

**Dicamba Update**  
**August 30 2017**  
**Bill Johnson**  
**Joe Ikley**



# Herbicide Drift in 2017

- Indiana – it's not just dicamba
- 244 official drift complaints (119 suspected dicamba)
  - Sharpen
  - Glyphosate
  - HPPD-inhibitors
  - Atrazine
  - Other auxins
    - 2,4-D burndown
    - Right-of-way applications
    - Brush control





# Sharpen Drift





# Auxin Drift



# Other Drift Cases

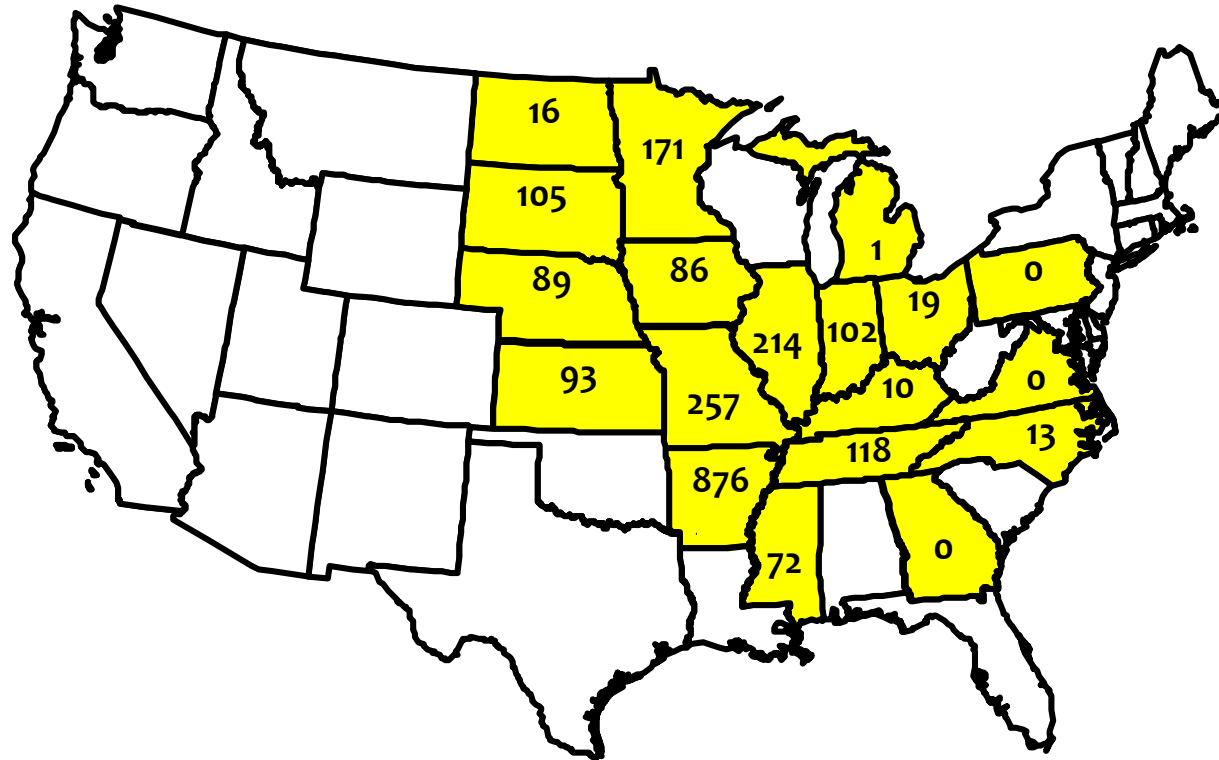




# Dicamba Update

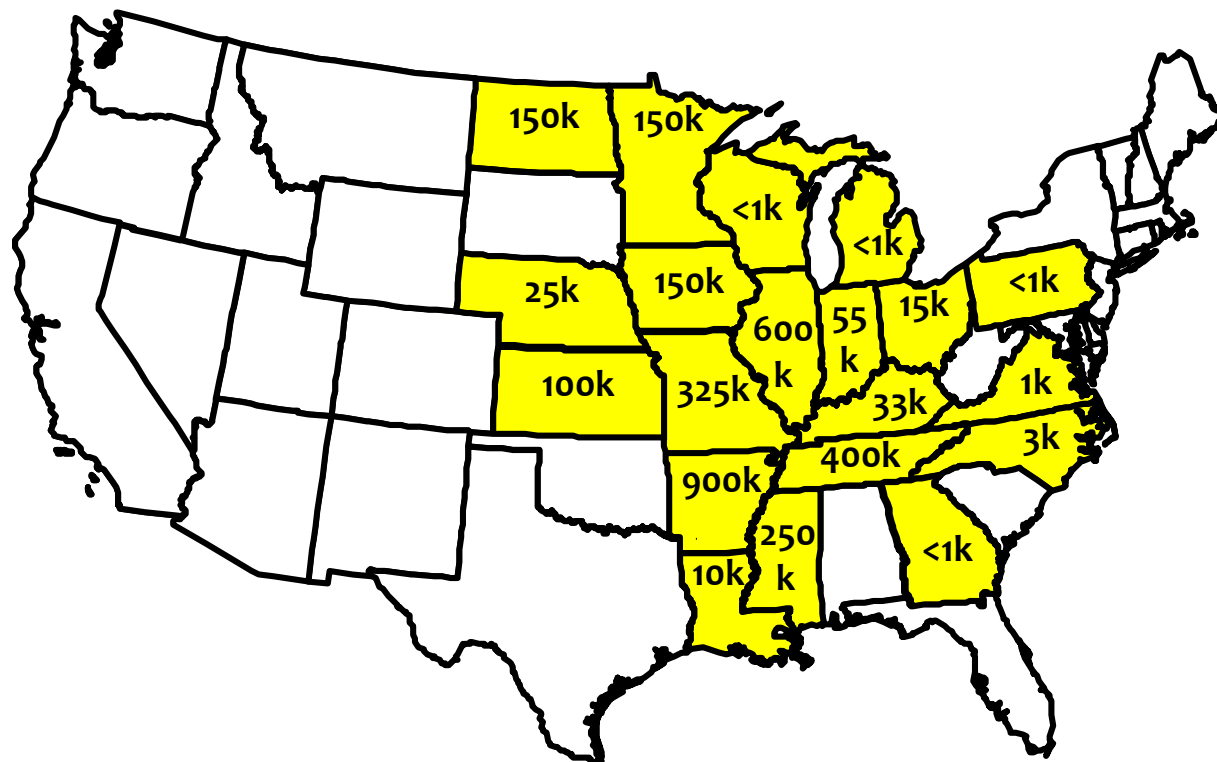


# Official Dicamba-related Injury Investigations as Reported by State Departments of Agriculture (\*as of August 10, 2017)



**\*Total: 2,242**

# Estimates of Dicamba-injured Soybean Acreage in the U.S. as Reported by State Extension Weed Scientists (\*as of August 10, 2017)

