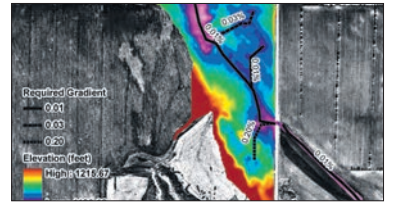


PRODUCTION

PRECISION IN AGRICULTURE TAKES EDUCATION

The future of farming will need administrators and technology experts, sometimes in the same farmer. | **Page 59**



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SEEDING PREDICTIONS

Winter cereal acre increase possible

Producers may not be able to harvest crops left in fields last fall before the spring seeding window closes

BY BRIAN CROSS
SASKATOON NEWSROOM

Wet fields in parts of Western Canada combined with unharvested acres from last year could translate into a noticeable bump in winter cereal plantings this fall, said the executive director of Winter Cereals Canada.

"There are going to be a lot of spring crops that aren't going to get seeded this year," said Jake Davidson.

"That's unfortunate but it does offer a tremendous opportunity for more winter cereals — wheat, rye or triticale — to go in this fall at a good date."

"Last time we had a situation where there was a lot of unseeded acres in the spring, our plantings (of winter cereals) did spike up a bit..."

Across Western Canada, nearly 2.5 million acres were left unharvested last fall.

That included about 1.3 million acres in Saskatchewan and 100,000 acres in Manitoba.

Those two provinces typically account for the vast majority of Western Canada's winter cereal plantings.

Western growers have been picking away at last autumn's unharvested acres over the past few weeks but progress has been slow.

Significant spring harvest delays will place added pressure on producers to deal with unharvested acres quickly before the spring seeding window passes.

"There's a lot of stuff that has to come off the fields before anyone plants anything," Davidson said.

"And in some cases, it's going to be a long time before farmers are even going to be able to get onto those fields (with a combine)."

According to recent media reports, as much as 900,000 tonnes of canola has yet to be harvested this spring.

Winter cereals typically follow canola or pulses in western Canadian crop rotations.



Hybrid rye will likely see opportunities in now soggy, unharvested fields this fall. | MICHAEL RAINE PHOTO

There's a lot of stuff that has to come off the fields before anyone plants anything.

JAKE DAVIDSON
WINTER CEREALS CANADA

In addition to offering growers a bit more breathing room during the busy spring season, winter cereals usually flower earlier than spring-seeded cereal crops.

This could offer growers relief from fusarium head blight, which was significant across the Prairies last year.

"It does flower earlier (than

spring wheat) so it does offer a bit of an advantage," Davidson said.

"Especially since we have a (winter wheat) variety, Emerson, that is rated as fusarium resistant."

Emerson acreage has been increasing steadily in areas that normally plant winter cereals.

It is one of the most widely grown varieties in Manitoba and has emerged as the most popular replacement for Falcon, which is no longer recognized as a select milling variety.

In addition to Emerson, other fusarium-resistant winter wheat varieties have been registered and others are being developed.

Davidson said interest in fall rye has also increased since hybrid rye

varieties, which offer substantially higher yields over non-hybrid cultivars, have become available.

Early-maturing canola varieties, including Brassica rapa cultivars, could also offer relief to growers who are struggling to balance harvest and seeding operations this spring.

Davidson said winter cereal crops in Saskatchewan came through the winter in relatively good shape.

But crops in Manitoba did not fare quite as well.

In southeastern Manitoba, winter wheat crops took a bit of a beating, he said.

Mild winter temperatures caused snow to melt and water pooled in low spots. When the freezing tem-

peratures returned, low spots and saturated soils caused significant damage.

"It's not what we would normally call winterkill because winterkill is normally caused by cold soils, blowing winds and a lack of snow cover.

"This was more a function of saturated soils and low spots that were totally frozen out."

In general, the condition of winter cereals is the worst near Winnipeg area with conditions gradually improving as you move west into Saskatchewan.

"It's a real dog's breakfast, depending on where you are located, the nature of your land and your drainage," Davidson said.

"In some areas, they look pretty good, but in others, it's a different story. North of Winnipeg, growers are ... considering some of their first plow-downs in 20 years."

In Saskatchewan, winter cereals came through the winter relatively well, said grower Dale Hicks from Outlook.

"In south-central Saskatchewan and southwest Saskatchewan, we came through very good," said Hicks, chair of the Saskatchewan Winter Cereals Development Commission.

Hicks said he anticipates a slight increase in the province's winter cereals plantings this year and an even bigger increase in 2018.

He said steady increases in canola acreage along with frustration with disease issues in durum will have producers looking for a new cropping alternative.

Winter cereal plantings peaked in Western Canada about six years ago when total plantings in Manitoba and Saskatchewan surpassed 600,000 acres.

In 2016, Manitoba growers planted about 140,000 acres of winter cereals.

Saskatchewan's 2016 plantings were about 260,000 acres, Davidson said.

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BREEDING RESEARCH

Canola gene turns off the green, reduces shatter

Scientists hope to find ways to use the ABI3 gene to remove chlorophyll, thus de-greening the seed after frost

BY ROBIN BOOKER
SASKATOON NEWSROOM

LACOMBE, Alta. — Researchers at the University of Calgary have developed a canola trait they say can reduce green seeds in canola hit by an early frost and improve

shatter resistance.

