

HERITAGE® Cooperative

2021 Trial Results

CROPLAN DKC62-70 RIB

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Introduction

2021 HERITAGE TRIAL RESULTS

"Combining technology, experience and knowledge to manage and simplify decisions, improve efficiency, protect our environment and increase profit on each acre"

We recognize that each acre is different and each farmer has specific management goals to meet their needs. That is why we conduct trials across the state of Ohio to determine solutions to optimize each season. Heritage combines the knowledge of our experienced Agronomy team along with the dedicated Crop Advantage team of ag technology specialists. Together they utilize tools to help manage each acre to its maximum potential.

We want to extend our sincere appreciation to everyone who participated in agronomic trials this year. These results would not be possible without the knowledge, time, energy and support of our growers, industry partners at WinField United, Crop Advantage team, Agronomy team and many others. We hope you find the 2021 Heritage Cooperative Trial Results informative and valuable.



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Field Forecasting Tool: Side Dress Urea Rate

OBJECTIVE:

The Crop Advantage team utilized the R7[®] Field Forecasting Tool (FFT) to help determine the rate of urea to use at side dress.

TRIAL INFORMATION:

Location: Coshocton County, OH Planting Date: 5/16/2021 Variety: DKC55-20RIB Population: 32,000 sds/ac Acres: 13



TRIAL STRATEGY:

The trial field is a 13-acre field that lays flat and runs west to east. The field was split in half during the side dress application, leaving one half as the control and the other being the experimental test. The control consisted of the farmer's original plan for urea rate at side dress. The test consisted of FFT's recommendation for urea rate at side dress.

With all preplant applications logged, planting data imported and weather factors recorded, FFT determined that 300 pounds of urea was the best rate to use for side dress. This rate was determined using tissue tests and the scenario tool on FFT. The FFT recommendation was 50 pounds higher than the farmer's original plan.



R7 FIELD FORECASTING TOOL

The R7 Field Forecasting Tool is your go-to guide for optimal in-season decision-making. It combines predictive weather models, agronomic practices, tissue testing and ground truthing to measure the health and performance of your crops. Quickly find when and where the next threat may be to tackle field deficiencies before ROI is compromised.





OBSERVATIONS:

The graph aboves shows estimated yield, gap of bushels and bushels lost. Applications and tissue samples have also been recorded for this field.

This graph displays data pulled after the side dress application at 300 pounds of urea. At the time of application, 300 pounds were put down on the test side of the field and 250 pounds on the control side. The application was recorded on June 18, 2021; corn was at the V5 growth stage.

YIELD RESULTS & PROFITABILITY:

Control: 195.8 dry bu/ac • \$929.54 **Test:** 213.9 dry bu/ac • \$1,010.36 Yield Difference: 18.1 bu/ac • \$80.82 gain/loss

COST AND PROFIT EVALUATION:

Urea cost (provided by farmer): \$0.19/pound Sell price (set by farmer): \$4.99/bushel

Control: 250 pounds of urea

Sell Price: 195.8 bu x \$4.99= \$977.04/acre Amount of N = 115 pounds Urea cost = \$47.50/acre

Profit: \$929.54

Test: 300 pounds of urea

Sell Price: 213.9 bu x \$4.99= \$1067.34/acre Amount of N = 138 pounds Urea cost = \$57.00/acre

Profit: \$1010.36

Planting Downforce Impact on Emergence

OBJECTIVE:

The Crop Advantage team conducted trials on two different corn planters to determine the impact downforce has on plant emergence and yield.

TRIAL STRATEGY:

The trial involved two different planters on two separate fields. Both trial areas are flat with coarser-textured soils. Each trial was conducted at half the planter's width, at a random spot in the field that was 17 ½ ft long.

From the day each field was planted, the team checked daily for five days to see if any plants had emerged. If a plant emerged, a colored flag that corresponded to the day of emergence was placed beside the emerged plant.

