



VIGOR2YIELD

AGPLUS COOPERATIVE

2022 CROP GUIDE

VISION

Enhancing Patron Prosperity

MISSION STATEMENT

Adding value to the communities we call home.

CORE VALUES

- Customers first
- Operate with honesty and integrity
- Safety is a top priority for employees and customers
- Employee development
- Operate profitably while growing

Vigor 2 Yield Product Line Will Make the Difference

The AgPlus Cooperative Vigor 2 Yield Crop Guide contains all the details covering our extensive line of plant performance products; including use rates, applications and yield data supporting these high-quality products.

The **Vigor 2 Yield** line of products have been researched and proven by our partner manufacturers, universities and third-party cooperators. These nutritional products make a solid recommendation for all customers' cropping needs. AgPlus Cooperative is committed to bringing the best quality products to the market to maximize crop production.

You will have the peace of mind knowing AgPlus Cooperative has taken the guess work out of selecting products for your farm and rest assured that we will be here to provide you with the agronomic support you expect.








Thank you for your support, your trust and your business.









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Vigor 2 Yield Product Quick Reference Guide

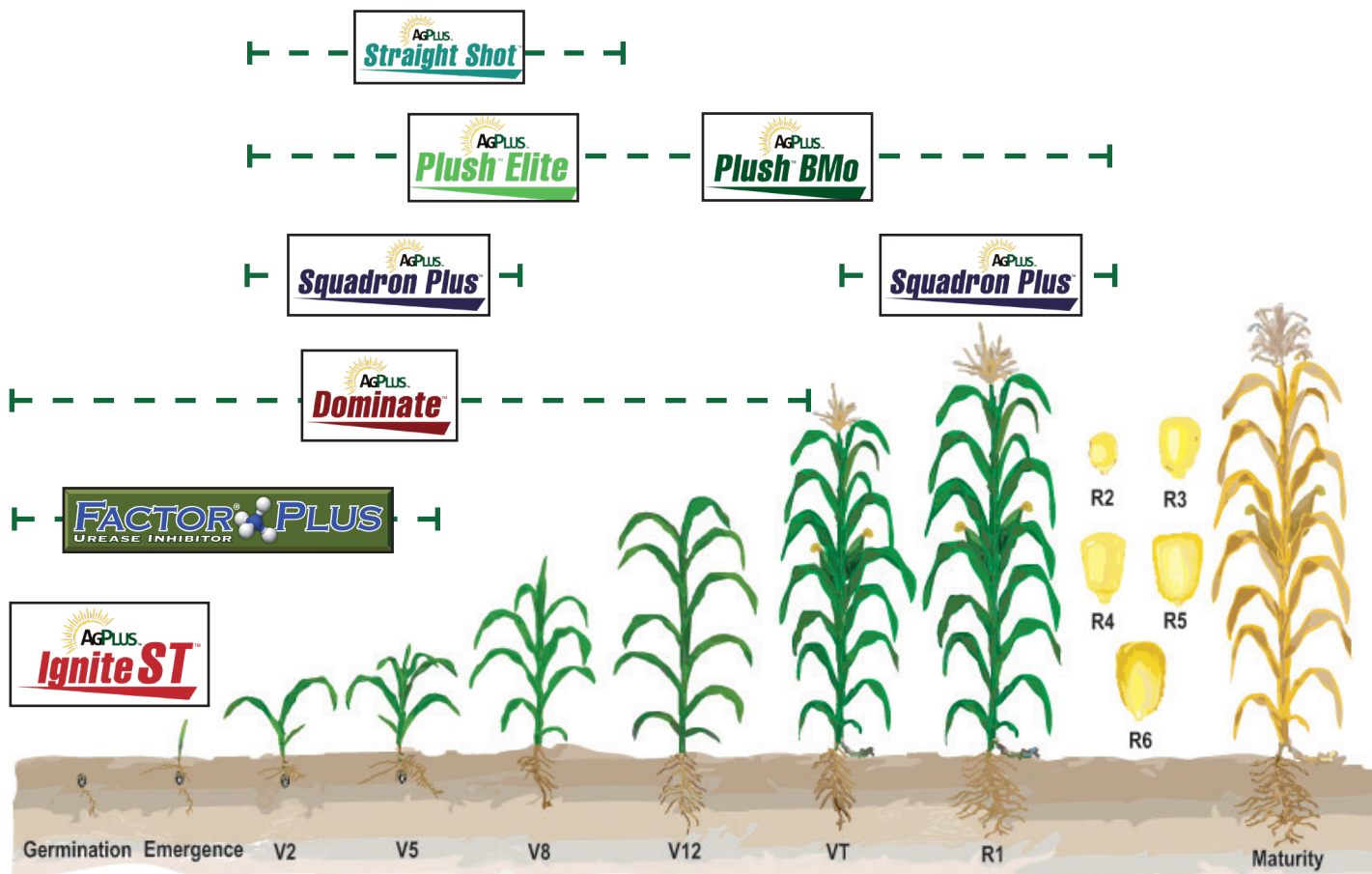
Product	Rates	Actives & Pounds/Gallon	Pkg. Size & Storage Temp	Comments
Seed Treatment				
	Corn - 2.4 oz/cwt Corn - 1.2 oz/80k Soy - 1.2 oz/cwt Soy - 0.6 oz/140k	Phosphorus - 0.7% Manganese - 0.05% Boron - 0.5% Iron - 0.1% Zinc - 0.5% Cytokinin, GA ₃ , IBA Amino Acid Package Glucose	2.5's <u>Corn</u> 1,487 unit Keg 2,700 unit DR. <u>Soybean</u> 2,975 unit Keg 5,400 unit DR.	Multiple mode biostimulant containing: Three production hormones to trigger even germination, a glucose food source, five nutrients specific to germination, and an amino acid package to improve assimilation of nutrients and water to and throughout the seed.
	Soybean: 1.45 fl oz/cwt	Ask your local AgPlus Representative	2 x 2.36 Gal 2,085 unit Keg	Ignite White Mold ST provides proven Systemic Acquired Resistance (SAR) to genetically protect soybeans with season long white mold protection.
Fertilizer Additives				
	4 grams/A	Premium Blend of 8 beneficial bacteria strains	4 x 40 acre case (160 A) Mag-Pak 20 lbs. (2,270 A)	Chasm FC is a premier microbial-based fertilizer catalyst that is designed to drive plant vigor and optimize yield potential.
	1 gal/100 gal	Polyamino Acid 38.2% 10.2 lbs/gal	265's 0°F	Shelter Plus is a phosphate fertilizer additive that is formulated to be added to liquid phosphate fertilizers. The unique proprietary polymer reduces phosphate fixation in the soil, leading to greater phosphate availability.
	3 qt/ton	Polyamino Acid 47.5% 10.8 lbs/gal	2.5's 265's 32°F	Shelter Ultra is a phosphate fertilizer additive specifically designed with to impregnate dry phosphate fertilizer. The proprietary polymer increases phosphate efficiency, micronutrient availability and plant uptake.
	2.06 qt/ton (Urea) 2.06 pt/ton (UAN)	NBPT 40.0% 9.21 lbs/gal	2.5's 250's 25°F	Factor Plus is a highly concentrated urease inhibitor for both UAN and Urea fertilizers. Use where above ground nitrogen loss occurs: pre-plant, side-dress or other surface applications. Volatility protection up to 14 days.
	1.5-3.0 pt/A	DCD 9.7 lbs/gal	2.5's 250's 0°F	Function is a nitrogen stabilizer that protects your applied nitrogen (Anhydrous, UAN, Urea and Manure) fertilizers from converting to nitrate and leaching through the soil profile.

Vigor 2 Yield Product Quick Reference Guide

Product	Rates	Actives & Pounds/Gallon	Pkg. Size & Storage Temp	Comments
Foliar Enhancements				
	4-8 oz/A	Cytokinin - 0.009% GA ₃ - 0.005% IBA - 0.005% 8.36 lbs/gal	2.5's 250's 40°F	Dominate is a powerful hormone based biostimulant with the right ratio and concentration of cytokinin, gibberellic acid and auxin to mitigate stress and improve yields across a wide range of crops and application timings.
	1 - 2 qt/A	Nitrogen - 7% Potassium - 1% Sulfur - 3% Iron - 1% Manganese - 2% Zinc - 2% + Crop Enhancement Components 10.8 lbs/gal	2.5's 250's 32°F	An enhanced blend of macro and micronutrients in combination with stress mitigation components. Plush Elite is formulated to supplement plant available nutrients to a wide range of crops throughout the growing season while crop stress protection.
	1-2 pt/A	Boron- 5.0% Molybdenum- 0.5%	2.5's 265's 32°F	Plush BMo is designed to provide an in-season foliar boron and molybdenum source critical for crop growth and development.
	8 oz/A	Dicarboxylic Acids + Crop Enhancement Components	2.5's 32°F	Stress mitigation technology fueled by Yield Breaker designed to increase stress tolerance and yield potential
	1-2 qt/A (2x2/Foliar) 2-8 qts/A (Soil Broadcast) 1-4 qts/A (Side-Dress)	Nitrogen - 8% Sulfur - 10% + Crop Enhancement Components 10.4 lbs/gal	2.5's 250's Bulk 32°F	A dynamic blend of sulfur and crop enhancement components that enhances nutrient uptake and increases plant health.
Yield Breaker Adjuvant				
	16 oz/A	Proprietary blend of ammonium sulfate, surfactants, polymers, crop enhancement components and antifoam	2.5's 250's 32°F	Industry first, yield increasing adjuvant that delivers premium drift reduction technology, superior water conditioning and an ultra efficient surfactant package.

USE GUIDELINES

-CORN-





V2Y CORN PROGRAM

SEED TREATMENT



IN FURROW



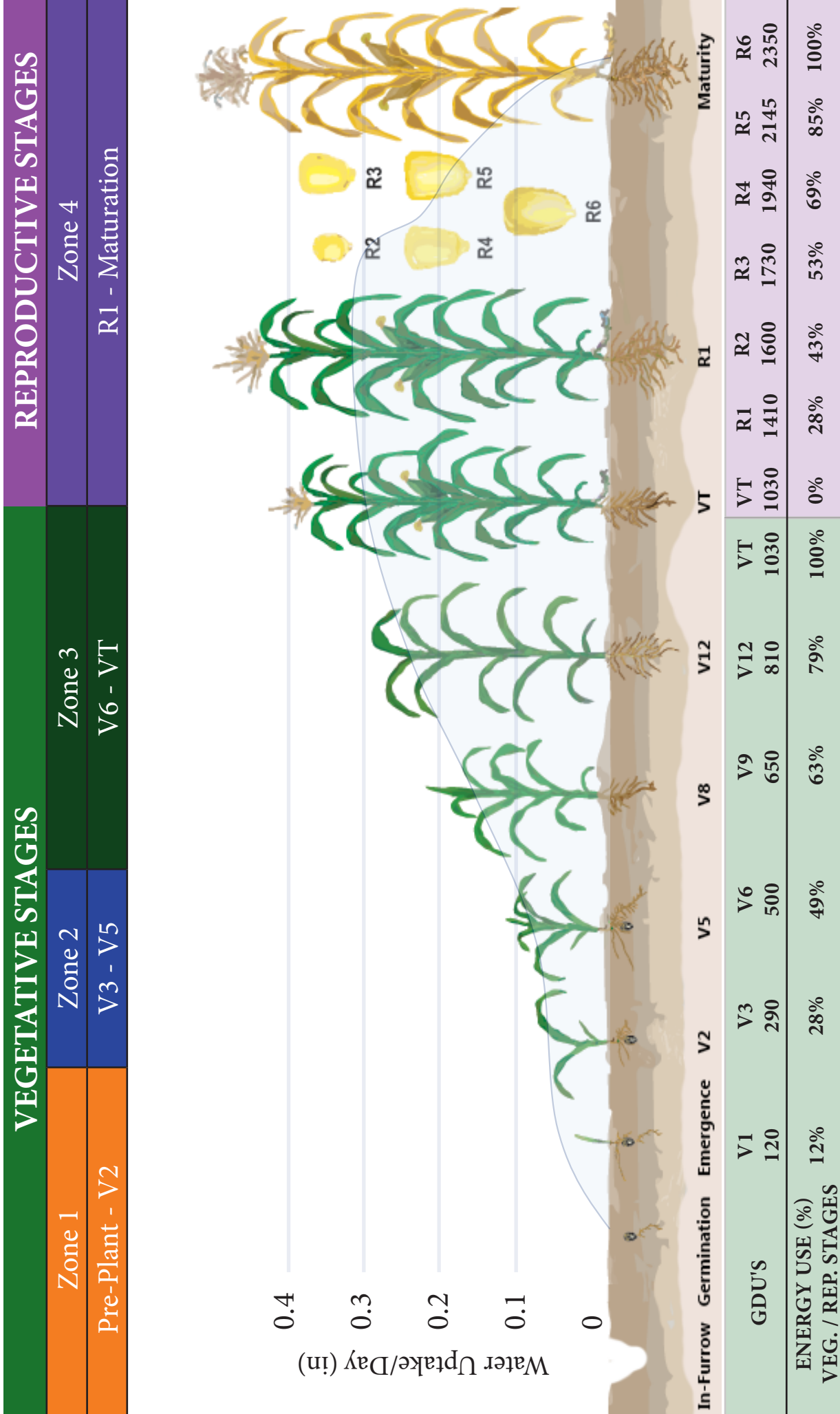
STARTER

EARLY POST (250-400 GDU)



