2024

AgRevival Research

YOUR GUIDE TO BETTER FARMING

www.agrevival.com

AgRevival

Your guide to better farming.

We test so you don't have to guess.

Innovation is critical in agriculture. It's why the United States leads the world in agricultural productivity. But when it comes to identifying the best new products and practices for your farm, innovation can be costly—in time and money.

We're here to help. Over the past 14 years, AgRevival has conducted research in corn, soybeans, and sugar beets. In 2024 AgRevival Research conducted 114 trials across more than 440 acres. These replicated trials are a combination of contracted research, Becks Practical Farm Research, and grower interest studies. You'll find examples of each research category in this year's publication. Use this guide as a starting point when you're looking into new products, practices, and management programs to bring the highest ROI for your farm.

Your Minnesota cooperator for Beck's Practical Farm Research.

In 2025 all of Beck's PFR protocols on corn and soybeans will be moving to the company's Olivia site and conducted in-house by Beck's employees. The cooperation between Beck's and AgRevival will not be ending, but continuing with some new research for us, including corn silage, alfalfa, and product characterization research. We knew this day would come and are looking forward to the expansion of research and to continue to help farmers succeed. While not contained in this book, the PFR studies can be viewed at www.beckshybrids.com/pfresearch.

2024 AgRevival Research

★ AgRevival Headquarters
• Research Locations

More studies. Greater accuracy.

The 2024 AgRevival Research book contains data from 22 studies. To be published in this book, all studies must contain multiple data points. We are committed to delivering accurate data, as this book is intended to be the starting point in your agronomic decision-making process.

Become a Project Partner

Project Partners are vital to providing the information found in this guide to growers across the United States. The Project Partners found across the bottom of these pages helped us in many ways including, but not limited to: equipment, crop inputs, and monetary investments to get this book into your hands. We thank all of our Project Partners who helped make the 2024 AgRevival Research book a success, and we look forward to serving you in the future.

Learn How We Do Our Research

KIBBLE EQUIPMENT · LEAD | MARKETING & DESIGN · MANDAKO · Max Systems LLC · NewFields Ag Innovations In Your Fields · Physagro BIOME · SUMMERS

2024 AgRevival Research

Corn Studies

Soybean Studies

Ask AgRevival

Have questions about the studies, products, or farming practices included in this book?

Get answers at **www.agrevival.com/contact**

Important Crop Development Stages

VE – V4

Root and plant establishment takes place.

V5 – V8

Yield potential is established.

V9 – VT

Vegetative growth takes place. The focus is on fulfilling the yield potential that was set earlier.

R1 – R3

Grain establishment takes place.

R4 – R6

Grain fill takes place.

VE – V3

Root and plant establishment takes place.

V3 – R1

Nodule development increases.

R2 – R3

Pod determination takes place. (Number of pods per node that can be filled.)

R4 – R5

Grain establishment takes place. (Number of beans per pod that can be filled.)

R6 – R8

Grain fill takes place.

Note:

Soybeans can have several functions occurring simultaneously during reproductive stages. This diagram is a generalization of the average function taking place.

Calculating Return-on-Investment

Pricing:

To calculate the 2024 commodity prices, we averaged the Friday Chicago Board of Trade closing future prices from September 1, 2023, through August 30, 2024. Recalculate your own return-per-acre using prices that you expect, should they differ significantly from the commodity and input prices used here.

Calculations:

We used commodity prices and product costs only in these ROI calculations. Feel free to factor in additional charges, such as application costs, to calculate your own return.

Test weight and bu./ac. were corrected to 15% moisture for corn and 13% moisture for soybeans.

Net Return =
Gross Income (Bushel Per Acre x Commodity Price Per Bushel) – Treatment Cost

Return-on-Investment =
Bushel Per Acre Difference x Commodity Price Per Bushel – Treatment Cost

Commodity Prices

$4.73/Bu.

$11.83/Bu.

Weather Summary

Rain, rain go away, come again another day. We received 27.25 inches of rain from May 1st to October 1st in 2024. During the same time period in 2023 we received 13.96 inches. From one extreme to the next! Farmers are faced with curveball after curveball and most of the time we have no control over it. We found ourselves on many rain days looking out at the field as it would begin to refill in the low areas just as it was about to dry out. There was one common question we kept asking: what are we going to do when the rain does stop and gives us an opportunity to take care of our crop?

Extreme weather patterns have been a recurring factor over the last few years and have shaped our mindset on our research and the timing of applications. Do we skip the treatment or keep striving for success? Adjusting the plan may involve tweaking rates and/or adding a pass because of the situation at hand.

One of our most profitable decisions this year was to continue with the side-dress pass and add a shot of nitrogen to the struggling corn crop. One strategy that didn't pay was trying to side-dress more nitrogen than planned. We knew the yield wouldn't be high across some farms, so side-dressing extra rates of nitrogen wasn't going to get us any additional yield because of other limiting factors affecting the crop.

We planted most of our crop in mid-May this year. Planting was followed by days of rain. Replants took place in mid-June through early July. This year was the latest we have ever replanted corn and soybeans. Due to the increase in moisture and prolonged wet soils, early applications of fungicide paid well this year as we protected the plants before the disease pressure became extreme.

When field conditions were good enough, we had to be doing something, whether it was side-dressing or weed control; it was time to go because rain was looming in the forecast. Some corn didn't get a herbicide application due to crop growth and field conditions; we'll need to watch these fields carefully for high weed pressure next year.

With the replants across the area, soybean aphids flooded into these fields and insecticide applications were needed across most of our region. We were blessed with a warm and dry fall that helped finish the crop. Whether they were replanted or planted late, we harvested most of the soybeans at the end of September and into early October with low moistures from the dry weather. The corn harvest started as soon as soybeans were finished. Yields were variable, but better then expected, and the corn was dry. Early-planted corn was dried to anywhere from 14 to 18 percent moisture and later-planted corn was in the low 20s range.

Most area growers didn't have a rain delay during harvest this year. The dry weather made fall tillage difficult early on. However, some shots of rain in late October and early November helped soften the top layer of soil and made tillage more consistent.

We have learned during 2024 and previous years to stick with the original plan whenever possible. Crops are resilient and will surprise us all from time to time. Every year is different and we never know what the future will hold.

Figure 1

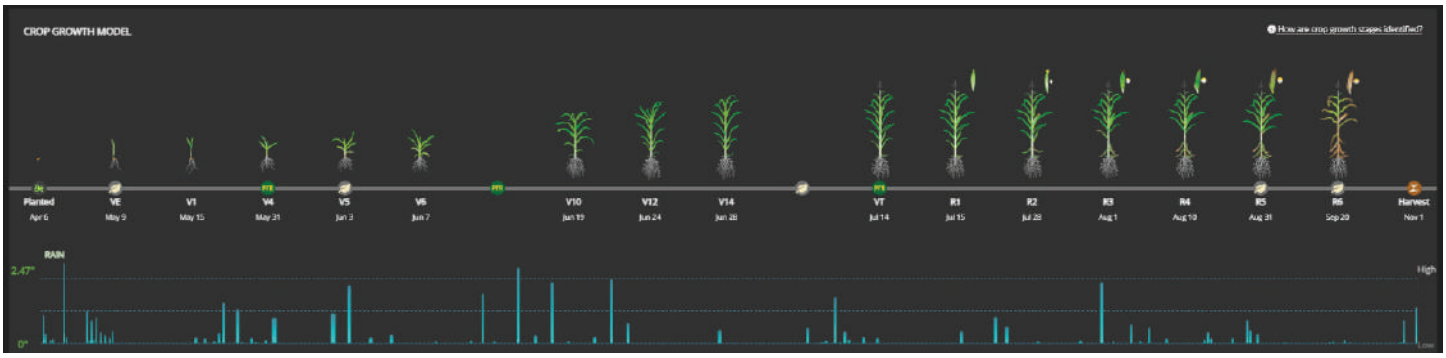


Figure 1 illustrates the entire growing season from April 6 to November 1st. Each blue line represents a rain day, with the horizontal dotted lines representing 1 inch and 2 inches of rain, respectively. As you can see, we had a lot of rain days and a fair amount of days around the 1-inch mark. The time between rain events was short and accessible field time was limited due to the wet conditions.

