

Enlist[®] Ahead Stewardship Training

Updated February 2022

Enlist[™] Ahead

Topics

- Introduction of the Enlist[®] weed control system
- Weed control and tank-mixing
- What makes Enlist herbicides different?
- Making successful applications of Enlist herbicides
- Nozzle and tank-mix selection
- Additional endangered species protection measures
- Additional 2022 label updates

This deck provides training and stewardship information for the Enlist[®] weed control system.

Supplemental label alert for herbicide sold after 1/11/2022

- **ATTENTION: ENLIST ONE® and ENLIST DUO® HERBICIDES MUST HAVE THIS NEW LABELING TO BE LAWFULLY APPLIED, DISTRIBUTED OR SOLD AFTER 1/11/2022.**
 - After 1/11/2022, Corteva has provided supplemental labeling for this product and users are under legal obligation to follow the supplemental labeling or the revised Section 3 labeling.
 - [Click here](#) for the Enlist One herbicide supplemental label.
 - [Click here](#) for the Enlist Duo herbicide supplemental label.
 - After 1/11/2022, all sellers and distributors of this product must ensure either the supplemental labeling accompanies products sold or distributed, or that the products are labeled with the revised Section 3 labeling.
 - It is a violation of FIFRA Section 12 to use a registered pesticide in a manner inconsistent with its labeling.
 - It is a violation of FIFRA Section 12 to sell or distribute a misbranded pesticide.
 - Civil penalties may be assessed in an amount up to \$20,528 for each unlawful sale or distribution under FIFRA.

Additional references

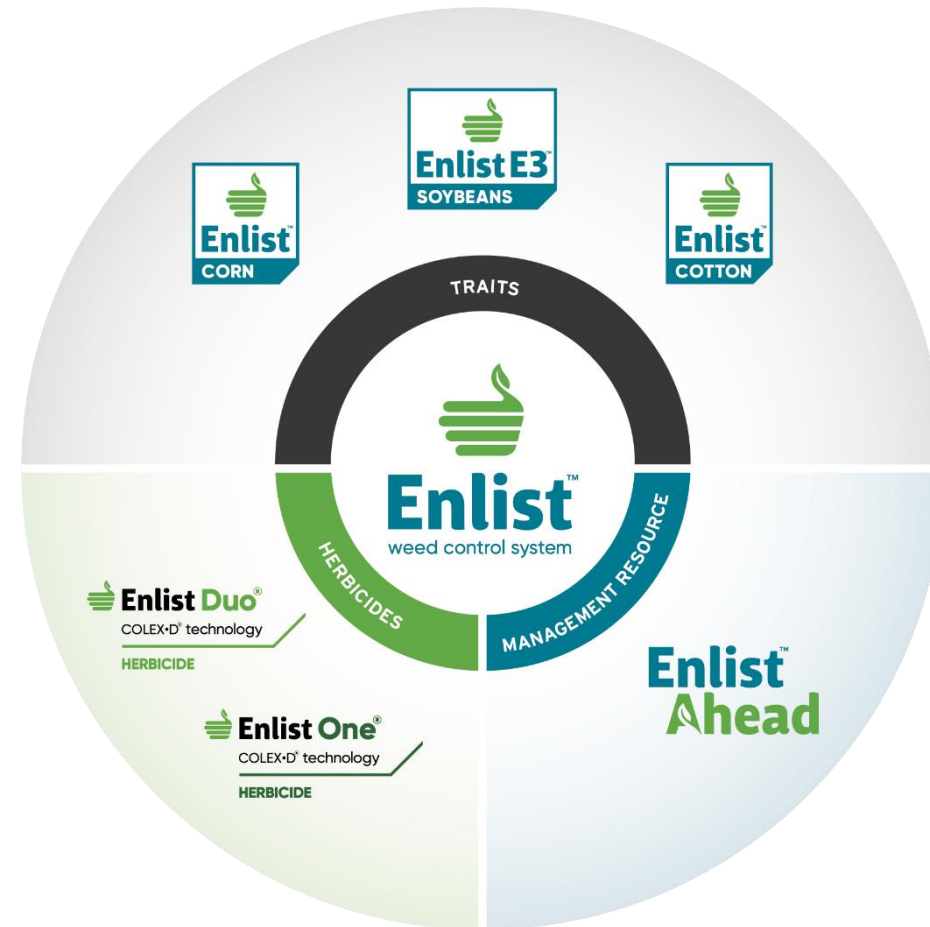
- Enlist One[®] herbicide [federal label](#)
- Enlist Duo[®] herbicide [federal label](#)
- [Traitstewardship.com](#) - Corteva Technology Use Agreements and other Corteva Product Use guides
- [EnlistTankMix.com](#) – qualified tank mix partner lists
- [Enlist.com/Nozzles](#) – qualified nozzle and pressure lists

Introduction of the Enlist[®] weed control system



The Enlist[®] weed control system

- The Enlist[®] weed control system advances herbicide and trait technology.
- Corteva Agriscience sells and services Enlist traits and Enlist herbicides.



The transgenic soybean event in Enlist E3[®] soybeans is jointly developed and owned by Corteva Agriscience LLC and MS Technologies L.L.C.

Choices to control tough weeds



Enlist Duo[®]
COLEX-D[®] technology
HERBICIDE

Convenient
proprietary blend of
2,4-D choline and
glyphosate

- Multiple sites of action in a convenient blend
- Great fit for acres where grass control is needed; works well for burndown
- Improved tank stability for a blend that stays mixed



Enlist One[®]
COLEX-D[®] technology
HERBICIDE

Straight-goods
2,4-D choline
with additional
tank-mix
flexibility

- Can tank-mix with Durango[®] DMA[®] or Liberty[®] herbicide
- More approved tank-mix partners: residual herbicides, insecticides, fungicides and more
- Flexibility to customize tank mixes to fit each farm's needs

Both with the on-target benefits of 2,4-D choline with Colex-D[®] technology

Authorized herbicide use with Enlist® crops



First pallet of Enlist Duo® herbicide sold in the U.S. in 2015

- Enlist One® and Enlist Duo® herbicides with Colex-D® technology are the only 2,4-D herbicides authorized for preemergence and postemergence use with Enlist® crops.
- The smart and only choice for in-crop use, with the benefits of reduced drift potential and near-zero volatility.
- Use of any other 2,4-D-containing product with Enlist crops is a violation of the grower Technology Use Agreement.

Leading trait technology

Enlist® traits expand crop tolerance to enable unrivaled weed control, helping you maximize your yield potential.



Varieties tolerant to:

- 2,4-D choline
- Glufosinate
- Glyphosate

The transgenic soybean event in Enlist E3® soybeans is jointly developed and owned by Corteva Agriscience LLC and MS Technologies L.L.C.



WideStrike® 3 *Insect Protection*
Roundup Ready® Flex Enlist®
varieties tolerant to:

- 2,4-D choline
- Glufosinate
- Glyphosate

Offered exclusively by PhytoGen®
cottonseed



Insect protection from SmartStax®
or PowerCore® trait technology –
hybrids tolerant to:

- 2,4-D choline
- Glyphosate
- Glufosinate*
- FOP herbicides

*Non-Bt Enlist® corn refuge hybrids do not contain glufosinate tolerance.

Weed management and tank-mixing with the Enlist[®] system



What is your integrated weed management plan?



Weed identification: know what you're trying to control



Proactive planning:

- Multiple herbicide sites of action, including residuals
- Sequential passes where needed
- Zero tolerance for escapes



Application best practices: timely sprays on 6" or shorter weeds with full labeled rates



Season-long scouting



Incorporate nonchemical practices: cultivation, crop rotation, cover crops



More resources:

- Enlist® Product Use Guide
- IWillTakeAction.com

Managing weed resistance

You can help manage weed resistance with an understanding of herbicide resistance and taking steps to prevent it.

How weed resistance spreads

For the first few years a herbicide is used, targeted weeds are controlled; however, after repeated application of the same herbicide — or herbicides with the same site of action — a few naturally occurring resistant weeds can remain in the field each year. As time goes on and resistant weeds thrive, the weed population starts to contain an even larger number of resistant weeds. Over time, the resistant weeds become the dominant population — rendering the herbicide no longer effective on that species.

The Enlist[®] weed control system provides an effective tool to use against these herbicide-resistant weeds, including glyphosate-, ALS- and HPPD-resistant weeds. Use the Enlist system as part of an integrated weed management program to deliver the exceptional performance you need.

Take advantage of different herbicide sites of action

It is a best practice to minimize selection for herbicide-resistant weed populations by proactively diversifying weed control strategies. A diversified weed management program may include the use of multiple herbicides with different sites of action and an overlapping weed control spectrum in combination with other practices, such as tillage operations and/or other cultural practices where appropriate. Using the labeled rate for herbicides and following directions for use is important to help prevent the onset of resistance.

The Weed Science Society of America (WSSA) classifies 2,4-D as a Group 4 herbicide (synthetic auxin) and glyphosate as a Group 9 herbicide (inhibitor of EPSP synthase). As with some herbicides, some naturally occurring weed biotypes that are resistant to 2,4-D or glyphosate may exist due to genetic variability in a weed population.

Steps to prevent weed resistance

Implementing a successful weed resistance management program will help ensure the continued efficacy of the Enlist[®] weed control system. These steps are important to the ongoing success of your program.

- 1. Use a herbicide PROGRAM APPROACH — with multiple sites of action**
- 2. Make TIMELY APPLICATIONS of herbicides**
- 3. SCOUT WEEDS before and after application**
- 4. SEE THE BIG PICTURE, beyond the field and the herbicide**
- 5. Agronomic and cultural PRACTICES**

Steps to prevent weed resistance

Use a herbicide PROGRAM APPROACH — with multiple sites of action

Start with a clean field, using either a burndown herbicide application or tillage. Use a broad-spectrum soil residual herbicide with different sites of action, followed by a timely postemergence application of an Enlist® herbicide.

If resistance is suspected, treat weed escapes with a herbicide that has a site of action other than Group 4 or 9 (if Enlist Duo® herbicide was used) or Group 4 (if Enlist One® herbicide was used) and/or use nonchemical methods to remove escapes, as practical, with the goal of preventing seed, root or tuber production. Utilize sequential applications of herbicides with alternative sites of action.

Rotate the use of an Enlist herbicide with non-Group 4 or non-Group 9 herbicides (when using Enlist Duo) or non-Group 4 (when using Enlist One).

Steps to prevent weed resistance

Always utilize multiple herbicide sites of action in your weed management plan.

Always plan a program approach with Enlist One[®] plus additional qualified tank-mix partners containing non-Group 4 herbicides or sequential postemergence applications of non-Group 4 herbicides.

Avoid using more than two applications of an Enlist[®] herbicide and any other Group 9 herbicide (when using Enlist Duo[®] herbicide) or Group 4 (when using Enlist One or Enlist Duo herbicide) within a single growing season unless in conjunction with another site of action herbicide with an overlapping spectrum.

Steps to prevent weed resistance

Make **TIMELY APPLICATIONS** of herbicides

Apply full, labeled rates of an Enlist[®] herbicide to actively growing weeds once the majority reach 3 to 6 inches in height.

SCOUT WEEDS before and after application

- Scout fields before application to ensure herbicides and use rate will be appropriate for the weed spectrum and weed size present.
- Scout fields after application to detect weed escapes or shifts in weed spectrum.
- Early detections of possible resistant species can limit the spread of these weed populations and allow for the implementation of alternate weed management practices.

Steps to prevent weed resistance

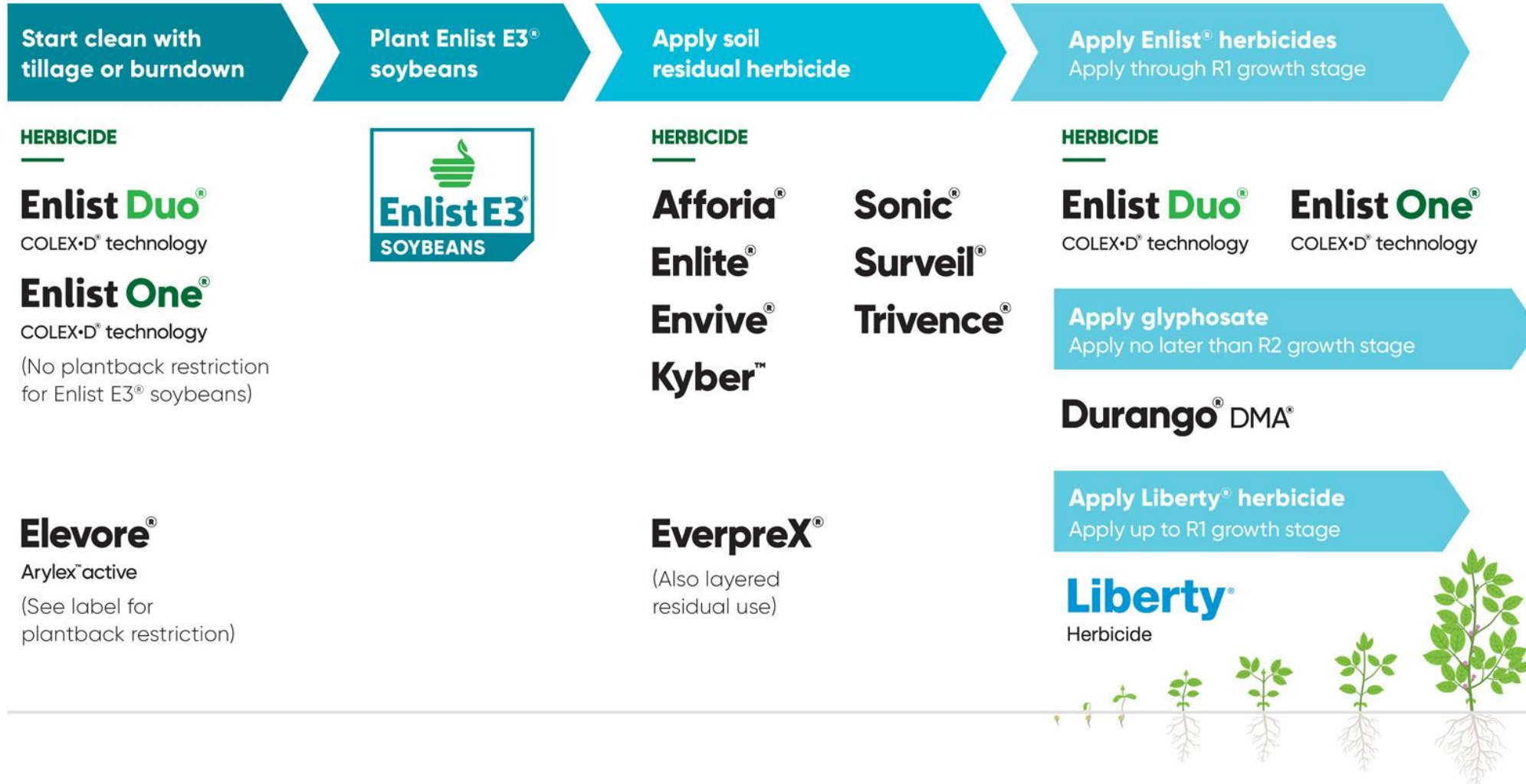
SEE THE BIG PICTURE, beyond the field and the herbicide

- Incorporate nonchemical weed control practices, such as mechanical cultivation, crop rotation, cover crops and weed-free crop seeds, as part of an integrated weed control program.
- Manage weeds in and around fields, during and after harvest, to reduce weed seed production.
- Thoroughly clean plant residues from equipment before leaving fields suspected to contain resistant weeds.

Agronomic and cultural PRACTICES

- Rotate crops and cultural practices to allow for a wider range of weed control practices.
- Use only commercial, weed-free crop seed.

Program approach with Enlist E3[®] soybeans



Program approach with WideStrike® 3 Roundup Ready® Flex Enlist® cotton



Start clean with tillage or burndown

Plant Enlist® Cotton

Apply soil residual herbicide

Apply Enlist® herbicides
Apply up to first white bloom

HERBICIDE

Enlist Duo®

COLEX-D® technology

Enlist One®

COLEX-D® technology

(No plantback restriction for Enlist® cotton)

Elevore®

Arylex™ active

LeadOff®

(See label for plantback restriction)



(With glyphosate and glufosinate tolerance)

HERBICIDE

EverpreX®

Staple® LX

Brake
Cotoran
Diuron
Prowl
Treflan

Acetochlor
Fluometuron
Prometryn

HERBICIDE

Enlist Duo®

COLEX-D® technology

Enlist One®

COLEX-D® technology

Apply glyphosate

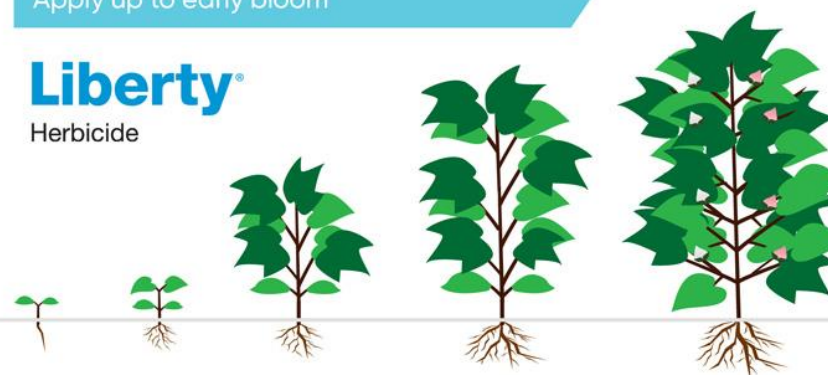
Apply up to 7 days prior to harvest

Apply Liberty® herbicide

Apply up to early bloom

Liberty®

Herbicide



Program approach with Enlist[®] corn



START CLEAN WITH TILLAGE OR BURNDOWN

Enlist[™] herbicides – no plant-back restriction

PLANT ENLIST[™] CORN



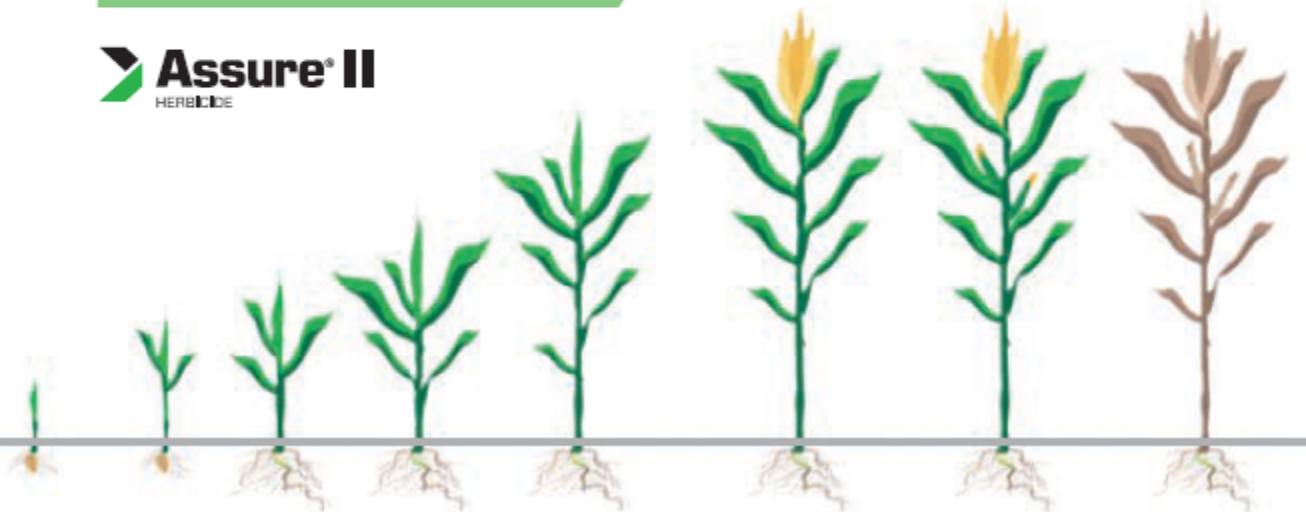
APPLY SOIL RESIDUAL HERBICIDE

- HERBICIDE**
- FulTime[®] NXT**
 - Keystone[®] NXT**
 - Realm[®] Q**
 - Resicore[®]**
 - SureStart[®] II**
 - Surpass[®] NXT**

APPLY ENLIST HERBICIDES
No larger than V8 growth stage or 30" tall
Can be applied with drop nozzles from 30-48" high

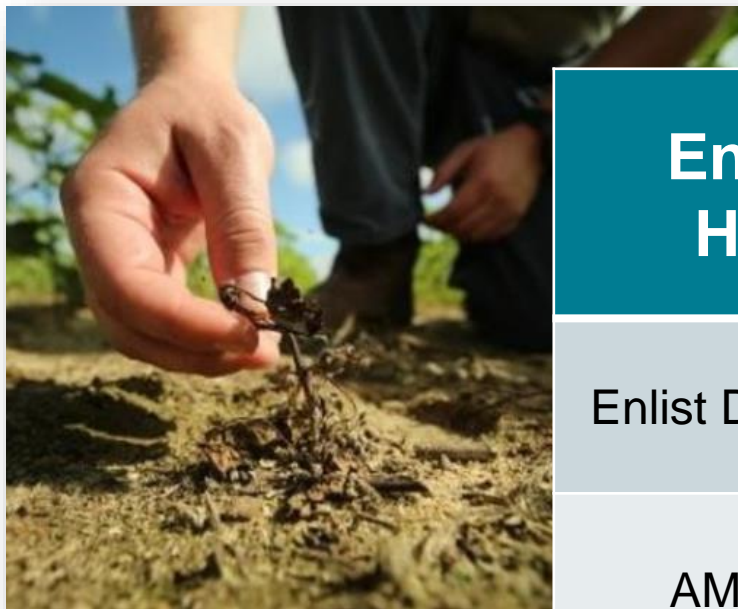


APPLY ASSURE II HERBICIDE⁶
From V2-V6 growth stage



⁶Assure[®] II herbicide (quizalofop) is a Group 1 herbicide for grass control, which is currently registered for in-crop use with Enlist[®] corn. FulTime[®] NXT and Keystone[®] NXT are Restricted Use Pesticides.

