



Precision
Planting®

PRECISION TECHNOLOGY INSTITUTE

2022 RESEARCH SUMMARY
PONTIAC, IL

Banding Dry Fertilizer Study

Objective: To evaluate yield and economics of traditional broadcast applications of dry fertilizer compared to 8" deep high concentrated strip-till banding.

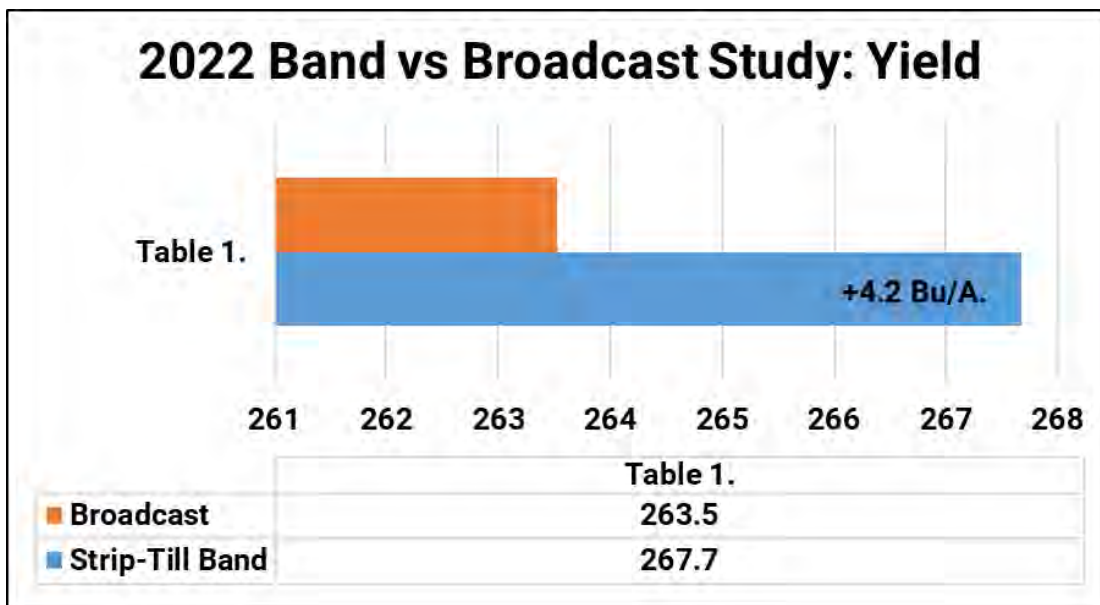
Based upon soil test results and yield goals of 250 Bu/A. corn in a corn/soybean non-irrigated rotation, 130# 18-46-0 and 65# 0-0-60 was applied in a traditional broadcast surface application made with a traditional spinner truck (Figure 1). Using the same 100% fertilizer rates, a strip-till bar was used to place fertilizer in high concentrated strips 8" deep on 30" corn rows (Figure 2). Corn was then planted directly into the strips above the 8" fertilizer placement. A KUHN® Krause® 1200 Gladiator® pulling a Montag® Equipment 2208 Gen 2 fertilizer cart was used to implement this testing program for 2022.

Results Table 1. illustrates strip-till fertilizer resulted in +4.2 Bu/A. yield gains over traditional broadcast applications. Corn yield from broadcast fertilizer averaged 263.5 Bu/A., while strip-till 267.7 Bu/A.

