Enlist™ Ahead Applicator Training

Enlist E3® Soybeans
2021 Season
Steve Snyder

Enlist Ahead

Enlist™ weed control system intro

CHAPTER 1

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 Dow AgroSciences LLC and MS Technologies LLC.

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

Can any 2,4-D herbicide be used 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 labeled for preemergence and postemergence use with Enlist crops.**
- The smart 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.

Advanced soybean trait technology

Exceptional weed control.
Easy to use.
Excellent yield.

Herbicide Tolerances
2,4-D choline
Glyphosate
Glufosinate

- Enables use of 3 sites of action for exceptional control of resistant weeds.
- Includes a molecular stack which brings all 3 herbicide tolerances into a single transgenic event.
- No cross-tolerance to dicamba.

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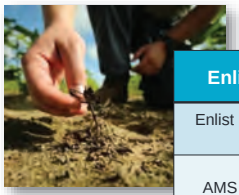
Weed management & tank-mixing with the Enlist system

CHAPTER 2

Designing a program approach in Enlist E3® soybeans

Postemergence treatments with Enlist E3® trait tolerances



Enlist Duo®	Enlist One® + Liberty®	Enlist One® + Durango® DMA
Enlist Duo @ 4.75 pt/A	Enlist One @ 2 pt/A	Enlist One @ 2 pt/A
AMS as needed	Liberty @ 32 oz/A AMS @ 1.5-3 lb/A	Durango @ 32 oz/A AMS as needed
Check **EnlistTankMix.com** for all qualified AMS and glyphosate products.		

Never use Enlist One alone – multiple herbicide sites of action!

Benefit of multiple sites of action

Liberty 32 oz + EverpreX 1.0 pt + AMS 2.5% v/v

Enlist One 2.0 pt + Liberty 32 oz + EverpreX 1.0 pt + AMS 2.5% v/v

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

Why spray small weeds?

- Weed management urgency (ie. height, growth ability, seed production) can be underestimated
- Waterhemp and Palmer amaranth grow at a rapid pace (multiple inches a 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 to that of the same size without the branching out
- Killing a 6" palmer or waterhemp can sometimes be like fighting a much larger plant

Measured weed height of ~9" tall on waterhemp

9" plant with multiple buds can be like controlling a much larger plant!

Approximately 65" of weed growth

Managing waterhemp acres

1. Use a quality pre-emergence 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 herbicide or 20 GPA for Enlist One + Liberty
   - High end of allowable pressure range
   - 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 14 days later and have a plan for a sequential pass for new flushes

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

Best practices for coverage & control

✓Spray when weeds are small: 6" 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 labeled pressure
✓Use sufficient water carrier volume: 10-15 gal/A recommended

Application Rates	
Enlist One®	**2.0 pt/A** (32 oz/A)
Enlist Duo®	**4.75 pt/A** (76 oz/A)

Layered Residual Benefits

York, Nebraska **July 24, 2020 – 17 DAT**

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

Tank mix decisions – crop response impact

Priorities for application?

Avoiding potential for crop response

Decision-making scale

Increasing potential for better weed kill with oil adjuvants and/or oil-based tank mix partners

Tank mix decisions – crop response impact

Example: Enlist Duo

Simple tank mix, little potential for crop response

Example: Enlist One + Liberty + s-metolachlor + oil adjuvant

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

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®	Enlist One® + FOPs or Clethodim	Enlist One + Glyphosate	Enlist One + Liberty® herbicide
Convenient – glyphosate built in	• Increase rate of grass herbicides by 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.	Another option if you prefer to adjust the rate of glyphosate in the mix	This mix used frequently when resistant broadleaves are present – but glufosinate (contact herbicide) not as effective on grass

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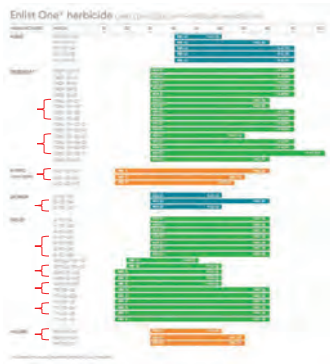
Selecting the best nozzle

Enlist One Qualified Nozzle Chart
Common to both Enlist herbicide labels



- **TeeJet AIXR, AI, AITTJ** or **Greenleaf TDXL** for best combo of coverage & droplet control
- **Wilger** for PWM systems (Aim Command or Exact Apply)
- **TTI** – ultra coarse nozzles not recommended for optimal coverage (increase pressure if used)

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

Adjuvants in the tank mix

Q: Can I add adjuvants?

