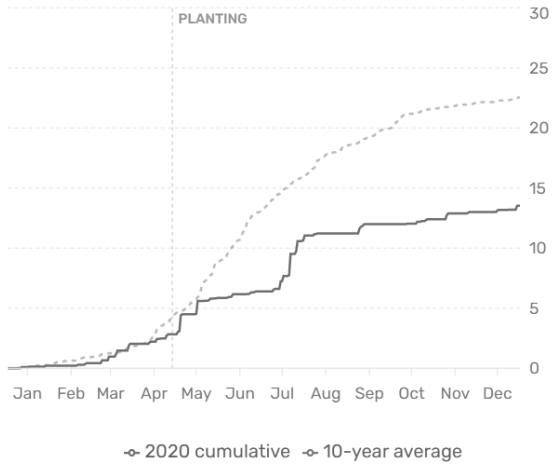
Granular vs Adapt-N for In-Season Nitrogen Management on Non-Irrigated Popcorn

Study ID: 0678111202001
County: Lincoln
Soil Type: Hord fine sandy loam 1-3% slope; Hersh fine sandy loam 3-5% slopes; Holdrege silt loam 3-7% slopes, eroded; Hord silt loam 1-3% slope; Hersh-Valentine soils 6-11% slopes; Uly-Coly silt loam 6-11% slopes; Hersh fine sandy loam 6-11% slopes
Planting Date: 4/28/20
Harvest Date: 10/7/20
Seeding Rate: 15,000-18,000
Row Spacing (in): 30
Hybrid: AP4002LR
Reps: 5
Previous Crop: Wheat
Tillage: Strip-till

Foliar Fungicides: None
Irrigation: None
Rainfall (in):



Introduction: This study evaluated two commercially available crop models, Granular by Corteva Agriscience™ and Adapt-N by Yara International, by comparing the in-season N rate recommendations produced by each. Nitrogen applications to the field included:

1) Variable-rate strip-till application of 10-34-0 on April 23, 2020, resulting in an average of 4 lb/ac N.
2) 10 gal/ac of 6-24-6 starter fertilizer resulting in 7 lb/ac N.
3) Variable-rate sidedress application with a dual coulter applicator applying 32% UAN using either Adapt-N or Granular prescriptions on June 8, 2020. Across the entire field, the Granular in-season N prescription recommended an average of 89 lb N/ac, whereas the Adapt-N in-season N prescription recommended an average of 34 lb N/ac. Prescriptions for each are shown in Figure 1.

