



*NORTHEAST AGRICULTURE RESEARCH FOUNDATION*

**2012 EFFECT OF FUNGICIDE ON LEAF SPOT DISEASES AND YIELD OF  
BARLEY AT MELFORT.**

Colleen Kirkham, Randy Kutcher, Garry



Peng and Stewart Brandt

EFFECT OF FUNGICIDE ON LEAF SPOT DISEASES AND YIELD OF NEWDALE, AC METCALFE  
and HARRINGTON BARLEY AT MELFORT, 2012

**NAME AND AGENCY:**

Kirkham C<sup>1</sup>, Kutcher H R<sup>2</sup>, Peng G<sup>1</sup> and Brandt S<sup>3</sup>

<sup>1</sup>Melfort Research Farm, Agriculture and Agri-Food Canada  
Box 1240, Melfort, Saskatchewan S0E 1A0

<sup>2</sup>Crop Development Center, University of Saskatchewan, Saskatoon, SK S7N 5A8

<sup>3</sup>Northeast Agriculture Research Foundation, Melfort, SK S0E 1A0

**Tel:** (306) 752-2776

**Fax:** (306) 752- 4911

**Email:** [colleen.kirkham@agr.gc.ca](mailto:colleen.kirkham@agr.gc.ca)

**MATERIALS:** Check, TILT 250E (propiconazole 125 g. ai/ha) and PROLINE 480 SC (prothioconazole 149 g. ai/ha).

**METHODS:** Barley varieties Newdale, AC Metcalfe and Harrington all 2 row malt were chosen for their resistance or susceptibility to leaf spot diseases. Newdale was considered the most resistant variety and listed as fair/good/fair for net-form of net blotch, spot-form of net blotch and spot blotch, respectively (Saskatchewan Variety of Grain Crops 2012 Guide); AC Metcalfe is rated very poor/fair/fair while Harrington is susceptible (poor) to all. Varieties were direct seeded into canola stubble on May 14<sup>th</sup> using an Edwards hoe drill with an 8 inch row spacing. Fertilizer was applied following soil test recommendations: side-banded urea at 70 kg/ha of actual N and seed-placed 14-20-10-10S at 100 kg/ha product. Target seeding rate was 300 plants per meter square. Plots of 4 X 10 meters were 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>.

Fungicides were applied at flag leaf fully emerged on July 3<sup>rd</sup> using a 2 meter boom mounted on the front of a 4 wheel ATV. PROLINE was applied in 100 L water /ha and TILT 250E was applied in 200 L water/ha as per label directions. Plots were monitored weekly for disease. Ten plants per plot were then assessed on July 26<sup>th</sup> at the late milk/early dough 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, total disease was assessed as opposed to each individual pathogen severity. Yield measurements were made on harvested samples taken from the centre of each plot on August 24<sup>th</sup> with a Wintersteiger plot combine. Quality measurements were taken from harvested samples and data were analyzed using analysis of variance procedures and fungicide treatment means deemed significantly different from the check using Dunnett's t test.

**RESULTS:** See Table 1.

Table 1. Effect of fungicide treatment on three Barley cultivars with varying resistance levels to Net form and spot form Net Blotch for foliar disease severity (flag and penultimate leaves and whole plant), yield, thousand seed weight (TSW), test weight (TW), plump (%) and thins (%) at Melfort , 2012

		<i>Yield</i> <i>Kg/ha</i>	<i>TW</i> <i>(kg/HL)</i>	<i>TSW</i> <i>(g)</i>	<i>Plump</i> <i>%</i>	<i>Thin</i> <i>%</i>	<i>Flag</i> <i>Leaf %</i>	<i>Pen</i> <i>Leaf %</i>	<i>Whole</i> <i>Plant</i> <i>(0-11)</i>
Harrington									
	TILT	3514	54.2	37.8	70.2	5.0	11.6	29.7	7.3
	PROLINE	4190*	56.4*	39.4*	78.6	4.5	5.5*	13.1*	5.8*
	Check	3297	53.9	35.5	70.0	3.2	22.5	43.4	8.7
AC Metcalfe									
	TILT	4021	58.0	38.6	80.9	2.3	4.8	9.0	5.6
	PROLINE	4088	57.9	39.0	80.8	3.1	2.7	4.6*	4.3
	Check	3912	58.1	38.5	79.7	2.3	3.3	9.7	4.9
Newdale									
	TILT	5077	57.6	39.3	79.6	2.8	3.0	5.0	4.4
	PROLINE	4969	57.3	38.6	75.8	3.5	2.6	3.4	3.4
	Check	5089	58.0	39.1	79.6	3.2	5.4	8.5	5.0

Treatments different from the unsprayed check indicated by asterisks using the Dunnett's t test.

**CONCLUSIONS:** Plots were seeded into more than adequate moisture with cool soil temperatures in the spring of 2012. Plants emerged 12 days after seeding but during the time period from seeding to emergence another 27 + mm of rain occurred which saturated the soil and created a hard pan that plants struggled to break through. Plants remained with wet feet continuing thru more than 12 precipitation events in June which added another 44+ mm above the long term average rainfall which is 63.5 mm. Plots were yellowing slightly by this time and warmer temperatures in the first week of June helped alleviate those symptoms. Above average rainfall continued for July with warm temperatures but surprisingly did not translate into heavy disease pressure. Harrington the most susceptible cultivar had the highest levels of disease for all foliar ratings. PROLINE was effective in increasing yields and improving kernel characteristics as well as reducing disease on Harrington and did show some effect of disease reduction on the penultimate leaves on AC Metcalfe.

Response to fungicides was limited to the most susceptible cultivar tested, Harrington; those with good host resistance saw no benefit from a fungicide application.