

[Ultimate coverage on every seed.]



This visual representation of the packaging may be different than the final product.

## Unique delivery system

- Delivers live biology directly on the seed at planting
- Excellent seed coverage
- Easy to store and apply

## Delivers more value

- 2 Azotobacters – Nitrogen Fixation
- 5 Bacillus - solubilize nutrients in soil
- 1 Trichoderma - draw nutrients in soil to the roots
- Biological plant stimulant (Terrasym) for aggressive root and shoot development
- Top of the market seed fluency with 1.35 lbs. Zinc, Mn & Fe

## TuneUp+ Corn – What are the biological ingredients and why is it special?

**2 species of Nitrogen Fixing Bacteria** and consortia of **Bacillus** species to improve nutrient use efficiency, aid in phosphate and potassium availability. **Very High Dose Rate: Colony Forming Units (CFU) of beneficial bacteria exceeds 65 billion spores per acre.**



<i>Azotobacter chroococcum</i>	Is a free-living <b>Nitrogen</b> fixing soil bacteria that can fix nitrogen from the atmosphere. This bacteria in this genus also can synthesize natural plant hormones and can stimulate microbes in the rhizosphere, improving plant growth and development.
<i>Azotobacter vinelandii</i>	A <b>Nitrogen</b> fixing bacteria which can take up nitrogen from air. Azotobacter species live in the soil and can convert atmospheric nitrogen to ammonia.
<i>Bacillus amyloliquefaciens</i>	Grows with plant roots and forms a long-lasting active biofilm on fine root hairs resulting in an excellent bio-fertilizer that can activate soil nutrients by changing the forms of soil elements.
<i>Bacillus licheniformis</i>	Is used to improve soil micro-ecology and to increase fertilizer use efficiency. This bacterium grows with plant roots and provide season long growth benefits.
<i>Bacillus megaterium</i>	Is a resilient bacterium that is known to produce phosphate-fixing and potassium-fixing fertilizers. It has a good effect organic phosphorus and other key nutrients in soil.
<i>Bacillus pumilus</i>	Is noted for enhancing plant boron uptake by increasing boron availability in the soil and has been documented to increase nitrogen uptake in plants.
<i>Bacillus subtilis</i>	Can solubilize soil phosphorous and enhance nitrogen utilization, as well as promoting plant growth. Bacillus subtilis also forms a protective film on plant roots as they grow.
<i>Trichoderma harzianum</i>	Fungal microorganism well known for its positive association with plant roots supporting plant health by improving root architecture and positively influencing plant nutrient uptake.

# 2020-2021 Farmer Trial Results

Terrasym Product Offerings Validated at Commercial Scale

## TERRASYM FOR SOYBEANS



**75%** win-rate

**+2.0 Bu/A** advantage

**+2.9%** Total root area

**+5.6%** Rooting depth

**+20.7%** Leaf tissue iron concentrations (ppm)

*Showcasing percent increase compared to control*

*All untreated checks and PPFM treatments have base fungicide and insecticide application*

**Source:**

**Soybean:** 2020 IN10T FarmerTrials; Root trends reported for Terrasym 401 as a seed treatment (V2-V4, 16 locations, 10 plants per treatment, per location) yield aggregate reported for 15 locations, 2021 AIP Trials; Root trends reported for Terrasym 401 as a planter box application (V2-V6, 15 locations, n = 20 plants per treatment, per location); Nutrient data reported for Terrasym 409 (V5-V6, 19 locations, 10 plants per treatment per location)

**Corn:** 2020 IN10T FarmerTrials; Root trends reported for Terrasym 450 as an in furrow treatment (V2-V4, 19 locations, 10 plants per treatment, per location), yield aggregate reported for TS450 as a seed treatment and in furrow treatment, 20 locations; 2021 AIP Trials; Root trends reported for Terrasym 450 as a planter box application (V4-V6, 13 locations, n = 10 plants per treatment per location); Nutrient data reported for Terrasym 450 as a seed treatment and in furrow treatment (V5-V6, 24 locations, 10 plants per treatment per location)

