

# Improving Agronomic Input Efficiency: Advanced Agronomic Practices Project Review



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# Outline

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- **The Study**
  - Objectives
  - Treatments
  - Site Years
- **Findings - Agronomic and Yield Response of:**
  - AC Foremost, AAC Penhold, Sparrow, Stettler, CDC Go
  - Feed barley cultivars
- **Summary**
- **Thank you**
- **Questions**



AC Foremost  
Advancement Management – Falher 2016

# Project Objectives

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1. Using a systems approach, determine synergistic benefits of stacking multiple agronomic practices: PGRs; supplemental UAN; Agrotain; and/or foliar fungicides to increase yields & economic returns of wheat & feed barley.
2. Compare small plot results from objective 1 with “Wheat 150” & “Barley 180” field scale trials to develop statistical tools to allow producers to effectively analyze field research.
3. Determine if wheat or feed barley cultivars respond differently to the intensive agronomic practices listed in objective 1.
4. Using a systems approach, determine which agronomic practices (PGRs, inter-row seeding) improve field pea harvestability.
5. Determine the benefits of various fungicide modes of action & application timings for use on feed barley.



# Most Interesting Objective...

- Determine the yield and agronomic response of 12 wheat cultivars to standard and advanced management



# 12 Wheat Cultivars Tested

Cultivar	Current Class	Aug 1, 2018 Class	% of 2013 AFSC acres	% of 2014 AFSC acres	% of 2015 AFSC acres	2015 AFSC Ranking	Height	Lodging	Distributor	CFIA Year of Registration
AC Foremost	CPS	CNHR	7.1%	7.1%	6.9%	#4	73 cm	VG	SeCan	1995
AAC Penhold	CPS	CPS	new	new	0.0%	#83	72 cm	Excellent	SeCan	2015
5700PR	CPS	CPS	3.7%	3.2%	2.5%		75 cm	VG	CPS Canada	2002
KWS Sparrow	SP	SP	new	new	0.0%		90 cm	VG	SeCan	2016 PGDC Approval
KWS Belvoir	SP	SP	new	new	0.0%		88 cm	VG	SeCan	2016 PGDC Approval
Harvest	HRS	CNHR	15.5%	11.1%	9.1%	#3	84 cm	VG	FP Genetics	2004
CDC Go	HRS	HRS	10.9%	12.5%	12.1%	#2	83 cm	G	Public	2003
Stettler	HRS	HRS	15.7%	18.6%	17.2%	#1	84 cm	G	SeCan	2008
CDC Stanley	HRS	HRS	3.0%	4.1%	4.4%	#6	87 cm	G	CPS Canada	2012
Thorsby	HRS	HRS	new	new	0.0%		97 cm	2.7	Canterra	2014
Coleman	HRS	HRS	new	new	0.0%		92 cm	1.9	Ed Lefsrud	2013
AC Andrew	SWS	SWS	0.2%	0.3%	0.2%	#44	79 cm	VG	SeCan	2004



Stettler, CDC Go, Harvest and AC Foremost made up 45% of wheat acres in 2015

In 2015, 5,061,006 acres (74%) were insured by AFSC.  
In 2016, 5,200,664 acres were insured by AFSC.

# Standard *verses* Advanced Management

## Standard Agronomic Management

Supplemental UAN	Only N applied at seeding for area average yield goals
PGR	n/a
Foliar Fungicide	n/a

## Advanced Agronomic Management

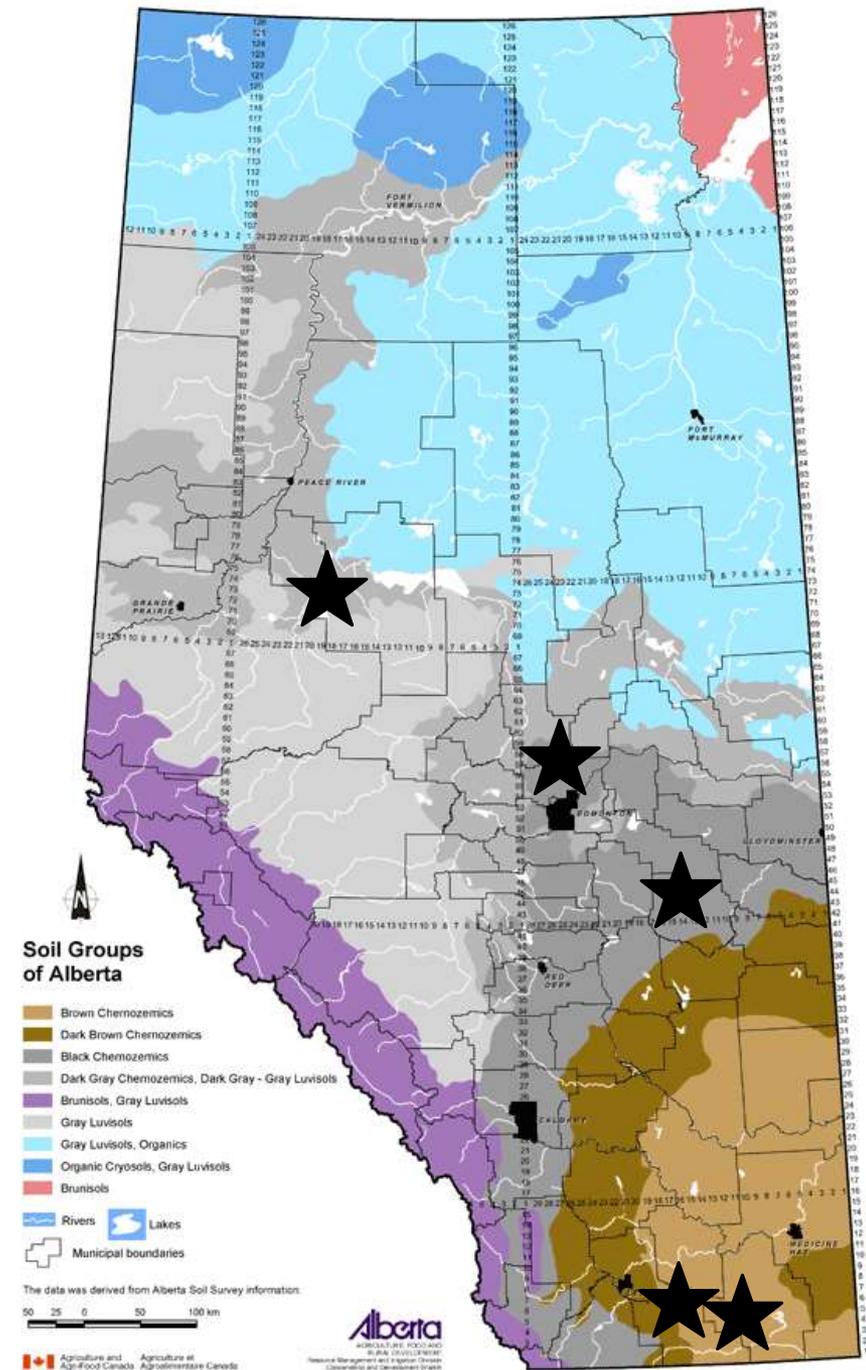
Product	Rate	Timing
Supplemental UAN 28-0-0 + Agrotain	30 lb N/ac	BBCH 29 (just prior to stem elongation). 46 DAP (days after planting)
PGR – Manipulator (chlormequat chloride)	0.73 L/ac	BBCH 30-31. 51 DAP
Twinline Foliar Fungicide (pyraclostrobin + metconazole)	202 mL/ac	BBCH 39 Flag leaf fully unrolled. 65 DAP.
Prosaro Foliar Fungicide (prothioconazole + tebuconazole)	320 mL/ac	~BBCH 55, 14d after flag fungicide. 78 DAP.