Postemergence treatments with Enlist® crops



Enlist Duo® Herbicide	Enlist One® + Liberty® Herbicide	Enlist One® + Durango® DMA® Herbicide
Enlist Duo @ 4.75 pt./A	Enlist One @ 2 pt./A	Enlist One @ 2 pt./A
AMS as needed	Liberty @ 2 pt./A AMS @ 1.5-3 lb./A	Durango @ 2 pt./A AMS as needed
Check EnlistTankMix.com for all qualified AMS and glyphosate products.		

Always utilize multiple herbicide sites of action in your weed management plan.

Tank-mix options: qualified glyphosate or Liberty[®] herbicide?

When selecting a tank mix partner with Enlist One[®] herbicide consider: weed pressure, weather conditions, agronomics, full-season weed management plan?

	Glyphosate	Liberty [®] herbicide	Both
Pros	<ul style="list-style-type: none"> Better for grass control than glufosinate 	<ul style="list-style-type: none"> Most effective post mix on resistant weeds (incl. waterhemp, pigweed) No true resistance to Liberty herbicide documented, per BASF Strong broadleaf control relative to grass control Best option for kochia 	<ul style="list-style-type: none"> 3 sites of action in one pass
Cons	<ul style="list-style-type: none"> Less activity on glyphosate-resistant weeds (including waterhemp, pigweed) 	<ul style="list-style-type: none"> Needs higher humidity conditions for best performance – spray 2 hrs after dawn to 2 hrs before sunset for optimal weed control Cost of glufosinate compared with glyphosate 	<ul style="list-style-type: none"> May have reduced activity on grasses Highest cost per acre Increased potential for speckling crop response

Benefit of multiple sites of action



Liberty[®] herbicide 2.0 pt. + EverpreX 1.0 pt.
+ AMS 2.5% v/v



Enlist One[®] herbicide 2.0 pt. + Liberty[®] herbicide 2.0 pt.
+ EverpreX[®] 1.0 pt. + AMS 2.5% v/v

Willmar, MN | Aug. 3, 2020 | 28 DAA

Why spray small weeds?

- Weed management urgency (e.g., height, growth ability, seed production) can be underestimated
- Waterhemp and Palmer amaranth grow at a rapid pace (multiple inches per day in some conditions) with prolific seed production
- Axillary growth of seed heads outside of the primary growing point
- Waterhemp with multiple seed axillary growth can be more difficult to control compared with the same size without the branching out
- Killing a 6" Palmer or waterhemp can sometimes be like fighting a much larger plant



Addressing heavy pigweed and waterhemp pressure

Waterhemp

- Typically grows 50%-70% faster than other annual weeds
- Typically produces ~250,000 seeds per plant

Palmer amaranth

- Can grow 2-4" per day under good conditions
- Has a higher germination rate than waterhemp
- Female plants can produce several thousand to more than 1 million seeds



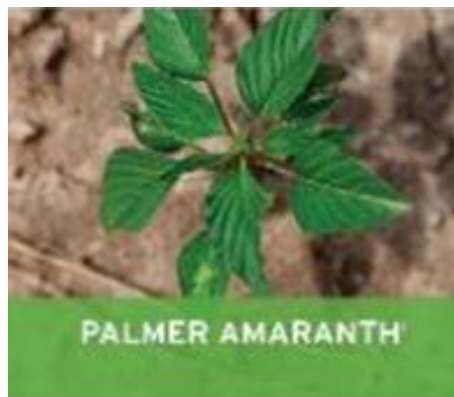
Untreated Palmer Amaranth
Mississippi, July 2018
MSU Research Plot (not
overseeded)

https://weedscience.missouri.edu/publications/50737_3_TA_FactSheet_Waterhemp.pdf

<http://bulletin.ipm.illinois.edu/wp-content/uploads/2014/05/Palmer-Amaranth-2014-HI.pdf>

Managing acres with dense pigweed

1. Use a quality preemergence residual herbicide with multiple sites of action
2. Plan a timely post application approximately 21 days after planting when weeds are less than 6" tall; scout to confirm. Call your applicator early to schedule a custom spray!



3. Spray for optimal coverage
 - 15 GPA for Enlist Duo[®] or Enlist One[®] + qualified glyphosate tank mix partner; or 20 GPA for Enlist One + Liberty[®] herbicides
 - Use the high end of allowable pressure range
 - Select an AIXR or other qualified nozzle that is not ultra coarse

4. Use the right tank-mix partners
 - Enlist One + Liberty recommended on gly-resistant waterhemp
 - Layered residual EverpreX[®] (S-metolachlor)
5. Scout approximately 14 days later and have a plan for a sequential pass for new flushes

Managing acres with dense waterhemp

1. Use a quality preemergence residual herbicide with multiple sites of action

2. Plan a timely postapplication approximately 21 days after planting when weeds are less than 6" tall; scout to confirm. Call your applicator early to schedule a custom spray!



3. Spray for optimal coverage

- 15 GPA for Enlist Duo[®] or Enlist One[®] + qualified glyphosate tank mix partner; or 20 GPA for Enlist One + Liberty[®] herbicides
- Use the high end of allowable pressure range
- Select an AIXR or other qualified nozzle that is not ultra coarse

5. Scout 14 days later and have a plan for a sequential pass for new flushes

4. Use the right tank-mix partners
Enlist One + Liberty recommended on gly-resistant waterhemp
Layered residual EverpreX[®] (S-metolachlor)

Plan for sequential passes for heavy pigweed and waterhemp acres

- Scout fields 14-21 days after crop emergence.
- Spray when weed size is < 6”.
- Use tank mix of Enlist One[®] + Liberty[®] herbicides.
- Use nozzle, pressure and carrier volume to maximize coverage.
- Use layered residuals in post passes.
- Plan for a second post pass to address new flushes.
- Scout fields to monitor.

Layered residual benefits

York, Nebraska: July 24, 2020 – 17 DAT

Enlist One[®] 2.0 pt. + Liberty[®] herbicide 2.0 pt.
+ **EverpreX[®] 1.0 pt.** + Bronc 2.5% v/v



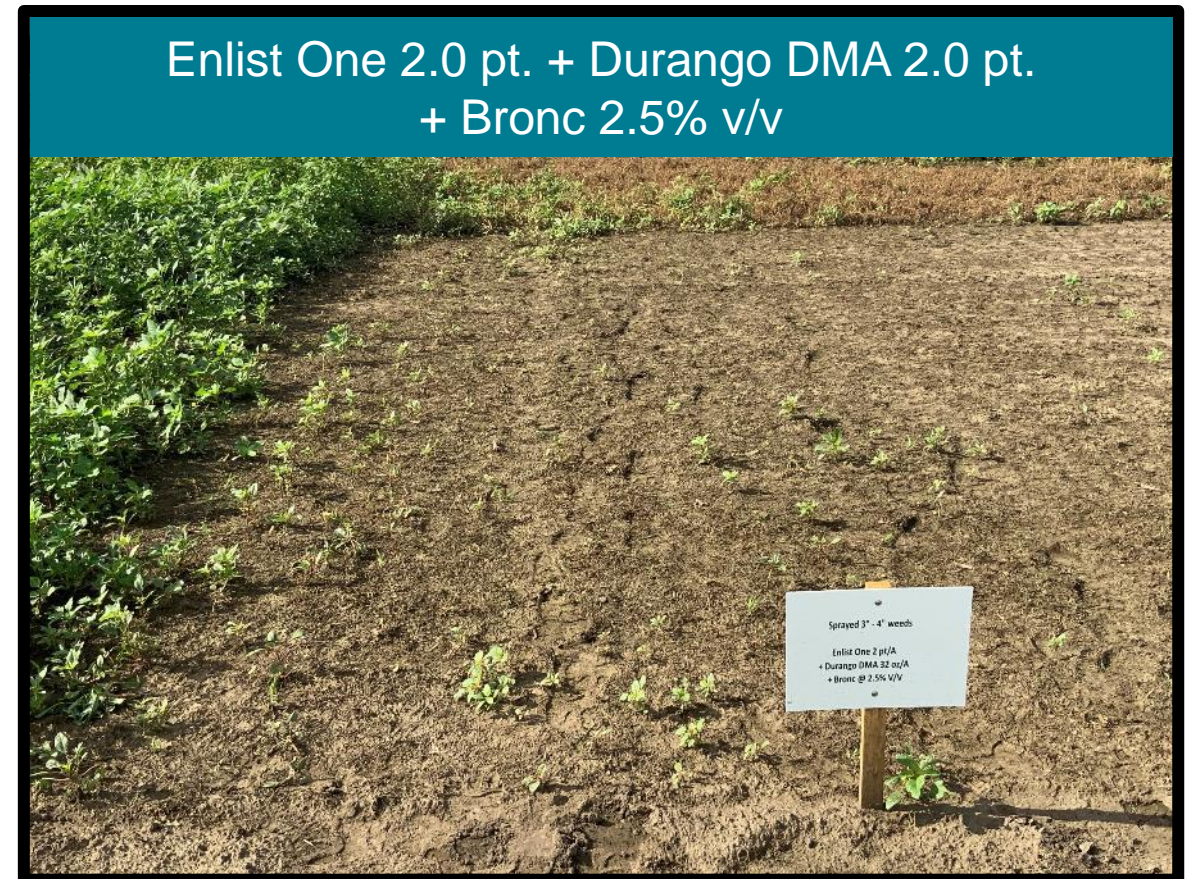
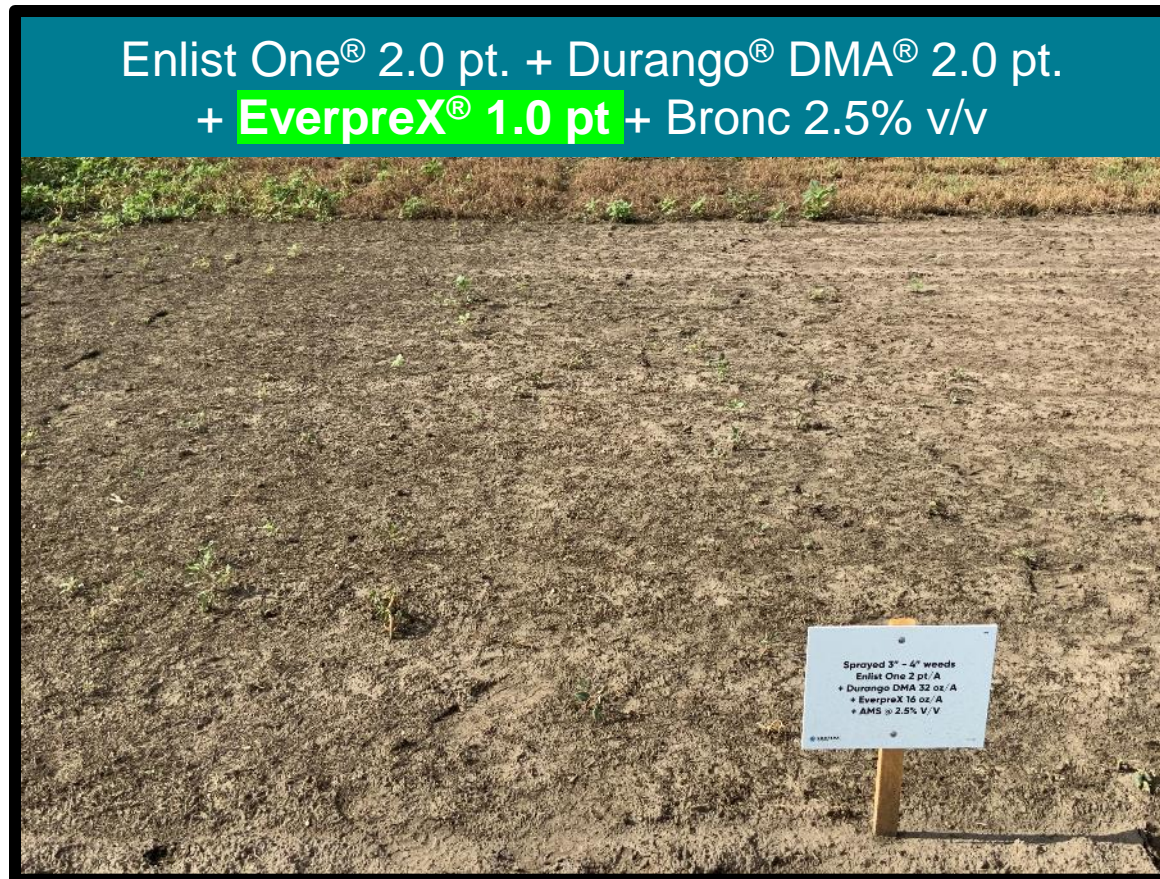
Enlist One 2.0 pt. + Liberty herbicide 2.0 pt.
+ Bronc 2.5% v/v



Photos courtesy of Jason Gibson; York, NE, regional technology demonstration

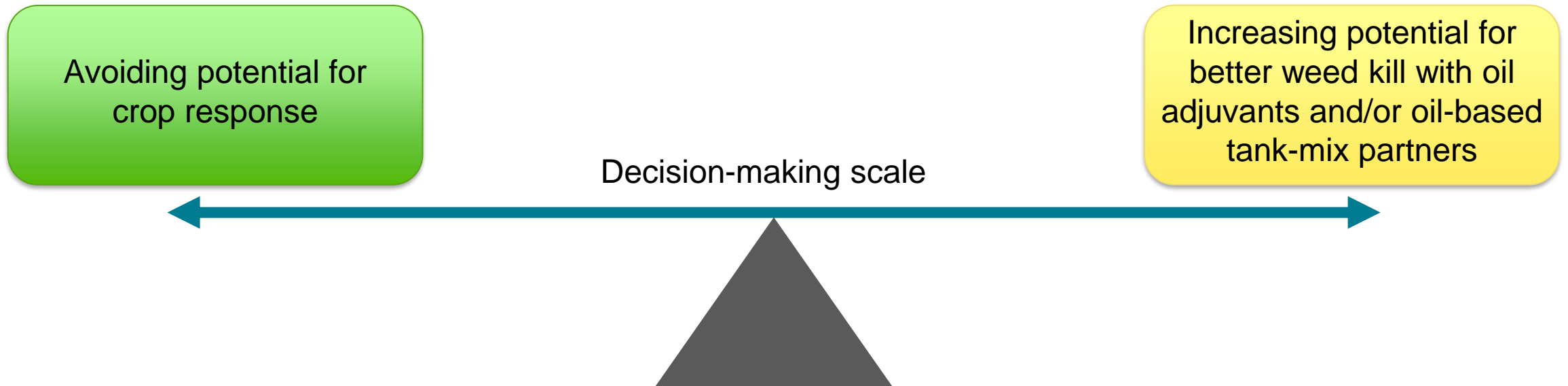
Layered residual benefits

York, Nebraska: July 24, 2020 – 17 DAT



Photos courtesy of Jason Gibson; York, NE, regional technology demonstration

Priorities for application?



Tank mix decisions – crop response impact

Example: Enlist Duo®
herbicide

Simple tank mix, little potential for crop response

Example: Enlist One® + Liberty®
herbicide + S-metolachlor + oil adjuvant

Residual control, more effective on glyphosate-resistant emerged weeds, more sites of action

Decision-making scale



Less potential for crop response

- Fewer tank-mix partners
- More mild environmental conditions (temperate)

More potential for crop response

- “Hotter” tank mix with more partners and/or oil-based partners
- More stressful environmental conditions (very hot, dry, humid)

Controlling grasses on Enlist[®] acres

What's the best option for you?

Enlist Duo[®] herbicide

Convenient –
glyphosate built in

Enlist One[®] herbicide + FOP or clethodim

- Increase rate of grass herbicides by at least 1/3 to overcome reduced efficacy.
- Use recommended adjuvants for grass herbicides.

Should not be used without an additional tank-mix partner or a sequential post pass for broadleaf control.

Enlist One + glyphosate

Another option if you prefer to adjust the rate of glyphosate in the mix

Enlist One + Liberty[®] herbicide

This mix used frequently when resistant broadleaves are present – but glufosinate (contact herbicide) not as effective on grass

Application rates for Enlist® herbicides

Maximize efficacy of applications:

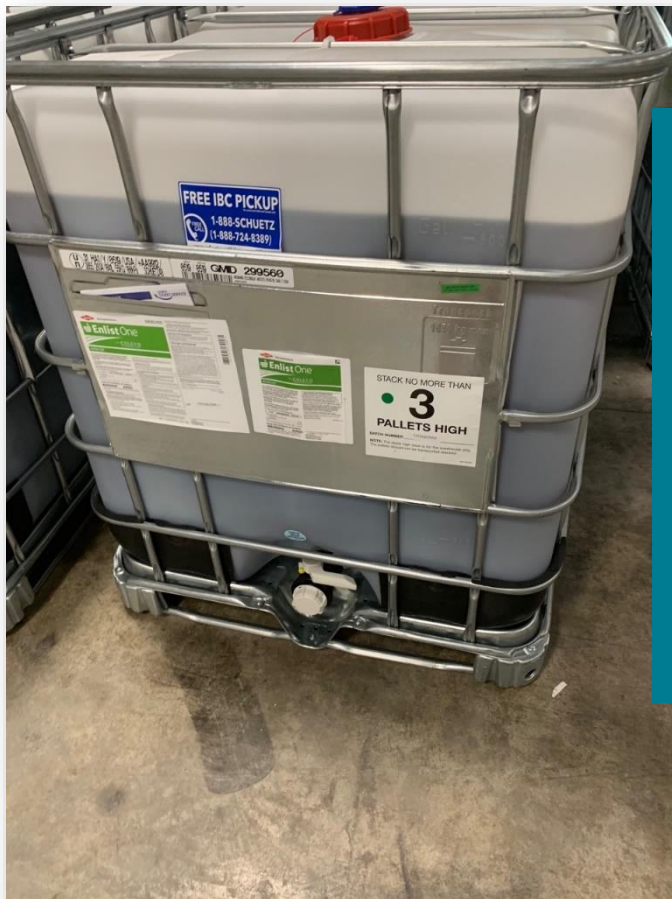
- Spray when weeds are 6 inches tall or less
- Spray when weeds are actively growing
- Apply full rates for best weed management of difficult-to-control weeds
- Use a qualified nozzle that provides best possible coverage
- Use upper end of qualified nozzle pressure range
- Use sufficient water carrier volume:
 - 10-15 gal/A recommended for Enlist herbicides
 - Do not use less than 10 gal/A
 - 15-20 gal/A recommend for Enlist One® + Liberty® tank mix
 - Do not use less than 15 gal/A

Application Rates	
Enlist One®	2.0 pt./A (32 oz./A)
Enlist Duo®	4.75 pt./A (76 oz./A)
<i>These rates provide 1 lb/A a.e.</i>	

What makes Enlist[®] herbicides different?



Enlist[®] herbicides: 2,4-D choline with Colex-D[®] technology



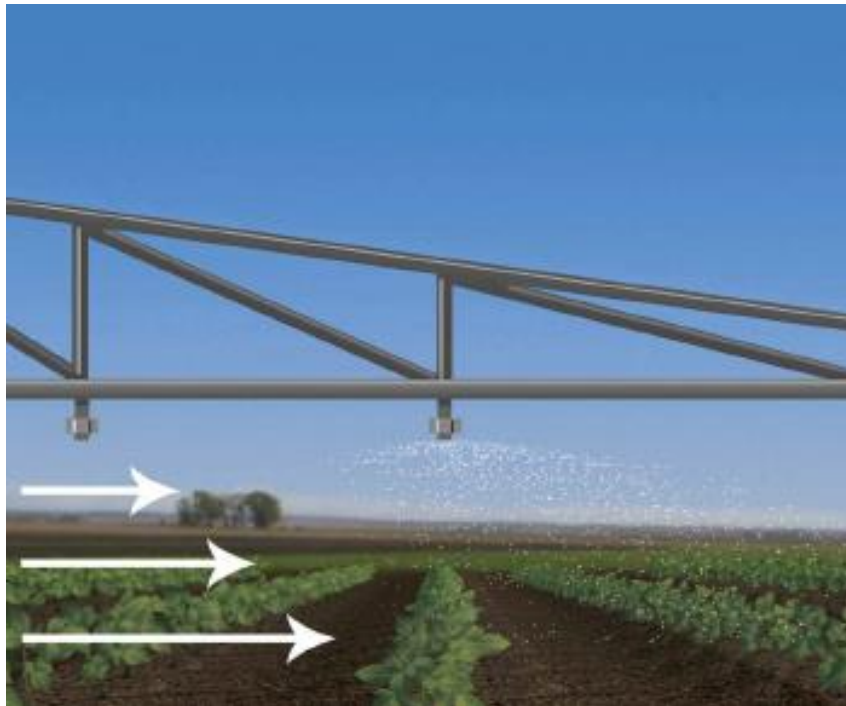
Enlist[®] herbicides are different than 2,4-D ester, amine and other traditional formulations:

- Near-zero volatility
- Reduced physical drift potential
- Better handling characteristics

Watch the [Enlist Story](#) to learn more about what's behind 2,4-D choline innovation.

