

CROP PERFORMANCE

## **Topics of Discussion**

Leverage LIVE Soil Microbiology – Unlock Your Soil High Yield Concepts Corn and Soy Biocapsule Power – Bio-Defense NCGA Yield Results... Quick Hits Excavator and UpC – Time pending





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## What is the yield potential of Corn? Soy?

# Corn: 907bu/ac (Tolenaar 1985) 624bu/ac Hula - 2023 (69%)

315bu/ac (de Wit 1967) 218 de la ce 2024 (69%)



## David Hula Hit Another New Record Corn Yield With 623 BPA, Now Thinks 900 BPA Is Possible



EXCAVATOR" CROP RESIDUE BREAKDOWN & NUTRIENT RELEASE AID

proponent of minimal tillage

practices, such as strip tillage, he's

found success with some biologicals.

Hula likes to use products, such as

Excavator by Meristem, that help

break down residue while also

releasing much-needed nutrients in

the soil to help feed to crop.

Another benefit of minimal tillage

combined with a biological has been

the reduction in the amount of

fertilizer he needs to apply.

## DAVID HUL

H:STRIP-TILL, MINIMUM-TILL, MULCH-TILL, RIDGE-TILL IRRIGATED CLASS

**1ST PLACE:** VIRGINIA

**1**ST PLACE: NATIONAL

YIELD: 8439

Source: https://www.agweb.com/news/crops/harvest/david-hula-hit-another-newrecord-corn-yield-623-bpa-now-thinks-900-bpa-possible



BRANDT® 12,302 followers 3d • S

He's done it AGAIN! Congratulations to Alex Harrell from GA for breaking his own world record with an astounding 218 bu/ac soybean yield. We're proud that BRANDT's innovative nutritional products were part of this achievement once again.

#BRANDT #AlexHarrell #WorldRecord #WorldRecordSoybeanYield #Soybean #Soybeans #Farming #Agriculture

## Harrell seasor Almos Brano

## New World Record Soybean Yield

218.3 !!!

**Alex Harrell** 

Lee County - GA

### WHAT IS THE YIELD GAP?



## **OPPORTUNITY!!!!!**



## **Revline Hopper** Throttle Corn + **Ether/Carbon**



Azotobacter vinelandii **Bacillus licheniformis Bacillus megaterium** Trichoderma harzianum

NEW: ETHER™ Enzyme Technology: 1 g/ac

This Lipase & Mannanase enzyme combo fosters microbial activity for long-



# How many pounds of N does it take to produce a bushel of corn?

# Yield Goal x 1.2....Do you need to apply that much?



# 5, 300

#### Pounds of Organic N – 4% OM – Top 8" Soil

Source: USDA - NRCS



#### Nitrogen Cycle



MERISTEM

Mineralization = Conversion of organic N to mineral NH4+



Source: Univ. of Delaware

#### **Phosphorus Cycle**



#### Source: Univ. of Alabama A&M + Auburn Ext.

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# NutrientTotal # in SoilPhosphorus1,200Potassium50,000Sulfur800

### Pounds of Nutrition – 3% OM – Top 6" Silty Clay Loam Soil – CEC of 18

Source: Gardner et al., Physiology of Crop Plants, 1985, and Lipman Conybeare (1936)







## ALL Plant Essential Nutrients are tied up in Soil Organic Matter

## Leverage Aggressive Microbes to Unlock SOM Nutrition – Take Costs Out – Drive Yield



#### Nitrogen Cycle



MERISTEM

Source: Univ. of Illinois Crop Physiology



**REVLINE**°

BID-CAPSULE

MERISTE

HOPPER THROTTLE

PI ANTER RAY TREAT

IETHER

## **Bio-Power Here to Stay**



Source: https://www.precedenceresearch.com/agricultural-biologicals-market

## **Revline Hopper** Throttle Corn + **Ether/Carbon**



NEW: ETHER™ Enzyme Technology: 1 g/ac

This Lipase & Mannanase enzyme combo fosters microbial activity for long-





## **The Meristem Acre**

A System Approach Elite Yield Platform





## Rule #1 High Yield Protocol Fundamentals in check!

pH...base fertility...STAND ESTABLISHMENT...pest mgmt...



Hybrid/variety....compaction...etc.

## **VTOP10ROI**

1. High Management Soybeans =	\$292.25
2. High Management Corn =	\$252.74
3. NETAFIM <sup>™</sup> Drip Irrigation =	\$168.80
4. Strip Cropping System =	\$150.48
5. 15' & 30' Drainage Tile =	\$99.20
6. At-Plant Micronutrient	\$93.40
7. Multi-Genetic Corn Planting =	\$85.80
8. SB FurrowForce® vs Dual Rubber Closing Wheels in No-Till =	\$64.22
9. SB Marco NutriStart BOOST 14-12-4-6S: 15 Gal Conceal® =	\$63.05
10. At-Plant Dual Band Conceal® vs Weed-n-Feed Nitrogen Prog. =	\$61.20

