



Canadian Grain
Commission

Commission canadienne
des grains

Quality Assurance – how it applies to your farm

Canadian Grain Commission

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Canada 

Topics

- Wheat Class Modernization
- Harvest Sample Program
- Fusarium / DON-Vomitoxin
- Summary

Canada's Comprehensive Wheat Quality Pillars

Variety Registration CFIA

- Crop Life Companies
- Breeders
- Farmers

Wheat Classification CGC

- Grading
- Handling System
- Marketers

Quality Assurance & Grading System CGC

- Farmers
- Handlers
- Marketers
- Customers

Wheat class background

- **1971** Canada Western/Eastern wheat class system
- **2008** Removal of Kernel Visual Distinguishability (KVD)
- **2008** GP class - demand for feed and ethanol varieties
- **2012** Elimination of single desk marketing
- Seeded acres of unregistered US varieties
- Gluten strength concerns from international customers

Background for modernization proposal

- Customer concerns related to gluten strength have increased in last few years
- Gluten strength is a function of wheat's glutenin and gliadin proteins and is key to bakery processing, crumb structure and gas retention in a loaf
- Quality of protein just as critical as Quantity



Background for modernization proposal

- Growing season, environmental conditions contributed to the problem
- Low gluten strength varieties
- PRC-WRT continually adjusts the check varieties for benchmarking
- Historically, varieties have not been reviewed once assigned to a specific class
- Potential for different classes of wheat to be marketed as producers desire yield potential of unregistered varieties

Wheat Class Modernization: Resolving Quality Parameters in CWRS & CPSR

Objectives

- Protect the quality and consistency
- Ensure new varieties meet the requirements for:
 - milling performance
 - dough strength
 - protein quantity
 - end product quality
 - water absorption (CPSR)

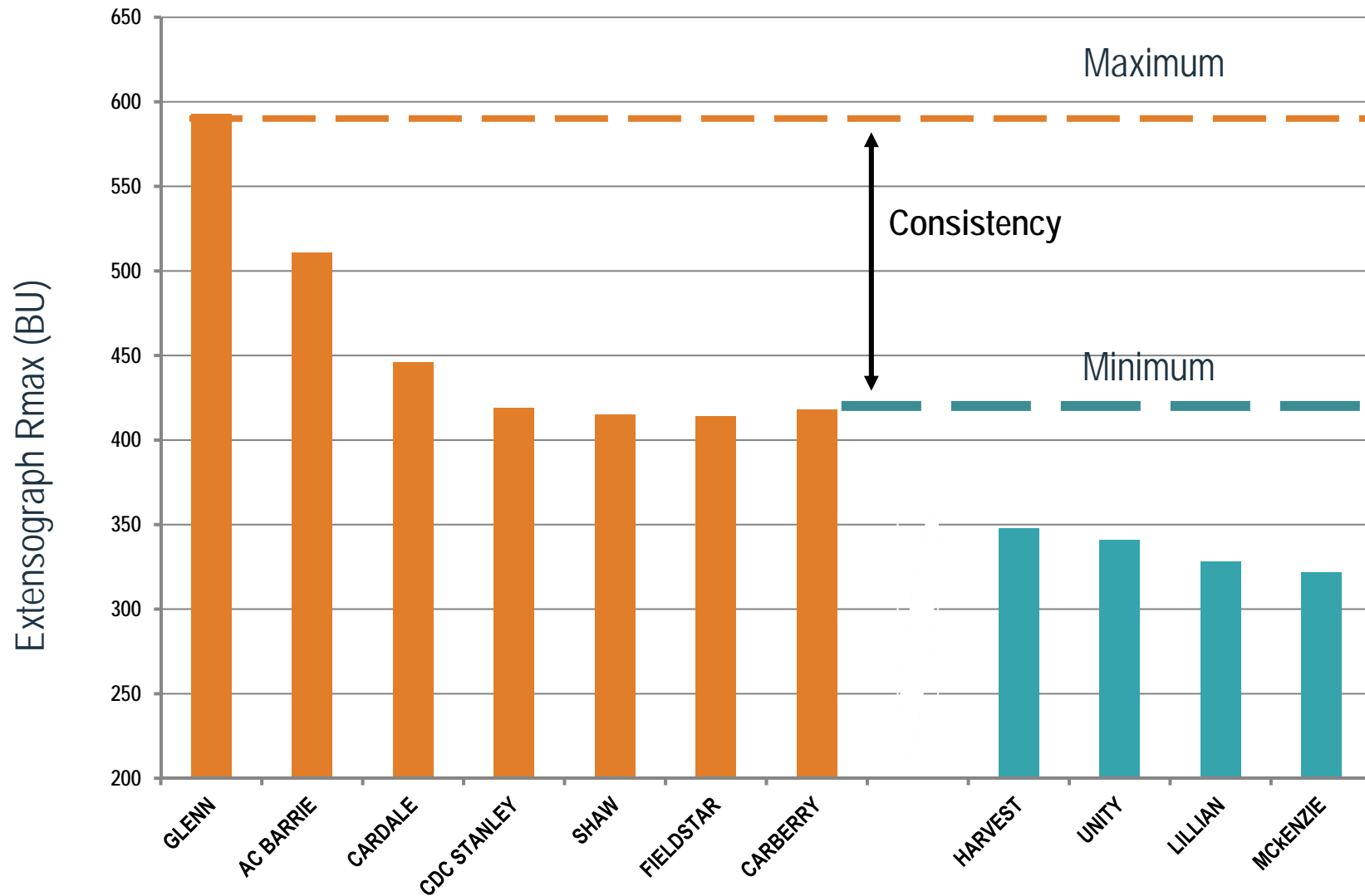
Wheat Class Modernization: Resolving Quality Parameters in CWRS & CPSR Classes

Process:

- PRC-WRT* reviewed and changed the current check varieties used for registration in all CWRS and CPSR trials –to ensure consistency
- established new, tightened “boundary” check varieties for the CWRS and CPSR Registration Trials to improve CWRS consistency of quality in both classes
- Moved varieties which did not fall within “boundary” to CNHR
- Continue to evaluate varieties to ensure consistency maintained

*Prairie Recommending Committee Wheat Rye & Triticale

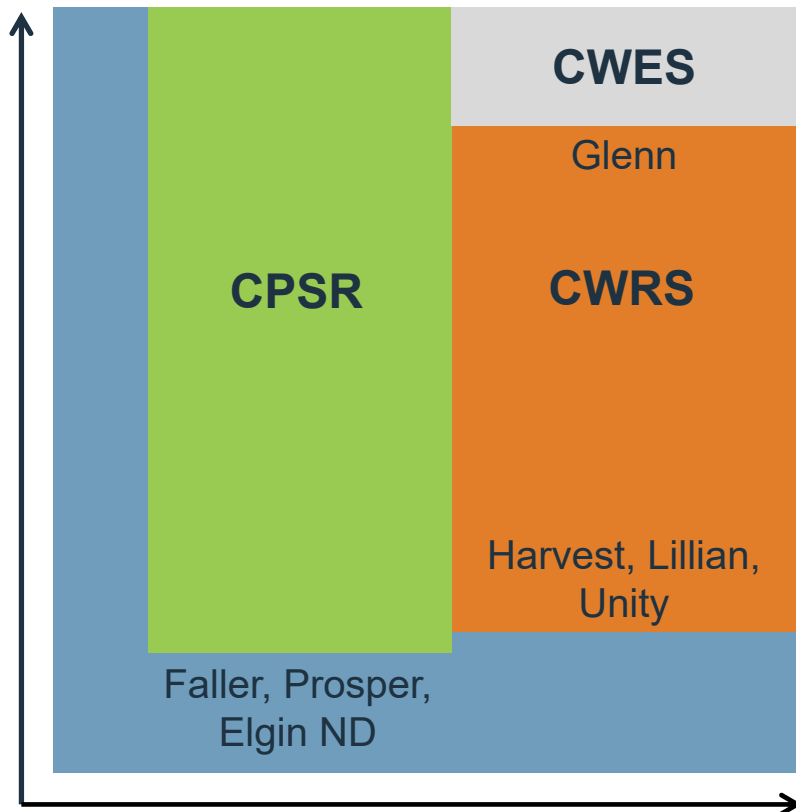
Extensograph Rmax (BU) for CWRS Varieties 2014 Harvest



