

Corn Response to Phosphorus and Potassium, Carrington, 2008

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The conventional-till field trial was established at the NDSU Carrington Research Extension Center on a Heimdal Emrick loam soil with soybean as the previous crop. Experimental design was a randomized complete block with four replications. Spring soil analysis indicated 8 ppm (med.) phosphorus, 164 ppm (high) potassium, 0.75 ppm (med.) zinc, 3.0% organic matter, 6.2 pH, and 0.12 mmho/cm (v. low) soluble salts. Potassium (0-0-60) was preplant (PPI) applied on May 5 and lightly incorporated. JumpStart seed treatment was applied on May 7. Mycogen '2K154' was planted in 4-row plots with 33 ft depth as 30-inch row spacing on May 8. Plant counts were taken on June 9. Plants were thinned to about 26,000 plants/A on June 17. The trial was harvested with a plot combine on November 4.

No statistical differences occurred among treatments with plant stand (table), although the untreated check stand tended to be greater compared to stands with fertilizer treatments. Days from planting to plant emergence was generally delayed by one day with in-furrow treatments compared to the untreated check, while days to silk was similar among treatments. Seed yield was similar among treatments, although the in-furrow phosphorus tended to improve yield compared to the untreated check. PPI potassium improved test weight compared to the untreated check. Seed moisture ranged from 19.5 to 19.6% with JumpStart and in-furrow phosphorus compared to the untreated check at 21.9%. Seed moisture tended to increase with increasing rates of potassium. Protein and starch were similar among treatments.

Table. Corn response to phosphorus and potassium.												
Treatment					Corn							
No.	Name	Rate	Unit	Application	Plant Stand	Days to Emerge	Days to Silk	Seed Yield	Test Weight	Seed Moisture	Seed Protein	Seed Starch
					plt/A	Jday		bu/A	lb/bu	%		
1	untreated check	x	x	x	26893	148	217	100.2	53.4	21.9	10.4	68.1
2	JumpStart	6	2 fl oz/ 800,000 seeds	seed	23573	148	217	104.6	54.3	19.6	10.0	68.6
3	P ₂ O ₅ (0-46-0)	10	lb/A	in-furrow	24901	149	217	116.4	54.5	19.5	10.7	67.7
4	K ₂ O (0-0-60)	10	lb/A	in-furrow	23241	148	217	107.6	54.4	21.8	10.3	68.1
5	K ₂ O (0-0-60)	20	lb/A	in-furrow	25233	149	218	98.5	53.4	23.9	10.2	68.2
6	K ₂ O (0-0-60)	60	lb/A	PPI	23573	148	217	100.2	55.9	24.5	10.2	67.9
Mean					24569	148	217	104.6	54.3	21.9	10.3	68.1
CV (%)					14.9	0.2	0.5	13.6	1.9	9.3	5.5	0.9
LSD (0.05)					NS	1	NS	NS	1.6	3.1	NS	NS