Soybean Performance with Tillage Systems and Fertilizer Placement, Carrington, 2009
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A field trial was conducted at the NDSU Carrington Research Extension Center to examine the performance of soybean under several tillage systems and fertilizer placement options. Experimental design was a randomized complete block with four replications. The previous crop was wheat and fall standing stubble was 9- to 12-inches tall. The dryland trial was established on a Heimdal-Emrick loam soil with 3.6% organic matter, 6.3 pH, and phosphorus at 9 ppm (med). Fall strip-till treatments were imposed on October 31, 2008, using a Yetter strip-till opener with 30-inch row spacing using a 5- to 6-inch tillage depth that established a berm 8- to 10-inches wide. Conventional-till plots were tilled on October 30, 2008, using a cultivator plus spring harrow and roto-tilled on May 11, 2009, at a 4-inch depth. Inoculated Dairyland Seed 'DSR401' was planted with a John Deere 71 4-row flex planter in 30-inch rows on May 22. 10-34-0 was applied at 6 gal/A as in-furrow, 2x2- inch, or mid-row bands during planting. Plant stand counts were taken on June 10. Conventional-till plots were cultivated between crop rows on July 3. The seed was harvested with a plot combine on October 14.

Soybean plant and seed development, plant density, seed yield and quality were similar among tillage systems (Table). No-till and strip till yield and test weight tended to be higher than conventional till. In-furrow applied fertilizer greatly reduced plant stand compared to the untreated check and other methods of fertilizer placement. This resulted in generally delayed plant and seed development, and reduced yield and seed count.

Table. Soybean Performance with Tillage Systems and Fertilizer Placement.

Tillage system/10-34-0 band placement	Plant emerge	R1	R8	Stand	Yield	Test weight	Seeds/lb	Seed oil	Seed protein
	Jday			plt/A	lb/A	lb/bu		%	%
Conventional/2x2 inch	155	201	263	106576	35.7	55.7	2795	19.5	37.6
No-till/2x2 inch	155	203	264	110892	38.5	56.2	2855	19.5	37.5
Strip till/2x2 inch	154	203	262	122181	37.7	56.5	2890	19.5	37.9
Strip till/mid-row	154	203	263	113880	38.6	56.1	2829	19.5	37.6
Strip till/in-furrow	156	204	268	17929	26.2	55.8	2600	19.6	37.3
Strip till	154	203	263	127493	37.7	56.2	2863	19.6	37.6
mean	154	203	264	99825	35.7	56.1	2805	19.5	37.6
CV (%)	0.4	0.5	0.2	16.0	7.1	1.1	2.8	0.7	0.8
LSD (0.05)	1	2	1	23987	3.8	NS	119	NS	NS