Existing class profile (gluten strength vs. protein)

Previous:

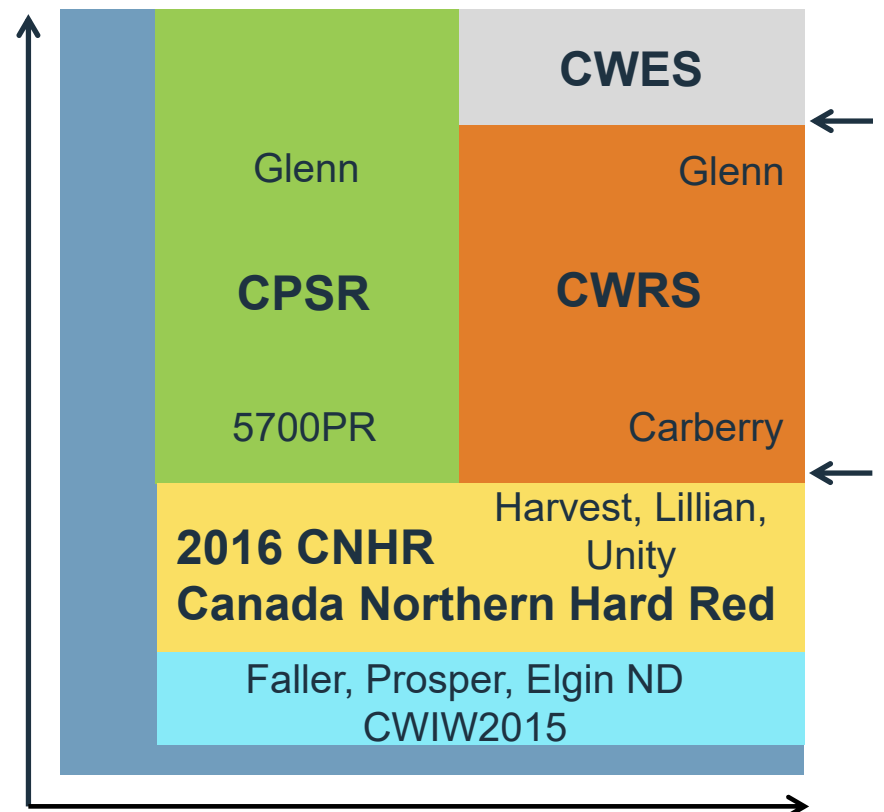
Hard Red Spring Wheat Canada vs U.S.



Protein Content, %

Current:

Hard Red Spring Wheat Canada vs U.S.



Protein Content, %

Note: U.S. HRS in blue; chart for illustration purposes only

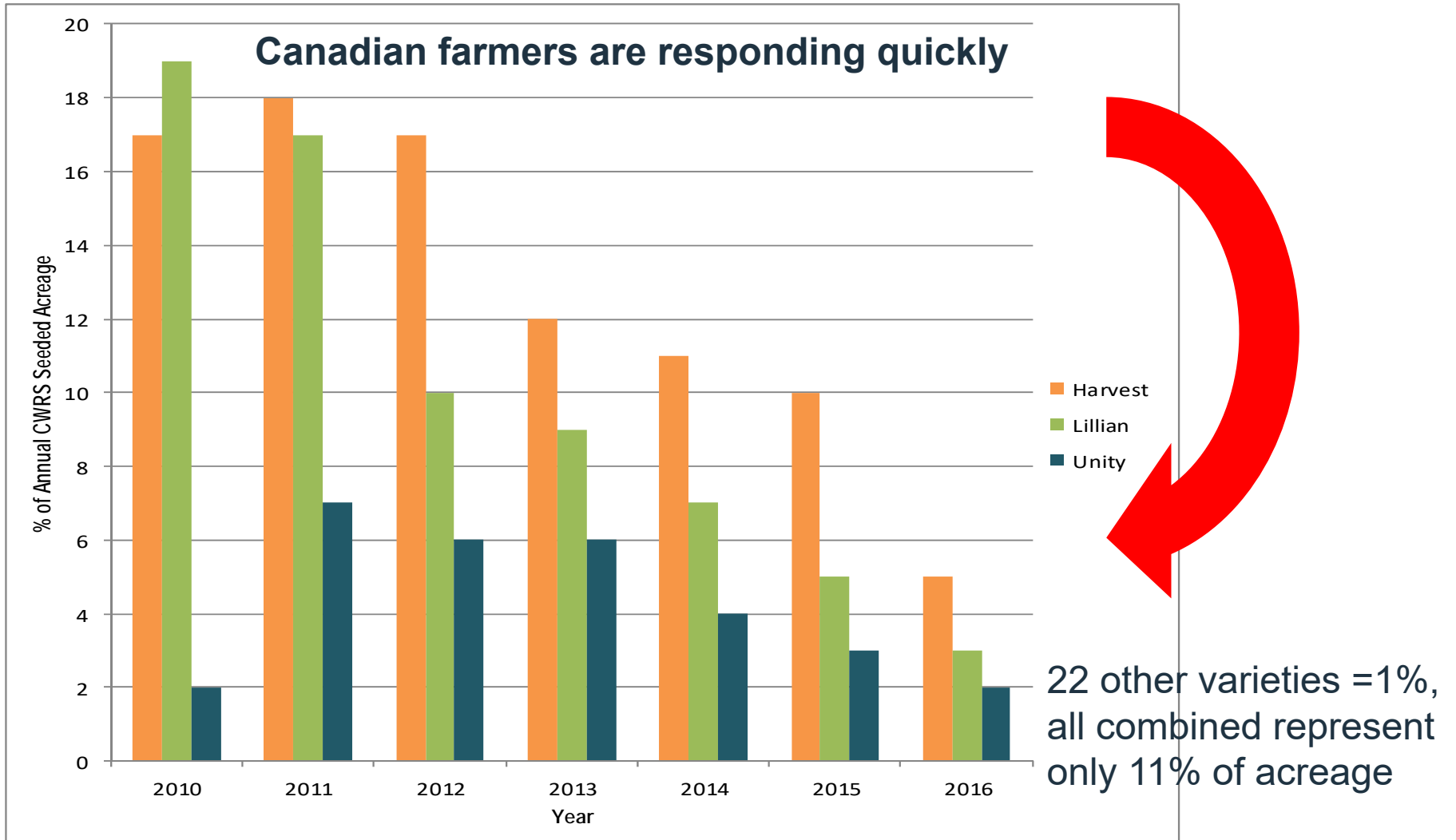
Varieties designated to Canada Northern Hard Red Class

CWRS - represents 12% of current acreage in 2016			
AC Cora	Alvena	Harvest	Neepawa
AC Abbey	Alikat	Kane	Park
AC Eatonia	CDC Osler	Leader	Pembina
AC Michael	Columbus	Lillian	Thatcher
AC Minto	Conway	McKenzie	Unity
			5603HR