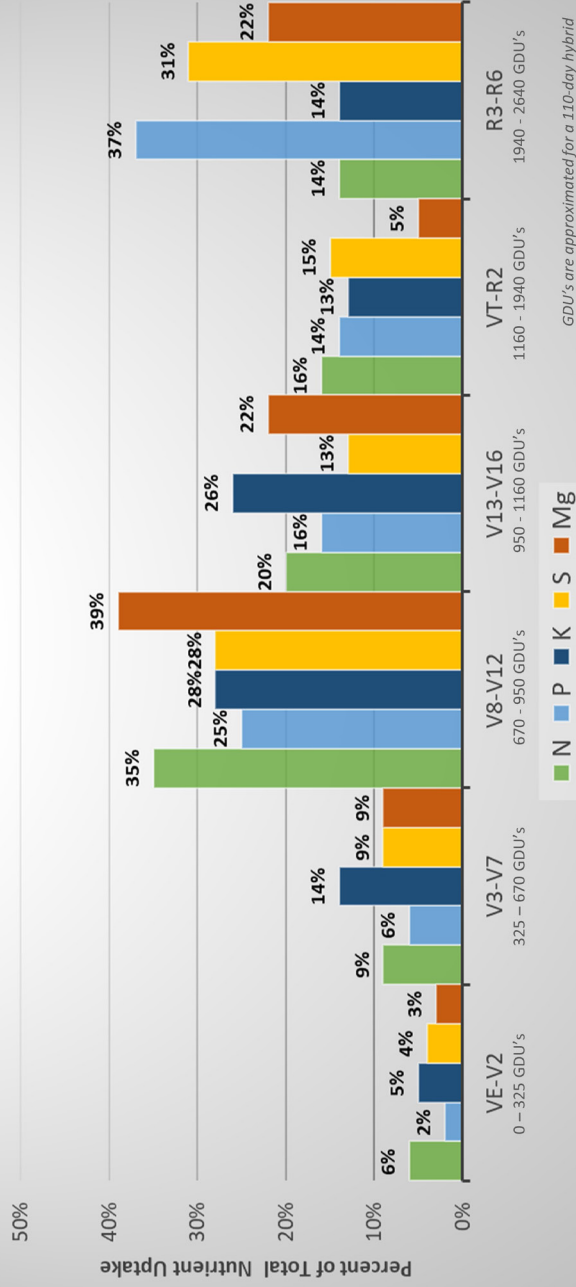
LATE POST (1000-1400 GDU)





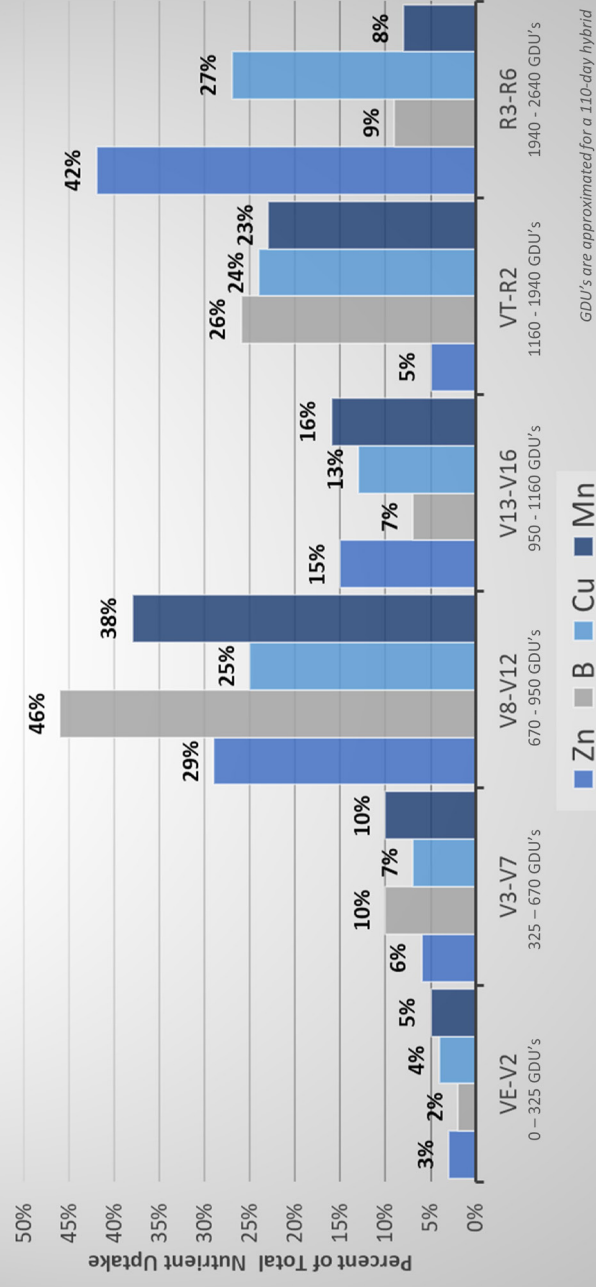
Corn Macronutrients: % of Total Uptake by Growth Stage

Information Interpreted from University of Illinois Nutrient Uptake Charts



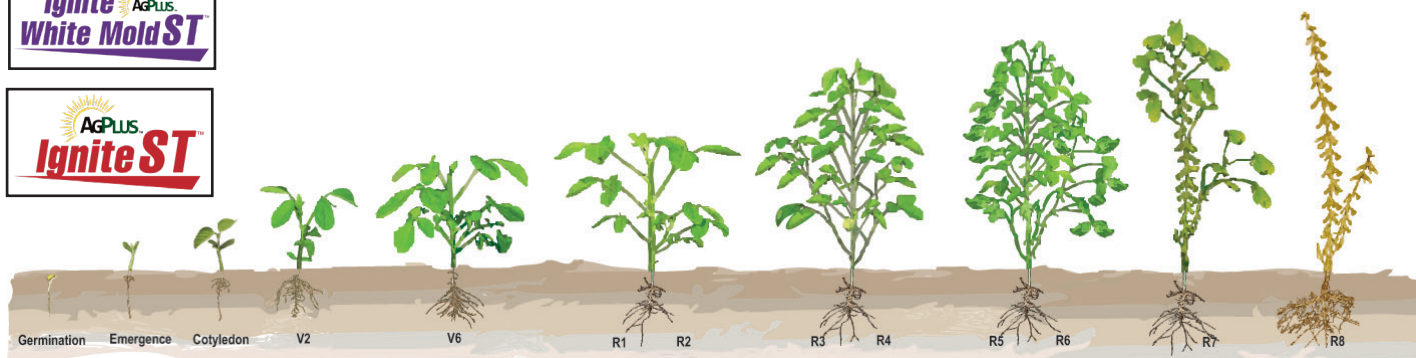
Corn Micronutrients: % of Total Uptake by Growth Stage

Information Interpreted from University of Illinois Nutrient Uptake Charts



USE GUIDELINES

-SOYBEAN-





V2Y SOYBEAN PROGRAM

SEED TREATMENT

Ignite AgPLUS
White MoldST

IN FURROW

AgPLUS
Chasm FC

AgPLUS
Shelter Plus

EARLY POST (300-500 GDU)

AgPLUS
Dominate

AgPLUS
Plush BMo

AgPLUS Yield Breaker
Straight Shot

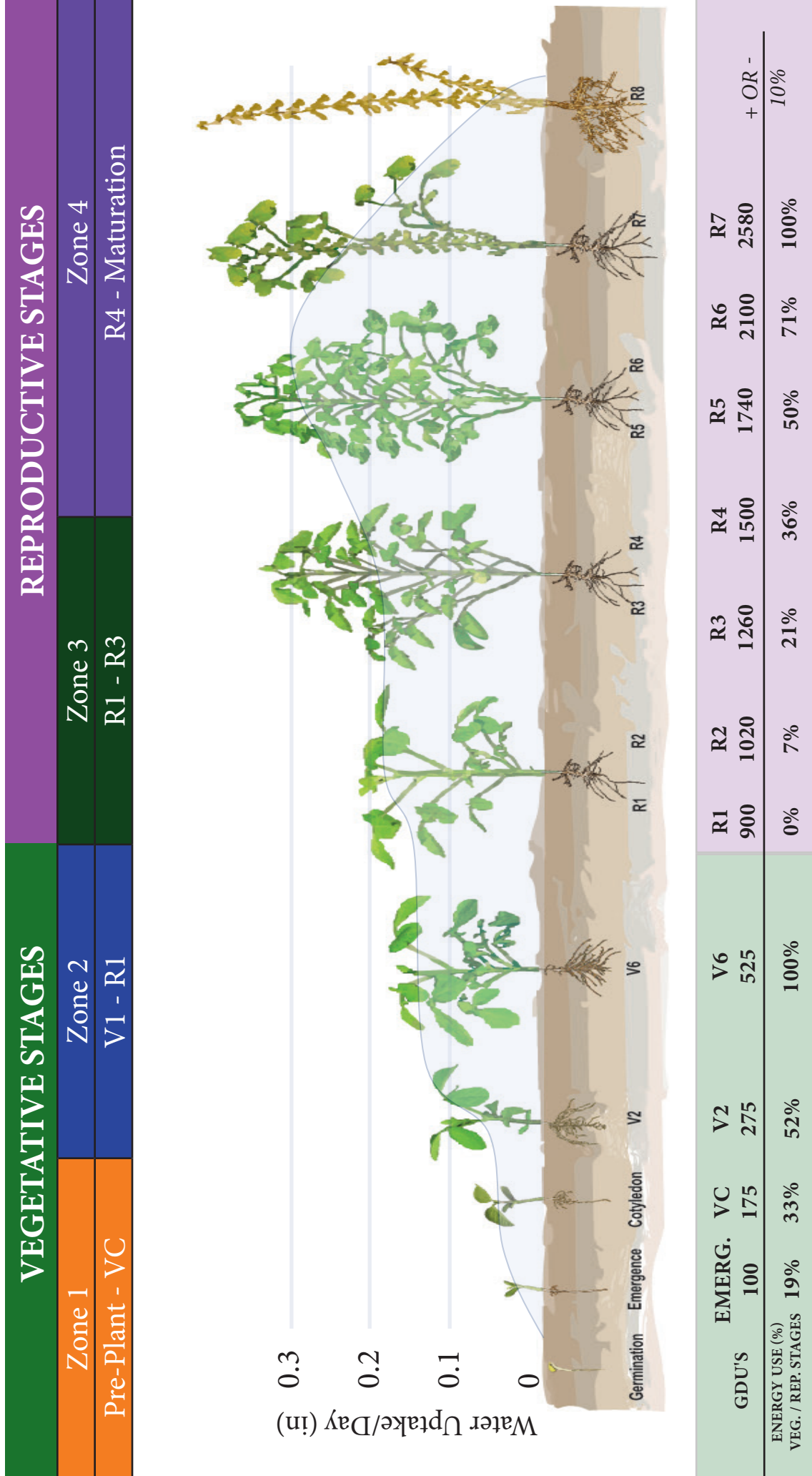
LATE POST (900-1150 GDU)