Types of off-target movement

Physical drift



Movement of driftable fines from spray boom away from intended spray target, before it reaches target

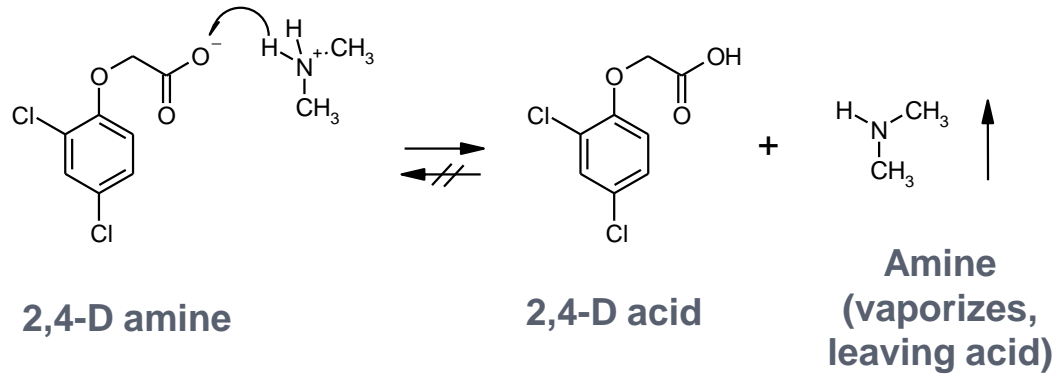
Volatility



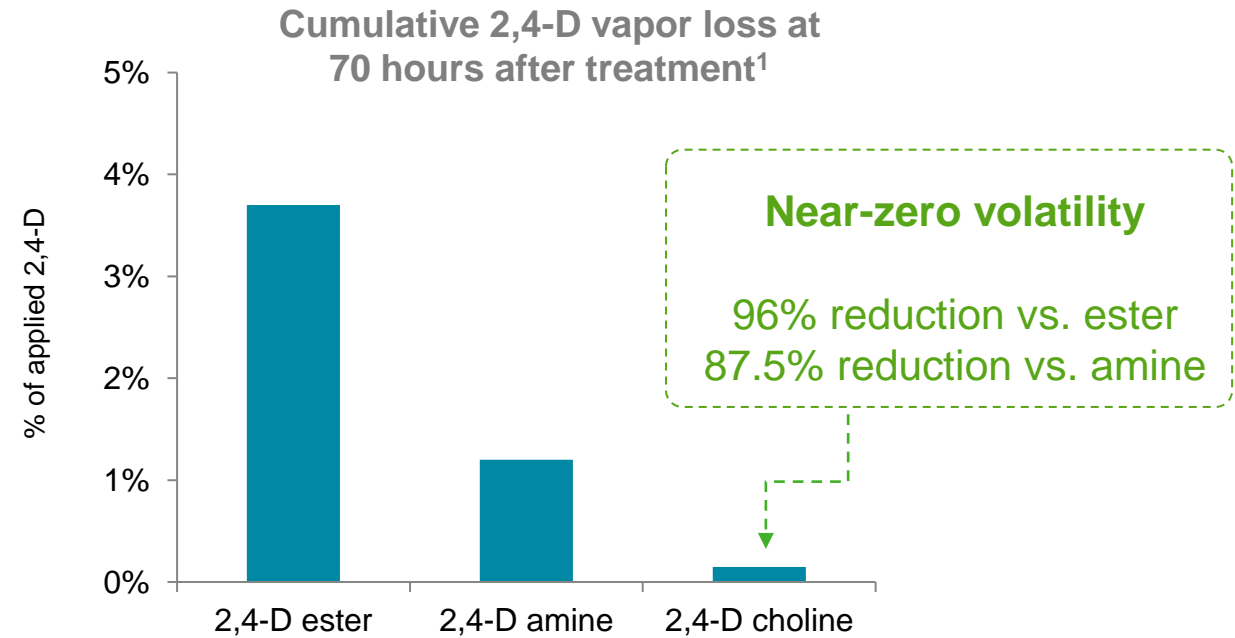
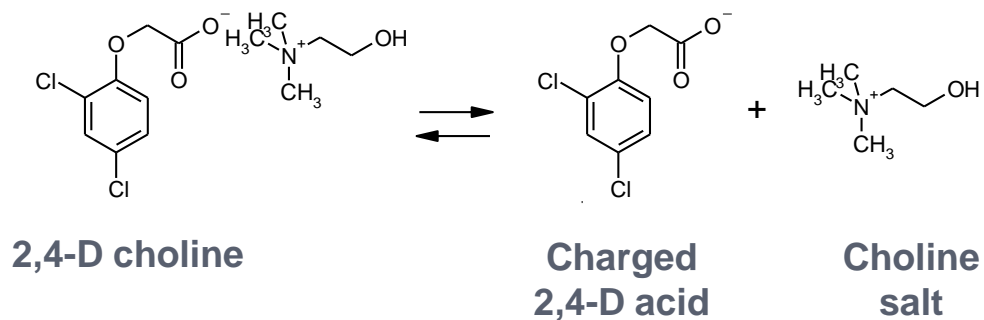
Movement of particles via vapor loss after spray hits target

2,4-D choline: Inherently less volatile

2,4-D amine (DMA) breaks apart, leaving behind volatile 2,4-D acid



2,4-D choline is more stable – stays associated



2,4-D choline is inherently less volatile than traditional forms of 2,4-D

In-field research confirms inherent low volatility of 2,4-D choline

Large in-field volatility trial
in soybeans without the Enlist™ trait



Adjacent soybeans
without the Enlist®
trait

Soybeans without the
Enlist® trait sprayed
with 2,4-D choline at
4x single rate



Soybeans adjacent to sprayed area
had no visible damage from volatility

Key differentiation: Tank-mix partners

Consider these products, which CAN be tank-mixed with Enlist® herbicides:

- Liberty® herbicide with Enlist One® herbicide
- Glyphosate DMA (Durango® DMA® herbicide) with Enlist One herbicide
- Qualified ammonium sulfate (AMS) products

Adding acidic products or AMS does not “break” the inherent low-volatility characteristics of 2,4-D choline

Only use tank-mix partners listed on EnlistTankMix.com for every application of Enlist herbicides.

Reduction of drift potential



Tank mix of glyphosate +
traditional 2,4-D



Enlist Duo[®] herbicide with
Colex-D[®] technology

Used with labeled low-drift nozzles, Enlist[®] herbicides with Colex-D[®] technology **reduce physical drift potential by 90%** compared with a tank mix of traditional 2,4-D and glyphosate.

- Reduces driftable fines without increasing relative droplet size
- Helps Enlist herbicides land and stay on target



Formulation of Enlist® herbicide with Colex-D® technology + using correct nozzles are critical for drift reduction.

Making successful applications of Enlist[®] herbicides



Label requirements

- Be aware of nearby crops and landscape – compatible and susceptible crops, required buffers
- Understand wind direction and wind speed
- Avoid temperature inversions
- Correct equipment: qualified nozzles, pressure and boom height
- Labeled tank-mix partners
- Thorough equipment cleanout

But first – let's discuss field planning

Field placement is key!

Soybeans without the Enlist® trait

Alfalfa/wheat

Enlist E3® soybeans

- Assess your weed pressure & make a plan.
- Capitalize on compatible crops.
- Minimize wind directional restrictions.

Corn

Key differentiation: Know the compatible crops

Key crops that are **not** listed as susceptible on the Enlist[®] labels:

Soybeans	Corn
Rice	Wheat
Sugarcane	Alfalfa
Peanuts	Sorghum

Watch out for susceptible crops

- Cotton without the Enlist® trait
- Cucurbits (ex. watermelons, pumpkins)
- Tobacco
- Grapes
- Tomatoes
- Fruiting vegetables



DO NOT SPRAY Enlist® herbicides when adjacent susceptible crops are downwind.



Wind direction @ 8 mph



DO NOT apply Enlist herbicides

What about crops/plants not specifically listed on the label?

- Always use caution around high-value/specialty crops
 - Ex. Sugarbeets, sweet potatoes, potatoes, hemp, nurseries, orchards, greenhouses
- Best approach is spraying when wind is blowing away from these crops



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Sensitive area buffers

Sensitive area buffers ARE:

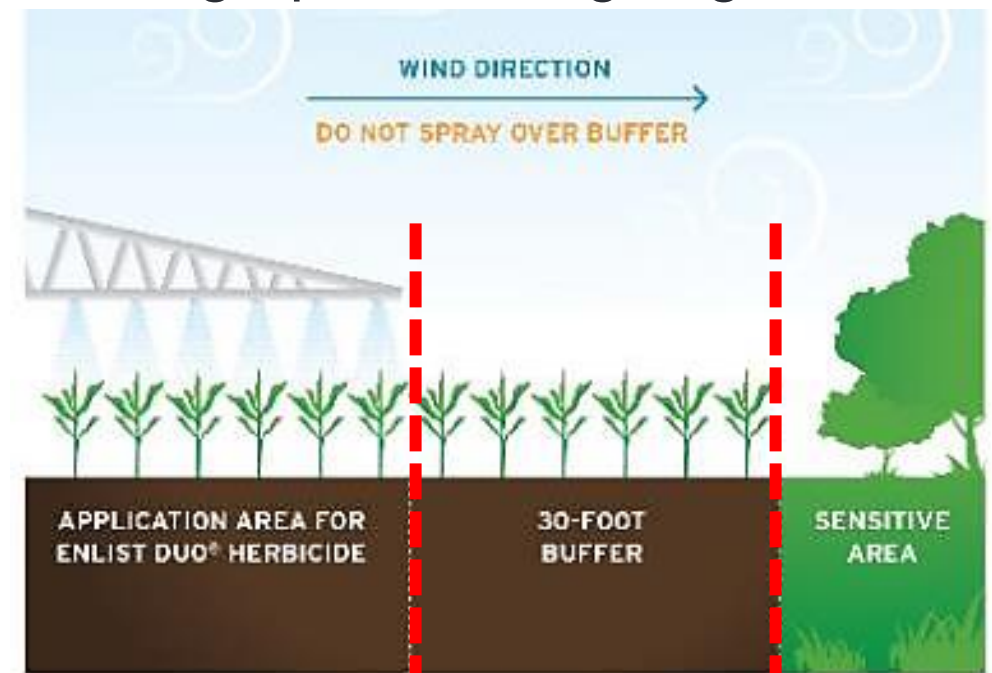
A requirement from EPA to protect potential endangered species habitat areas

Sensitive area examples

- Wooded area
- Pasture
- Roadside ditch
- Lawns

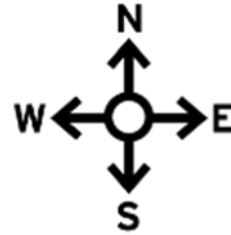
Sensitive area buffers ARE NOT:

Meant to protect downwind adjacent susceptible crops – including cotton without the Enlist[®] trait, tomatoes, cucurbits, grapes, fruiting vegetables

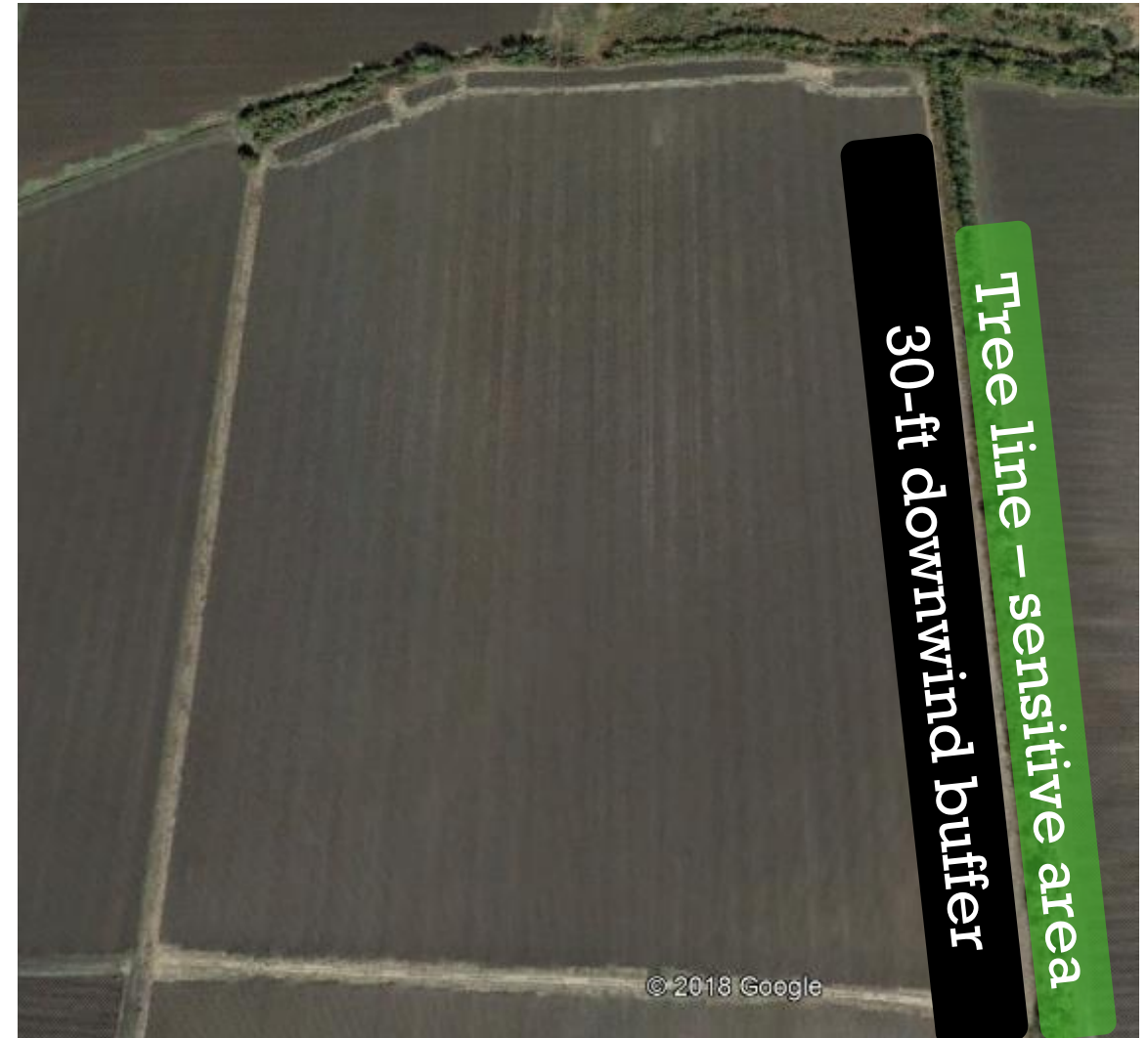


Sensitive area and buffers

Winds blowing from the west to the east at 6 mph



Sensitive area buffers do not apply to cropland but are required by the label to protect potential endangered species habitat. Examples of sensitive areas: tree lines and meadows.



Wind and environment



Wind direction: Not blowing toward adjacent susceptible crops.

Wind speed: Apply when wind speed is between 3 and 10 mph. *Check state requirements for maximum wind speed. Federal label maximum is 15 mph.*

Shifting winds: Keep an eye out for wind direction shifts during application.

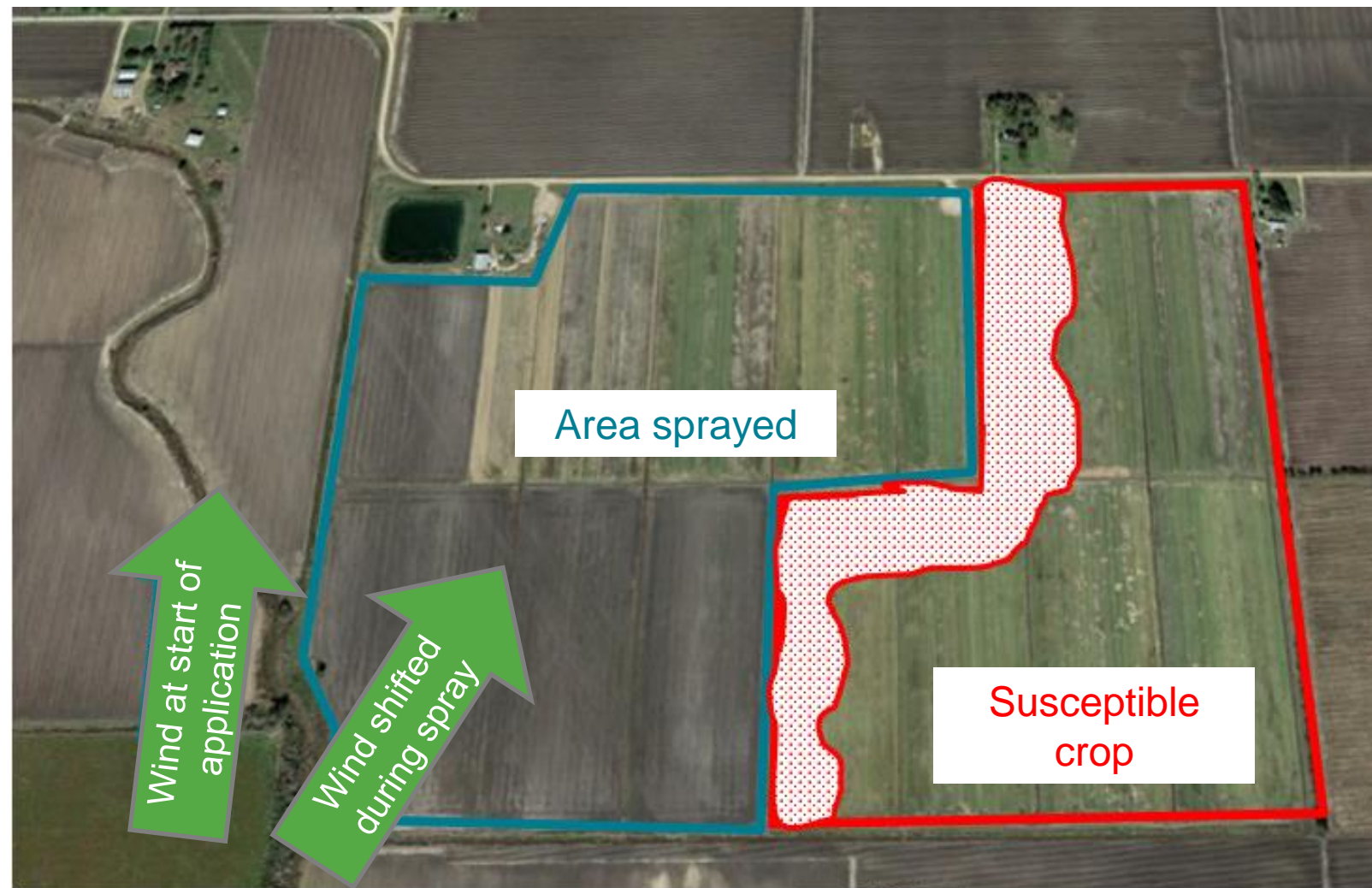
Inversions: Do not spray when a temperature inversion is present.

Watch for shifting winds

Use extra caution when spraying parallel to a susceptible crop.

