

2025

INNOVATION FARM RESULTS



WELCOME TO THE 2025 NUTRIEN INNOVATION FARM NETWORK BOOK.

Our Nutrien Agronomy team has put in a lot of hours on the work that you will see represented in the pages ahead. Their dedication to serving agriculture is evident through the care this team puts into testing and scaling full-acre solutions that are applicable to growers in geographies across North America.

On behalf of Nutrien Ag Solutions, we hope that you find the information in this book about technology advancements, agronomic practices, and product recommendations as a valuable resource for your 2026 planning.

Throughout the next 127, you will find agronomic and economic data that was compiled from a variety of unique trials across our four innovation farms. Beyond the findings from these trials, the Nutrien Agronomy team works with Loveland Products, Dyna-Gro® Seed, and your local Crop Consultants on creating protocols for farmer acres. This system is called One Nutrien Trials. By continuing to standardize trial layouts and processes through the One Nutrien Trials, we are building a unified data workflow that connects local outcomes to regional and national insights, strengthening confidence in our recommendations. These trials remain the engine for locally relevant agronomic insights, designed to validate product performance in the field while also creating a robust, aggregated dataset across geographies. With strong alignment from our Loveland and Dyna-Gro partners, we are building momentum to ensure every trial—whether seed, crop protection, or nutrition—delivers value that translates directly to grower decisions.

The insights in this booklet are not possible without the collaboration of our retail branches, farmers, equipment dealers, R&D suppliers, and cross-functional teams from Loveland Products, Dyna-Gro Seed, Waypoint Analytical, marketing, and Nutrien Agronomy.

All the data at our innovation farms are captured at the scale and speed of farming with the use of commercial-grade equipment, latest precision technology, and production quality analytical services. These data-backed insights are created to support our crop consultants and farmers. They simplify the decision-making process by providing readily available, full-acre solutions that are easily replicated and adapted to our customers' fields.

The goal of our innovation farm network is to revolutionize agriculture through the five key components of equipment, technology, products, practices, and people. By focusing on these elements, we aim to enhance the productivity and sustainability of every acre our farmers operate.

Thank you for your support of our team, innovation farm network, and most importantly, for trusting us to deliver valuable insights that can be used throughout your season. For more information about the solutions shared in this booklet and how they can be applied to your operations, please contact your local Nutrien Ag Solutions Crop Consultant.

Thank you,

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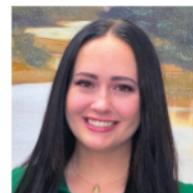
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PEOPLE

Serve as a platform to spark interest in agriculture, attract top talent, and build lasting relationships

GROWERS

The purpose of Innovation Farms is to create a unique way to engage our stakeholders and tangibly demonstrate how Nutrien's sustainable offerings, in collaboration with suppliers and manufacturers, solve the most pressing agronomic and environmental challenges.



CROP CONSULTANTS

PRACTICE

A comprehensive hub to showcase full-acre solutions across highly managed acres to achieve the best ROI



PRODUCTS

Showcase whole-acre solutions that increase yield and ROI, with the data to support them

TECHNOLOGY

Showcase the latest ag technology and how growers can replicate use on a larger scale



EQUIPMENT

Demonstrate the latest innovation in equipment by maximizing the value in each pass with machine enabled agronomy



THE VISION OF THE INNOVATION FARM NETWORK IS TO REVOLUTIONIZE AGRICULTURE BY HARMONIZING THE FIVE COMPONENTS OF EQUIPMENT, TECHNOLOGY, PRODUCTS, PRACTICES AND PEOPLE. BY DOING THIS, WE AIM TO ENHANCE THE PRODUCTIVITY AND SUSTAINABILITY OF EVERY ACRE OF OUR GROWERS. THE TRUE POWER IN THE INNOVATION FARM NETWORK LIES IN EACH STRATEGIC LOCATION AND UNIQUENESS.

RESEARCH & DEVELOPMENT (STRATEGIC PARTNERS)

INNOVATION FARM



GENE/TRAIT IDENTIFICATION

PROOF OF CONCEPT

DEVELOPMENT

PRE-LAUNCH
Nutrien Agronomy
Innovation Farm Trials

COMMERCIAL LAUNCH
Nutrien Agronomy
Whole Acre Solutions

CHAMPAIGN, IL

The Champaign Innovation Farm provides the most comprehensive variable environment to evaluate equipment, products, and practices. It has the largest focus on Machine-Enabled Agronomy of all the farms. This includes training and working closely with our chief drone pilot to ensure FAA compliance. The Champaign Farm is focused on working closely with Loveland Products and Dyna-Gro Seed.



OWENSBORO, KY

The Owensboro Innovation Farm provides large field scale trials to provide further evaluation of whole-acres solutions. It also works closely with Loveland Products and Dyna-Gro Seed for local expertise. The Owensboro Farm also utilizes the facility for training and agronomic specific assessments.

WINTERVILLE, MS

The Winterville Innovation Farm provides the most diverse set of crops. Not only do they have corn and soybeans, but also cotton and rice. It also has a large focus on cotton breeding with Dyna-Gro Seed. Along with Dyna-Gro Seed, Winterville also focuses on utilizing Loveland Products across the farm.



SELMA, CA

The Selma Innovation Farm provides insight a permanent crop focus adding almonds and citrus crops to the network. It is designed to deliver product via fertigation through a highly-sensored irrigation manifold. The Selma Farm also works closely with Loveland Products and several satellite farms to provide more innovative information on other specialty crops throughout the West.



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A LOOK BACK ON 2025

The Nutrien Innovation Farms focus on bringing new technology, the latest equipment, product recommendations, and agronomic practices together. To best represent this process, the Nutrien Agronomy team works closely with Loveland Products, Dyna-Gro Seed, and local Nutrien Ag Solutions Crop Consultants to generate solutions with a return on investment-focused recommendation. The One Nutrien Trial system allows us to standardize trial layouts and processes, with a unified workflow that provides outcomes with regional and national insights. Our One Nutrien Trials are designed to demonstrate product performance at the scale of a modern farming operation, while also collecting data across geographies that can help inform and bring the best agronomic advice straight to our farmers to help with decision-making and new product adoption.

In 2025, across Selma, Owensboro, Winterville, and Champaign, our farms hosted 104 events with over 4,700 attendees, representing nearly 10 million acres. From large-scale grower field days to targeted training sessions, these farms showcased how data and innovation come together in the field. Whether it was a corn harvest in Winterville, Loveland Products and Dyna-Gro® Seed in Owensboro, almond harvest and crop nutrition days in Selma, or operator training and product launches in Champaign, the Innovation Farms have proven to be hubs where agronomy, education, and innovation intersect.

2025 HIGHLIGHTS:

- On March 20, we held a ribbon-cutting ceremony to celebrate the new Champaign Innovation Farm facility, which is a hub to host events such as trainings, team meetings, and customer engagements.
- This summer, Avery Watson, Nutrien Ag Solution's first FFA student ambassador, passed the baton to Grace Bickers. Grace is working at the Champaign Innovation Farm on an agribusiness project focused on planting, nurturing, growing, and selling sweet corn.
- Machine-Enabled Agronomy continues to be a priority for our team, with ongoing RTK boundary collection training and upgrades to our Echelon platform. Earlier this year, we welcomed Will Fellmeth, our Chief Drone Pilot, who has been overseeing regulation and training efforts for Unmanned Aerial System (UAS) pilots across our North American footprint.
- We completed another year of our Agronomy Essential training program over the summer with events hosted at each of our innovation farm locations. These training sessions focus on soil, plant nutrition and crop protection, and seed in a hands-on format for our crop consultants.
- Each of these highlights plus the many hosted events offer a critical platform to reinforce our commitment to our growers.

By demonstrating our One Nutrien Trials platform at our innovation farms, coupled with our proprietary Loveland Products and Dyna-Gro Seed, we are building an unmatched dataset that not only reflects local conditions but also scales to support business decisions across geographies. Our ultimate goal remains clear; support the Loveland Products and Dyna-Gro Seed brands, and build a layered, reliable database that helps us explain the 'why' on product performance. We're excited to share the results from our 2025 trials throughout this book. If you're interested in adopting any of these practices on your own operation or have any questions, please reach out to your local Nutrien Ag Solutions Crop Consultant.

Best,

THE INNOVATION FARM MANAGERS

CHAMPAIGN, IL



**SCAN THE QR TO VISIT THE CHAMPAIGN
INNOVATION FARM RESULTS PAGE**

CHAMPAIGN, IL WEATHER

I'm not sure a "normal" weather years exists anymore. Ahead of planting at the Champaign Innovation Farm, the major concern was the risk of summer drought development. A lack of winter snow combined with very low soil moisture levels in March and April pointed toward a dry and hot year. Large dust storms from Texas, Oklahoma, and Kansas blew across the Midwest and hit the farm in March and April as Spring 2025 took the new top spot as the windiest spring in 50 years.

Some late April and early May storms improved soil conditions for planting and finally some heat was put into the soil as mid-May temperatures rebounded. Crop emergence was normal, but the forecast suggested a decrease in the rate of accumulation of GDDs (growing degree days). From May 21 to June 10, the farm experienced a top 20 cold stretch compared to the last 133 years and GDD accumulation dropped off fast. By the time the heat returned in late June, the crop was about a week behind on the typical accumulation of GDDs.

Late June through July turned hot with highs breaking into the 90s, but the bigger issue was the hot overnight low temperatures. The Champaign Innovation farm experienced an extra 20 days of low temperatures > 70°F when compared to a typical summer. It was quite stormy too. Rainfall from big summer thunderstorms was regular in June and heavy at times in July, but throughout the growing season, the Champaign Innovation Farm was never above normal for rainfall. In fact, the farm was running on a 6 to 10 inch rainfall deficit when you included evaporation.

The heat finally broke as the calendar had turned to August, but evidence of the rapid accumulation of heat was found as scouting revealed "Rapid Growth Syndrome" and "Tassel Wrap" in our corn plots. As we were scouting fields in August, the temperatures turned cool again with low temperatures in 50s and highs struggling to get into the 70s. The bigger problem was the consecutive days without any rainfall in August. Between August 1 and Oct 18, the crop received just 2.8 inches which was a 6 inch deficit during the critical grainfill time period. In total, the Champaign Innovation Farm received just 13" from planting to harvest which is an 8 inch total deficit.

One of the biggest struggles with the hot humid nights in June and July was that it was near ideal conditions for disease pressure. By Aug 22, the estimated total number of hours that the leaf surface was wet since April was 981 hours – the most when compared to the last decade and nearly 400 hours more what was experienced in 2023.

Harvest was rapid in October as only 0.08" of rain fell from October 1 to October 18.

ERIC SNODGRASS SENIOR FELLOW SCIENTIST

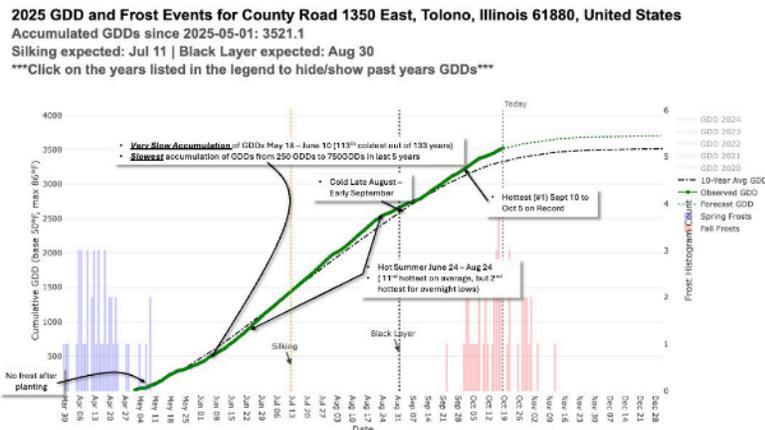
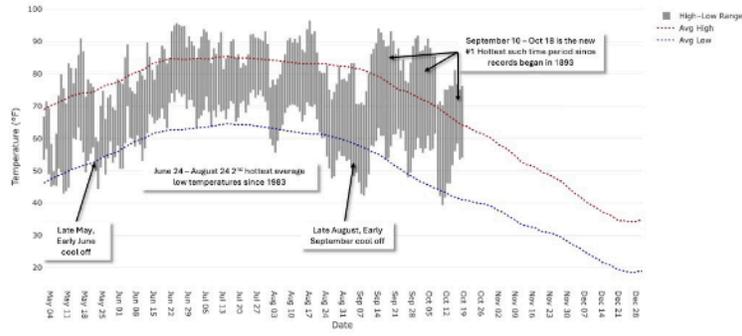


Figure 1. Growing Degree Day analysis for the Champaign Innovation Farm.

2025 Daily High and Low Temperatures for County Road 1350 East, Tolono, Illinois 61880, United States



2025 Daily and Cumulative Precipitation for County Road 1350 East, Tolono, Illinois 61880, United States

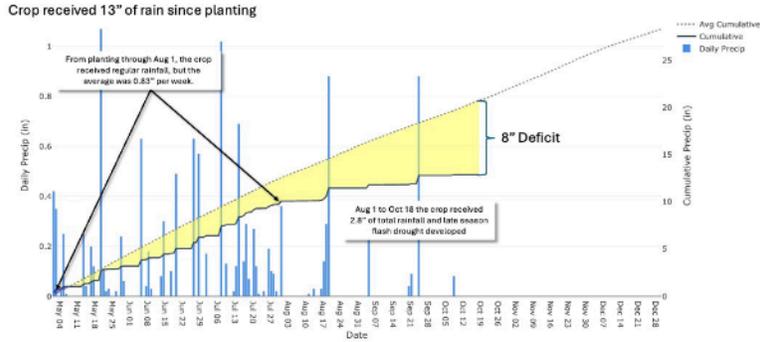


Figure 2. (Top) Daily high and low temperature from planting to harvest at the Champaign Innovation Farm. (Bottom) Daily rainfall analysis plus cumulative rainfall statistics for the Champaign Innovation Farm from planting to harvest.

Year-to-Date Precip - Evap (ERAS) near Tolono, Illinois

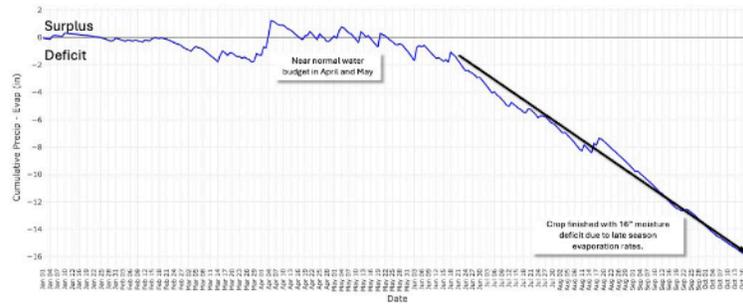


Figure 3: Year-to-Date water budget (precipitation-evaporation) for the Champaign Innovation Farm

Leaf Wetness Hours since Apr 1 — Tolono, Illinois

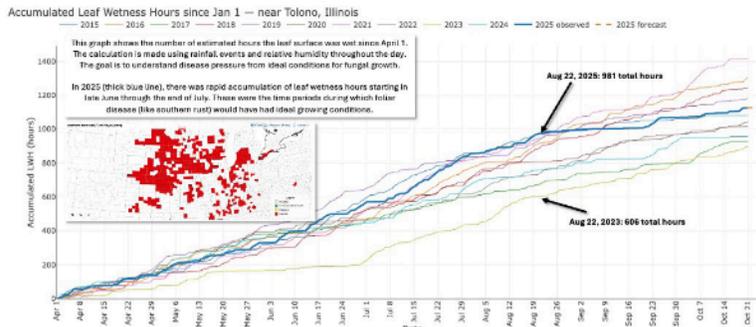
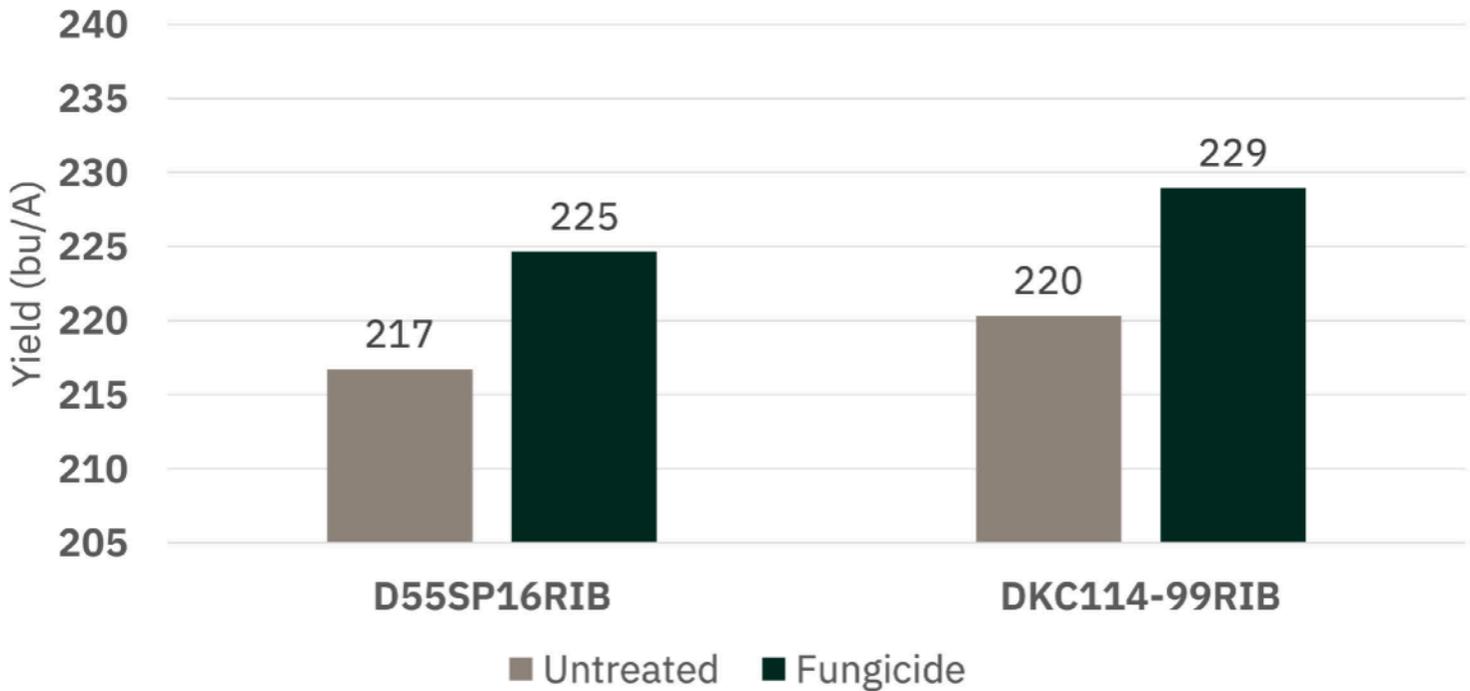


Figure 4. Total accumulation of leaf wetness hours over the last 10 years from April 1 to October 20, 2025 for the Champaign Innovation Farm



Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
D55SP16RIB DKC114-99RIB	5/10/25	7/18/25	10/2/25

MINIMAL MANAGEMENT CORN SYSTEM



OBJECTIVE:

This trial evaluated corn grown under standard management and use of whole-field yield average as a general frame of reference when comparing other corn trials on the farm.

METHOD:

Two corn hybrids were planted at a target population of 36,000 seeds/A. There was 110 units of N (32% UAN) applied pre-emerge with Instinct NEXGEN® Nitrogen stabilizer product (24 fl. oz./A and EXTRACT XC (1 gal/A)). An additional 70 units of 32% UAN was applied at side-dress. A standard pre-emerge and post-emergence herbicide program was applied, with a Delaro® Complete (8 fl. oz./A) fungicide application at R1.

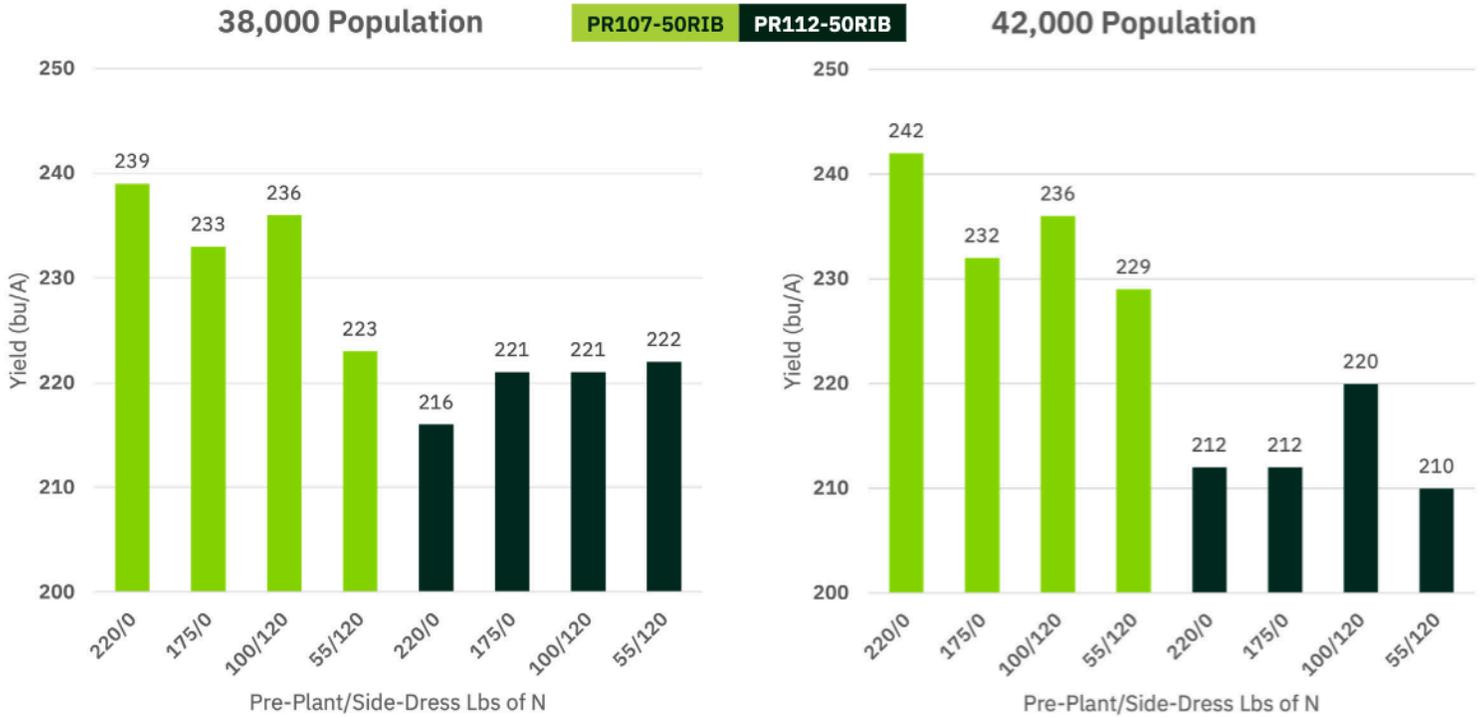
TAKEAWAY:

Both hybrids responded positively to a fungicide application. Rainfall was below average throughout the growing season, resulting in a 10-inch deficit by harvest. Persistent high nighttime temperatures in July contributed to the development of Tar Spot and Southern Rust across the region. The weather conditions we experienced at the farm this year were highly conducive to initiate infection and allow for spread. Given these challenges, the inclusion of at least one fungicide application has become a clear management priority, with many growers now considering a second post-flowering application. Even without fungicide, the trial averaged 218.5 bu/A an impressive yield given the environmental stress experienced during the season.



NUTRIEN X PRECEON™ SYSTEM

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
PR107-50RIB PR112-50RIB	5/12/25	4/28/25 6/16/25	9/30/25



OBJECTIVE:

The objective of this trial was to showcase two Preceon™, short-corn hybrids and various management techniques for product performance.

METHOD:

Two Preceon hybrids were planted at target populations of 38,000 and 42,000 seeds/A. Nitrogen (32% UAN) was applied either entirely pre-plant or split between planting and a side-dress application; the pre-plant treatment included 22 fl. oz./A of Instinct NXTGEN® nitrogen stabilizer. All plots received a fungicide application of 8 fl. oz./A Delaro® Complete.

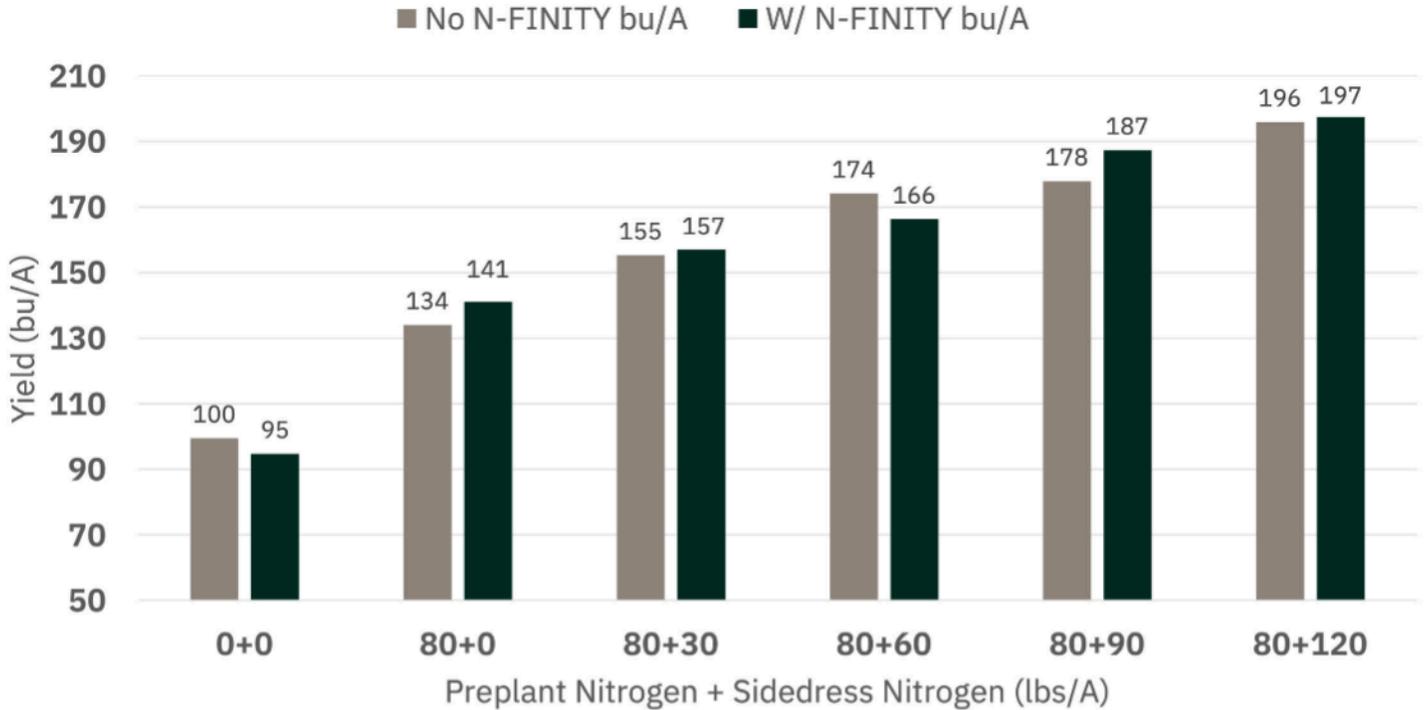
TAKEAWAY:

There was minimal yield response to plant population for either hybrid; however, PR107-50RIB outperformed PR112-50RIB overall. Contrary to expectations, the full pre-plant nitrogen application (217 lbs N/A) yielded higher than the split applications. When the total nitrogen rate was reduced by 20% (to 173 lbs N/A), yields remained strong—averaging around 232 bu/A—suggesting a potential improvement in return on investment.

Results indicate that optimized nitrogen management plays a critical role in both product performance and placement for Preceon hybrids.

N-FINITY IN SECOND-YEAR CORN

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
D55SP16RIB DKC114-99RIB	5/10/25	May 2024 & May 2025	10/2/25



OBJECTIVE:

Evaluate performance of N-FINITY™ in the same field for a second consecutive year across a range of nitrogen rates in a corn on corn rotation.

METHOD:

This trial was established using two hybrids, two planting treatments (with and without N-FINITY), and five nitrogen rates in a randomized complete block design, consistent with the treatment structure used in 2024. A planting prescription file was utilized with the starter system to apply N-FINITY at a rate of 1 qt/A via an in-furrow application. Nitrogen rates ranged from 0 to 200 total units of N, with 80 units applied preplant and the remaining nitrogen applied at the V5 growth stage using a side-dress Y-drop system.

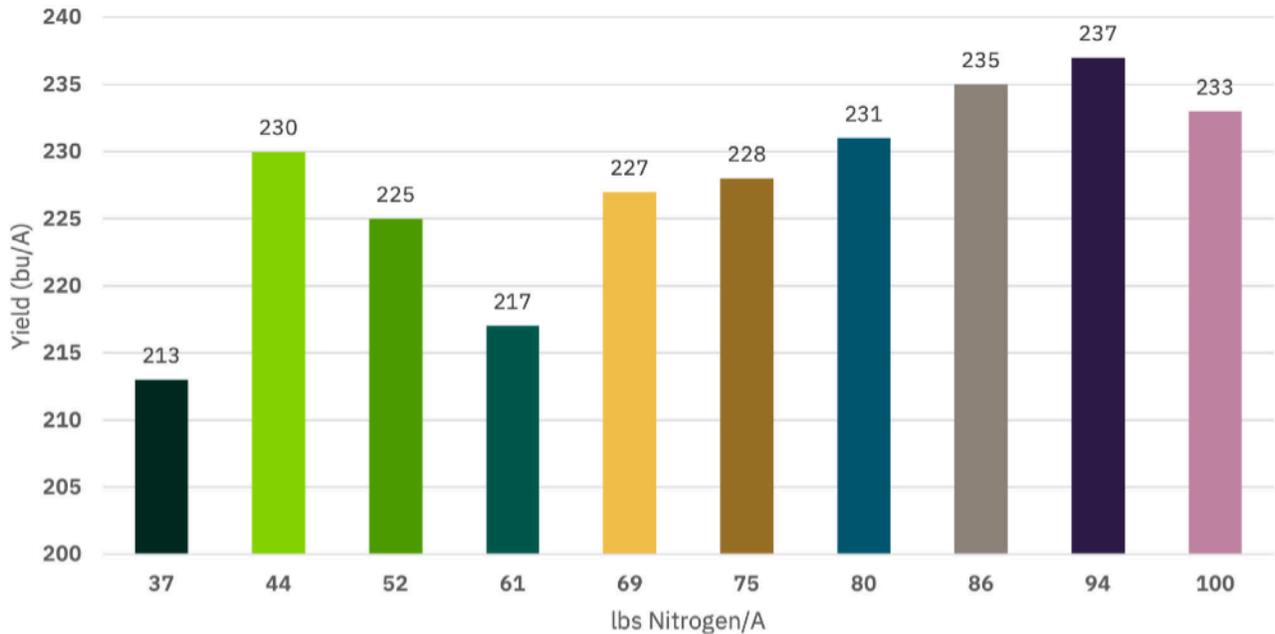
TAKEAWAY:

The N-FINITY treatments generally produced higher yields than the untreated checks. In both cases, yield increased as nitrogen rate increased, following a typical nitrogen response curve. The objective of this study was not to maximize yield through excessive nitrogen application, but rather to identify the Economic Optimum Nitrogen Rate (EONR)—the rate that provides sufficient fertility while maintaining a positive return on investment (ROI). The overall trial average yield was 162 bu/A. Based on a 32% UAN price of \$390/ton, N-FINITY at \$70/gal and a corn price of \$4.00 per bushel, the treatment that delivered the highest ROI was N-FINITY applied at a total of 170 units of nitrogen. These results demonstrate that N-FINITY can help optimize nitrogen efficiency and profitability, supporting more sustainable and economically sound crop management decisions.



VARIABLE RATE PLANTING WITH HD NITROGEN IN CORN

HD Side-Dress Nitrogen

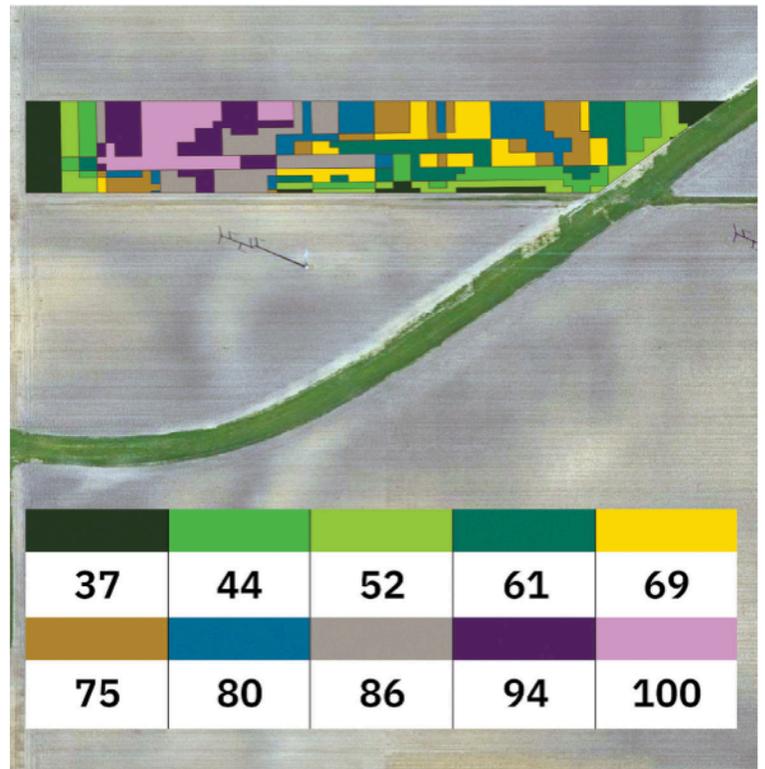


OBJECTIVE:

Showcase the technology Nutrien Agronomy programs can provide for variable rate planting and nitrogen application.

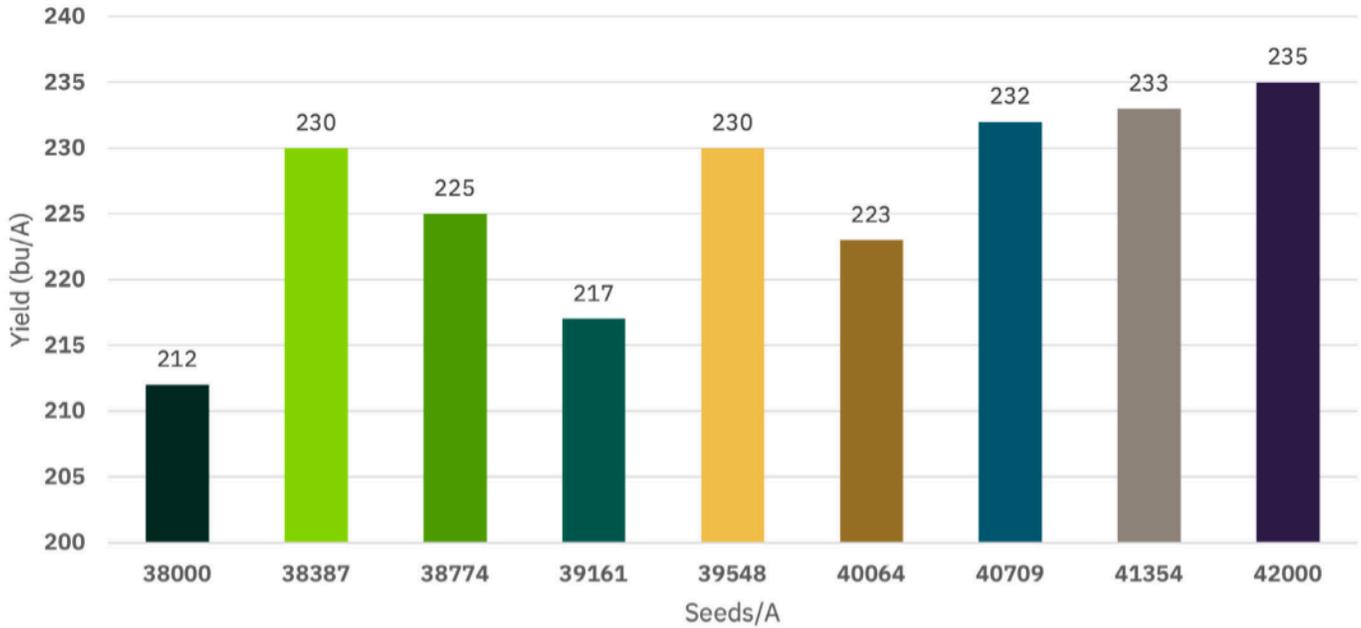
METHOD:

Three Preceon™ hybrids were variable rate planted in strips, with populations ranging from 38,000 seeds/A, up to 42,000 seeds/A - 9 seeding rates in total. A pre-plant nitrogen rate of 110 units was applied to the entire block with Instinct NXTGEN® Nitrogen stabilizer prior to planting as 32% UAN. Ten Nitrogen rates ranging from 37 units of N, up to 100 units of N were applied at side-dress timing as 32% UAN. The lowest populations received the lowest Nitrogen rates. Due to the complexity of this trial and the field space, data is reported on population and nitrogen rates separately. There was not a significant yield difference between the hybrids.



Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
PR107-50RIB PR108-20RIB PR112-50RIB	5/13/25	6/12/25	10/1/25

Variable Rate Planting



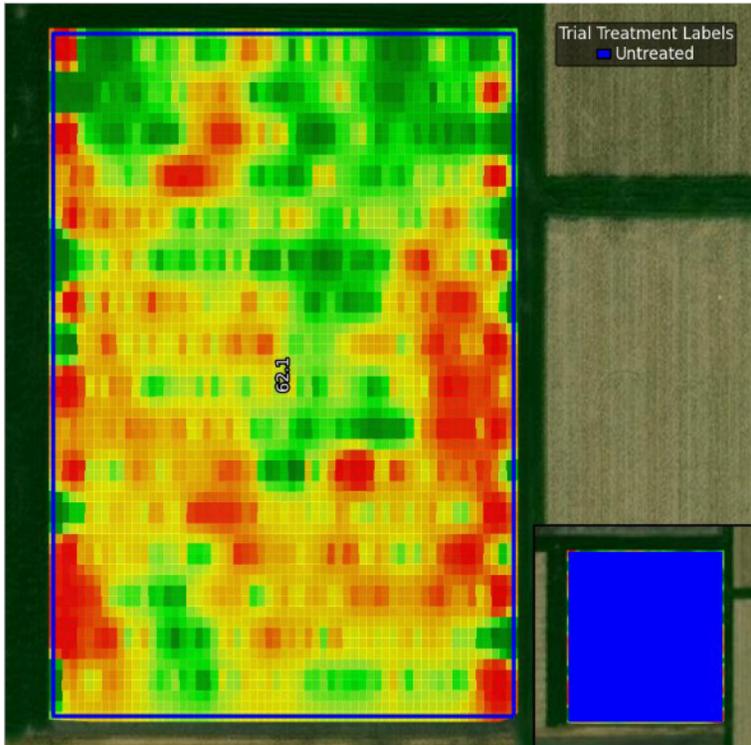
TAKEAWAYS:

The largest return on investment was seen on the 38,387 seeds/A planting rate with 154 total units of nitrogen (110 lbs pre-plant + 44 lbs side-dress). The nitrogen response and planting population curves generally follow what we would expect to see with a plateau effect once reaching the highest nitrogen and seeding rates. Ensuring that our growers are being good stewards of the resources they have and are using the technology we have available for their operations, will make sure they are customers for years to come. Finding an economic optimum nitrogen rate and planting population are two principles that allow our growers to be efficient in their operations. Reach out to your Nutrien Ag Solutions Agronomic Sales Manager for guidance on setting up variable rate planting or HD nitrogen prescriptions.



MINIMAL MANAGEMENT SOYBEAN SYSTEM

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
S35ES82	4/28/25	N/A	9/18/25



PRE-EMERGENCE PROGRAM	POST EMERGENCE PROGRAM
MATADOR-S, 36 fl. oz./A	Enversa™, 48 fl. oz./A
Roundup Powermax® 3, 30 fl. oz./A	Intensity, 12 fl. oz./A
Sonic® Boom, 14 fl. oz./A	Liberty® Ultra, 32 fl. oz./A
AMAZE GOLD, 64 fl. oz./A	Enlist One®, 32 fl. oz./A
LOW VOL 4, 16 fl. oz./A	HERBIMAX, 32 fl. oz./A
	AMAZE GOLD, 64 fl. oz./A

OBJECTIVE:

This trial evaluated soybeans grown under minimal management and use the whole-field average as a general frame of reference when comparing other soybean trials on the farm.

METHOD:

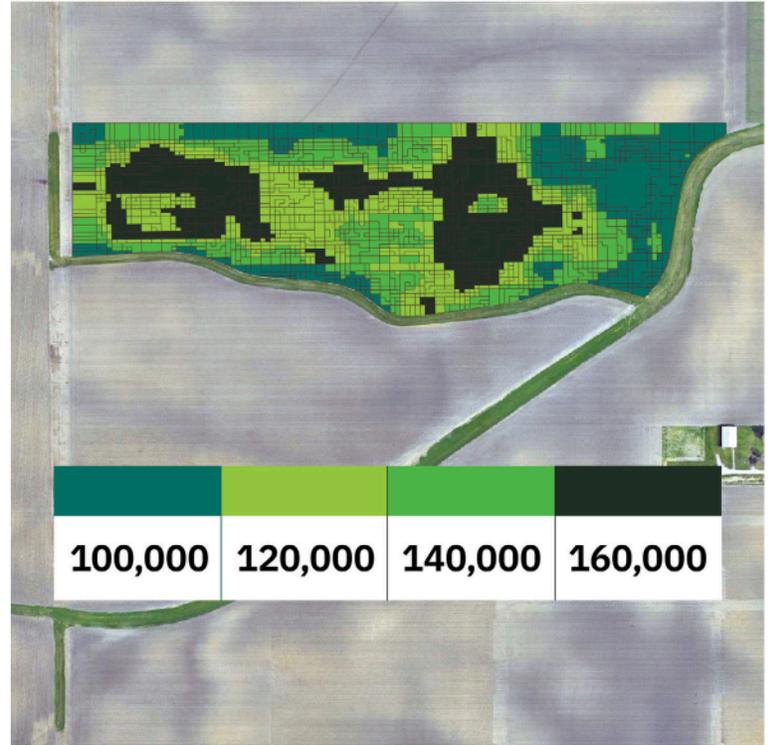
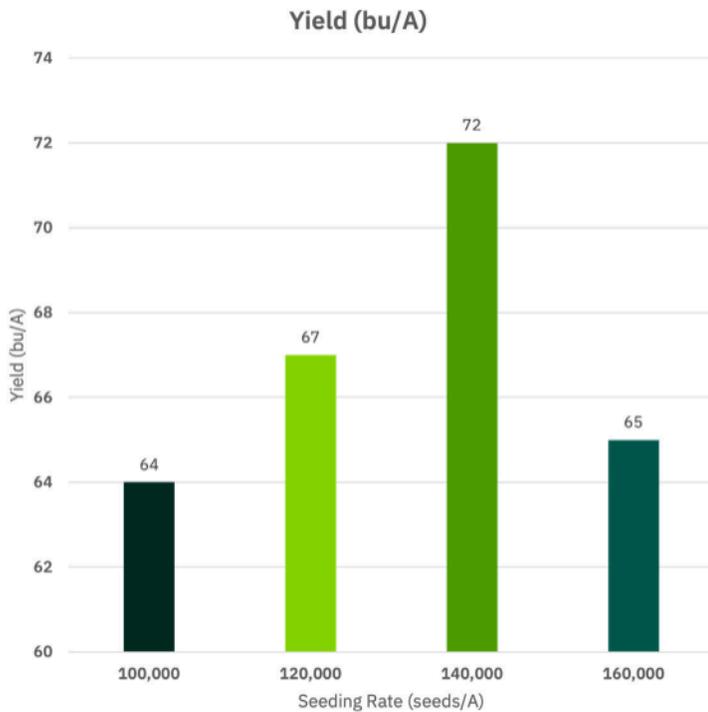
A standard pre-emerge and post-emerge herbicide program was used. No fungicide or nutritional products were applied. Seeding rate was 120,000 seeds/A.

TAKEAWAY:

This trial is like the title says – minimal management. This was done to get a baseline yield for soybean production on the farm without the additions of nutritional or disease management products. The average yield for this block was 62 bu/A.

HD SOYBEAN PROGRAM

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
S31EN96	4/24/25	6/14/25	9/17/25



OBJECTIVE:

The objective of this trial was to showcase planter capabilities and precision planting technologies that are offered to customers through Nutrien Agronomy.

METHOD:

Four soybean seeding rates ranging from 100,000 to 160,000 seeds/A were evaluated. Seeding rates were determined using the HD Soybean Program in Echelon®, which utilizes productivity zones—largely influenced by elevation—to optimize seeding rate adjustments for specific field areas. The entire trial block received a fungicide application of Delaro® Complete on July 14.

TAKEAWAY:

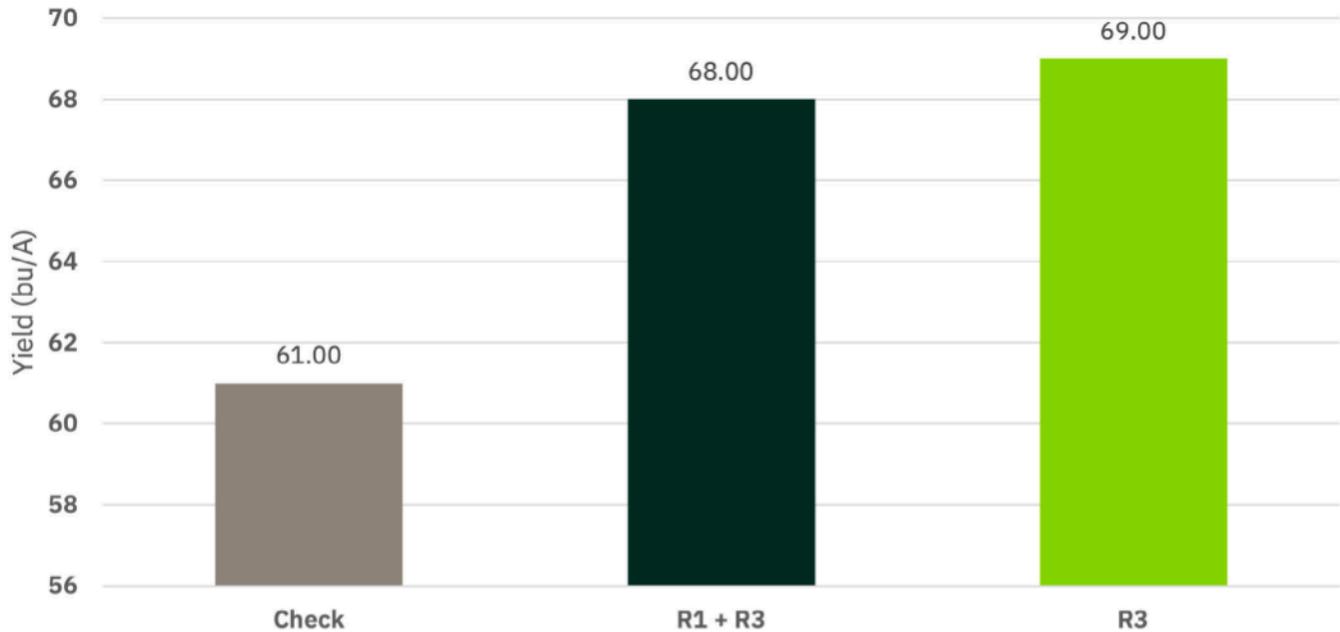
The highest-yielding zone in this trial was planted at 140,000 seeds/A, producing an average yield of 72 bu/A—an increase of nearly 7.6 bu/A compared to the minimal management block planted at 120,000 seeds/A (as seen on page 19). These results demonstrate that strategically varying soybean populations can be an effective management approach to maximize productivity and return per acre. Variable rate technology (VRT) enables growers to capitalize on higher-productivity acres by allocating more resources where yield potential is greatest, while reducing inputs on lower-productivity ground to improve overall efficiency and return on investment.