AgPLUS
Dominate

AgPLUS Yield Breaker
Plush Elite

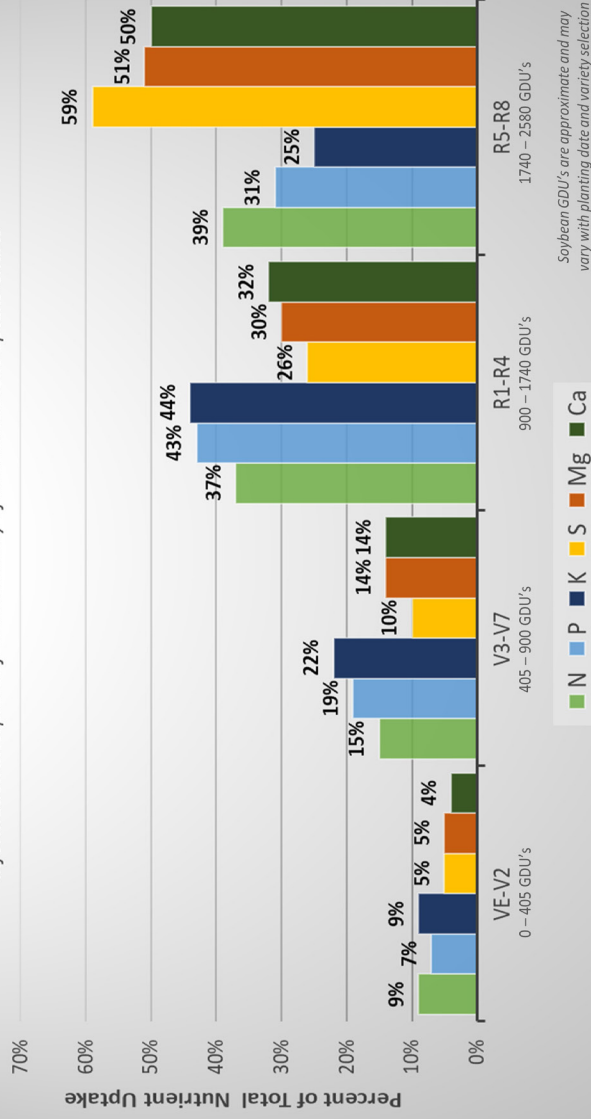
AgPLUS Yield Breaker
Straight Shot

 **Miravis[®] Neo**



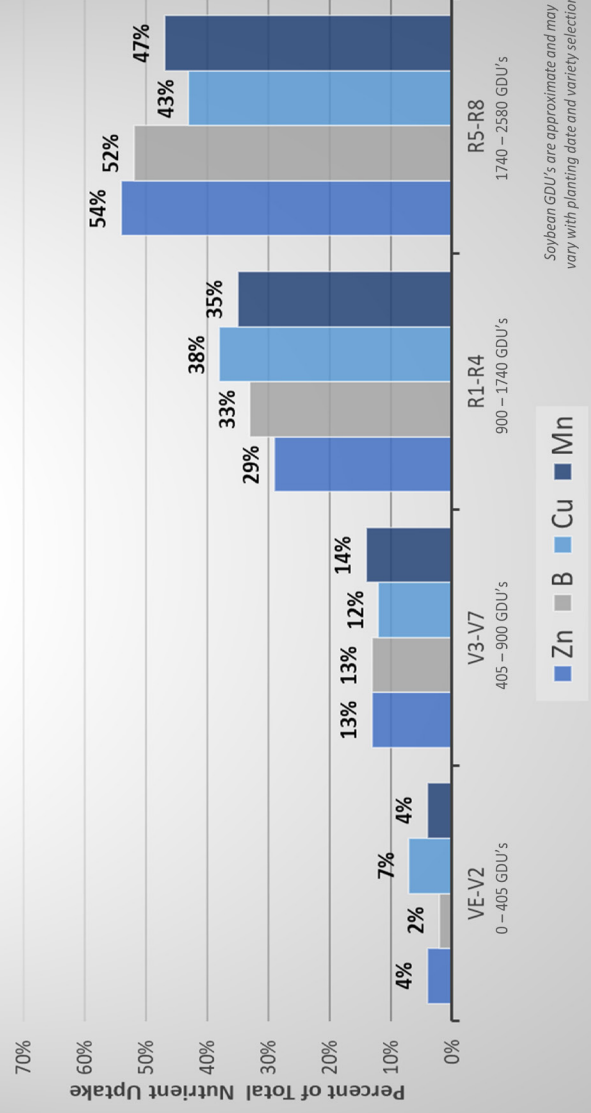
Soybean Macronutrients: % of Total Uptake by Growth Stage

Information Interpreted from University of Illinois Nutrient Uptake Charts



Soybean Micronutrients: % of Total Uptake by Growth Stage

Information Interpreted from University of Illinois Nutrient Uptake Charts



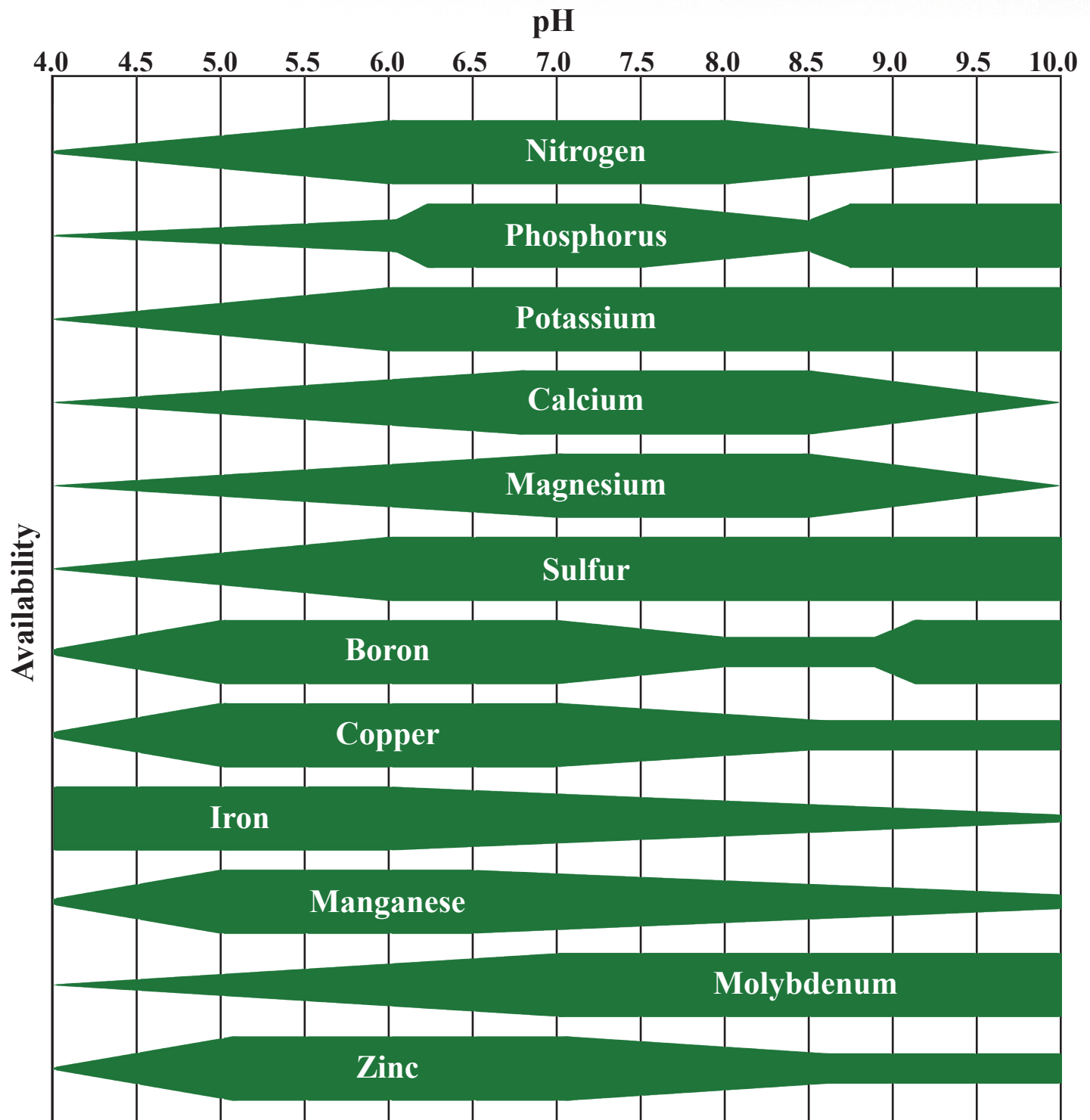
MACRONUTRIENT CHARACTERISTICS

Nutrient	Function	Mobile In		pH Effect on Availability
		Plant	Soil	
Nitrogen (N)	A constituent of many plant cell components, including amino acids, deficiencies rapidly inhibit plant growth.	Yes	Yes	Declines below 5.0 and above 8.0
Phosphorus (P)	Known as the root nutrient. Integral component of plant cells, in respiration and photosynthesis as well as plant membranes. Component used in plant energy metabolism.	Yes	No	Declines below 5.0 and above 7.5
Potassium (K)	Involved in photosynthesis, carbohydrate translocation, protein synthesis, cell osmotic potential and respiration.	Yes	No	Declines below 4.5
Calcium (Ca)	Necessary for seed and fruit production. Helps regulate nutrient uptake by roots and carbohydrate movement throughout the plant.	No	No	Most available between 7.0 and 8.5
Magnesium (Mg)	Essential for chlorophyll synthesis, energy storage reactions (involving phosphorus), formation of amino acids and promotes vigorous early growth, uniform maturity and winter hardiness.	Yes	No	Most available between 7.0 and 8.5
Sulfur (S)	Building blocks for proteins, essential for nitrogen fixation by root-nodulating bacteria on legumes, and essential for chlorophyll formation.	No	Yes	Declines below 5.5

MICRONUTRIENT CHARACTERISTICS

Nutrient	Function	Mobile In		pH Effect on Availability
		Plant	Soil	
Boron (B)	Necessary in conversion of carbohydrates into protein. Promotes early maturity, affects flower set/fruiting, quality and yield.	No	Yes	Most available between 5.0 and 7.5
Chloride (Cl)	Essential for oxygen production in photosynthesis, maintaining turgor (water content) in plant cells and regulating water loss.	Yes	Yes	--
Copper (Cu)	Component of enzymes involved with photosynthesis and energy production. Essential for legume root nodulation and nitrogen fixation.	No	No	Most available between 5.0 and 7.0
Iron (Fe)	Major role in chlorophyll formation. Catalyst in cellular division and growth.	No	No	Decreases above 7.0
Manganese (Mn)	Aids in chlorophyll formation. Acts as an enzyme catalyst for carbohydrates and nitrogen transformation.	No	No	Most available between 5.0 and 7.0
Molybdenum (Mo)	Component of an enzyme that converts nitrate to ammonium. Essential for protein synthesis and flower formation and pollen viability.	Yes	No	Most available above 6.5
Zinc (Zn)	Essential for early growth - enzyme reactions and sugar formation. Used for protein formation and hormone production.	No	No	Most available between 5.0 and 7.0

NUTRIENT AVAILABILITY (pH)



Adapted from Cornell University NRCCA Resources

Notes

[illegible]



PROVIDING FASTER, EVEN EMERGENCE

Features & Benefits of Ignite ST

- Combination of 5 essential nutrients placed on the seed for seedlings to maximize early and efficient uptake
- Blend of extracts including amino acids, glucose, and vitamins to induce enzyme activity, enhance germination and early growth
- Includes a balanced ratio of Cytokinin, Gibberellic Acid, and Auxin to stimulate germination and early growth

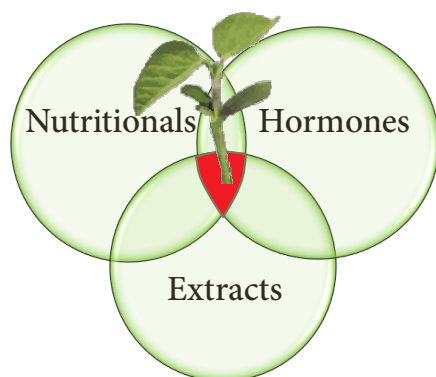
lbs/gallon
9.04

Phosphorus	0.70%
Manganese	0.05%
Boron	0.50%
Iron	0.10%
Zinc	0.50%

	Corn
Rate per cwt	2.4 fl oz/cwt
Rate per 80K/140K	1.2 fl oz/80K

Every seed with the same chemical message & the same food source creates the most evenly emerged stands!

*Rate per 80K is based on an average seed weight of 1,600 kernels per pound
Rate per 140K is based on an average seed weight of 2,800 soybean seeds per pound*



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.

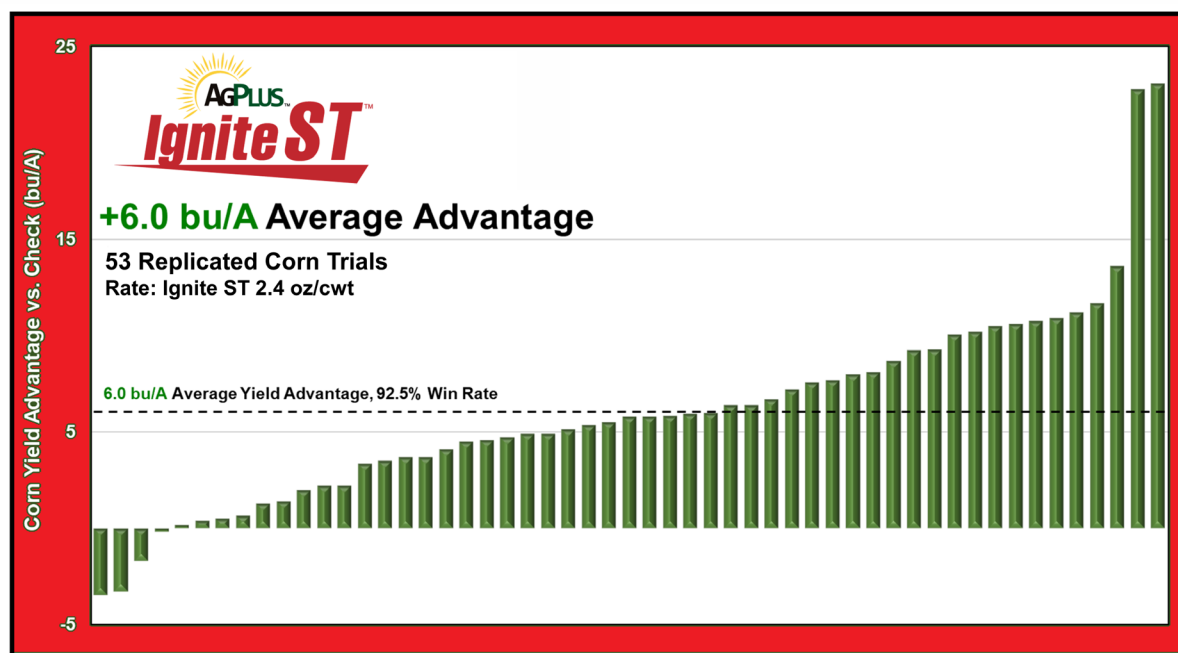
Idole-3-Butyric Acid (IBA)

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



THE HIGHEST YIELD POTENTIAL IS THE DAY YOU PLANT!