INSIDE

## **In-Season Yield Preservation Tips and Tricks**

## Yield is a function of.....

X

## # of seeds or kernels / acre (START – PROTECT)

## Weight of each seed (GRAIN FILL EFFICIENCY)







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## **Zn Sources used at planting**

#### Pleasant Plains Research Farm 2023



Starter in furrow

Starter + 9% Zinc

Starter + Ether + Zn



## In-Season Yield Preservation Tips and Tricks

- 1. Foliar Nutrition..." I struggle to see a positive ROI..."
  - Focus micronutrients early leverage stress mitigation molecules
  - Focus macronutrients late
  - <u>ALWAYS</u> pair a proper PGR/Stress pack <u>WITH</u> foliar nutrition
  - Junk in Junk out



## In-Season Yield Mitigation Tips and Tricks

- 1. Foliar Nutrition..." I struggle to see a positive ROI..."
  - Focus micronutrients early leverage stress mitigation molecules
  - Focus macronutrients late
  - <u>ALWAYS</u> pair a proper PGR/Stress pack <u>WITH</u> foliar nutrition
  - Junk in Junk out
- 2. LEVERAGE BIOLOGY Unlock potential Dr. Below: >25% of
- Goal is to keep solar panels on as long as possible With in-season foliar
   YOU MUST FINISH!!!
   YOU MUST FINISH!!!
- 4. Keep it simple...
  - Adjust to weather/yield potential outlook but DON'T GIVE UP
  - Do not spend yourself broke...utilize current passes



#### **Base HYP Corn**



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MERISTEM

#### Base HYP Corn

#### 25% YIELD CAN BE IMPACTED IN-SEASON



CROP PERFORMANCE

#### Base HYP Co

ALL LTE

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SOYBEAN

10:06

Messages

AT PLAN

THE SEE

NUTRIE

Previous Kansas Soybean Value Contest winner takes top honors once more

An earlier contest deadline and intermittent weather challenges did not keep growers across Kansas from entering their soybeans in the 2024 Kansas Soybean Yield and Value Contests, which maintained strong participation from varying regions. A total of 56 unique entries made their way into the contests – 35 submitted for value analysis and 36 submitted for yield placement. Fifteen first-time participants entered their crop.

McClain Family Farms LLC of **Phillips County** submitted the highest-yielding entry in the contest with a new state record 126.6 bushels per acre. The previous state record of 114.3 was set in 2020 by Sam Miller of Reno County. McClain's Channel 2823RFX soybeans were entered in the statewide no-till, irrigated division of the contest.

Haug Family Farms LLC, Nemaha County, submitted the top dryland entry of the yield contest. The Golden Harvest 3913XF soyb made 96.9 bushels per acre.

il kansassoybeans.org

Meristem high yield soybean program sets the new Kansas state record for Josh @ firebolt ag!





PREPLANT OR

POST-HARVEST:

MANAGE RESIDUE &

EXCAVATOR AMS

AMS & NON-IONIC SURFACTANT WITH RIENT RELEASE & CROP RESIDUE BREAKDO

EXCAVATOR

CROP RESIDUE BREAKDOWN & NUTRIENT RELEASE AID

**INCREASE NUTRIENTS** 

#### HarvestShield Complete

Biological Product Designed to Prime Plants to Better Tolerate Stress



 Shields impact of abiotic stresses, securing increased yield potential

 Promotes vegetative and reproductive growth during key rain events on stressed acres

#### STRESS MITIGATION VALUE

L-Proline: an anti-stressor (osmotic regulator) amino acid accumulated by plants to fight off abiotic stresses. Plants primed with Proline are tolerant to stress before the event occurs. Proline is an antioxidant that regulates the balance of active oxidation in plant cells through a synergistic relationship.

Phenolic Acid Compounds: metabolites play an important role as local or systemic resistance builders in protecting plants against pathogens. Phenolic Acid compounds are more potent than humic and fulvic as they are naturally released from the plant's seeds, roots, and/or residue decomposition to improve tolerance to stress and signal cell wall growth.

#### Zinc (Zn).. ..0.50% Derived from urea, zinc sulfate, manganese sulfate, boric acid, sodium molybdate

ALSO CONTAINS NON-PLANT FOOD INGREDIENTS: L-Proline Phenolic Acids. ...19,800 ppm

#### **RECOMMENDED USE RATE**

FOLIAR APPLICATION

Apply 1 gt/acre and repeat as needed.

HARVESTSHIELD COMPLETE is more effective if applied prior to stress events or during rapid vegetative growth stages. Application may also be beneficial during early to midflowering growth stages.

#### PRODUCT AVAILABILITY

- 2x2.5 gallon jugs
- 250-gallon tote

Density: 9.09 lb/gal

## 1. Phenol......5,000 ppm 2. L-Proline......19,800 ppm

#### + Micronutrient Pack





#### HarvestShield Complete

Biological Product Designed to Prime Plants to Better Tolerate Stress

Crops under stress stop growing and producing sugars.

They start producing **PHENOLS** – their **defense weapons** against biotic and abiotic stresses!

That's secondary metabolism - the plants "immune response".





