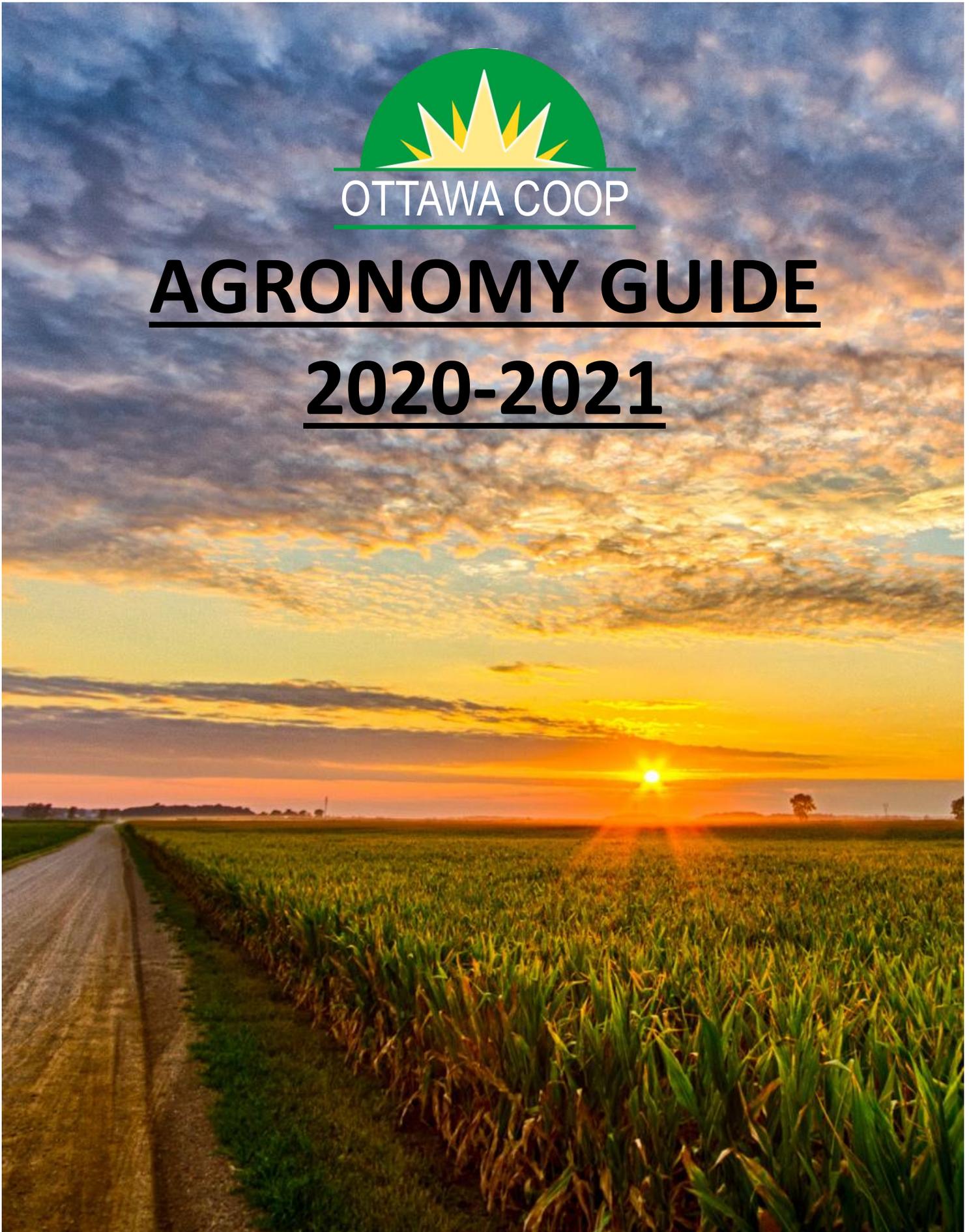




AGRONOMY GUIDE

2020-2021



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TRUTERRA™

Truterra™ Insights Engine

Farmer-Led Stewardship, Driving Value from Farm-to-Fork

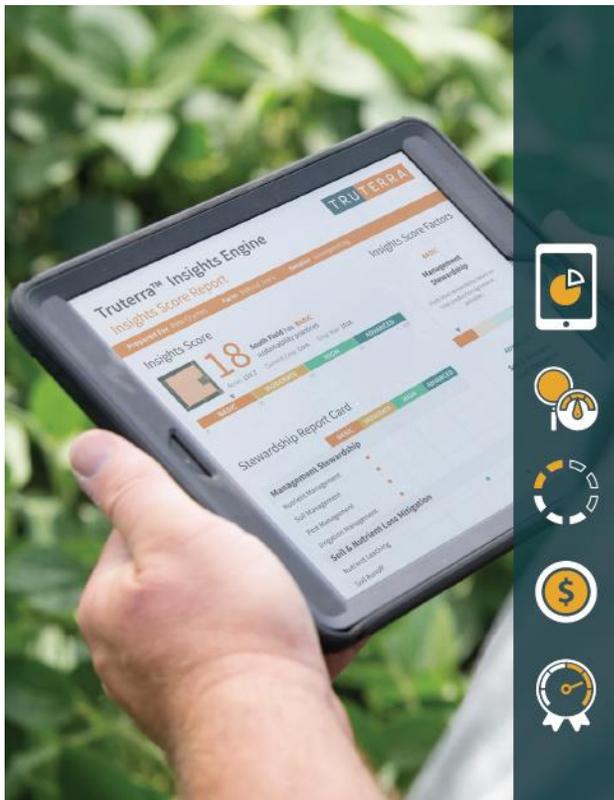
The Truterra™ Insights Engine by Truterra, LLC is a first-of-its-kind, interactive on-farm stewardship digital platform that helps both farmers advance their goals for stewardship and financial return-on-investment in real time, acre-by-acre and food companies measure sustainability progress.

One of the biggest challenges in food system sustainability is the lack of comprehensive tools that can quantify results and demonstrate system-wide progress on sustainability.

Truterra™ Insights Engine fills that critical need. It can bring together the value of stewardship practices with the agronomic expertise and technological capabilities of agricultural retailers to create field-customized insights for farmers.

A key differentiator is its design to be of value for farmers first and foremost. The Truterra™ Insights Engine was designed by a farmer-owned cooperative, to be used by farmers, agricultural retailers, and agricultural experts in their quest to help improve on-farm economic and natural resource stewardship.

Truterra™ Insights Engine is the next step in farmer-led and -driven sustainability, establishing clear metrics and a common language for sustainability that is meaningful for farmers and the ultimate customers of their farms - food companies and end consumers.



FOR FARMERS & AG RETAILERS

Through an interactive dashboard, farmers and ag retailers are able to use the Truterra™ Insights Engine to:

Enter on-farm data to create a report for each field that showcases the conservation practices, creates customized options for improvement, and helps farmers plan scenarios across many possible stewardship activities.

Analyze a full range of stewardship factors and find products, practices and technologies to match specific conditions on each acre.

Measure and track stewardship progress over time and spot potential opportunities for improvement.

Estimate the potential return on investment a farmer can expect as a result of applying those recommendations, giving farmers the information they need to make the right choices for their businesses.

Generate an insights 'score' that allows them to track their progress over time and showcase results with their customers.

FOR FOOD COMPANIES

Truterra™ Insights Engine offers companies expanded metrics that help them achieve their sustainability goals.

Truterra™ Insights Engine can help document and measure how companies, in partnership with farmers, are meeting their sustainability commitments and driving measurable improvements in air quality, water quality and quantity, and soil health.



FOR THE FOOD SYSTEM

The Truterra™ Insights Engine has the potential to take transparency and accountability across the food supply chain to the next level, providing insights to farmers that flow all the way to the consumer.

The Truterra™ Insights Engine is available for farmers and food retailers as the core offering under the Truterra, LLC brand, a suite of on-farm conservation offerings.

Visit www.TruterraInsights.com for more information on how to access the tool.

Truterra, LLC is a wholly-owned subsidiary of Land O'Lakes, Inc., a farmer-owned food and agricultural cooperative.

