



Precision MRTN

Optimum Nitrogen Management

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N-Sense introduces Precision MRTN – The sidedress nitrogen fertilizer management option for farmers wanting to maximize both nitrogen-use-efficiency and profitability in corn production.

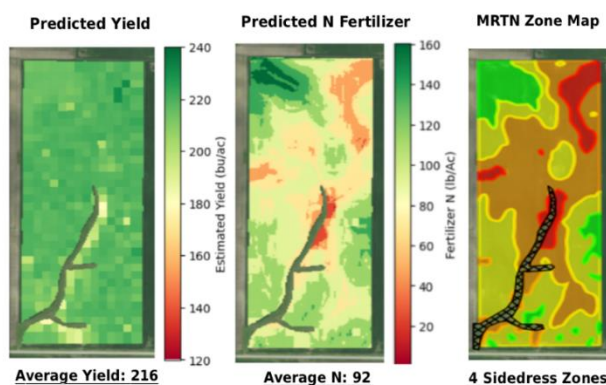
Background: Maximum Return to Nitrogen (MRTN), developed by Land Grant Universities, is the most widely used nitrogen fertilizer management strategy for corn production in the US. MRTN was calibrated with data from hundreds of nitrogen rate trials conducted over decades on grower farms across the Corn Belt. To use on-line MRTN tools, such as the **Corn Nitrogen Rate Calculator**, growers must enter the location of the farm, fertilizer type, fertilizer price, expected corn price, and crop rotation. The tool returns the economically optimum nitrogen fertilization rate for the region. *Unfortunately, MRTN lacks precision.* The recommended N fertilizer rates are a regional average and fail to consider unique features of a field such as the spatial variability of soils and corn yields.

The Solution: N-Sense has solved this problem with our new Precision MRTN software. To use N-Sense's Precision MRTN, a grower must first register a field, upload data for recent soil tests from grid sampling, the cropping history, and field average yields for the last 10 years. The grower must also select weather scenario's for spring (up to sidedress time) and predict summer weather (Options: Very-Wet, Wet, Average, Dry, & Very-Dry). N-Sense's software gathers historic weather, satellite, NDRE, NDVI, LIDAR, and soil survey data for the field and then builds and calibrates a unique machine-learning model of corn yield response to growing-season weather and the intrinsic ability of soils in the field to supply nitrogen to a growing crop. The result is a high-resolution sidedress nitrogen fertilizer prescription. The accuracy of N-Sense's Precision MRTN prescriptions can be further improved by including data for late-spring nitrate tests using our soil-nitrate sensor.

On the right is an example of output from N-Sense's Precision MRTN software for a 64-acre field. The farmer always has the option to adjust recommended N fertilizer rates, up or down. The final product is a pdf report for the farmer's records that also includes predicted outcomes for other weather scenario's and a prescription file that can be uploaded to a fertilizer spreader.

Weather is a major risk in N management. By sidedress time the farmer knows the spring weather, which greatly reduces the weather risk. On the following page are five of 25 possible weather scenarios for this field.

Weather Scenario: Average Spring & Average Summer



Precision MRTN Sidedress Management Zones				
N (lb/ac) Zone Ranges	0-46.9	46.9-92	92-115	115-160.2
Zone Categories	Very Low	Low	Optimum	High
Acres in Zone	4.8	27.6	25.0	6.9
N-Sense Rec. lb-N per acre	43.2	79.5	106.5	135.1
Farmer's Final Decision	-	-	-	-

Total Fertilizer needed: 5997 pounds



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