Figure 2

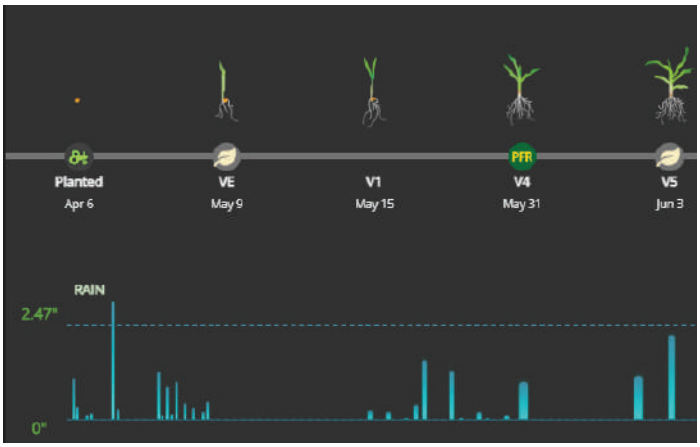


Figure 2 illustrates April and May, when we began planting our acres. As you can see, we had rain during the end of April and early May, which set us up with good soil moisture for planting. What caused the issues for plant growth was the many rain days (and amount of rain) that followed planting, which caused oversaturated soils and ponding water. Crops finally had a chance to grow in early June. However, growth was slow and the crop color was very pale due to the lack of biological activity in the soil.

Figure 3

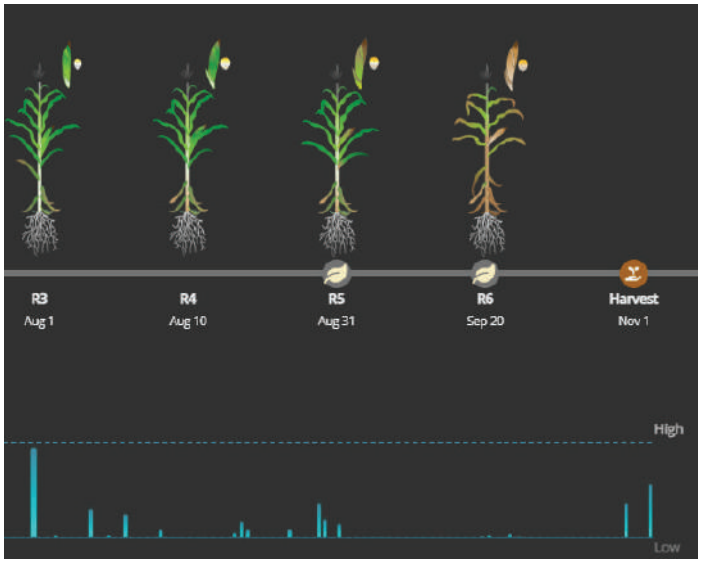


Figure 3 illustrates August to November. Shots of rain in August helped during grain fill periods, which helped the yield on both corn and soybeans. From September through November we received almost no rain. Because of the dry ground, any rain we did receive was absorbed quickly into the soil, which kept harvest on time.

Research Plot Descriptions

We are thankful for the various locations on our research farm. The distance spread between farms north to south is 9 miles, east to west is 11 miles. Just enough to experience different weather conditions, but close enough to evaluate different soil types or crop rotations within similar environments. As you may notice, we name our farms after books of the Bible. The most important lessons in life live in the best guide to life, the Bible. As the stories and parables in the Bible, these farms don't just provide us data, they are the platform for the experiences we share through stories, to help you gain a better understanding of how something may work on your farm. Here is a little bit about each one.

Genesis (15 acres)

Genesis is AgRevival's original research location and will now be expanding north and south with additional acres. In 2024 most of the original acres drowned out after planting and was replanted with soybeans in late June. With the rotation mixed up and the additional acres surrounding this farm, we will take next growing season to layout new grass alleyways and get a rotation set in new study blocks, including longer strip research on the new parts of the farm.

Malachi (84 acres)

We call Malachi our "Minnesota farm" because of the many unique soil variations represented, much like our state. There is an area of 5.5% organic matter on silty clay loam soil, as well as a 12-acre silty sand hilltop with 1.4% organic matter. This allows us to conduct the same study on completely different soils, but with the same temperature swings and precipitation, within a half mile radius. With newly established grass alleys, the data, visuals, and learning opportunities are unique on Malachi.

Romans (53 acres)

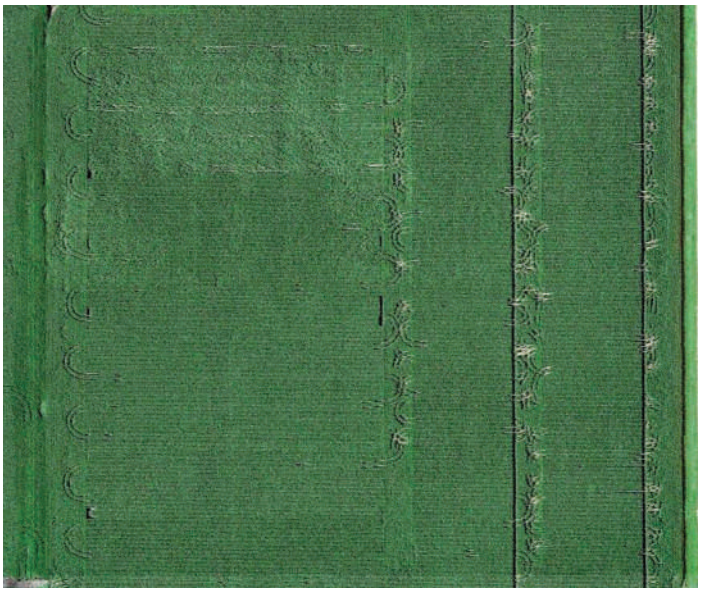
This farm has been the home of Beck's PFR for 7 years now. Beck's research will continue here, but the rotation and studies on the farm will change. The front block will be planted into alfalfa and the back two blocks will be in a corn-on-corn or corn-on-soybeans rotation, with the studies focused on corn silage and manure. The second block will remain a corn and soybean rotation and will be used to study hybrids and varieties.

Isaiah (102 acres)

Isaiah is our most localized research ground and represents the average soil in the area. Years of great manure management have set the stage for some great research. This location is the host for much of our partnered research because of the observed performance. Isaiah provides a great host for longer strip trials that stretch more than 500 feet. Grass alleys throughout give easy access for plot tours that want data sets spread across multiple locations.

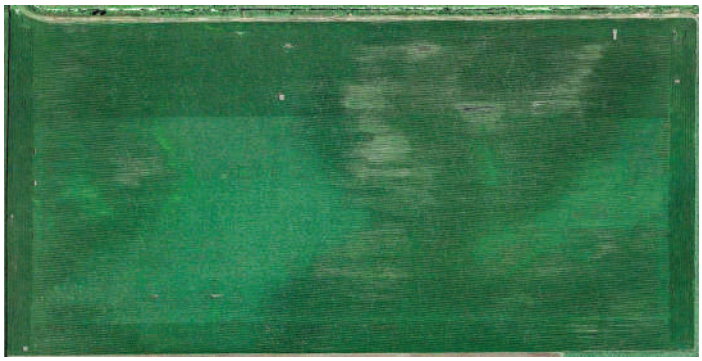
Titus (53 acres)

Titus will serve as the research location for Beck's Product Characterization plots. We also have our multiyear tillage study with Summers and Great Plains in place for year number three in 2025 and are excited to see what that data will show after the last two years of weather extremes. With the grass alleyways throughout this farm there is opportunity to walk through the studies and observe visible differences throughout the growing season.



Esther (37 acres)

Variable is the best word to describe this farm, which is now a great asset for our trial research. Here we have room for a few replicated studies, but plenty of room for larger trials to test equipment and geospatially collect data. We're setting up Esther as a corn-on-corn farm to test tillage, nutrient programs, products to fight pests, and other products or practices associated with growing corn following corn. This farm was a great addition and will serve as a medium between replicated research and practical application.