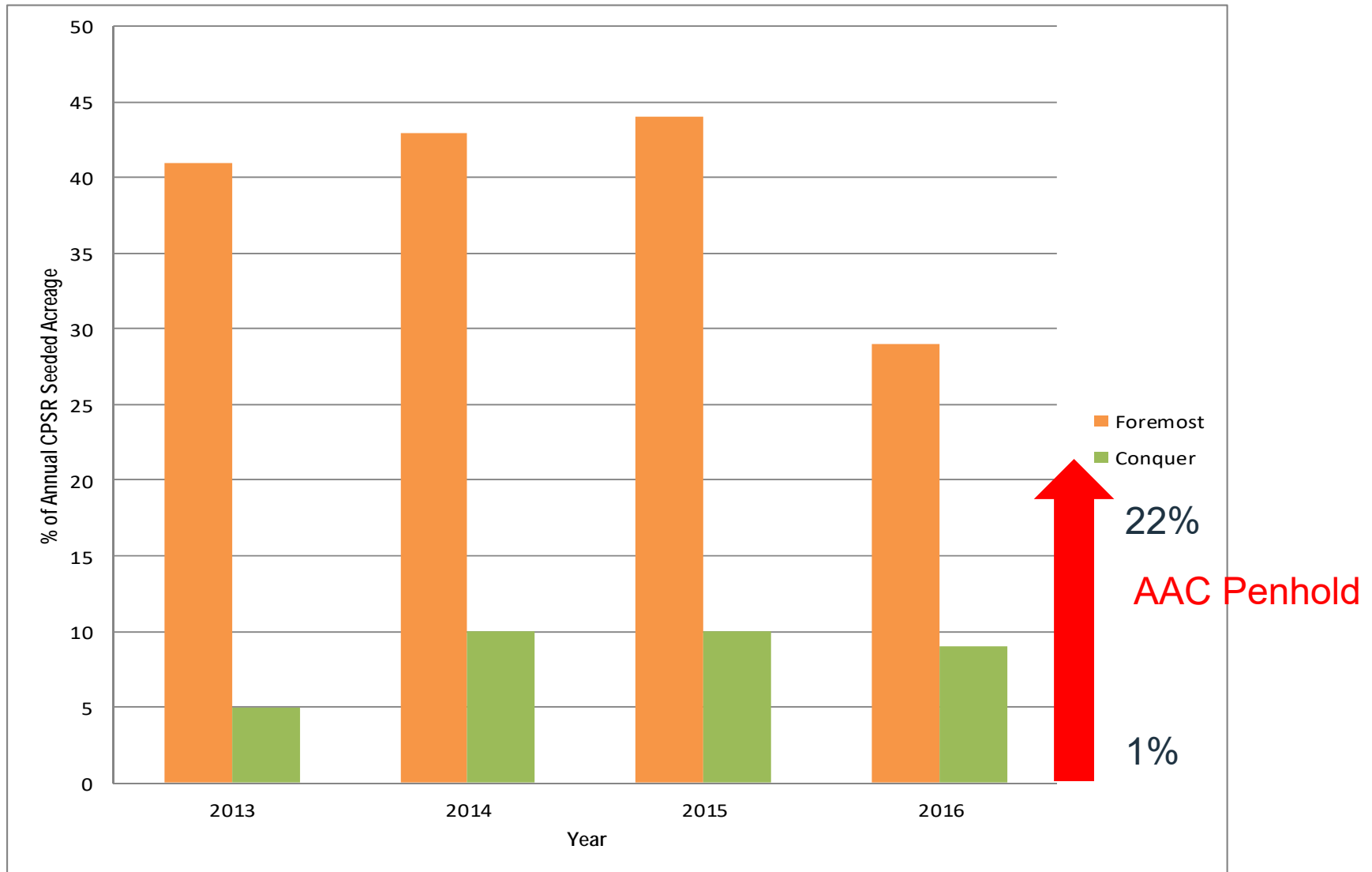
CPSR			
AC Foremost	AC Taber	Conquer	Oslo
AC Crystal (August 1, 2019)			

Varieties will be designated to CNHR class as of August 1, 2018. Will impact spring 2018 seeding intentions.

Impact: Specific CWRS Variety Survey 2010-2016



Impact: Specific CPSR Variety Survey 2013-2016



Western wheat classes and grades

Prior to 2016										
CWAD	CWRS	CWHWS	CWRW	CWSWS	CPSR	CPSW	CWES	CWF	CWGP	CWIW
1	1	1	1	1	1	1	1		1	1
2	2	2	2	2	2	2	2		2	2
3	3	3	3	3	CW Feed	CW Feed	CW Feed			3
4	CW Feed	CW Feed	CW Feed	CW Feed						CW Feed
5								Removed August 1, 2016		

August 1, 2016									
CWAD	CWRS	CWHWS	CWRW	CWSWS	CPSR	CPSW	CWES	CWSP	CNHR
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	CW Feed	CW Feed	CW Feed		3
4	CW Feed	CW Feed	CW Feed	CW Feed					CW Feed
5									

Questions from producers?

- Transition timeframe, August 1, 2018
- 1 growing season remaining
- Can you still grow and sell the 29 varieties?
- CWRS remains Canada's premium wheat class
- Price/marketing of new class

Grading System

- Ensures all stakeholders receive fair value for the grain
- The Canadian Grain Commission is mandated to continuously monitor and scientifically evaluate all grading standards to ensure they have the appropriate quality for their intended use

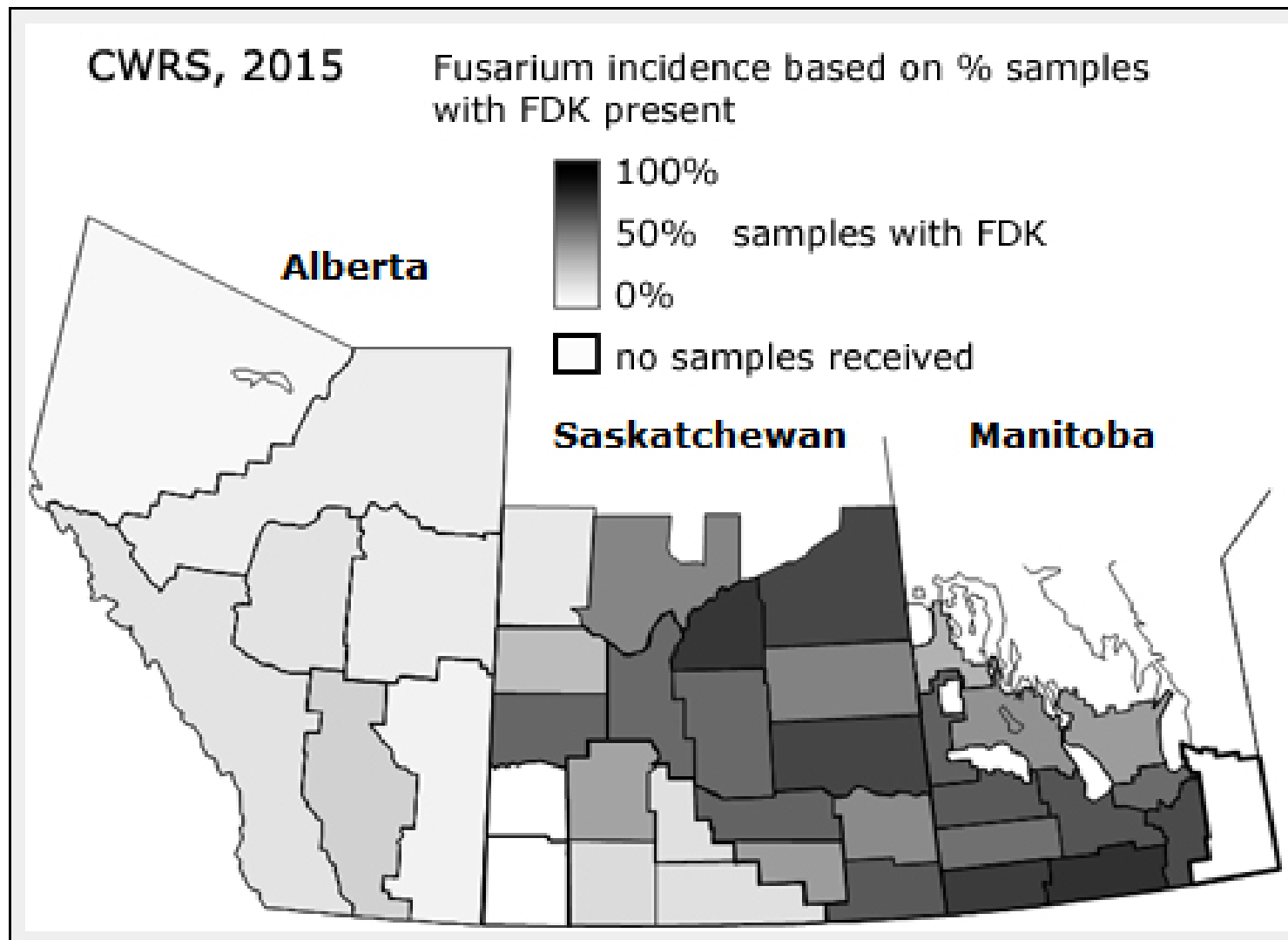
Fusarium and DON (Vomitoxin)