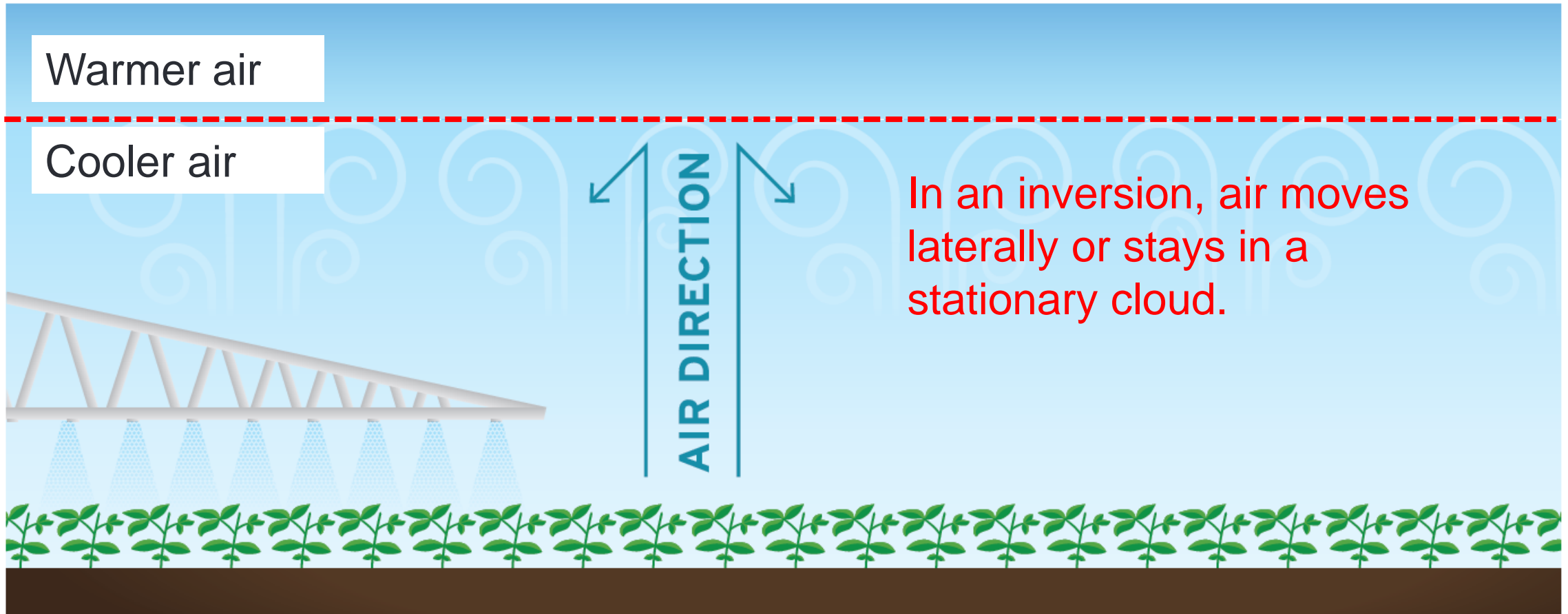
Monitor wind throughout application.

Immediately stop spraying if the wind shifts toward an adjacent susceptible crop.



Be aware of wider angle where wind direction may shift.

Don't spray into a temperature inversion!



When an inversion is not present, air continues to move vertically through the atmosphere.

Identifying temperature inversion

What is it? When a layer of warm air covers a layer of cooler air, effectively putting a lid on the surface-level air that prevents it from rising and mixing normally into the upper atmosphere.

Factors to keep in mind

Wind speed No wind is not a good thing. Apply when winds are between 3 and 10 mph.

Time of day Typically occurs early morning (dawn) or late afternoon (dusk).

Temperature Can occur if temperature remains within 5 degrees of the nighttime low.

Visual signs Fog is a good indication of an inversion, but it may not always appear under low-humidity conditions.

Check conditions before and during every application

- ✓ Nighttime and current temperatures via weather reports on a smartphone/tablet or download a weather app.
- ✓ Wind speed using an anemometer.
- ✓ Wind direction using a windsock.
- ✓ Release smoke or powder to indicate particle movement.

Inversion present with fog



Equipment setup



Nozzles & pressure: Use only qualified nozzles within pressure ranges specified.

Boom height: Boom height of 24” or less above crop canopy.

Start with a clean sprayer: Ensure sprayer is clean before mixing a load with Enlist® herbicides.

Sprayer cleanout – sanitizing all equipment

Ensure all equipment is thoroughly cleaned after application to avoid contamination. Sometimes it's the small parts that present the biggest risk of being overlooked.

- In addition to the sprayer, keep pumps and other transfer equipment clean.
- At the beginning of the season, be sure all equipment was cleaned after its last use.
- Don't let the spray solution sit in the sprayer overnight.
- Pay close attention to hoses, screens, filters, pumps and dead ends on the boom.



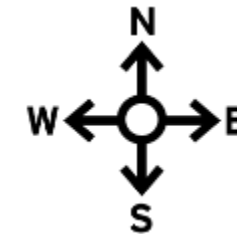
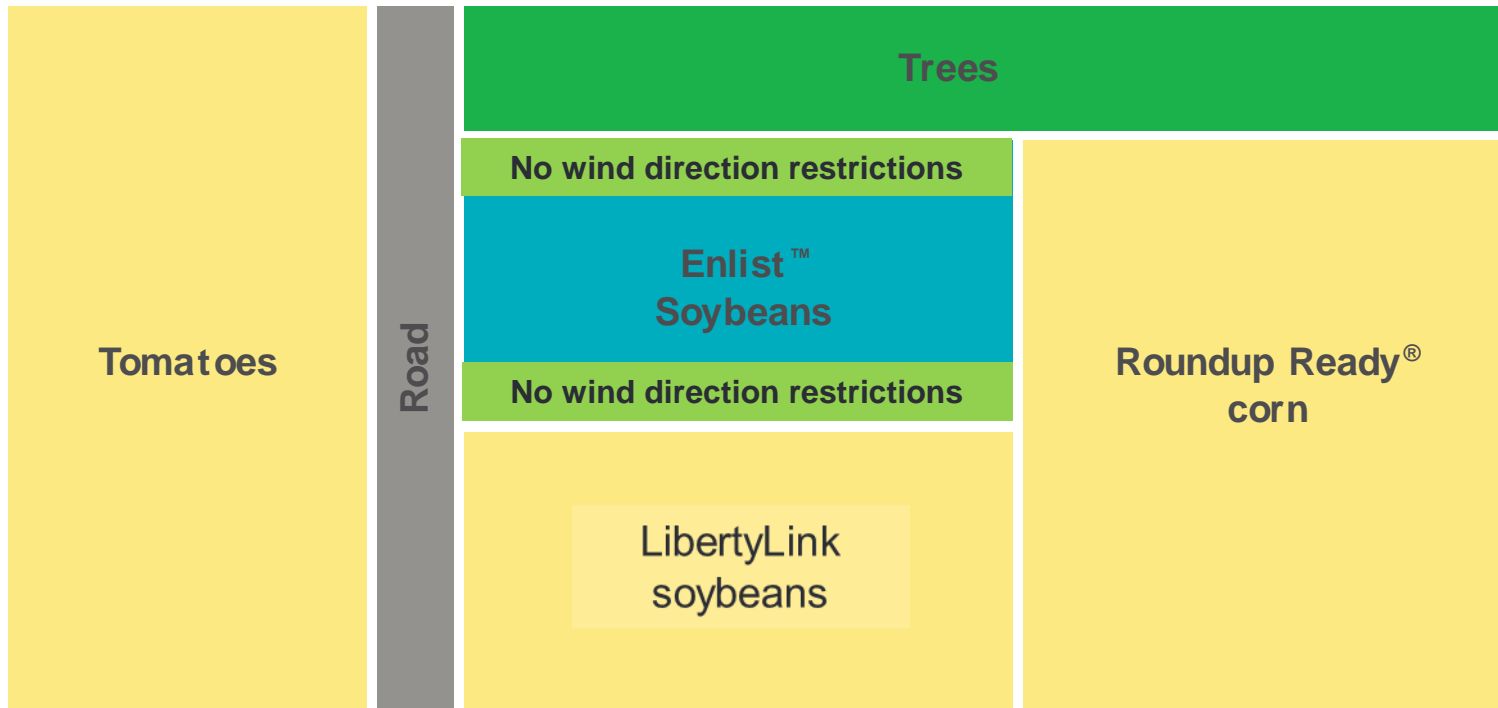
The triple-rinse procedure is detailed on the Enlist[®] herbicide labels and the Sprayer Cleanout Guide on [Enlist.com](https://www.enlist.com) > Enlist Ahead.

Spray scenarios



Should you spray?

The wind is blowing from the north to the south at 3-10 mph.



A buffer is not required when the wind is blowing away from a sensitive area.

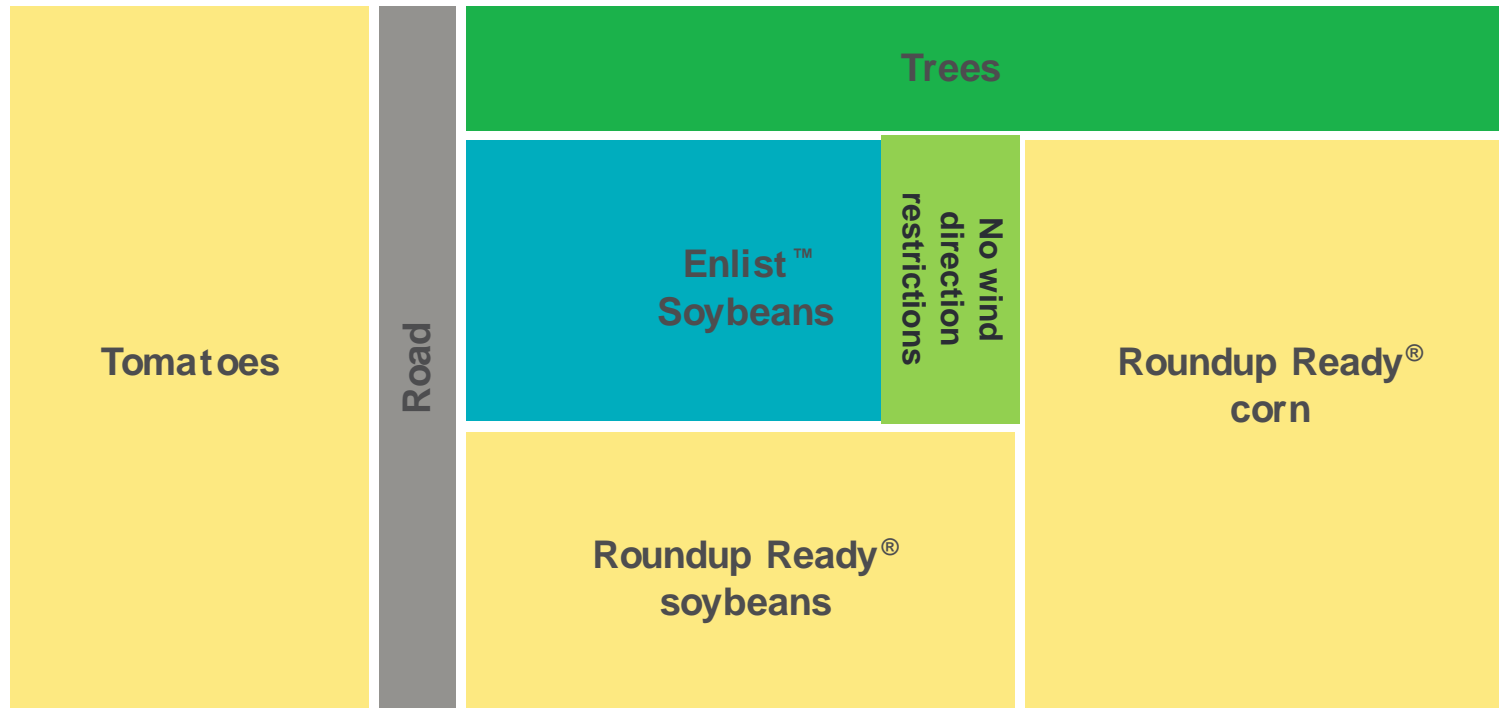
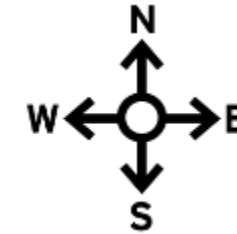
The application can occur when the wind is blowing toward soybeans without the Enlist® trait, as they are not listed on the label as a susceptible crop.

Enlist® herbicides on Enlist E3® soybeans

However, use caution when wind is blowing parallel to tomatoes. Recommendation in this scenario is to wait until wind is blowing away from the susceptible crop.

Should you spray?

The wind is blowing from the west to the east at 3-10 mph.



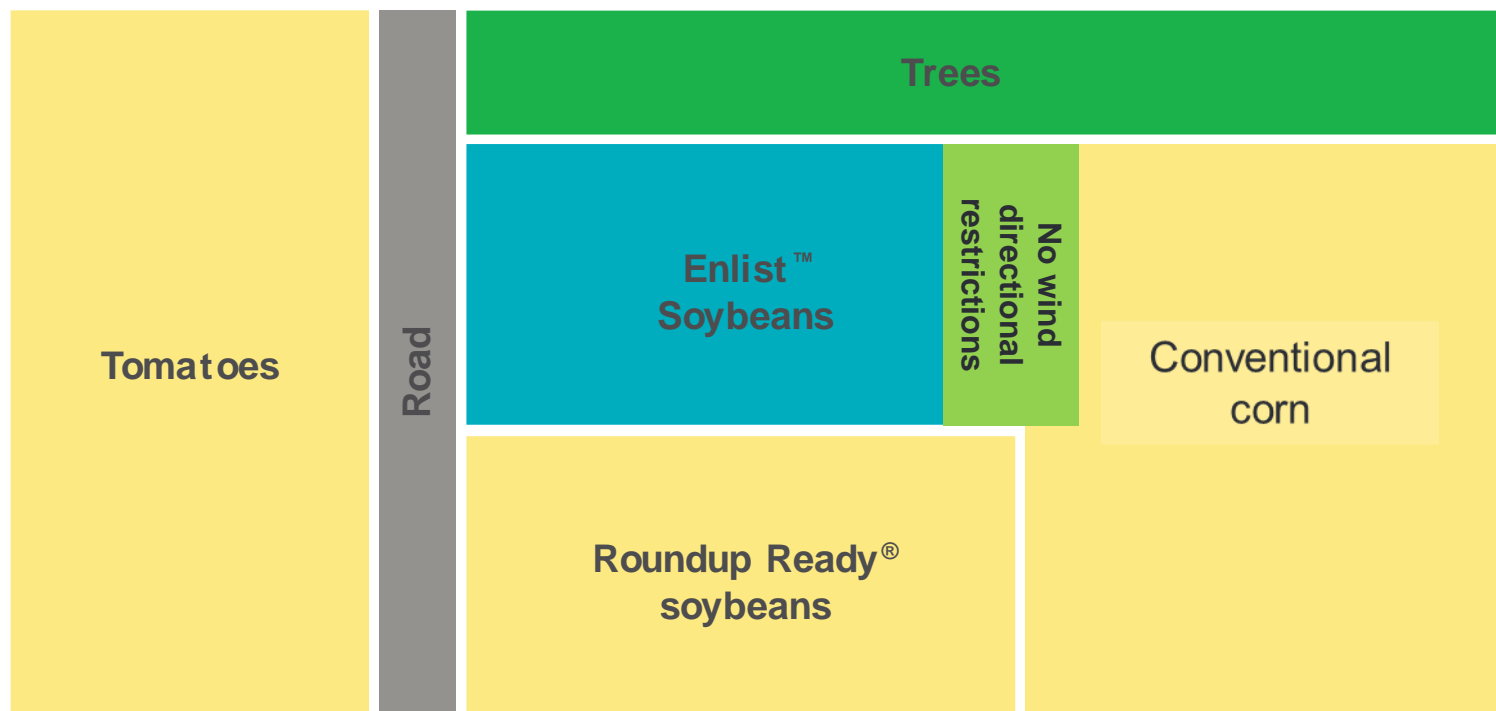
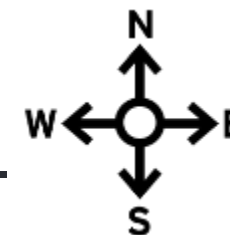
Neither corn nor soybeans are listed as a susceptible crop on the label.

A buffer is not required when the wind is blowing away from a sensitive area (trees).

Enlist® herbicides on Enlist E3® soybeans

Should you spray?

The wind is blowing from the west to the east at 17 mph.



DO NOT SPRAY – 17 mph exceeds maximum wind speed on Enlist herbicide labels.

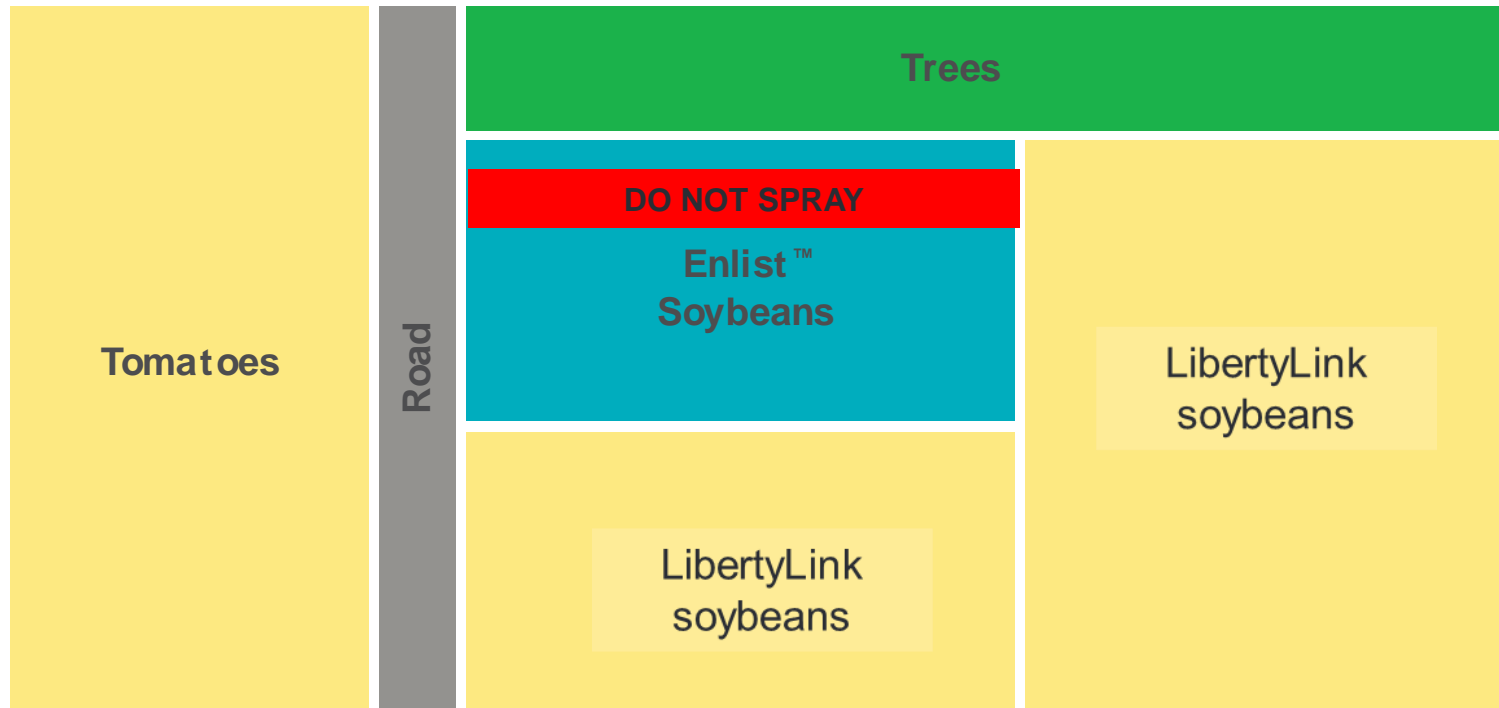
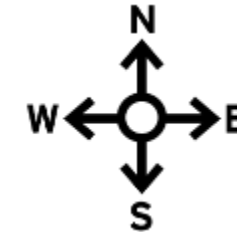
If wind speed were less than 15 mph:

- *Neither corn nor soybeans are listed as a susceptible crop on the label.*

Enlist® herbicides on Enlist E3® soybeans

Should you spray?

The wind is blowing from the east to the west at 3-6 mph.



Enlist[®] herbicides on Enlist E3[®] soybeans

Do not spray when the wind is blowing toward a susceptible crop.

Wait until wind is blowing away from a susceptible crop.