TRUTERRA™

A man and a woman are kneeling in a field, examining a plant. The man is wearing a cap and a vest, and the woman is wearing a plaid shirt. They are both looking at the plant with interest.

TRUTERRA™

Truterra™ Insights Engine

Benchmarking Farmer Progress and Mapping Change Over Time

Designed for farmers by a farmer-owned cooperative, the Truterra™ Insights Engine by Truterra, LLC is a first-of-its-kind, interactive on-farm stewardship digital platform that will help farmers advance their business and conservation goals in real time while offering companies expanded metrics that help them achieve marketplace sustainability goals.

A key offering of the Truterra Insights Engine is the Insights Score, which gives farmers critical information about their on-farm stewardship practices, highlighting areas where they are excelling while also highlighting opportunities to adjust management and adopt new practices. The Insights Score allows farmers to track progress over time and showcase it with their customers.

WHAT IS THE TRUTERRA INSIGHTS ENGINE INSIGHTS SCORE?

By analyzing a variety of on-farm practices, the Truterra Insights Engine generates a field-level Insights Score on a scale from 0 to 100. The score indicates a basic, moderate, high or advanced level of stewardship on a given field.

HOW IS THE INSIGHTS SCORE CALCULATED?

The Insights Score is calculated based on an algorithm evaluating field-level data. The Insights Score factors in each field's unique properties – such as varying soil types, topography and weather – as well as the crop production activities and conservation practices that are in use.



MODELING FOR THE FUTURE

Using the Truterra Insights Engine, farmers can test how adopting new or updating existing on-farm conservation practices can impact their Insights Score, as well as five key stewardship indicators.



Nitrogen Use Efficiency

Indicates estimated nitrogen use efficiency for producing the current grain crop.



Sheet & Rill Erosion

Indicates the estimated tons per acre of soil that erodes in the field each year due to water interacting with the top soil. The interaction could be from rain fall or water running across the land.



Wind Erosion

Indicates the estimated tons per acre of soil that erodes in the field each year due to wind blowing across the field.



Soil Quality Trend

Indicates the predicted trend in gains, losses, or maintenance of soil organic matter and soil carbon based on current field operations and crop management.



Net GHG Emissions

Indicates the estimated net greenhouse gas (GHG) emissions in pounds per acre per year, taking into account the total fuel usage from farm equipment operations, carbon dioxide aeration and respiration from the soil, and nitrous oxide emissions from commercial fertilizer.

Visit www.truterrainsights.com for more information on how to access the tool.



TRUTERRA™

Truterra™ Insights Engine

Better Protecting the Planet
By Saving Farmers Money

Designed by a farmer-owned cooperative, for farmers, the Truterra™ Insights Engine by Truterra, LLC is a first-of-its-kind, interactive on-farm stewardship digital platform that helps farmers advance their goals for stewardship and financial return-on-investment in real time while offering companies expanded metrics that help them achieve sustainability goals.

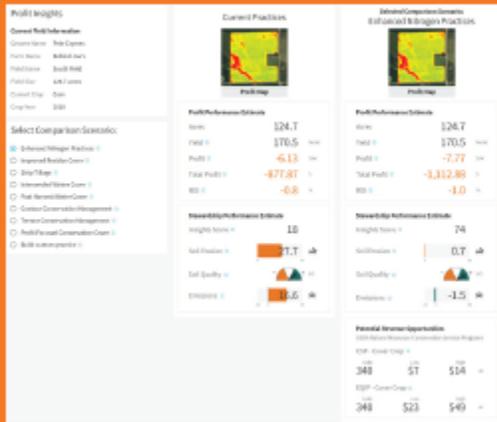
Truterra, LLC understands that farmers need to balance the long-term success of their farm business with protecting natural resources. Farmers know that factors like erosion and runoff are not only bad for the environment, they also lose a farm money and can jeopardize the long-term health of a farm business.

Profit Insights

Through the Profit Insights capability, the Truterra™ Insights Engine takes a unique approach to natural resource stewardship by starting the conversation focused on a farm field's profitability, giving farmers an acre-level understanding of where they're making money in a field and where they're losing money. More often than not, where the field is unprofitable is also where the field is experiencing unsustainable soil erosion and nutrient losses.

The Profit Insights capability offers farmers and ag retailers the information they need to create customized solutions and make informed decisions about field and crop management opportunities to enhance their return-on-investment (ROI) and stewardship. Profit Insights helps farmers model how adopting new or expanded conservation practices can help a farm save money while also improving soil health, reducing runoff and other positive environmental outcomes.





Through its Profits Insights capability, the Truterra™ Insights Engine:

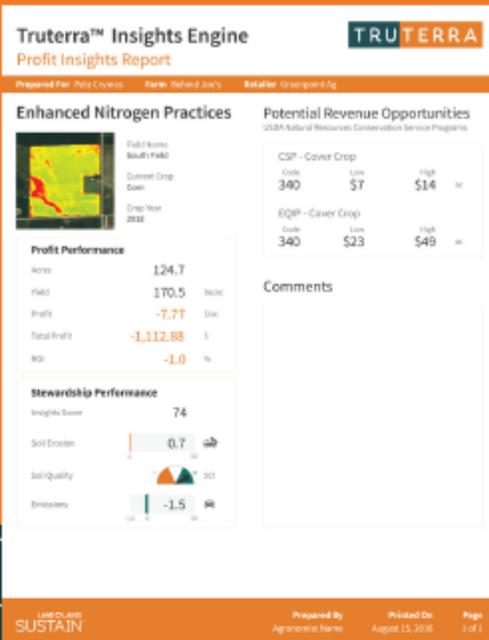
Offers eight different pre-built “bundles” of stewardship practices so that farmers can compare to the activities currently in place on their fields. Farmers also have the option of selecting individual practices to understand their economic and environmental impacts.

Compares the impacts the bundles of stewardship practices have across multiple factors, including economic indicators such as per-acre and field-level profitability and ROI, as well as key stewardship outcomes including:

- **The Insights Score** – a quantitative benchmarking of a field’s stewardship activities.
- **Soil Erosion** – total estimated erosion measured in 20-ton dump trucks.
- **Soil Quality Trend** – estimated trend of soil organic matter and soil carbon.
- **GHG emissions** – total estimated net CO₂-equivalent emissions measured in number of cars.

Generates a profit heat map that reveals where a field is profitable – or not – based on the mix of agronomic and conservation practices. The heat map helps farmers to identify where and how they can adopt practices designed to improve a field’s ROI and sustainability.

Identifies financial assistance opportunities for sharing the cost of conservation practices available through the U.S. Department of Agriculture’s Natural Resources Conservation Service.



The Truterra™ Insights Engine creates a framework for continuous improvement by focusing on a field’s profitability and empowering farmers and their trusted advisors with options for improving both a farm’s ROI and stewardship.

Visit www.TruterraInsights.com for more information on how to access the tool.

BRINGING CUSTOMIZED CONSERVATION SOLUTIONS TO YOU

CONSERVATION AGRONOMIST HIGHLIGHT

Meet Kaitlin Gibbons

Conservation Agronomist
Franklin County Conservation District

Kaitlin graduated from Iowa State University with a Bachelor of Science in Agronomy. Her new role was funded by a technical assistance grant in conjunction with NRCS, NACD, and Truterra to promote and increase conservation adoption and on-farm sustainability. Kaitlin has been working with Ottawa Coop and the Truterra™ Insights Engine to help Ottawa Coop growers leverage field-customized insights to create conservation solutions on their acres. She is excited to see how



she can benefit producers by providing them with agronomic knowledge and expertise with government funded conservation programs to help conserve their natural resources for many generations to come.

Contact Kaitlin at 785-241-7207 or frco.agronomist@gmail.com

Farmers are able to use the Truterra™ Insights Engine to:

- Generate an insights score to measure and track stewardship progress over time
- Enter on-farm data for each field to help spot potential areas of improvement
- Analyze a full range of stewardship factors
- Develop customized recommendations for every acre
- Estimate the potential return on investment a farmer can expect as a result of applying those recommendations.
- Ability to connect to field print calculator scoring in addition to the Insights Score™



Why Stabilize your Nitrogen?

