Indiana Pesticide Review Board
153rd Meeting

2017-18 Dicamba Review

March 16, 2018

-Dave Scott-
Office of the Indiana State Chemist
What Happened in 2017?
Need to Set the Stage for Soybean Production
2016 Soybean Acreage and States
2017 Soybean Planted Area
(000) Acres and Change From Previous Year

- U.S. 90,142 #
- 6,709
- # Record High
- NC = No Change

USDA-NASS
1-12-18
Official Dicamba-related Injury Investigations as Reported by State Departments of Agriculture (*as of October 15, 2017)

*Total: 2,708

©Dr. Kevin Bradley, University of Missouri
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>
Note: Highlighted counties with no number indicate cases still being processed.
Dicamba over doubled the demand for sample analysis by our state laboratory.
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 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... 102(79%)
Applicators Involved

• Certified commercial applicators... 24%

• Certified private applicators... 66%

• Non-certified applicator... 11%
Products Applied

- Engenia... 44%
- FeXapan... 8%
- Xtendimax... 36%
- Others, both dicamba & non-dicamba... 12%
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... 22%
- Application into an inversion... 0%
- Volatilization... 0%
- Runoff... 0%
- Blown dust particles... 0%
- Tank contamination... 4%
- Unknown or undeterminable... 74%
Documented Violations

- Total violative cases... 94%
- Wind blowing toward adjacent sensitive crops... 33%
- Failed to maintain a 110’ buffer... 2%
- Wind less than 3 mph... 3%
- Wind (or gusts) greater than 15 mph... 4%
- Rain in forecast within 24 hours... 1%
- No site survey... 9%
- Did not visit web sites... 71%
- Exceeded boom height... 1%
Preliminary Laboratory Observations

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

• No clearly measureable/detectable 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.

• Any hope of residue support on drift vs. volatility or inversion or dust particles may be in some tank mix partners.
What 2017 Investigations To Date Suggest

• Applicators don’t read, don’t comprehend, choose not to follow, or don’t have the ability to follow the new dicamba labels. (94% violation rate)

• Dicamba is unstable & short-lived in environment when it comes to collecting meaningful forensic evidence. (30+ days post application = too long for residues)

• Determining particle drift vs. volatility or other off-target movement with scientific certainty is EXTREMELY difficult in investigation process. (73% undetermined cause of off-target movement)
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
13. Options for Dealing with a Pesticide Drift Incident (PPP-110) (pdf, 658kb)
14. How to File a Fertilizer or Pesticide Complaint (pdf, 30kb)
2018 Mandatory Dicamba Training

- 181 private & commercial applicator programs approved (Jan.-Apr. 1)
- Estimated over 5,000 CA & PA trainees to date
- Over 435 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
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 vs. 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
• Quick Guide to 2018 Label Requirements

• Developed by PPP

• Included as part of the MandatoryDicamba Training Take-Home Materials
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.
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”

Along with developing dicamba-resistant soybean varieties, Monsanto and BASF developed new formulations of dicamba herbicides for use in RR2 Xtend® soybeans. These formulations are supposed to have lower volatility than previous dicamba products. The herbicide products are XtendiMax® (Monsanto), FeXapan® (same thing as XtendiMax®, but sold by DuPont), and Engenia® (BASF).

The federal labels for these herbicides provide very detailed...
March 13, 2018
FREQUENTLY ASKED QUESTIONS (30 items)
Dicamba Use & Mandatory Training in INDIANA

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.

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
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.
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
Still To Do for 2018?

• Finalize 2017 investigation process & data analysis.

• Continue the mandatory dicamba training opportunities.

• Monitor RUP sales to insure dicamba being sold to CAs only.

• Update OISC drift investigation SOP to account for dicamba.

• Determine how 2018 incident/investigation data will be collected & shared with EPA.
Questions?

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