A: Yes, all qualified tank mix partners are on **EnlistTankMix.com.**

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
- 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 set up.

Tank-mixing order

Enlist

• **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) • 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), 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®

- 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 glufosinate products or glyphosate into the tank at the same time as Enlist One.
- If dry products are going in the tank, thoroughly mix for 5 mins; may take longer with cold water.

Spraying for effective weed control

- Application must deliver a lethal dose of herbicide
- Attack growing point (above vs. below ground)
- Coverage is crucial (crop stage / weed size)
- Coverage – pressure, boom height, carrier volume, speed
- Herbicide type (contact vs. systemic)
- GPA and nozzle (matched to your needs)
- Environmental conditions and time of application
- Read the label (rate, weed height, surfactants, sprayer setup)

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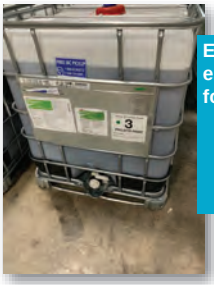
What makes Enlist™ herbicides different?

CHAPTER 3

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



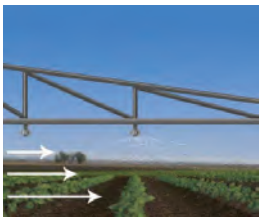
Enlist™ herbicides are different than 2,4-D ester, amine and other traditional formulations:

- 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

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

Addressing physical drift

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

Making successful Enlist herbicide applications

CHAPTER 4

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: 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

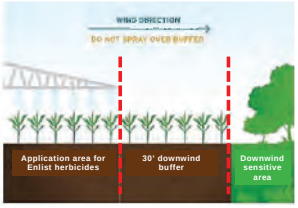
Sensitive area buffers

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 non-Enlist cotton



Key differentiation:
Know the compatible crops

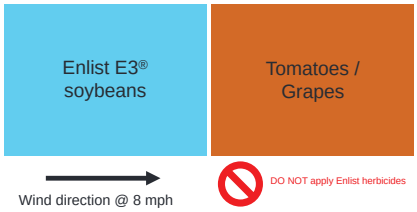
- Key crops that are **not** listed as susceptible on the Enlist™ labels:

Soybeans	Corn
Rice	Wheat
Sugarcane	Alfalfa
Peanuts	Sorghum

Watch out for susceptible crops

- Non-Enlist cotton
- Cucurbits (ex. watermelons, pumpkins)
- Tobacco
- Grapes
- Tomatoes
- Fruiting vegetables

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



What about crops / plants not listed?

- **Always use caution around high-value / specialty crops**
  - **Ex. Sugar beets, sweet potatoes, potatoes, hemp, nurseries, greenhouses**
- **Best approach is spraying when wind is blowing <u>away from</u> these crops**

Wind direction

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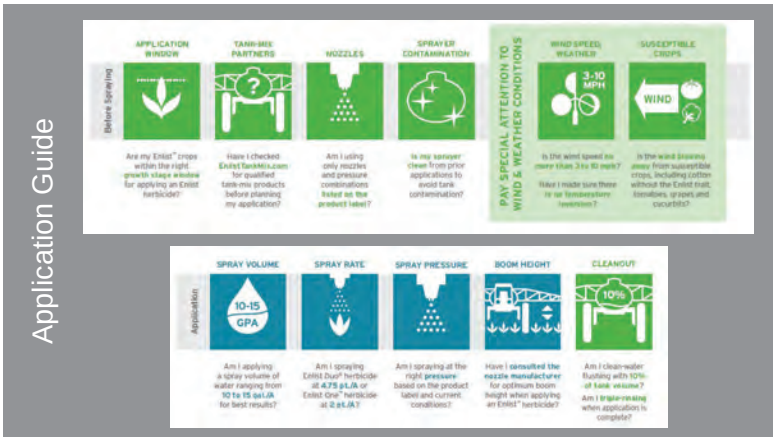

Conclusion

CHAPTER 5

Find More Resources at Enlist.com

<u>Enlist.com</u>

- Enlist online training (link at top of site)
- Tank mix partner list

Enlist Ahead section

- Enlist Ahead Programs
- Literature
  - Product Use Guide – *illustrated label*
  - Application Guide – *checklist reference*
  - Tank mix sequence guidance
  - Additional literature pieces