

Indiana Pesticide Review Board 153rd Meeting

2017-18 Dicamba Review

March 16, 2018

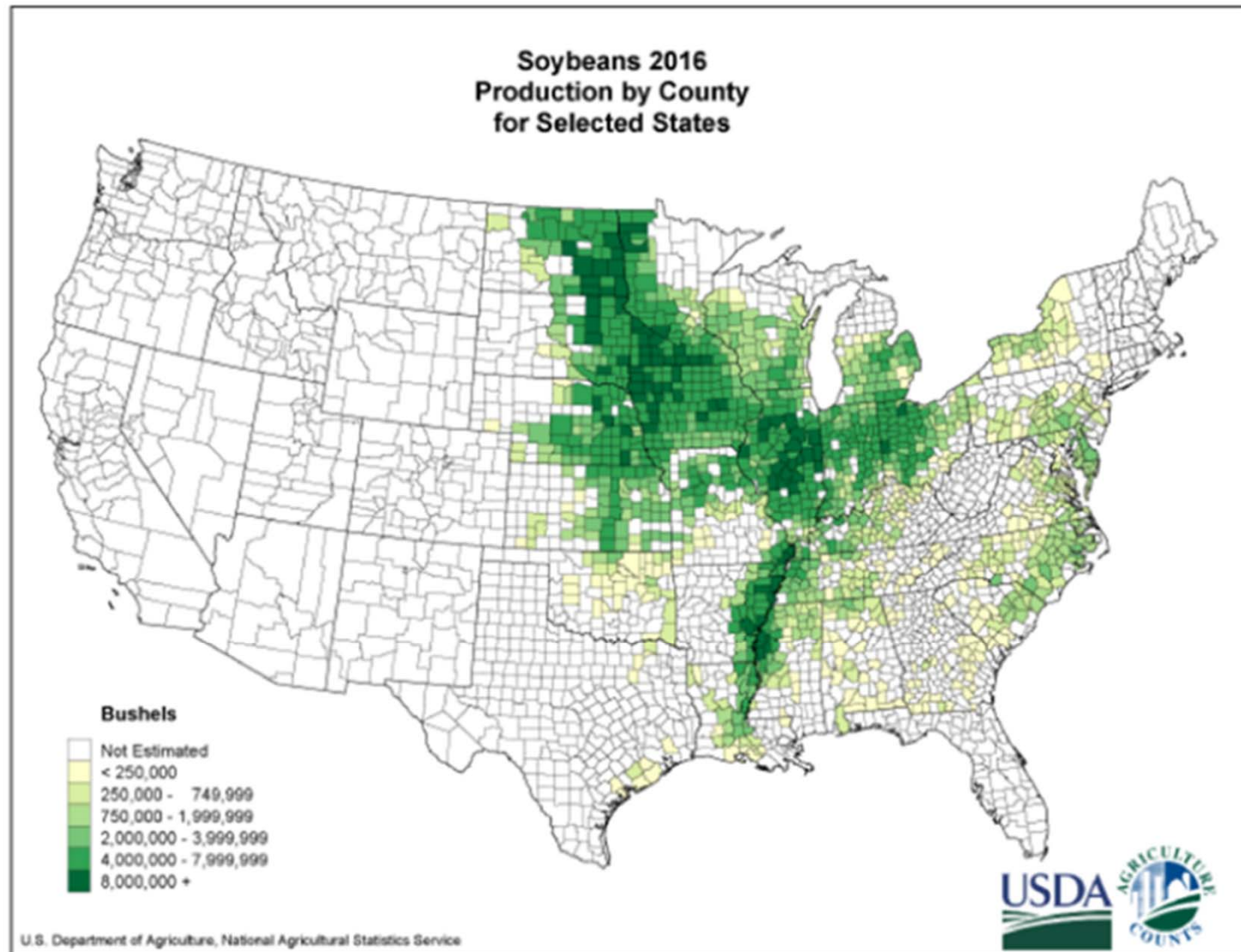
*-Dave Scott-
Office of the Indiana State Chemist*



What Happened in 2017?