- Canada recognizes the importance of “safety first” in all commodities.
- Normally FDK infection occurs at flowering however this year it also occurred later
- Weather influences at flowering
- *Species of Fusarium - F. graminearum*
- Visual assessment difficult to predict deoxynivalenol (DON) levels
- Companies are testing for DON to manage their purchases to ensure meeting customer needs for safety ie: MRL's

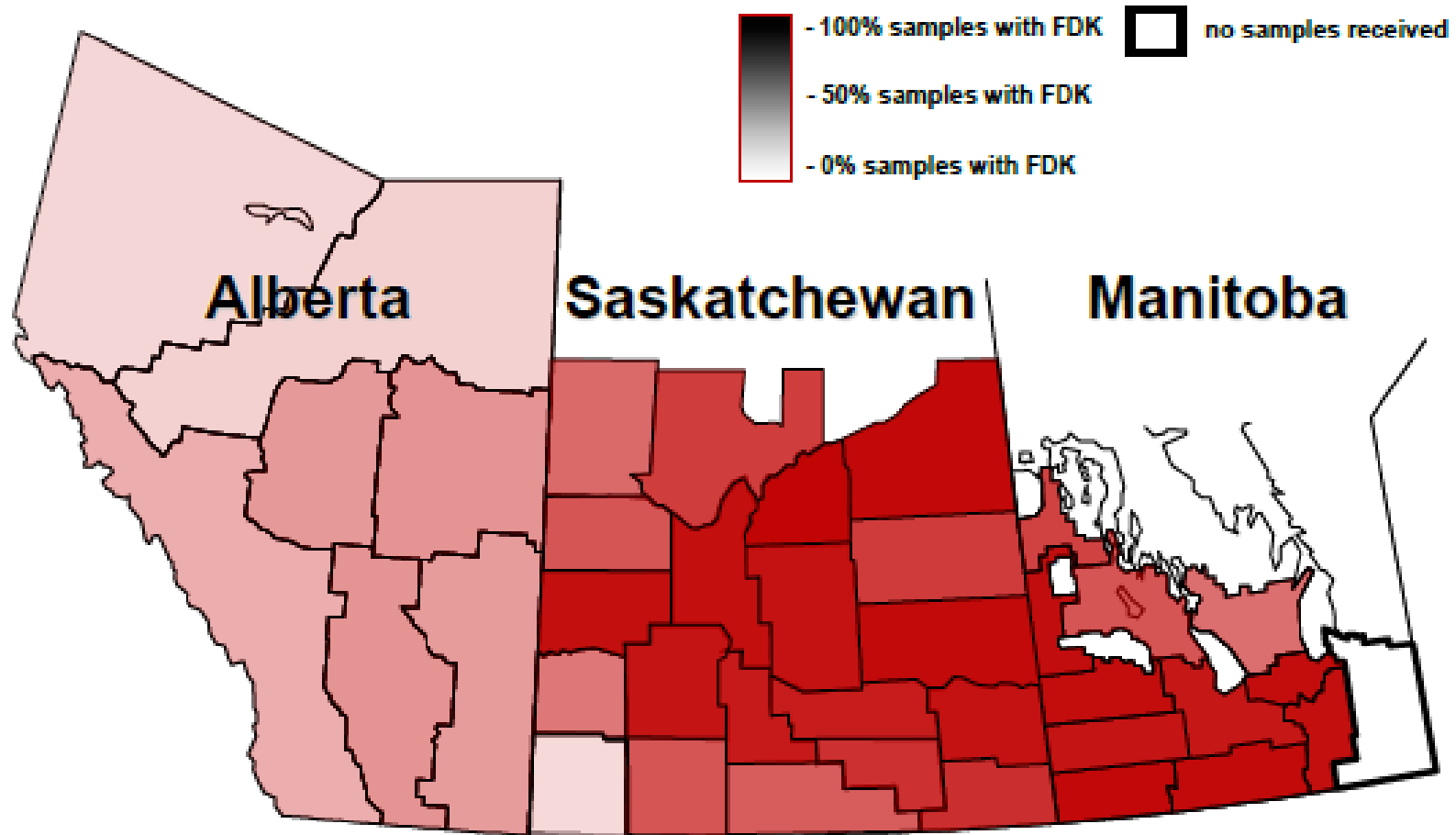


Incidence of Fusarium Damage 2015

<https://www.youtube.com/watch?v=oHUWChdDmVQ>



Incidence of Fusarium Damage 2016



Canadian Grain Commission

DON testing

- ELISA (enzyme-linked immunosorbent assay) technology
- DON Testing in the grading system
- Sampling
- Time

Refining Visual Standards for Mildew

- Mildew is caused by a fungus (*Alternaria*) which develops due to high humidity or moisture on grain
- It can impact flour colour
- Canada's weather (2014 & 2015) had higher humidity and we observed elevated amounts of mildew on the wheat kernels
- Conducted two years, 2014 & 2015 crop years, of rigorous scientific evaluation

