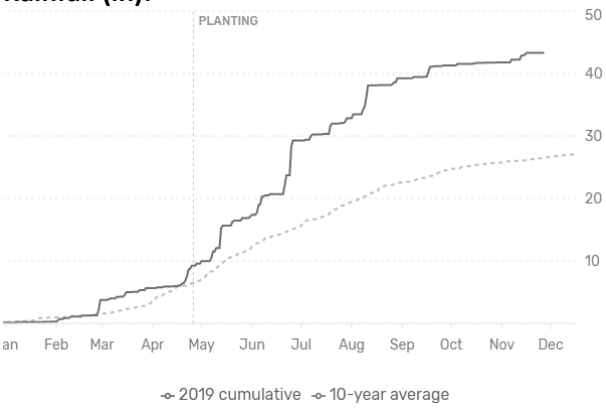
Nitrogen Application to Corn Following Cover Crops

Study ID: 0731061201901
County: Franklin
Soil Type: Kenesaw silt loam, 0-1% slope; Kenesaw silt loam, 1-3% slope
Planting Date: 5/10/19
Harvest Date: 10/15/19
Seeding Rate: 32,000
Row Spacing (in): 30
Reps: 4
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** Roundup® on 5/25/19 ***Post:*** Halex® GT on 6/10/19
Seed Treatment: Poncho®

Foliar Insecticides and Fungicides: None
Irrigation: Pivot, Total: 2"
Rainfall (in):



Introduction: This study is being conducted on a soil health demonstration farm as part of the Nebraska USDA/Natural Resources Conservation Service's (NRCS) Soil Health Initiative, and involves the farmer, the Nebraska On-Farm Research Network, and the USDA/NRCS. The purpose of this study was to better understand N management of corn following cover crops. Nitrogen was applied as urea broadcast at V6 at four rates: 0, 100, 175, and 250 lb N/ac. Additionally, the 0 lb N/ac treatment was split so that half had a rye cover crop preceding it, and half did not (therefore the 0 lb N/ac treatment with no cover crop was not randomized). Plots were 80 feet wide and 200 feet long, with the exception of the 0 lb N/ac treatments, which were only 40 feet wide. For treatments that had cover crops preceding corn, the cover crop was rye planted on November 15, 2018. Corn was planted on May 10, 2019 and cover crops were terminated with herbicide on May 25, 2019 at a height of 18". Yield was collected for each plot by hand harvesting.

Results:

	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
0 lb/ac N Following No Cover Crop	245 A*	939.31 A
0 lb/ac N Following Cover Crop	219 B	837.81 B
100 lb/ac N Following Cover Crop	247 A	905.09 AB
175 lb/ac N Following Cover Crop	242 A	855.71 B
250 lb/ac N Following Cover Crop	262 A	904.89 AB
P-Value	0.001	0.013

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre adjusted to 15.5% moisture.
‡Marginal net return based on $3.83/bu corn and $0.40/lb of N. Cover crop costs differences were not included in net return analysis.

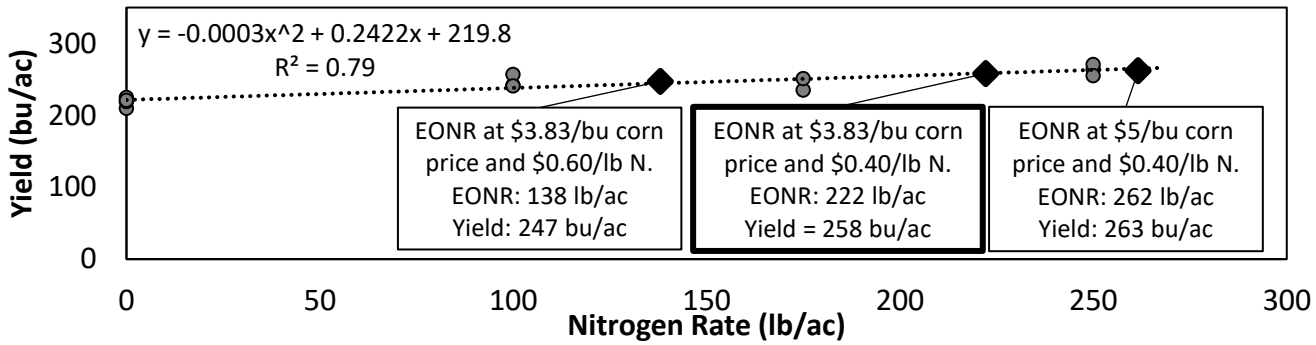


Figure 1. Yield versus nitrogen rate based on the four cover crop nitrogen rate treatments.

Summary: Yield for the 0 lb N/ac treatment with a cover crop was lower than yield for the 0 lb N/ac treatment without a cover crop. For the treatments with cover crops, at a corn price of $3.23/bu and N price of $0.40/lb, the optimum N rate was 222 lb/ac.

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In Partnership with: Nebraska Corn Board, Nebraska Soybean Checkoff, Nebraska Corn Growers Association, Nebraska Dry Bean Commission