

ADOPT

Agricultural Demonstration of Practices and Technologies

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ADOPT Project #20110365

Maximizing Benefits from Foliar Fungicides on Wheat and Barley

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Objectives:

Cereal leaf spotting diseases are frequently believed to reduce yield and quality in northwest Saskatchewan. A number of fungicide products have recently been approved for use in addition to propiconazole (Tilt/Bumper/Pivot), a product in use for approximately 20 years. The benefit to using foliar fungicide to control cereal leaf diseases depends on weather conditions, yield potential and the inherent genetic resistance or tolerance of varieties of wheat and barley to the various pathogens responsible for leaf spotting diseases.

Rationale:

The agricultural media and many industry agronomists suggest that producers in northern Saskatchewan should consider using foliar fungicide treatments as a routine practice in cereal production. However, the number of cereal varieties and fungicide products that can be tested on-farm is limited. A demonstration of varietal resistance and fungicide product in a replicated project is desired by these cereal producers. Application of fungicide at herbicide timing has been promoted by many retail outlets but research does not support as good of control as more appropriate timing at flag leaf. Information and demonstrations showing the importance of timing will save producers financially.

Materials and Methods:

Demonstration project at the CLC was implemented using 2 varieties of spring wheat and 2 varieties of barley. Varieties will differ in their levels of resistance (low vs high) to pathogens responsible for leaf spotting diseases. Four foliar fungicides were applied to these varieties using the recommended rates and water volumes at the appropriate growth stage (flag leaf).

1. untreated
2. Tilt (Demethylation inhibitor type fungicide - propiconazole from Syngenta)



3. Headline (strobilurin fungicide - pyraclostrobin from BASF)
4. Proline (Demethylation inhibitor type fungicide - prothioconazole from Bayer)
5. Stratego (Demethylation inhibitor type & strobilurin fungicide - propiconazole & trifloxystrobin from Bayer)

The second part of the project will investigate fungicide applications at 2 timings with one product on wheat. Treatments:

1. no fungicide
2. fungicide at herbicide time
3. fungicide at flag leaf
4. fungicide at herbicide and flag leaf

Prior to seeding this demo on canola stubble, a litre of Vantage Plus Max II was used to burn off. May 21st saw us drill our 14' x 100' plots with a 9350 JD hoe drill. Lillian and Harvest wheat were seeded at 90 lbs/ac with 60 lbs of N, 30 lbs of phos and 15 lbs of sulphur. Lillian seed was treated with recommended rates of Vitaflow 280 with Harvest, Copeland and Legacy barley being treated with Gemini. Both barleys (Copeland & Legacy) were seeded at 75lbs/ac. Soil conditions were cool with considerable moisture. These plots were slow to emerge, with some plots being delayed due to excessive moisture. These plots were delayed, giving barnyard grass the upper hand, causing severe yield losses in some of the treatments. We applied 0.80l/ac of MCPA Amine on June 25 to control the competition. All fungicides were applied at recommended rates. Combining occurred on Sept 15.

The second part of this demo was seeded to Utmost wheat at 109 lbs/ac with the same fertilizer as above. The seed was treated with VitaFlow 280 with emergence occurring on May 28th. This demo was on a very well drain site that did not experience the saturated soils and allowed the wheat to emerge quite evenly, with the crop competing quite well with the weeds. Proline @ 135gr/ac was applied at appropriate timing (flag leaf, with herbicide & at herbicide timing and again at flag) combining occurring on Sept 17th.