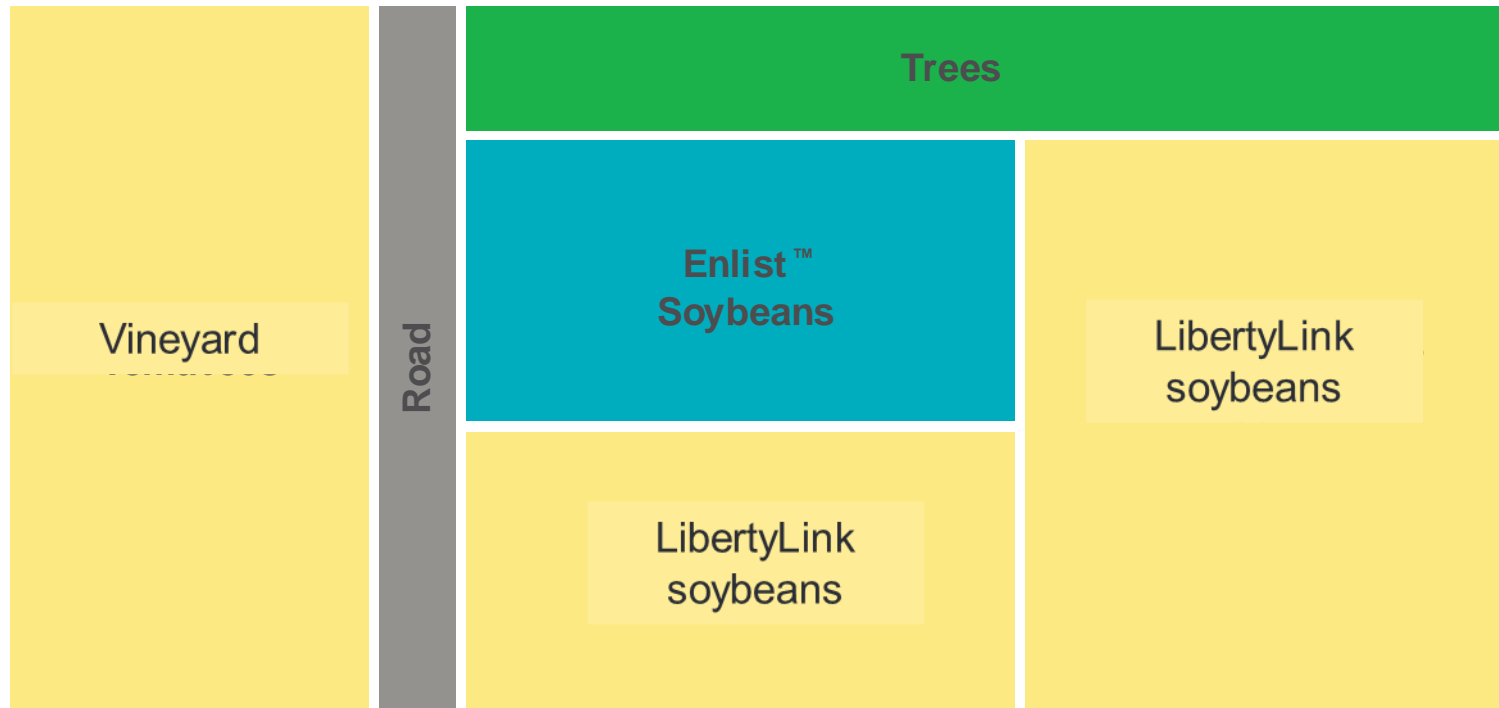
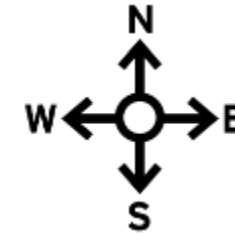
If needed due to weather conditions, utilize pass of Liberty[®] herbicide and/or glyphosate.

Susceptible Crops:

- Non-Enlist cotton
- Cucurbits
- Grapes
- Tobacco
- Tomatoes
- Fruiting vegetables

Should you spray?

The wind is blowing from the west to east at 2-3 mph.



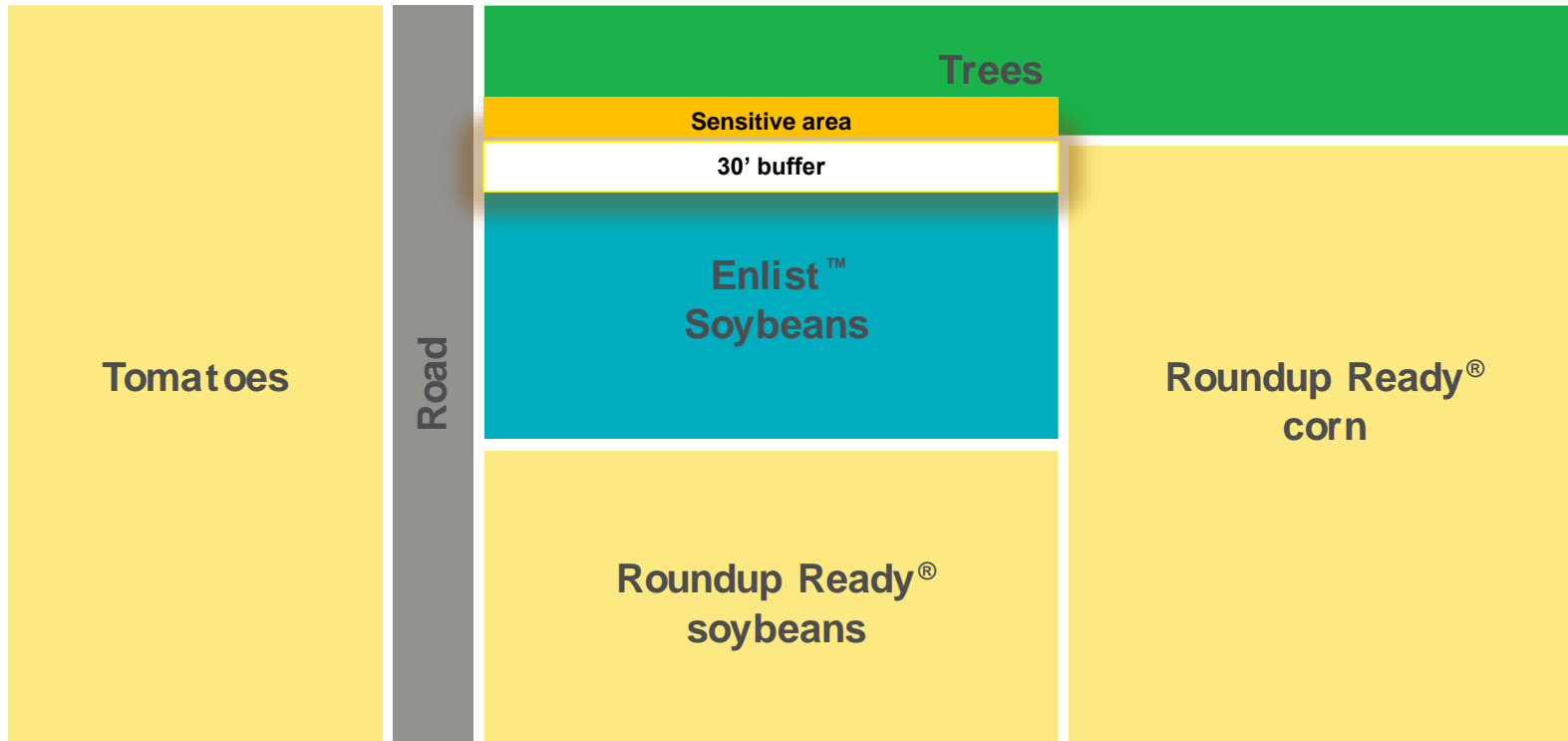
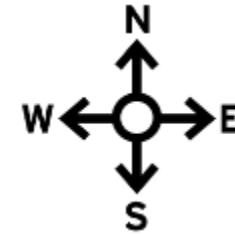
Enlist® herbicides on Enlist E3® soybeans

Not recommended to spray – use caution in light/variable winds, due to risk of temperature inversion and inability to assess wind direction. Recommended wind speed range is 3-10 mph.

If needed due to weather conditions, apply Liberty® herbicide and/or glyphosate.

Sensitive areas and buffers

The wind is blowing from the south to the north at 3-10 mph.



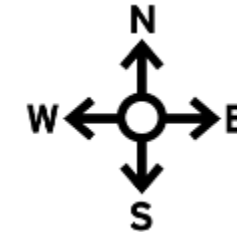
A 30' downwind buffer is required to protect the sensitive area.

Exercise caution with wind blowing parallel to a susceptible crop.

Enlist[®] herbicides on Enlist E3[®] soybeans

Should you spray?

The wind is blowing from the west to the east at 3 mph.



DO NOT SPRAY when wind is blowing toward cotton without the Enlist[®] trait!

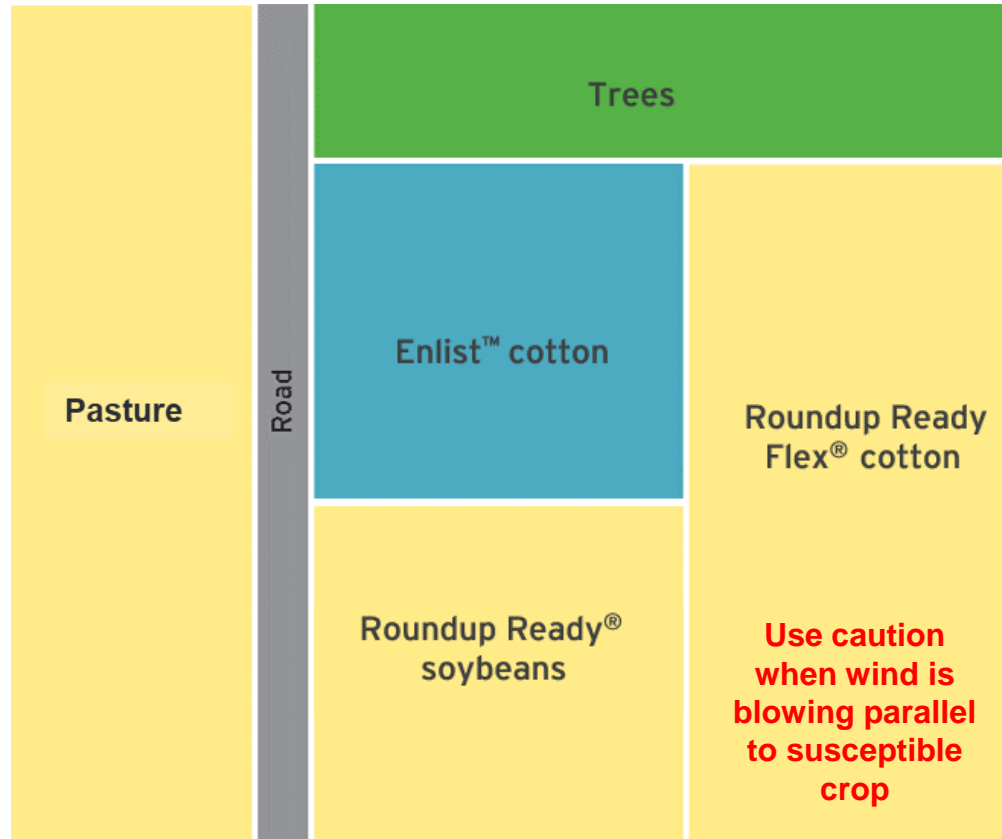
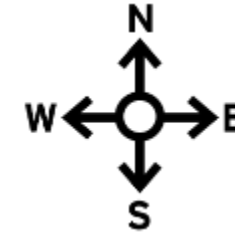
You would need an E/SE wind to make this application consistent with label requirements.

Also, use caution in light/variable winds, due to risk of temperature inversion and inability to assess wind direction.

Enlist[®] herbicides on Enlist E3[®] soybeans

Should you spray?

The wind is blowing from the north to the south at 5 mph.

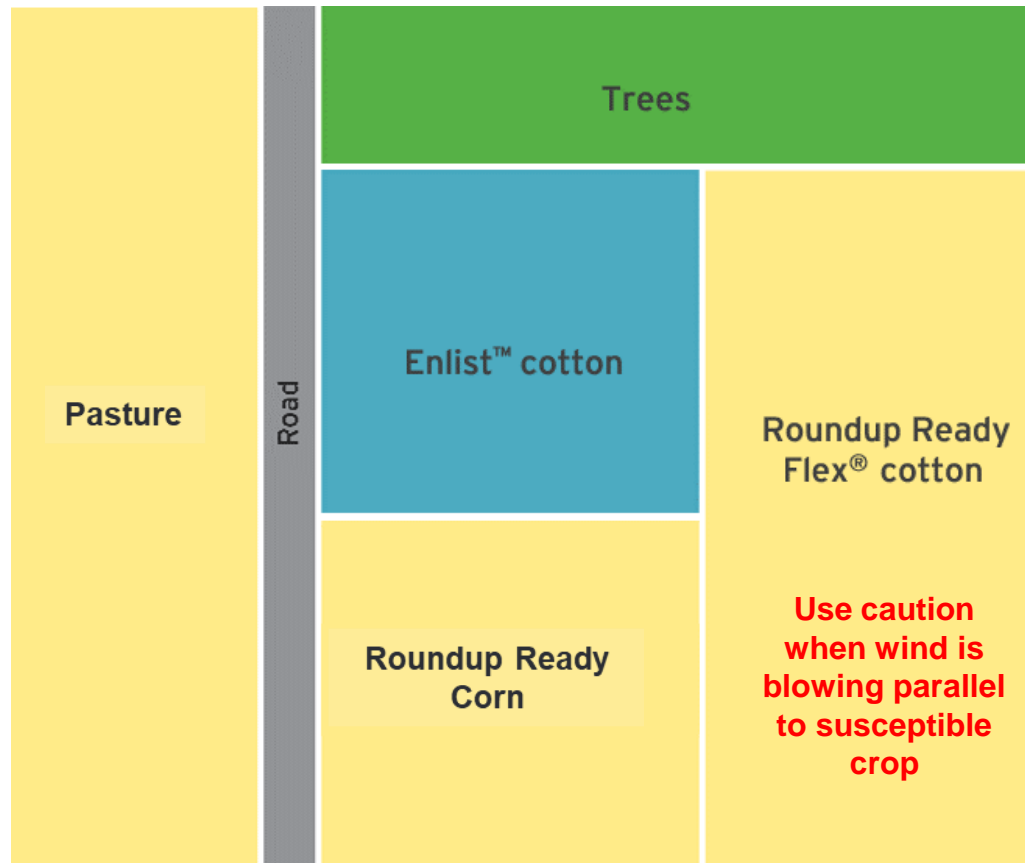
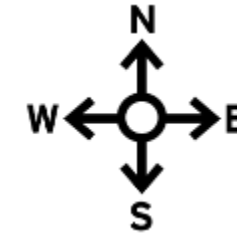


Although soybeans are not a susceptible crop for Enlist[®] herbicides, use caution when wind is blowing parallel to cotton without the Enlist trait.

Recommendation in this scenario is to wait until wind is blowing away from the susceptible crop.

Should you spray?

The wind is blowing from the north to the south at 5 mph.

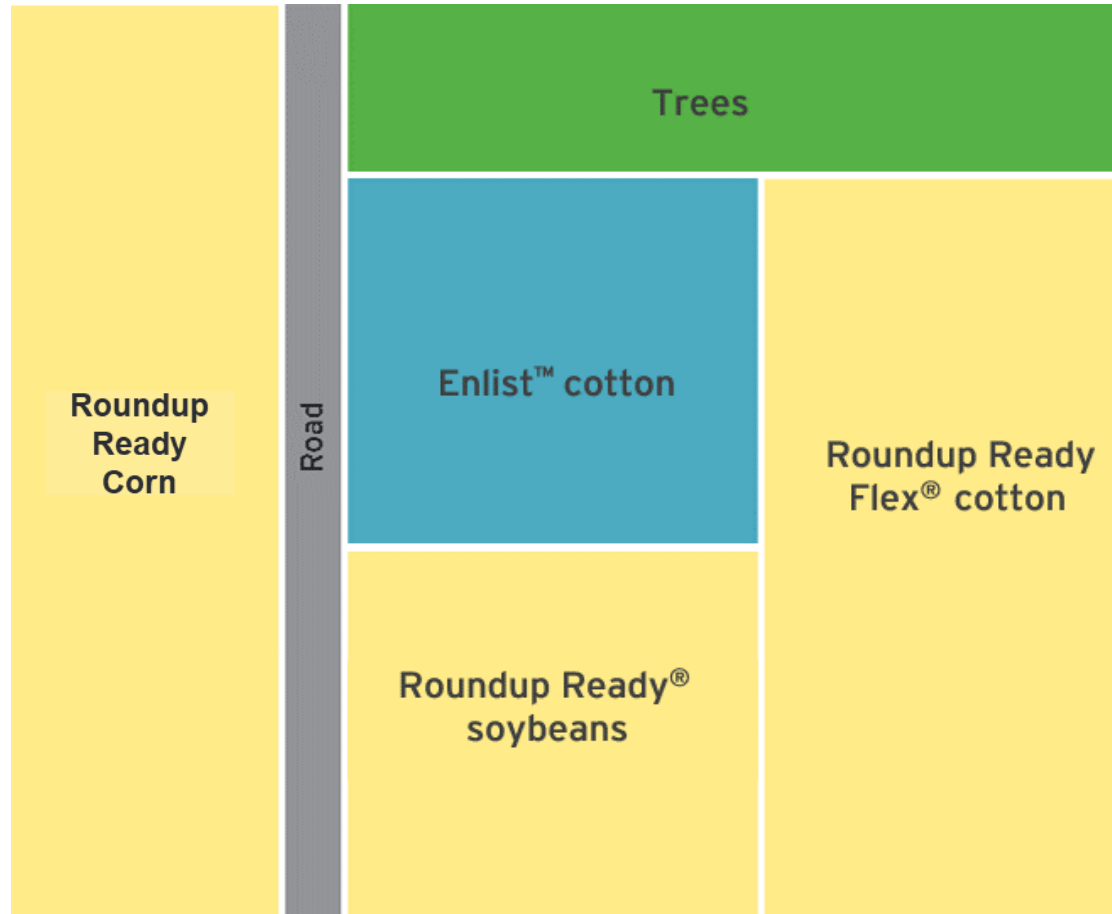
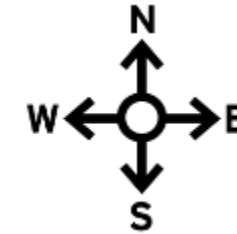


Although corn is not a susceptible crop for Enlist® herbicides, use caution when wind is blowing parallel to cotton without the Enlist trait.

Recommendation in this scenario is to wait until wind is blowing away from the susceptible crop.

Should you spray?

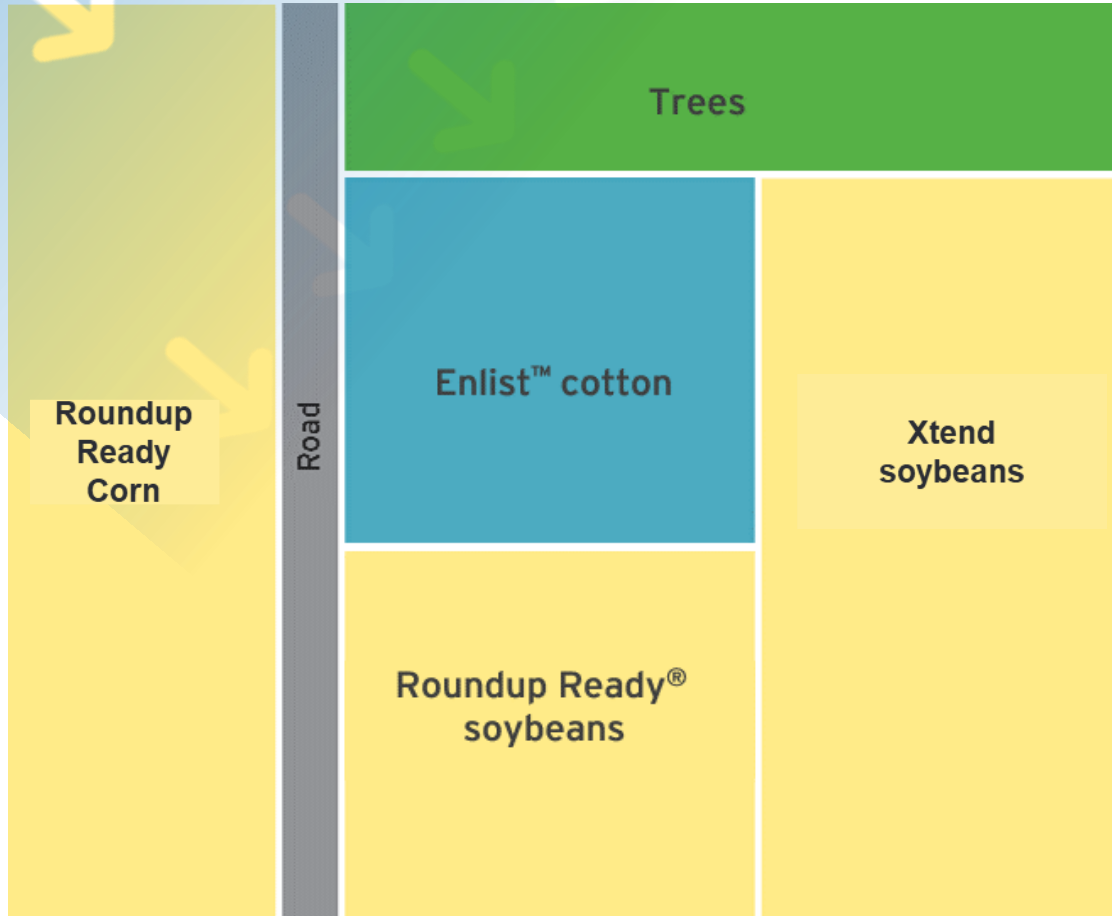
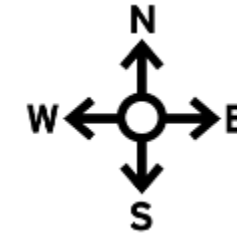
The wind is blowing from the east to the west at 9 mph.



Yes, OK to spray. When the wind is blowing away from the susceptible crop and toward a crop not listed as susceptible, Enlist® herbicides can be applied.

Should you spray?

