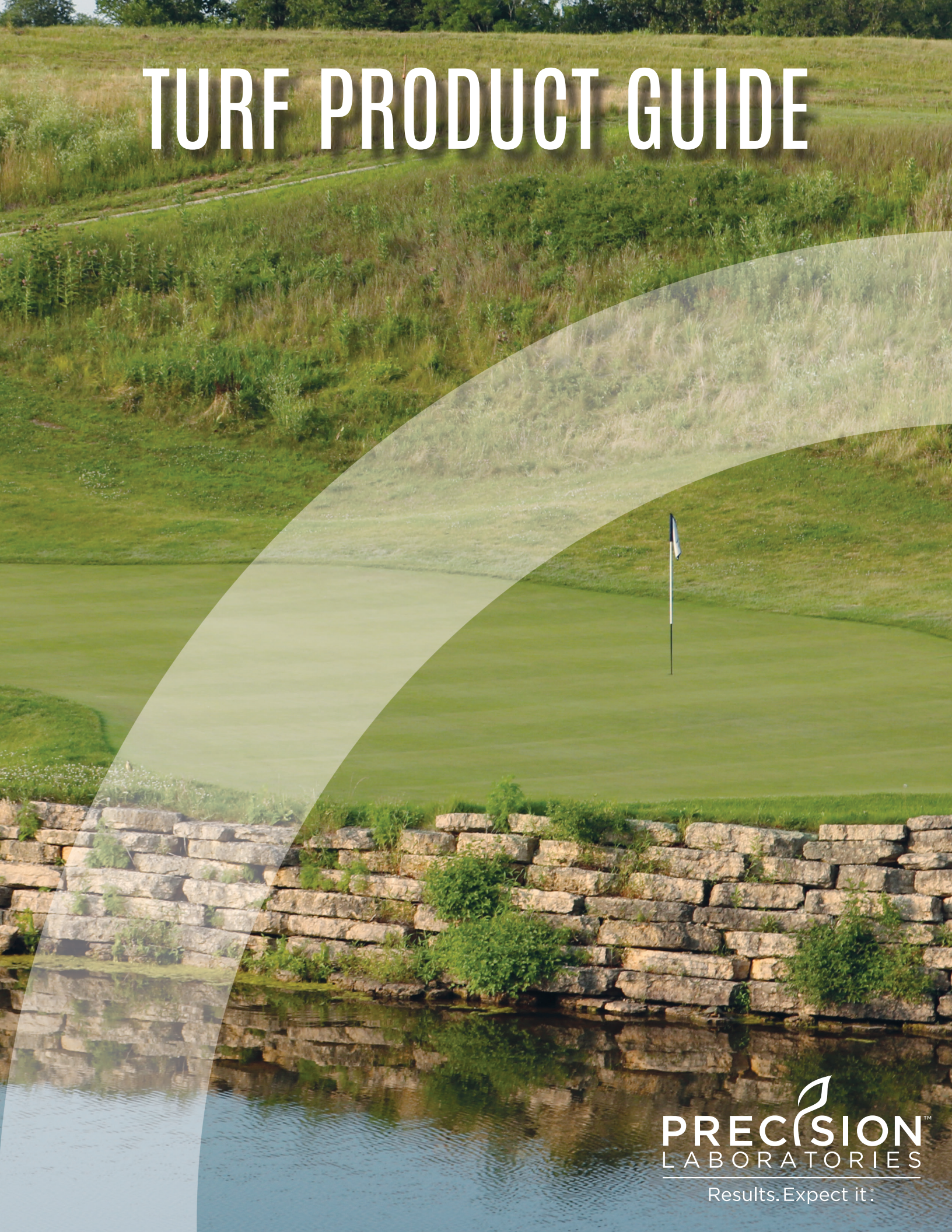
TURF PRODUCT GUIDE



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, soil and water produce quality turf.

INNOVATIVE, SENSIBLE, EFFECTIVE PRODUCTS.

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TECHNICAL EXPERTISE

INNOVATION

RESULTS. EXPECT IT.

PRECISION™ LABORATORIES
Results. Expect it.®

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.