Figure 1. Broadcast Dry Fertilizer



Figure 2. Strip-Till Banded Fertilizer



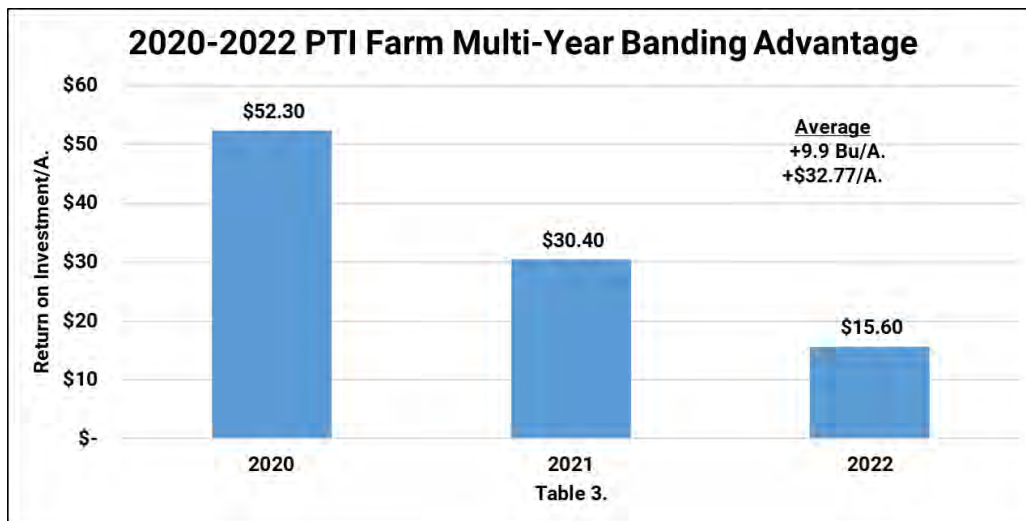
Broadcast vs Banding Dry Fertilizer Study Continued

Using University of Illinois Machinery Cost Estimates in Table 2., strip-till resulted in additional costs of +\$9.60/A. in comparison to a conventional tillage program. Using this cost scenario, Table 2. illustrates the economic impact from our 2022 study. Strip-till, with its tillage and fertility system, posted positive economic gains of +\$15.60/A. over a conventional tillage system.

Table 2. University of IL Machinery Cost Estimates

Tillage Practice	Category	Cost
Conventional	Soil Finisher	\$ 11.10
	Plant	\$ 17.20
	Fertilizer Spread	\$ 3.00
	Total:	\$ 31.30
Strip Till	Strip	\$ 17.30
	Plant	\$ 17.20
	Burndown	\$ 6.40
	Total:	\$ 40.90

Table 3. illustrates multi-year data from the PTI Farm over the years 2020, 2021 and 2022. Over this timeframe, banding dry fertilizer has resulted in average yield gains of +9.9 Bu/A. with a return on investment of +\$32.77/A.



Broadcast vs Banding Rate Efficiency Study

Objective: To evaluate yield and economics of traditional broadcast applications of dry fertilizer compared to concentrated strip-till bands applied 8" in depth under the corn row.

Based upon soil test results and yield goals of 250 Bu/A. corn in a corn/soybean rotation, 130# 18-46-0 and 65# 0-0-60 was applied as a recommended fertility application from a Fall 2021 soil test.

To study placement efficiency, dry fertilizer was applied in a traditional broadcast surface application as a spinner truck (Figure 1). Using the same fertilizer rates, a strip-till bar was used to place fertilizer in high concentrated strips 8" deep on 30" corn rows (Figure 2). Corn was then planted directly into the strips above the 8" fertilizer placement. Corn was also planted in a strip-till situation with the broadcast fertilizer, however as surface applied on top of the fall strips. A KUHN® Krause® 1200 Gladiator® pulling a Montag® Equipment 2208 Gen 2 fertilizer cart was used to implement this testing program for 2022.