- More nitrogen available for plant uptake by slowing the conversion of nitrogen into forms that can be lost through *volatilization*, *leaching* and *denitrification*
- Ensures longer period of increased nitrogen availability for plant uptake
- Maintaining N improves potential for maximizing yield
- Stabilizing N protects the environment
 - Prevents leaching nitrate into surface and ground water
- Protects applied nitrogen all season long
- Provides flexibility in application schedules



Nitrogen Stabilizers

N-Serve Nitrogen Stabilizer for Anhydrous

NutriSphere Nitrogen Stabilizer for Anhydrous

What it does:

- Reduces Nitrogen loss
- Improves standability
- Provides healthier corn and consistently higher yields
- Reduces risk of stalk rot
- Enables quicker crop dry down
- Reduces leaching of nitrates and denitrification
- Keeps nitrogen available for corn crop and helps protect water quality

When to use it:

- Add with anhydrous ammonia in fall and spring
- Rates: Add 1 qt. per acre



With N-Serve

Without N-Serve

N-Serve®

PROTECTS NITROGEN AT THE PLANT ROOT ZONE

NITROGEN STABILIZER

N-Serve® Nitrogen Stabilizer

- Active ingredient is nitrapyrin
- Oil based formulation that mixes well with anhydrous ammonia
- Optimizes yield potential of corn when used with anhydrous ammonia
- Proven and trusted technology for over 35 years

How Does N-Serve® Work?

N-Serve® inhibits the Nitrosomonas bacteria in the soil keeping Nitrogen in the stable ammonium form longer and protected from leaching and denitrification.



Application Rates

Fall applications

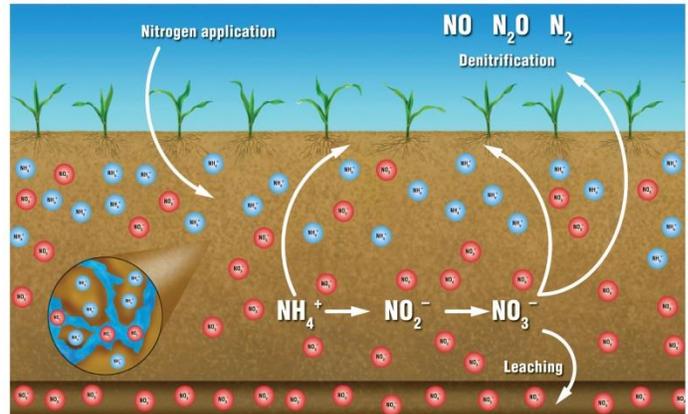
1 quart per acre

Spring applications

Pre-emerge: 1 quart per acre

Sidedress: 0.5 to 1 quart per acre

What Happens to Unstabilized Nitrogen?



When Do Nitrogen Losses Occur?

Most Nitrogen Losses occur during the Spring:

- Spring Rains and warm soil temperatures lead to heavy losses through both leaching and denitrification.
- Stabilizing with N-Serve® greatly reduces both leaching and denitrification protecting nitrogen in the root zone.

Stronger, Healthier Plants

- Increased yield
- Improved standability
- Reduced risk of stalk rot
- Increased grain protein
- Faster crop drydown

For more information about N-Serve® visit www.NitrogenStabilizers.com or contact your local Dow AgroSciences sales representative.



NutriSphere-NH3™
specifically formulated
to protect anhydrous
ammonia applications



Providing long-lasting protection of anhydrous ammonia

NutriSphere-NH3™ is a new formulation specifically designed to protect nitrogen applied as anhydrous ammonia from being lost through nitrification.

NEW WAY TO PROTECT N

NutriSphere-NH3 provides a number of performance benefits and advantages, including:

- Protects anhydrous ammonia applications against loss through nitrification; reducing nitrate leaching and denitrification
- Application rate of 32 Fl. Oz./A creates a fixed, cost-efficient investment per acre
- Easy to handle and use formulation with very little odor
- Unique dual-injection delivery system is specifically designed for optimum application and ease of use with anhydrous ammonia

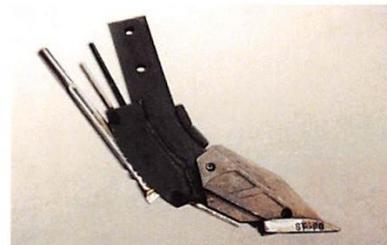
PROVEN NUTRISPHERE-N® PERFORMANCE

- NutriSphere-N® Nitrogen Fertilizer Manager is a proven technology that has been used on more than 34 million acres
- NutriSphere-N protects against loss to volatilization, leaching and denitrification by keeping more nitrogen in its stable ammonium form for a longer period of time
- Long lasting protection up to 10-12 months



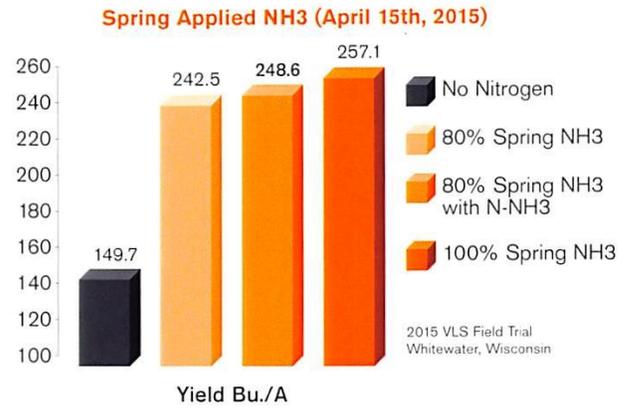
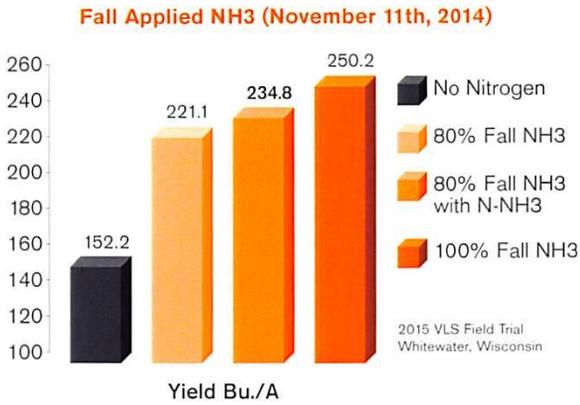
APPLYING NUTRISPHERE-NH3 WITH DUAL INJECTION

- Equipment Details:
 - The dual application system features special knives (shown below) and application tubes allowing for precise placement of NutriSphere-NH3 one-half inch above the anhydrous in the soil.
 - The SureFire Ag Systems' constant flow pump and electromagnetic flowmeter allow for precise amounts (98%+ accuracy) of material to be applied regardless of speed.



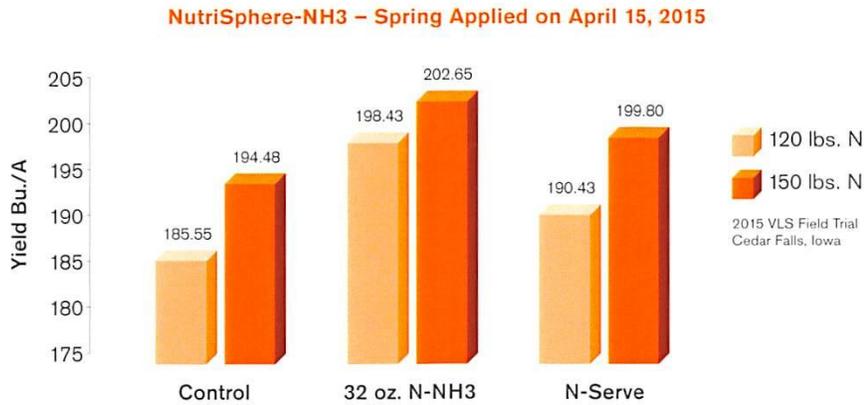
Dual application knife from Shield Ag Equipment.