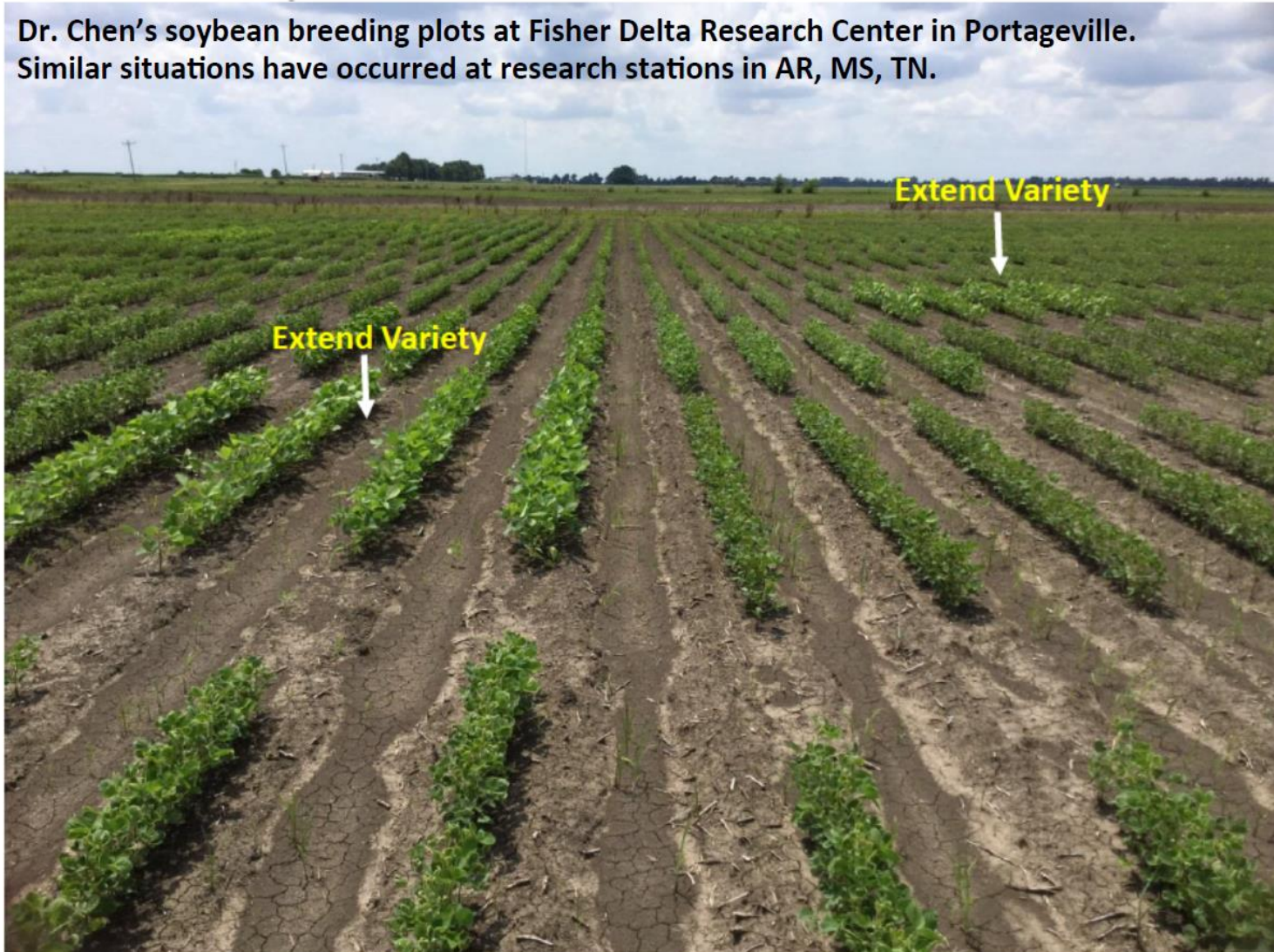


**\*Total: ~3.1 million**

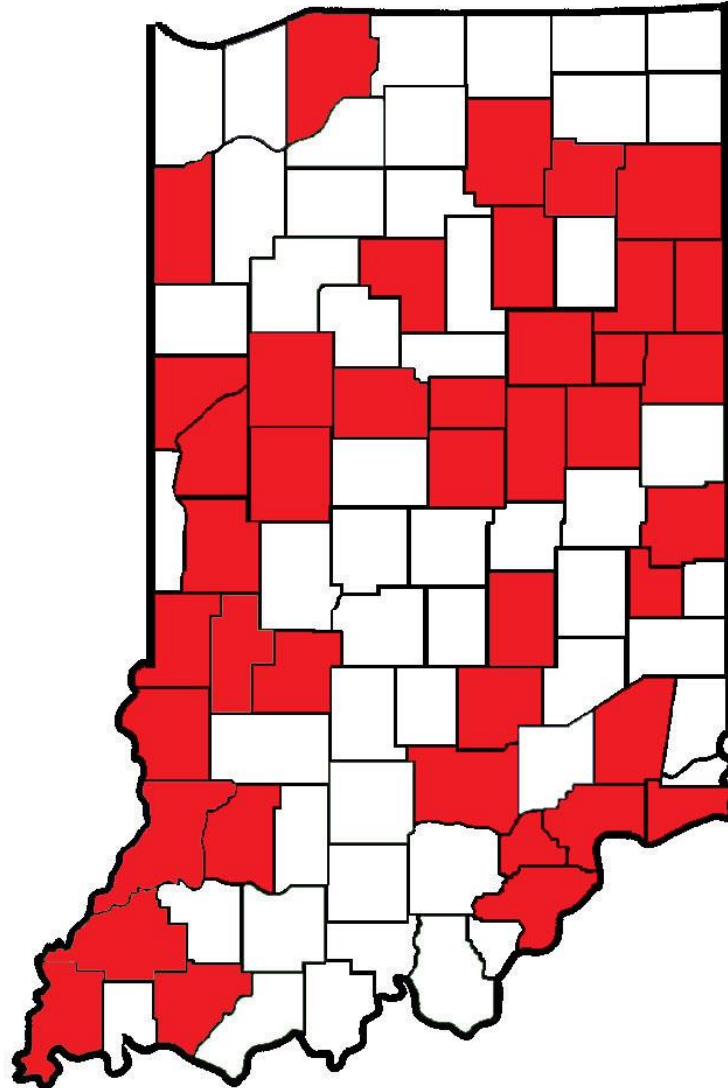


# Ag Experiment Station (Mizzou Weed Science)

Dr. Chen's soybean breeding plots at Fisher Delta Research Center in Portageville. Similar situations have occurred at research stations in AR, MS, TN.



# Vegetation Samples Submitted to PPDL with Confirmed Dicamba Symptoms





# Dicamba Injury

- Early season through mid-June
  - Many cases were linked with application in corn
- June 19<sup>th</sup> to present
  - A shift to more cases involving applications on soybean
- What injury patterns are occurring?
  - Some fields have injury gradient from point source
  - Many fields have uniform symptomology across entire field
    - Some >100 acres

# How is Dicamba Moving?

- Drift
  - Many windy days when soils were fit
- Ignoring buffers
- Temperature Inversions
- Volatility
  - Use of older formulations?
- Sprayer contamination
- Movement on soil?