ACTIVO™ Activator Adjuvant with Turf Pigment

A unique activator adjuvant formulated with a green pigment to optimize pesticide performance and turfgrass appearance.

Use Rates	Package Size
0.5-1.5 fluid ounces per 1,000 ft.²	2 x 2.5 gal

SOLAROUS™ Chromatic Plant Enhancer

Fuses a blend of chromatic reflective ingredients and innovative surfactant systems to increase coverage and adhesion on the plant.

Use Rates	Package Size
0.5 – 2 oz/1,000 ft^2 + 50 gal of water/acre	4 x 1 gal

ENVY™ Turf Pigment

Pigment dispersion improves color, masks injury and enhances spray coverage.

Use Rates	Package Size
Turf: 16 oz + 50 gal of water/acre **Trees and Shrubs:** 16 oz + 50 gal of water	4 x 1 gal

WINTERGREEN™ PLUS Sprayable Turf Cover

A nonphytotoxic, colorant and antidesiccant formulated to impart a natural green color to dormant or actively growing turf. Wintergreen Plus protects sensitive turfgrass during dormant periods and accelerates spring green-up.

Use Rates	Package Size
16 - 32 oz/1000 sq ft	2 x 2.5 gal 20 gal

REGREEN™ Permanent Turfgrass Colorant

Nonphytotoxic colorant specifically formulated to impart a long-lasting, natural green color when applied to dormant and non-dormant turfgrasses.

Use Rates	Package Size
Dormant Turf: 12 oz/1000 sq ft **Nondormant Turf:** 8 oz /1000 sq ft	2 x 2.5 gal

REPLACE XL™ Commercial Sand Pigment

Unique pigment dispersion, formulated to impart a natural, dark green color to sand used for filling divots and topdressing playing surfaces on golf courses and athletic fields.

Use Rates	Package Size
1-2 oz/100 lb sand	2 x 2.5 gal 250 gal

SIGNAL™ Blue Spray Pattern Indicator

Concentrated, temporary, blue spray pattern indicator and solution colorant designed to be added to plant protectants and other liquid spray solutions.

Use Rates	Package Size
1 qt/100 gal	4 x 1 gal 30 gal 55 gal

SUPER SIGNAL™ BLUE Blue Spray Pattern Indicator Concentrate

Concentrated blue spray pattern indicator provides temporary visibility of spray applications.

Use Rates	Package Size
16-32 oz/100 gal	12 x 1 qts 2 x 2.5 gal

SIGNAL™ BLUE EZ SoluPak™ Blue Spray Pattern Indicator

Highly visible blue spray pattern indicator provides temporary visibility of applications. Waterproof, foil-lined SoluPak prevents accidental staining.

Use Rates	Package Size
1 Pak/50 gal	12 x 2 oz SoluPaks per carton, 4 cartons per master case

SIGNAL™ GREEN Green Spray Pattern Indicator

Green spray pattern indicator formulated to further reduce awareness of pesticide applications compared to ordinary blue spray colorants by providing a temporary green tint to treated areas.

Use Rates	Package Size
32-64 oz/100 gal	4 x 1 gal 55 gal

SUPER SIGNAL™ GREEN Green Spray Pattern Indicator Concentrate

Concentrated green spray pattern indicator formulated to further reduce golfer awareness of pesticide applications compared to ordinary blue spray colorants by providing a temporary green tint to treated areas.

Use Rates	Package Size
16-32 fl oz per 100 gal of solution	12 x 1 qts

SIGNAL™ GREEN EZ SoluPak™ Green Spray Pattern Indicator

Green spray pattern indicator further reduces golfer awareness of applications compared to blue colorants. Waterproof, foil-lined SoluPak prevents accidental staining.

Use Rates	Package Size
1 Pak/50 gal	12 x 2 oz SoluPaks per carton, 4 cartons per master case

RUNWAY™ Turf Marking Foam

Quick dissipating turf foam marker. Will not discolor sensitive turf like ordinary marking foams.

Use Rates	Package Size
3 fl oz/2 gal of water	12 x 1 qt

PRECISE POND™ Nutrient & Sludge Metabolizer

Combination of enzymes and bacteria that preemptively digest phosphorus and nitrogen in the water column, and accelerate the breakdown of partially decomposed organic matter, waste, and sludge.