#### HarvestShield Complete

Biological Product Designed to Prime Plants to Better Tolerate Stress



HOMESTRETCH

STRESS-MITIGATING ADVANCED NUTI



#### HarvestShield Complete Data Corn









Homestretch

STRESS-MITIGATING ADVANCE



#### HarvestShield Complete Data Soybeans









Homestretch



#### HarvestShield Complete Data Soybeans



- Stress (Heat & Drought)
- Stress (Heat and Drought ) + Foliar PRIME 23015-6















#### Normal vs. Intensive Management Senescence at R6

+20.1 Bu/A

## 67.9 Bu/Ac

**Normal** 

## 88.0 Bu/Ac

#### **Intensive Management**




w/ Fungicide Pass

- Focus Macronutrients Late + B/Mo
- Goal is to keep solar panels on!
- Maximize sugar movement...Suppress Ethylene...Improve photosynthetic efficiency
- Synchronize pollination & reduce kernel abortion









#### LATE-SEASON NUTRITION APPLICATION

Because boron (B) must be mineralized from organic matter, coarse-textured soils often experience deficiencies. Dry weather reduces mineralization and limits the movement of B to the plant, which is another common cause of deficiency. Soybean plants do not require large amounts of B, so foliar applications may be an effective method of remediation. Dry weather also impacts potassium (K) availability by collapsing the clay lattice and trapping the molecules, preventing them from moving to the plant in soil water. Potassium is often one of the first visual deficiencies we see in a dry spell. Although large quantities of potassium are required, we have seen some benefits to supplemental foliar K, especially in dry years.

	LATE-SEASON NUTRITION	PFR PROVEN ROI	ROI WIN %	YIELD ADVANTAGE (BU./A.)	YIELD WIN %	APPLICATION RATE & TIMING	ANALYSIS	COMPANY
$\land$	BRANDT® SMART K B	\$16.73	73%	1.5	73%	1 pt. @ R3	2-0-16-2.5B-0.2Mo	Brandt Consolidated, Inc.
~	BRANDT <sup>®</sup> Smart B-mo™	\$13.18	82%	1.8	82%	1 pt. @ R3	0-0-0-5B-0.5Mo	Brandt Consolidated, Inc.
	NACHURS® K-FLEX®	\$6.51	67%	1.3	73%	1 gal. @ R3	0-0-19-65	NACHURS ALPINE SOLUTIONS
	FULLTEC K™	\$5.81	60%	1.0	67%	4 oz. @ R3	0-0-9-1.9B-0.3Co	Spraytec Fertilizers LLC.
	HARVEST MORE® UREA MATE	\$2.22	50%	0.8	58%	2.5 lb. @ R3	5-10-27-0.15B	StollerUSA

#### Which ear would you rather have?









Synchronize reproductive phase





#### Greater pollination + more energy capture

#### = More Yield!

#### **REVLINE™ LATE SEASON on Soybean**



#### Source: PGR AgVantage, 2022

#### **REVLINE<sup>™</sup> LATE SEASON on Corn @VT**





### Rule #1 High Yield Protocol Fundamentals in check!

pH...base fertility...STAND ESTABLISHMENT...pest mgmt...



Hybrid/variety....compaction...etc.



REVLINE®

BID-CAPSUL TECHNOLOG

# <u>100% of time</u> = unlocks nutrition + biostimulant + starter nutrition

# <u>Components Approach</u>

# Leveraging biocapsule to UNLEASE new Technology



**REVLINE**°

BID-CAPSULE

MERISTE

HOPPER THROTTLE

PI ANTER RAY TREAT

IETHER

# **Bio-Power Here to Stay**



Source: https://www.precedenceresearch.com/agricultural-biologicals-market

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Terrasym<sup>®</sup> 408/450 is comprised of a beneficial microbe class called M-trophs. This product works by colonizing the roots to improve early-season growth and nutrient uptake. In 2022, the spring weather conditions at many locations were challenging, which may help explain some of these responses. After three years of testing, Terrasym 408/450 is PFR Proven<sup>™</sup>.





Terrasym<sup>®</sup> is a component part of  $REVLINE^{TM}$  HOPPER THROTTLE<sup>TM</sup>

#### 3-YEAR MULTI-LOCATION TERRASYM® 408/450 RETURN ON INVESTMENT





TERRASYM<sup>®</sup> 408/450











#### INTENT FarmerTrials® Results – 1 Season of Trialing



#### Soybeans +3.1bu/A

75% win-rate

+3.1 Bu/A advantage\*

+9.6% Total root area

+5.7% Rooting depth

+19.4% Leaf tissue iron (Fe) concentrations (ppm)

+21.5% Leaf tissue iron (Mn) concentrations

(ppm)

16 locations in 7 states, large acreage side by sides



#### Corn +7.1bu/A

80% win-rate

+7.1 Bu/A win advantage\*

+6.2% Total root area

+9.0% Nodal root length

+17.5% Leaf tissue iron (Fe) concentrations (ppm)

+12.6% Leaf tissue manganese (Mn)

concentrations (ppm)