FUNGICIDE TIMING IN SOYBEAN

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
S35ES82	4/28/25	6/23/25 7/14/25	9/15/25

Fungicide Timing



OBJECTIVE:

Determine the benefits of a fungicide application at R1 only versus a sequential, two-pass program at the R1 & R3 growth stages in soybean.

METHOD:

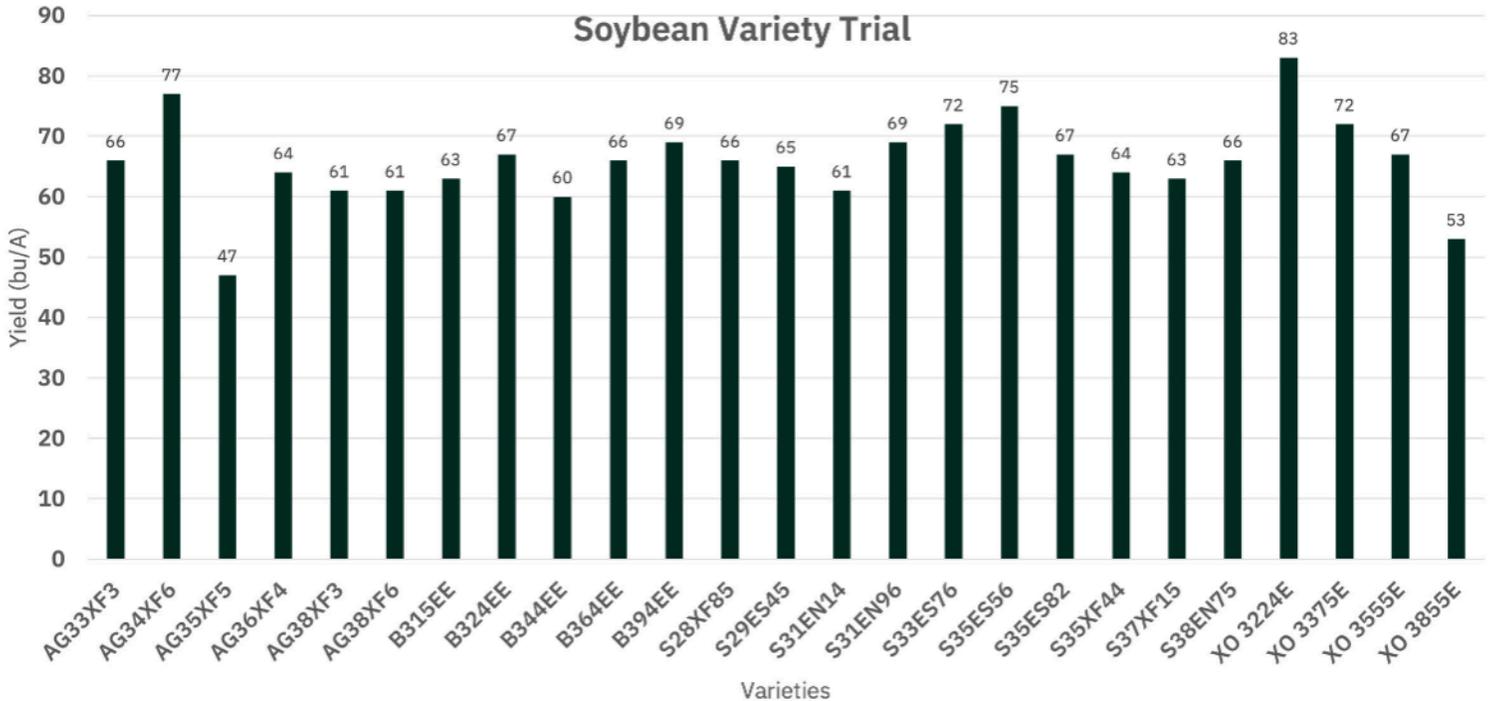
The trial block is was separated into three treatments – no fungicide, Delaro Complete fungicide at R1, and Delaro® Complete Fungicide at R1 and R3 growth stages. Yield benefits were compared between the two treatments. Each fungicide pass also included a 4 fl. oz./A rate of FRANCHISE®.

TAKEAWAY:

Fungicide applications in soybeans offer more than just disease protection—they also promote overall plant health and help protect yield during critical growth stages. This study, consistent with previous studies, showed that two fungicide passes did not necessarily deliver a higher return on investment compared to a single application. When selecting the most effective timing for a single fungicide pass, targeting the R3 growth stage typically provides the best results, unless significant disease pressure is already present earlier in the season. Regardless, applying at least one pass of fungicide to every soybean acre should become a standard way of operating.

SOYBEAN VARIETY SHOWCASE

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	4/30/25	7/14/25	9/19/25



OBJECTIVE:

Evaluate yield performance of key soybean varieties from four genetic lineups – Asgrow®, Brevant®, Dyna-Gro® Seed, and Xitavo®.

METHOD:

Planting population was set to 120,000 seeds/A for all entries. An R3 fungicide-insecticide application was made on July 14th containing:

CHOICE® TRIO 5 fl. oz./A

Delaro® Complete 10 fl. oz./A

FRANCHISE® 2 fl. oz./A

TOMBSTONE™ HELIOS® 2 fl. oz./A

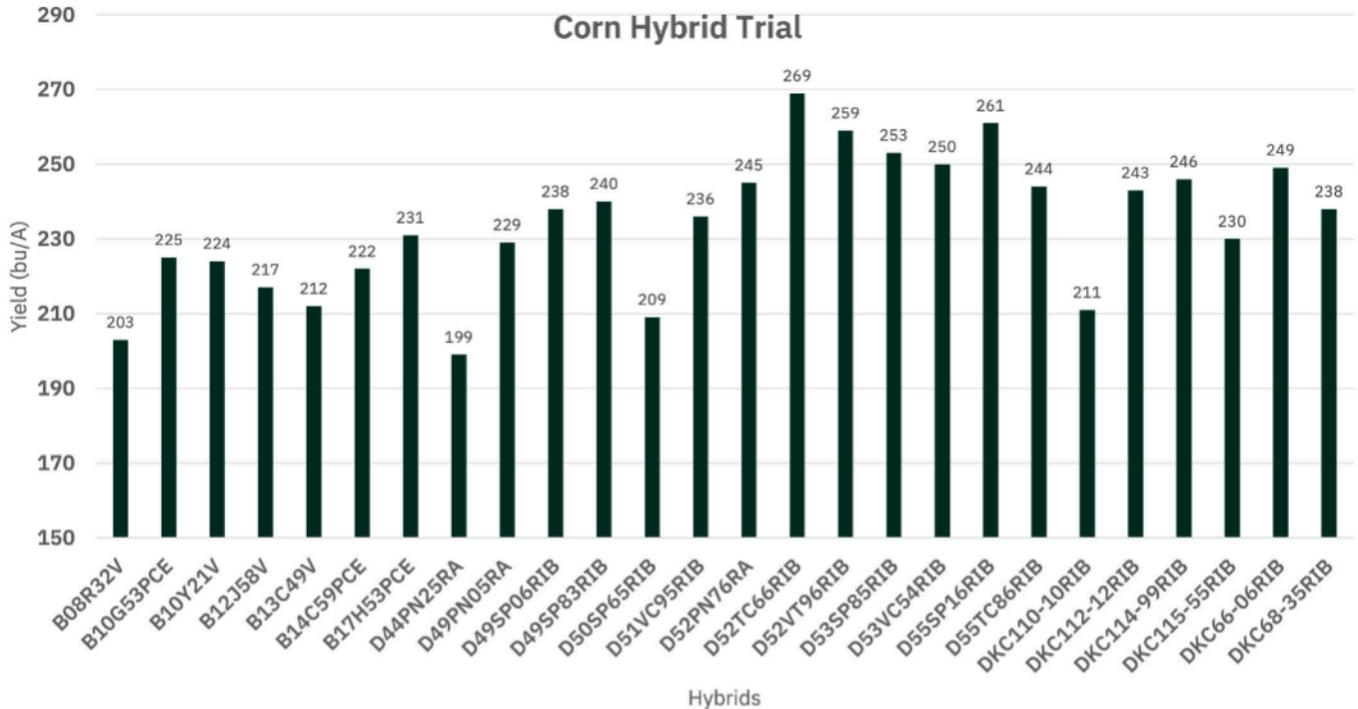
TAKEAWAY:

These results provide valuable insights for crop consultants, supporting more precise product placement by considering relative maturity and disease resistance packages best suited to each grower’s operation.



CORN HYBRID SHOWCASE

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Mutiple	5/14/25	6/12/25 7/18/25	10/06/25



OBJECTIVE:

Compare yield performance of more than two dozen corn hybrids representing three genetic lineups –Brevant®, Dyna-Gro® Seed, and DEKALB®.

METHOD:

Planting population was set to 36,000 seeds/A for all entries. A pre-plant nitrogen application with Instinct NXTGEN® stabilizer was made to both treatment blocks, with a target N rate of 105 lbs/A, using 32% UAN. An additional 70 lbs of N, applied as 32% UAN was made on June 12th. At R1, the following fungicide application and abiotic stress mitigation was also made:

CHOICE® TRIO @ 5 fl. oz./A

Delaro® Complete @ 8 fl. oz./A

FRANCHISE® @ 2 fl. oz./A

RADIATE NEXT® @ 2 fl. oz./A

TERRAMAR® @ 32 fl. oz./A

TAKEAWAY:

Yields in this block were strong across all brands, with five entries exceeding 250 bu/A. Notably, three of those top performers—D52TC66RIB, D55SP16RIB, and D52VT96RIB—were from the Dyna-Gro Seed proprietary lineup. Providing growers access to high-performing genetics is essential to maintaining competitiveness in the marketplace. Trials like this are valuable because they allow for direct, side-by-side product comparisons under a consistent management program, offering clear insight into product performance potential.



UNMANNED AERIAL SYSTEMS USE AT THE INNOVATION FARMS AND ACROSS NUTRIEN AG SOLUTIONS

2025 was a busy year for those implementing Unmanned Aerial System (UAS) technology here at Nutrien Ag Solutions. Aerial applications UAS participated in a variety of operations across the nation covering 26,500 acres to provide crop protection services to growers and explore this technology further. We'll review some of the impact UAS has made this year.

At the Owensboro Kentucky Innovation Farm, Remote Pilot Luke Wilson utilized UAS to apply crop protection and nutritionals to corn and soybeans. Luke utilized their UAS for both general crop protection and treatments at multiple timings. On corn, all fungicide/insecticide blends were applied at VT/R1. In soybeans, applications were made at both R3 and R5. With the wet conditions at the beginning of the season and early influx of disease in Kentucky this year, both corn and soybeans responded well to applications. You can read more about Owensboro's trial work on page 65. Additionally, there was little to no damage to soybeans during applications. In the past, a significant portion of soybeans has been damaged with traditional ground rigs in plot scenarios at the Owensboro Innovation Farm when attempting to evaluate late season management strategies. But with UAS, the aircraft flies over the crop and does not damage it, thus increasing yields. While typical field scenarios (vs plot scenarios) would not see damage to this degree, UAS played a crucial part in ensuring data consistency at the Owensboro site. Next year, Luke plans to continue utilizing UAS technology for late season applications and similar blanket crop protection applications that were made this year.



On the west coast, the aircraft have been humming all year and will continue to hum into the fall. Remote Pilots Dylon McClure and Michael Loftis from the Salinas, California branch, have conducted crop protection applications for a variety of specialty crop. With roughly 10,500 acres flown so far this year and a year-end goal of 12,000, Dylon and Michael exemplify the potential impact UAS can make within Nutrien Ag Solutions.

Near to Dylon and Michael in California, Remote Pilot Mason Alves out of the Santa Maria, CA branch has conducted a niche UAS operation, beneficial bug release. With the acquisition of complex airspace authorizations near to Lompoc and Camarillo, CA, Mason will bring this unique UAS service to new growers in Southern California.

Back in the corn belt, Remote Pilot Luke Davenport and team from the Clarksville, Tennessee branch impressively conducted roughly 10,000 acres of corn fungicide applications this year. With UAS operations projected to ramp up in Clarksville next year, Luke and team hope to double their coverage in 2026. To the north of Clarksville in central and eastern Illinois, Remote Pilot Jack Taff conducted 5,000 acres of fungicide application across multiple crops. On top of the service Jack provided to local growers, he conducted 1,300 acres of One Nutrien Trials. These trials will equip those within Nutrien Ag Solutions with objective data and evidence of the success of UAS aerial applications and Nutrien Ag Solution's crop protection products.

On the east coast, Remote Pilot Justin O'Ferrell and Dylan Reed conducted a variety of crop protection services. Early in the year Justin and Dylan made applications on wheat utilizing fungicide/nutritional blends. In the summer months, their focus shifted to corn and soybean fungicide applications.



While 2025 was a busy year for UAS, 2026 is projected to be even busier. Dozens of individuals and groups within Nutrien Ag Solutions are attempting to begin conducting flights, and current UAS operations hubs are seeking to expand operations. Individuals within the company are confirming efficacy and finding business cases across a wide variety of scenarios and needs, from research to retail. With UAS adoption increasing each day, the sky is the limit to the benefit this technology can offer us. Wishing all clear skies and tail winds in 2026!

WILL FELLMETH

NA CHIEF
DRONE PILOT

LUKE WILSON

SENIOR RESEARCH
AGRONOMIST



WELCOME GRACE BICKERS AS OUR 2025 STUDENT AMBASSADOR

“They definitely drive me to be the better version of myself and to try new things. They were the ones who told me to apply for the student ambassador role. They saw the opportunity even before I did.”

As a student at Unity High School in Illinois with no family farm or ag background to speak of, what started as a push from friends quickly grew into a passion rooted in curiosity, hard work and community. Now entering her junior year, Grace is following in Avery’s footsteps as this year’s Student Ambassador for Nutrien Ag Solutions, working alongside Thaddeus Bates, Sr. Manager, Innovation Farms and Keith Gingerich, Champaign Innovation Farm Manager. In the second year of her agribusiness project, Grace is once again applying her entrepreneurial skills to planting, nurturing, growing and selling sweet corn. Her journey into agriculture is an inspiring reminder that the future of farming is for anyone willing to dig in.

Grace joined FFA during her freshman year of high school and now serves as a Unity FFA chapter officer and manages Unity’s two school plots, while balancing her involvement in basketball and softball.

“You don’t have to come from an ag background to be part of it. If anything, I hope I can be a role model for other students who are curious but unsure where to start.”

She credits Thaddeus and Keith for helping guide her first growing season, where she planted and sold her own sweet corn crop for the first time. Supported by the team at Nutrien Ag Solutions, Grace has taken ownership of the sweet corn plot, making it very much her own. She chooses where to sell, how to price it and even how to promote it (usually through Unity FFA’s social channels and word-of-mouth in her community).

“It was just a small patch behind the Innovation Farm building, but getting to watch it grow, harvest it and then actually sell it—that was a huge learning experience.”

She’s trying something new this year by planting in stages to spread out the harvest and hopefully extend her selling window. She’s excited to see the results of these changes in this year’s conditions.

And while Grace has her eye on a potential future in psychology, she knows the skills she’s learning in ag will stick with her for life. “Hard work, dedication and commitment,” she says. “You can’t just plant something and walk away.”

As Grace prepares for another sweet corn season, follow along on our Facebook and Instagram for her updates from the field.



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OWENSBORO, KY

Corn ROI: \$4.50, Soybean ROI: \$10.50



**SCAN THE QR TO VISIT THE OWENSBORO
INNOVATION FARM RESULTS PAGE**

OWENSBORO, KY WEATHER

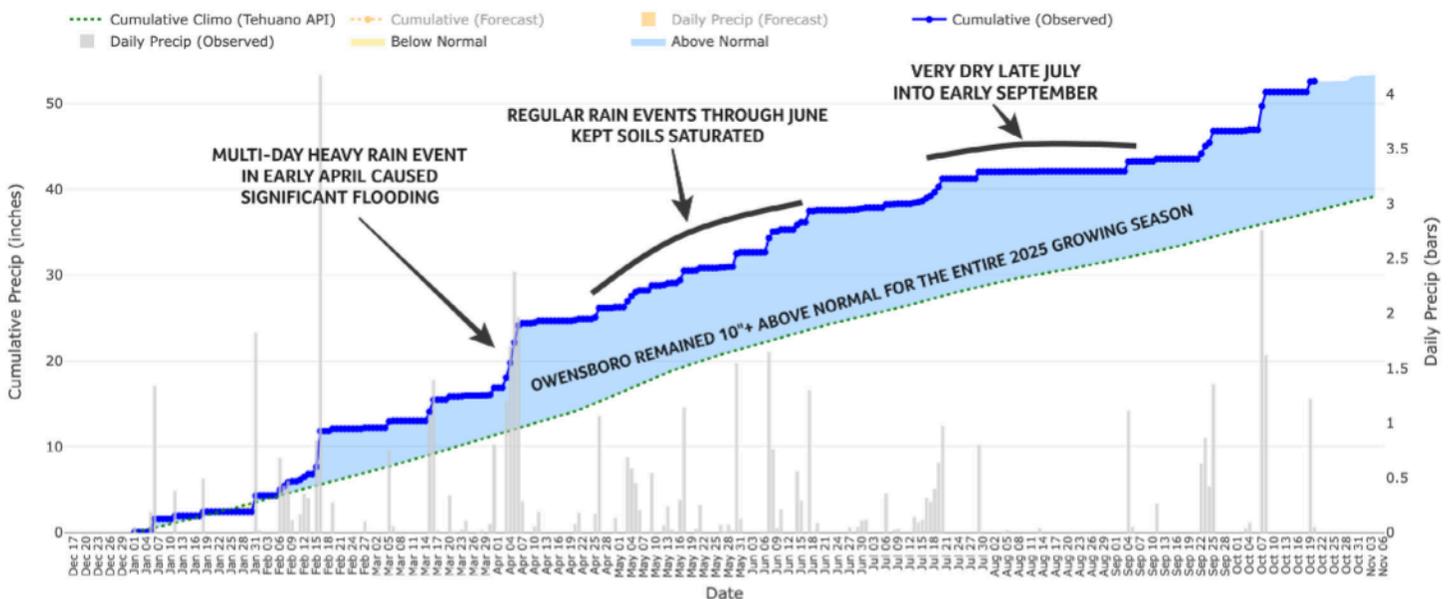
Heavy rains and severe storms came early and often across the Mid-South where farmers battled areal flooding that overlapped with the 2025 planting season. At the Owensboro farm, more than 8 inches of rain fell during a particularly stormy stretch from April 2-6, while frequent storms carrying on through the rest of April, May, and June kept soils saturated and delayed field work.

Summer brought a shift to hot and drier conditions from mid-June to mid-July, but late July storms helped ease some early flash drought concerns. Thanks to frequent rains and a wide-open Gulf, summer 2025 went down as the most humid on record across the Ohio River Valley, heightening pressure from crop diseases and fungi.

Heat stress was most noticeable in the form of persistently warm nights, with overnight lows in the mid to upper 70s through much of June and July. A period of prolonged dryness did arrive in August, and a lack of regular rainfall lasting through September led to rapid onset drought and falling river levels across the region similar to the conclusion of the 2024 growing season.

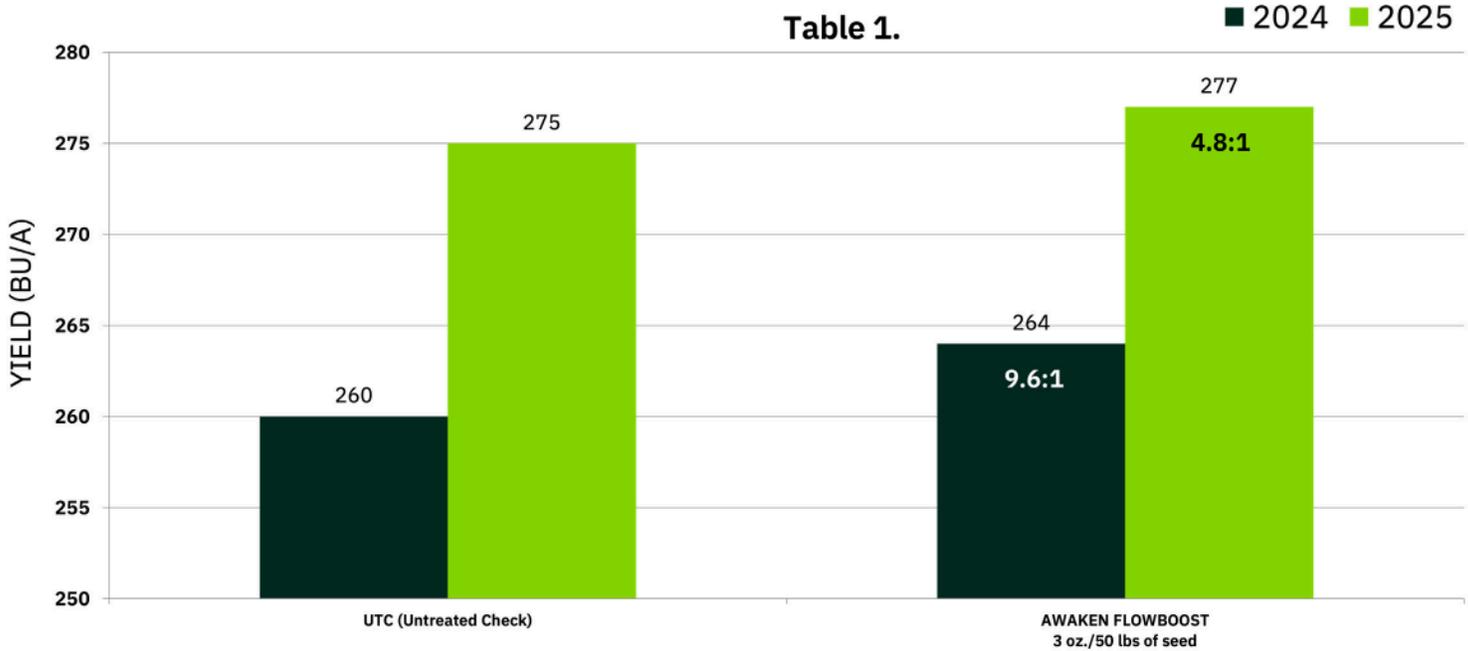
ANDREW PRITCHARD SENIOR SCIENTIST

2025 PRECIPITATION SUMMARY FOR OWENSBORO, KY



AWAKEN FLOWBOOST: SIMPLE WAY TO NOTCH MORE YIELD

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 56TC44	4/14/25	Planter Box Treatment	9/2/25



OBJECTIVE:

Show how AWAKEN FLOWBOOST® added to seed corn pre-treated upstream with a standard fungicide-insecticide package can improve plant vigor, yield and return on investment (ROI) beyond that of a standard program alone.

METHOD:

Conducted as a replicated strip trial with three reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

A simple comparison was made between seed corn pre-treated with a standard, upstream fungicide-insecticide package and the same treatment enhanced downstream with the addition of AWAKEN FLOWBOOST at 3.0 fl. oz./50 lbs of seed. AWAKEN FLOWBOOST in this instance was applied as a planter box treatment; it was mixed thoroughly to ensure good seed coverage.

AWAKEN FLOWBOOST is a talc/graphite replacement that provides both seed lubricity and a nutritional package featuring phosphorus, iron, manganese, molybdenum and zinc. In addition to being labeled on corn as a direct planter box treatment, it also can be metered through a commercial treater and applied to seed corn before it goes in the planter.

TAKEAWAYS:

AWAKEN FLOWBOOST lifted corn yield 2 bu/A. Though a modest response, it was very cost-effective in delivering a 4.8:1 ROI in 2025.

This simple-to-use product also is proving its consistency. In a similar 2024 corn study at the Owensboro Innovation Farm, AWAKEN FLOWBOOST increased corn yield 4 bu/A and generated an ROI of 9.6:1 (see graph above). That's an average 3 bu/A boost across the past two growing seasons.

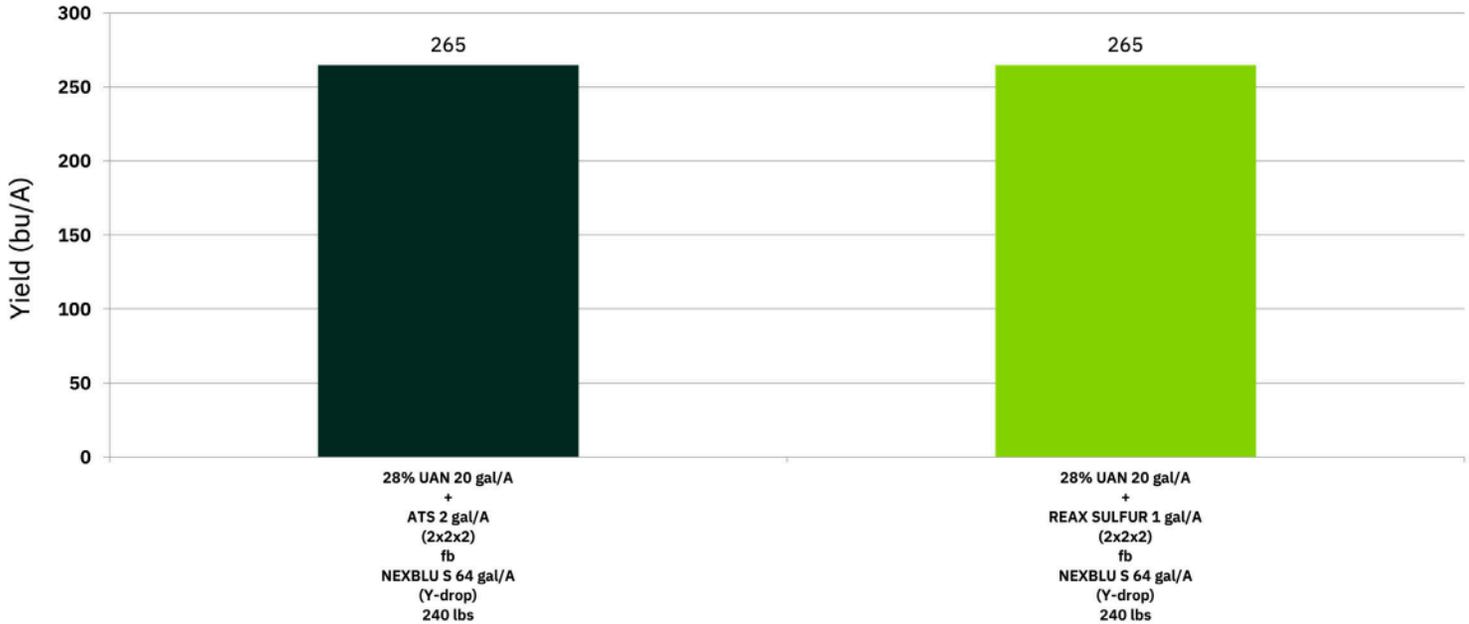
Despite the very small physical amount of nutrition supplied by this planter box treatment, the trial results reinforce the importance of germinating seeds and seedlings having immediate access to key nutrients at the outset of the crop's life cycle. As an AWAKEN FLOWBOOST-coated corn kernel imbibes soil water and germinates, the radicle and seminal ("seedling") roots can actively absorb nutrients directly from the treatment. That gives seedlings an early edge in developing larger, more prolific permanent root systems that equip the crop to efficiently absorb more water and nutrients through the course of the growing season.

AWAKEN FLOWBOOST's yield-enhancing performance extends to soybeans, too. For results on how it performed in that crop at Owensboro during 2025, be sure to check out the pertinent report elsewhere in this book.

REAX SULFUR DEMONSTRATES EFFICIENCY

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 56TC44	4/14/25	At Plant, V5	9/2/25

Table 1.



OBJECTIVE:

Demonstrate improved nutrient use efficiency with a new sulfur product in a high-yield corn environment.

METHOD:

Expanding on the above-stated objective, this experiment was designed to validate the potential for new REAX™ SULFUR to fully match or exceed the performance of ammonium thiosulfate (ATS) when compared at a one-to-two ratio.

REAX SULFUR features a 9-0-0-18S analysis and also includes proprietary C² Technology (reacted carbon and carbohydrates). A gallon of REAX SULFUR contributes almost 1 lb of nitrogen (N), about 2 lbs of sulfur (S) and 0.2 lb of humic acids. ATS (12-0-0-26S), in contrast, delivers about 1.3 lbs of N and 2.9 lbs of S per gallon; it does not contain any humic acids or other carbon-based substances.

The study was conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

A SurePoint™ Ag Sentinel™ Liquid Monitoring system coupled with Precision Planting® Conceal® 2x2x2 attachments facilitated treatments made at planting time. Side-dress treatments made at V5 were surface banded on both sides of each row using the 360 Y-Drop system mounted on a plot sprayer.

Two programs were compared, featuring the following combinations of products, rates and application timings:

1. UAN 28% 20 gal + ATS 2 gal/A 2x2x2 at planting fb NEXBLU® S (26-0-0-2.7S) 64 gal/A Y-drop at V5 (240 lbs/A total seasonal N)
2. UAN 28% 20 gal + REAX SULFUR 1 gal/A 2x2x2 at planting fb NEXBLU S (64 gal/A Y-drop at V5 (240 lbs/A total seasonal N)

Treatment 1 supplied 242 lbs of N and 24.4 lbs of sulfur per acre, setting the N-to-S ratio at about 10:1. Treatment 2 delivered 240 lbs of N and 20.5 lbs of S per acre, establishing an N-to-S ratio at just under 12:1. The Y-drop side-dress application at V5 in Treatment 2 also included NITRAIN® 2.0 for protection against N volatilization loss.

TAKEAWAY:

Though Treatment 2 provided approximately 4 lbs/A less sulfur to the corn, its yield at 265 bu/A was identical to Treatment 1 (See Table 1). Thus, the objective of validating REAX SULFUR'S efficiency in matching performance with ATS when compared in one-to-two ratio was fully met.

The work also underscores the power of C² Technology in making REAX SULFUR more efficient. The C² Technology sequesters S in its plant-available sulfate form longer in the soil solution, giving roots more opportunity to absorb it. That means a higher percentage of each pound of S supplied by REAX SULFUR makes it into the plant to support growth and yield.

REAX SULFUR also was evaluated in other fertility-focused corn studies at the Owensboro Innovation Farm during 2025, including its use as a foliar treatment. Be sure to examine those results elsewhere in this section of the book.



CORN STARTER PROGRAMS NOT JUST ABOUT NUTRIENTS

OBJECTIVE:

Demonstrate how adding ACCOMPLISH MAX® to a standard starter fertilizer program can enhance both yield and net income.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

The study made a straightforward comparison between two in-furrow starter programs:

1. RISER® 3 gal + SNIPER® LFR 6.8 fl. oz./A
2. RISER 3 gal + SNIPER LFR 6.8 fl. oz. + ACCOMPLISH MAX 1 qt/A

In-furrow treatments were managed with a Surepoint™ Ag Sentinel™ Liquid Monitoring system on the planter.

The entire trial site received 240 lbs/A actual nitrogen (N). It was split applied, starting with a pre-plant, broadcast application of UAN 28% at 33.3 gal/A (100 lbs N), followed by a V5 Y-drop side-dress treatment with NEXBLU® S (26-0-0-2.7S) at 50 gal/A (140 lbs N). Surface-applied N at both timings was protected against volatilization loss with the inclusion of NITRAIN® 2.0 at 1 qt/ton.

The V5 side-dress application also supplied about 15 lbs/A of sulfur to the crop.

A V5 foliar spray of NUTRISYNC® COMPLETE 3D at 2 qts/A also blanketed the entire trial. CHOICE® TRIO water conditioner and LIBERATE® adjuvant were paired with the foliar nutritional, both at 1 qt/100 gal (0.25% v/v).

TAKEAWAYS:

Adding ACCOMPLISH MAX to the RISER-SNIPER LFR combination pushed corn yield 5 bu/A higher than that mix alone (Table 1). The 2025 results track closely with those from a year earlier, when the addition of ACCOMPLISH MAX led to a 3 bu/A advantage under similar growing conditions in a high-yield environment.

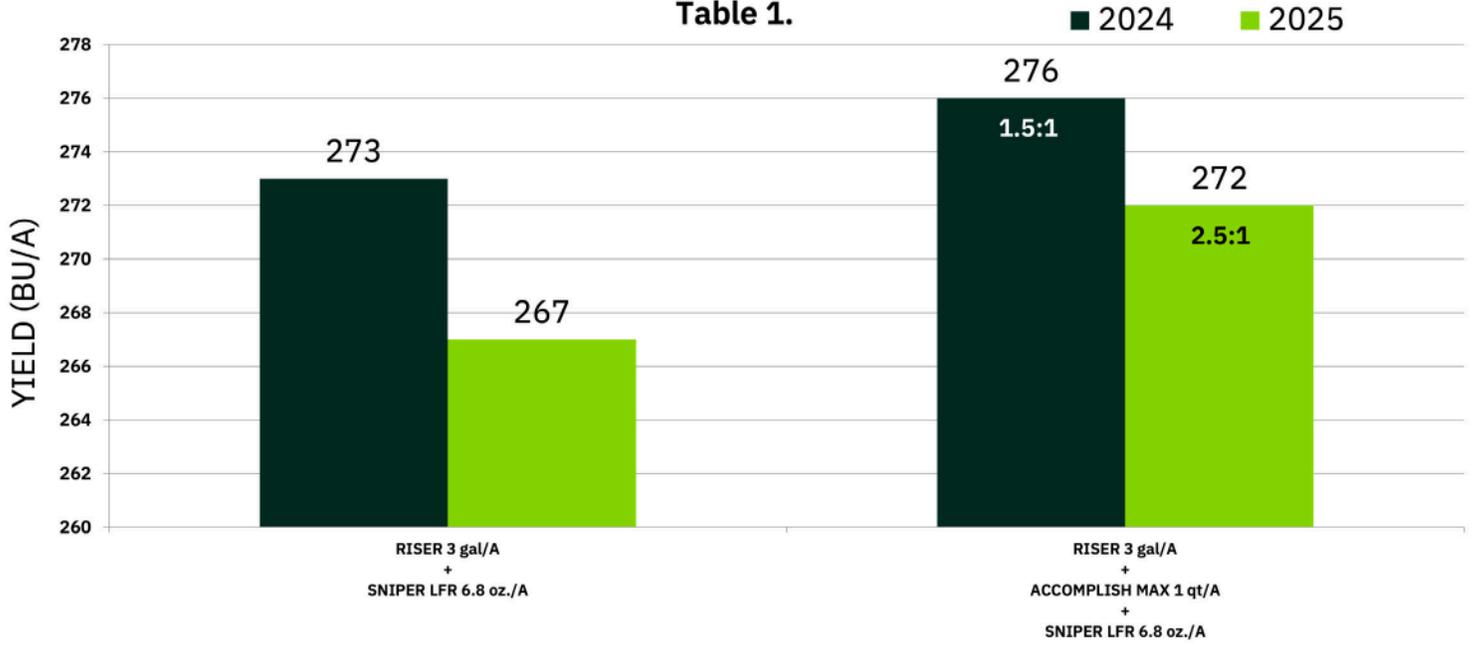
Return on investment from adding ACCOMPLISH MAX was solid both years, too, calculating to 2.5:1 in 2025 and 1.5:1 in 2024.

RISER + SNIPER LFR in-furrow combination is an excellent foundational starter program. It includes several essential nutrients – including zinc – and an insecticide that together increases and protects early root development and strong plant vigor.

Both aspects are kicked up a notch via the ACCOMPLISH MAX addition. When placed in-furrow, its blend of unique biochemistries enhances nutrient availability in the seed zone, further propels root growth and fortifies young plants against abiotic stress factors, including cool, wet soils that often challenge the crop in early spring.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	At Planting	9/18/25

Table 1.



COMPARING SULFUR PRODUCTS WITH SIDE-DRESS NITROGEN IN CORN

OBJECTIVE:

Demonstrate improved nutrient use efficiency with a new liquid sulfur (S) product blended with nitrogen (N) in side-dress applications on corn.

METHOD:

Expanding on the above-stated objective, this experiment explored new REAX™ SULFUR's potential to fully match or exceed the performance of ammonium thiosulfate (ATS) when compared at a one-to-two (1:2) volumetric ratio.

REAX SULFUR features a 9-0-0-18S analysis and also includes proprietary C² Technology (reacted carbon and carbohydrates). A gallon of REAX SULFUR contributes almost 1 lb. of nitrogen (N), about 2 lbs of sulfur (S) and 0.2 lb. of humic acids. ATS (12-0-0-26S), in contrast, delivers about 1.3 lbs of N and 2.9 lbs of S per gallon; it does not contain any humic acids or other carbon-based substances.

The study was conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

Prior to planting, 100 lbs of N per acre were put down as 28% UAN in a surface broadcast application across the entire trial site. Preplant N was protected against volatilization loss with the inclusion of NITRAIN® 2.0 at 1 qt/ton.

At V5, a grower standard (GSP) and three additional side-dress programs were compared, each one applied using the 360 Y-Drop system mounted on a Lee Avenger plot sprayer. Specific products and rates used in each of the four treatments included:

1. GSP: UAN 28% 45 gal + ATS 5 gal/A + NITRAIN 2.0 1 qt/ton
2. UAN 28% 45 gal + REAX SULFUR 2.5 gal/A + NITRAIN 2.0 1 qt/ton
3. UAN 28% 45 gal + ATS 5 gal + BLACKMAX® 22 0.5 gal + EXTRACT 0.5 gal/A
4. UAN 28% 45 gal + REAX SULFUR 2.5 gal + EXTRACT 0.5 gal/A

With the trial's primary focus on using REAX SULFUR at a rate only half that of ATS, it bears emphasizing that 5 gallons of ATS supplies 14.5 lbs of S, whereas 2.5 gallons of REAX SULFUR delivers 4.9 lbs of S. Thus, actual sulfur amounts applied via Treatments 2 and 4 were just slightly more than a third of that contributed by ATS in Treatments 1 and 3.

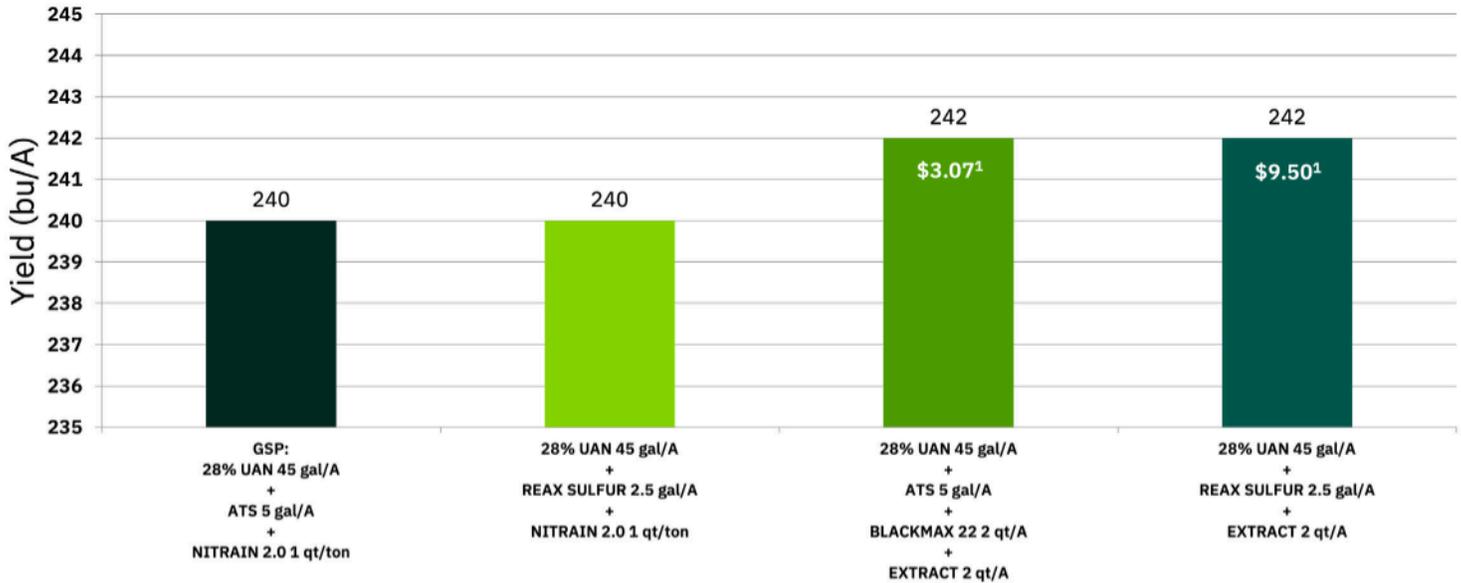
TAKEAWAYS:

Though yield differences were minimal between treatments, key conclusions still can be drawn from the data.

The study's most direct comparison of the two S sources is between Treatments 1 (GSP) and 2. Notably, the latter yielded the same as the GSP, while doing so with 9.6 lbs. less sulfur per acre. (See Table 1.) That speaks directly to the nutrient uptake efficiency associated with REAX SULFUR's C² Technology. Its uniquely extracted humic acids help sequester S in plant-available sulfate form longer in the soil, giving roots more opportunity to absorb it. That means a higher percentage of each pound of S supplied by REAX SULFUR makes it into the plant versus sulfur contributed by a commodity product such as ATS.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 56TC44	4/14/25	V5	9/2/25

Table 1.



GSP = Grower Standard Program

¹Amounts reflect additional net revenue generated per acre versus the GSP.

With additional products and variables entered into Treatments 3 and 4, the comparison between ATS and REAX SULFUR is not as head-to-head. Still, there's solid merit in the fact REAX SULFUR again matched yield (242 bu/A) with ATS applied at twice the rate. And from an economic standpoint, REAX SULFUR's inclusion in Treatment 4 also helped deliver the top performance, generating \$9.50 more net revenue per acre than the GSP and \$6.43 more per acre than Treatment 3.

Thus, the objective of validating REAX SULFUR'S efficiency in matching or exceeding performance when used at only half the rate of ATS was fully met.

Another trial aspect deserving mention is the comparison between NITRAIN 2.0 used in Treatment 2 and EXTRACT included in Treatment 4. Loveland Products NITRAIN 2.0 contains the industry-leading urease inhibitor NBPT, which protects surface-applied urea against volatilization loss. EXTRACT, also from Loveland, features proprietary biocatalyst technology that improves soil nutrient solubility and availability. Though not considered or promoted as either a urease or nitrification inhibitor, EXTRACT does frequently improve N use efficiency when used with surface-applied nitrogen.

Though EXTRACT coupled with UAN and REAX SULFUR (Treatment 4) in this instance demonstrated a modest 2 bu/A yield advantage over NITRAIN 2.0 paired with the same combo in Treatment 2, crop consultants and growers alike can be confident that both products have excellent fits in many types of soil-applied liquid fertilizer treatments.



SOIL + FOLIAR SULFUR COMBO EXCELS IN CORN

OBJECTIVE:

1. Ascertain potential corn yield difference between sulfur (S) applied only to the soil at V5 versus a combination of soil and foliar-applied S at the same timing.
2. Demonstrate positive yield impact and return on investment (ROI) for two Loveland Products proprietary sulfur products sprayed on V5 corn.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

Soil analysis prior to trial initiation indicated an S level of 14 lbs/A, based on 6-inch sampling depth and Mehlich 3 extraction. That's categorized as low.

Treatments included:

1. GSP (15 lbs/A Sulfur as NEXBLU® S Y-drop V5)
2. GSP + NUTRISYNC® SULFUR 1 qt/A Foliar V5
3. GSP + REAX™ SULFUR 1 qt/A Foliar V5
4. GSP + REAX SULFUR 2 qts/A Foliar V5

V5 foliar treatments were applied through a John Deere 412 sprayer at a 15 gal/A volume. They also included CHOICE® TRIO water conditioner and LIBERATE® adjuvant, both at 1 qt/100 gal (0.25% v/v).

The entire trial site (including the GSP) received 240 lbs/A actual nitrogen (N) in split applications, with 100 lbs/A broadcast pre-plant as UAN 28% and an additional 140 lbs/A in the form of NEXBLU S (26-0-0-2.7S) sidedressed at V5 using the 360 Y-drop system. The urea fraction of the surface-applied N in both instances was protected against volatilization loss with NITRAIN® 2.0 at 1 qt/ton.

The Y-drop treatment also provided 15 lbs/A actual sulfur as reflected in the treatment list.

