



**Plot2  
Farm**

**2023**

# **PLOT2FARM TRIAL RESULTS**

An on-farm research trial program  
supported by Alberta Grains



**Alberta  
Grains**

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## Special thanks

*The success of the Plot2Farm program is due to the contributions from many parties. Without these groups, this year's trials would not have been a success.*

**A special thanks to:**

- Triple H Farms
- Bishops Farms
- Southwest Farms
- Blue J Farms
- Porozni Farms
- Newman Farms
- Vermue Farms
  
- FarmWise Inc
- ENtegrity Ag Solutions
- Christine Suominen at Richardson Pioneer Lamont
  
- Sheri's Ag Consulting
- SGS Biovision Labs
- Print 3



## Statistical phrases for reference

- 1 Statistical Significance:** means that the difference between two or more sets of data is not likely due to random chance and due to a specific treatment. In simpler terms, if something is statistically different, it means that there's a strong reason to believe that the difference is real and meaningful and due to treatments applied.
- 2 The difference is not statistical:** means that the difference between two or more sets of data is likely due to random chance rather than a real, meaningful difference. In simpler terms, if something is non-statistically different, it suggests that the observed differences could just be a coincidence or fluke.
- 3 p-value:** This is a measure used to determine the significance of results. A low p-value (less than 0.05) usually indicates that the results are statistically significant.
- 4 CV% (Coefficient of Variation):** This is a way to show how much the numbers in a group differ from each other, expressed as a percentage. In simpler terms, it helps you understand how "spread out" the data is. A higher CV% means the data points are more spread out, and a lower CV% means they are closer together.
- 5 Replicate Treatments:** This means conducting the same experiment treatments multiple times in the same location to ensure the results are reliable. Replication helps confirm that an observed effect is consistent and not just a one-time occurrence.
- 6 Significant Differences:** This phrase is used to indicate whether the differences between treatments are statistically meaningful. It is often accompanied by p-values).
- 7 Randomized:** Randomly assigning treatments to different areas within each replication. The goal is to eliminate bias and make sure the results are generalizable. It's like shuffling a deck of cards to ensure a fair game.
- 8 Values with the same letter are not significantly different:** In tables, you might see values followed by letters like 'a' or 'b.' If two values have the same letter in the same column, it means that statistically, they aren't different enough to be considered separate results.
- 9 Trends:** Refers to observable patterns in the data that may not be statistically significant but are worth noting.
- 10 Yield at X% seed moisture content:** This is a specific measure of yield that takes into account the moisture content of the seed. It is used for more accurate comparisons.
- 11 Non-statistically significant trends:** This phrase indicates that while there's a noticeable pattern in the data, it's not strong enough to be considered statistically valid. It's like saying there seems to be a relationship between two things, but we can't be sure without more evidence.

## Considerations

Although the Plot2Farm trials are conducted using science-based and statistically focused methods, they are conducted in a single location under specific farm and management conditions. It's important to note that results may vary based on different environmental conditions, management practices, and genetic factors. Farm scale trials, as they stand, do not replace small plot research results. Rather, they add further context to the information. Producers should consider farm-scale research findings as one piece of a larger puzzle. While the data provides valuable insights, it should be combined with other research and tailored advice to make well-informed decisions for your specific farm conditions.

# Seeding Rate Trials

## Increasing seeding rates in spring wheat (Willow Creek)

This trial was conducted with the agronomic support of FarmWise Inc.