RIGHT APPLICATIONS AT THE RIGHT TIME



Timing is critical – Fall N loss was high, resulting in a high return for NutriSphere-NH₃.

SPRING APPLIED ANHYDROUS AMMONIA



NUTRISPHERE-N® HV

A VERDESIAN NUE SOLUTION™

NutriSphere-N® HV Nitrogen Liquid Fertilizer Manager keeps more nitrogen available for plant uptake and impacts all three forms of N loss. This helps contribute to higher yield potential and can reduce the amount of nitrogen that winds up in surface or ground water through runoff and leaching.

CHEMISTRY

- Shields nitrogen on a molecular level by inhibiting enzymes and keeping more nitrogen in the more immobile ammonium form for a longer period of time
- Provides long-lasting protection against volatilization and leaching
- Provides long-lasting protection for high volume liquid fertilizers

KEY BENEFITS

- Formulated specifically for liquid nitrogen fertilizers
- Protects against three forms of nitrogen loss
- Protects soil health and water quality

HANDLING AND APPLICATION

- NutriSphere-N HV was designed for high-volume UAN application rates of 15 gallons per acre or greater
- Easy to use, easy to handle
- Easy application via applicator or fertigation

OTHER KEY POINTS

- Used on more than 46 million acres in 40 states
- 3.6 ROI in responsive sites



REGION

All



CROP

Row and Specialty Crops



TIMING

Preplant, Post Plant Broadcast, Siddress, Post Direct (V-Drill)



RATE

.64 oz/gal UAN up to 18 oz./ac.



PACKAGE

2.5 gal, 250 Gal. Tote, Bulk



ASK US ABOUT THE VERDESIAN

**PERFORMANCE
GUARANTEE**

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UNTREATED CHECK 60GPA 28-0-0-5



NUTRISPHERE-N HV 18OZ/A 60GPA 28-0-0-5



NutriSphere-N and HV combined Trials 2013-2017

25

20

50 Sites (~200 replications)
37 wins (74%)
5.65 bu/a increase all sites
9.98 bu/a increase responsive sites

15

10

5

0

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

-95

-100

-105

-110

-115

-120

-125

-130

-135



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AVAIL[®]T5

A VERDESIAN NUE SOLUTION™

AVAIL[®] T5 uses patented polymer technology to make applied phosphorus (P) more available for plant uptake, speeding early growth, making crops healthier and boosting yields – while continuing to reduce the amount of P lost to the environment. The improved formulation also means better handling, storage and ease-of-use.

IMPROVED PHOSPHORUS EFFICIENCY

- More phosphate uptake means stronger roots/shoots and better early performance
- Better stress tolerance for early-season performance
- On average, 45% more P available depending on soil type

POWERED BY NEW GENERATION T5 (TETRA) POLYMER

- More Effective Charge (8-24% in agronomic pH range)
- AVAIL T5 has a negative charge that provides the material with a high cation exchange capacity (CEC), about 4x that of humic acids
- Enhanced 3D polymer structure

IMPROVED FORMULATION AND APPLICATION

- Improved efficacy across range of soil pH and more consistent across all soil types
- Better handling, storability, and ease-of-use
- Use to treat broadcast, banded, and in-furrow Phosphorus applications
- Available in both liquid and granular formulations



REGION

Midwest



CROP

Corn, cereals,
soybeans and cotton



TIMING

Pre-season, Planting, In-Season



RATE

Granular: 2 qt./ton
Liquid: 2 qt./100 Gal.



PACKAGE

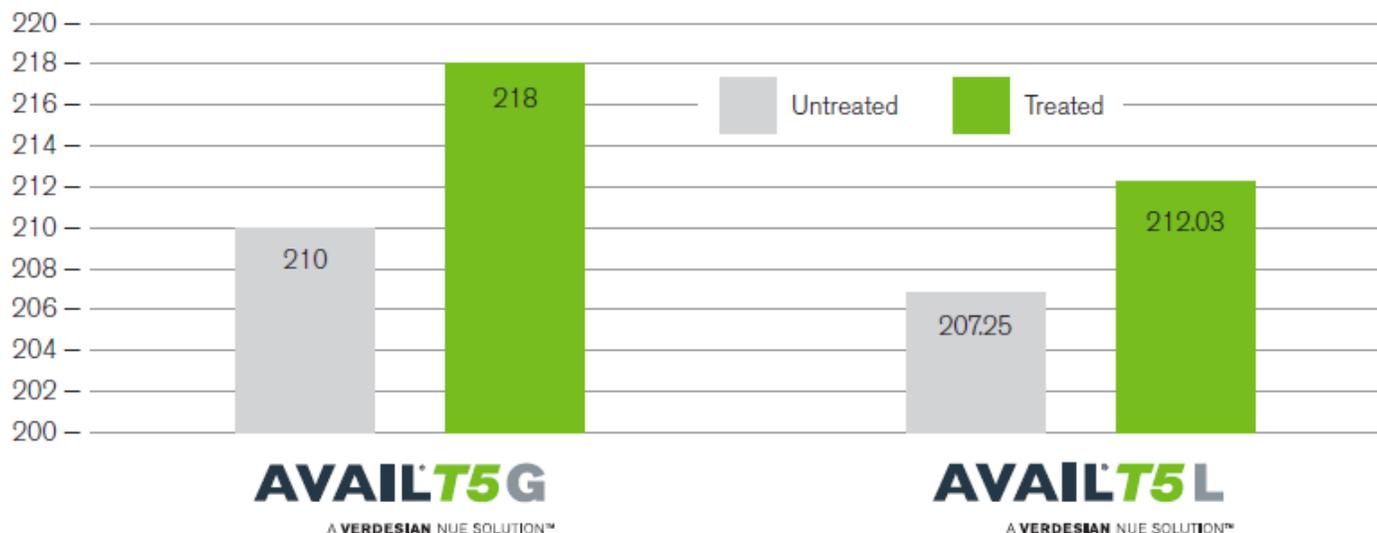
2.5 Gal., 250 Gal. Tote, Bulk

AVAIL T5 G: USE GUIDELINES FOR GRANULAR P FERTILIZER AT FULL RATE

pH	SOIL TEST PHOSPHORUS RATING				
	Very Low	Low	Medium	High	Very High
< 5.0	5	5	4	3	3
5.1-5.7	5	5	4	3	2
5.8-6.2	5	4	3	2	2
6.2-6.8	3	3	3	2	1
6.8-7.4	5	4	3	2	2
7.4-8.0	5	5	4	3	2
> 8.0	5	5	4	3	3

FULL RATE PHOSPHORUS		
AVAIL T5 ROI Rating	Expected Probability of Positive ROI	Expected ROI
5	> 95%	5x +
4	> 90%	3x-5x
3	> 80%	2x-4x
2	> 60%	1.5x-2x
1	> 40%	.5x-1.5x

2018 CORN DEMO TRIALS FROM 30 SITES (79% WIN RATE):



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MicroSync Pro™

MicroSync Pro™ Granular Micronutrient Fertilizer is formulated for use in broad acre crops and designed to be blended with NPK granular fertilizer programs. This combination micronutrient formulation is a free flowing, low dust, and uniform granular fertilizer, which contains a unique combination of Sulfates and Sucrates for enhanced microbial activity and bioavailability. MicroSync Pro boosts soil fertility programs by providing a superior balance of nutrients precisely formulated to prevent or correct micronutrient deficiencies.

WHY MICROSINC PRO?

- **Verdesian Polymer Technology** and carboxylates synergize micronutrient and sulfur availability for plant uptake
- **Nutripaction® Technology** — Uniformly blended combinations of finely divided particles compacted together produces homogeneous granules consistent in particle size and analysis. In the soil, Nutripaction® granules are activated by soil moisture creating millions of particles within the root zone for conversion and uptake
- **Balanced nutrient formulations** designed with your crop in mind, delivering three critical micronutrients and sulfur
- **Ideal for blending** with NPK fertilizers with an ideal spread pattern at 10-40 lbs. per acre
- **Matches particle size and bulk density** of most dry fertilizers for a more uniform distribution of critical nutrients

DIRECTIONS FOR USE:

MicroSync Pro is intended for use in mixing or blending with other fertilizer materials. This product is recommended for correction of multiple deficiencies, as determined by tissue analysis and soil testing, on any agricultural or horticultural crop where a deficiency of Boron, Manganese and/or Zinc may exist. When deficiencies exist, use the following table or consult your local agricultural extension professional or your local professional consultant. This product is for soil application only.

