PURDUE EXTENSION | LOCAL FACES COUNTLESS CONNECTIONS

2018 Indiana Required Training for Users of Engenia, FeXapan and Xtendimax dicamba products

"Threading the Needle"

Presenter:

The purpose of this presentation is three-fold:

1. To help you meet the label mandated training requirements for 2018.
2. To inform you of your responsibilities in complying with specific label use directions and requirements.
3. To help you appreciate the risks of off-target movement associated with the use of these products & the weed control and increased yields they may bring.

"Threading the Needle"

Labels require applicators to attend dicamba-specific training approved by the State (OISC) before applying **Engenia, FeXapan, or Xtendimax in 2018.**

Training required for **ALL** applicators using these products:

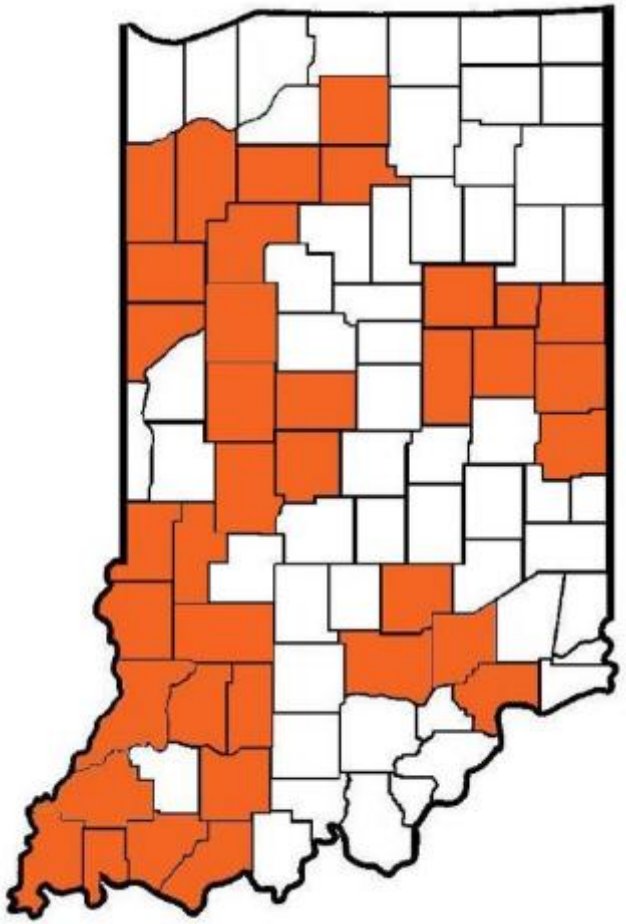
1. Category 1 commercial applicators
2. Registered technicians working under direct supervision
3. Certified private applicators (farmers)
4. Non-certified applicators working under private applicator supervision

This program has been approved by OISC and meets your label-required training obligations under state and federal regulations

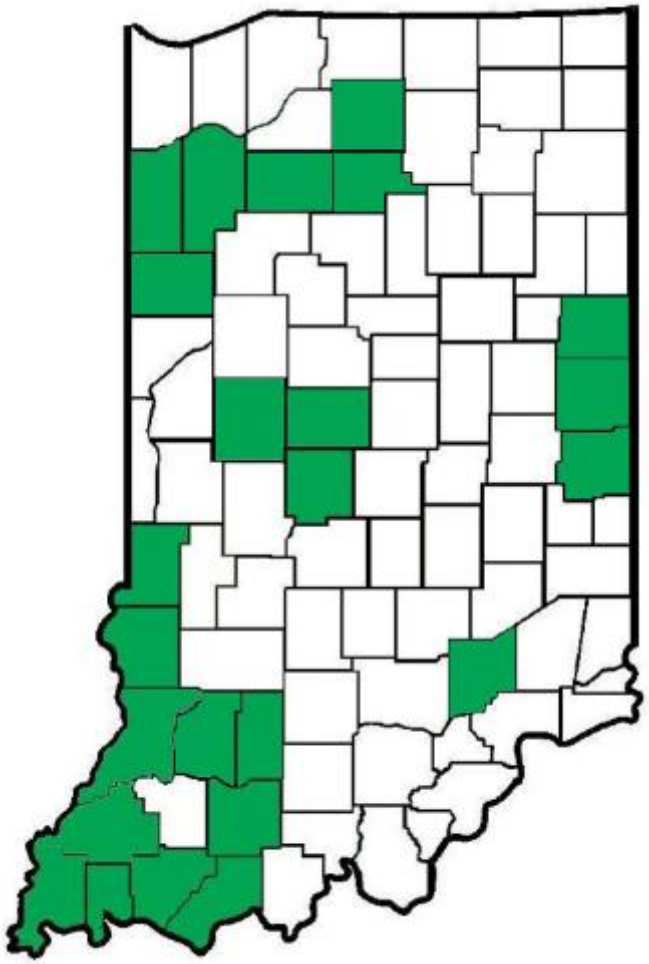
The Emergence of Resistant Weeds

What Can We Say About This That You Don't Already Know

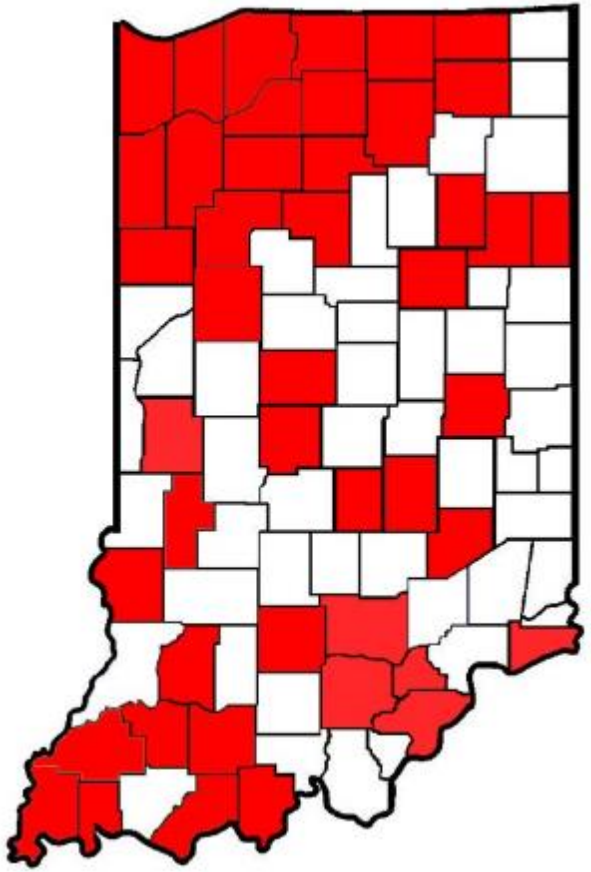
Glyphosate-Resistant Waterhemp



PPO-Resistant Waterhemp

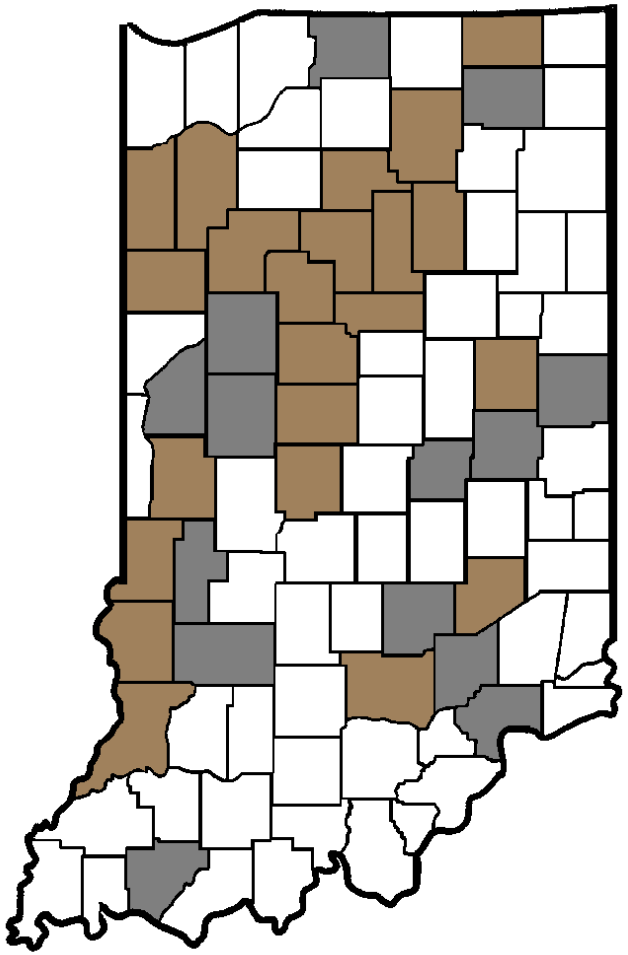


Palmer Confirmed (assumed glyphosate + ALS-resistant)

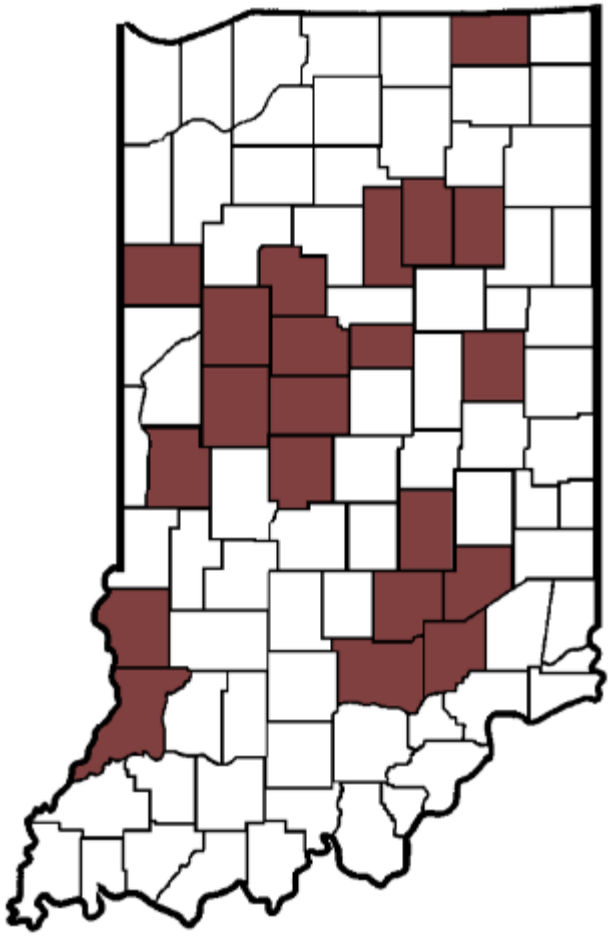


PPO-Resistant Palmer

Glyphosate-Resistant Giant Ragweed



ALS-Resistant Giant Ragweed



The Need

- Many herbicide-resistant weeds are already here, more to come
- Resistance of multiple weeds to multiple herbicide modes of action is a game changer
- Marestail - $20/A and Giant Ragweed - $30/A
- Waterhemp and Palmer - $50/A
- No new sites of action (unique active ingredients) coming to market any time soon
- Reluctance to return to intensive tillage programs

Control Options

- Cover crops can help with Marestail, but results are very erratic with Palmer and Giant Ragweed.