Need to Set the Stage for Soybean Production

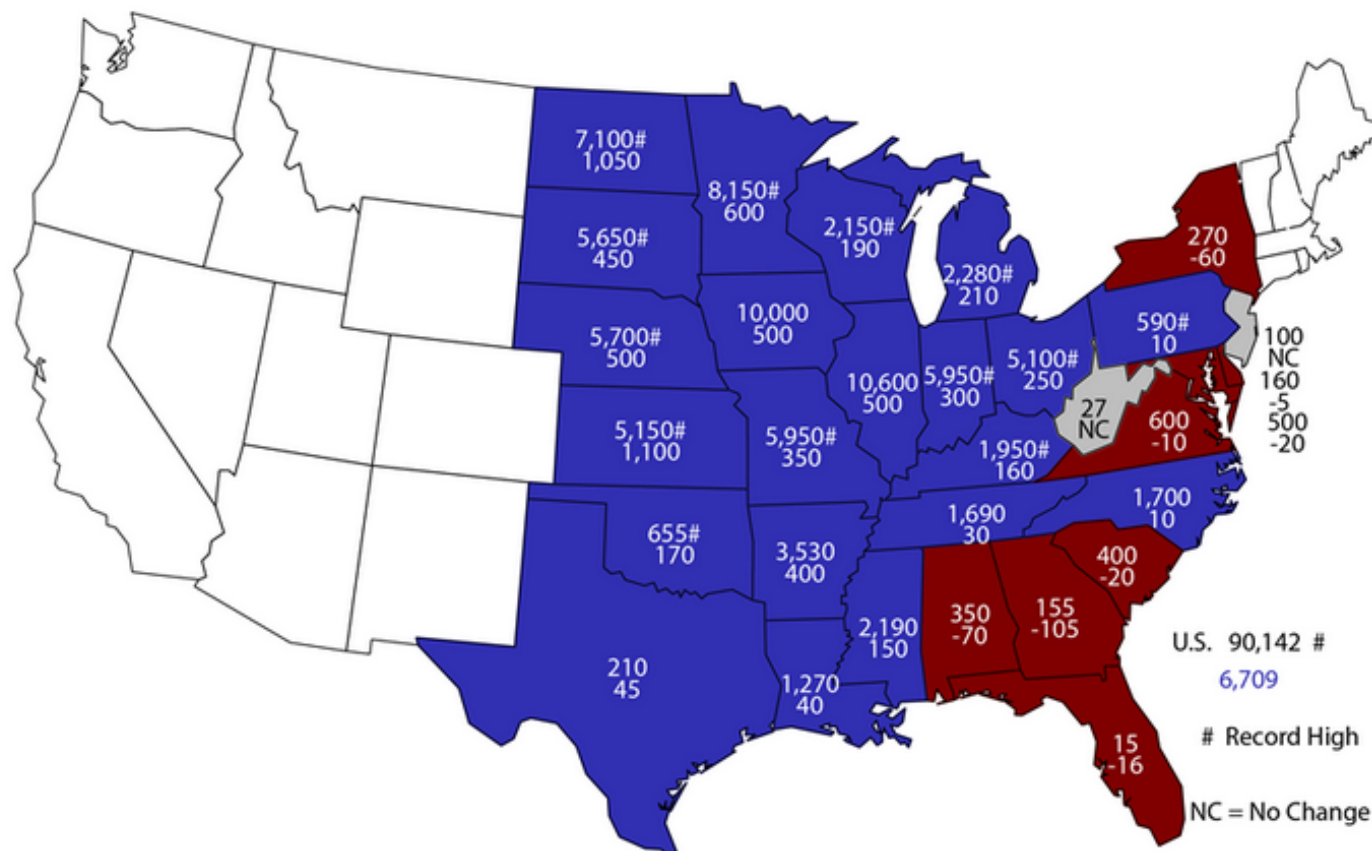
2016 Soybean Acreage and States



Soybeans: Acreage & Change from Previous Year by State

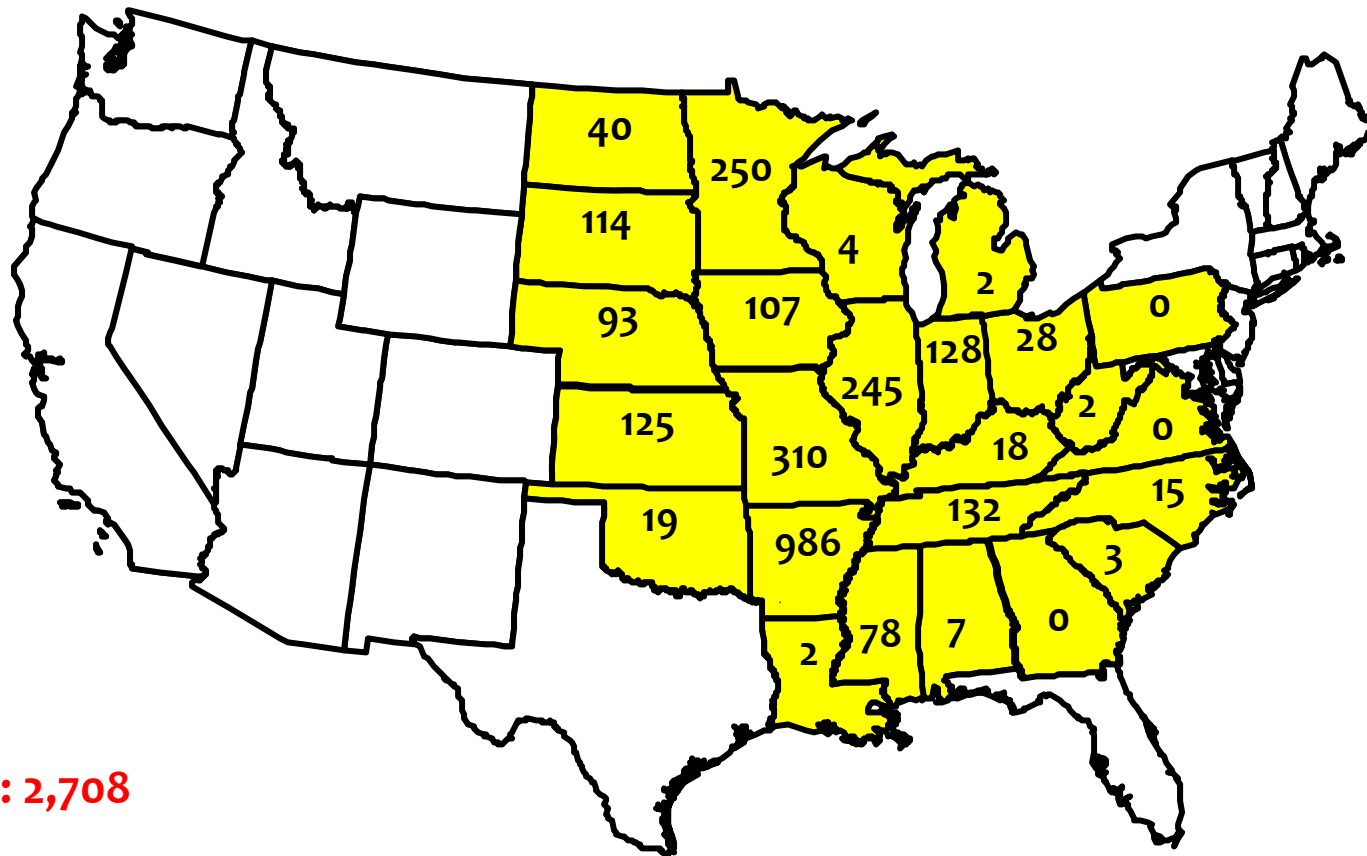