Amount of MicroSync Pro per Acre will provide "x" lbs of nutrient per acre				
	10 Lbs/Acre	20 Lbs/Acre	30 Lbs/Acre	40 Lbs/Acre
Sulfur	0.95	1.90	2.85	3.80
Zinc	0.75	1.50	2.25	3.00
Manganese	0.50	1.00	1.50	2.00
Boron	0.12	0.25	0.37	0.50



GUARANTEED ANALYSIS:

- Calcium (Ca) 7.0%
- Sulfur (S) 9.5%
- Boron (B) 1.25%
- Manganese (Mn) 5.0%
- Zinc (Zn) 7.5%

Derived from: Ammonium Sulfate, Calcium Sulfate, Sodium Borate, Manganese Sulfate, Zinc Sulfate and Zinc Sulfate

APPLICATION RATES PER ACRE:

- MILD** deficiency 10-15 lbs.
- MODERATE** deficiency 15-25 lbs.
- SEVERE** deficiency 25-40 lbs.

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein.

NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

Micro Products, Macro Results®

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Tomorrow's Science Delivering Today's Returns

WARNING! Excessive amounts of Boron may cause injury to crops. This product is intended for use in further blending with agricultural grade fertilizers and should be applied evenly. Application equipment should be calibrated to insure targeted rates of application. Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm>. MicroSync Pro is a trademark and Nutripaction is a registered trademark of Verdesian Life Sciences. Important: Always read and follow label use directions. © 2017 Verdesian Life Sciences. All rights reserved. VLS 170391





Take Off[®] LS

BUILD BIGGER PLANTS FROM THE INSIDE OUT



**Plant health is the key to higher yields.
Set your crop up for success with our revolutionary
new nutrient management technology that helps
build bigger, stronger plants from the inside out.**

ENERGIZE YOUR CROPS WITH TAKE OFF LS

It works inside the plant to increase nutrient uptake, resulting in:



**Faster germination
and emergence**



**Stronger,
healthier plants**



**More efficient
use of nutrients**



**Greater yield
potential**

Take Off[®] LS



HOW IT WORKS

By mimicking a naturally-occurring molecule that optimizes a plant's nitrogen acquisition, Take Off LS allows plants to more efficiently assimilate nitrogen and carbon to build a bigger, more vigorous plant. The end result is more overall nutrient uptake and nutrient use efficiency, leading to more bushels per acre produced per unit of nutrients applied to or present in the soil.

BENEFITS

A stronger, more uniform crop emergence and more rapid early growth, resulting in treated plants that have more biomass and that are one or more growth stages ahead of untreated plants by mid-season

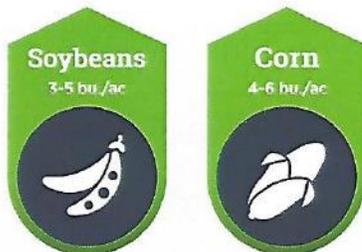
(IN-FURROW APPLICATION)

Greener, taller plants with more leaf area than untreated counterparts (FOLIAR APPLICATION)

Vigorous, darker green corn that reaches reproductive stage several days before untreated plants

(SIDEDRESS-APPLIED WITH UAN)

PROVEN RESULTS



Trials conducted in 2016 in IA, IL, TN and WI found that soybeans and corn treated with a foliar application of Take Off LS at post-emergence yielded significantly more bushels per acre than their untreated counterparts.

APPLICATION GUIDELINES

	In-furrow applications	Foliar	Side-dress/layby fertilizer
Corn	✓	✓	✓
Soybeans	✓	✓	
Wheat, rice, barley & other cereals		✓	
Cotton	✓	✓	
Alfalfa hay & forage crops		✓	
Canola		✓	

Take Off LS is a flexible nutrient use efficiency product that can be applied at multiple timings, either alone or in a tank mix with commonly-used fertilizers or crop protection products.

Our data shows that the most consistent yield performance and ROI has come from applications made at planting to mid-season, regardless of the crop.

While you don't need to apply more than once per season, field experience and trial data indicate that multiple applications throughout the year can provide additional benefits in plant health and yield.

RECOMMENDED APPLICATION RATES

	Single application	Multiple applications
Low rate: 1 pt/ac		✓
High rate: 2 pt/ac	✓	✓

FOR MORE INFORMATION

Call **800.868.6446** or visit **vlsci.com** to find your local specialist.



Reduce nitrogen loss and improve phosphorus availability from manure.

more than manure[®]

Nutrient Manager

More Than Manure[®] (MTM[®]) Nutrient Manager is the only product on the market proven to reduce phosphorus lock-up and nitrogen loss from volatilization, leaching and denitrification when applied to manure. By reducing valuable nutrient loss from your manure applications, it can help you see better overall crop performance and increased yield potential.

APPLICATION METHOD

LIQUID MANURE SYSTEMS:

- MTM can be added to pits or lagoons that are 25% full or a minimum of 14 days prior to agitation and pumping.
- If MTM cannot be added 14 days before pumping, add product to the load-out truck or honey wagon during fill.

DRY MANURE SYSTEMS:

- Apply directly over the top of dry manure already spread in the field along with at least 15 gallons of water or liquid fertilizer.

APPLICATION RATE

18 oz. per acre

RATE CALCULATION FOR LIQUID MANURE

$$\frac{\text{\# Gallons in pit, lagoon, load-out truck or honey wagon}}{\text{\# Gallons of manure applied per acre}} \times \frac{18 \text{ oz./acre rate}}{128 \text{ oz./gallon mix}} = \text{Gallons of MTM required for pit, lagoon, load-out truck or honey wagon}$$

CORN TRIALS (ALL MANURES)



- Reduces phosphorus lock-up in the soil
- Protects nitrogen from volatilization, leaching and denitrification
- Can reduce ammonia levels in confinement facilities
- Can reduce solids and crusting in pits or lagoons
- Non-toxic to livestock and soil bacteria
- Crop rotation flexibility

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Tomorrow's Science Delivering Today's Returns

*Data on file.
Important: Always read and follow label use directions.
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Wake up your crops.

Good morning sunshine. It's time to wake up your crops with Advantage Plus® a complete starter, with more vital nutrients than 10-34-0. Protect your yield, have more consistent emergence and start strong.



Advantage Plus TM



Fall Spraying Recommendations

Pasture

Remedy Ultra	1 pt/ac
Milestone	5 oz/ac
Pasturegard HL	1 ½ pt/ac
Grazon P+D	1 qt/ac
Tordon	1 pt/ac
Grazon Next HL	2 pt/ac
Chaparral	3 oz/ac

**All products should be mixed with
surfactant.**



DuraCor™
HERBICIDE

GrazonNext® HL
HERBICIDE

Chaparral™
HERBICIDE

Visit us at rangeandpasture.com

Wheat Programs

Greenup

	<u>Rate/Acre</u>
Urea	80 lbs. N + NutriSphere + 1 pint TAKEOFF LS
UAN	70 units with Nutrisphere HV + 1 pint Takeoff LS
Finesse	.3 oz/acre
Harmony Extra	.6 -.9 oz/acre

Wheat Hi-Yield Program

1st topdress 70 lbs. N + NutriSphere + 1 pint TAKEOFF LS

2nd trip: Fungicide + 1 pint TAKEOFF LS

At Flag Leaf

Trivapro	Fungicide
or	
Priaxor	Fungicide



Wheat Fungicide Application Timing

<u>Fungicides</u>	<u>Apply at</u>	<u>Rate</u>
Priaxor	Feekes 4-6	4 fl oz/ac
Trivapro	Feekes 8	13.7 oz/ac
Approach Prima	Feekes 9	6.8 oz/ac

Wheat Recommendations

Starter Recommendations

50-46-60-15-1 with AVAIL

18-46-60-15-1 with AVAIL

Burndown/Preplant

Finesse .3 oz/ac

Powermax 32-44 oz/ac

Quelex .75oz/ac

Fungicide

Trivapro 13.7 oz/ac

Priaxor 4 oz/ac

Prosaro 6.5-8.2 oz/ac

Stratego Yield 2-4 oz/ac

Approach Prima 6.8 oz/ac

All fungicide to be applied at flagleaf to full head emergence.