# Weather in June and July

- All data compiled using weather station at the Agronomy Center for Research and Education (ACRE)
- Calculated number of spray hours based on Xtendimax/FeXapan label
  - 3 – 15 MPH winds
  - Wind gusts included into “ideal” spray hours calculation
- Recalculated spray hours based on Missouri emergency rules
  - 3 – 10 MPH
  - 9 AM – 3 PM

# Spray Hours with Current Label – 334

June 2017						
◀ May 2017						Jul 2017 ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

GREEN = More than 8 ideal spray hours in a day (3-15 MPH winds, including gusts)

YELLOW = Less than 8 ideal spray hours in a day (3-15 MPH winds, including gusts)

RED = Could not spray due to forecast rain event or fields too wet.



# Spray Hours with Current Label – 266

July 2017						
◀ Jun 2017						Aug 2017 ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

GREEN = More than 8 ideal spray hours in a day (3-15 MPH winds, including gusts)

YELLOW = Less than 8 ideal spray hours in a day (3-15 MPH winds, including gusts)

RED = Could not spray due to forecast rain event or fields too wet

# Spray Hours with Missouri Rules – 49

June 2017						
◀ May 2017						Jul 2017 ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 9-10, 2-3	2	3
4	5 11-3	6	7	8	9 9-10	10 9-10
11	12	13	14	15	16	17
18	19	20	21	22 10-2	23	24
25 9-10	26 9-11	27	28 9-1	29	30	

GREEN = Can Spray all 6 hours

YELLOW = Cannot spray all 6 hours

RED = Could not spray due label restrictions or fields too wet

# Spray Hours with Missouri Rules – 100

July 2017						
◀ Jun 2017						Aug 2017 ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6 9-10, 11-3	7	8
9	10	11	12	13	14	15 9-12, 1-3
16	17	18 10-3	19	20	21	22
23	24	25	26	27 10-3	28	29 9-12, 1-3
30 11-3	31 9-12, 2-3					