# When?

- 3 years (2014-2016)

# Where?

- Lethbridge irrigated
- Lethbridge Dryland
- Killam
- Bon Accord
- Falher



# Precipitation - 2014

	Leth Irrigated		Leth Dryland		Killam		Bon Accord		Falher	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
May	33	1.3	57	2.2	24	0.9	40	1.6	18	0.7
June	221	8.7	130	5.1	106	4.2	60	2.4		
July	67	2.6	28	1.1	54	2.1	40	1.6		
August	58	2.3	35	1.4	40	1.6	13	0.5		
Sept	46	1.8	75	3.0	39	1.5	42	1.7	0	0.0
<b>Total</b>	<b>425</b>	<b>16.7"</b>	<b>325</b>	<b>12.8"</b>	<b>263</b>	<b>10.4"</b>	<b>194</b>	<b>7.6"</b>	<b>101</b>	<b>4.0"</b>
LTA	226	8.9"	245	9.6"	258	10.2	295	11.6"	238	9.4"
Soil Moisture @ Seeding (0-6")					22%		29%		Good/excellent	
Seeding Date†	May 15, 2014		May 21, 2014		May 16, 2014		May 8, 2014		May 20, 2014	
Harvest Date	Sept 16, 2014		Sept 17, 2014		Sept 23, 2014		Sept 19, 2014		Sept 6, 2014	



# Precipitation - 2015

	Leth Irrigated		Leth Dryland		Killam		Bon Accord		Falher	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
April	0	0"	5	0.2"	n/a	n/a	0	0"	n/a	n/a
May	29.2	1.1"								
June	23.0	0.9"								
July	37.5	1.5"								
August	14.6	0.6"	12.3	0.5"	57.3	2.3"	24.0	0.9"	55.1	2.2"
Sept	n/a	n/a	n/a	n/a	63.7	2.5"	n/a	n/a	28.7	1.1"
<b>Total</b>	<sup>104 + 178 =</sup> 282	<sup>4.1 + 7 =</sup> 11.1"	116	4.6"	252 131	9.9" 5.1"	127	5.0"	156	6.1"
LTA	228	9"	233	9.2"	263	10.4"	259	10.2"	245	9.6"
Soil Moisture @ Seeding (0-6")					17%		25%			
Seeding Date	April 22		April 17		May 12		April 28		May 13	
Harvest Date	Aug 28		Aug 20		Sept 24		Aug 25		Sept 17	

# Precipitation - 2016

	Lethbridge Irrigated		Lethbridge Dryland		Killam		Bon Accord		Falher	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
April	16	0.6	9	0.4	n/a	n/a	0	0	n/a	n/a
May	68	2.7	68	2.7	123	4.8	65	2.6	60	2.4
June	23	0.9	23	0.9	108	4.3	48	1.9	213	8.4
July	106	4.2	106	4.2	52	2.0	111	4.4	60	2.4
August	43	1.7	43	1.7	54	2.1	108	4.3	63	2.5
Sept	n/a	n/a	n/a	n/a	8	0.3	13	0.5	39	1.5
<b>Total</b>	256+242 = 498	<b>19.6"</b>	249	<b>9.9"</b>	345	<b>13.7"</b>	345	<b>13.7"</b>	435	<b>17.1"</b>
LTA	228	9"	233	9.2"	263	10.4"	259	10.2"	245	9.6"
Soil Moisture @ Seeding (0-6")					15.6%		20.6%			
Seeding Date†	April 11		April 21		May 16		April 28		May 11	
Harvest Date	August 22		August 22		Sept 22		Sept 19		Sept 14	



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# AC Foremost

AC Foremost  
Advancement Management – Falher 2016

Alberta

# AC Foremost – Management Differences



**Significant lodging response at:**

1 of 14	2014	2015	2016
Leth Irrig	no	no	no
Leth Dry	n/a	n/a	no
Killam	no	n/a	yes
Bon A	no	n/a	no
Falher	n/a	n/a	no

14 site yrs	Height (cm)	Height Decrease (cm)	Height Decrease %
Standard	73 cm		
Advanced	66 cm	6.6 cm	10% ***

12 site yrs	NDVI	NDVI Improvement	NDVI Improvement %
Standard	0.37		3.6% inc. significant at 6 of 12 site years
Advanced	0.38	0.01	

10 site years	% Leaf Disease	Leaf Disease Reduction	Leaf Disease Reduction %
Standard	30%		
Advanced	7%	23%	-77%

# % Leaf Disease – AC Foremost

12.5% of the leaf area is infected

95% of the leaf area is infected

32 bu/ac yield  
increase  
between  
standard and  
advanced  
management

Foremost-Adv  
Killam 2016

Foremost-Std  
Killam 2016

# AC Foremost – Management Differences



AC Foremost  
Std

AC Foremost  
Adv

## Significant yield response at:

11 of 14	2014	2015	2016
Leth Irrig	yes	yes	yes ?
Leth Dry	yes	yes	no
Killam	yes	yes	yes
Bon A	yes	n/a	yes
Falher	no	no	yes