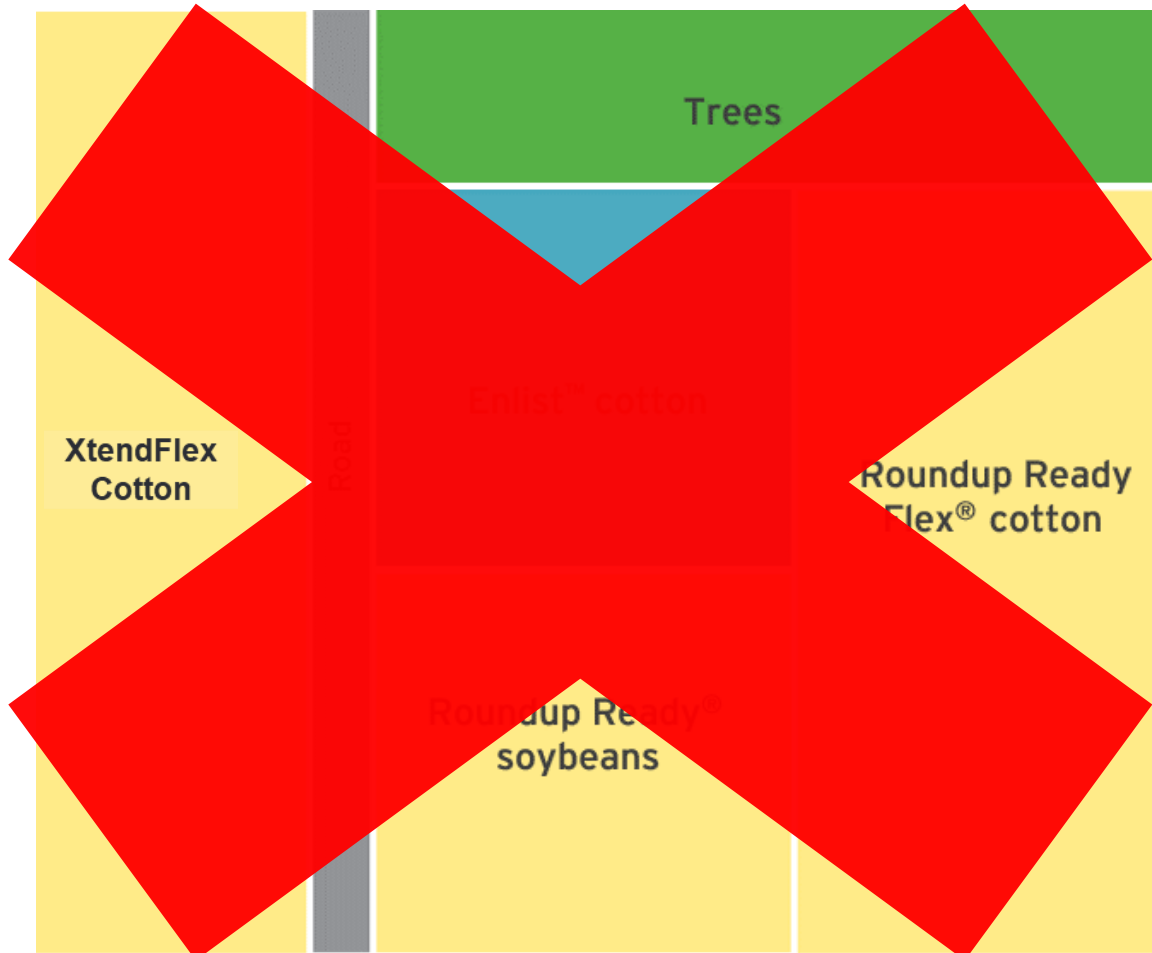
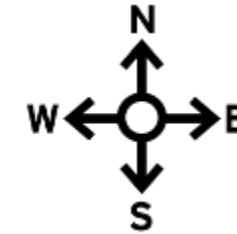
The wind is blowing from the NW to the SE at 9 mph.



Yes, OK to spray. When the wind is blowing toward a crop not listed as susceptible, Enlist[®] herbicides can be applied.

Should you spray?

The wind is blowing from the east to the west at 9 mph.



DO NOT SPRAY when wind is blowing toward cotton without the Enlist[®] trait!

Nozzle and tank-mix selection



Qualified nozzle summary




Only use nozzles and corresponding pressures listed on [Enlist.com/Nozzles](https://www.enlist.com/Nozzles) for every application of Enlist[®] herbicides.

- Enlist One[®] herbicide now has 111 qualified nozzles; Enlist Duo[®] herbicide has 106 qualified nozzles.
 - Added 63 with Enlist One (had 48 previously), added 83 with Enlist Duo (had 23 previously).
 - Now 90 nozzles qualified for both Enlist One and Enlist Duo.
- Qualified nozzle categorization helps with selection criteria: best for coverage vs. additional drift control.
- Conversations must start with the applicator's current nozzle selection – what nozzle will best achieve their goals, considering weed spectrum, carrier volume, ground speed, setup (PWM or traditional), proximity to susceptible crops?



Find the broad selection of qualified nozzles at [Enlist.com/Nozzles](https://www.enlist.com/Nozzles).

Choosing the best nozzle for you

Coverage guide (factor of type, size and/or pressure range):

-  Provides best balance of coverage and drift control
-  Provides additional drift control by creating larger droplets
-  No classification

For PWM Systems:

-  **NOZZLE** Designed for use with PWM systems
-  **NOZZLE** Use with John Deere ExactApply™ system ONLY

• Step 1 – coverage

- The classification of a nozzle considers BOTH its type and its qualified pressure range
 - Any nozzle except AM with a maximum qualified pressure less than 50 psi was not classified as best coverage regardless of type. AM is built for coverage, achieves very coarse droplets within qualified pressure range.
- No classification means this nozzle is not categorized. Either no information was available to classify it (i.e. Lechler), or its qualified pressure range limits the utility (ex. max is below 50 psi).

• Step 2 – traditional or PWM (pulse width modulation system) use

- The orange classification for PWM system is for nozzles specifically designed for PWM use and stated as such by their manufacturer. It does not include nozzles such as TTI (able to use in some PWM systems, but not specifically designed as a PWM nozzle).

90 Nozzles Qualified for Both Enlist One® and Enlist Duo® herbicides

Best for coverage with qualified drift control

Traditional

AIXR	11003
AIXR	11004
AIXR	11005
AIXR	11006
AIXR	11008
AIXR	11010

AI	11004
AI	11006
AI	11008

AM	11003
AM	11004
AM	11005
AM	11006

AITTJ	11010
-------	-------

TADF	11008
------	-------

AVI	110025
AVI	11003
AVI	11004
AVI	11005
AVI	11006

TDXL	11003
TDXL	11004
TDXL	11005
TDXL	11006

ULD & PSULDQ	12003/2003
ULD & PSULDQ	12004/2004
ULD & PSULDQ	12005/2005
ULD & PSULDQ	12006/2006
ULD & PSULDQ	12008/2008

Best for coverage with qualified drift control

PWM

MR	11006
MR	11008
MR	11010
MR	110125
MR	11004
MR	11005

PSLDMQ	2006
PSLDMQ	2008
PSLDMQ	2010

Additional drift control

Traditional

TTI	11002
TTI	110025
TTI	11003
TTI	11004
TTI	11005
TTI	11006
TTI	11008
TTI	11010

TTI60	11003
TTI60	11004
TTI60	11005
TTI60	11006
TTI60	11008

TDXL-D	11002-D
TDXL-D	110025-D
TDXL-D	11003-D
TDXL-D	11004-D
TDXL-D	11006-D
TDXL-D	11008-D

Additional drift control

PWM

SD	11004
SD	11005
SD	11006
SD	11008
SD	11010

DR	11003
DR	11004
DR	11005
DR	11006
DR	11008
DR	11010
DR	110125

UR	11003
UR	11004
UR	11005
UR	11006
UR	11008
UR	11010

ULD & PSULDQ	13003/3003
ULD & PSULDQ	13004/3004
ULD & PSULDQ	13005/3005
ULD & PSULDQ	13006/3006
ULD & PSULDQ	13008/3008

Refer to qualified nozzle charts for manufacturer, pressure range, and coverage category information.

Tank-mixing with Enlist® herbicides



Tank-mixing provides benefits:

- Ability to spray multiple sites of action in one pass
- Ability to use layered residuals

See all qualified tank-mix partners at EnlistTankMix.com.

Check [EnlistTankMix.com](https://enlisttankmix.com) for tank mixes

Only use tank-mix partners listed on [EnlistTankMix.com](https://enlisttankmix.com) for every application of Enlist® herbicides.

Qualified tank-mix partners ARE:

- Products that passed the EPA-mandated drift testing protocol.

One reason for the testing protocol for drift is protecting sensitive areas where listed species may have habitat.

Qualified tank-mix partners ARE NOT:

- Tested for crop response
- Tested for physical tank-mix compatibility
- An agronomic recommendation from Corteva Agriscience
- An endorsement of any kind from Corteva Agriscience
- An indicator of performance

Enlist Duo® and Enlist One® herbicides may only be tank-mixed with products that have been tested and found not to adversely affect the spray drift properties of Enlist® herbicides. A list of those products may be found at [EnlistTankMix.com](https://enlisttankmix.com). Enlist One offers additional tank-mix flexibility with products such as Liberty® herbicide.

Products listed on [EnlistTankMix.com](https://enlisttankmix.com) have not been tested for crop response, e.g., leaf burn. The addition of tank-mix products may cause increased crop response. Applications of products containing crop oils or vegetable-based oils are more likely to result in a crop response. Listing does not imply endorsement of use.

Key differentiation: Tank-mix partners

- ✓ Additional drift-reducing adjuvants (DRAs) are not required with Enlist[®] herbicides; built in drift reduction with Colex-D[®] technology
- ✓ Volatility reducing agents (VRAs) are not required with Enlist herbicides
- ✓ No prohibition on AMS; in fact, qualified AMS recommended with Liberty[®] herbicide tank mix, and as needed with qualified glyphosate tank mix

Only use tank-mix partners listed on EnlistTankMix.com for every application of Enlist herbicides.

Adjuvants in the tank mix

Q: Can I add adjuvants?

A: Yes, all qualified tank-mix partners are on [EnlistTankMix.com](https://www.enlist.com/enlist-tank-mix).

Enlist® herbicides do not require any adjuvants per the federal label.

Q: Should I add adjuvants?

A: Assess the needs for your spray and consult your local retailer. Use quality adjuvants. You may consider:

- AMS for water conditioning
- Crop oil concentrates for leaf penetration
- Surfactants to reduce droplet surface tension

Oil concentrates and surfactants are not a substitute for good weed management practices – timely spraying when weeds are small, using sufficient gallons per acre and proper nozzle/pressure setup.

Tank-mixing order

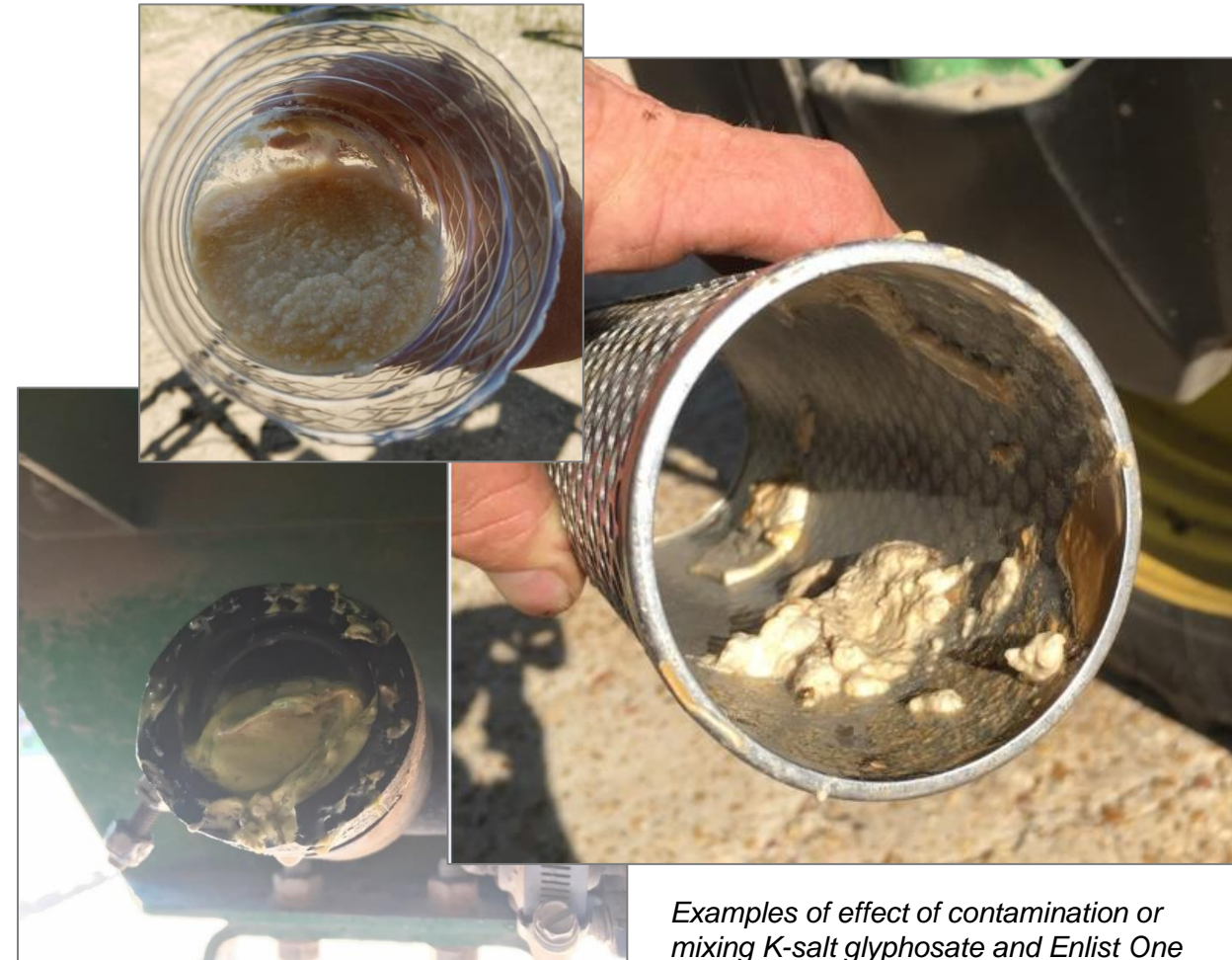
- **Begin with half-full tank of water carrier.**
- **Begin agitation and continue throughout mixing process.**
- **Add products in the following order:**

1. AMS/water-conditioning agents	6. Capsule suspension (CS) or suspension emulsion (SE)
2. Preslurry water-soluble packets	7. Emulsifiable concentrate (EC), such as S-metolachlor
3. Wettable powders/dry flowables	8. Soluble liquids (SL) <ul style="list-style-type: none"> • Enlist Duo[®] at 4.75 pt./A or Enlist One[®] at 2 pt./A • Glyphosate products, including Durango[®] DMA[®] and Abundit[®] Edge • Glufosinate products, including Liberty[®] herbicide • Other SLs
4. Compatibility agents	9. Crop oil concentrate (COC), methylated seed oil, (MSO), non-ionic surfactant (NIS), other adjuvants
5. Liquid flowables	10. Top off with water carrier

If needed, do a jar test – key is keeping products proportional in the jar test to mixing actual load.

Avoid mixing mistakes with Enlist One® herbicide

- Start with a clean sprayer – no contamination.
- Use sufficient water volume – start with tank half-full of water.
- Add products one at a time, allowing enough time for recirculation between each product.
- Do not pour glyphosate into the tank or inductor at the same time as Enlist One® herbicide.
- If dry products are going in the tank, thoroughly mix for 5 minutes; may take longer with cold water.



Examples of effect of contamination or mixing K-salt glyphosate and Enlist One concentrate at same time.

Avoiding the gunk up during mixing

To successfully tank-mix Enlist One® herbicide + K-salt glyphosate:

- Plenty of water
- Plenty of time to agitate
- Mix products one at a time in proper mixing order



10 gallons carrier volume
Enlist One @ 2 pt./A
Roundup PowerMAX @ 22 oz./A
Brawl @ 1 pt./A

Products dumped into inductor at same time;
less than 25% full of water

Additional endangered species protection measures



Management of runoff

Sound management of runoff benefits landowners, farmers and the environment. Land managers/applicators of Enlist[®] herbicides must effectively implement mitigation measures that reduce, to the maximum extent practicable, runoff from treated fields.

Application Scheduling

- Maximize the time between the product application and rainfall (or planned irrigation)
- Do not apply this product when soil is saturated or at field capacity, or when a storm event likely to produce runoff from the treated area is forecast (by NOAA/National Weather Service, or other similar forecasting service) to occur within 48 hours following application
- Do not irrigate treated field within 48 hours of application

Soil Hydrologic Grouping and Corresponding Mitigation Measures

- Users must know the soil hydrological type where application is occurring to implement required mitigation measures to prevent runoff. Soils are grouped into one of four categories based on runoff potential. Refer to the next slide for category definitions.
- Reference the table of “credits”: The farmer/land manager will achieve mitigation measure credits depending on soil type with additional credits required for less permeable soils. Credits are earned by implementing mitigation measures.

Runoff mitigation measure requirements

To reduce runoff from treated fields to the maximum extent practicable, the land manager/ applicator must effectively implement measures in the following table:

For land with **Hydrologic Soil Groups* A & B:**
minimum of 4 credits

For land with **Hydrologic Soil Groups* C & D:**
minimum of 6 credits

*Hydrologic Soil Group (HSG) definitions:

- A = Sand, loamy sand or sandy loam
- B = Sandy clay loam
- C = Silt loam or loam
- D = Clay loam, silty clay loam, sandy clay, silty clay or clay

Mitigation Measures			Credits
Reduce number of applications – reduced number of applications of Enlist® products per year. Applications may be made at any time during crop development but must maintain a minimum 12-day re-treatment interval.	3 applications		0
	2 applications		2
	1 application		4
Residue Tillage Management: no-till, strip-till, ridge-till, and mulch-till			4
Vegetative Filter Strips	30 ft. off-field vegetative buffer on down slope	HSG A or B	2
		HSG C or D	0
	100 ft. off-field vegetative buffer on down slope	HSG A or B	4
		HSG C or D	1
Field border: border with dense vegetative stands with a minimum width of 30 ft.			2
Cover crop			2
Vegetative barrier: Permanent strips of dense vegetation along the contours of the field with a minimum width of 3 ft.			2
Contour buffer strips or terrace			2
Grassed waterway			2
Water and sediment basin			1
Contour farming or contour stripcropping			1

‘Management of Runoff’ section added

Previous label version

Brief mentions of preventing runoff were contained in the Environmental Hazards section and in the Product Information > Spray Coverage section.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

New “Management of Runoff” section has been added to the label to provide additional protection directions for off-field areas.

Menu of good runoff management stewardship practices on label, applicator must effectively implement a number of measures dependent on soil type.

Additional detailed information found on [Enlist.com/MitigationMeasures](https://www.enlist.com/MitigationMeasures).

This section was added to further the protection of potential endangered species habitat located in off-field areas.

Additional runoff management language in Uses > Restrictions section – change to 48-hour restriction



Previous label version

- Do not irrigate treated fields for **at least 24 hours** after application of Enlist One[®] herbicide.
- Do not make application of Enlist One if rain is expected in the **next 24 hours**.

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

Do not apply this product when soil **is saturated, or when a storm event likely to produce runoff from the treated area is forecasted (by NOAA/National Weather Service, or other similar forecasting service) to occur within 48 hours following application.**

Do not irrigate treated fields within 48 hours of application.

Additional information on [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures)

Measure	Measurements or additional definitions found on website
Contour buffer strips	<ul style="list-style-type: none"> • Strips of permanent herbaceous vegetation, primarily of perennials such as grass, alternated with wider cultivated strips that are farmed on the contour. • Cultivated strip widths must be a minimum of 15 feet wide. • The integrity of the buffer must be maintained for the entire width and length.
Terraces	<ul style="list-style-type: none"> • A stair stepping technique of creating flat or nearly flat crop areas along a gradient. • The ends of terraces, including turnrows, must be structured and maintained to prevent concentrated flow from damaging the function of the terrace.

This material is an excerpt from [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures) – visit the website for full information.

Additional information on [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures)

Measure	Measurements or additional definitions found on website
Contour farming	<ul style="list-style-type: none"> The use of ridges and furrows formed by tillage, planting and other farming operations following the contour to change the direction of runoff from directly downslope to across the slope. Contour farming must only be implemented on slopes between 2 and 10 percent, minimum ridge height of 1 inch, in areas with 10-year rain events less than 6.5 inches/24hrs, and with a length of slope between 100 and 400 feet long.
Contour strip cropping	<ul style="list-style-type: none"> A field is managed with planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips following the contour across a field. Less than half the field may be planted in row crops, and at minimum 50% of the slope must be planted with low erosional risk plants. Strip cropping is not as effective if the row crop strips are too wide and must only be implemented on slopes $\leq 10\%$ slope. Establish and maintain the rows as close to the contour as possible.

This material is an excerpt from [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures) – visit the website for full information.

Additional information on [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures)

Measure	Measurements or additional definitions found on website
Cover crop	<ul style="list-style-type: none"> A close-growing crop that temporarily protects the ground from wind and water erosion during times when cropland is not adequately protected against soil erosion. The cover crop must be planted after harvest of the previous season’s crop and remain on the field up to the field preparation for planting the Enlist® crop.
Field border	<ul style="list-style-type: none"> A field border is defined as a strip of permanent vegetation established at the edge or around the perimeter of a field. Establishment and maintenance of the field border and immediately upslope (typically a cropped area) must aim to eliminate or significantly reduce concentrated flow and promote surface sheet flow runoff. The minimum width for the purpose of reducing pesticides in solution must be 30 feet and be comprised of a permanent dense vegetative stand.
Grassed waterway	<ul style="list-style-type: none"> Natural or constructed vegetated channels designed to direct surface water, flowing at nonerosive velocities, to a stable outlet (e.g., another vegetated channel, an earth ditch). The Enlist user must establish a maintenance program to maintain waterway capacity, vegetative cover and outlet stability.