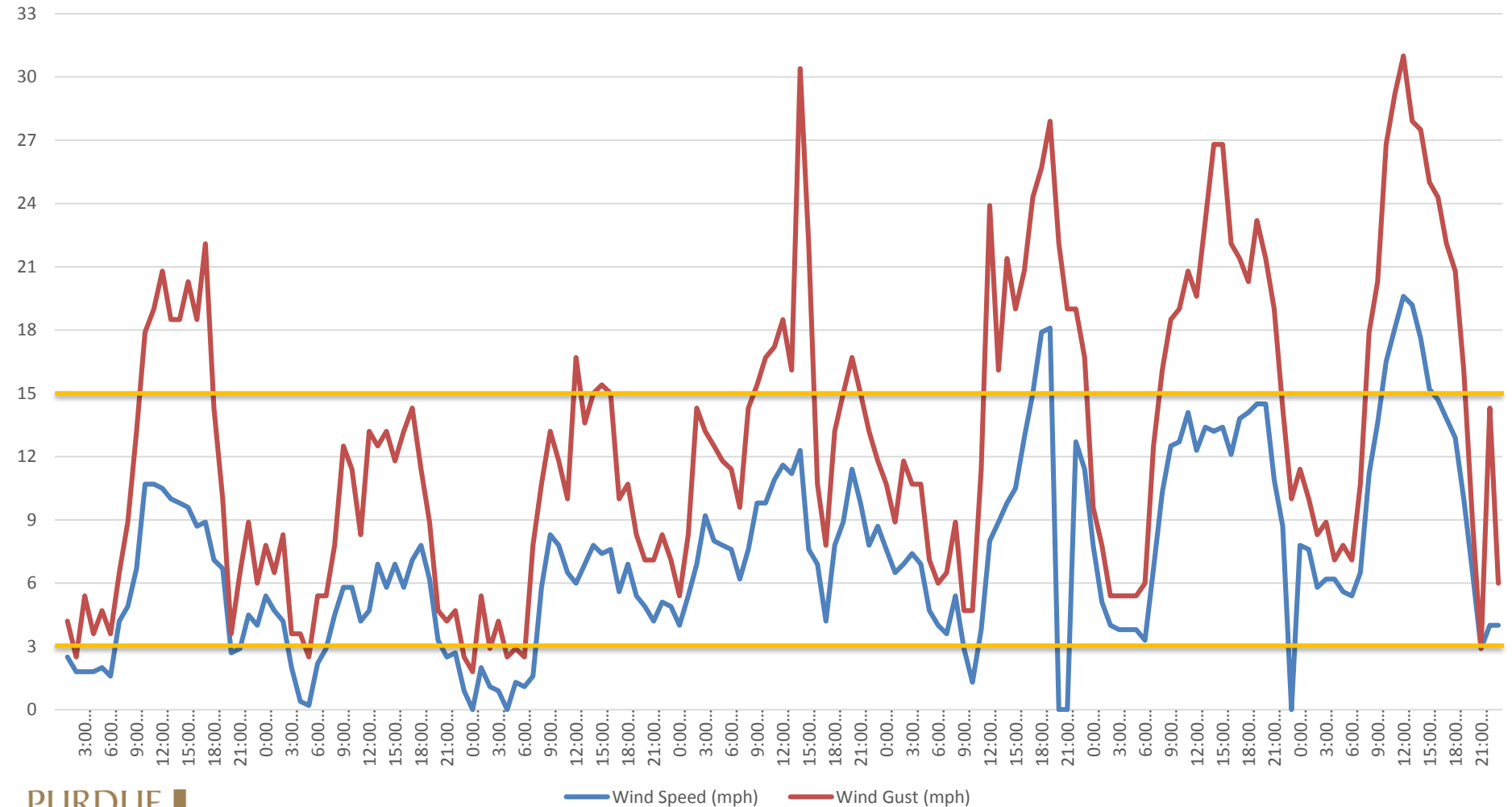
GREEN = Can spray all 6 hours

YELLOW = Cannot spray all 6 hours

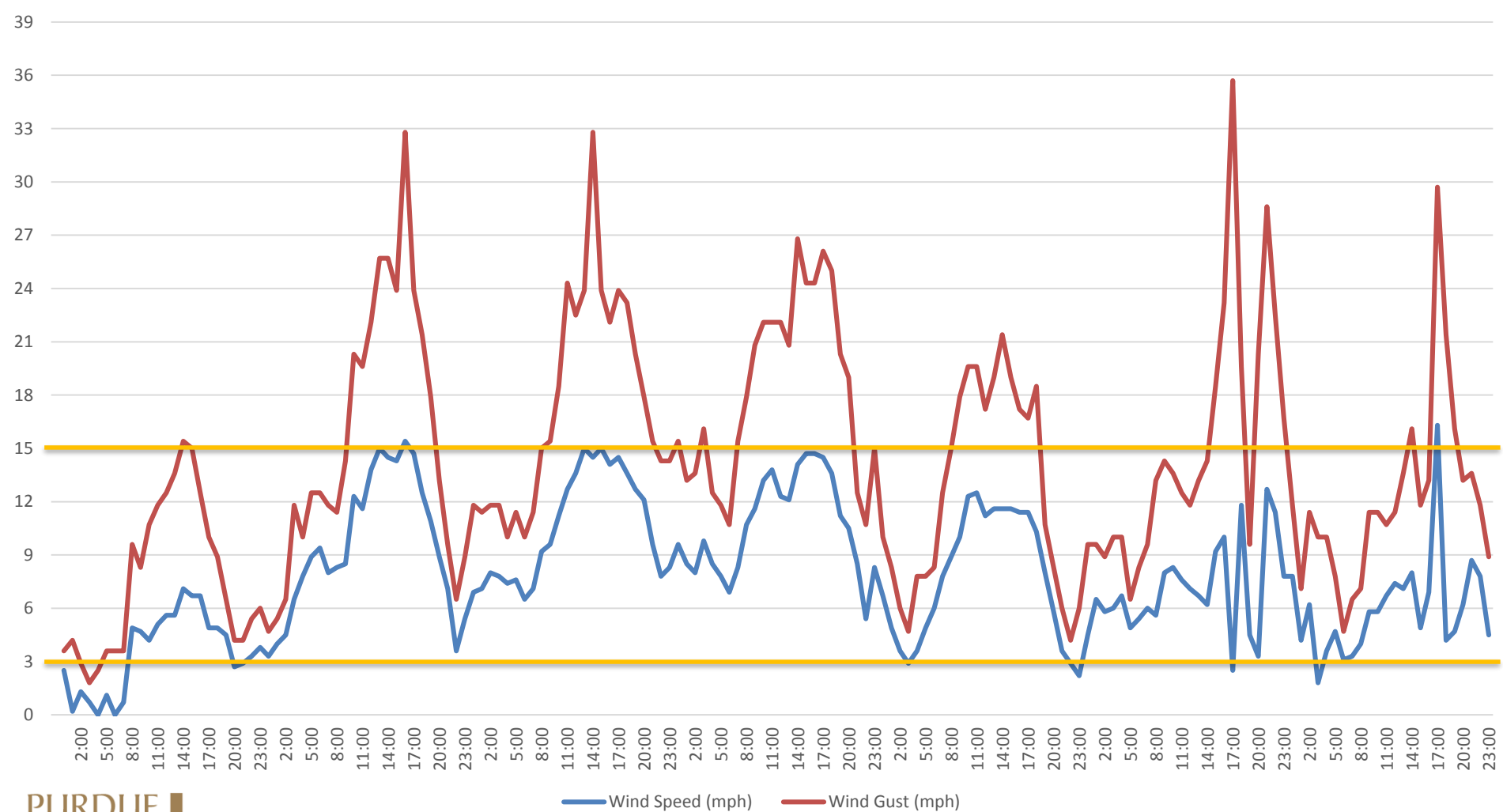
RED = Could not spray due to label restrictions or fields too wet



