Sunflower Performance with Tillage Systems and Fertilizer Placement, Carrington, 2009
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A field study was conducted at the NDSU Carrington Research Extension Center to examine the performance of sunflower 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. Mycogen '8N386CL' oil sunflower was planted with a John Deere 71 4-row flex planter in 30-inch rows on May 19. 10-34-0 was applied at 4 gal/A. 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 November 13.

Plant development, and seed yield and quality generally were similar among treatments (Table). Sunflower plant density and yield with in-furrow application of fertilizer was similar to density with banded fertilizer (soil separation between fertilizer and seed). Lack of crop yield response to fertilizer placement may have been due to the medium level of soil phosphorus.

Table. Sunflower Performance with Tillage Systems and Fertilizer Placement.

Tillage system/ fertilizer placement	Plant emergence	First flower	PM[1]	Plant stand	Seed yield	Test weight	Seed moisture	Seed oil
	Jday			plt/A	lb/A	lb/bu	%	%
Conventional/ band	155	224	272	20585	733	29.7	10.6	35.1
No-till/band	156	224	272	14941	730	29.9	10.2	36.4
Strip till	155	224	272	22909	870	30.4	9.5	36.4
Strip till/fall band	155	224	272	13613	815	30.1	10.4	36.1
Strip till/band	155	224	272	18925	823	29.9	9.9	36.6
Strip till/in-furrow	155	224	272	14941	736	30.3	10.0	36.5
mean	155	224	272	17,652	784	30.0	10.1	36.2
CV (%)	0.2	0.2	0	23	14.3	2.0	6.9	2.1
LSD (0.05)	1	NS	NS	6120	NS	NS	NS	NS

[1]PM = Physiological maturity.