To then study rate efficiency, fertilizer was applied at the following rate structure in both strip-till bands and broadcast applications:

- ✓ 100% Fertilizer Rate
- ✓ 75% Fertilizer Rate
- ✓ 50% Fertilizer Rate
- ✓ 25% Fertilizer Rate
- ✓ 0# Rate

Figure 1. Broadcast Dry Fertilizer



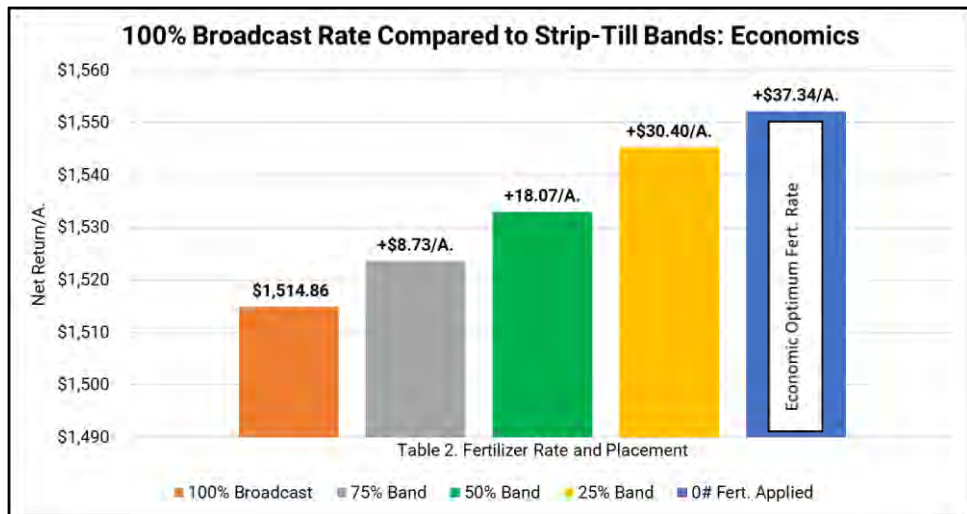
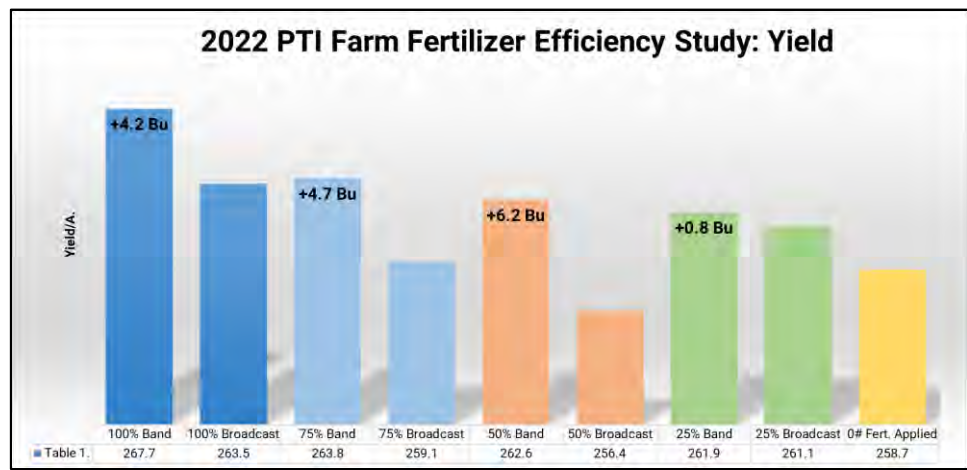
Figure 2. Strip-Till Banded Fertilizer with Montag® cart



Broadcast vs Banding Rate Efficiency Study Continued

Results: Table 1. illustrates the yield of all rates in band and broadcast applications. Highest yield came from 100% and 75% bands at 267.7 to 263.8 Bu/A. Overall, high concentrated bands of fertilizer surpassed broadcast spreading yields at every individual rate percentage by an average of 4.0 Bu/A. Conversely, 0# fertilizer resulted in only 9 Bu/A. yield losses compared to 100% fertilizer rates in a band.