Use Rates	Package Size
Initial dosage: 3 to 6 pounds per surface acre of water. **Maintenance:** 1.5 to 2 pounds per surface acre of water.	6 x ½ lb water-soluble packets per carton, 4 cartons per master case 60 x ½ lb water-soluble packets per case

SPECTRUM™ Aquatic Nutrient Metabolizer

Function-specific formulation of select bacteria strains improves water quality by reducing nutrient levels and suspended organic matter in the water column.

Use Rates	Package Size
Initial dosage: 3-6 lb/acre **Maintenance:** 1.5-2.0 lb/acre	6 x ½ lb water-soluble packets per carton, 4 cartons per master case 120 x ½ lb water-soluble packets per drum

DEVOUR™ Aquatic Waste & Sludge Reducer

Proprietary blend of enzymes, facultative and nonfacultative bacteria accelerates breakdown of partially decomposed organic matter.

Use Rates	Package Size
Initial dosage: 3-6 lb/acre **Maintenance:** 1.5-2.0 lb/acre	6 x ½ lb water-soluble packets per carton, 4 cartons per master case 120 x ½ lb water-soluble packets per drum

TRUE BLUE™ Lake & Pond Dye

Proprietary blend of environmentally friendly, nontoxic dyes reduces sunlight penetration and imparts a natural blue color.

Use Rates	Package Size
1 qt/acre-foot	4 x 1 gal

TRUE BLUE™ EZ SoluPak™ Lake & Pond Dye

Proprietary blend of environmentally friendly, nontoxic dyes reduces sunlight penetration and imparts a natural blue color. Waterproof, foil-lined SoluPak prevents accidental staining.

Use Rates	Package Size
1 Pak/acre-foot or 325,000 gal	6 x 5.25 oz SoluPaks per carton, 4 cartons per case

JET BLACK™ EZ SoluPak™ Lake & Pond Dye

Proprietary blend of environmentally friendly, nontoxic black dyes reduces sunlight penetration and imparts a natural black, reflective color. Waterproof, foil-lined SoluPak prevents accidental staining.

Use Rates	Package Size
1 Pak/acre-foot or 325,000 gal	6 x 5.25 oz SoluPaks per carton, 4 cartons per case

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
1 quarts per 50 gallons of rinsate	12 x 1 qt 4 x 1 gal

INCIDE OUT™
Spray Tank Cleaner

Liquid spray tank cleaner that emulsifies and bonds crop protection residues to rinse water for complete purging.

Use Rates	Package Size
1 qt/100 gal of clean water rinsate	12 x 1 qt 4 x 1 gal

KNOCKDOWN™
Foam Suppressant

Foam suppressant designed to quickly defoam spray solutions containing nonionic surfactants, silicone surfactants or crop oil concentrates.

Use Rates	Package Size
Anti-foam: 1-4 oz/100 gal of solution **General Defoamer:** 2–4 oz/100 gal of solution	12 x 1 qt 4 x 1 gal

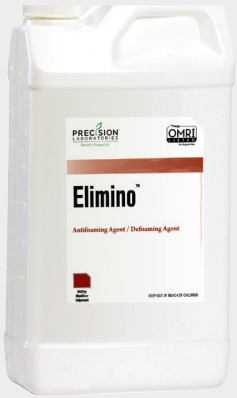
GUNDOWN ELITE™
Antifoaming & Defoaming Agent

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

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

ELIMINO™
Antifoaming & 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
1–10 oz/100 gallons of spray solution	12 x 1 qt

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
1–4 pt/100 gal of spray solution to prevent antagonistic tank mixing conditions. 3–6 pt/100 gal of spray solution to correct tank mix incompatibilities.	2 x 2.5 gal 275 gal

WATER MANAGEMENT

MAKE EVERY DROP COUNT

CREATE GREAT OUTDOOR PLAYING SURFACES USING LESS WATER

WATER WARS

What we know for sure:

- Competition and demand for water will continue to be fierce
- Water supply is decreasing
- You can be pro-active about water

WHOA NELLY, THAT'S A LOT

Gallons of irrigation water used annually on golf courses

2 BIL

That's all the water flowing down Niagara Falls for nearly 45 minutes!