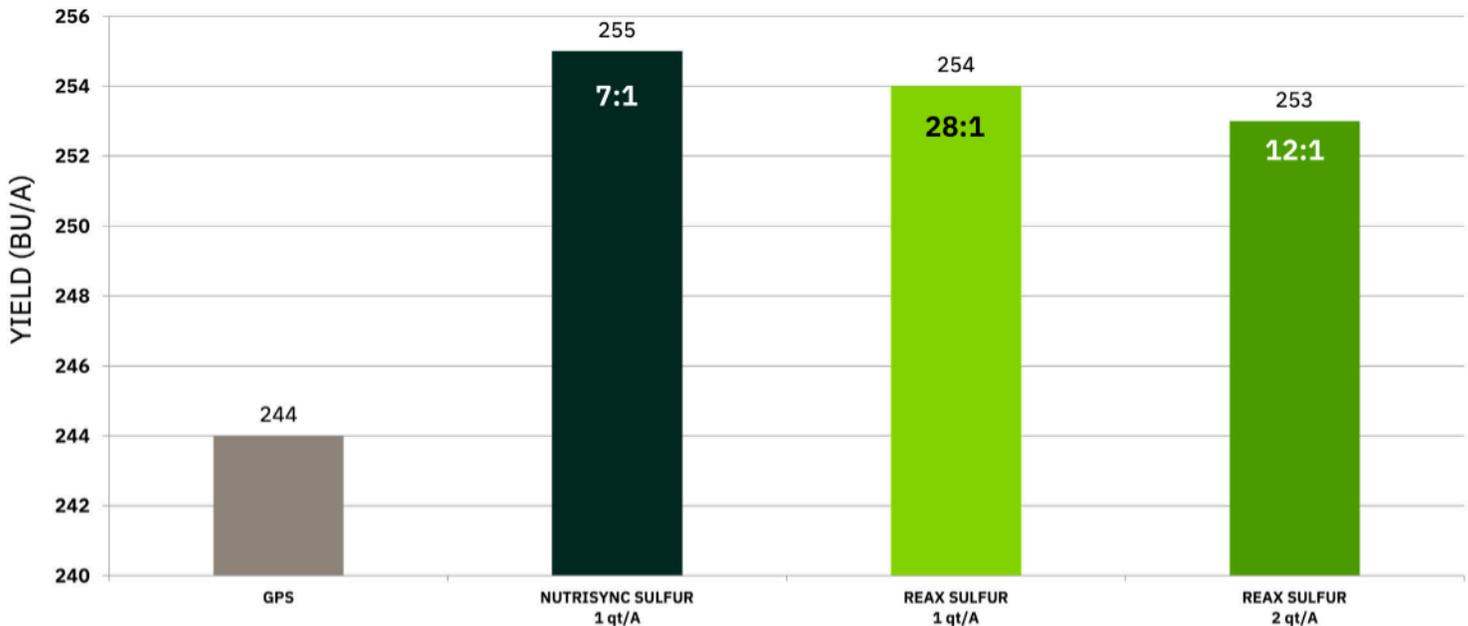
TAKEAWAYS:

Most notably, the three combinations of soil- and foliar-applied S (Treatments 2 – 4) yielded in a range of 9 to 11 bu/A (3.7 to 4.5%) better than soil-applied S alone (GSP). This underscores how timely foliar sprays can improve crop root absorption of soil-applied nutrients. Think of it as analogous to driving a pump-priming process within the plants to encourage greater root uptake.

The results also reflect important technological features of the foliar sulfur products evaluated here. NUTRISYNC SULFUR, for example, includes proprietary Nutrien Transport Technology. It increases nutrient transport (i.e., mobility) from initial leaf tissue absorption sites to where they're needed in concentrated regions of active plant growth. Through somewhat different processes, the C² Technology (reacted carbon and carbohydrates) in REAX SULFUR also promotes both improved foliar absorption and in-plant mobility.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 53SP85	4/15/25	V5	9/2/25

Table 1.



Sulfur by nature is relatively immobile in plants. It's apparent both REAX SULFUR and NUTRISYNC SULFUR helped overcome that aspect. By fostering better above-ground S transport in the corn, they indirectly influenced increased S uptake from the soil and led to the higher yields observed.

Yield differences between the three foliar treatments were minimal; all gave strong performances. ROIs were excellent for all three treatments, too. However, REAX SULFUR at 1 qt/A clearly stood out with an impressive 28:1 return on investment. Though REAX SULFUR at 2 qts/ac also performed well, it held no yield or economic advantages over the 1 qt/A rate in this instance.

The V5 timing of both the soil and foliar S applications in this trial should not be overlooked. V5 generally marks the onset of rapidly accelerating sulfur uptake and utilization in corn. Thus, it's crucial to have adequate amounts of this secondary macronutrient available from this point through the heart of the grain fill process. Co-timing both Y-drop and foliar sulfur applications at V5 clearly supported that requirement as reflected in the yield results.

It can be reasonably inferred that nitrogen use efficiency (NUE) also was increased by Treatments 2 – 4. Sulfur boosts NUE by increasing plant N uptake and utilization. If S is lacking, a plant's ability to absorb and use N is correspondingly hindered, too. By improving corn's overall sulfur nutritional status, the pertinent treatments simultaneously helped the crop make better use of the applied N.



SEQUENTIAL FOLIAR MICROS AID IN FIGHT AGAINST STRESS

OBJECTIVE:

Show positive yield influence from sequentially applying individual foliar micronutrients at strategic growth stages in a high-yield corn environment.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

The impetus for this trial stemmed from previous, multi-year studies at the Owensboro farm that showed consistently positive corn yield responses from individual foliar micronutrients, wherein each one was evaluated strictly on their own. That earlier work resulted in strong yield increases from foliar copper (Cu) used at V5, manganese (Mn) sprayed at V10 and boron (B) applied on corn at VT-R1.

This study expanded on those prior efforts by linking some of those foliar micros in sequential applications made at strategic timings.

Treatments included:

1. Untreated Check (UTC)
2. NUTRISYNC® COPPER 1 pt/A V5 followed by (fb) NUTRISYNC MANGANESE 2 qts/A V10
3. NUTRISYNC COPPER 1 pt/A V5 fb NUTRISYNC BORON 1 qt/A VT

All V5 and V10 treatments were applied through a John Deere 412 sprayer at a 15 gal/A volume. A high clearance Lee Avenger plot sprayer was used to make the VT boron application, also in a 15 gal/A volume.

CHOICE® TRIO water conditioner and LIBERATE® adjuvant were included in all treatments, both at 1 qt/100 gal (0.25% v/v).

The entire trial site received 240 lbs/A actual nitrogen (N) in split applications, with 100 lbs/A broadcast pre-plant as UAN 28% and an additional 140 lbs/A in the form of NEXBLU® S (26-0-0-2.7S) side dressed at V5 using the 360 Y-drop system. All surface-applied N was protected against volatilization loss with inclusion of NITRAIN® 2.0 at 1 qt/ton.

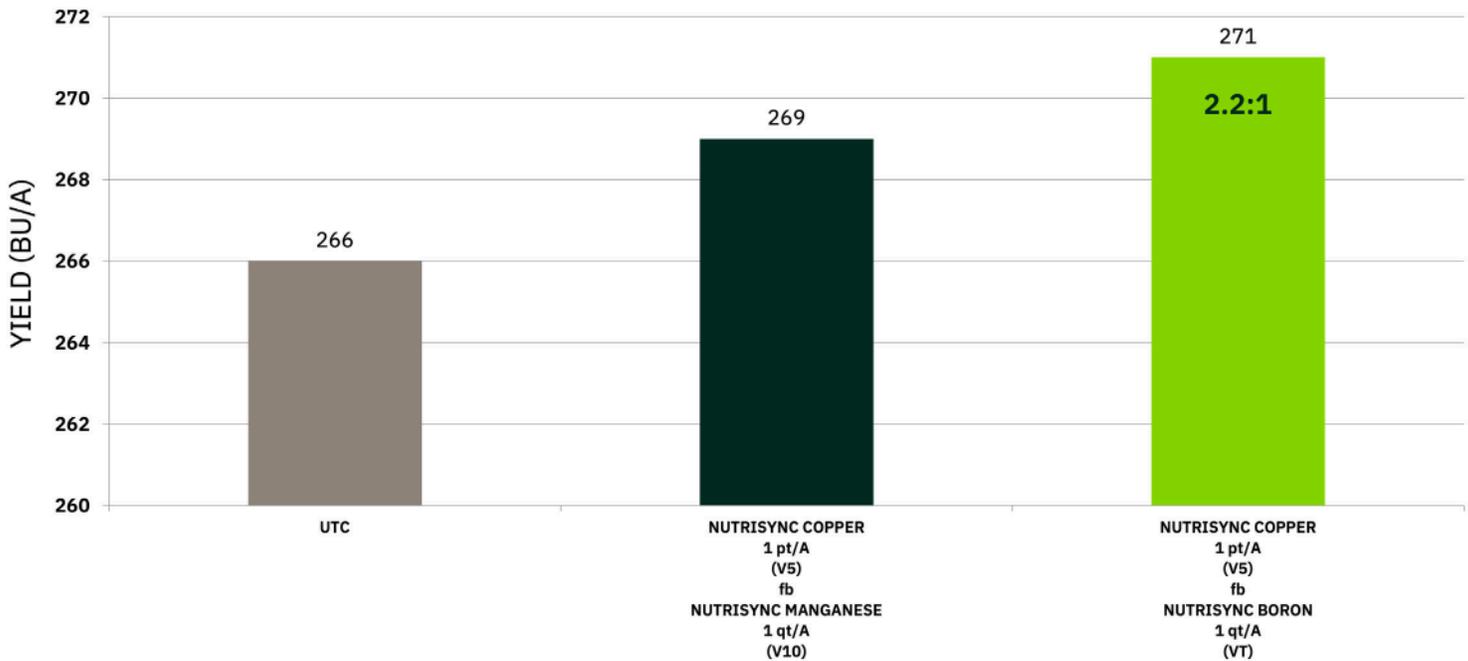
TAKEAWAYS:

Though both Treatments 2 and 3 lifted yields versus the check, the combination of NUTRISYNC COPPER at V5 followed by NUTRISYNC BORON at VT showed the strongest increase at 5 bu/A. ROI from that treatment was a solid 2.2:1.

2025 corn yields from mid-April plantings at the Owensboro farm were good and held at or slightly above trendline thanks to abundant rainfall during approximately the first two-thirds of the growing season. However, a flash drought and hot weather that persisted from late July into September likely pared away some top-end performance from treatments in this trial.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 53SP85	4/15/25	V5, VT	9/2/25

Table 1.



Still, the data underscore how important micronutrient nutrition is in the face of abiotic stress. Particularly noteworthy is the fact Treatment 3, which included the VT boron application, was the highest yielder. Adequate B is especially critical when mid- to late-summer heat and drought stress challenges corn’s reproductive phase. Boron supports structural integrity and vitality of silks and pollen essential to pollination success. It also subsequently aids sugar transport from leaves and stalks to developing kernels.

B, Cu and Mn are all considered immobile within corn plant tissue. Their ability to move to areas of active growth are challenged even more under hot, dry conditions like those the farm experienced in the last leg of the season. However, the proprietary Nutrient Transport Technology featured in all three NUTRISYNC products evaluated in this study helps overcome immobility and ensures micros make it to where they’re needed most.

Be sure to read reports elsewhere in this “Owensboro” section of the book that detail multi-year results from other studies done with various Loveland Products foliar nutritionals, including those featured in this trial.



FOLIAR BORON, SULFUR BOOST CORN AT VT

OBJECTIVE:

Highlight the yield and ROI benefits of using foliar boron (B) and sulfur (S) either alone or combined on tassel stage corn.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

The following treatments all were applied at VT:

1. UTC
2. REAX™ SULFUR 1 qt/A
3. REAX SULFUR 2 qts/A
4. NUTRISYNC BORON 1 qt + REAX SULFUR 1 qt/A

Treatments 2 – 4 included CHOICE® TRIO water conditioner at 1 qt/100 gal (0.25% v/v) and FRANCHISE® CO-PILOT adjuvant at 3.2 fl. oz./A. Each treatment went on in 15 gallons of water per acre through a high clearance Lee Avenger plot sprayer.

The entire trial site received 240 lbs/A actual nitrogen (N) in split applications, with 100 lbs/A broadcast pre-plant as UAN 28% and an additional 140 lbs/A in the form of NEXBLU® S (26-0-0-2.7S) side dressed at V5 using the 360 Y-DROP system. The urea fraction in all surface-applied N was protected against volatilization loss with inclusion of NITRAIN® 2.0 at 1 qt/ton.

The V5 Y-drop sidedress-nitrogen application also provided 15 lbs/A actual sulfur to each treatment, including the UTC.

All corn was protected with a VT fungicide-insecticide spray featuring Trivapro® at 13.7 fl. oz./A + Tombstone™ at 2.8 fl. oz./A. In an actual commercial setting, any of the foliar nutritional programs evaluated in this study easily could have been tank mixed with the crop protection treatment.

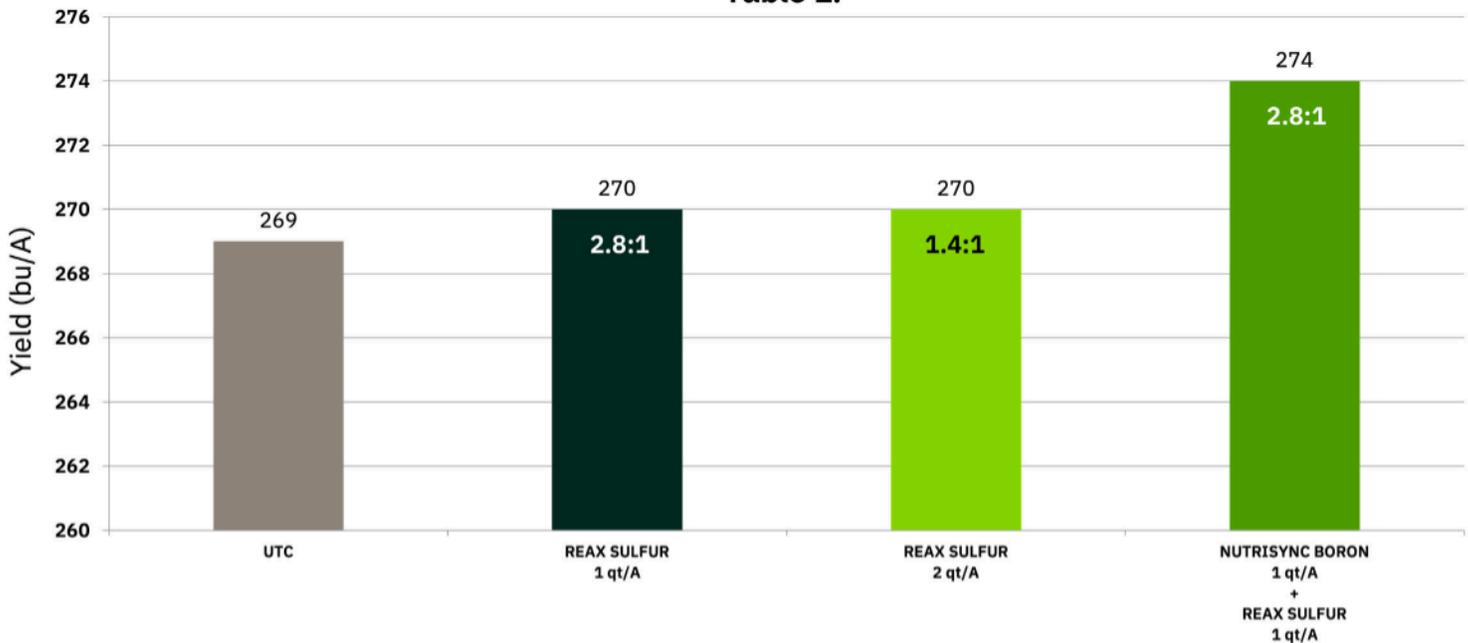
TAKEAWAYS:

Combining sulfur and boron at VT gave the best yield response at 5 bu/A (1.9%) above the check, which also generated a positive 2.8:1 ROI. Though REAX SULFUR alone at the 1 and 2 qt/A rates nudged yield upward only 1 bu/A in both cases, those responses still were sufficient to drive positive financial returns.

The findings suggest NUTRISYNC BORON exerted more influence on yield than sulfur at the VT timing. There are compelling agronomic reasons to support that observation.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 53SP85	4/15/25	VT	9/2/25

Table 1.



B plays an especially critical role throughout corn’s reproductive phase, beginning at VT. Applying a foliar boron product then that’s readily absorbed and efficiently moved within the plant helps support structural integrity of pollen and silks to ensure successful pollination. It also aids in the efficient transport of sugars from leaves and stalks to developing kernels.

Meanwhile, REAX SULFUR generated a demonstrably greater yield increase when sprayed on younger, V5-stage corn in a separate study at the Owensboro farm. In that trial, 1 and 2 qt/A rates of REAX SULFUR drove yield upward 10 and 9 bu/A, respectively, compared to a grower standard program. For more details surrounding that work, see the report on page 37.



SYNGENTA®-LOVELAND PRODUCTS CO-PROMOTION

YIELDS BENEFITS IN CORN

OBJECTIVE:

Highlight the yield and economic benefits of pairing fungicides with foliar nutritionals in a high-performing corn environment.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter.

Treatments included:

1. UTC
2. Trivapro® 13.7 fl. oz/A (VT)
3. Trivapro 13.7 fl. oz + NUTRISYNC® BORON 1 qt./A (VT)
4. Miravis® Neo 13.7 fl. oz./A (V5) fb Trivapro 13.7 fl. oz./A (VT)
5. Miravis Neo 13.7 fl. oz. + NUTRISYNC COPPER 1 pt./A (V5) fb Trivapro 13.7 fl. oz. + NUTRISYNC BORON 1 qt./A (VT)

All V5 sprays included LIBERATE® adjuvant at 1 qt/100 gal (0.25% v/v) and were applied through a John Deere 412 sprayer in a 15 gal/A volume. VT treatments, also made in 15 gal of water per acre, went on through a high-clearance Lee Avenger plot sprayer and included FRANCHISE® COPILOT adjuvant at 3.2 fl. oz./A.

The entire trial site (including the GSP) received 240 lbs/A actual nitrogen (N) in split applications, with 100 lbs/A broadcast pre-plant as UAN 28% and an additional 140 lbs/A in the form of NEXBLU® S (26-0-0-2.7S) sidedressed at V5 using the 360 Y-DROP system. The urea fraction of the surface-applied N in both instances was protected against volatilization loss with NITRAIN® 2.0 at 1 qt/ton.

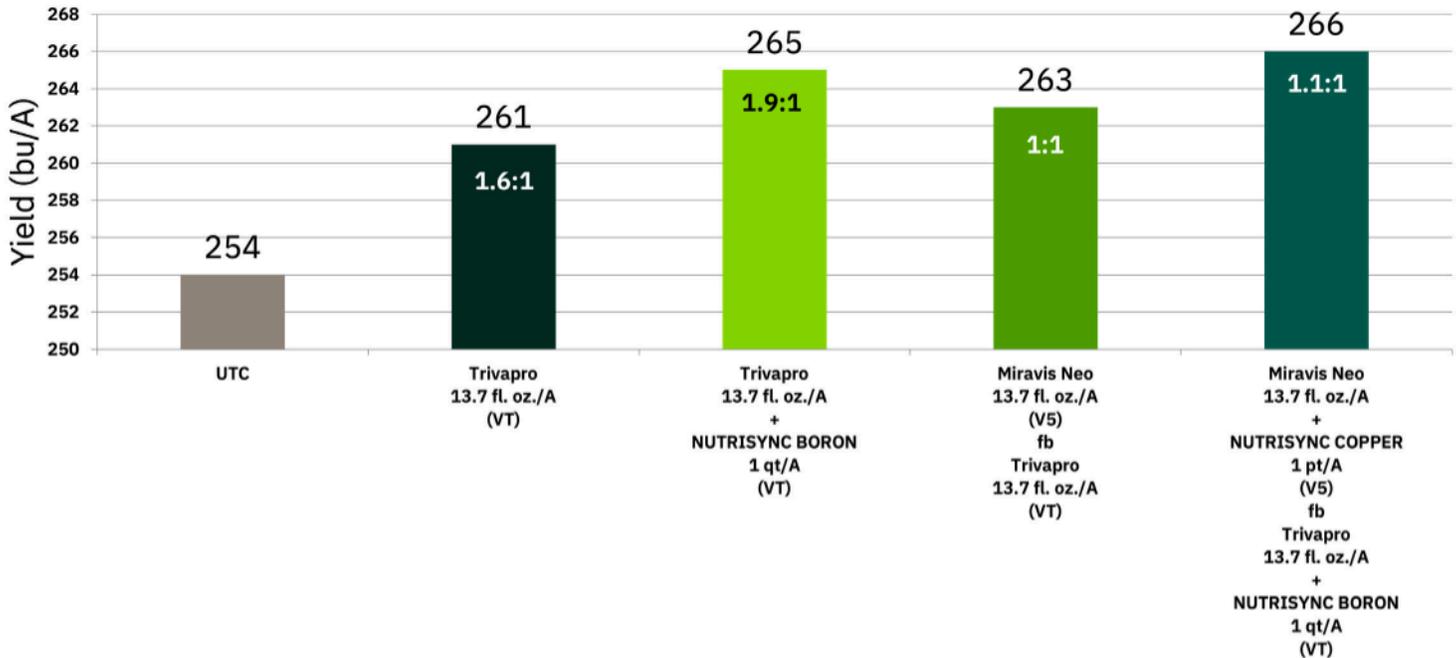
TAKEAWAYS:

Despite relatively low corn disease pressure at the Owensboro Innovation Farm in 2025, fungicides alone still fostered moderate yield increases and positive financial returns. Trivapro at VT (Treatment 2) outdueled the UTC by 7 bu/A and generated a 1.6:1 ROI. A sequential, two-pass program featuring Miravis Neo at V5 followed by Trivapro at VT (Treatment 4) was 9 bu/A better than the UTC, but ROI fell back to 1.1:1 owing to the additional cost associated with a second spray.

The Trivapro + NUTRISYNC BORON combination at VT (Treatment 3) was the overall superior performer in terms of both yield and profitability, yielding 11 bu/A over the check and generating a trial-best 1.9:1 ROI. Treatment 3 also epitomizes two long standing insights gathered from fungicide and foliar nutritional work in corn at Owensboro.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 53SP85	4/15/25	V5, VT	9/2/25

Table 1.



First, across many studies there stretching back nearly two decades, single-pass fungicide treatments made in the VT-R1 period consistently have generated the highest ROIs. Though various sequential programs involving two or more fungicide application timings have in some instances outyielded a single-pass at VT-R1, their ROIs almost always are weaker than the latter.

Secondly, work at Owensboro over the past half decade consistently has shown yield and economic benefits from plugging a boron (B) spray in at VT-R1, whether applied alone or paired with a fungicide. That trend and timing reflects the agronomic importance of B in supporting the physical integrity of corn pollen and silks to ensure good pollination as well as the micronutrient’s critical role in aiding sugar movement into developing kernels.

Treatment 5 gave the strongest yield response in the study by outperforming the UTC 12 bu/A, but its ROI was a narrow 1.1:1 due to additional product expenses.

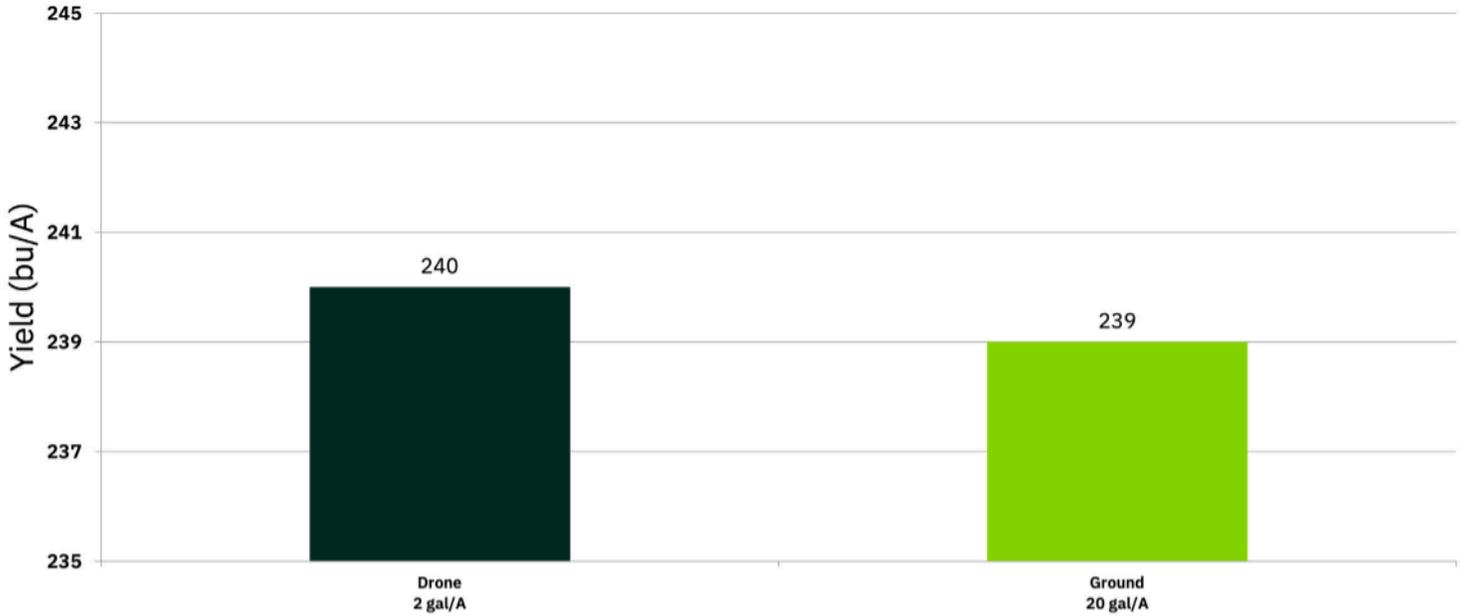
It bears noting that flash drought development over the last month prior to physiological maturity likely pared some top-end corn yield potential away from each of the study’s treatments. Had the late season rainfall and temperature pattern been a bit more favorable, the Owensboro farm staff surmises that all treatments, especially those with nutritionals in the mix, would have performed significantly better.



CORN FUNGICIDE EFFICACY: GROUND VS. DRONE APPLICATION

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 53SP85	4/15/25	VT	9/2/25

Table 1.



OBJECTIVE:

Identify whether significant efficacy differences occur between ground- and drone-based fungicide-insecticide applications made at the VT growth stage in a high yield corn environment.

METHOD:

Conducted as a replicated strip trial with three reps per treatment. Corn was no-tilled into soybean stubble at 34,000 seeds/A in 30-inch rows with a John Deere® 1745 planter. Strips were 20 feet wide by 260 feet long.

To minimize risk of drift potentially skewing data between the two application systems, 10-foot-wide, untreated buffers were tucked between each sprayed strip.

Treatments included:

1. Trivapro® 13.7 fl. oz. + TOMBSTONE™ 2.8 fl. oz./A + FRANCHISE® 1qt/100 gal (0.25% v/v) drone-applied at a 2 gal/A spray volume.
2. Trivapro 13.7 fl. oz. + TOMBSTONE 2.8 fl. oz. + FRANCHISE 3.2 fl. oz./A ground-applied at a 20 gal/A spray volume.

An XAG P100 Pro Agricultural Drone was used to make Treatment 1, while Treatment 2 was made with a high-clearance plot sprayer.

TAKEAWAY:

Both application systems provided good spray coverage in the upper crop canopy (ear leaf and above) and afforded excellent protection against fungal pathogens and insects. Though the drone treatment quantitatively held a 1 bu/A corn yield advantage over spraying with a ground rig, it was not a statistically significant difference.

Results of this work lend general support to the expanding use of Unmanned Aerial Systems (UAS) for application of crop protection products, foliar nutritionals and other products. However, the outcome also reinforces the importance of proper drone operation to ensure accurate spray patterns and optimal product efficacy.

In this instance, the Owensboro farm staff did its homework ahead of time by carefully studying and determining factors such as effective swath width, proper overlap, correct operating height above the crop canopy and application speed to achieve uniform spray coverage with the XAG P100.

In contrast, it's apparent within the commercial sector that not all application drone operators have exercised the same level of diligence at this point. Reports of streaked fields after some UAS applications confirm that problems exist with such factors as improper overlap (swath width too wide), inconsistent flight height and/or incorrect nozzle/disc choice. Such problems will need to be reduced to a minimum to further solidify drone-based applications as a consistently viable option.





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CORN FUNGICIDES CONSISTENTLY PAY LONG TERM

OBJECTIVE:

Reaffirm the ongoing yield and economic benefits of using fungicides as a key component of an overall disease management strategy in corn.

METHOD:

This data is a compilation of multiple corn fungicide studies conducted at the Owensboro farm over at least the previous six years (or longer in the case of certain products tested). Extensive evaluations have been done at both the V10 and VT growth stages.

Nearly all leading fungicide brands have been represented in this work. Yield results are shown as consolidated averages for all products above the untreated check.

The work consistently has been conducted as replicated strip trials with two reps per treatment. Strips were 20 feet wide by 260 feet long. Corn was rotated after soybeans and planted in 30-inch rows at 34,000 seeds per acre in all instances.

Fungicide applications over the full, multi-year run of these evaluations have all been made with a Lee Avenger plot sprayer at spray volume of 15 gal/A.

An appropriate (non-NPE) adjuvant generally was matched with every treatment. At V10 timings, the adjuvant choice frequently was LIBERATE®, while VT sprays typically included FRANCHISE®. Going forward, any VT-timed corn fungicide work likely will be switched to new FRANCHISE CO-PILOT adjuvant.

TAKEAWAYS:

Fungicides applied at either V10 or VT have yielded excellent long-term average responses, presently setting at an 11 bu/A advantage for corn sprayed at V10 and an even stronger, 17 bu/A increase for treatments made at tassel stage. (See Table 1.)

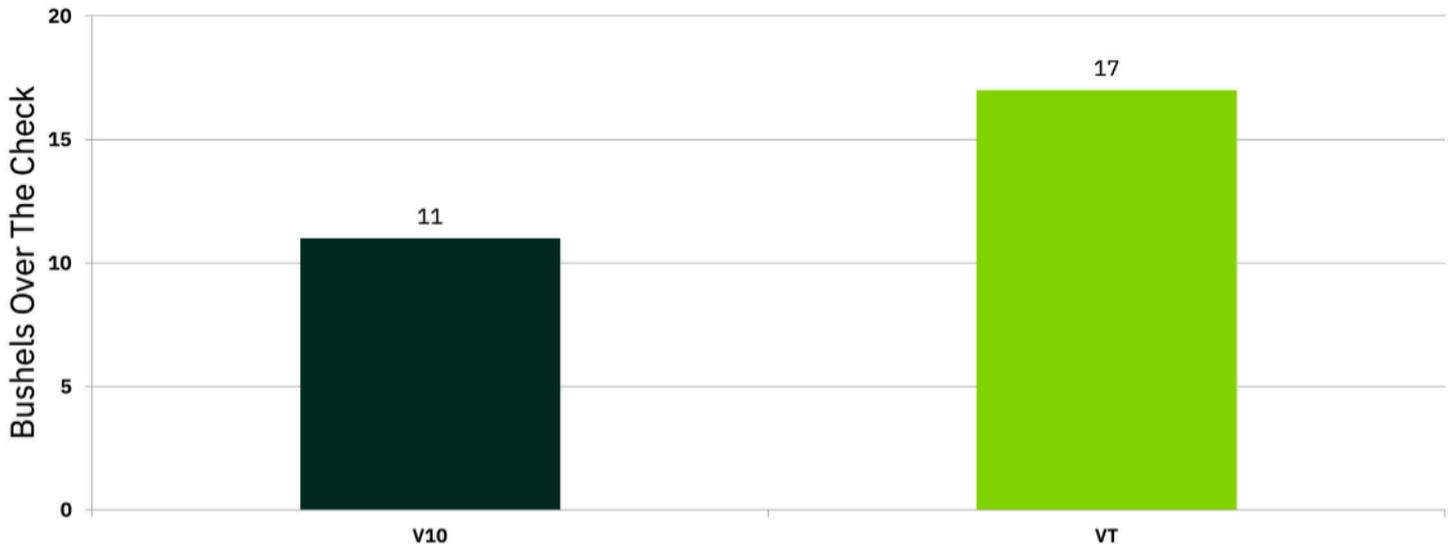
Relative disease pressure from primary foliar fungal pathogens such as gray leaf spot, northern corn leaf blight and southern rust has at times varied widely from year to year. Yet even in seasons with lighter pressure the Owensboro farm has seen consistently positive responses to fungicide treatments at both the V10 and VT timings, with tassel stage sprays almost always showing the largest yield increases in any given year.

A considerable amount of work at Owensboro also has been done with sequential fungicide applications at both V10 and VT. Though those two-pass programs sometimes have generated higher overall yield outcomes than either V10 or VT sprays alone, they generally are weaker from an ROI standpoint.

Studies reflected in the data shown here and other work at Owensboro stretching back nearly two decades consistently have found that single-pass fungicide treatments made in the VT-R1 period generate the highest ROIs.

An important sidebar to that observation is the fact the Owensboro farm has never encountered a major infestation from tar spot. Though it was detected there in 2025, it occurred late and never spread to yield-threatening levels. If this emerging fungal pathogen ever becomes a more serious issue at Owensboro and other points south of the Ohio River, it's possible a two-pass fungicide strategy could take on more importance, as it has in some tar spot strongholds farther north.

Table 1. MULTI-YEAR YIELD ADVANTAGE (2020 – 2025)



* Averages across leading branded fungicides



MULTIYEAR TESTING DEMONSTRATES NUTRITIONALS' CONSISTENCY

OBJECTIVE:

Reaffirm the long-term performance of proprietary nutritional products that have consistently delivered strong corn yield responses and positive ROIs.

METHOD:

This data reflects multi-year (2020 – 2025) trial work at the Owensboro Innovation Farm with several nutritional-based products from the Loveland Products portfolio. Each individual product or combination of products included in Table 1 has been evaluated in corn at the rate(s) and timings shown for a minimum of three consecutive years, with some as many as six years. The actual number of testing seasons for each product/combination is indicated along the bottom of the graph.

Though subtle differences in testing methodology may have occurred from year to year among some trials consolidated within this data, all studies were conducted in replicated strips with a minimum of two reps per treatment. Strips typically were 20 feet wide by 260 feet long.

Corn in each instance was planted behind soybeans in 30-inch rows at 34,000 seeds/A. Most of the work was done in a no-till setting, with a few trials conducted under minimum tillage.

Five of the six products represented – NUTRISYNC® COMPLETE 3D, NUTRISYNC COPPER (Cu), MAXIMUM N-PACT® K, NUTRISYNC MANGANESE (Mn) and NUTRISYNC BORON (B) – are foliar nutritionals. Each was sprayed in 15 gallons of water/A. CHOICE® TRIO water conditioner and LIBERATE® adjuvant also were included in the spray tank with each treatment, both at 1 qt/100 gal (0.25% v/v).

BLACKMAX® 22 + EXTRACT is a soil-applied combination targeted at enhancing both yield and nitrogen use efficiency in this instance; the Owensboro farm has evaluated it with UAN applied via Y-drop technology as a V4-V5 side-dress treatment annually from 2022 to 2025.

TAKEAWAYS:

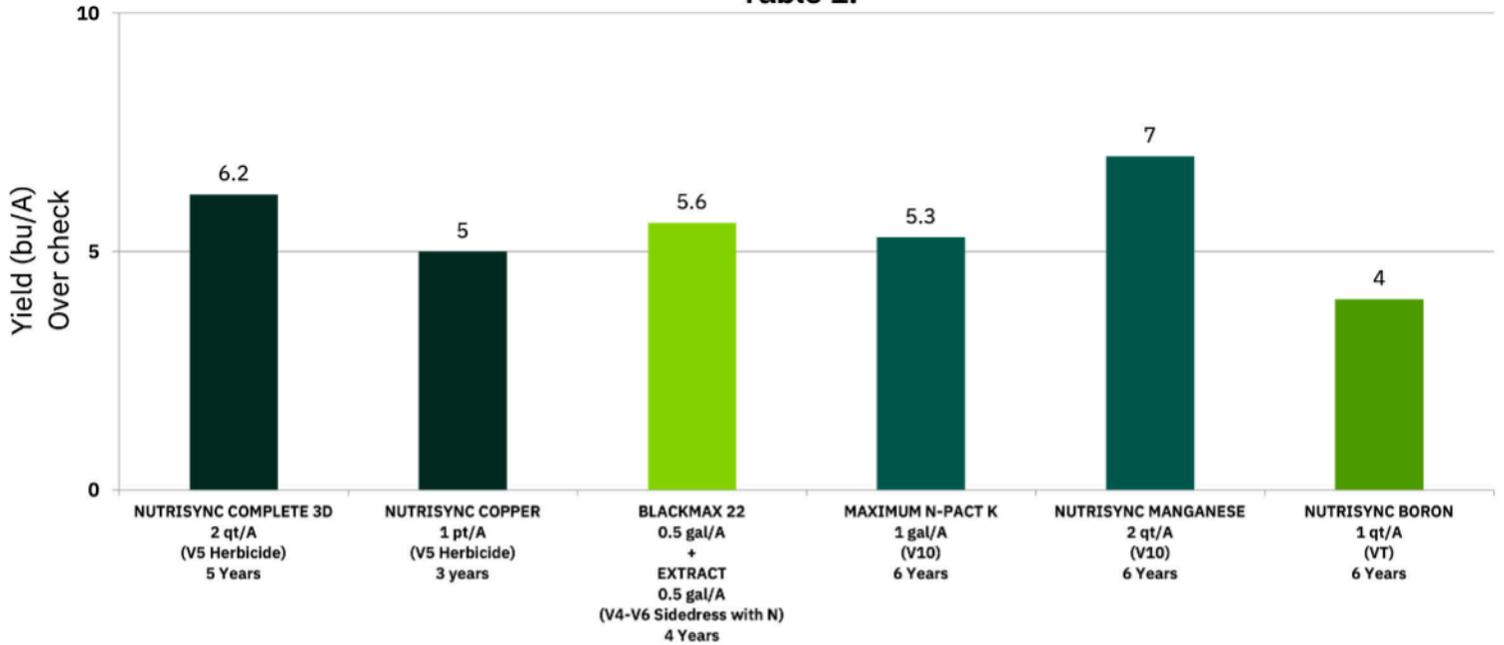
NUTRISYNC COMPLETE 3D has been a model of consistency. Across five years of evaluations, this foliar nutritional – featuring a comprehensive balance of macro and micronutrients – has delivered an average corn yield increase of 6.2 bu/A when applied at 2 qts/A at the V5 growth stage. As with all NUTRISYNC-branded products, it features Loveland's proprietary Nutrient Transport Technology, which speeds nutrient movement (i.e., mobility) from initial leaf tissue absorption sites to where they're needed in regions of active plant growth.

NUTRISYNC COPPER applied at 1 pt/A at V5 has shown an average 5 bu/A yield boost in three consecutive seasons (2023 – 2025) of testing. Corn grown on medium- to fine-textured soils in the Ohio River Valley historically has seldom showed significant yield responses to supplemental Cu fertilizer of any type. However, these three-year results at Owensboro suggest the status quo for this micronutrient may be changing. As corn yields continue trending higher, it's reasonable to expect native plant-available Cu levels in the upper portion of the soil profile will decline. As they do, foliar copper sprays will provide one of the most cost-effective and agronomically efficient ways to address the situation.

NUTRISYNC BORON is another long-term, consistent performer. Applied at a 1 qt/A rate on tassel stage (VT) corn, it's given an average 4 bu/A response over six years. Though progressive growers operating in high-yield environments should consider incrementally adding supplemental B at multiple times in the corn production cycle, the VT timing is especially strategic. Applying NUTRISYNC BORON then helps support structural integrity of pollen and silks to ensure

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	Various	V5, V10, VT	Various

Table 1.



successful pollination. It also aids in the efficient transport of sugars from leaves and stalks to developing kernels.

NUTRISYNC MANGANESE sprayed on V10 corn at 2 qts/A has improved yield by an average of 7 bu/A over six years. More details about its performance and Mn fertility needs in corn are found in a separate article that begins on page 71 in this book.

MAXIMUM N-PACT K is a popular foliar nutritional that includes potassium and nitrogen – the latter in the highly efficient urea triazone form. Six years of evaluations with it at the V10 timing at Owensboro have produced an average yield increase of 5.3 bu/A. It also pairs nicely then with other foliar nutritional and/or an abiotic stress relieving product such as TERRAMAR®.

BLACKMAX® 22 + EXTRACT paired with UAN in side-dress applications has proven consistently effective in improving both corn yield and N use efficiency. Four consecutive years (2022 – 2025) of trials with this combination at Owensboro have spurred an average 5.6 bu/A yield increase. BLACKMAX 22's C² Technology (reacted carbon and carbohydrates) helps sequester plant-available N forms longer in the soil solution, thereby giving corn roots more opportunity to absorb them. Meanwhile, EXTRACT's biocatalyst properties aid mineralization of N from organic matter, making more of it plant available, too.



PLANTING DEPTH EXPLORED IN SOYBEANS

OBJECTIVE:

Determine if there's merit to planting soybeans at a deeper-than-traditional depth.

METHOD:

The mere suggestion of planting soybeans 3 inches deep is enough to cause many growers and agronomists to either cringe or roll their eyes – perhaps both. Yet in certain pockets of the Ohio Valley there recently has been limited-but-vocal advocacy for deeper planting as a means of controlling plant height, tightening node spacing and reducing lodging risk.

Chatter was sufficient to motivate the Owensboro farm staff to design this factorial experiment to address the topic. It featured four planting depths, with each one evaluated at 130,000 and 160,000 seeds/A. The four seeding depths were:

1. 0.5 inch
2. 1.0 inch
3. 2.0 inch
4. 3.0 inch

Typical planting depth is 1 to 1.5 inches – no deeper than 2 inches – across most U.S. soybean growing areas. The half inch and 3-inch depths included in this study would – by most standards – be considered excessively shallow and excessively deep, respectively.

This evaluation was done as a non-replicated strip trial (only one rep per treatment). Strips were 20 feet wide by 310 feet long. Soybeans were no-tilled into cornstalks with a John Deere® 1745 planter in 15-inch rows.

TAKEAWAYS:

Though planted in mid-April, conditions at Owensboro between then and month's end were near ideal for prompt soybean germination and emergence. Plants at all four depth-by-seeding-rate combinations were out of the ground in about a week, with only a few hours difference between any of them. Relatively warm soils and absence of any hard, beating rains during that period clearly favored quick emergence, even from the 3-inch planting depth.

Stand counts taken at the conclusion of emergence showed insignificant differences among treatments at the 160K seeding rate. The 130K seeding rate reflected a similar pattern among the half inch, 1-inch and 2-inch planting depths, but there was an approximate 13% stand count decrease at the 3-inch depth. (See Table 1.)

Plant height and internodal spacing were measured at various times during the season, with no significant differences observed between any of the treatments. Thus, the suggestion by some that deeper planting might help keep plants shorter and reduce spacing between nodes on main stems was not supported by this study.

Little yield difference between treatments (Table 2) was noted either, though the weakest yield of all eight combinations tested came from the 3-inch planting depth at 160,000 seeds.

Conversely, the highest recorded yield (77 bu/A) was produced with the half-inch planting depth at 160,000 seeds/A. Caution, however, is urged toward viewing that result as anything other than an artifact of the season. As a single data point, it should not be seen as justification to plant extra shallow.

Nor does this data lend any support for a deep, 3-inch planting depth. Though soybeans did emerge rather successfully and quickly from that depth in this experiment, the overall long-term risk of engaging in such a practice remains high. Had a packing rain or extended cool, wet conditions set in before emergence took place, results likely would have painted a more disadvantageous picture for deep soybean planting.

The best agronomic advice continues to support planting 1 to 1.5 inches deep, or perhaps 2 inches under certain seedbed or soil moisture conditions.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	-	9/19/25

Table 1. Stand Counts

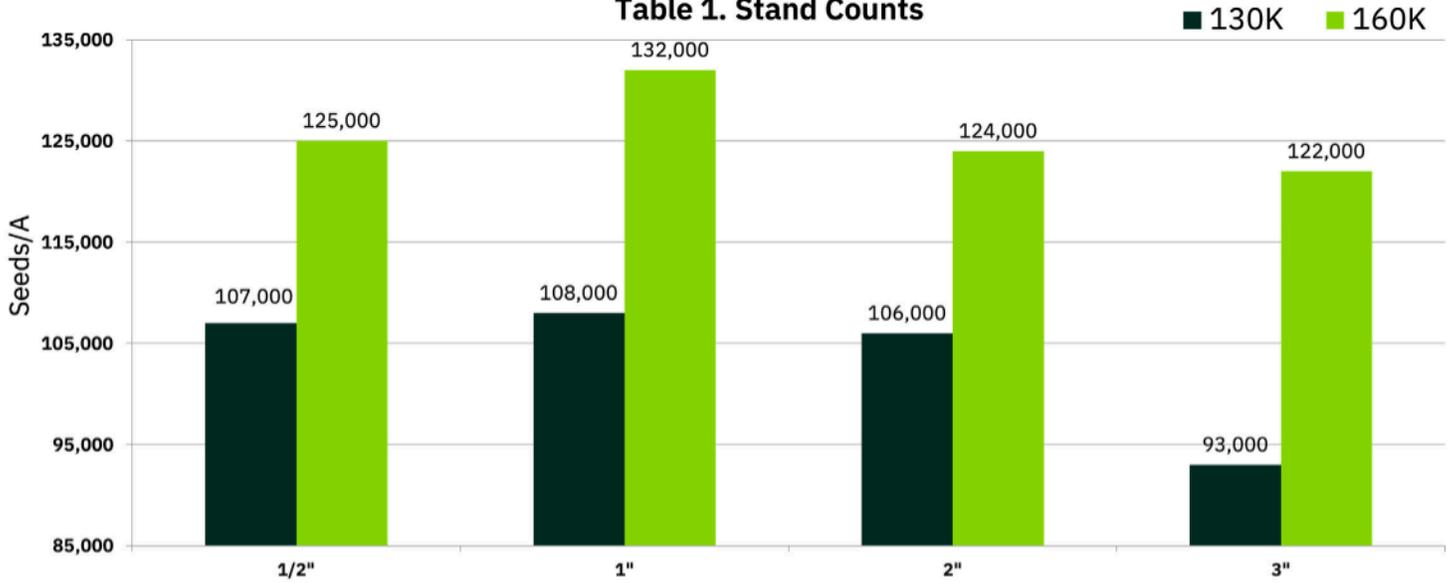
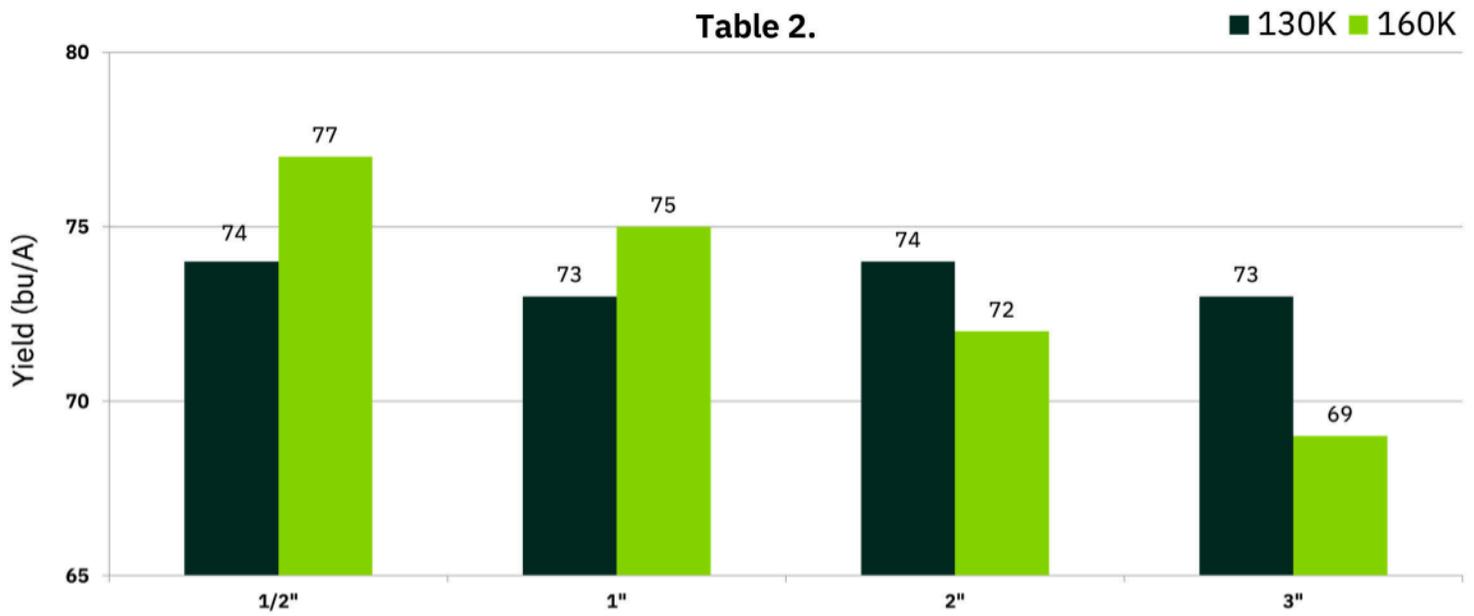


Table 2.