Data



SEASON LONG WHITE MOLD PROTECTION

Features of White Mold Protection System

- Seed treatment designed to suppress White Mold in soybeans throughout the growing season
- A balanced ratio of plant hormones signals a consistent emergence message
- Plant extracts and essential nutrients fuel early growth and seedling vigor



White mold growth on soybeans

Cytokinin (Kinetin)

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

Gibberellic Acid (GA)

Stimulates shoot elongation, regulates production of hydrolytic enzymes in grains

Indole-3-Butyric Acid (IBA)

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

Rate per cwt	1.45 fl oz/cwt
Rate per 140K	0.73 fl oz/140K

Rate per 140K is based on an average seed weight of 2,800 soybean seeds per pound

GUARANTEED ANALYSIS 0-0.7-0

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.	



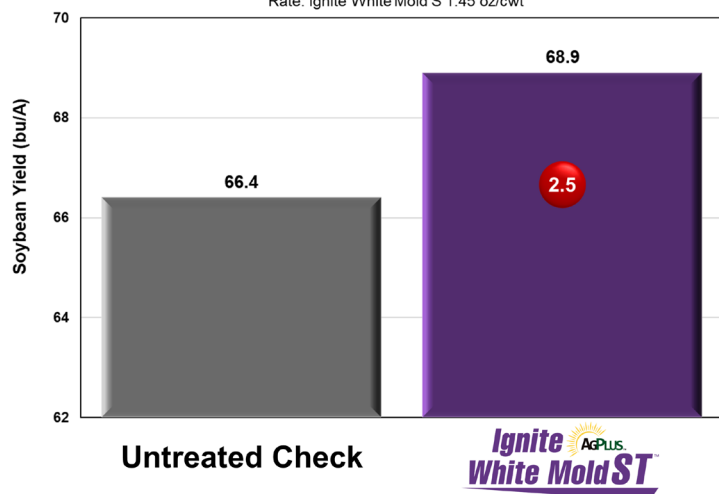
S.A.R. TECHNOLOGY - GENETIC WHITE MOLD RESISTANCE

Benefits of White Mold Protection System

- Combination of 5 essential nutrients to boost germination and early growth
- Blend of extracts including amino acids, glucose, & vitamins to induce enzyme activity, enhance germination & early growth
- Includes a balanced ratio of Cytokinin, Gibberellic Acid, & Auxin to stimulate germination and early growth
- Utilizes the S.A.R. (Systemic Acquired Resistance) mode of action that activates the plants own genetic resistance to diseases by stimulating the plants natural defense pathways before disease sets in

Ignite White Mold ST

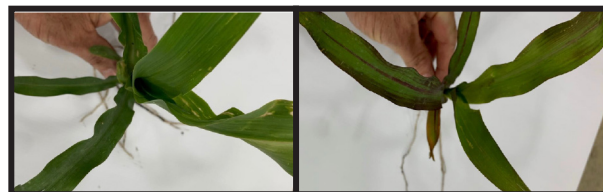
7 Replicated Soybean Trials
Rate: Ignite White Mold S 1.45 oz/cwt



A PREMIER MICROBIAL-BASED FERTILIZER CATALYST

Benefits of Chasm FC

- Improve microbial diversity in the soil
- Increases nutrient availability and uptake
- Enhances nutrient mineralization
- Maximize fertilizer efficiency and return on investment



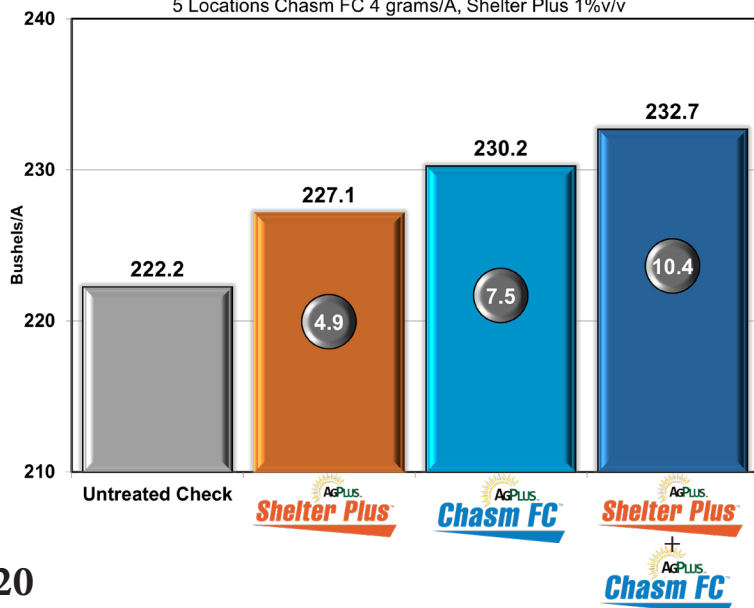
Chasm FC promotes the mineralization of Phosphorus in the soil for season long benefits. Note above the increased Phosphorus uptake and reduction of purpling.

Features of Chasm FC

- Sources of bacteria derived from agricultural soils in the U.S.
- A CFU count significantly higher than the industry average
- Compatible tank mixing with fertilizers, pesticides and adjuvants
- Apply in-furrow, 2x2, strip-till, dry fertilizer impregnation, soil broadcast or early post

In Furrow Corn Trial

All Treatments had 3 gal/A 9-24-3
5 Locations Chasm FC 4 grams/A, Shelter Plus 1%v/v



Use Rates:

4 grams/Acre
(in-furrow)

4-6 grams/Acre
(dry impregnation & broadcast)

Technical Information

1 bottle = 160 grams or 40 Acres

1 case = 4 bottles or 160 Acres

Mag-Pack = 20 lbs or 2,270 Acres

Shelf Life: 5 years



MICROBIAL FUNCTIONS

Microorganism	Microbe Function Description
Bacillus coagulans	Boosts phosphorus solubilization, solubilizes zinc, manganese and potassium for improved plant uptake.
Bacillus licheniformis	Promotes root establishment; aides in soil mineralization; nutritionally adaptive; strong composter of organic polymers in the soil to convert nutrients into plant available forms.
Streptomyces rimosus	Produces large amounts of enzymes to protect root zone; strong fungal remediation activity; uses alternate forms of organic carbohydrates.
Streptomyces violascens	Strong secretor of enzymes for the breakdown of complex polymers and chitin in the soil. Excellent colonizer and decomposer for extensive nutrient recycling and breakdown of organic matter.
Thermobacillus composti	Boosts plant biomass; strong secretor of enzymes that breakdown organic matter for better conversion to plant useable forms.
Thiobacillus feroxidans	Improves and accelerates iron solubility. Works to chelate calcium, magnesium, manganese and zinc from the soil and into a soluble form. Strong colonizer of the rootzone for enhanced nutrient recycling.
Pseudomonas putida	Improves phosphorus and potassium solubilization from soil (phosphorus availability); boosts plant biomass and photosynthesis; accelerates composting.
Rhodopseudomonas capsulatus	Boosts nitrogen assimilation at the rootzone for improved nitrogen uptake. Strong recycler of organic nutrients and minerals in the soil for rapid nutrient availability and uptake.

Chasm FC Provides Perimeter Protection

Chasm FC's consortium of bacteria have been selected to out-compete the "bad" microorganisms already present in the soil, while not affecting the beneficial microbes. This allows Chasm FC to "clean the root zone" while also helping reduce stress on the plant's roots.

PHOSPHATE PROTECTION FOR LIQUID FERTILIZER SOLUTIONS

Features & Benefits of Shelter Plus

- Designed for use with liquid phosphate fertilizers
- Can be mixed and stored for extended periods of time with all liquid phosphate fertilizers
- Starter application places Shelter Plus in the crop root zone, promoting immediate nutrient uptake efficiency

Rate

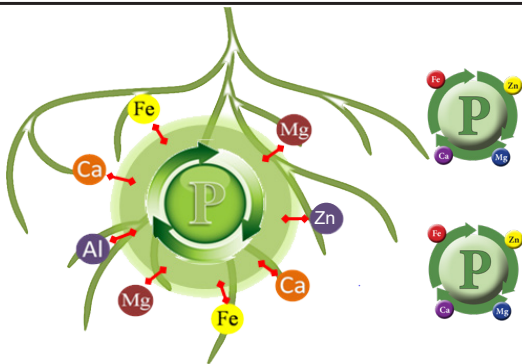
1% v/v

lbs/gallon

10.2

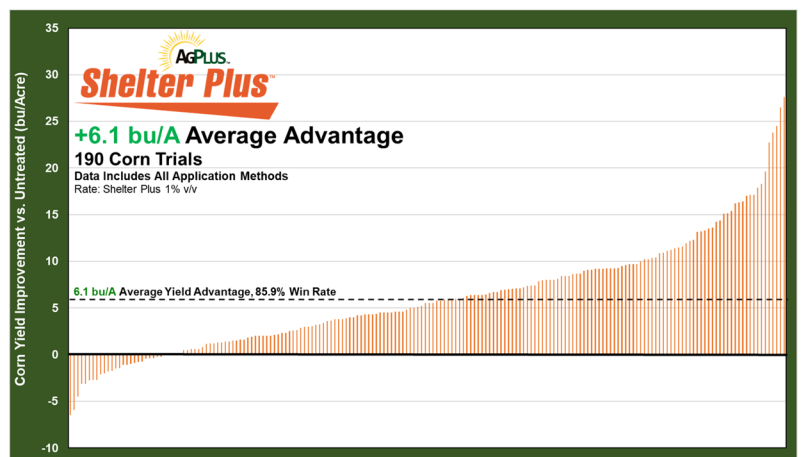
pH

6.0



**PROMOTE EARLY SEASON ROOT GROWTH, VIGOR AND
IMPROVE OVERALL PLANT STRUCTURE**

**INCREASE YOUR FERTILIZER EFFICIENCY AND
RETURN ON INVESTMENT**





PHOSPHATE PROTECTION FOR DRY FERTILIZER IMPREGNATION

Features & Benefits of Shelter Ultra

- Designed for use with dry phosphate impregnation
- Can be impregnated onto dry phosphate fertilizer and stored for an extended period of time
- Low viscosity designed for easier handling, especially in cold weather

Rate

3 qt/ton

lbs/gallon

10.8

pH

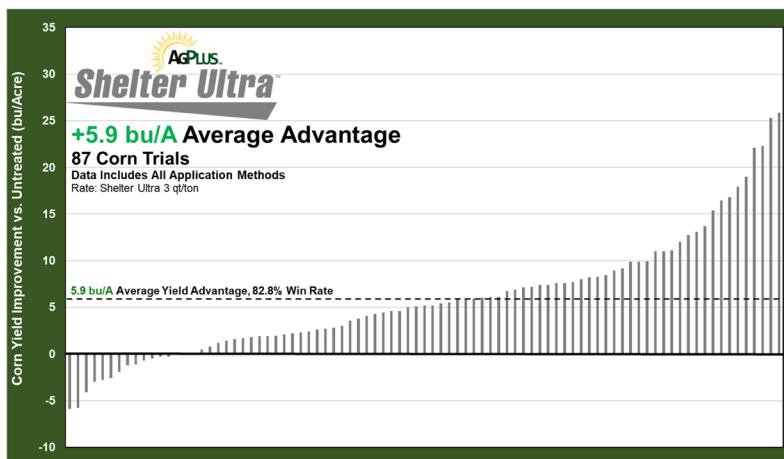
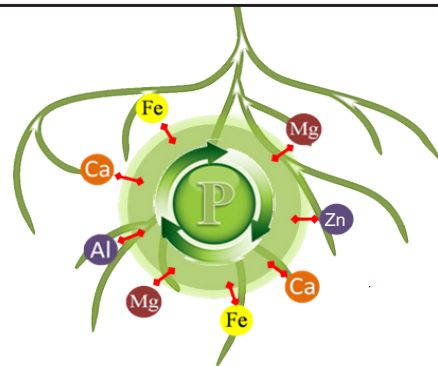
5.5



**KEEP APPLIED PHOSPHATES
MORE READILY AVAILABLE**



**MORE PHOSPHATE AVAILABLE LEADS TO
HIGHER YIELD POTENTIAL**





PLANT HORMONE BLEND PROVEN TO INCREASE PLANT GROWTH AND DEVELOPMENT

Features & Benefits of Dominate

- Contains the right ratio and concentration of plant hormones for optimum growth
- Enhances physiological activity in the plant to maximize yield
- Highly compatible formulation for tank mixing with fertilizers, adjuvants and pesticides
- Boosts plant growth and development for higher yield potentials and ROI

Rate

4-8 oz/A

lbs/gallon

8.36

pH

3.43

The correct balance of these three hormones is critical for maximizing plant performance and yield potential.