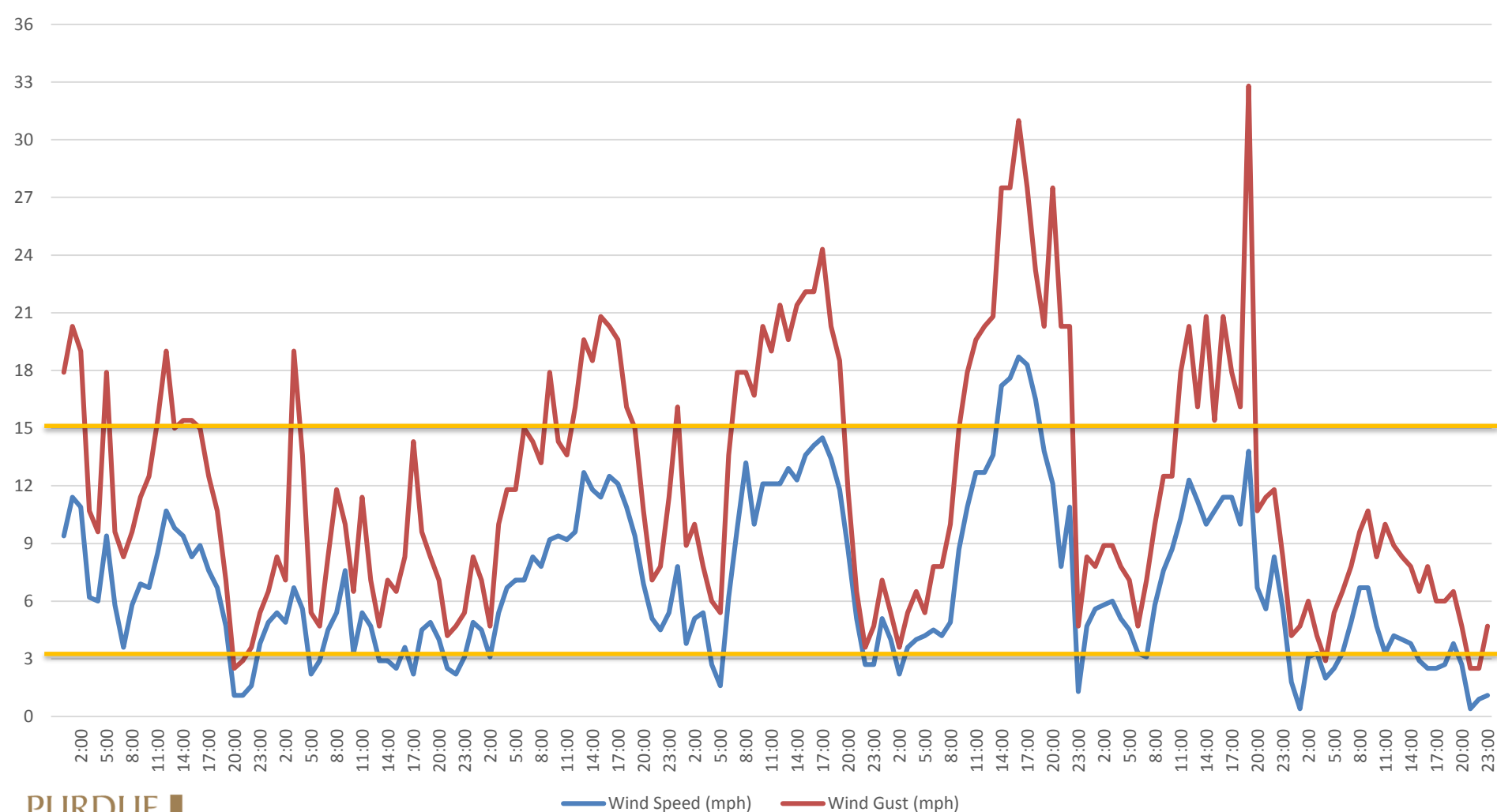
# June 1 – 7



# June 8 – 14

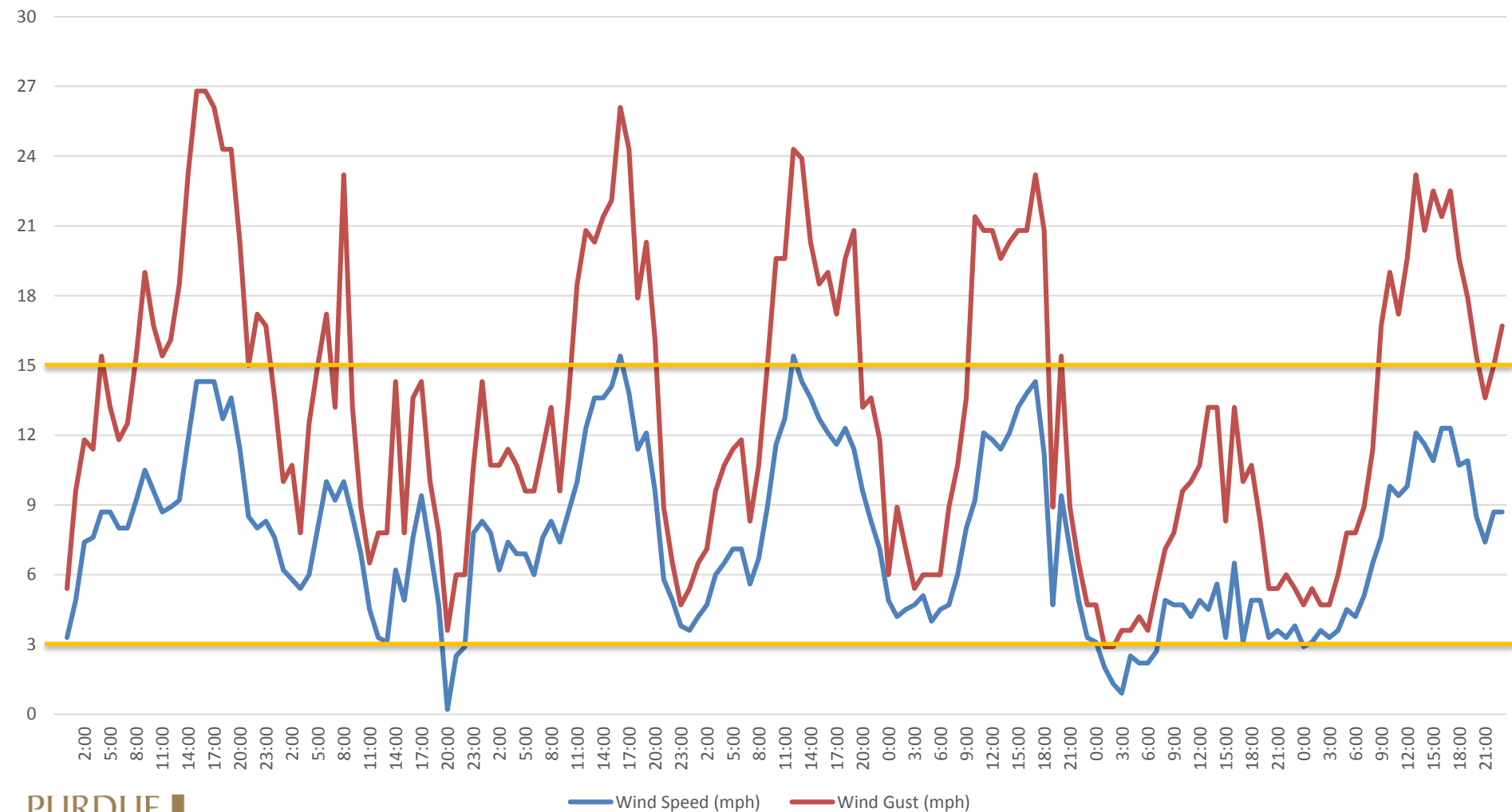


# June 15 – 21

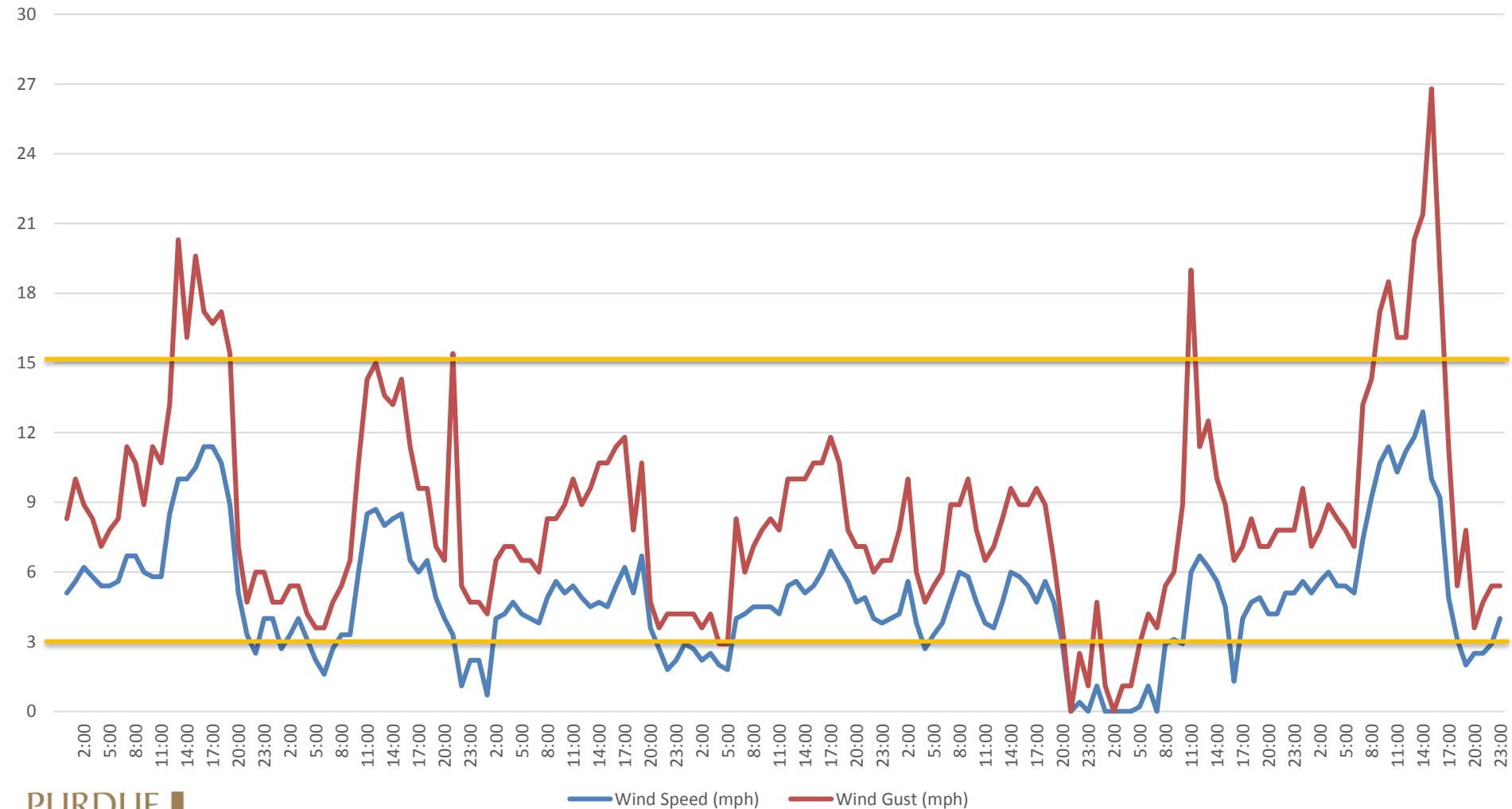




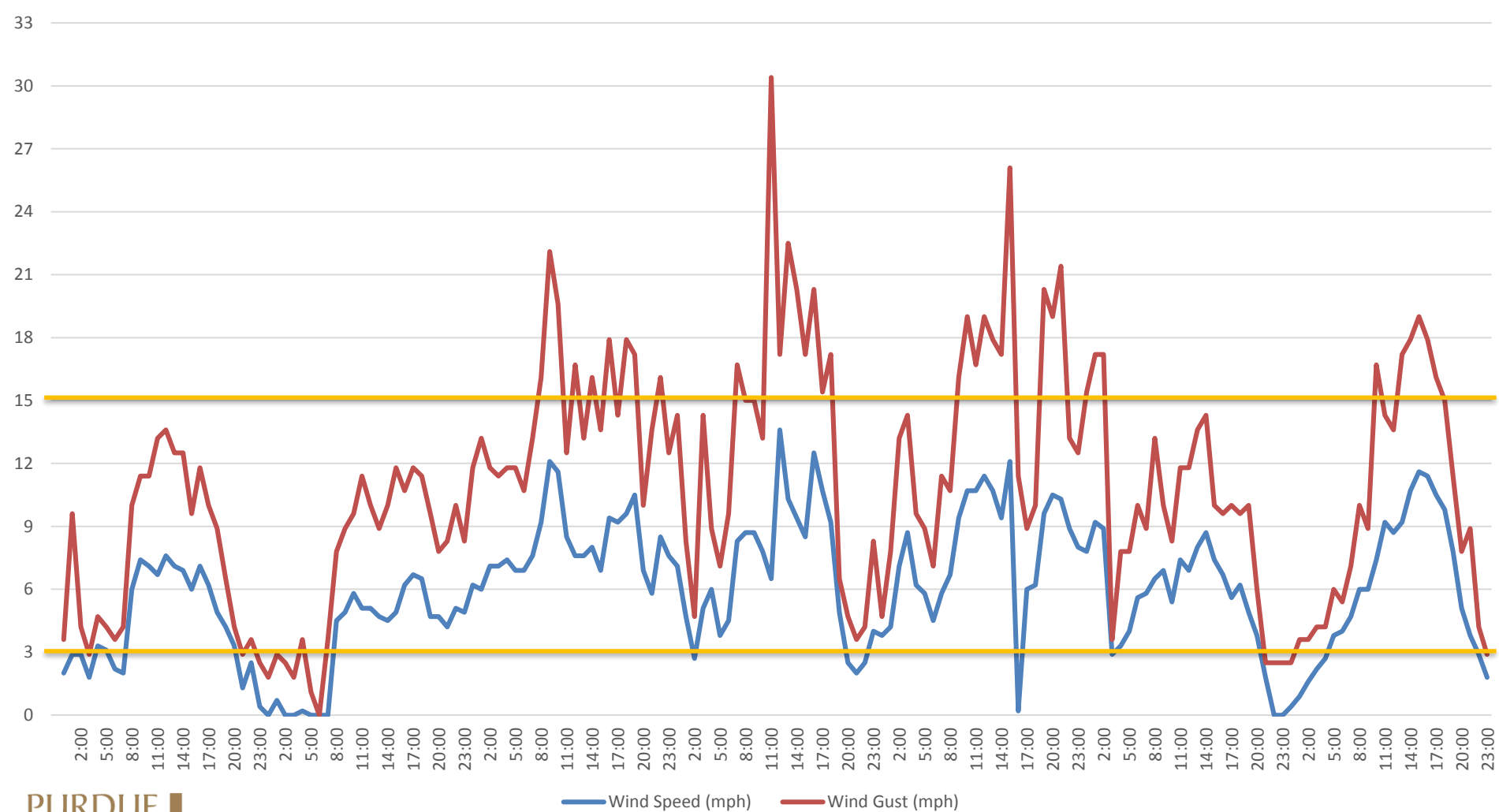
# June 22 – 28



# July 1 – 7

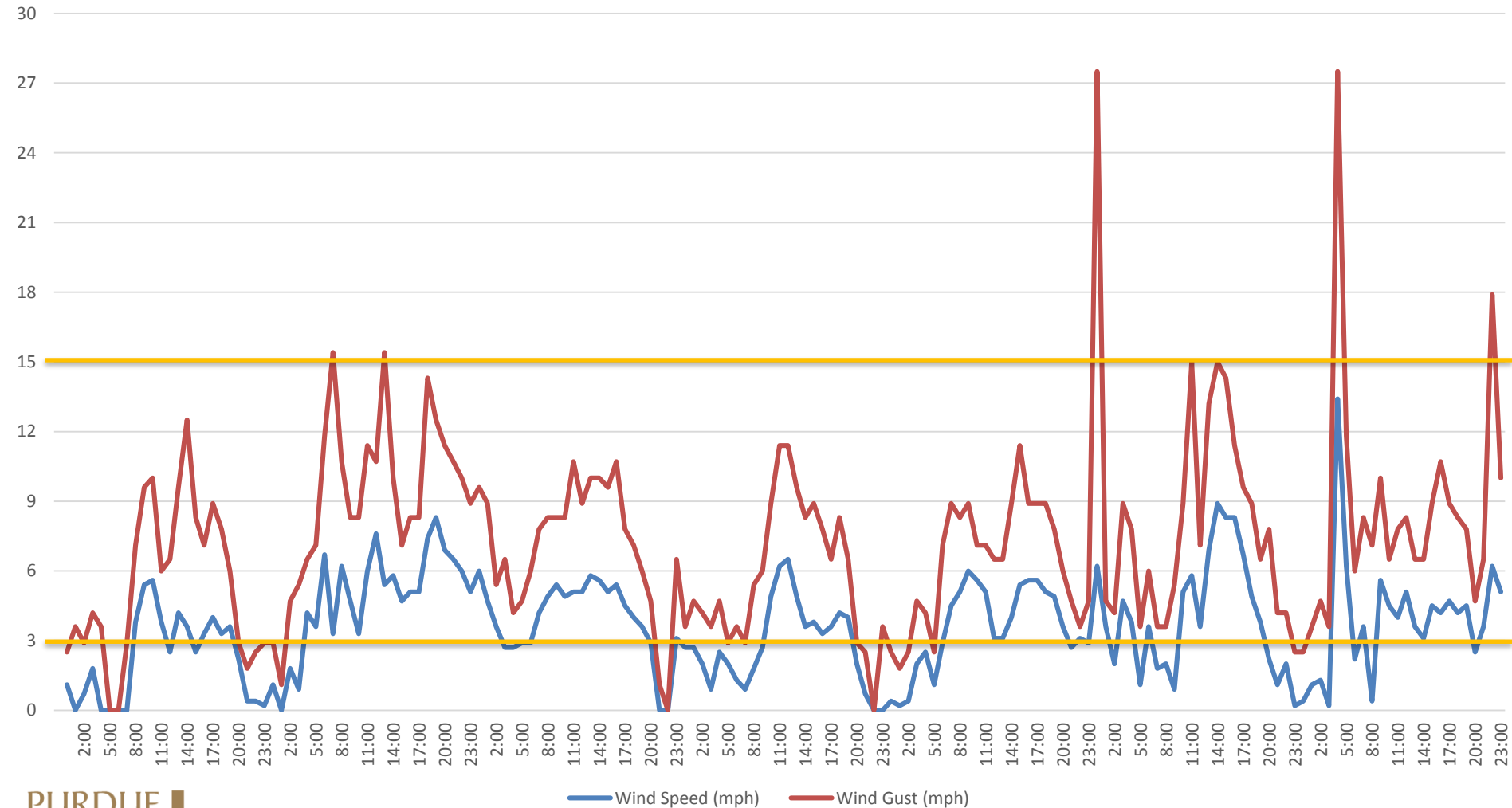


# July 8 – 14

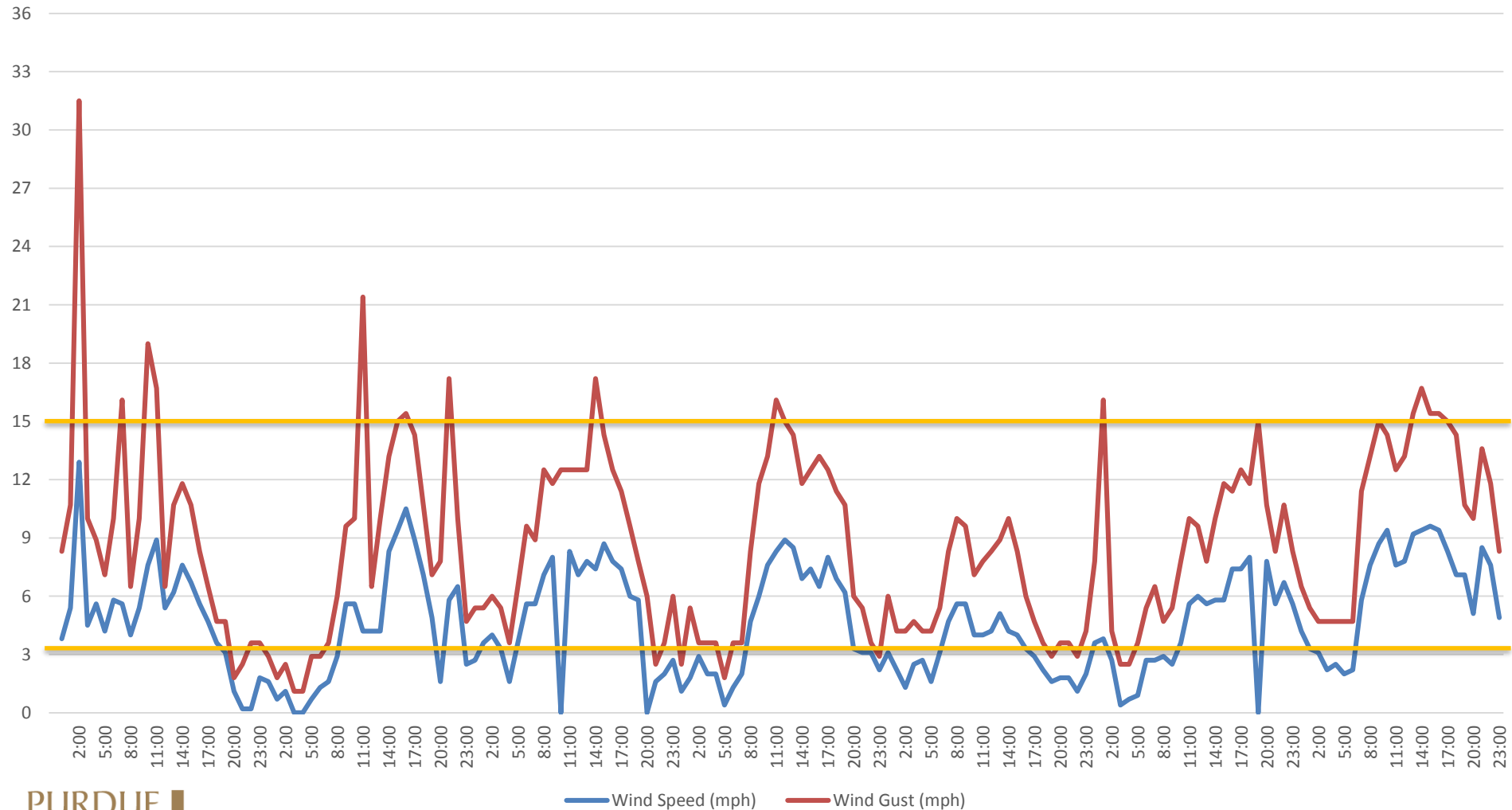




# July 15 – 21



# July 22 – 28



# Environmental Conditions for Well Documented Cases

- June 22 – 24 spray hours
