

Evaluation of seed treatments for testing control of crown and foot rot in winter wheat, Bingham County, ID, 2010-2011.

The trial was established in the fall of 2010 to test product effectiveness against *Fusarium* foot rot in a heavily inoculated winter wheat field in Bingham county, ID. The field was grown under partial irrigation to mimic dryland conditions (<15 inches of precipitation) and to favor disease development. The field had been cropped to spring wheat in the preceding year and has soil type Declo loam of 0-2% slope, 1.1% organic matter, and pH 8.4. Seed of Moreland hard red winter wheat was planted at 1,000,000 seeds/A on 18 Oct 10. Experimental plots (5 x 26.6 ft planted, 5 x 22.6 ft harvested) were arranged in a randomized complete block design with 4 replicates. Fungicide seed treatments were applied by Bayer CropScience (see Table 1). Row spacing was set at 7-in. with seven rows per plot, planted using a double disk opener with a Hege 500 series drill. All rows (except the non-inoculated control) were inoculated with sterilized millet seed colonized with twenty different isolates of *Fusarium culmorum* at 5g millet/row-foot directly after planting on 18 Oct. Fall stand (Zadoks=GS 10) was calculated as the % plot stand on 19 Nov. Snow fell on 20 Nov and snow cover lasted from then until mid-January. A mid-winter stand (%) was recorded 24 Jan. Spring stand and vigor (0-4 scale 0 = dead, 2 = half chlorotic/necrotic, and 4 = vigorous all green plants) were also measured 27 Apr (Zadoks=GS 21). Weeds were controlled with 1pt/A Maestro MA and 2/3 pt/A Starane applied 25 May. Plots were harvested 19 Aug with a small plot combine. Yield and test weight were determined with the Harvestmaster system on the combine, but a corrected test weight was calculated after cleaning the grain from each plot. Protein was also determined from harvested grain samples using a FOSS 6500 NIR whole grain analyzer. After harvest, ten plant samples per plot were collected and rated for stem discoloration associated with *Fusarium* infection using the rating scale of 0 to 4, where 0 = no, 1 = trace, 2 = slight, 3 = moderate, and 4 = severe discoloration of the roots, crown and stem base. Data were analyzed using the general linear models procedure (Proc GLM) in SAS. Fisher's protected LSD was used for means comparisons.

No significant differences occurred between treatments for fall stand, test weight, yield, plant disease at harvest, or grain protein (see Table 3). There were significant differences in stand rated 24 Jan, spring stand and spring vigor rated 27 Apr (Table 2). Treatments 4 (Proceed Concentrate + Poncho 600 FS) and 8 (Charter + Apron XL + Stamina) had the highest stands at both rating dates (Figure 2), significantly higher than treatments 6 (Dividend Extreme + Rancona), 7 (Dividend Extreme + Rancona + Cruiser 600FS), and 10 (untreated inoculated) in January (Figure 3), and significantly higher than 1 (untreated non inoculated), 6 (Dividend Extreme + Rancona), 7 (Dividend Extreme + Rancona + Cruiser 600FS), and 10 (untreated inoculated) in April (Figure 4).

Table 1. Seed treatments and application rates on Moreland hard red winter wheat in Aberdeen, ID.

Entry No.	Entry/Trt. Description	AI Conc. Conc.	AI Conc. Unit	Dosage G A/100 KG	Transformed Dosage	Appl./Slurry Volume
1	UNTREATED non inoculated				OZ/CWT	OZVCWT
2	PROCEED CONCENTRATE	122.65	GA/L	8	1	16
3	PROCEED CONCENTRATE PONCHO 600 FS	122.65 600	GA/L GA/L	8 5	1 0.1278	16 16
4	PROCEED CONCENTRATE PONCHO 600 FS	122.65 600	GA/L GA/L	8 12.5	1 0.3195	16 16
5	PROCEED CONCENTRATE PONCHO 600 FS	122.65 600	GA/L GA/L	8 30	1 0.767	16 16
6	DIVIDEND EXTREME RANCONA	115 40.7	GA/L %AW/W	22.5 13.53	3 0.51	16
7	DIVIDEND EXTREME RANCONA CRUISER 600FS	115 40.7 600	GA/L %AW/W GA/L	22.5 13.53 12.5	3 0.51 0.3195	16 16
8	CHARTER APRON XL STAMINA	25 350 18.4	GA/L GA/L %AW/W	5.05 0.91 5.23	3.1 0.04 0.4	16 16 16
9	CHARTER APRON XL STAMINA GAUCHO 600 FS	25 350 18.4 600	GA/L GA/L %AW/W GA/L	5.05 0.91 5.23 12.5	3.1 0.04 0.4 0.3195	16 16 16 16