**Closest Town:** Claresholm, Alberta

**Soil type:** Orthic Dark Brown Chernozem on medium textured till

**Seeding Date:** May 3, 2023

**Harvest Date:** August 26, 2023

**Row Spacing:** 10" (25.5cm)

**Variety(s):** AAC Brandon

**Reps:** Four

**Previous Crop:** Wheat

**Tillage:** No-till

**Herbicides: Pre:** Glyphosate + Prepass™ Flex

**In-Crop:** Simplicity™ GoDRI™ + Octtain™ XL

**Seed Treatment:** Insure® Cereal

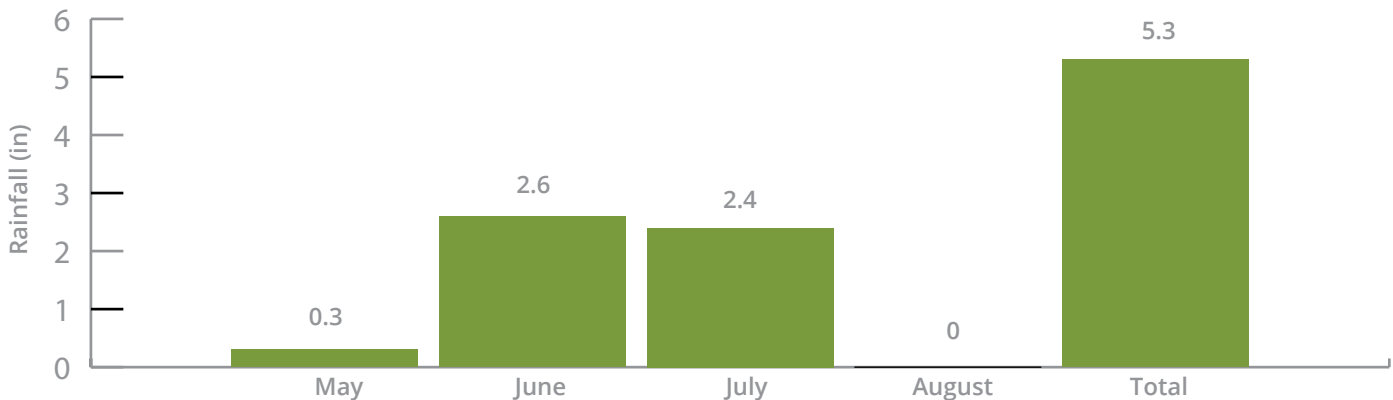
**Foliar Insecticides:** None

**Foliar Fungicides:** None

**Fertilizer:** 75N-26P-0K lbs nutrient/ac

**Irrigation:** None

### Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Southwest Farms in Claresholm, Alberta, this trial compared three different seeding rates on the spring wheat variety, AAC Brandon. The trial was seeded using a New Holland hoe drill with 10" (25.5cm) row spacings and 3 1/2" paired row openers. Seeding rates to target plant stand treatments were determined using thousand kernel weight, germination percentage and farm-specific emergence mortality estimates. The thousand kernel weight of the seed lot was 30g. Seeding rates to attain the treatment target plant stands of 25 (treatment 1), 30 (treatment 2) and 35 plants/ft<sup>2</sup> (treatment 3) were 80, 96, and 111lbs of seed ac<sup>-1</sup>, respectively. Treatments were replicated and randomized.

## Treatments

### *Trial design goal*

To determine the yield and grain quality impacts of seeding rates on spring wheat.

**Treatment 1:** Target 25 plants/ft<sup>2</sup>

**Treatment 2:** Target 30 plants/ft<sup>2</sup>

**Treatment 3:** Target 35 plants/ft<sup>2</sup>



## Results

### *In-crop assessment results*

For plant stand counts 21 days after seeding, all treatments were significantly different from each other (Table 1). However, each treatment fell 4-5 plants /ft<sup>2</sup> short of the intended target. This is likely due to the challenging germination and early growing conditions causing increased mortality.

The emergence percentage across the entire trial ranged from 81.6 to 83.7%. average emergence was 82.6%.

### *Yield results*

No significant yield differences were seen between target plant stand treatments (Table 1).