Corn Recommendations

Starter for Grain

80 bushel removal	12-30-24-6-3 with AVAIL
90 bushel removal	13-34-27-6-3 with AVAIL
100 bushel removal	15-38-30-7-3 with AVAIL
120 bushel removal	18-46-36-8-3 with AVAIL
140 bushel removal	21-53-42-10-3 with AVAIL
160 bushel removal	24-61-48-11-3 with AVAIL
180 bushel removal	26-68-54-13-3 with AVAIL
200 bushel removal	30-76-60-14-3 with AVAIL

Starter for Silage

10 ton/ac	10-27-65-9-3 with AVAIL
20 ton/ac	21-54-130-18-3 with AVAIL
30 ton/ac	31-80-195-27-3 with AVAIL

Fall Spraying

Atrazine 4L	1 qt/ac
Atrazine 90 DF	1.1 lbs/ac
Hornet	4 oz/acre
Autumn Super	.5 oz/ac
Valor SX	2 oz/ac
Basis blend	.825 oz/ac

All products to be applied with 1 pt/ac of dicamba or 1 qt/ac 24D LV6.

A soil sample is highly recommended to achieve the appropriate fertilizer recommendation.

Soybean Recommendations

Starter

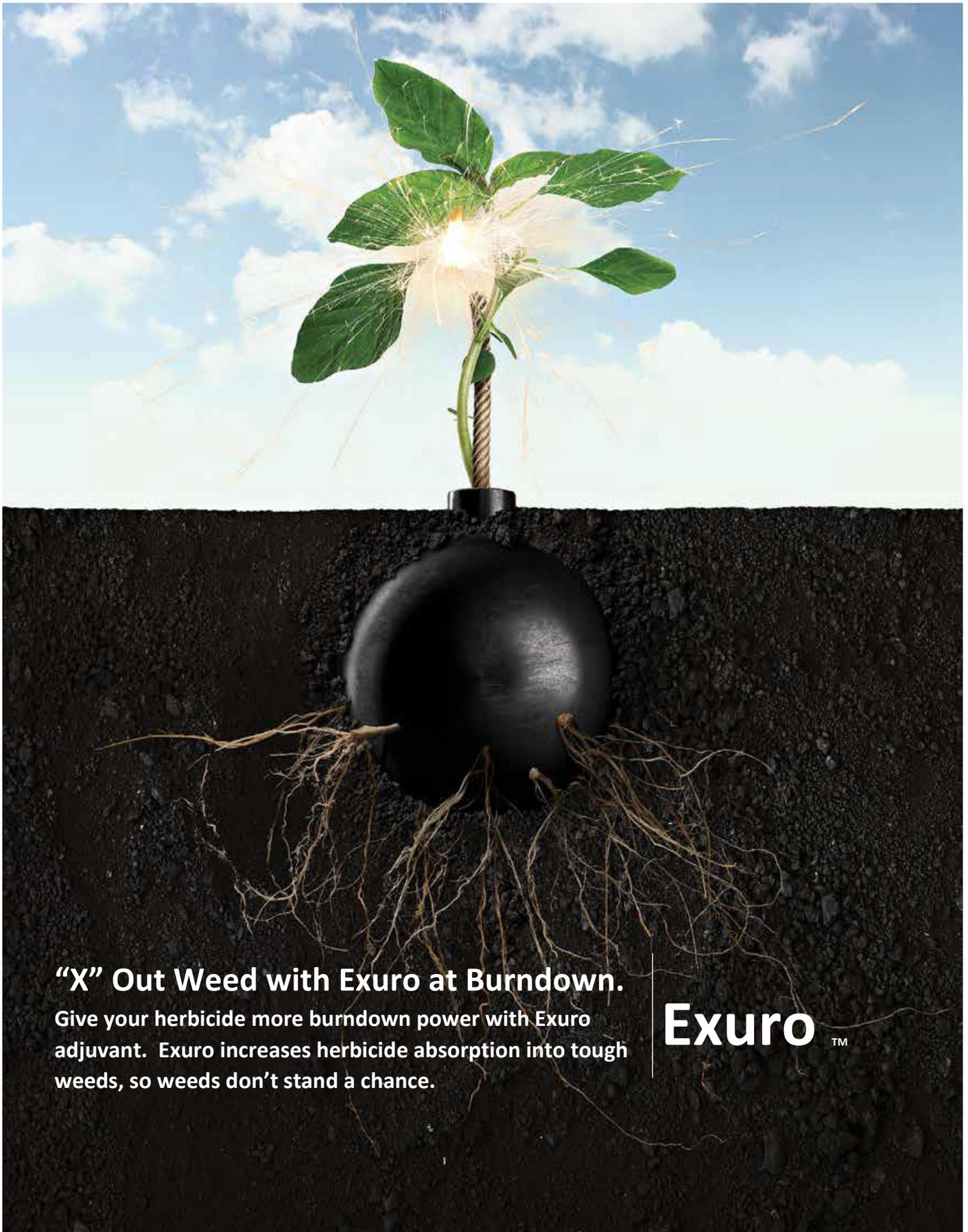
30 bushel removal	9-24-42-7 with AVAIL
40 bushel removal	12-32-56-9 with AVAIL
50 bushel removal	15-40-70-11 with AVAIL
60 bushel removal	19-48-84-13 with AVAIL

Fall Spraying

Sonic	5-6 oz/ac
Valor XLT	3 oz/ac
Metribuzin	16 oz/ac
Blanket 4F	4-6 oz/ac
Autumn Super	.5 oz/ac

**All products to be applied with 1 pint/acre Dicamba or
1 quart/acre 24D LV6.**

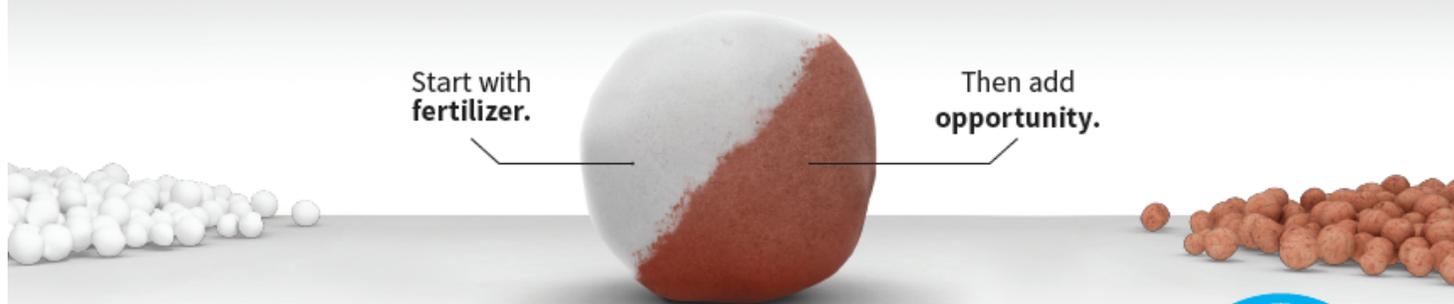
**A soil sample is highly recommended to achieve
the appropriate fertilizer recommendation.**



“X” Out Weed with Exuro at Burndown.

Give your herbicide more burndown power with Exuro adjuvant. Exuro increases herbicide absorption into tough weeds, so weeds don't stand a chance.

Exuro TM

INNOVATIVE NUTRIENTS


ZINC DDP[®]


PRODUCT DESCRIPTION

Wolf Trax™ Zinc DDP combines two forms of Zinc into a Dry Dispersible Powder, or DDP, with a proprietary adjuvant package to achieve synergy with a carrier for improved plant uptake. Wolf Trax Zinc is delivered along with every granule and prill, providing more feeding sites in closer proximity to plant roots for earlier uptake.