13 site yrs	Yield (bu/ac)	Yield Increase (bu/ac)	Yield Increase %
<b>Management</b>			
Standard	80.4		
Advanced	94.6	14.1	17.6% ***
14 site yrs	Bushel Weight (lbs/bu)	Bu Wt Increase (lbs/bu)	Bu Wt Increase %
<b>Management</b>			
Standard	63.4		
Advanced	63.7	0.3	0.5% NS
12 site yrs	Days to Maturity (days)	DTM Increase (days)	DTM Increase %
<b>Management</b>			
Standard	106		1.0% **
Advanced	107	+1.1 d	

# AC Foremost – Management Differences



Management	Protein (%)	Protein Increase	Protein Increase %
Standard	12.3%		
Advanced	12.6%	0.3%	2.4% **
Management	N Yield (lbs N/ac)	N Yield Increase (lbs N/ac)	N Yield Increase %
Standard	107		
Advanced	128	21	19.7% ***
Management	N Recovery (%)	N Recovery Increase (%)	N Recovery %
Standard	114%		
Advanced	98%	-16%	-14% ***

# AC Foremost

	Increase with advanced management
Height	-6.6 cm ***
Lodge	Significant at 1 of 14 site yrs
NDVI	+3.6% @ 6 of 12 site yrs
Leaf disease	- 23%
DTM	+1.1 days **
Yield	+14.1 bu/ac *** (+10.6 bu/ac w/ late fungicide only)
Bushel weight	<b>NS</b>
Protein	+0.3% **
N Yield	+21 lbs N/ac ***
N Recovery	-16% ***

AC Foremost  
Advancement Management – Falher 2016

Alberta

Note: Dash board yield responses are based on results from 2014-2016 Wheat Gx Management results at 10-14 sites. Results must be substantiated with the rest of the 2016 data.



AAC Penhold  
Std (Left) Adv (Right) Management  
Falher 2016

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# AAC Penhold

# AAC Penhold – Management Differences



**Significant lodging response at:**

<b>1 of 14</b>	2014	2015	2016
Leth Irrig	no	no	no
Leth Dry	n/a	n/a	no
Killam	no	n/a	no
Bon A	no	n/a	yes
Falher	n/a	n/a	no

14 site yrs Management	Height (cm)	Height Decrease (cm)	Height Decrease %
Standard	71 cm		
Advanced	64 cm	7.1 cm	11% ***
12 site yrs Management	NDVI	NDVI Improvement	NDVI Improvement %
Standard	0.36		4.0% inc.
Advanced	0.38	0.015	significant at 6 of 12 site years
11 site yrs Management	Leaf Disease	Leaf Disease Reduction	Leaf Disease Reduction %
Standard	24 %		
Advanced	13 %	11 %	-44%

# AAC Penhold – Management Differences



AAC Penhold Std

AAC Penhold Adv

Significant yield response at:

5 of 14	2014	2015	2016
Leth Irrig	yes	yes	no ?
Leth Dry	yes	no	no
Killam	yes	no	no
Bon A	no	n/a	yes
Falher	no	no	no

13 site yrs	Yield (bu/ac)	Yield Increase (bu/ac)	Yield Increase %
Management			
Standard	81.5		
Advanced	87.0	5.6	6.8% **
14 site yrs	Bushel Weight (lbs/bu)	Bu Wt Increase (lbs/bu)	Bu Wt Increase %
Management			
Standard	64.5		
Advanced	63.9	-0.6	-1.0% NS
12 site yrs	Days to Maturity (days)	DTM Increase (days)	DTM Increase %
Management			
Standard	106.5		0.5% NS
Advanced	107.0	+0.5 d	

# AAC Penhold – Management Differences



Management	Protein (%)	Protein Increase	Protein Increase %
Standard	13.1%		
Advanced	13.3%	0.2%	1.6% <sup>NS</sup>
Management	N Yield (lbs N/ac)	N Yield Increase (lbs N/ac)	N Yield Increase %
Standard	119		
Advanced	128	8.6	7.2% *
Management	N Recovery (%)	N Recovery Increase (%)	N Recovery %
Standard	121%		
Advanced	97%	-24%	-20% ***

# AAC Penhold



AAC Penhold  
Std (Left) Adv (Right) Management  
Falher 2016

	Increase with advanced management
Height	-7.1 cm ***
Lodge	Significant @ 1 of 14 site yrs
NDVI	+4.0% @ 6 of 12 site yrs
Leaf disease	-11%
DTM	<b>NS</b>
Yield	+5.6 bu/ac **
Bushel weight	<b>NS</b>
Protein	<b>NS</b>
N Yield	+8.6 lbs N/ac *
N Recovery	-24% ***



Sparrow  
Std (Left) Adv (Right) Management  
Falher 2016

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# Sparrow

# Sparrow – Management Differences



**Significant lodging response at:**

<b>0 of 14</b>	2014	2015	2016
Leth Irrig	<b>no</b>	<b>no</b>	<b>no</b>
Leth Dry	n/a	n/a	<b>no</b>
Killam	<b>no</b>	n/a	<b>no</b>
Bon A	<b>no</b>	n/a	<b>no</b>
Falher	n/a	n/a	<b>no</b>

14 site yrs			
Management	Height (cm)	Height Decrease (cm)	Height Decrease %
Standard	80 cm		
Advanced	71 cm	9.3 cm	12% ***
12 site yrs			
Management	NDVI	NDVI Improvement	NDVI Improvement %
Standard	0.44		3.9% inc. significant at 7 of 12 site yrs
Advanced	0.46	0.02	
10 site yrs			
Management	Leaf Disease	Leaf Disease Reduction	Leaf Disease Reduction %
Standard	5.9%		
Advanced	2.1%	3.8%	-64%

# Sparrow – Management Differences



Significant yield response at:

10 of 14	2014	2015	2016
Leth Irrig	yes	no	yes ?
Leth Dry	yes	yes	yes
Killam	yes	no	yes
Bon A	no	n/a	yes
Falher	no	yes	yes