2014 & 2015 Crop Year CWRS Mildew

Mildew in the brush

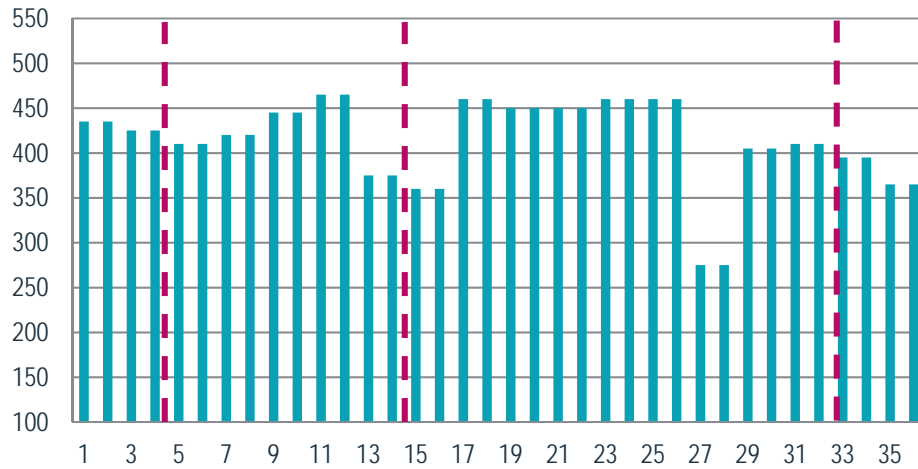


Mildew Research

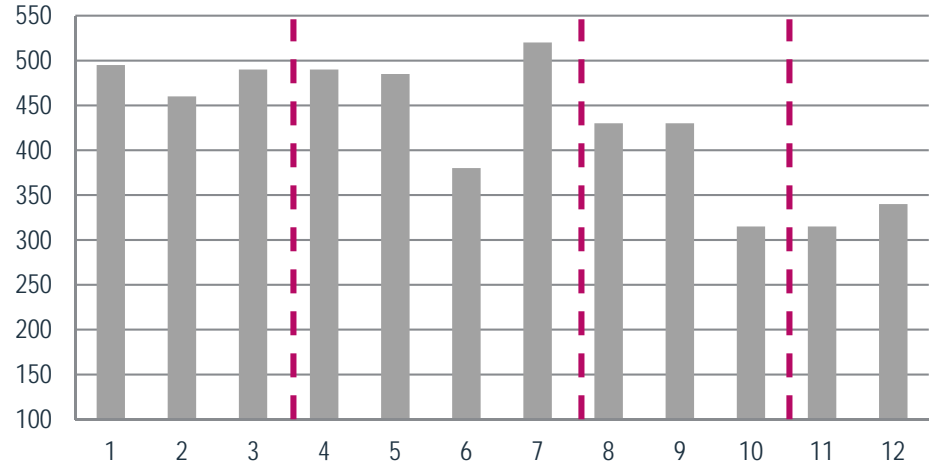
- Falling number
- Clean Wheat Mill Yield Percent
- Wheat & Flour Protein Content
- Flour Ash Content
- Water Dough Brightness 2h
- Water Dough Brightness 24h

Influence of Mildew on CWRS

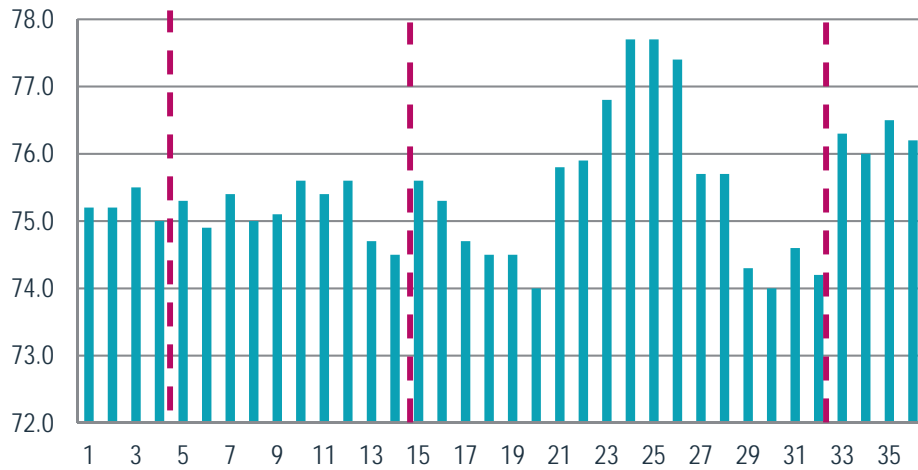
Falling Number (sec) 2014



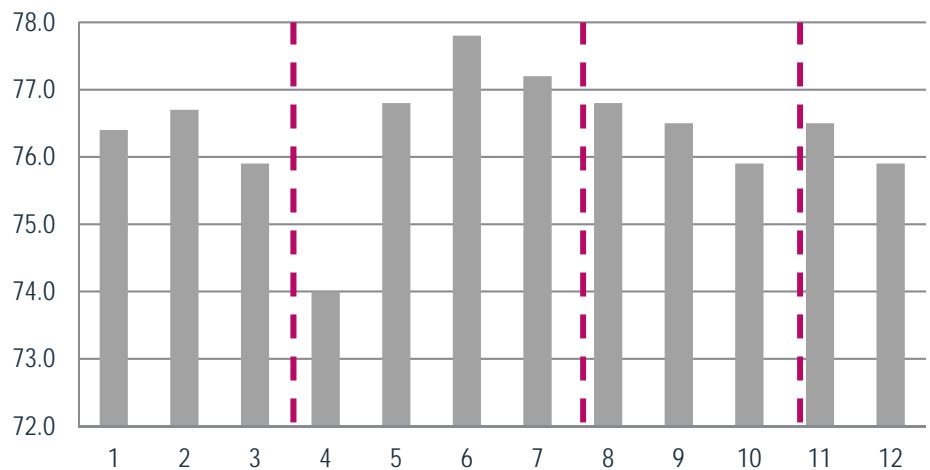
Falling Number (sec) 2015



Clean Wheat Mill Yield Percent



Clean Wheat Milling Yield Percentage



Impact of Refining Visual Guides for Mildew in CWRS

- Scientific testing has shown that moderate levels of mildew has no impact on the flour quality or end products
- The refinement of visual grading guides for mildew only impact the aesthetic appearance of the wheat but has no impact on soundness or end use functionality

Harvest Sample Program

- Information reaches marketers, buyers and processors around the world
- It informs millers, bakers, brewers and food manufacturers the end use functionality of this year's crop
- Supports research



Harvest Sample Program

- A evaluation of Canadian grain quality
- Conducted by the Canadian Grain Commission each fall



The Harvest Sample Program

- Annual
- Voluntary
- Informative
- Free
- Quality data at grainscanada.gc.ca

Goals of Harvest Sample Program

- Assess quality of annual harvest
 - Grades
 - End use functionality
- Identify grading factors within crops which are relevant to the harvest
- Supports scientific research in grain quality & safety

Harvest Sample Program

- Sign up
- The producer receives free grade, dockage, protein
- Postage is prepaid
- Used in Standards preparation
- Information reaches marketers, buyers and processors around the world