Day one emergence is defined as the first day a plant was visible, day two would be the day after that and that pattern continued up to day five. The goal of flagging each plant was to see if plant emergence corresponded to yield at harvest.



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The team chose to look at two planters because downforce plays a key role in creating a uniform stand. A uniform stand, or even emergence, means plants are up and out of the ground at the same time. Having a uniform stand eliminates plants that are behind in growth stages which leads to lower yield. A plant one leaf stage behind will only produce half an ear. A plant two leaves behind will not produce anything, thus becoming a weed.

Precision Planting[,] AirForce AirForce is a downforce control system that measures variability in the field and automatically adjusts your downforce needs to changing field environments, so you stop sacrificing yield as environments in your fields change.

PLOT 1 DATA:

Plot 1	Day 1	Day 2	Day 3	Day 4	Day 5
Row 1	23	8	2	0	0
Row 2	31	1	1	0	0
Row 3	27	7	0	0	0
Row 4	26	5	1	0	0
Row 5	25	1	0	1	1
Row 6	28	5	1	0	0

PLOT 2 DATA:

Plot 2	Day 1	Day 2	Day 3	Day 4	Day 5
Row 1	17	8	4	1	0
Row 2	6	8	12	2	0
Row 3	8	11	9	1	1
Row 4	8	12	8	1	2
Row 5	9	9	7	1	2
Row 6	11	13	4	3	0
Row 7	20	8	4	0	1
Row 8	14	15	2	1	1

ADDITIONAL NOTES:

The planter from plot 1 has Precision Planting's AirForce installed. AirForce is a planter-wide downforce control system. This system allows the farmer to automatically change the amount of downforce while planting across the field to ensure row units have 100% ground contact.

The planter from plot 2 only has spring downforce, which is a manually-controlled system.

OBSERVATIONS:

Looking at the chart and comparing the two different planters, plot 1 had considerably less late-emerging plants than plot 2.



SUMMARY:

Using data from plot 2, the effect plant emergence has on yield was determined. The pictures above show a visible difference in ear size, length, and kernel depth. These results show why having a uniform emergence across your field is so important.



DAY 1 VS. DAY 5 EMERGENCE



Corn Tissue Sample Results

CORN TISSUE SAMPLE RESULTS & RECOMMENDATIONS:

When comparing Heritage samples to the rest of Ohio, similarities can be seen in nitrogen (N), Sulfur (S), zinc (Zn) and manganese (Mn) deficiencies. Some of Heritage's internal samples showed more potassium (K) deficiencies in later samples.

These nutrient deficiencies can be easily corrected. Sulfur can be corrected with a dry application of ammonium sulfate (AMS), which could help some N issues if foliarly applied. The Zn and Mn should be addressed multiple times throughout the year with in-furrow/starter and foliar applications. Products like ULTRA-CHE[®] 9% Zn and MAX-IN[®] ZMB are products that can be applied to help.

Things to consider in 2022:

- → When do you apply your nitrogen?
 - All PRE?
 - PRE and POST?
 - PRE, POST and POST?
- → Are you using a nitrogen stabilizer?

The following graphs represent 2021 corn tissue sampling data. The green, yellow and red bars represent the percent of sufficient, responsive and deficient nutrients found in the tissue samples.



During the 2021 growing season, Heritage pulled 291 corn tissue samples and 90 soybean tissue samples - an increase of almost double from the 2020 season.

OHIO CORN TISSUE RESULTS:



HERITAGE COOPERATIVE **V10 CORN TISSUE RESULTS:**



green = sufficient yellow = responsive

green yellow red 2019 2019 2019

red = deficient



yellow 2020

red 2020

green 2020

yellow 2021

red 2021

green 2021

SOYBEAN TISSUE SAMPLE RESULTS & RECOMMENDATIONS:

Looking at the tissue sample results for soybeans, sulfur (S), manganese (Mn) and copper (Cu) are present, boron (B) and potassium (K) become deficient as plants move into reproductive growth.