Exodus (78 acres)

Exodus gives us the ability to test strategies we can't test in 250–400-foot passes, such as tillage equipment, high-speed planting, and the use of NH3 as a base nitrogen to name a few. We also use it to test field-scale trials, in conjunction with our replicated studies, to identify how closely our data aligns with the experience you may have on your farm. In the Bible, the book of Exodus tells the story of the Israelites' journey toward the promised land. This farm will be the first of many that will take the learning and understanding of your replicated research toward your land.

Haggai (18 acres)

Haggai is an isolated 18-acre plot that is very consistent from end to end. With this location coming out of its three-year study, we have an opportunity to use this farm as a testing area for things like conventional corn and reduced tillage. We can also compare weed pressure and soil health on Haggai to Malachi, which is right across the drainage ditch.

Tillage Program Study

PURPOSE

To evaluate a variety of tillage programs and how each program impacts plant health and overall yield.

OBSERVATION

This growing season was completely different from last year for the tillage study. It helped paint a picture of the soil structure we are dealing with when it comes to large amounts of rain and, in this case, consistent rain events throughout the growing season. Having some sort of tillage and, in this case, the deeper tillage allowed for great root penetration and more pore space in the soil to retain water when we experienced such events.

Tillage Program	Moisture	Yield	Yield Change	2-year Avg. Yield
No Till	19.1	147.1	N/A	176.6
Fall Strip Till	20.6	174.5	+ 27.4	196.9
AgRevival Conventional Tillage Program (Fall Disc Rip, Spring Field Cultivator)	**20.2**	**204.2**	**+ 57.1**	**207.4**
Great Plains Vertical Tillage Program (Fall Max-Chisel®, Spring Turbo-Max®)	19.6	199.7	+ 52.6	199.9
Summers MFG Vertical Tillage Program (Fall and Spring VRT Renegade®)	21.7	181.8	+ 34.7	194.5

Residue Management Study

CORN AFTER CORN

PURPOSE

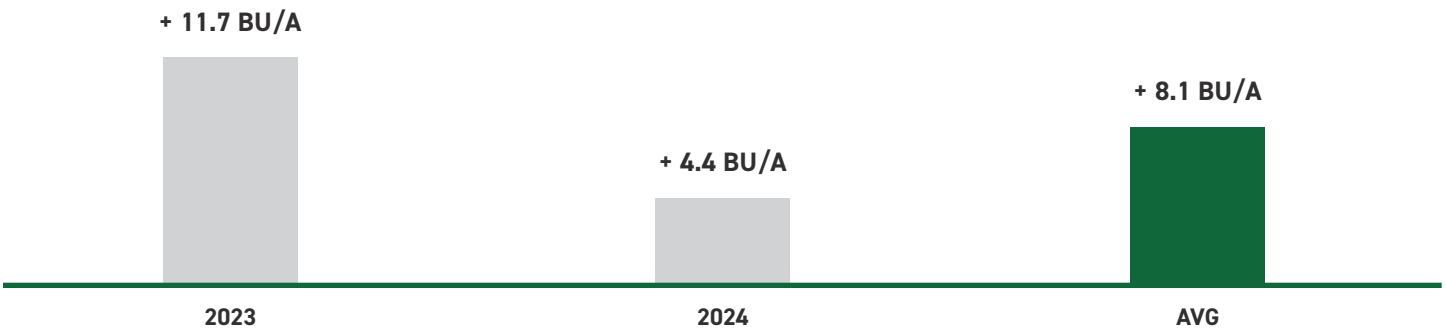
To evaluate products formulated to decompose crop residue and their impacts on residue degradation, plant health, yield, and ROI.

OBSERVATION

For our second year of evaluating these products, we applied them after harvest. Both products provided us with a yield increase and a positive ROI. These are two great options to apply to your residue in the fall or spring to aid in residue breakdown and make more usable nutrients available to the upcoming crops.

Post Harvest Treatment	Moisture	Yield	Yield Change	ROI
Control	21.1	184.0	N/A	N/A
12.8 oz. DB32	21.8	188.4	+ 4.4	+ $3.93
32 oz. BioChop	**22.3**	**190.0**	**+ 6.0**	**+ $20.38**

2-Year Average Yield Increase for DB32



Nitrogen Program

CORN AFTER CORN

PURPOSE

To evaluate different nitrogen programs and how each program impacts yield and ROI.

OBSERVATION

Ample rain early in the growing season assisted the performance of the spring application of nitrogen, whether Urea or UAN. The second major takeaway is the importance of having an in-season source of nitrogen by splitting nitrogen applications. This growing season we noticed the importance of sticking with the original planned nitrogen applications; amounts played a huge role in yields. In some areas where we pulled back the side dress application, we missed out on a $48 return on investment. As we see below, depending on the nitrogen used, increasing our side dress amount only had a positive impact on NH3 fall applications.

Treatment	Moisture	Yield	Yield Change	Nitrogen Cost	Net Return
All Nitrogen UAN					
Total N 210 lbs. Spring Applied: 45 Stream Bar & 165 Side Dress @ V3	**23.6**	**194.8**	**N/A**	**$123.90**	**$797.50**
Total N 210 lbs. Spring Applied: 90 Stream Bar & 120 Side Dress @ V3	23.0	192.8	- 2.0	$123.90	$788.04
Base Nitrogen Urea					
Total N 130 lbs. Spring Applied: 130 lbs. N Urea PPI	21.2	176.0	N/A	$72.80	$759.68
Total N 175 lbs. Spring Applied: 130 lbs. N Urea PPI & 45 Side Dress @ V3	**18.7**	**200.4**	**+ 24.4**	**$99.35**	**$848.54**
Total N 220 lbs. Spring Applied: 130 lbs. N Urea PPI & 90 Side Dress @ V3	20.3	199.8	+ 23.8	$125.90	$819.15
Base Nitrogen Anhydrous Ammonia					
Total N 130 lbs. Control- Fall applied: 130 lbs. N Anhydrous Ammonia	23.5	153.6	N/A	$59.80	$666.73
Total N 175 lbs. Fall applied: 130 lbs. N Anhydrous Ammonia & 45 Side Dress @ V3	25.8	170.6	+ 17.0	$86.35	$720.58
Total N 220 lbs. Fall applied: 130 lbs. N Anhydrous Ammonia & 90 Side Dress @ V3	**24.6**	**178.0**	**+ 24.4**	**$112.90**	**$729.04**

Planting Time After Spring Tillage Study

PURPOSE

To evaluate the yield impacts on planting directly after spring tillage or waiting for the soil to dry and warm one day before planting.

OBSERVATION

The third year of this study again demonstrates the importance of allowing the ground to sit a day before planting. When we couple this study's results with our planting date data from the past 7 years, the optimal planting window is early to mid May. When you have an opportunity to plant in early May or late April, we would recommend planting soybeans first and waiting for conditions to improve. Allow time to work the ground and then let it recover for more ideal planting conditions for corn.

Planting Date (Field was worked on May 13th)	Moisture	Yield	Yield Change
May 13th	20.3	211.5	N/A
May 14th	**19.9**	**213.1**	**+ 1.6**

3-Year Average Yield Increase For Waiting One Day

In-Furrow Trials

PURPOSE

To evaluate in-furrow solutions and how they impact yield and ROI.

OBSERVATION

We performed two studies that evaluated different in-furrow approaches. The first study looked at three different solutions using two different sugar products—eXceed™ Nano Brown Sugar and MicroBoost. As we look back at other studies throughout the years, some sugar products perform better foliar versus in-furrow. Most sugar products provide a positive ROI and are a low-cost opportunity to make your application most profitable.

