

N-TIME™ IMPACTS

MONITOR BIOLOGICALS

N-time™ offers a high-resolution satellite view of the crop canopy that this farmer used to monitor how an applied biological product impacted his crop during the season.

Giltner, NE - 2022



MONITOR BIOLOGICALS

CASE STUDY SUMMARY

A farm operation near Giltner, NE implemented N-Time™ on 8 pivot irrigated cornfields during the 2022 growing season. This operation used N-Time™ to monitor fields on which they applied Pivot Bio PROVEN 40, so they could determine whether to intervene with synthetic nitrogen. N-Time™ worked alongside PROVEN 40 to help this operation improve nitrogen use efficiency (NUE) by 35% and save 39 lb-N/ac on average. This operation also outpaced its expected yield by 58 bu/ac. The two fields included in this case study will show how they did it.

OPERATION OVERVIEW

Field 1 Profile

Soil Type(s): Silt Loam
Seed Type(s): NK Enogen E111V7-5122
Topography: Minimal slope
Previous Crop: Corn

Field 2 Profile

Soil Type(s): Silt Loam
Seed Type(s): P1185AM (East), P1563 (West)
Topography: Moderate slopes
Previous Crop: Soybeans

GILTNER AREA WEATHER APRIL-SEPTEMBER 2022

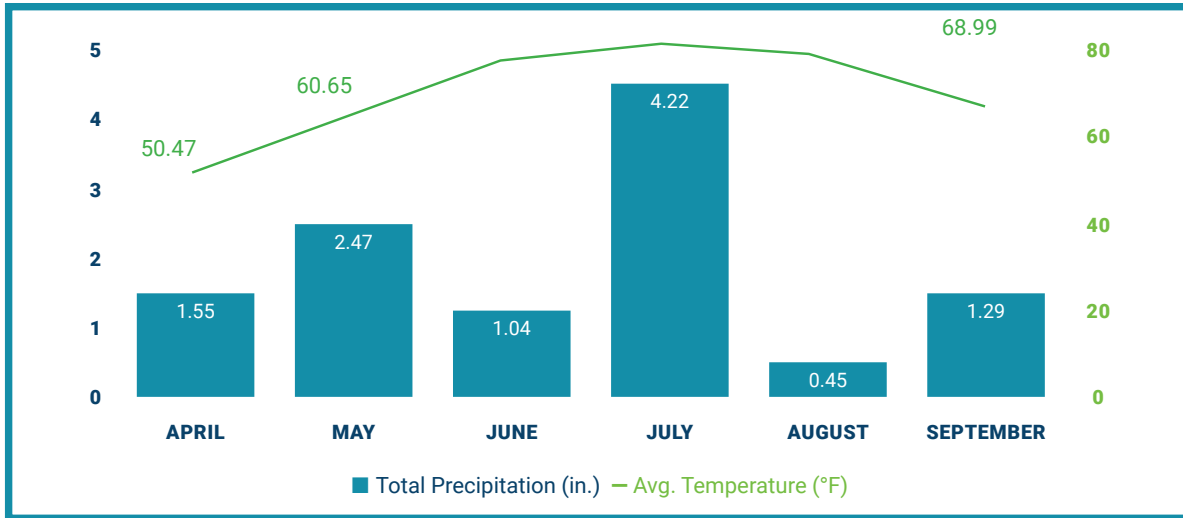


FIG. 1

STANDARD NITROGEN MANAGEMENT

When following corn, Field 1 typically receives a total of 240 lb-N/ac. Most nitrogen is applied with a heavy top-dress urea application. The remaining amount is applied via fertigation. Meanwhile, Field 2 typically receives 210 lb-N/ac when following soybeans. Over half of the nitrogen is applied pre-plant with liquid fertilizer, and the remaining nitrogen is applied via fertigation.



N-TIME™ IMPLEMENTATION

This operation's service provider collected elevation, slope, and soil electrical conductivity (EC) data to build SWAT map zones for these fields. These were reduced from 10 zones to 2 zones (Field 1) or 3 zones (Field 2) and uploaded into N-Time™ to inform indicator block placement. Indicator blocks for Field 1 were established using a prescribed top-dress application of urea (46-0-0) at 210 lb-N/ac on June 17. For Field 2, indicator blocks were established in a prescribed application of 32% UAN at 120 lb-N/ac mid-April prior to planting. As-applied data was shared using John Deere Ops Center, and indicator block locations were adjusted as needed based on this data. Pivot Bio PROVEN 40 was applied at a uniform rate on both fields. After blocks were established, this operation followed N-Time™ analytics and recommendations closely to determine if there was any crop need for synthetic nitrogen fertilizer.