BOTTOM LINE:
We need to improve water and energy use on turf.

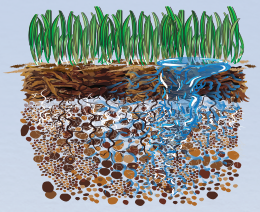
WHAT YOU CAN DO:

ANNUAL AUDITS CAN SAVE 10–15% ON IRRIGATION COSTS

- ✓ Audit your irrigation system
- ✓ Follow good agronomic practices
- ✓ Use innovative soil surfactants

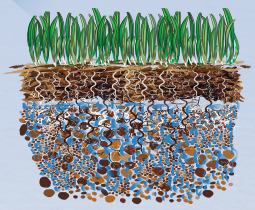
UTILIZE SOIL SURFACTANTS

INFILTRATION SURFACTANTS



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

& HYDRATION SURFACTANTS



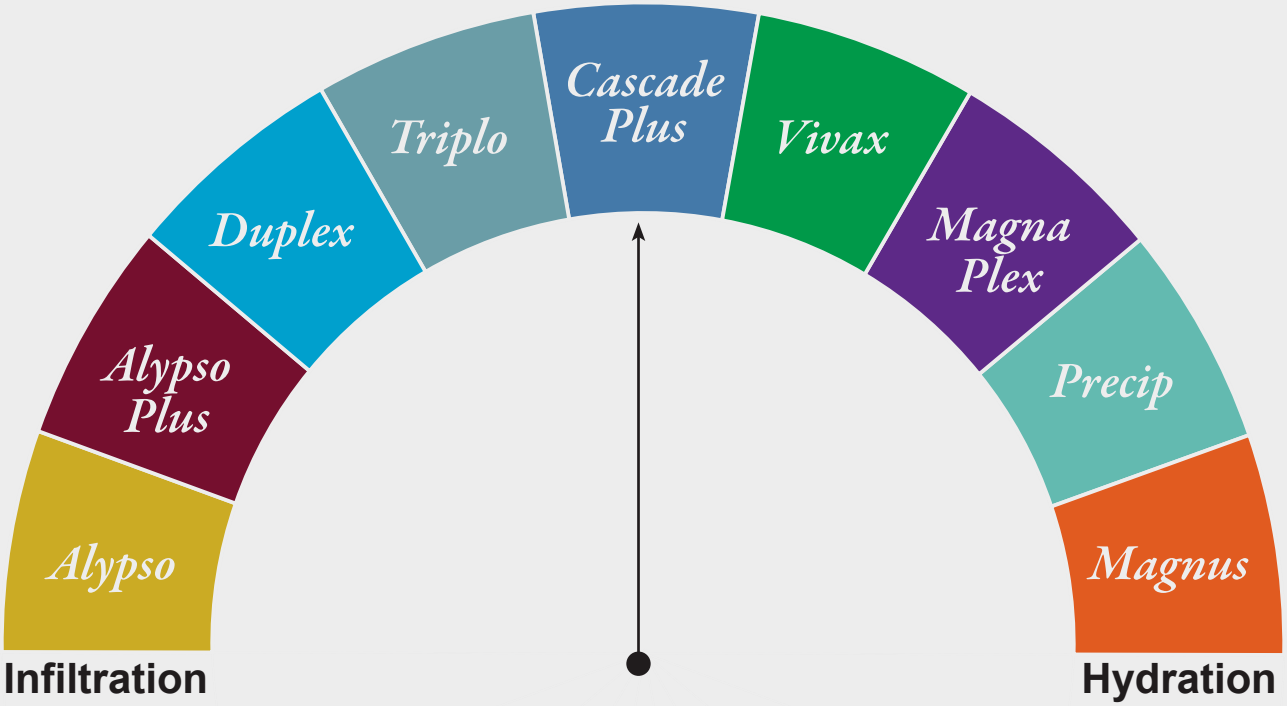
- Holds water in the root zone
- Maintains water content
- Reduces plant stress

Precision Laboratories Can Help

We believe better water management makes an important, positive impact on the world and are committed to do our part through education, awareness, and development of innovative chemistries.

