

# Winter Wheat Response to Previous Crop and Timing of Nitrogen Fertilizer Applications

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**O**bjectives: Compare winter wheat response to 1) previous crop and 2) nitrogen (N) fertilizer application timing.

Methods: To compare winter wheat response to previous crop, 'Jerry' winter wheat seed was sown into 5-7 inch spring wheat stubble and 16-24 inch tall field pea regrowth on September 18, 2007, and into soybean stubble on October 23. The fertilizer treatments evaluated were 1) untreated check, 2) 11-52-0 starter fertilizer, 3) fall-applied 28-0-0, 4) 28-0-0 applied 50% in the fall and 50% in the spring, 5) spring-applied 28-0-0, and 6) spring-applied urea. The fall P<sub>2</sub>O<sub>5</sub> and N soil test results, legume credit, applied N for treatments 3-6, and total N are listed in Table 1. N fertilizer treatments were surface applied on October 25 and April 18, 2008, for the fall and spring timings. The 28-0-0 was applied with a CO<sub>2</sub> hand-boom sprayer with SJ3 streamjet nozzles. The urea was broadcast applied. The winter wheat was harvested August 5 (field pea and spring wheat previous crop trials) and August 19 (soybean previous crop trial).

**Table 1. Fall soil test results, legume credit, and applied and total nitrogen.**

Previous Crop	Fall Soil Test		Legume Credit		Total
	P <sub>2</sub> O <sub>5</sub> (ppm)		Nitrogen (lb /A)	Applied	
Field Pea	10	45	40	45	130
Soybean	5	19	40	45	104
Spring Wheat	8	65	0	66	131

An excellent stand was established in the field pea regrowth and spring wheat stubble. In the soybean stubble, the planting could be considered dormant seeding since very few seeds actually emerged in the fall. Snow cover in the field pea, spring wheat and soybean residue was 2-4 inches, 3-6 inches, and 0-1 inch respectively when measured on January 15, 2008 (Figures 1-3). Heavy deer feeding occurred on the winter wheat in the field pea and spring wheat residue in early April. In the soybean residue, winter wheat plant development was delayed since germination occurred in the spring. On May 15 winter wheat was in the 4-5 leaf growth stage in the field pea and spring wheat residue while only in the 1-3 leaf growth stage in the soybean residue. Additional N did not increase grain yield in any of the previous crop trials when compared to the untreated check (Tables 2-4). The use of a starter fertilizer did increase grain yield in the spring wheat previous crop trial (Table 3).



Figure 1. Field pea regrowth.



Figure 2. Spring wheat stubble.



Figure 3. Soybean stubble.

**Table 2. Winter wheat response to field pea previous crop and fertilizer timing.**

Treatment	Timing	Rate product/a	# spikes million/a	Plant Height inch	Plant Lodge 0-9	1000 KWT gram	Protein %	Test Weight lb/bu	Grain Yield bu/a
1	Untreated Check		1.1	33.3	0	35.6	12.0	59.4	57.0
2	11-52-0	At-planting	60 lb	1.0	33.9	0	35.4	11.9	58.9
3	28-0-0	Fall	15 gal	1.1	34.1	0	35.0	12.5	60.0
4	28-0-0 / 28-0-0	Fall/Spring	7.5 gal /	1.2	34.3	0	35.0	12.3	59.1
5	28-0-0	Spring	15 gal	1.1	34.8	0	35.5	12.3	62.0
6	Urea	Spring	98 lb	1.0	34.4	0	35.2	12.5	55.9
LSD (P=.05)			NS	NS	NS	NS	NS	NS	NS
CV (%)			8.94	2.57	0	3.43	4.13	0.63	14.02
Grand Mean			1.1	34.1	0	35.3	12.3	59.3	58.8

**Table 3. Winter wheat response to spring wheat previous crop and fertilizer timing.**

Treatment	Timing	Rate product/a	# spikes million/a	Plant Height inch	Plant Lodge 0-9	1000 KWT gram	Protein %	Test Weight lb/bu	Grain Yield bu/a
1	Untreated Check		1.4	36.4	0	33.9	12.4	58.4	61.0
2	11-52-0	At-planting	60 lb	1.3	36.2	0	33.1	12.2	71.5
3	28-0-0	Fall	15 gal	1.6	36.2	0	32.9	12.5	63.2
4	28-0-0 / 28-0-0	Fall/Spring	7.5 gal /	1.2	36.6	0	33.4	12.4	63.3
5	28-0-0	Spring	15 gal	1.4	36.4	0	32.9	12.5	66.3
6	Urea	Spring	98 lb	1.5	35.8	0	31.8	12.9	59.6
LSD (P=.05)			NS	NS	NS	NS	NS	NS	6.4
CV (%)			16.94	3.30	0	5.12	2.66	1.77	6.57
Grand Mean			1.4	36.3	0	33.0	12.5	58.2	64.2

**Table 4. Winter wheat response to soybean previous crop and fertilizer timing.**

Treatment	Timing	Rate product/a	# spikes million/a	Plant Height inch	Plant Lodge 0-9	1000 KWT gram	Protein %	Test Weight lb/bu	Grain Yield bu/a
1	Untreated Check		1.0	29.1	1.0	33.7	12.8	55.6	46.3
2	11-52-0	At-planting	60 lb	0.9	30.7	1.0	34.6	13.1	51.2
3	28-0-0	Fall	15 gal	0.8	30.9	1.0	35.1	12.9	47.0
4	28-0-0 / 28-0-0	Fall/Spring	7.5 gal /	0.9	30.7	1.3	33.9	13.0	52.6
5	28-0-0	Spring	15 gal	0.8	30.3	1.3	34.4	12.9	48.7
6	Urea	Spring	98 lb	0.9	29.3	1.0	33.8	12.8	47.7
LSD (P=.05)			NS	NS	NS	NS	NS	NS	NS
CV (%)			22.20	5.90	23.83	2.75	0.46	1.84	16.78
Grand Mean			0.9	30.2	1.1	34.2	12.9	56.1	48.9