VR SOY VS STATIC SEEDING RATE

Table 1.

TREATMENT TIER	SEEDING	PRE-PLANT	POST (V3-V4)	R3
1	140,000		NUTRISYNC COMPLETE 3D 2 qt/A	VELTYMA 7 oz./A + SWAGGER 8 oz./A
	VR (100,000 – 140,000)			
2	140,000		RADIATE 2 oz./A + NUTRISYNC SULFUR 1 qt/A	VELTYMA 7 oz./A + REAX BORON 1 qt/A + SWAGGER 8 oz./A
	VR (100,000 – 140,000)			
3	140,000	ATS 5 gal/A + BLACKMAX 22 2 qt/A + EXTRACT 2 qt/A	RADIATE 2 oz./A	VELTYMA 7 oz./A + REAX BORON 1 qt/A + REAX SULFUR 1 qt/A + SWAGGER 8 oz./A
	VR (100,000 – 140,000)			

OBJECTIVE:

Determine how yield and economic returns in static and variable rate soybean seeding systems may be influenced by agronomic management intensity.

METHOD:

Conducted as a factorial study in replicated strips with four reps per treatment. Strips were 20 feet wide by 260 feet long. A John Deere® 1745 was used to plant soybeans at either a static rate of 140,000 seeds/A or with a variable rate (VR) prescription that ranged from 100,000 to 140,000.

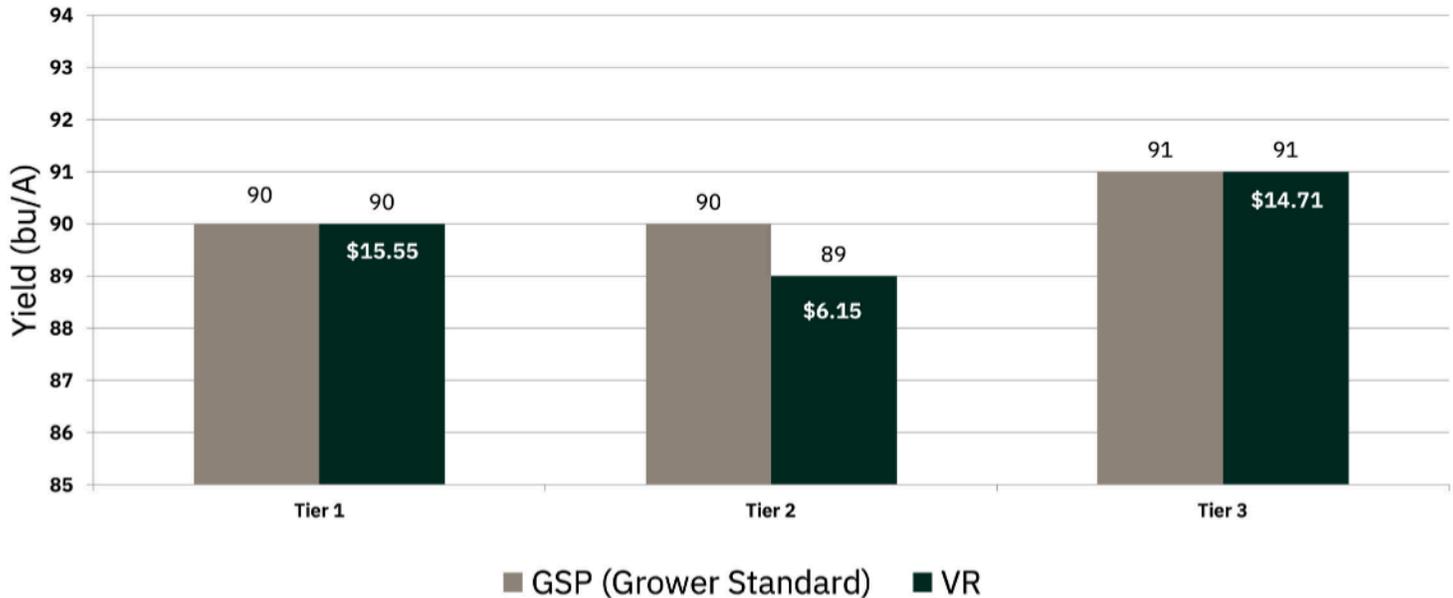
On-the-go seeding adjustments within the variable rate system were based on differences in field elevation and the wetness index (moisture stress potential) of soils within each elevation range. In general, variable seeding rates were highest in zones with greatest risk of moisture stress – either excessive or insufficient water – and lowest in zones with minimal moisture stress risk.

Additionally, three distinct agronomic management levels were evaluated across both the static and VR systems (See Table 1). They included:

- Management Tier 1 (Basic): Dyna-Gro Dyna-Shield™ Platinum treated seed (at planting) fb NUTRISYNC® COMPLETE 3D 2 qt/A at V4 fb Veltyma® 7.0 fl. oz. + SWAGGER® 8 fl. oz./A at R3
- Management Tier 2 (Medium): Dyna-Gro Dyna-Shield™ Platinum treated seed (at planting) fb RADIATE® 2.0 fl. oz. + NUTRISYNC SULFUR 1 qt/A at V4 fb Veltyma 7.0 fl. oz. + SWAGGER 8.0 fl. oz. + REAX® BORON 1 qt/A at R3
- Management Tier 3 (High): ATS 5 gal + BLACKMAX® 22 2 qt + EXTRACT 2 qt/A (pre-plant burndown) + Dyna-Gro Dyna-Shield™ Platinum treated seed (at planting) fb RADIATE 2.0 fl. oz./A at V4 fb Veltyma 7.0 fl. oz. + SWAGGER 8.0 fl. oz. + REAX BORON 1 qt

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 38EN75	4/17/25	-	9/18/25

Table 2.



ROI is based on each respective GSP (Ex. Tier 1 static vs Tier 1 VR, Tier 2 static vs tier 2 VR, Tier 3 static vs tier 3 VR)

+ REAX SULFUR 1 qt/A at R3

LIBERATE® adjuvant was included with all V4 treatments at 1 qt/100 gal (0.25% v/v) and FRANCHISE® adjuvant was used with all R3 treatments at 3.2 fl. oz./A.

TAKEAWAYS:

Yield differences were negligible between the static seeding rate and VR systems as well as between the three management tiers. More to the point, yields were outstanding for all six seeding rate x management tiers evaluated, ranging from 89 to 91 bu/A. (See Table 2.)

Though the VR system held no outright yield advantage versus static rate seeding, it did drive higher net returns per acre in all three management tier scenarios. Those figures ranged from an improved return of \$6.15/A for the Tier 2 management program to \$15.55/A for Tier 1. Since yield differences were essentially non-existent, those extra dollars obviously were garnered via overall reductions in seed use within the VR system.

Visitors to the Owensboro Innovation Farm recognize there aren't many immediately outward signs of significant variability across its acres. Topography is generally level and both surface and internal drainage are good. Though several soil types are represented, all of them are silt loams with strong productivity indexes.

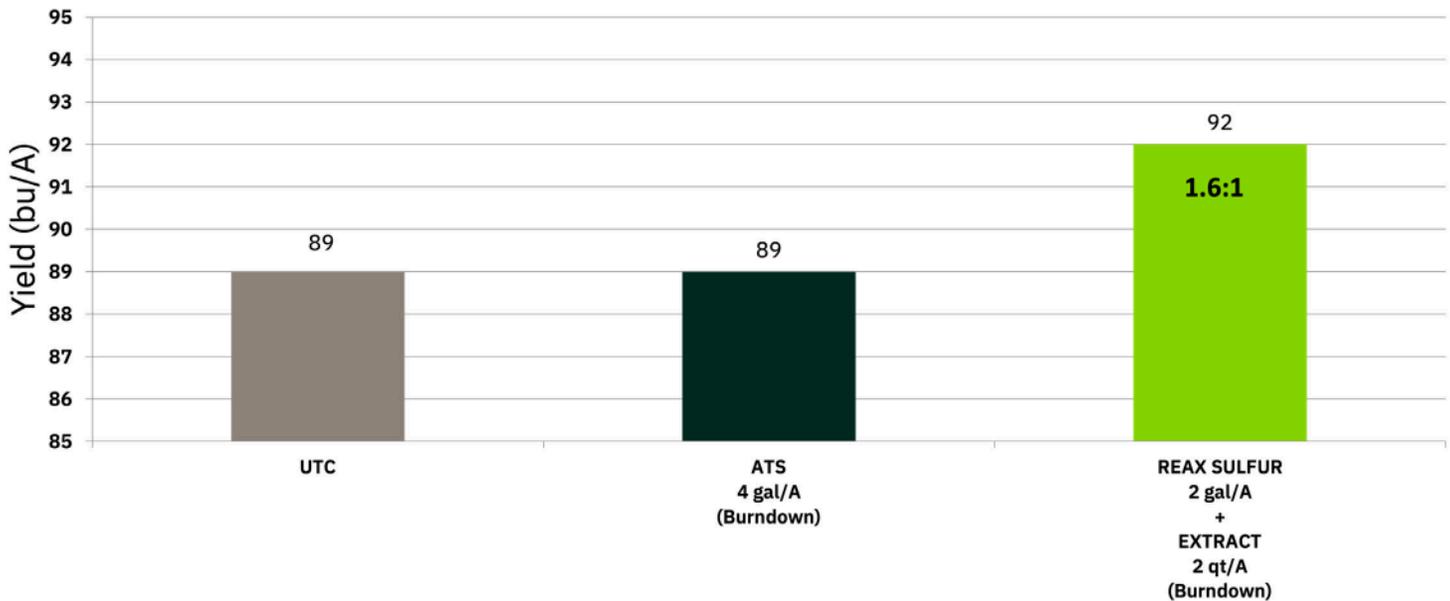
That uniformity aspect likely carries the most weight in explaining lack of yield difference between VR and static rate seeding in this study. Still, enough variation in elevation and wetness index existed to reduce overall seed use and improve profitability with the VR approach.

Soybean growers, especially those dealing with extensive field variability, may well be advised to give VR seeding a closer look if they've not already done so.

REAX SULFUR FITS WELL IN BURNDOWN APPLICATIONS

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 38EN75	4/17/25	V4, R3	9/18/25

Table 1.



OBJECTIVE:

Learn how nutrient use efficiency is affected when REAX SULFUR, a new sulfur (S) product containing C² Technology, is combined with EXTRACT, containing Biocatalyst Technology, is applied at preplant burndown timing in a high-yield, no-till soybean environment.

METHOD:

Expanding on the above-stated objective, this experiment was designed to validate the potential for new REAX™ SULFUR to fully match or exceed the performance of ammonium thiosulfate (ATS) when compared at a one-to-two ratio.

REAX SULFUR features a 9-0-0-18S analysis and also includes proprietary C² Technology (reacted carbon and carbohydrates). A gallon of REAX SULFUR contributes almost 1 lb of nitrogen (N), about 2 lbs of sulfur and 0.2 lb of humic acids. ATS (12-0-0-26S), in contrast, delivers about 1.3 lbs of N and 2.9 lbs of S per gallon; it does not contain any humic acids or other carbon-based substances.

The study was conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were no-tilled into cornstalks at 140,000 seeds/A with a John Deere® 1745 in 15-inch rows.

Treatments included:

1. UTC

2. ATS 4 gal/A at burndown

3. REAX SULFUR 2 gal + EXTRACT 2 qts/A at burndown

TAKEAWAYS:

The combination of REAX SULFUR and EXTRACT yielded 3 bu/A better than either the UTC or ATS applied at 4 gal/A. It also generated a strong ROI of 1.6:1 (60%).

The objective of validating REAX SULFUR'S efficiency in matching performance with ATS when compared in one-to-two ratio was fully met.

The work also underscores the power of C² Technology in making REAX SULFUR more efficient. C² Technology sequesters S in its plant-available sulfate form longer in the soil solution, giving roots more opportunity to absorb it. That means a higher percentage of each pound of S supplied by REAX SULFUR makes it into the plant to support growth and yield.

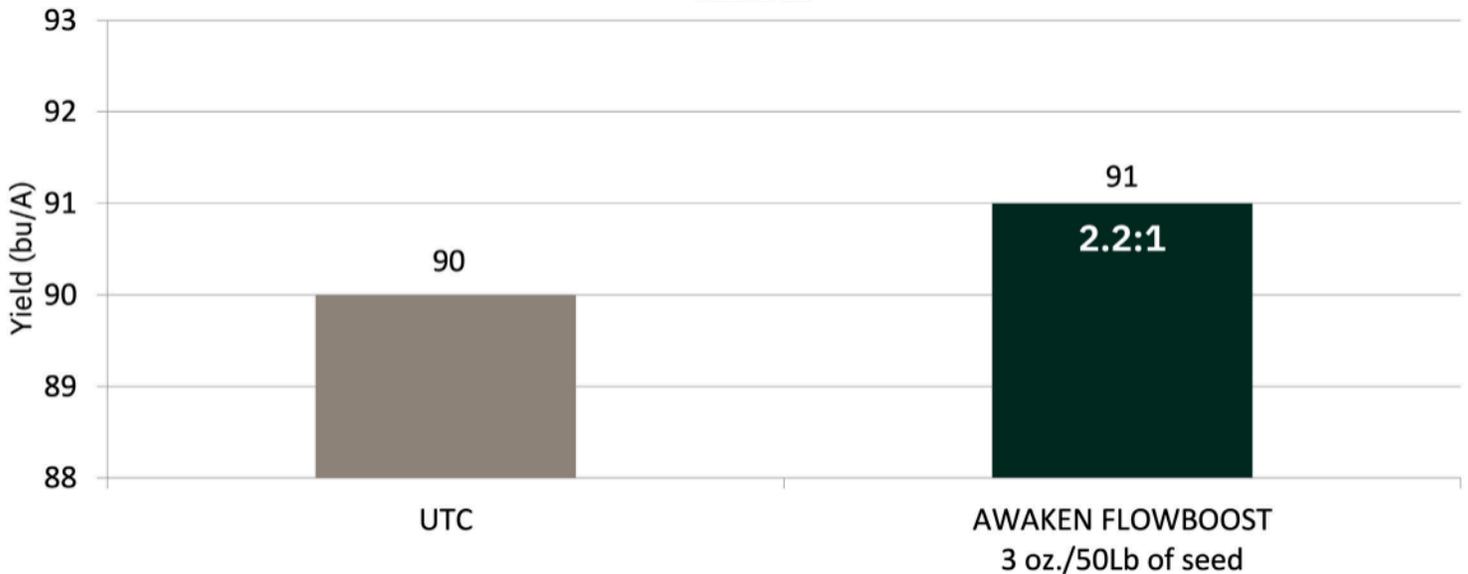
S is crucial to many aspects of soybean performance, including the production of two sulfur-containing amino acids used in building protein. It also is essential in the nitrogen fixation process and in the production of certain enzymes and chlorophyll.

EXTRACT's contribution in this study should not be overlooked. When broadcast in no-till burndown fashion as it was in Treatment 3, EXTRACT's components accelerate breakdown of old crop residue, which speeds the pace of nutrient recycling to the current crop. That undoubtedly played a complementary role in the 3 bu/A yield increase achieved.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 38EN75	4/17/25	Planter Box Treatment	9/18/25

AWAKEN FLOWBOOST STRENGTHENS SOYBEAN PERFORMANCE

Table 1.



OBJECTIVE:

Show how adding AWAKEN FLOWBOOST® to a standard fungicide-insecticide seed treatment can improve plant vigor and yield beyond that provided by the standard treatment alone.

METHOD:

Conducted as a replicated strip trial with four reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were planted at 140,000 seeds/A with a John Deere® 1745 in 15-inch rows.

A simple comparison was made between a “grower standard” soybean seed treatment (EQUITY VAYO®) and the same treatment enhanced with the planter box addition of AWAKEN FLOWBOOST at 3.0 fl. oz./50 lbs of seed.

AWAKEN FLOWBOOST is a talc/graphite replacement that provides both seed lubricity and a nutritional package featuring phosphorus, iron, manganese, molybdenum and zinc. On soybeans it can be used either as a traditional seed treatment (e.g., mixed with a fungicide/insecticide treatment and applied to seed before it goes in the planter), a direct planter box treatment or as a seed finisher.

TAKEAWAY:

Soybeans yielded 1 bu/A better with the addition of AWAKEN FLOWBOOST versus the standard fungicide-insecticide seed treatment alone. That single-bushel response, however, was sufficient to drive a positive 2.2:1 ROI.

Granted, the physical amount of nutrition supplied by this planter box treatment is small. Yet the results reinforce how critically important immediate nutrient access is to soybean seedlings at the very beginning of their life cycle.

As a seed coated with AWAKEN FLOWBOOST imbibes water and germinates, its fledgling primary root (taproot) quickly absorbs nutrients from the treatment. That gives the plant an early edge in developing a larger taproot along with more prolific lateral and tertiary roots as well as root hairs. Greater early root mass offers two key advantages:

- 1) More potential sites for *Rhizobium japonicum* bacteria to form nitrogen-fixing nodules, and
- 2) Greater ability to absorb water and nutrients from the soil as the season progresses.

AWAKEN FLOWBOOST also has delivered solid yield and bottom-line performance in corn trials at the Owensboro Innovation Farm. When used as a corn planter box treatment in 2025 and 2024, it increased yield 2 bu/A and 4 bu/A, respectively, which generated positive ROIs ranging from 4.8:1 to 9.6:1. Those results are detailed more specifically elsewhere in this book.



SEEDS TREATMENTS SET THE TABLE FOR HIGH-YIELD SOYBEANS

OBJECTIVE:

Reaffirm the importance of using robust, comprehensive seed treatments in high-yield soybean production environments.

METHOD:

This multi-year trial extended from 2023 to 2025. Early to mid-April planting dates were achieved in each of the three years. Evaluations were conducted as replicated strip trials with two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were planted with a John Deere® 1745 at 140,000 seeds/A in 15-inch rows.

Five treatments were compared each year as follows:

1. UTC (untreated seed)
2. EQUITY VAYO® 1.86 fl. oz./140,000 seeds
3. EQUITY VAYO 1.86 fl. oz./140,000 seeds + Saltro® 1.52 fl. oz./cwt
4. EQUITY VAYO 1.86 fl. oz. + ILEVO® 1.18 fl. oz./140,000 seeds
5. EQUITY VAYO 1.86 fl. oz. + Avodigen® 0.55 fl. oz./140,000 seeds

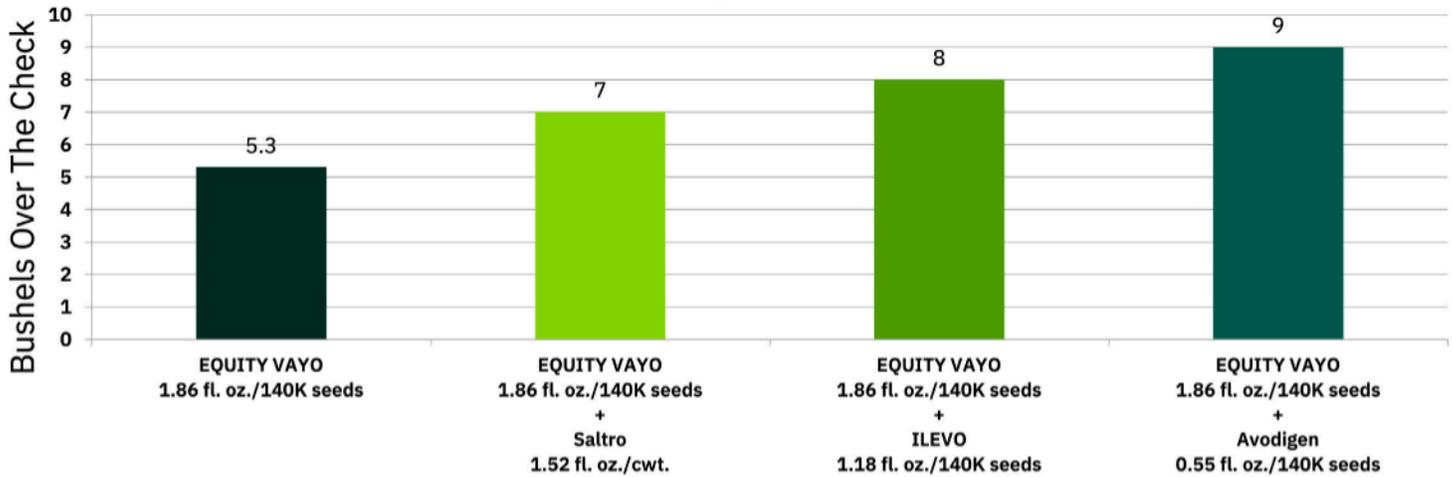
The entire trial was further protected against late-season foliar diseases and insects with an application of Veltyma® 7.0 fl. oz. + SWAGGER® 10 fl. oz. + FRANCHISE 3.2 fl. oz./A at R3.

Here's a closer look at the products featured in Treatments 2 through 5:

- EQUITY VAYO from Loveland Products is a foundational, broad-spectrum treatment that combines five fungicides and a neonicotinoid insecticide. It guards germinating seeds and seedlings against attacks by *Pythium*, *Rhizoctonia*, *Phytophthora* and *Fusarium*. It also provides early-season protection from several insects such as bean leaf beetle and seed corn maggot.
- Saltro. From Syngenta®, this is a bolt-on product typically added to a foundational fungicide-insecticide seed treatment such as EQUITY VAYO. Saltro offers protection from early season infection by the *Fusarium* species that causes sudden death syndrome (SDS); it also has nematicidal activity to help suppress soybean cyst nematode (SCN).
- ILEVO. Another bolt-on product, this seed treatment from BASF® aids in protecting young seedlings against SCN and infection by the SDS causal agent.
- Avodigen from FMC® also is a bolt-on treatment. It combines a pair of biofungicides/nematicides that together aid early-season protection from seedling diseases caused by *Rhizoctonia* and *Fusarium* species as well as provides SCN suppression.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Various	Early - Mid April	Seed Treatment	Early - Mid September

Table 1. Multi-Year Yield Averages Above the Check (2023-2025)



TAKEAWAYS:

Yield results over the full course of the study are reported in Table 1 as three-year averages above the untreated check.

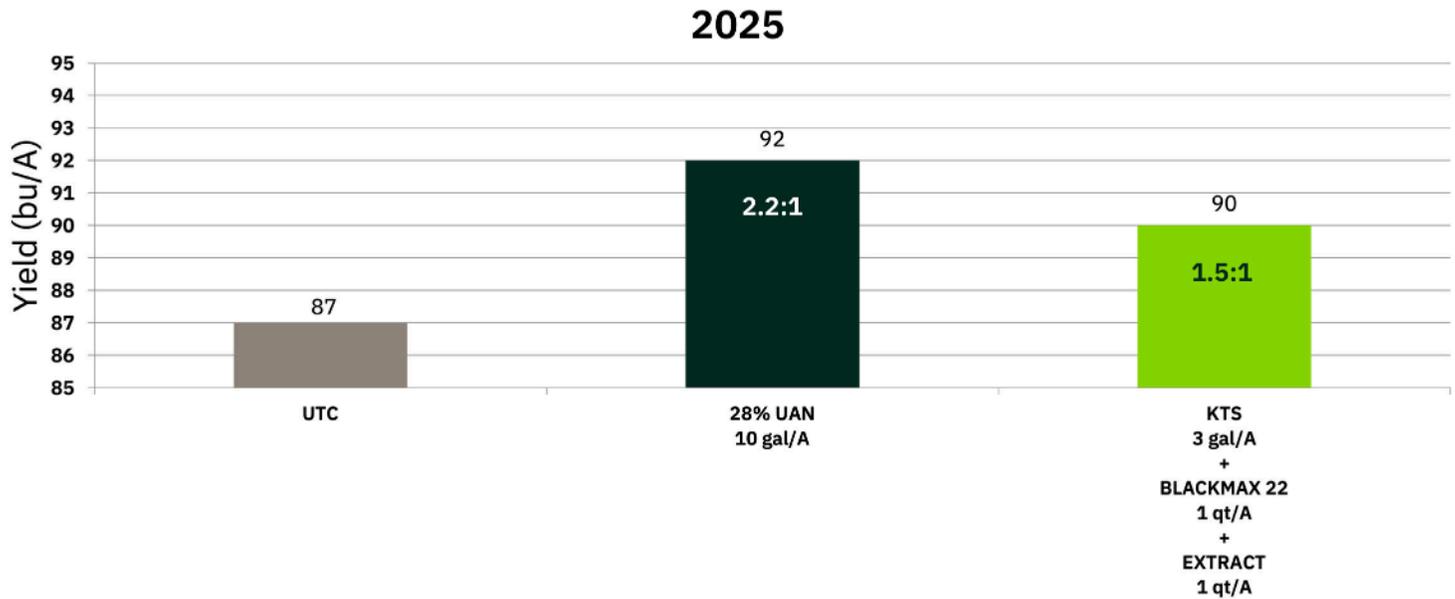
EQUITY VAYO's 5.3 bu/A average advantage firmly substantiates the importance of starting with a broad-spectrum fungicide-insecticide seed treatment. With today's trend toward earlier soybean planting and reduced seeding rates, EQUITY VAYO ensures strong emergence and seedling vigor through oftentimes challenging soil conditions.

The data clearly indicate EQUITY VAYO has driven the majority of the yield response. Yet each of the other three products that offer varying degrees of SCN control or suppression have further enhanced performance when tag teamed with EQUITY VAYO.

Interestingly, previous sampling for SCN at the Owensboro farm has only found extremely low egg counts, which historically has suggested minimal potential impact from the pest. However, the positive additive yield responses from Avodigen®, ILEVO® and Saltro® indicate that even relatively low SCN populations are perhaps posing more harm to the crop than previously thought.

The declining efficacy of PI 88788 may hold the explanation. For many years it has been the most common genetic source of SCN resistance used in commercial soybean varieties. But that same widespread use has selected for new SCN races or strains that are now able to at least partially overcome PI 88788's protection, leading to decreased effectiveness.

2X2X2 FERTILIZER PLACEMENT DRIVES BEAN YIELDS



OBJECTIVE:

Improve early-season plant vigor, increase nutrient use efficiency and enhance yield by banding certain key nutrients and other growth-promoting products on both sides of the row at planting.

METHOD:

Conducted as a replicated strip trial with two replications per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were planted at 140,000 seeds/A in 30-inch rows. A SurePoint Surepoint™ Ag Sentinel™ Liquid Monitoring system coupled with Precision Planting® Conceal® 2x2x2 attachments were used to apply treatments.

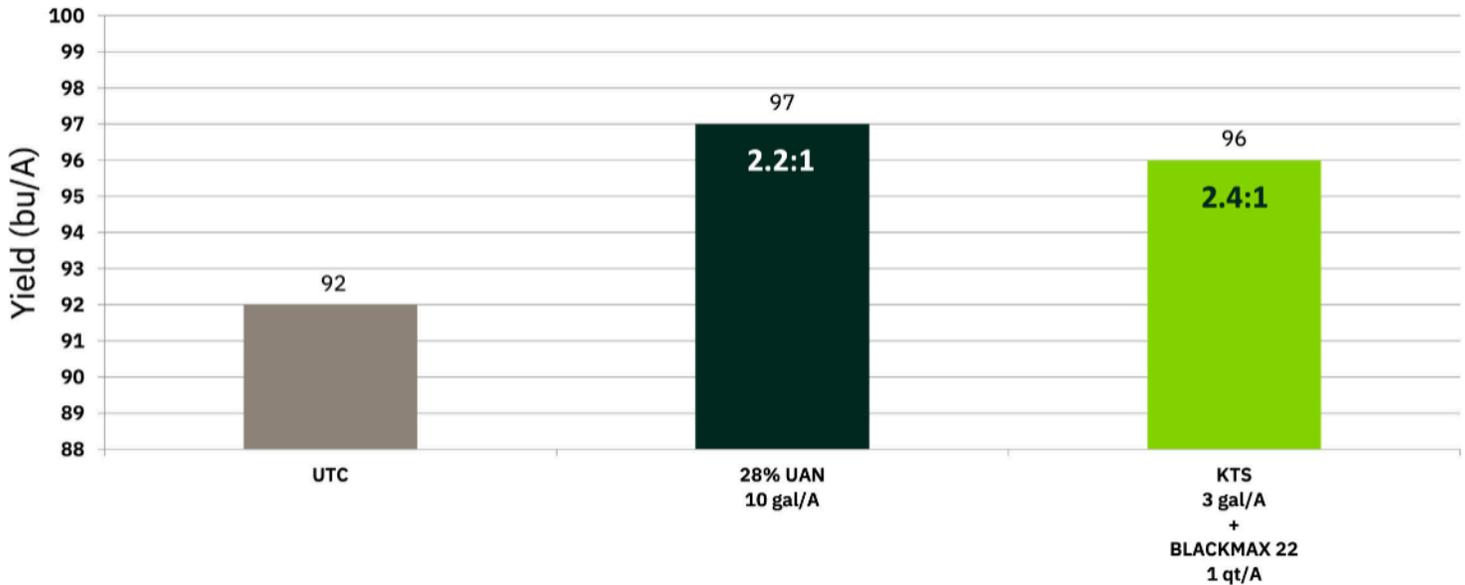
Treatments included:

1. Untreated Check (UTC)
2. UAN 28% 10 gal/A
3. Potassium Thiosulfate (KTS) 3 gal + BLACKMAX® 22 1 qt + EXTRACT 1 qt/A

At the V4 growth stage, a blanket foliar application of NUTRISYNC® COMPLETE 3D at 2 qt/A was made across all treatments. The nutritional spray also included CHOICE® TRIO water conditioner and LIBERATE® adjuvant, both mixed at 1 qt/100 gal (0.25% v/v).

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	At Planting	9/18/25

2024



TAKEAWAYS:

Banding UAN 28% at 10 gal/A on both sides of the row at planting increased yield by 5 bu/A (+5.7%) over the UTC and generated a 2.2:1 ROI. The KTS + BLACKMAX®22 + EXTRACT combination in Treatment 3 bumped yield 3 bu/A (3.4%) with a positive ROI of 1.5:1. (See Table 1.)

This marks the second consecutive year the Owensboro farm has evaluated UAN 28% on soybeans at the 10 gal/A rate in a 2x2x2 placement. Interestingly, the 2024 trial also showed a 5 bu/A yield improvement with it in a similar high-yielding environment. (See Table 2.)

Supplementing soybeans with nitrogen (N) has not been a widespread practice, especially at the season's start. The concern has been that early season N fertilizer might cause plants to "get lazy" and fail to nodulate properly as they draw from the applied source. However, this work at Owensboro and other studies in the past decade seem to be putting that worry to rest.

A key factor in this matter would seem to be the amount of supplemental nitrogen used. After all, 10 gallons of 28% UAN only supplies 30 lbs of actual N. That's a relatively modest number when compared against the total, seasonal nitrogen demand of a 90 bu/A soybean crop.

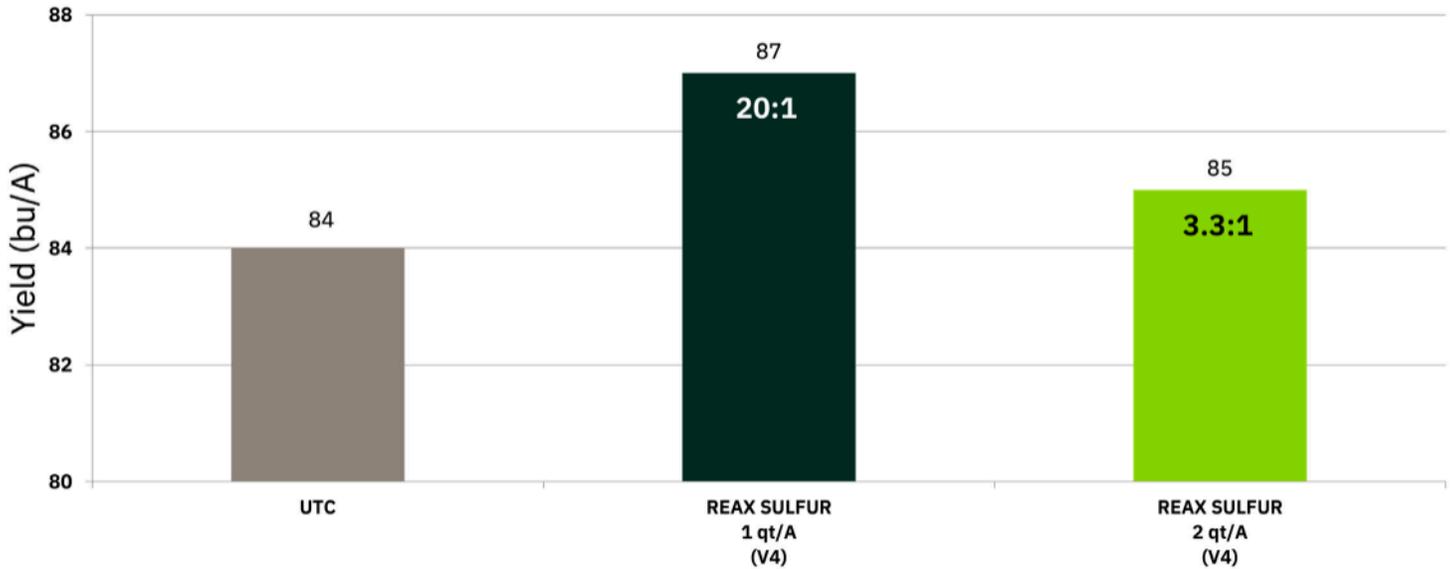
Estimates vary on exactly how much nitrogen is required to produce a single bushel. But using a relatively conservative range of 4 to 6 lbs/bu, that means a 90 bu/A yield would need 360 to 540 lbs of N. Again, a modest 30 lbs banded alongside the row at planting pales by comparison.

The results from 2024 and 2025 certainly are encouraging and likely will compel the Owensboro farm staff to continue some iteration of this trial in 2026.

REAX SULFUR IS FOLIAR OPTION IN SOYBEANS

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	V4	9/18/25

Table 1.



OBJECTIVE:

Evaluate REAX™ SULFUR at two rates in V4 soybeans to verify crop safety, yield performance and ROI.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 310 feet long. Soybeans were no-tilled into cornstalks with a John Deere® 1745 planter at 140,000 seeds/A in 15-inch rows.

Treatments included:

1. UTC
2. REAX SULFUR 1 qt/A at V4
3. REAX SULFUR 2 qts/A at V4

Treatments were applied through a John Deere 412 sprayer at a 15 gal/A volume. They also included CHOICE® TRIO water conditioner and LIBERATE® adjuvant, both at 1 qt/100 gal (0.25% v/v).

TAKEAWAYS:

Both the 1 qt and 2 qt/A rates of REAX SULFUR gave positive soybean yield responses versus the check. However, the 1 qt rate was superior with a 3 bu/A advantage and an outstanding 20:1 ROI.

A similar study done in V5 corn at the Owensboro farm showed the same trend – that the lower, 1 qt/A REAX SULFUR rate was optimal for peak yield and economic performance when used as a foliar application.

No apparent phytotoxicity was observed with either rate; foliar crop safety with REAX SULFUR appears to be excellent.

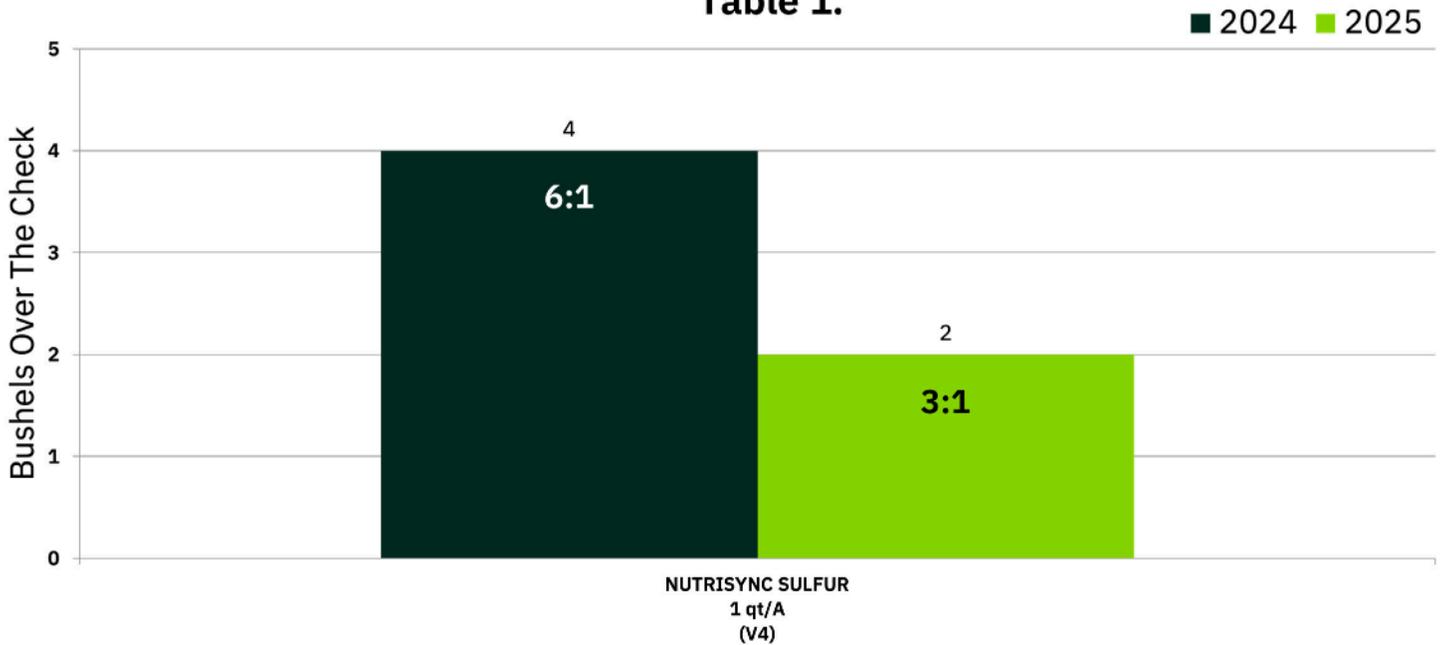
Sulfur (S) by nature is relatively immobile in plants. The C² Technology (reacted carbon and carbohydrates) in REAX SULFUR helps in that regard by promoting both improved foliar absorption and in-plant mobility.

S is crucial to many aspects of soybean performance, including production of two sulfur-containing amino acids (cysteine and methionine) used in building protein. It also is essential in the nitrogen fixation process and in the production of chlorophyll and certain enzymes. A foliar application of REAX SULFUR offers an excellent avenue down which to meet these needs.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Various	Various	V4	Various

NUTRISYNC SULFUR PERFORMS WELL ON V4 SOYBEANS

Table 1.



OBJECTIVE:

Demonstrate multi-year yield and income benefits with NUTRISYNC® SULFUR applied to V4 soybeans.

METHOD:

This is a simple, two-year study comparing NUTRISYNC SULFUR sprayed on V4 soybeans to an untreated check. In both 2024 and 2025 the work was done as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were no-tilled into cornstalks with a John Deere® 1745 at 140,000 seeds/A in 15-inch rows.

NUTRISYNC SULFUR was applied at 1 qt/A in a 15 gal/A total spray volume and included both CHOICE® TRIO water conditioner and LIBERATE® adjuvant, each at 1 qt/100 gal (0.25% v/v).

TAKEAWAY:

NUTRISYNC SULFUR demonstrated excellent performance in both trial years, producing a 4 bu/A advantage over the UTC in 2024 and a 2 bu/A increase in 2025 (See Table above). Those translate to ROIs of 6:1 and 3:1, respectively.

The growing importance of using supplemental sulfur (S) in well-managed soybeans can not be overstated. This crucial secondary nutrient is essential in supporting nitrogen fixation and the production of certain enzymes and chlorophyll. It also directly aids in the manufacture of two sulfur-containing amino acids (cysteine and methionine) used in building soybean protein.

Though mobile in soil, S is relatively immobile in plants. Fortunately, the proprietary Nutrient Transport Technology featured in NUTRISYNC SULFUR helps overcome that challenge. It speeds sulfur transport (i.e., mobility) from initial leaf tissue absorption sites to where it's most needed in concentrated regions of active plant growth.

Crop consultants and growers alike can confidently turn to NUTRISYNC SULFUR for supplementing an overall S management strategy.

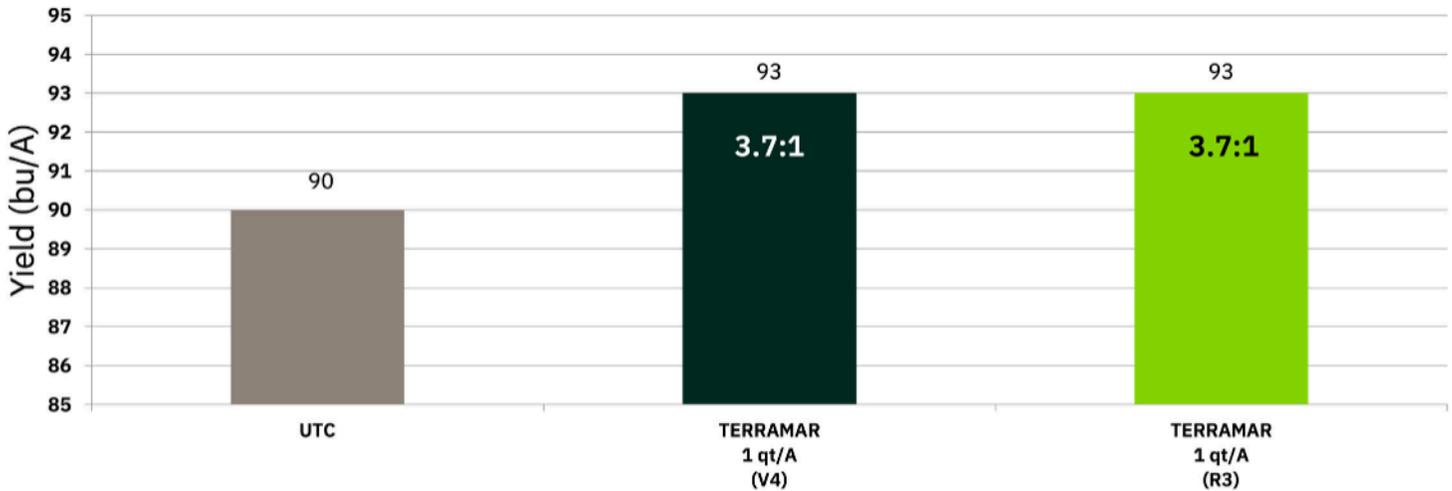
In addition to supplying S via foliar treatment, growers in high yield environments likely will need to consider soil-based sulfur applications as well. REAX™ SULFUR, featured in other trial work reported elsewhere in the Owensboro section of this book, is a good option for supplying S to the soil and offers the added flexibility of being labeled for foliar use, too.



TERRAMAR BOOSTS SOYBEAN STRESS TOLERANCE

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	V4, R3	9/18/25

Table 1.



OBJECTIVE:

Achieve further validation of the positive impact TERRAMAR® has on yield via enhanced plant tolerance to abiotic stress.

METHOD:

Conducted as a replicated strip trial featuring two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were planted with a John Deere® 1745 at 140,000 seeds/A in 15-inch rows.

Treatments included:

1. UTC
2. TERRAMAR 1 qt/A + LIBERATE® 1 qt/100 gal (0.25% v/v) at V4
3. TERRAMAR 1 qt/A + LIBERATE 1 qt/100 gal (0.25% v/v) at R3

All treatments were applied in a total spray volume of 15 gal/A.

TAKEAWAYS:

TERRAMAR fostered 3 bu/A yield increases and excellent 3.7:1 ROIs at both the V4 and R3 spray timings.

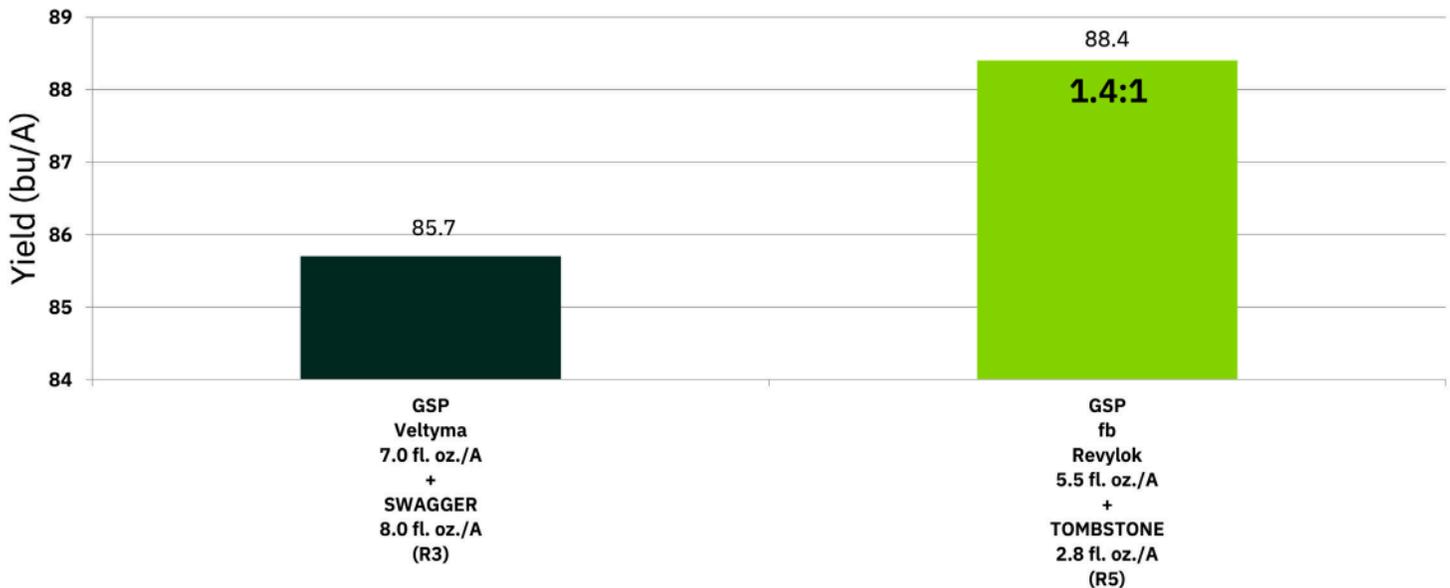
The results demonstrate its versatile fit as a foliar treatment within both the vegetative and reproductive phases of a soybean crop. Manufactured through proprietary bio-extraction of seaweed (kelp meal) and leonardite, TERRAMAR'S unique metabolic compounds improve plant response to stressful conditions such as heat and dry weather.