20 locations in 7 states, large acreage side by sides



### **2024 PRACTICAL FARM RESEARCH**

IONLOCK<sup>™</sup> Zinc

#### 2024 MULTI-LOCATION RESULTS

TREATMENTS	EMERGED POPULATION	POPULATION DIFFERENCE	BU./A.	BU./A. DIFFERENCE	RETURN ON INVESTMENT	
Control: 2 oz./unit of Seed 80/20 Talc/Graphite Blend	32,792		242.5			
2 oz./unit of Seed BRANDT® EnzUp® SeedFlow Zn	32,833	+41	247.1	+4.6	+\$14.14	
4 oz./unit of Seed GroPak™ A.I.	33,576	+784	245.8	+3.3	+\$13.22	
3 oz./unit of Seed Stride Bio™	33,479	+687	244.8	+2.3	+\$8.04	
0.5 oz./unit of Seed BioWake <sup>™</sup> for Corn	33,167	+375	244.4	+1.9	+\$3.27	
Corn \$4.73/Bu. 80/20 Talc/Graphite Blend \$3.25/lb. Stride Bio <sup>™</sup> \$37.44/lb. BRANDT <sup>®</sup> EnzUp <sup>®</sup> SeedFlow Zn \$146.50/lb. GroPak <sup>™</sup> A.I. \$24.00/lb. BioWake <sup>™</sup> for Corn \$448.00/lb. These results are based on the disclosed study parameters and participating sites.						



### **REVLINE**° HOPPER THROTTLE CORN PLANTER BOX TREATMEN BID-CAPSULE TECHNOLOGY **IETHER** NUTRIENT & MICROBIAL PLANTER BOX DELIVERY SYSTEM MERISTEM Manufactored tov Manistrativ Crop Parti data village flurk i Costorie

# What is next?

# CORN Yield Loss Due to 'Disease'...

# What is #1?



# **CORN Yield Loss Due to 'Disease'**



# **Corn Nematodes:**

# **56.4 Million Bushels**

# **Destroyed Annually**

Proportion of 2023 corn yield lost for the most problematic diseases across the 29 U.S. This figure represents the loss of approximately 465.1 million bushels of corn. The "Others" category includes all diseases in this survey not represented individually





ERISTEM

# **CORN Yield Loss Due to 'Disease'**



### **Root and Lower Stalk Rots:**

### **204.9 Million Bushels**

### **Destroyed Annually**

Proportion of 2023 corn yield lost for the most problematic diseases across the 29 U.S. This figure represents the loss of approximately 465.1 million bushels of corn. The "Others" category includes all diseases in this survey not represented individually



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ERISTEM

# SOYBEAN Yield Loss Due to 'Disease'...

# What is #1?



# **SOYBEAN Yield Loss Due to 'Disease'**



# Soybean Cyst Nematode:

# 87.9 Million Bushels

# **Destroyed Annually**

Proportion of 2023 soybean bushels estimated lost for the most problematic diseases. This figure represents 221.1 million bushels of soybean yield reduction. The "Other" category includes all diseases in this survey not represented individually





ERISTEM

## **SOYBEAN Yield Loss Due to 'Disease'**



## **SDS + PRR + Seed Disease**

### **44.7 Million Bushels**

## **Destroyed Annually**

Proportion of 2023 soybean bushels estimated lost for the most problematic diseases. This figure represents 221.1 million bushels of soybean yield reduction. The "Other" category includes all diseases in this survey not represented individually



CROP PERFORMANCE

# CORN Yield Loss Due to 'Insects'...

# What is #1?



## **CORN Yield Loss Due to 'Insects'**



# Corn Rootworm:

# **519.5** Million Bushels

# **Destroyed Annually**

Common name and relative proportion of estimated yield losses for invertebrate pests of corn in 2023. Others includes all species listed with the exception of the six highlighted here





# Big 5: Corn Nematodes + CRW + Corn Root Rots + SCN + SDS/PRR/Seed ~ \$4,000,000,000 Stolen



### Using \$4/bu corn and \$9/bu soy



# **Big 5: Corn Nematodes + CRW + Corn** Root Rots + SCN + SDS/PRR/Seed ~ \$4 Billion Stolen **Protect your crops from Yield Robbers** How?





# REVLINE OPPER THROTTLE BID-CAPSUL ETHE UTRIENT & MICROBIAL PLANTER BOX DELIVERY SYST

# The future is here... **Bio-Defense**



### Revline<sup>®</sup> Hopper Throttle<sup>™</sup> Corn + GuardX<sup>™</sup>\*

- GuardX<sup>™</sup>\* <u>Corn Rootworm Protection</u> + Root Regeneration :
  - EPA Registered PPFM
  - GuardX<sup>™</sup>\* up-regulates genetic natural defense root exudates
  - CRW not able to sense root
    - + Root Regeneration





VT2 Untreated vs VT2 + GuardX RHTC

Full Drone Video is Insane

<u>GUARDX is Game Changer in</u> <u>CRW Management</u>

REVLINE®

HOPPER THROTTLE

CORN

**Replace planter insecticide** 

Manage Extended Diapause on Rotated Acre w/o Trait Upgrade or Insecticide



### Revline<sup>®</sup> Hopper Throttle<sup>™</sup> Corn + GuardX<sup>™</sup>\*

- 20 years Corn on Corn Extreme CRW Pressure NW Iowa
- Force EVO Full Rate vs Guard X.....STX corn



