

Winter wheat response to previous crop and foliar fungicides, Ellendale, 2007

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The trial was conducted as a joint project between Ducks Unlimited and the NDSU Carrington Research Extension Center, with financial support from Syngenta. Experimental design was a randomized complete block with a split-split plot arrangement and three replications. Main factor was previous crop, split factor was variety, and split-split factor was fungicide. The trial was direct seeded in 15-inch rows with a 6- to 7-inch spread at 1.2 million pure live seeds/acre (treated with Dividend Extreme + Cruiser at 2 + 1 oz/100 lb seed) on Sep 25, 2006 on previous crop stubble including spring wheat, field pea, flax and soybean. Soil pH was 6.0, with 5.5% organic matter, and soil N at 0- to 24-inch depth ranged from 139 to 336 lb/acre. Starter fertilizer was applied as 10-34-0 at 8 gpa + 28-0-0 at 2 gpa + TJMicroMix at 3 pt/acre. On April 16, 2007, 28-0-0 was applied at 5 gpa on wheat, flax, and pea ground, and at 20 gpa on soybean ground. Quilt at 7 fl oz/A was applied on May 9 to tillering wheat with a hand-boom plot sprayer equipped with 8001 flat fan nozzles delivering 12 gal/A at 30 psi. Tilt at 4 fl oz/A plus NIS at 0.125% v/v was applied on June 11 to wheat at early to full flowering with TJ60 8002EVS nozzles delivering 12 gpa at 30 psi. Flag leaf disease (leaf rust = leaf and stripe; leaf spot = tan spot, Septoria, and bacterial) was visually evaluated on June 25 and Fusarium head blight (scab) was evaluated on July 5. The trial was harvested with a plot combine on July 20.

Grain yield was highest with soybean as the previous crop (table). Test weight and kernel weight were highest with the previous crops of soybean and spring wheat. Millennium had the highest yield and test weight of the three varieties. There was an advantage with kernel weight and protein with Jerry compared to Millennium. Yield and quality of Millennium and Jerry were substantially higher than Radiant. Leaf rust and Fusarium head blight was greater in Radiant compared to the other varieties. There was minimal wheat response to fungicide application at the tillering stage compared to the untreated check. Grain yield and quality improved with fungicide application at flowering or with sequential application of fungicides compared to the untreated check. There were significant differences with the variety and fungicide interaction for leaf rust and leaf spot disease, and grain quality (data not shown).

Table. Winter wheat response to crop rotation and fungicides, Ellendale, 2007.

Treatment	Disease					Grain Yield (bu/A)	Test Weight (lb/bu)	250 KWT (gram)	Protein (%)
	Flag Leaf Rust (%)	Flag Leaf Spot (%)	FHB Incidence (%)	FHB Severity (%)	FHB Severity Index (%)				
Previous crop									
flax	3	25	24	55	14	51.9	55.8	7.39	12.6
hrs	3	22	19	54	11	59.1	57.7	7.91	12.1
pea	3	23	21	58	14	53.1	55.6	7.42	12.8
soy	4	20	22	62	14	66.1	57.8	7.86	12.2
LSD 0.05	NS	NS	NS	NS	NS	2.8	0.5	0.15	0.2
Variety									
Jerry	1	18	18	54	10	62.5	57.2	8.26	12.9
Millennium	1	25	19	46	10	66.2	59.2	7.98	12.4
Radiant	9	23	28	73	20	44.0	53.8	6.70	11.8
LSD 0.05	1	NS	1	1	1	3.3	0.5	0.30	0.2
Fungicide									
UTC	7	24	22	64	14	54.1	56.1	7.52	12.2
tiller	5	24	23	60	15	56.1	56.2	7.48	12.3
flower	1	19	20	51	11	59.9	57.3	7.80	12.5
till/flow	1	21	22	55	13	60.1	57.4	7.80	12.6
LSD 0.05	2	3	NS	1	NS	3.2	0.3	0.20	0.1
mean	3	22	22	58	13	57.6	56.7	7.65	12.4
C.V.%	109	32	41	35	54	12	1	1	2