



*NORTHEAST AGRICULTURE RESEARCH FOUNDATION*

**2012 EFFECT OF FUNGICIDE ON LEAF SPOT DISEASES AND YIELD OF  
WHEAT AT MELFORT, 2012**

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## EFFECT OF FUNGICIDE ON LEAF SPOT DISEASES AND YIELD OF AC BARRIE, INFINITY and 5603HR WHEAT AT MELFORT, 2012

**CROP:** Wheat (*Triticum aestivum* L.), cvs. AC Barrie, Infinity and 5603HR

**PEST:** Tan spot (*Pyrenophora tritici-repentis* (Died.) Drechs), Septoria complex (*Septoria* spp.)  
Fusarium Head Blight (*Fusarium* spp.)

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**MATERIALS:** Check, TILT 250E (propiconazole 125 g. ai/ha), HEADLINE EC (pyraclostrobin 148 g. ai/ha) and PROSARO 250 EC (prothioconazole + tebuconazole 200 g. ai/ha).

**METHODS:** Three Canadian Western Red Spring wheat cultivars: Infinity, 5603HR both rated good for leaf spot disease resistance and AC Barrie, rated poor, according to the Saskatchewan Varieties of Grain Crops 2012, were direct seeded into the previous seasons wheat stubble (with a history of Fusarium Head blight) on May 11<sup>th</sup> using an Edward's hoe drill with a 20 cm (8 inch) row space. The 5603 HR cultivar has awned heads while the others are awnless. Fertilizer was applied at soil test recommendations: side-banded urea at 70 kg/ha of actual N and seed-placed 14-20-10-10 at 100 kg/ha. Target seeding rate was 300 plants per square meter, all seed was fungicide treated just prior to seeding with RAXIL MD (tebuconazole and metalaxyl) to prevent seed rot and pre-emergent damping off. Plots were 4 X 10 meters arranged in a randomized complete block design with four replicates. STELLAR (2.5 g/L florasulam + 100 g/L fluroxypyr and 600 g/L MCPA ester) and AXIAL (100 g/L pinoxaden) herbicides were applied as a tank mix with Adigor adjuvant in crop at the 3-4 leaf stage (label rates) to control broadleaf and grassy weeds on June 7<sup>th</sup>.

HEADLINE EC and PROSARO 250 EC were applied in 100 L water /ha and TILT 250E was applied in 200 L water/ha. HEADLINE and TILT fungicides were applied when the flag leaf was fully emerged on July 5<sup>th</sup> using a 2 meter boom mounted on the front of a 4 wheel ATV. PROSARO was applied with the same equipment July 19<sup>th</sup> at approximately the 50% flowering stage. This application date was on the latter end of the optimum timing spectrum due to rain delays. Plots were monitored for leaf spot symptoms and assessed on July 31<sup>st</sup> at the late milk growth stage using a 0-11 point scale (Horsfall-Barratt) converted to a percentage leaf area diseased for flag and penultimate leaves. Plants were also assigned a rating between 0-11 (McFadden scale) based on assessment of disease symptoms on foliage of the whole plant. Fifty heads per plot were removed and collected on August 13<sup>th</sup>, placed in the freezer overnight and assessed for fusarium head blight (FHB) infection the following day. FHB levels were assessed on a visual scale provided by NDSU of 0 to 10 where 1= 10% spike infection and 10=100% spike infection.

Yield measurements were made on harvested samples taken from a 1.3 x 10 meter strip from the centre of each plot on September 7<sup>th</sup> with a Wintersteiger plot combine. Quality (thousand kernel weight and test weight) was assessed on harvested samples, data analyzed using analysis of variance procedures, and treatment means different the unsprayed check determined with Dunnett's t test.

**RESULTS:** See Table 1.

Table 1. Effect of fungicide treatment on AC Barrie, Infinity and 5603HR wheat for foliar disease symptoms (flag and flag-1leaves and whole plant), % spike infection (Fusarium Head Blight), yield, thousand seed weight (TSW) and test weight (TW) at Melfort, 2012.

		<b>Yield Kg/ha</b>	<b>TSW (g)</b>	<b>TW (kg/hL)</b>	<b>Flag leaf %</b>	<b>Flag -1 Leaf %</b>	<b>Whole Plant (0-11)</b>	<b>FHB % spike</b>
AC								
Barrie								
	TILT	4033	36.2*	77.7	5.4	6.1*	2.6*	38.2
	HEADLINE	4096	34.9	77.7	4.1*	2.9*	2.1*	32.1
	PROSARO	4420	36.7*	78.7*	4.0*	15.6	3.3	30.6
	Check	3450	33.3	77.3	8.8	28.2	4.8	30.9
Infinity								
	TILT	3208	29.4	73.5	4.5	7.2*	2.9*	54.8
	HEADLINE	3319	29.0	73.3	2.6*	3.4*	2.5*	54.9
	PROSARO	4122*	31.0*	76.3*	3.1*	13.0	3.5	41.5*
	Check	3044	27.9	72.7	7.5	25.8	4.2	64.7
5603								
HR								
	TILT	4061	31.7	76.5	3.7	4.2	2.7	41.3
	HEADLINE	4181	31.5	77.3	3.5	4.2	2.5	38.8
	PROSARO	4924*	32.4*	78.5*	3.0	5.6	2.8	26.1
	Check	3879	30.2	77.0	4.3	17.8	3.6	39.4

Treatments different from unsprayed check indicated by an asterisks (\*) using Dunnett's t test.

**CONCLUSIONS:** All plots were seeded early May in ideal soil moisture and air temperatures conditions with rows visible within 10 days. Temperatures later in the month dipped slightly; the last frost on May 25<sup>th</sup> with no damage detected on any of the plots. Rainfall amounts in excess of 112 mm in June plus another 100 mm in July combined for 77 mm of precipitation above the long term averages for those months. This seemed to have a negative impact on foliar leaf disease as levels on the checks of all cultivars was <10% for the flag leaf evaluations and <28% for the most susceptible cultivar on the penultimate leaves. Whole plant ratings showed minimal levels of leaf disease across all the cultivars. Even with low disease pressure HEADLINE and TILT applications did reduce the amount of leaf infection on AC Barrie and Infinity wheat on the penultimate and whole plant. Disease severity on flag leaves was reduced by HEADLINE and PROSARO on the same two cultivars. None of the fungicides tested showed improved disease control potential from that of the check for 5603HR.

Infinity, rated "Very Poor" for FHB having 34 and 25 percent greater spike infection levels than AC Barrie and 5603HR which are rated "Fair" and showed a significant decrease in infection from the check with the use of PROSARO. The "Fair" rated cultivars were not improved, in this trial, with the use of fungicides with respect to this disease.

Thousand seed weights and test weights of all cultivars were improved with the application of PROSARO, while TILT had showed a benefit over the check only for thousand seed weight on AC Barrie. PROSARO, while improving the yields of 5603HR and Infinity, did not show any benefit when applied to AC Barrie.

Under conditions at Melfort in 2012 where foliar leaf disease pressure was light, fungicides reduced leaf spot severity slightly, but had no effect on yields. TILT increased TSW of AC Barrie. Fields such as this one, with a history of FHB infection, showed gains in quality data from the application of PROSARO for all cultivars tested and yields of two cultivars were significantly higher than the unsprayed check.