In-Furrow Treatment	Moisture	Yield	Yield Change	Net Return
16 oz. RSTC 17® + 16 oz. eXceed™ Nano Brown Sugar + 16 oz. BioGreen	16.2	170.1	N/A	$786.13
16 oz. RSTC 17® + 16 oz. MicroBoost + 16 oz. BioGreen	16.1	175.7	+ 5.6	$815.18
8 oz. Regulator + 16 oz. eXceed™ Nano Brown Sugar + 16 oz. BioGreen	15.8	169.7	N/A	$788.68
8 oz. Regulator + 16 oz. MicroBoost + 16 oz. BioGreen	15.8	174.5	+ 4.4	$813.95
3 gal. 10-34-0 + 16 oz. eXceed™ Nano Brown Sugar + 16 oz. BioGreen	**15.6**	**181.8**	**N/A**	**$841.60**
3 gal. 10-34-0 + 16 oz. MicroBoost + 16 oz. BioGreen	15.4	180.9	- 0.9	$839.91

In-Furrow Treatment	Moisture	Yield	Yield Change	ROI
Control	20.3	196.0	N/A	N/A
5 gal. 10-34-0	20.3	204.1	+ 8.1	+ $22.06
6 oz. pH Max + 16 oz. eXceed™ Nano Brown Sugar + 16 oz. Nanozyme 2.0 + 16 oz. Zinc 9%	**21.1**	**213.7**	**+ 17.7**	**+ $68.30**

In-Furrow Study by Hybrid

PURPOSE

To evaluate hybrid response to common in-furrow programs and its impacts on yield and ROI.

OBSERVATION

This new study evaluates two different root structures and how they influence the effectiveness of an in-furrow program. First-year results show that this is something we need to continue to research in our quest to provide sound recommendations to growers. This data also confirms the importance of when applying new products or practices in your operation, using the new product or practice on multiple hybrids and/or multiple locations will give you the best look at how they will impact your yield and ROI.

In-Furrow Treatment	Moisture	Yield	Yield Change	ROI
Hybrid A - Balanced Root Structure				
Control	**17.3**	**200.4**	**N/A**	**N/A**
16 oz. CarbonWorks RSTC 17® + 16 oz. MicroBoost + 16 oz. BioGreen	16.7	201.5	+ 1.1	- $10.67
5 gal. 10-34-0 + 16 oz. eXceed™ Nano Brown Sugar	16.4	203.5	+ 3.1	- $6.15
Hybrid B - Horizontal Root Structure				
Control	13.9	172.1	N/A	N/A
16 oz. CarbonWorks RSTC 17® + 16 oz. MicroBoost + 16 oz. BioGreen	14.0	179.1	+ 7.0	+ $17.24
5 gal. 10-34-0 + 16 oz. eXceed™ Nano Brown Sugar	**14.7**	**182.0**	**+ 9.9**	**+ $26.01**

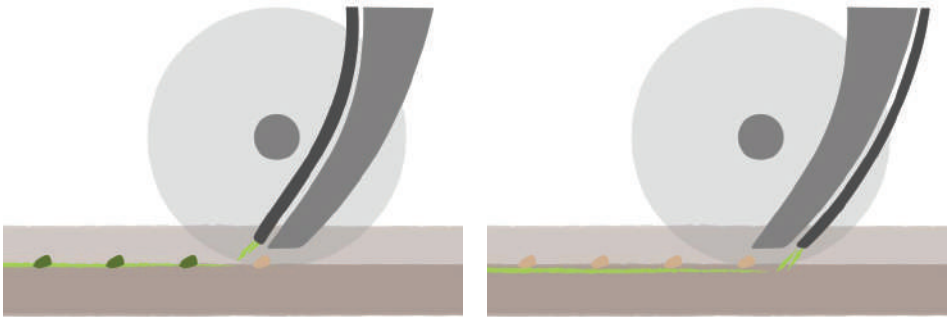
In-Furrow Placement Study

PURPOSE

To evaluate the placement of a starter solution in relation to the seed and how this impacts germination, yield, and ROI.

OBSERVATION

This year's results are slightly different for the carbon/biological in-furrow solution. Last year it was better to apply the product on top of the seed rather than underneath. We added Frenzy from Dakota Bio to this year's test. Frenzy includes a unique enzyme produced by beneficial bacteria. We are looking forward to next year's results!



Treatment	Moisture	Yield	Yield Change	ROI
Control (No additional treatments)	16	186.5	N/A	N/A
5 gal. 10-34-0 + 16 oz. eXceed™ NBS applied in-furrow under the seed	16.8	202.0	+ 15.5	+ $52.51
5 gal. 10-34-0 + 16 oz. eXceed™ NBS applied in-furrow on top of seed	16.2	196.7	+ 10.2	+ $27.44

Control (No additional treatments)	16	186.5	N/A	N/A
16 oz. CarbonWorks RSTC 17® + 16 oz. MicroBoost + 16 oz. BioGreen applied in-furrow under the seed	16.5	202.0	+ 15.5	+ $57.44
16 oz. CarbonWorks RSTC 17® + 16 oz. MicroBoost + 16 oz. BioGreen applied in-furrow on top of seed	16.3	191.5	+ 5.0	+ $7.78

Control (No additional treatments)	16	186.5	N/A	N/A
16 oz. Frenzy applied in-furrow under the seed	15.7	184.4	- 1.1	- $17.24
16 oz. Frenzy applied in-furrow on top of seed	16.1	189.6	+ 3.1	+ $2.62

Stream Bar Timing Study

PURPOSE

To evaluate the use of stream bars as a way of applying UAN nitrogen as a supplemental nitrogen program up to the V1 growth stage.

OBSERVATION

There are a few key takeaways from this study. An early application of USABLE nitrogen for the corn plant shows time and time again to be the most profitable, no matter the application style. Looking at application methods, there are many things to consider: Planter set-up and time for filling nitrogen when trying to get the crop in the ground; sprayer spacing set up and tank size to cover more acres between fills; applying a pre-herbicide; and field and weather conditions. All of these factors are important considerations when choosing which method to use. This year we had a quarter inch of rain the day following this application, which helped move the nitrogen in the soil. Using sprayer nozzles provides an equal "sheet" of nitrogen across the entire acre, while a stream bar directly over the row is focusing the application on a third of the surface area. Positives and negatives apply for both applications. Focusing a band of nutrients to the row increases volume where needed. However, wind or boom sway can cause the streams to move off the row. Planter-applied nitrogen is agronomically the best application method due to application control.

Treatment	Moisture	Yield	Yield Change
Control: 2x2x2 60 Units UAN	19.7	173.9	N/A
60 Units UAN Pre-Emerge 28%	**20.0**	**192.3**	**+ 18.4**
60 Units UAN Stream Bar 28% @ Pre-Emerge	20.0	176.6	+ 2.7
60 Units UAN Stream Bar 28% @ V1	20.2	164.1	- 9.8

Xylem Plus Trials

PURPOSE

To evaluate timings and rates of Xylem Plus and its impacts on plant health and ROI.

OBSERVATION

There are few takeaways from this study and three years of data for this product. First, the 32-oz. rate in the corn-on-corn study resulted in a positive ROI. Second, getting this product in the plant early seems to be the best option. Over the three years, in-furrow and foliar were similar in yield response. It mostly depended on disease pressure and time of crown rot infection. As we saw this year, a late-season fungicide pass was profitable in hybrids that had late-season disease pressure or are responsive to fungicide applications. The way this product moves through the plant, we recommend an early application of Xylem Plus and then monitoring for late-season disease pressure to determine whether to use a Fungicide at R1.

Corn after Corn Treatment	Moisture	Yield	Yield Change	ROI
Control	19.0	180.1	N/A	N/A
24 oz. Xylem Plus In-Furrow	22.8	178.8	+ 1.3	- $3.79
32 oz. Xylem Plus In-Furrow	22.8	183.3	+ 3.2	+ $1.89
32 oz. Xylem Plus @ V6	22.9	185.4	+ 5.3	+ $11.82
32 oz. Xylem Plus In-Furrow + 7 oz. Veltyma® @ R1	23.9	191.1	+ 11.0	+ $11.31
32 oz. Xylem Plus + 7 oz. Veltyma® @ R1	**24.4**	**195.0**	**+ 14.9**	**+ $29.76**
7 oz. Veltyma® @ R1	24.3	193.9	+5.6	- $0.98

Corn after Soybeans Treatment	Moisture	Yield	Yield Change	ROI
Control (No additional treatments)	25.8	179.2	N/A	N/A
32 oz. Xylem Plus In-Furrow	25.1	195.9	+ 16.7	+ $65.74
32 oz. Xylem Plus In-Furrow & 7 oz. Veltyma® @ R1	25.7	205.0	+ 25.8	+ $81.31
32 oz. Xylem Plus @ V3	25.4	186.8	+ 6.8	+ $18.91
24 oz. Xylem Plus @ V3 & 7 oz. Veltyma® @ R1	25.7	203.0	+ 23.8	+ $75.16
24 oz. Xylem Plus In-Furrow & 24 oz Xylem Plus @ V3	25.6	188.0	+ 8.8	+ $21.74
7 oz. Veltyma® @ R1	**25.4**	**205.1**	**+ 25.9**	**+ $95.04**

Xylem Plus Trials

PURPOSE

To evaluate timings of Xylem Plus against a generic Azoxystrobin and more common fungicide application at R1 and its impacts on plant health and ROI.