Guaranteed Analysis	
Zinc (Zn) 11.00% Water Soluble	62.00%

Derived from: Zinc Oxide and Zinc Sulfate

Product Specifications		
Appearance	Color	Carrier Load (w/w)
Powder	White	0.80%

Typical Carriers: 15-15-15, DAP, MAP, MKP, MOP, SOP, Urea and others

Carrier Amount	Wolf Trax Zinc DDP (max)	Elemental Zn
1 Ton (2,000 lbs.)	16 lbs.	9.92 lbs.

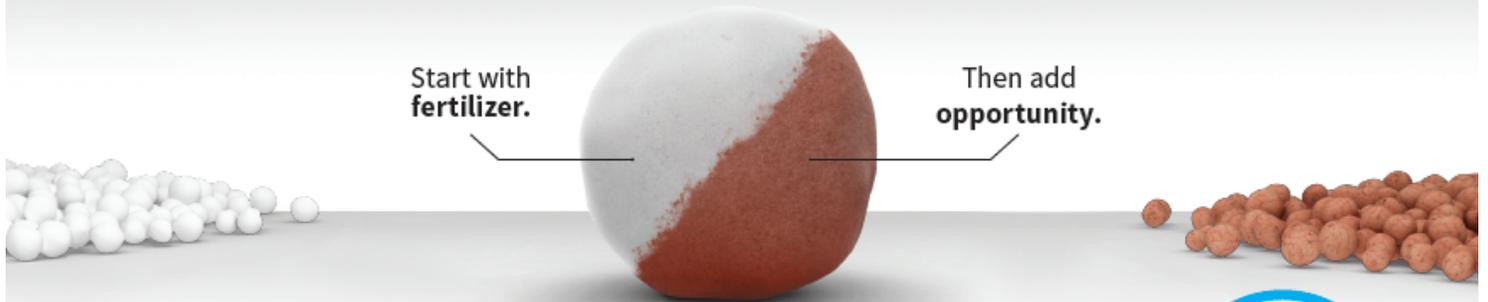
KEY BENEFITS

- Adheres to carriers with EvenCoat® Technology, through the combination of electrostatic interaction and the aid of a proprietary adjuvant blend
- Extends window of availability by combining two sources of Zinc
- Increases root absorption of non-soluble Zinc by milling which multiplies the reactive surface area
- Extends the zone of Zinc availability through the combination of soluble and non-soluble forms
- Increases the number of interception points for roots to access bioavailable Zinc early in the growing season
- Provides flexibility in storage, transport and blending

NOTES



INNOVATIVE NUTRIENTS



BORON DDP[®]



PRODUCT DESCRIPTION

Wolf Trax™ Boron DDP combines three forms of Boron into a Dry Dispersible Powder, or DDP, with a proprietary adjuvant package to achieve synergy with a carrier such as fertilizers for improved plant uptake. Wolf Trax Boron is delivered along with every granule or prill, providing more feeding sites in closer proximity to plant roots for earlier uptake.

Guaranteed Analysis	
Boron (B) 100% Water Soluble	18.50%

Derived from: Boric acid, Sodium Tetraborate and Potassium Tetraborate

Product Specifications		
Appearance	Color	Carrier Load (w/w)
Powder	Pink	0.40%

Typical Carriers: 15-15-15, DAP, MAP, MKP, MOP, SOP, UREA and others

Fertilizer Amount	Wolf Trax Boron DDP (max)	Elemental B
1 Ton (2,000 lbs.)	8 lbs.	1.48 lbs.

KEY BENEFITS

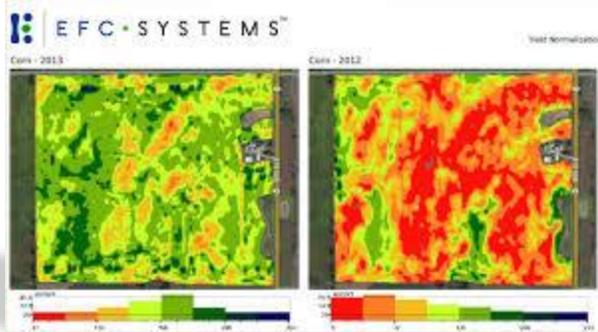
- Adheres to carriers with EvenCoat® Technology, through the combination of electrostatic interaction and the aid of a proprietary adjuvant blend
- Extends window of availability by combining three sources of Boron
- Increases root absorption of Boron by milling which multiplies the reactive surface area
- Increases the number of interception points for roots to access bioavailable Boron early in the growing season
- Even distribution in the field and around the carrier reduces the potential for Boron hotspots that can cause toxicity
- Provides flexibility in storage, transport and blending

NOTES



Field Advantage

OTTAWA COOP

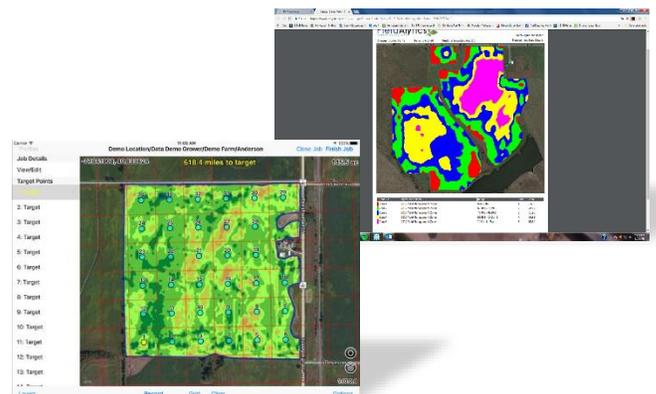


Why Precision Farming?

- Take inventory of fertility on each field.
- Stop throwing fertilizer \$ where it is not needed.
- Variable rate application technologies allow you to place the products only where needed to maximize crop productivity.
- Utilize Yield data and make it useful in fertility, seed, and production.
- Know the right placement of seed hybrids for maximum profitability.
- To be an overall better manager of all farming practices.

Solutions for Better Decision making

- Maximize economic yields by utilizing information based on sound decision making.
- Utilized multi years of information trends for decision making.
- Make hybrid/variety decisions based on your operations performance.
- Utilize multi-layers of information in analysis process.





Field Advantage
OTTAWA COOP

- Monitor fields from preplant burn down applications to dry down for harvest.
- Find problems at a minimal stage before it reaches the Economic Injury Level (EIL)
- Full team of agronomists develops the best treatments/recommendations.
- Best chance to maximize yield by catching problems early.



What's Included?

Weekly field checks

- Weeds, diseases, insects
- Deficiencies
- Growth stages, Population counts, Yield estimates
- Tissue/Soil Sampling for nutrient monitoring
- General crop health monitoring

Call the **Ottawa Coop Production Office** for further information if interested. (785) 242-1032

SEED



Offering Stine Enlist E3 Soybeans which offer robust tolerance to Enlist One (New 2,4-D Choline), Glyphosate, and Glufosinate herbicides. New this year we will also be carrying the newest trait platform of Asgrow Xtendflex Soybeans, they include the Roundup Ready 2 Xtend system with added Glufosinate tolerance. Ask about our aggressive early order pricing and discounts.

Cover Crops

Cereal Rye: \$12/50lbs (Bulk or Bulk Bags)
\$14/bag (56lb bags)

Turnips/Radish: \$90/bag (50lbs)

Triticale: \$12.50/50lbs (Bulk or Black Boxes)
\$13.25/50lbs (Bulk Bags)
\$13.50/bag (50lbs)

Cover Crop Blend: \$25/50lbs (Bulk or Bulk Bags)
\$27/bag (50lbs)

Contains 46lbs Cereal Rye, 2lbs Turnips, 2lbs Radish per 50lbs
50lbs/acre recommended plant rate

Cover crops can be applied by plane or ground rig through us if needed. Application charges will apply. Special mixes can be ordered, call for pricing and availability.