- Growers will migrate to the best perceived short-term solutions through their GMO seed purchases:
  - Liberty Link
  - Xtend
  - Enlist
  - Bleacher beans (Balance GT and MGI)) – 2019???

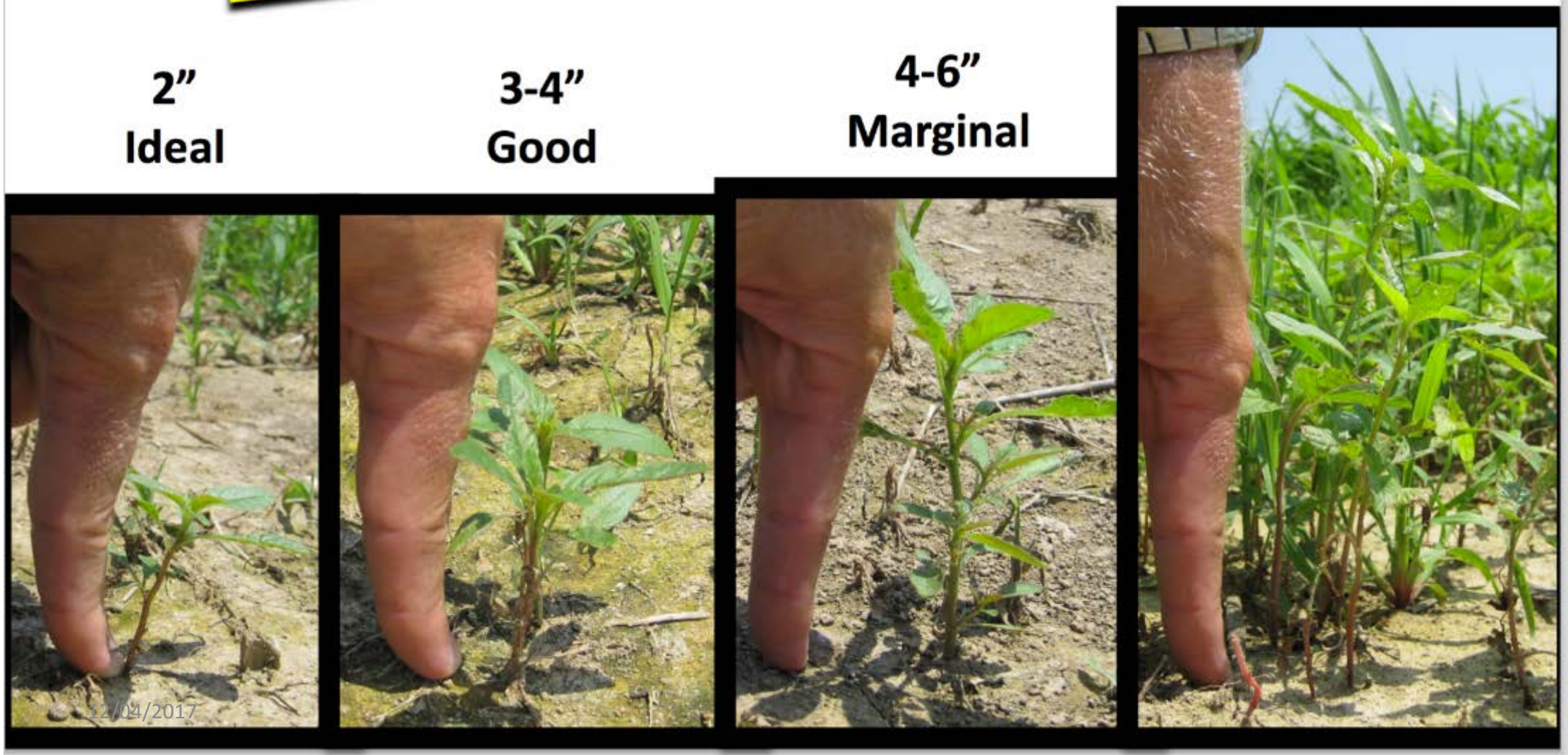
Dicamba products registered for dicamba-tolerant (DT) soybeans appear to be an effective option.

4 Inches or Less or YOU'RE ON YOUR OWN

Postemergence (In-crop)

USE INSTRUCTIONS: This product may be used to control broadleaf weeds in Roundup Ready 2 Xtend® Soybean. In-crop applications of this product can be made from emergence (cracking) up to and including beginning bloom (R1 growth stage of soybeans). Do not make in-crop applications of this product after beginning bloom (R1 growth stage of soybeans). The maximum and minimum rate for any single, in-crop application is 22 fluid ounces (0.5 lb a.e. dicamba) per acre. Using the appropriate application rate may reduce the selection for resistant weeds. For best performance, control weeds early when they are less than 4 inches. To the extent permitted by applicable law, Monsanto Company does not warrant product performance of applications to labeled weeds greater than 4 inches in height.

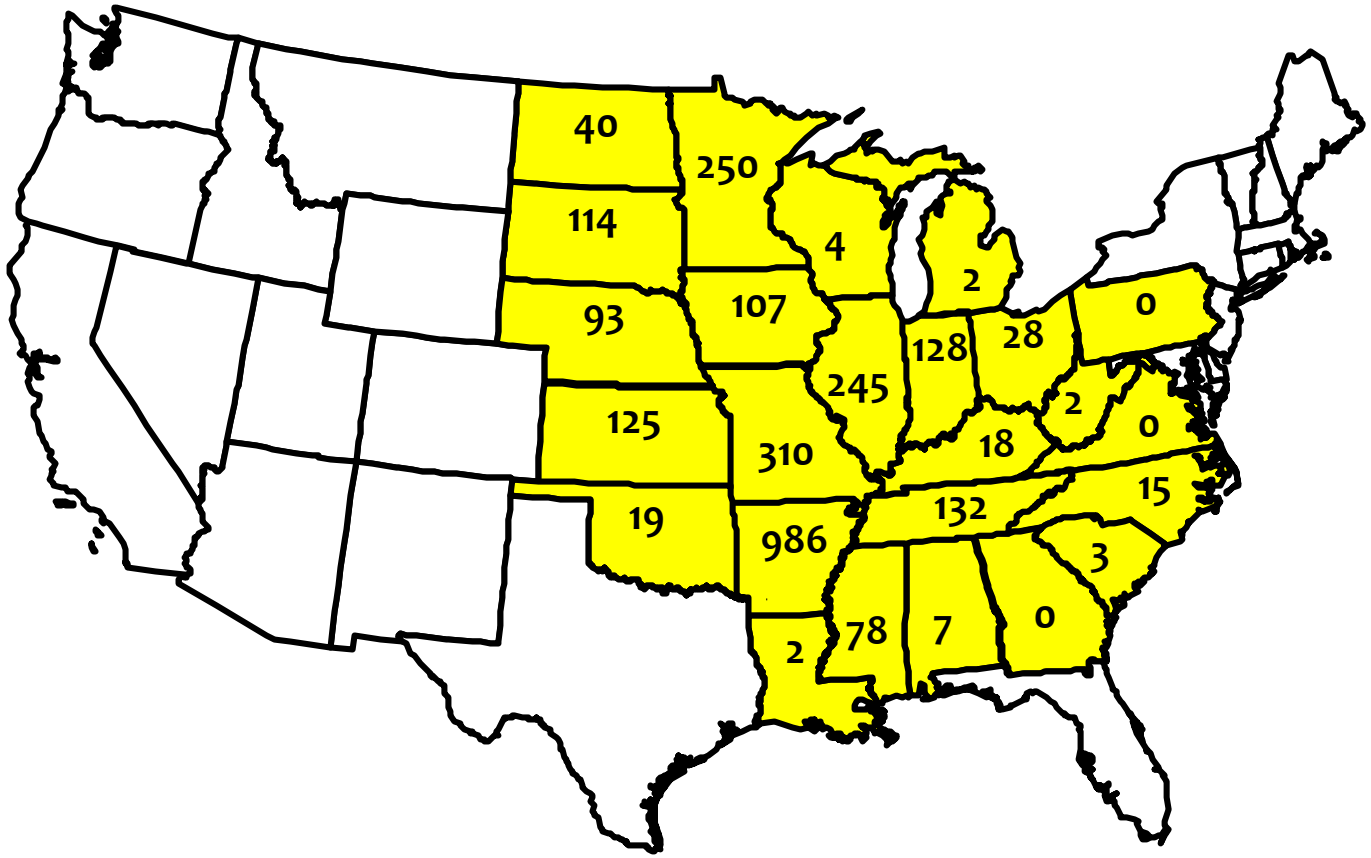
Just Give Weeds The Finger!



Dicamba – What Happened in 2017?

Official Dicamba-related Injury Investigations as Reported by State Departments of Agriculture

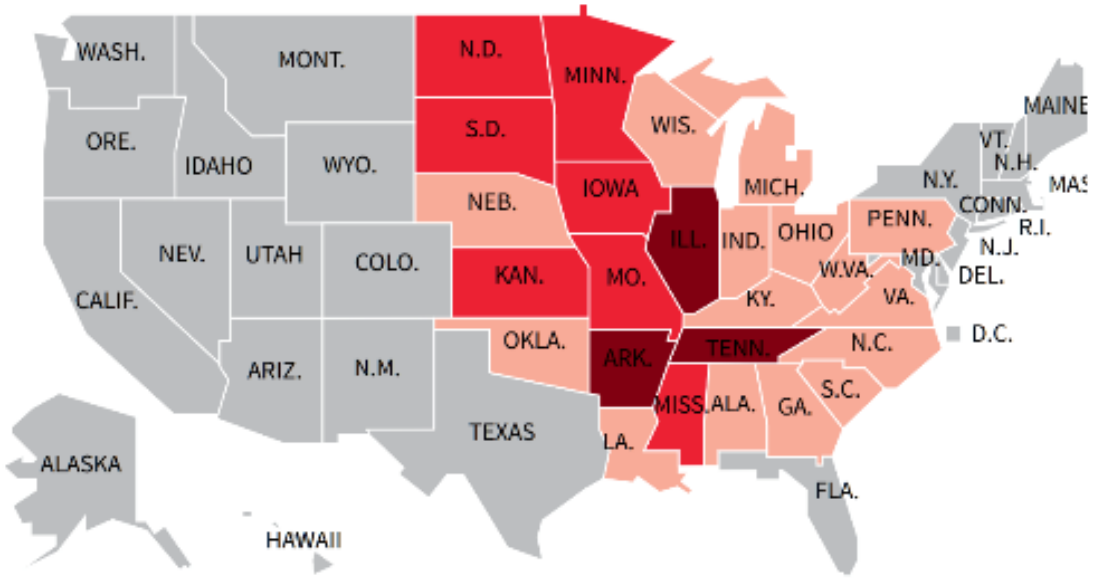
(*as of October 15, 2017)



