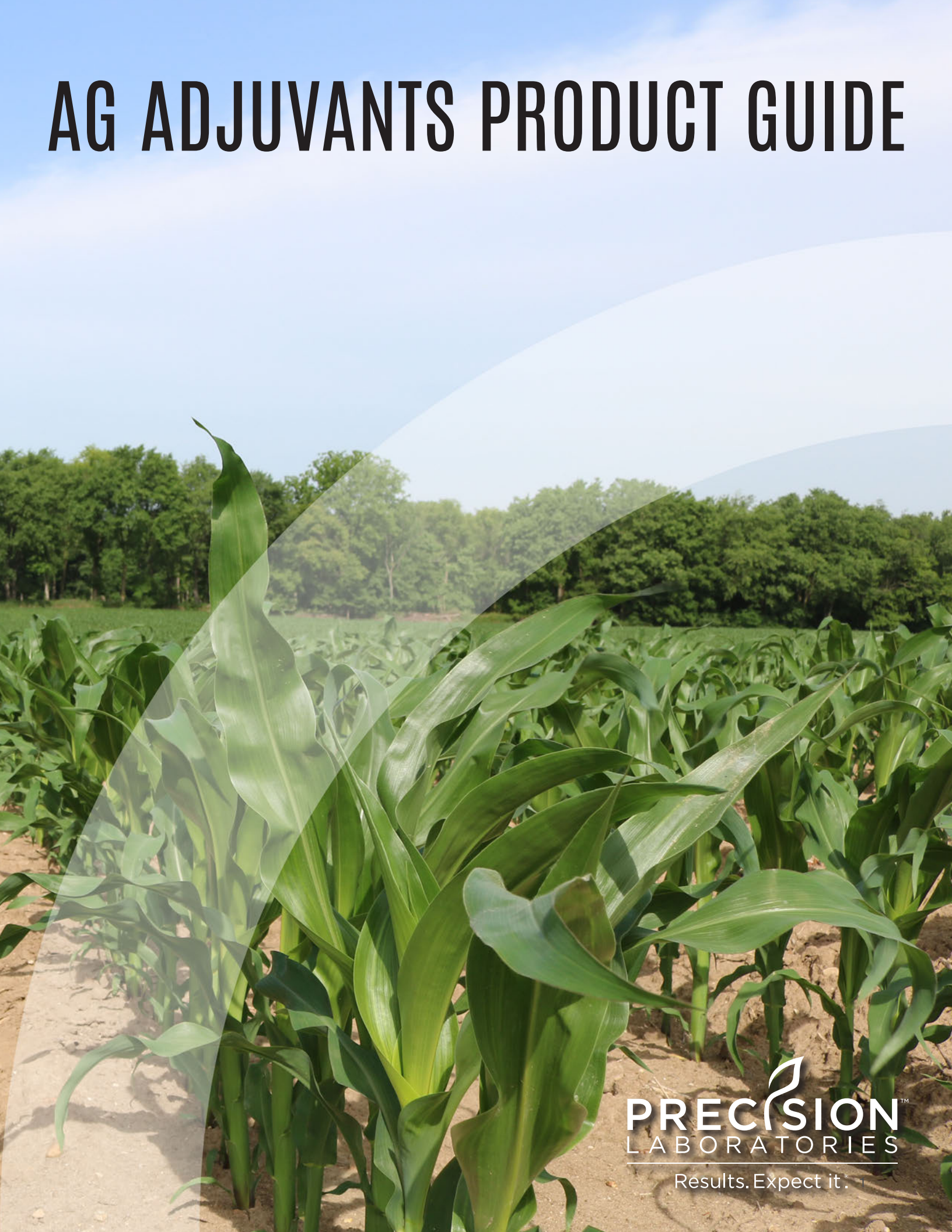



AG ADJUVANTS PRODUCT GUIDE



PRECISION
LABORATORIES™

Results. Expect it.™



At Precision Laboratories, innovation isn't a buzzword – it's built into every product we design. Our products are university and field-tested to ensure biological performance and optimum value. Our specialized chemistries for plants, seeds, soil and water produce high-yielding crops and quality turfgrass.

**INNOVATIVE, SENSIBLE,
EFFECTIVE PRODUCTS.**

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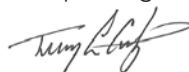
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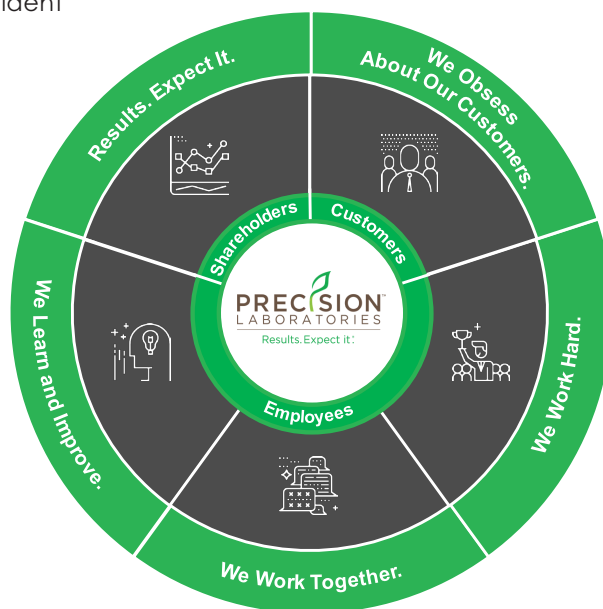
FROM OUR PRESIDENT

Thank you for taking the time to consider Precision's portfolio of specialty chemical products. Your assessment of the results these products deliver is the true measurement of their value. If you are a customer today, I trust you've seen that value. If you're new to Precision, I look forward to our demonstration of value to you.

Our daily activities focus on the three priorities of customer, employee and shareholder. Core values demonstrated by each member of the Precision team are identified in this graphic, those being an obsession about our customers, hard work as a team, a spirit of constantly learning and improving and delivering results, which you can expect.



