Preventing Off-Target Movement with Dicamba

Module 3

In this module:

- List specific label requirements for approved products
- Describe best management practices (BMPs) for application
- Understand your responsibility as the applicator
Who’s responsible for avoiding drift at the site of application?
The **applicator** is responsible for avoiding drift at the site of application!
Approved Products

Only Use Approved Herbicides

✧ Three approved dicamba herbicide products in Missouri
  • Engenia
  • XtendiMax
  • FeXapan

✧ All registered as Restricted Use Pesticides with EPA

✧ Only certified applicators with training may purchase and apply

✧ MDA issued a 24c Special Local Need label with state-specific requirements
Use Rate & Application Window
## Application Rate Guidelines

Minimum and Maximum Single Application Rates

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Engenia</th>
<th>FeXapan</th>
<th>XtendiMax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Single Application Rate: Anytime</td>
<td>12.8 oz/A</td>
<td>22 oz/A</td>
<td>22 oz/A</td>
</tr>
<tr>
<td>Maximum Single Application Rate: Pre-plant or Pre-emergence</td>
<td>12.8 oz/A</td>
<td>44 oz/A</td>
<td>44 oz/A</td>
</tr>
<tr>
<td>Maximum Single Application Rate: In-Crop (Over the Top)</td>
<td>12.8 oz/A</td>
<td>22 oz/A</td>
<td>22 oz/A</td>
</tr>
</tbody>
</table>
Application Rate Guidelines
Application Timing and Maximum Rates with Dicamba-Tolerant Cotton

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Pre-plant (oz/A)</th>
<th>Post-emergence (oz/A)</th>
<th>Total Season (oz/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engenia</td>
<td>25.6</td>
<td>51.2</td>
<td>51.2</td>
</tr>
<tr>
<td>FeXapan</td>
<td>44</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>XtendiMax</td>
<td>44</td>
<td>88</td>
<td>88</td>
</tr>
</tbody>
</table>

7 Days Pre-harvest

7 day wait period before harvest
Application Rate Guidelines

Application Timing and Maximum Rates with Dicamba-Tolerant Soybean

<table>
<thead>
<tr>
<th></th>
<th>Pre-plant</th>
<th>Beginning Bloom (R1)</th>
<th>Total All Applications Per Season Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engenia™</strong></td>
<td>25.6 oz/A</td>
<td>25.6 oz/A</td>
<td>51.2 oz/A</td>
</tr>
<tr>
<td><strong>FeXapan™</strong></td>
<td>44 oz/A</td>
<td>44 oz/A</td>
<td>88 oz/A</td>
</tr>
<tr>
<td><strong>XtendiMax®</strong></td>
<td>44 oz/A</td>
<td>44 oz/A</td>
<td>88 oz/A</td>
</tr>
</tbody>
</table>

7-14 day wait period before harvest
Cutoff Dates

Missouri-Specific Application Window Restrictions

Application of Engenia, XtendiMax, and FeXapan is prohibited after:

June 1, 2018

Southeast Missouri Counties
Dunklin, Pemiscot, New Madrid, Stoddard, Scott, Mississippi, Butler, Ripley, Bollinger and Cape Girardeau

July 15, 2018

All Remaining Missouri Counties

15
Tank Mixtures & Handling
Tank Mixtures
Do’s and Don’t’s with Tank Mixing

- Refer to the product website for approved tank mix partners
  - Engenia | www.EngeniaTankMix.com
  - XtendiMax | xtendimaxapplicationrequirements.com
  - FeXapan | www.fexapanapplicationrequirements.dupont.com

- Only use products registered for use in Missouri
- Use approved drift reduction agents (DRAs), if required
- Ensure system is properly cleaned before mixing
- Follow the tank mix order and check compatibility

- Use ammonium salts (e.g., AMS, UAN)
- Use acidifying water conditioners
Best Practice for Handling and Mixing

Limit Points of Potential Contamination When Mixing Products

Mix product directly in the sprayer

Product applied directly on the field

If there is no “upstream” product handling, then the sprayer is the sole source of contamination!
Equipment & Sprayer Settings
Equipment Requirement