Soybean nutrient deficiencies can be easily corrected. Sulfur and K can be remedied with a dry application, and a foliar spray application can help the Mn, B and Cu deficiencies.

Things to consider in 2022:

- → Are you making any in-season dry applications?
- → What micronutrients are you using?
 - Some micronutrient mixes contain more than one nutrient, like MAX-IN ZMB, which has Zn, Mn, and B.

Tissue samples pulled from 2021, helped identify nutrient deficiencies with:

PRIMARY NUTRIENTS: nitrogen (N), phosphorus (P) & potassium (K) **SECONDARY NUTRIENTS:** calcium (Ca), magnesium (Mg) & sulfur (S) **MICRONUTRIENTS:** boron (B), zinc (Zn), copper (Cu) & manganese (Mn)

The following graphs represent 2021 soybean tissue sampling data. The green, yellow and red bars on the charts below represent the percent of sufficient, responsive and deficient nutrients found in the tissue samples.

HERITAGE COOPERATIVE **V5 SOYBEAN TISSUE RESULTS:** Nitrogen (N) V5 6 5 4 3 2 1 ò 2020 vellow 2020 red 2020 green 2021 green 2021 vellow 2021 Potassium (K) V5 9876543210 2020 vellow 2020 red 2020 green 2021 green 2021 2021 vellow Phosphorus (P) V5 9876543210

2021 green

2021 vellow 2021 red



2020 green 2020 vellow 2020 red



OHIO SOYBEAN TISSUE RESULTS:



HERITAGE COOPERATIVE R1 SOYBEAN TISSUE RESULTS:









Nutrient Deficiency Identification

OVERVIEW:

Learn about the key nutrients essential for plant and soil health and high yields. The following images showcase common nutrient deficiencies identified in Heritage Cooperative's 2021 tissue sampling data. Key takeaway: tissue sampling helps to diagnose issues before they become visual.

All images are courtesy of the IPNI Crop Nutrient Deficiency Image Collection.

SOYBEAN POTASSIUM DEFICIENCY: Yellow banding on the margin of the leaf

SOYBEAN SULFUR DEFICIENCY:

Interveinal chlorosis (yellow in between veins) to the tip of the leaf and stunted growth

SOYBEAN MANGANESE DEFICIENCY:

Pale yellow plant with interveinal chlorosis on upper leaves

SOYBEAN BORON DEFICIENCY:

Abnormal growth or yellowing towards the tip of the leaf



















CORN NITROGEN DEFICIENCY:

Inverted "V" shape from the mid-rib out

CORN POTASSIUM DEFICIENCY:

Yellow banding on the margin of the leaf

CORN SULFUR DEFICIENCY:

Interveinal chlorosis to the tip of the leaf and stunted growth

CORN ZINC DEFICIENCY:

Interveinal chlorosis/ yellow band that starts at the base but fades before it gets to the tip of the leaf

CORN MANGANESE DEFICIENCY:

Pale yellow plant with interveinal chlorosis on upper leaves















2021 ANSWER PLOT OVERVIEW:

In 2021, fungicide results were very favorable nationally, throughout the Eastern Corn Belt, and Ohio. 2021 was a moderate year for diseases like gray leaf spot and northern corn leaf blight. However, tar spot, a newer disease for the Eastern Corn Belt, impacted northwestern and central parts of Ohio. Connect with your Heritage agronomist for further updates on this disease.

Growers noted the visual benefits across treated acres in 2021, including longer stay green, better dry down and better stalk integrity, overall making for a faster harvest.

The following graphs represent yield results from 2020 & 2021. These results show responses to different fungicides, compare multiple locations, and correlate to response-to scores.

2020 ANSWER PLOT YIELD DATA:

The graph below compares Delaro® Complete and Protegam® YLD to the untreated hybrid.



2020 Answer Plot Yield Data

Data was collected from Answer Plots in 2020. National data is a consensus of 32 locations. The Eastern Business Unit includes 6 locations in Attica, OH, Dale and Franklin, IN, Effingham, Le Roy, and Pleasant Plains, IL.



