

## 2017 Alberta Agriculture and Forestry – Bon Accord Cereal Agronomy Research Highlights

Sheri Strydhorst, PhD., Agronomic Research Scientist, Barrhead, AB

Results presented here are based on 1 site year or data (unless otherwise noted) and very different findings may occur in other years and growing conditions. Due to the limited data set, nothing in this document is intended simply as something producers and agronomists should consider for future growing seasons. This document is simply a presentation of the 2017 data.

### Genetics x Fungicide – Bon Accord

At Bon Accord in 2017, 4 CWRS (AAC Brandon, AAC Viewfield, CDC Landmark VB and Cultivar X) and 2 CPS (AAC Goodwin and SY Rowyn) cultivars were tested for their response to: 4 fungicide treatments (untreated, Trivapro at flag leaf, Prosaro applied at Fusarium head blight (FHB) timing, and dual).

### Genetics x N fertilizer Rates x PGR – Bon Accord

At Bon Accord in 2017, the same 6 cultivars were tested for their response to: 5 Nitrogen fertilizer rates (0, 36, 71, 107, 143 lbs N/ac) applied at seeding, as urea, in a mid-row band, and 2 PGR treatments (No PGR vs Trinexapac-ethyl – the new PGR from Syngenta which is currently under PMRA review for registration).

### Cultivar Specific Responses

#### **AAC Brandon - CWRS**

- Slightly lower yields than AAC Viewfield (6.6% less) or CDC Landmark (3.0% less)
- Intermediate standability – Manipulator could be beneficial under ideal growing conditions
- Fungicide greatly reduced leaf disease
- Flag and Dual Fungicide increased yields by 10%; Head fungicide increased yields by 13%
- Good test weight (66 lbs/bu)
- Excellent protein (13.6%) with 164 lbs total N/ac
- **Based on these findings AAC Brandon at Bon Accord in 2017 required: 164 lbs total N/ac + Manipulator + Flag or Head fungicide**

#### **AAC Viewfield - CWRS**

- Highest yielding cultivar; yields equivalent to CPS cultivars
- Optimal yields with 128+ lbs total N/ac
- One of the best standing cultivars
- Head timing fungicide greatly reduced leaf disease
- Flag Fungicide increased yields by 12%; head fungicide increased yields by 21%; Dual Fungicide increased yields by 17%
- Highest test weight (66.9 lbs/bu)
- Low protein. Required 200 lbs total N/ac to achieve 13.5% protein
- Falling number was 410 seconds
- **Based on these findings AAC Viewfield at Bon Accord in 2017 required: 200 lbs total N/ac + Head fungicide**

#### **CDC Landmark VB - CWRS**

- 2<sup>nd</sup> highest yielding cultivar; yields equivalent to CPS cultivars
- Optimal yields with 128+ lbs total N/ac
- One of the best standing cultivars
- Increasing N rates DID NOT increase lodging
- Head fungicide resulted in the lowest disease levels
- Head fungicide increased yields by 12%; Dual Fungicide increased yields by 11%
- Head fungicide extended days to physiological maturity by 1.8 days
- Highest test weight (66.9 lbs/bu)

- Good protein. Required 164 lbs total N/ac to achieve 13.8% protein
- Highest Falling number (425) seconds
- **Based on these findings CDC Landmark VB at Bon Accord in 2017 required: 164 lbs total N/ac + Head fungicide**

#### ***Cultivar X - CWRS***

- Lowest yielding cultivar; 15% less than AAC Brandon; 20% less than AAC Viewfield
- Optimal yields with 128+ lbs total N/ac
- Worst standing cultivar; PGR improved standability but still not as good as other CWRS cultivars without a PGR
- Fungicide reduced leaf disease but still this cultivar had the highest levels of leaf disease
- There was no significant yield response to fungicide
- Good test weight (65.4 lbs/bu)
- Highest protein. Required 93 lbs total N/ac to achieve 13.4% protein
- High Falling number (421 seconds)
- **Based on these findings Cultivar X at Bon Accord in 2017 required: 128 lbs total N/ac + Manipulator**

#### ***AAC Goodwin - CPS***

- High yielding cultivar; 5.5% higher yields than AAC Brandon
- Optimal yields with 164+ lbs total N/ac
- One of the best standing cultivars
- Increasing N rates DID NOT increase lodging
- This cultivar had the lowest disease levels and fungicide further reduced disease
- There was no significant yield response to fungicide
- Good test weight (65.5 lbs/bu)
- High protein for CPS (12.5%). Required 57 lbs total N/ac to achieve 11.0% protein
- Falling number was 404 seconds
- **Based on these findings AAC Goodwin at Bon Accord in 2017 required: 164 lbs total N/ac**

