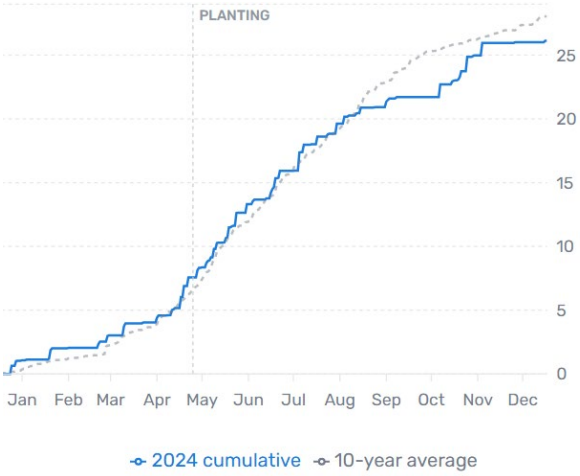
Optimizing N Rate with and Without Pivot Bio PROVEN® 40

Study ID: 0064099202401
County: Kearney
Soil Type: Coly-Kenesaw silt loam; Hersh fine sandy loam
Planting Date: 5/9/24
Harvest Date: 9/24/24
Population: 32,000
Hybrid: Beck's® 5864 AM
Reps: 3
Previous Crop: Soybean
Tillage: Strip-till
Herbicides: ***Pre:*** 2 qt/ac Fulltime® + 44 oz/ac glyphosate ***Post:*** 2.5 qt/ac Acuron® + 24 oz/ac glyphosate + 5 oz/ac Status®
Seed Treatment: Pivot Bio PROVEN® 40 in half of planter
Foliar Insecticides: 7.3 oz/ac bifenthrin on 7/19/24
Foliar Fungicides: 7.1 oz/ac Veltyma® on 7/19/24. 7.1 oz/ac Veltyma® on 8/8/24.
Fertilizer: 15 lb N/ac + 51 lb P/ac fall of 2023; 64 lb N/ac + 9 lb K/ac + 6 lb S/ac from three fertigations

Note: Rye cover crop planted in fall of 2023, grazed with sheep until 4/1/24. Rye was chemically terminated 4/13/24. 20% green snap on July 7.
Irrigation: Pivot, Total: 8.6"
Rainfall (in):



Introduction: Nitrogen fertilizer is a significant input in corn systems. Additionally, N loss through leaching, volatilization, and denitrification pose environmental concerns and reduce profit. Pivot Bio PROVEN® 40 is an N-fixing bacterial inoculant that is expected to fix 40 lb N/ac over the growing season. Biological N fixation for cereal crops has potential to increase N efficiency and decrease N loss. The objective of this study was to evaluate Pivot Bio PROVEN® 40 on corn yield and net return. Pivot Bio PROVEN® 40 was applied as a seed treatment and compared to a check. The entire field received 80 lbs of N between a fall fertlizer application and 3 fertigation applications. Both the Pivot Bio PROVEN® 40 treatment and check were evaluated at four sidedress nitrogen rates, 0 lb N/ac, 40 lb N/ac, 80 lb N/ac, and 120 lb N/ac applied as 32% UAN. Early season stand counts were taken on June 18, 2024. These counts where taken shortly after a hail event.

Results:

	Stand Count (plants/ac)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
80 lb N/ac	32,167 A	230 D	915 B
80 lb N/ac + Pivot Bio PROVEN® 40	31,500 A	230 D	892 B
120 lb N/ac	32,000 A	260 BC	1024 A
120 lb N/ac + Pivot Bio PROVEN® 40	31,500 A	260 C	997 A
160 lb N/ac	31,167 A	269 ABC	1040 A
160 lb N/ac + Pivot Bio PROVEN® 40	31,333 A	270 AB	1020 A
200 lb N/ac	30,833 A	271 A	1026 A
200 lb N/ac + Pivot Bio PROVEN® 40	31,000 A	270 AB	999 A
P-Value:	0.600	<0.0001	<0.0001

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $4.35/bu corn, $0.60 N lb/ac and $26/ac for Pivot Bio PROVEN®

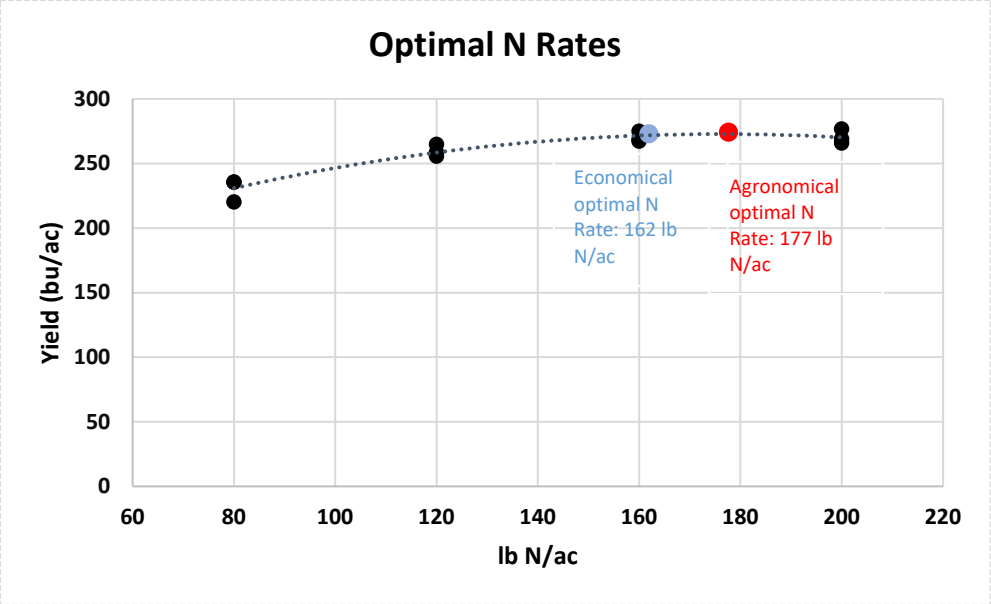


Figure 1: AONR and EONR regardless of the addition of Pivot Bio.

Summary:

- There were no differences for stand count between treatments.
- There were significant differences in yield and marginal net return between the treatments.
- The EONR was 162 lb N/ac, and the AONR was 177 lb N/ac, regardless of with or without Pivot Bio PROVEN® 40.
- The highest yields were achieved with 160 and 200 lbs N/ac with and without Pivot Bio PROVEN® 40.
- The 80 lb N/ac rates with and without Pivot Bio PROVEN® 40 resuted in lower marginal net returns compared to the other treatments.