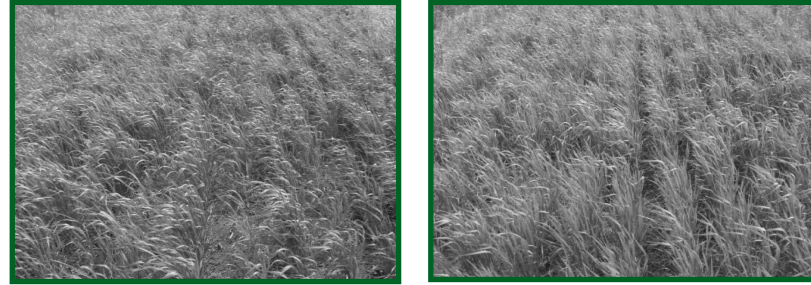


## WINTER WHEAT DIAP RESEARCH UPDATE

research community and the industry partners. I hope this momentum can carry forward for several more years.

Fig. 1: CDC Buteo planted south of Lethbridge, AB. No seed treatments applied on left; Raxil WW seed treatment applied on right.



## SCOUTING FOR STRIPE RUST

**Janine Paly – Agrologist, Ducks Unlimited Canada**

Field scouting is an important management practice in every crop rotation and winter wheat is no exception, especially when scouting for diseases.

Winter wheat produces a high amount of biomass, which, while setting the stage for a high yield, can also provide an environment for fungal diseases like stripe rust to develop. Stripe rust is not a new disease, but only recently has it been a threat to winter wheat production in Prairie Canada.

Typically, stripe rust is more common in southern Alberta, however, this past summer it was reported throughout the Prairies. There are two types of populations; a cool strain which blows in from the Pacific northwestern U.S., which typically affects Alberta and some parts of Saskatchewan, while the warmer strain blows in from the Mississippi Valley and affects Manitoba.

Stripe rust forms small yellow-orange pustules, which appear parallel to veins, creating large stripes on leaves. The presence of stripe rust pustules diminish a leaf's ability to photosynthesize energy, thus diminishing yield potential. When a stripe rust infection reaches a high level of severity, the disease is capable of infecting the seed head; this in turn can have negative effects on grade. Most winter wheat varieties are susceptible to this disease, however, a few varieties do offer some tolerance. In 2011, it is believed that the mutating stripe rust managed to side-step Radiant's resistance gene, Yr10.

Researchers were out this past fall in southern Alberta scouting both volunteer fields and planted winter wheat crops to determine the presence and level of infection of stripe rust. Dr. Denis Gaudet, a plant pathologist with Agriculture and Agri-Food Canada (AAFC) said that AAFC is monitoring the affected regions by sampling the fields throughout the winter and by bringing infected plants

into the greenhouse and observing the level of spore survivability.

In the spring of 2012, producers should be walking their fields regularly after spring growth begins. Both winter wheat and spring wheat are susceptible to the same types of stripe rust and air currents can carry spores between fields, therefore it is very important to check your fields regularly.

In case of infection, producers can treat stripe rust by applying a foliar fungicide which has been approved for use in winter wheat.



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Thank you to Bayer CropScience for their partnership and support of an initiative with Ducks Unlimited Canada called *Winter Cereals: Sustainability in Action*.

**Winter Cereals**  
*Sustainability in Action*

A PROGRAM OF  
DUCKS UNLIMITED CANADA  
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### WINTER WHEAT ADVISOR

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## AFTER WET YEAR, PRAIRIE FARMERS SEE BENEFITS IN GROWING WINTER WHEAT

### Acres up significantly from 2010

There seems to be a great deal of crop growing under the snow this winter. Statistics Canada just released its seeded acre numbers for this fall and found that winter wheat acreage is up significantly from last year as a result of a wet spring and early summer. Farmers are seeing the many benefits of growing winter wheat and the potential of this fall-seeded crop is still growing.

"Winter wheat was a great solution for farmers who couldn't seed this past spring," said Paul Thoroughgood, regional agrologist with Ducks Unlimited Canada (DUC). "Including winter wheat in the crop rotation improves the efficiency of the operation by conserving labour and capital by distributing the workload throughout the year."

The seeded acreage for this fall is over 1.3 million acres, up from 695,000 acres seeded in 2010. The provincial breakdown for winter wheat acres seeded in 2011 is 580,000 in both Manitoba and Saskatchewan and 175,000 in Alberta.

"New varieties, improved marketing options and the agronomic advantages provided by winter wheat makes it an attractive choice for many growers. Farmers know growing winter wheat is a better use of soil moisture. In the spring, when others are fighting wet seeding conditions, winter wheat is already in the ground growing," said Thoroughgood.

According to Thoroughgood, some other winter wheat benefits include:

- Higher yields: 15 to 40 per cent higher than spring-seeded wheat. Available varieties are suitable for milling, feed and ethanol markets.
- More efficient use of inputs: Increases competition and different timing of herbicide applications can increase the effectiveness of those herbicides in other years of the crop rotations.
- Pest avoidance: Avoids common wheat pests such as orange blossom wheat midge and wheat stem sawfly; eliminating insecticide applications.
- Conservation: Conserves labour and capital; shifting a portion of seeding to the fall removes some of the stress and challenges faced in the spring.