10 untreated inoculated

Table 2. Agronomic data from Aberdeen of ten various seed treatments (as reported in Table 1). Fall stand, biomass fresh weight, biomass dry weight, spring green-up, and final head count (counted as the number of viable tillers for plants per foot of row) are reported.

trt	Treatment	24-Jan Winter stand (%)	27-Apr Plant stand (%)	27-Apr Plant vigor (1-4)	Test weight (lbs/bu)	Yield (bu/A)	Plant disease (0-4 scale)	Grain protein (%)	
1	UTC non inoculated	67.5	67.5	BC	3.8	60.9	91.8	1.4	12.3
2	Proceed	65	72.5	ABC	4	62	96.6	1.7	13.2
3	Proceed+Poncho	70	72.5	ABC	4	62.3	84.3	1.7	12.9
4	Proceed+Poncho	75	80	A	4	60.4	84.9	1.6	12.3
5	Proceed+Poncho	67.5	77.5	AB	4	60.9	100	1.5	12.7
6	Dividend Extreme+Rancona	62.5	65	C	4	60.6	89.7	1.5	13.7
7	Dividend Extreme+Rancona+Cruiser	55	65	C	3.5	59.8	91.8	1.5	14
8	Charter+ApronXL+Stamina	75	80	A	4	60.6	91.8	1.8	14.7
9	Charter+ApronXL+Stamina+Gaucho	72.5	77.5	AB	4	60.7	86.7	1.8	14
10	UTC inoculated	62.5	67.5	BC	4	61.1	97.8	1.6	13.5
	average	67.3	72.5		3.9	60.9	91.5	1.6	13.3
	LSD ^z	12.3	11.3		0.3	2.8	17.6	0.7	2.9
	CV ^y	12.6	10.7		6	3.2	13.2	28.4	14.9
	P>FZ ^x	0.0557	0.0396		0.0678	0.7983	0.6355	0.9663	0.749
	NS				NS	NS	NS	NS	NS
	MSE	72.129	60.74		0.054	3.771	146.73	0.203	3.919

^zLSD = Fisher's protected least significant difference at $P < 0.05$. NS = not significantly different.

^yCV = coefficient of variation for the analysis of variance (ANOVA).

^x $P > F$ = probability associated with the F value when using the Proc GLM procedure in SAS.

Figure 1. Effects of various seed treatments on yield of plots under high disease pressure from *Fusarium culmorum*, causing crown rot and foot rot of wheat. No statistically significant effects existed for seed treatment on yield.

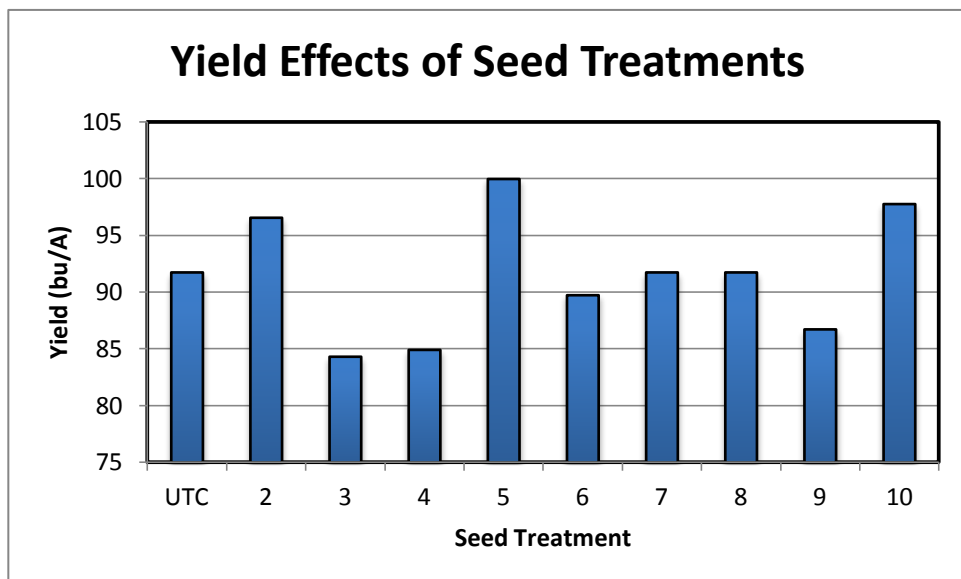


Figure 2. Effects of various seed treatments on plant stand in plots on ratings taken 1-24-11 and 4-27-11 under high disease pressure from *Fusarium culmorum*, causing crown rot and foot rot of wheat.