Though evaluated alone in this study, it can be conveniently tank mixed with many types of crop protection products and foliar nutritionals.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 38EN75	4/17/25	R3, R5	9/18/25

SEQUENTIAL FUNGICIDE-INSECTICIDE PROGRAM BENEFITS SOYBEANS

Table 1.



OBJECTIVE:

Demonstrate how extending protection against foliar diseases and insects later into the growing season can enhance plant performance and net revenue in a high-yield soybean production environment.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were no-tilled into cornstalks at 140,000 seeds/A in 15-inch rows with a John Deere® 1745 planter.

A standard single fungicide-insecticide application at the traditional R3 growth stage timing was compared with a sequential program featuring a second fungicide-insecticide treatment at R5. Specifically, the treatments included:

1. GSP (Veltyma® 7.0 fl. oz. + SWAGGER® 10.0 fl. oz./A) at R3
2. GSP fb Revylok® 5.5 fl. oz. + TOMBSTONE® 2.8 fl. oz./A at R5

The Veltyma + SWAGGER treatment made at R3 was aerially applied with an XAG P100 Pro Agricultural Drone in a total spray volume of 3 gal/A. The Revylok + TOMBSTONE combination at R5 was ground applied with a Lee Avenger plot sprayer in a 20 gal/A total volume.

Both the R3 and R5 applications included FRANCHISE® CO-PILOT adjuvant at 1 qt/100 gal (0.25% v/v).

TAKEAWAYS:

The two-pass fungicide-insecticide program (Treatment 2) outperformed the standard R3-only timing by 2.7 bu/A and generated a 1.4:1 ROI (40%). (See Table 1.)

Over the past 20-plus years, data generally has pointed to a single fungicide-insecticide application at the R3 growth stage as being optimal with respect to both soybean yield and financial performance. High-yield environments, however, merit stronger consideration for spraying a second time at the beginning of seed fill (R5). Results from this trial support that tactic.

The R5 growth stage marks a critical phase when accumulated nutrients, photosynthates and proteins from other parts of the plant (e.g., leaves, stems and petioles) begin moving into developing seeds. It's also when protection from an earlier fungicide-insecticide treatment often begins to wear thin. If late-season fungal disease pressure or pod/seed-attacking insects take substantial hold at that point, they can quickly take a slice from the crop's top-end potential.

Applying the Revylok + TOMBSTONE tankmix at R5 in this trial added an extended layer of protection and captured more of the crop's true yield potential.



LATE-SEASON INSECTICIDE + NUTRITIONAL COMBO **BENEFITS SOYBEANS**

OBJECTIVE:

Illustrate additional yield and ROI advantages from supplementing a traditional fungicide treatment at R3 with a follow-up foliar nutritional and insecticide application at the early seed-fill stage.

METHOD:

Conducted as a replicated strip trial with two reps per treatment. Strips were 20 feet wide by 260 feet long. Soybeans were planted with a John Deere® 1745 at 140,000 seeds/A in 15-inch rows.

All treatments were aerially applied with an XAG P100 Pro Agricultural Drone in a total spray volume of 3 gal/A. Treatments included:

1. Grower Standard Practice (GSP) (Veltyma® 7 fl. oz. + SWAGGER® 10 fl. oz. + RE-NFORCE® K 2 qt + FRANCHISE® 3.2 fl. oz./A at R3)
2. GSP followed by (fb) TOMBSTONE™ 2.8 fl. oz. + MAXIMUM N-PACT® 2 qt + REAX™ BORON 1 qt + FRANCHISE 3.2 fl. oz./A at R5

TAKEAWAYS:

Supplementing a traditional R3 fungicide-insecticide-nutritional application with a follow-up nutritional and insecticide spray at R5 paid extra dividends in a high-performing soybean environment. (See Table 1.) The yield advantage for making the second pass was a modest 2 bu/A, but it was sufficient to drive a positive ROI of 1.2:1 (20%).

The R5 growth stage marks a critical phase when accumulated nutrients, photosynthates and proteins begin moving into developing seeds from other parts of the plant (e.g., leaves, stems and petioles). Agronomically, it's an opportune time in high-yield environments to bolster that process with key foliar nutrients such as nitrogen and boron. And an insecticide added to the mix then helps extend protection against late-season, pod/seed-damaging insects, especially stink bugs.

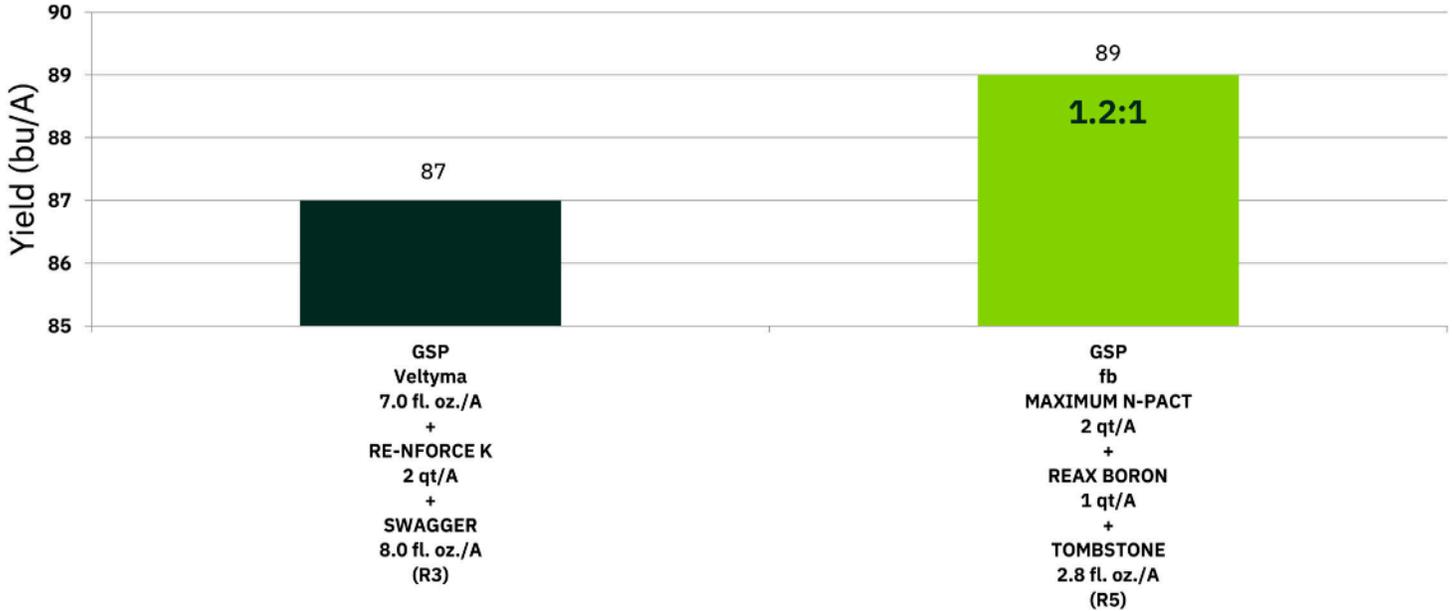
On the downside, an R5 application made with a traditional ground rig means tracking the field at a more precarious time. Soybeans laid over by wheel traffic at R3 tend to stand back up quite well and show no major negative yield impact. By R5, however, plants are taller and generally stiffer; any that get driven down then are less likely to fully recover to a normal vertical position that's optimal for growth. Yield drag that occurs in the tracks can somewhat counter potential gains from the products applied.

That's where the emerging and expanding use of application spray drones offers a clear advantage. They afford clean access to R5 soybeans and remove wheel tracks from the equation.

This was the Owensboro farm's first year using a spray drone in certain trial work, including this study. The results are encouraging and likely will lead to more evaluations of this type in 2026 and beyond.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Dyna-Gro Seed 41XF65	4/17/25	R3, R5	9/18/25

Table 1.



R3 SOYBEAN FUNGICIDES

DELIVER LONG TERM

OBJECTIVE:

Reaffirm the ongoing yield and economic benefits of using fungicides as a key component of an overall disease management strategy in soybeans.

METHOD:

This data is a compilation of multiple soybean fungicide studies conducted at the Owensboro farm over nine consecutive years (2017 – 2025). All treatments were made at the R3 growth stage.

Nearly all leading fungicide brands have been represented in this work. The yield figure shown in the accompanying graph is a consolidated average response for all products above the untreated check.

From 2017 to 2021, the work was done in a small plot, replicated environment using an RCB (randomized complete block) design. Applications during that period were mostly managed with a CO²-powered backpack sprayer and made in a 15 gal/A volume.

Starting in 2022, the soybean fungicide evaluations shifted to a larger, replicated strip trial format with two reps per treatment. And applications since then have been made with a self-propelled Lee Avenger plot sprayer, again at a 15 gal/A volume.

In all instances, soybeans were rotated after corn and typically planted in 15-inch rows at 140,000 seeds/A.

Appropriate adjuvants – either FRANCHISE® or LIBERATE® – were paired with all soybean fungicide treatments. More recently, CHOICE® TRIO water conditioner sometimes has also been added to the spray tank.

TAKEAWAY:

Over the nine-year span of testing and across all products, the average response to R3 fungicide treatment has been 6 bu/A. Taking into account fluctuating commodity prices and retail fungicide costs over nearly a decade, that 6-bushel response still is sufficient to have generated positive ROIs in each and every one of the years the work was carried out.

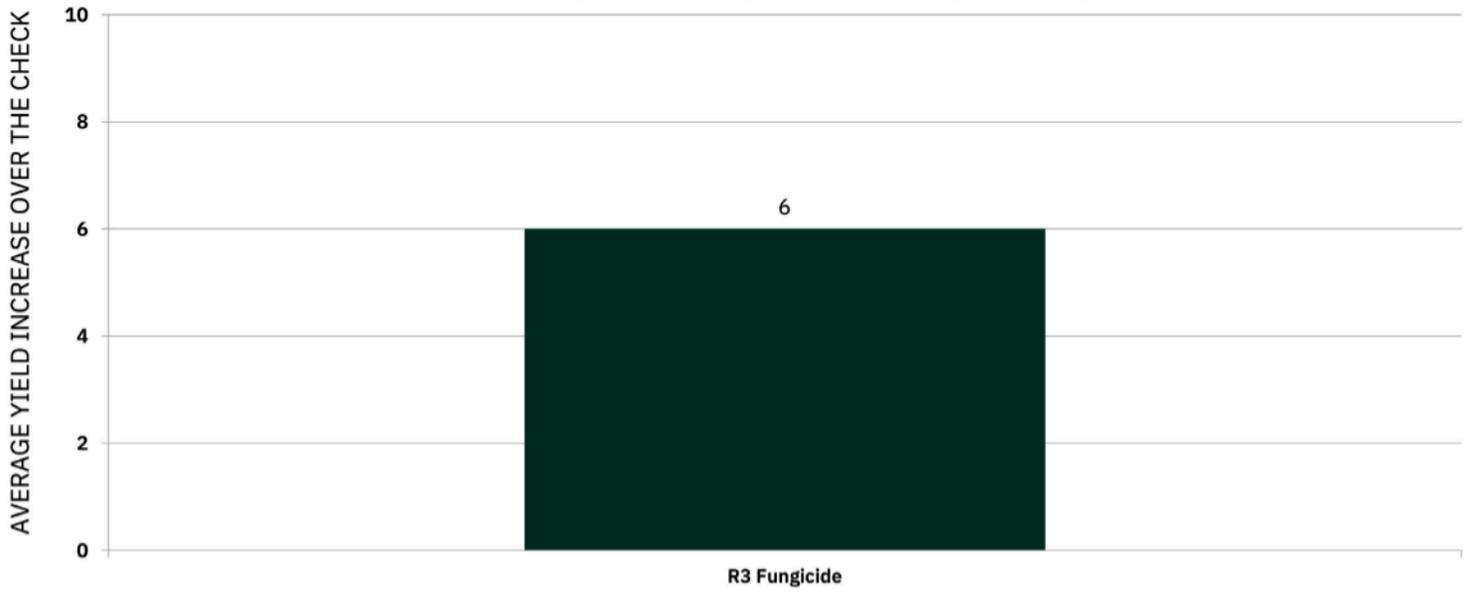
Fungal disease pressure and individual product performance indeed varied from year to year over the long course of these studies. However, the overall result speaks to consistency and lends solid support to managing soybeans with an appropriate R3 fungicide, especially in good yielding environments.

The Owensboro farm also has done limited work with various two-pass fungicide approaches in soybeans, most notably with an initial R3 spray followed by a second treatment at R5. Though those sequential programs sometimes have outyielded a solo treatment at the traditional R3 timing, they generally are weaker from an ROI standpoint.

Part of the challenge with R5 spray timings in years past was the issue of wheel tracks. Though soybeans tend to spring back nicely from ground rig traffic at R3, the taller, stiffer nature of plants at R5 is less forgiving. Some gains achieved with a second fungicide pass at R5 likely have been offset by wheel track injury.

However, with increased adoption of spray application drone technology, the door may be opening wider to take a closer look at two-pass soybean fungicide programs that remove wheel traffic from the equation. The Owensboro farm initiated some limited work in this regard in 2025 and likely will explore more possibilities in 2026 and beyond.

MULTI-YEAR YIELD ADVANTAGE



PROVEN FOLIARS SHINE AT V4, R3 TIMINGS

OBJECTIVE:

Reaffirm the long-term performance of proprietary foliar nutritional products that have consistently delivered strong soybean yield responses and positive ROIs.

METHOD:

The Nutrien Innovation Farm at Owensboro has conducted a series of multi-year soybean trials with several foliar nutritionals from the Loveland Products portfolio. Each nutritional featured in Table 1 has been evaluated at the rate and timing shown for a minimum of three consecutive years, with some as many as six to seven years. The specific number of testing seasons for each product is indicated along the bottom of the graph.

All trials consolidated within this data have been conducted in replicated strips with a minimum of two reps per treatment. Strips typically are 20 feet wide by 260 feet long.

Soybeans in each instance were planted behind corn in 15-inch rows at approximately 140,000 seeds/A. Most of the work has been done in no-till settings, with a few trials conducted under minimum tillage.

All foliar treatments typically have been made in 15 gallons of water/A. LIBERATE® adjuvant was included in each instance at 1 qt/100 gal (0.25% v/v) to maximize on-target spray delivery, achieve excellent leaf surface adherence and drive superior nutrient absorption into plant tissue. Many treatments also have included CHOICE® TRIO water conditioner at 1 qt/100 gal (0.25% v/v) to further enhance nutritional performance.

TAKEAWAYS:

All six products have proven to be models of consistency in terms of both yield enhancement and profitability. Nutrien Ag Solutions crop consultants and grower-customers alike can use them with confidence they'll work well across a diverse range of field and weather environments.

Here's a closer look at each product's multi-year performance at Owensboro, along with some of their basic features and benefits.

NUTRISYNC® COMPLETE 3D has fostered an average 2.3 bu/A soybean yield increase across seven years of testing when used on V4 soybeans at 2 qts/A. That translates into a solid 1.7:1 ROI.

Featuring a comprehensive balance of macro and micronutrients, this foliar nutritional fits conveniently in tank mixes with early postemergence herbicide sprays. As with all NUTRISYNC-branded products, it contains Loveland's proprietary Nutrient Transport Technology, which accelerates nutrient movement (i.e., mobility) from initial leaf tissue absorption sites to where they're most needed in the plant's active growth regions.

RADIATE® is not a nutritional per se, but rather a patented formulation of two naturally occurring plant hormones – IBA and kinetin. Collectively they drive enhanced root and shoot growth as well as support reproductive development and other benefits. Over the past six years at the Owensboro farm, RADIATE at a standard 2 fl. oz./A rate applied on V4 soybeans has spurred an average 2.9 bu/A yield bump and an impressive 6.3:1 ROI.

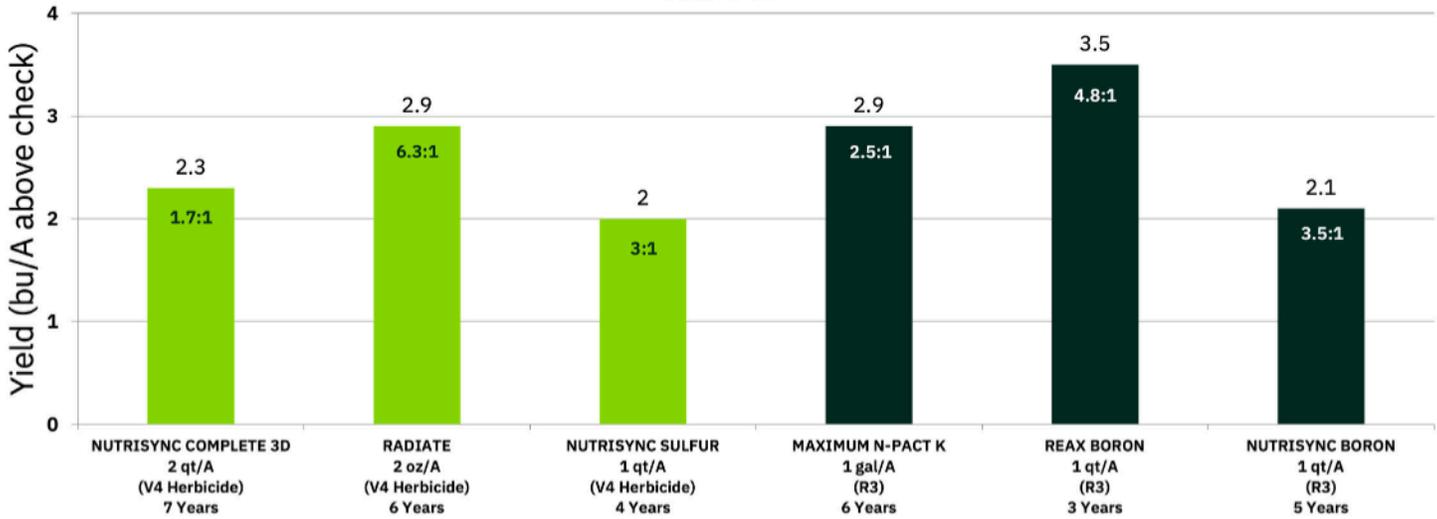
These results parallel and reinforce what RADIATE has been showing on commercial acres for nearly 20 years. In pragmatic terms, it's a consistent performer that deserves a place in every soybean field. Though the work at Owensboro has targeted the V4 growth stage, RADIATE can be effectively applied from V2 to V6. It pairs well with early postemergence herbicide sprays and tank mixes readily with other foliar nutritionals, too. The RADIATE label also has an option for in-furrow use at planting at rates of 2 to 4 fl. oz./A.

NUTRISYNC SULFUR applied at 1 qt/A on V4 soybeans has improved yield an average of 2 bu/A and produced a 3:1 ROI in four straight years (2022 – 2025) of evaluation. Sulfur (S) plays several vital roles in soybeans, including formation of certain amino acids vital in building protein. It supports the nitrogen (N) fixation process in root nodules, meaning a shortfall of S can indirectly deprive the crop of adequate N, too.

Supplemental S is best targeted to soybeans early in the season to ensure availability throughout key vegetative and reproductive growth

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	Various	V4, R3	Various

Table 1.



- Several foliar nutritional products in the Loveland Products portfolio have demonstrated consistently positive impact on soybean yields and ROI over multiple testing seasons at the Owensboro Innovation Farm.
- Whether attempting to correct in-season deficiencies or pushing a crop's overall nutritional status, growers can apply these products with confidence they'll deliver strong results across a diverse range of field and weather environments time after time.

stages. A V4 foliar application of NUTRISYNC SULFUR fits that requirement well.

Importantly, though mobile in soil, S is relatively immobile in plants. The proprietary Nutrient Transport Technology in NUTRISYNC® SULFUR, helps overcome that challenge and supports efficient S movement to where it's needed most.

MAXIMUM N-PACT® K is a popular foliar nutritional that includes potassium and nitrogen – the latter in the highly efficient urea triazone form. Six years of evaluations with it at the R3 timing in soybeans at Owensboro have produced an average yield increase of 2.9 bu/A and an ROI of 2.5:1. It also pairs nicely then with fungicides, insecticides, other foliar nutritional products and/or an abiotic stress relieving product such as TERRAMAR®.

REAX™ BORON, across three consecutive years (2023 – 2025) of assessment at the R3 growth stage, has lifted soybean yield an average of 3.5 bu/A when used at 1 qt/A. That equates with a strong, 4.8:1 ROI.

REAX BORON's performance is strongly supported by its C² Technology (reacted carbon and carbohydrates), which promotes both improved foliar absorption and in-plant boron mobility.

NUTRISYNC BORON is another long-term, consistent performer. Applied at a 1 qt/A rate on R3 soybeans, it's given an average 2.1 bu/A yield increase and solid 3.5:1 ROI over five years.

Though once categorized as relatively non-responsive to supplemental boron (B), soybeans today clearly show an increasing demand for well-timed additions of this micronutrient. That assessment is particularly valid in high-yield environments. B aids in root growth, soybean flower development and pollination. It also supports sugar transport from leaves, stems and petioles into developing seeds during pod fill.

Because it's required only in small amounts, foliar feeding offers an ideal, highly efficient way to supply B to soybeans. Both NUTRISYNC BORON and REAX BORON are excellent choices to meet this need.





ANSWERING THE CALL FOR FOLIAR MANGANESE IN CORN

NUTRISYNC® MANGANESE EXCELS IN MULTIYEAR EVALUATIONS AT OWENSBORO FARM

Though manganese (Mn) traditionally has been a more yield-limiting nutrient in soybeans and cereal crops, emerging data suggests its status deserves to be more closely monitored in cornfields, too.

Over the six-year span from 2020 to 2025, 61.7% of all corn tissue samples processed through NutriScription showed Mn trending at below optimum levels. That's based on 65,500 samples submitted from all Nutrien Ag Solutions divisions east of the Rockies.

The prevalence of low or deficient Mn tissue levels was greatest among younger corn plants. Below critical amounts were found in 73.3% of samples collected between crop emergence and the V4 growth stage, while 63.9% of samples in the V6 to V8 category dipped below that line.

Across the categories covering the V10 to R1 stages, samples testing below optimum ranged between 52.7 and 58.4%. Subtle improvement in manganese's status at the mid-season growth stages suggests as corn root systems expand and explore more of the soil profile, they encounter increased levels of the micronutrient to absorb. But are they getting enough in time to fully overcome and offset earlier shortfalls?

According to The Fertilizer Institute, total soil manganese derived naturally from the Earth's crust generally has ranged from 0.002 to 0.30%. For most of North America's modern corn-growing history, this "native" Mn has efficiently met the crop's needs on the vast majority of acres and soil types. But is it sufficient today? The NutriScription numbers cast doubt.

A bushel of corn requires only 0.0002 pounds of Mn. That means a 200 bu/ac crop removes just 0.64 ounces (18.1 grams) per acre. But don't let the tiny physical amount needed obscure manganese's importance. Like other micronutrients, Mn is just as essential to the crop's growth and development as the macro and secondary nutrients that are used in significantly larger amounts. Among its roles, manganese:

- Functions as an activator in plant enzyme systems; it's also a component of certain enzymes,
- Plays a direct role in photosynthesis,
- Accelerates seed germination and crop maturity,
- Aids in lignin synthesis, which is crucial to corn stalk strength and standability, and
- Increases phosphorus and calcium availability.

With both genetic corn yield potential and Mn crop removal poised to continue rising together, the need for supplemental Mn fertilization appears primed to grow, too. An excellent way to supply corn with Mn is by foliar feeding. In fact, spraying a high-quality, water-soluble Mn fertilizer on corn leaves is more efficient than delivering the nutrient via soil-applied sources.

Among foliar product options, Loveland Products' NUTRISYNC MANGANESE is an excellent choice. It is rapidly absorbed by foliage and assimilated into the plant. Proprietary Nutrient Transport Technology (found in all NUTRISYNC-branded products) then speeds mobilization of the Mn to meristematic regions (growth areas) where it's most needed. It also provides the ancillary benefit of remobilizing other nutrients already in the plant at time of application and helping direct them to vital areas of need sooner as well.

NUTRISYNC MANGANESE's performance in corn has stood out consistently across six consecutive years of evaluations at the Nutrien Innovation Farm in Owensboro, KY. In 2020, the farm's research agronomists ran two side-by-side experiments – one featuring NUTRISYNC MANGANESE applied on V10 corn, the other at tassel (VT). Treatments in both studies were randomized and replicated.

The V10 trial was a simple comparison between Trivapro® fungicide used alone as a grower standard practice and a Trivapro + NUTRISYNC MANGANESE combination. Adding the Mn source at 3 pts/A spawned an 11 bu/A yield increase versus fungicide alone (Table 1).



Table 1. NUTRISYNC MANGANESE 3 pts/A on V10 Corn

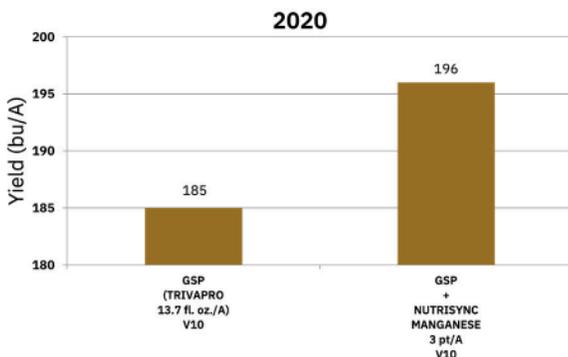
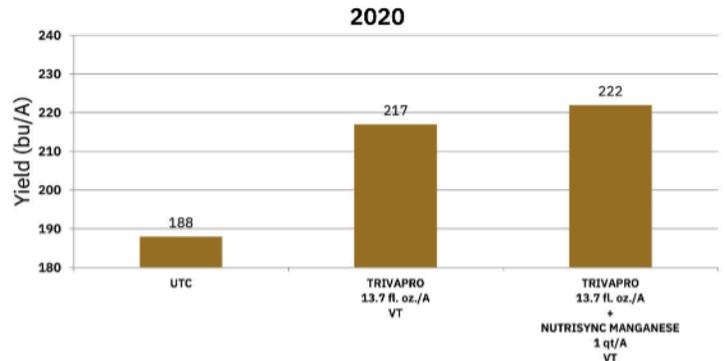


Table 2. NUTRISYNC MANGANESE 1 qt/A on VT Corn



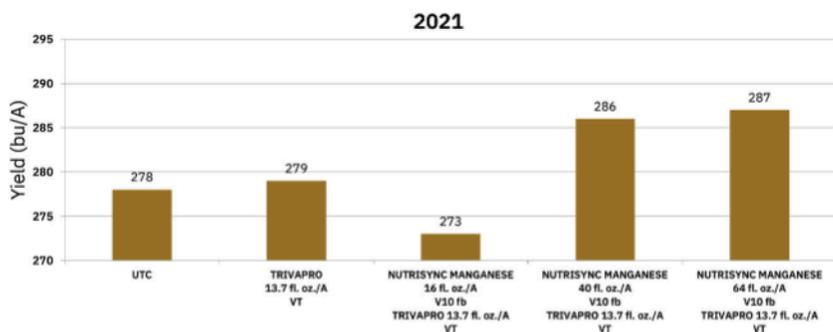
In the VT study (See Table 2), an untreated check was pitted against Trivapro alone and a mix of Trivapro with a slightly lower 2 pt/A NUTRISYNC MANGANESE rate. Trivapro alone at VT boosted corn yield 29 bu/A by protecting the crop against a serious late-season southern rust infestation. Adding Mn to the equation brought even better results, increasing yield another 5 bu/A beyond Trivapro alone.

“Frankly, the 2020 results caught us a little off guard,” reflects Owensboro farm manager Ryan Neely. “Prior to that point we hadn’t run any foliar manganese corn trials. Our soil tests up to that time consistently had shown adequate to high Mn levels at the site where we conducted those tests, so we hadn’t anticipated a significant response to foliar Mn treatment going into this.”

“That made the results all the more eye-opening,” adds Tim Sickman, manager of regional agronomy with Nutrien Ag Solutions. “Despite the existence of significant soil-based Mn, that work drove us to more seriously question whether today’s elite corn genetics are capable of absorbing critical amounts of Mn from the soil fast enough to sustain yield potential. And it simultaneously lends staunch support to foliar feeding as an excellent means of supplementing that need.”

In 2021, the Owensboro farm followed up with another V10 corn study. The work was expanded by evaluating NUTRISYNC MANGANESE at three rates representing the low (16 fl. oz.), middle (40 fl. oz.) and high (64 fl. oz.) points of the recommended rate range per acre for corn on the product label. Table 3 shows those results.

Table 3. NUTRISYNC MANGANESE At Three Rates On V10 Corn



Lack of yield response at the 16 fl. oz. (1 pt/A) rate suggests it was insufficient to fully meet the crop’s Mn needs under the outstanding growing conditions and high yield environment the farm experienced in 2021. But at the 40 fl. oz. (2.5 pts) and 64 fl. oz./A (4 pts) rates, corn yields jumped 8 and 9 bu/A, respectively, versus the untreated check, and 7 and 8 bu/A compared with Trivapro alone.

Neely says it’s notable that NUTRISYNC MANGANESE’s consistent performance at V10 across both years occurred under two significantly different growing environments. The 2020 trial was conducted in late planted (June 1) corn that faced more overall heat and disease pressure, particularly during grain fill. In contrast, the 2021 project was planted April 5 and had near perfect end-to-end growing conditions featuring timely rains, minimal heat stress and low disease pressure. Yet in these two

markedly different scenarios, NUTRISYNC MANGANESE used at V10 beat grower standards by 7 to 11 bu/A.

Between 2021 and 2022, the farm pulled up stakes at its original home and moved about 3 miles west northwest to a new test site, where annual evaluations of NUTRISYNC MANGANESE on V10 corn have continued each year since. Though both the former and current sites are nearly identical in terms of their predominant silt loam soil types and generally level topography, the latter offers significantly improved surface and internal drainage.

“In switching to the new location, we were curious to learn if responses to foliar Mn would be similar,” explains Luke Wilson, senior research agronomist at the Owensboro farm. “With one minor exception, yield results have continued to closely parallel those from the former spot.” Table 4 provides the details.

The 2025 trial is the only one to register a flat response among the six consecutive years of tests between the two locations. The farm staff views it as an anomaly, likely stemming from a flash drought that began at the farm in late July and remained in force through corn harvest.

Sickman agrees. “Even with no yield bump in 2025 factored into the equation, the full data set gathered over the past half dozen growing seasons shows NUTRISYNC MANGANESE on V10 corn has delivered an average 7 bu/A yield increase between the two test sites,” he points out.

Even at today’s lower corn prices, that translates to roughly \$19.50 additional net revenue per acre or a 2.6:1 average ROI.

“The trend we’re seeing at that V10 timing is one of overall consistency,” Neely adds. “NUTRISYNC MANGANESE applied then has produced strong yield responses and positive ROIs in five out of six years or over 83 percent of the time.”

“A foliar nutritional with an 80+ percent win rate over several seasons is one that both Nutrien Ag Solutions crop consultants and grower-customers can place high confidence in,” Sickman asserts.

Importantly, the Owensboro farm also has looked at NUTRISYNC MANGANESE applied on V4 to V5 corn (post herbicide timing). However, responses at those earlier growth stages have been limited in their environment.

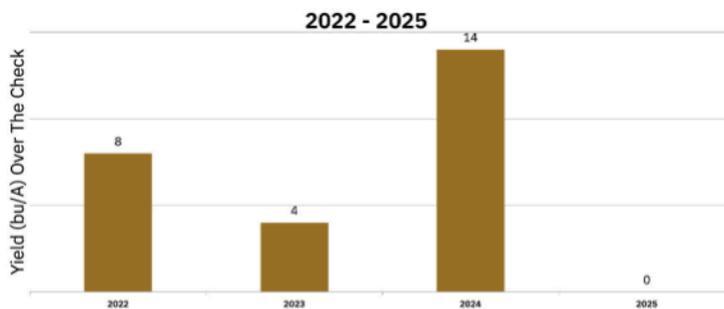
“That’s not to say good responses aren’t possible from earlier spray timings in other corn-growing settings or geographies,” Sickman emphasizes. “In soils with either low Mn levels or those that tend to tie it up (e.g., high organic matter) foliar manganese at V4 to V5, for example, likely would perform quite well.”

“Yet across six years of studies under our specific conditions at Owensboro,” Wilson adds, “the V10 timing consistently has sorted out to be the sweet spot, with VT also having shown a decent level of yield response in earlier work.”

Though V10 lands in between traditional post herbicide and fungicide spray timings, the Owensboro farm team urges progressive growers to carefully consider its strategic significance.

“V10 occurs almost in the middle of corn’s most aggressive stretch of vegetative growth and nutrient uptake. It affords a timely opportunity to spoon feed supplemental nutrition or apply abiotic stress relief agents, both of which likely will continue to rise in importance as yield potential continues trending upward,” Sickman concludes.

Table 4. NUTRISYNC MANGANESE 2 qts/A on V10 Corn



TIM SICKMAN MANAGER, REGIONAL AGRONOMY



NUTRIEN AG SOLUTIONS PARTICIPATING IN BAYER'S PRECEON™ GROUNDBREAKER PROGRAM

Over the past 5 years, Nutrien Ag Solutions has been testing, learning, and working closely with Bayer Crop Science's Preceon™ Smart Corn System, Bayer's new short-stature corn. Nutrien and Bayer are exploring how to best deliver a valuable Preceon Smart Corn System experience for Nutrien's farmers - working within Nutrien's extensive retail footprint, utilizing Nutrien's agronomic expertise, and leveraging digital systems. Bayer provides the product innovation, seed genetics, and overall system design, while Nutrien Ag Solutions contributes agronomic insights & grower engagement to support management of the crop across the season. The system is enabled by field specific insights, powered by Bayer's FieldView™ platform and Nutrien's Digital Hub.

A major focus of the collaboration has been working within Bayer Crop Science's Preceon Ground Breakers® program to build a scalable launch model, which enables selected Nutrien Crop Consultants to identify and work alongside participating growers. This approach ensures the system is tested and adopted under real-world retail conditions. From a digital perspective, both companies are working to coordinate data alignment between platforms to create a seamless experience for growers.

Together, Bayer and Nutrien are preparing for successful participation in the 2026 Ground Breakers program which will lay the foundation for the continued collaboration. If you are interested in learning more, please reach out to your Nutrien Ag Solutions Crop Consultant.



From left to right: Justin Ritchhart, Bayer; Devin Hammer, Bayer; Ryon Appel, Nutrien; Haley Underwood, Nutrien; Jason Holman, Bayer; Sean Evans, Bayer; Lindsey Battle, Bayer; Scott Stein, Bayer; Andrew Penney, Bayer



WINTERVILLE, MS



**SCAN THE QR TO VISIT THE WINTERVILLE
INNOVATION FARM RESULTS PAGE**

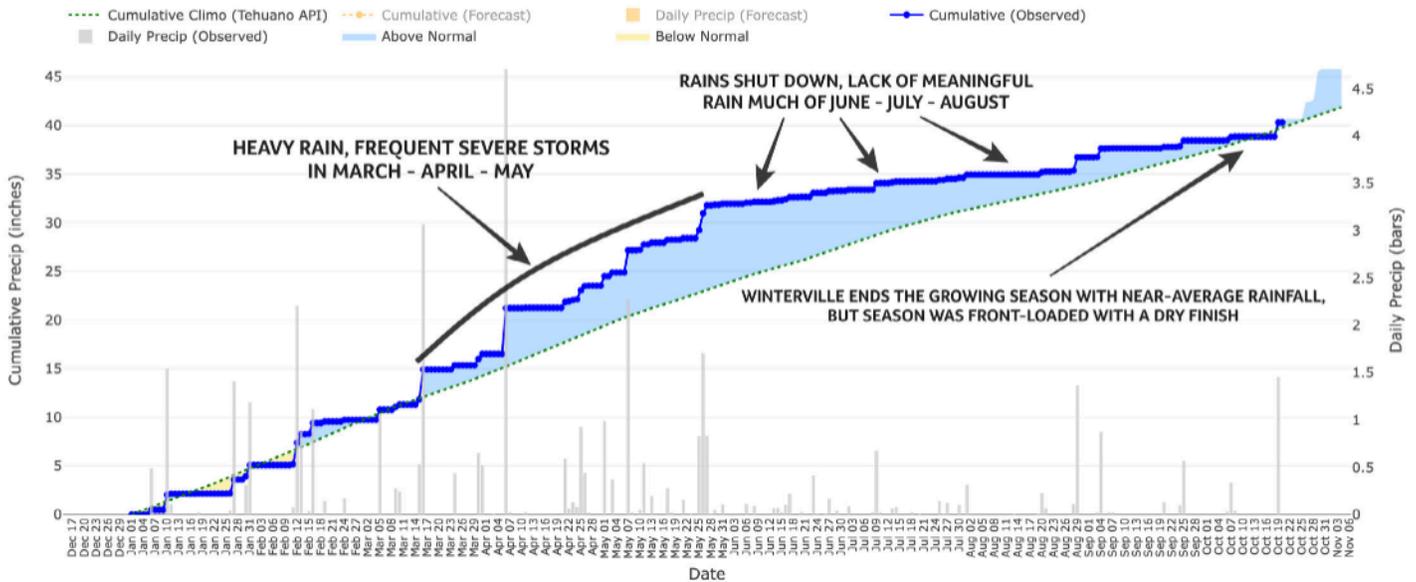
WINTERVILLE, MS WEATHER

At Winterville, MS, late winter and spring storm systems brought flooding and difficult fieldwork conditions from March through May. Between April 20 and May 27 alone, the farm picked up nearly 10 inches of rain, but unlike nearby Owensboro, KY the rains shut off after late May leading to summer drought development across the Lower Mississippi River.

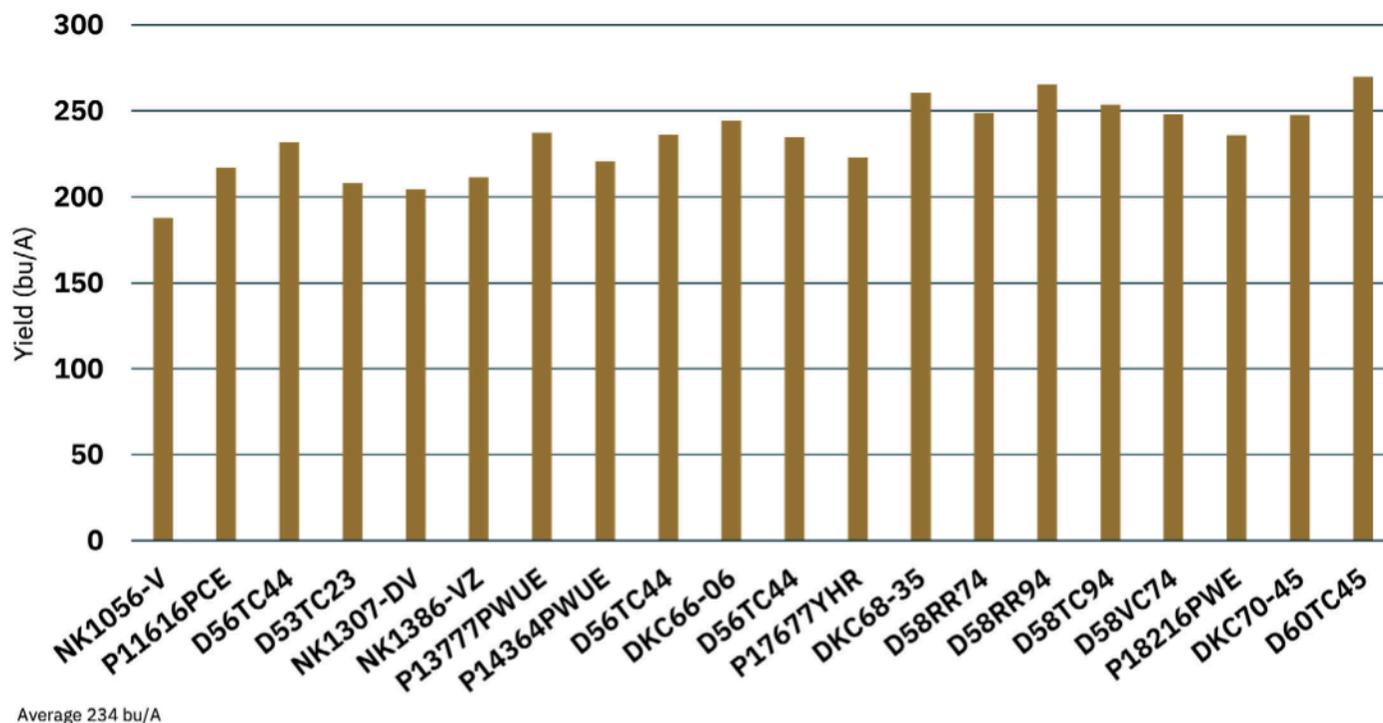
Heat and humidity reached record levels at times in June, July, and August, with summer 2025 ranking among the top 30 hottest in 133-years of weather records for the region. While there was some relief from summer heat in September and October, a lack of regular rainfall dating back to late May allowed significant drought to establish itself across the region during the fall harvest season.

ANDREW PRITCHARD SENIOR SCIENTIST

2025 PRECIPITATION SUMMARY FOR WINTERVILLE, MS



Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	3/27/25 - 3/28/25	At-Planting	8/11/25 - 8/14/25



OBJECTIVE:

The purpose of these trial blocks was to display key corn hybrids from four supplier genetic lineups, as well as Dyna-Gro® Seed.

METHOD:

Seeding Rate ~35,000 seeds/A

Fertilizer Applied – 246 lbs N Total

- 0-23-30 @ 200 lbs/A + 1.6 oz./cwt TITAN® XC Preplant
- 41-0-0-4 @ 125 lbs/A – Planting
- 28-0-0-5 @ 50 gal/A + 1 gal/A BLACKMAX® 22– Sidedress V5
- 46-0-0 @ 100 lbs/A – VT

Herbicides Applied

- 16 oz./A FORTITRI® + 32 oz./a ATRAZINE – Pre-emerge
- 64 oz/a Halex® GT + 32 oz./a ATRAZINE – V4

Nutritional's Applied

- 2 oz./A RADIATE® – V4
- 32 oz./A NUTRISYNC® COMPLETE 3D – V4
- 32 oz./A TERRAMAR® – V4

TAKEAWAYS:

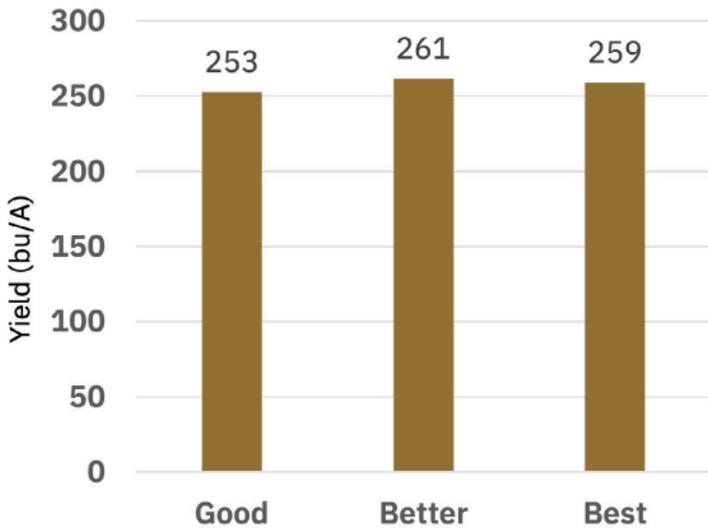
Corn yield results had Dyna-Gro Seed D60TC45 with the highest overall yield @ 270 bu/A. For three consecutive years, D60TC45 has been the highest yielding corn hybrid at the Winterville, MS location.

Additional hybrids that averaged over 250 bu/A included: D58RRC94 @ 265 bu/A; DEKALB® 68-35 @ 261 bu/A; and D58TC94 @ 254 bu/A.

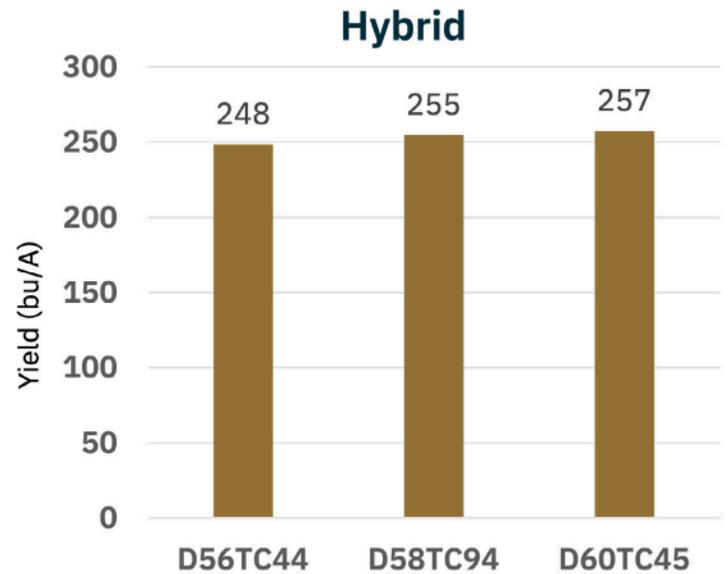


CORN - GOOD, BETTER, BEST PROGRAMS

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
D56TC44 D58TC94 D60TC45	3/27/25	Multiple	8/13/25



Average 253.5 bu/A



Yields averaged across all treatments. Excluded rep 3 due to salt injury.

