

Corn Performance with Row Spacing and Fertilizer Placement, Carrington

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A field study continued at the NDSU Carrington Research Extension Center to examine the performance of corn with row spacing and starter fertilizer. Experimental design was a randomized complete block with split-plot arrangement (whole plot = 2 row widths and split plot = fertilizer treatments) and four replications. The trial was established on conventionally tilled, Heimdal-Emrick loam soil with 2.8% organic matter, 7.6 pH, 5 ppm (low) phosphorus, and 189 ppm (high) potassium. Soil nitrogen totaled 151 lb/A from 36 lb/A soil residual nitrate-N, 40 lb/A credit from previous field pea crop, and 75 lb/A from urea fertilizer applied May 5. Preplant incorporated 10-34-0 liquid fertilizer was applied as a broadcast treatment on May 14. DeKalb 'DKC33-78 RIB' (83 day relative maturity) Roundup Ready corn was planted with a John Deere 71 4-row flex planter on May 15 in 22- and 30-inch rows, and included treatments of 10-34-0 and 6-24-6 liquid fertilizer applied in-furrow and/or in a 2x0" band. UAN at 52 lb N/A was applied with stream nozzles on June 17 at the V5 corn stage to 2 of 4 trial replications and was incorporated into the soil with 0.57 inches of rain on June 18. Grain was harvested with a plot combine on November 18.

Averaged across fertilizer treatments, early season corn stand with 30-inch rows was 35,390 plants/A and stand with 22-inch rows was 34,310 plants/A (Table 1). Plant development and height was similar between row spacings. Below-ear stalk breakage was not observed on October 27. Grain yield tended to be higher with 22-inch rows at 143.7 bu/A compared to 135.8 bu/A with 30-inch rows. Test weight was heavier with 22-inch rows while harvest moisture was similar between row spacings.

Table 1. Corn Response to Row Spacing, Carrington

Row Spacing inches	Plant					Seed		
	Emergence Jday	Silk	Stand (May 31) plt/A	Height (July 4) inches	Height (Aug 1) inches	Yield bu/A	Test Weight lb/bu	Harvest Moisture %
30	148	215	35,390	18	65	135.8	55.2	17.3
22	148	214	34,310	19	66	143.7	55.9	17
LSD (0.05)	NS	NS	NS	NS	NS	NS	0.6	NS
C.V. %	0.2	0.7	7.4	11.6	4.6	15.8	1.7	4.2

Time from planting to silk stage required less days with in-furrow fertilizer compared to the untreated checks (Table 2). Plant stand was similar among all treatments. Plant height generally tended to be shorter with the untreated checks compared to fertilizer treatments. Grain yield tended to improve with fertilizer compared to the untreated checks. With 30-inch rows, band plus in-furrow 10-34-0 tended to increase yield compared to band application. With 22-inch rows, yield tended to improve with band- vs. broadcast-applied 10-34-0. Also, yield was similar with in-furrow 10-34-0 and 6-24-6 applied at similar actual P/A rates.

Table 2. Corn Response to Starter Fertilizer, Carrington

Treatment			Plant					Seed		
Liquid Fertilizer	Application		Emerge	Silk	Stand (May 31)	Height (July 4)	Height (Aug 1)	Test		Harvest
	Rate	Method						Yield	Weight	Moisture
	gpa		Jday		plt/A	inches		bu/A	lb/bu	%
30-inch rows:										
untreated check	x	x	148	216	35,860	17	60	121.1	53.9	17.9
10-34-0	17.3	broadcast	148	216	36,520	17	65	135.7	56.1	16.9
10-34-0	12	2x0" band	148	215	36,190	17	66	135.4	54.7	17.7
10-34-0	6 plus 6	band plus in-furrow	149	214	32,540	20	66	141.1	55.8	16.9
6-24-6	8.7	in-furrow	149	214	35,860	20	67	145.6	55.7	17.1
22-inch rows:										
untreated check	x	x	148	216	33,490	17	65	131.1	56.0	16.9
10-34-0	17.3	broadcast	148	215	36,210	18	68	142.5	54.5	18.3
10-34-0	6	2x0" band	148	215	34,400	19	67	165.4	56.0	16.5
10-34-0	6	in-furrow	148	213	33,490	19	66	139.7	56.6	16.8
6-24-6	8.7	in-furrow	148	212	33,950	20	65	140.0	56.6	16.4
LSD (0.05)			NS	2	NS	NS	NS	NS	1.4	1.1
Mean			148	214	34,850	18	66	139.8	55.6	17.2
C.V. %			0.2	0.7	7.4	11.6	4.6	15.8	1.7	4.2

Top-dressed N tended to increase corn yield providing 169.0 bu/A compared to 159.8 bu/A without post N [LSD (0.05): NS].