Terry Culp
President



ADDING VALUE



TECHNICAL EXPERTISE

- Collaboration with top researchers have validated claims of superior performance and quality
- Laboratory capabilities and resources to help you solve everyday problems
- Technical training conducted by a nationally recognized staff to give your sales team the confidence to sell more effectively



INNOVATION

- Basic manufacturing to build solutions from the molecule to completion
- Developing breakthrough products for specific customer needs
- Leader in Total Spray Droplet Management®



RESULTS. EXPECT IT.

- Adjuvant supplier to leaders on the CropLife™ 100 list
- Track record of growing customers' adjuvant business
- Customized marketing support for your sales team

Drift control isn't enough, you need

TOTAL SPRAY DROPLET MANAGEMENT[®]

IN THE TANK



GET IT RIGHT - FROM THE START

- **CLEAN THE ENTIRE SPRAY SYSTEM**
Residual active ingredients from previous spray mixes may cause crop injury with subsequent loads.
- **CONSIDER WATER QUALITY**
Water conditioning agents may be needed to ensure performance of the spray solution.
- **MIX IN THE PROPER ORDER**
Adding products in the incorrect sequence may cause compatibility issues.
- **FOLLOW LABEL RECOMMENDATIONS**

THROUGH THE AIR

WATCH THE WEATHER

- Wind speed and direction
- Temperature and humidity
- Thermal inversions

WHAT YOU CAN DO

- Select the correct nozzle
- Spray at the correct pressure
- Use drift reduction adjuvants



ON THE TARGET



INNOVATIVE CHEMISTRIES THAT ENHANCE:

- **DROPLET RETENTION**
Reduce kinetic energy of spray droplets to minimize droplet bounce and maximize retention.
- **DROPLET COVERAGE**
Spread the product over the leaf surface for superior coverage.
- **PRODUCT ABSORPTION**
Promote product movement into the target plant for increased absorption.

Get more successful spray applications with our innovative solutions that improve droplet retention and coverage while dramatically reducing off-target movement and exposure.

To learn more, go to www.PrecisionLab.com

WATCH THE TSDM® VIDEO SERIES AND GET 3 CCA CREDITS TOWARD YOUR GOAL!



We believe the safety and efficacy of spray applications can be enhanced by managing factors in the tank, through the air and on the target. That's why we developed the **Total Spray Droplet Management®** education series. It highlights the importance of managing spray applications to protect people and the environment while maximizing product performance.

KEY TOPICS INCLUDE:

- Agronomics
- Droplet spectrum
- Nozzle types
- System pressure
- Calibration
- Use of adjuvants
- How weather and other interactions affect applications

We are pleased to offer the series with six quizzes for Continuing Education Units (CEUs). Certified Crop Advisors have the opportunity to earn .5 credit for each of the quizzes for a total of 3 credits.



www.precisionlab.com/ag-total-spray-droplet-management

THE PROVE PROGRAM

Partner Research, Observation, and Validation Experience



The **PROVE Program** from Precision Laboratories demonstrates performance and value of new, innovative products for the marketplace.



P - Partner

We collaborate with partners interested in evaluating new technologies that will shape the future of the industry.



R - Research

Our efforts include large-scale, real-world applications, along with small-plot experiments that allow us to closely examine product performance.



O - Observe

The trial observations allow us to demonstrate that our products are innovative, sensible and effective for our end users.



V - Validate

Members of our Product Management and Marketing Team work closely with our PROVE Program partners to validate performance, fit and return on investment.



E - Experience

The PROVE Program provides first-hand experiences with new products, increasing confidence in and excitement for our latest innovations.



TSDM

IN THE TANK

GET IT RIGHT - FROM THE START

- **CLEAN THE ENTIRE SPRAY SYSTEM**
Residual active ingredients from previous spray mixes may cause crop injury with subsequent loads.
- **CONSIDER WATER QUALITY**
Water conditioning agents may be needed to ensure performance of the spray solution.
- **MIX IN THE PROPER ORDER**
Adding products in the incorrect sequence may cause compatibility issues.
- **FOLLOW LABEL RECOMMENDATIONS**



WATER CONDITIONERS

DERIVA™ WATER CONDITIONING AGENT

A water conditioning agent that protects the performance potential of glyphosate, dicamba and 2,4-D from antagonistic metal ions found in hard water and leaf tissue. Ammonium ion free formulation



Use Rates	Package Size	Product Weight
0.5-1.0% v/v (2-4 qt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	9.45 lbs per gal

OMNIX™ LDF LIQUID AMS & ANTI-FOAM

Liquid ammonium sulfate that contains 3.4 lbs of AMS per gal plus anti-foam.



Use Rates	Package Size	Product Weight
2.5-5.0% v/v for glyphosate tank mixes (2.5-5 gal/100 gal of spray solution)	275 gal mini	10.00 lbs per gal

ANTI-FOAM, DEFOAMERS AND COMPATIBILITY

ELIMINO™ ANTIFOAMING AGENT/ DEFOAMING AGENT

An OMRI-listed antifoam and defoaming agent designed to effectively prevent or reduce foam formation in agricultural applications of crop protection and / or fertilizer products.



Use Rates	Package Size	Product Weight
1–10 oz/100 gal of spray solution	12 x 1 qt	2.10 lbs per qt

GUNDOWN ELITE™ ANTIFOAMING AND DEFOAMING AGENT

Outperforms ordinary defoamers by delivering superior foam suppression under agitation as well as quick defoaming performance.



Use Rates	Package Size	Product Weight
Anti-foam: 0.5-2 oz/100 gal General Defoamer: 0.5-4 oz/100 gal	4 x 1 gal 12 x 1 qt	8.44 lbs per gal

CONVERT™ COMPATIBILITY AGENT

Eliminates compatibility problems associated with tank mixing UAN solutions or suspension fertilizers with emulsifiable concentrates and flowable crop protection products.



Use Rates	Package Size	Product Weight
1–4 pt/100 gal of spray solution to prevent antagonistic tank mixing conditions	2 x 2.5 gal 275 gal mini	8.70 lbs per gal
3–6 pt/100 gal of spray solution to correct tank mix incompatibilities		

SPRAYER MAINTENANCE

ERASE™ SPRAY SYSTEM CLEANER


Emulsifies oily residues in sprayer lines and hoses while elevating rinsate pH to degrade vulnerable crop protection products.