This material is an excerpt from [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures) – visit the website for full information.

Additional information on [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures)

Measure	Measurements or additional definitions found on website
Residue and tillage management	<ul style="list-style-type: none"> • Conservation tillage practices such as no-till, strip-till, ridge-till and mulch-till. • More than 20% of the surface must remain covered with plant residue.
Vegetative barrier	<ul style="list-style-type: none"> • Narrow, permanent strips of stiff stemmed, erect, tall and dense vegetation established in parallel rows on the contour of fields to reduce soil erosion and sediment transport. • Minimum barrier width of 3 feet, and must maintain the integrity of the barrier for the entire width and length.
Water and sediment control basins	<ul style="list-style-type: none"> • An earthen embankment or basin, or a combination ridge and channel constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable engineered outlet. • Maintenance must include ensuring a healthy grassed or vegetative surface within the interior of the basin, inspections after major storms and repair to damaged areas, as well as removal and redistribution of excess sediment back to the field.

This material is an excerpt from [Enlist.com/MitigationMeasures](https://enlist.com/MitigationMeasures) – visit the website for full information.

Example: 6 credits required, residue management

- Farmer is managing residue on his Enlist E3[®] soybean field with silt loam soil (Hydrological Group C). Makes two applications of Enlist[®] herbicide during the year.
 - Two applications of Enlist herbicide = 2 credits
 - Residue management = 4 credits

No-till



Strip-till



Reduced-till/Mulch-till



Example: 6 credits required, conventional tillage

- Farmer is conventional till on his Enlist E3[®] soybean field with sandy clay soil (Hydrological Group D). Makes a single application of Enlist[®] herbicide during the year.
 - One application of Enlist herbicide = 4 credits
 - Vegetative barrier = 2 credits
 - Permanent strips of dense vegetation along the contours of a field with a minimum width of 3 feet.

Vegetative Barrier



Additional endangered species protection language in Uses > Restrictions section - county mitigations



Previous label version

Listed 29 counties located in AZ, FL and TN where Enlist herbicides could not be sprayed due to endangered species mitigations.

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

Endangered Species Advisory/Protection Requirements: This product may have effects on federally listed threatened or endangered species or their critical habitat in some locations. When using this product, you must follow the measures controlling the product use relevant to your location (see Supplemental Label).

Do not use Enlist One[®]/Enlist Duo[®] in the following counties: See Supplemental Label

Endangered Species section of 'Directions for Use': Obtaining Endangered Species Protection Bulletins



Previous label version

*No reference to
Bulletins Live.*

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

It is a federal offense to use any pesticide in a manner that results in an unauthorized “take” (e.g., kill or otherwise harm) of an endangered species and certain threatened species, under the Endangered Species Act Section 9. When using this product, you must follow the measures contained in the Endangered Species Protection Bulletin for the area in which you are applying the product. You must obtain a bulletin no earlier than six months before using this product.

To obtain Bulletins, consult <http://www.epa.gov/espp/>, call 1-844-447-3813, or email ESPP@epa.gov. You must use the Bulletin valid for the month in which you will apply the product.

Bulletins Live is a website used by EPA to inform users how to manage a product in an area where listed species have been found. As of 2/1/22, no information has been populated by EPA on Bulletins Live regarding Enlist herbicides.

Importance of pollinator protection

A healthy pollinator population is one metric by which to measure a diverse ecosystem. Soil health, water quality and biodiversity are all important in delivering ecosystem benefits and an affordable and abundant food supply. Corteva Agriscience actively works to protect the health of both pollinators and the ecosystems they inhabit through a variety of initiatives, including:

Pollinator protection – best management practices to reduce potential pesticide exposure

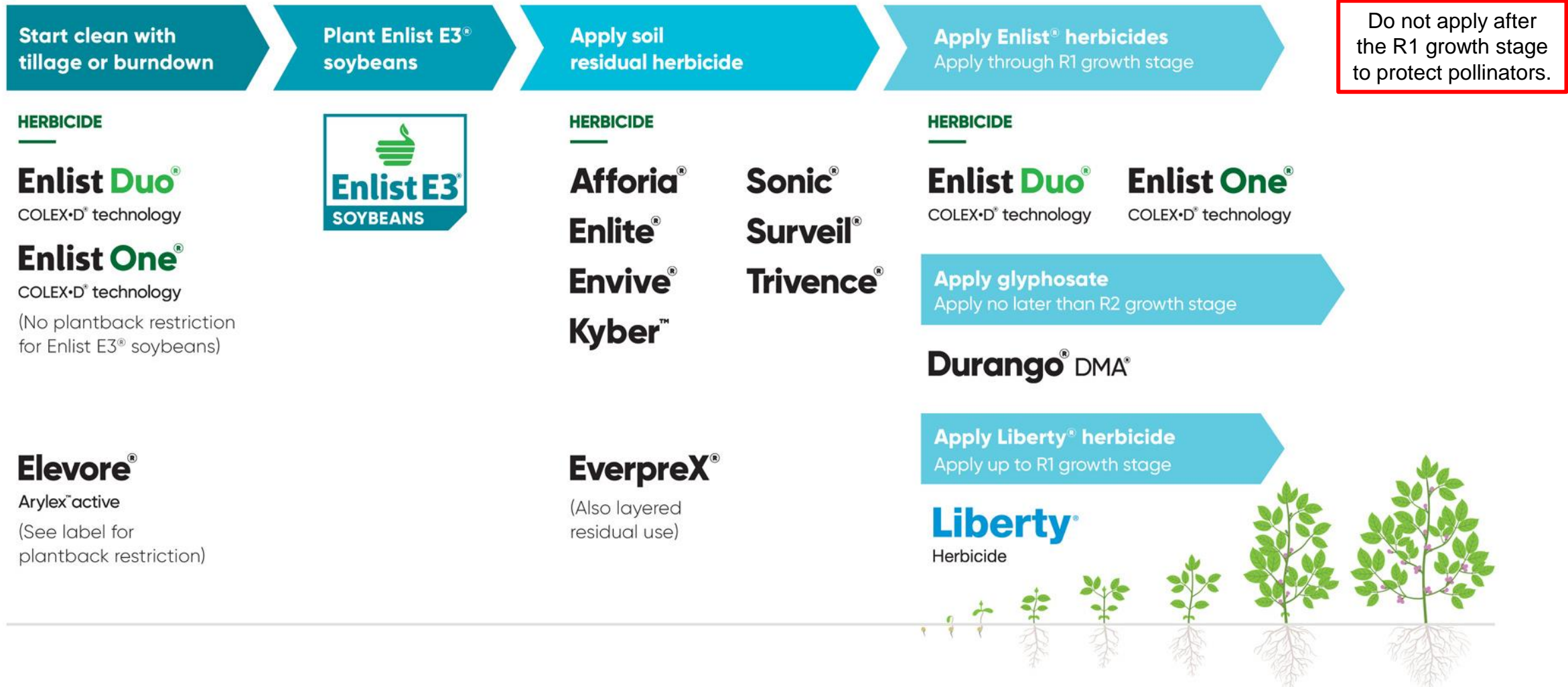


- Protect and enhance nonfarmland pollinator habitat, such as wildflower areas, border areas, and hedge and fence rows.
- Understand the pollinator needs for food, shelter and protection from hazards in your operations.
- Follow all product label restrictions and recommendations to protect pollinators.
- Follow all field planning and application best management practices listed in this guide to fully understand neighboring environments and to reduce potential pesticide exposure to these environments.
- Read and implement any required pollinator protection practices as provided by your seed supplier, such as those found in the [Corteva™ 2022 Soybean United States Product Use Guide](#)

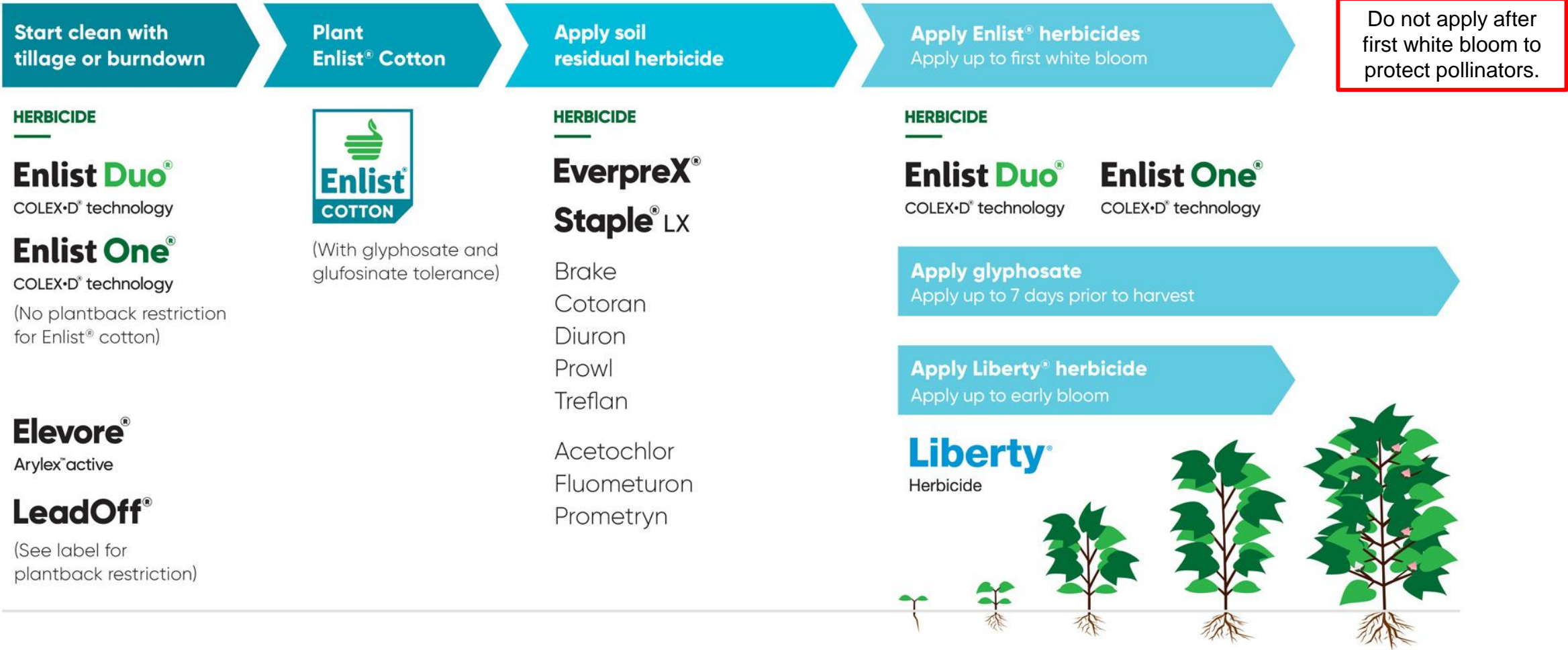
Pollinator protection – Enlist[®] herbicide label provisions

- “This product is designed to control certain weeds and if used outside the label requirements may adversely impact the forage and habitat of nontarget organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of nontarget organisms by following label directions intended to minimize spray drift and runoff.”
- “This product is moderately toxic to bees on an acute basis and may cause chronic risk to pollinators or other terrestrial invertebrates. Do not apply this product to blooming vegetation or if bees or other pollinating insects are visiting the treatment area.”
- “Do not apply in soybeans containing the Enlist[®] trait after the R1 growth stage.”
- “Do not apply to cotton containing the Enlist trait after first white bloom.”
- “Follow all label directions in Spray Drift Management and Management of Runoff sections for all applications.”
- “Do not apply Enlist herbicide aerially.”
- “Do not apply during a temperature inversion.”
- “Do not apply with any tank-mix partner that is not listed on EnlistTankMix.com.”
- “Use only qualified nozzles.”

Enlist E3[®] soybeans: Apply through R1 growth stage



Cotton with the Enlist® trait: Apply up to first white bloom



Reporting ecological incidents to Corteva Agriscience

- It is a federal offense to use any pesticide in a manner that results in an unauthorized “take” (e.g., kill or otherwise harm) of an endangered species or certain threatened species, under the Endangered Species Act Section 9. When using an Enlist[®] herbicide, you must follow the measures contained in the Endangered Species Protection Bulletin for the area you are applying the product.

- **To report ecological incidents, including mortality, injury or harm to nontarget plants and animals, call 855-ENLIST1 (855-365-4781).**

Additional label updates – implemented in January 2022



Additional label changes summary

- Weed height – maximum 6”
- Rainfast defined as within 4 hours
- Rate range eliminated for postapplications on Enlist® crops – high rate now only rate
- Wind speed range stated as 3-10 mph recommended
- Greenhouses removed from acceptable buffer areas
- Tank-mix procedure added to label
- Enlist Duo® herbicide burndown ahead of soybeans without the Enlist trait plantback restriction reduced to 14 days
- Minimum carrier volume clarified as 10 GPA
- Waterhemp listed as a hard to control weed – with residuals and sequential passes needed for program approach
- Other minor clarifications: Authorized herbicide language aligned to TUA; HRM residual language; location of susceptible crops language earlier in label document; no fertilizer carriers reinforced; Enlist Duo tank mix procedure second rinse language correction

Nozzle listing moved to Enlist.com/Nozzles



Previous label version

Listing of qualified nozzles and corresponding pressure range was listed directly on the labels.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Qualified nozzles and pressure ranges are no longer listed directly on the labels; now the listing on Enlist.com is the official, definitive listing of qualified nozzles. As of January 2022, Enlist One and Enlist Duo each have more than 100 qualified nozzles listed.

Nozzle listings have already been located on EnlistTankMix.com for several years.

This change allows updates to nozzle listings in the future with more agility.

Rainfastness defined as 4 hours

Previous label version

Rainfastness: Heavy rainfall soon after application may wash off this product from the foliage.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Rainfastness: **Enlist One®/ Enlist Duo® herbicide is rainfast within 4 hours following application.**

The product should not be applied when heavy rain is expected that may saturate the soil and lead to runoff.

Language to describe use of authorized herbicides

Previous label version

2,4-D products that do not contain COLEX-D[®] Technology are not authorized for use in conjunction with Enlist corn, soybeans and cotton.

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

Enlist herbicides with Colex-D[®] technology are the ONLY 2,4-D containing products authorized and specifically labeled for use with Enlist crops.

Updated language matches the Corteva Technology Use Agreement ([find a copy at this website](#)).

Maximum weed height defined as 6”

Previous label version

Stage of Broadleaf Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual and perennial rate tables for specific weeds. When treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions, reduced weed control may result.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Stage of Broadleaf Weeds: **Apply when weeds are less than 6 inches in height.** Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual and perennial rate tables for specific weeds. When treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions, reduced weed control may result.

Language clarified that Enlist® herbicides are not residuals



Previous label version

Limited Soil Activity: Though some suppression of annual weeds emerging soon after application may occur when this product is applied at **higher rates within the rate range**, optimum control is achieved when the majority of weeds are emerged at the time of application. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Limited Soil Activity: Though some suppression of annual weeds emerging soon after application may occur, optimum control is achieved when the majority of weeds are emerged at the time of application.

Language previously referred to a rate range for applications; the range has been eliminated for postapplications in the updated label.

Clarifications in additional HRM practices section

Previous label version

Thoroughly clean plant residues from equipment before leaving fields suspected to contain resistant weeds.

Avoid using more than two applications of Enlist One® and any other Group 4 herbicide within a single growing season unless in conjunction with another mode of action herbicide with overlapping spectrum.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Thoroughly clean plant **and soil** residues from equipment before leaving fields suspected to contain resistant weeds.

Avoid using more than two **in-crop** applications of Enlist One® and any other Group 4 herbicide within a single growing season unless in conjunction with another mode of action herbicide with overlapping spectrum.

Location of susceptible plants section within the label

Examples of cucurbits crops, and tobacco added



Previous label version

Was located below the spray drift management section, which led to confusion for some that buffers were relevant to downwind sensitive crops.

At the time of application, the wind cannot be blowing toward adjacent commercially grown tomatoes and other fruiting vegetables (EPA crop group 8), cucurbits (EPA crop group 9), grapes and cotton.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Now located before the language on spray drift management, so the notes on do not spray for downwind adjacent susceptible crops appears on the label before the buffer diagram.

At the time of application, the wind cannot be blowing toward adjacent commercially grown tomatoes and other fruiting vegetables (EPA crop group 8), cucurbits (EPA crop group 9, **including pumpkins, melons and cucumbers**), grapes, **tobacco** and cotton.

Clarified wind speed recommended range

Previous label version

Wind Speed

Do not apply at wind speeds greater than 15 mph.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Wind Speed

Do not apply at wind speeds greater than 15 mph. Wind speeds can vary during application. For best results, apply when wind speeds are between 3 and 10 mph.

Updated language reflects recommendations in place in commercial materials since 2012 when Enlist Ahead program began – Corteva recommends applications take place during 3-10 mph winds.

Greenhouses removed from buffer exception listing

Previous label version

- You must maintain a 30-foot downwind buffer (in the direction in which the wind is blowing) from any area except:
 - Roads, paved or gravel surfaces.
 - Planted agricultural fields (except those crops listed in the “Susceptible Plants” section).
 - Agricultural fields that that have been prepared for planting.
 - Areas covered by the footprint of a building, shade house, **green house**, silo, feed crib, or other man-made structure with walls and or roof.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

- You must maintain a 30-foot downwind buffer (in the direction in which the wind is blowing) from any area except:
 - Roads, paved or gravel surfaces.
 - Planted agricultural fields (except those crops listed in the “Susceptible Plants” section).
 - Agricultural fields that that have been prepared for planting.
 - Areas covered by the footprint of a building, shade house, silo, feed crib, or other man-made structure with walls and or roof.

Tank-mix procedure added to label

Previous label version

No directions for tank mix procedure or steps were listed.

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

New “Tank-mix Sequence Procedure” has been added following the sprayer cleanout section on the label.

This section was added for the convenience of applicators. The language used on the updated label matches that guidance given through commercial Enlist Ahead materials since 2019 on the tank-mix procedure sheet.

Now single labeled rate for postapplications on Enlist[®] crops; Repeat 6” maximum weed height.



Previous label version

Postemergence

Apply **1.5 to** 2.0 pints of Enlist One[®] per acre.

Apply when **weeds are small**...

Apply **3.5 to** 4.75 pints of Enlist Duo[®] per acre.

Apply when **weeds are small**...

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

Postemergence

Apply **2.0 pints** of Enlist One[®] per acre. Apply
when weeds are **no larger than 6 inches**...

Apply **4.75 pints** of Enlist Duo[®] per acre. Apply
when weeds are **no larger than 6 inches**...

This change is intended to encourage good stewardship in-crop by use of full rates for best weed control. The rate range was NOT eliminated for burndown and pre uses in order to enable additional opportunities for Enlist herbicides to participate in these markets where alternatives are generic 2,4-D or other AIs.

Minimum volume clarified to be 10 GPA

Previous label version

Carriers and Spray Volumes

Apply in a broadcast spray volume of water ranging from 10 to 15 gallons per acre for best results.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Carriers and Spray Volumes

Apply in a broadcast spray volume of water ranging from 10 to 15 gallons per acre for best results. **Do not apply less than 10 gallons total spray volume per acre.** Do not substitute water with nitrogen **or other fertilizer solutions** as carrier.

Minimum carrier volume language is now a clear requirement rather than a recommended range. This language applies to all use patterns, including fallow and burndown.

No use of fertilizer carriers reinforced

Previous label version

Carriers and Spray Volumes

Do not substitute water with nitrogen solutions as carrier.

Updated Enlist® herbicide labels (Enlist One® and Enlist Duo®)

Carriers and Spray Volumes

Do not substitute water with nitrogen **or other fertilizer solutions** as carrier.

This requirement is being reinforced for all use patterns, because qualified nozzle and tank-mix testing is based on using only water as the carrier. Therefore, no other carriers should be used with Enlist herbicides.

Palmer amaranth and waterhemp clarifications in Controlled weeds > annuals table



Previous label version

Weed listed in table as: pigweed, Palmer

Footnote on hard to control weeds:

¹ Hard-to-control weeds, such as Palmer amaranth, may require a total program approach including soil-applied residual herbicide(s) followed by a single or sequential post herbicide application.

Updated Enlist[®] herbicide labels (Enlist One[®] and Enlist Duo[®])

Weed listed in table as: **Palmer amaranth**

Footnote on hard to control weeds:

¹ Hard-to-control weeds, such as Palmer amaranth **and waterhemp**, may require a total program approach including soil-applied residual herbicide(s) followed by a single or sequential post herbicide application.

This change allows appropriate expectations to be set on program approach needs when dealing with both Palmer amaranth and waterhemp.

Enlist Duo® herbicide burndown plant-back on soybeans without the Enlist trait reduced to 14 days



Previous label version

Preplant (Burndown)

Applications must be made **not less than 30 days** prior to planting soybeans.