OBSERVATION

Because we experienced many rain events early in the growing season and throughout the summer, applying fungicide before disease pressure mounted seemed to be the most profitable this year. A generic Azoxystrobin can be cheap insurance for your crop for disease pressure before pollination begins.

Corn after Soybeans Treatment	Moisture	Yield	Yield Change	ROI
Control	20.0	155.8	N/A	N/A
32 oz. Xylem Plus In-Furrow	21.1	158.8	+ 3.0	+ $0.94
32 oz. Xylem Plus @ V3	20.8	158.7	+ 2.9	+ $0.47
32 oz. Xylem Plus @ V8	20.8	162.3	+ 6.5	+ $17.50
6 oz. Generic Azoxystrobin @ V8	**21.2**	**163.8**	**+ 8.0**	**+ $31.72**
7 oz. Veltyma® @ R1	21.1	162.6	+ 6.8	+ $4.69

3-Year Multi Hybrid and Multi Location Average

Foliar Nozzle Spacing Study

PURPOSE

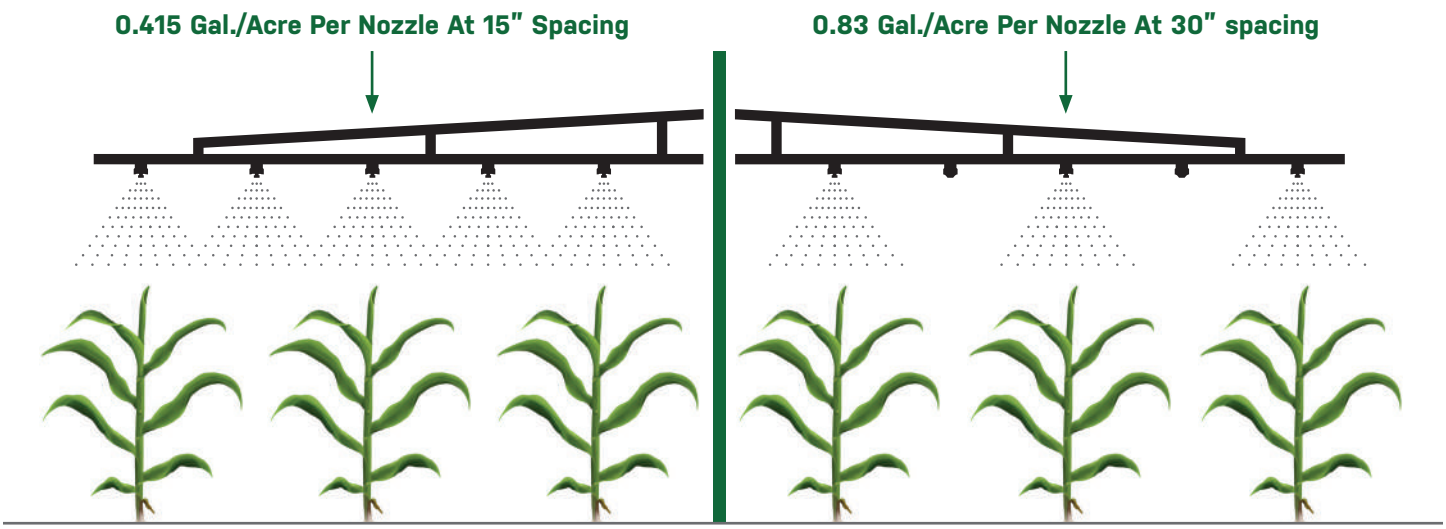
To evaluate the placement of a foliar application and its impact on yield and ROI.

OBSERVATION

Year two brought us almost identical yield benefits to banding the spray application directly over the row. We saw a 1.5-bushel increase from 15-inch to 30-inch nozzle spacing. We have one more year of data coming in 2025 for this study. However, we are confident in this two-year data, seeing similar performance with two completely different growing seasons. Next year we plan to take this study a step further and look at application rate when going from 15- to 30-inch nozzle spacing.

V4 Treatment: 32 oz. MicroBoost + 32 oz. BioGreen	Moisture	Yield	Yield Change	ROI
Control (No Foliar Application)	16.3	205.0	N/A	N/A
Foliar sprayed through all nozzles (15-in. spacing)	16.4	208.5	+ 3.5	+ $10.56
Foliar sprayed through every other nozzle (30-in. spacing)	**16.2**	**209.9**	**+ 4.9**	**+ $17.18**

60-Foot Boom 20 Gal./Acre



2-Year Average

Foliar Study

PURPOSE

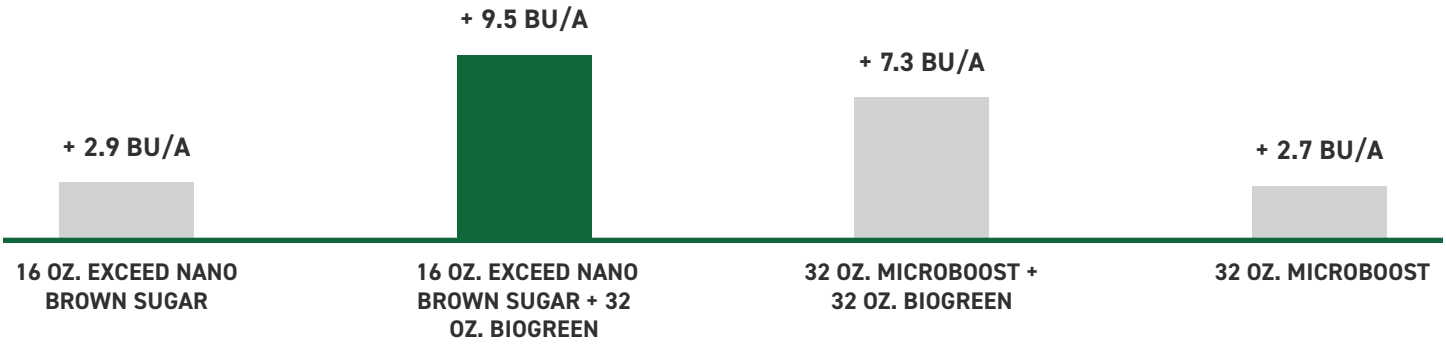
To evaluate the impacts of foliar products on plant health, yield, and ROI.

OBSERVATION

There are two different sugar products in this study: MicroBoost and eXceed™ Nano Brown Sugar, which we mixed with BioGreen—a nutrient stabilizer that contains microbes targeted for nitrogen and phosphorus fixation, micronutrient absorption, and root growth. With the addition of BioGreen to the foliar application, we have seen a great return this year and a higher yield response.

V4 Treatment	Moisture	Yield	Yield Change	ROI
Control (No additional treatments)	20.6	175.5	N/A	N/A
16 oz. eXceed™ Nano Brown Sugar	21.0	178.9	+ 3.4	+ $11.52
16 oz. eXceed™ Nano Brown Sugar + 32 oz. BioGreen	**20.7**	**190.6**	**+ 15.1**	**+ $58.86**
32 oz. MicroBoost + 32 oz. BioGreen	20.8	187.4	+ 11.9	+ $44.29
32 oz. MicroBoost	21.7	178.3	+ 2.8	+ $9.24

2-Year Average Yield Increase



Residue Management Study

PURPOSE

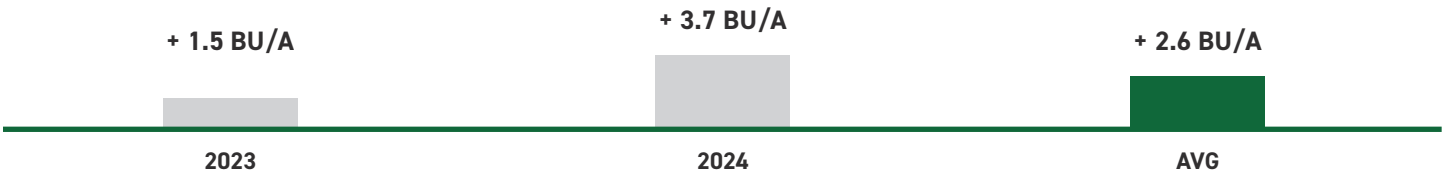
To evaluate biological residue management products applied after harvest and how they impact residue breakdown and ROI.