### Revline<sup>®</sup> Hopper Throttle<sup>™</sup> Corn + GuardX<sup>™</sup>\*

- Dryland Corn on Corn Nebraska
- GuardX + Capture vs Capture Only









#### **Replicated 3rd Party Trials – CONTROLLED RESEARCH**

**Rotated Acre** 

NO RHT Check: 262.0 bu/ac

RHTC+Ether: 273.2 bu/ac

RHTC+Ether+GX: 277.4 bu/ac

+15.4bu/ac....ROTATED ACRE







Corn Bioinsecticide –

**CRW Protection** 



Win Performance Advantage<sup>1</sup>

65 trials<sup>3</sup> across 9 states 2023-present<sup>4</sup> **Corn Biostimulant** 

+7.7 Bu/Ac<sup>2</sup>

Win Performance Advantage<sup>1</sup>

144 trials<sup>3</sup> across 12 states over 2020-2023







https://newleafsym.com/



**RHTC+Ether/Carbon+GuardX vs Check** 



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https://newleafsym.com/





### 2024 Silage Cks Avg: +3.38 T/Ac



+3.3 T/Ac

+4.0 T/Ac



		. 0	
5-9-24 9-12-24	Soil Text Previous Irrigated	Crops Feed Devland: I//1	2 - (2)
34 001			N Tonni
RCS034	lehi (domen	Tens erre Mai	Mare 20% A
RC 5834	utcru	27.84	
-	+3.4	T/Ac	

:5- :9- :3	8-24 12-24 food		Soil Texture: mad Previous Crop: Face Irrighted/Dryland: Fr/19 g Tet					
	Hybrid	Silage Weight	Acrease	Green Tons/ acre	% Moisture	Tons/acre 20% Mois	Crude Protein % of D.	
0	RC6148 3010A	54720	1.57	17.42	Unt	reated	-	
Eo	2010A	54820	1.41	19.44	Tune	up + C	RW	
		+2.	0 T	-/Ac				



### Revline<sup>®</sup> Hopper Throttle<sup>™</sup> Corn + GuardX<sup>™</sup>\*

#### • TAKE COSTS OUT!!!

- Trait Support Moderate to High Pressure
  - <u>Replace planter insecticide...</u>
  - Less time, less money, more bushels
  - Safe and easy to handle
- Trait Reduction Low Pressure
  - 2<sup>nd</sup>/3<sup>rd</sup> Year Corn
  - Rotation Extended Diapause
  - REDUCE COST







# REVLINE® HOPPER THROTTLE ORN PLANTER RAY TREAT BID-CAPSULE **IETHER** NUTRIENT & MICROBIAL PLANTER BOX DELIVERY SYSTE MERISTEM

# The future is here... **Bio-Defense**



## **BIO-CAPSULE**<sup>TM</sup> **COVERAGE & EFFICACY: BIO-DEFENSE CONTROLS**







CROP PERFORMANCE



Soybean Ultimate Defense + PrePhyte<sup>™</sup> ST+ Metalaxyl ST



PREPHYTE

- PrePhyte<sup>™</sup> ST\* BioFungicide + Metalaxyl
  - Broad spectrum fungal pathogen control
  - EPA Registered
  - EXCLUSIVE to MERISTEM
  - 2024: ~200k ac Proof of Concept



#### **BIO-CAPSULE™ on Soybean Research Objectives**



#### 3<sup>rd</sup> Party Independent - AIP



Document the presence of Bacillus on the seed throughout planting



Document the presence of Metalaxyl on the seed throughout planting



Evaluate emergence and early season growth compared to current grower standard F/I seed treatment










POWERED BY



#### **Study Results** META AXYL



**BIO-CAPSULE = 10x** increase in bacillus **CFU** count over standard F&I seed treatment

**BIO-CAPSULE =** nearly 2.5x bacillus **CFU** count compared to industry goal



REVLINE

HOPPER THROTTLE SOYBEAN

LANTER BOX TREATMEN

## **Emergence: Plant Count**



Key Takeaway: Equal performance to grower-std F&I seed treatment observed across environments.





#### Keokuk, IA

#### **BIO-CAPSULE™**



Keokuk, IA



## V4 Growth Stage: Plant Mass



Key Takeaway: Equal performance to grower-standard F&I seed treatment observed across environments.



#### Standard F&I



Franklin, IA

#### **BIO-CAPSULE™**



Franklin, IA





## BIOCAPSULE IS HIGHLY EFFECTIVE DELIVERY METHOD FOR BIO-DEFENSE

## **BIO-DEFENSE: PROTECT YIELD - TAKE COSTS OUT**

Widely available for 2025



CROP PERFORMANCE







## New Product Concept: Introducing Hopper Throttle<sup>™</sup> Soybean MaxStax<sup>™</sup>





CROP PERFORMANCE



## **ULTIMATE SOYBEAN PROTECTION CONCEPT**

國際政權保護和 約 前 圖 圖 前 前



## **Buy Naked Soybeans NOW!**











### **ULTIMATE SOYBEAN PROTECTION**

**HOPPER THROTTLE™ MAXSTAX™** Soybean is a revolutionary combination of 16 crop inputs delivered seamlessly through an advanced planter box seed fluency system. Powered by Meristem's patented BIO-CAPSULE™ Technology, farmers now have an easy-to-use system to replace costly traditional liquid soybean seed treatment.