*Total: 2,708

ESTIMATES OF DICAMBA-INJURED SOYBEAN ACREAGE BY STATE

No data available* | Less than 100,000 | 100,000-400,000 | 400,000 or more



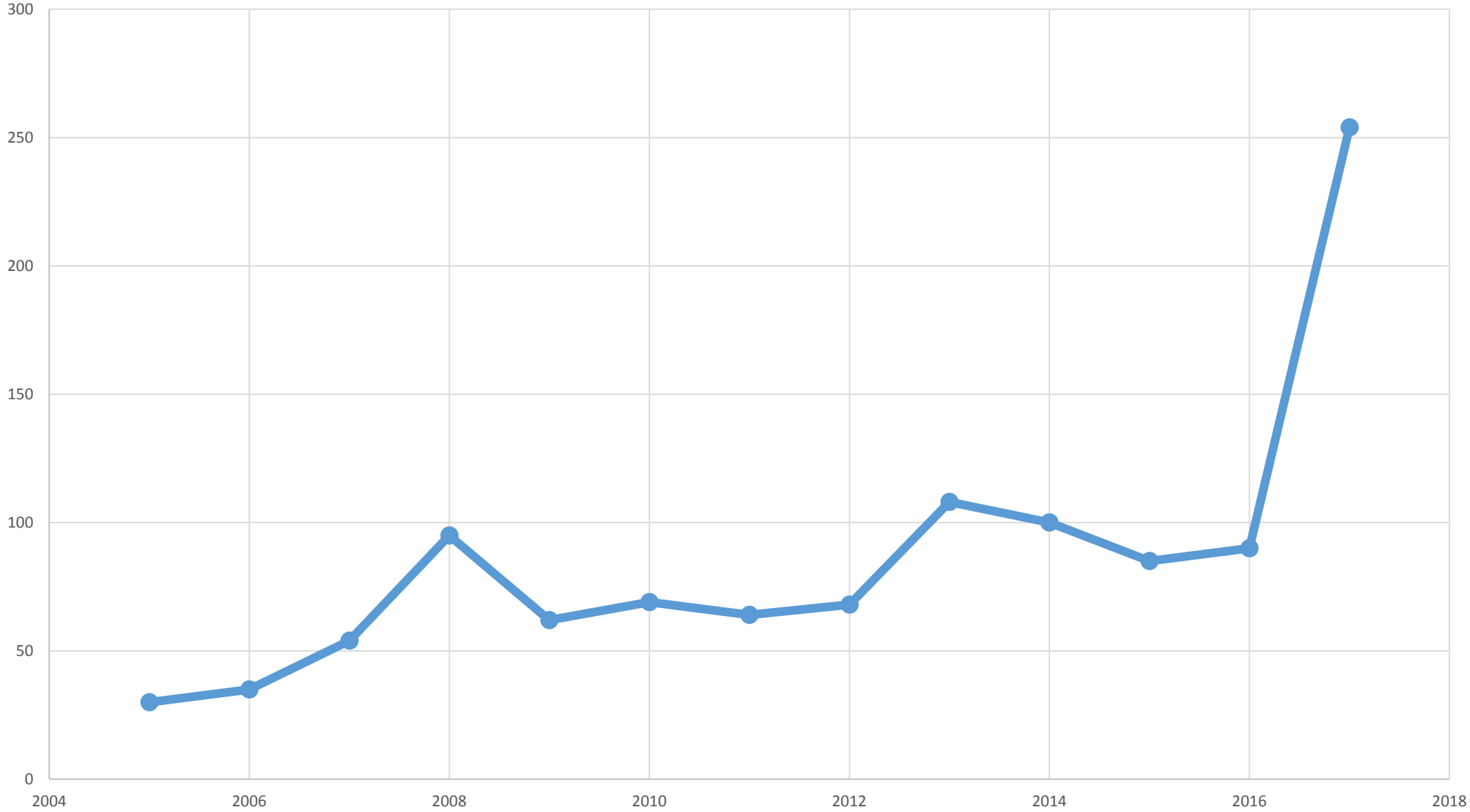
* No weed science contact in the state or state produces little to no soybean.

Note: Data as of Oct 15, 2017

Source: Kevin Bradley, University of Missouri

By Han Huang | REUTERS GRAPHICS

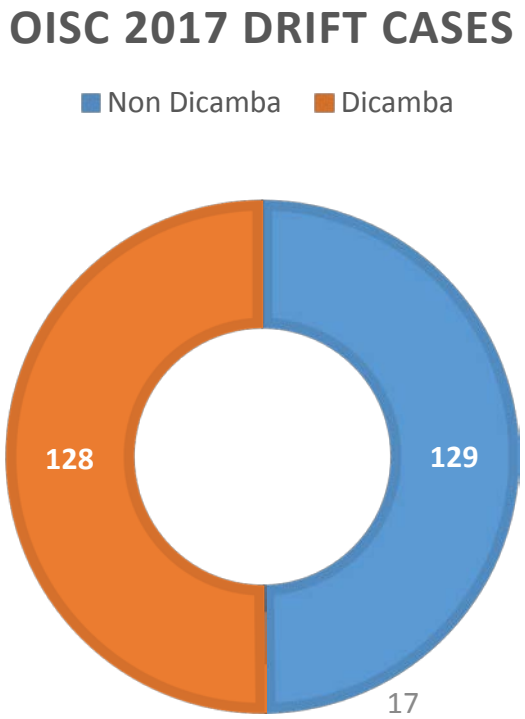
OISC received record-setting numbers of drift complaints in 2017 for **ALL** types of applications



Recent Drift & Dicamba Data for Indiana

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

- As of October 27, 2017



Details of 25 confirmed dicamba investigations to date

Applicators involved:

- 24% Certified commercial applicators
- 72% Certified private applicators
- 4% Noncertified applicator

Products applied:

- 32% Engenia
- 16% FeXapan
- 48% Xtendimax
- 4% Weedmaster (old formulation)

Target crop/site:

- 96% Soybean
- 4% Corn

Details of 25 confirmed dicamba investigations to date

Off-Target Exposure Crop/Site

- 88% Non-DT Soybeans
- 4% Ornamentals
- 4% Garden
- 4% Person

Route of Off-target Exposure

- 32% Particle drift
- 0% Volatilization
- 0 % Runoff
- 0% Tank contamination
- 0% Blown dust particles
- 68% Unknown or undeterminable

How might off-target dicamba exposure occur?

- Particle drift?
- Application made during temperature inversions?
- Volatility after application?
- Illegal use of older formulations?
- Failure to properly clean sprayer?
- Movement on wind-blown soil?
- Runoff?
- Unknown or undeterminable?

There are many possible explanations

2017 Dicamba Complaint Violations to Date

- Total violative cases…**25/25…100%**
- Drift… **32%**
- Wind blowing toward adjacent sensitive crops…**44%**
- Failed to maintain a 110 ft buffer...**16%**
- Wind less than 3 mph…**8%**
- Wind (or gusts) greater than 15 mph…**20%**
  - 2018 labels, 10 mph…**40%**
- Rain in forecast within 24 hours…**4%**
- Did not visit DriftWatch…**60%**
- Did not visit registrant web site…**56%**

EPA and Manufacturers Agreed to Make Xtendimax, Engenia, and FeXapan Federally RUPs and to Add More Label Restrictions

GROUP 4 HERBICIDE

XTENDIMAX® With VaporGrip® Technology

DuPont™ FeXapan™ herbicide Plus VaporGrip® Technology

GROUP 4 HERBICIDE

Engenia®

Herbicide

Group 4 Herbicide

Engenia, FeXapan, and Xtendimax Federally Registered Until November 2018

EPA will decide whether the products should continue to be registered. It appears this will depend partially on the number of off-target incidents in 2018.

This is our chance to get it right for 2018 or growers may lose these new-use dicamba products. Dicamba-tolerant seed may be available, but these herbicides may not.

RUP by Indiana Pesticide Review Board (IPRB)

Classified agricultural herbicides containing at least 6.5% dicamba as State Restricted-Use Pesticide (RUP). This does not include many of the products used in turf and right-of-way.

Examples of newly state-restricted dicamba products include:

- Status
- Clarity
- Banvel
- Sterling Blue
- WeedMaster
- DiFlexx

The RUP Box will not be on the label of these state-restricted use pesticides.

RUP classification:

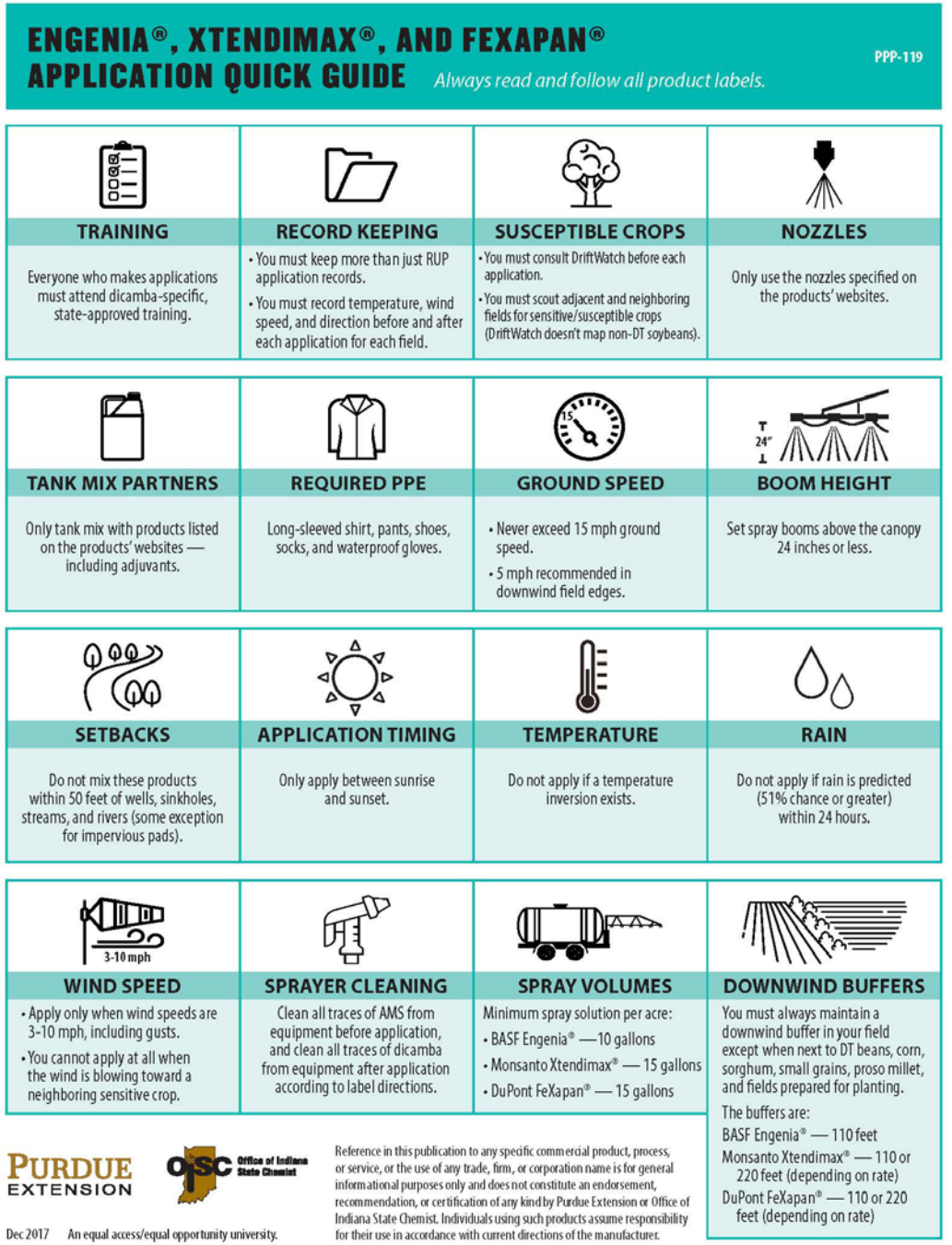
1. Restricts sale & distribution to registered RUP dealers only;
2. Requires dealers to keep sales records for two years;
3. Restricts purchase and use to certified applicators only;
4. Requires users to keep application records for two years.