Visit PrecisionLab.com today to learn more about our new soil surfactants.

Dial in your Water Management Program

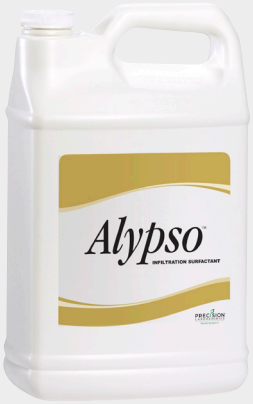


PRECISION™ LABORATORIES

Results. Expect it.®

ALYPSO™ Infiltration Surfactant

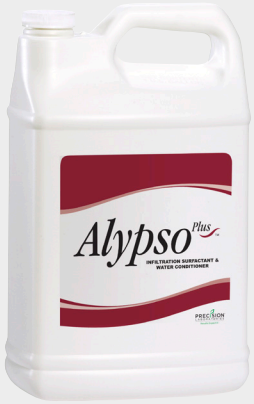
Unique, naturally-derived surfactant that speeds up the infiltration of irrigation through thatch and into hard-to-wet soils.



Use Rates	Package Size*
Injection: 1 pt /acre **Spray:** 16 - 24 oz/acre	2 x 2.5 gal 20 gal 55 gal

ALYPSO™ PLUS Infiltration Surfactant & Water Conditioner

Contains a naturally-derived surfactant that reduces the surface tension of water and improves the infiltration of rainfall and irrigation into and throughout the turf or plant root zone. The water conditioner in Alypso Plus reduces pH and addresses issues associated with poor water quality.



Use Rates	Package Size*
Injection: 32 oz/acre **Spray Application:** 32 oz/acre	2 x 2.5 gal 20 gal 55 gal

DUPLEX™ Infiltration Surfactant

Designed for irrigation injection, Duplex combines penetrants with a buffering agent that neutralizes hard water ions. Duplex improves the infiltration of rainfall or irrigation through thatch, moving water, plant protectants or nutrients into the soil solution.

Use Rates	Package Size*
Injection: 20 oz/acre **Spray Application:** 20 oz/acre	2 x 2.5 gal 20 gal 55 gal

TRIPLO™ Hydration & Infiltration

Triplo is a combination of surfactants designed to increase the movement of irrigation and rainwater into and throughout the rootzone of natural playing surfaces.

Use Rates	Package Size*
2.5-5 oz/1000 sq ft	2 x 2.5 gal 20 gal 55 gal

CASCADE™ PLUS Hydration & Infiltration

A combination of nonionic surfactants that hydrate the soil and penetrate to provide deeper, more uniform water infiltration, Cascade Plus is used to prevent localized dry spot, correct hydrophobic soil conditions and provide firmer, faster playing surfaces under all conditions.

Use Rates	Package Size*
16 ounces/1000 sq ft	2 x 2.5 gal 20 gal 55 gal

VIVAX™ Hydration & Infiltration

A combination of new surfactant technologies designed to manage water across a wide range of soil and turf types, making it ideal for use on golf courses and sports turf.

Use Rates	Package Size*
5 ounces/1000 sq ft	2 x 2.5 gal 20 gal 55 gal

Denotes water conditioning properties

*Bulk tote quantities for liquid surfactants available upon request.

MAGNAPLEX™
Hydration & Infiltration

MagnaPlex combines the hydration of Magnus and the infiltration of Duplex in a convenient, easy-to-use formulation that does not require immediate post-application irrigation.

Use Rates	Package Size*
Spray Application: 5 oz/1000 sq ft **Injection:** 32 oz/acre	2 x 2.5 gal 20 gal 55 gal

PRECIP™
Hydration & Infiltration

Formulated to address hydrophobicity and water acceptance in soils, PRECIP increases the infiltration of water into the soil and improves the length of hydration.

Use Rates	Package Size*
2 - 8 oz (59 to 237 ml) in a minimum of 1 gallon (3.79 L) of water per 1,000 ft²	2 x 2.5 gal

MAGNUS™
Hydration Surfactant

A nonionic surfactant blend that produces uniform hydration in the root zone and optimized growing conditions for new seedlings, stressed turf and upper root zone species.