#### ***SY Rowyn - CPS***

- High yielding cultivar; 3.1% higher yields than AAC Brandon
- Highest yields with 128+ lbs total N/ac
- Intermediate standability; Manipulator improved standability
- This cultivar had relatively high disease levels
- Flag and Dual Fungicide increased yields by 9-10%; head fungicide increased yields by 7%
- Acceptable test weight (64.3 lbs/bu)
- High protein for CPS (12.5%). Required 57 lbs total N/ac to achieve 11.3% protein
- Falling number was 398 seconds
- **Based on these findings SY Rowyn at Bon Accord in 2017 required: 128 lbs total N/ac + Manipulator + Flag Fungicide**

#### **Summary**

**AAC Viewfield** was the top ranked cultivar, requiring 200 lbs total N/ac to maximize yield and protein. It also required a head fungicide.

Pro: High yield and standability

Caution: low protein risk

**CDC Landmark VB** was the second ranked cultivar, requiring 164 lbs total N/ac to maximize yield and protein. It also required a head fungicide.

Pro: High yield, standability, midge tolerance

Caution: head fungicide delayed days to physiological maturity by 1.8 d

**AAC Brandon** was the third ranked cultivar requiring 164 lbs total N/ac, a PGR and a flag fungicide to maximize yield, standability and protein.

Pro: High yield and excellent protein.

Caution: lodging risk.

#### **2017 Growing Season:**

- Plots were seeded May 17, 2017 at a depth of 1" into harrowed canola stubble. Seed was treated with Raxil PRO. Soil temperature was 7.3°C and soil moisture was 22.5% at 0-6"; 21.4% at 6-12"; 15.5% at 12-24"; 11.4% at 24-48" depth. 20 lbs P2O5/ac (0-45-0) was seed placed, 15 lbs K2O/ac (0-0-51-17) was mid-row banded, 5 lbs S/ac (0-0-51-17) was mid-row banded according to soil test recommendations for a 90 bu/ac CWRS and 100 bu/ac CPS yield goal. On June 29, 2017 a foliar application of 0.2 kg Cu/ha (0.18 lbs/ac) was made.
- Pre-seed burnoff with Heat + Glyphosate was applied May 16, 2017; Stellar + Axial were applied May 31, 2017.
- PGR applications were made June 19, 2017 at BBCH 31 (1<sup>st</sup> node is at least 1cm above tillering node).
- Flag Fungicide applications were made July 4, 2017 and Fusarium Head Blight fungicide applications were made July 14, 2017.
- All herbicides and fungicides were applied at recommended label rates.
- The Genetics x Fungicide trial was harvested on September 25, 2017 and the Genetics x N x PGR trial was harvested on September 26, 2017
- Growing season precipitation was 211.5mm or 8.3". May 17-31 = 23mm or 0.9"; June = 85mm or 3.3"; July = 46mm or 1.8"; August = 23mm or 0.9"; September 1-26 = 35mm or 1.4"

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#### **For more information please contact:**

Sheri Strydhorst, PhD  
Research Scientist - Agronomy

Ministry of Agriculture and Forestry  
Crop Research and Extension Division  
Box 4560  
6203-49th Street  
2nd Floor Provincial Building  
Barrhead, Alberta T7N 1A4  
Tel 780-674-8248  
sheri.strydhorst@gov.ab.ca

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**Table 1. Yield, leaf disease and days to maturity of AAC Brandon, AAC Viewfield, CDC Landmark VB, AAC Goodwin and SY Rowyn cultivars when grown with 4 fungicide treatments (untreated, Trivapro at flag leaf, Prosaro applied at Fusarium head blight (FHB) timing, and dual) at Bon Accord, AB in 2017.**