  - 3-10 MPH for 11 hours; over 10 MPH for 13 hours
  - 15 hours with gusts over 15 MPH
- June 27 – 9 spray hours
  - Winds under 5 MPH from 2 PM until 6 AM next morning
  - High temps in low to upper 80's until first rain on June 30
- July 3 – 3 spray hours
  - Winds below 5 MPH all day until 11 AM next morning
  - High temps in upper 80's until first rain on July 7

# 110' Downwind Buffer?





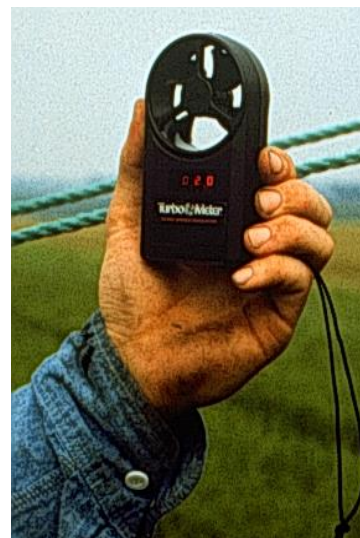
# Recognizing Inversions:

- Under clear to partly cloudy skies and light winds, a surface inversion can form as the sun sets
- Under these conditions, a surface inversion will continue into the morning until the sun begins to heat the ground



# Precautions for Inversions:

- Surface inversions are common
- 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
  - 5 degree temp rise after sun-up
- Use of a smoke bomb or smoke generator is recommended to identify inversion conditions