Use Rates	Package Size*
4 to 6 ounces/1000 sq ft	2 x 2.5 gal 20 gal 55 gal

CASCADE™ PLUS
Hydration & Infiltration

Specifically formulated to increase both the rate and depth of water and nutrient infiltration on hydrophobic soils.

Use Rates	Package Size
3.5 - 7.0 lbs/1000 sq ft Each 42 pound bag treats approximately 5,700 sq ft at the 7 pound rate	42 lb bag

CASCADE™ PLUS
Fertilizer 0-0-20
Wetting Agent & Fertilizer

Combines the proven wetting agent technology of Cascade Plus with a unique fertilizer blend.

Use Rates	Package Size
5 lbs/1000 sq ft to obtain 8 oz of Cascade Plus per 1000 sq ft	50 lb bag

CASCADE™ PLUS
Fertilizer 15-0-10
Wetting Agent & Fertilizer

Combines the proven wetting agent technology of Cascade Plus with a unique fertilizer blend.

Use Rates	Package Size
5 lbs/1000 sq ft to obtain 8 oz of Cascade Plus per 1000 sq ft.	50 lb bag

*Bulk tote quantities for liquid surfactants available upon request.

CASCADE™ PLUS Fertilizer 3-1-0 Wetting Agent & Fertilizer

Combines the proven wetting agent technology of Cascade Plus with a unique fertilizer blend.

Use Rates	Package Size
10 lbs/1000 sq ft to obtain 8 oz of Cascade Plus per 1000 sq ft.	50 lb bag

VIVAX™ PLUS Fertilizer 0-0-20 Wetting Agent & Fertilizer

Combines the new, innovative surfactant technologies in Vivax with a mini-prill fertilizer. It is designed for use on premium playing surfaces, such as golf courses and athletic fields.

Use Rates	Package Size
5 lbs/1000 sq ft	50 lb bag

VIVAX™ 10G Hydration & Infiltration

Combination of surfactants that increase volumetric water content and improve water infiltration across a wide range of soils and turf types. Its granular formulation makes Vivax 10G suitable for use on golf courses, athletic fields and other turf areas.

Use Rates	Package Size
3.5 lbs/1000 sq ft	42 lb bag

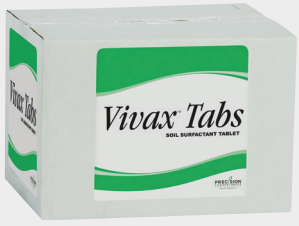
IN-FLOW™ Infield Skin Maintenance

A granular soil conditioner and surfactant that influences water's ability to flow into and throughout the profile of infield skins. This helps sports turf managers find the desired balance between water retention and movement, resulting in a better performing infield over a longer period of time.

Use Rates	Package Size
5 lbs/1000 sq ft	50 lb bag

VIVAX™ TABS Hydration & Infiltration

Easy-to-use tablet that contains Vivax. Designed to improve water infiltration into and throughout localized dry spots (LDS) and provide relief from plant stress across a wide range of soils and turf types.



Use Rates	Package Size
One tablet covers 12,000 - 18,000 sq ft of turf	24 – 6 ounce tablets per case

PRECISION EZ TABS™ Rescue Tablet

An easy-to-use tablet, containing the same active ingredient as Magnus, designed to hydrate the plant root zone and provide a rescue treatment for hot spots.

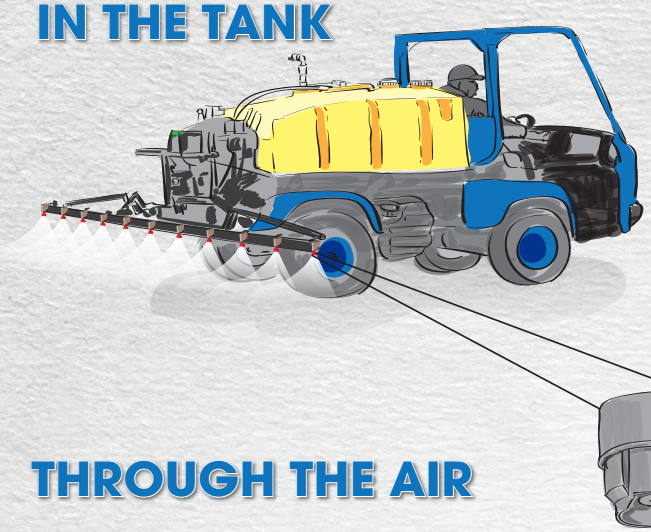
Use Rates	Package Size
One tablets covers approximately 12,000-18,000 square feet of turf. Severity of localized dry spot, water temperature, water pressure and application technique may cause coverage to vary.	24 – 6 ounce tablets per case