13 site yrs	Yield (bu/ac)	Yield Increase (bu/ac)	Yield Increase %
<b>Management</b>			
Standard	94.3		
Advanced	103.7	9.4	10% ***
14 site yrs	Bushel Weight (lbs/bu)	Bu Wt Increase (lbs/bu)	Bu Wt Increase %
<b>Management</b>			
Standard	59.7		
Advanced	57.6	-2.0	-3.4% ***
12 site yrs	Days to Maturity (days)	DTM Increase (days)	DTM Increase %
<b>Management</b>			
Standard	112.3		1.0% ***
Advanced	113.4	+1.1 d	

# Sparrow – Management Differences



Management	Protein (%)	Protein Increase	Protein Increase %
Standard	11.6		
Advanced	11.6	0.02	0.2% <sup>NS</sup>
Management	N Yield (lbs N/ac)	N Yield Increase (lbs N/ac)	N Yield Increase %
Standard	123		
Advanced	133	9.5	7.7% <sup>**</sup>
Management	N Recovery (%)	N Recovery Increase (%)	N Recovery %
Standard	124%		
Advanced	99%	-25%	-20% <sup>***</sup>

# Sparrow



Sparrow  
Std (Left) Adv (Right) Management  
Falher 2016

	Increase with advanced management
Height	-9.3 cm ***
Lodge	NS at 14 of 14 site yrs
NDVI	+3.9% @ 7 of 12 site yrs
Leaf disease	- 4%
DTM	+1.1 days ***
Yield	+9.4 bu/ac ***
Bushel weight	-2.0 lbs/bu ***
Protein	<b>NS</b>
N Yield	+9.5 lbs N/ac **
N Recovery	-25% ***



Stettler  
Std Management  
Lethbridge Irrigated 2016

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# Stettler

# Stettler – Management Differences



## Significant lodging response at:

<b>1 of 14</b>	2014	2015	2016
Leth Irrig	<b>no</b>	<b>no</b>	<b>no</b>
Leth Dry	n/a	n/a	<b>no</b>
Killam	<b>no</b>	n/a	<b>no</b>
Bon A	<b>no</b>	n/a	<b>yes</b>
Falher	n/a	n/a	<b>no</b>

14 site yrs Management	Height (cm)	Height Decrease (cm)	Height Decrease %
Standard	88 cm		
Advanced	80 cm	8.7 cm	10% ***
12 site yrs Management	NDVI	NDVI Improvement	NDVI Improvement %
Standard	0.36		4.6% inc significant at 6 of 12 site yrs
Advanced	0.38	0.02	
11 site yrs Management	Leaf Disease	Leaf Disease Reduction	Leaf Disease Reduction %
Standard	14%		
Advanced	11%	3%	-18%

# Stettler – Management Differences



Significant yield response at:

<b>7 of 14</b>	2014	2015	2016
Leth Irrig	no	no	yes ?
Leth Dry	yes	yes	no
Killam	yes	no	yes
Bon A	no	n/a	yes
Falher	no	no	yes

13 Site Years	Yield (bu/ac)	Yield Increase (bu/ac)	Yield Increase %
Standard	74.4		
Advanced	81.0	6.7	9.0% ***
14 site yrs	Bushel Weight (lbs/bu)	Bu Wt Increase (lbs/bu)	Bu Wt Increase %
Standard	63.9		
Advanced	63.8	-0.1	0.2% NS
12 site yrs	Days to Maturity (days)	DTM Increase (days)	DTM Increase %
Standard	106.5		
Advanced	107.1	+0.6 d	0.6% NS

# 2016 Stettler - Field Scale Strip Trials



Management	Yield (bu/ac)	Yield Increase (bu)	Yield Increase %
Untreated Control	79.9		
Prosaro at Head Timing	78.5	-1.4 bu/ac	NS

Prosaro applied at 50% anthesis

Untreated control

# Stettler – Management Differences



Management	Protein (%)	Protein Increase	Protein Increase %
Standard	13.9%		
Advanced	14.1%	0.15%	15% <sup>NS</sup>
Management	N Yield (lbs N/ac)	N Yield Increase (lbs N/ac)	N Yield Increase %
Standard	116		
Advanced	124	7.7	6.6% *
Management	N Recovery (%)	N Recovery Increase (%)	N Recovery %
Standard	115%		
Advanced	93%	-22%	-19% ***

# Stettler



Stettler  
Std Management  
Lethbridge Irrigated 2016

	Increase with advanced management
Height	-8.7 cm ***
Lodge	Significant @ 1 of 14 site yrs
NDVI	+4.6% @ 6 of 12 site yrs
Leaf disease	-3%
DTM	<b>NS</b>
Yield	+6.7 bu/ac ***
Bushel weight	<b>NS</b>
Protein	<b>NS</b>
N Yield	+7.7 lbs/ac *
N Recovery	-22% ***



CDC Go  
Std (Left) Adv (Right) Management  
Falher 2016

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# CDC Go

# CDC Go – Management Differences



## Significant lodging response at:

<b>4 of 14</b>	2014	2015	2016
Leth Irrig	no	no	yes
Leth Dry	n/a	n/a	yes
Killam	yes	n/a	no
Bon A	no	n/a	yes
Falher	n/a	n/a	no

14 site yrs Management	Height (cm)	Height Decrease (cm)	Height Decrease %
Standard	83		
Advanced	77	6.9 cm	8% ***
12 site yrs Management	NDVI	NDVI Improvement	NDVI Improvement %
Standard	0.343		3.9% inc. significant at 4 of 12 site years
Advanced	0.356	0.013	
10 site yrs Management	Leaf Disease	Leaf Disease Reduction	Leaf Disease Reduction %
Standard	30 %		
Advanced	12 %	18 %	-61%

# CDC Go – Management Differences



**Significant yield response at:**

<b>10 of 14</b>	2014	2015	2016
Leth Irrig	yes	yes	yes ?
Leth Dry	yes	yes	no
Killam	yes	no	yes
Bon A	no	n/a	yes
Falher	no	yes	yes

13 site yrs	Yield (bu/ac)	Yield Increase (bu/ac)	Yield Increase %
<b>Management</b>			
Standard	76		
Advanced	85	8.2	10.7% ***
14 site yrs	Bushel Weight (lbs/bu)	Bu Wt Increase (lbs/bu)	Bu Wt Increase %
<b>Management</b>			
Standard	63.6		
Advanced	63.5	-0.1	-0.2% <sup>NS</sup>
12 site yrs	Days to Maturity (days)	DTM Increase (days)	DTM Increase %
<b>Management</b>			
Standard	104.0		1.5% ***
Advanced	105.5	+1.6 d	