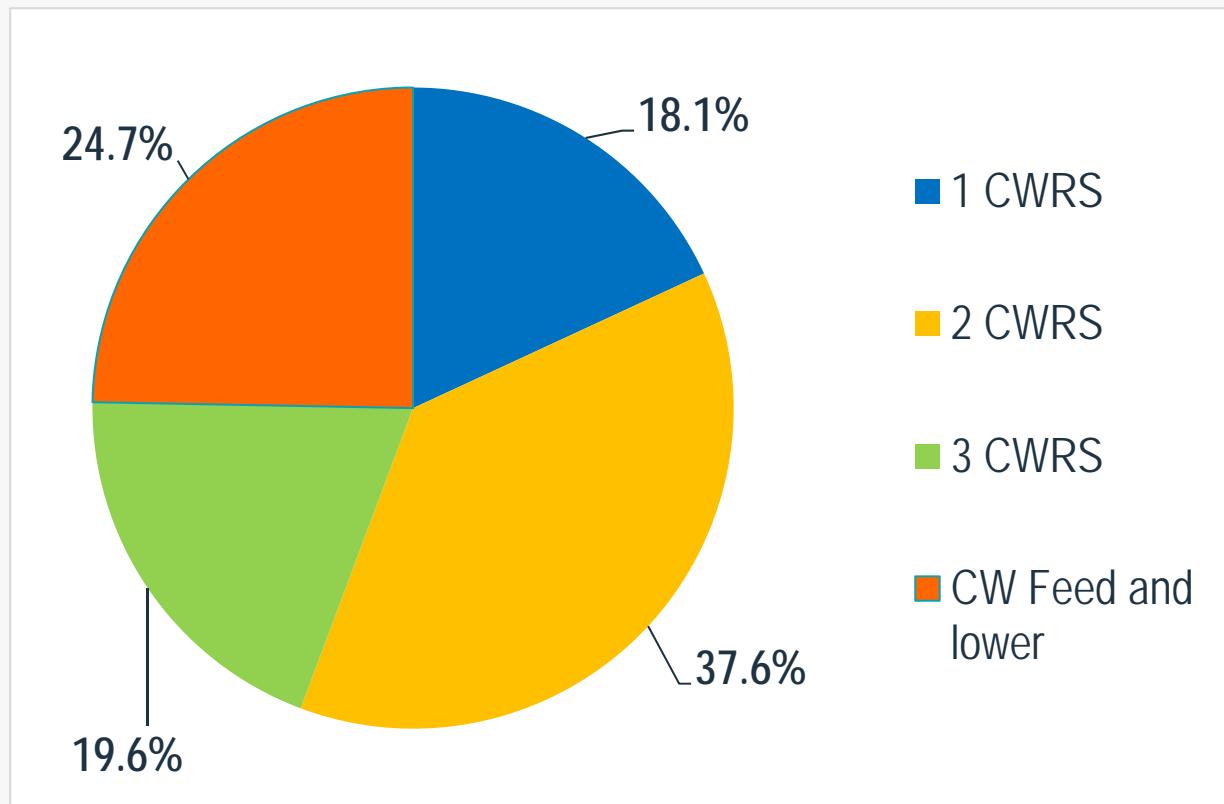


Harvest Sample Statistics

- In 2016, 11,433 samples graded in 2016
- Representing 12 different grain types

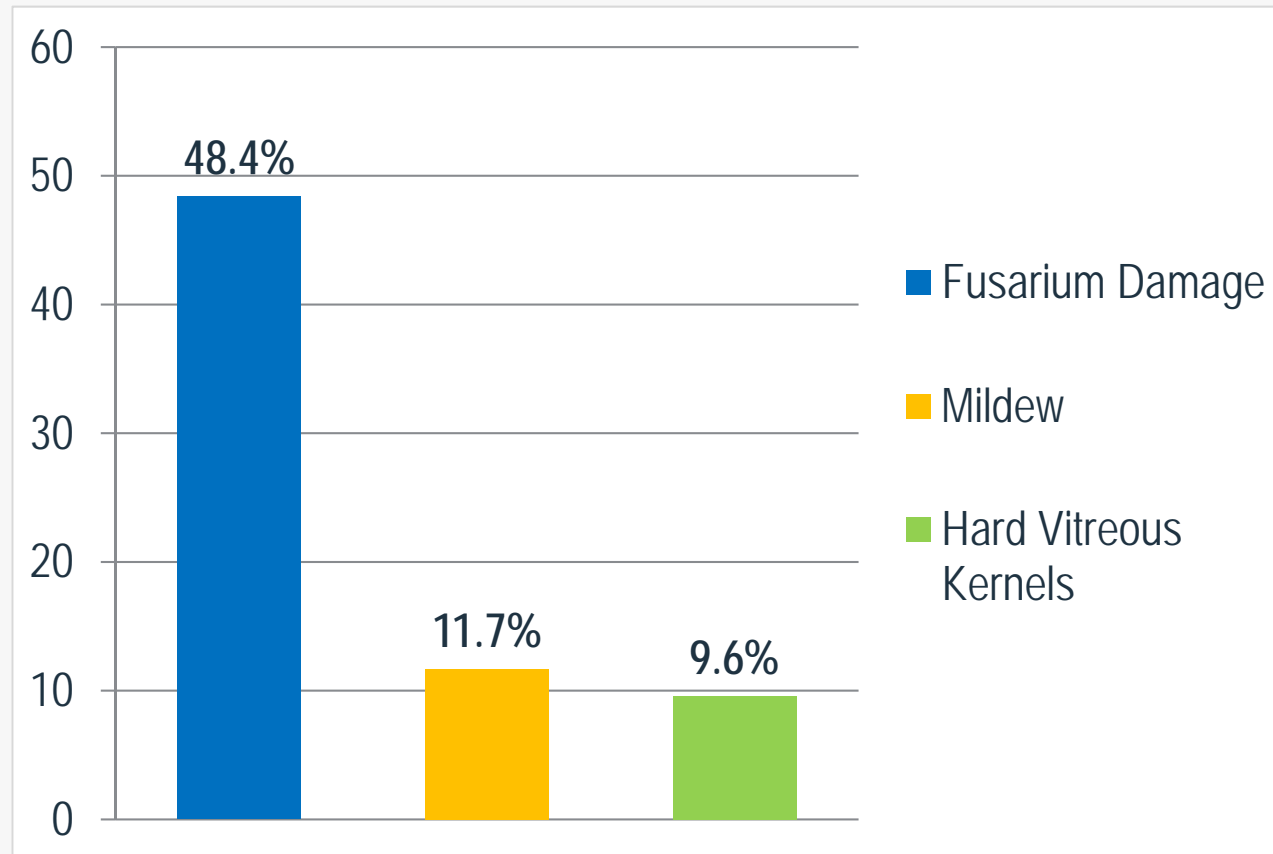
Harvest Sample Statistics

4491 CWRS samples



→ 57.2% in top 2 grades (74.1% - 2015)

