



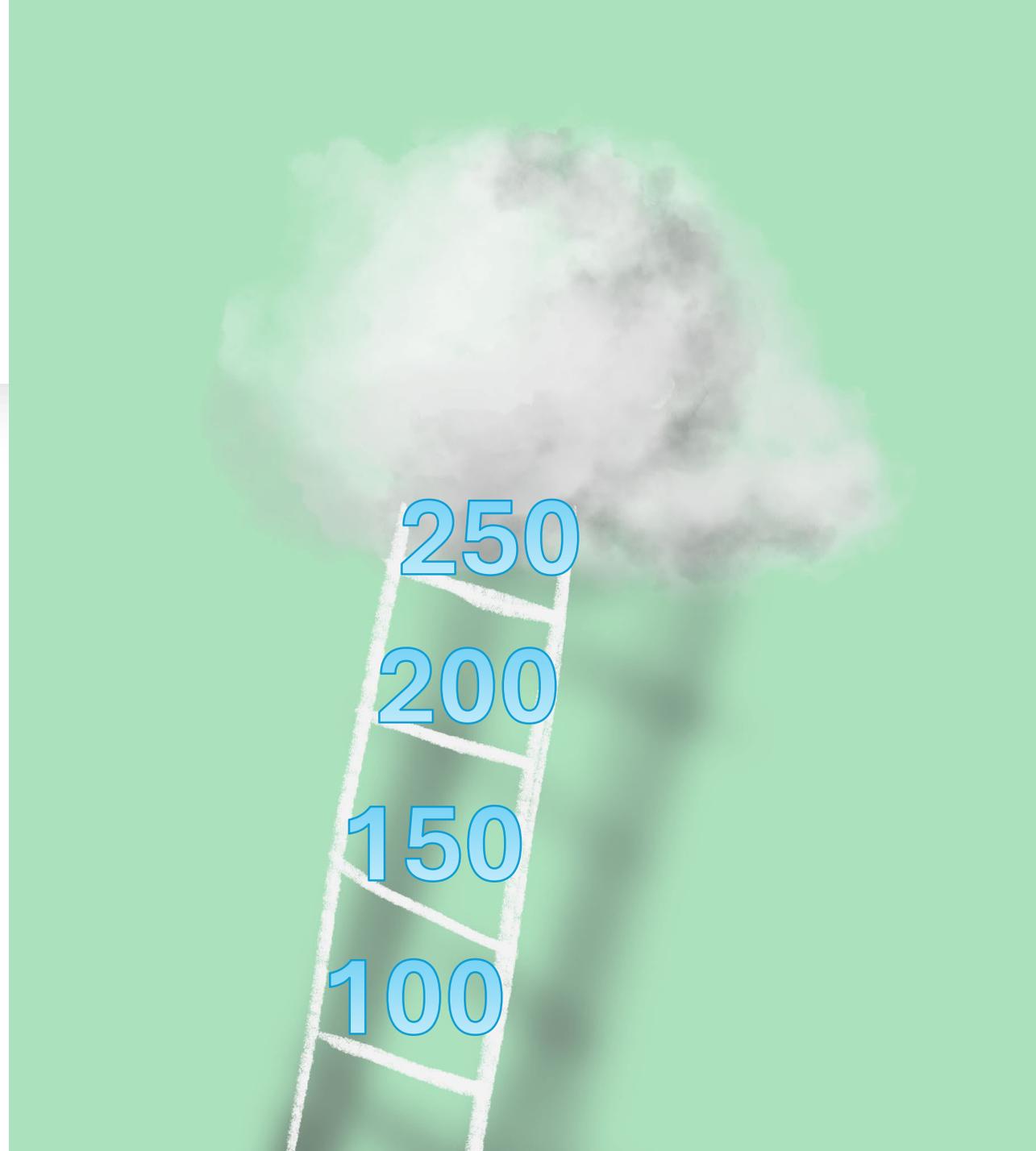
Nitrogen fertilizer management for *Beta vulgaris* in southern Minnesota.

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Presentation Outline

- Materials and methods
- 2024 Trials
 - Nitrogen Placement
 - Nitrogen Rate Ladder
 - Additional Products
- Summary



Materials and methods

- All trials conducted as RCBD with 4 reps
- Remove edge effect (pulled by hand)
- Harvest center 2 rows
- 2 quality samples
- Data analyzed using Sas 9.4, Proc GLM



360 Bandit System

- 3" x 0.75"
- 3" x 0" (surface dribble)
- Liquid 32% UAN vs Broadcast Urea incorporated with a field cultivator



Soil test results for the two trial locations from fall soil sample in 2023.