Use Rates	Package Size	Product Weight
2 qt/100 gal of rinsate	12 x 1 qt 4 x 1 gal	2.59 lbs per qt 10.39 lbs per gal

BATCH MIXING CAN OFFER UNIQUE CHALLENGES WHEN IT COMES TO COMPATIBILITY.

These charts can help determine when to use CONVERT based on the formulation types in the tank mix.

	OK, No Compatibility Agent Needed
	CONVERT Required
	CONVERT Reduced Rate Option
	Do Not Batch Mix

UAN CARRIER POST ADD ATS
























	SL	EC	SC	SE	FC	ZC	ME	LC
SL								
EC								
SC								
SE								
FC								
ZC								
ME								
LC								

UAN CARRIER ONLY

	SL	EC	SC	SE	FC	ZC	ME	LC
SL								
EC								
SC								
SE								
FC								
ZC								
ME								
LC								

	OK, No Compatibility Agent Needed
	CONVERT Required
	CONVERT Reduced Rate Option
	Do Not Batch Mix

WATER CARRIER ONLY

	SL	EC	SC	SE	FC	ZC	ME	LC
SL								
EC								
SC								
SE								
FC								
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ME								
LC								

	OK, No Compatibility Agent Needed
	CONVERT Required
	CONVERT Reduced Rate Option
	Do Not Batch Mix



TSDM

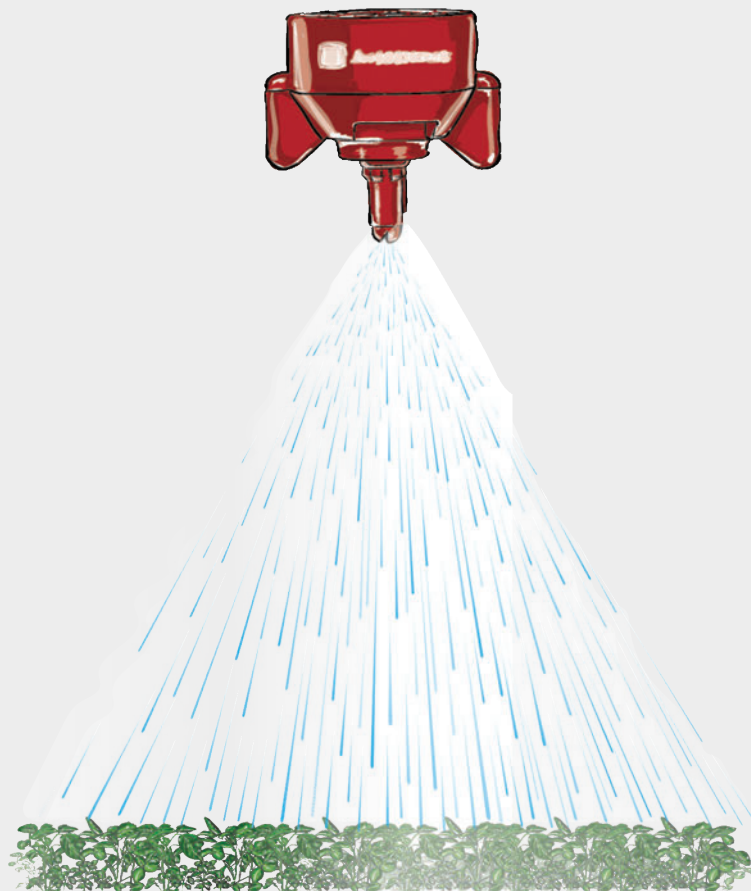
THROUGH THE AIR

WATCH THE WEATHER

- Wind speed and direction
- Temperature and humidity
- Thermal inversions

WHAT YOU CAN DO

- Select the correct nozzle
- Spray at the correct pressure
- Use drift reduction adjuvants (DRAs)



DRA QUICK REFERENCE

	Intact™ Pro	Intact™ Advanced	Intact™ Maxx	Taragon™ Elite	Taragon™ Xtra	Taragon™ Maxx	Border™ Xtra 8L	Nexum™ NG	Direct™ RS	Direct™ Pro
Function										
Drift Control	X	X	X	X	X	X	X	X	X	X
Vapor Reduction			X			X				
Water Conditioner		X	X	X	X	X	X			
Deposition Aid	X	X		X	X		X	X	X	X
Retention	X	X	X				X	X		
Activator							X			
Antifoam				X		X				
Approvals										
Engenia®	X	X	X	X		X		X	X	X
Enlist Duo®	X				X		X	X		
Enlist One®	X				X		X	X		
Tavium®	X	X	X	X		X		X	X	
XtendiMax®	X	X	X	X		X		X	X	
CPDA	X	X		X	X		X	X		

THROUGH THE AIR

THROUGH THE AIR

**INTACT™ PRO
DRIFT CONTROL & FOLIAR
RETENTION AGENT AND
DEPOSITION AID**

A concentrated stand-alone drift reduction and deposition aid technology. It is pump-shear resistant and enhances spray droplet retention on target leaf surfaces.

E, X, EO, T



Use Rates	Package Size	Product Weight
General Use: 0.125 -0.375% v/v (1-3 pt/100 gal of solution) XtendiMAX®: 0.375% v/v (3 pts) Engenia®: 0.25% v/v (2 pts)	2 x 2.5 gal 275 gal mini	8.7 lbs per gal

**TARAGON™ ELITE
WATER CONDITIONING
AGENT, NONIONIC
SURFACTANT, HUMECTANT,
DRIFT CONTROL AND
ANTIFOAMING AGENT**

Convenient premix of drift reduction technology and water conditioning agents that protects the performance potential of dicamba-based products or tank mixes from antagonistic metal ions.

E, X, T



Use Rates	Package Size	Product Weight
0.625% v/v (5 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	9.56 lbs per gal

**BORDER™ XTRA 8L
ACTIVATOR &
DRIFT RETARDANT**

A patented, activator adjuvant formulated to maximize crop protection performance on a wider range of weed species by maximizing adhesion of the spray solution to the leaf surface, while providing required amounts of ammonium sulfate for improved uptake. Provides 8.5 lbs of ammonium sulfate plus the optimum 8 oz level of HPG polymer technology.