**Table 1:** Plant stand counts, yield, and quality results comparing three target plant stands (25 plants/ft<sup>2</sup>, 30 plants/ft<sup>2</sup>, and 35 plants/ft<sup>2</sup>) on the spring wheat variety, AAC Brandon, in Claresholm, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)	
<b>25 plants/ft<sup>2</sup></b>	20.4	a	37.7	a	15.03	a	64.2	a
<b>30 plants/ft<sup>2</sup></b>	24.8	b	38.5	a	14.95	a	64.2	a
<b>35 plants/ft<sup>2</sup></b>	29.3	c	38.1	a	15.03	a	63.9	a
<b>p-value</b>	<b>&lt;0.0001</b>	<b>***</b>	<b>0.969</b>	<b>NS</b>	<b>0.7343</b>	<b>NS</b>	<b>0.1036</b>	<b>NS</b>
<b>CV%</b>	15.6	%	3.23	%	2.01	%	0.29	%

Values with the same letter within a column are not significantly different. Significant difference if  $p \leq 0.05$ .

### *Grain quality results*

As with the yield results, no differences were seen in quality parameters including protein and bushel weight (Table 1).

## Summary

Overall, no significant differences were seen in yield when increasing seeding rates. This contrasts research seen in small plot research which demonstrates an increase in yield at increasing seeding rates (Beres et al, 2011, Collier et al, 2021). Environmental conditions led to significant impacts on yield across the field. It is possible that reduced moisture resources leading to crop stress limited the upward potential of higher seeding rates.

### **References:**

Beres, B. L., Cárcamo, H. A., Yang, R. C., & Spaner, D. M. (2011). Integrating spring wheat sowing density with variety selection to manage wheat stem sawfly. *Agronomy journal*, 103(6), 1755-1764.

Collier, G.R.S.; Spaner, D.M.; Graf, R.J.; Beres, B.L. (2021) Optimal Agronomics Increase Grain Yield and Grain Yield Stability of Ultra-Early Wheat Seeding Systems. *Agronomy*, 11, 240. <https://doi.org/10.3390/agronomy11020240>