FIG. 2

NITROGEN NARRATIVE

Nitrogen applications under this operation's typical management program without N-Time™ are shown in the diagram below. Applications for these two fields using N-Time™ are shown next to the typical nitrogen management program. Pivot Bio (PB) was applied on both fields. After indicator blocks were established for both fields, N-Time™ did not recommend a nitrogen application. This differed from the farmer's typical approach of 1-3 fertigation applications. With no fertigation, they applied 210 lb-N/ac total for Field 1 and 120 lb-N/ac for Field 2.

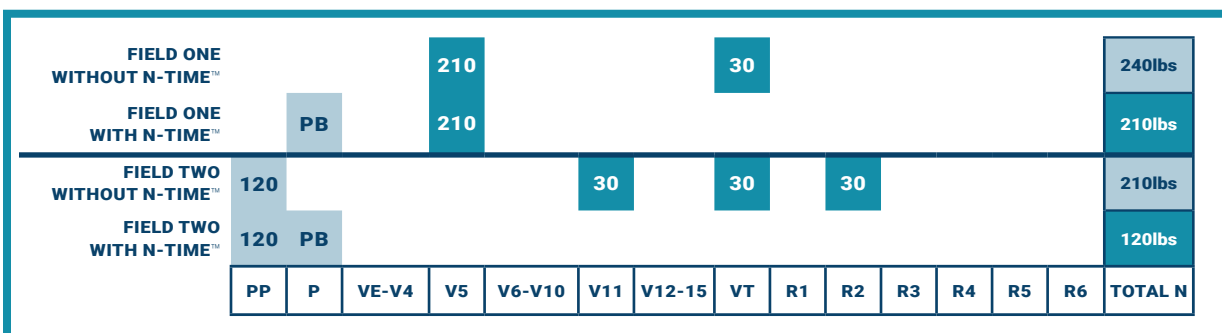


FIG. 3

N-TIME™ RESULTS

After applying Pivot Bio PROVEN 40 at planting in 2022, this operation monitored its fields for in-season synthetic nitrogen needs using N-time™. Instead of using its typical in-season schedule of 1-3 nitrogen applications via fertigation, it did not fertigate once during the 2022 growing season.

As a result, this operation maximized its NUE – up to 0.43 lb-N/bu on Field 2. The average NUE was 0.66, and the operation saved, on average, 39 lb-N/ac. Across all enrolled acres – and at a nitrogen price of \$0.63/lb – this operation saved nearly \$29,000. But considering a nitrogen price of \$1.02/lb in 2022, savings equated to nearly \$53,500 across all acres. In 2023, this operation plans to lower its base rate below 100 lb-N/ac on one field to give N-Time™ more control to recommend in-season nitrogen applications. On other fields, they will continue to use Pivot Bio and use N-Time™ to ensure they provide their crops with optimal synthetic nitrogen.

	WITHOUT N-TIME™	WITH N-TIME™
Yield (bu/ac)	214	272
N Applied (lb/ac)	216	178
NUE (lb/bu)	1.01	0.66
N Spent (\$/ac)	136.24	111.83

FIG. 4

	Total N applied (lb/ac)	Change in N applied (lb/ac)	N Savings (\$/ac)	Yield (bu/ac)	NUE (lb-N/bu)	Change in NUE (%)
Field One	210	-40	35.2	261	0.7	29
Field Two	120	-90	56.70	281	0.4	51

FIG. 5

FARMER'S THOUGHTS

"N-Time™ was a tool that gave us the confidence to use a biological and know we would not run short of nitrogen through the growing season. We planned on a late season nitrogen application and N-Time™ showed us we did not need that application, effectively saving us 70 pounds of synthetic nitrogen; while also having a record high whole farm average."



If you'd like to see this performance on your field, visit sentinelfertigation.com to learn more.