OBJECTIVE:

The purpose of this trial was to evaluate three product management plans for corn from Loveland Products, on three Dyna-Gro® Seed hybrids: D56TC44, D58TC94, D60TC45.

METHOD:

Every plot to receive “good” treatments.

“Better” = Good + Better

“Best” = Good + Better + Best

Good Treatments

- 1.6 oz./cwt TITAN® XC on dry P&K blends
- 16 oz./A INFUSE® @ planting
- 2 oz. RADIATE® @ V4

Better Treatments

- 13.7 oz./A Trivapro® @ VT
- 2 oz./A FRANCHISE® CO-PILOT @ VT
- 1 gal/A BLACKMAX® 22 @ Sidedress

Best Treatments

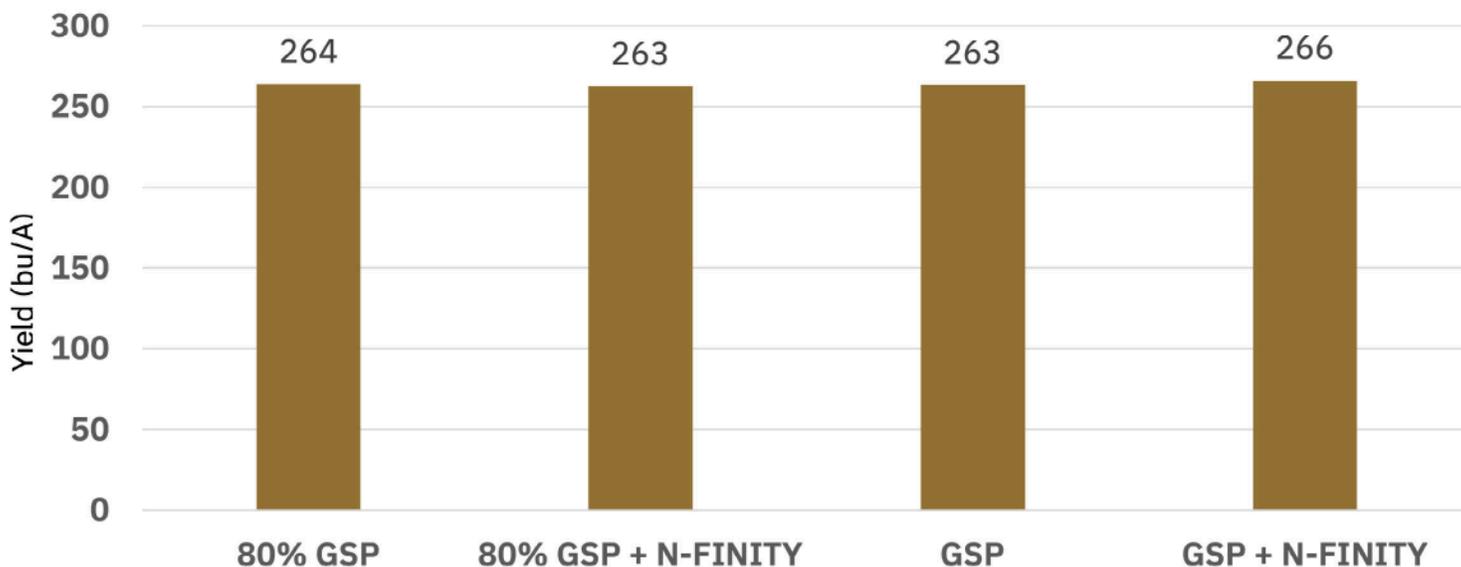
- 16 oz./A NUTRISYNC® COMPLETE 3D @ V6
- 32 oz. TERRAMAR® @ V6

TAKEAWAYS:

Better and Best treatments resulted in an increase of 8 and 6 bushel, respectively, as compared to the Good treatment @ 253 bu/A (Figure I).

Comparing Dyna-Gro Seed hybrid performance, when averaged across treatments, yields were greater than 255 bu/A for both D58TC94 and C60TC45 (Figure II).

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
D60TC45	3/26/25	4/28/25 (V5)	8/14/25



Average 264 bu/A

OBJECTIVE:

The purpose of this trial was to evaluate the benefits of adding N-FINITY™ for nitrogen management, while also decreasing the total amount of nitrogen that was applied.

METHOD:

Four treatments were applied via sidedress coulter applicator @ V5 and replicated thrice:

Grower Standard (GSP)

- 50 gal/A 28-0-0-5

GSP + N-FINITY

- 50 gal/A 28-0-0-5
- 32 oz./A N-FINITY

GSP @ 80%

- 40 gal/A 28-0-0-5

GSP @ 80% + N-FINITY

- 40 gal/A 28-0-0-5
- 32 oz./A N-FINITY

TAKEAWAYS:

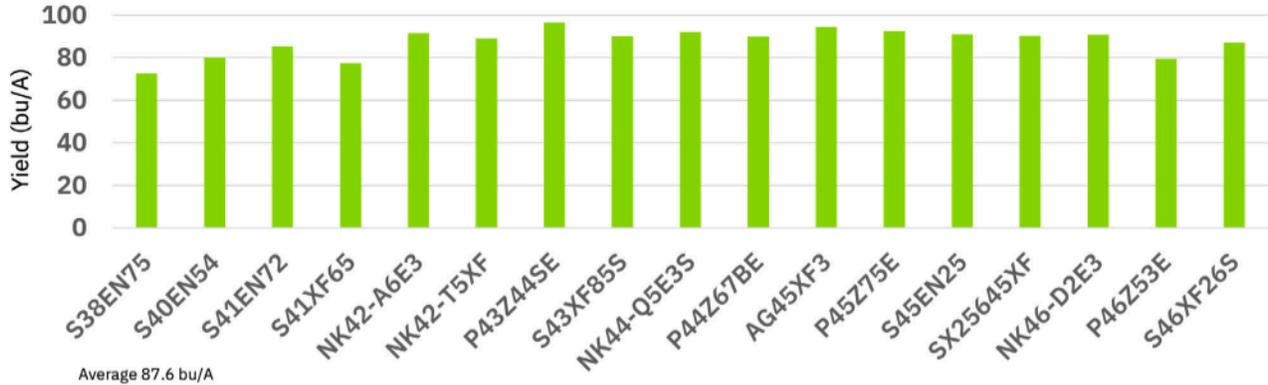
Corn plots averaged 264 bu/A across all treatments. There were no statistical differences between any treatments. Trial exhibited no nitrogen stress throughout the growing season even at 80% N use rate. Nitrogen use efficiency (NUE) of 1.07 to 1.34 was calculated for this trial. Future studies will further reduce N rates to capture critical N levels to maximum corn yield in the Delta.



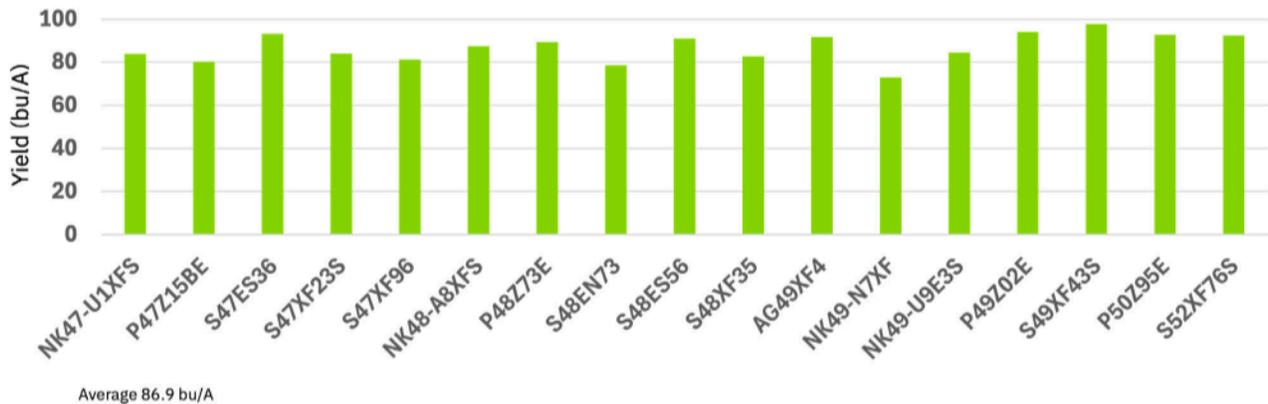
SOYBEAN VARIETY TRIALS

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	4/14/25 - 4/15/25	At-Planting	9/12/25 - 9/15/25

Early Maturity Trial



Mid-Full Maturity Trial



OBJECTIVE:

The purpose of this trial block is to display key soybean varieties from four supplier genetic lineups and Dyna-Gro® Seed.

METHOD:

Herbicides Applied

- 32 oz./A INTIMIDATOR® + 16 oz./A INFUSE® – Pre-plant
- 32 oz./A Prefix® + 25 oz./A Liberty® ULTRA + 38 oz./A MAKAZE® @ V4

Nutritional's Applied

- 2 oz./A RADIATE® @ V4
- 16 oz./A NUTRISYNC® COMPLETE 3D @ V4

- 32 oz./A TERRAMAR® @ R3
- 64 oz./A LOKOMOTIVE® @ R3
- 16 oz./A NUTRISYNC BORON @ R3

Fungicides Applied

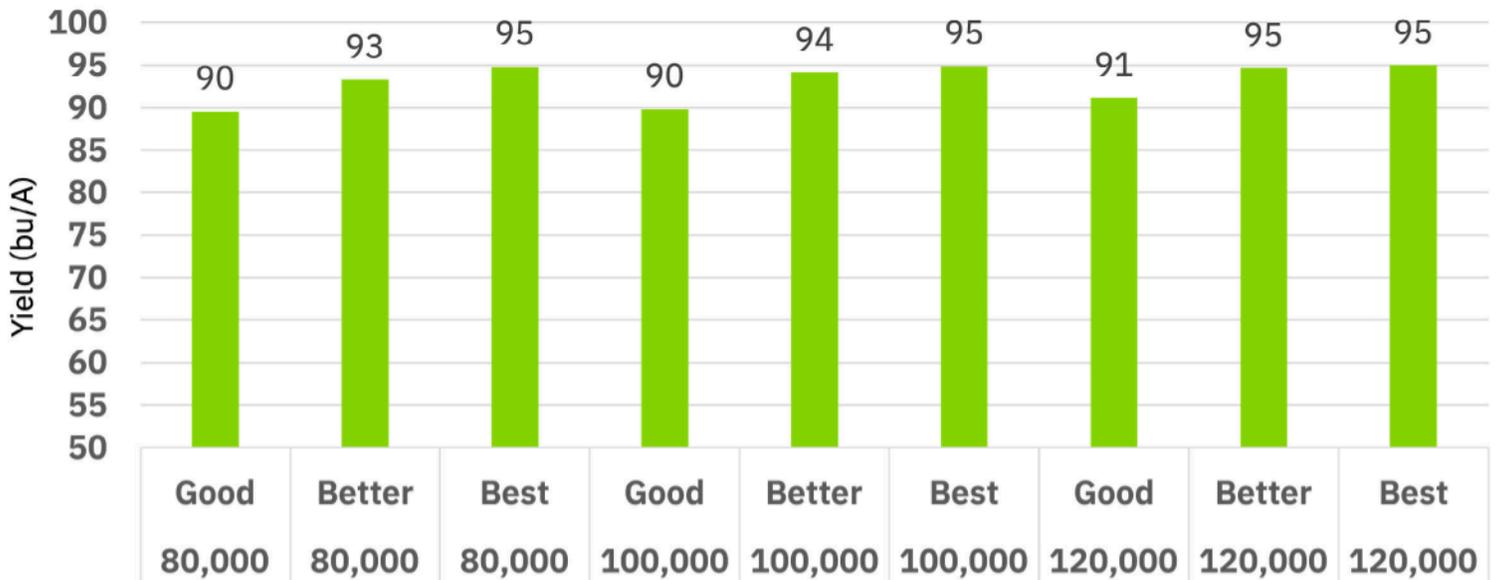
- 13.7 oz./A Miravis® Top + 2 oz./A FRANCHISE® CO-PILOT @ R3

TAKEAWAYS:

Dyna-Gro Seed S49XF43S averaged 98 bu/A was the highest yielding variety in 2025. The 2024 trial winner, Pioneer® Seed P49Z02E, placed second among full season varieties @ 94.1 bu/A. Among early maturing varieties Pioneer Seed P43Z44SE @ 96.5 bu/A, Asgrow® AG45XF3 @ 94.4 bu/A and Dyna-Gro Seed S45EN25 @ 91 bu/A.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
S49XF43S	4/14/25	Multiple	9/15/25

SOYBEAN - GOOD, BETTER, BEST PROGRAMS



Average 93 bu/A

OBJECTIVE:

The purpose of this trial was to evaluate three Loveland Products management plans for soybeans.

METHOD:

Every plot to receive “good” treatments.

“Better” = Good + Better

“Best” = Good + Better + Best

Seeding Rate – 80,000; 100,000; 120,000 seeds/A

Good Treatments

- 1.6 oz./cwt TITAN XC on dry P&K blends
- 16 oz./A INFUSE @ planting
- 2 oz. RADIATE @ V4

Better Treatments

- 13.7 oz./A Miravis® Top + 2 oz./A FRANCHISE CO-PILOT @ R3

Best Treatments

- 16 oz./A NUTRISYNC COMPLETE 3D @ V4
- 32 oz./A TERRAMAR® @ R3
- 64 oz./A LOKOMOTIVE® @ R3
- 16 oz./A NUTRISYNC BORON @ R3

TAKEAWAYS:

For the second year in a row there were no statistical differences in soybean population with all populations averaging 93 bu/A. On average, Better and Best treatments out yielding Good treatments from 3-5 bu/A, respectively. While not the 8-10 bushel response we observed in 2024, yields were improved above the Good only treatments.



RICE VARIETY TRIALS

OBJECTIVE:

The purpose of this trial block is to display key rice varieties from four supplier genetic lineups and Dyna-Gro® Seed.

METHOD:

Row Spacing – 7.5” drill

Variety – DG263L ~40 lbs/A

Fertilizer Applied – 167 lbs N Total

- 9-23-30 @ 200 lbs/A + 1.6 oz./cwt TITAN® XC – Preplant
- Zinc Sulfate @ 28 lbs/A – Preplant
- 41-00-4 @ 250 lbs/A – Early Tiller
- 46-0-0 @ 100 lbs/A – Mid-Season

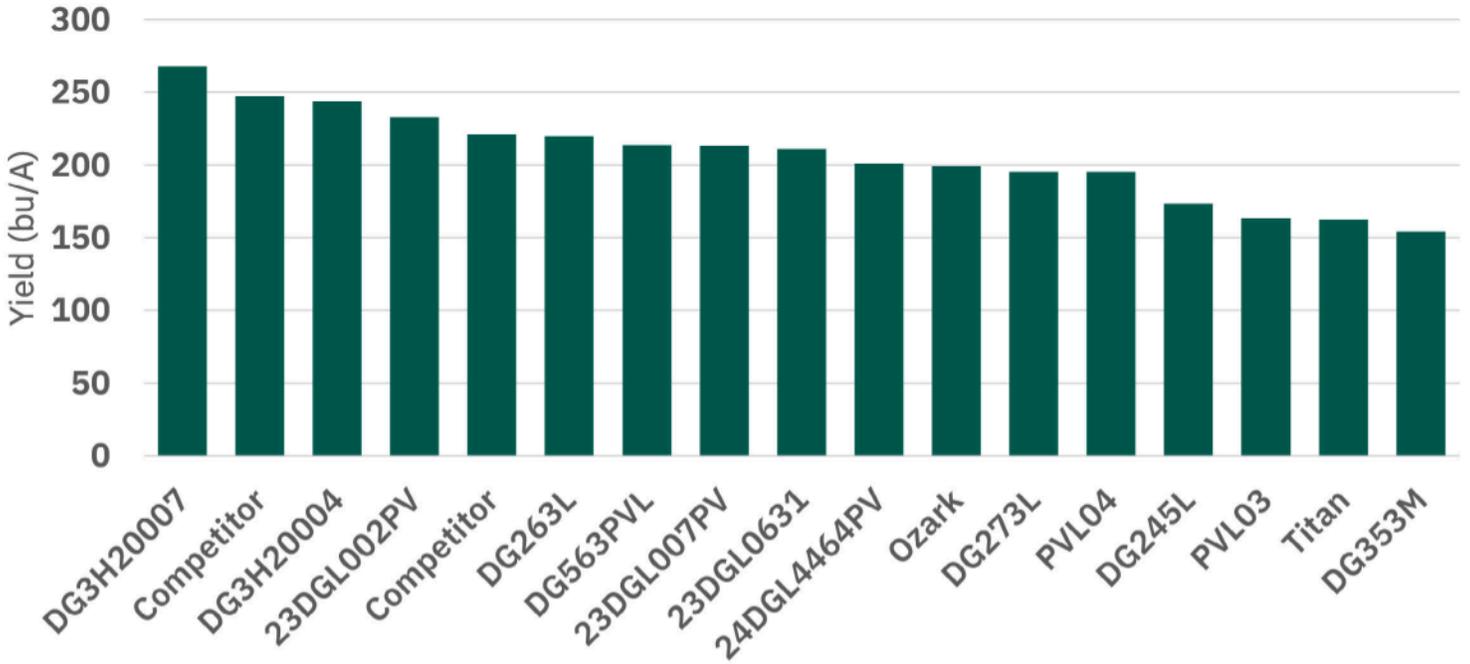
Herbicides Applied

- 8 oz./A Command® 3ME + 3 oz./A Sharpen® – Pre-emerge
- 15 oz. Clincher® SF + 38 oz./A STEALTH® + 16 oz./A HERBIMAX® – 3 Leaf Rice

TAKEAWAYS:

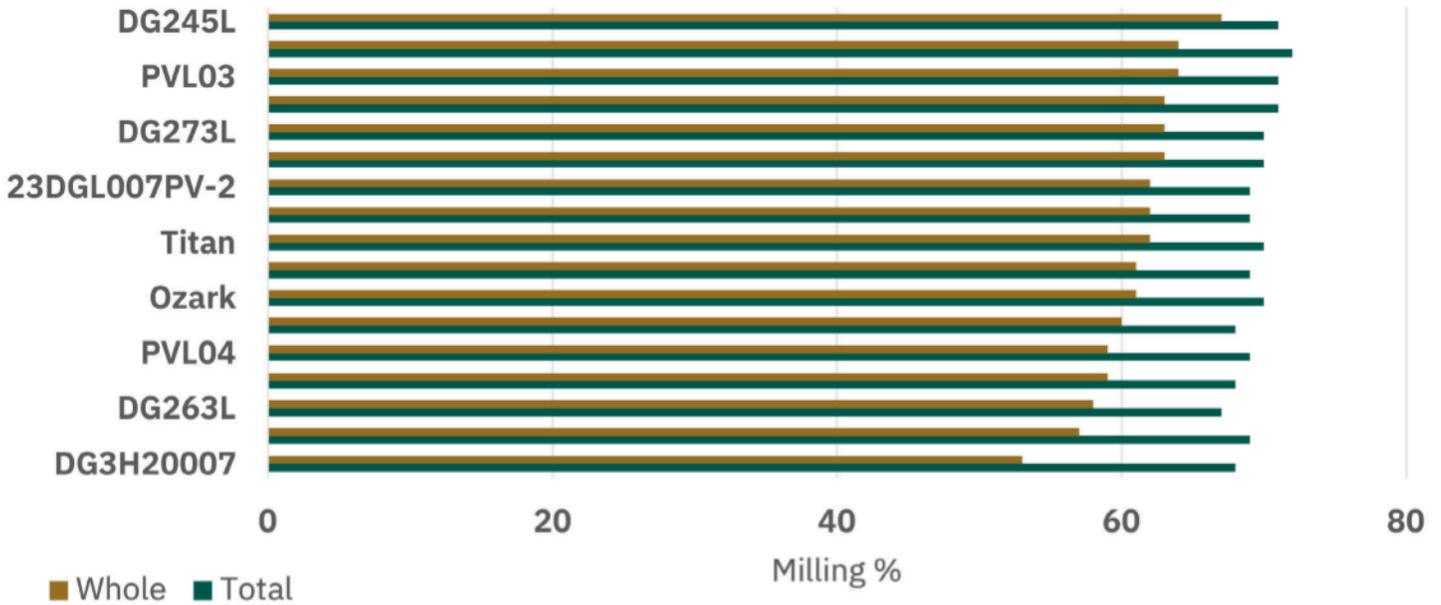
The Dyna-Gro Seed Variety Strip Trial serves as a data set to gather geographical data points across multiple environments. The Winterville, MS Innovation Farm offers a sandy loam soil type with a higher pH that often taxes rice plants in the way of nutrient availability as well as increased herbicide activity for certain compounds. The Dyna-Gro hybrids performed exceptionally well at this site yielding with currently available hybrids. DG263L, DG563PVL, and DG273L performed well compared to other inbred lines with DG245L leading the way in milling yields, a consistent quality metric seen across multiple environment.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Multiple	4/15/25	Multiple	8/19/25



Average 207 bu/A

Milling Yield





PRECISION AGRONOMY: A SMARTER APPROACH TO MANAGING SUB-FIELD VARIABILITY

Historically, site-specific management approaches have been limited to single-factor practices—fertilizer or seeding rate, hybrid, or timing. Growers today require more than a single-factor approach to drive yield—they require a data-driven precision system that connects agronomy, economics, and technology to reveal true return on investment (ROI) at the field level.

In 2025, Nutrien utilized a precision agronomic systems approach at the Owensboro Innovation Farm to optimize every input decision at a sub-acre level—fertility, seeding, and product placement—around measurable return on ROI. Rather than treating these decisions as independent, the systems approach connects them through our proprietary HD technology, digital tools, and innovation farm insights that drive both agronomic and economic performance.

TOTAL MANAGEMENT PLAN IN CORN

SEEDING	NITROGEN	TREATMENT	DIFFERENCE/ ADDITION
34,000 VS HD SEED RECOMMENDATIONS (32,000 - 36,000)	225 lbs STATIC VS HD NITROGEN RECOMMENDATIONS (200 - 250 lbs)	1	STANDARD MANAGEMENT PROGRAM
		2	BLACKMAX 22 (V4 SIDE-DRESS)
		3	BLACKMAX 22 (V4 SIDE-DRESS) NUTRISYNC COPPER (POST-HERBICIDE)

IN-FURROW: RISER + SNIPER
 VT: TRIVAPRO + TOMBSTONE + NUTRISYNC BORON



Figure 1. Nutrien Agronomy total precision agronomic system management plan in corn for Owensboro Innovation Farm.

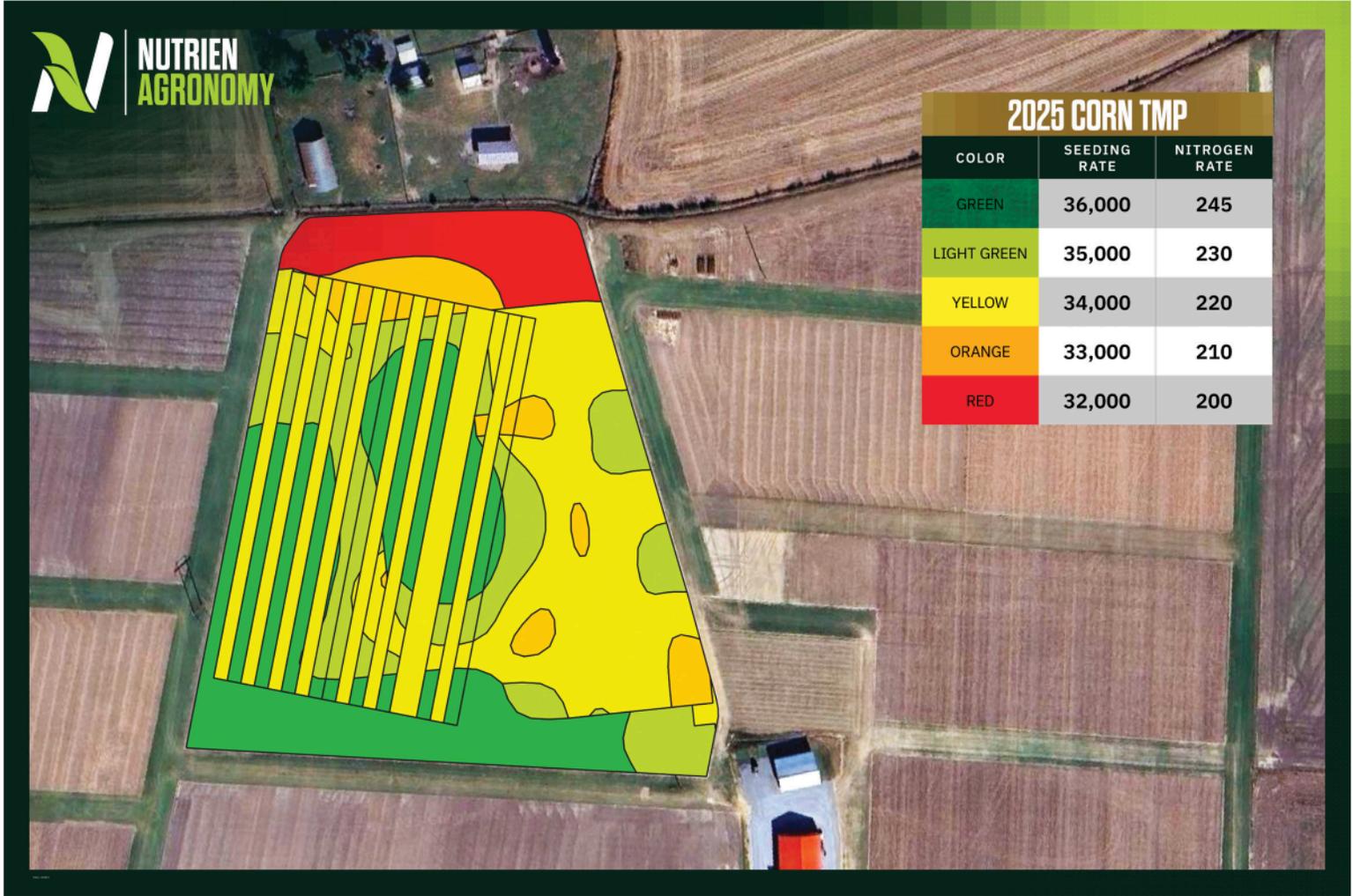


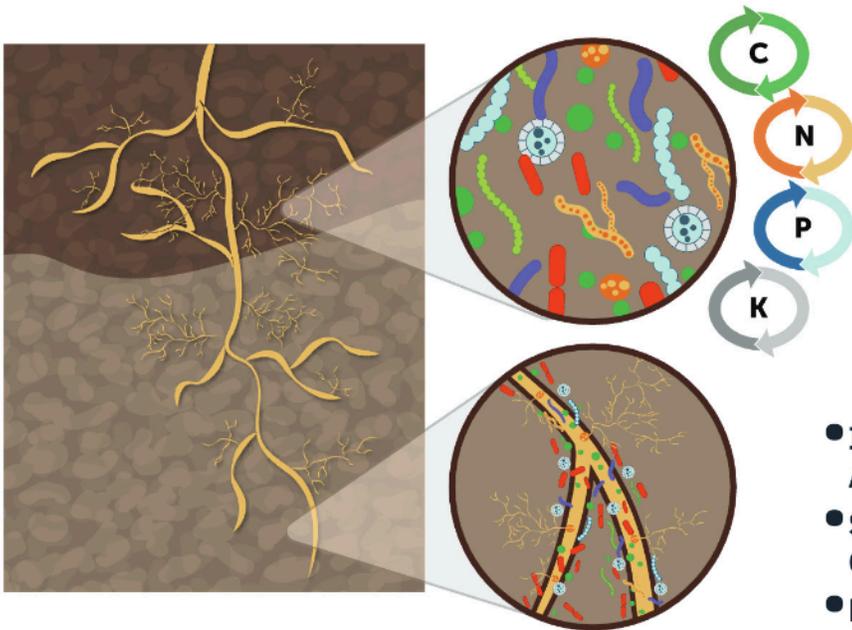
Figure 2. Precision Agronomy systems approach to corn seeding, fertility, product placement and hybrid management plan

Precision agronomic practices are more than operational efficiency—it’s the foundation of sustainable and profitable agronomy. By integrating variable-rate fertility, seeding, and placement into a single precision agronomy system, growers can move from descriptive agronomy to predictive profitability, turning field variability into a competitive yield advantage with our Dyna-Gro Seed and Loveland Products.

JENNI FRIDGEN AGRONOMIC SALES MANAGER

SOIL BIOLOGY AT THE INNOVATION FARMS

For the past four years, soil biology testing has improved our understanding of how certain products and practices perform across the Innovation Farms. While yield is a critical metric of agronomic success, soil biology helps show the in-season impacts of our programs and pinpoint why treatments affect yield. This insight improves how we communicate the agronomic benefits of our approaches and, long term, will be essential to enabling more confident recommendations and improved product placement.



What is soil biology?

- INCREDIBLY DIVERSE, COMPLEX COMMUNITY OF MICROORGANISMS
- ENGINE THAT DRIVES NUTRIENT CYCLING

What do soil microbes do?

- INCREASE NUTRIENT AVAILABILITY AND UPTAKE
- STIMULATE CROP GROWTH AND PROTECT CROPS FROM STRESS
- BUILD GOOD SOIL STRUCTURE

WHAT IS SOIL BIOLOGY?

Soil biology is the living component of soil, and the term often specifically describes the microscopic life within soils. While soil biology includes a wide range of microbes, it is typically dominated by bacteria and fungi, which play three key agronomic roles:

- **Microbes keep nutrients moving**
 - » The role soil microbes play in cycling nutrients, especially nitrogen, can't be overstated. When we talk about nutrient cycling, we're typically referring to the transformation of nutrients like nitrogen, phosphorus, and potassium between crop-available forms (like phosphates) and other forms that crops can't use (like calcium phosphates). Most of these nutrient-cycling transformations depend on microbial activity.
- **Bacteria and fungi make pathways for water**
 - » Bacteria and fungi each play unique roles in building soil structure. Bacteria make sticky glues that bind soil particles together, improving structure at both small and large scales. Fungi make other kinds of glues and grow through the soil like roots, physically holding soil together. Together, these bacterial glues and fungal "roots" create channels for water to move through. This kind of structure improves water infiltration and reduces evaporative loss.
- **Soil biology helps crop handle stress**
 - » Microbes generally support crop health by cycling nutrients and building soil structure that helps retain water. However, some microbes play more specific roles in reducing crop stress. One especially important group of microbes is arbuscular mycorrhizal fungi, often abbreviated AMF. These AMF grow into crop roots and extend outward into the soil, collecting nutrients (mainly phosphorus) to trade for crop sugars. By growing past the root zone, AMF effectively expand crop root mass. This improves crop access to other nutrients like nitrogen as well as water, helping to protect crops during drought.

CONTACT

If you would like more information on soil biology testing, contact your Agronomic Sales Manager or a member of the Waypoint Soil Biology team below:

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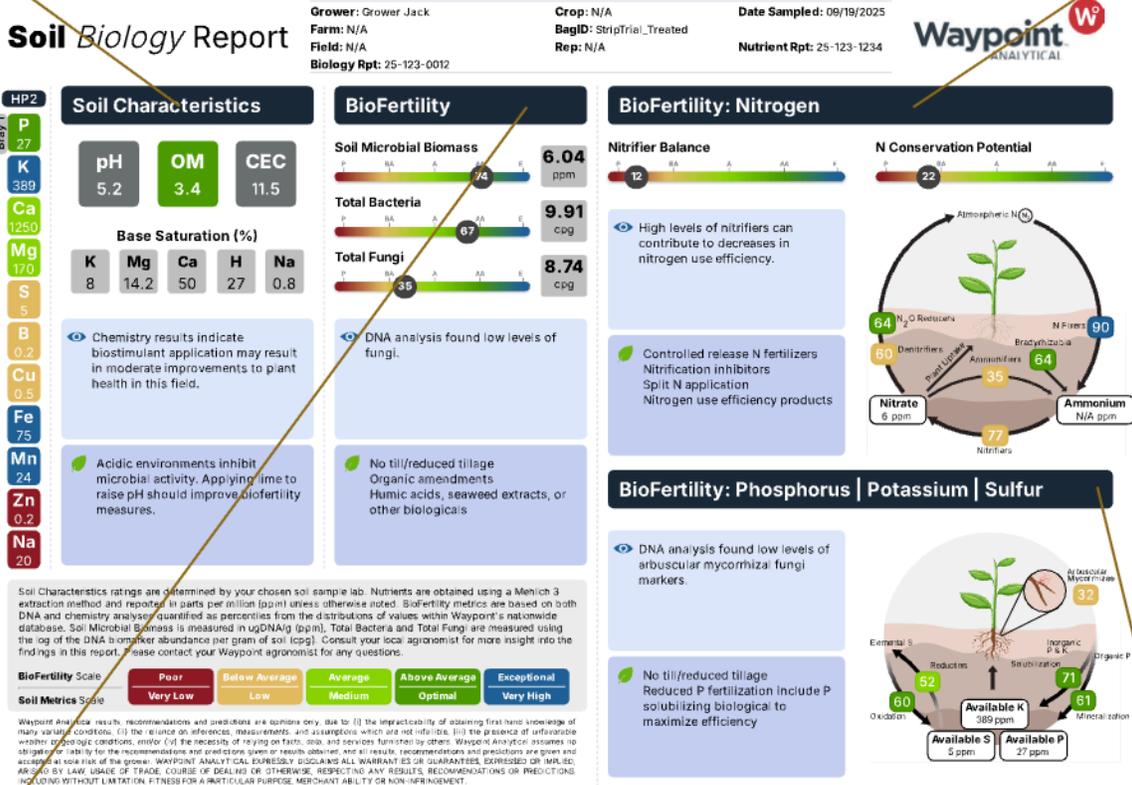
ABryan@waypointanalytical.com

SOIL CHARACTERISTICS

This section will include the traditional results from your requested soil nutrient extraction. The information about nutrient availability and soil characteristics provided here is helpful for interpreting biological results within the context of your soil.

BIOFERTILITY: N

The metrics under this section describe the nitrogen-cycling organisms in your soil and how these microbes are balanced between nitrogen loss and retention. You can use this section to guide your nitrogen management decisions.



BIOFERTILITY

This section describes the total amount of life in your soil, as well as the specific abundances of fungi and bacteria. These values are great indicators of how much horsepower your soil has to break down residues, store carbon, slow soilborne disease, and build good soil structure.

BIOFERTILITY: P, K & S

These metrics tell you how inclined your soil is to cycle P, K, and S into crop-available forms. You can use this information to inform your fertility and management decisions.

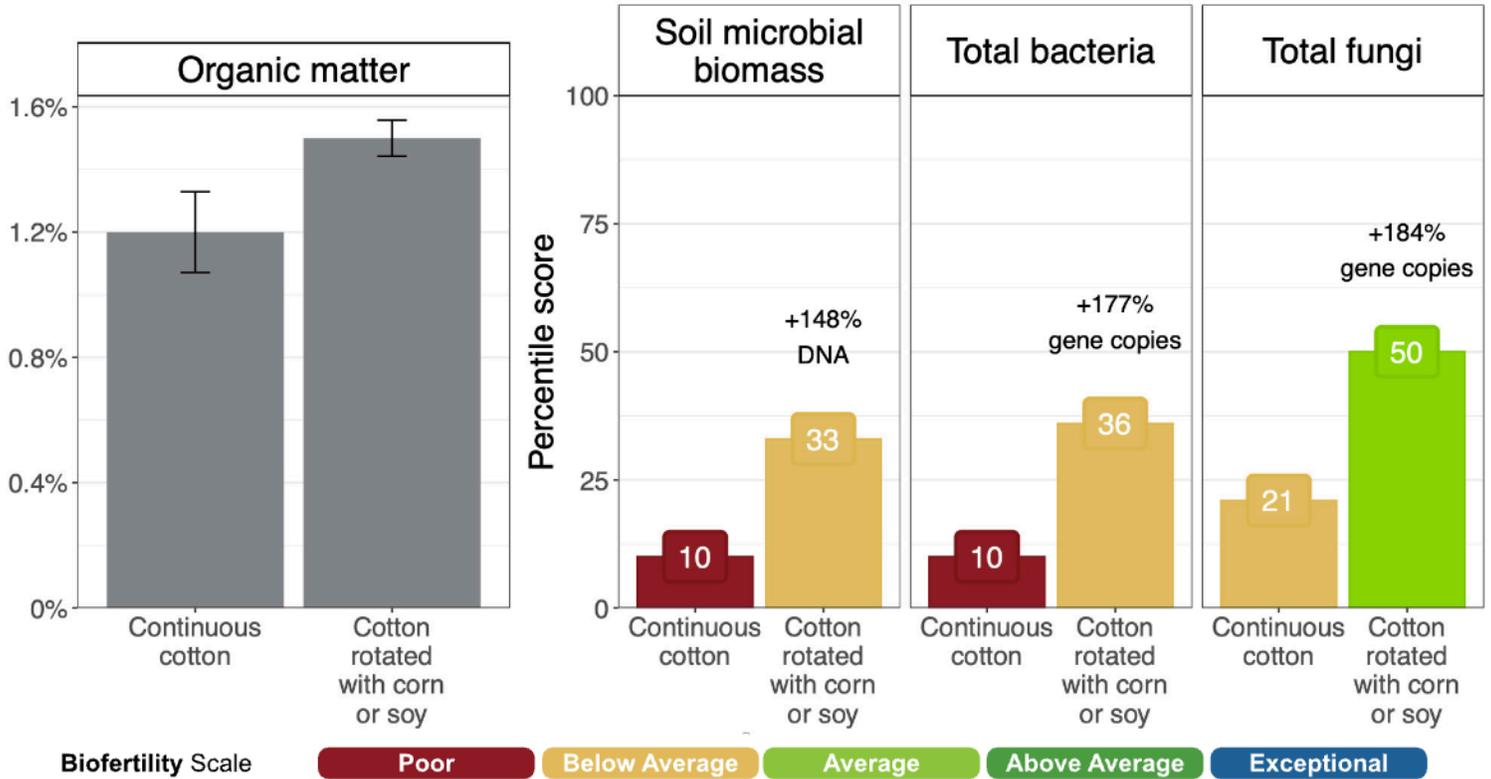
THESE RESULTS, RECOMMENDATIONS AND PREDICTIONS ARE OPINIONS ONLY, DUE TO: (I) THE IMPRACTICABILITY OF OBTAINING FIRST-HAND KNOWLEDGE OF MANY VARIABLE CONDITIONS, (II) THE RELIANCE ON INFERENCES, MEASUREMENTS, AND ASSUMPTIONS WHICH ARE NOT INFALLIBLE, (III) THE PRESENCE OF UNFAVORABLE WEATHER OR GEOLOGIC CONDITIONS, AND/OR (IV) THE NECESSITY OF RELYING ON FACTS, DATA, AND SERVICES FURNISHED BY OTHERS. USER ASSUMES NO OBLIGATION OR LIABILITY FOR THE RECOMMENDATIONS AND PREDICTIONS GIVEN OR RESULTS OBTAINED, AND ALL RESULTS, RECOMMENDATIONS AND PREDICTIONS ARE GIVEN AND ACCEPTED AT SOLE RISK OF THE GROWER. USER EXPRESSLY DISCLAIMS ALL WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED, ARISING BY LAW, USAGE OF TRADE, COURSE OF DEALING OR OTHERWISE, RESPECTING ANY RESULTS, RECOMMENDATIONS OR PREDICTIONS, INCLUDING WITHOUT LIMITATION, FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY OR NON-INFRINGEMENT.



SOIL BIOLOGY AT THE INNOVATION FARMS (CONT)

AT WINTERVILLE

For many years, Winterville has been rotating some cotton fields into corn or soy, while keeping others in continuous cotton. Rotating is more costly, but corn and soy leave behind valuable nitrogen-rich residues compared to the woody, nitrogen-poor residues from cotton. Continuous cotton can create nitrogen limitations that slow microbial activity and reduce the availability of other nutrients. Rotation helps improve crop nutrition in cotton years in part by feeding soil microbes, which play a key role in making nutrients available to crops.



To assess how rotations had changed soil biology, we sampled seven cotton fields at Winterville. All seven fields were in cotton when samples were pulled, but four fields had been in continuous cotton and the remaining three had been rotated with corn or soy.

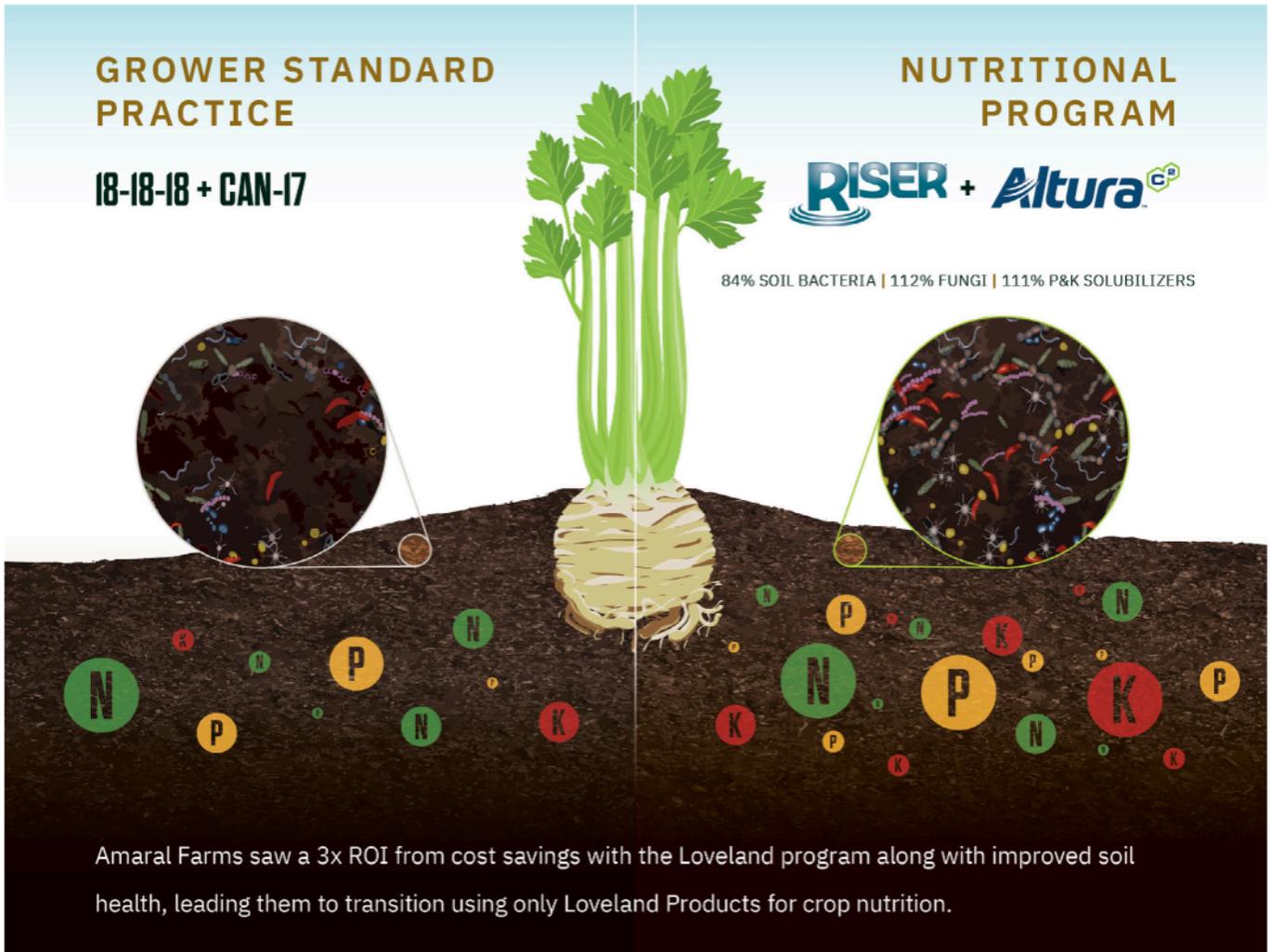
Cotton fields in rotation had more than twice as much bacteria and fungi as fields in continuous cotton. This is strong evidence that nitrogen-rich corn and soy residues are feeding soil biology. A larger, more active microbial community can break down more organic material and cycle nutrients into forms crops can use more quickly. Because microbes store nutrients in their cells, higher levels of biology also represent larger pools of nutrients that can't be leached but can become available when microbes die.

Rotated fields also showed improvements to organic matter. As microbes process crop residues and die, their bodies contribute to the formation of organic matter. While organic matter takes years to build, soil biology will respond more quickly to management changes, with higher levels of biology signaling an improved capacity to build up organic matter over time.

AT SELMA

California's Ag Order 4.0 limits nitrogen applications in an effort to reduce nitrate levels in drinking-water aquifers along the Central Coast. Over the next few decades, growers will gradually be required to reduce nitrogen applied. The order has sparked conversation about how to maintain yields with reduced inputs.

The Gonzales satellite farm, located in California's Central Coast, was interested in reducing inputs from their standard celery program of 600 lbs/A of 18-18-18. The alternative program they decided to trial used RISER® and ALTURA™ supplemented with CAN-17. This program cut applied nitrogen by 26%, and slashed phosphorus and potassium applied by 89% and 99%, respectively.



The RISER and ALTURA program produced the same yield (in cartons/acre) as the grower standard, and the soil biology data collected point to why a program with less nutrients applied still maintained yields. For one, soils treated with RISER and ALTURA had more than twice as much fungi, which not only break down nutrients trapped in organic matter, but also homogenize nutrition in the soil. The program also specifically promoted microbes that keep nitrogen, phosphorus, and potassium in crop-available forms. Together, these results suggest that increased soil biology stimulated by RISER and ALTURA was able to help make up the difference in nutrients applied to keep yields high.



SELMA, CA



**SCAN THE QR TO VISIT THE SELMA
INNOVATION FARM RESULTS PAGE**

Paramount

Fruit

Del Rey, CA

2005



PARAMOUNT FRUIT
Processing

INNOVATION FARM WEATHER

TRACKING FIRES AND FOG IN A WESTERN SUMMER

“It’s chilly here!” That’s been the recurring text from friends and colleagues in San Francisco. And they’re not wrong. So far, 2025 is shaping up to be one of the coolest summers in the Bay Area since the late ‘90s or earlier, with average temperatures hovering around 59°F. The same chill stretches down the coast through Los Angeles and San Diego.

Meanwhile, back here in Central Illinois, where my office and our Champaign Innovation Farm are located, we’ve been dealing with heat indices well over 100°F in recent days and humidity levels that have the outside air resembling something like soup. It’s been a stark contrast to the foggy, jacket-worthy mornings out West. Consider me envious. That cooler air hasn’t always been limited to the coast. It’s occasionally surged inland, slipping across the Coastal Ranges and moderating temperatures in California’s Central Valley. Despite a few isolated heatwaves, much of the region has run near or even below historical temperature averages since the start of summer. This is a big change from 2024, when record-breaking heat dominated much of the western U.S.