2020 ATTICA, OH ANSWER PLOT YIELD DATA

The graph below looks at the data from Attica Answer Plot. It shows the yield difference between a hybrid that has a low response to fungicide (Low RTF) and another hybrid with a moderate response to fungicide (Moderate RTF).



2020 Attica, OH Answer Plot Yield Data

2021 ATTICA, OH ANSWER PLOT YIELD DATA

The graph below shows 2021 yield data at the Attica Answer Plot. The trial involved two application timings of Delaro Complete, an early V10, a normal R1 application, and an untreated check. The trial was done on only one variety, Croplan 4079VT2P/RIB, with three replications. There was no statistical difference but a numerical difference of 4-5 bu/ac.



Product Highlight: Ascend [®] SL



Ascend plant growth regulator (PGR) contains the optimal combination of three EPA registered PGRs to:

- → promote plant growth
- \rightarrow aid in photosynthesis
- → help defend against stress

ASCEND SL IN-FURROW ROI FOR CORN



NATIONAL YIELD DATA





Upper Sandusky Corn Plot

TRIAL INFORMATION:

Location: Upper Sandusky, OH Planting Date: 5/21/2021 Population: 33,500 sds/ac Row Spacing: 30 in Tillage: Strip Till

KEY TAKEAWAY:

Heritage Cooperative provides leading genetics from top brands in the industry. Work with your local Heritage agronomist to determine the best fit for your operation.



TRIAL LOCATION: Wyandot County, OH

ENTRY	BRAND	VARIETY	TRAITS	RM	SEED TREATMENT	HARVEST POP.	РLОТ WEIGHT	HARVEST MOISTURE	ROW LENGTH	ROW SPACE	ROWS HARVESTED	TEST WEIGHT	VIELD
1	DEKALB	DKC56-15RIB	TRERIB	106	CORN ACC ELT 2021		7036	18	1155	30	8		228.6
2	DEKALB	DKC56-65RIB	SSRIB	106	CORN ACC ELT 2021		7334	18	1155	30	8		238.2
3	DEKALB	DKC57-29RIB	TRERIB	107	CORN ACC ELT 2021		6394	18	1155	30	8		207.7
4	DEKALB	DKC58-64RIB	SSRIB	108	CORN ACC ELT 2021		6996	19	1155	30	8		224.5
5	DEKALB	DKC59-82RIB	VT2PRIB	109	CORN ACC ELT 2021		7516	19	1155	30	8		241.2
6	DEKALB	DKC62-89RIB	TRERIB	112	CORN ACC ELT 2021		7480	19	1155	30	8		240.0
7	DEKALB	DKC63-57RIB	VT2PRIB	113	CORN ACC ELT 2021		7484	19	1155	30	8		240.2
8	DEKALB	DKC64-64RIB	SSRIB	114	CORN ACC ELT 2021		7792	19	1155	30	8		250.0
9	CROPLAN	4444VT2PRIB	VT2PRIB	104	CORN ACC ELT 2021		6926	17	1155	30	8		227.7
10	CROPLAN	4676SS/RIB	SSRIB	106	CORN ACC ELT 2021		7018	18	1155	30	8		228.0
11	CROPLAN	4997VT2PRIB	VT2PRIB	109	CORN ACC ELT 2021		7592	18	1155	30	8		246.6
12	CROPLAN	CP5073VT2PRIB	VT2PRIB	110	CORN ACC ELT 2021		7452	18	1155	30	8		242.1
13	CROPLAN	5073SS/RIB	SSRIB	110	CORN ACC ELT 2021		7116	18	1155	30	8		231.2
14	CROPLAN	5115VT2PRIB	VT2PRIB	111	CORN ACC ELT 2021		7286	18	1155	30	8		236.7
15	SHUR GROW	SG-638VT2PRIB	VT2PRIB	103	UNLISTED (F+I)		6396	18	1155	30	8		207.8
16	SHUR GROW	EXP NO.1	SSRIB	111	UNLISTED (F+I)		6740	18	1155	30	8		218.9
17	SHUR GROW	SG-668SSRIB	SSRIB	107	UNLISTED (F+I)		6802	18	1155	30	8		221.0
18	SHUR GROW	EXP 4	VT3P		UNLISTED (F+I)		6372	18	1155	30	8		207.0
19	SHUR GROW	SG-668VT2PRIB	VT2PRIB	107	UNLISTED (F+I)		6748	18	1155	30	8		219.2
20	SHUR GROW	EXP NO.1	SSRIB	111	UNLISTED (F+I)		6992	18	1155	30	8		227.1
21	SHUR GROW	SG-751YGCB/RR2	RR2/YGCB	110	UNLISTED (F+I)		7046	18	1155	30	8		228.9
22	BREVANT	B02V87AM	АМ	102	LUMIGEN CORN FI		6998	18	1155	30	8		227.3
23	BREVANT	B04R11Q	QROME	104	LUMIGEN CORN FI		7010	18	1155	30	8		227.7
24	BREVANT	B07H01AM	AM	107	LUMIGEN CORN FI		7254	18	1155	30	8		235.6
25	BREVANT	B10R89AM	AM	110	LUMIGEN CORN FI		6920	18	1155	30	8		224.8
26	BREVANT	B09K10Q	QROME	109	LUMIGEN CORN FI		6912	18	1155	30	8		224.5
27	BREVANT	B13A10AM	AM	113	LUMIGEN CORN FI		6676	18	1155	30	8		216.9
28	CROPLAN	5115VT2PRIB	VT2PRIB	111	CORN ACC ELT 2021								

