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Corn Nitrogen Rate Calculator Update

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Abstract
The Iowa nitrogen (N) response database in the corn nitrogen rate calculatorwas recently updated, with response trials added from 2009 research. There are now 188 trials for corn following soybean and 89 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.

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Corn Nitrogen Rate Calculator Update

By John Sawyer, Department of Agronomy

Nitrogen (N) Response Trials Added
The Iowa nitrogen (N) response database in the corn nitrogen rate calculator was recently updated, with response trials added from 2009 research. There are now 188 trials for corn following soybean and 89 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 changed slightly from last year. 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. 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.

What is the Corn Nitrogen Rate Calculator?
The Corn Nitrogen Rate Calculator Web tool is located at http://extension.agron.iastate.edu/soilfertility/nrate.aspx. It is a resource that aids N rate decisions for corn production and is helpful in determining the effect of fertilizer and corn price on application 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, PM 2015. 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 rate guidelines in Iowa for different N and corn grain prices.				
Price	Corn Following Soybean		Corn Following Corn	
Ratio[1]	Rate[2]	Range[3]	Rate[2]	Range[3]
$/lb:$/bu	lb N/acre			
0.05	148	134 - 166	199	184 - 215
0.10	128	116 - 142	180	167 - 192
0.15	116	105 - 126	163	151 - 176
0.20	104	93 - 115	150	139 - 160

[1] Price per lb N divided by the expected corn price. For example, N at $0.40/lb N and corn at $4.00/bu is a 0.10 price ratio. Corn held at $4.00/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 August 16, 2010 (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 office, on the Web through the ISU Extension Distribution Center at https://www.extension.iastate.edu/store, 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 Web site is located at: http://extension.agron.iastate.edu/soilfertility/.

John Sawyer is professor with research and extension responsibilities in soil fertility and nutrient management.