## Soybean response following winter rye cover crop, Wishek, 2018.

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The trial was conducted in 2018 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 19 ppm P (Olsen), 318 ppm K, 4.5% organic matter, 4.8 pH (0-6" depth), and 0.31 mmho/cm soluble salts (0-6" depth). 'ND Dylan' rye was direct seeded into soybean stubble in 7-inch rows at 1.2 million PLS/A on October 6, 2017. Proseed '30-20 RR2Y' seed inoculated with rhizobium bacteria was planted in 14-inch rows on May 25. North Dakota Agricultural Weather Network (NDAWN) monthly rain (inches): May = 3.1; June = 3.3; July = 3.9; August = 1.6; and September = 1.8. Soybean seed was harvested with a plot combine on September 26.

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 May 25.
- 2. PP Roundup PowerMax plus NIS+AMS on May 2 to 3-leaf (tillering) rye.
- 3. PP Roundup PowerMax plus NIS+AMS on May 25 to 1- to 2-joint rye.

POST Roundup PowerMax plus NIS+AMS was applied on June 21 across all plots for general weed control. Herbicide treatments were applied with a hand-boom sprayer delivering 10 gpa through 8001 flat-fan nozzles at 35 psi.

Rye termination method and timing had minimal influence on dates of soybean plant emergence (Table). Soybean plant stand was statistically similar among treatments but tended to be greater with the conventional check and near recommended level with early spring rye termination versus rye termination at soybean planting. Soil moisture was similar among treatments. Seed yield and quality were similar among treatments. However, yield tended to be greater with the conventional check compared with rye as a cover crop.

Table. Soybean response to rye cover crop, Wishek, 2018.										
	Pla	ant <sup>a</sup>				Seed				
		Stand (21-								
		Jun; V2					Test			
Trt no.	Emergence	stage)	Soil moisture (%) <sup>b</sup>			Yield	weight	count	Oil	Protein
	DOY	plt/A	25-May	21-Jun	18-Jul	lb/A	lb/bu	no./lb	%	
1	154	162,200	16.5	19.4	16.4	60.0	54.8	2785	19.0	35.9
2	154	147,300	16.4	17.0	15.6	50.9	55.0	2815	19.0	35.8
3	155	120,500	13.9	18.8	16.7	51.2	55.0	2735	18.8	35.8
Mean	154	143,300	15.5	18.4	16.2	54.0	54.9	2780	18.9	35.8
CV (%)	0.0	18.3	12.3	13.2	8.7	13.0	0.8	9.4	1.0	1.0
LSD (0.10)	1	NS				NS				
<sup>a</sup> DOY (day of year): 154=June 3.										
<sup>b</sup> Extech digital soil moisture meter (model MO750) at 4-inch soil depth.										