ED, EO



Use Rates	Package Size	Product Weight
2.5% v/v. (2.5 gal/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	9.97 lbs per gal

**INTACT™ ADVANCED
DRIFT CONTROL, WATER
CONDITIONING & FOLIAR
RETENTION AGENT**

A convenient premix of drift reduction technology and water conditioning agents that minimize off target movement while protecting the performance potential of glyphosate and dicamba.

E, X, T



Use Rates	Package Size	Product Weight
0.5-1.0% v/v. (2-4 qt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	9.91 lbs per gal

**TARAGON™ XTRA
WATER CONDITIONING
AGENT, NONIONIC
SURFACTANT, HUMECTANT
& DRIFT CONTROL AGENT**

Premix of drift reduction technology and water conditioning agents that protects the performance potential of glyphosate and 2,4-D premixes or tank mixes from antagonistic metal ions found in hard water and leaf tissue while further reducing drift risk.

ED, EO



Use Rates	Package Size	Product Weight
0.25-0.5% v/v. (1-2 qt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	9.67 lbs per gal

APPROVED DRAs*
E = Engenia
ED = Enlist Duo
EO = Enlist One
T = Tavium
X = Xtendimax
*Always check manufacturer websites for approved tank mixes and specific use instructions prior to mixing or applying.

**NEXUM™ NG
DRIFT CONTROL AGENT**

Enhances pesticide performance by improving spray solution deposition and coverage on targeted leaf surfaces while reducing driftable spray fines. **ED, EO**



Use Rates	Package Size	Product Weight
4-6 oz/acre in 5-20 GPA applications	2 x 2.5 gal 275 gal mini	7.74 lbs per gal

**PRECISIVE™
NONIONIC SURFACTANT,
DRIFT REDUCTION AGENT
AND DEPOSITION AID**

An APE/NPE free, OMRI listed, nonionic surfactant



Use Rates	Package Size	Product Weight
Ground: 0.125-0.5% v/v (1-4 pt/100 gal of spray solution) Aerial: 0.25-0.5% v/v (2-4 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	8.55 lbs per gal

**DIRECT™ RS
DRIFT RETARDANT/
DEPOSITION AID**

Reduces drift risk and maximizes pesticide performance by binding ultra small spray particles together into larger droplets which are more capable of hitting the intended target. **E, X, T**



Use Rates	Package Size	Product Weight
1-4 oz/100 gal of spray solution	12 x 1 qt	2.08 lbs per qt

**DIRECT™ PRO
DRIFT RETARDANT/
DEPOSITION AID**

Contains antifoam and is formulated to meet the needs of professional applicators. **E**



Use Rates	Package Size	Product Weight
0.5-3 qt/100 gal of spray solution 1-5 qt/100 gal for aerial applications	275 gal mini	8.34 lbs per gal

THROUGH THE AIR

DRIFT AND VAPOR REDUCTION AGENTS

**INTACT™ MAXX
VOLATILITY REDUCING &
WATER CONDITIONING
AGENTS, DRIFT RETARDANT
AND RETENTION AID**

A multifunctional adjuvant premix designed for use with dicamba-containing tank mixes. It uses a unique plant-based, shear-resistant polymer that improves pesticide performance by increasing adhesion and retention of large spray droplets to the leaf surface. Intact Maxx is recognized as an approved DRA for dicamba-based tank mixes.



Use Rates	Package Size	Product Weight
XtendiMAX®: 1.75% v/v (7 qt /100 gal of solution) Engenia®: 1.875% v/v (7.5 qt /100 gal of solution)	2 x 2.5 gal 275 gal mini	9.2-10.84

**TARAGON™ MAXX
VOLATILITY REDUCING &
WATER CONDITIONING
AGENTS, NONIONIC
SURFACTANT, DRIFT
REDUCTION AND
ANTIFOAMING AGENT**

A unique multi-functional adjuvant premix designed and approved for use with dicamba containing tank mixes. Recognized as a qualified and approved DRA for dicamba-based tank mixes.



Use Rates	Package Size	Product Weight
26 fl oz/acre	2 x 2.5 gal 275 gal mini	11.28



TSDM

ON THE TARGET

INNOVATIVE CHEMISTRIES THAT ENHANCE:

- **DROPLET RETENTION**

Reduce kinetic energy of spray droplets to minimize droplet bounce and maximize retention.

- **DROPLET COVERAGE**

Spread the product over the leaf surface for superior coverage.

- **PRODUCT ABSORPTION**

Promote product movement into the target plant for increased absorption.



MSO ULTRA™ MSO & SURFACTANT

Methylated soy oil blend formulated to enhance crop protection performance under a wider range of weather conditions and weed species.



Use Rates	Package Size	Product Weight
1.0% v/v or a minimum of 20–24 fl oz/acre	2 x 2.5 gal 275 gal mini	7.45 lbs per gal

PERSIST® ULTRA PREMIUM METHYLATED CANOLA OIL

A unique methylated canola oil and surfactant blend that optimizes crop protection performance and mixing characteristics with a wider range of tank-mix partners than ordinary methylated seed oils or crop oils.



Use Rates	Package Size	Product Weight
1.0% v/v or a minimum of 20-24 fl oz/acre	2 x 2.5 gal 275 gal mini	7.54 lbs per gal

KIXYT™ HIGH SURFACTANT MSO CONCENTRATE

A low use rate, high surfactant load, methylated canola oil concentrate that enhances crop protection performance. It combines the cuticle penetration properties of a premium methylated canola oil with a proprietary surfactant system to deliver higher levels of biological performance at lower use rates than traditional oil-based adjuvants.



Use Rates	Package Size	Product Weight
0.5% v/v or a minimum of 10-12 fl oz/acre	2 x 2.5 gal 275 gal mini	7.73 lbs per gal

NEW RIPARA™ HIGH SURFACTANT MODIFIED VEGETABLE OIL CONCENTRATE, DEPOSITION AID AND DRIFT RETARDANT

An APE/NPE-free, high surfactant methylated seed oil formulation with built-in drift reduction and deposition technology. Used at 50% of the traditional use rate of ordinary methylated seed oils or crop oil concentrates.