Marcus Samuel, associate professor at the University of Calgary, said canola hit by frost 22 to 30 days after flowering is the most susceptible time for green seed damage.

He said green seed dockage costs

Canadian growers more than \$150 million each year.

The research team Samuel heads at the University of Calgary is studying the ABI3 gene's role in the canola seed degreening process. It was found to help in activation of other genes that remove chloro-

phyll from the seeds.

"It could provide dual protection against green seed and pod shatter. The long-term goal is to integrate this technology into a germplasm, said Samuel during Murray Hartman's ScienceOrama in Lacombe., Alta.

He said the research has used genetic modified plants in developing the technology, but researchers are working on ways to improve ABI3 expression with a non-GMO approach.

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CANOLA GENE

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The research team first discovered that ABI3 is important in the degreening process through its research with Arabidopsis thaliana, a relative of canola commonly used in developing new canola traits.

“If we can understand how the degreening works in the model organism, it’s easy to take that methodology and shift it over,” Samuel said.

Researchers proved ABI3 plays a major role in reducing green colour by removing the gene from Arabidopsis and observing the degreening process in the plant’s seeds.

“With the ABI3 mutant at maturity, the green colour is fixed; the seeds looked green. While in the controls, the green colour com-



MARCUS SAMUEL
UNIVERSITY OF CALGARY PROFESSOR

pletely disappears and it’s a normal-looking seed at maturity.”

Researchers found that the ABI3 gene controls two genes responsible for degreening.

Then the research team overexpressed the ABI3 gene in an Arabidopsis plant, exposed it to frost and examined its ability to degreen its seeds.

“In the untransformed controls you clearly see the green colour was fixed after two or three days of



Researchers examining the effects of an overexpressed ABI3 gene on green seeds after frost also found the gene reduces pod shatter. | FILE PHOTO

frost. But when you overexpress this gene, like when you put in more of this gene, you clearly see the green colour was completely gone. It was able to tolerate the frost and continue to decolorize and move the chlorophyll even after frost exposure,” Samuel said.

Researchers then put the gene into canola and produced multiple transgenic plants in which the ABI3 gene was shown to be active and overexpressed.

We “checked plants frozen at -3 C for six hours and they were more tolerant than the check,” Samuel said.

“So now (researchers) wanted to test the seeds to see if they were able to degreen after a frost expo-

sure. It did this beautifully and gave a solution to the degreen problem. It was able to completely eliminate the green colour.”

More the merrier

Transgenic canola lines with an overexpressed ABI3 gene had the same yield, but their pod mass increased compared to the check.

“We also think ABI3 can induce factors that can make the pods stronger, the replum thicker, and pods are more tolerant to frost and desiccation. That’s why the seeds are able to degreen with no problem under frost conditions,” Samuel said.

The research team performed a

shaker test to assess pod shatter, which was lower with the transgenic lines compared to the check.

There is a cell line that holds pods together. It is lignified and acts as a strong polymer. When pods dry out, a tension pulls on this layer and when it breaks, pod shatter occurs.

“What we see on our cases is that there is an extra lignified layer throughout the pods in the ABI3 overexpression lines and that tension from drying is never transferred to the lignified layer.”

He said the pods are shatter tolerant not resistant, and he foresees no problems with combining.

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FEATURED AGROLOGIST

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2017 Honours & Awards Recipients



Outstanding Young Agrologist Award
Bennie Dunhin, MSc, PAg
Nominator: Duane Horvey, PAg

Bennie has assisted in establishing consistent results from the agronomy research trials operated by Grow Community of Independents and United Suppliers. He has helped generate local objective information to make better informed decisions. He has helped local growers understand which products and practices have the best fit for their situation. Since establishing the trial standards for Grow Community of Independents and United Suppliers they have submitted 908 trials, and Cavalier Agrow, where Bennie is the agronomy manager, has completed 514 trials since 2012.

Bennie has successfully implemented a Precision Agronomy Platform for Cavalier Agrow. He is pushing the boundaries of precision agriculture, by taking the large amount of data from site specific soil tests and correlating it with yields. Bennie’s great knowledge of soils and nutrition has helped to make sense of the biggest problems, and give growers a great return on their investment with precision agriculture.

Bennie has a Masters in Plant Pathology from the University of the Free State in South Africa and immigrated to Canada in 2009 with his family.



Recognition Award
George Lewko, PAg
Nominator: SIA Provincial Council

George has been active on branch, council and various committees for 20 years, providing service and leadership to the profession. He started with the NE branch executive and in 1999 became the branch rep on Provincial Council. He served as President from 2005-2006 and developed strong relationships with other Institutes of Agrology across Canada resulting in a new national organization, Agrology Agronomes Canada.

One of his legacies is the development and delivery of the professionalism & ethics seminars and courses over the years. He started as a coordinator with the Articling Agrologist Seminars and his growing expertise in professionalism & ethics resulted in invitations to present for the Manitoba Institute of Agrologists. George played a key role in the creation of the online course and final exam of the current professional & ethics program.

George has served on the Discipline Committee and contributed to the newest scope of practice, which is forensic agrology. George has practiced forensic agrology for ten years and is one of the pioneers in establishing standards of practice taught during the “Orientation to Forensic Agrology.”

George has a BSA from the U of S in 1992 majoring in crop science and minor in horticulture. He worked with Inputs Management Agro (IMAg) until 2013, and is now a Forensic Agrologist.

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