamba can move significant distances.

• Was new or old formulation dicamba used?
  • This became important because we were trying to evaluate new formulation performance & labeling restrictions vs. old.

• Was off-target exposure from drift, run-off, sprayer contamination, temperature inversion, volatilization, legal use or “off-label” use?
  • Historically we focused almost exclusively on particle drift violations, but now reported cause of off-target exposures may be quite variable.

• If misuse was documented, what parts of the label were violated?
  • Historically, we focused primarily on drift (performance std.), now which design std. was violated may be important to effectiveness of labeling.
2017 Reported Dicamba Investigation Details

• Total drift complaint investigations... 257

• Dicamba drift complaint investigations... 129

• Dicamba investigations processed... 93 (72%)
Applicators Involved

• Certified commercial applicators... 23%

• Certified private applicators... 65%

• Non-certified applicator... 12%
Products Applied

• Engenia... 41%
• FeXapan... 9%
• Xtendimax... 41%
• Others, both dicamba & non-dicamba... 9%
Target Crop/Site

• Soybeans... 93%

• Corn... 6%

• Right-of-Way... 1%
Off-Target Exposure Crop/Site

• Non-DT Soybeans... 93%
• Melons... 1%
• Gardens... 2%
• Ornamental... 3%
• Person... 1%
Route of Off-Target Exposure

• Direct particle drift... 26%

• Application into an inversion... 0%

• Volatilization... 0%

• Runoff... 0%

• Blown dust particles... 0%

• Tank contamination... 3%

• Unknown or undeterminable... 71%
Documented Violations

- Total violative cases... 95%
- Wind blowing toward adjacent sensitive crops... 45%
- Failed to maintain a 110’ buffer... 2%
- Wind less than 3 mph... 7%
- Wind (or gusts) greater than 15 mph... 15%
- Rain in forecast within 24 hours... 1%
- No site survey... 9%
- Did not visit web sites... 72%
- Exceeded boom height... 1%
What 2017 Investigations To Date Suggest

• Applicators don’t read, comprehend, choose to follow, or have the ability to follow 100% of the label.

• Dicamba is unstable & short-lived in environment.

• 2017 dicamba labels were very difficult to comply with 100% (threading the needle).

• Determining particle drift vs. volatility or other off-target movement with scientific certainty is EXTREMELY difficult in investigation process.
Preliminary Laboratory Observations

• No clear correlation between drift or volatility & dicamba active ingredient or metabolite residues in vegetation or soil samples.

• No clearly measurable residue gradients.

• Target fields range 50 to 100,000 ppb (non-soybean veg)

• In drift confirmation cases, range BQL to 15 ppb.

• In cases w/o other evidence supporting drift, range BDL to 50 ppb.
Cost to the State

• Remain abreast of evolving & changing issues.
• Respond to constant media, public & legislative inquiries.
• Design & implement more extensive investigation procedures designed to document label compliance, need for better labeling & cause of off-target movement.
• Facilitate additional enforcement & appeal case load.
• Develop, review, approve, facilitate, implement, deliver, monitor, record attendance, & determine reciprocity for mandatory training.
• Evaluate need, develop, & implement state regulatory restrictions.
• Develop, communicate & implement label interpretation policies.
• Address staff & cooperator morale issues.
State contributors to the dicamba effort

• Indiana Pesticide Review Board
• Purdue Pesticide Programs
• Purdue Weed Scientists
• Purdue Cooperative Extension Service
• Indiana Agricultural Retailers & Risk Coordinators
• Commercial & Private Applicators
• Office of the Indiana State Chemist
Dicamba Herbicide Updates

http://www.oisc.purdue.edu/pesticide/dicamba.html
Dicamba Herbicide Updates (23 items)

1. Mandatory Dicamba Training for Use of Engenia, FeXapan, or Xtendimax in Indiana in 2018:
   A) [2018 Mandatory Dicamba Training Presentation](source: Purdue Pesticide Programs, 74-slide PPT)
   B) [Dicamba Application Record Keeping and Quick Guide](pdf, 1,338kb)
   C) [Precautions for Dicamba Use in Xtend Soybeans](pdf, 443kb)
   D) [2018 Guidance for Interpreting Dicamba Labeling Terms & Phases](pdf, 242kb)

2. [Frequently Asked Questions](pdf, 59kb)

3. [Dicamba RUP Applicator Notice](11-20-17) (pdf, 52kb)

4. [Dicamba RUP Dealer Notice](11-20-17) (pdf, 869kb)

5. [Registrants of Dicamba-Containing Agricultural Herbicide Products Notice](12-20-17) (pdf, 39kb)

6. [List of state RUP dicamba herbicides](01-30-18) (pdf, 77kb)

7. [2017 & 2018 Dicamba Use and Related Activities](pdf, 575kb)

8. [EPA and States' Collective Efforts Lead to Regulatory Action on Dicamba](pdf, 22kb)

9. As of October 27, 2017, the Office of Indiana State Chemist (OISC) has received 257 total drift complaints for 2017, and 129 of those drift complaints are alleged to involve a Dicamba herbicide. [View map of final numbers](pdf, 427kb)

10. [County by County Map of Vegetation Samples Submitted to Purdue's Plant and Pest Diagnostic Laboratory (PPDL) for Identification of Dicamba Exposure Symptomology](08-14-17) (pdf, 60kb)

