Corn Response to Nitrogen Rates, Carrington

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The objective of the study was to examine corn performance with several nitrogen (N) rates to provide additional information for a database to revise NDSU corn N recommendations. Experimental design was a randomized complete block with four replications. Two dryland field trials were conducted at the Carrington Research Extension Center and Fessenden (Wells County; cooperator = Mitch Lloyd). Materials and methods are listed in Table 1.

Table 1. Materials and methods for corn response to N rates study, 2012.

			Soil Analysis (spring test)							Corn[1]			
Trial Location	Previous Crop	Tillage System	Organic matter (%) 0-6 inches	pH	N lb/A (0-24 inches)	P ppm	K ppm	Zn ppm	Planting Date	RR Hybrid	Starter Fertilizer	Stand plants/A	Harvest Date
Carrington	wheat	conv	3.1	6.4	41	5	174	0.61	25-Apr	DKC33-53	10 gal/A 10-34-0 IF	22,840 (1-Jun)	8-Oct
Fessenden	wheat	strip	2.2	6	38	6	241	0.54	3-May	K7482 & 4104	200 lb/A MES10 2x2 band	37,185 (31-May)	12-Oct

[1]Planted in 30-inch rows.

At Carrington, seed yield was statistically similar among N rates, but tended to increase with increasing N rates (Table 2). At Fessenden, seed yield increased with 80 lb N/acre but not with higher N rates compared to the untreated check (Table 3). Test weight tended to increase with N rates at ≥80 lb/acre.

Table 2. Corn response to N rates, Carrington, 2012.

	Corn					
Nitrogen	Silk Date	Seed Yield	Test Weight	Seed Moisture	Seed Protein	Seed Starch
lb N/acre	days	bu/acre	lb/bu	%	%	%
untreated check	201	110.6	57.0	15.2	7.0	73.5
40	200	121.9	58.2	15.3	8.3	72.6
80	201	125.5	58.0	15.3	9.0	71.7
120	200	126.8	57.5	15.4	8.6	72.1
160	200	124.7	58.1	15.3	8.9	71.7
200	201	135.4	57.1	15.6	9.0	71.8
Mean	201	124.2	57.7	15.3	8.5	72.2
C.V. (%)	0.4	8.7	1.0	2.3	5.0	1.0
LSD (0.05)	NS	NS	0.9	NS	0.6	1.1

Table 3. Corn response to N rates, Fessenden, 2012.

Nitrogen	Seed Yield	Test Weight	Seed Moisture	Seed Protein	Seed Starch
lb N/acre	bu/acre	lb/bu	%	%	%
untreated check	153.6	57.2	16.1	6.6	73.8
40	177.1	57.4	15.8	7.8	72.6
80	212.2	57.9	15.9	8.0	72.8
120	202.1	57.8	15.9	8.2	72.8
160	205.8	57.9	15.8	8.4	72.5
200	194.1	57.9	15.9	8.7	72.3
Mean	190.8	57.7	15.9	7.9	72.8
C.V. (%)	13.4	1.2	2.3	5.1	0.8
LSD (0.05)	38.6	NS	NS	0.6	0.9