TSDM

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 can interact adversely with current spray mix.
- **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**

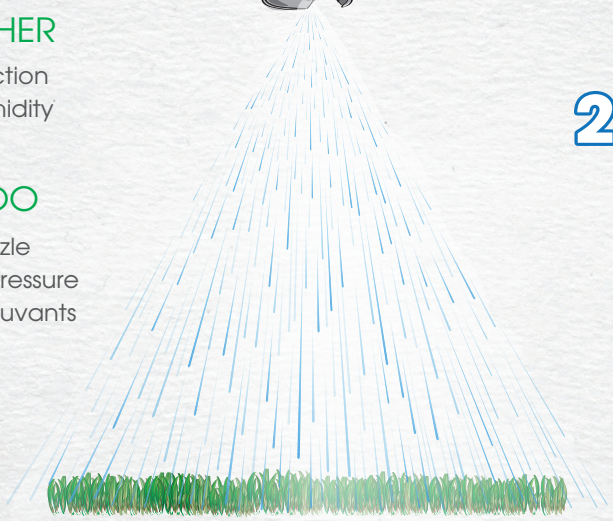
THROUGH THE AIR

WATCH THE WEATHER

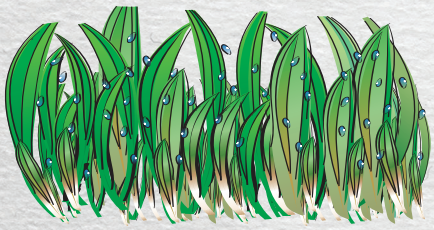
- Wind speed and direction
- Temperature and humidity
- Thermal inversions

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**

Total Spray Droplet Management is a registered trademark of Precision Laboratories, LLC

BORDER™ 2.0
Drift Control Agent & Deposition Aid

A concentrated liquid adjuvant for spray droplet management. It enhances the performance of spray applications by modifying the physical characteristics of the spray droplet, improving droplet retention while reducing off-target movement.

Use Rates	Package Size
0.25%–0.50% v/v (2–4 pints)/ 100 gal	2 x 2.5 gal 12 x 1 qt

DIRECT™ RS
Drift Retardant/ Deposition Aid

Drift retardant reduces drift risk and maximizes pesticide performance by binding ultra-small spray particles into larger droplets.

Use Rates	Package Size
1-4 oz/100 gal	12 x 1 qt

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
1.0% v/v or a minimum of 20-24 fl oz/acre	2 x 2.5 gal 250 gal

MICROYL™
Crop Oil Replacement

Activator adjuvant provides superior performance and improved turfgrass safety at lower use rates than ordinary crop oil concentrates.

Use Rates	Package Size
3–4 pt/100 gal	2 x 2.5 gal 250 gal

COMPOUND™
Activator Adjuvant

A low-use-rate, low odor activator adjuvant blend designed to maximize the performance of tank mixes applied to turf and ornamentals. Compound effectively buffers spray solutions, maximizes spread, enhances plant cuticle and cell wall penetration and reduces the off-target movement of tank mix partners.

Use Rates	Package Size
1 – 6 pt/100 gal (0.125% v/v - 0.75% v/v)	12 x 1 qt 2 x 2.5 gal 20 gal

AQUALOCK™
Anti-Transpirant

AquaLock is a unique wax dispersion that forms a thin, flexible, water-repellent layer on plant surfaces. AquaLock protects plants against drought, extreme temperatures, wind and sunscald. AquaLock may extend watering intervals for turf and ornamental crops.

