

Dry bean response to tillage system, Logan Center, 2019.

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The field trial was conducted at the NDSU SHARE Farm near Logan Center as part of a multi-year study with the objective to develop and evaluate soil health building management practices (reduced tillage, cover crops, and soil salinity management) in a pinto bean/corn/soybean/spring wheat rotation. The 2019 trial measured response of pinto bean to two basic tillage systems. Experimental design was a randomized complete block with three replications. Treatments: 1) conventional till using a 'Joker' high-speed disk (May 13), and 2) direct planted into spring wheat stubble (reduced till). Pinto bean was planted on May 29 in 30-inch rows. Plants were pulled on September 19, dried, and seed threshed with a plot combine.

Direct-seeded pinto bean plant population was 24-27% greater than conventional-till when measured about 3 and 7 weeks after planting (Table). The greater plant density likely was due to increased and more uniform soil moisture for seed germination, and protection from wind damage (with standing stubble) in the reduced-till environment. Crop residue after bean planting was significantly greater with reduced-till compared to conventional till. Plant height, canopy closure, seed yield and test weight generally were similar between tillage systems.

Tillage system	Plant population			Plant height	Plant residue (ground cover)	Canopy closure (%)		Seed	
	plants/A			inches	%	visual	Canopeo	yield	TW
	13-Jun	23-Jun	23-Jul	23-Jul	23-Jun	26-Jul		lb/A	lb/bu
conventional	43,380	57,550	52,240	19	33	62	66	2903	61.2
direct seed	57,010	76,140	71,720	18	97	59	64	2882	61.4
C.V. (%)	11.6	5.6	10.6	11	8.7	2.4	5.8	5	0.1
LSD 0.10	NS	8,960	15,730	NS	14	NS	NS	NS	0.1