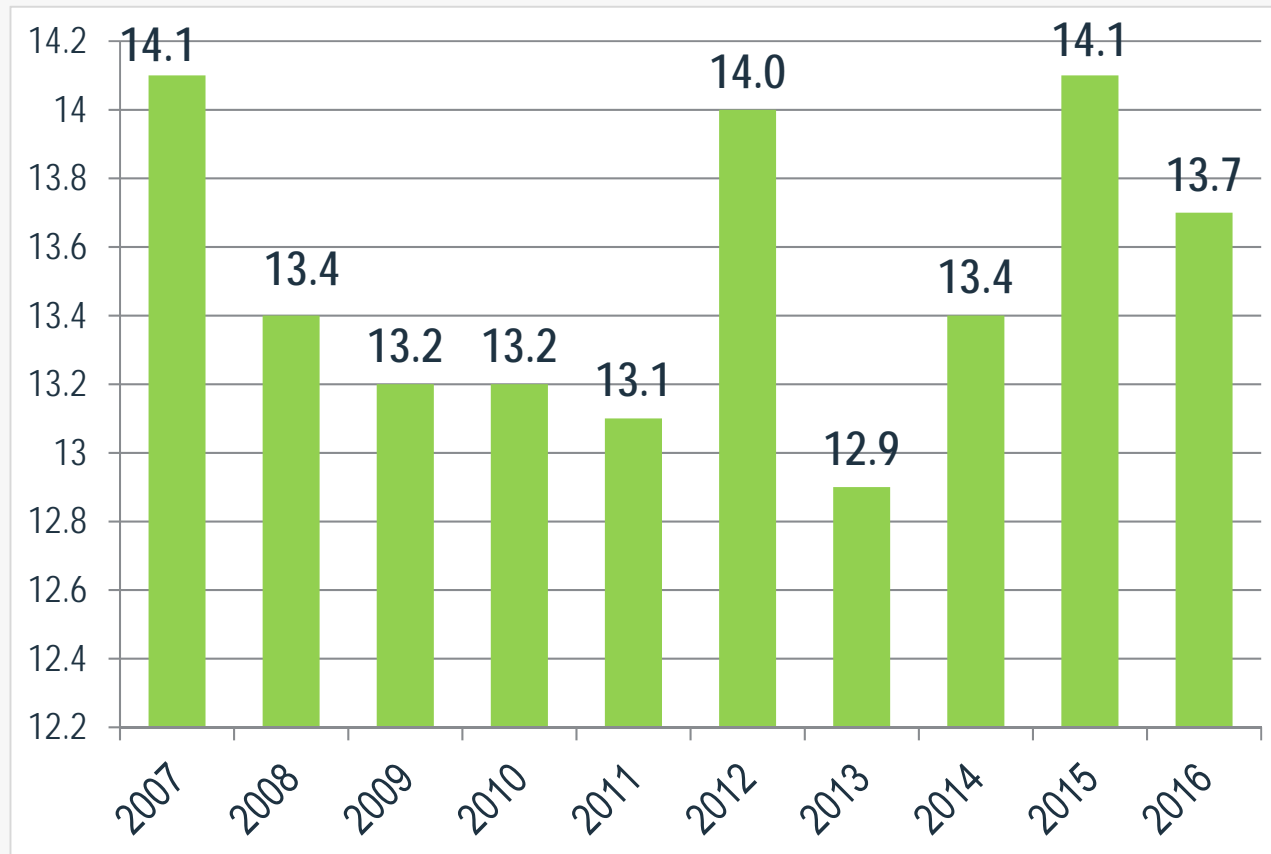
CWRS Grading Factors



Note: Samples may contain more than one grading factor

CWRS 10 Year Average Protein

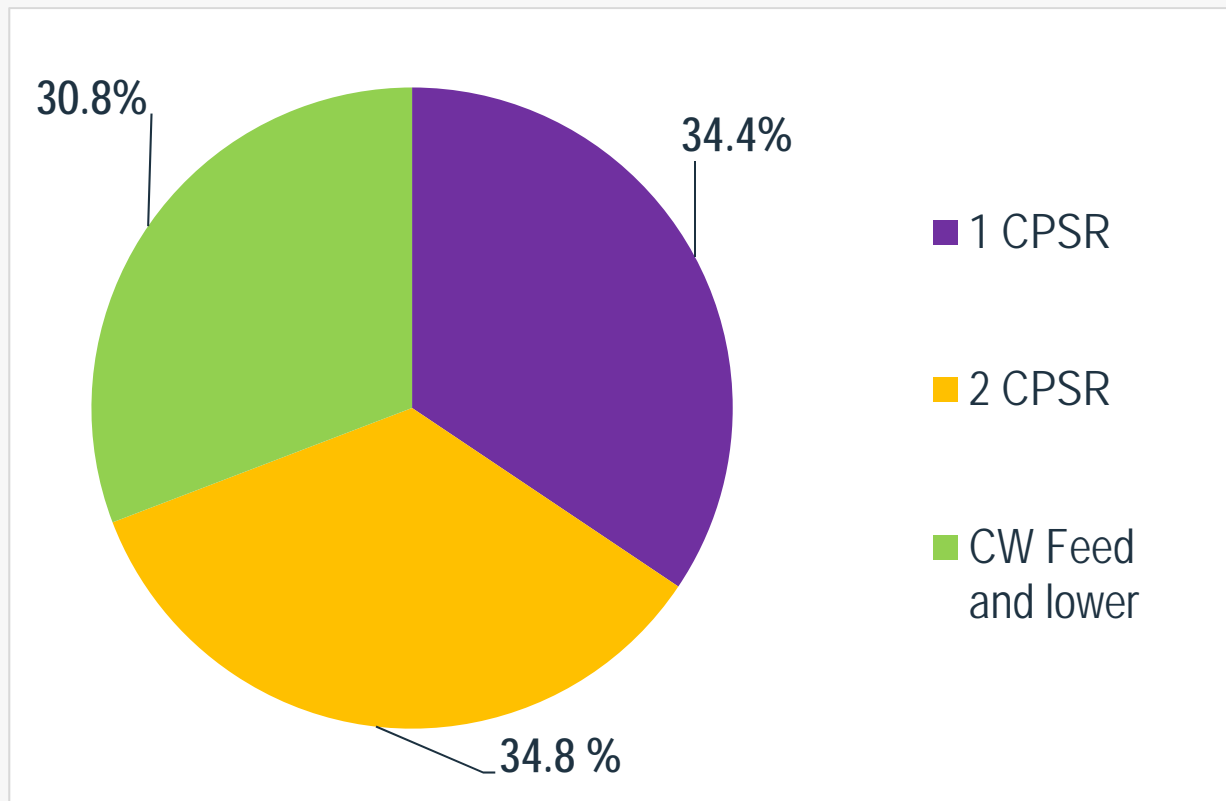
13.5% moisture basis.