# CDC Go – Management Differences



Management	Protein (%)	Protein Increase	Protein Increase %
Standard	13.4		
Advanced	13.5	0.1	0.7% <sup>NS</sup>
Management	N Yield (lbs N/ac)	N Yield Increase (lbs N/ac)	N Yield Increase %
Standard	115		
Advanced	127	11.8	10% <sup>***</sup>
Management	N Recovery (%)	N Recovery Increase (%)	N Recovery %
Standard	113		
Advanced	94	-18.8	-20 % <sup>***</sup>

# CDC Go

	Increase with advanced management
Height	-6.9 cm ***
Lodge	Sign at 4 of 14 site yrs
NDVI	+3.9% at 4 of 12 site yrs
Leaf disease	- 18%
DTM	+1.6 days ***
Yield	+8.2 bu/ac ***
Bushel weight	<b>NS</b>
Protein	<b>NS</b>
N Yield	+ 11.8 lbs N/ac ***
N Recovery	-18.8% ***

CDC Go  
Adv Management  
Falher 2016

Alberta

Note: Dash board yield responses are based on data interpretation from combined agronomic practices at 11-14 site years. Response to individual agronomic practices have not been tested.

# Summary

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AC Foremost  
Advancement Management – Falher 2016

Alberta

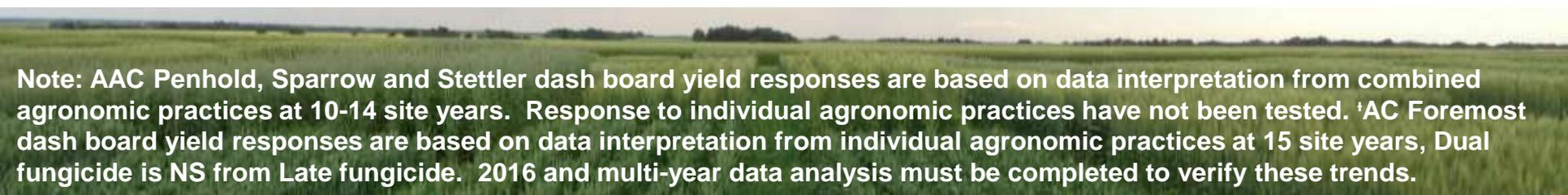
# Dash Board Comparisons – 10-14 site years

	AC Foremost <sup>†</sup>	AAC Penhold	Sparrow	Stettler	CDC Go
Height	-6.6 cm ***	-7.1 cm ***	-9.3 cm ***	-8.7 cm ***	-6.9 cm ***
Lodge <small>(Significant @)</small>	1 of 14 site yrs	1 of 14 site yrs	NS	1 of 14 site yrs	4 of 14 site yrs
NDVI <small>(Significant @)</small>	+3.6% @ 6 of 12 site yrs	+4.0% @ 6 of 12 site yrs	+3.9% @ 7 of 12 site yrs	+4.6% @ 6 of 12 site yrs	+3.9% @ 4 of 12 site yrs
Leaf disease	- 23%	-11%	- 4%	-3%	- 18%
DTM	+1.1 days **	NS	+1.1 days ***	NS	+1.6 d ***
Yield	+14.1 bu/ac *** (+10.6 late fung only)	+5.6 bu/ac **	+9.4 bu/ac ***	+6.7 bu/ac ***	+8.2 bu/ac ***
Test weight	NS	NS	-2.0 lbs/bu ***	NS	NS
Protein	+0.3% **	NS	NS	NS	NS
N Yield	+21 lbs N/ac ***	+8.6 lbs N/ac *	+9.5 lbs N/ac **	+7.7 lbs/ac *	+11.8 lbsN/ac ***
N Recovery	-16% ***	-24% ***	-25% ***	-22% ***	-18.8% ***

Note: AAC Penhold, CDC Go, Sparrow and Stettler dash board yield responses are based on data interpretation from combined agronomic practices at 12-14 site years. Response to individual agronomic practices have not been tested. <sup>†</sup>AC Foremost dash board yield responses are based on data interpretation from individual agronomic practices at 15 site years. 2016 and multi-year data analysis must be completed to verify these trends.

# Dash Board Comparisons – 10-14 site years

	AC Foremost	AAC Penhold	Sparrow	Stettler	CDC Go
Yield Response	<b>11 of 14 ***</b>	<b>5 of 14 **</b>	<b>10 of 14 ***</b>	<b>7 of 14 ***</b>	<b>10 of 14 ***</b>
UAN	✗	✗	✓	✗	✗
PGR	✗	✗	✗	✗	✓
Flag Fungicide	✗	✗	✗	✗	✗
Late Fungicide	✓	✗	✗	?	✓
Dual Fungicide	✗	✗	✗	✗	✗
Price – Dec 16, 2016; (Central AB)	\$4.72 - 0.50 = \$4.22/bu Feed \$4.30	\$4.72/bu	\$4.30/bu	\$6.39/bu	\$6.39/bu
Average Yield	90 bu/ac †	82 bu/ac	104 bu/ac	81 bu/ac	85 bu/ac
Management Cost	\$26/ac	n/a	\$25/ac	\$26/ac	\$47/ac
Net Return	\$361/ac	\$387	\$422	\$492	\$496
Class	CNHR Aug 1/18	CPS #2 12.0%	SP	CWRS #2 13.5%	CWRS #2 13.5%



Note: AAC Penhold, Sparrow and Stettler dash board yield responses are based on data interpretation from combined agronomic practices at 10-14 site years. Response to individual agronomic practices have not been tested. 'AC Foremost dash board yield responses are based on data interpretation from individual agronomic practices at 15 site years, Dual fungicide is NS from Late fungicide. 2016 and multi-year data analysis must be completed to verify these trends.