PURDUE EXTENSION | LOCAL FACES COUNTLESS CONNECTIONS

Pay attention to the labels.

Many requirements among the three products are similar, but a few differences.

The Quick Guide you received will help.



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 | OISC Office of Indiana State Chemist

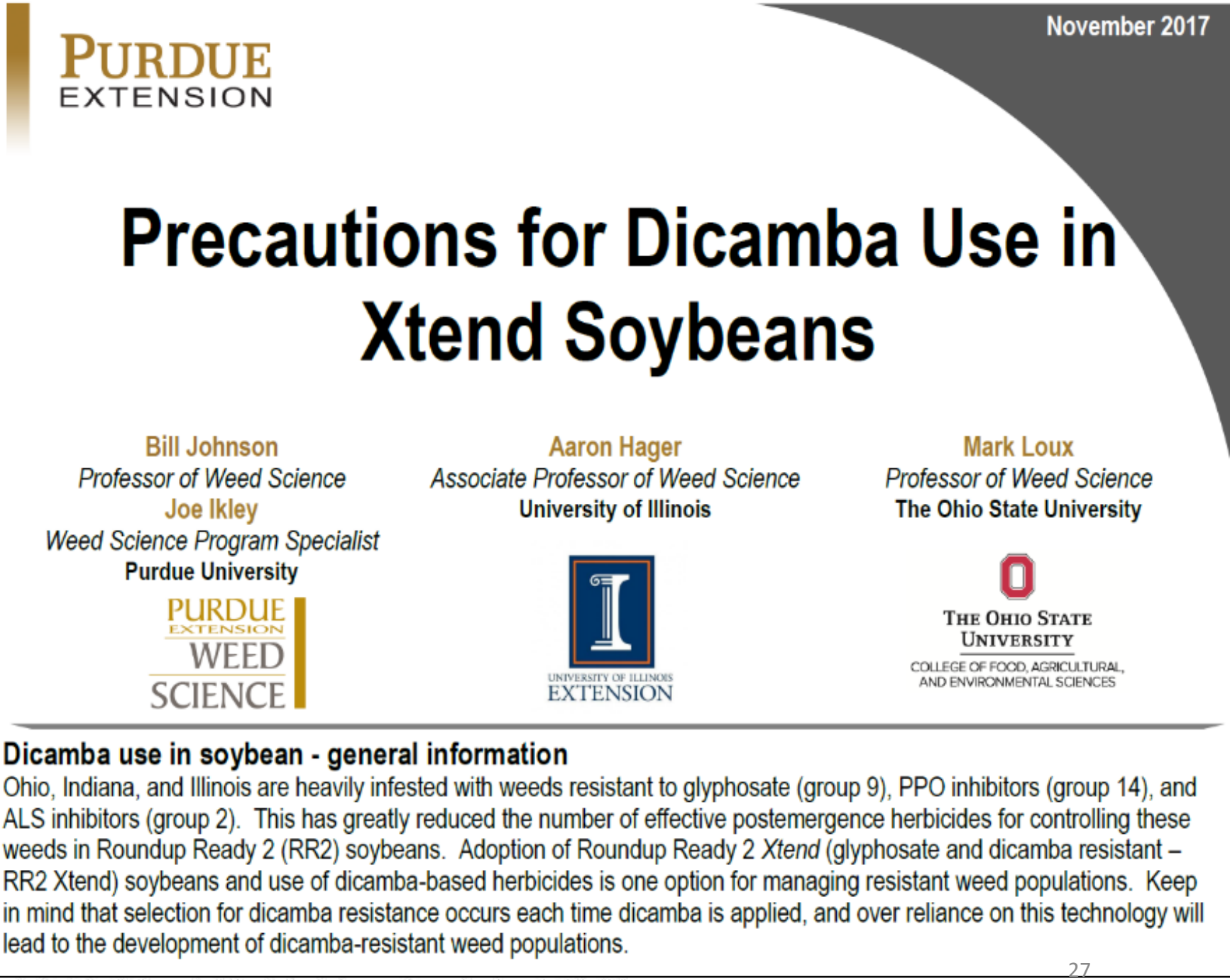
Dec 2017 An equal access/equal opportunity university.

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.

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"



PURDUE EXTENSION

November 2017

Precautions for Dicamba Use in Xtend Soybeans

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THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Dicamba use in soybean - general information

Ohio, Indiana, and Illinois are heavily infested with weeds resistant to glyphosate (group 9), PPO inhibitors (group 14), and ALS inhibitors (group 2). This has greatly reduced the number of effective postemergence herbicides for controlling these weeds in Roundup Ready 2 (RR2) soybeans. Adoption of Roundup Ready 2 *Xtend* (glyphosate and dicamba resistant – RR2 Xtend) soybeans and use of dicamba-based herbicides is one option for managing resistant weed populations. Keep in mind that selection for dicamba resistance occurs each time dicamba is applied, and over reliance on this technology will lead to the development of dicamba-resistant weed populations.

Let's walk through what a work day would look like when applying Engenia, Xtendimax, or FeXapan products.

Pre-Application Records

- Record proof of OISC-approved dicamba-specific training.
  - *Training is required for all applicators, including those who do not hold a permit or a registered technician credential.*
  - *Proof of training will include date, location & CCH or PARP number.*

- Record review date of *DriftWatch* for nearby sensitive crops & sites.

- Determine who farms neighboring/adjacent fields & what sensitive non-DT crops may be planted there *(non-DT soybeans not on DriftWatch)*.

Neighboring/Adjacent Fields & Areas Include:

- Touching or abutting
- Separated by:
  - Vegetative strip
  - Fence row
  - Tree row
  - Farm lane
  - Driveway
  - Street
  - County, state, or interstate road
  - Railway corridor
- Separated by:
  - Drainage ditch (not CRP lands)
  - Residential area
  - Body of water
  - Known threatened or endangered species habitat
  - Natural area
  - Wooded lot
  - Other similar field boundaries

driftwatch™
Specialty Crop Site Registry
by FieldWatch

Specialty Crop Site Registry
Producer View

www.driftwatch.org/

Purchasing Product at the RUP Dealer (Ag Retailer/Distributor)

- Provide evidence of a private applicator permit or Category 1 license to purchase restricted-use dicamba products.
- Keep your receipt for all purchases of Engenia, Xtendimax, and FeXapan. Receipts will become part of your application record.
- RUP dealer is not required to ask whether you have completed dicamba training, but they might.

PURDUE EXTENSION | LOCAL FACES COUNTLESS CONNECTIONS

Required Record Keeping for Each Application of these new Dicamba Products.

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**

At the Farm or Custom Ag Shop

Plan application date and time:

- Look at weather forecast
  - No application if rain expected within 24 hrs. (OISC policy forecast 51% or greater).
  - No application if wind speeds less than 3 mph or greater than 10 mph (including gusts).
  - No application before sunrise after sunset.
  - No application if wind blowing toward neighboring/adjacent sensitive crops.

At the Farm or Custom Ag Shop

Mixing:

- Carrier rate will be minimum of 10 or 15 gallons depending on product. Product rates vary.
- Tank mix **ONLY** with other pesticides and adjuvants listed on the manufacturer's designated dicamba website.
- Do not tank mix with ammonium sulfate (AMS) or urea ammonium nitrate (UAN).
- Use **ONLY** nozzles listed on the website.
- Do not mix dicamba within 50 feet of well, sink hole, streams, rivers, lakes, reservoirs. Some exceptions with impermeable mixing and load pads.

6.1 Restrictions

The applicator must read the entire label, including product labeling and follow all restrictions for XtendiMax® With VaporGrip® Technology. Restrictions included, but are not limited to:

- DO NOT APPLY THIS PRODUCT AERIALLY.
- DO NOT TANK MIX WITH PRODUCTS CONTAINING AMMONIUM SALTS SUCH AS AMMONIUM SULFATE (AMS) AND UREA AMMONIUM NITRATE. Small quantities of AMS can greatly increase the volatility potential of dicamba. Read the TANK MIXING INSTRUCTIONS of this label (Section 8.0) for instructions regarding other tank mix products.
- DO NOT APPLY TO CROPS UNDER STRESS DUE TO LACK OF MOISTURE, HAIL DAMAGE, FLOODING, HERBICIDE INJURY, MECHANICAL INJURY, INSECTS, OR WIDELY FLUCTUATING TEMPERATURES AS INJURY MAY RESULT.
- DO NOT APPLY THROUGH ANY TYPE OF IRRIGATION EQUIPMENT. DO NOT TREAT IRRIGATION DITCHES OR WATER USED FOR CROP IRRIGATION OR DOMESTIC PURPOSES.
- DO NOT MAKE APPLICATION OF THIS PRODUCT IF RAIN IS EXPECTED IN THE NEXT 24 HOURS.

Review the entire label including, specific crop use direction sections for additional restrictions.

8.0 TANK MIXING INSTRUCTIONS

XtendiMax® With VaporGrip® Technology may only be tank-mixed with products that have been tested and found not to adversely affect the offsite movement potential of XtendiMax® With VaporGrip® Technology. A list of those products may be found at www.xtendimaxapplicationrequirements.com.