\* Bokmeyer, J. (2024). Bio-Capsule Delivery System coverage of Active Ingredients: A field study of delivery of dry seed actives through commercial planter equipment. Indianapolis, IN, Ag Ingenuity Partners.

#### **BUYING NAKED SEED**

Farmers can buy naked seed and use seed fluency through MAXSTAX, efficiently delivering fungicides, insecticides, inoculants, biocontrols mand micronutrients.

#### THE EFFICACY DATA SET

#### BIO-CAPSULE = 10x increase in bacillus CFU/g count over standard F&I seed treatment.

Industry leaders have established a target goal of 100,000 CFU count per seed BEFORE planting, with an acceptable range of one log of CFU variation.

AFTER running through the planter, BIO-CAPSULE surpassed by nearly 2.5x bacillus CFU count compared to the industry goal. \*





GUARD C + BORNE X + PREPHYTE+ Metalaxyl on the left (two row plots) and Untreated Control (Two rows) on right.

### SYNERGISTIC EFFECT



- Efficacy against a broad range of fungal diseases – especially SDS
- Top seed safety profile for germination and stand protection
- No phytotoxic seedling effect (Halo Effect)
- Compatible with other seed treatments and inoculants





## **16 COMPONENTS**





#### 5 oz Terrasym®

Proven, industry-leading biostimulant PPFM strain that generates massive root structures.

#### 2 Nitrogen-Fixing Microbes

Azospirillum brasilense; Azospirillum lipoferum

#### **10 Biofertility Microbes**

Azotobacter chroococcum; Azotobacter vinelandii; Thiobacillus ferrooxidans; Paenibacillus azotofixans; Bacillus amyloliquefaciens; Bacillus licheniformis; Bacillus megaterium; Bacillus pumilus; Bacillus subtilis; Trichoderma harzianum

#### BORNE XTM

EPA-registered biofungicide to prevent soil-borne fungal diseases such as Fusarium (causal agent for SDS) and Rhizoctonia.

## ſ

#### GUARD M™

EPA-registered, bioinsecticide for soybeans that targets seedcorn maggots and other secondary pests

#### GUARD C™

Bionematicide containing Fungal chitosan to suppress nematodes while stimulating root and plant growth.



Active Carbon

ETHER<sup>™</sup> Enzyme Technology

Lipase & Mannanase enzymes that increase

biological activity & activate nutrient availability



### **PROTECT – TAKE COST OUT**

BIO-CAPSULE TECHNOLOGY	HOPPER THROTTLE™ MAXSTAX™ SOYBEAN: <b>Components</b>	Farmer Traditional Liquid Seed Treatment: <b>Components</b>	Farmer Traditional Liquid Seed Treatment: Cost Per Unit of Soybeans Seeding Rate 140,000/AC	
<u>_</u>	PREPHYTE™ & METALAXYL	3 Fungicides	\$9.00	
	GUARD C™	5		
	GUARD M™	Neonic Insecticide	\$3.00	
•	Industry-Leading RACEREADY™ Bradyrhizobia Inoculant	Inoculant Bradyrhizobium	\$3.00	
	BORNE X™	SDS Control – Saltro/ILEVO/Cyst	\$10.00	
	80/20 Talc/Graphite	Talc/Graphite	\$1.00	
TOTAL PROTECTION VALUE: \$26.00				

<b>OPTIMIZE – MAKE IT PAY</b>					
BIO-CAPSULE TECHNOLOGY	HOPPER THROTTLE™ MAXSTAX™ SOYBEAN: <i>Components</i>	Plant Health & Yield Drivers: <b>Components</b>	Plant Health & Yield Drivers: <b>Cost</b>		
	5 oz Terrasym®	PGR	\$6.00		
	Ten microbes to help release bound-up plant nutrition Two strains of <i>Azospirillum</i> to fix nitrogen	Nitrogen Fixers/ Nutrients Solubilizer	\$12.00		
	ETHER™ Enzyme Technology with Active Carbon	Starter - 6-24-6	\$24.00		
	0.43 lbs IONLOCK™ Zinc	Zinc	\$6.00		
	Mn & Fe Seed Fluency blend	Mn/Fe	\$1.00		
	Seed cost savings by dropping seeding rate to 110,000/AC		\$5.00		
TOTAL OPTIMIZATION VALUE: \$54.00					

### VALUE IN THE PAIL: \$80.00





## **ULTIMATE CORN PROTECTION - CONCEPT**

**建制度和原因用于的消息的的**。





### - BROAD SPECTRUM CONTROL AGAINST PESTS -



BIOINSECTICIDE





BIONEMATICIDE



BIOINSECTICIDE



## Big 5: Corn Nematodes + CRW + Corn Root Rots + SCN + SDS/PRR/Seed ~ \$4 Billion Stolen









## **Bio-Defense is Here to Stay...only Generation 1**

## Leverage <u>*LIVE*</u> Biology with BioCapsule





REVLINE®

BID-CAPSU TECHNOLO

# *Efficient Starter* + *FINISHER*

## Harness <u>LIVE</u> biology TAKE COSTS OUT!

## **Bio-Defense is HERE**

## **Upshift C with ETHER Enzyme Technology**





#### Enzyme with Water Soluble Fertilizer

UPSHIFT® C powered by ETHER™ Enzyme Technology combines two enzymes specifically identified to increase phosphate availability, increase nutrient and water availability and boost plant growth, while maximizing microbial activity.