Use Rates	Package Size	Product Weight
8–12 fl oz/acre	2 x 2.5 gal 275 gal mini	7.45 lbs per gal

PERSIST® ADVANCED MODIFIED VEGETABLE OIL, SPREADER AND EMULSIFIER

Low use rate, methylated seed oil and silicone surfactant blend that provides maximum leaf surface coverage and penetration compared to ordinary silicone surfactant blends. The high quality MSO penetrates the waxy cuticles on the leaves of weeds, while the silicone surfactant ensures coverage of the leaf surface.



Use Rates	Package Size	Product Weight
Ground: 0.125% v/v (1 pt/100 gal of spray solution) or 2–3 fl oz/acre Aerial: 2–3 fl oz/acre or up to 0.75% v/v (3 qt/100 gal) in 1–5 gal of water/acre	2 x 2.5 gal	7.6 lbs per gal

NEW SALIA™ HIGH SURFACTANT OIL CONCENTRATE, DEPOSITION AID, AND DRIFT RETARDANT

SALIA™ is an APE/NPE free high surfactant oil concentrate formulation with built in drift reduction and deposition technology. SALIA is used at 50% of the traditional use rate of ordinary crop oil concentrates or methylated seed oils.



Use Rates	Package Size	Product Weight
8–12 fl oz/acre	2 x 2.5 gal 275 gal mini	7.32 lbs per gal

**EXCHANGE™
HIGH SURFACTANT
CROP OIL CONCENTRATE**

A low use rate, high-load, crop oil concentrate replacement that enhances crop protection performance when compared to ordinary crop oil concentrate.



**VIGOR™
83-17 CROP OIL
CONCENTRATE**

Premium crop oil concentrate designed for maximum leaf surface coverage and penetration with post emergence crop protection products.



Use Rates	Package Size	Product Weight
0.5% v/v or a minimum of 10-12 fl oz/acre	2 x 2.5 gal 275 gal mini	7.32 lbs per gal

Use Rates	Package Size	Product Weight
1.0% v/v (1 gal/100 gal of spray solution or 1-2 pt/acre)	2 x 2.5 gal 275 gal mini	7.2 lbs per gal

**VESTIS™
ORGANOSILICONE
WETTING AGENT**

An OMRI-listed, nonionic organosilicone wetting agent designed for use with; crop protection products, plant growth regulators, fertilizers, microbial products and plant nutritionals.



**CHEM-STIK™
NONIONIC
SPREADER-STICKER**

A nonionic spreader-sticker that maximizes leaf surface coverage of spray solutions, while providing wash off protection. Use higher rates for maximum wash off protection.



Use Rates	Package Size	Product Weight
3.2–13 fl oz/100 gal of spray solution 12–19 fl oz/100 gal for aerial applications	4 x 1 gal 275 gal mini	8.32 lbs per gal

Use Rates	Package Size	Product Weight
4-16 fl oz/100 gal of spray solution	4 x 1 gal	8.68 lbs per gal

**CHEM-STIK LpH™
SPREADER-STICKER &
BUFFER**

A unique nonionic spreader-sticker formulated to protect crop protection products from premature chemical breakdown by buffering the spray solution to a slightly acidic pH level of 5.0 to 6.0.



**SPEED™
NONIONIC SILOXANE
SURFACTANT**

Low-foaming, low use rate, nonionic siloxane surfactant that utilizes SILQUICK™ wicking action for superior leaf surface coverage.



Use Rates	Package Size	Product Weight
16-48 fl oz/100 gal of spray solution	2 x 2.5 gal	8.68 lbs per gal

Use Rates	Package Size	Product Weight
0.1-0.125% v/v or 1-1.5 fl oz/acre of spray solution	4 x 1 gal	8.54 lbs per gal

TACHEON™ COMPLETE SPREADER / STICKER

Reduces surface tension of spray solutions and results in more effective wetting and more uniform coverage.



Use Rates	Package Size	Product Weight
10 fl oz – 2 qt/100 gal of spray solution	2 x 2.5 gal 275 gal mini	8.51 lbs per gal

TACHEON™ DROP SPREADER / STICKER

A unique activator adjuvant that combines the spreading characteristics of a nonionic organosilicone surfactant with the cuticle penetrating power of soy lecithin.



Use Rates	Package Size	Product Weight
2.5 - 8 fl oz/acre	2 x 2.5 gal 275 gal mini	8.60 lbs per gal

TACHEON™ SPREAD WETTING AGENT, SPREADER AND PENETRANT

A 100% active organosilicone surfactant, spreader and penetrant that rapidly reduces spray solution surface tension and results in more effective wetting and more uniform coverage on foliar surfaces.



Use Rates	Package Size	Product Weight
1.5 fl oz/acre	4 x 1 gal 2 x 2.5 gal	8.39 lbs per gal

TACHEON™ DUO SPREADER AND WETTING AGENT

A nonionic organosilicone wetting agent useful in the application of herbicides, fungicides, insecticides, microbial products, fertilizers and plant growth regulators in horticultural and arable crops.



Use Rates	Package Size	Product Weight
Ground: 12 - 64 fl oz/100 gal of spray solution Aerial Sprays: 32 - 64 fl oz/100 gal of spray solution General Spreader/Wetter: 6 - 32 fl oz/100 gal of spray solution	2 x 2.5 gal 275 gal mini	8.51 lbs per gal

NEW BALANCE™ WITH ANTI-FOAM PH ACIDIFIER & NIS

Citric acid-based, pH modifier and nonionic surfactant designed to lower spray solution pH and improve leaf surface coverage.



Use Rates	Package Size	Product Weight
8-64 fl oz/100 gal of spray solution	4 x 1 gal	9.12 lbs per gal

AMMONIUM SULFATE BASED ADJUVANTS

DELIVER™ AMS & NONIONIC SURFACTANT

Surfactant plus ammonium sulfate system that delivers more consistent control of a wider range of hard-to-control weed species. 2.5 gal/100 gal spray solution equals 8.5 lbs of ammonium sulfate. No additional surfactant or defoamer needed.



Use Rates	Package Size	Product Weight
1.25-2.5% v/v (1.25-2.5 gal/100 gal of spray solution)	2 x 2.5 gal 250 gal mini	10.06 lbs per gal

OMNIX™ LDF LIQUID AMS & ANTI-FOAM

Liquid ammonium sulfate that contains 3.4 lbs of AMS per gal plus anti-foam.