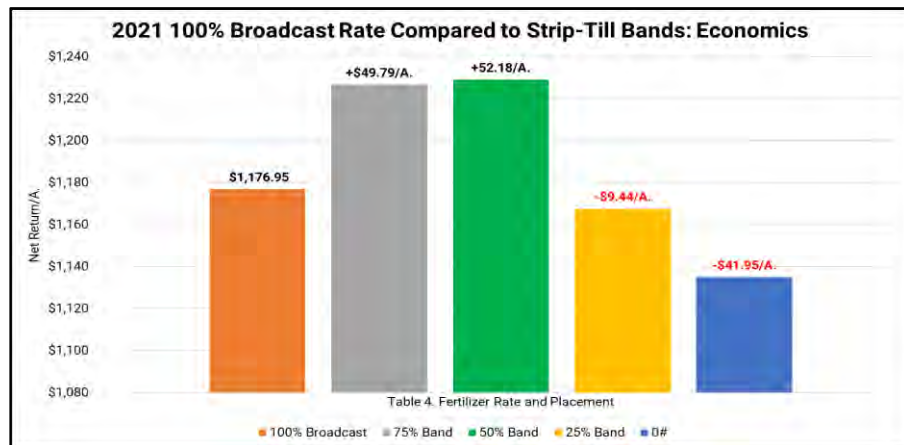
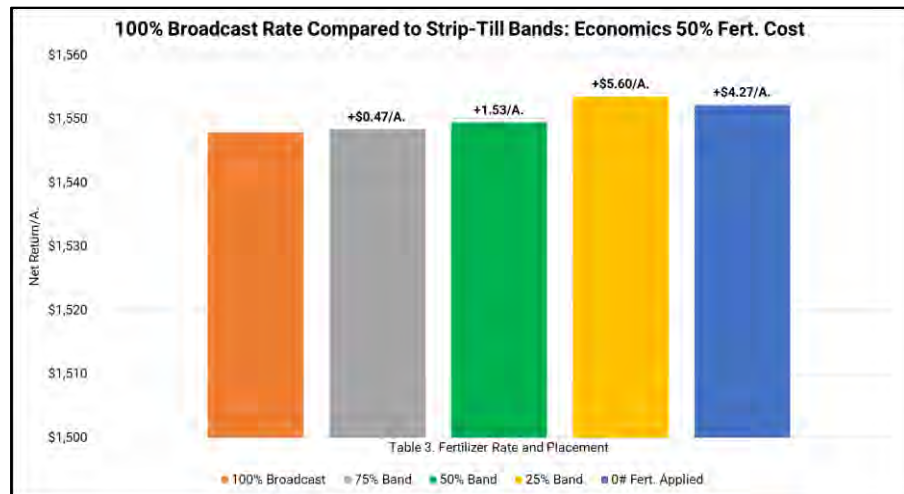
Table 2. summarizes economic optimum rate and placement. 0# of fertilizer proved economic optimum fertilizer rate. With 0# fertilizer rates yielding within 9 Bu/A. of 100% rates, compounded with historically high DAP and Potash prices, a 9 Bu/A. fertilizer advantage will not pay for itself. Each time fertilizer was reduced, it created a positive return on investment compared to 100% broadcasted rates. 75% bands resulted in gains of +\$8.73/A., 50% bands +\$18.07/A. and 25% at +\$30.40/A.



Broadcast vs Banding Rate Efficiency Study Continued

Table 3. illustrates a scenario using 2022 corn yield by fertilizer rate, however, assumes a 50% cost reduction of DAP and Potash for the study. Since farmers are battling historical high prices of fertilizer today, we thought it would be interesting to see if fertilizer response would pay for itself even in a 50% lower cost scenario? However, even with 50% cost, reduced rates of fertilizer still offered positive return on investment. In fact, 0# of fertilizer resulted in economic gains of \$4.27/A. All other reduced banded rates offered gains as well, ranging from +\$0.47/A. to +\$5.60/A. What does this mean? Fertilizer did not pay for itself in 2022.