Upper Sandusky Soybean Plot



TRIAL INFORMATION:

Location: Upper Sandusky, OH Planting Date: 5/25/2021 Population: 160,000 sds/ac Row Spacing: 15 in Tillage: Minimal Till

KEY TAKEAWAY:

Regardless of the trait package, Heritage Cooperative offers a full lineup of soybean varieties that will work for your farm.



TRIAL LOCATION: Wyandot County, OH

ENTRY	BRAND	VARIETY	TRAITS	МЯ	SEED TREATMENT	HARVEST POP.	РГОТ МЕІСНТ	HARVEST MOISTURE	ROW LENGTH	ROW SPACE	ROWS HARVESTED	TEST WEIGHT	YIELD
1	ASGROW	AG27XF1	XF	2.7	SOY ACC STD 2021		1973	12.2	1161	15	15		66.41
2	ASGROW	AG28XF2	XF	2.8	SOY ACC STD 2021		1940	12.0	1161	15	15		65.44
3	ASGROW	AG30XF2	XF	3.0	SOY ACC STD 2021		1991	11.8	1161	15	15		67.32
4	ASGROW	AG34XF2	XF	3.4	SOY ACC STD 2021		1854	11.9	1161	15	15		62.61
5	ASGROW	AG35XF1	XF	3.5	SOY ACC STD 2021		1829	12.2	1161	15	15		61.56
6	ASGROW	AG37XF2	XF	3.7	SOY ACC STD 2021		1870	12.4	1161	15	15		62.8
7	ASGROW	AG38XF1	XF	3.8	SOY ACC STD 2021		1879	12.0	1161	15	15		63.39
8	CROPLAN	CP2742XF	XF	2.7	UNLISTED (F+I)		1682	11.6	1161	15	15		57.0
9	CROPLAN	CP3140XF	XF	3.1	UNLISTED (F+I)		1893	11.8	1161	15	15		64.0
10	CROPLAN	CP3442XF	XF	3.4	UNLISTED (F+I)		1871	11.7	1161	15	15		63.33
11	CROPLAN	CP3650XF	XF	3.6	UNLISTED (F+I)		1782	11.9	1161	15	15		60.18
12	CROPLAN	CP3940XF	XF	3.9	UNLISTED (F+I)		1803	11.9	1161	15	15		60.89
13	SHUR GROW	SG-2962XF	XF	2.9	UNLISTED (F+I)		1711	11.7	1161	15	15		57.92
14	SHUR GROW	SG-3162XF	XF	3.1	UNLISTED (F+I)		1589	11.8	1161	15	15		53.73
15	SHUR GROW	SG-3462XF	XF	3.4	UNLISTED (F+I)		1944	11.8	1161	15	15		65.73
16	SHUR GROW	SG-3762XF	XF	3.7	UNLISTED (F+I)		1972	11.9	1161	15	15		66.6