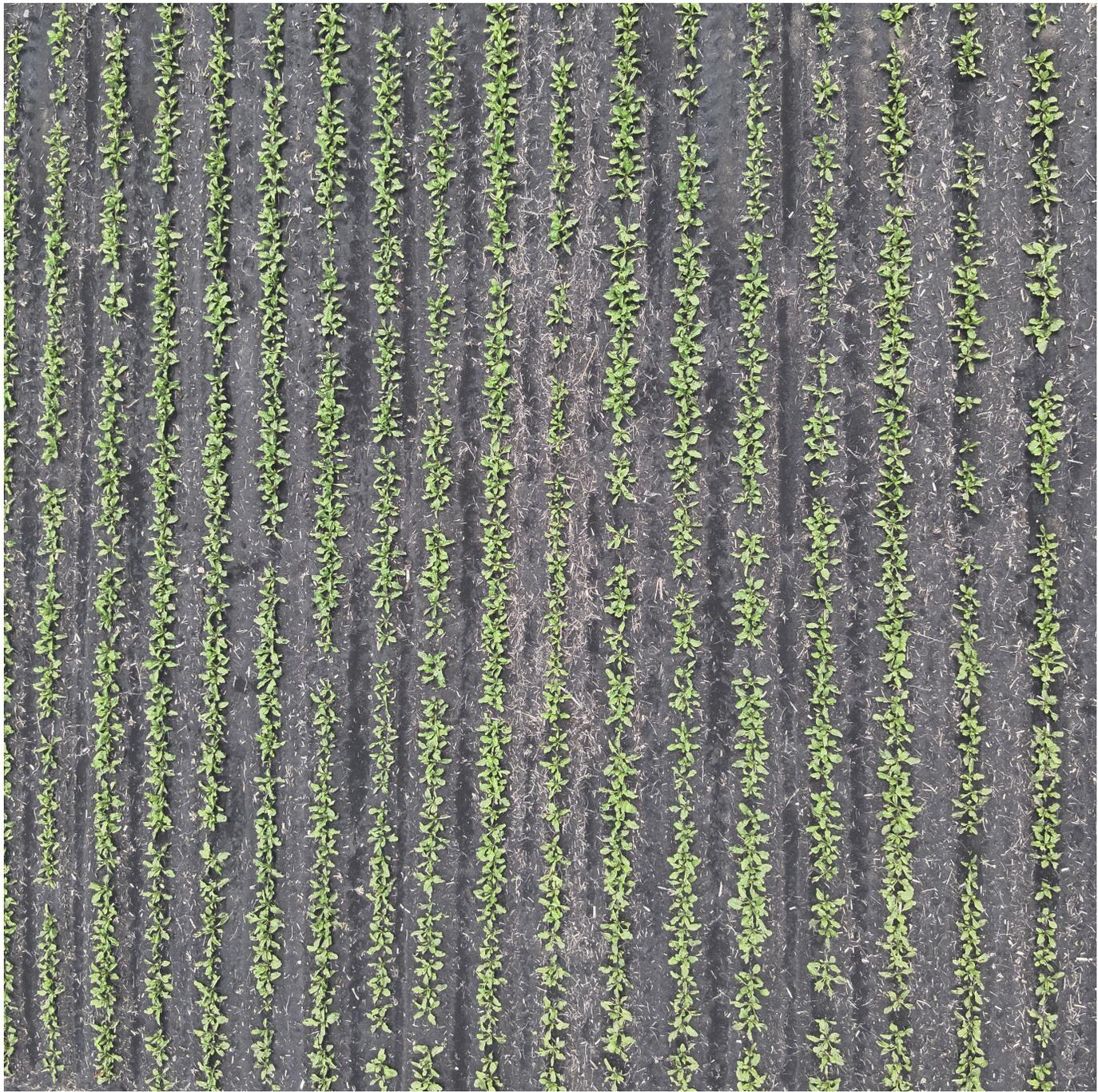
Soil test	Sacred Heart	Roseland
Previous Crop	Soybean (10-15%)	Field Corn (65-70%)
Soil nitrate-N 0-4 ft. (lbs N/A)	36	12.5
Olsen P 0-6 in. (ppm)	10	5
K 0-6 in. (ppm)	181	178
pH 0-6 in. (unitless)	7.8	7.9
Organic matter 0-6 in. (%)	5.2	6.5