WHAT’S DRIVING THE COOLDOWN?

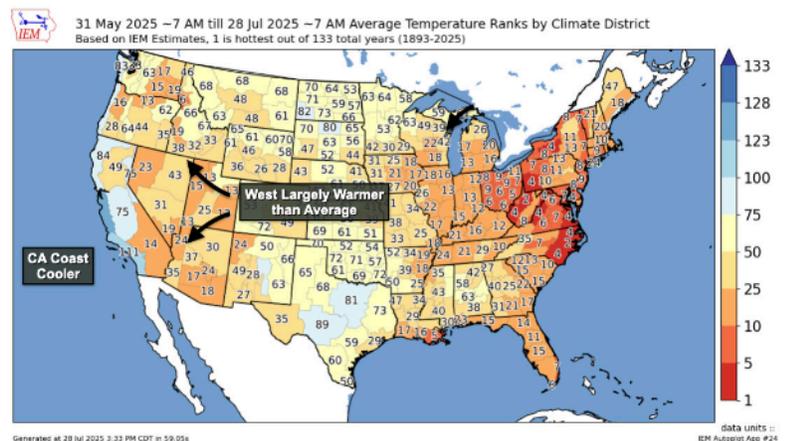
One key player: the North Pacific High. This semi-permanent high-pressure system sits off the West Coast and is especially strong this year. It enhances onshore flow, essentially pushing in cool, moist marine air from the ocean. When this high is strong, like it has been this summer, it supercharges the classic “No Sky July” pattern: persistent fog, mist, and chilly air hugging the coast. While refreshing for people, these conditions also create a prime environment for fungal pathogens in crops, which is something growers have to watch closely.

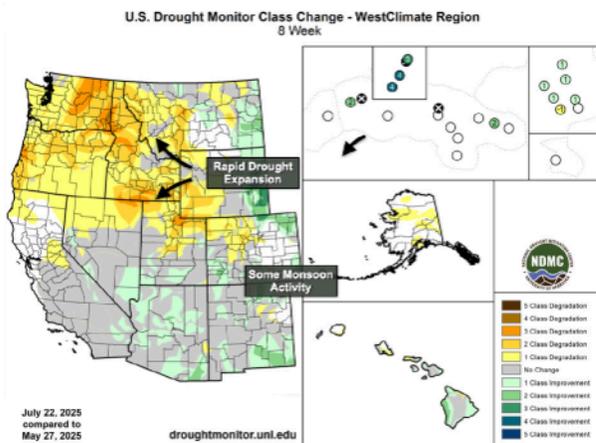
Outside of California’s coastal influence, the rest of the West has experienced a different trend.

From the Rockies to the Northwest and down into the Southwest, temperatures have been running warmer than average. It hasn’t been the record-breaking heat of last year, but it’s still hot enough to raise concern—especially when combined with widespread dryness. Take the Columbia Plateau, for instance: it’s seen virtually no measurable precipitation since May. That’s led to a rapid expansion of drought across the Northwest, with nearly 67% of the western U.S. now in some stage of drought as of late July.

Ironically, the same North Pacific High that’s keeping San Francisco cool is also blocking moisture from reaching the Pacific Northwest. The result? An uptick in wildfire activity. Oregon’s Cram Fire has already scorched nearly 100,000 acres, making it the largest wildfire in the U.S. so far this year. A brief cooldown in late July, along with another forecast dip in temperatures next week, could help with containment across the West. Still, long-range outlooks show heat returning to the western U.S. in August. The good news is this could finally open the door for some Pacific moisture to move in, possibly bringing scattered precipitation to the Pacific Northwest and Central Washington. If this comes with dry lightning and new fire starts, it may arrive as a double-edged sword.

Farther south, the early-season boost to the Monsoon earlier this summer has faded. Most of the rainfall has shifted east, with New Mexico and Texas seeing the bulk of the moisture—and the tragic flash flooding grabbing national headlines. If the Northwest heats



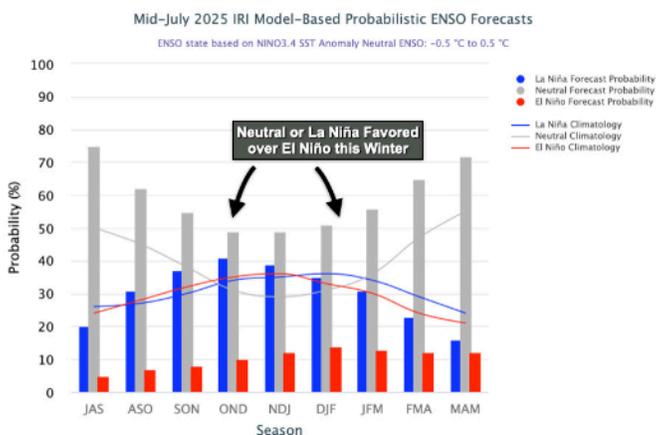


up again, we might see a resurgence of Monsoon activity across Arizona and the desert Southwest.

In the Eastern Pacific, the hurricane season got off to a fast start, with a steady stream of tropical disturbances and even a few major hurricanes. The season's first storm, Tropical Storm Alvin, formed in late May and delivered some remnant moisture to the Desert Southwest. Since then, most of the activity has stayed offshore, either near the southwestern coast of Mexico or out over open water. Recently, Major Hurricane Iona developed in the Central Pacific, tracking well south of Hawaii and posing no threat to the islands. While tropical activity is likely to taper off in August as atmospheric conditions become less favorable, it only takes one storm to make an impact.

Even a single system—though rare—can bring moisture surges into Southern California, the Southwest, or threaten Hawaii more directly.

There is another twist to watch in the Pacific: the recent cooling of sea surface temperatures in the central tropical Pacific. That's caught my attention this July, if only in the last two weeks.



Earlier this summer, I would've said we were looking at even odds for La Niña conditions returning later this year. But with this new cooling trend, the scales may be tipping more firmly in that direction. And that matters. Recent trends suggest La Niña events may be becoming more common in the 21st century than they were in the decades leading up to 2000. Historically, La Niña tends to bring wetter conditions to the Pacific Northwest, but it's far from a guarantee, and every La Niña year is different. For example, California and the Colorado River Basin have seen relatively healthy water reserves over the past two years. But another La Niña this winter could change that, especially for southern parts of the West, including California.

California has been relatively dry since spring. While that's not uncommon during the dry season, it's enough to raise some early warning flags as we near the start of the new water year in October. Water levels in the Colorado River are no longer at their crisis lows from 2022, but they're falling behind where we were in 2023 and 2024. If we get weak snowfall in the Rockies this winter, reservoirs like Lake Mead and Lake Powell could fall even further. Seasonal outlooks for early winter (November–January) are hinting at dry conditions for California. That said, these forecasts haven't performed well this year. It's entirely possible that even with a dry start, a parade of atmospheric rivers could still swing through in late winter or early spring, like we've seen in recent winters, bringing precipitation totals back up to normal.

Until then, we'll keep a close eye on the Pacific. Whether it's marine air keeping the coast cool or ocean temperatures hinting at the next climate phase, the signals this summer are setting the stage for what could be a dramatic and consequential water year out West.

MATT REARDON SENIOR SCIENTIST



A, B, AND C TREATMENT PROTOCOLS USED ON SELMA ALMONDS

This table represents the fertigated protocols delivered throughout the 2025 season with seven injections into the almond blocks. The table will be referenced in subsequent papers as the almond ABC protocols. Note the color-coded difference between proprietary and commodity fertilizer types.

2025 Almond Protocols (gls/A)			
Products	A	B	C
10-34-0			14
ACTUATE®	2	0.5	
ALTURA™ NST	7		
BOROSOL 10			1
CAN 17	25	28	34
EVOLUTION®	3.5	1.25	
KTS		11	22
MARITIME®	3	1	
PROLOGUE®		0.75	
PROZINC			1
REAX™ PLUS BORON	0.25		
REAX PLUS ZINC	2	0.25	
REAX K30	12	8	
STRUCTURE®		13	
UN32	37	40	41
Loveland Products			
Commodity			

A, B, AND C TREATMENT PROTOCOLS USED ON SELMA CITRUS

This table represents the fertigated protocols delivered throughout the 2025 season with five injections into the both citrus blocks. The table will be referenced in subsequent papers as the citrus ABC protocols. Note the color-coded difference between proprietary and commodity fertilizer types.

2025 Citrus Protocols <small>Individual for either Tango or GF</small>			
Products	A	B	C
ACTUATE	1	1	1
CAN 17	15	15	15
EVOLUTION	4	4	4
MARITIME	2.25	2.25	2.25
REAX PLUS BORON	0.5	0.5	0.5
REAX PLUS MANGANESE	1	1	1
REAX PLUS ZINC	1	1	1
REAX K30	10	10	10
STRUCTURE	25 gls	20 gls	15 gls
UN32	26	26	26
Loveland Products			
Commodity			

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Tango Madarins	Spring 2021	Throughout the season	February 2025

LOVELAND PRODUCTS PROGRAM

MANDARINS (TANGOS)

TABLE 1. Selma innovation farm mandarin programs with A, B and C product details

Products	A	B	C
EVOLUTION®	5	5	5
ALTURA™ NST	23	18	13
REAX™ PLUS ZINC	1.25	1.25	1.25
ACTUATE®	2	2	2
REAX™ 30	14	14	14
CAN 17	30	30	30
REAX™ PLUS Mn	1.25	1.25	1.25
MARITIME®	2	1	1
UN32	28.5	28.5	28.5
REAX™ PLUS BORON	0.5	0.5	0.5
ACCOMPLISH® CA	1	0.5	-

Loveland Products
Commodity

TABLE 2. 2025 Mandarin quality parameters yielded from 2024 A, B and C protocols



OBJECTIVE:

A fertigation programmatic approach involving the injection of three various Loveland Products blends throughout the 2023 season was evaluated for yield and quality in February 2024.

METHOD:

Seven unique liquid fertilizer blends were applied from mid-February to late August 2023. Among these, only ALTURA NST, MARITIME, and ACCOMPLISH® CA were varied across three main protocols. These products were used in greater quantities in the A and B programs compared to the traditional grower standard, Program C (Table 1).

TAKEAWAY:

Yield increases across the A, B, and C treatments were negligible, with Treatments A and B showing only 1.4% and 0.5% increases over Treatment C, respectively. However, the most notable improvements were observed in the yield quality parameter categories (Table 2).

Mandarins in Sizes 18 and 21—the largest size categories—showed improvements over the grower standard Treatment C. For Size 18, Treatments A and B demonstrated 6% and 9% improvements over C, respectively. In the Size 21 category, A and B showed 4% and 5% improvements, respectively. These results are particularly significant given the early stage of the orchard’s development. As the orchard is only in its fifth leaf, further differentiation in fruit quality—and eventually yield—is expected as the trees continue to mature.

OMEX SIZE N AS A NITROGEN USE EFFICIENCY (NUE) FERTILIZER

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Broccoli	April 23	Twice throughout growth	June 21, 23 and 26

TABLE 1. Size N protocols, injection dates and side dress amounts for the broccoli nitrogen study

Date	Activity	Product	Rate
4/23/25	Injection - treated side	Omex Size N	2 qts/A
5/16/25	Injection - treated side	Omex Size N	2 qts/A
5/28/25	Both sides	CAN-17	35 gal/A

TABLE 2. Individual crop quality assessment and eventual yield in boxes/A for GSP and TRT (Omex Size N)

Measurement/unit	GSP	TRT	% change
Weight (lbs)	4.1	4.2	4%
Stalk Thickness	1.1	1.4	17%
Plant height (in)	15.1	18.3	21%
Leaf length (in)	7.2	8.0	10%
Leaf width (in)	6.4	6.2	-3%
Nodes	12.6	12.2	-3%

		Boxes per acre		
Date	Activity	GSP	TRT	% change
6/21/25	Pick 1	3912		
6/23/25	Pick 2		4536	
6/26/25	Pick 3	896	796	
		4808	5332	11%

OBJECTIVE:

To evaluate whether an amine-based nitrogen fertilizer (Omex Size N) can increase broccoli yield compared to standard grower practices in the Salinas Valley.

METHOD:

Two applications of Omex Size N were made to a broccoli field transplanted in early April, each at 2 quarts per acre on April 23 and May 16. At the time of side-dress, the grower had not applied fertilizer to either side of the split field. However, one month before harvest, both sides received a uniform application of CAN-17 at 35 gallons per acre (Table 1).

On May 28, individual crop quality metrics—including weight, stalk thickness, plant height, and leaf-to-node ratios—were quantitatively measured. Tissue and soil biome samples were collected at various stages of crop development. Yield was determined in late June on three different dates (21, 23, 26) (Table 2).

TAKEAWAY:

Both individual crop measurements and final boxed yields showed a positive response to the two applications of Size N. Compared to the grower standard practice (GSP), broccoli weight, stalk thickness, and plant height increased by 4%, 17%, and 21%, respectively. Harvest occurred over three pick dates, with the Size N–treated side achieving a cumulative yield increase of 10.9% over the GSP.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Celery	Late December	At-Planting	April 3

PRELIMINARY TRIALS ON N-FINITY™ ON CELERY IN ARIZONA

TABLE 1. Treatment code for various CAN-17 and N-FINITY rates per acre

TREATMENT	CAN-17	N-FINITY™
GSP	20 gal/A	0
NF1	12 gal/A	1 qts/A
NF2	16 gal/A	1 qts/A
NF3	20 gal/A	1 qts/A

TABLE 2. Monitored sampled attributes of celery (Tissue %N, soil NO₃-N, N-Fixers and ammonifiers)

ATTRIBUTE	GSP	NF1	NF2	NF3
Tissue %N	4.86	5.45	5.17	5.89
Soil NO ₃ -N (ppm)	22.7	21.8	28.9	39.9
Biome N Fixers	14.5M	13.5M	9M	25M
Ammonifiers	190M	210M	200M	500M
Yield (lbs/rep)	239.5	274	285.1	257.2

Yield was in lbs/rep area

OBJECTIVE:

To evaluate the efficacy of N-FINITY™ on celery in the Arizona market while reducing the use of traditional CAN-17 nitrogen rates.

METHOD:

CAN-17 was applied at three different rates alongside a standard N-FINITY rate of 1 qt/A. A 20 gal/A rate of CAN-17 served as the control treatment (Table 1)

On January 6, tissue samples were collected to measure %Total N. On March 10, both conventional soil samples and soil biome assessments were taken to evaluate nitrogen-cycle microbial indicators and inorganic NO₃-N concentrations. Harvest yields were recorded on April 3 (Table 2).

TAKEAWAY:

Tissue and soil nutrient analyses revealed significant increases in nitrogen content with N-FINITY application. Soil biome attributes, specifically nitrifiers and ammonifiers, showed positive improvements with N-FINITY additions, with the highest treatment (NF3) exhibiting the greatest enhancement. Celery yield peaked at the NF2 treatment level, surpassing both the grower standard practice (GSP) and the first N-FINITY level (NF1) (see Table 2).

ALMOND YIELD, ROI AND WUE UNDER LOVELAND PRODUCTS ABC TREATMENT PROGRAMS

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Almonds/ Independence	2021	7 injections throughout the season	8/12/25

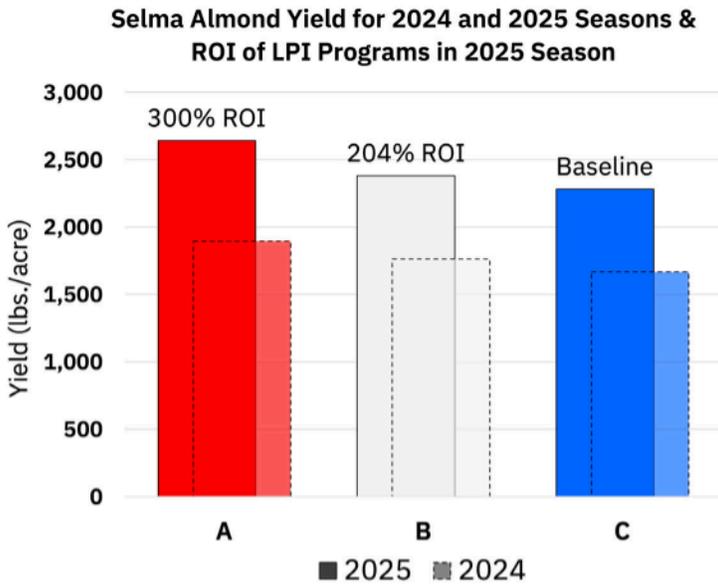


Fig 1. Almond yield and ROI for 2025 and previous year

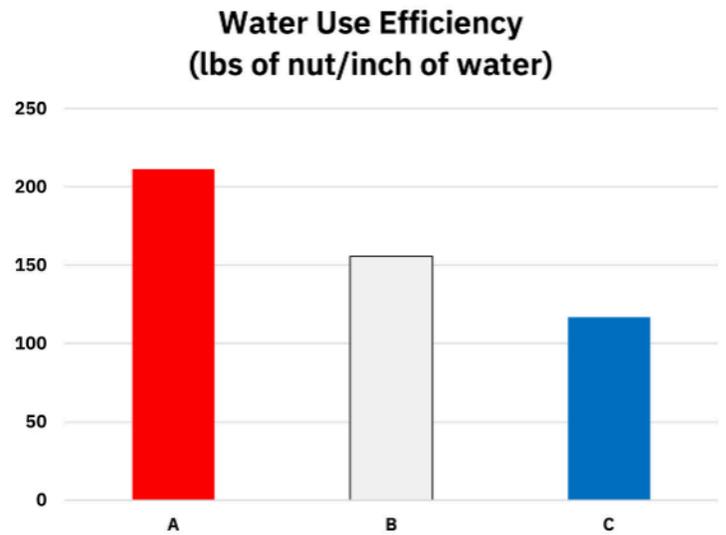


Fig 2. Water use efficiency (WUE) for the ABC treatments

OBJECTIVE:

To evaluate the yield, return on investment and water use efficiency relating to the production of fifth-leaf almonds under the ABC Loveland Products blend program (see page 99).

METHOD:

To prepare for harvest activities, the 24-acre almond orchard had reduced irrigation applications several days prior to the Aug 12 & 13 harvest. At harvest, individual bins for each treatment were used to collect the gross amount of almond (trash+hulls+shells+nuts) material. Quality analysis was performed at the huller.

Grower cost of products injected throughout the season were gleaned for protocols A, B and C in order to calculate ROI while also assuming \$2.64/lb at market levels for almond meats. Tree water

use using TreetoScope technology was used to determine water use efficiency (WUE).

TAKEAWAY:

After crackout calculations (e.g. removal of hull material), almonds yielded 2,640, 2,382 and 2,281 lbs/A for the A, B and C treatments, respectively reflecting the stair stepping yield pattern for the ABC treatments continued from the previous year as well. ROI calculations for 2025 also resulted in 300% for treatment A and 204% for treatment B using treatment C as the baseline for ROI calculations (Fig 1).

Using TreetoScope data which calculates the exact daily tree water use, it was discovered that the water use efficiency (WUE) was 211, 156 and 117 lbs of almonds produced per inch of water consumed for the A, B and C treatments, respectively (Fig 2).

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Grapefruit/ MeloGold	2021	Throughout Season	10/3/25

GRAPEFRUIT YIELD AND QUALITY UNDER LOVELAND PRODUCTS ABC PROGRAMS

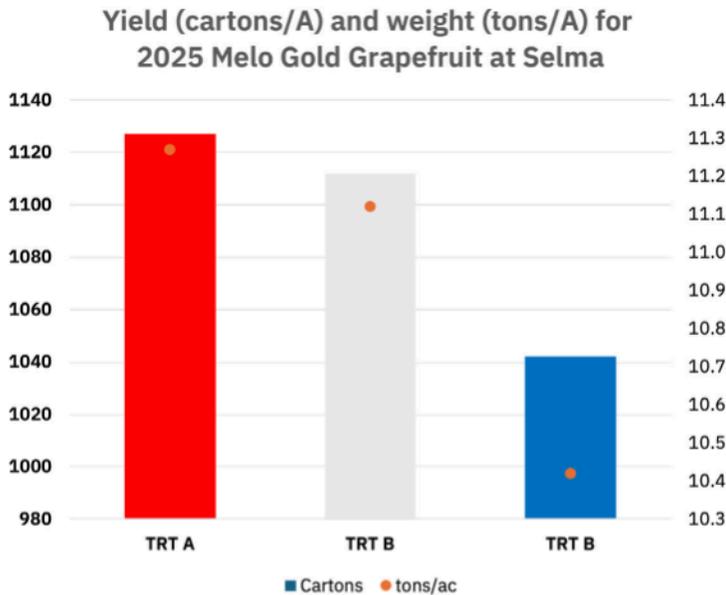


Fig 1 Yield and estimated weight for 2025 Selma grapefruit

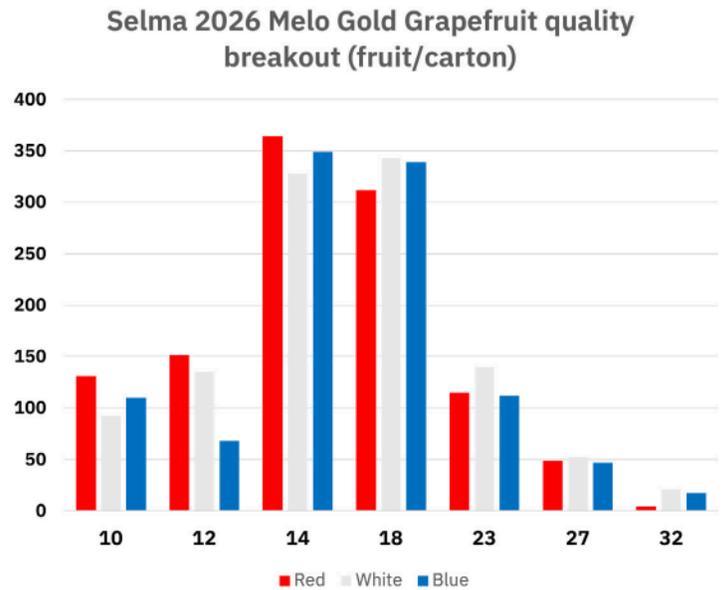


Fig 2 Quality parameters for 2025 Selma grapefruit

OBJECTIVE:

To evaluate the yield and quality characteristics of Melo Gold grapefruit citrus under an Loveland Products program (see page 99) approach using various product fertigated blends applied over the course of the season yet only varying the source of phosphorous via STRUCTURE®.

METHOD:

Five fertigation injections were applied throughout the season, each featuring a slightly different product mix tailored to meet the nutritional needs of the grapefruit trees. During the first injection, the only variable among the treatments was the rate of the product STRUCTURE, applied at 25, 20, and 15 gallons for treatments A, B, and C, respectively. All other product rates remained consistent across treatments and throughout the season.

Irrigation applications were kept as uniform as possible, with scheduling based on data from multiple sensors distributed throughout the orchard. Harvest was

performed on October 3rd whereby fruit were collected and separated by treatment into bins.

TAKEAWAY:

Yield, expressed as cartons per acre and estimated weight (tons per acre), followed a stair-step pattern among treatments. Treatment A produced 1,127 cartons/acre, followed by 1,112 cartons for Treatment B and 1,042 cartons for Treatment C. Assuming 20 lb per carton, the corresponding estimated yields were 11.3, 11.1, and 10.4 tons/acre for Treatments A, B, and C, respectively (Fig. 1).

Quality parameters indicated that Treatment A produced larger fruit, dominating the larger size categories up to 18 fruit per carton. Beyond this point, the smaller size categories (from 20 to 32 fruit per carton) were primarily represented by Treatments B and C (Fig. 2).



TREETOSCOPE OBSERVATIONS OF ALMOND TREE WATER USE RESPONDING TO ABC TREATMENT PROTOCOLS

Hybrid/Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Almonds/ Independence	Perennial	Throughout Season	Early August

Selma Innovation Farm Almonds ETa (inches)

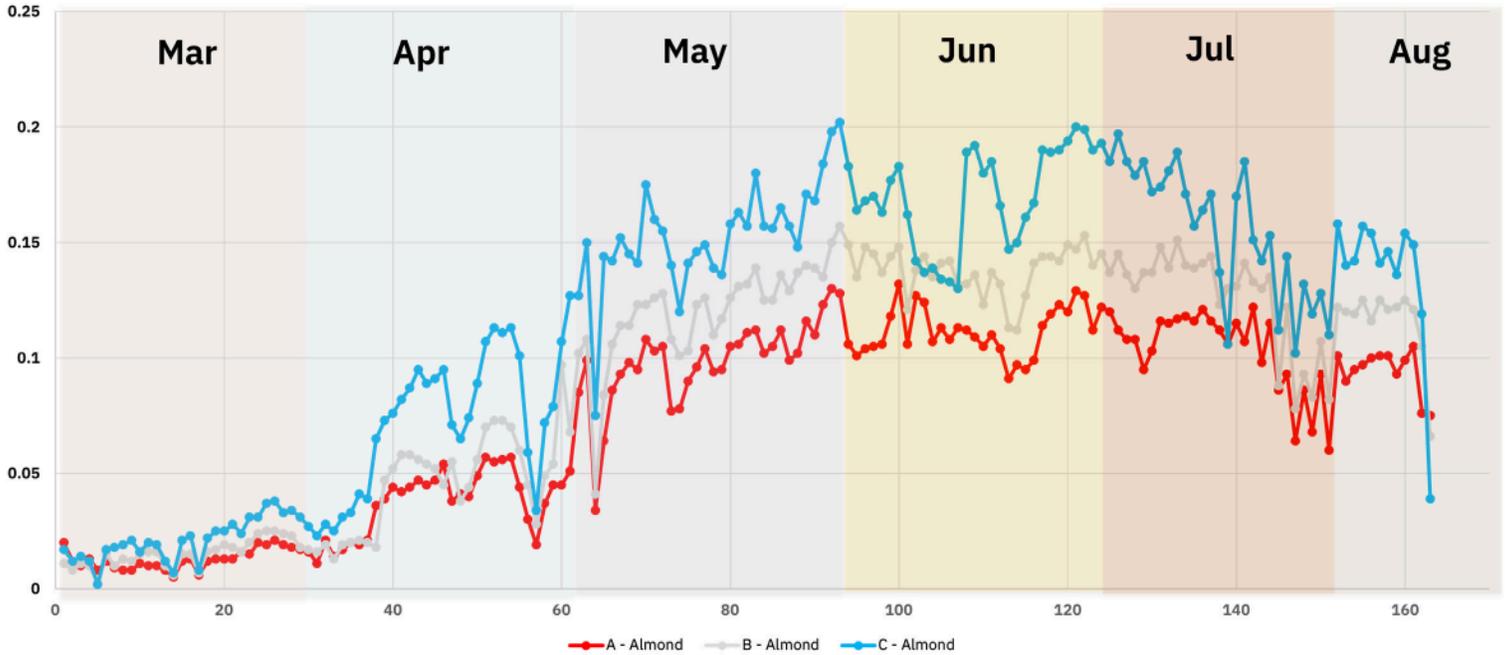


Fig 1. Treetoscope ETa calculations for the ABC protocols for almonds

OBJECTIVE:

To evaluate differential crop water use in almond trees via heat-pulse technology under the ABC Loveland Products blend program (see page 99).

METHOD:

Treetoscope heat-pulse sensors were installed in the almond orchard in early February '25 and replicated in sets of four sensors per each of the A, B or C treatments. Sensor data was then used to schedule irrigations throughout the season. ETa or actual evapotranspiration was determined using Treetoscope heat-pulse algorithms based on xylem sap flow velocity and tree trunk circumference measurements.

TAKEAWAY:

When reviewing season water use, treatment C transpired more water on most days throughout the season compared to treatments B and A, respectively (Fig 1). The water use differences were unexpected since it was assumed that the A and B treatments would produce greater leaf area per tree, thus having more surface area from a transpiring leaf surface

and thus more water use.

To explain this, earlier in the year, a random sub sample of A, B and C spurs, approximately 1 foot long, were collected whereby the A spurs had a heavier load of fruit followed by slightly less for the B spurs and very little comparatively for C spurs (Fig 2). This could explain the measured water use discrepancy such that the C treatment trees were transpiring proportionally more water throughout the season whereas the A and B treated trees were focusing absorbed water into proportionally more fruit that had already been established at bloom.

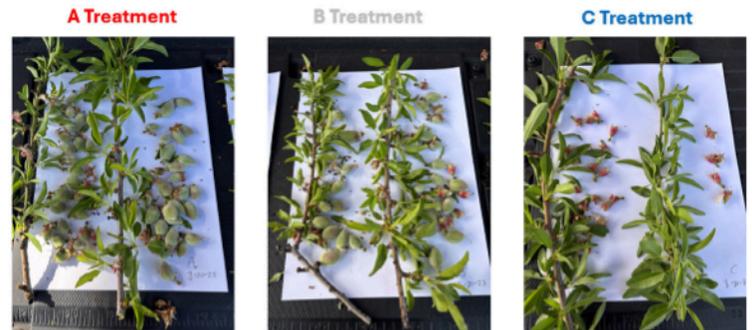


Fig 2. Random spurs sampled about 1 month after peak bloom

ALMOND TREE TRUNK OBSERVATIONS DURING PRE-HARVEST DRY DOWN

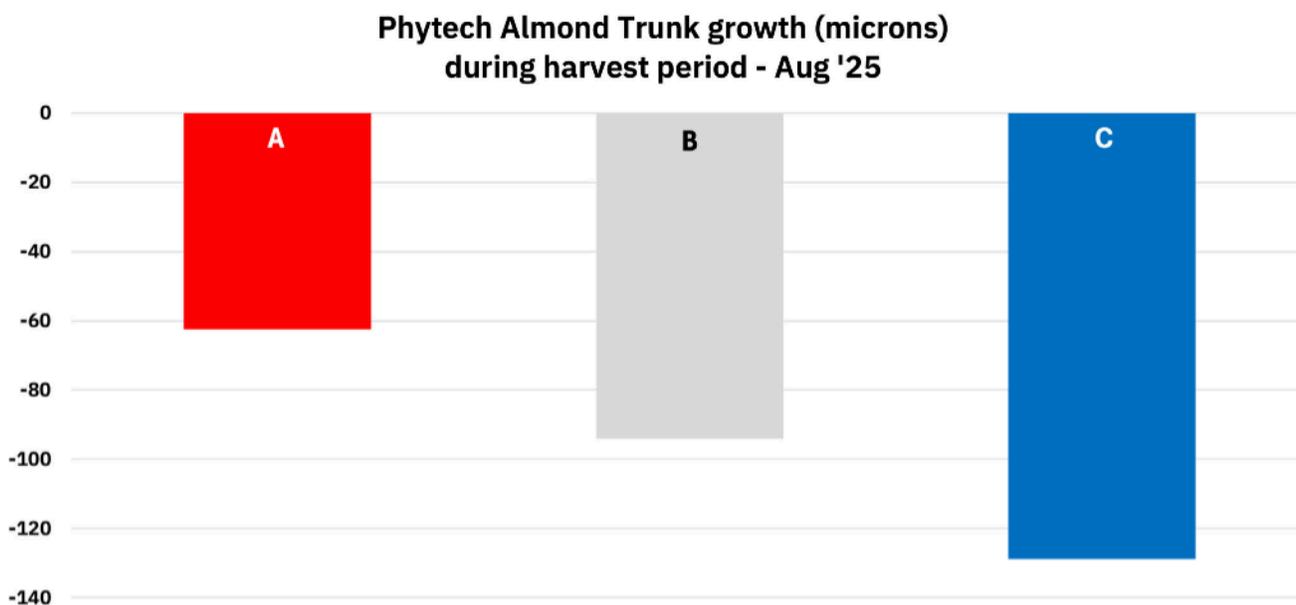


Fig 1. Net almond tree trunk shrinkage approximately 48 hours before harvest

OBJECTIVE:

To evaluate whether Loveland Products protocols produce differential decreases in almond tree trunk growth patterns during traditional pre-harvest “dry down” under the ABC Loveland Products blend program (see page 99).

METHOD:

Phytech dendrometry sensors, measuring trunk shrinkage and growth in microns, were installed in the previous season across the ABC-treated almond plots. In 2025, these sensors were also used to guide irrigation scheduling. Pre-harvest water cutbacks are implemented to promote hull split, improve nut removal during shaking, along with keeping the orchard floors dry for eventual harvest equipment. Dendrometry sensors had to be removed at harvest so trunk shrinkage was monitored up until the day before harvest.

TAKEAWAY:

Although the reduced pre-harvest irrigation amounts were applied uniformly across all ABC treatments, the C (commodity) treatment exhibited the greatest trunk shrinkage (Fig. 1).

A stair-step pattern also emerged that corresponded to ABC protocols (e.g. A trees had the least trunk shrinkage, followed by B and then C which had the most shrinkage or stress). The A and B treatments seem to have improved water-use efficiency and enhanced abiotic stress particularly during this most stressful stage of the season (pre-harvest dry down).

MIDSUMMER LEAF WATER STRESS OBSERVATIONS IN ALMOND TREES UNDER ABC PROTOCOLS

Hybrid/Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Almonds/ Independence	Perennial	7/1/25	Early August

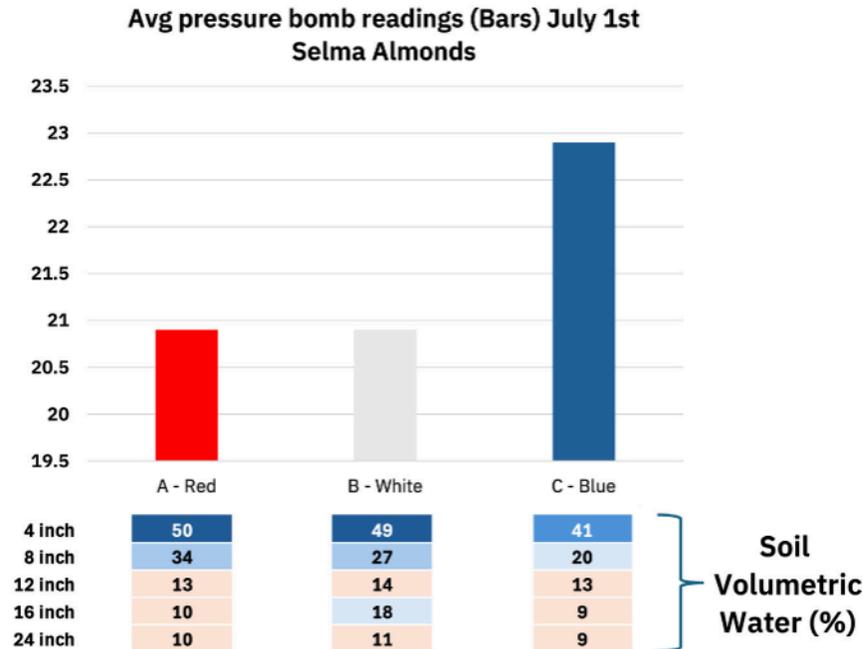


Figure 1. Almond pressure bomb readings (bars) measured on July 1st with simultaneous readings of the soil profile soil moisture status via Crop Connect sensors

OBJECTIVE:

To observe almond leaf water potential stress indicators during summer mid-day heat to discern possible differences under the ABC Loveland Products blend program (see page 99).

METHOD:

A standard pressure bomb apparatus was used at solar noon on July 1, 2025. A replicated collection of 5 mature almond leaves per A, B, and C protocol was obtained.

During pressure bomb readings, the exact time of day was also documented to determine the simultaneous soil moisture status from the Crop Connect soil moisture probes within the A, B, and C treated areas (Figure 1).

TAKEAWAY:

Pressure bomb readings (or matric potential) were lowest in the A and B treatments compared to the C or control plots. Soil moisture readings during plant stress readings were also greater for A and B plots compared to C even though irrigation events were evenly distributed across treatments throughout the season

Lower matric potential data (e.g. less stress) reflect better water use efficiency of almond trees growing in the A and B treatments vs the commodity treatment C. Our hypothesis is that inputs from blends within the A and B treatments encourage hormonal responses within the tree's physiology which allow it to adapt to heat stress at mid-day. This lowering of stress could also result in leaf spurs becoming reproductive buds rather than vegetative in the following season.

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Almonds/ Independence	2021	Throughout Season	8/12/25 - 8/13/25

ALMOND SOIL AND BIOME RESPONSES TO ABC TREATMENT STRATEGIES

Almond Nitrogen Biome percentiles by treatment

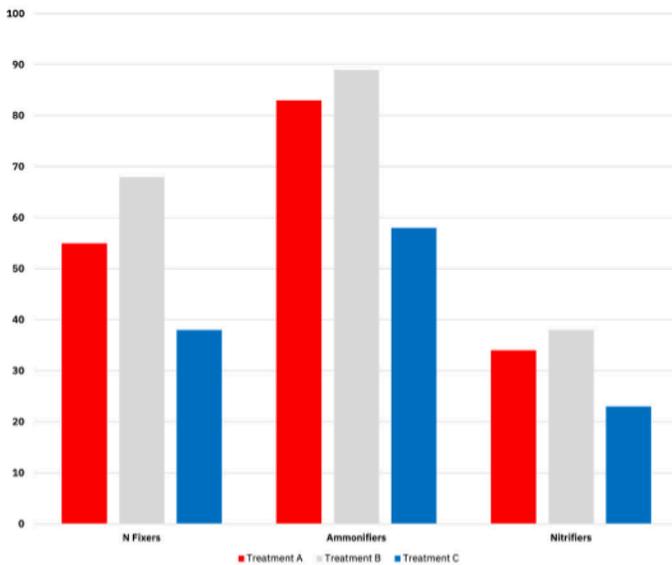


Fig 1. Percentile ranking of nitrogen related soil biome components found in almond ABC treated soil

OBJECTIVE:

To evaluate the effects of the ABC Loveland Products blend program (see page 99) on the soil biome on 5th-leaf almonds.

METHOD:

Soil samples were collected in June 2025 and submitted to Precision Agri Lab for inorganic analysis and then shipped to Waypoint Analytical in Champaign, IL for biome analysis. The June sampling date was chosen based on the assumption that the soil biome would have responded to the Loveland Products ABC treatment protocols which commenced in March. Although almonds are a permanent crop with deep rooting patterns, soil samples were collected at the 6-inch (15 cm) depth.

TAKEAWAY:

The A and B protocols from the Loveland Products

Almond P & K Biome percentiles by treatment

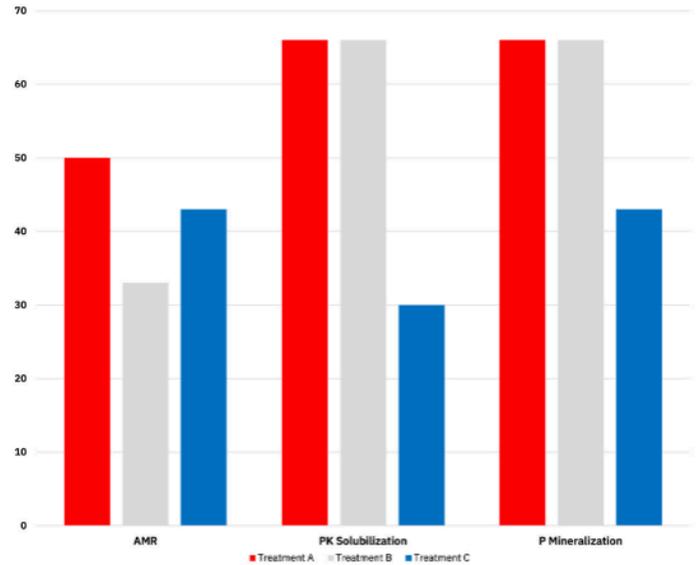


Figure 2. Percentile ranking of AMF, PK solubilization and P mineralization found in almond ABC treated soil

program stimulated the soil biome more effectively than the C treatment, with notable increases across several key attributes.

Within the soil biome nitrogen-related groups—such as N-fixers, ammonifiers, and nitrifiers—the percentile ratings were substantially elevated compared to the control or treatment C (Fig 1). This suggests an improved capacity for sustained nitrogen cycling.

Phosphorus and potassium associated biome components also trended higher compared to the control, with the only exception of AMR enzyme levels under treatment B (Fig 2).

These results indicate that the carbon and biological chemistries unique to the A and B blends are enhancing soil microbial activity in ways that directly support nutrient cycling. In turn, this likely improves the efficiency of applied fertilizers while also reinforcing the role of the treatments in promoting a more biologically active and resilient soil environment.

N-FINITY ON COASTAL STRAWBERRIES

OBJECTIVE:

To evaluate the effect of N-FINITY™ on strawberry leaf nitrogen levels, soil biome nitrogen components and real time soil nitrate levels over time.

METHOD:

Strawberries (var ALTURA™) grown in eastern Salinas Valley were selected for this study in 2025. A non-treated portion of the field was used to represent grower standard practice (GSP) while the soil in the treated area was injected with N-FINITY @ 2 qts/A on May 8th. Preliminary tissue samples were taken on May 20th, Jun 13th, Jul 9th and Aug 8th. Soil biome samples were taken on June 13th.

One AquaSpy® soil nitrate probe was installed in each experimental plot to record changes in soil nitrate levels (Fig 1). Readings were taken.

TAKEAWAY:

Leaf tissue total N (%) in the N-FINITY treated strawberries increased after May 20th, peaked on Jul 9th, but remained higher than GSP until the last sampling on Aug 8th (Fig 2).

Soil biome attributes related to nitrogen cycle activity increased in the treated plot for N-Fixers, ammonifiers and nitrifiers by 23%, 9% and 115%, respectively compared to the GSP (Fig 3).

Continuously monitored soil nitrate data using the AquaSpy sensor at the one-foot depth proved sporadic yet volatile for the GSP plot. Smoother and more gradual increases in soil NO₃-N levels were observed for the N-FINITY treated plot at the same one-foot depth.

For the nitrate readings at the two-foot depth, higher soil nitrate levels were observed in June and thereafter for the treated plot compared to the GSP, reflecting greater mineralization, and enhanced nitrogen fixation from the N-FINITY product (Fig 4).



Fig 1. AquaSpy soil nitrate probe in strawberries

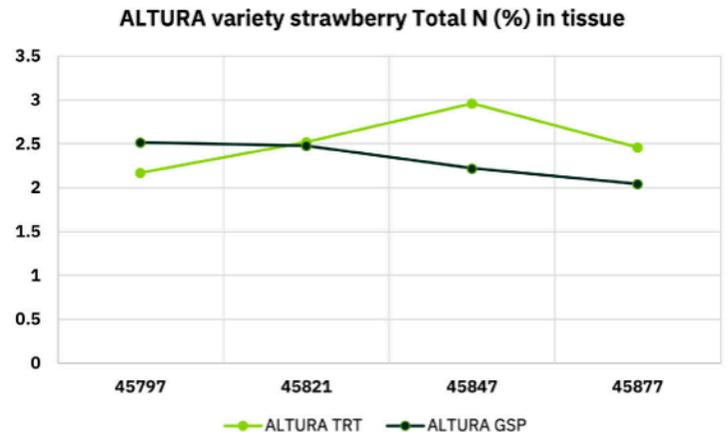


Fig 2. Strawberry tissue Total N (%) after treatment (May 8th)

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
ALTURA	Early February	Plant Establishment	Multiple

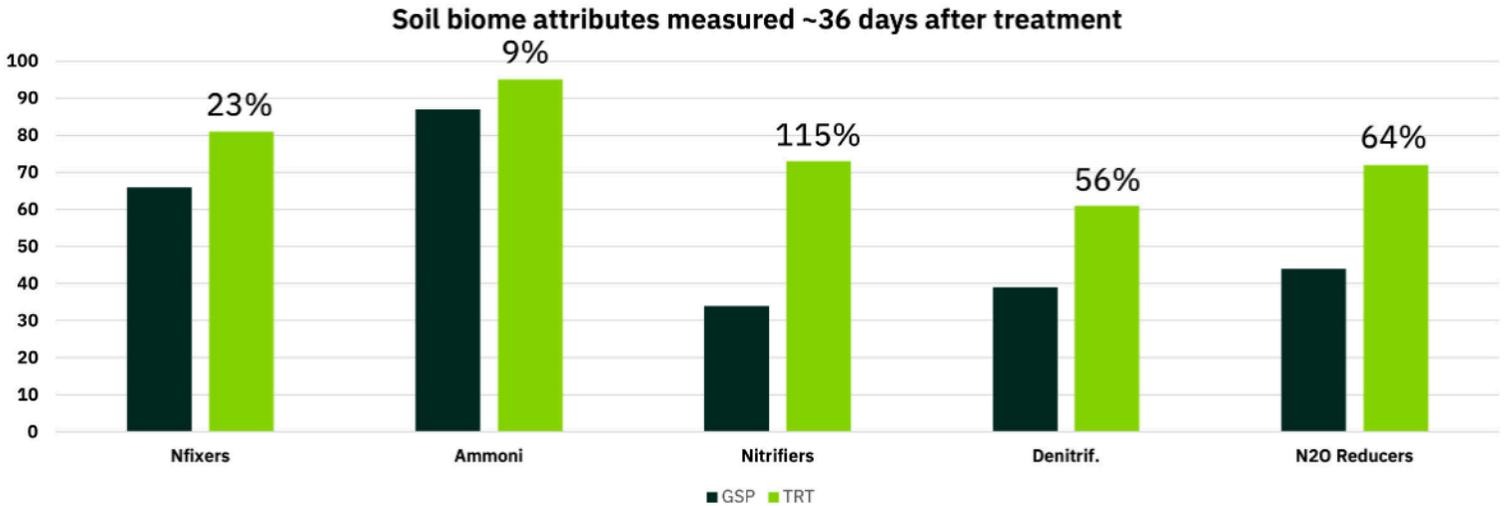


Fig 3. Soil biome components of nitrogen for N-FINITY treated (TRT) soil v Grower Standard Practice (GSP).