# Is feed barley cultivar specific management valuable?

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# 10 Feed Barley Cultivars Tested

Cultivar	Class	Year of registration	Grain yield potential ‡ ----- % -----	Disease Resistance ψ					Lodging rating ¶
				Scald	Spot blotch	Net-form net blotch	Spot-form net blotch	Height ---cm---	
Amisk	6 row feed	2013	-	I	MR	S	I	74	VG
Breton	6 row feed	2012	106	I	MR	I	MR	81	F
Muskwa	6 row feed	2011	105	MR	I	MS	MR	73	G
Gadsby	2 row feed	2010	112	R	S	MS	MR	83	F
Busby	2 row feed	2008	104	I	MR	MS	MR	78	G
CDC Austenson	2 row feed	2008	112	S	MR	MS	R	78	G
Champion	2 row feed	2007	113	S	MS	S	I	77	G
CDC Coalition	2 row feed	2006	110	S	I	S	MR	74	G
Vivar	6 row feed	2000	110	I	XX	R	MR	74	VG
Xena	2 row feed	1999	112	S	S	S	I	78	G



# Yield & Agronomic Response to Advanced Mng't

	Standard Management	Advanced Management	Improvement w/ Advanced Management	Statistical Difference
Height	73.4 cm	73.1 cm	0.3 cm	NS
Head length	7.1 cm	7.1 cm	0	NS
Lodging (0-100)	15.9	15.7	0.2	NS
<b>NDVI</b>	<b>0.36</b>	<b>0.39</b>	<b>0.03</b>	<b>P=0.012 *</b>
<b>Maturity</b>	<b>97.9 days</b>	<b>99.0 days</b>	<b>1.1 days</b>	<b>P=0.008 **</b>
<b>Yield</b>	<b>95 bu/ac</b>	<b>104 bu/ac</b>	<b>9 bu/ac</b>	<b>P&lt;0.001 ***</b>
Bushel Weight	51.9 lbs/bu	52.2 lbs/bu	0.3 lbs/bu	NS
<b>Seed Weight</b>	<b>46.2 g/1000 seeds</b>	<b>47.1 g/1000 seeds</b>	<b>0.9 g/1000 seeds</b>	<b>P=0.001 **</b>

# Gadsby: showing similar lodging under Adv and Std

## Lethbridge Irrigated: August 4<sup>th</sup> 2015



**Standard Management**



**Advanced Management**

Cultivar	Height with Standard Mngt (cm)	Height with Advanced Mngt (cm)	Height Reduction with Advanced Mngt(cm)	Lodging Index under Standard Mngt (0 = No Lodging; 100 = Flat)	Lodging Index under Advanced Mngt (0 = No Lodging; 100 = Flat)
Gadsby	94	90	-5	28	35
			**No statistically significant height reductions**		**No statistically significant lodging reductions**

Preliminary Results - Trends must be supported with additional years of data

# CDC Austenson: showing similar lodging under Adv & Std Bon Accord : August 12<sup>th</sup> 2014



Cultivar	Height with Standard Mngt (cm)	Height with Advanced Mngt (cm)	Height Reduction with Advanced Mngt(cm)	Lodging Index under Standard Mngt (0 = No Lodging; 100 = Flat)	Lodging Index under Advanced Mngt (0 = No Lodging; 100 = Flat)
CDC Austenson	77	78	+1	37	38

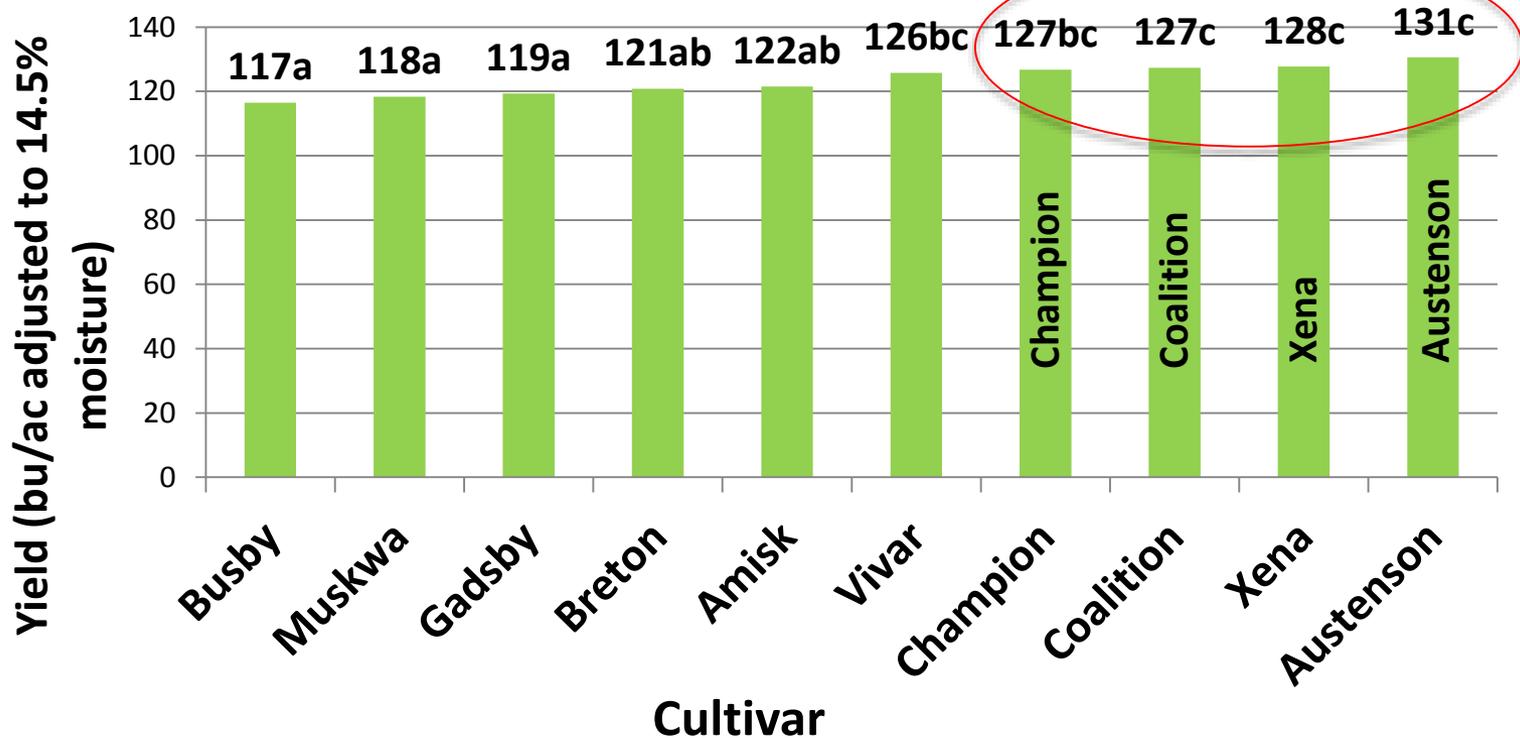
Preliminary Results - Trends must be supported with additional years of data