The applicator must check the list of tested products found not to adversely affect the offsite movement potential of XtendiMax® With VaporGrip® Technology at www.xtendimaxapplicationrequirements.com no more than 7 days before applying XtendiMax® With VaporGrip® Technology.

DO NOT tank mix any product with XtendiMax® With VaporGrip® Technology unless:

1. The intended tank-mix product is identified on the list of tested products;
2. The intended products are not prohibited on either this label or the label of the tank mix product; and
3. All requirements and restrictions on www.xtendimaxapplicationrequirments.com are followed.

At the Application Site/Field

- Scout the nearby fields for sensitive crops.
- Confirm neighbor's downwind soybeans are dicamba-tolerant.
- Confirm the wind is not blowing toward adjacent susceptible/sensitive crops.
- Confirm a temperature inversion does not exist at boom height.
- Maintain 110- to 220-foot downwind buffer for all applications.
- Buffers can include fields readied for planting, and select dicamba tolerant crops (see list on label).

Sensitive and susceptible crops

Include but not limited to:

- Non-DT soybeans and cotton
- Cucumber & melons
- Flowers
- Fruit trees
- Grapes
- Ornamentals (including greenhouse-grown and shade-house grown broadleaf plants)
- Peanuts
- Peas and beans
- Peppers
- Tomatoes
- Other fruiting vegetables
- Potatoes & sweet potatoes
- Tobacco
- Nurseries
- Other broadleaf plants

At the field of application

What is this called?

Recognizing Inversions

- Under clear to partly cloudy skies with low winds, a surface inversion is often present from late afternoon until mid-morning
- Be especially careful near sunset and an hour or so after sunrise, unless…
  - There is low heavy cloud cover
  - The wind speed is greater than 5-6 mph at ground level
  - There has been at least a 5 degree temperature rise since sunrise

Smoke Bomb Test (Univ. of Missouri Weed Science)

4 PM – No Inversion Present

7:30 PM – Inversion Present

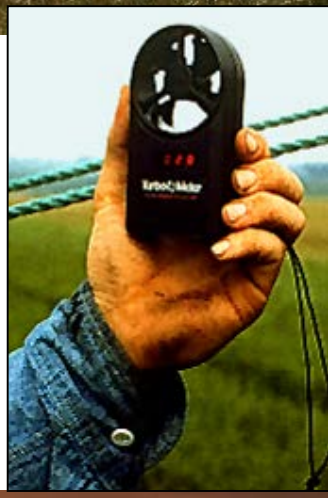
Smoke Bomb Test (Univ. of Missouri Weed Science)

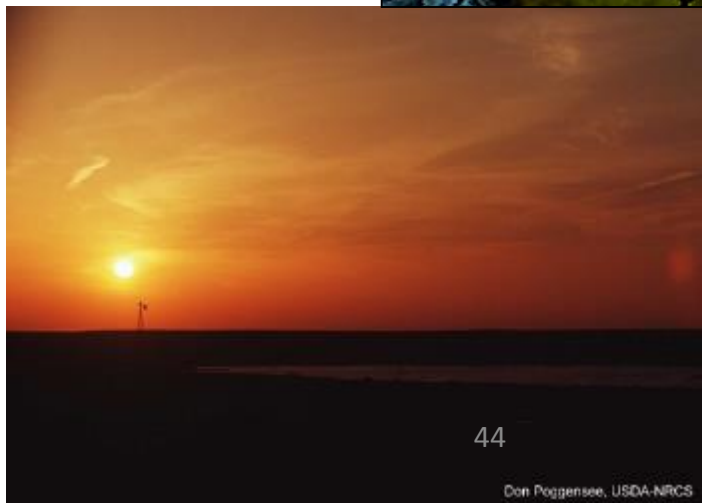
4 PM – No Inversion Present

7:30 PM – Inversion Present

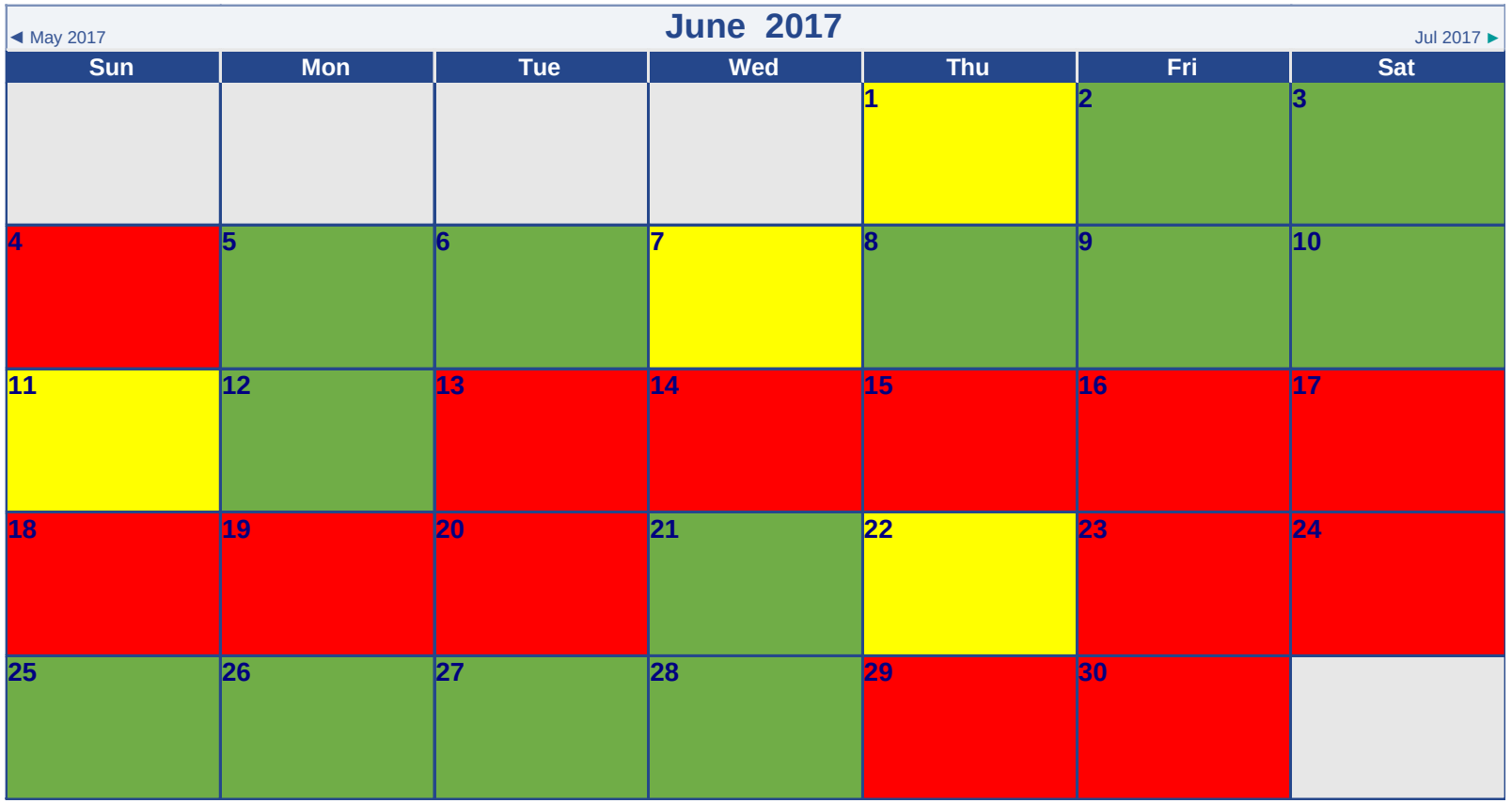
At the Application Field/Site:

- Sprayers must not travel more than 15 mph
- Spray boom must not exceed 24 in. above the crop canopy
- Wind speeds must be between 3 and 10 mph, including gusts
- Only apply between sunrise and sunset.
- At start & end of each application measure & record the following at boom height:
  - Date
  - Times
  - Temperatures
  - Wind directions
  - Wind speeds and gusts
  - Measuring equipment & method (ex. Pocket Spray Smart)





184 Legal Spray Hours At Agronomy Center (ACRE) with 2017 Label

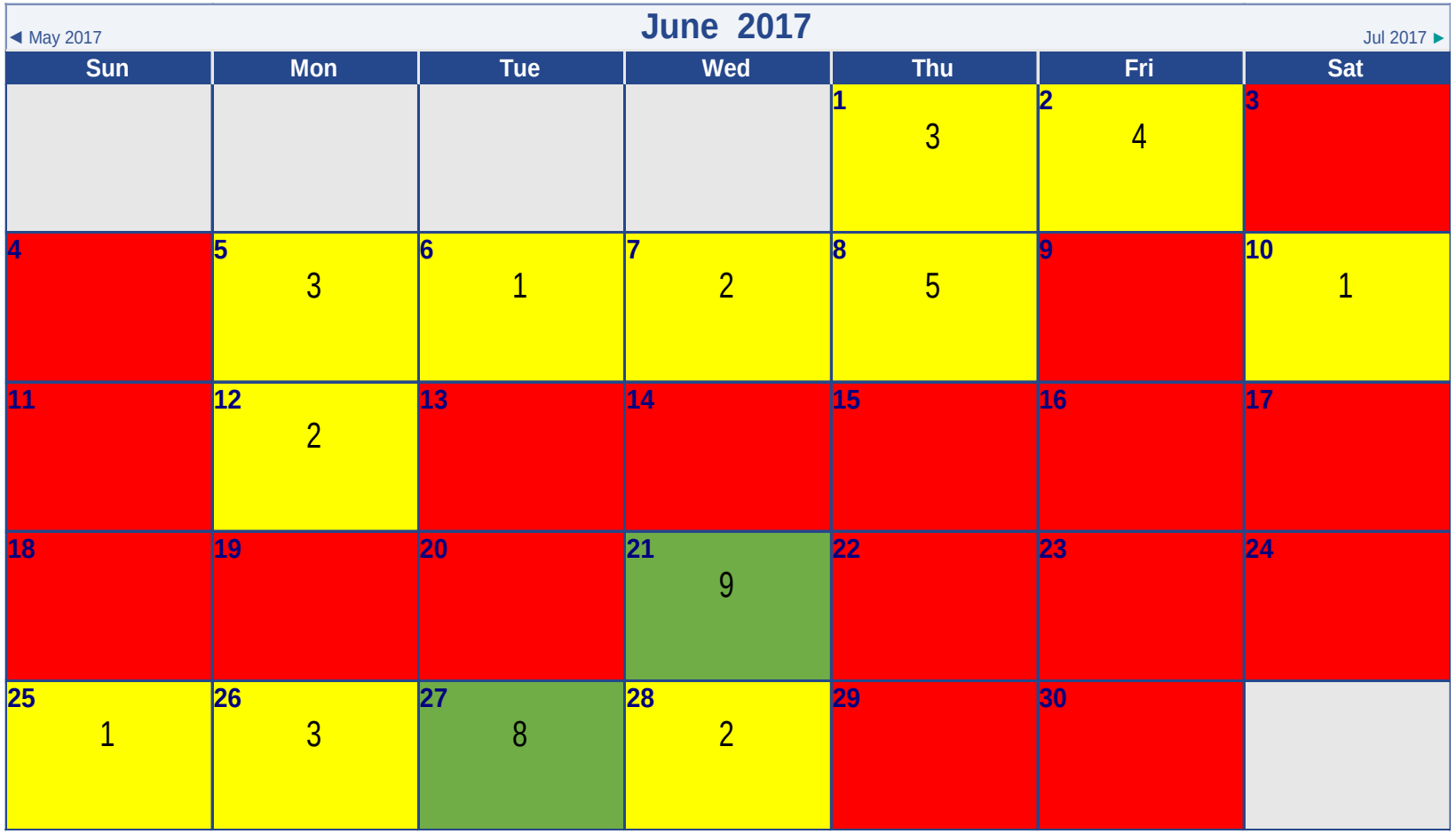


The no spray red boxes from June 13-20, 8 days, 2” weeds can quickly grow past 4”. What’s your backup plan?