2017 Soybean Planted Area (000) Acres and Change From Previous Year



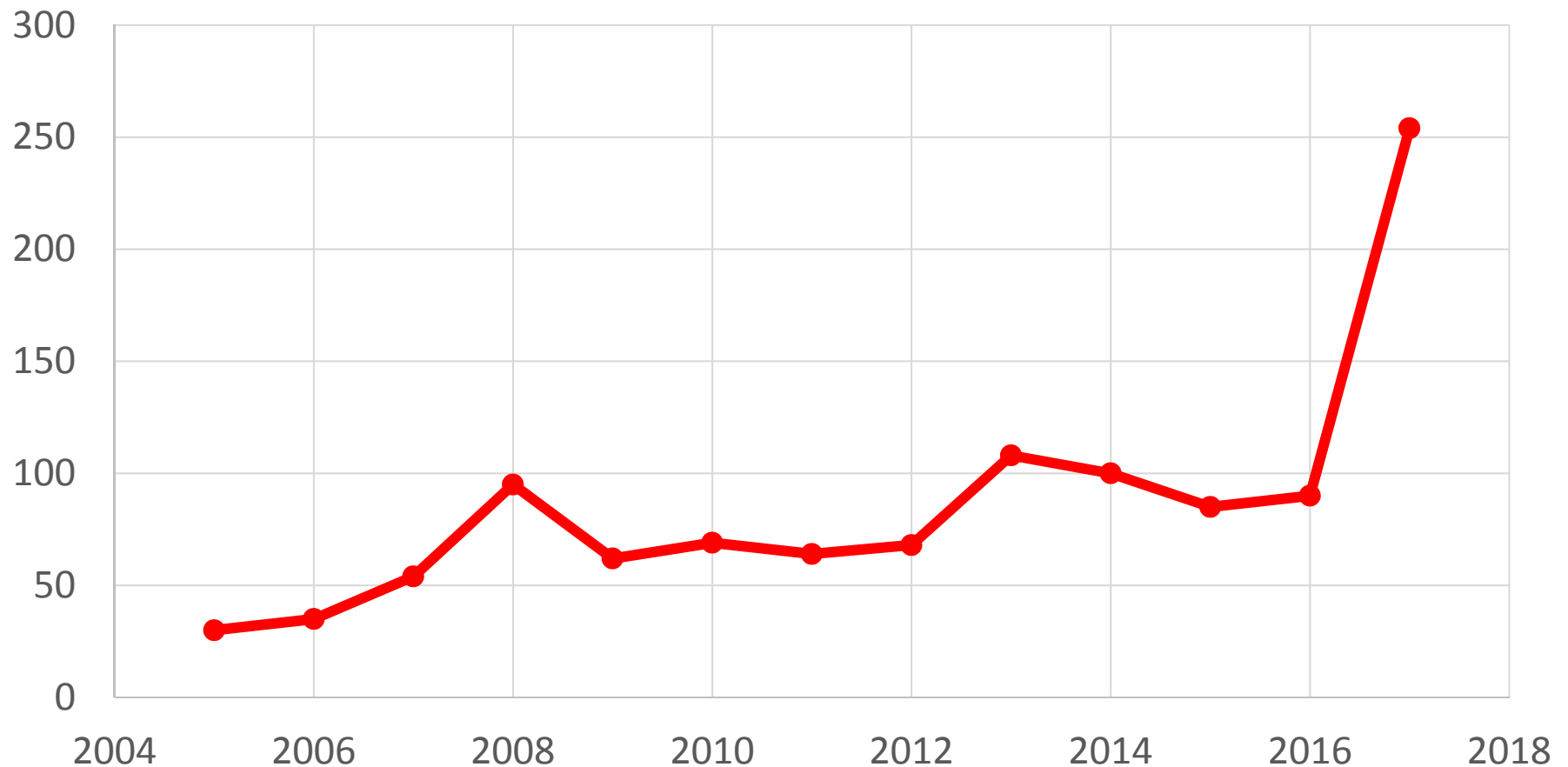
USDA-NASS
1-12-18

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



***Total: 2,708**

Indiana experienced state record # of total drift complaints in 2017

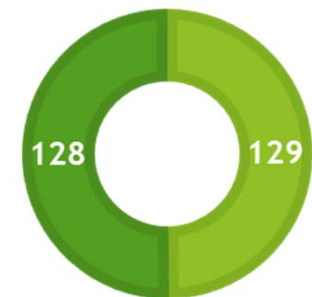


Recent Indiana Drift & Dicamba Data

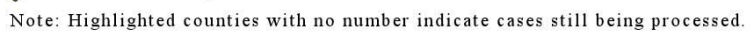
<u>Year</u>	<u>Total Drift</u>	<u>Dicamba</u>	<u>Percent</u>
2013	92	3	3%
2014	83	5	6%
2015	81	8	10%
2016	74	3	4%
2017	257	129	50%