11. [What have we learned so far about these incidents?](pdf, 86kb)

12. [Final Rule - Restricted Use Classification of Dicamba Containing Herbicides](PPP-110) (pdf, 658kb)

13. [Options for Dealing with a Pesticide Drift Incident](pdf, 658kb)

14. [How to File a Fertilizer or Pesticide Complaint](pdf, 30kb)
2018 Mandatory Dicamba Training

• State training required by Indiana 24(C)
• 181 private & commercial applicator programs approved (Jan.-Apr. 1)
• Estimate over 3,000 CA & PA trainees to date
• Over 160 non-certified trainees to date
• Some attending training more than once
• Some “snow bird” farmers will require training in April/May
• Training targeted for about 1 hour
• Training tweaked weekly based on questions & suggestions
• FAQs updated weekly based on questions
• Many plan on planting DT beans, but doing only dicamba pre-plant
• Registrants reps: IN is anti-dicamba & IN training is “fake news”
2018 Indiana Required Training for Users of Engenia, FeXapan and Xtendimax dicamba products

“Threading the Needle”
The purpose of this training is three-fold:

1. Meet the 2018 label-mandated* training requirement.
2. Communicate responsibilities in complying with specific label use directions & requirements for these products.
3. Communicate the balance of risks of off-target movement & the increased weed control associated with the use of these products.

*this refers to federal label requirements for users, negotiated by U.S. EPA and the manufacturers of these three new dicamba products
Pay attention to the labels.

The Quick Guide you received will help.
This handout includes experience-based recommendations from University Extension Weed Specialists to assist with safe & effective dicamba applications.

ALWAYS follow required, legal use restrictions...

“The label is the law”
The following FAQs are in response to issues raised throughout the 2018 mandatory dicamba training season. Updates will be posted at [http://www.oisc.purdue.edu/pesticide/dicamba.html](http://www.oisc.purdue.edu/pesticide/dicamba.html).

1. **Who needs mandatory dicamba training?**

   **IMPORTANT:** Only three dicamba products are approved for post-emergent use on dicamba-tolerant soybeans in Indiana:

   Engenia *(BASF is the registrant)*
   
   XtendiMax with Vapor Grip Technology *(Monsanto is the registrant)*
   
   FeXapan with Vapor Grip Technology *(DuPont is the registrant)*

   These products are Restricted Use Pesticides and can only be purchased and used by certified applicators *(private applicators and commercial applicators)*. Prior to applying or using any of these three dicamba products, the applicator must complete dicamba training. For private applicators (farmers) this includes the person who holds the private applicator license and any person who works under the private applicator’s supervision when applying the product. For commercial applicators, both the licensed commercial applicator and the registered technician who works under the supervision of the commercial applicator must have the training before applying the product. This training requirement applies to applications made to soybeans and to applications on any other crops listed on these product labels.

2. **Do mixers, loaders, handlers, and spray equipment cleaners need training?**

   Yes, anyone who is responsible for any part of the application process which includes mixing, loading, application, or cleaning dicamba application equipment must attend the training. The
Required Record Keeping for each application of these new Dicamba Products.

While record keeping is an applicator requirement, OISC recognizes that some tasks on the list may be jointly performed & shared by various commercial applicator business staff.
The label is complex, requiring much from the user of these products.

Observe OISC’s guidance for “Interpreting Dicamba Label Terms And Phrases.”

Guidance was developed thru consultation & input with EPA & registrants.

OFF TARGET MOVEMENT

“Do not allow herbicide solution to mist, drip, drift or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result.”

“Do not apply under circumstances where spray drift may occur to food, foliage, or other plantings that may be damaged or the crops thereof rendered unfit for sale, use or consumption.”

These restrictions would apply to any off-target movement to any desirable vegetation by means of drift, including drift resulting from application during a temperature inversion. It would not apply if it can be determined that off-target movement was from volatility, runoff, or exposed windblown soil particles.

TEMPERATURE INVERSIONS

“Do not apply this product during temperature inversion, as the off-target movement potential is high.”

“Do not apply Tengenia when temperature inversions exist at the field level.”

“Do not apply this product between sunset and sunrise.”

“Apply only during the following period: sunrise until sunset.”

Sunrise shall be defined as time of sunrise, and sunset shall be defined as time up to 30 minutes after sunset, as recorded by a reliable weather recording service. Temperature inversions shall be identified by reliably recorded calm or 0-3 mph winds during application.

SENSITIVE/SUSCEPTIBLE CROPS

“Do not apply when wind is blowing in the direction of neighboring sensitive crops.”

“Do not apply this product when wind is blowing toward adjacent non-dicamba tolerant crops. This includes non-dicamba tolerant soybeans and cotton.”

“Sensitive/susceptible crops include, but are not limited to non-GT soybeans and cotton, cucumber and melons (H-PA crop group 9), flowers, fruit trees, grapes, ornamentals including...
We still have a long way to go in developing **clear, concise & consistent (C³)** labels that both applicators and state regulators can comprehend.
Questions About 2018 Labels

- Is there a difference between “susceptible” & “sensitive”?
- Is there a difference between “neighboring” & “adjacent”?
- How are “adjacent” & “neighboring” defined?
- When are downwind buffers required?
- What are downwind buffers intended to protect?
  - Sensitive crops, sensitive plants, sensitive areas?
- Why are downwind buffers required for some areas that can also be approved label use sites?
Questions?

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