

Soybean response to phosphorus, Carrington, 2007

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A field study was conducted at the NDSU Carrington Research Extension Center to examine selected phosphorus inputs and application methods on soybean seed yield and quality. Experimental design was a randomized complete block with four replications. The previous crop was spring wheat. The irrigated, conventional-till trial was established on a Heimdal Emrick loam soil with 47 lb/A (0-24") nitrate-N, 11 ppm P205, 140 ppm potassium, 0.9 ppm Zn, 0.4% carbonate, 0.23 mmho/cm (0-6") and 0.32 mmho/cm (6-24") soluble salts, 3.2% organic matter and 7.6 pH. NuTech 'NT-0090 RR' soybean was planted on June 6. Special products used in the trial included: 6-0-0-9Zn, Nortrace; 'Avail', Southern States polymer coating enhancing the effectiveness of phosphate fertilizers; 'LX7 BioActive Organic Humate', Humax Manitoba product containing fulvic acid, cane molasses and 38 trace minerals. See table for additional treatment descriptions. Foliar treatments were applied with a CO₂-pressurized hand-boom sprayer delivering 14 gal/A at 30 psi with 8001 flat-fan nozzles to R2 growth stage soybean on July 20. The trial was harvested with a plot combine on October 22.

Plant stand was similar among treatments in both the 14- and 30-inch rows (Table). Days from planting to physiological maturity, and seed yield and quality were similar among treatments in both row spacings. Lack of response to phosphorus treatments was likely due to the high initial level of P205 as indicated by the spring soil analysis.

Table. Soybean response to phosphorus, Carrington, 2007.

Treatment Name	Rate	Unit	Timing	Plant		Seed Yield	Test Weight	Seeds/lb	Oil %	Protein %
				Stand	PM					
				plts/A	Jday	bu/A	lb/bu			
14-inch rows:										
untreated check	x	x	x	141640	272	59.8	55.0	3385.6	17.7	33.6
broadcast 10-34-0	8	gal/A	plant	137370	271	60.4	53.8	3423.6	17.6	33.6
mid-row 11-52-0	60	lb/A	plant	123375	272	57.7	54.9	3393.3	17.7	33.5
foliar 6-0-0-9Zn	32	fl oz/A	R2	150180	271	59.2	54.0	3334.6	17.7	34.0
Mean				139125	271	59.3	54.4	3384	17.7	33.7
C.V. (%)				26.1	0	7.5	1.4	3.6	0.9	2.4
LSD (0.05)				NS	NS	NS	NS	NS	NS	NS
30-inch rows:										
untreated check	x	x	x	116535	267	48.6	54.3	3374.5	17.6	33.6
broadcast 10-34-0	8	gal/A	plant	112220	267	47.4	54.4	3309.3	17.7	33.5
in-furrow 10-34-0	4	gal/A	plant	104915	267	48.6	55.0	3324.8	17.6	33.6
in-furrow 10-34-0	8	gal/A	plant	103920	268	47.8	54.0	3342	17.6	33.5
in-furrow 4-16-16	9	gal/A	plant	99935	267	47.9	54.5	3310	17.7	33.2
in-furrow 4-16-16	18	gal/A	plant	106245	266	48.5	53.9	3338.4	17.5	33.6
2x2 10-34-0	8	gal/A	plant	111225	266	49.3	54.0	3349.9	17.7	33.2
Y-not Split-it 10-34-0	8	gal/A	plant	120190	266	48.1	54.1	3437.2	17.6	33.4
in-furrow Avail + 10-34-0	4	gal/A	plant	110560	266	46.1	54.2	3384	17.8	33.4
in-furrow Avail + 10-34-0	8	gal/A	plant	106910	268	48.7	54.2	3299.9	17.4	34.1
in-furrow LX7 Bioactive/ foliar LX7 Bioactive	32/1 6	fl oz/A	plant/ R2	95950	266	49.6	54.5	3366.1	17.7	33.5
Mean				108055	267	48.2	54.3	3347	17.6	33.5
C.V. (%)				12.2	0.4	5.3	1.7	2.7	1.6	2.0
LSD (0.05)				NS	NS	NS	NS	NS	NS	NS