Warden[®] CX 2 Soybean Seed Care Innovation Trials

OBJECTIVE:

Test a new seed treatment concept that includes benefits of current Warden CX with the highest rate of mefenoxam fungicide (Apron XL), sedaxane fungicide (Vibrance) and New PCBX fungicide (Vayantis). Test and analyze plant health effects and yield response compared to current fungicide + insecticide seed treatment offers.



TRIAL 1 INFORMATION:

Location: Homeworth, OH Planting Date: 5/14/2021 Harvest Date: 9/27/2021 Variety: AG30XF0 Tillage: No-Till

TRIAL 1 OVERVIEW:

In the Climate FieldView screenshot, there is a green and blue area. The green area represents the new Warden CX 2 seed treatment, and the blue area represents the current formulation of Warden CX.

To compare seed treatments, a similar number of acres were pulled from FieldView data, and yields were identified. This information is highlighted with the large red circle and arrow in the screenshot below. For this trial, the soybeans treated with Warden CX 2 were **4 bu/ac** better than the beans treated with Warden CX.

		2.5 ac Harvested	13.2% Moisture	50 bu Average	u /ac e Yield				2
1.00	^	By Hybrid		Avg. Yield	Acre				
C. C.	•	AG30XFO Warden CX 2 AG30XFO		52 48	1.3 1.2	> >			
	~	By Soil		Avg. Yield	Acre				
	~	By Population		Avg. Yield	Acre				
	~	By Elevation		Avg. Yield	Acre				
A ST AND	^	By Planter Date		Avg. Yield	Acre				
C	5/14,	/2021		50	2.5	>			
				Delete	Cancel				
					1 _		т	R	Lecenter



TRIAL 2 INFORMATION:

Location: Sebring, OH Planting Date: 5/20/2021 Harvest Date: 10/2/2021 Variety: AG27XF1 Tillage: Chisel Plowed

TRIAL 2 OVERVIEW:

In the FieldView screenshot, for this trial, the blue area represents the new Warden CX 2 seed treatment, and the orange area represents the current formulation of Warden CX.

Again, looking at the large red circle and arrow, you will see a comparable area with yields attached. Warden CX 2 was **3 bu/ac** better than the beans treated with Warden CX.

5.8 ac Harvested	10.6% Moisture	7 Ave	6 bu/ac erage Yiel	d	
By Hybrid	Avg. Y	ield	Acre		Contraction of the second s
AG27XF1 NEW TREA		78	3.0	>	
e AG27XF1		75	2.8	>	
∽ By Soil	ļ	vg. Yield	Acre		
✓ By Population	ļ	vg. Yield	Acre		
✓ By Elevation	ŀ	vg. Yield	Acre		
∧ By Planter Date	A	vg. Yield	Acre		AG
5/20/2021		76	5.8	>	AG27XF1 TREAT

TRIAL 3 INFORMATION:

Location: Greenford, OH Harvest Date: 10/1/2021 Variety: AG30XF0 Tillage: Conventional

TRIAL 3 OVERVIEW:

Note planting date is not identified in the information section for this trial. Of the three trials, the Greenford trial produced the most interesting results. In the FieldView screenshot for this trial, the blue area represents the new Warden CX 2 seed treatment, and the orange area represents the current formulation of Warden CX.

Again, looking at the large red circle and arrow, you will see a comparable area with yields attached. Warden CX 2 was 1 **bu/ac** better than the beans treated with Warden CX. Page 22 shares further information about these results.