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Results:



Variety Legacy	Rep 1	Rep 2	Average Yield	% Increase over check	Average % Plump
Check	57.2 bu/ac	43.9 bu/ac	50.6 bu/ac	check	95.5%
Tilt	33.9 bu/ac	54.6 bu/ac	44.3 bu/ac	-13 %	95.7%
Headline	58.6 bu/ac	62.6 bu/ac	60.6 bu/ac	+17 %	97.4%
Proline	38.4 bu/ac	50 bu/ac	44.2 bu/ac	-13%	96.3%
Stratego	54.7 bu/ac	37.9 bu/ac	46.3 bu/ac	-9%	97.1%

Variety Copeland	Rep 1	Rep 2	Average Yield	% Increase over check	Average % Plump
Check	50 bu/a c	51 bu/a c	50.5 bu/ac	check	95.3%
Tilt	51.2 bu/a c	42.6 bu/a c	47 bu/ac	-7 %	96.8%
Headline	51.2 bu/a c	54 bu/a c	52.6 bu/ac	+4 %	97%
Proline	40 bu/a c	48.6 bu/a c	44.3 bu/ac	-13%	96.3%



Stratego	46.6 bu/a c	30.6 bu/a c	38.6 bu/ac	-24%	97.3%
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Variety Harvest	Rep 1	Rep 2	Average Yield	% Increase over check	TKW
Check	36.2 bu/ac	19.7 bu/ac	28 bu/ac	check	3.80g
Tilt	40.5 bu/ac	13.8 bu/ac	27.1 bu/ac	-3 %	3.64g
Headline	38.9 bu/ac	26 bu/ac	32.5 bu/ac	15 %	3.44g
Proline	34 bu/ac	17.5 bu/ac	25.8 bu/ac	-8%	3.62g
Stratego	34.6 bu/ac	31.4 bu/ac	33 bu/ac	16%	3.44g

Variety Lillian	Rep 1	Rep 2	Average Yield	% Increase over check	TKW
Check	36.2 bu/ac	19.7 bu/ac	28 bu/ac	check	2.14g
Tilt	40.5 bu/ac	13.8 bu/ac	27.1 bu/ac	-3 %	3.64g
Headline	38.9 bu/ac	26.1 bu/ac	32.5 bu/ac	14%	2.88g
Proline	34 bu/ac	17.5 bu/ac	25.8 bu/ac	-8%	3.52g
Stratego	34.6 bu/ac	21.3 bu/ac	28 bu/ac	same	3.60g



Variety Utmost	Rep 1	Rep 2	Average Yield	% Increase over check	TKW
Check	41.2 bu/ac	39.7 bu/ac	40.5 bu/ac	check	2.14g
F@ herb	45.2 bu/ac	48.7 bu/ac	47 bu/ac	14 %	3.06g
F@ flag	47.3 bu/ac	46.1 bu/ac	46.7 bu/ac	14%	3.19g
F@ herb & flag	42.8 bu/ac	45.7 bu/ac	44.3 bu/ac	8%	3.14g

Supporting Information
Acknowledgements:

We would like to express our gratitude to the Ministry of Agriculture for the funding support and in-kind support with this project. To recognize the ADOPT program and the Ministry we had signage at the sites.

Field Days:

- Conservation Learning Centre – Annual Field Day – July 17th - 45 people
- Conservation Learning Centre – Combine Clinic – Aug 9th – 55 produce
- Report on the project to be posted on our website
www.conservationlearningcentre.com

Abstract:



With both plots receiving a litre of glyphosate days prior to seeding, soil temperatures were still cool with excessive moisture delaying seeding to the 21st of May. Cool conditions allowed for barnyard grass to compete and reduce yields. We seeded our barley at 75lbs/ac and our wheat at 90lbs. All plots had 60 lbs of N, 30 lbs of phos and 15 lbs of sulper. Although our yields were reduced due to weeds and excessive moisture, our grain quality was quite good with our barley being of good quality with slims being minimal and plumpness averaging in the mid to high 90's. Overall, Headline appeared to provide the best results and Proline providing the least for both our barley and wheat.

The field scale wheat trial (Utmost) had the same management practices employed with fungicides applied at different stages of plant growth. Both fungicides applied at herbicide timing and at flag leaf produced a 14% yield increase while the treatment at herbicide timing and again at flag only realized an 8% increase. It appears Headline provided the best protection on our fungicide trial with our field trial on wheat providing unexpected results. We had anticipated a higher yield response to the application of Proline at Herbicide and flag leaf while the best yield responses were the same at flag leaf and at herbicide timing.