The increase in winter wheat acres also benefits spring-nesting waterfowl, particularly northern pintails; a species in decline since the late 1970s. This benefit to waterfowl, with support from Bayer CropScience, led DUC to invest \$6 million in variety development and agronomic research in the past three years.

"The increase in acreage is a result of a great deal of co-operation between many organizations such as Bayer CropScience, Ducks Unlimited Canada and the provincial winter wheat producer commissions, but at the end of the day, the increase in seeded acres is the result of producers wanting to experience the benefits of winter wheat on their farms," added Thoroughgood.

## BIN FULL OF REASONS WINNERS ANNOUNCED

Ducks Unlimited Canada (DUC), Bayer CropScience and Behlen Industries LP are pleased to announce the winners of the Bin Full of Reasons challenge in Saskatchewan, Manitoba and Alberta.

"We are happy to award the three Behlen Industries 4,100 bu hopper-mounted grain bins to Travis Greenbank of Wawota, Sask., Wade Simpson of Boissevain, Man. and Matt Stanford of Coaldale, Alta.," says Paul Thoroughgood, Regional Agrologist – Prairies for DUC. "Out of 205 submissions in all three provinces, these entries were selected as the winners by our panel of judges. I know each of these winter wheat growers will put their new grain bins to good use on their farms."

The Bin Full of Reasons challenge asked agricultural producers to provide submissions of how winter wheat is important for conservation on their farm; whether that be conservation of labour, equipment or the environment.

The early maturity of winter wheat helps producers reduce stress at harvest. By having a crop that is ripe and ready to combine earlier, the workload is spread out, taking the pressure off of manpower and equipment resources.

As an environmental benefit, winter wheat also provides excellent nesting cover for ducks in the spring and habitat for other wildlife making winter wheat a tool of sustainability to incorporate in cropping rotations.

"We are thankful for the support from Behlen Industries who is supplying the three grand prizes for the challenge," says Thoroughgood. "I'd also like to thank our long-time winter wheat partner Bayer CropScience. Without our *Winter Cereals: Sustainability in Action* initiative, contests like this would not be possible."

The Bin Full of Reasons winners were officially announced during:

- **Crop Production Week** – Saskatoon, Sask. (January 9-12, 2012)
- **Manitoba Ag Days** – Brandon, Man. (January 17-19, 2012)
- **FarmTech** – Edmonton, Alta. (January 24-26, 2012)

For more information, visit [GrowWinterWheat.ca](http://GrowWinterWheat.ca).

## A USEFUL TOOL TO PREDICT WINTER WHEAT SURVIVAL

**Mark Akins – Agrologist, Ducks Unlimited Canada**

The perfect storm is "brewing" in coffee shops across Western Canada. A big rebound in winter wheat acreage (over 1.3 million), introduced many new growers to the crop this winter. Now begins the wild speculation about winter wheat survival.

For those who wish to better understand the mechanisms of winter hardiness and get an idea of how their crop is coping, Dr. Brian Fowler (University of Saskatchewan Crop Development Centre) and Ken Greer (Western Ag Innovations), have built a web-based model to simulate winter wheat's reaction to cold temperatures. It is available at: [www.usask.ca/agriculture/plantsci/winter\\_cereals/index.php](http://www.usask.ca/agriculture/plantsci/winter_cereals/index.php).

The model consists of soil temperature data from soil probes at crown depth (roughly two inches below soil surface), and known acclimation, vernalization and low-temperature damage reactions

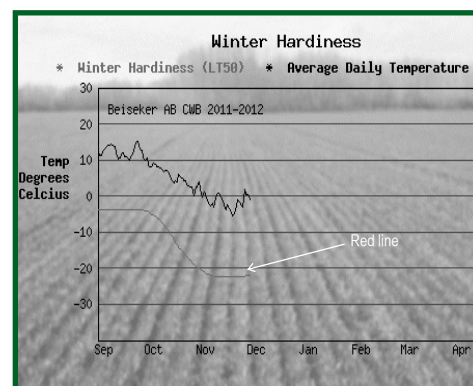
from winter wheat plants. The model has soil probes at different areas across the Prairies for 2011/2012 allowing growers to use a site reflecting their area's conditions. The location can be easily changed by clicking on the available locations and seasons.

Other factors besides soil temperature that affect winter hardiness are included and adjust what is known as the LT50 (lethal temperature to kill 50 per cent of the plants). The user can change the variety as there are subtle, but significant differences in LT50. By clicking the management impact calculator, growers can also factor in agronomic conditions such as seeding date, seeding depth, seed-placed phosphorus and seed-placed nitrogen. These factors may affect the hardiness of the crop in a positive or negative way and automatically change the LT50.

Output of the model is very simple with a graph showing soil temperature over the winter (the black line) and the estimated

LT50 of the winter wheat crop (the red line). If the black line reaches the red line, damage to the winter wheat is predicted.

