CORN NITROGEN RATE CALCULATOR UPDATE

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What is the Corn Nitrogen Rate Calculator?

The *Corn Nitrogen Rate Calculator* is an online tool that allows determination of nitrogen (N) application rates for corn production and is helpful in determining the effect of fertilizer and corn price on needed rates. The method for calculating suggested N rates is based on a regional (Corn Belt) approach to N rate guidelines. Details on the approach are provided in the regional publication *Concepts and Rationale for Regional Nitrogen Rate Guidelines for Corn*. This approach and the *Corn Nitrogen Rate Calculator* are now being used by seven states across the Corn Belt: Iowa, Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin.

Nitrogen (N) Response Trials Added

The Iowa N response database in the calculator was recently updated, with response trials added from 2012 research. There are now 230 trials for corn following soybean and 125 trials for corn following corn. Being able to easily update the database with recent data is one of the many advantages to this dynamic database approach for corn N rate guidelines. Having new response trial data allows rapid updating with changing hybrid genetics, rotations and climatic conditions.

With the updated database, calculated N rates have decreased slightly from previous years, the result of a lower N fertilization rate requirement in the dry 2012 season. The table below gives the N rate at the maximum return to N (MRTN) and the profitable N rate range from the updated calculator for several N: corn grain price ratios (price of N fertilizer in $ per lb N divided by the price of corn in $ per bu). You can work with any price of N and corn you wish when running the calculator. Output information includes the N rate at the MRTN, the profitable N rate range, the net return to N application, the percent of maximum yield and the selected N fertilizer product rate and cost.

Nitrogen rates determined from the calculator are directly the total fertilization amounts for each rotation, with no need to further adjust rate for previous crop. That is, for the soybean-corn rotation, there is no need to subtract a “soybean credit” as the rotation effect is already accounted for by the N rate trials that the database is derived from.

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Nitrogen Rate Guidelines in Iowa for Different N and Corn Grain Prices

Price Ratio[1]	Corn Following Soybean		Corn Following Corn	
	Rate[2]	Range[3]	Rate[2]	Range[3]
$/lb:$/bu	- - - - - - - - - - - - - - - lb N/acre - - - - - - - - - - - - - - -			
0.05	154	140 - 170	216	198 - 239
0.10	134	122 - 146	187	176 - 201
0.15	120	110 - 129	170	158 - 182
0.20	108	99 - 117	153	143 - 164

[1] Price per lb N divided by the expected corn price. For example, N at $0.60/lb N and corn at $6.00/bu is a 0.10 price ratio. Corn held at $6.00/bu for all price ratios.

[2] Rate is the lb N/acre that provides the Maximum Return To N (MRTN). All rates are based on results from the *Corn N Rate Calculator* as of January 31, 2013 (http://extension.agron.iastate.edu/soilfertility/nrate.aspx).

[3] Range is the range of profitable N rates that provides a similar economic return to N (within $1.00/acre of the MRTN).

Resources for N Rate Decisions

The *Corn Nitrogen Rate Calculator* Web tool is located at:
http://extension.agron.iastate.edu/soilfertility/nrate.aspx

The regional publication *Regional Nitrogen Rate Guidelines for Corn* (PM 2015) can be ordered through any ISU county extension and outreach office, from the ISU Extension Online Store at https://store.extension.iastate.edu/ , or by calling (515) 294-5247. An electronic copy of the publication is available at www.extension.iastate.edu/Publications/2015.pdf

The ISU Agronomy Extension Soil Fertility website is located at:
http://www.agronext.iastate.edu/soilfertility/

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