Updated Enlist Duo® herbicide label

Preplant (Burndown)

Apply up to 4.75 pints per acre **not less than 14 days** prior to planting soybeans.

This plant-back interval is comparable with market norms for non-Enlist 2,4-D herbicide products. The change enables additional opportunities for growers to substitute Enlist Duo with near-zero volatility for traditional 2,4-D products, at the same plant-back interval they are accustomed to for burndown.

Cleanout procedure for Enlist Duo® herbicide, clarification that second rinse requires 10% of tank volume filled with water



Previous label version

Sprayer Cleanout, Step 4

During the second rinse, **fill** the container with clean water.

Updated Enlist Duo® herbicide label

Sprayer Cleanout, Step 4

During the second rinse, fill the container **to at least 10% of the total tank volume** with clean water.

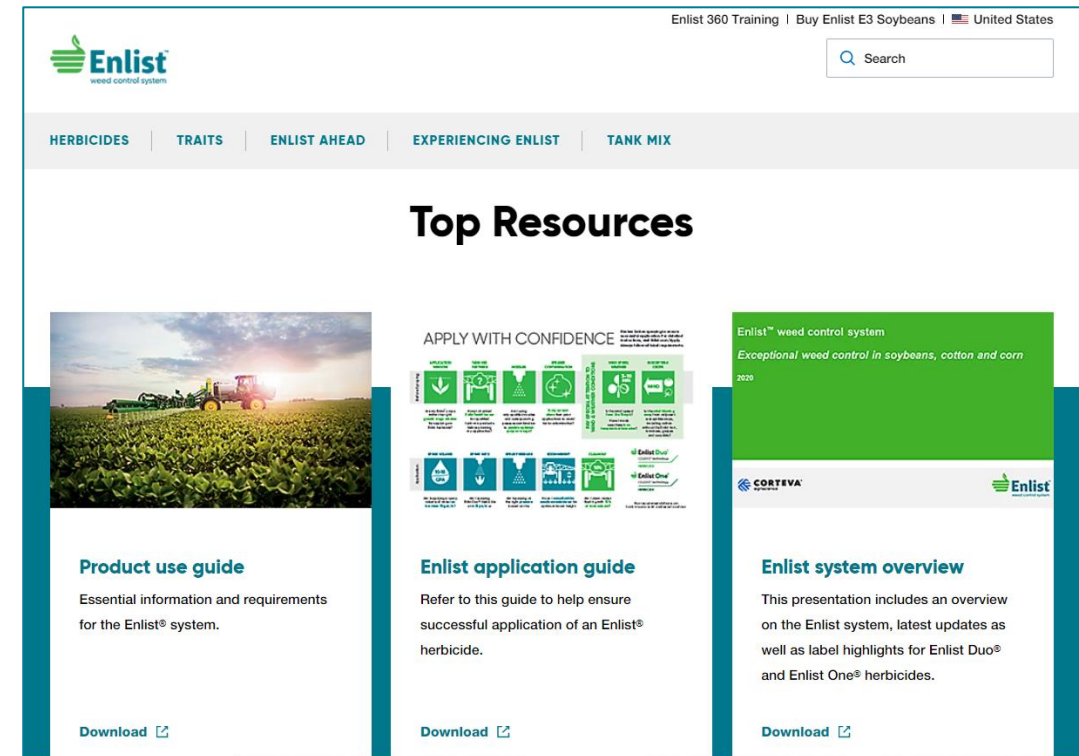
This change simply corrects an oversight that was on the previous label; now the language for Enlist Duo matches the language for Enlist One on cleanout step 4.

Conclusion



Find more resources at Enlist.com

- Enlist® online training, live webinar sign ups and webinar recordings (link at top of site)
- Qualified tank-mix partner list
- Qualified nozzle list
- Mitigation measures information
- Literature
 - Product Use Guide – *illustrated label*
 - Application Guide – *checklist reference*
 - Tank-mix sequence guidance
 - Additional literature pieces



Appendices

Additional slides if needed

Liberty[®] herbicide: Preferred glufosinate tank-mix partner with Enlist One[®] herbicide



Liberty[®]
Herbicide

Tank-mix of Enlist One + Liberty herbicides:

- Two effective sites of action in one pass
- Best postemergence option for glyphosate-resistant waterhemp, pigweed and kochia management
- Quick, consistent broad-spectrum weed control
- Maximizes the value of Enlist[®] trait

Application of Enlist One[®] + Liberty[®]
herbicide
Arkansas, June 2018

Optimize the Tank-Mix of Enlist One® + Liberty® Herbicides



Rates:	2 pts./A (32 oz) of Enlist One + 2 pts./A (32 oz) of Liberty herbicide
Weed Size:	< 3” tall
Adjuvants:	Use 1.5 to 3 lb./A of AMS. <i>May be any combination of qualified dry AMS, liquid AMS or AMS-containing products found on EnlistTankMix.com.</i>
App. Window:	No later than R1 (beginning bloom) on Enlist E3® soybeans
Volume:	20 GPA recommended for best performance of Liberty herbicide, especially when grasses or dense weeds are present. 15 GPA min. required with Enlist One + Liberty herbicides.
Nozzles	Use nozzle and corresponding spray pressure from the <u>qualified list for Enlist One herbicide</u> . Optimize coverage with qualified nozzles by using a less coarse nozzle with a higher operating pressure, such as an AI, AIXR, AITTJ or TDXL.
Weather:	Liberty (contact herbicide) can be challenged by certain weather conditions <ul style="list-style-type: none"> • Low humidity can reduce activity – increase spray volumes • Avoid spraying in cloudy conditions
Wind Speed:	10 mph maximum
Time of day:	BASF recommends spraying Liberty herbicide from 2 hrs after sunrise to 2 hrs before sunset. No time-of-day restrictions on Enlist herbicide labels.

Crop Response



Potential Crop Response: Droop

- “Sleepy” or “droopy” beans after Enlist herbicide application is temporary crop response as 2,4-D is metabolized
- Typically grows out in 24-48 hrs
- More prone in stressed environments – heat, humidity, younger soybeans
- No impact on yield



Potential Crop Response: Necrosis

- Can appear 24-72 hrs after application
- Cosmetic response that will not affect new growth
- More likely with multi-way tank mixes and oil-based products (ECs, COC, MSO, HSOC, etc)
- More prone in stressed environments – heat, humidity, younger crop
- No impact on yield



Potential Crop Response: Necrosis



Enlist One + PowerMax + Anthem Maxx (pyroxasulfone + fluthiacet)



Glyphosate + s-metolachlor tank mix

Weed control



Agronomic considerations for tank mixes with grass herbicides



- **Consider these factors when evaluating an addition of a grass control herbicide to an Enlist[®] load:**
 - Growth regulator herbicides, including Enlist Duo[®] and Enlist One[®], are most effective when applied to actively growing weeds
 - The tank mixing of a growth regulator, like Enlist Duo or Enlist One, with a grass control herbicide such as clethodim or quizalofop can result in decreased herbicidal activity
 - You may achieve better weed control results spraying grass control herbicides in a separate pass from the growth regulator herbicides

Controlling volunteer corn in Enlist[®] soybeans

- Clethodim is the leading herbicide for the control of volunteer corn in the US; it requires the use of NIS (non-ionic surfactant) or COC (concentrated crop oil).
- Select Max (clethodim from Valent) is a qualified tank-mix partner with Enlist One[®] herbicide. The volunteer corn control recommendation is provided here from Valent.
- To overcome any reduction in volunteer control when mixing with Enlist One, the recommendation from Valent is to increase the rate by 1/3. Corteva research data supports this rate increase to overcome the antagonism.

See Select Max label for NIS or COC requirements and rates.

Check **EnlistTankMix.com** for qualified NIS and COC products.

Volunteer Corn Height	Volunteer Corn Stage	Select Max rate when applied with Enlist One or other broadleaf products that are antagonizing
12 in	≤ V4	8 fl oz/A
24 in	V5-V7	12 fl oz/A
36 in	≥ V8	16 fl oz/A

More on tank mixing & jar tests



When in doubt, perform a jar test

Information on adjuvants, with detailed jar test instructions on page 36 (Purdue University):

<https://ppp.purdue.edu/wp-content/uploads/2016/08/PPP-107.pdf>

Steps to completing a jar test for a 1,000-gal tank mixture

1. Measure at least 16 oz of water into a 1-quart jar. This starts us at 50% of tank volume
 - Be sure to use the same water you will fill your spray tank with
2. Determine rates of each spray component to add
3. Add spray components to the jar following proper mixing order and stir mixture thoroughly
4. Fill the jar the rest of the way with water
5. After mixing, let solution stand for 10–15 minutes and observe results

Jar test example

32 oz Enlist One[®] + 32 oz Liberty[®] herbicide + 40 oz Roundup + 0.5 pint Water Conditioner
Carrier volume of 15 GPA

1. 16 oz of water (2 cups)
2. 1 teaspoon (4.16 ml) water conditioner
3. 1 tablespoon (17 ml) Enlist One
4. 1 tablespoon (17 ml) Liberty herbicide
5. 1.5 tablespoon (21 ml) Roundup
6. Top off with water and agitate...

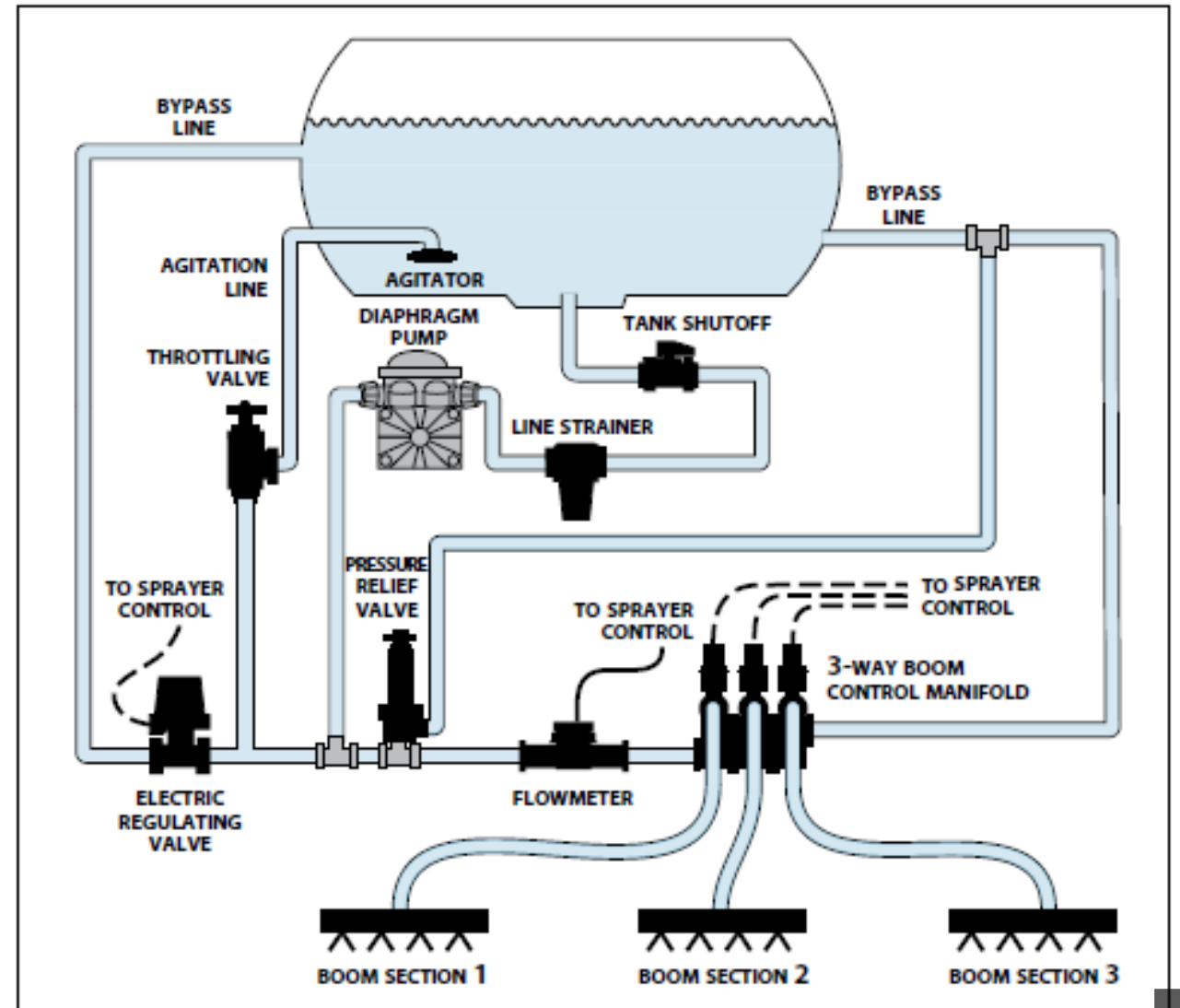
Note: Prior to mixing ensure all products are listed on EnlistTankMix.com

Jar tests are most effective when we mix products proportionally to commercial tank mix

Additional topics

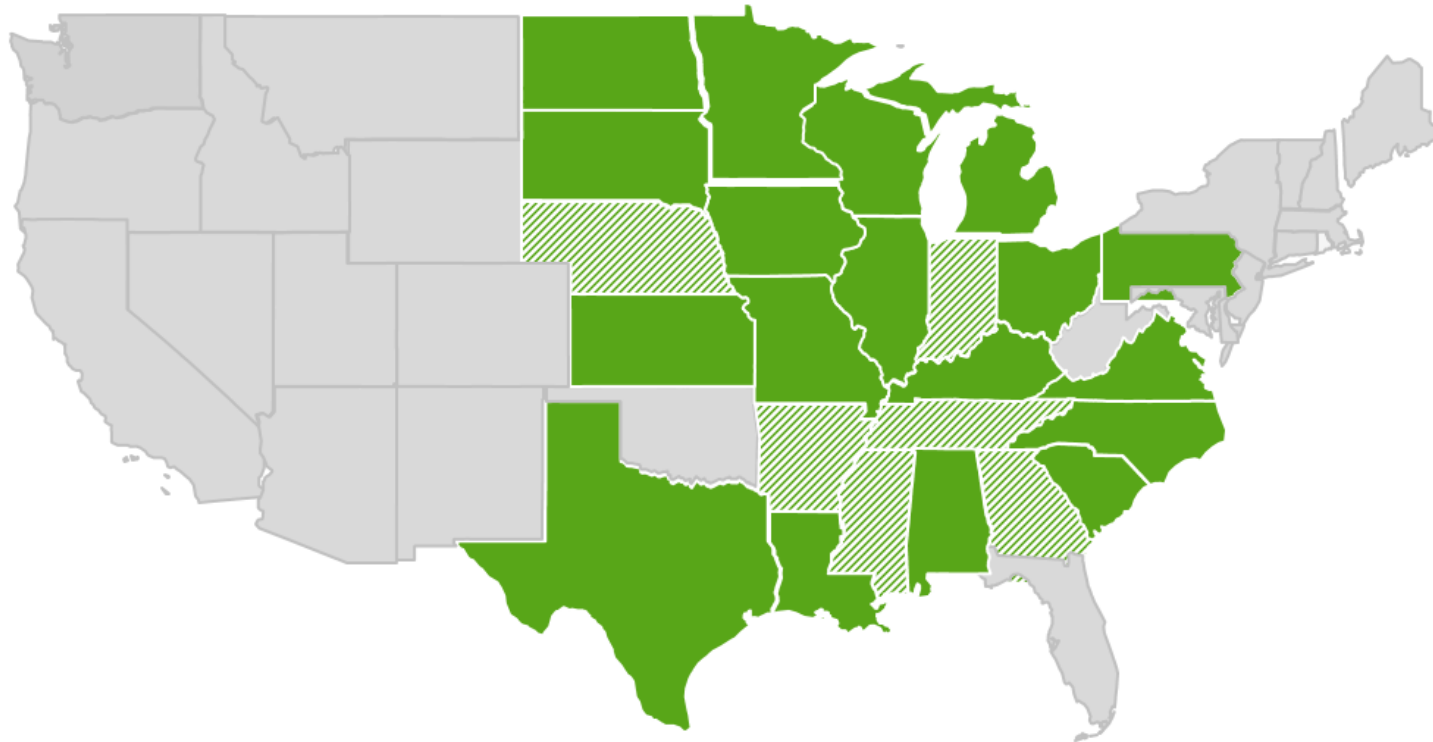


Avoid contamination of the entire system




University testing before launch

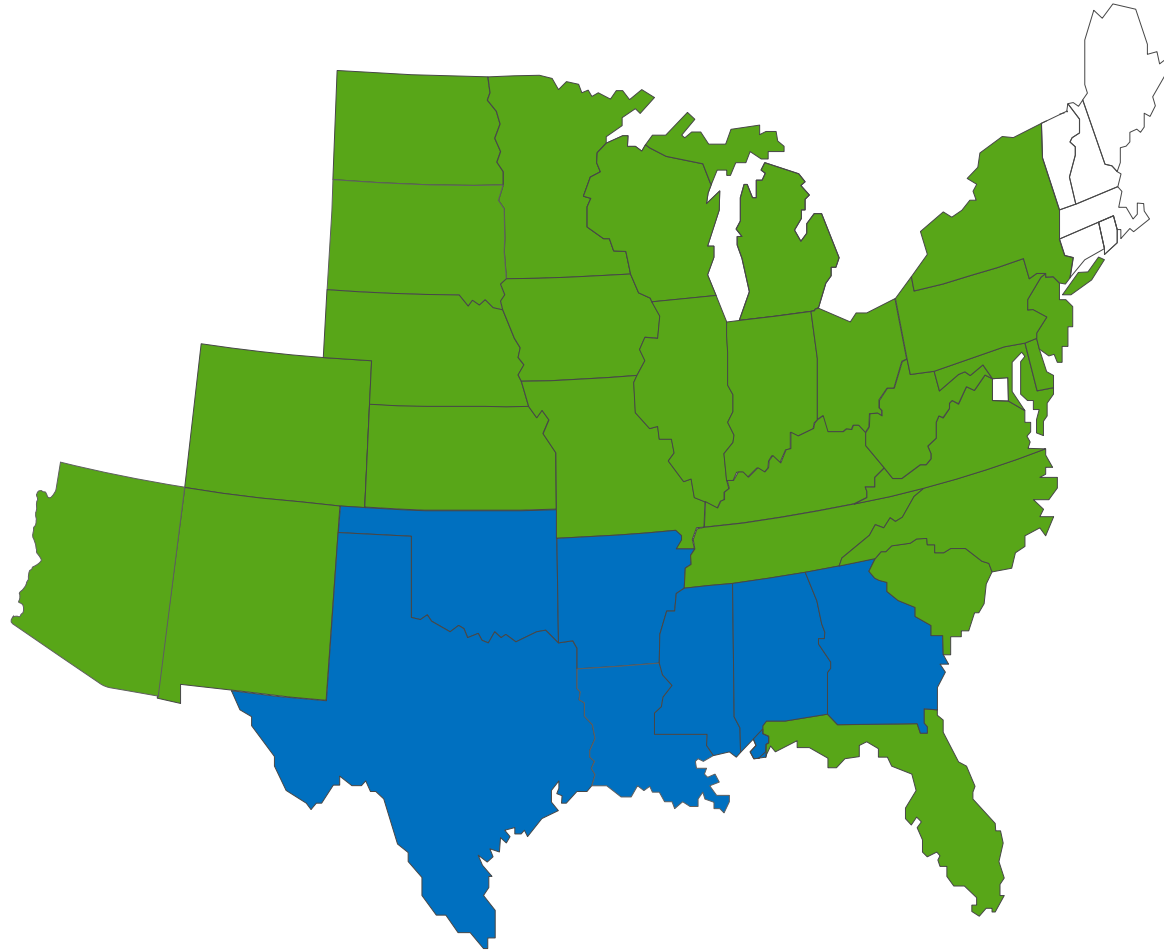
University weed scientists have been working with Enlist® traits and herbicides since 2007.





 States where the Enlist® system has been tested.

 States where off-target movement studies were conducted with Enlist Duo® herbicide beginning in 2011.

Additional state requirements for 2022 season



-  No additional state requirements beyond section 3 federal label.
-  State has a 24c or additional state rules in place beyond the federal label.

See 24c labels on [CDMS](#)

Key differentiation: Maximum residue levels

Group	Crop	2,4-D	Glyphosate	Dicamba	Glufosinate
1	Root and tuber vegetables	Y	Y	N	N
2	Leaves of root and tuber vegetables	Y	Y	N	N
3	Bulb vegetables	Y	Y	N	N
4	Leafy vegetables	Y	Y	N	N
5	<i>Brassica</i> leafy vegetables	Y	Y	N	N
6	Legume vegetables (including soybeans)	Y	Y	N	N
7	Foliage of legume vegetables	Y	Y	N	N
8	Fruiting vegetables	Y	Y	N	N
9	Cucurbit vegetables	Y	Y	N	N
10	Citrus fruit	Y	Y	N	Y
11	Pome fruit	Y	Y	N	Y
12	Stone fruit	Y	Y	N	Y
13	Berries (includes grapes)	Y	Y	N	Y
14	Tree nuts	Y	Y	N	Y

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