Green = > 8 spray hours in a day (3-15 mph winds including gusts)
Yellow = < 8 spray hours in a day (3-15 mph winds, including gusts)
Red = No spray; rain forecast or fields too wet

ution.

Agronomy Center (ACRE) – 44 Legal Spray Hours With 2018 Revised Label



June 2017

◄ May 2017 | Jul 2017 ►

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 3	2 4	3
4	5 3	6 1	7 2	8 5	9	10 1
11	12 2	13	14	15	16	17
18	19	20	21 9	22	23	24
25 1	26 3	27 8	28 2	29	30	

Green = > 8 spray hours in a day (3-15 mph winds including gusts)
Yellow = < 8 spray hours in a day (3-10 mph winds, including gusts)
Red = No spray; rain forecast or fields too wet

NE Purdue Ag Center
50 legal spray hours in June with 2018 label

◄ May 2017 — **June 2017** — Jul 2017 ►

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 3	2 6	3
4	5	6 2	7 2	8 5	9 1	10
11	12 2	13 3	14	15 3	16 8	17 1
18	19	20	21 6	22	23	24
25	26	27 6	28 2	29	30	

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SE Purdue Ag Center – 64 legal spray hours in June with the 2018 label

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◄ May 2017 — **June 2017** — Jul 2017 ►

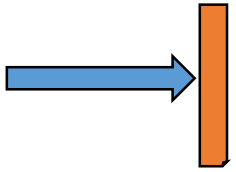
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2 8	3 4
4 5	5	6 4	7 6	8 6	9 2	10 3
11 4	12 2	13	14	15	16	17
18	19	20	21 4	22	23	24
25 2	26 3	27 6	28 4	29 1	30	

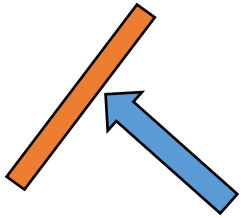
Working Through the Label Required Buffers Is CHALLENGING!

Helpful definitions:

A buffer is the area NOT sprayed.

A buffer is always perpendicular to the wind direction.





Neighboring/adjacent=The field or area immediately next to (touching) the target field.

Also means field or area separated from the target field by only a fence row, vegetative strip, tree row, lane, driveway, road, drainage ditch, residential area, creek, river, etc.
…*See OISC handout for a more complete list.*

Working Through the Label Required Buffers Is CHALLENGING!

Questions to Ask **BEFORE** Spraying

1) Is wind between 3-10 mph & not gusting over 10 mph?

- If yes, proceed to next question. If no, STOP, can't spray.

2) Is wind blowing completely away from any adjacent downwind sensitive crop (opposite direction)?

- If yes, proceed to next question. If no, STOP, can't spray.

3) If wind is between 3-10 mph & there are no adjacent sensitive crops, do I need a downwind buffer?

- Yes, **downwind buffers required for every application** *(buffer not required for CRP areas)*.

Working Through the Label Required Buffers Is CHALLENGING!

4) How much of the required 110 ft. or 220 ft. downwind buffer must come from within my field?

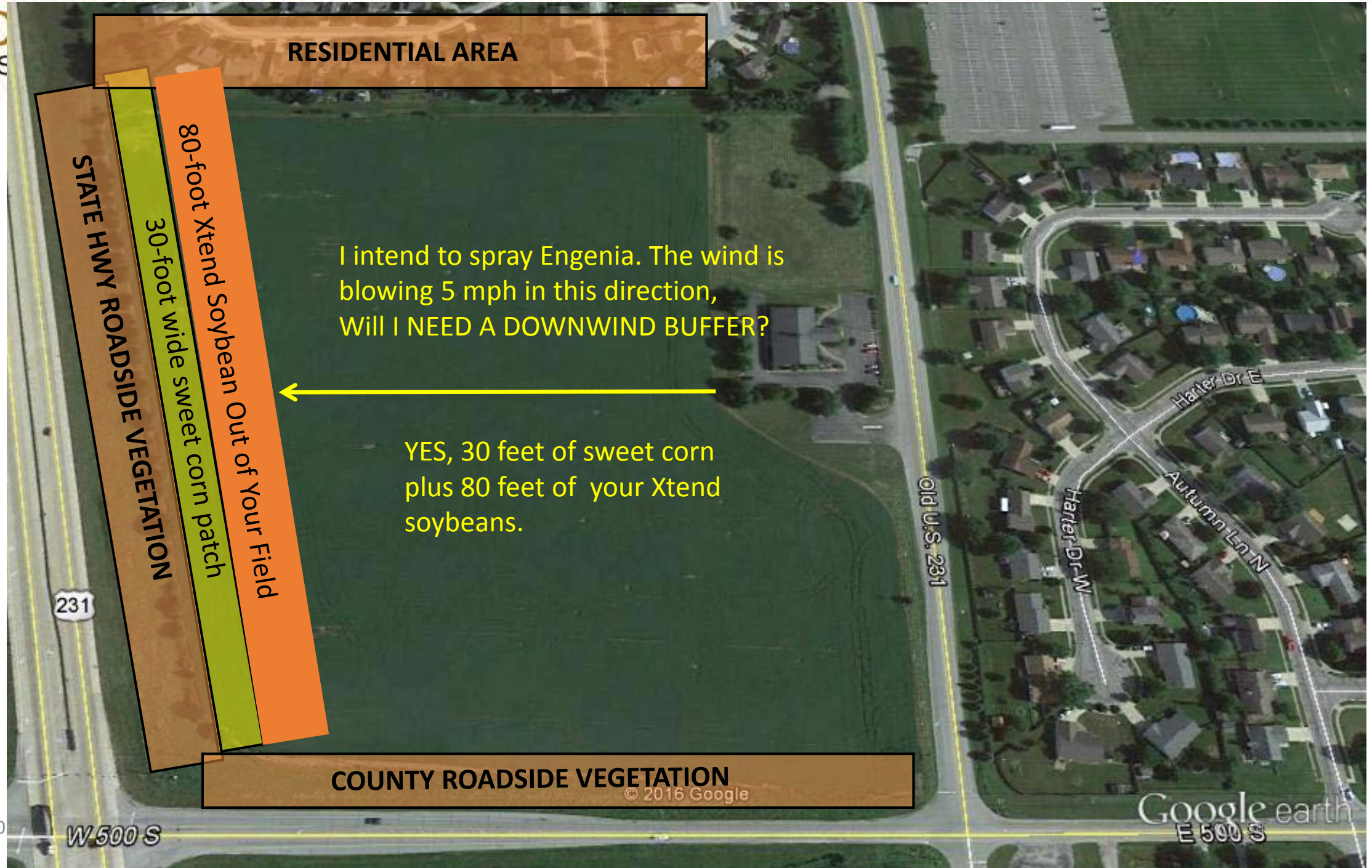
- Depending on what is downwind of your DT soybeans, the buffer might be calculated:
  - all from within your field (100%);
  - partially from your field & partially from the neighboring property; or
  - all from the neighboring property (100%).

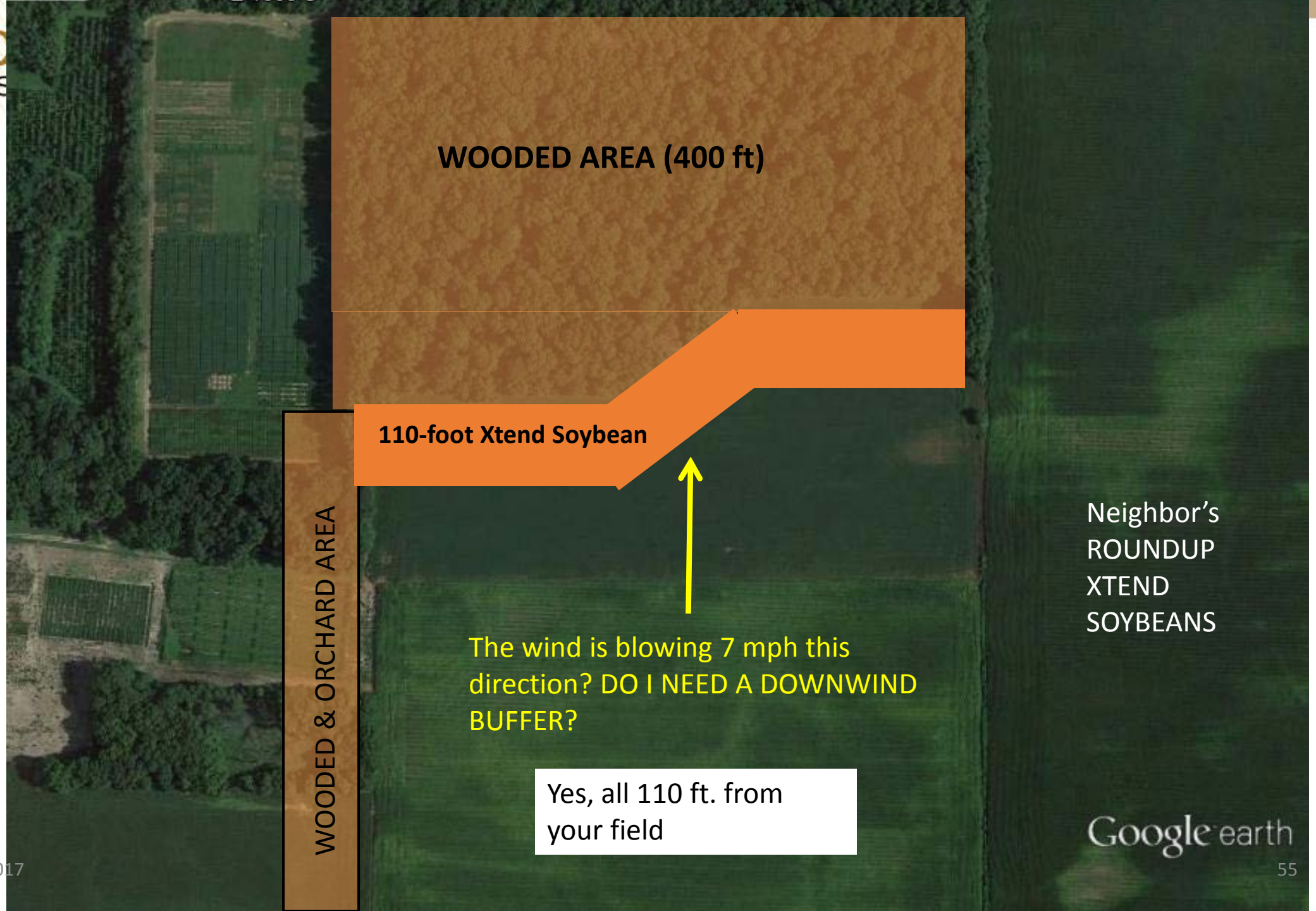
Required Downwind Buffers

The labels specify the **entire buffer** will always be in your field, except when the following are **immediately adjacent** to the downwind side of your field.

