Soybean response following winter rye cover crop, Wishek, 2019.
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The trial was conducted in 2019 at the NDSU Carrington Research Extension Center off-station crop research site near Wishek, with support from the ND Soybean Council, to examine the performance of soybean with winter rye grown as a preplant (PP) cover crop. Experimental design was a randomized complete block with four replications. The dryland trial was established on a reduced-till loam soil with spring soil test indicating 28 ppm P (Olsen), 208 ppm K, 4.3% organic matter, 6.7 pH (0-6" depth), and 0.19 mmho/cm soluble salts (0-6" depth). 'ND Dylan' rye was direct seeded into wheat stubble in 7-inch rows at 1.2 million PLS/A on October 26, 2018. 'PFS19B04' seed inoculated with rhizobium bacteria was planted in 14-inch rows on June 3. NDAWN) monthly rain (inches): May = 3.8; June = 2.8; July = 5.7; August = 3.0; September = 5.4; and October = 2.9; for a season total of 23.6 inches. Soybean seed was harvested with a plot combine on November 6.

Treatments for rye termination methods including herbicides:
1. Conventional check (no rye). PP Roundup PowerMax (32 fl oz/A) plus NIS+AMS (2.5% v/v) and Zidua Pro (4.5 fl oz/A) on June 5 (2 days after planting) to jointing (≤ 12-inch tall) rye.
2. PP Roundup PowerMax plus NIS+AMS on May 10 (25 days before planting) to 1- to 1.5-leaf rye.
3. PP Roundup PowerMax plus NIS+AMS on June 5.

POST Roundup PowerMax plus NIS+AMS was applied on July 2 across all plots for general weed control with soybean at V2 growth stage. Herbicide were applied with a hand-boom sprayer delivering 14 gpa at 35-40 psi with TJ FF80015 or Turbo nozzles.

Soybean response with rye as a cover crop was similar with plant stand, late-season canopy cover, seed yield and seed quality compared to the conventional-production check (Table). Soil moisture also was similar among treatments. Seed yield and quality were similar among treatments.

Table. Soybean response, soil mositure, and weed control with rye cover crop, Wishek, 2019.

Trt no.	Plant stand (2-Jul; V2 stage)	Plant canopy		Soil moisture (%)[a]			Foxtail control[b] (2-Jul)	Seed			
		Canopeo (5-Jun)	Visual (25-Jul)	3-Jun	2-Jul	25-Jul		Yield	Test weight	Oil	Protein
	plt/A						%	bu/A	lb/bu	%	
1	180,200	2	81	18.4	14.8	15.4	94	60.2	56.7	16.9	38.2
2	166,100	3	86	18.0	14.6	14.0	66	64.4	56.3	17.0	37.9
3	182,300	14	79	15.4	16.5	16.2	71	51.3	56.8	16.7	38.3
Mean	176,200	7	82	17.2	15.3	15.2	77	59.3	56.6	16.9	38.1
CV (%)	12.5	46.9	12.1	12.3	16.2	12.0	3.6	24.5	0.6	0.9	0.8
LSD (0.10)	NS	4	NS	NS			4	NS			

[a]Extech digital soil moisture meter (model MO750) at 4-inch soil depth.
[b]Green and yellow.

Foxtail control was greater with the check, likely due to use of the soil-applied herbicide, compared to treatments with rye. After trial maintenance application of glyphosate on July 2, weed control was adequate among treatments.