# Yield response

- **Cutlivars did not respond differently to advanced management**
- **The advanced management package increased yield province wide, but it was never profitable**
  - **Advanced management costs \$97/ac**
  - **Advanced management increased yield by 9bu/ac**
  - **@ \$3.00/bu, we needed a yield increase of 32 bu/ac to pay for advanced management**

# Yield of 10 varieties across AB

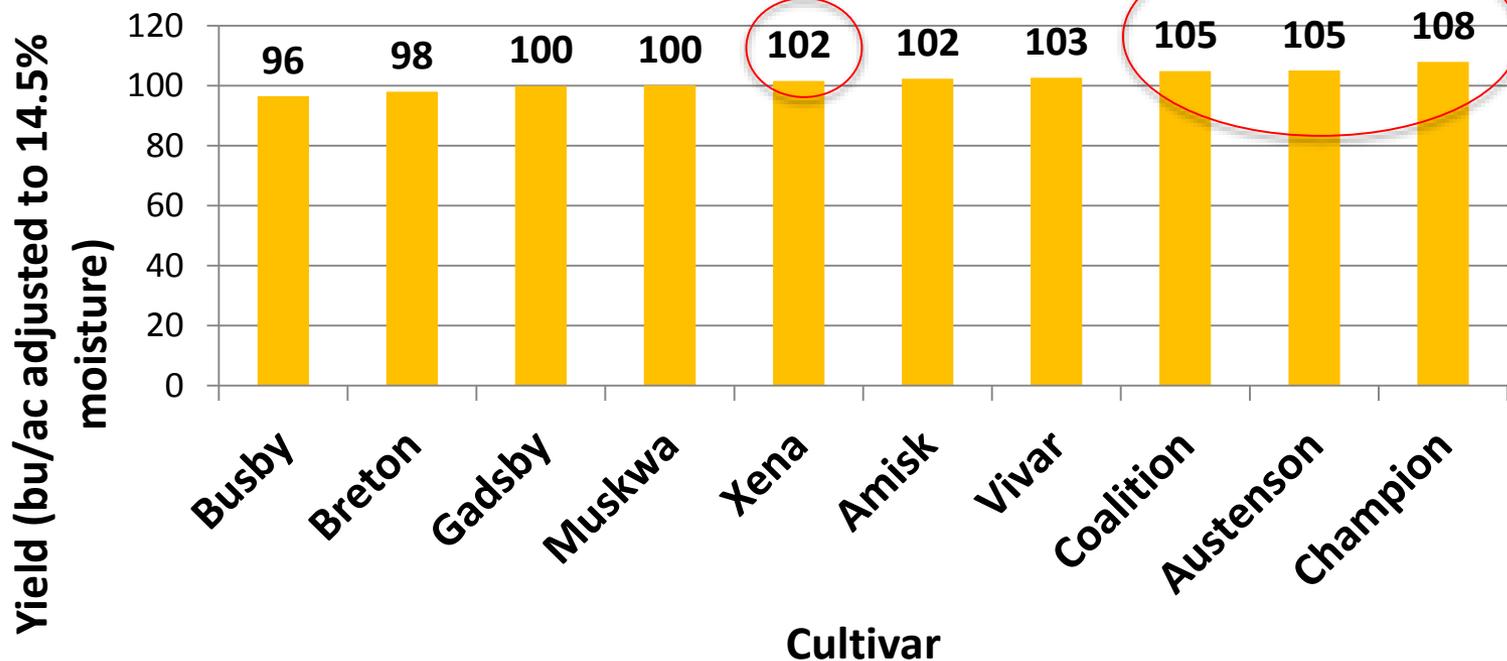
- CDC Austenson, Xena, Champion were the top-yielding cultivars province-wide
- However... cultivars yielded differently depending on environment



\*Yield results are averaged over standard and advanced management

# Top Yielding Varieties at “dry” sites

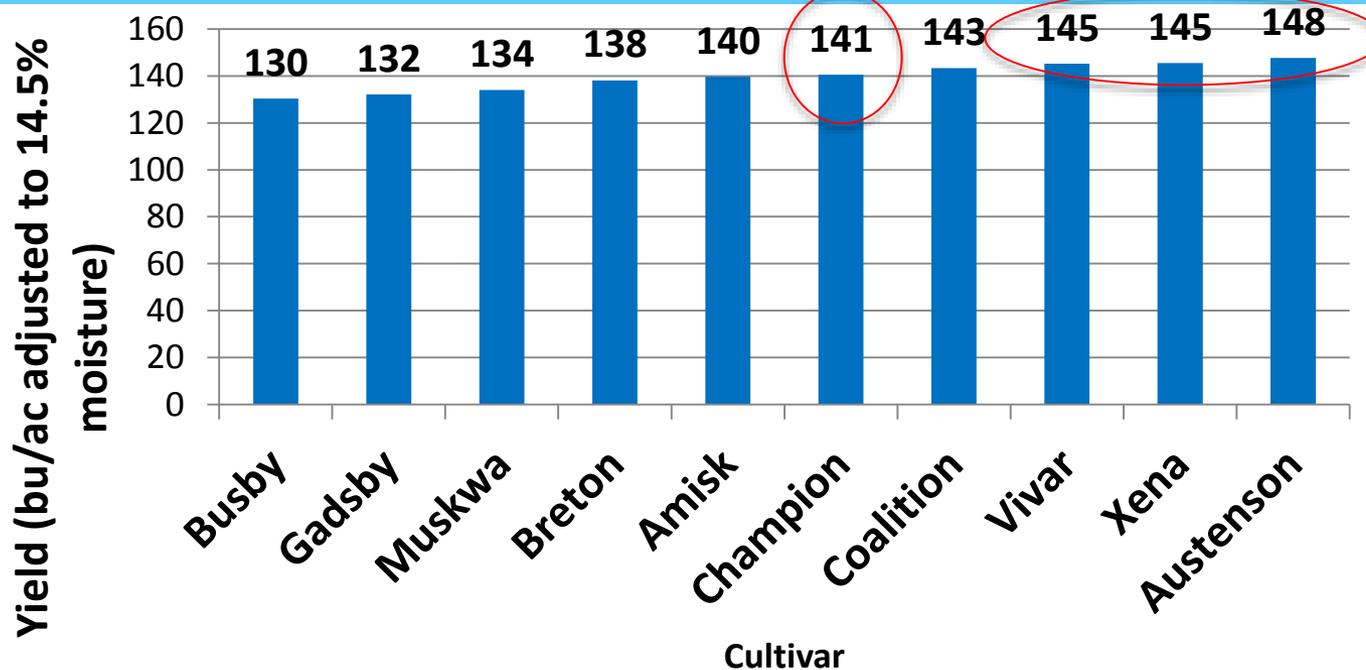
- Overall yields are lower in dry conditions (less than 7” of rain)
- CDC Austenson, Coalition, and Champion remain in the top 3
- Champion performed very well in dry conditions
- Xena ranked lower under dry conditions (6<sup>th</sup> place)