OBSERVATION

Biological residue management products help breakdown residue and make nutrients more available for the following year's crop. Similar to the corn study, both products provided a positive ROI this growing season.

Post Harvest Treatment	Moisture	Yield	Yield Change	ROI
Control	9.7	51.6	N/A	N/A
12.8 oz. DB32	**9.6**	**55.3**	**+ 3.7**	**+ $26.89**
32 oz. BioChop	9.7	54.3	+ 2.7	+ $23.94

2-Year Average Yield Increase for DB32



Tillage Program Study

PURPOSE

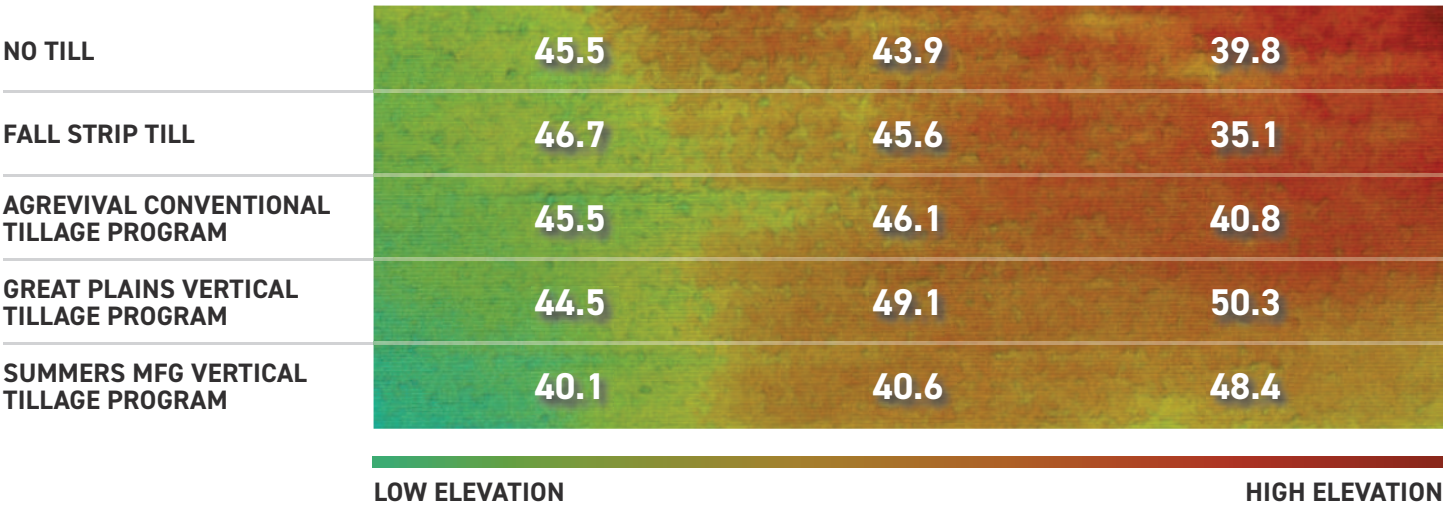
To evaluate a variety of tillage programs, and how each program impacts plant health and overall yield.

OBSERVATION

For year two of our tillage study, we split the harvested data into three different ranges from west to east. As we see in the photo below of the elevation map, the western portion is at the bottom side of a hill, and as we move east, the plot increases in elevation (red/orange on the map). Looking at strip till, for example, the highest yield this year was on the west side (or lower elevation) and as the elevation increased we saw the yield decrease by over 10 bushels. We notice the opposite in the Summers and Great Plains tillage programs as they increased yield as we increased field elevation. This was a main reason we wanted this study to be multi-year and stretch across a majority of the field with elevation and soil changes. These variabilities help to gain a better understanding on each tillage program we are testing and where each practice will be the best option.

Tillage Program	Moisture	Yield	Yield Change	2-Year Avg. Yield
No Till	11.9	43.1	N/A	48.6
Fall Strip Till	11.2	42.5	- 0.6	49.9
AgRevival Conventional Tillage Program (Fall Disc Rip, Spring Field Cultivator)	10.9	44.1	+ 1.0	49.3
Great Plains Vertical Tillage Program (Fall Max-Chisel®, Spring Turbo-Max®)	**11.0**	**48.0**	**+ 4.9**	**52.9**
Summers MFG Vertical Tillage Program (Fall and Spring VRT Renegade®)	11.1	40.2	- 2.9	49.3

Average Yield by Elevation



2x2x2 Study

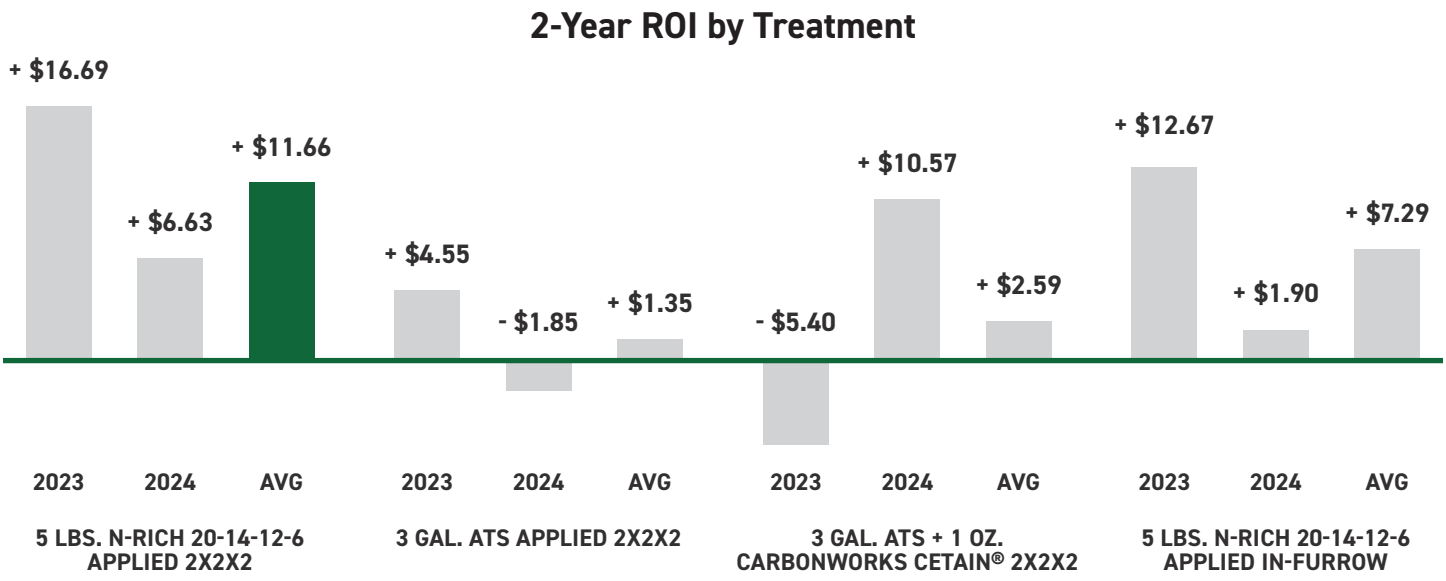
PURPOSE

To evaluate the use of products with nitrogen, phosphorus, and potassium and how they impact return on investment.

OBSERVATION

Being able to use the 2x2x2 system on your planter for providing both nitrogen when planting corn and some nutrients for early-season plant growth in soybeans is the drive behind this study. Our two years of data suggests it is a good idea to use the system for soybeans as well. Although products like N-Rich can be used in-furrow on soybeans, it seems getting the application split into 2 streams and away from the seed provides the highest yield and ROI response in this study.