Cytokinin (Kinetin)

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

Gibberellic Acid (GA)

Stimulate shoot growth through internode elongation, as well as induce seed germination

Indole-3-Butyric Acid (Auxin)

Enhances root growth; involved in apical dominance, stimulates cell elongation, enhances fruit and seed development



Balanced Ratio



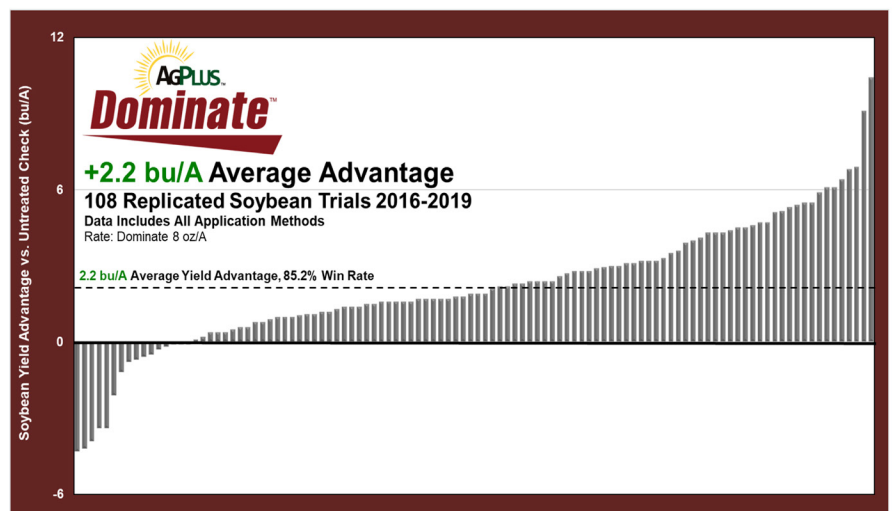
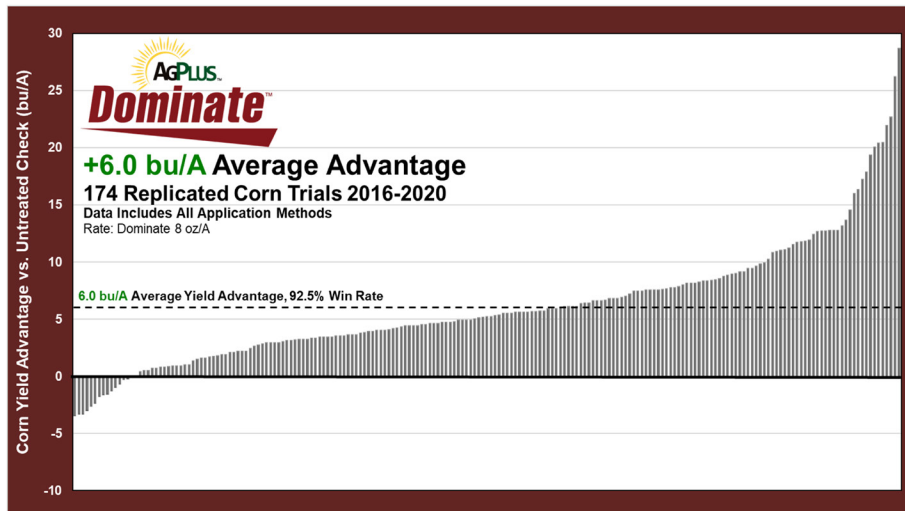
High Auxin to Cytokinin



High Cytokinin to Auxin



DOMINATE HAS PROVEN ITSELF, TIME AND TIME AGAIN





INNOVATIVE TECHNOLOGY TO DRIVE YIELDS

A proprietary suite of biostimulant actives that maximizes crop efficiencies by supplying readily available energy to the crop, promoting enhanced growth and increased yields

Features & Benefits of Yield Breaker:

- Unique blend of biostimulant actives
- Formulated in different ratios to maximize each products crop enhancement
- University studied and proven to promote yield in a variety of cropping systems
- A unique opportunity to capture yield potential by improving crop growth and overall plant health
- Yield Breaker products offer a large range of application flexibility, tank-mix compatibility and ability to bring ROI with every application



Suite of biostimulant actives:

- | | | |
|--------------------------|-----------------------|------------|
| • specific L-amino acids | • L-amino acid blends | • vitamins |
| • organic acids | • dicarboxylic acids | • etc. |



FREQUENTLY ASKED QUESTIONS

How does Yield Breaker maximize crop efficiency?

Yield Breaker provides the plant more available energy to use where it deems necessary, improves plant growth, enhances overall plant health and protects against a wide range of yield-robbing stresses leading to increased crop quality and maximized yield.

When is the best time to apply Yield Breaker Technology?

In-furrow, sidedress or foliar when applications when a pesticide or nutritional product is planned. Because of the infinite number of combinations with pesticides, Yield Breaker containing products fit a wide array of application timings.

Can I add multiple products fueled by Yield Breaker in a tank mix?

Yes. There is no concern of biostimulant overload when applying multiple products fueled by Yield Breaker in the same application or multiple applications within the same growing season.

Can I tank-mix with hormone-biostimulants - i.e. Dominate?

Yes. Different modes of action are complimentary to maximizing results for the crop. Although, jar-testing for tank-mix compatibility is always recommended.

ELITE NUTRITIONAL AND BIOSTIMULANT PACKAGE

Features & Benefits of Plush Elite

- Provides essential nutrients in combination with the yield driving actives of Yield Breaker
- Maximum nutrient absorption and availability
- A tool for improving plant health
- Increases potential for higher yields & ROI
- Apply foliar with pesticide applications
- Provides 6 key nutrients for crop growth

Rate

1-2 qt/A

lbs/gallon

10.8

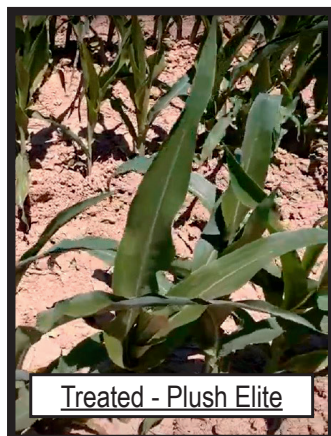
pH

8.0-8.9

Nitrogen	7.0%
Potassium	1.0%
Sulfur	3.0%
Iron	1.0%
Manganese	2.0%
Zinc	2.0%

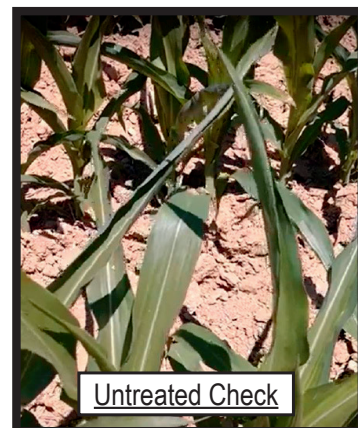
+

Yield Breaker
**STRESS
MITIGATION
COMPONENTS**



Notice the heavy leaf roll on the untreated plants.

Plush Elite prepares the crop for stress, minimizing negative crop responses, preventing yield loss!



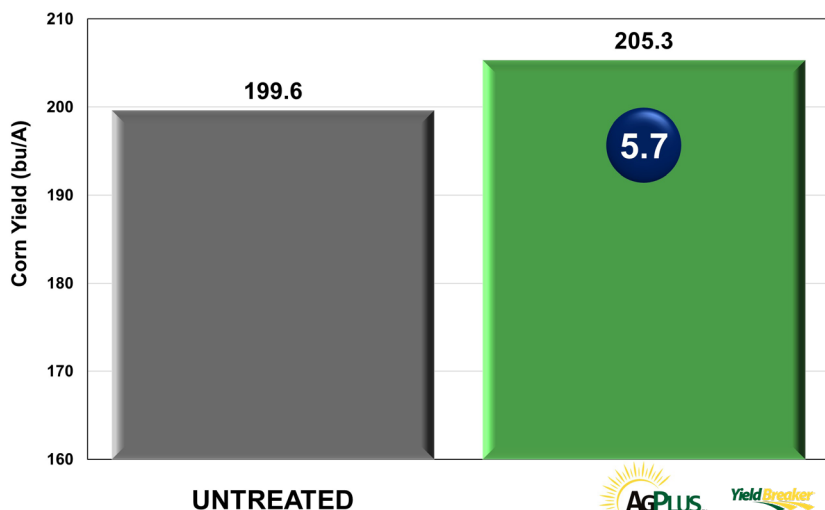


ENHANCING GROWTH TO INCREASE YIELD POTENTIAL

Plush Elite Applied at V3

6 Replicated Corn Trials

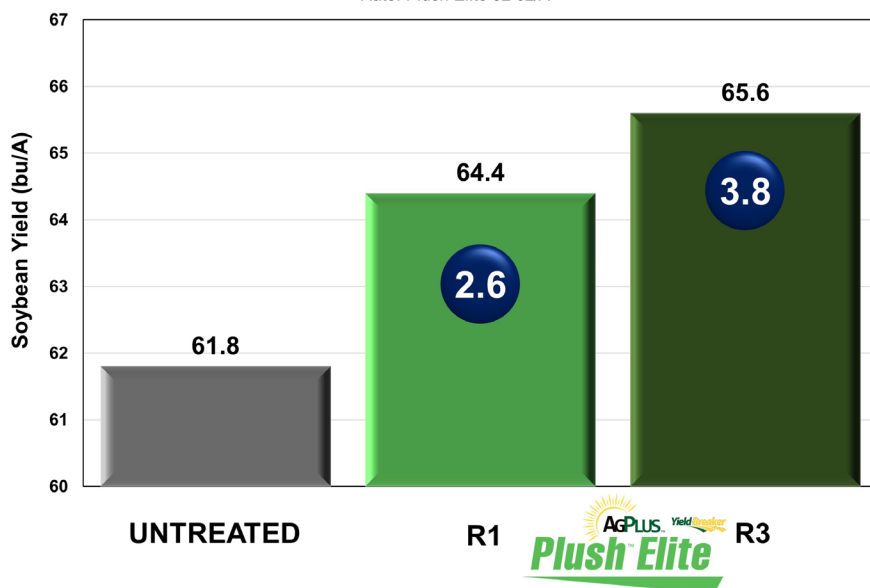
Rate: Plush Elite 32 oz/A



Plush Elite Applied at R1 & R3

6 Replicated Soybean Trials

Rate: Plush Elite 32 oz/A





TAKING ALFALFA PRODUCTION TO ANOTHER LEVEL

Vigor 2 Yield Alfalfa Recommendation

- Improve the tonnage and quality of every cutting
- Dominate signals and enhances vegetative growth
- Plush Elite and Plush BMo provide the proper nutrients to fuel enhanced biomass growth and development, as well as abiotic stress protection
- Straight Shot works to get these actives into the plant while providing readily available energy to fuel crop functions and processes



8 oz/A



32 oz/A



16 oz/A

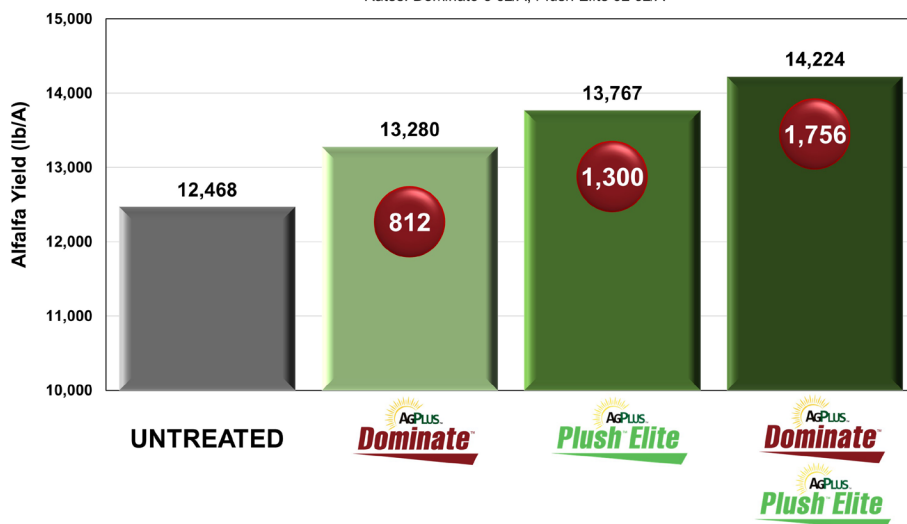


16 oz/A



Dominate and Plush Elite Average Season Total Across Four Applications

2 Replicated Alfalfa Trials - Wisconsin
Rates: Dominate 8 oz/A, Plush Elite 32 oz/A





BORON AND MOLYBDENUM - CRITICAL IN CROP DEVELOPMENT

Features & Benefits of Plush BMo

- Coupling the synergistic nutrients of Boron and Molybdenum to provide efficient crop enhancement
- Contains a unique formulation of boron that increases tank-mixing capabilities
- Designed to be compatible with a wide range of tank mix partners
- Apply before or after deficiency symptoms appear

Rate

1-2 pt/A

lbs/gallon

10.4

pH

7.0

Soybeans

- Boron promotes early maturity, improving pod set and grain quality
- Molybdenum is key component of nitrate reductase enzyme, timely application promotes nitrogen efficiency as soybean root nodule performance declines
- Increase nitrogen efficiency, flowering, pod set and pod fill, correlating to yield

Corn

- Boron plays a large role in reproductive development, pollen formation and grain fill
- Boron is necessary in the conversion of carbohydrates into proteins
- Molybdenum boosts conversion of nitrate to ammonium in the plant, this provides enhanced nitrogen levels for protein synthesis and to begin driving grain fill

Conditions that Favor Boron Deficiency: Over saturated soils can result in boron leached out of the root zone. Deficiencies can also occur in drought conditions, as boron moves to the roots via mass flow. Most commonly is deficient in coarse soil types.