# Nitrogen Rate Trials

## Increasing nitrogen rates in barley (Mountain View)

**Closest Town:** Carstairs, Alberta

**Soil type:** Medium textured Orthic Black Chernozem

**Seeding Date:** May 26, 2023

**Harvest Date:** October 22, 2023

**Row Spacing:** 25.4cm (10"), 3" paired row

**Variety(s):** Sirish

**Reps:** Four

**Previous Crop:** Peas

**Tillage:** Spring disk

**Herbicides: Pre:** None

**In-Crop:** Prominex™ + MCPA + Axial® Xtreme

**Seed Treatment:** Vibrance® Quattro

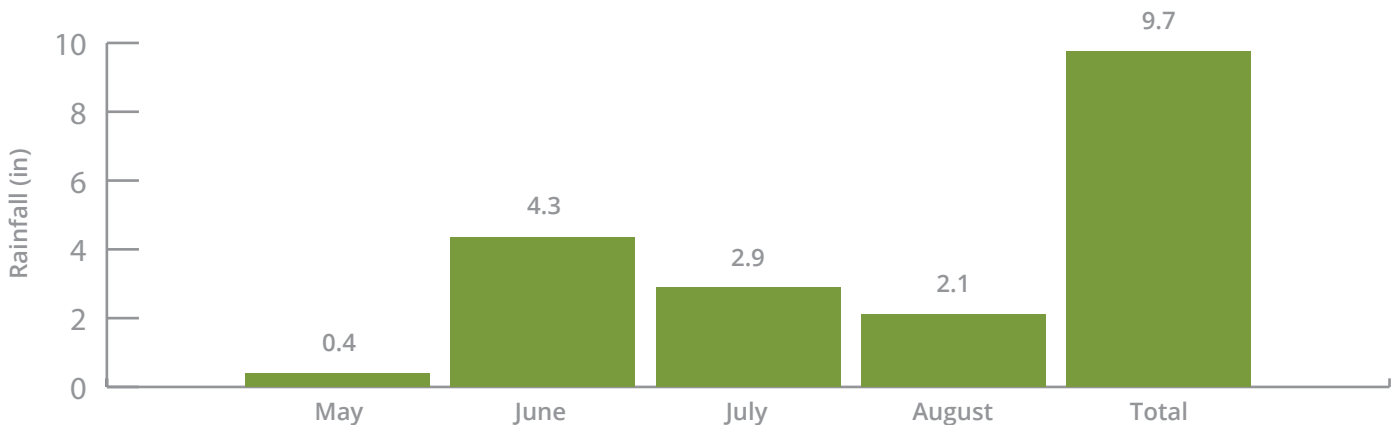
**Foliar Insecticides:** None

**Foliar Fungicides:** Marivas® Neo 300SE

**Fertilizer:** 60/70/80N-38.5P-11K lbs nutrient/ac

**Irrigation:** None

Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Triple H Farms in Carstairs, Alberta, this trial compared increasing nitrogen rates on the barley variety, Sirish. The trial was seeded using a 60-ft wide drill with 10" row spacings and 3" openers. A base level nitrogen fertility rate of 60 lbs/ac N was determined using soil testing and yield goals in relation to farm and field history. Additional treatments for increasing nitrogen were determined by adding an additional 10 lbs of nitrogen/ac and 20 lbs of nitrogen/ac. Other macronutrients were assessed and applied at rates to mitigate potential deficiencies. Treatments were replicated and randomized.

## Treatments

### *Trial design goal*

To determine the yield and grain quality impacts of increasing nitrogen rates on barley.

**Treatment 1:** 60 lbs of nitrogen/ac

**Treatment 2:** 70 lbs of nitrogen/ac

**Treatment 3:** 80 lbs of nitrogen/ac

## Results

### *In-crop assessment results*

Plant stand counts were collected 21 days after seeding. Plant stands ranged from 18.8-19.9 plants/ft<sup>2</sup>. However, no significant differences in plant stands were seen between treatments (Table 1).

### *Yield results*

Treatments had no significant effect on yield (Table 1).

**Table 1:** Yield, and quality results comparing increasing nitrogen rates of 60lbs nitrogen/ac, 70 lbs nitrogen/ac, and 80 lbs nitrogen/ac on the barley variety Sirish in Carstairs, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)	
<b>60 lbs of nitrogen/ac</b>	19.9	a	123	a	11.8	a	50.5	a
<b>70 lbs of nitrogen/ac</b>	19.9	a	127	a	11.9	a	50.6	a
<b>80 lbs of nitrogen/ac</b>	18.8	a	124	a	11.3	a	50.2	a
<b>ANOVA p-value</b>	<i>0.6423</i>	<i>NS</i>	<i>0.5371</i>	<i>NS</i>	<i>0.1377</i>	<i>NS</i>	<i>0.2187</i>	<i>NS</i>
<b>CV%</b>	9.71	%	4.12	%	3.40	%	0.71	%

### *Grain quality results*

Treatments had no significant effect on grain quality. Grain protein and bushel weight were statistically the same between all treatments (Table 1).

### *Economics*

Due to no statistical difference in the treatment results, each additional 10lbs of nitrogen/ac would cost an additional \$7.89/ac (assuming a urea cost of \$800/tonne). Therefore, treatment 1(60 lbs of nitrogen/ac) was the most economical treatment.

## Summary

Increasing nitrogen by 10lbs/ac and 20lb/ac caused no impacts to yield or quality of Sirish barley. There are numerous reasons why this may be the case including yield limiting early season stress due to lack of rainfall, a substantial birch effect occurring when rainfall did arrive that may have increased available nitrogen in the soil, and total rainfall limiting maximum yield potential. It is likely that nitrogen was not the limiting factor under the trial conditions.