This is the second year in a row where reduced rates of fertilizer proved higher return on investment than what was determined by soil testing and standard recommendations. Table 4. illustrates 2021 economics of 100% broadcast fertilizer, compared to 75%, 50% 25% and 0# banded fertilizer rates. For the 2021 growing season, a 50% reduction of fertilizer achieved economic optimum rate. This 50% reduction is interesting, as we thought it might indicate banding could offer a 50% efficiency factor compared to 100% broadcast rates. However, in year two of this ten-year study, this theory may not be accurate, as 0# rates of fertilizer actually provided a higher return on investment compared to applied fertilizer rates in 2022.



Wrap Up

Precision Planting is excited to share our 2022 PTI research farm results and findings. We hope they provide useful insights that help drive thoughtful consideration around future crop management. The PTI Farm is working diligently to continue with long-term studies that provide multi-year data analysis for decision-making purposes. We will continue to work with our Precision Planting Premier Dealers to identify opportunities to find new research objectives, driving innovation and development of new solutions in the field. Precision Planting continues to find new ways to provide commitment to the development of innovations and insights that allow for the highest yield and ROI opportunities for your farm and family.

One of our goals at the PTI Farm is to continue to bring new, fresh, and unique ideas, so that when growers visit the farm they see and experience new technology. “Challenging the Status Quo” is an important concept to us and we always want to offer the opportunity for growers to experience, compare, and challenge their traditional ways of farming to other means. We all know that change is inevitable, but knowing what and when to change is critical to a business. At the PTI farm, we are excited about all of the agronomic trials slated for 2023 and you will not want to miss our upcoming field days. We look forward to seeing you throughout July-September at the Precision Planting Precision Technology Institute at Pontiac, IL.

Precision Planting would like to extend our sincere gratitude to the support and dedication of our Precision Planting Premier Dealers. Precision Planting Premier Dealers are world-class certified precision agriculture experts, with rigorous training and knowledge of the industry and issues facing farmers today. Our Premier Dealers are experienced professionals helping you know more, and ultimately creating more yield and profitability.

The ability to provide unbiased and objective insights into the agronomic research is important to us and we appreciate all Premier Dealers who scheduled and invited growers to the farm in 2022. If you are interested in visiting the PTI Farm in 2023, please contact a Precision Planting Premier Dealer to schedule your visit to the PTI Farm. For your convenience, click here to use our Dealer Locator to find the Precision Planting Premier Dealer nearest you.

http://www.precisionplanting.com/#dealer_locator/



Premier Dealer

PRECISION TECHNOLOGY INSTITUTE

All the research summarized here, was conducted as part of multiple research plots, by a team of experienced staff at the Precision Technology Institute research farm in Pontiac, Illinois. PTI is committed to challenging the status quo, to give growers agronomic insights and the tools that can help provide improved yield and economic bottom line on your own farm.

One of the questions that you may be asking after reviewing the extensive data and results from our 2022 research plots, is why? Why implement over 100 research plots, over 400 acres, with daily on-farm visits and agronomic discussions, through this time of uncertainty and so many new unknowns. The answer is what it has always been; we must continue to challenge the status quo. We must find better, smarter, and higher return on investment solutions for the growers and their farms. Precision Planting created the Precision Technology Institute in Pontiac, Illinois to provide a place for growers to meet and learn, while providing results of research plots that illustrate the practical value of their products in real world situations. The research we are sharing is designed by Precision Planting to better understand what solutions, in combination with real-world scenarios can actually provide, both a yield and economic benefit. These are learnings that we will continue to develop, implement, study and share, to provide our growers with the tools to help improve their bottom line.

Precision Technology Institute feels the best way to serve this goal to growers is as simple as having conversations. As part of this vision of having an on-going dialogue with growers, there are many ways to become part of the learnings and findings throughout the year, including an exciting new opportunity to visit PTI's new state of the art facility.



Become an Insider

A simple way to stay informed, as well as up to date on the research we are collecting here at the PTI Farm is to become an Insider. Subscribe to the InsidePTI weekly videos at insidepti.com for all your agronomic needs.