## TERRASYM FOR CORN



**80%** win-rate

**+4.5 Bu/A** advantage

**+6.7%** Total root area

**+7.3%** Rooting depth

**+9.6%** Nodal root length

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

**+12.6%** Leaf tissue manganese concentrations (ppm)



# Terrasym Results



Terrasym® 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 **terrasym**

*Terrasym® is a component part of TuneUp+ Corn*



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



TERRASYM® 408/450

# TuneUp+ Corn



**PLANTER BOX TREATMENT & MICROBIAL SYSTEM FOR BUILDING ROOT MASS & OPTIMIZING NUTRIENT UPTAKE**

## Defining The Value In The Pail

### TuneUp+ Corn

**BASE INGREDIENTS:**

80/20 TALC, GRAPHITE AND MICRONUTRIENT BLEND

**GUARANTEED ANALYSIS**

Iron (Fe).....	0.70%
Manganese (Mn) .....	0.90%
Zinc (Zn).....	27.00%
Derived from Ferrous Oxide, Manganese Oxide, and Zinc Sulfate.	

**BIO-CAPSULE INGREDIENTS: POWERED BY TERRASYM®**

**ALSO CONTAINS NON-PLANT FOOD INGREDIENTS:**

Azotobacter Chroococcum.....	7.1x10 <sup>9</sup> CFU/g
Azotobacter Vinelandii.....	7.1x10 <sup>9</sup> CFU/g
Bacillus Amyloliquefaciens.....	9.6x10 <sup>9</sup> CFU/g
Bacillus Licheniformis.....	1.9x10 <sup>10</sup> CFU/g
Bacillus Megaterium.....	9.6x10 <sup>9</sup> CFU/g
Bacillus Pumilus.....	1.6x10 <sup>10</sup> CFU/g
Bacillus Subtilis .....	9.6x10 <sup>9</sup> CFU/g
Trichoderma Harzianum.....	6.4x10 <sup>6</sup> CFU/g
Methylobacterium gregans.....	1x10 <sup>9</sup> CFU/g

Component	Price/Ac
80/20 Talc Graphite	<b>\$7.75</b>
Iron (Fe)	<b>\$2.00</b>
Manganese (Mn)	<b>\$2.00</b>
Zinc (Zn) 9%	<b>\$8.00</b>
Competitive Azo Microbe Package	<b>\$25.00</b>
Competitive Nutrient Solubilizin Microbe Package	<b>\$15.00</b>
PGR Biological (Terrasym®)	<b>\$4.00</b>
	<b>\$56.75</b>

[Ultimate coverage on every seed.]

**Industry-Leading Bio-Fertility & N-Fixing Microbes**

Azotobacter chroococcum  
Azotobacter vinelandii  
Bacillus amyloliquefaciens  
Bacillus licheniformis  
Bacillus megaterium  
Bacillus pumilus  
Bacillus subtilis  
Trichoderma harzianum

CFU count 65 Billion  
100% Increase from previous version

**6.25 oz Terrasym®**  
Proven, Industry-Leading Bio Stimulant PPFM strains that generate massive root structures.

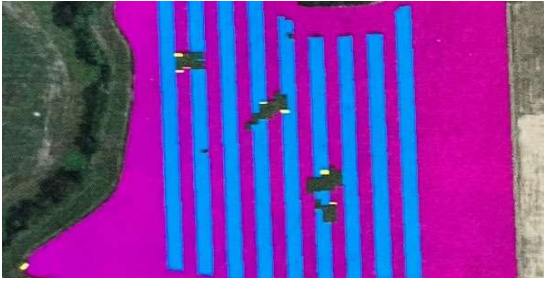
**1.35 lbs Zinc**

**80/20 Talc/Graphite + Mn & Fe**

This visual representation of the packaging may be different than the final product.



Untreated 197.98 bu/Ac



Treated 205.87 bu/Ac

+7.89 Bu/ac

Untreated 198.5 bu/Ac

Treated 204.6 bu/Ac

+6.1 Bu/ac

Untreated 249.35 bu/Ac



Treated 255.9 bu/Ac

+6.55 Bu/ac

# TuneUp+ Corn Results



	*Cooperator		*Planting Date	5/14/2022	
	Address		*Planting Rate	38,000	
	City	Lexington	*Previous Crop	SOYBEANS	
	*State	IL	*Tillage System	CONVENTIONAL	
	*Zip Code		*Harvest Date	10/14/2022	
	Phone		*GPS Coordinates for Plot Area (Lat/Lon)		
	*Plot State	Illinois	First Row Front:	40.654532	-88.66382
	*Plot County	McLean	Last Row Front:	40.655715	-88.663866
	*Plot Crop	Corn	Last Row Back:	40.655703	-88.661011
	Herbicide		First Row Back:	40.654542	-88.660962
Fungicide/Insecticide			Selling Price		\$6.50 / Bushel
Yield: Plot Weight x (100 - Harv. Moist.) x Crop Factor ÷ Row Length ÷ Row Width ÷ Rows Harvested					

