

## Spring Wheat Response to Fall Cover Crop, Wishek, 2009.

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The study was conducted to measure the performance of spring wheat grown on fall-seeded cover crop ground. Experimental design was a randomized complete block with four replications. The study was conducted at the Tri-county research site near Wishek. Oats was the previous crop grown during 2008. Fall soil analysis indicated 2.8% organic matter, 6.0 pH, 83 lb N/acre, and 8 ppm phosphorus. Cover crops were planted on August 26 at  $\leq$  one-inch depth including 'N-builder' (nine species commercial mix from PulseUSA, Bismarck), inoculated 'Admiral' field pea, oilseed radish, 'Garrison' sugarbeet, and 'purpletop' turnip. Volunteer oat and cover crop growth was terminated with heavy snowfall on November 6. Nitrogen at 50 lb N/acre as urea was preplant applied as a control treatment and an additional 50 lb N/acre was applied across number 2 and 4 reps. 11-52-0 at 100 lb product/acre was preplant applied across the trial. The fertilizer was incorporated with a 'Summers' heavy harrow. 'Faller' HRS wheat was direct-seeded at 1.25 million pure live seed/acre into the oat and cover crop residue on May 14. The trial was harvested with a plot combine on August 24.

Percent ground cover was visually evaluated on October 15 (Table 1). Volunteer oat had the highest density and was the most consistent plant species present during evaluation. Plant species ranged from 2- to 20-inches in height or width. Wheat seed yield, seed size, and protein were highest with the treatment of 50 lb N/acre. The application of 50 lb N/acre on two replications resulted in taller plants, increased yield, and larger seed, and tended to have higher protein compared to the two untreated replications (Table 2).

Cover crop		Ground Cover (15-Oct)	Wheat Plant		Wheat Seed			
Treatment <sup>1</sup>	Planting Rate		Heading Date	Height	Yield	Test Weight	Count	Protein
	lb/acre	%	Jday	cm	bu/acre	lb/bu	seeds/lb	%
50 lb N/acre	x	38	187	66	32.4	60.1	14187	13.9
N-Builder	29	44	188	64	25.8	59.8	15032	12.6
Field pea	60	41	189	63	26.9	59.6	15103	12.3
Radish+sugarbeet+turnip	2+4+2	39	188	62	27.7	59.3	15152	12.3
Field pea+radish+sugarbeet+turnip	30+1+2+1	39	188	63	25.7	59.6	15157	12.4
untreated check	x	43	188	63	25.5	59.7	15296	12.5
mean		41	189	63	27.3	59.7	14988	12.6
C.V. (%)		21.1	0.6	4.9	7.6	0.6	2.0	0.3
LSD (0.05)		NS	NS	NS	3.1	NS	453	0.5

<sup>1</sup>N-Builder = cover crop mix from PulseUSA.

Nitrogen		Wheat Plant		Wheat Seed			
Treatment	Application Rate	Heading Date	Height	Yield	Test Weight	Count	Protein
	lb N/acre	Jday	cm	bu/acre	lb/bu	seeds/lb	%
Urea	50	188	68	28.5	59.9	14398	13.1
untreated check	x	188	59	20.1	59.5	15578	12.2
LSD (0.05)		NS	7	4.9	NS	746	NS