Soybean performance with tillage systems and fertilizer placement, Carrington, 2010.
(Greg Endres and Paul Hendrickson)

A field study was conducted at the NDSU Carrington Research Extension Center to examine the performance of soybean under several tillage systems and methods of fertilizer placement. Experimental design was a randomized complete block with four replications. The previous crop was wheat and fall standing stubble was 8- to 12-inches tall. The dryland trial was established on a Fram-Wyard loam soil with 3.6% organic matter, 7.6 pH, and phosphorus at 10 ppm (med). Conventional-till plots were roto-tilled at a 3-inch depth on November 5, 2009, tilled on April 27, 2010 using a cultivator plus spring harrow, and cultivated between crop rows on June 23. Fall strip-till treatments were imposed on November 9 using a Yetter strip-till opener with 30-inch row spacing using a 5- to 6-inch tillage depth that established a berm 10-inches wide. Inoculated Dairyland Seed '0401' Roundup Ready soybean was planted with a John Deere 71 4-row flex planter in 30-inch rows on May 19. Liquid 10-34-0 was applied at 4 gal/A during planting. Plant stand counts were taken on June 3. Seed was harvested with a plot combine on October 4.

Plant stand and development was similar among the three tillage systems with 2x2-inch fertilizer placement (table). Strip till yield was similar to no-till and greater than conventional till. The higher yield with reduced tillage was likely due to additional soil moisture. Test weight, seed count, and seed oil and protein were similar among tillage systems. Among fertilizer placement methods with strip till, in-furrow application reduced plant stand and increased development time and lodging. Seed yield and protein also was reduced with in-furrow compared to other fertilizer placement methods.

Table.

Tillage system/10-34-0 band placement	Plant emerge	R1	R8	Plant stand	Plant lodge	Seed yield	Test weight	Seeds/lb	Seed oil	Seed protein
	Jday			plt/A	0-9	lb/A	lb/bu		%	%
Conventional/2x2 inch	149	185	255	161026	1	47.5	56.5	3336	19.5	34.1
No-till/2x2 inch	149	186	255	170322	0	50.1	57.1	3420	19.5	33.9
Strip till/2x2 inch	149	185	256	164346	1	51.7	57.2	3347	19.6	34.0
Strip till/in-furrow	151	187	262	55114	3	45.4	59.5	3286	19.6	32.8
Strip till/mid row	149	185	256	163682	1	51.1	57.5	3413	19.7	21.9
Strip till	149	185	256	165010	0	53.5	57.5	3281	19.7	21.9
mean	149	185	257	146583	1	49.9	57.5	3347	19.6	33.7
CV (%)	0.2	0.2	0.9	9.4	57.1	3.9	3.6	2.6	1.4	1.3
LSD (0.05)	1	1	4	20788	1	3.0	NS	NS	NS	0.6