

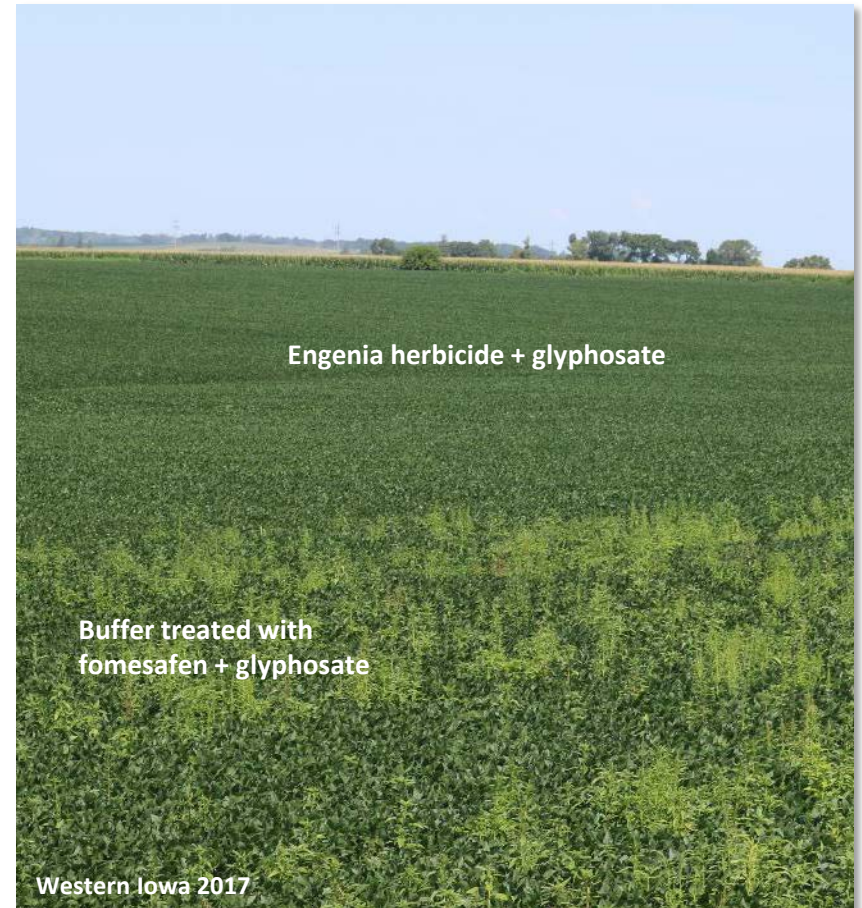


# Engenia<sup>®</sup> Herbicide Stewardship in 2018

Gery Welker  
BASF Corporation

# Engenia® Herbicide Update & Stewardship Overview

- **2017 Performance**
- **2017 Off-target Investigations**
  - Common causes
  - Date of application
- **2018 Education**
  - Training outline
  - Key elements for on-target applications
  - Impact of not following the label
- **Effective Weed Management**