This product is designed for dissolving in water and applying through fertilizing equipment into actively growing root zones, or injected near the seed during planting. It has a low salt index, so it is ideal for use as a starter or sidedress fertilizer applied directly to the soil.

ETHER Enzyme Technology is designed to kick start the uptake of available soil nutrients and water, while maximizing microbial activity.

#### AGRONOMIC BENEFITS

Phosphatase: Phosphatase enzymes release phosphate from organic phosphate sources in the soil, which increases nutrient availability and uptake.

Mannanase: Mannanase enzymes break down starches that surround the outermost layer of the root tip. This chemical reaction increases the flow of water and nutrients to the root zone and sugars in the plant. This in turn boosts root growth and increases microbial activity.

#### PRODUCT BENEFITS

- Supports germination and early vigor
- Aids in microbial activity
- Boosts root growth
- Increases nutrient availability and uptake

PUT YOUR CROP ON THE FAST TRACK TO HIGHER YIELDS



#### GUARANTEED ANALYSIS 12-58-0

fotal Nitrogen	
12:0% Ammoniacal nitrogen	
wailable Phosphate (P,O,)	
Derived from monoammonium phosphate.	

#### DIRECTIONS FOR USE

UPSHIFT C is recommended for multiple crops.

#### RECOMMENDED USE RATE

Starter or side-dress fertilizer: Use minimum of 2.5 lb/acre at planting, dissolved in warm water

For best use, mix 0.5 lb concentrate/gal of water. DO NOT exceed 2 lb UPSHIFT C per gallon of water. Repeat as needed

Direct Replacement for 10-34-0 starter fertilizer: For every 1 gallon of 10-34-0 fertilizers, replace with 0.5 lbs of UPSHIFT C dissolved into 1 gallon of water.

A maximum of 2 lb UPSHIFT C can be dissolved per gallon. However, longer mix times are required and this is only recommended for users that have heated water and strong agitation.

May be run through irrigation systems.



## **Upshift C powered by Ether**

## 12-58-0 Dry Soluble Powder

Mix 1/2# per gallon of water

Replaces 1 gallon 10-34-0...6-24-6....

Do not pay to ship water

## Leverage Ether Enzyme tech.



#### **Enzyme with Water Soluble Fertilizer**

UPSHIFT<sup>®</sup> C powered by ETHER<sup>™</sup> Enzyme Technology combines two enzymes specifically identified to increase phosphate availability, increase nutrient and water availability and boost plant growth, while maximizing microbial activity.

This product is designed for dissolving in water and applying through fertilizing equipment into actively growing root zones, or injected near the seed during planting. It has a low salt index, so it is ideal for use as a starter or sidedress fertilizer applied directly to the soil.

**ETHER Enzyme Technology** is designed to kick start the uptake of available soil nutrients and water, while maximizing microbial activity.

#### AGRONOMIC BENEFITS

**Phosphatase:** Phosphatase enzymes release phosphate from organic phosphate sources in the soil, which increases nutrient availability and uptake.

**Mannanase:** Mannanase enzymes break down starches that surround the outermost layer of the root tip. This chemical reaction increases the flow of water and nutrients to the root zone and sugars in the plant. This in turn boosts root growth and increases microbial activity.

#### PUT YOUR CROP ON THE FAST TRACK TO HIGHER YIELDS



#### GUARANTEED ANALYSIS 12-58-0

Total Nitrogen	
12.0% Ammoniacal nitrogen	
Available Phosphate (P2O5)	
Derived from monoammonium phosphate.	

#### ALSO CONTAINS NON-PLANT FOOD INGREDIENTS

Phosphatase	5.0 x 10 <sup>2</sup> µUnits/g
Mannanase	2.2 x 10 <sup>6</sup> µUnits/g

#### **DIRECTIONS FOR USE**

UPSHIFT C is recommended for multiple crops.

#### **RECOMMENDED USE RATE**

**Starter or side-dress fertilizer**: Use minimum of 2.5 lb/acre at planting, dissolved in warm water

For best use, mix 0.5 lb concentrate/gal of water. DO NOT exceed 2 lb UPSHIFT C per gallon of water. Repeat as needed

**Direct Replacement for 10-34-0 starter fertilizer**: For every 1 gallon of 10-34-0 fertilizers, replace with 0.5 lbs of UPSHIFT C dissolved into 1 gallon of water.