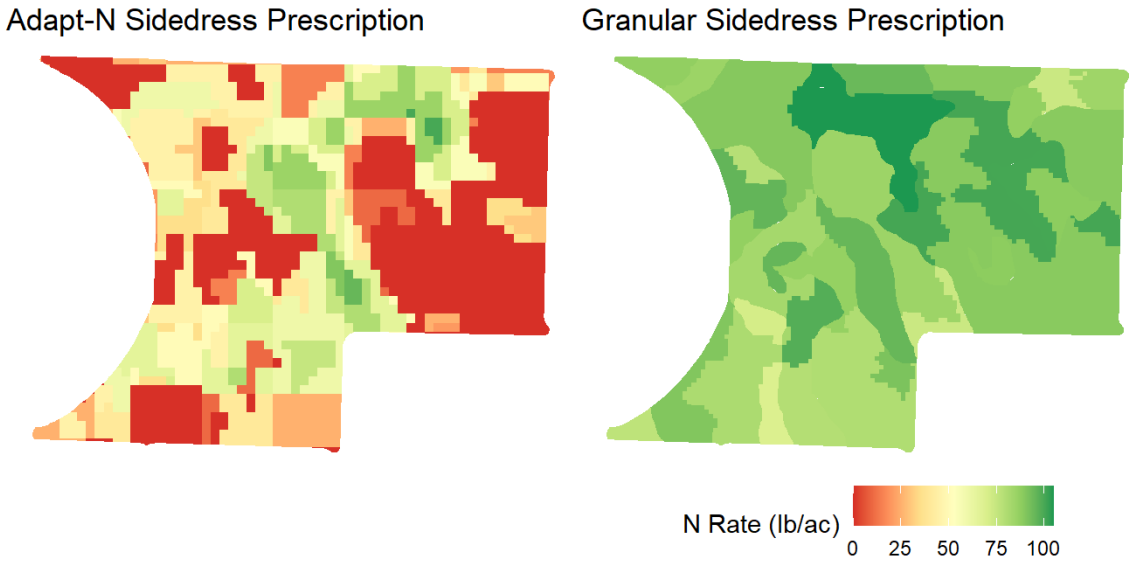


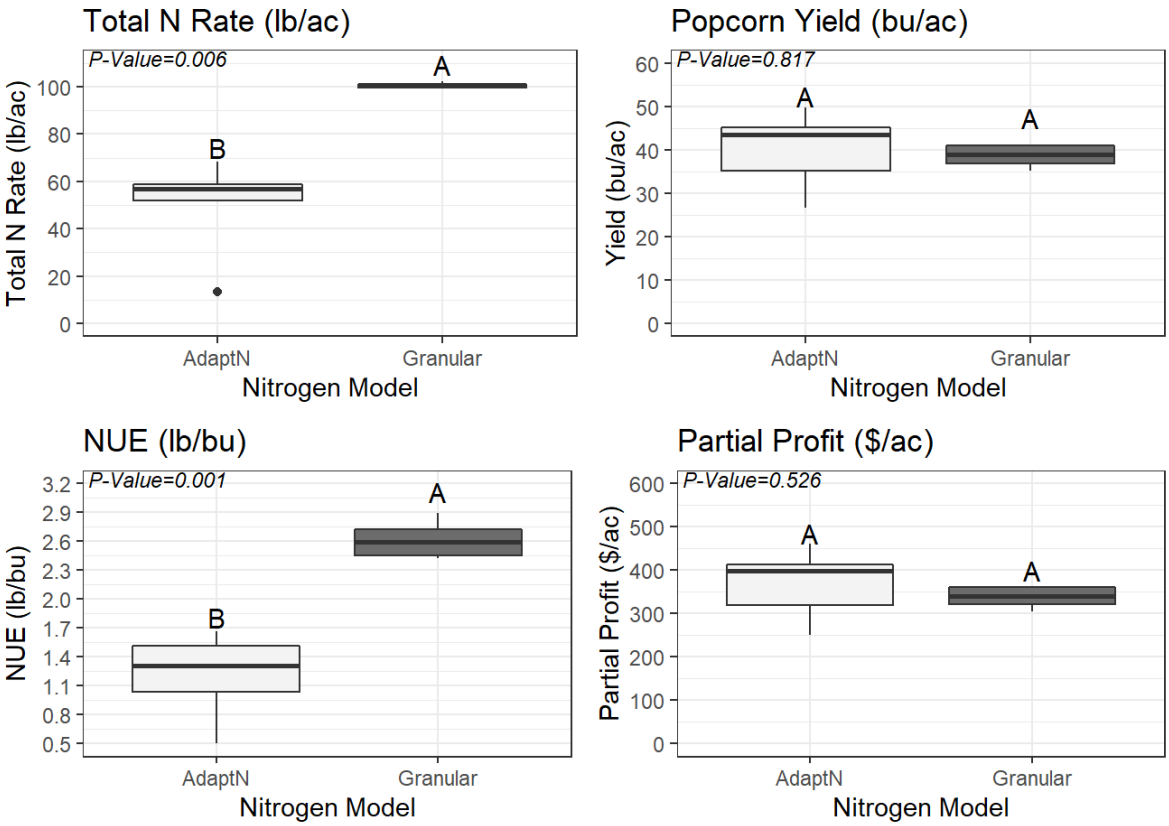
Figure 1. Adapt-N and Granular N recommendation prescriptions for in-season application.

Geospatial yield monitor data were collected at the end of the growing season and post-processed to remove errors with Yield Editor software from the USDA. The as-applied sidedress data were evaluated, and only areas that achieved N application rates within 10% of the target rate were included for yield analysis.

Results:

	Total N rate (lb/ac)	Moisture (%)	Yield (bu/ac)†	Partial Factor Productivity of N (lb grain/lb N)	lbs N/bu grain	Marginal Net Return‡ ($/ac)
Adapt-N	50 B*	13.1 A	40 A	60 A	1.21 B	368.49 A
Granular	101 A	13.6 A	39 A	23 B	2.59 A	342.20 A
P-Value	0.06	0.34	0.817	0.072	0.001	0.526

*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 $9.60/bu popcorn ($0.16/lb at 60 lb/bu) and $0.32/lb N.



Summary:

- The total N rate using Granular was 51 lb/ac higher than the N rate using Adapt-N.
- The yield target for the field was around 100 bu/ac; however, lower than normal rainfall and strong winds resulted in lower yields. There was no yield difference between the two models evaluated.
- Adapt-N had better nitrogen use efficiency; Adapt-N used 1.4 lb/ac less N to produce a bushel of grain than Granular.
- Marginal net return was not statistically different between the two models evaluated.

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