OISC 2017 DRIFT CASES

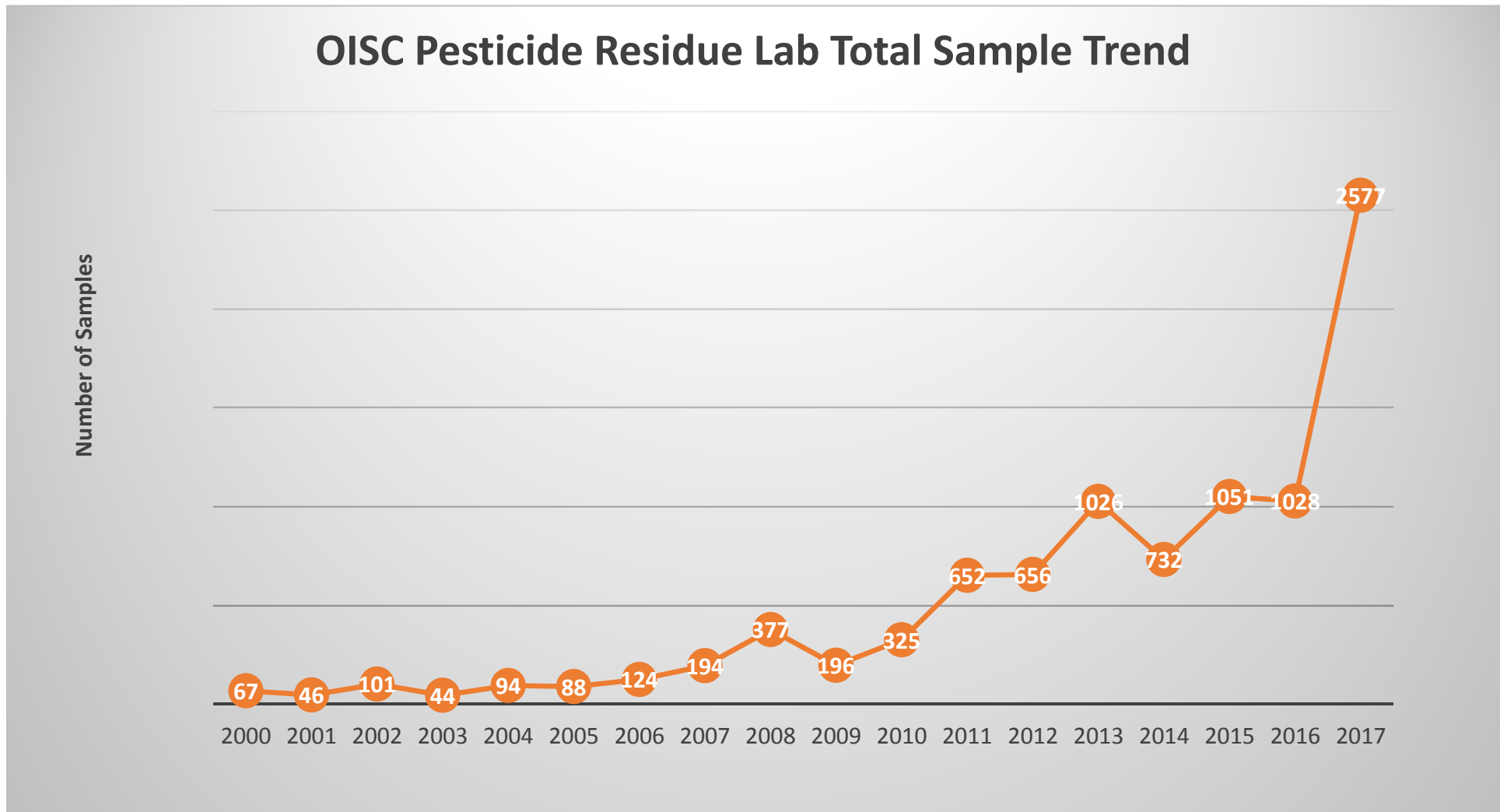
■ Non Dicamba ■ Dicamba



2017



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%
- Ornamentals... 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”

Presenter:

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 Mandatory Dicamba Training Take-Home Materials

ENGENIA®, XTENDIMAX®, AND FEXAPAN® **APPLICATION QUICK GUIDE**

Always read and follow all product labels.