# Engenia® Herbicide

## Performance in 2017

### ■ Excellent performance overall

### ■ Weeds targeted:

- Palmer amaranth, waterhemp, marestail, kochia, and other tough broadleaf weeds

### ■ Systems approach

- PRE followed by Post
- Layered residuals with Post

### ■ Primary cause for efficacy calls:

- Poor coverage and/or big weeds
- Slow, cool growing conditions



# Engenia<sup>®</sup> Herbicide

## Alleged off-target claims

### Most common causes based on information provided:

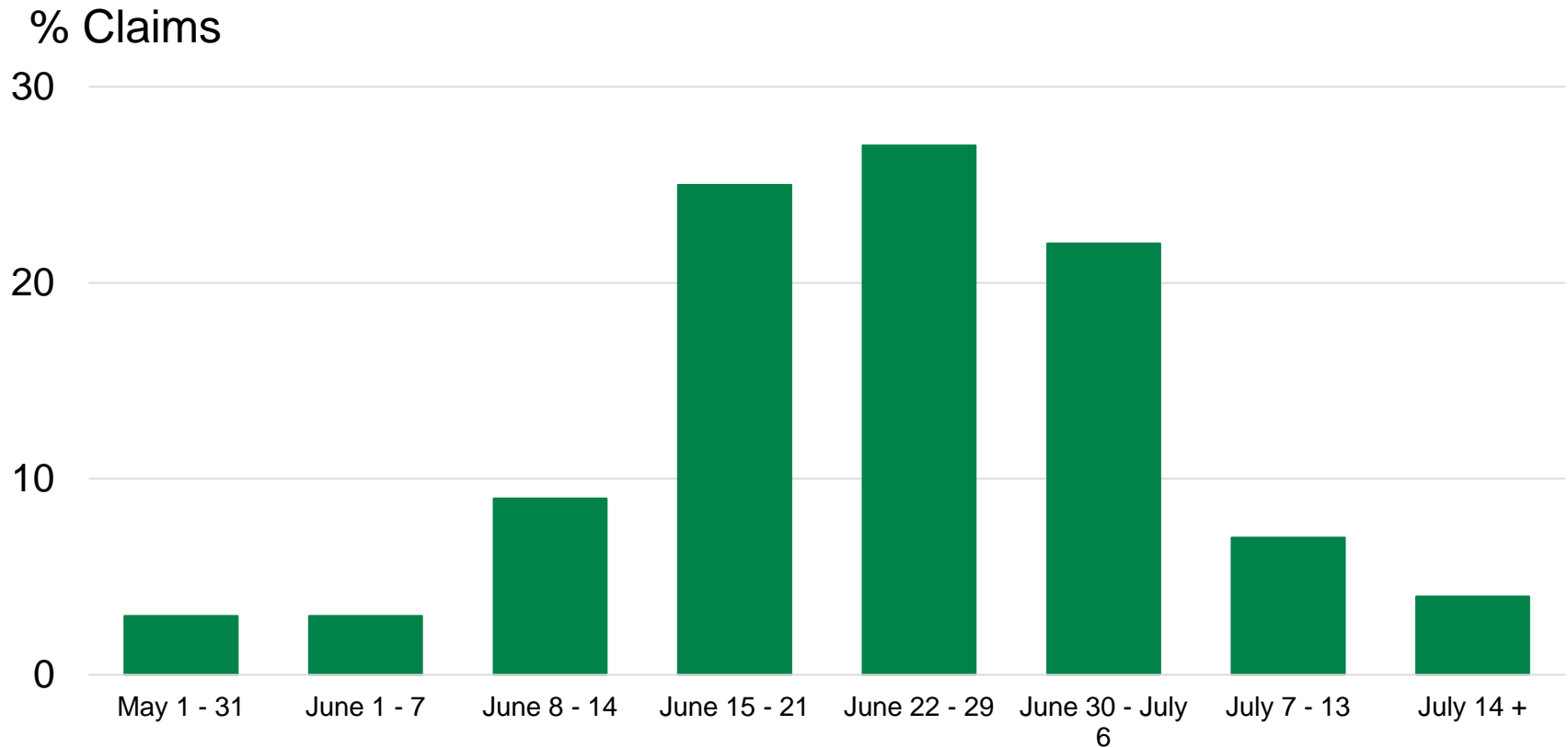
- Buffer zone less than label
- Wind speed too high
- Temperature inversion present
- Wrong nozzle
- Boom too high
- Spray tank contamination