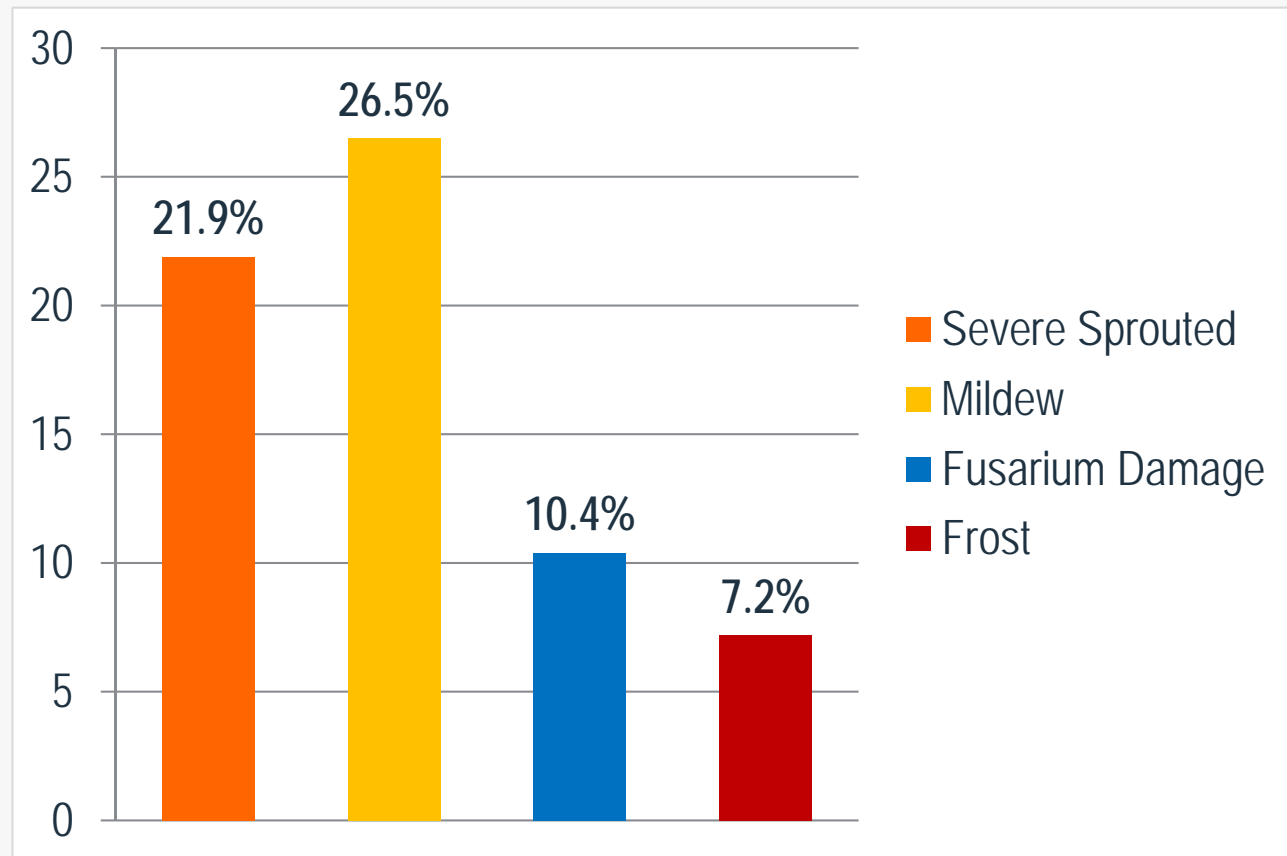
10 Year average – 13.5%

Harvest Sample Statistics

279 CPSR samples

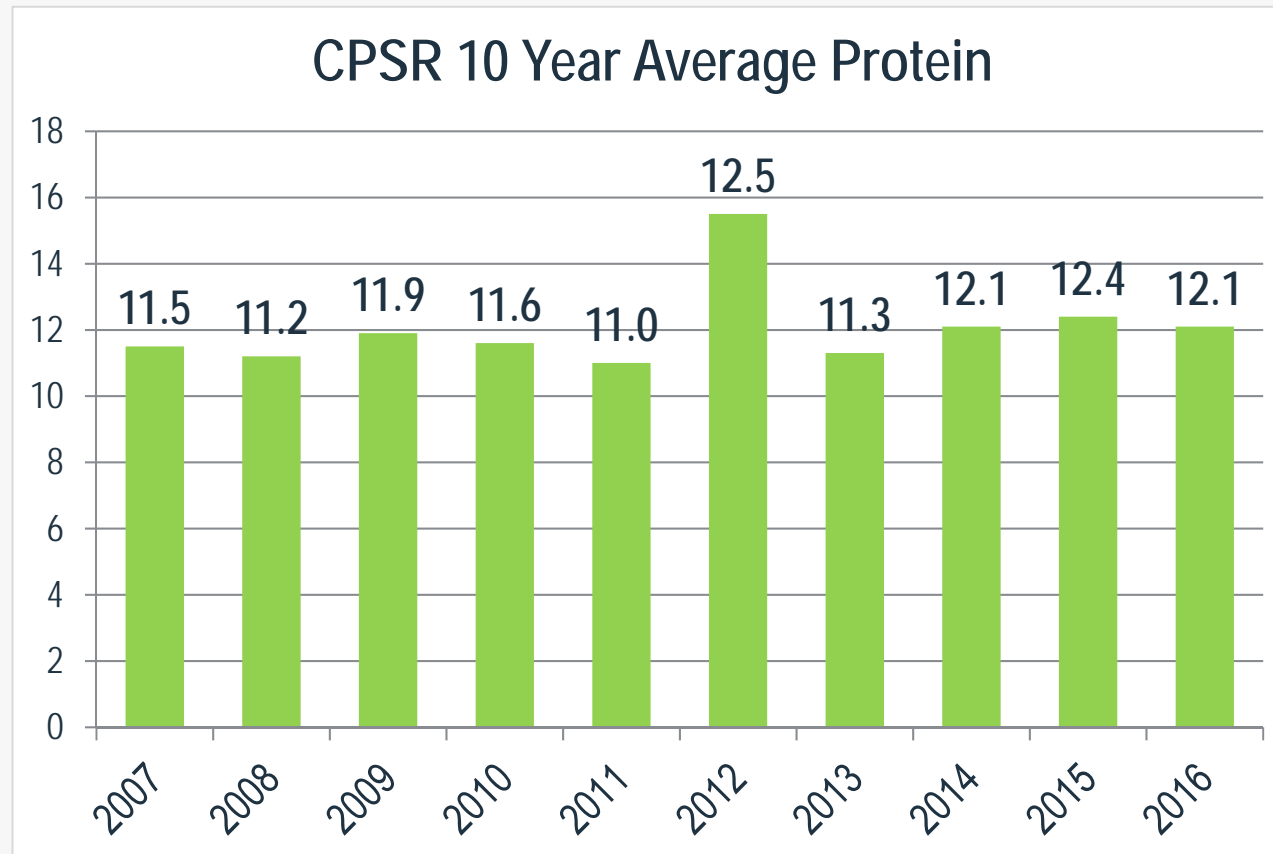


CPSR Grading Factors



CPSR 10 Year Average Protein

13.5% moisture basis.



10 year average – 11.8%

Canola

- 1526 samples
- **No. 1 Canada – 96%**



Chlorophyll content range (mg/kg)

Canola No. 1 Canada

	In the seed (mg/kg)				
	2016	2015	2014	2013	2012
Manitoba	10.2	9.7	12.0	14.0	13.4
Saskatchewan	11.3	11.2	11.3	17.3	15.8
Alberta	12.8	12.6	15.7	15.0	17.2
Western Canada	11.5	11.2	13.1	15.8	15.9

Oil content in Canola, No. 1 Canada

	Oil content (%, 8.5% m.b.)			
	2016		2015	2014
	Mean	Range	Mean	Mean
Manitoba	44.0	37.5 – 49.0	43.8	43.8
Saskatchewan	45.1	37.1 – 49.9	44.8	44.9
Alberta	44.2	38.0 – 49.5	44.0	44.4
Western Canada	44.6	37.1 – 49.9	44.4	44.5

Peas

Yellow - 388 samples

- No. 1 Can – 27.0%
- No. 2 Can – 48.2%
- Extra No. 3 – 0.5%
- No. 3 Can – 23.5%



Green - 75 samples

- No. 1 Can – 25.3%
- No. 2 Can – 36.0%
- No. 3 Can – 24.0%



Protein Content (%)

Peas, Yellow

Protein content, % 23.2% dry basis		
	As of Oct 28, 2016	10 year average
No. 1 Canada	21.2	23.2
No. 2 Canada	21.7	23.3
No. 3 Canada	22.6	23.8

How Do We Protect Producer Rights?

- Grain Grades
- Subject to Inspector's Grade and Dockage
- Producer cars
- Payment protection
- Penalty clause in contract with grain companies that have a defined delivery period

Subject to Inspector's Grade and Dockage

- A right under the Canada Grain Act



Subject to Inspector's Grade and Dockage

- Sample taken must be agreed upon by producer and elevator manager
- Grade
- Dockage
- Moisture
- Protein



Subject to Inspector's Grade and Dockage

- Sample submitted to the Canadian Grain Commission
- Sample is graded and a certificate issued to both the producer and the elevator
- Grade is binding

Canadian Grain Commission Industry Services		Commission canadienne des grains Services à l'industrie		Canada		
Submitted Sample Certificate (S) / Certificat d'échantillon soumis (S)				Certificate No. / N° de certificat: 16		
FOR ACCOUNT OF / POUR LE COMPTE DE Cargil Limited P.O. Box 70 Pincourt ON N6J 1V2				DATE Aug 05, 2015	OFFICE OF INSPECTOR CHATHAM	GRAIN Canadian Wheat
				GRADE 2 CE SOFT RED WINTER	MOISTURE % IMPARTED % 12.4	TOTAL 83.6
IDENTIFICATION 270564	SAMPLE LOCATION Lieu d'échantillonnage Provenance	REMARKS / REMARQUES PROTEIN 18.0 % FUSARIUM DAMAGE 0.73 % MILDEW WHT CLASS DECLARED BY SHEPPER				
COMMENT / REMARQUES Disputed - Dispute Party: Martin Farming						
I-126 A sample of the lot or consignment identified above has been submitted to the Canadian Grain Commission for grading. This grade on this certificate pertains only to the sample submitted. Any weights reported on this certificate have been declared by the shipper. Un échantillon du lot ou du chargement identifié ci-haut a été soumis à la Commission canadienne des grains (CCG) aux fins de classement. Le grade sur le certificat se rapporte seulement à l'échantillon soumis. Tout poids indiqué sur le présent certificat a été déclaré par l'expéditeur.						
CGC Industry Services - ISO 9001:2008 - Services à l'industrie CCG						
CGC - CHATHAM Inspector / Inspecteur						

Grain Storage

- Safe storage moisture levels & grain temperature
- Aeration bins
- Ochratoxin A



Canada 