This model can be a useful tool to remind growers of best management practices important to winter wheat as well as giving an idea of how their crop is doing throughout the winter. Its reliability has also been proven more reliable than coffee shop speculation.



Soil temperature (black line) and LT-50 temperature (red line). If soil temperature line drops below the LT-50 temperature, winter kill may be expected.

## WINTER WHEAT DIAP RESEARCH UPDATE

**Dr. Brian Beres – ICM Systems Biologist, Agriculture and Agri-Food Canada**

**Editor's note:** *In the summer of 2010, Ducks Unlimited Canada, Winter Cereals Manitoba Inc., the Saskatchewan Winter Cereals Development Commission, and the Alberta Winter Wheat Producers Commission submitted a proposal to Agriculture and Agri-Food Canada's (AAFC) Developing Innovative Agri-Products (DIAP) initiative to conduct a series of winter wheat agronomic research projects. All research is conducted by AAFC researchers throughout the Prairies. Dr. Brian Beres with AAFC in Lethbridge is the principle researcher in these studies. Enclosed is Brian's first part of a two part summary of the first year of the DIAP studies. For a more complete summary visit [GrowWinterWheat.ca](http://GrowWinterWheat.ca).*

We have wrapped up our first field season of AAFC's DIAP winter wheat project and it has been a challenging year. The weather wreaked havoc for many, but it was interesting to see that on many of the field day tours the winter wheat plots/crop usually looked the best. In some locations, it was the only viable experiment that remained from the excessive rain and subsequent floods. The following is a brief update of the project.

**Sub-activity 1.1 – Determine the influence of seed- and foliar-applied fungicides and insecticides on fall stand establishment and overwinter survival of winter wheat. Seed Treatment Results**

A total of eight sites were successfully grown last year to study the effects of seed-applied fungicides, insecticides or dual combinations. Plant stands did not differ, but plant growth and vigour appeared to improve with seed treatments if there was a response. A combined mixed model analysis of all eight sites indicates the interaction of seed treatment and fall-applied foliar fungicide (Prothioconazole) strongly affected grain yield ( $P=0.04$ ). The

combination seed treatment combining Imidacloprid insecticide with Tebuconazole and Metalxyl fungicides (Raxil WW) improved grain yield over the check (no seed treatment) and Metalxyl alone.

**Fall-applied Foliar Fungicide Results**

We were interested to see if fall-applied fungicides would have any effect on winter wheat stand establishment, particularly if pathogens such as stripe rust were present. A mixed model analysis of the three sites with confirmed stripe rust pressure (Lethbridge (rainfed), AB; Melfort and Scott, SK) indicates that applying foliar fungicides (Prothioconazole – 'Proline') will improve grain yield over no application of fungicides. A combined mixed model analysis over all sites also indicated improved grain yield with a fall-applied foliar fungicide ( $P=0.01$ ). These results are intriguing as it would appear that the fungicide application elicited a favourable plant physiological response even in the absence of the pathogen. For sites with stripe rust pressure, the results might indicate that the rust spores overwintered, and that perhaps a systemic mode of action of Prothioconazole persisted in the crop throughout the winter. Overwintering of stripe rust is plausible for Lethbridge as rust spores have been known to overwinter in the region; however, spores are not known to overwinter in regions near Melfort or Scott, SK (D. Gaudet, B. Puchalski personal communication).

**Sub-activity 1.2 – Improving the success of planting winter wheat into barley grain stubble.**

One of the goals of this project is to successfully grow winter wheat in stubble other than canola. Barley would be a reasonable alternative, particularly in shorter season areas. We were interested to see what management strategies would be needed to control volunteer barley. In all sites planted in 2010, all volunteer barley was suppressed by the winter wheat growth and competitiveness

(cv. CDC Buteo). Therefore, we concluded that we should instead change the objective to:

*Determine the efficacy of novel herbicides in controlling weeds in sub-optimal and optimal stands of winter wheat.*

If a producer does experience reduced stand establishment, this study will help develop herbicide recommendations to optimize weed management. I like the new focus, which will involve wild oat and cleaver pressure; and a new chemistry, Pyroxyulfone, compared to Group 2 and 4 industry standards.

**Sub-activity 1.3 – Managing nitrogen when planting winter wheat on barley grain stubble.**

The major focus of this sub-activity is to determine if nitrogen management recommendations need to be altered when planting winter wheat into barley stubble. There is some concern that heavy trash left behind at barley harvest could lead to N immobilization and cause deficiencies in winter wheat. This study has been established this past fall and will be grown in Brandon, northern and southern Alberta.

**Sub-activity 1.4 – Crop growth enhancement through improved residue management strategies.**

This sub-activity builds upon 1.2 and 1.3, but expands to involve a wide array of potential alternative stubbles from barley to camelina. We have established this experiment at four locations and have planted the winter wheat into the various stubble treatments last fall.

**Summary**

It has been a very rewarding experience working with Ducks Unlimited Canada, Winter Cereals Canada, Winter Cereals Manitoba Inc, Saskatchewan Winter Cereals Development Commission, and the Alberta Winter Wheat Producer's Commission. I think we have created some momentum for interest in winter wheat production and have established a great synergy between the agronomy

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