**Any combination of these factors could magnify off-target movement**

# Alleged Off-target Claims

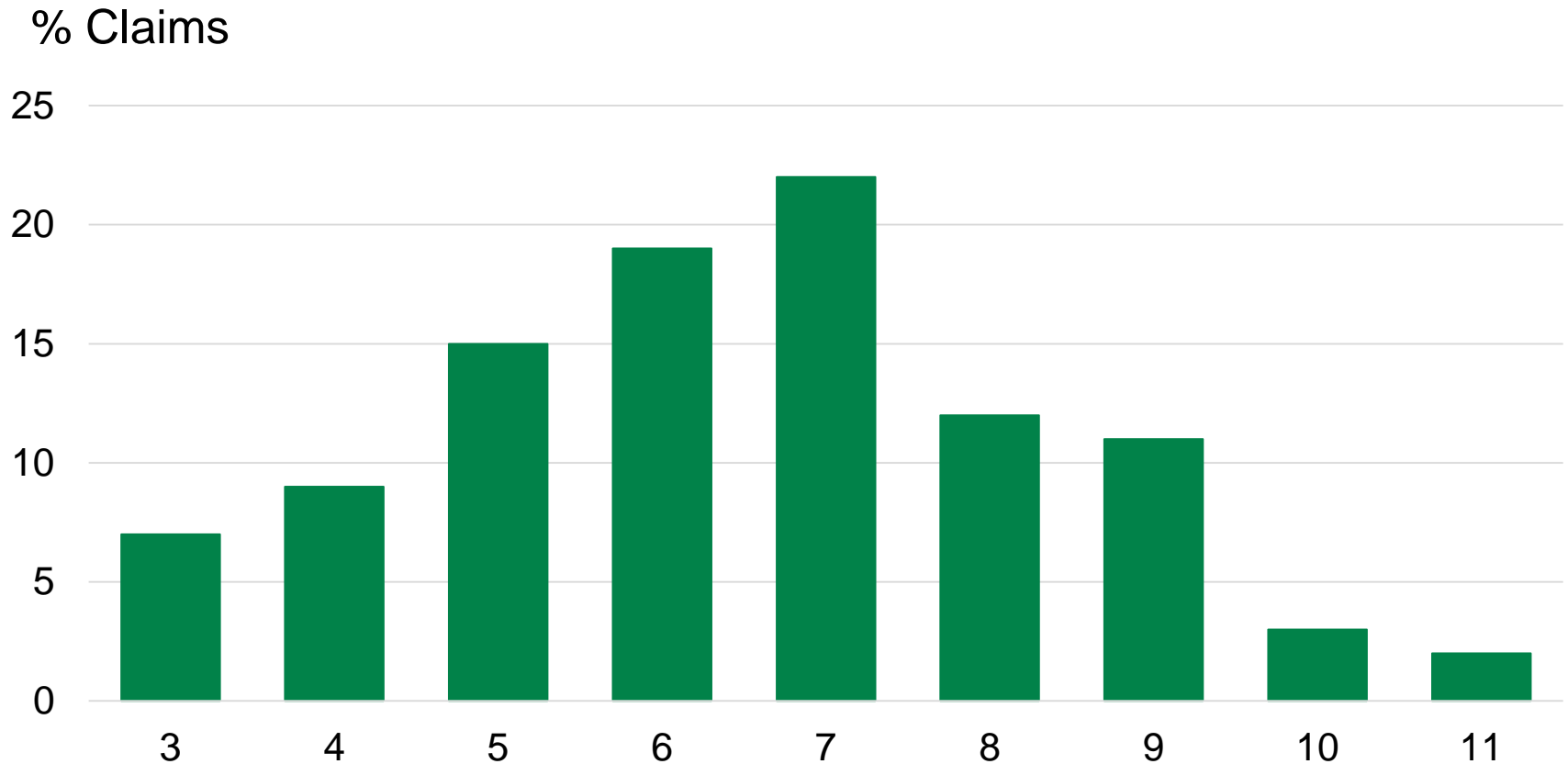
Reported date of Engenia<sup>®</sup> herbicide application



Curve similar to market data on when applications were made

# Alleged Off-target Claims

Reported weeks after planting when Engenia<sup>®</sup> herbicide was applied



**69% of claims – applications made 6+ weeks after planting**









# Engenia<sup>®</sup> Herbicide

## Dicamba applicator training outline for 2018

- Why does dicamba require additional precautions
- Label requirements for approved dicamba formulations
- Understanding temperature inversions
- Spray system hygiene
- Record keeping
- Using dicamba in a weed management system
- Summary



# Soybean Sensitivity To Herbicides

Rate	Dicamba	Glufosinate	Glyphosate
1/100 of field rate			
1/1000 of field rate			

**Soybeans are extremely sensitive to dicamba relative to other herbicides**



# Engenia<sup>®</sup> Herbicide

## Key elements for on-target applications

1. **Nozzles and boom height**
2. **Wind speed/direction and buffers**
3. **Tank mixtures**
4. **Avoid temperature inversions**
5. **Spray system hygiene**