Calvin Wenger
Seed Manager
calw@ottawacoop.com
620-504-2135

Corn Seed Treatment

Any amount of corn can be treated. All treated corn will be delivered in a black box even if only a small amount is treated. All treated corn is non-returnable.

Tripidity

- Blend of growth additives, sugars, amino acids, and micronutrients
- Enhances uniformity and quickness of germination
- Offsets early season nutrient deficiencies
- Contains an optimal combination of nutrients and plant hormones
- Reduces negative effects caused by environmental stresses
- Boosts early plant growth and development for higher yield potential

\$18/unit (Approx \$6/acre depending on plant population)

Corn Seed Treatment



TRIPIDITY™ ST

Tripidity ST biostimulant is a uniquely designed seed treatment that provides essential nutrients and biostimulant additives which can maximize early seedling vigor and crop development, for maximizing yield potential.

- Tripidity ST is a unique blend combining essential macro and micro nutrients and a proprietary blend of plant extracts to stimulate seed germination and to maximize early seedling growth and vigor. Tripidity ST also includes a balanced ratio of three hormones designed to work together to enhance seed germination and seedling establishment, provide stress reduction in cold soils, enhance cell elongation, and increase nutrient uptake for higher yield potentials.
- Multiple factors start affecting yield the moment the seed is planted. Treating seeds with an industry leading fungicide and insecticide, coupled with effective biostimulants will drive and increase yield.
- Germinating seedlings can only draw from the energy within the seed until the start of photosynthesis. Tripidity ST provides the building blocks for cell walls, membranes, and the components of key growth processes before the plant can create its own.

Balanced Ratio of Hormones

Cytokinin (Kinetin)

Stimulates cell division, involved in shoot growth, delays leaf senescence and activates dormant buds.

Gibberellic Acid (GA)

Stimulates seed germination, shoot elongation, flowering, and regulates production of hydrolytic enzymes in grains.

Indole-3-Butyric Acid (IBA)

IBA is an auxin that enhances root growth; involved in apical dominance, stimulates cell elongation, enhances fruit and seed development.

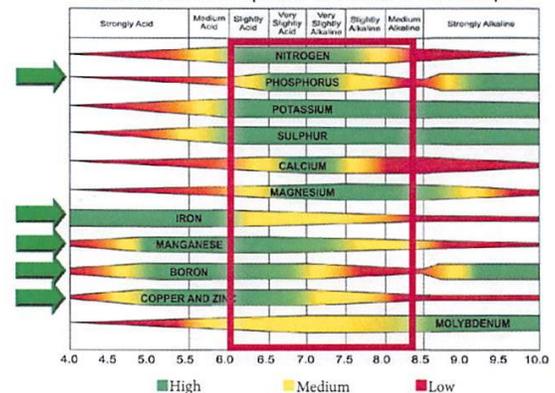
GUARANTEED ANALYSIS

0-0.70-0

Available Phosphate (P ₂ O ₅)	0.70%
Manganese (Mn)	0.05%
0.05% EDTA Chelated Manganese	
Boron (B)	0.50%
Iron (Fe)	0.10%
0.10% EDDHA Chelated Iron	
Zinc (Zn)	0.50%
0.50% EDTA Chelated Zinc	

Derived from: Diammonium phosphate, Manganese EDTA, Boron ethanolamine, Ortho-Ortho Iron EDDHA & Zinc EDTA.
EDTA is ethylenediaminetetraacetic acid.

Plant Nutrient Uptake in Relation to Soil pH



Biostimulants can increase yield by allowing the crop to perform at an optimum level, even under stress.



Soybean Seed Treatment Options

Rancona XT Plus (Fungicide)

- Protects seed from both seed-borne and soil-borne pathogens.
- Better chance of good stand
- Protection up to 3 weeks after planting



Rancona Complete (Fungicide/Insecticide)

- Contains all benefits of Fungicide treatment
- Added broad spectrum insect protection
- Up to 60 days of protection after planting, systemic so the product is absorbed into plant while growing.

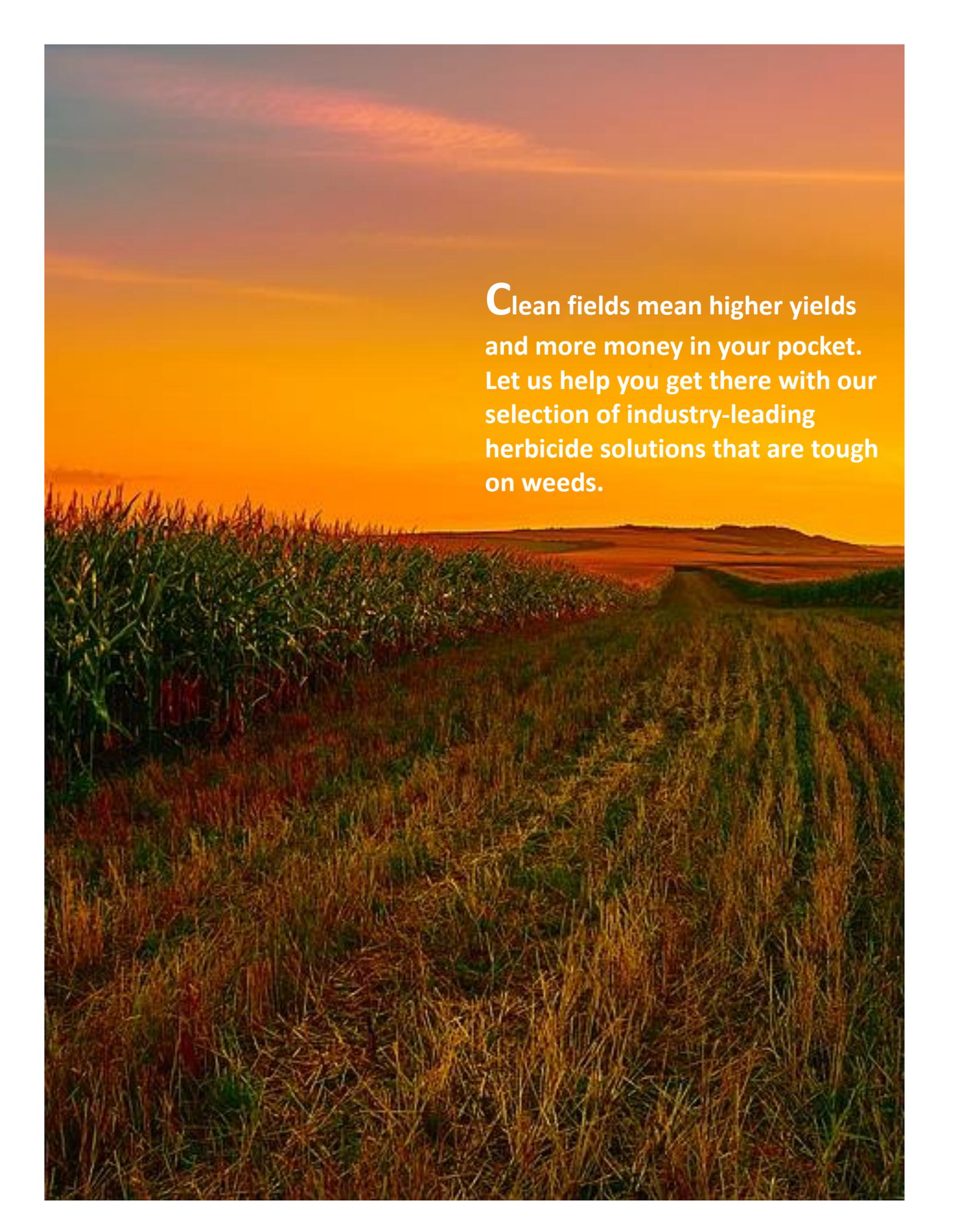


Preside CL (Inoculant)

- High count live rhizobia bacteria with up to 90 days on seed out of ground survival
- Increased emergence and nodulation
- Takeoff technology included for increased nitrogen utilization



Calvin Wenger
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Clean fields mean higher yields
and more money in your pocket.
Let us help you get there with our
selection of industry-leading
herbicide solutions that are tough
on weeds.