

Nitrogen Rate Guidelines – Maximizing the Rate of Return

Nitrogen Application Rate Guidelines for Corn

(For more info, see [http://www.soils.wisc.edu/extension/Nitrogen Application Rate Guidelines for Corn pubs/A2809.pdf](http://www.soils.wisc.edu/extension/Nitrogen%20Application%20Rate%20Guidelines%20for%20Corn%20pubs/A2809.pdf).)

Justification: While the yield response of corn to applied N has not changed, the economics of corn production have. Recently soil fertility specialists in Wisconsin, Minnesota, Iowa, and Illinois have agreed to use the same philosophy to develop N rate guidelines for corn (grain). The philosophy used is based on maximizing return to N fertilizer. The new N rate guidelines were developed as a means to provide growers guidance on how much they might adjust their N application rates and maintain or enhance profitability depending upon their individual farm situation. Research data collected in Wisconsin from research farms and grower fields over a period of 20 years was used to develop the guidelines.

SUGGESTED N APPLICATION RATES FOR CORN(GRAIN) AT DIFFERENT N:CORN PRICE RATIOS								
Soil and Previous Crop	N:Cor n Price Ratio (\$/lb N:\$/bu)							
	0.05		0.10		0.15		0.20	
	Rate ^{*3}	Range ^{*4}	Rate ^{*3}	Range ^{*4}	Rate ^{*3}	Range ^{*4}	Rate ^{*3}	Range ^{*4}
lb N/a (Total to Apply) ^{*2}								
HIGH YIELD POTENTIAL SOILS Corn, Forage Legumes, Leguminous vegetables, Green manures ^{*5} Soybean, Small grains ^{*6}	190	170-210	165	155-180	150	140-160	135	125-150
	140	125-160	120	105-135	105	95-115	95	80-105
MEDIUM YIELD POTENTIAL SOILS Corn, Forage Legumes, Leguminous vegetables, Green manures ^{*5} Soybean, Small grains ^{*6}	145	130-160	125	115-140	115	105-125	105	95-110
	130	110-150	100	85-120	85	70-95	70	60-80
IRRIGATED SANDS AND LOAMY SANDS All Crops ^{*5}	215	200-230	200	185-210	185	175-195	175	165-185
NON-IRRIGATED SANDS AND LOAMY SANDS All Crops ^{*5}	140	130-150	130	120-140	120	110-130	110	100-120

*1 To determine soil yield potential, consult UWEX publication A2809 or contact your county agent or agronomist.

*2 Includes N in starter.

*3 Maximum return to N (MRTN) rate.

*4 Profitability range within \$1/a or MRTN rate.

*5 Subtract N credit for forage legumes, legume vegetables, animal manures, green manures.

*6 Subtract credits for animal manures and second year forage legumes.

Guidelines for choosing an appropriate N application rate for corn (grain)

- 1) If there is more than 50% residue cover at planting, use the upper end of the range.
- 2) For small grains grown on medium and fine textured soils, the mid to low end of the profitable range is the most appropriate.
- 3) If 100% of the N will come from organic sources, use the top end of the range. In addition, up to 20 lb N/a in starter fertilizer may be applied.
- 4) For medium and fine textured soils with: < 2% organic matter, use the high end of the range; > 10% organic matter, use the low end of the range.
- 5) For coarse textured soils with: < 2% organic matter, use the high end of the range; > 2% organic matter, use the mid to low end of the range.
- 6) If there is a likelihood of residual N, then use the low end of the range or use the high end of the range and subtract preplant nitrate test (PPNT) credits.
- 7) For corn following small grains on medium and fine textured soils, the middle to low end of the range is most appropriate.

Use your crop data to calculate the N rate for your corn: <http://cnrc.agron.iastate.edu/agsource.com>