Treatment	Moisture	Yield	Yield Change	ROI
Control	9.8	42.0	N/A	N/A
5 lbs. N-Rich 20-14-12-6 applied 2x2x2	9.4	43.3	+ 1.3	+ $6.63
3 gal. ATS applied 2x2x2	9.3	42.3	+ 0.3	- $1.85
3 gal. ATS + 1 oz. CarbonWorks CetaiN® 2x2x2	**9.3**	**43.4**	**+ 1.4**	**+ $10.57**
5 lbs. N-Rich 20-14-12-6 applied In-Furrow	9.1	42.9	+ 0.9	+ $1.90



Soybean Strategies Study

PURPOSE

To evaluate the use of a product with nitrogen, phosphorus, and potassium and how it impacts return on investment.

OBSERVATION

After seeing a positive return last year when using this product 2x2x2 and in-furrow we wanted to test other application methods for this product. We used an application rate of 20 gallons per acre for both foliar and drop hose. Providing extra nutrition paid off this year with the early stress from the abundance of moisture. Both applications had rain shortly after application to help move nutrients into the soil profile and root zone.

Treatment	Moisture	Yield	Yield Change	ROI
Control (No additional treatments)	8.9	41.5	N/A	N/A
5 lbs. N-Rich 20-14-12-6 applied 2x2x2	8.8	42.4	+ 0.9	+ $1.90
5 lbs. N-Rich 20-14-12-6 applied @ V4	8.7	43.4	+ 1.9	+ $13.73
5 lbs. N-Rich 20-14-12-6 applied w/drop hose @ V4	**8.8**	**44.5**	**+ 3.0**	**+ $26.74**

Planting Time After Spring Tillage Study

PURPOSE

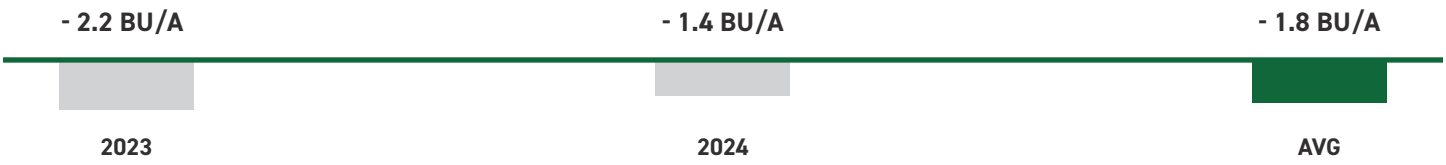
To evaluate waiting for the soil to dry and warm before planting after spring tillage.

OBSERVATION

Year two resulted in similar yield loss when waiting a day to plant soybeans after spring tillage. This planting time after tillage data, combined with our planting date data, suggests planting soybeans first if those early windows of field work present themselves. A few points to note. The soybeans we used in this study are Beck's Soybeans, treated with Escalate Seed Treatment, which helps protect the seed in early stress conditions. We are learning that soybeans today are more resilient than corn when planted into non-ideal conditions. High risk = high reward in soybean planting. Pushing the conditions can be unnerving. However, if stand is an issue, spotting in an earlier soybean maturity is still more profitable than a thin corn stand. Multiple data sets are elevating confidence in planting soybeans early.

Planting Date (Field was worked on May 13th)	Moisture	Yield	Yield Change
May 13th	10.2	55.9	N/A
May 14th	10.2	54.5	- 1.4

2-Year Average Yield Decrease



In-Furrow Placement Study

PURPOSE

To evaluate the placement of a variety of products placed in-furrow and its impacts on germination and ROI.

OBSERVATION

With the addition of two new products, this study once again highlights the importance of in-furrow placement depending on the product. In two out of the three products, placement was the difference of positive ROI, which we observed in last years' data as well. We will be continuing to look at this study in the coming years.

Treatment	Moisture	Yield	Yield Change	ROI
Control (No additional treatments)	10.7	33.5	N/A	N/A
24 oz. RSTC 17® + 16 oz. eXceed™ Nano Brown Sugar applied in-furrow under the seed	10.7	34.6	+ 1.1	- $6.36
24 oz. RSTC 17® + 16 oz. eXceed™ Nano Brown Sugar applied in-furrow on top of seed	10.7	35.2	+ 1.7	+ $0.74

Control (No additional treatments)	10.7	33.5	N/A	N/A
16 oz. Frenzy applied in-furrow under the seed	10.6	36.3	+ 2.8	+ $21.08
16 oz. Frenzy applied in-furrow on top of seed	10.6	37.8	+ 4.3	+ $38.83

Control (No additional treatments)	10.7	33.5	N/A	N/A
32 oz. Xylem Plus applied in-furrow under the seed	10.6	35.7	+ 2.2	+ $12.78
32 oz. Xylem Plus applied in-furrow on top of seed	10.7	33.9	+ 0.4	- $8.52

Planting Date x Population x Maturity Study

PURPOSE

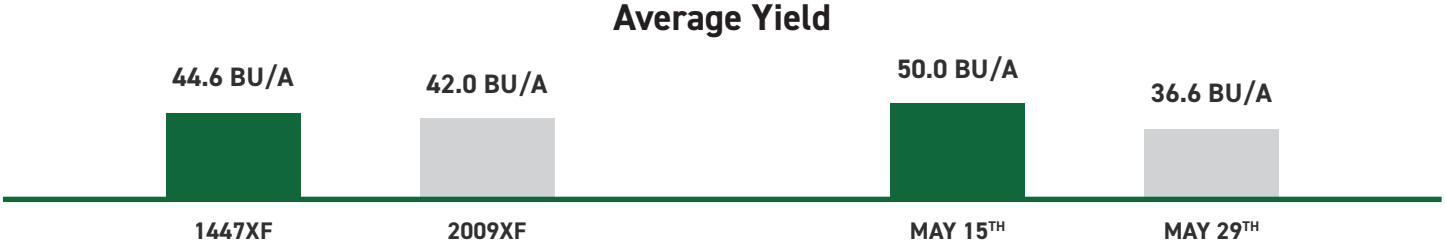
To evaluate the impacts of planting population as we proceed through the planting season with two varieties.

OBSERVATION

When is the right time to start increasing planting populations and what is the right population to start planting soybeans at? These are the questions we wanted to answer. 1447XF is characterized as a wide summer canopy soybean while 2009XF are more of a medium summer canopy soybean. In our first-year attempt at this study, we only accomplished two of the three planting dates as our June planting date was drowned out by rain. One takeaway is that increased population in the later planting paid off for both varieties. Another is that all three planting dates experienced the same stresses that drowned one of them out, yet the earliest planting date still had a 13+ bushel per acre advantage. We continue to see the benefits of planting soybeans early; they are more resilient than we give them credit for. Stay tuned for next year's continued research on this study.

Treatment on 1447XF	Moisture	Yield	Yield Change	ROI
May 15th @ 130K	10.8	47.6	N/A	N/A
May 15th @ 150K	**10.9**	**53.3**	**+ 5.7**	**+ $56.87**
May 15th @ 170K	10.8	53.0	+ 5.4	+ $42.76
May 29th @ 130K	10.2	36.6	N/A	N/A
May 29th @ 150K	9.9	37.6	+ 1.0	+ $1.27
May 29th @ 170K	**9.9**	**39.4**	**+ 2.8**	**+ $12.00**

Treatment on 2009XF	Moisture	Yield	Yield Change	ROI
May 15th @ 130K	**8.9**	**51.1**	**N/A**	**N/A**
May 15th @ 150K	9.0	48.9	- 2.2	- $37.28
May 15th @ 170K	9.5	45.9	- 5.2	- $84.02
May 29th @ 130K	8.6	28.1	N/A	N/A
May 29th @ 150K	8.8	35.9	+ 7.8	+ $81.02
May 29th @ 170K	**8.9**	**42.0**	**+ 13.9**	**+ $141.94**



In-Furrow Recommendation Study

PURPOSE

To evaluate products applied in-furrow and their impact on yield and ROI.

OBSERVATION

Similar to the corn study, we are seeing an increase in yield and ROI when using MicroBoost in-furrow. The highest ROI resulted from using a sugar source and 24 oz. RSTC 17 again this year. This has been our recommendation and will continue for soybeans when the option for in-furrow application is available.