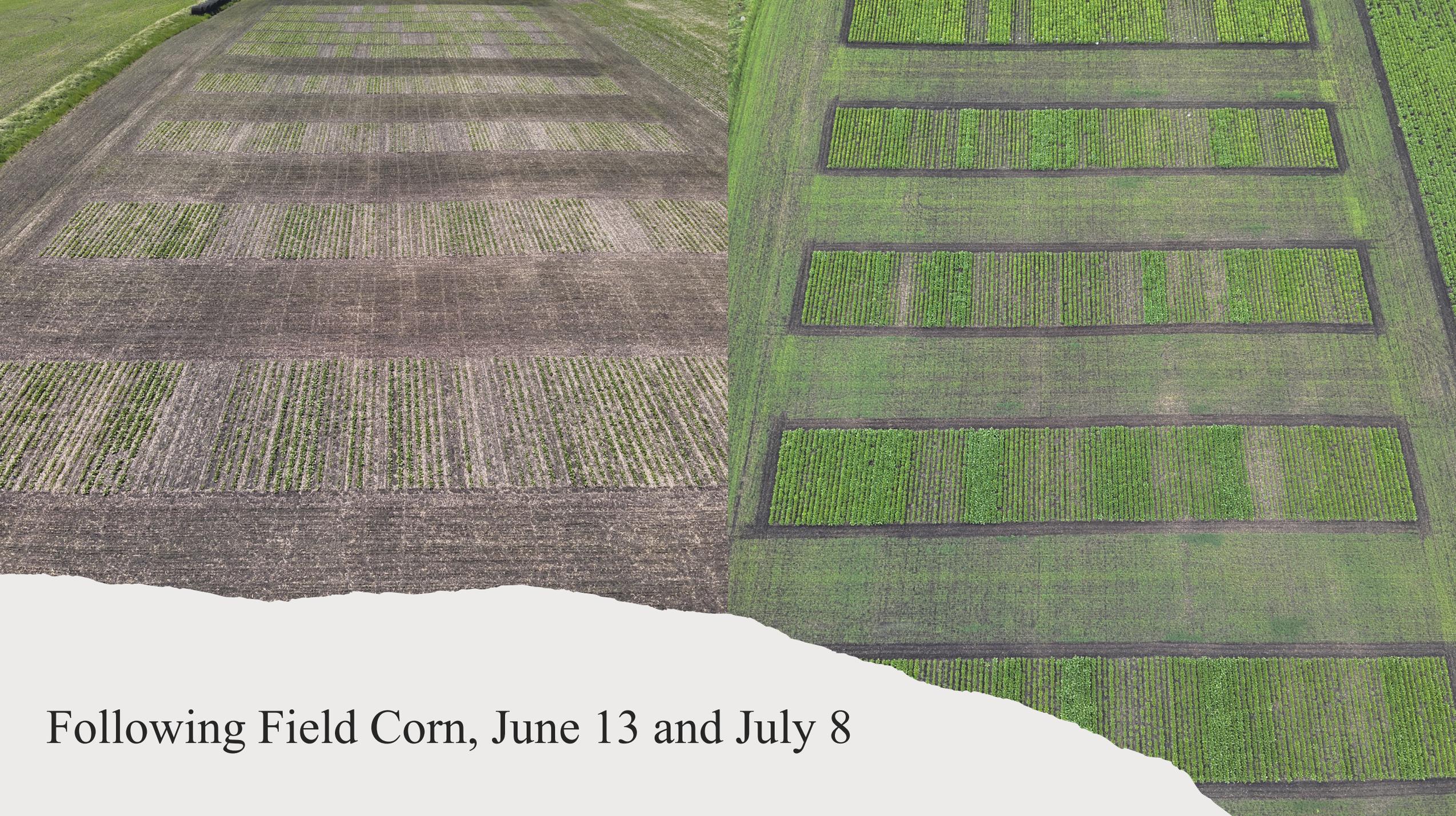
Treatment	Applied N	Total N (Field Corn)	Total N (Soybean)
Control (Residual N)	0	13	36
Broadcast Urea	30	43	66
Broadcast Urea	60	73	96
Broadcast Urea	90	103	126
Broadcast Urea	120	133	156
Broadcast Urea	150	163	186
Broadcast Urea	180	193	216
Broadcast Urea	210	223	-
3x1 32%	30	43	66
3x1 32%	60	73	96
3x0 32%	30	43	66
3x0 32%	60	73	96
Receptor	30	43	66
Envita SC	30	43	66
Transit Foliar	30	43	66
Lalstim Osmo	30	43	66

Additional Products Tested

Product	Description
Receptor	Indole-3-butyric Acid, Gibberellic Acid, and Kinetin. Applied infurrow. Promote early season growth.
Envita SC	<i>Gluconacetobacter diazotrophicus</i> (1 x 10 ⁸ CFU/ml) Applied foliar at 8-10 leaf stage. Nitrogen fixing biological that colonizes the plant.
Transit Foliar	0.5% chelated zinc. Applied foliar at 8-10 leaf stage. Improves uptake and movement of nutrients.
Lalstim Osmo	97% Glycine betaine. Applied foliar at 8-10 leaf stage. Protects plant cells against negative effects of environmental stresses.