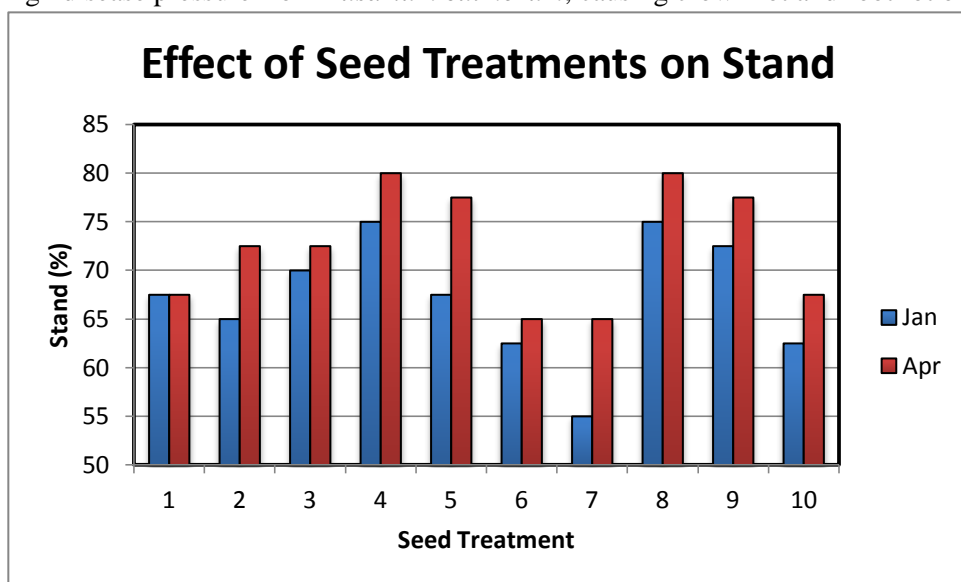


Figure 3. Effects of various seed treatments on plant stand in plots on ratings taken 1-24-11 under high disease pressure from *Fusarium culmorum*, causing crown rot and foot rot of wheat. Treatments with a different letter are significantly different at LSD alpha = 0.05.

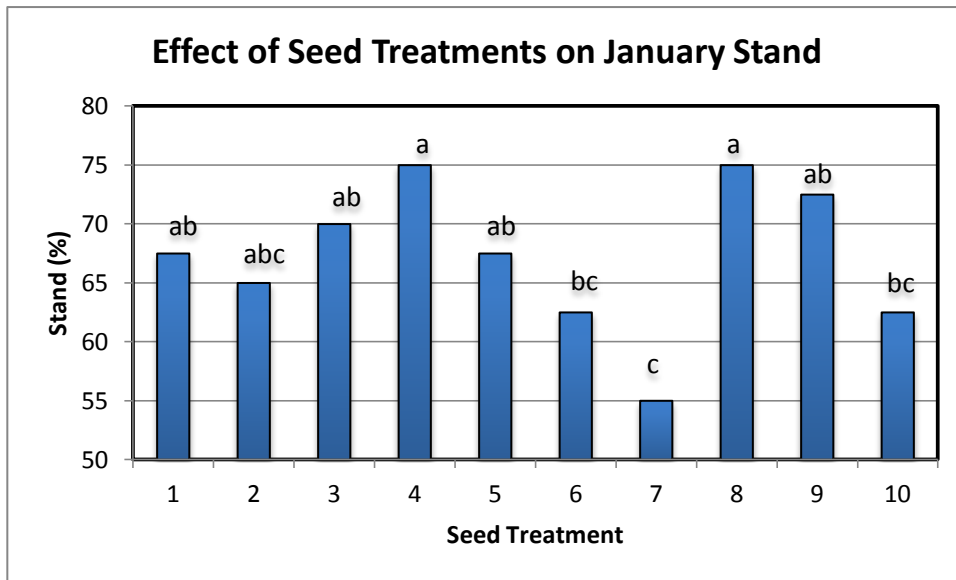


Figure 4. Effects of various seed treatments on plant stand in plots on ratings taken 4-27-11 under high disease pressure from *Fusarium culmorum*, causing crown rot and foot rot of wheat. Treatments with a different letter are significantly different at LSD alpha = 0.05.