JPSHIFT C **CONCENTRATED STARTER SYSTEM** DK 59-82 Upshift 260.3 Opti start 255.9 P0953 Upshift 277 Opti start 270.3

nmary Equipment W	leather Setup	
Wet Weight 14,484.1 lb/ac	Total Wet Weight 368,130.3 lb	
Moisture 24.1%	Throughput 2,480.0 bu/hr	
/ariety	Yield 🗘	
	206.7 bu/ac	
DKC 101-35MERI	240.5 bu/ac	11/ Ohu/
DKC101-35RIB	225.7 bu/ac	+14.00U/a
otals/Averages		
otal Wet Weight	368,130.3 lb	
"hroughput (Wet)	155596.4 lb/hr	
🖋 Edit	Delete	
View i	in Analyze	

## **Starter Trial 2024**





Upshift C @ 5 gal	0.8%	\$17/ac
6-24-6 type @ 5 gal	0.5%	\$28/ac
10-34-0 type @ 5 gal	0.5%	\$20/ac
Hi-Cost Clear @ 5 gal	0.4%	\$45/ac
V3 Tissue Sample	% P in Plant Tissue	Cost/Ac

Friends do not let friends....buy over-priced starter...leverage Ether

## **Upshift C with ETHER Enzyme Technology**



## Q and A





## Residue Biodigester + Nutrient Release – TAKE COSTS OUT!!







Untreated Treated

## **RESULTS FROM THE FIELD**





#### **EXCAVATOR ON CORN: SIDE BY SIDE**

	UNTREATED	TREATED	
MOISTURE	24.90%	26%	
WEIGHT	4,717 lbs grain	6,521 lbs grain	
ROW	629' row length, 8 rows 30"	795' row length, 8 rows	
BU/A	257	277	



Putnam Seed Service Greencastle, IN







## **RESULTS FROM THE FIELD**



Charlesworth - 8, Aaron Crop Year: 2023 Farm: Whaten Field: JWhatenE / John Whaten E Crop Zone: Com

**Treatment Analysis Map** 



## + 13.4bu/ac

B	<b>RA</b> ofessiona	ND Agricultu		Treatment Analysis Data Charlesworth - 8, Aaron Crop Year: 2023 Farm: Whaten Field: JWhatenE / John Whaten E Crop Zone: Com					
A_Yield	Moisture	Trt	Acres	Quantity	StdDev	Count	Min	Max	
246.06	16.85	TriA	9.69	2385	11,58	2279	175.96	287.6	
232.62	16.52	UnTrtA	8.74	2033	15.36	2578	166.01	285.53	

EXCAVATOR®

CROP RESIDUE BREAKDOWN & NUTRIENT RELEASE AID



## **RESULTS FROM THE FIELD**



### **4 weeks after Treatment**

### Excavator AMS + CycleStrike





## 3 weeks of treatment with EXCAVTOR<sup>®</sup> AMS with CYCLESTRIKE











## 3 weeks of treatment with EXCAVTOR<sup>®</sup> AMS with CYCLESTRIKE







## EXCAVATOR<sup>®</sup>



Take Costs Out!!!



## David Hula Hit Another New Record Corn Yield With 623 BPA, Now Thinks 900 BPA Is Possible



EXCAVATOR" CROP RESIDUE BREAKDOWN & NUTRIENT RELEASE AID

proponent of minimal tillage

practices, such as strip tillage, he's

found success with some biologicals.

Hula likes to use products, such as

Excavator by Meristem, that help

break down residue while also

releasing much-needed nutrients in

the soil to help feed to crop.

Another benefit of minimal tillage

combined with a biological has been

the reduction in the amount of

fertilizer he needs to apply.

## DAVID HUL

H:STRIP-TILL, MINIMUM-TILL, MULCH-TILL, RIDGE-TILL IRRIGATED CLASS

**1ST PLACE:** VIRGINIA

**1**ST PLACE: NATIONAL

YIELD: 8439

Source: https://www.agweb.com/news/crops/harvest/david-hula-hit-another-newrecord-corn-yield-623-bpa-now-thinks-900-bpa-possible

## Soybean White Mold Side x Side

Spring Applied with Pre-Herbicide Pass

Was not intended to be SWM study...Excavator Split

Dramatic infection decrease Sclerotia degradation Soil/Residue interface

**Southern Wisconsin 2023** 





## FIGHT BACK WITH EXCAVATOR<sup>TM</sup>

### 3:1 RETURN ON INVESTMENT

Through multi-location/multi-state research trials, EXCAVATOR™ has proven to deliver a 3:1 return on investment through one or a combination of the following benefits.



Breaking down residue faster will allow faster planting, stronger stands and fewer skips



More nutrients available early

\$39/ac

\$25/ac



Less tillage required

\$18/ac

2%+

in soil health index





## Q and A

## EXCAVATOR AMS

AMS & NON-IONIC SURFACTANT WITH NUTRIENT RELEASE & CROP RESIDUE BREAKDOWN





CROP RESIDUE BREAKDOWN & NUTRIENT RELEASE AID **POWERED BY** 





## Thank you!

Q and A





## APPENDIX

Q and A