Use Rates	Package Size	Product Weight
2.5-5.0% v/v for glyphosate tank mixes (2.5-5 gal/100 gal of spray solution)	275 gal mini	10.00 lbs per gal

ACTIVATOR

SORBYX™ DEPOSITION AID AND ACTIVATOR

Sorbyx is a unique soil adsorption and activation aid designed to reduce leaching and critical concentration loss of certain residual herbicides from the germination zone.

Use Rates	Package Size	Product Weight
16 fl oz/acre	2 x 2.5 gal	8.18 lbs per gal



ON THE TARGET

NONIONIC SURFACTANTS (NIS)

NIS 90:10™ NONIONIC SURFACTANT

Economical, 90% active, low-foaming, nonionic activator adjuvant that enhances crop protection performance by improving spray solution coverage and penetration of target leaf surfaces.



Use Rates	Package Size	Product Weight
0.125-0.5% v/v (1-4 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	8.45 lbs per gal

NIS 80:20™ NONIONIC SURFACTANT

Economical, 80% active, low-foaming, nonionic activator adjuvant that enhances crop protection performance by improving spray solution coverage and penetration of target leaf surfaces.



Use Rates	Package Size	Product Weight
0.125-0.5% v/v (1-4 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal mini	8.53 lbs per gal

SeedZone™ IF



NUTRIENT MANAGEMENT AID



SeedZone™ IF is a sustainably sourced nutrient management tool that improves nitrogen and potassium availability to grow healthier plants with more roots, stronger stalks, and yield potential.

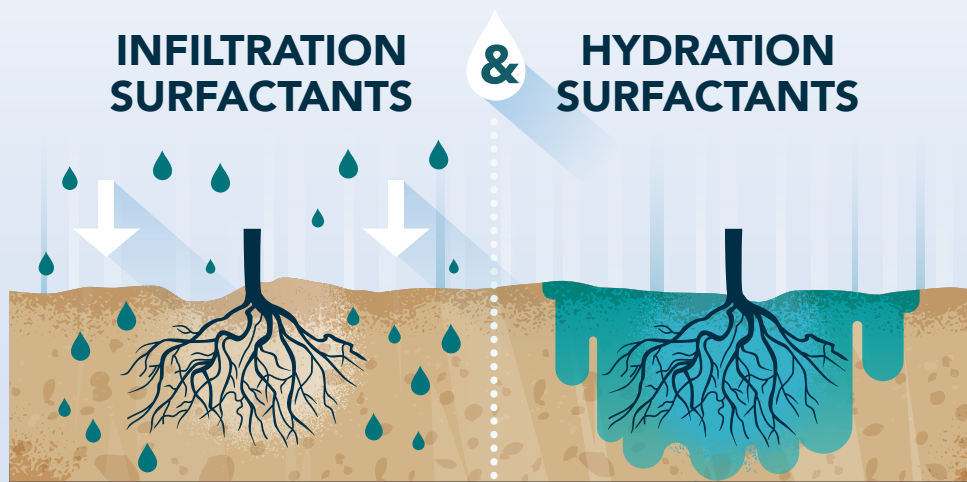
It is based on patented carboxymethyl cellulose (CMC) technology that enhances the moisture environment in the furrow when applied at planting to improve nutrient availability and uptake.

Use Rates	Package Size	Product Weight
<ul style="list-style-type: none">• 12.8 fl oz/acre• Product may be used with any crop where furrow application is used as a production practice• Product can be applied directly in the seed furrow, y-drop, or 2x2, depending on planter set-up and other products applied	2 x 2.5 gal	10.14 lbs per gal

NUTRIENT
MANAGEMENT AID

IRRIGATION

WATER OPTIMIZERS



- Breaks down surface tension
- Reduces evaporation and run-off
- Moves water uniformly throughout the root zone

- Holds water in the root zone
- Maintains water content
- Reduces plant stress

At Precision Laboratories, we help growers harness the power of their water with Irrigation Water Optimizers.

These chemistries benefit water use and efficiency while maximizing soil health, nutrient uptake and the performance of soil-applied inputs, resulting in higher yields, better quality and increased profits.

[PRECISIONLAB.COM/IWO](https://precisionlab.com/iwo)

**STRETTA™
IRRIGATION WATER
OPTIMIZER**

The first plant-derived irrigation water optimizer with fertilizer compatibility. Stretta improves the availability and performance of irrigation water, nutrients, and other soil-applied products throughout the plant root zone, optimizing the growing environment.



Use Rates	Package Size	Product Weight
2 quarts / 1 quart per acre	2 x 2.5 gal	9.31 lbs per gal

**TOLERO™
IRRIGATION INJECTION
SURFACTANT**

A highly concentrated blend of two surfactants that improves the movement and retention of water throughout the plant root zone.



Use Rates	Package Size	Product Weight
1 quart / 1 pint per acre	2 x 2.5 gal 275 gal mini 55 gal drum	8.611 lbs per gal

**DOMINO™
IRRIGATION INJECTION
SURFACTANT**

An advanced formulation of four surfactants. Domino effectively moves and holds water in all soil types while resisting microbial breakdown.



Use Rates	Package Size	Product Weight
1 quart / 1 pint per acre	2 x 2.5 gal 275 gal mini	8.46 lbs per gal

**CORSO™
IRRIGATION SURFACTANT**

A formulation of three surfactants ideal for tight soils. Corso moves water throughout the soil and holds it where needed.



Use Rates	Package Size	Product Weight
1 quart / 1 pint per acre	2 x 2.5 gal 275 gal mini	8.47 lbs per gal

**QUICKIN™
IRRIGATION SURFACTANT**

A combination of two surfactants that reduce surface tension to uniformly and quickly penetrate hard-to-wet soils. Quickin reduces runoff and aids in the uptake of other crop inputs.



Use Rates	Package Size	Product Weight
1 quart / 1 pint per acre	2 x 2.5 gal 275 gal mini 55 gal drum	8.38 lbs per gal

Product Weights & Storage Guidelines

Not all products can survive a freeze and thaw cycle in stable condition. Use the information below to protect your investment in Precision Laboratories' technologies and manage storage of your inventory.