Only Use Ground Sprayers At Approved Sprayer Speeds

**DO!**

- ≤ 15 mph

**DON’T!**

- Aerial application
Nozzle Type & Pressure Requirement

Ensures Droplets That Are Less Prone to Drift
Nozzles & Pressure

Use Approved Nozzles At Approved Pressure

Check with manufacturers on the approved nozzles and proper pressure type at these websites

Engenia | [www.EngeniaTankMix.com](http://www.EngeniaTankMix.com)

XtendiMax | [xtendimaxapplicationrequirements.com](http://xtendimaxapplicationrequirements.com)

FeXapan | [www.fexapanapplicationrequirements.dupont.com](http://www.fexapanapplicationrequirements.dupont.com)
Boom Height Requirement
Ensures Consistent Nozzle Performance

**DO!**

< 24” boom height
Decreased Drift Potential

**DON’T!**

> 24” boom height
Increased Drift Potential
## Spray Volume Requirement

Minimum Spray Volume Per Acre

<table>
<thead>
<tr>
<th></th>
<th>Engenia</th>
<th>FeXapan</th>
<th>XtendiMax</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10 GPA</td>
<td>&gt; 15 GPA</td>
<td>&gt; 15 GPA</td>
<td>&gt; 15 GPA</td>
</tr>
</tbody>
</table>

15-20 GPA recommended
Proper Cleaning & System Hygiene
Required Cleaning & System Hygiene

Being Mindful of System Hygiene Prevents Contamination

Clean the tank **before** application and triple-rinse **after** each application

**DO!** Use a strong cleaning solution as the second step
  - Commercial detergent
  - Spray cleaner

Ensure the following are thoroughly cleaned
  - Pumps
  - Hoses
  - Tanks
  - Other mixing and loading equipment

Consider having a dedicated system for all equipment
Best Practices to Avoid Contamination

Identify and Clean Potential Points of "Upstream" Contamination

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

Remember! Anything the formulated product and/or spray solution touches prior to the sprayer can be a source of contamination and must be cleaned.
Buffer Zone & Sensitive Species
Buffer Zones

Respect the Required Buffers at Different Rates

Engenia

XtendiMax & FeXapan @ 22 oz/A

XtendiMax & FeXapan @ 44 oz/A
Calculating Buffer Zones

Include These Areas in Your Buffer Zone Calculations

The following areas can be included as part of the buffer zone:

- Agricultural fields prepared for planting
- Fields planted to dicamba tolerant soybeans or cotton
- Fields planted to corn, sorghum, proso millet small grains and sugarcane
- Roads, paved or gravel surfaces
- Areas covered by the footprint of a building, shade house, silo, feed crib, or other man made structure with walls and/or roof
# Sensitive vs. Non-Sensitive Areas

Survey the Application Site to Identify Potential Sensitive Areas Before Spraying

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
<th>Spray Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitive Crops</td>
<td>Non-DT soybeans and cotton, Alfalfa, Sunflowers, Fruiting vegetables (e.g., tomatoes), Tobacco, Cucurbits, Grapes, Tree fruit, Residential areas</td>
<td>DO NOT spray if any wind is blowing toward neighboring fields/areas</td>
</tr>
<tr>
<td>Threatened and Endangered Species</td>
<td>Native vegetation, Woodland, Bodies of water</td>
<td>Only spray with required downwind buffer* (110’ or 220’) and 3-10 MPH wind</td>
</tr>
<tr>
<td>Non-Sensitive Areas</td>
<td>Corn, sorghum, wheat, DT soybean and cotton, Unplanted ag fields</td>
<td>No downwind buffer needed as long as there is a 3-10 MPH wind</td>
</tr>
</tbody>
</table>

*FeXapan and XtendiMax @ 22 oz/A requires 110’ buffer and @ 44 oz/A requires 220’ buffer; Engenia @ 12.8 oz/A requires 110’ buffer

Know your surroundings before making a dicamba application.
Best Practice: Communicate!