# Nozzle Selection

First & most important decision made by an applicator

**Incorrect nozzles  
can increase drift  
by 66 times\***



\*Based on increased deposition at 110' in AGDISP modelling comparing approved TTI 11004 vs. unapproved TT 11004 each at 60 PSI

# Boom Height Requirement

Key for consistency of nozzle performance

**24''**

**Maximum Boom Height  
Above Target**

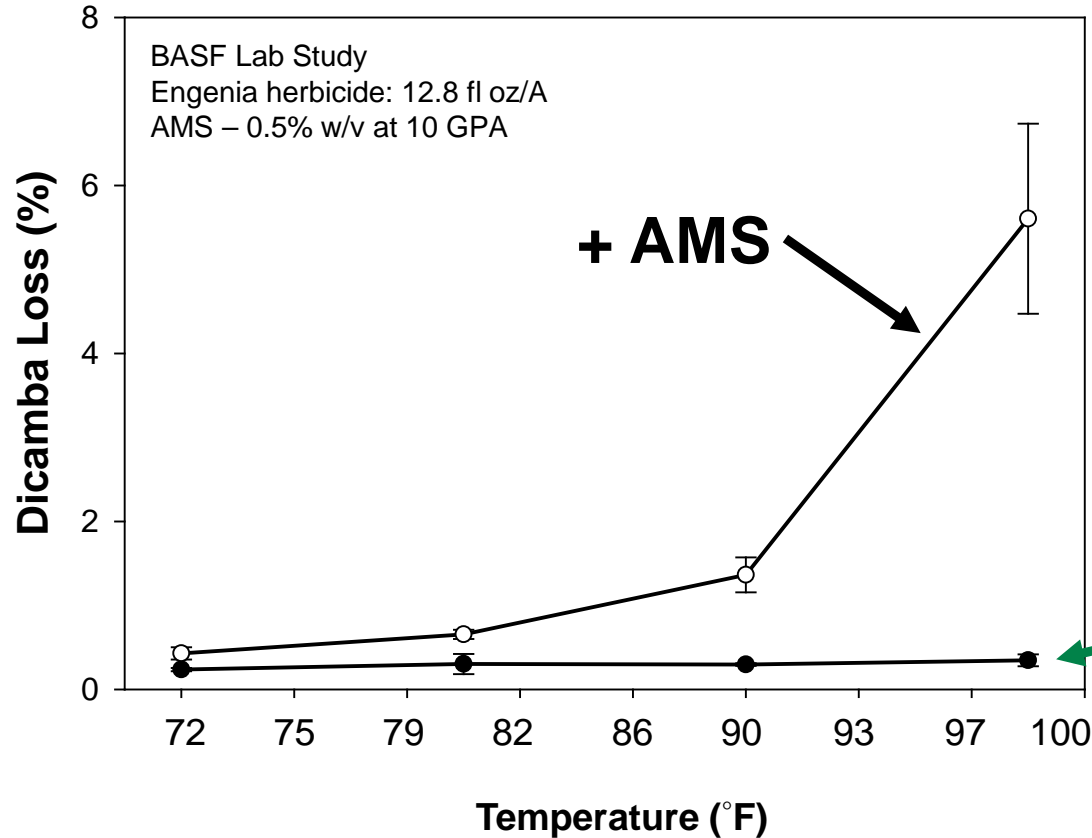


**48'' height can  
increase drift  
potential by  
5.6 times\***

\*Based on increased deposition at 110" in AGDISP modelling comparing 24" vs. 48" above target with approved TTI 11004 at 60 PSI