TRA S	8.7 ac Harvested	12.2% Moisture	46 bu/ac Average Yield	d
C.S.S.	By Hybrid	Avg. Yield	Acre	
1	AG30XFO NEW TREA	TMENT 46	4.3	>
L. n	AG30XFO	45	4.4	>
	∽ By Soil	Avg. Yield	Acre	
	✓ By Elevation	Avg. Yield	Acre	
and the second	∽ By Planter Date	Avg. Yield	Acre	



Warden® CX 2 Soybean Seed Care Innovation Trials (cont.)

TRIAL 3

The screenshot shows two different maps, one with the "planting date" layer selected and the other with the "variety" layer selected. The map on the left with red circles indicates the planting dates, and the map on the right with yellow circles shows where the varieties were planted.



The planting date map shows which parts of the field were replanted on May 22 & 23, identified in blue and orange. The green areas of the map were not replanted.

The variety map shows the orange area was planted with Warden CX and the blue area was the Warden CX 2.

When considering the differences in treatments and planting dates, **only 15%** of the acres treated with Warden CX 2 needed to be replanted, while **93%** of the acres treated with Warden CX were replanted.

In conclusion, Warden CX is one of the best treatments on the market, and the team will continue to experiment and watch new seed treatments like Warden CX 2.

Warden[®] CX vs. Warden[®] CX 2



The images below from each trial show visible differences between plants treated with Warden CX and Warden CX 2.



TRIAL 1 HOMEWORTH, OH 7/22/2021







TRIAL 3 GREENFORD, OH 7/21/2021

Utrisha™ N Nutrient Efficiency Corn Trials

OBJECTIVE:

To evaluate the effectiveness and impact of nitrogen fixation biological, Utrisha, in corn to provide late-season N availability for enhanced yield. The agronomy team evaluated Utrisha in three locations across Union County.



TRIAL LOCATION: Union County, OH

TRIAL 1 INFORMATION:

Location: Union County, OH Planting Date: 5/18/2021 Harvest Date: late-September Variety: DKC6489 Population: VR avg. 33,150 sds/ac Acres: 40, 120 ft alternating passes

TRIAL 2 INFORMATION:

Location: Union County, OH Planting Date: 5/18/2021 Harvest Date: mid-October Variety: P1359 Population: VR avg. 31,663 sds/ac Acres: 20

TRIAL 3 INFORMATION:

Location: Union County, OH Planting Date: 5/18/2021 Harvest Date: mid-October Variety: P1197 Population: VR avg. 31,342 sds/ac Acres: 20

TRIAL OVERVIEW & STRATEGY:

Each trial had nitrogen applications at planting, 2x2 starter placement, followed by side dress applications at V3-4. SD-N was applied VR of 150 unit average. In the trial involving DKC6489, Utrisha was applied in 120 ft alternating passes. The P1359 & P1197 trials had 20-acre application blocks within each field. Utrisha was applied at 5 oz/ac at the V4-5 growth stage. Tissue samples were taken at V8 & R1 by soil type in treated and untreated spatially referenced locations. NDVI imagery was evaluated weekly from mid-June to early August.





TISSUE ANALYSIS AT V8:

Tissue test N levels were evaluated and did not show a significant difference between treated and untreated zones. All samples showed potential response to additional N with < 1.3% difference to adequate ppm range, statistically the same.

TISSUE ANALYSIS AT R1:

N ppm levels were evaluated between treated and untreated zones. Untreated displayed an average ppm of non-yield limiting N levels. Treated zones showed a lower potential response ppm average. Adequate N ppm levels separation was < 1.1%, statistically the same.



*The closer results are to the center of the graph, the more deficient the nutrient. The tissue results shown above represent checks and tests from Trial 1. Similar results were observed across all trials.

NDVI IMAGERY:

NDVI images were evaluated for plant growth and health approximately once/week starting mid-June to early August. Visual differences were minimal between treated and untreated zones, primary changes were influenced by soil type.