Improve Decision Making by Communicating with Neighbors

- Visit with neighbors regarding their cropping plans
- Use the flag the technology system to help communicate what is planted
- Consult sensitive crop registries for location of specialty crops and other sensitive sites
- Record areas of potential buffer zones around all edges of the fields

Conventional Crop: Use extreme caution
Clearfield Rice & STS Soybean traits; ALS tolerant
Roundup Ready trait; glyphosate tolerant
Xtend trait; dicamba, glyphosate tolerant
Enlist trait; 2,4-D, glufosinate, and glyphosate tolerant
Liberty Link trait; glufosinate tolerant
Buffer Zone Examples

Spray or Not?

Today’s Conditions

Wind from West

3 to 10 MPH

110’ downwind buffer (e.g., road)

✅ Spray!
Buffer Zone Examples

Spray or Not?

Today’s Conditions

Wind from NW

3 to 10 MPH

90’ downwind buffer (e.g., road)

DON’T SPRAY!

YOUR FIELD

Liberty Link Soybean

Enlist Corn

Prepared for Planting

Conventional Soybean
Buffer Zone Examples

Spray or Not?

Today’s Conditions

Wind from West
3 to 10 MPH
90’ downwind buffer (e.g., road)

DON’T SPRAY!

YOUR FIELD

Liberty Link Soybean

Enlist Corn

Prepared for Planting

Roundup Ready 2 Xtend Soybean
Weather Conditions & Time of Day
Weather Conditions

Follow Weather Guidelines to Ensure Conditions are Conducive for Application

Wind Speed
- >3 mph and <10 mph
- Must be recorded at boom height at the start and end of application

Precipitation
- cannot be applied if rain is expected in the next 24 hours

Temperature & Humidity
- Temperature must be recorded at the beginning and end of application
- No temperature inversions
Time of Day Requirement

Missouri-Specific Application Window Restrictions

7:30 a.m. → Spray → 5:30 p.m.
Record Keeping & Notice of Application
Record Keeping Requirements

Keep Good Records of Spray Applications

- Make daily entries to spray logs.
- Be sure to record environmental conditions.
- Reduces mistakes.
- Protects you from legal action.

1. Applicator full name
2. Certification number
3. Product name
4. EPA registration number
5. Total amount applied
6. Application month, day, year
7. Location of application
8. Crop or site receiving application
9. Size of area treated
10. Applicator proof of training
11. Application timing
12. Receipts of purchase
13. Product label(s) including 24c state, local needs
14. Downwind buffer zone calculation
15. Document awareness of sensitive crops
16. Date and procedure for spray system cleanout
17. List of tank-mix products with EPA registration numbers
18. Start and finish time
19. Nozzle and pressure
20. Air temperature
   - Record at boom height at start and finish if applying Engenia
21. Wind speed and direction at start and finish
Notice of Application Requirement

Missouri-Specific Requirement: File a Notice of Application

Review & Application

Module Essentials

✦ Follow the label
✦ Use best management practices for application
✦ Ultimately, the applicator is responsible for proper application and use
✦ For the most up-to-date information visit the Missouri Department of Agriculture’s Website

Dicamba Facts

Use Rate & Application Window
Tank Mixtures & Handling
Equipment & Sprayer Settings
Buffer Zones & Sensitive Species
Weather Conditions & Timing
Record Keeping & Notice

Helpful Tool: Reference Guide
In this module:

- List specific label requirements for approved products
- Describe best management practices (BMPs) for application
- Understand your responsibility as the applicator
Acknowledgements

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Missouri Department of Agriculture  
BASF Company  
Monsanto Company

**Sources**

Engenia Herbicide U.S. EPA Section 3 Label (EPA Registration Number 7969-345)  
Engenia Herbicide Missouri Department of Agriculture 24c Special Local Need Label  
FeXapan Herbicide U.S. EPA Section 3 Label (EPA Registration Number 352-913)  
FeXapan Herbicide Missouri Department of Agriculture 24c Special Local Need Label  
XtendiMax Herbicide U.S. EPA Section 3 Label (EPA Registration Number 524-617)  
XtendiMax Herbicide Missouri Department of Agriculture 24c Special Local Need Label