# Tank Mixtures:

## Impact of AMS on dicamba volatility



### Test Conditions:

Duration: 24 hours

Air flow: 0.5 l/min  
using 2.5 l tank

RH: 35%

Substrate: glass

Engenia® herbicide  
Alone

AMS increases potential volatility by 20 times



# Temperature Inversions

## Impact on physical spray drift

### HySplit Modeling of Spray Drift Utilizing Actual Weather Conditions

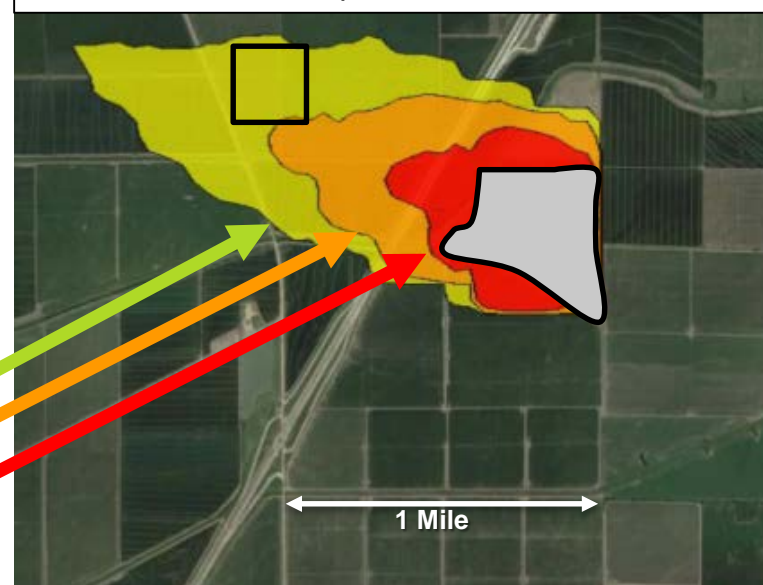
#### Labeled Application

Turbo TeeJet Induction (TTI) nozzles at 60 PSI applied at 1 PM on June 6, 2017.  
Wind speed ~9 MPH.



#### During An Inversion

Turbo TeeJet Induction Nozzles (TTI) at 60 PSI applied at 9 PM on June 2, 2017.  
Wind speed < 3 MPH



#### Proportion of Field Rate

- 1/10,000X
- 1/1,000X
- 1/100X

June 6 modeling with 15 minute droplet half life. June 2 modeling with no droplet half life. Based on weather data from Keiser, AR.

**12X larger area impacted during inversion**

# How much dicamba does it take to potentially contaminate a sprayer?

3 ml of  
formulated  
product



12 fl oz of  
spray solution



Commercial sprayer with  
1000 gallon tank  
Application volume: 10 GPA

Hygiene is critical to preventing spray system contamination

# “Upstream” Handling and Mixing

Multiple points of potential contamination

- **Storage tanks/shuttles**
- **Hoses and pumps at the “shed” and in the field**
  - Especially unlined EPDM hoses
- **Mixing and loading equipment**
- **Nurse trucks**



**Dedicated system(s) recommended to prevent contamination**

# For Application Success, Follow These Best Practices:

Factor	Increase in off-target movement	Label Requirement
Nozzle choice	<b>66X<sup>1</sup></b>	Only use approved nozzles <sup>2</sup>
Boom height	<b>5.6X<sup>1</sup></b>	Maintain boom height ≤ 24"
Wind speed	<b>3.4X<sup>1</sup></b>	Only spray if wind between 3-10 mph
Sensitive Areas & Crops	<b>HIGH</b>	Know what is downwind
Inversion	<b>12X larger area</b>	<b>DO NOT</b> spray at night or during an inversion
AMS/UAN tank-mix	<b>20X increase in volatility</b>	Only use approved tank mixtures <sup>2</sup>
Spray system hygiene	<b>HIGH</b>	Clean sprayer/mixing equipment before and after application

