

Corn response to nitrogen rates, Carrington, 2010.

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The objective of the study is 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 field trials were conducted at the NDSU Carrington Research Extension Center. Materials and methods are listed in Table 1.

Table 1. Materials and methods for corn response to N rates study, CREC, 2010.												
Trial	Previous crop	Soil analysis (spring test)						Corn ¹				
		Organic matter (%)	pH	N	P	K	Zn	Planting date	RR hybrid	Planting rate	Starter fertilizer	Harvest date
		0-6 inches		lb/A (0-24 inches)	ppm					seeds/A		
Carrington dryland	wheat	3.7	7.5	37	7	148	0.61			26,000		
Carrington irrigated	sunflower	3	7.9	27	11	172	1.08	4-May	DK33-53	30,000	10-34-0 5 gpa	13-Oct

¹Planted in 30-inch rows.

In the dryland trial, silk date, seed yield and moisture, and test weight were similar among N rates (Table 2). However, seed yield tended to increase and moisture decrease with increasing N rates.

Table 2. Dryland corn response to N rates, Carrington, 2010.

Nitrogen lb N/acre	Corn			
	Silk date days	Seed yield bu/acre	Test weight lb/bu	Seed moisture %
untreated check	207	142	56.6	16.7
40	207	148	56.0	16.6
80	207	157	56.5	16.3
120	207	163	56.9	16.1
160	207	168	56.5	16.0
200	207	168	57.0	16.2
mean	207	157.6	56.7	16.3
C.V. (%)	0.2	8.2	1.2	2.0
LSD (0.05)	NS	NS	NS	NS

In the irrigated trial, plant and ear height increased slightly and seed moisture tended to decrease with N compared to the untreated check (Table 3). Seed yield tended to increase with increasing N rates up to 120 lb N/acre. Test weight was similar among N rates.

Table 3. Irrigated corn response to N rates, Carrington, 2010.						
Nitrogen	Corn					
	Silk date	Plant height	Ear Height	Seed yield	Test weight	Seed moisture
lb N/acre	days	inches	inches	bu/acre	lb/bu	%
untreated check	85	101	37	140	55.6	17.8
40	85	103	39	150	55.8	17.3
80	85	103	39	159	56.3	17.4
120	85	104	41	176	55.9	16.9
160	85	103	40	165	56.1	17.0
200	85	104	41	166	55.7	17.3
mean	85	103	39	159.0	55.9	17.3
C.V. (%)	0.2	1.0	3.5	9.3	1.3	3.1
LSD (0.05)	NS	2	2	22.0	NS	NS