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The NDVI maps above showcase data from Trial 1. Similar results were observed across all trials.

Utrisha™ N Nutrient Efficiency Corn Trials (cont.)

YIELD DATA:

Yield data was evaluated in treated & untreated zones and by soil type within the treated & untreated zones





TRIAL SUMMARY:

Of the three trials, two showed a significant yield response of 12-14 bu/ac. The tissue tests at V8 & R1 were expected to have shown a higher concentration of N ppm in treated vs. untreated, but results were inconclusive. The NDVI images were also anticipated to show greater "plant biomass," reflecting the additional N present in the treated zones, but did not reflect expectations.

When evaluating yield, trial results indicated an approximate 4.5X return on investment for 66% of the locations. Hybrids rated for a moderate to high response-to N management may have a more consistent response to this product.





Envita™ Nitrogen Efficiency Corn Trials

OBJECTIVE:

To evaluate the effectiveness and impact of nitrogen fixation biological, Envita in corn to provide late-season N availability for enhanced yield. The agronomy team evaluated Envita in two locations across Union County.



TRIAL LOCATION: Union County, OH

TRIAL 1 INFORMATION:

Location: Union County, OH Planting Date: 5/18/2021 Harvest Date: late-September Variety: DKC6489 Population: VR avg. 33,150 sds/ac Acres: 40

TRIAL 2 INFORMATION:

Location: Union County, OH Planting Date: 5/18/2021 Harvest Date: mid-November Variety: Channel 210-79DGVT2 Population: VR avg. 33,306 sds/ac Acres: 40



TRIAL OVERVIEW & STRATEGY:

Each trial had nitrogen applications at planting, 2x2 starter placement, followed by side dress applications at V3-4. SD-N was applied VR of 155 unit average. Both trials had Envita applied in 40-acre blocks within the fields. Envita was applied at 3.2 oz/ac on V4-5 growth stage. Tissue samples were taken at V8 & R1 by soil type in treated and untreated spatially referenced locations. NDVI imagery was evaluated weekly from mid-June to early August.





TISSUE ANALYSIS AT V8:

Tissue test N levels were evaluated and did not show a significant difference between treated and untreated zones. All samples showed potential response to additional N with minimal differences to adequate ppm range, statistically the same.

TISSUE ANALYSIS AT R1:

N ppm levels were evaluated between treated and untreated zones. Untreated displayed an average ppm of marginal return of additional N. Treated zones showed a slightly higher N ppm concentration average.



green = sufficient _____ yellow = responsive _____ red = deficient

*The closer results are to the center of the graph, the more deficient the nutrient.

The tissue results shown above represent a checks and tests from Trial 2. Similar results were observed in Trial 1.

NDVI IMAGERY:

NDVI images were evaluated for plant growth and health approximately once/week starting mid-June to early August. In Trial 1, visual differences were minimal between treated and untreated zones. However, Trial 2 began to show enhanced plant growth in mid-to-late July.



The NDVI maps above showcase data from Trial 2. Minimal visible differences were shown in Trial 1.

Envita™ Nitrogen Efficiency Corn Trials (cont.)

YIELD DATA:

Yield data was evaluated in treated & untreated zones and by soil type within the treated & untreated zones







TRIAL SUMMARY:

Of the two trials, Trial 1 showed a significant yield response of 6.8 - 8.2 bu/ac, and Trial 2 showed a much higher yield advantage. The tissue tests at V8 were expected to have shown a higher concentration of N ppm in treated vs. untreated, but the results were inconclusive. At the R1 test, N ppm concentration was marginally higher in the treated zone. The NDVI images were also anticipated to show greater "plant biomass," reflecting the additional N present in the treated zones. This expectation was reflected in Trial 2 but not in Trial 1.

When evaluating yield, trial results indicated a return on investment for both locations. Hybrids rated for a moderate to high response-to N management may have a more consistent response to this product.

envita







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