Following Field Corn, June 13 and July 8

Following Field Corn, July 1



Check



30lbs urea



30lbs 3x0



30lbs 3x1

Following Field Corn, July 1



Check



30lbs urea



90lbs urea

Following Soybean, July 1



Check



30lbs urea



30lbs 3x0



30lbs 3x1

Following Soybean, July 1



Check

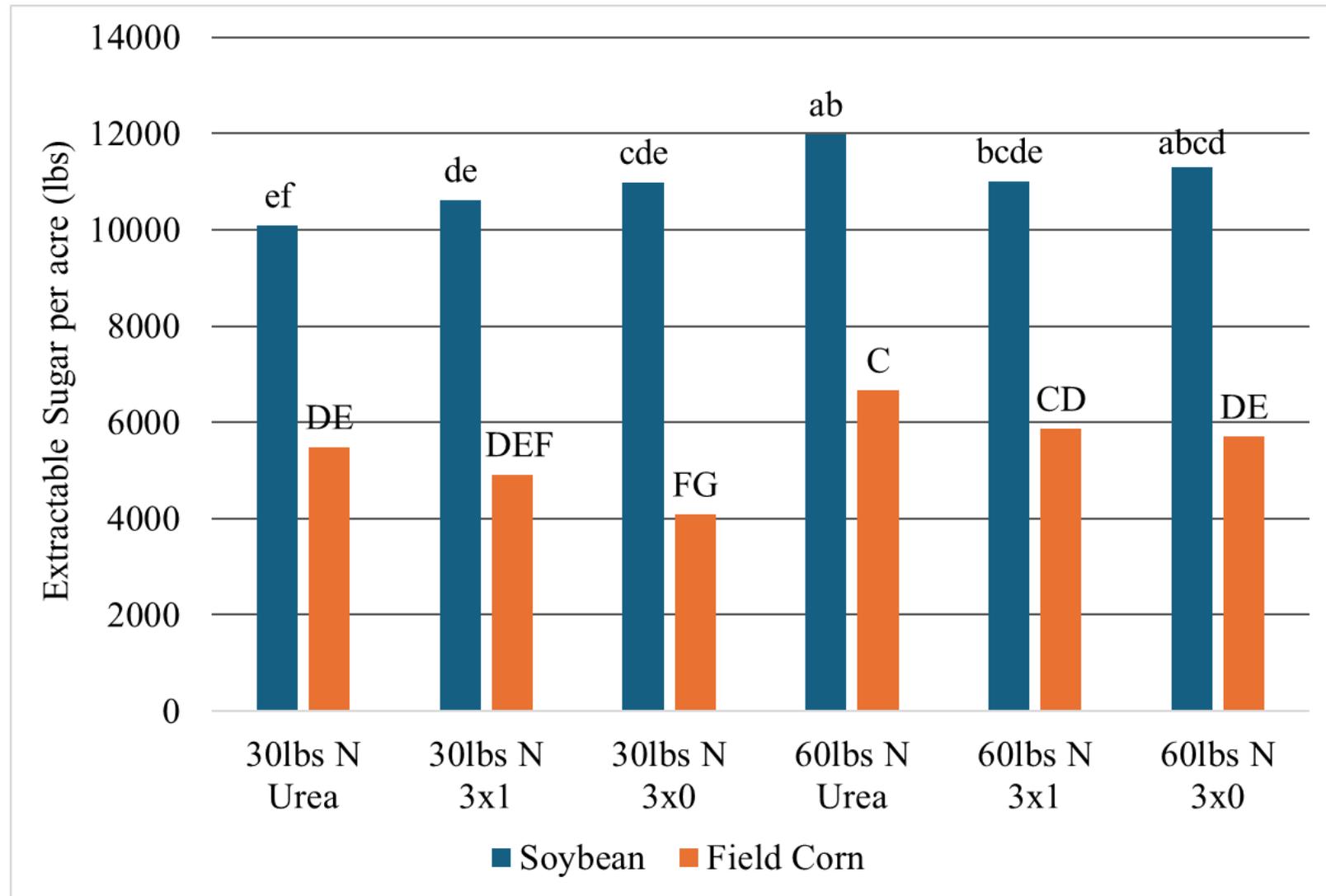


30lbs urea

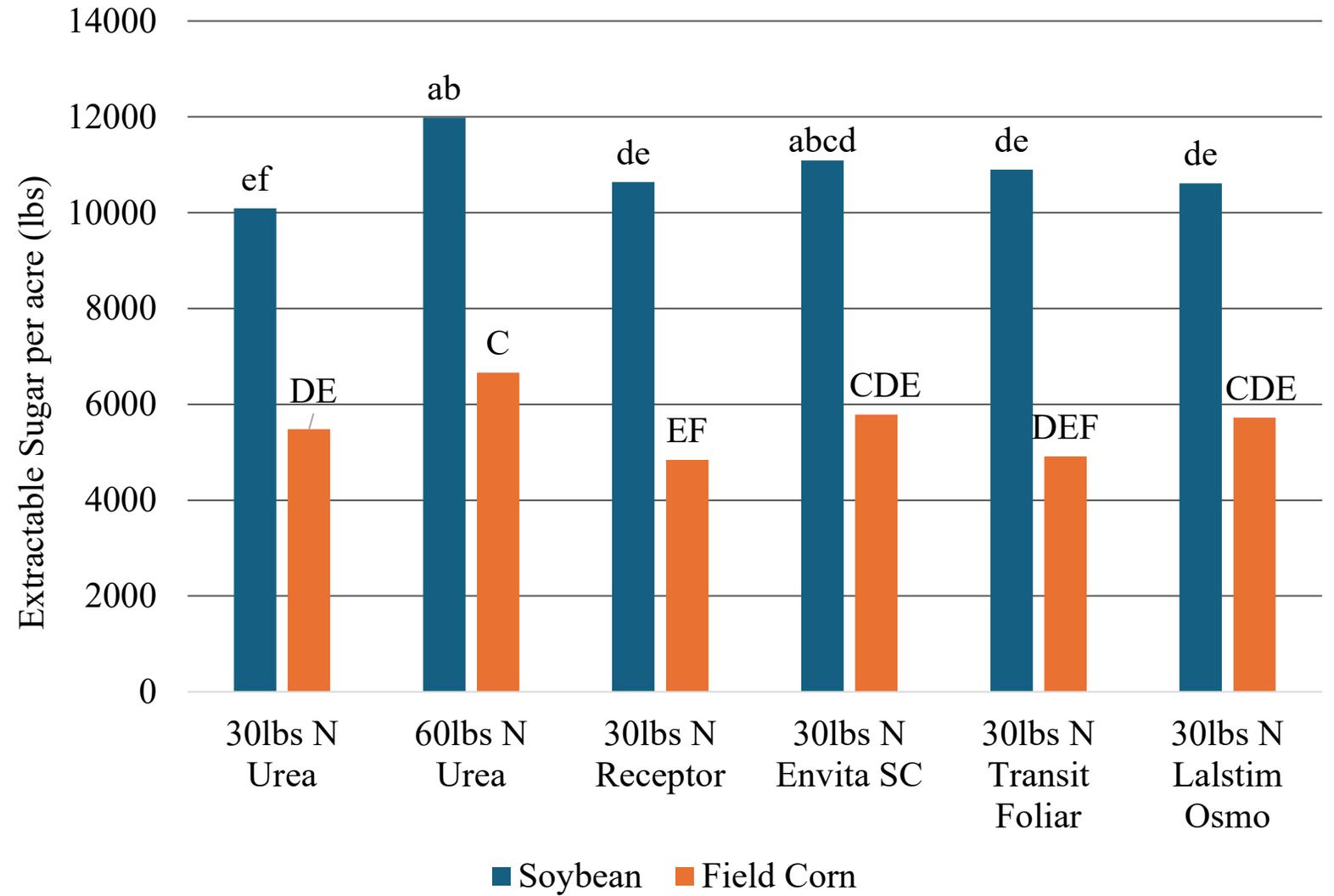


90lbs urea

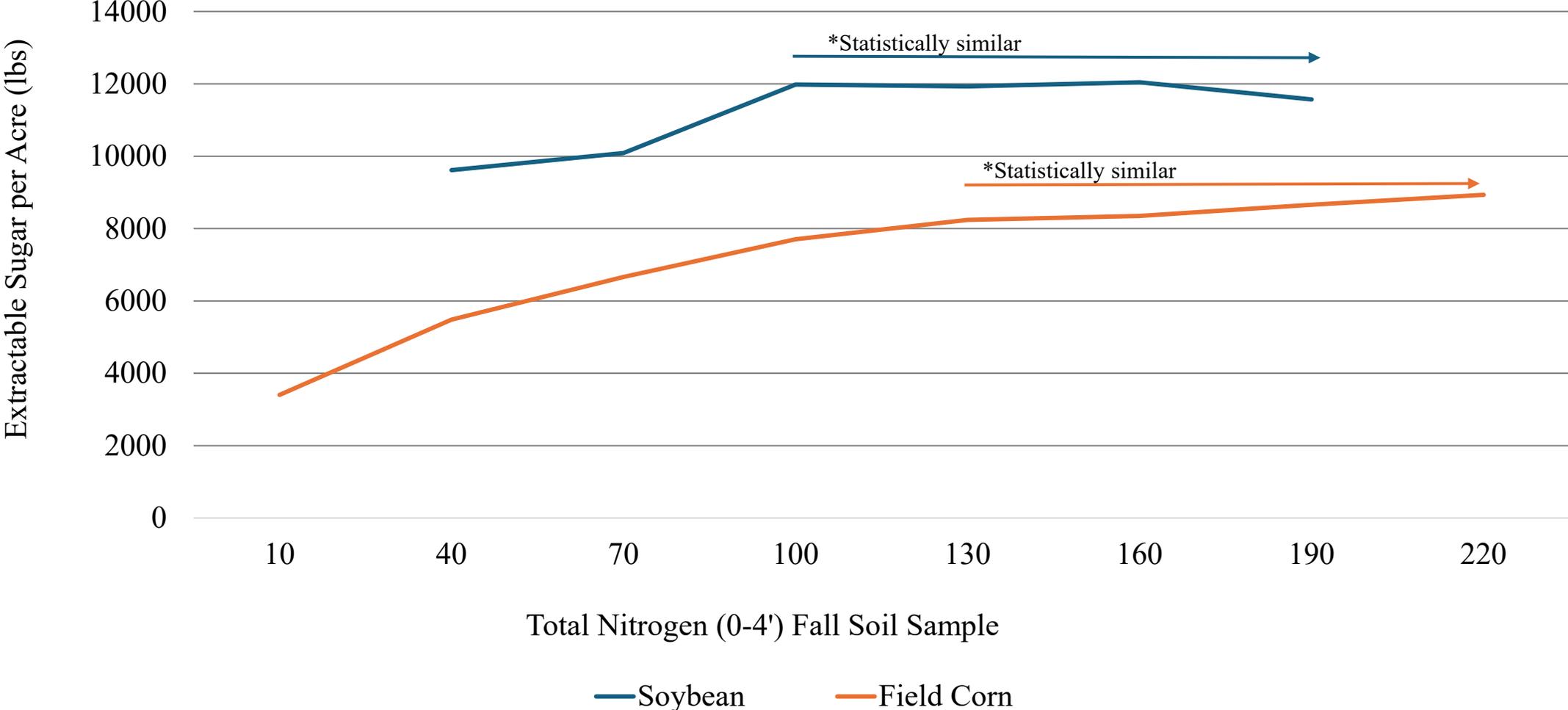
Nitrogen Placement



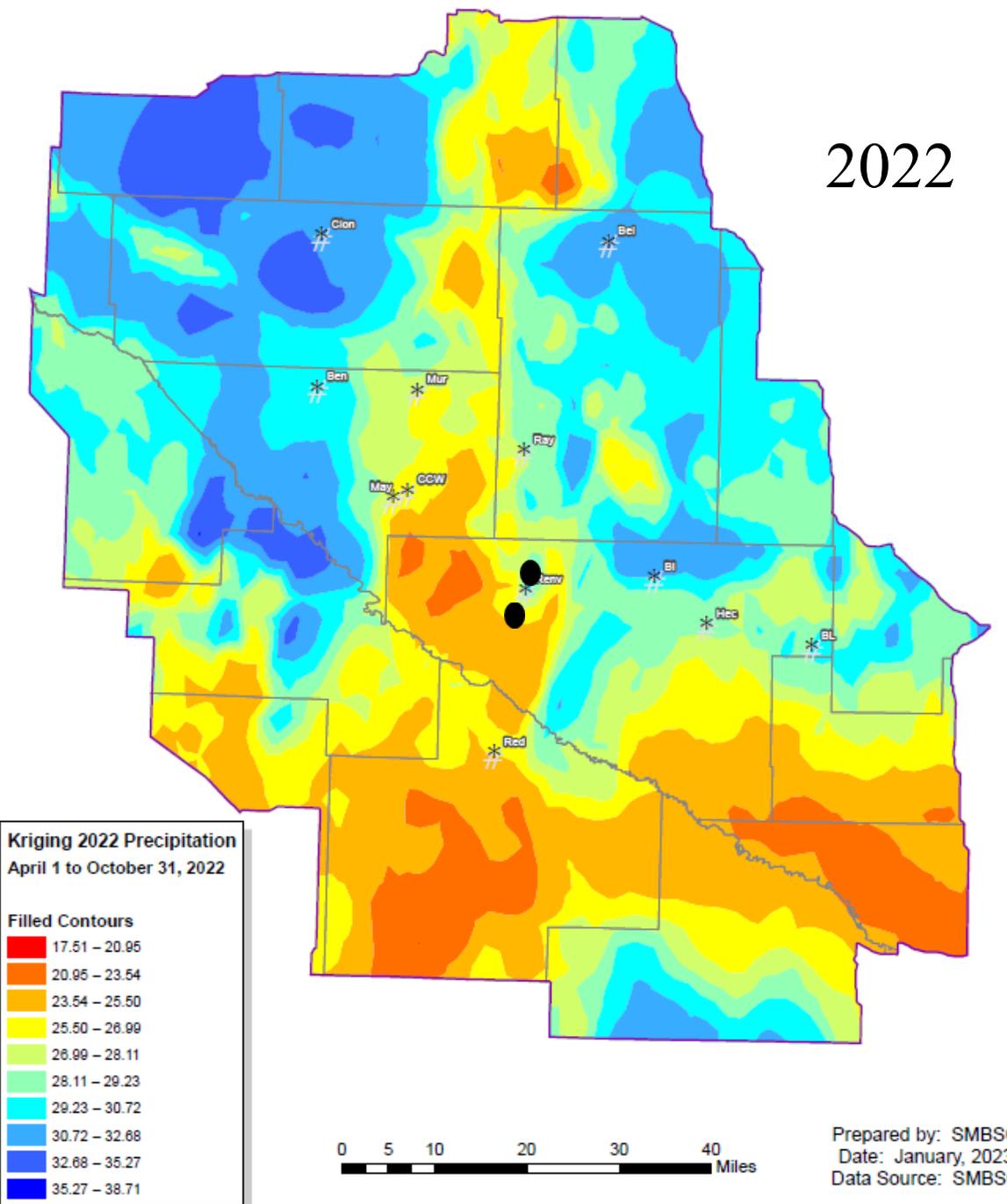
Additional Products



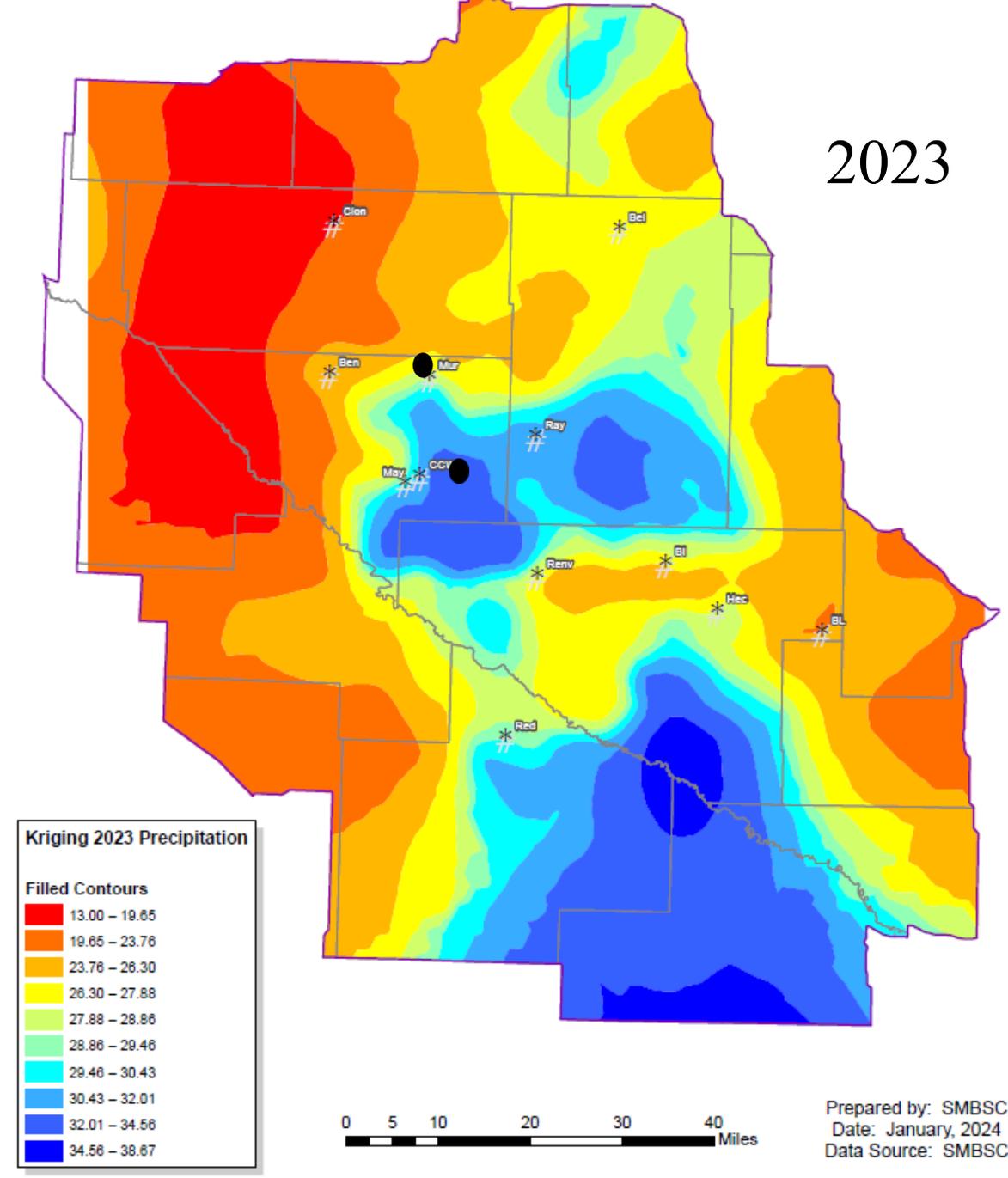