	Yield adjusted to 14.5% moisture (bu/ac)								
	CWRS				CPS				
	AAC Brandon	AAC Viewfield	CDC Landmark VB	Cultivar X	AAC Goodwin	SY Rowyn			
No Fungicide	118 a	127 a	129 a	101	133	125 a			
Trivapro at Flag Leaf	130 b	142 b	138 ab	103	141	136 b			
Prosaro at FHB	133 b	154 c	144 b	103	143	134 ab			
Dual Fungicide	130 b	148 bc	143 b	110	143	137 b			
Cultivar Average	128 B	142 C	139 C	104 A	140 C	133 B			
Note: Strip trials with AAC Brandon at John Guelly's near Pickardville showed a 6.1 bu/ac yield increase with Prosaro vs an untreated control. However this difference was not significant.									
<b>Foliar Disease Ratings McFadden Scale, 1991 (1 = no disease; 11 = &gt;50% leaf disease on lower and mid canopy and 26-50% on upper canopy)</b>									
CWRS				CPS					
	AAC Brandon	AAC Viewfield	CDC Landmark VB	Cultivar X	AAC Goodwin	SY Rowyn			
No Fungicide	10.9 a	10.2 a	10.6 a	10.8 a	9.5 a	10.5 a			
Trivapro at Flag Leaf	8.1 b	8.6 b	9.2 b	9.2 b	7.2 b	8.7 b			
Prosaro at FHB	7.8 b	7.1 c	7.3 c	9.1 b	6.5 b	8.1 bc			
Dual Fungicide	7.8 b	7.3 c	6.4 d	8.7 b	6.9 b	7.6 c			
Cultivar Average	8.6 B	8.3 B	8.3 B	9 C	7.5 A	8.8 B			
<b>Days from Seeding to Physiological Maturity (days)</b>									
CWRS				CPS					
	AAC Brandon	AAC Viewfield	CDC Landmark VB	Cultivar X	AAC Goodwin	SY Rowyn			
No Fungicide	109.5	108.5	106.4 a	105.4	107.3	109.3			
Trivapro at Flag Leaf	108.9	108.4	107.1 ab	105.4	107.9	109.6			
Prosaro at FHB	110.4	109.6	108.2 bc	105.5	108.2	109.8			
Dual Fungicide	110.0	109.1	108.9 c	105.9	107.5	110.4			
Cultivar Average	109.70 D	108.91 CD	107.66 B	105.56 A	107.72 BC	109.77 D			

Lowercase letters following fungicide treatment means indicate statistical significance as determined by Fisher's protected LSD at  $P \leq 0.05$ . If two numbers in the same column have the same letter, those treatments are NOT significantly different. If two numbers in the same column have different letters, those treatments ARE significantly different.

Uppercase letters following cultivar treatment means indicate statistical significance as determined by Fisher's protected LSD at  $P \leq 0.05$ . If two numbers in the same column have the same letter, those cultivars are NOT significantly different. If two numbers in the same column have different letters, those cultivars ARE significantly different.

Table 2. Yield and lodging of AAC Brandon, AAC Viewfield, CDC Landmark VB, AAC Goodwin and SY Rowyn cultivars when grown with 5 nitrogen fertilizer rates and with or without plant growth regulator (PGR) at Bon Accord, AB in 2017.

Yield adjusted to 14.5% moisture (bu/ac)									
CWRS					CPS				
	AAC Brandon	AAC Viewfield	CDC Landmark VB	Cultivar X	AAC Goodwin	SY Rowyn	Avg		
0 lbs N/ac	122	125 a	122 a	101 a	123 a	121 a	119		
36 lbs N/ac	126	135 b	128 a	104 ab	134 bc	127 ab	126		
71 lbs N/ac	130	140 bc	133 ab	109 bc	132 ab	134 bc	130		
107 lbs N/ac	129	138 b	135 ab	114 c	143 c	141 c	133		
143 lbs N/ac	133	147 c	141 b	116 c	144 c	138 c	136		
No PGR	126	138	132	107	137	130	128		
Trinexapac-ethyl PGR	130	136	131	111	133	134	129		
Cultivar Average	128 B	137 C	132 BC	109 A	135 C	132 BC	129		
Lodging (1=upright; 9=flat)									
CWRS					CPS				
	AAC Brandon	AAC Viewfield	CDC Landmark VB	Cultivar X	AAC Goodwin	SY Rowyn	Avg		
0 lbs N/ac	2.5 a	1.3 a	1.9	3.3 a	1.6	2.4 ab	2.2		
36 lbs N/ac	2.6 a	1.4 ab	1.7	4.0 bc	1.8	2.2 a	2.3		
71 lbs N/ac	2.6 a	1.8 ab	1.9	4.6 c	1.6	2.9 bc	2.6		
107 lbs N/ac	3.4 b	2.1 b	2.1	3.8 ab	1.8	3.5 cd	2.8		
143 lbs N/ac	3.4 b	3.1 c	1.8	4.6 c	2.1	3.9 d	3.2		
No PGR	3.1 b	2.1 b	2.0 b	4.5 b	1.9 b	3.1 b	2.8		
Trinexapac-ethyl PGR	2.7 a	1.8 a	1.8 a	3.7 a	1.7 a	2.9 a	2.4		
Cultivar Average	2.9 B	1.9 A	1.9 A	4.1 C	1.8 A	3.0 B	2.6		

Lowercase letters following nitrogen and PGR treatment means indicate statistical significance as determined by Fisher's protected LSD at P≤0.05. If two numbers in the same column have the same letter, those treatments are NOT significantly different. If two numbers in the same column have different letters, those treatments ARE significantly different.

Uppercase letters following cultivar treatment means indicate statistical significance as determined by Fisher's protected LSD at P≤0.05. If two numbers in the same column have the same letter, those cultivars are NOT significantly different. If two numbers in the same column have different letters, those cultivars ARE significantly different.

# Seed Protein Content in Response to Increasing N Fertilizer Rates