Use Rates	Package Size
Turf: 2-8 oz/ 1000 sq ft **Ornamentals:** 4-8 oz in 1 gallon of water	2 x 2.5 gal

Denotes water conditioning properties

LV™ Water Conditioning Agent, Surfactant & Humectant

LV is specifically formulated for low volume sprayer applications. The powerful water conditioning system of LV is blended with a non-ionic surfactant to increase product and spray solution efficacy.

Use Rates	Package Size
0.125% - 0.5% v/v (16-32 oz./100 gal)	4 x 1 gal

PEN-A-TRATE ECO™ Nonionic Surfactant, Drift Reduction Agent

An OMRI-certified, nonionic surfactant and drift reduction product that ensures spray applications stay on target. The environmentally-friendly formulation allows use in and around aquatic areas. The high surfactant load provides improved performance for spray mixes on turf and ornamentals.

Use Rates	Package Size
1-4 pt/100 gal	4 x 1 gal

SYNC™ Activator Adjuvant

SYNC is a unique adjuvant technology designed to enhance the performance of contact and systemic fungicides, herbicides and insecticides, even when applied in reduced spray carrier volumes.

Use Rates	Package Size
1 pt/100 gal	12 x 16 oz

DELUX™ Surfactant Plus AMS Adjuvant

Biodegradable activator surfactant and ammonium sulfate premix enhances performance of glyphosate and certain postemergence herbicides.

Use Rates	Package Size
4-5 qt/100 gal phenoxies.	2 x 2.5 gal

NEW BALANCE™ pH Acidifier Surfactant

Citric-based, pH acidifier, buffer and nonionic surfactant modifies spray solution pH when breakdown from alkaline hydrolysis can reduce insecticide and fungicide performance.

Use Rates	Package Size
Use rate depends on desired pH. See product label.	4 x 1 gal

PRECISION SPREADER™ Nonionic Surfactant

A general purpose spray adjuvant, used to enhance the spreading and coverage of sprays.

Use Rates	Package Size
1/2 pt. - 2 qt. / 100 gal	2 x 2.5 gal 250 gal

Denotes water conditioning properties

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
0.125-0.5% v/v (1-4 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal

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
0.125-0.5% v/v (1-4 pt/100 gal of spray solution)	2 x 2.5 gal 275 gal

CHEM-STIK™ Nonionic Spreader-Sticker

Nonionic spreader sticker maximizes leaf surface coverage of spray solutions, while providing washoff protection from untimely rainfall.

Use Rates	Package Size
4-16 fl oz/100 gal	4 x 1 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.

Use Rates	Package Size
16-48 oz/100 gal	2 x 2.5 gal

SPEED™ NONIONIC Siloxane Surfactant

Low-foaming, low-use rate, nonionic siloxane surfactant moves spray solution up and down plant for superior coverage.

Use Rates	Package Size
Always use the rate of nonionic surfactant recommended on the pesticide label.	4 x 1 gal

VESTIS™ Organosilicone Wetting Agent

Vestis is a nonionic organosilicone wetting agent designed for use with plant protection products, plant growth regulators, fertilizers, microbial products and plant nutritionals. Vestis lowers spray solution surface tension to improve wetting and uniformity of leaf surface coverage.

Use Rates	Package Size
3.2–13 oz/100 gal	4 x 1 gal

Denotes water conditioning properties

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 (*Convert™/Gundown Elite™, Knockdown™*)
   *Compatibility agents will reduce spray solution pH.
3. Dry Products
   a. Ammonium sulfate and dry micronutrients
   b. Drift retardants
   c. WP, DF, WDG, SP formulations
4. Liquids
   a. Drift retardants
   b. Suspo Emulsions (SE)
   c. Aqueous Suspensions (AS)
   d. Flowables (F or FL)
   e. Micro encapsulated (ME)
   f. Suspension concentrates (SC)
   g. Liquid Concentrates (LC)
   h. Emulsifiable concentrates (EC)
   i. Solutions (S or SL), liquid and concentrate suspension fertilizers, chelated micronutrients and growth hormones
   j. Capsule Suspensions (CS)
   k. Adjuvants
      i. Crop oil concentrates
      ii. High surfactant oil concentrates
      iii. Methylated seed oils
      iv. Oil-based DRT
      v. Nonionic surfactants
      vi. Water conditioning agents

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

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

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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.

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