# Smoke Bomb Test (Mizzou Weed Science)

---

## Using Smoke Grenades to Validate our Inversion Modeling (June 8, 2017)

Released at 4:00, No Inversion Present

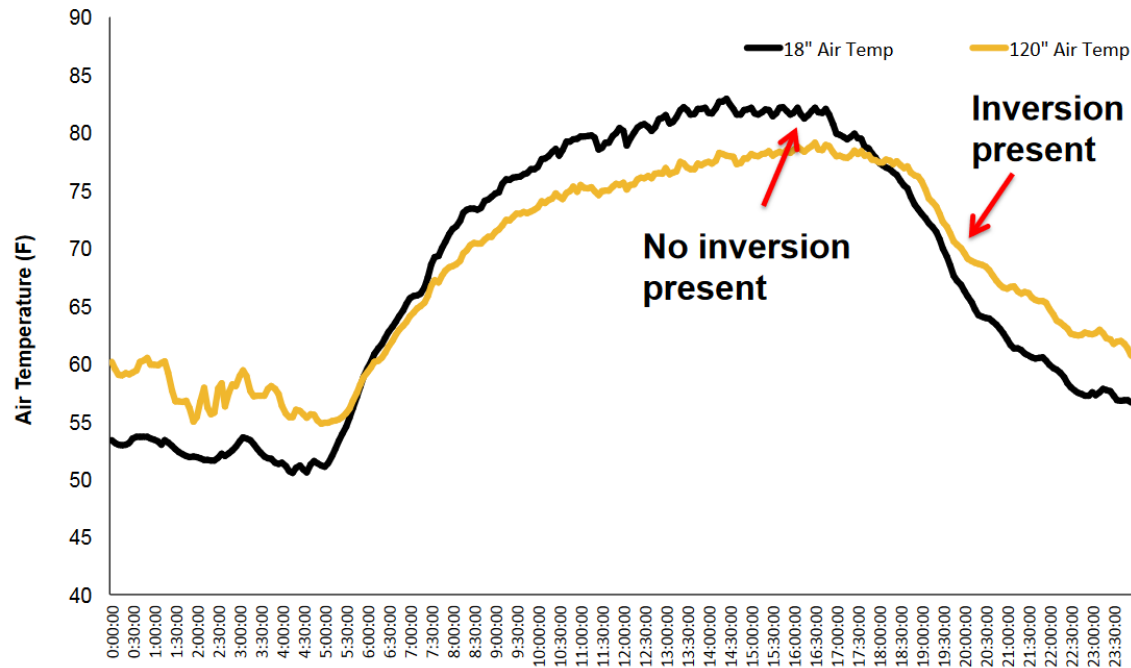


Released at 7:30, Inversion Present



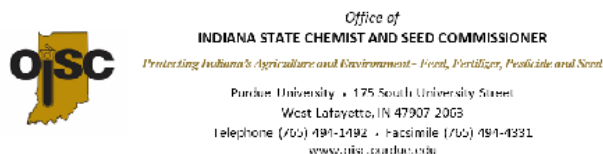
# Temperatures at Test Times (Mizzou Weed Science)

## Temperatures at Smoke Bomb release – June 8, 2017 Bradford Research Farm





# http://www.oisc.purdue.edu/pesticide /news\_alerts.html



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

## February 21, 2017 What You Should Know About Purchasing & Using Dicamba-Based Herbicides

### Background:

The Indiana Pesticide Review Board (IPRB) was created by the Indiana legislature to direct pesticide rulemaking and policy for Indiana. Board members are appointed by the Governor. The IPRB is comprised of government and university scientists; industry, conservation organization and public representatives; and commercial and private pesticide applicators. The Board has authority to adopt rules to establish a list of Restricted Use Pesticides (RUPs) and to develop restrictions for the distribution and use of pesticides in Indiana.

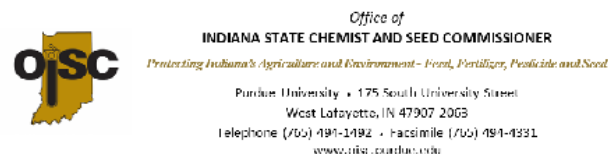
The IPRB has been studying and discussing the use of 2,4-D and dicamba containing herbicides on soybeans almost continuously since 2007. At that time, it was brought to the Board's attention that 2,4-D and dicamba tolerant soybeans were being developed to create additional options for growers/farmers to control certain noxious weeds that have become resistant to currently used soybean herbicides. In addition to the potential benefits of such weed control developments, serious concerns about off-target movement (drift and volatilization) and damage from these highly active herbicides to sensitive crops and sites (i.e. tomatoes, grapes, melons, fruits, vegetables, non-tolerant soybeans, ornamentals, etc.) have been debated.

Dicamba tolerant (DT) soybean and cotton crop seeds were approved by USDA for planting in 2016. As a result, some U.S. growers in parts of the Midwest and South planted these crops, even though U.S. EPA had not yet made a decision to approve any dicamba-based herbicides for use on these crops. In spite of having no dicamba product to apply legally on these crops, a significant number of growers proceeded to use unlabeled dicamba herbicides. Many incidents of misuse resulted in numerous non-target damage claims. Preliminary estimates suggest that Missouri alone investigated over 220 complaints, involving at least 62 private applicators, and over 41,000 acres of damaged soybeans, peaches, tomatoes, melons, and other crops and residential plantings.

Late in 2016 and early 2017, U.S. EPA made a determination to accept the registration for several dicamba-based herbicide products labeled for both pre-emergence and post-emergence use on DT soybeans. The currently accepted soybean products are Monsanto Company's XtendiMax with VaporGrip Technology (EPA Reg. No. 524-617), BASF's Engenia Herbicide (EPA Reg. No. 7969-345), and DuPont's FeXapan Herbicide Plus VaporGrip Technology (EPA Reg. No. 352-913). These new products bear labels with many new and detailed drift restrictions and requirements not found on most older herbicide labels.

### Regulatory Action in Indiana:

In response to requests for regulatory safeguards to protect non-target sites and crops, the IPRB voted unanimously on November 30, 2016 to start the rulemaking process to classify dicamba herbicides as state Restricted Use Pesticides (RUPs) for Indiana.



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

## February 21, 2017 Dicamba Use on Soybeans in Indiana

### New Labels, New Requirements, & New Uses of Dicamba on Soybeans:

Currently there are three dicamba soybean products that have been accepted by U.S. EPA and are registered for use in Indiana in 2017, Monsanto's XtendiMax with VaporGrip Technology (EPA Reg. No. 524-617), BASF's Engenia Herbicide (EPA Reg. No. 7969-345), and DuPont's FeXapan Herbicide Plus VaporGrip Technology (EPA Reg. No. 352-913).

The labels for these products have use directions and restrictions, many of which may be new to pesticide applicators. The below-listed requirements and restrictions apply to each of these products, unless specifically marked with the product name.

1. Do not apply this product aerially.
2. Do not apply if rain is expected within 24 hours after application. (*XtendiMax/FeXapan*)
3. Do not apply if rain is expected within 4 hours after application. (*Engenia*)
4. Do not harvest or feed soybean forage within 7 days after final application.
5. Do not harvest or feed soybean hay within 14 days after final application.
6. Do not tank mix with anything other than water except as permitted on [www.xtendimaxapplicationrequirements.com](http://www.xtendimaxapplicationrequirements.com) (*XtendiMax*) or [www.engeniatankmix.com](http://www.engeniatankmix.com) (*Engenia*) or [www.fexapanapplicationrequirements.dupont.com](http://www.fexapanapplicationrequirements.dupont.com) (*FeXapan*).
7. Must check web site for acceptable tank mix directions within 7 days prior to application.
8. Do not tank mix if tank mix partner product labels prohibit it.
9. Do not tank mix with products such as ammonium sulfate or urea ammonium nitrate.
10. Do not add adjuvants that will further decrease pH or acidify the spray. (*Engenia*)
11. Must check web site for acceptable tank mix directions of drift reduction agents (DRA).
12. Must check with DRA manufacturer to determine if DRA will work with required nozzle, spray pressure, and spray solution.
13. Do not mist, drip, drift, or splash onto desirable non dicamba tolerant vegetation.
14. Must use only Tee Jet TTI110004 nozzles at max. pressure of 63 psi or nozzles/pressures on web site.
15. Do not exceed 15 mph application ground speed.
16. Do not exceed boom height of 24 inches above target weed or crop canopy.
17. Do not apply during temperature inversion.
18. Do not apply at wind speeds greater than 15 mph.
19. Do not apply at wind speeds less than 3 mph. (*XtendiMax/FeXapan*)