Treatment	Moisture	Yield	Yield Change	Net Return
16 oz. RSTC17 + 16 oz. eXceed NBS + 16 oz. BioGreen	10.3	48.8	N/A	$558.87
16 oz. RSTC17 + 16 oz. MicroBoost + 16 oz. BioGreen	10.4	49.5	+ 0.7	$569.71
8 oz. Regulator + 16 oz. eXceed NBS + 16 oz. BioGreen	10.1	49.6	N/A	$572.77
8 oz. Regulator + 16 oz. MicroBoost + 16 oz. BioGreen	10.2	50.8	+ 1.2	$589.53
24 oz. RSTC 17 + 16 oz. eXceed NBS	**10.2**	**51.5**	**N/A**	**$589.87**
24 oz. RSTC 17 + 16 oz. MicroBoost	10.2	51.4	- 0.1	$591.25

AMS Study

PURPOSE

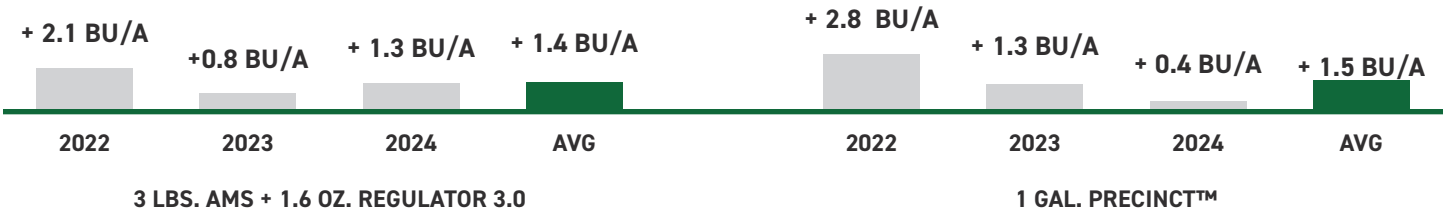
To evaluate water conditioning products when applying Liberty and Roundup and how each impacts weed kill and yield.

OBSERVATION

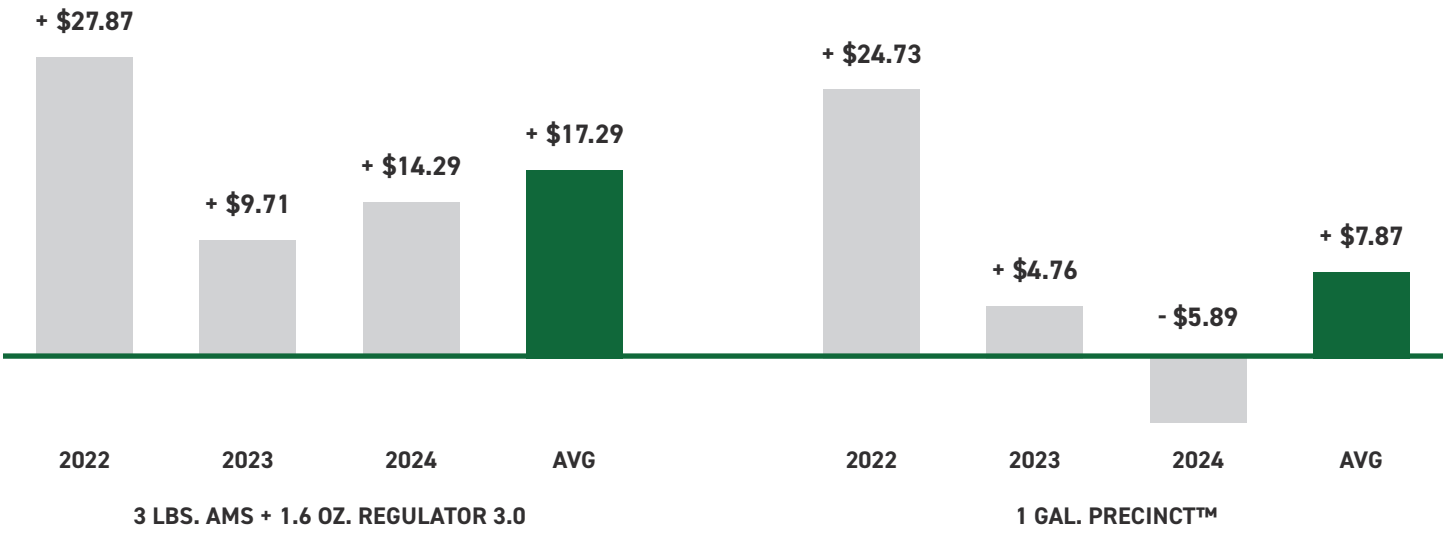
The final year of this study resulted in a similar yield increase when adding Regulator 3.0 to the application or using a liquid AMS product like Precinct™ as an alternative to a dry spray-grade AMS. Both provide an additional benefit of mixing ease, ensuring uniform tank mixes. We want to recognize the consistent performance of Regulator 3.0, a product that is designed to return the water used to a more natural state, like rainwater.

Treatment	Moisture	Yield	Yield Change	ROI
Control: 3 lbs. AMS	11.1	48.8	N/A	N/A
3 lbs. AMS + 1.6 oz. Regulator 3.0	**11.2**	**50.1**	**+ 1.3**	**+ $14.29**
1 gal. Precinct™	10.9	49.2	+ 0.4	- $5.89

3-Year Average Yield Increase



3-Year Average ROI



Fungicide and Insecticide Study

PURPOSE

To evaluate the addition of sugar and insecticide to a already planned fungicide application and if the addition will improve plant health and provide a higher ROI.

OBSERVATION

This year, the fungicide used determined whether or not we had a positive ROI. However, when we added a water conditioner and a sugar source, the pass was more profitable. We did have some aphid pressure when this application was made, which can be seen in the 1.2-bushel increase. The addition of sugar and/or a water conditioner made for a higher yield and also was enough to make the fungicide/insecticide pass a positive ROI where it was negative before we added each product to the mix.

R3 Treatment	Moisture	Yield	Yield Change	ROI
Control: No Fungicide	10.2	49.3	N/A	N/A
5 oz. Lucento®	10.2	50.3	+ 1.0	- $10.85
5 oz. Lucento® + 3.2 oz. Mustang® Maxx	10.3	51.5	+ 2.2	- $1.36
5 oz. Lucento® + 3.2 oz. Mustang® Maxx + 16 oz. eXceed™ Nano Brown Sugar	10.3	52.1	+ 2.8	+ $1.17
5 oz. Lucento® + 3.2 oz. Mustang® Maxx + 16 oz. eXceed™ Nano Brown Sugar + 3.2 oz. Regulator 3.0	**10.5**	**53.0**	**+ 3.7**	**+ $9.64**

Control: No Fungicide	10.2	49.3	N/A	N/A
8 oz. Revytek®	10.5	52.8	+ 3.5	+ $11.55
8 oz. Revytek® + 16 oz. eXceed™ Nano Brown Sugar	10.6	53.1	+ 3.8	+ $10.53
8 oz. Revytek® + 16 oz. eXceed™ Nano Brown Sugar + 3.2 oz. Reg. 3.0	**10.6**	**53.4**	**+ 4.1**	**+ $11.90**

Trademark Information

Veltyma and Revytek is a registered trademark of BASF

CarbonWorks CetaiN® and CarbonWorks RSTC 17® and CarbonWorks Replenish®, are registered trademarks of Carbon Works, Inc.

eXceed™ Nano Brown Sugar, and Regulator 3.0™, Zinc 9.0™ are trademarks of Max Systems LLC.

Lucento and Mustang® Maxx is register trademark of FMC

Precinct™ are registered trademarks of CHS Agronomy.

Max-Chisel and Turbo-Max are Registered Trademarks of Great Plains Manufacturing

VRT Renegade is a Registered Trademark of Summers Manufacturing, Inc.

Ask how we can help you implement these tested products, practices, and management programs on your farm.

We're here to help.

(320) 979-4835 | www.agrevival.com
natefirle@agrevival.com
blakejarve@agrevival.com
loganmiller@agrevival.com

Notes

Notes

Notes

2024

AgRevival

(320) 979-4835 | www.agrevival.com
157 East 13th Street | Gibbon, MN 55335

$45.00