Adjuvant and Marking Foam Products							
Product Name	Pack-out			Unit of Measure	Pure Product Weight (lbs per um)*	Shipping Weight (lbs per um)*	Shipping Weight (per drum/case/mini)*
Border Xtra 8L	2	x	2.5	gl	10.06	10.92	54.60
	275	gl	mini	gl	10.06	10.56	2904
	4500	x	bulk	gl	10.06	9.97	44865
Chem-Stik	4	x	1	gl	8.68	9.41	37.64
Chem-Stik LpH	2	x	2.5	gl	8.68	9.54	19.08
Convert	2	x	2.5	gl	8.70	9.56	47.80
Corso	2	x	2.5	gl	8.99	9.85	49.25
	275	gl	mini	gl	8.99	9.49	2610
Deliver	2	x	2.5	gl	10.06	10.92	54.60
	250	gl	mini	gl	10.06	10.56	2904
Direct RS	12	x	1	qt	2.15	2.52	30.24
Direct Pro	1	x	275	gl	8.40	9.37	2577
Deriva	2	x	2.5	gl	9.44	10.30	51.50
	275	gl	mini	gl	9.44	9.94	2685
Domino	2	x	2.5	gl	8.50	9.37	46.85
	260	gl	mini	gl	8.50	9.03	2483
Elimino	12	x	1	qt	2.10	2.47	29.64
Erase	12	x	1	qt	2.58	2.95	35.40
	4	x	1	gl	10.32	11.06	44.24
Exchange	2	x	2.5	gl	7.32	8.17	40.85
	275	gl	mini	gl	7.32	7.81	2148
Gundown Elite	12	x	1	qt	2.08	2.45	29.40
	4	x	1	gl	8.30	9.04	36.16
Intact	2	x	2.5	gl	8.83	9.69	48.45
	275	gl	mini	gl	8.83	9.33	2566
Intact Advanced	2	x	2.5	gl	9.73	10.59	52.95
	275	gl	mini	gl	9.73	10.23	2813
Kixyt	2	x	2.5	gl	7.73	8.60	43.00
	275	gl	mini	gl	7.73	8.24	2266
MSO Ultra	2	x	2.5	gl	7.45	8.31	41.55
	275	gl	mini	gl	7.45	7.95	2186
New Balance	4	x	1	gl	9.12	9.86	39.44
Nexum	2	x	2.5	gl	7.74	8.6	43.00
	275	gl	mini	gl	7.74	8.24	2266
NIS 80:20	2	x	2.5	gl	8.53	9.39	46.95
	275	gl	mini	gl	8.53	9.03	2483
NIS 90:10	2	x	2.5	gl	8.45	9.31	46.55
	275	gl	mini	gl	8.45	8.95	2461
Omnix LDF	275	gl	mini	gl	9.97	10.47	2879
Persist Ultra	2	x	2.5	gl	7.48	8.34	41.70
	275	gl	mini	gl	7.48	7.98	2170

Adjuvant and Marking Foam Products							
Product Name	Pack-out			Unit of Measure	Pure Product Weight (lbs per um)*	Shipping Weight (lbs per um)*	Shipping Weight (per drum/case/mini)*
Precisive	2	x	2.5	gl	8.55	9.40	47.00
	275	gl	mini	gl	8.55	9.04	2486
Quicken	2	x	2.5	gl	8.38	9.24	46.20
	275	gl	mini	gl	8.38	8.88	2442
Ripara	2	x	2.5	gl	7.45	8.31	41.67
	275	gl	mini	gl	7.45	7.95	2170
Salia	2	x	2.5	gl	7.32	8.18	41.54
	275	gl	mini	gl	7.32	7.82	2148
Sorbyx	2	x	2.5	gl	7.84	8.71	43.55
Stretta	2	x	2.5	gl	9.26	10.12	50.60
Tacheon Complete	2	x	2.5	gl	8.51	9.37	47
Tacheon Drop	4	x	1	gl	8.60	9.33	46.65
	2	x	2.5	gl	8.60	9.46	47.30
	275	gl	mini	gl	8.60	9.09	2500
Tacheon Duo	2	x	2.5	gl	8.51	9.37	47
Tacheon Spread	2	x	2.5	gl	8.39	8.25	46
Taragon Elite	2	x	2.5	gl	9.56	10.42	52.10
	275	gl	mini	gl	9.56	10.06	2767
Taragon Xtra	2	x	2.5	gl	9.5	10.36	51.80
	275	gl	mini	gl	9.5	10	2750
Tolero	12	x	1	qt	8.66	9.52	38.08
	2	x	2.5	gl	8.66	9.16	45.80
Transport Plus	2	x	2.5	gl	9.84	10.7	53.50
	275	gl	mini	gl	9.84	10.34	2844
Vertex	2	x	2.5	gl	9.08	9.86	49.30
	275	gl	mini	gl	9.08	9.5	2613
Vestis	4	x	1	gl	8.33	9.07	36.28
Vigor	2	x	2.5	gl	7.20	7.99	40.00
	275	gl	mini	gl	7.20	7.63	2098

Storage Guidelines

- This product does not require heated storage.
- Protect product from freezing. If product freezes warm to room temperature and shake or recirculate before use.
- Product must be stored above 32° F.
- Product must be stored above 40° F.

*All weights are subject to 3-5% variance, always check product weight/density on mini-bulk label for greatest accuracy.

Tank Mixing Sequence Guidelines

General Recommendations

It is recommended that a compatibility test be done prior to mixing any combination of crop protection products.

If using a mixing vat or inductor, make sure there is adequate agitation and a minimum of 15% of the desired finished spray volume carrier in the mixing vessel prior to diluting the crop protection products. If the mixing vessel cannot hold the required minimum volume, open the valve and add the crop protection products in the recommended order.

Mixing Sequence

1. Sulfonylurea Herbicides

**Add before reducing pH, or pre-slurry in 5 gallons of water at pH 8.5-9.5, and add once completely dissolved.*

Use 2-4 oz of household ammonia in 5 gallons of water to raise pH to desired level.