- Agricultural fields prepared for planting.
- Planted agricultural fields containing asparagus, corn, DT soybeans, sorghum, proso millet, or small grains.
- Manmade structures with walls and a roof *(limited usefulness).*
  - Paved or gravel road surfaces
    - ***Warning****: vegetative shoulders alongside a road prevent most roads from being used as part of the buffer. Most of the time this exception serves no practical purpose & roads can* ***not*** *be used as part of the buffer calculation.*


RESIDENTIAL AREA
110-foot Xtend Soybean Out of Your Field
STATE ROAD VEGETATION SHOULDER
231
I intend to spray 22 fluid oz. of Xtendimax. If the wind is blowing 5 MPH from this direction, and Hwy 231 Measures 110 ft across, DO I NEED A DOWNWIND BUFFER?
YES, Highway 231 is not immediately adjacent to field. The 110 ft buffer will come out of your field.
COUNTY ROAD VEGETATION SHOULDER
W 500 S
E 500 S
Old U.S. 231
Harter Dr E
Harter Dr W
Autumn Ln N
Google earth


RESIDENTIAL AREA
80-foot Xtend Soybean Out of Your Field
30-foot wide sweet corn patch
STATE HWY ROADSIDE VEGETATION
I intend to spray Engenia. The wind is blowing 5 mph in this direction, Will I NEED A DOWNWIND BUFFER?
YES, 30 feet of sweet corn plus 80 feet of your Xtend soybeans.
COUNTY ROADSIDE VEGETATION
231
Old U.S. 231
Harter Dr E
Harter Dr W
Autumn Ln N
W 500 S
E 500 S
© 2016 Google
Google earth


WOODED AREA (400 ft)
110-foot Xtend Soybean
WOODED & ORCHARD AREA
The wind is blowing 7 mph this direction? DO I NEED A DOWNWIND BUFFER?
Yes, all 110 ft. from your field
Neighbor's ROUNDUP XTEND SOYBEANS
Google earth

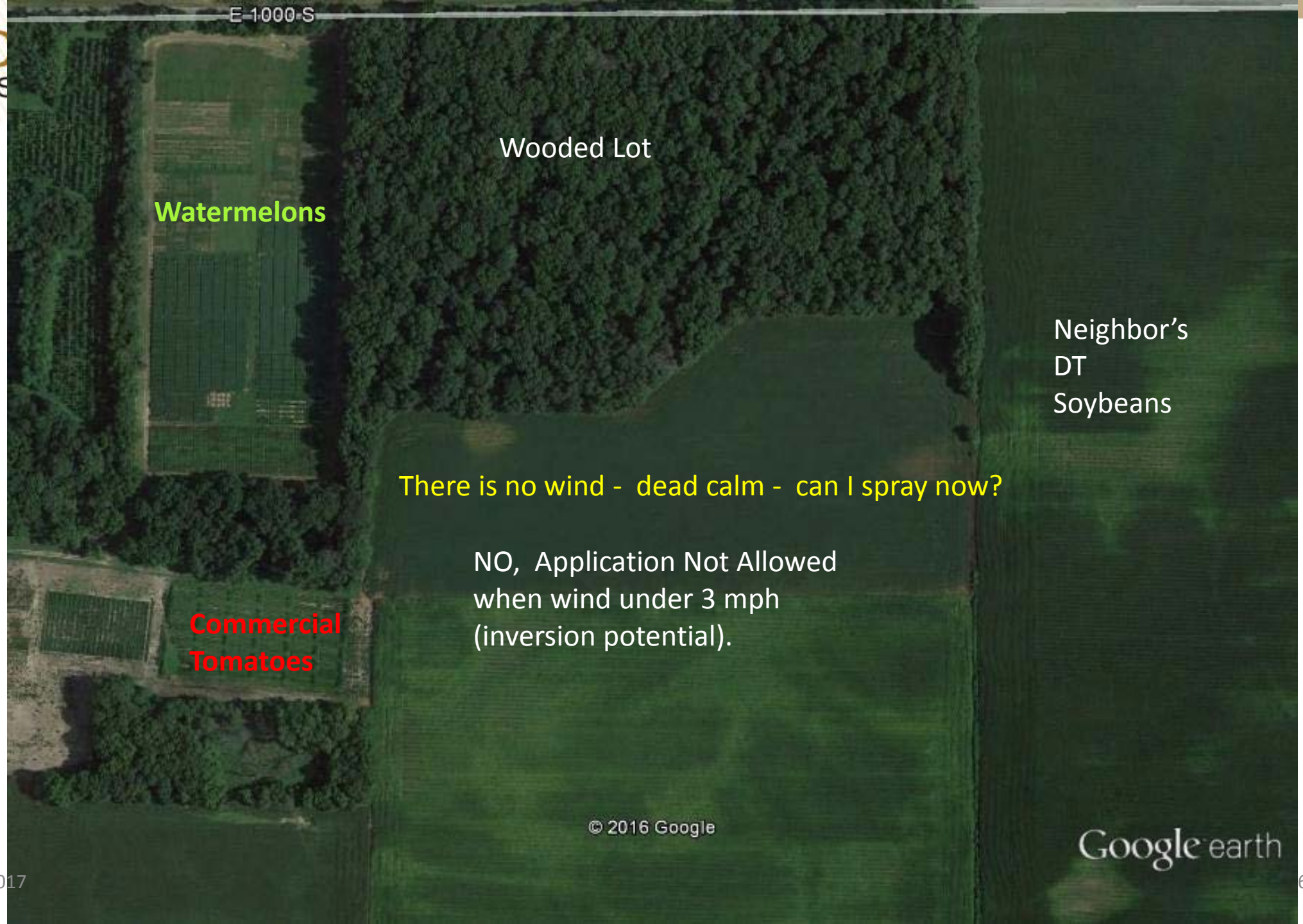

RESIDENTIAL AREA
110-foot Xtend Soybean Out of Your Field
STATE ROAD VEGETATION SHOULDER
I intend to spray 22 fluid oz. of Xtendimax If the wind is blowing 5 MPH from this direction, and Hwy 231 Measures 110' across, DO I NEED A DOWNWIND BUFFER?
YES, Highway 231 is not immediately adjacent to field. The 110' buffer will come out of your field.
COUNTY ROAD VEGETATION SHOULDER
231
Old U.S. 231
Harter Dr E
Harter Dr W
Autumn Ln N
W 500 S
E 500 S
© 2016 Google
Google earth


WOODED LOT
If the wind is blowing 8 mph this direction?
DO I NEED A DOWNWIND BUFFER?
YES – All 110 feet of buffer from your neighbor's Xtend soybeans
110-foot Xtend Soybean
Neighbors
ROUNDUP
XTEND
SOYBEANS
© 2016 Google
Google earth


E 1000 S
If the wind is blowing 4 mph this direction?
DO I NEED A DOWNWIND BUFFER
Buffer is a moot point.
Application NOT ALLOWED when wind is blowing toward sensitive crop.
Commercial Tomatoes
© 2016 Google
Google earth


E 1000 S
If the wind is blowing 9 mph this direction? Can I spray now?
No! It's not just limited to commercial tomatoes this year. Wind blowing toward neighboring sensitive crop you cannot spray!
Grandpa's Private Grape Arbor
© 2016 Google
Could apply to part of the field on this side of dashed line
Google earth


E 1000 S
Grapes & Beehives
Wooded Lot
Neighbor's Corn & Wheat
If the wind is blowing 13 mph this direction?
Can I spray FeXapan now?
Neighbor's personal vegetable garden
No. Cannot spray when wind is above 10 mph.
© 2016 Google
Google earth


E 1000 S
Wooded Lot
Watermelons
Neighbor's
DT
Soybeans
There is no wind - dead calm - can I spray now?
NO, Application Not Allowed
when wind under 3 mph
(inversion potential).
Commercial
Tomatoes
© 2016 Google
Google earth


E 1000 S
Wooded Lot
County road with vegetative shoulder
110-foot Xtend Soybean
If the wind is blowing 9 MPH this direction?
DO I NEED A DOWNWIND BUFFER?
Yes, all 110 ft. from your field
110-foot Xtend Soybean
Neighbors ROUNDUP XTEND SOYBEANS
Google earth


E 1000 S
Nature Preserve
Melons
Well, when the heck can I spray???
Non-DT Soybeans
When winds are 3-10 MPH not blowing toward sensitive crops,
It's between sunrise and sunset,
No rain forecast (51%) for next 24 hours
Grapes
Commercial Tomatoes
Still need a downwind buffer!
AND, volatility can occur for several days after application and move with any wind at that time.
Plant Nursery
So USE YOUR BEST JUDGEMENT
Consider BMP of any sensitive plant within ½ mile or more!
Google earth