Come Visit us at the New Home of PTI

While a lot of research was happening over the year, PTI also has been breaking ground and completing the vision of a showplace for Precision Planting and growers to meet to continue conversations. In the late fall of 2020, we built a new home and enjoyed showing it to thousands of visitors as they came to our field days during the summer. We look forward to sharing this beautiful complex with more growers in the future and are excited to use it as an avenue to have more amazing conversations and learning opportunities with growers through-out the years to come.



More New Construction

The Precision Technology Institute is proud to announce our joint venture with GSI Grain Systems on a brand new state of the art grain drying and storage system. This project will be complete by summer 2023 and we invite you to come see and understand how the PTI Farm Team will use this technology in relation to agronomy testing at the PTI Farm.



Come Experience Field Days at PTI

So what can you expect when attending summer field days at PTI? Whether you are a frequent visitor or looking forward to your first visit, PTI field days are a high energy, information packed, learning experience. Here are some of the one of a kind experiences you can choose to take advantage of all provided by Precision Planting at the Precision Technology Institute.

- **The Driver's Seat**

In our 27-acre sandbox, you take the wheel. Here, we hand YOU the keys to different tractor/planter combinations and allow you to run the equipment in real time, learning more in depth about how each piece works and the technology behind it. Precision Planting Support Technicians will be co-piloting in the buddy seat at this time, to answer any questions that may come about throughout your experience.

- **Core Principles and Planting Fundamentals**

This hands-on demo is led by the Precision Planting Regional Managers walking the growers through the importance of planter maintenance and furrow creation. Growers can see in person correct and incorrect furrow creation from two different planter row units. During this time, growers can interactively measure and correct the furrow created throughout the different planting conditions.

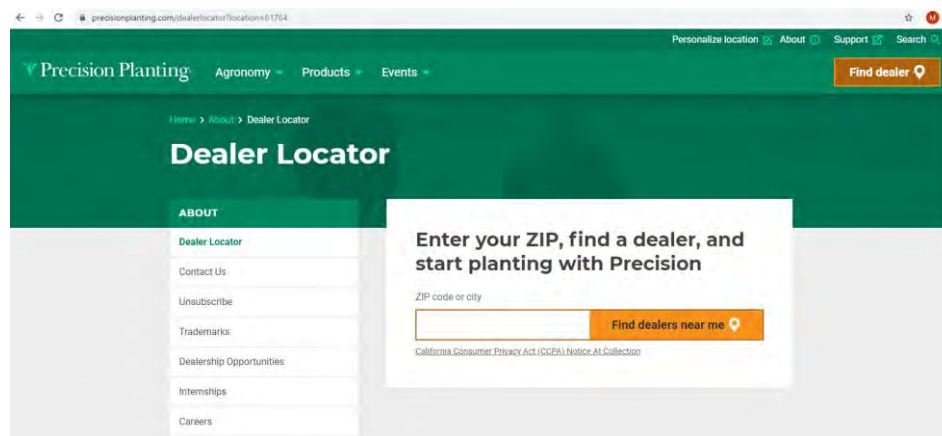
- **Agronomy Tour**

Lead Agronomist and PTI Farm Director, Jason Webster, takes you out into the field to dive deeper into the innovative agronomy and technology that we use each season throughout the different plots. You will learn about our new water recycling and tile drainage system, research tools, and technology/products available to implement on your farm.

- **Industry Days**

Each year, we invite industry partners to use PTI as an avenue to showcase their products and technology during the year. These customer focused field days are led by the industry partner's employees. If you are interested in hosting an industry day or becoming an industry partner of Precision Planting, contact the PTI Team at ptipontiac@precisionplanting.com.

For more information regarding attendance of a PTI Field Day or Industry Day, reach out to your Precision Planting Premier Dealer or visit our website at precisionplanting.com/events to schedule a visit.



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Acknowledgements and Legal Statement

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The University of Illinois Machinery Cost Estimates provided by The University of Illinois Farm Business
The Iowa State University Tillage Rate provided by the Iowa State University Extension and Outreach.