PPP-119

 TRAINING Everyone who makes applications must attend dicamba-specific, state-approved training.	 RECORD KEEPING • You must keep more than just RUP application records. • You must record temperature, wind speed, and direction before and after each application for each field.	 SUSCEPTIBLE CROPS • You must consult DriftWatch before each application. • You must scout adjacent and neighboring fields for sensitive/susceptible crops (DriftWatch doesn't map non-DT soybeans).	 NOZZLES Only use the nozzles specified on the products' websites.
 TANK MIX PARTNERS Only tank mix with products listed on the products' websites — including adjuvants.	 REQUIRED PPE Long-sleeved shirt, pants, shoes, socks, and waterproof gloves.	 GROUND SPEED • Never exceed 15 mph ground speed. • 5 mph recommended in downwind field edges.	 BOOM HEIGHT Set spray booms above the canopy 24 inches or less.
 SETBACKS Do not mix these products within 50 feet of wells, sinkholes, streams, and rivers (some exception for impervious pads).	 APPLICATION TIMING Only apply between sunrise and sunset.	 TEMPERATURE Do not apply if a temperature inversion exists.	 RAIN Do not apply if rain is predicted (51% chance or greater) within 24 hours.
 WIND SPEED • Apply only when wind speeds are 3-10 mph, including gusts. • You cannot apply at all when the wind is blowing toward a neighboring sensitive crop.	 SPRAYER CLEANING Clean all traces of AMS from equipment before application, and clean all traces of dicamba from equipment after application according to label directions.	 SPRAY VOLUMES Minimum spray solution per acre: • BASF Engenia® — 10 gallons • Monsanto Xtendimax® — 15 gallons • DuPont FeXapan® — 15 gallons	 DOWNWIND BUFFERS You must always maintain a downwind buffer in your field except when next to DT beans, corn, sorghum, small grains, proso millet, and fields prepared for planting. The buffers are: BASF Engenia® — 110 feet Monsanto Xtendimax® — 110 or 220 feet (depending on rate) DuPont FeXapan® — 110 or 220 feet (depending on rate)

PURDUE
EXTENSION

ISC Office of Indiana
State Chemist

Reference in this publication to any specific commercial product, process, or service, or the use of any trade, firm, or corporation name is for general informational purposes only and does not constitute an endorsement, recommendation, or certification of any kind by Purdue Extension or Office of Indiana State Chemist. Individuals using such products assume responsibility for their use in accordance with current directions of the manufacturer.

Dec 2017 An equal access/equal opportunity university.

12/04/2017

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.

Required Records for Engenia, Xtendimax, FeXapan Applications

Personal Information			
Name & license number of certified applicator			
Name (and RT number if applicable) of person making application (if different from above)			
Dicamba training (mm/dd/yy, city, CCH or PARP number)			
Pre-application		Date(s) (mm/dd/yy)	
Checked DriftWatch for nearby sensitive sites/crops			
Checked registrant website for tank-mix partners			
Dicamba purchase (include the receipt)			
Sprayer cleaned of all traces of AMS			
Application			
Date (mm/dd/yy)			
Target crop			
Field location/description			
Field size			
Pre- or post-emergent (circle one)		Pre-emergent	Post-emergent
Date crop planted (mm/dd/yy)			
List all pesticide trade names applied (include EPA registration numbers)			
List all adjuvant trade names			
Downwind buffer (circle one)	100% my field	____ft. in my field + ____ft. in adjacent property	100% adjacent property
Application Weather Conditions			
	Start of Application		End of Application
Time			
Temperature at boom height			
Average wind speed over 2-minute span, facing wind at boom height			
Average wind direction over 2-minute span (0-360 degrees preferred over N, S, SW, etc.)			
Method or equipment used to measure weather			
Post-application			
Date sprayer cleaned of all dicamba residue (mm/dd/yy)			
Cleanout method according to label directions			