Nitrogen Rate Comparison

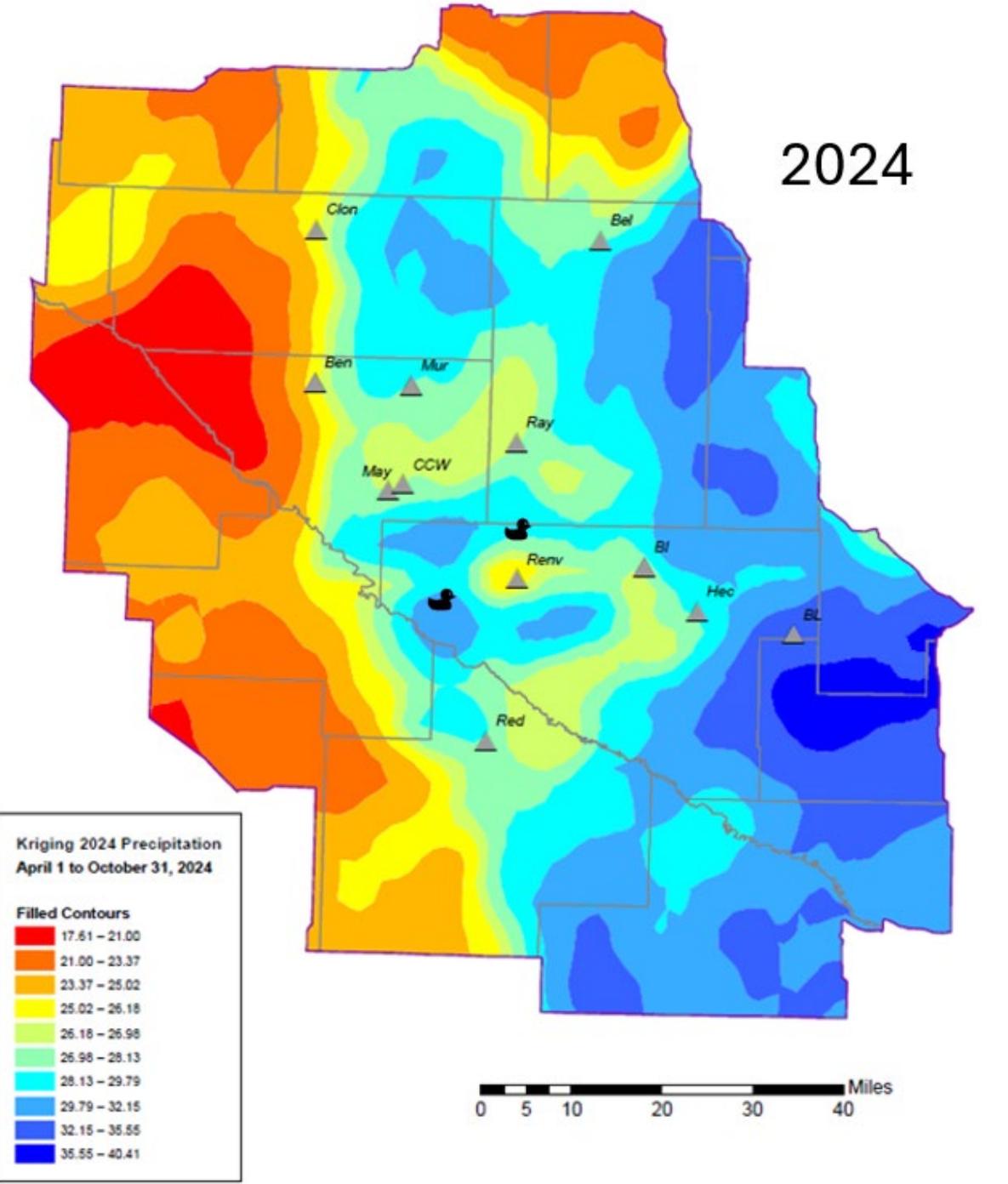


2022



2023





2022 – No response following soybean and response up to 75lbs total N following field corn.

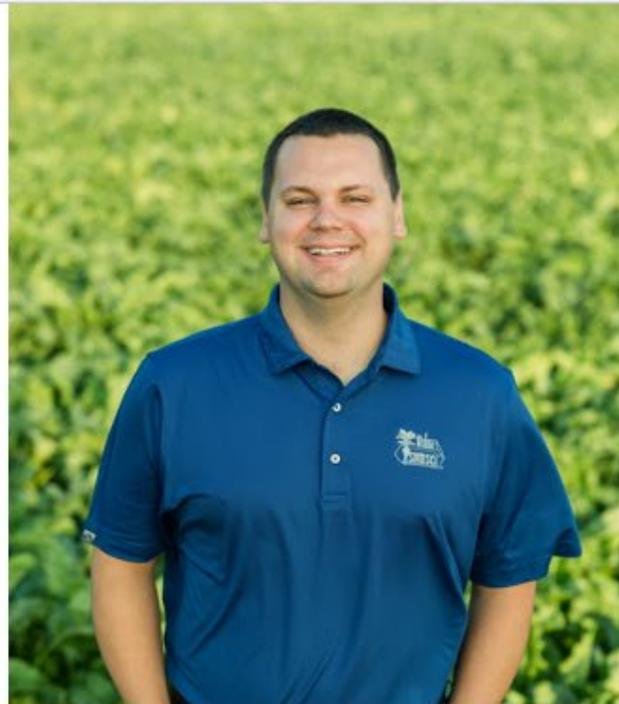
2023 – No response following soybean and response up to 70lbs total N following field corn.

2024 – Response up to 100lbs total N following soybean and 130lbs following field corn.

Summary

- The use of a 3x1 UAN placement vs broadcast urea showed no differences. The use of a surface dribble of UAN showed reduced yield compared to broadcast urea at some locations.
- No longer saw a benefit to additional N over 130lbs of Total N following field corn. Even less response following soybean.
 - Current long-term data shows similar results.
- Have seen no consistent response to additional products tested.





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