

Fertilizer N Rate Recommendation Update for Corn

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Summary

Corn is the leading crop in South Dakota (SD). Successful production heavily relies on N fertilizer application to maximize yields. Non-optimal N rate use can affect the farmer's profitability and the environment. The current N fertilizer guideline is more than 10 years old. Increased yield levels and newer genetics warrant completing studies aimed at updating the current guidelines. The overall goal of the research is to reevaluate and update (if necessary) the current corn fertilizer N rate recommendations through identifying and using recent research data and conducting N rate field trials throughout the state. At the end of the first 4 years of this project, the current fertilizer N rate recommendation will be updated. The project can help to improve farmer's profitability and lower environmental impact associated with over application of N fertilizer.

Goal and Objectives:

The goal of this project is to update the fertilizer N rate recommendation for corn in SD. The objectives of the project are i) to continue with field studies in 2020 to collect corn yield response to N rate application data and ii) to create a corn N fertilizer response database where data from past, current, and future N fertilizer rate studies can be combined and evaluated now and on-going into the future to be able to more easily evaluate the current N recommendation and update as needed.

2023 Results:

- Study was conducted at 13 field sites in central and eastern South Dakota.
- Soil samples were collected for soil health (0-6 in.) and soil fertility (0-6, 6-24 in.) prior to planting and fertilization.
- At-planting nitrogen fertilizer treatments ranging from 0-200 lbs ac⁻¹ were applied.
- Sidedress nitrogen applications for split applications were/will be applied at either V6 or V10
- Plant and soil (0-12, 12-24 in.) samples will/were collected at V6 and V10 for both single and split applications totaling N rates of 80 or 120 lbs N ac⁻¹ at four of the sites.
- Plant and soil samples are currently being processed and prepared to be evaluated for soil physical, chemical, and biological parameters.

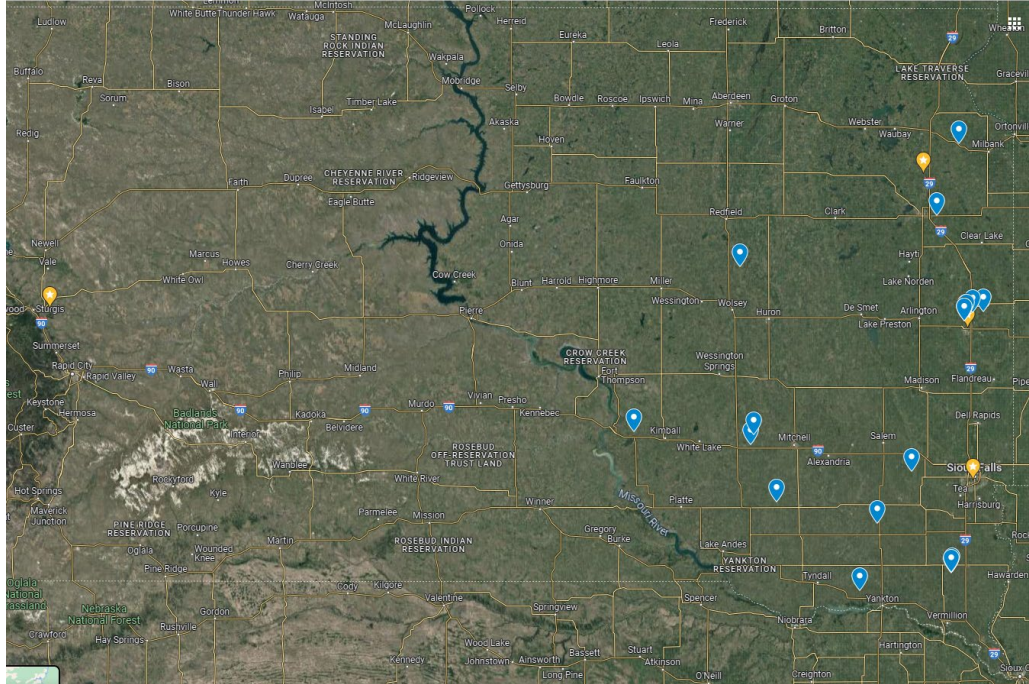


Figure 1. Thirteen field research locations where the N rate and timing studies are established for the 2023 growing season.

Impacts:

- Updated SD Corn N fertilizer recommendations.
- Training of a graduate and several undergraduate students in soil fertility.
- 50 min. presentation of current N fertilizer rate study results to 105 persons
- Creation and publication of YouTube video series regarding use and accuracy of South Dakota’s N recommendation system.

<https://www.youtube.com/channel/UCm0PUerOFPSZ1sL9WychTVw>

Project Budget (As of June 1, 2023):

Budget Category	Budget	Total	
		Expenses	Available
Salaries	\$33,946.00	\$0.00	\$33,946.00
Benefits	\$9,387.00	\$0.00	\$9,387.00
Travel	\$3,600.00	\$0.00	\$3,600.00
Contractual	\$49,000.00	\$0.00	\$49,000.00
Supplies	\$4,000.00	\$1,200.00	\$2,800.00
Tuition remission	\$0.00	\$0.00	\$0.00
Capital Equipment	\$0.00	\$0.00	\$0.00
Non-Capital Equipment	\$0.00	\$0.00	\$0.00
F&A (Indirect) Charges	\$0.00	\$0.00	\$0.00
Total	\$99,933.00	\$1,200.00	\$98,733.00