Websites

BASF Engenia® Herbicide Tank Mix: www.engeniatankmix.com

Monsanto Xtendimax® Application Requirements: www.xtendimaxapplicationrequirements.com

DuPont FeXapan® Application Requirements: www.fexapanapplicationrequirements.dupont.com

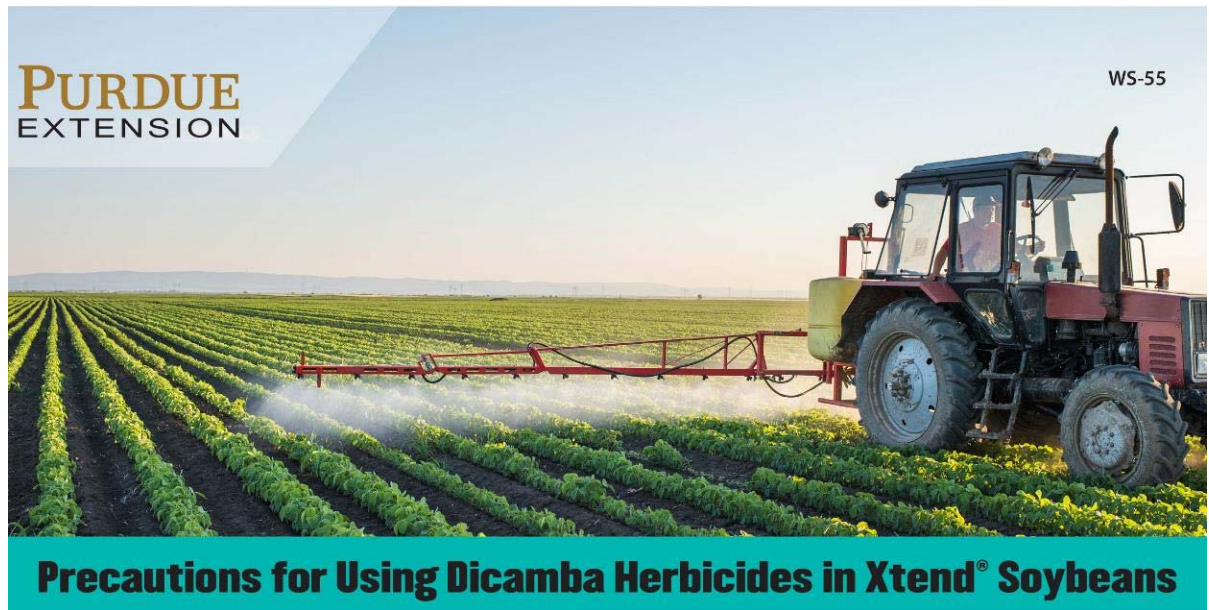
DriftWatch: driftwatch.org

Office of Indiana State Chemist Dicamba Update (downloadable PDF available here): www.oisc.purdue.edu/pesticide/dicamba.html

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”



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ag.purdue.edu/btny/weedservice
Bill Johnson, Professor of Weed Science
Joe Ikley, Weed Science Program Specialist

The Ohio State University
u.osu.edu/osuweeds
Mark Loux, Professor of Weed Science

University of Illinois
extension.cropsciences.illinois.edu/fieldcrops/weeds
Aaron Hager, Associate Professor of Weed Science

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.

2/9/2018



Office of
INDIANA STATE CHEMIST AND SEED COMMISSIONER

Protecting Indiana's Agriculture and Environment - Feed, Fertilizer, Pesticide and Seed

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Robert D. Waltz, Ph.D.
*State Chemist &
Seed Commissioner*

2018

Guidance for Interpreting Dicamba Labeling Terms & Phrases (11 26 17)

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, forage, 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 Engenia 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-DT soybeans and cotton, cucumber and melons (EPA crop group 9), flowers, fruit trees, grapes, ornamentals including

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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