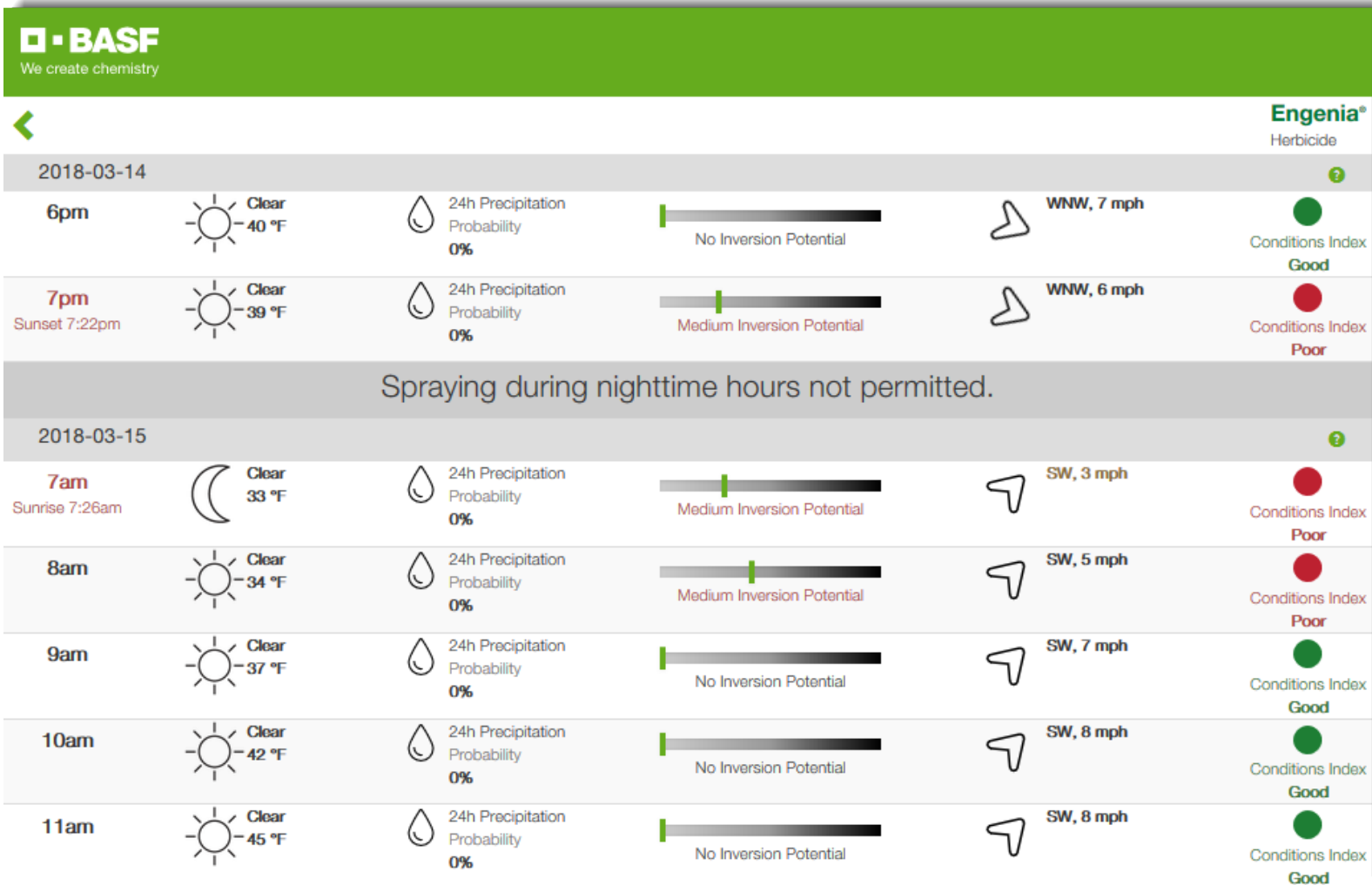
<sup>1</sup>Based on increased deposition at 110' in AGDISP modeling.

<sup>2</sup>As listed on the website of the approved dicamba product.



# Engenia<sup>®</sup> Herbicide

Visit [www.engeniaspraytool.com](http://www.engeniaspraytool.com)



# Engenia<sup>®</sup> Herbicide

## Summary

- Applicator education, sound decision making, and label adherence is critical for success in 2018
- Required record keeping will support proper application and education
- Emphasis on a system approach for effective control and resistance management
  - Strong PRE residual program followed by POST Engenia herbicide + residual herbicide within 5 weeks of planting

**If an applicator is unwilling or unable to follow the application requirements specified on the label:**

***Recommend that he/she NOT use Engenia herbicide***



We create chemistry

**Always read and follow label directions.  
Engenia is a US EPA Restricted Use Pesticide.**

Engenia and Zidua are registered trademarks of BASF Corporation.  
©2018 BASF Corporation. All Rights Reserved.