Fall-established cover crop tolerance to soybean herbicides, Carrington, 2020. Greg Endres, Kirk Howatt and Mike Ostlie. The trial was conducted at the NDSU Carrington Research Extension Center with support from the North Dakota Soybean Council to evaluate the tolerance of six late-summer planted, cool-season cover crops on ground previously treated with eight soybean herbicides that have soil residual. Experimental design was a randomized complete block with splitplot arrangement (whole plot = cover crop and subplot = herbicide) and three replicates. The field trial was established on an irrigated, conventionally-tilled, Heimdal-Emrick loam soil with 3.3% organic matter and 7.9 pH (0- to 6-inch depth). 'AG03X7' dicamba-tolerant soybean was planted at 200,000 seeds/A on May 29 in 22-inch rows. A hand-held boom sprayer was used delivering 17 gpa at 35 psi through TeeJet turbo 02 nozzles to the center 6.7 ft of 10- by 30-ft strips. PRE herbicides [metribuzin (Sencor), sulfentrazone (Spartan), flumioxazin (Valor), pyroxasulfone (Zidua), and imazethapyr (Pursuit)] were applied at standard rates on May 30 with 53 F, 41% RH, and 8 MPH wind on dry soil; 1 inch of irrigated water was applied on June 4. POST herbicides [dicamba (Engenia), fomesafen (Flexstar) and glufosinate (Liberty 280)] were applied on June 29 with 73 F, 83% RH, and 8 mph wind to second trifoliate (V2) stage soybean; 1 inch of irrigated water was applied on August 1. Irrigation water plus rain totaled 21.8 inches during May 30 to October 9. Soybean at the full seed formation (R6) stage was terminated by mowing on August 24. Cover crops were planted August 27 into the soybean stubble with a no-till drill in 7.5-inch rows: 'Tradition' barley, 'ND Dylan' winter rye, 'ND Dawn' field pea, 'ND Hammond' flax, 'Jackhammer' radish and turnip. Barley at 3-4 leaf (tillering), winter rye at 3 leaf (tillering), field pea at 2-3 inch height, flax at 0.5-1 inch height, and radish and turnip at 2-4 leaf stages were visually evaluated on September 24 [28 days after p

Cover crop injury generally was low (Table). Radish and turnip were tolerant of all herbicides. Sencor, Valor, Liberty 280 and Spartan/Flexstar did not inure cover crops. Plant injury exceeding  $\geq$ 10%: barley = Flexstar; winter rye = Pursuit, Engenia and Flexstar; and flax = Spartan.

Table.														
		-	Cover crop injury <sup>1</sup>											
Herbicide			24-Sep						8-Oct					
Treatment	Rate	Application timing <sup>2</sup>	Barley	Winter rye	Field pea	Flax	Radish	Turnip	Barley	Winter rye	Field pea	Flax	Radish	Turnip
	fl oz product/A								%			-		
Sencor 75 DF	0.33 lb		0	0	0	0	0	0	0	0	0	0	0	0
Spartan 4F	10		7	0	0	0	0	0	0	0	0	12	0	0
Valor SX	3 oz		0	0	0	0	0	0	0	0	0	0	0	0
Zidua SC	4		7	0	0	0	0	0	0	0	0	0	0	0
Pursuit	3	PRE	0	12	8	0	0	0	0	0	0	0	0	0
Engenia + CA Ridion	12.8 + 2% v/v		0	12	0	0	0	0	0	0	0	0	0	0
Flexstar + HSMOC	12 + 24		10	0	0	0	0	0	0	12	0	0	0	0
Liberty 280 + AMS	32 + 3 lb	POST	0	0	0	0	0	0	0	0	0	0	0	0
Spartan 4F/Flexstar + HSMOC	10/12 + 24	PRE/POST	0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.10)			NS						NS					
<sup>1</sup> Biomass and/or stand	reduction.													
<sup>2</sup> PRE=May 30; POST=	June 29.													