No.	Business Brand	Hybrid	Seed Trt	RM	Trait	Harvest Weight	Harvest Moist %	Row Width	Row Length	# Rows	Harvest Pop.	Tst Wt.	Bu/Acre @ 15% mst	Gross Income	Yield Rank	Income Rank
1	STONE	6368RIB	TuneUp+ Corn	113	SSTX	4286	22.4	30	800	6		59.9	253.6	\$ 1,536.03	1	1
2	STONE	6368RIB	BioniQ	113	SSTX	4170	22.3	30	800	6		58.5	247.1	\$ 1,497.86	5	4
3	STONE	6368RIB	Untreated	113	SSTX	4108	22.1	30	800	6		58.1	244.0	\$ 1,482.32	7	7
4	STONE	6368RIB	Indigo 229	113	SSTX	4196	22.7	30	800	6		58.7	247.4	\$ 1,493.51	4	5
5	STONE	6368RIB	Biotrinsic M33/34	113	SSTX	4150	22.3	30	800	6		59.0	245.9	\$ 1,490.68	6	6
6	STONE	6368RIB	Biotrinsic W10	113	SSTX	4196	22.4	30	800	6		59.8	248.3	\$ 1,503.77	3	3
7	STONE	6368RIB	Biotrinsic W12	113	SSTX	4210	21.8	30	800	6		59.1	251.1	\$ 1,529.49	2	2
<b>PLOT AVERAGE</b>							<b>22.3</b>						<b>248.2</b>	<b>\$ 1,504.81</b>		

# Western Corn Belt - Yield



Operations Center

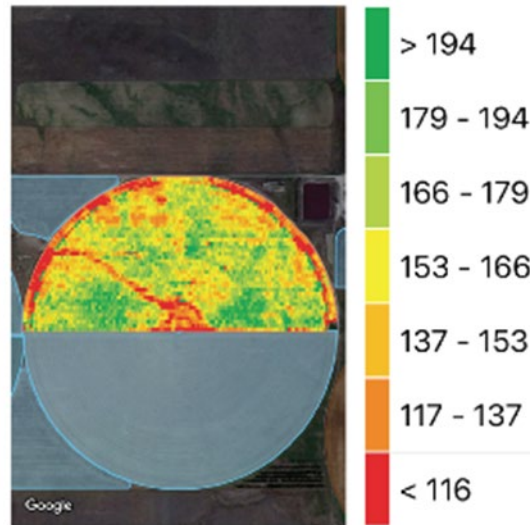
**TuneUp+**  
Corn

2022 Corn: Harvest

Middle Circle north

Layer: Yield

Anderson's irrigated | Anderson Livestock



<b>Work Start Time</b> Oct 22, 2022 at 4:33:20 PM	<b>Average Wet Weight</b> 9,102.00 lb/ac	<b>--- YIELD</b> 130.00 bu/ac
<b>Work End Time</b> Oct 31, 2022 at 1:06:48 PM	<b>Avg. Speed</b> 4.6 mi/hr	<b>Machines</b> 1H0S780SEMT815881
<b>Total Yield</b> 9,909.8 bu	<b>DKC37-50 VT2PRIB TOTAL</b> 5,434.20 bu	<b>Crop Type</b> Corn
<b>Dry Yield</b> 160.8 bu/ac	<b>DKC37-50HT TOTAL</b> 4,473.00 bu	
<b>Average Moisture</b> 14.9 %	<b>--- TOTAL</b> 2.60 bu	
<b>Area</b> 61.6 ac	<b>DKC37-50 VT2PRIB YIELD</b> 157.60 bu/ac	<b>+7.1 Bu / Acre Advantage</b>
<b>Wet Weight</b> 560,957.0 lb	<b>DKC37-50HT YIELD</b> 164.93 bu/ac	