THE INDUSTRIES FIRST - YIELD INCREASING ADJUVANT

Features & Benefits of Straight Shot

- Industry standard drift reduction and coverage technology
- Fueled by Yield Breaker technology
- AMS based water conditioning
- Ultra efficient surfactant package for increased coverage and cuticle penetration

Rate

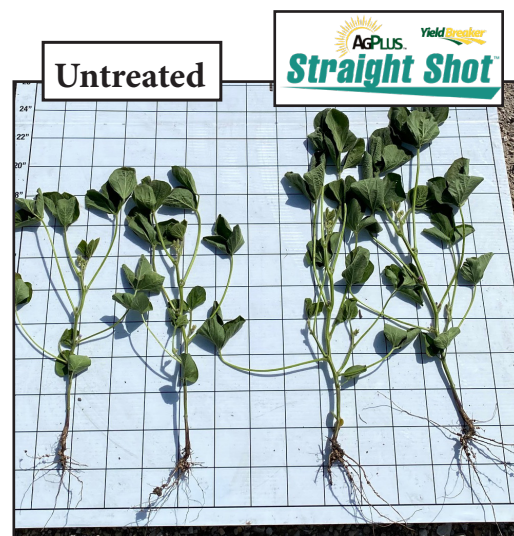
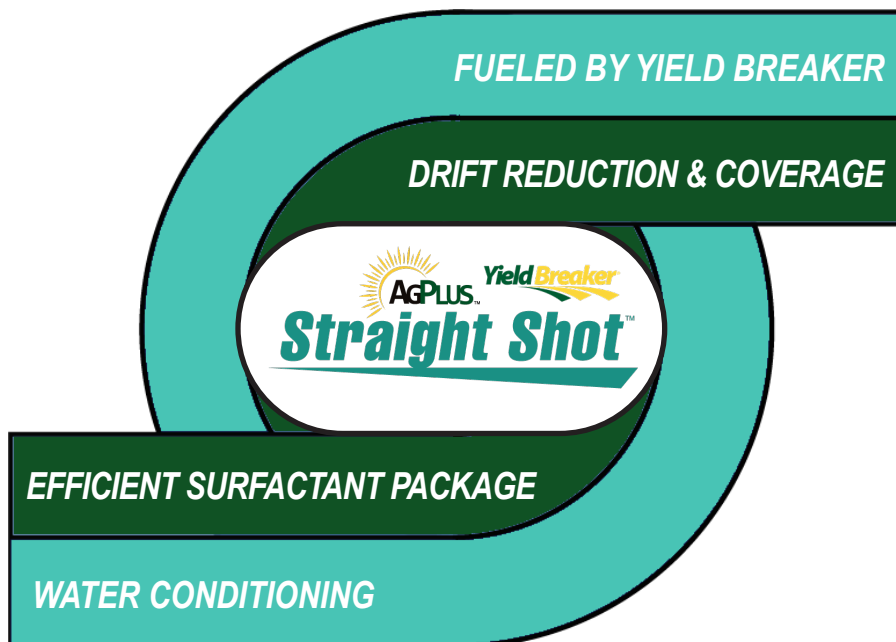
16 oz/A

lbs/gallon

10.0

pH

5.5 - 7.5



What does STRAIGHT SHOT do?

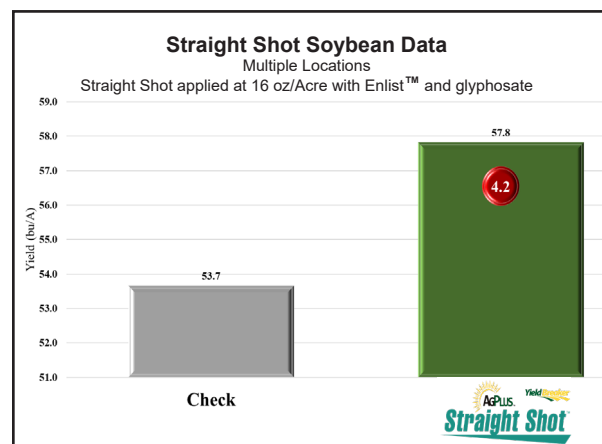
STRAIGHT SHOT Fueled by Yield Breaker Technology has proven yield enhancing components in a premium adjuvant package that improves tank mix performance.



ADVANCED TECHNOLOGY TO IMPROVE CROP PERFORMANCE

Fueled by Yield Breaker Technology:

- Plant derived crop enhancement components selected to drive multiple plant functions resulting in improved yield potential
- Patent pending process to maintain crop enhancement component integrity and maximize plant utilization
- Unique adjuvant with yield promoting technology



Industry Standard Drift Reduction and Coverage Technology:

- Proven drift reducing technology
- Maximized canopy penetration and coverage aid
- Blended easy to use water soluble polymers for superior application performance



STIMULATES THE CROP'S NATURAL STRESS PROTECTION

Features and Benefits of Squadron Plus

- Squadron Plus triggers the plant's natural abilities to minimize stress, while providing efficient energy to the plant
- Protects and repairs the plant before, during or after a stress event by triggering 450+ enzymatic reactions in the plant
- Provides fuel and energy to support the increased enzymatic activity occurring within the plant
- This increased enzymatic activity increases photosynthesis, energy, and carbohydrate utilization that results in increased efficiencies and higher yield potential

Rate

8 oz/A

lbs/gallon

9.37

pH

6.5-7.5



Protect, Repair, Energize

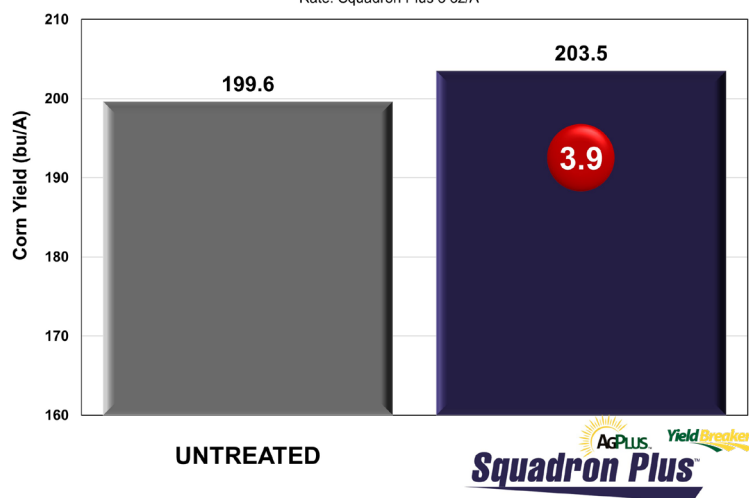
Mitigating stress and providing efficient energy to the plant means quicker recovery from stress events and more focus on growth and yield.

INCREASE STRESS TOLERANCE AND YIELD POTENTIAL

Squadron Plus Data Summary

6 Replicated Corn Trials (V3, V12, VT)

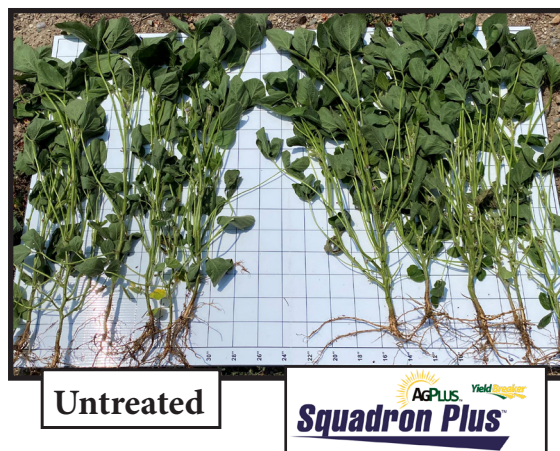
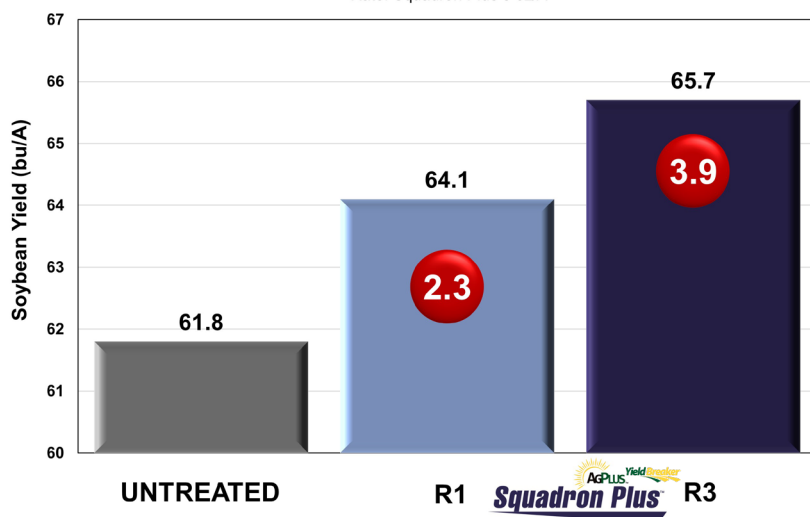
Rate: Squadron Plus 8 oz/A



Squadron Plus Applied at R1 & R3

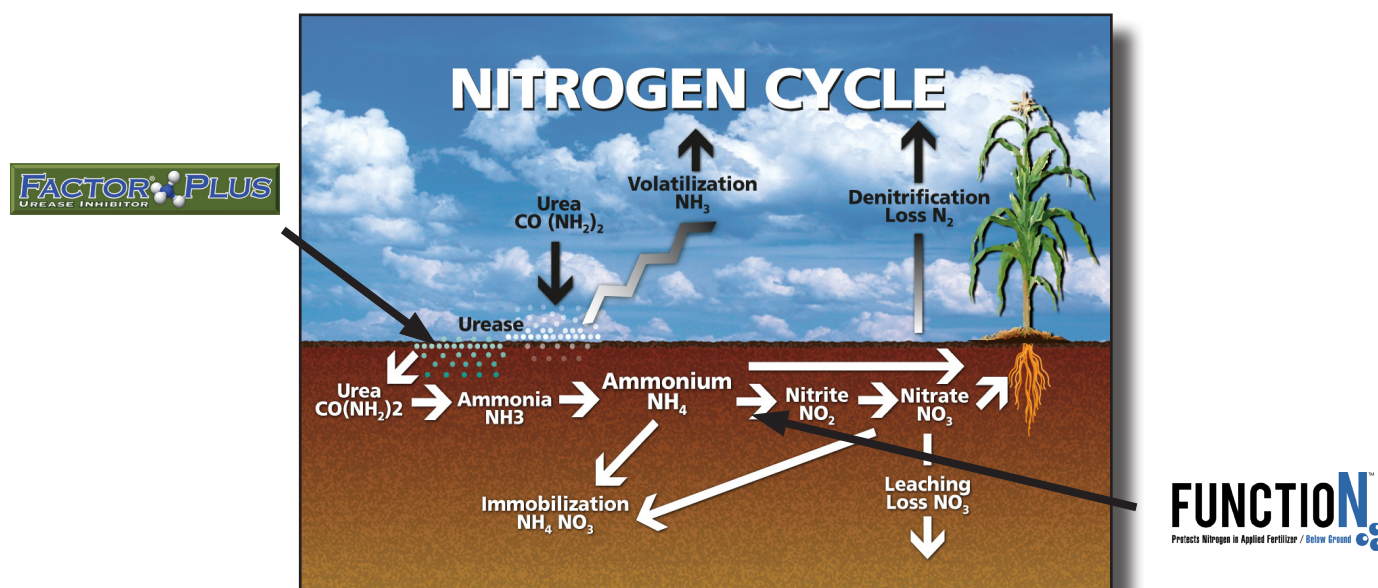
6 Replicated Soybean Trials

Rate: Squadron Plus 8 oz/A



NITROGEN PROTECTION OVERVIEW

Factor Plus Urease Inhibitor has a positive impact on surface applied nitrogen. Factor Plus inhibits the urease enzyme that transforms urea into the ammonia form. After it is transformed to ammonia it may be lost to ammonia volatilization. This loss reduces yields and grower profits. By inhibiting this conversion process more nitrogen stays in a usable form in an area where the crop can utilize it. Factor Plus offers volatility protection for up to 14 days.



FunctionN affects the nitrogen cycle through the slowing down or putting to rest the *Nitrosomonas* bacteria that are present in the soil. FunctionN is a bacteriostat, meaning it doesn't kill the bacteria in the soil but puts them in a state of rest or stasis.

By keeping the applied nitrogen in the ammonium form, it decreases leaching through the soil profile and ensures the nitrogen is available for uptake by the crop.



THE MOST CONCENTRATED NBPT PRODUCT ON THE MARKET

Features & Benefits of Factor Plus

- Factor Plus is a unique formulation with 40% NBPT
- NBPT is recognized by the NRCS as a proven and effective method of urease inhibition
- Use where above ground nitrogen loss occurs:
~ pre-plant, side-dress, other surface applications
- Easy handling and low odor characteristics
- Low use rate means less space needed to store product

Rate

2.06 qt/ton (Urea)
2.06 pt/ton (UAN)

lbs/gallon

9.21

pH

7.1
(in 1% water)

NBPT

40.0%



Factor Plus Treated UAN

Vs.