2. Compatibility Agents and Defoamers (*ConvertSM*, *Gundown EliteSM*, *KnockdownSM*)

**Compatibility agents will reduce spray solution pH.*

3. Dry Products

- Ammonium sulfate and dry micronutrients
- Drift retardants
- WP, DF, WDG, SP formulations

4. Liquids

- Drift retardants (*DirectSM RS*, *Border Xtra 8L*, *IntactSM*, *Intact Advanced*, *TaragonSM Elite*, *Taragon Xtra*, or *Transport PlusSM*)
- Suspo Emulsions (SE)
- Aqueous Suspensions (AS)
- Flowables (F or FL)
- Micro encapsulated (ME)
- Suspension concentrates (SC)
- Liquid Concentrates (LC)
- Emulsifiable concentrates (EC)
- Solutions (S or SL), liquid and concentrate suspension fertilizers, chelated micronutrients and growth hormones
- Capsule Suspensions (CS)
- Adjuvants
 - Crop oil concentrates (*VigorSM*)
 - High surfactant oil concentrates (*ExchangeSM*, *Volare DCSM* or *KixytSM*)
 - Methylated seed oils (*MSO UltraSM* or *Persist[®] Ultra*)
 - Oil-based DRT (*NexumSM*)
 - Nonionic surfactants (*VertexSM*, *NIS 80:20SM*, *NIS 90:10SM*, *SpeedSM* or *Chem-StikSM*)
 - Water conditioning agents (*DerivaSM*)

Precision Laboratories is a leading provider of specialized chemistries applied to plants, seeds, soil and water to maximize resource and biological performance potential while stewarding the environment.

Guarantee

Precision Laboratories is recognized as having the highest level of customer service. We guarantee the integrity and quality of every product we sell and provide 24-hour technical assistance to ensure complete customer satisfaction. Our products are backed by university and independent research, and proven through field-testing by respected agriculture professionals.

Important: Read and follow all label directions before using any product. Additional product and technical information is available on our website; www.precisionlab.com. All products are trademarks or registered trademarks of their respective companies.

Did You Know?

We have a series of online videos that go into more detail about tank mixing sequence and compatibility issues.

Contact Information

Hours: 7:30 a.m.–4:30 p.m. CT

Phone: (800) 323-6280

24-hour Technical Service:

(800) 323-8351

Don't Plug Your Sprayer

Correct Mixing Order and Procedures Increase Productivity, Reduce Risk.

Compatibility problems can cost applicators a lot of time and money — in wasted product, spraying time due to plugged sprayers and even lost customers — when the job isn't done correctly.

The Root of the Problem

Before glyphosate-resistant weeds began to emerge it was not uncommon for applicators to mix water-soluble liquids like glyphosate and surfactant together in an inductor or mixing vat with little or no water, and with little or no problems. But times are changing. More glyphosate-resistant weeds means more tank mixing with tank-mix partners that aren't water-soluble, leading to compatibility problems.

The two leading causes of incompatibility problems are:

- 1) Little or no water to dilute crop protection products when using a mixing vat or inductor cone
- 2) Improper mixing sequence

Mixing Vats and Inductor Cones

Are you creating a new crop protection formulation? When combining undiluted crop protection products and adjuvants in a mixing vat or inductor cone that's what you're doing. These new "combinations" were not formulated to be together, undiluted, so they often begin to gel or salt out quickly. The good news is they usually rinse out of the mixing vat or inductor cone easily. The bad news is you've now transferred the problem to your sprayer, leading to plugged screens, lines and nozzles.

The Mixing Vat Solution

If you're going to use a mixing vat or inductor you have two options to avoid tank mixing problems:

- 1) Add enough water to the mixing vat or inductor cone to dilute your tank mix partners. This is usually no less than 10-15% of the entire volume of the anticipated spray load. Example: 1,000 gallon load requires an inductor cone or mixing vat that can hold 100-150 gallons of water.
- 2) If your mixing vat will not hold the appropriate levels of water, then you should open the valve and add products individually in the proper mixing order. Follow each product with a water rinse before adding the next.

Improper Mixing Sequence

Even a slight change in mixing order makes a huge difference in product efficacy and compatibility. Something as simple as reversing the mixing order between a flowable (F) herbicide, like atrazine, and an emulsifiable concentrate (EC), like 2,4-D, can cause a cottage cheese-type consistency that will plug sprayers. Other mixing errors increase the amount of residue and buildup on the interior sidewalls of the sprayer's tank leading to longer cleanout times and the increased risk of cross contamination.

Fixing the Mixing Sequence

Make sure that you add products in the correct order. Most crop protection product labels state a preferred mixing sequence. If you're still not sure, simply conduct a small compatibility test to verify the mixing order that produces the most stable tank mix. Directions for conducting compatibility tests can be found on crop protection labels. If you want to learn more about proper mixing order, watch the compatibility video on our YouTube channel.



Stable tank mixes form milky emulsions, like those in the container on the left in the photo above. When using liquid nitrogen as a carrier, the addition of compatibility agents, like Convert™, can prevent tank mixes from quickly separating and leaving residues trapped inside the tank. Convert can reduce the risk of cross contamination and lower levels of weed control.

Did You Know?

Get your Compatibility Test Kits from Precision Laboratories. Call our customer service team at (800) 323-6280 to order a kit.

Or, you can download Mix Tank for iPhone and Android, which determines the proper mixing sequence based on the products selected.

NOTES

Mix Tank App

- ✓ **User Registration and Login**

 - Backup/restore feature for more secure data
 - Share data across devices
- ✓ **Record Nozzle Type**

 - Keep track of the nozzle used in the spray log feature
- ✓ **Free & Opt-in Weather**

 - Weather integration is now free
 - Optional record weather data at the beginning of spray log
- ✓ **Air Print**

 - Option to print spray logs and mix sheets directly from device
- ✓ **More Resources**

 - More product info for products in the app, including data sheets



Mix Tank for iPhone and Android

Mix Tank makes mixing, spraying and recordkeeping instantly easy. Winner of *AgProfessional* magazine's Readers' Choice Top Product of the Year award, the free Mix Tank app for iPhone and Android is designed to assist agricultural applicators with:

- proper tank-mixing order
- provide mixing precautions
- conveniently maintain accurate spray log records
- product info



Scan to download the Mix Tank App



for iOS



for Android

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www.youtube.com/MixTankApp