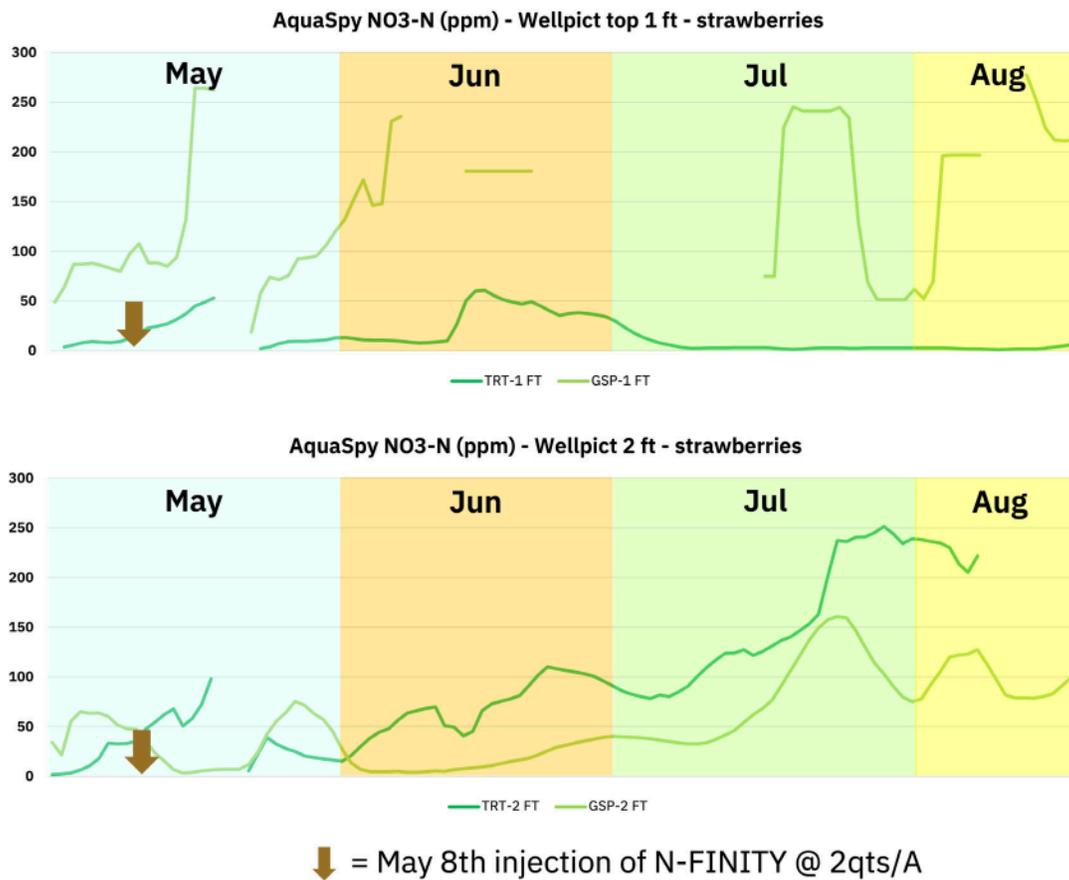


Fig 4. AquaSpy soil NO3-N monitored for four months at 1 and 2 foot depths



N-FINITY ON COASTAL BROCCOLI

OBJECTIVE:

To evaluate the efficacy of N-FINITY™ on broccoli tissue, soil biome and yield while also observing real time soil nitrate throughout the season.

METHOD:

On July 19, one half of a 10-acre broccoli field was fertilized with 26 gal/A of a grower standard blend (28-0-0) while the other half was injected with 2 qts/A of N-FINITY (Table 1).

On July 29 and August 12 the entire field was side-dressed with another 26 gal/A of the GSP blend.

Samples for tissue were taken August 7th while soil biome samples were taken August 13th. Throughout the season, real time monitoring of soil nitrate was recorded using AquaSpy® probes at 1 and 2 foot depths.

TAKEAWAY:

Broccoli leaf tissue NO₃-N increased 313% in the N-Finity treated side while soil NO₃-N levels at the time of soil biome sampling showed an increase of 42% (Table 2).

AquaSpy soil NO₃-N data temporarily displayed a smooth and consistent nitrogen profile status from the probe representing the N-FINITY treated area (TRT) whereas larger fluctuations occurred on the GSP side (Fig 1). Soil NO₃-N from biome sampling on Aug 13 coincided very closely with what the AquaSpy probes were recording on that particular day.

Soil biome data from the N-FINITY treated plot revealed an increase in microbial biomass of 46% and a Nitrate balance increase of 45% compared to the GSP plot (Figure 2).

DATE	PRODUCT	RATE	SIDE OF FIELD
19-Jul	28-0-0	26 gal/A	South side
19-Jul	N-FINITY	2 qts/A	North side
29-Jul	28-0-0	26 gal/A	Both sides
12-Aug	28-0-0	26 gal/A	Both sides

Table 1. Fertilizer activity for broccoli trial in Gonzales

ATTRIBUTE	DATE	GSP	TRT	% CHANGE
Tissue NO ₃ -N (ppm)	8/7/25	2177	8994	313%
Soil NO ₃ -N (ppm)	8/13/25	28.4	40.2	42%

Table 2. Tissue and soil NO₃-N response to N-FINITY application

Hybrid/ Variety	Planting Date	Application Date/ Growth Stage	Harvest Date
Broccoli	Mid Summer	At Planting	--

N-FINITY Trial on Broccoli - AquaSpy soil NO₃-N (ppm) with time

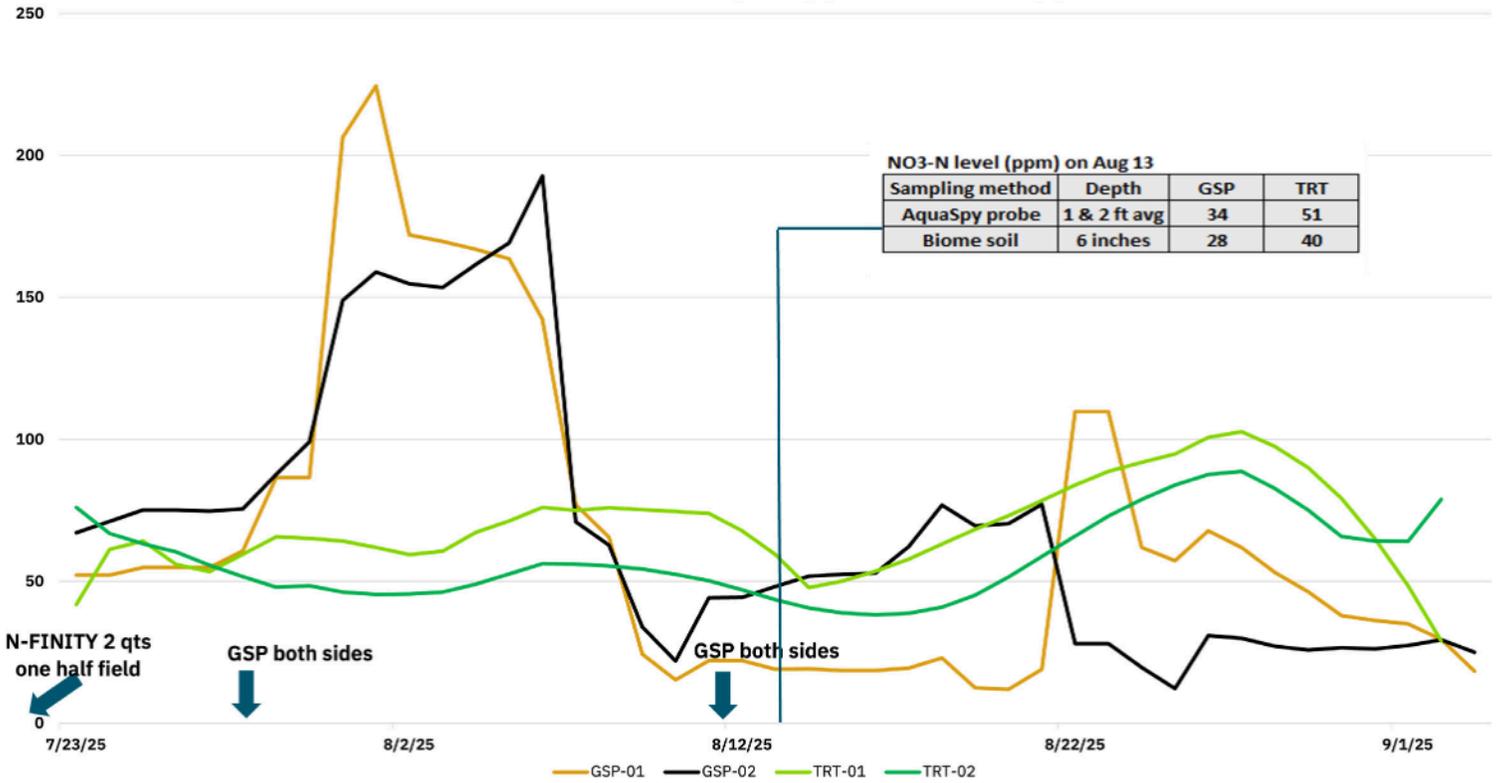


Fig 1. AquaSpy real time soil NO₃-N data during N-FINITY broccoli trial

FIELD	MICROBIAL BIOMASS	NITRATE BALANCE
GSP	4.6	3.9
TRT	6.7	5.7
% CHANGE	46%	45%

Fig 2. Soil biome data from August 13 sampling

COMPARING WATERMAXX 2 AND AQUA EXPRESS SOIL ADJUVENTS FOR SOIL MOISTURE MANAGEMENT IN COASTAL WINE GRAPES

OBJECTIVE:

To evaluate the soil water penetration and water holding capacity of two different soil adjuvants in a wine grape vineyard in Salinas Valley.

METHOD:

A Pinot Noir grape vineyard near Chualar, CA having historical issues with water penetration was selected for a soil adjuvant trial in 2025. The vineyard was split several times for either WATERMAXX® 2 applications or AQUA EXPRESS® (Fig 1)

WATERMAXX 2 was injected on June 21st at 2 qts/A and AQUA EXPRESS (ver 1) was injected at 2 qts/A on June 23rd. Each treated area was approximately 5 acres.

CropConnect capacitance sensor probes (40 inches deep) were installed approximately one month prior to treatment to continuously monitor in-situ soil moisture. One sensor was installed on the WATERMAXX 2 treated side while a second sensor was installed on the AQUA EXPRESS side of the split area.

Periodic volumetric soil moisture was monitored at 15 minute intervals at every 6 inch intervals down to the entire 40 inch depth. Readings started in late June and continued until early August.

TAKEAWAY:

Noticeable differences in soil moisture content in the top 8 inches were observed soon after soil adjuvants were applied. AQUA EXPRESS appeared to have higher moisture levels than WATERMAXX 2, especially earlier in the season, closer to when the soil adjuvants injections occurred (Fig. 2)

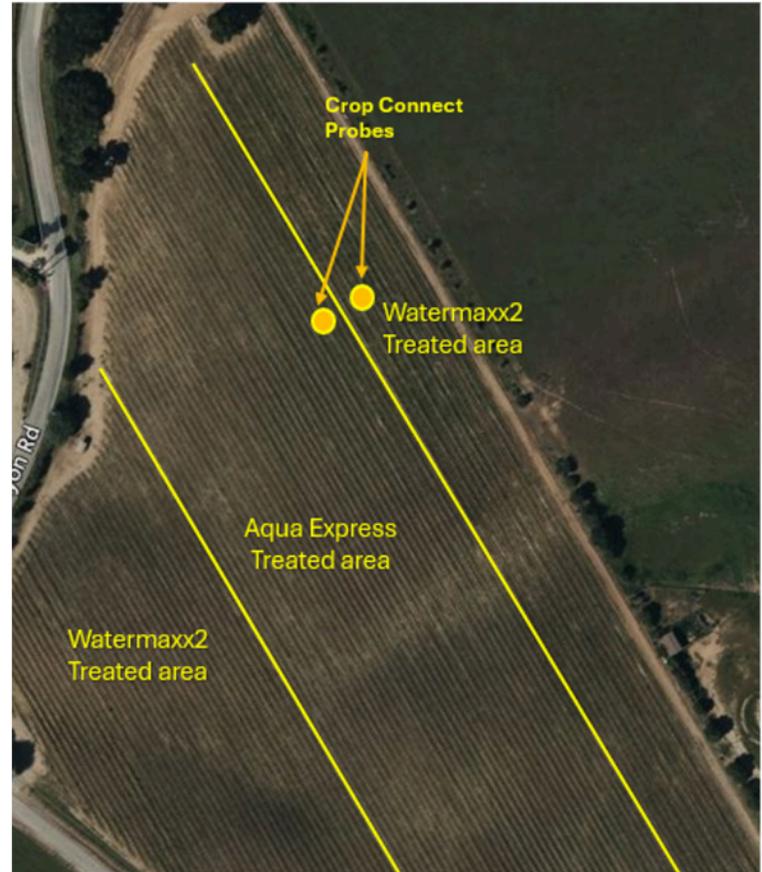


Fig 1. Location of Crop Connect soil moisture probes in Chualar Pinot Noir vineyard

Throughout the experiment which included six noticeable irrigations, soil moisture levels in the top 8 inches from the AQUA EXPRESS treatment were higher than WATERMAXX 2 (averaging 21.5% vs 20.3%, respectively).

More available water, even in winegrapes which can sometime benefit from water stress after veraison, can help with water use efficiency issues such that every drop of water pumped and delivered goes into wine grape production

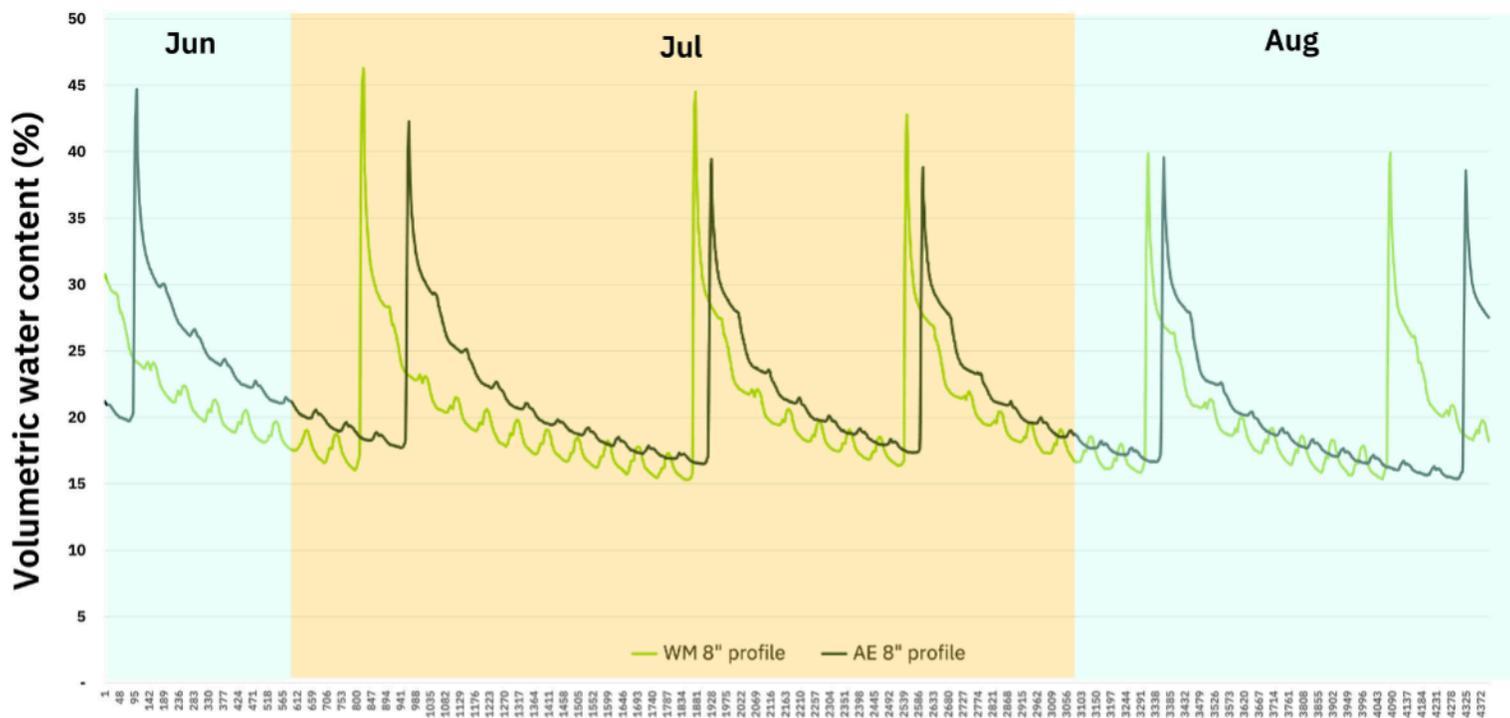


Figure 2. Volumetric soil water for top 8-inches after Watermaxx 2 (WM) and Aqua Express (AE) applications



FARM SENSORS: TURNING ABUNDANT DATA INTO SMARTER DECISIONS

At the Selma Innovation Farm in Central California, more sensors are deployed than on nearly any other farm in North America. These instruments are distributed across 24 acres of almonds (Independence variety), 6 acres of mandarins (Tango variety), and 6 acres of grapefruit (Melogold variety). Beyond guiding irrigation decisions, the sensors continuously collect data throughout the season, enabling Nutrien Ag Solutions staff to better understand how Loveland Products nutritionals and management protocols influence crop physiology and overall production.

SENSOR TECHNOLOGIES AT SELMA

The Selma farm's sensor portfolio reflects the wide range of irrigation aids currently available to growers. Examples include:

- Crop Connect soil moisture capacitance probes — a trusted standard in irrigation management for nearly 30 years (graphical output on Fig 1).
- Treetoscope heat pulse sensors — measure precisely how much water a tree or vine uses each day via heat dissipation and trunk diameter calculations (Fig 2).
- Phytch dendrometry sensors — tracks trunk growth dynamics while integrating soil moisture data with pressure transducers for a holistic view of crop water use (Fig 3).

These sensors are used aggregately for daily irrigation decisions. The collected data clearly shows how Loveland Products fertigation treatments impact the current season and helps guide decisions for future years, which is especially important for permanent crops like almonds and citrus.

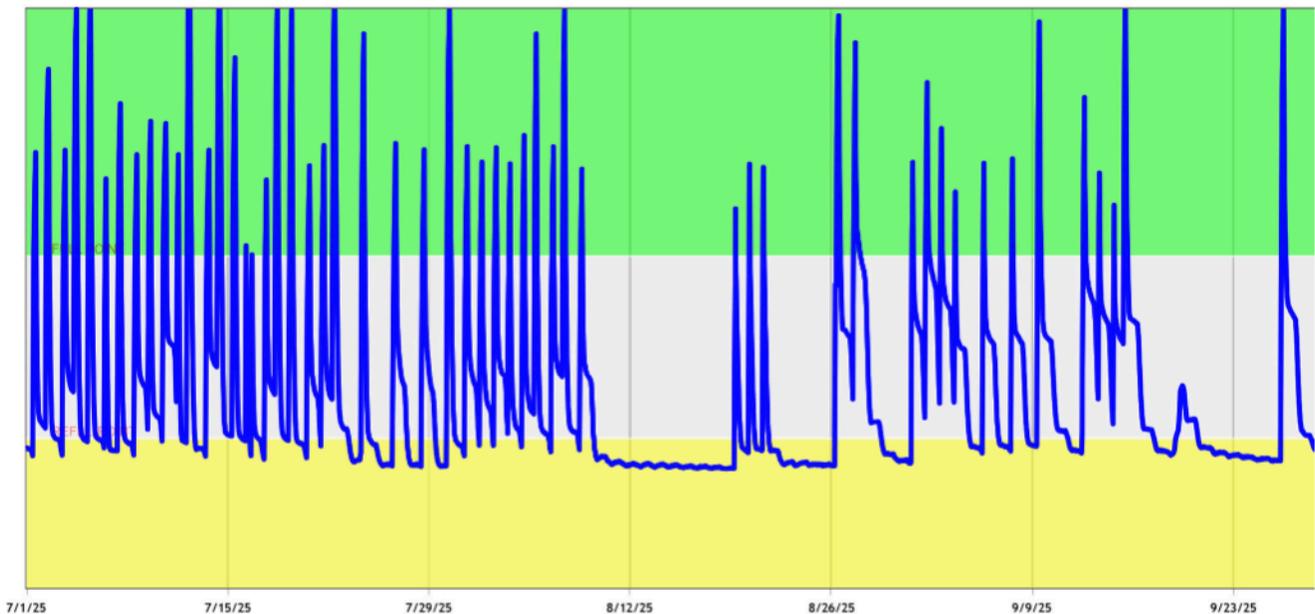


Fig 1. CropConnect almond soil profile moisture data from July through August. Harvest dry down depicted towards season's end

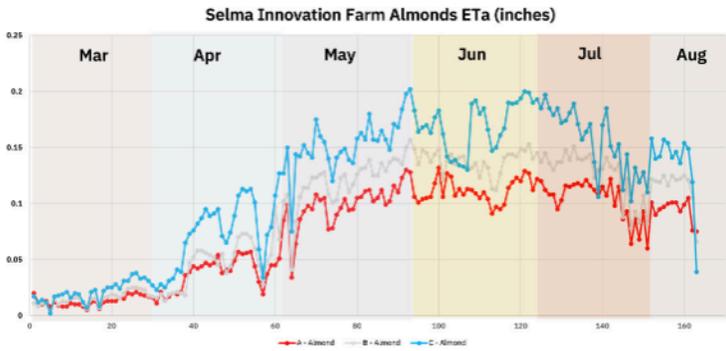


Fig 2. Treetoscope data showing higher water use in the almond commodity treatment (C) compared more water use efficient treatments A and B

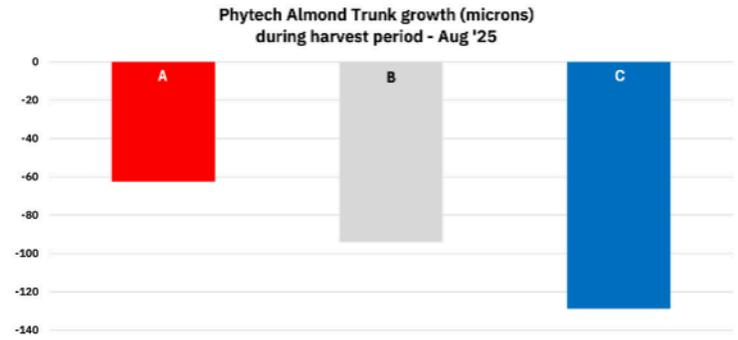


Fig 3. Phytech dendrometry data (microns) on almonds trunk growth documenting various degrees of trunk shrinkage prior to almond harvest based which correlates to Loveland Products ABC treatment protocols

We have found these sensors are critical to adjusting irrigation and understanding growth pattern response among the ABC treatments, an especially important factor in permanent crops. Nor could we adequately quantify water-use efficiency and the effects observed from Loveland Products fertility products without this sensor technology.

No matter which sensor system a grower chooses, the outcome is the same: better decisions regarding when and how much to irrigate. It is clear that sensors aid in developing a fertigation plan that aligns water delivery with crop nutritional needs.

WHAT'S COMING

In 2025, the Selma Innovation Farm tested AquaSpy®, a new real-time soil nitrate (NO₃-N) sensor and an emerging tool that will become increasingly important in highly regulated production environments such as California.

AquaSpy probes measure not only in-situ soil NO₃-N but also calculate volumetric water content, salinity, temperature, and redox potential. Figure 4 illustrates soil NO₃-N patterns averaged through the soil profile under the almond ABC treatment protocols. While nitrogen delivery was held constant across the ABC treatments, AquaSpy data revealed that Loveland Products treatments A and B delivered more N to the root zone compared to their commodity counterparts (treatment C).

Looking ahead, the 2026 ABC almond protocols are expected to introduce new nitrogen formulations. Real-time NO₃-N monitoring will be critical to ensure these applications are even more 'Nitrogen efficient' than in previous years.

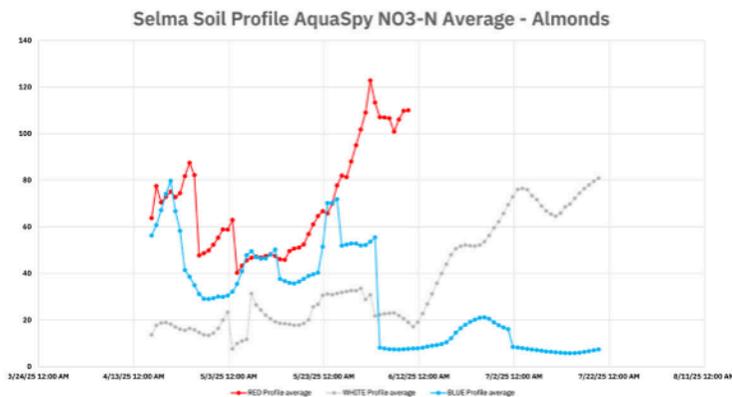


Fig 4. Real time soil nitrate (NO₃-N) averaged throughout the almond soil profile during the 2025 season in the Selma Innovation Farm

SUMMARY

With a growing array of sensor technologies available, growers have more tools than ever before to optimize irrigation and water use efficiency. The right choice ultimately comes down to which system delivers the most value per dollar and the time invested, along with ease of use and data discernability.

RICHARD MEAD REGIONAL AGRONOMY MANAGER



MAPPING THE PRODUCTIVITY PULSE OF A FIELD

Every field tells a story — not just of a single season, but of the patterns written into its soil, slope, and management history. By combining up to ten seasons of Sentinel satellite imagery into a single, normalized view, Nutrien Ag Solutions' HD Zones distills that history into productivity maps that highlight where a field performs consistently well, where it struggles, and where those lines sometimes blur. These long-term zones form the foundation of our modern One Nutrien Trials approach: understanding the variability underneath field-scale trials, and accounting for that variability when analyzing the results.

Unlike one-off imagery snapshots that can mislead due to weather or timing, multi-year composites give agronomists and growers a stable, repeatable picture of the land's potential. That stability makes HD Zones a powerful tool for trial placement — ensuring products are evaluated in representative, meaningful environments, not just where the crop happens to look best.

TRIALS WHERE THEY MATTER MOST

Across Nutrien's network of Innovation Farms, field-scale trials are increasingly designed using these productivity maps. Instead of running basic strip trials, trials can now be aligned with natural management zones. A new nitrogen stabilizer or biostimulant might be tested both in high-yield areas that push nutrient efficiency, and in low-yield zones that highlight stress tolerance. The goal is not just to prove a product "works," but to understand where and why it works best.

This approach doesn't just increase our confidence in understanding product performance — it shortens the feedback loop between innovation and on-farm decision-making. Ultimately, results from HD Zone-guided trials can be fed directly into digital agronomy tools used by local Nutrien Ag Solutions agronomists and crop consultants, helping them translate findings into tailored, field-specific recommendations for their growers.

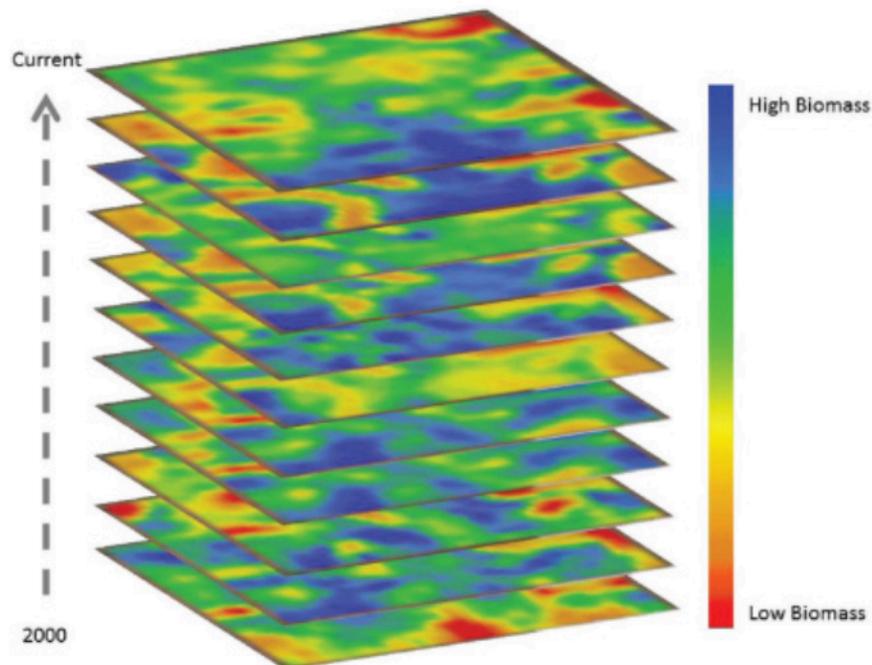


Figure 1 - illustration of HD Zones' normalization of multi-year satellite imagery

FROM SATELLITE TO SENSOR: SEEING MORE, SOONER

Once trials are placed, higher-resolution data collection steps in. Drone-based multispectral imagery can capture subtle differences in canopy vigor, chlorophyll, and stress responses across both treatments and zones. By combining multiple vegetation indices – such as NDVI (an indicator of plant biomass and vigor) and NDRE (an indicator of chlorophyll concentration and nitrogen status) – agronomists can see treatment effects weeks before they’re visible on the ground.

These high-definition insights help validate how a product performs in-season, linking visible responses to measurable outcomes at harvest, and can be particularly valuable when assessing the performance of specialty crops, where spatial yield data is less commonly collected. They also provide a scalable model: drone and satellite data can be layered across thousands of acres, bringing research at the speed of farming into everyday agronomy.

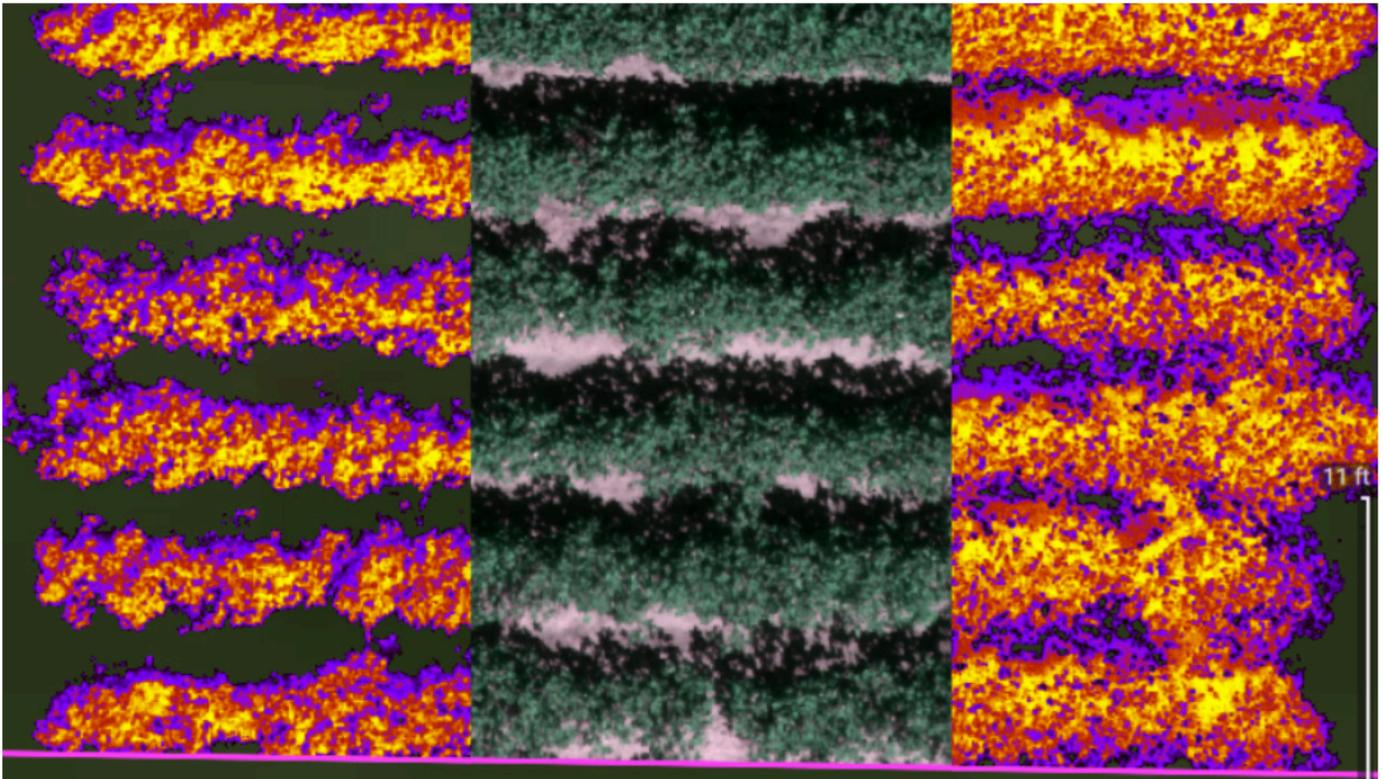


Figure 2 – high-res drone imagery in cotton: soil-optimized NDVI (left), visible (middle), NDRE (right)

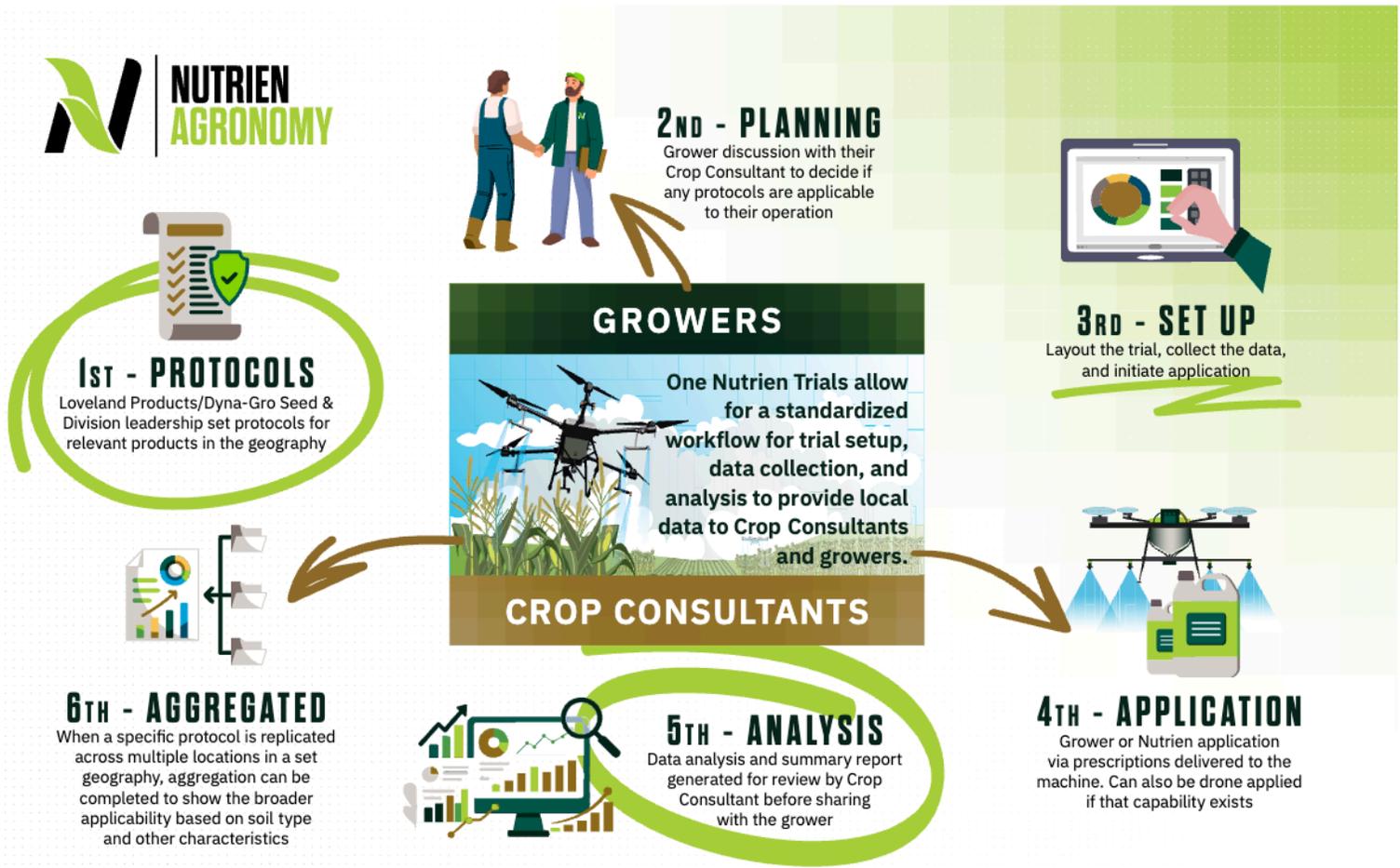
TURNING DATA INTO CONFIDENCE

Ultimately, the integration of HD Zones and in-season imagery isn’t just about pixels and algorithms. It’s about giving agronomists the confidence to recommend products based on evidence they’ve seen play out in local conditions. This integration of multiple layers of remote-sensed field insights moves “proof” out of the plot book and into the field, where agronomists and growers can act on results in real time.

GUS SKINNER AGRONOMIC SALES MANAGER



ONE NUTRIEN TRIALS TURNS LOCAL FIELD TRUTH INTO BRAND-READY DECISIONS



Nutrien is sharpening its edge in data-driven agronomy with One Nutrien Trials, an initiative that captures the full season—from soil tests to harvest—to explain the why behind product performance and speed better decisions on real farms.

Our goal remains clear: support the Loveland Products and Dyna-Gro® Seed brands, build a layered, reliable database that helps us explain the why on products performance. That focus is reshaping how field teams test, learn and recommend.

LOCAL FIRST, SCALED EVERYWHERE

For growers, the promise is practical: fewer wasted passes, tighter timing, and recommendations tuned to each field’s zones and conditions. For the business, the same evidence scales to division and regional views and becomes brand dossiers that strengthen positioning for Loveland Products and Dyna-Gro® Seed with consistent, repeatable proof.

Farmers don’t ask for national averages—they ask what works here. One Nutrien Trials answers questions with local truth you access and the confidence in the performance.

WHAT CHANGES IN THE CAB AND AT THE COUNTER

- Playbooks, not guesswork: Season-aware “if/then” guides turn analytics into clear actions by zone and stage.
- Shared source of truth: Field teams and brand leaders view identical, normalized analytics—no more reconciling spreadsheets.
- Faster Insights: In-season reading, application timing and weather impacts are captured and traced to outcomes.

BRAND-READY BY DESIGN

By standardizing protocols, data fields and quality checks, Nutrien Ag Solutions converts field notes into the full season story of the life of the crop evidence, driving conversations, sales training and competitive positioning for our proprietary products.

HOW TO GET INVOLVED

Nutrien Ag Solutions Crop Consultants have access to a list of available trial protocols developed by our National, Regional, and Divisional teams—each designed to address product development and placement goals within their respective geographies. Crop Consultants can then partner with growers to identify a protocol and field that best fit both parties.

From there, the One Nutrien Trials process takes over, using a standardized approach to trial placement. By leveraging background layers such as soil fertility, historical yield data, elevation, and productivity zones, the team can strategically position each trial for success. Once placement is finalized, a tailored layout and application prescription are shared with the Nutrien Ag Solutions branch or grower for execution.

IN-SEASON DATA COLLECTION

This step is critical. Providing our growers with a full-season view of product performance goes far beyond yield at harvest. Through tissue sampling, scouting, soil biology analysis, and imagery, we capture the full story—ensuring each product delivers as promised.

While many factors influence a growing season, only a few are within our control. Documenting in-season insights helps strengthen relationships between Crop Consultants and growers, turning each trial into a valuable story of collaboration and proof of performance.

END-OF-SEASON SUMMARY

With a standardized approach to yield analysis, One Nutrien Trials ensures all harvest data is treated consistently - allowing for meaningful comparisons across years and geographies.

Each end-of-season report includes yield data alongside key weather insights such as rainfall, temperature, and growing degree days (GDDs), benchmarked against a 20-year average. This context helps both consultants and growers better understand performance relative to seasonal conditions.

The result: local truth in, better decisions out—and a stronger foundation for Loveland Products and Dyna-Gro® Seed to lead with confidence.

If you're interested in participating in 2026 trials, contact your local Nutrien Crop Consultant. They'll coordinate with the Nutrien Agronomy team to design a field-specific trial tailored to your operation.







WE ARE GRATEFUL FOR THE SUPPORT FROM OUR PARTNER COMPANIES:

BAYER CROP SCIENCE, BASF, CORTEVA, JOHN DEERE, SYNGENTA, FENDT, LOVELAND PRODUCTS, DYNA-GRO SEED



JOHN DEERE



BAYER CROP SCIENCE

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DYNA-GRO SEED

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OUR STREAMLINED
FINANCING

+ A SOLID CROP PLAN

+ 3 FOOTBALL PRACTICES

- 1 BABYSITTER

= FINANCING THAT
GETS FARMING

The equation is different with us.

Your acres, your terms—apply online and learn about offers at NutrienFinancial.com



FEATURED LOVELAND PRODUCTS GLOSSARY

PRODUCT NAME		PRODUCT DESCRIPTION
ADJUVANTS		
CHOICE® TRIO		CHOICE® TRIO is a non-AMS liquid water conditioner designed to aid in the performance of chemistries susceptible to the negative effects of hard water, including herbicides, fungicides, insecticides and nutritional. CHOICE TRIO performs via three modes of action: sequestering, chelating, and complexing of all hard water cations.
FRANCHISE® CO-PILOT		FRANCHISE® CO-PILOT is a premium NPE-free surfactant that is specifically formulated for aerial applications to increase droplet deposition while minimizing variability in performance. FRANCHISE CO-PILOT is fungicide friendly and provides improved mixability as it combines a LECI-TECH® surfactant system with a compatibility agent, differentiating it from other surfactants.
INFUSE®		INFUSE® is a proprietary vegetable-oil based soil adjuvant designed to hold soil-applied chemistry in the targeted areas longer allowing for more consistent weed control.
LIBERATE®		LIBERATE® is an uptake-enhancing surfactant blend. LIBERATE is designed for use with pesticides that recommend a non-ionic surfactant and works especially well with systemic chemistry to reduce driftable fines.
PLANT NUTRITION		
ACCOMPLISH MAX®		ACCOMPLISH MAX® is a next-generation biocatalyst that improves nutrient availability and increases crop tolerance to environmental stresses like cold temperatures, drought and salinity from applied fertilizers. Combine the power of ACCOMPLISH MAX with your existing fertility program for greater nutrient mineralization and less stress, so that you can help your crop live up to its full potential.
ALTURA™ NST		ALTURA™ NST is a phosphate and zinc nutritional designed to provide immediately available phosphate and to maintain availability well into the growing season. ALTURA NST is optimized with C ² and Nutrient Solubilizing Technologies for the needs of permanent and specialty crops. When applied in a drip, drench or in-line application, ALTURA NST maximizes nutrient uptake and extends availability for a robust approach to early-season nutrient management.
BLACKMAX® 22		BLACKMAX® 22 is a nutritional enhancement tool designed to positively impact nutrient availability and support positive soil attributes. As part of a fertilizer program, the C ² Technology in BLACKMAX 22 can give growers more nutrition for their crops and provide a better soil environment in which to grow.
MARITIME®		MARITIME® is a highly soluble biological extraction of kelp. This unique extraction process produces a broad range of plant-available compounds and more active byproducts (primary and secondary metabolites that increase nutrient and plant functioning) than chemical extraction methods. These bio-active compounds affect soil health and the interaction between crops and the rhizosphere, leading to improved uptake of nutrients and improved tolerance to stress.
MAXIMUM N-PACT® K		MAXIMUM N-PACT® K is an enhanced slow-release nitrogen that provides a stable source of foliar nitrogen with the addition of potassium for increased uptake, translocation and utilization of nitrogen and potassium, with excellent crop safe.
N-FINITY™		N-FINITY™ is a combination of soil amending microbes designed to improve nitrogen use efficiency through direct nitrogen fixation, recruitment of nitrogen fixers to associate with plant roots and liberation of organic nitrogen in the soil.

PRODUCT NAME		PRODUCT DESCRIPTION
NUTRISYNC® COMPLETE 3D		NUTRISYNC® COMPLETE 3D is a fully formulated foliar nutrition tool powered by NUTRISYNC proprietary Nutrient Transport Technology and contains key plant major and micronutrients. NUTRISYNC Nutrient Transport Technology helps growers load, haul and deliver nutrients critical for growth and development to areas that are most needed, providing better utilization of nutrients to fulfill plant demands.
RADIATE®		RADIATE® is designed to drive root and shoot growth through a patented formulation of IBA and kinetin in optimized ratios to enhance early-season vigor and drive maximum plant performance. The proven technology in RADIATE provides growers with consistent performance across various crops.
RADIATE NEXT®		RADIATE NEXT® is a foliar-applied plant growth hormone solution that drives root growth and development while increasing the photosynthetic rate to improve energy production and realize higher yields. Applied at a low use rate and labeled for nearly every crop, RADIATE NEXT helps maximize performance below ground and now above.
REAX™ SULFUR		REAX™ SULFUR is the latest addition to Loveland Products REAX nutritional lineup. REAX SULFUR combines C ² Technology, Loveland Products industry-leading carbon-based technology, with two plant-available sulfur sources. The formulation has been optimized for in-season soil applications to address sulfur deficiencies across a wide range of crops. The C ² component of REAX SULFUR improves overall efficiency and performance, allowing for flexible application rates in 2x2 or at side-dress.
RISER®		RISER® is a low-salt, root zone safe, highly pure banded, and in-line nutrition solution that contains Acetate Technology and a suite of micronutrients. RISER is formulated to provide essential nutrients when the crop needs them the most. It also helps access the nutrition growers have in their soils for optimizing nutrient uptake, plant health and crop yields.
TERRAMAR®		TERRAMAR® is a proprietary bio-extraction of seaweed and leonardite, designed to increase nutrient uptake, enhance CEC and chelation. By delivering unique metabolic compounds, TERRAMAR enhances microbial activity in the rhizosphere and improves plant response to stressful conditions. TERRAMAR is specially formulated for enhanced compatibility in fertilizer systems to promote plant health and performance.
TITAN® XC		Drive performance in your crop with TITAN® XC. Improve performance of every dry fertilizer application with TITAN XC to make nutrition available more quickly and support extended uptake. Specifically formulated for impregnation on dry fertilizer blends, TITAN XC is the key to quick release and uptake of vital plant nutrients. The unique and concentrated biochemistry in TITAN XC provides the broadest range of activity across major and micronutrients to maximize the return on your dry fertilizer investment.
CROP PROTECTION		
FORTITRI®		FORTITRI® is a unique corn and soybean pre-emergent herbicide from Loveland Products. This is an excellent option for both one or two pass herbicide programs and is a great resistant management tool that offers broad spectrum control of over 75 grass and broadleaf weeds. FORTITRI consists of three powerful active ingredients that deliver both burndown and residual control, and it may be used with or without atrazine.
SEED TREATMENT		
AWAKEN FLOWBOOST®		AWAKEN FLOWBOOST® is a premier seed lubricity agent available from Loveland Products. It contains a unique blend of nutrients to help promote early season growth and nutrient uptake. Additionally, it provides top tier seed lubrication to achieve better seed singulation, as well as extremely low dust-off properties.
EQUITY VAYO®		EQUITY VAYO® is an in-can formulation with a potent six-way insecticide plus fungicide seed treatment for soybeans. EQUITY VAYO delivers multiple modes of action to help fight soil born disease resistance, improved control of pythium and phytophthora, and controls a broad spectrum of insects. Growers can have the confidence every seed planted will contribute to maximum yield potential on every acre.