UAN Alone



**PROTECT NITROGEN FROM VOLATILITY
FOR UP TO 14 DAYS**



**STABLE, COMPATIBLE,
EASY-TO-USE FORMULATION**

FUNCTION[®]

Protects Nitrogen in Applied Fertilizer / Below Ground

PROTECTS APPLIED NITROGEN FROM BELOW GROUND LOSSES

Features & Benefits of FunctionN

- FunctionN is a proprietary DCD formulation with a unique solvent system, easy-to-use and patent pending formulation
- Slows the nitrification process, keeping nitrogen in the ammonium form longer
- Can be used with Anhydrous, UAN, Manure or through irrigation systems
- Excellent storage and handling, non-corrosive formulation

Rate

1.5-3 pt/A

lbs/gallon

9.7

pH

7.7



EXCELLENT STORAGE AND HANDLING
NON-CORROSIVE



PROTECTS NITROGEN FROM
LEACHING



KEEPING NITROGEN IN THE ROOT ZONE
WHEN THE PLANT NEEDS IT



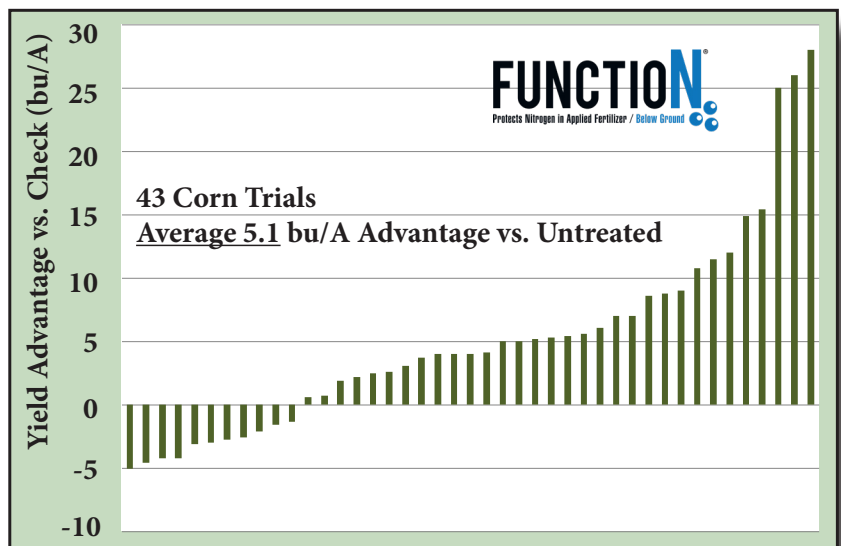
INCREASED YIELD POTENTIAL
5.1 BUSHEL ADVANTAGE



UAN with FunctionN

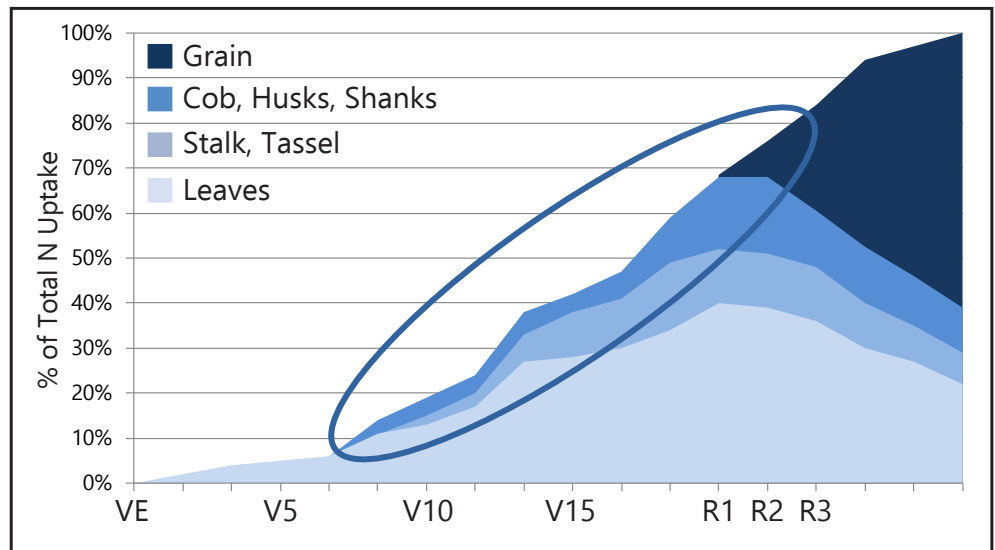


UAN Alone



KEEP YOUR NITROGEN AVAILABLE AT CRUCIAL GROWTH STAGES

Roughly 80% of a corn plants total nitrogen need occurs 75 days after emergence!



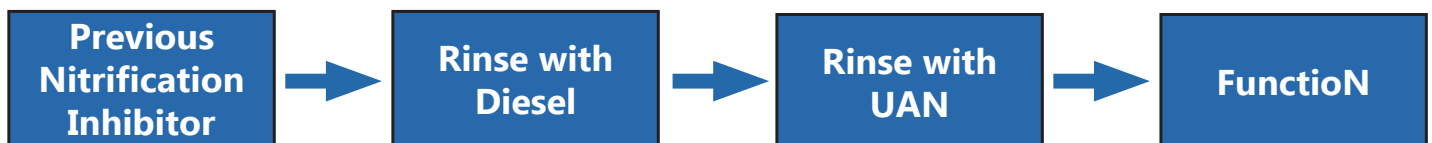
Nitrogen uptake graph sourced from the University of Illinois

Anhydrous Ammonia Applications of FunctionN

- Non-corrosive, excellent cold weather handling, NRCS approved
- Can be pumped through most commercial NH₃ injection systems
- Can be used in any sidekick system on the market



Switching Nitrification Inhibitors in an Injection System





DYNAMIC BLEND OF SULFUR & CROP ENHANCEMENT COMPONENTS

Nitrogen (N) 8%

Sulfur (S) 10%

Use Rates

2" by 2"

1-2 quarts/acre

Soil Broadcast

2-8 quarts/acre

Side-Dress / Y-Drop

1-4 quarts/acre

Foliar

1-2 quarts/acre

lbs/gallon

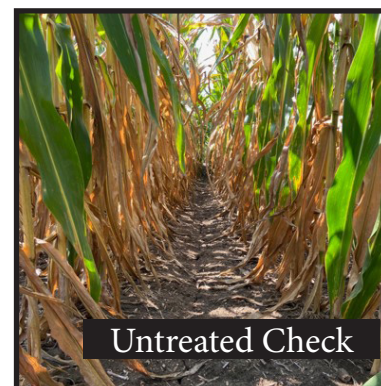
10.4

pH

4.5-5.5

Features & Benefits of Taurus Sulfur

- Provides sulfur in the sulfate form, which is immediately available for crop uptake
- Excellent application flexibility
- Low use rate when compared to other sulfur options on the market, such as Ammonium Thiosulfate (ATS)
- Fueled by yield-bursting crop enhancement components that energize the plant and increase yield potential



Importance of Sulfur in Crop Production

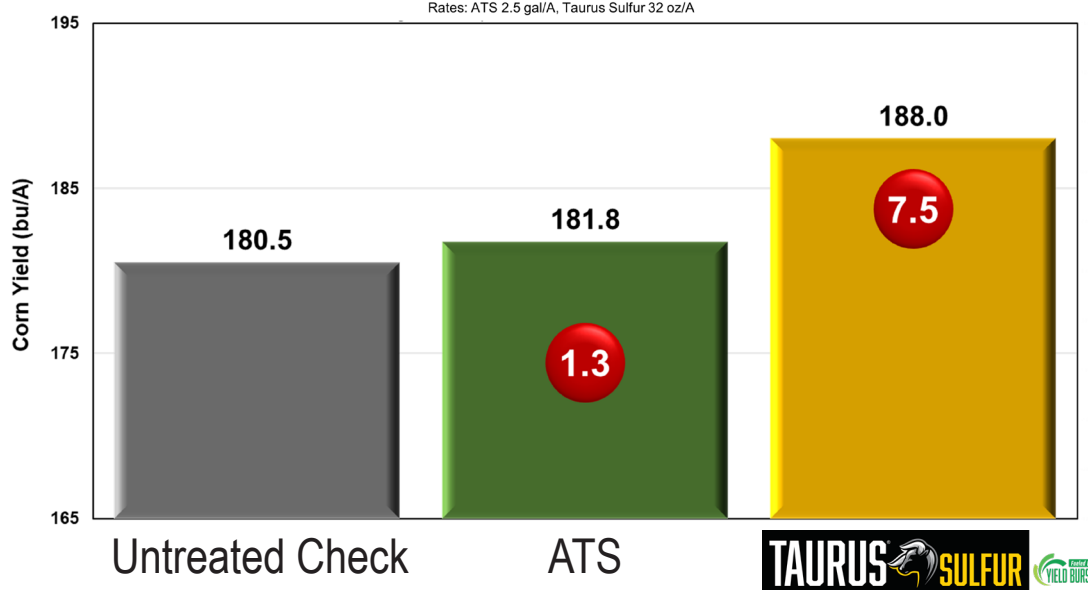
Sulfur is a secondary nutrient that plays a critical role in crop production. It is a key component of many protein enzymes, helps regulate photosynthesis and assists in nitrogen fixation in legume crops.

Applying Taurus Sulfur in early season applications will provide the crop with much-needed sulfur as well as crop enhancement components, helping the crop realize its full yield potential.

DRIVE NUTRIENT UPTAKE AND INCREASE PLANT HEALTH

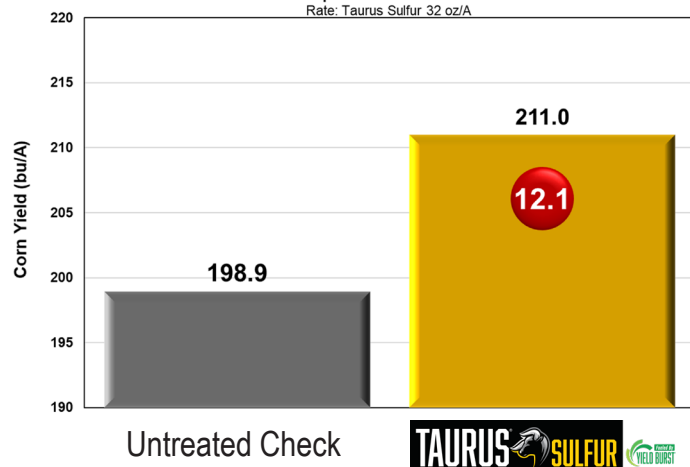
Nitrogen and Sulfur Side-Dress Applications

4 Replicated Corn Trials
Rates: ATS 2.5 gal/A, Taurus Sulfur 32 oz/A



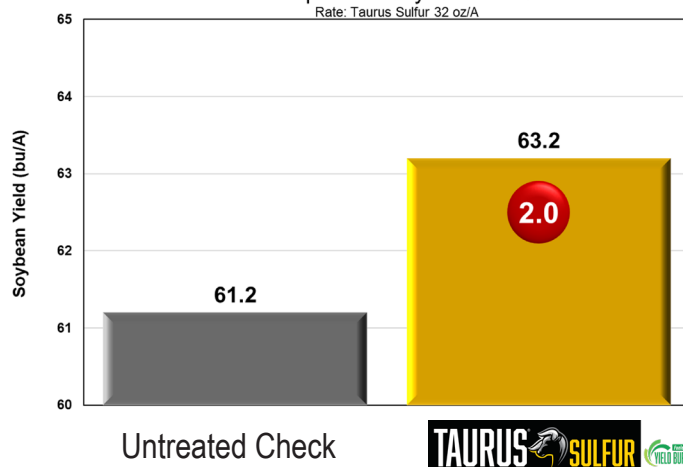
Taurus Sulfur Post Applications

14 Replicated Corn Trials
Rate: Taurus Sulfur 32 oz/A



Taurus Sulfur Post Applications

8 Replicated Soybean Trials
Rate: Taurus Sulfur 32 oz/A



REFERENCE TABLES

-TISSUE SAMPLES-

Crop	Stage of Growth	Plant Part	Number of Samples
<i>Alfalfa</i>	At Bud or 1/10th Bloom	Upper 1/3 of plant	30-40
<i>Corn</i>	Seedling Stage	All above ground plant parts	20-30
	Prior to Tasseling	Last fully developed leaf	15-20
	Tasseling to Silking	Leaf opposite and below ear	15-20
<i>Grasses</i>	At Stage of Best Quality	Leaves from upper 1/3 of the plant	30-40
<i>Small Grains</i> (Oats, Rice & Wheat)	Prior to Heading	Four uppermost leaves	40-50
<i>Sorghum (Milo)</i>	Before or at Heading	Second leaf from top of the plant	20-30
<i>Soybeans</i>	Prior to or at Initial Bloom, Before Pod Set	Fully developed leaves at top of the plant	20-30
<i>Sugarbeets</i>	At Midgrowth	Fully expanded leaf midway between inside and outside whorl (separate petiole from the blade)	30-40

Adapted from A&L Agronomy Handbook www.algreatlakes.com

REFERENCE TABLES

- TISSUE SAMPLE


SUFFICIENCY RANGES-

Crop		N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
		Percent (%)							Parts Per Million (ppm)					
<i>Alfalfa</i>	From	3.00	0.25	0.25	2.50	0.30	1.00	0.01	25	25	30	50	8	40
	To	4.50	0.35	0.45	3.80	0.80	2.50	0.04	80	70	100	250	20	300
<i>Corn (At Tassel)</i>	From	2.80	0.20	0.25	1.80	0.20	0.30	0.01	6	25	30	50	20	20
	To	3.50	0.50	0.40	3.00	0.50	0.70	0.03	20	50	100	250	60	300
<i>Grasses (Forage)</i>	From	2.00	0.20	0.30	2.00	0.20	0.40	0.02	10	25	30	50	5	25
	To	3.00	0.50	0.60	4.00	0.40	0.80	0.15	20	60	200	300	20	250
<i>Potato</i>	From	4.00	0.25	0.30	3.50	0.50	0.70	0.01	25	30	60	100	10	50
	To	6.00	0.50	0.70	6.50	1.10	2.00	0.15	60	70	200	200	25	250
<i>Sorghum (Milo)</i>	From	2.50	0.20	0.30	1.70	0.20	0.30	0.01	6	25	30	50	6	20
	To	3.50	0.50	0.50	3.00	0.50	0.60	0.03	20	50	100	250	20	300
<i>Soybeans</i>	From	4.00	0.25	0.25	1.75	0.25	0.50	0.01	25	25	35	50	8	50
	To	5.50	0.60	0.50	3.00	0.60	2.00	0.03	60	50	100	150	20	200
<i>Sugarbeets</i>	From	3.00	0.30	0.30	3.50	0.50	0.60	0.01	30	30	40	80	10	50
	To	4.50	0.90	0.70	6.00	1.20	1.30	0.05	60	60	100	200	20	200
<i>Sunflowers</i>	From	3.40	0.25	0.26	2.50	0.37	1.10	0.01	25	20	50	60	6	50
	To	4.00	0.35	0.35	3.20	0.90	1.50	0.02	40	35	100	200	10	100
<i>Wheat</i>	From	4.00	0.20	0.24	2.00	0.20	0.28	0.01	6	22	32	36	6	20
	To	5.00	0.30	0.36	3.00	0.30	0.42	0.03	10	34	48	54	10	300