\*Yield results are averaged over standard and advanced management

# Top Yielding Varieties at “wet” sites

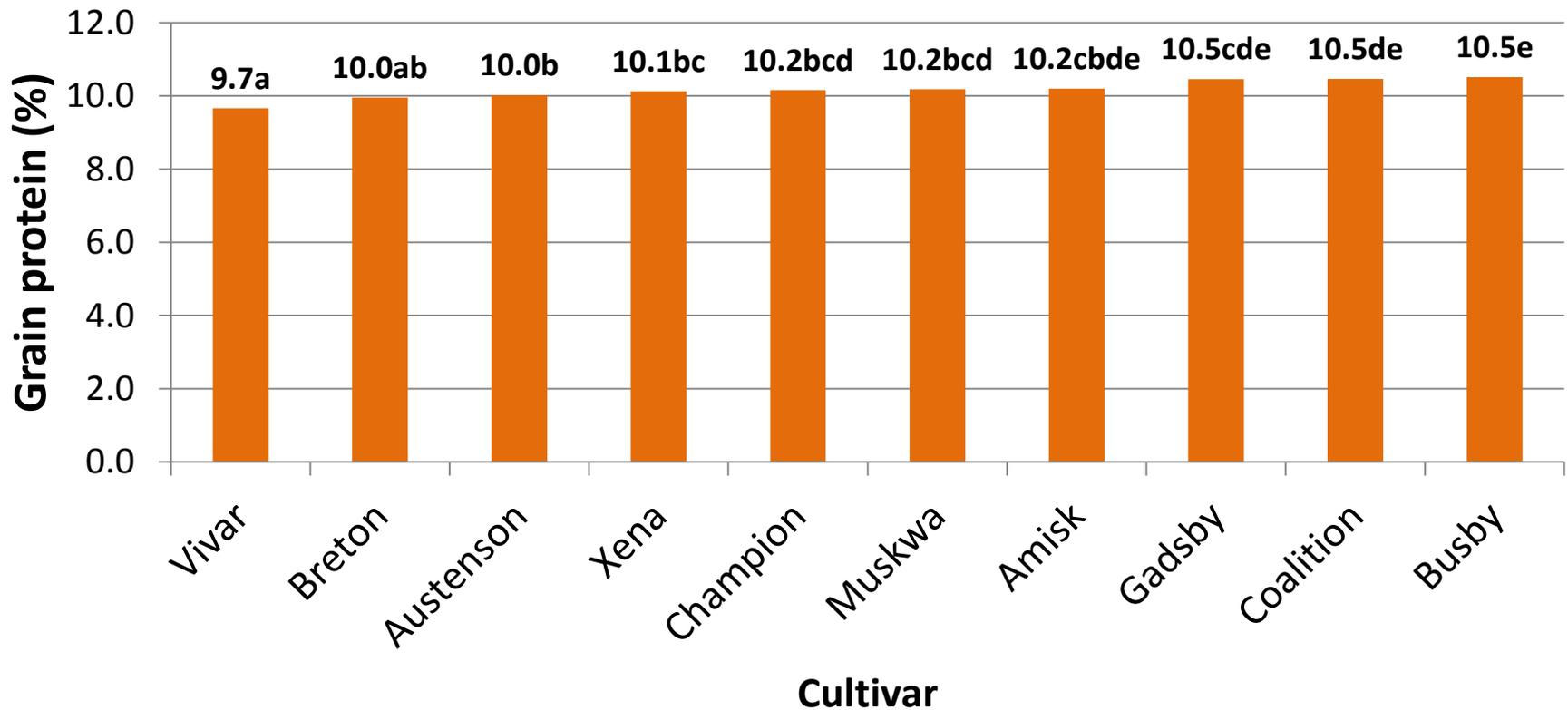
- Overall yields are higher in wet conditions (>7” of rain)
- Xena does well when moisture is high
- ***CDC Austenson does well in wet and dry conditions***
- Champion ranks lower under wet conditions than dry (1<sup>st</sup> in dry)



\*Yield results are averaged over standard and advanced management

# Protein Content of Varieties

- Low yielding varieties had high protein (Busby and Gadsby)
- CDC Austenson yielded high but protein was in the bottom 3 varieties
- Vivar was intermediate yielding and lowest protein
- ***CDC Coalition was in the top 3 highest yielding cultivars, and it maintained high protein (2<sup>nd</sup>)***



# Summary

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- **When growing feed barley, get the basics right first**
  - **Cultivar selection; Certified seed; ROTATION**
- **Additional inputs only increase profitability if the basics are missing**



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# Thanks

Alberta

# Advanced Agronomic Practices in Wheat, Barley and Pea to Maximize Yield and Harvestability

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Questions?

# Cost of Wheat Management Practices

Management Practice	Additional Management Cost
Control - No UAN, PGR or Fungicide	\$ -
UAN 1.25x - 30 lbs Actual N	\$ 25
PGR - CCC @ 0.7 L/ac or 1.73L/ha	\$ 21
Single Twinline Application @ Flag Leaf 0.202L/ac	\$ 18
Single Prosaro Application @ Head Emerge Leaf 0.324L/ac	\$ 26
Dual Twinline + Prosaro (same rates and timings)	\$ 44
UAN 1.25x + PGR + Dual Fungicide	\$ 93
UAN 1.25x + PGR + Late Fungicide	\$ 75
PGR + Late Fungicide	\$ 46

# % Leaf Disease – AAC Penhold



# % Leaf Disease – Sparrow



# % Leaf Disease – Stettler