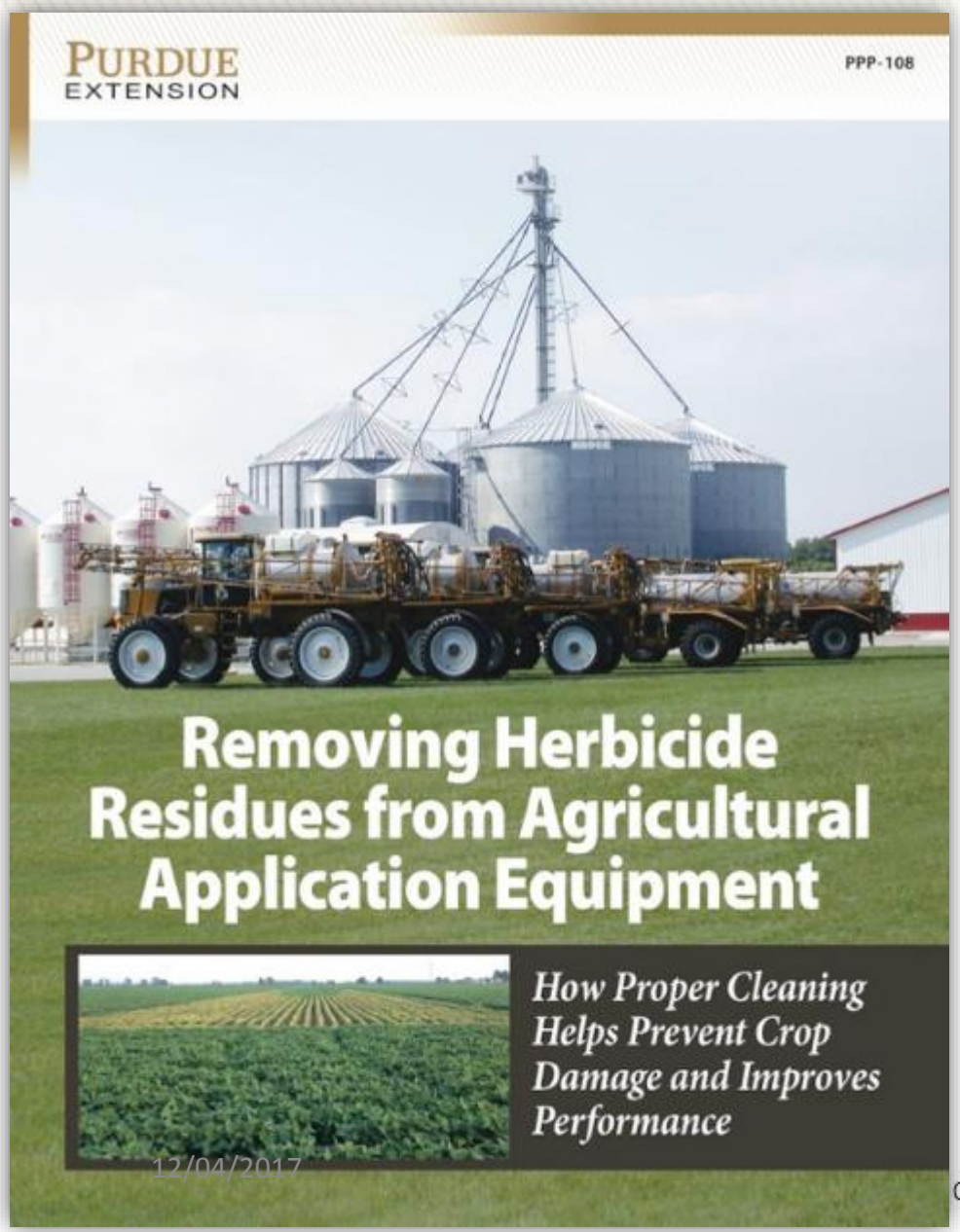
Clean the Spray Tank

Tank contamination will likely play a large role in off-target movement of synthetic auxin herbicides, especially dicamba.

Based on **our results**, spraying a dicamba-resistant soybean field with a 16 fl oz/A rate of Clarity and then…

leaving 8 fl ozs of solution in a 1,200 gallon spray tank would result in **significant foliar injury** to a subsequent non-DR soybean field… **but not necessarily yield loss!**

leaving about 1 gallon of that solution in the tank would result in **significant yield loss** to a subsequent non DR soybean field.



Post Application

Confirm and record that the spray system has been rinsed according to the label.

Post Application

- Create the records within 14 days of application.
- Keep records for at least 2 years.
- Remember, if split treatment is made in a field, two separate records will be required since application time, temperature, & winds may be different.
- Required application recordkeeping consists of two parts:
  1. Standard RUP records *(all dicamba products);* plus
  2. Label-required records *(Xtendimax, Engenia, & FeXapan.)*

RUP application information (all RUP Dicamba Products)

- Location
- Applicator name and permit number
- Date of application
- Crop
- Pest
- Acres treated
- Rate
- Total amount used
- Brand name & formulation
- Manufacturer
- EPA registration number

Additional records for Xtendimax, Engenia, and FeXapan include:

1. Proof the applicator was trained
2. Receipts for product purchase
3. Product label
4. Date you visited DriftWatch for nearby sensitive crops & documentation that you surveyed nearby fields for sensitive crops prior to application *(BMP within ½ mile).*
5. Pre-emergence or Post-emergence *(if post, also include number of days after planting).*
6. List of all products in the tank mix
7. Type of nozzle & pressure used
8. Date & start & finish times of application
9. Air temperature at the start & end of application, measured at boom height
10. Wind direction & speed at start & end of application, measured at boom height
11. Date the sprayer was cleaned & method used to clean it

PURDUE EXTENSION | LOCAL FACES COUNTLESS CONNECTIONS

You were given this recordkeeping form to use as a guide. The form is available at OISC website as a pdf you can print or fill in and save electronically.

Required Records for Engenia, Xtendimax, FeXapan Applications

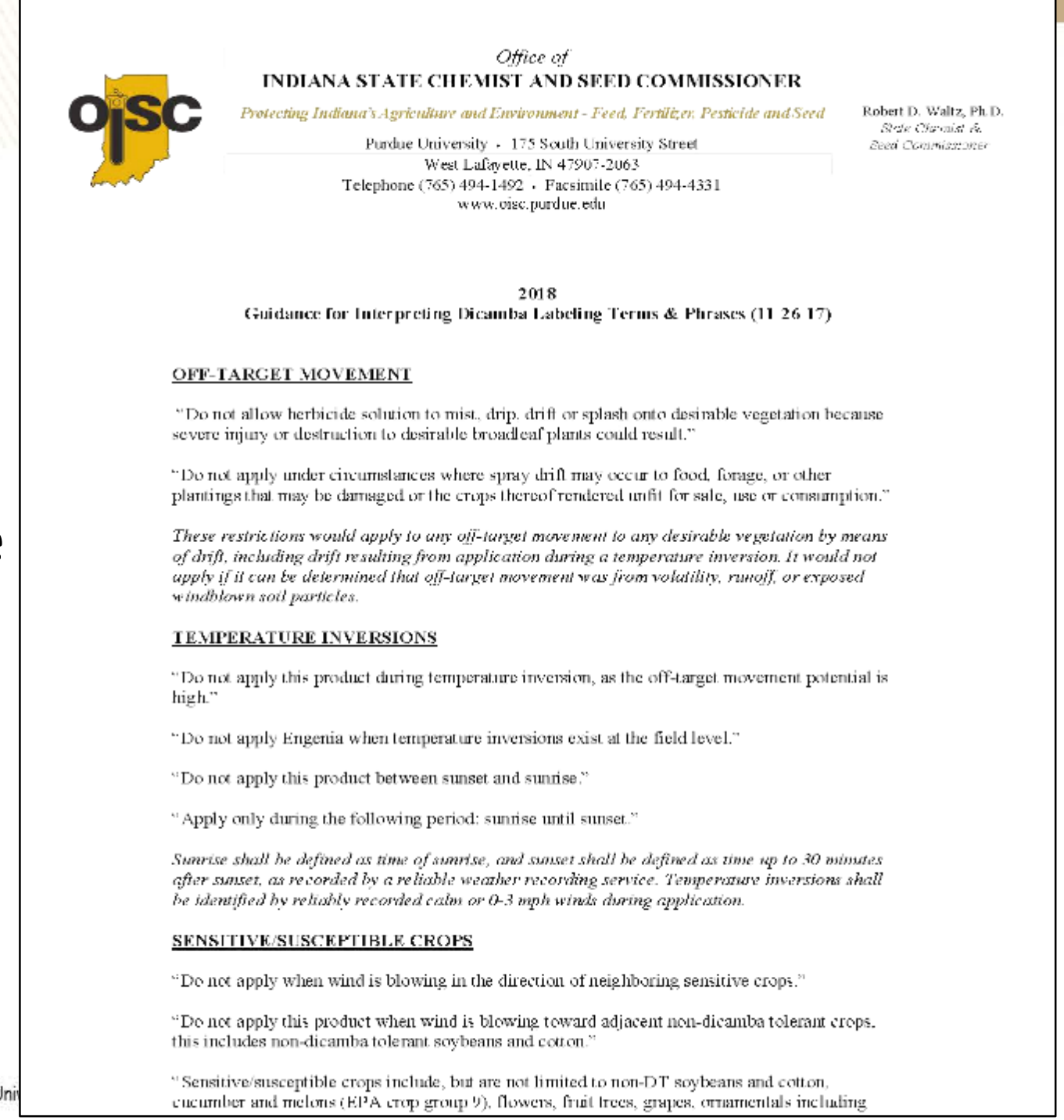
Personal Information			
Name & license number of certified applicator			
Name (and RT number if applicable) of person making application (if different from above)			
Dicamba training (mm/dd/yy, city, CCH or PARP number)			
Pre-application	**Date(s) (mm/dd/yy)**		
Checked DriftWatch for nearby sensitive 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**

The label is complex, requiring much from the user of these products.

Observe OISC's guidance for "Interpreting Dicamba Label Terms And Phrases."



Office of
INDIANA STATE CHEMIST AND SEED COMMISSIONER

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

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

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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

Keep in mind

Rotate herbicide classes when possible as a way of reducing resistance. Dicamba is a Group 4.

Questions

Q: We've been spraying dicamba on corn since the 1960's and there hasn't been any resistance issues, so why can't I just spray Engenia, FeXapan, or Xtendimax 3 times a season?

A: We've been down this road, it was called "Roundup Ready". HISTORY will repeat itself if we do the same thing – RESISTANCE!

Bill Johnson, Purdue weed scientist

Do your part to preserve the technology!

Conclusion

- Weed resistance is a real and ever-growing issue.
- Rotate herbicide classes when possible as a way of reducing resistance.
- Dicamba products are important tools in managing resistant weeds such as marestail, Palmer, and water hemp in dicamba-tolerant crops such as soybeans.
- The label is written to put all of the liability (both regulatory and civil) on the applicator. Follow the label.
- There are alternatives to dicamba products in soybeans in many cases.

"Threading The Needle"

To prevent spray technology from falling apart in 2018

Contributors:

- Joe Ikley, Weed Science Professional Assistant, Purdue University
- Bill Johnson, Professor of Weed Science, Purdue University
- Dave Scott, Pesticide Program Administrator, Office of Indiana State Chemist
- Fred Whitford, Clinical Engagement Professor, Purdue Pesticide Programs

Best Management Practices

- Do not apply if sensitive crops are within ½ mile
- Pay attention to wind forecast 2-3 days after application
- Use an app like Spray Smart to check for inversions
- Avoid applications when temperatures exceed 80 degrees
  - Higher temps = higher risk for volatility
- Consider Preplant, Preemergence, or very early Postemergence only

POCKET™ SPRAY SMART

TALK TO YOUR NEIGHBORS

PURDUE WEED SCIENCE