Adapted from A&L Agronomy Handbook www.algreatlakes.com

REFERENCE TABLES

-CROP REMOVAL-



Crop	lbs/bu	Unit	N	P ₂ O ₅	K ₂ O	Mg	Ca	S
			lbs of Plant Food Removed per Unit					
<i>Alfalfa</i>	NA	Ton	56.0	15.0	60.0	5.0	28.0	5.0
<i>Corn</i>	56 lbs	Bu	0.80	0.40	0.29	0.06	0.03	0.07
<i>Corn Silage</i>	NA	Ton	8.3	3.5	8.0	1.0	1.2	0.9
<i>Fescue</i>	NA	Ton	40.0	16.0	48.0	4.8	9.0	4.4
<i>Potato</i>	60	cwt	0.33	0.15	0.53	0.025	0.025	0.016
<i>Rice</i>	45 lbs	Bu	0.65	0.28	0.17	0.05	0.04	0.04
<i>Sorghum</i>	60 lbs	Bu	0.85	0.40	0.25	0.08	0.07	0.09
<i>Soybeans</i>	60 lbs	Bu	4.10	0.85	1.45	0.23	0.22	0.20
<i>Sugarbeets</i>	NA	Ton	4.10	0.60	7.0	0.4	1.2	0.40
<i>Sunflowers</i>	NA	cwt	3.60	1.70	1.10	0.28	0.30	0.33
<i>Wheat</i>	60	Bu	1.20	0.55	0.35	0.14	0.06	0.10

Adapted from A&L Agronomy Handbook www.algreatlakes.com

FERTILIZER CHARACTERISTICS

Liquid Fertilizers							
Product	Analysis			Weight	Nutrients lbs/gallon		
	N	P ₂ O ₅	K ₂ O	lbs/gal	N	P ₂ O ₅	K ₂ O
28% UAN	28	0	0	10.66	2.98	0	0
32% UAN	32	0	0	11.06	3.54	0	0
Anhydrous Ammonia (Gas)	82	0	0	5.15	4.22	0	0
Polyphosphate	10	34	0	11.65	1.16	3.96	0
Ortho-Poly Blend	7	21	7	11.00	0.77	2.31	0.77
Orthophosphate	9	18	9	11.11	1.00	1.99	0.99

Liquid Fertilizers Quick Conversions				
Product	Gallons/Ton	Nutrients lbs/ton		
		N	P ₂ O ₅	K ₂ O
28% UAN	187.62	560	0	0
32% UAN	180.83	640	0	0
Anhydrous Ammonia (Gas)	388.35	1640	0	0
Polyphosphate (10-34-0)	171.67	200	680	0
Ortho-Poly Blend (7-21-7)	181.82	140	420	140
Orthophosphate (9-18-9)	180.02	180	360	360

Dry Fertilizers			
Product	Analysis		
	N	P ₂ O ₅	K ₂ O
Urea	46	0	0
MAP	11	52	0
DAP	18	46	0
Potash	0	0	60



Contains a proprietary blend of 8 beneficial microbial strains.

Direction For Use

- Can be applied in-furrow, dry broadcast impregnation, side-dress, foliar application, broadcast liquid applications, drip and pivot irrigation.
- Tank mix compatible with liquid fertilizers, herbicides, insecticides, fungicides and adjuvants.
- Agitate well before use.
- Can be used on all soil and crop types.

Use Rate:

4 grams/A (in-furrow)
4-6 grams/A (dry impregnation & broadcast)

Mixing Instructions

Fill tank with one-half the desired amount of liquid fertilizer solution. Add the required amount of Chasm FC. Add the remaining amount of liquid fertilizer solution while allowing the agitation to thoroughly mix Chasm FC into the liquid/suspension fertilizer solution.



Poly amino acid (L-aspartic acid), sodium salt 38.2%

DIRECTIONS FOR USE

Shelter Plus easily mixes with Pre-Plant, Starter or Side-Dress liquid/suspension fertilizer solutions. It is however, recommended that, due to the potential variability in some liquid/suspension fertilizer solutions, compatibility is checked by mixing small quantities of each at the appropriate ratio of fertilizer with **Shelter Plus**. If coagulation occurs or sediments are formed – DO NOT USE THAT FERTILIZER AS A CARRIER. Do not mix with acid solutions with a pH below 4.

Use Rate: 1.0% v/v**

(1 gallon/100 gallons of liquid/suspension fertilizer solution).

** Use 1.5% v/v (1.5 gallon/100 gallons of liquid/suspension fertilizer solution) when applied to soils with high levels of any of the following - Ca, Al, Fe or Mg.



Amino acid based polymers, as a potassium salt 47.5%

DIRECTIONS FOR USE

Impregnate **P Max Ultra EZ-FLO** onto dry phosphate fertilizer (e.g.: 0-46-0, 18-46-0, 11-52-0) during the receiving process as it is transferred into bulk storage or during the custom blending process.

Use Rate: 3 quarts/ton (2,000 lbs.) of phosphate fertilizer

Application during custom blending operation:

When impregnating **P Max Ultra EZ-FLO** onto the dry phosphate fertilizer during the custom blending operation follow the steps below:

- 1.) Add phosphate fertilizer to blender
- 2.) Impregnate with **P Max Ultra EZ-FLO** at 3 quarts/ton
- 3.) Add additional fertilizer components to complete the blend



GUARANTEED ANALYSIS 7-0-1

Total Nitrogen (N)	7.0%	Iron (Fe)	1.0%
7.0% Ammoniacal Nitrogen		1.0% Chelated Iron	
Soluble Potash (K ₂ O)	1.0%	Manganese (Mn)	2.0%
1.0% Potassium		2.0% Chelated Manganese	
Sulfur (S)	3.0%	Zinc (Zn)	2.0%
3.0% Combined Sulfur		2.0% Chelated Zinc	

Derived from: Anhydrous Ammonia, Citric Acid, Ferrous Sulfate, Manganese Sulfate, Zinc Sulfate, Potassium Thiosulfate.

Soil Applied

Row Starters - Apply 1 to 2 quarts/acre.

TANK MIXING INSTRUCTIONS WITH FERTILIZERS

1. Fill tank at least ½ full of liquid fertilizer.
2. Pour in desired rate of **Plush Elite** while agitating.
3. Finish filling tank with liquid fertilizer with agitation running.
4. If needed, add other chemicals after the **Plush Elite** + fertilizer mix has been prepared.

Do not use **Plush Elite** with 100% orthophosphate-based fertilizers.

Foliar Applied

Broadcast - Apply 1 to 2 quarts/acre.

TANK MIXING INSTRUCTIONS WITH PESTICIDES

1. Fill tank ½ full of water.
2. Add AMS based water conditioner adjuvants and other tank mix adjuvants (as needed), agitate.
3. Pour in desired rate of **Plush Elite**, continue agitation.
4. Add pesticides per label, continue agitation.
5. Finish filling tank.



GUARANTEED ANALYSIS 0-0-0

Boron (B)	5.0%	Molybdenum (Mo)	0.5%
5.0% Soluble Boron		0.5% Soluble Molybdenum	

Derived from: Boric Acid, Sodium Molybdate

Foliar Applied

Apply 1 to 2 pints/acre prior to the occurrence of nutrient deficiency symptoms. For ground applications use a water carrier volume of 10 GPA minimum or 5 GPA for aerial applications. In severe nutrient deficient crops, a second application should be made two weeks after initial application. **Plush BMO** may be tank mixed with pesticide applications.

TANK MIXING INSTRUCTIONS WITH PESTICIDES

1. Fill tank ½ full of water.
2. Add AMS based water conditioner adjuvants and other tank mix adjuvants (as needed), agitate.
3. Pour in desired rate of **Plush BMO**, continue agitation.
4. Add pesticides per label, continue agitation.
5. Finish filling tank.

Soil Applied

Apply 1 to 2 quarts/acre. Do not apply in-furrow.

TANK MIXING INSTRUCTIONS WITH FERTILIZERS

1. Fill tank at least ½ full of liquid fertilizer.
2. Pour in desired rate of **Plush BMO** while agitating.
3. Finish filling tank with liquid fertilizer with agitation running.
4. If needed, add other chemicals after the **Plush BMO**.



Patented blend of select dicarboxylic acids and crop enhancement components

Rates: 8 oz/A

Application Information: Foliar applications should be made in sufficient water volume to provide adequate uniform coverage and wet foliage. If spraying Squadron Plus alone, use a non-ionic surfactant at 1-2 quarts/100 gallons. If tank mixing Squadron Plus, follow the tank mix product(s) recommendations for specific adjuvant uses. Squadron Plus can be tank mixed with herbicides, insecticides, fungicides and fertilizers. Squadron Plus may be applied by ground or aerial equipment to all crops.

Mixing Instructions:

1. Fill spray tank one-third to one-half full, maintaining agitation.
2. Add adjuvants and other tank mix materials to the spray tank.
3. Add appropriate amount of Squadron Plus.

Tank Mix Instructions: Since all combinations have not been tested, the compatibility of Squadron Plus with any potential tank mix partner should be determined in small amounts with a jar test.



Active Ingredients

Cytokinin - 0.009%
GA₃ - 0.005%
IBA - 0.005%

Rates: 8 oz/A

Mixing Instructions: This product readily mixes in water to form a spray to be applied through conventional liquid application and sprinkler irrigation systems. Shake this product before use. To achieve thorough spray coverage, dilute with a sufficient volume of water, however avoid excessive runoff. Apply within 12 hours of spray solution preparation and be sure to maintain agitation during application. This product may be applied as a tank mix with foliar fertilizers, fungicides, herbicides, and insecticides but should be added last when preparing the spray mixture.

Application Instructions: Apply this product by ground or air to foliage at a finished spray volume of 2-10 gallons per acre, unless specified otherwise on this label. The larger spray volumes of water may be used if it does not create excessive runoff. For best results, make applications in early morning or late evening. If applying this product as a band or foliar-directed spray, the application rate should be decreased from the recommended broadcast rate proportional to the percent of the field surface covered by the spray but DO NOT apply below the minimum rate listed in the label.



Active Ingredients

Proprietary blend of ammonium sulfate, surfactants, polymers, crop enhancement components and antifoam

Rates: 16 oz/A

Mixing Instructions: Add Straight Shot to the spray tank first before adding any other tank mix product, unless the tank mix pesticide(s) or additives direct otherwise.

Straight Shot is a tank mix adjuvant that is designed to improve application efficiency and crop enhancement. Straight Shot may be used with pesticides that either require or suggest the use of ammonium sulfate and/or ammonium sulfate + surfactants as the recommended adjuvant.

APPLICATION RECOMMENDATIONS

Urea Blending

Use a fertilizer blender with impregnation equipment to uniformly coat the urea particles. Blend **FACTOR Plus** with urea, before making a complete blend with other components. If blend appears wet, a drying agent may be added to the urea. AG 79 is an example of a drying agent. Add drying agent at 2 pounds per quart of **FACTOR Plus** and adjust up or down as desired pending outcome.

Use Rate: 2.06 quarts (66 fl. ozs.) **FACTOR Plus**/ton of urea.

UAN Solutions

Fill spray tank half full of UAN and add **FACTOR Plus** directly to the UAN solution and agitate. Allow agitation to continue while adding remainder of UAN until thoroughly mixed into a complete solution with **FACTOR Plus**.

Use Rate: 2.06 pints (33 fl. ozs.) **FACTOR Plus**/ton of UAN solution.



(Proprietary NBPT Blend)

N-(n-butyl) thiophosphoric triamide (NBPT) delivered as a 40% by weight solution.



Proprietary DCD Blend

Dicyandiamide for UAN, Anhydrous & Manure

FunctionN is very stable & compatible and can be pre-blended in storage tanks or blended just prior to applying UAN. If pre-blended in storage tanks, tank recirculation is recommended before use.

See supplemental labeling for anhydrous applications

Use Rates:

Many factors play a role in the nitrification process. Use the table below to determine actual use rates for a given soil pH and OM%.

	Pints of FunctionN/A*	
	Organic Matter (OM)%	
	OM <2.5%	OM >2.5%
pH 6-7	1.5	2.0
pH 7-8	2.5	3.0

*See Supplemental Labels for Urea, Anhydrous, Irrigation and Manure



VIGOR2YIELD

AGPLUS COOPERATIVE

2022 CROP GUIDE