# Enhanced Efficiency Nitrogen Fertilizer Trials

## Increasing percentage of spring-applied nitrogen as Environmentally Smart Nitrogen (ESN<sup>®</sup>) in spring wheat (Parkland)

This trial was conducted with the agronomic support of ENtegrity Ag Solutions

**Closest Town:** Stony Plain

**Soil type:** Orthic Dark Gray Chernozem

**Seeding Date:** May 15, 2023

**Harvest Date:** September 28, 2023

**Row Spacing:** 30.5cm (12")

**Variety(s):** 5700

**Reps:** Four

**Previous Crop:** Canola

**Tillage:** Heavy harrow in fall

**Herbicides:** Pre: None

**In-Crop:** Everest<sup>®</sup> + Pixxaro<sup>™</sup>

**Seed Treatment:** Rancona<sup>®</sup> Trio

**Foliar Insecticides:** None

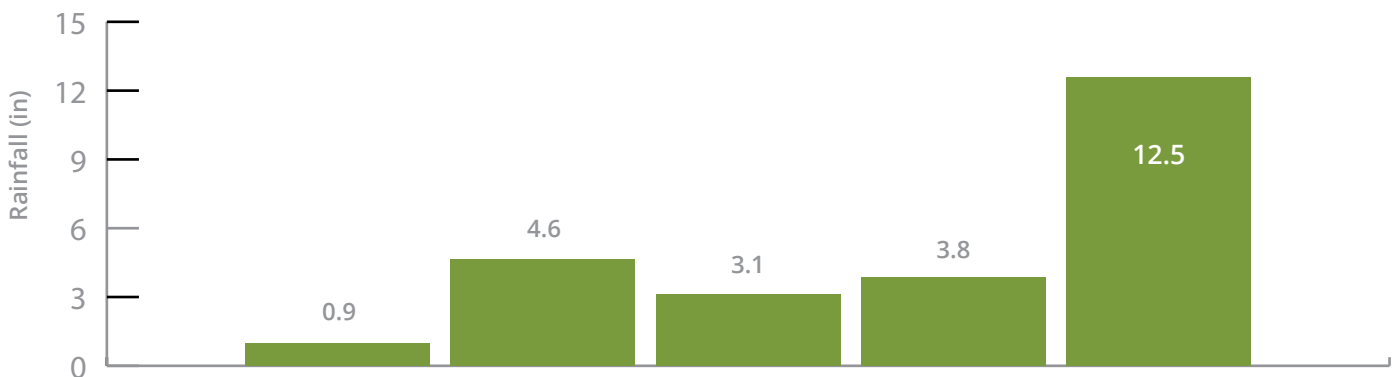
**Foliar Fungicides:** Roxar<sup>™</sup>

**Fertilizer:** 100N-35P-35K-13S lbs nutrient/ac

**Irrigation:** None

### Rainfall:

Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Vermue Farms in Stony Plain, Alberta this trial compared the impacts of increasing the percentage of spring-applied nitrogen in the form of Environmentally Smart Nitrogen<sup>®</sup> (ESN). The trial was seeded using a Morris Contour Drill with 12" (30.5cm) row spacings and 3" openers. The phosphorus, potassium, and sulfur blend was applied through the paired row seed boot while the different ratios of urea and ESN were applied through the mid-fertilizer band. Target plant stand of 32.5 plants ft<sup>2</sup> using a seeding rate of 165 lbs ac<sup>-1</sup>. Treatments were replicated and randomized.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality impacts of increasing percentages of ESN as total nitrogen at seeding on spring wheat.

**Treatment 1:** 100% of nitrogen from urea

**Treatment 2:** 25% of nitrogen from urea and 75% of nitrogen from ESN

**Treatment 3:** 50% of nitrogen from urea and 50% of nitrogen from ESN

## Results

### *In-crop assessment results*

Plant stand assessments were conducted on 21 days after seeding. Plant stand ranged from 26-27.9 plants/ft<sup>2</sup>. There was no significant difference in plant stand between treatments.

### *Yield and quality results*

No significant differences in yield were seen between any treatments (Table 1). No significant difference in protein or any other quality factors were seen.

**Table 1:** Yield, and quality results comparing 100% urea, 50:50 urea:ESN, and 25:75 urea-ESN, as nitrogen at on the Canadian Prairie Spring Red (CPSR) variety 5700 in Stoney Plain, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)	
100% urea	26.0	a	74.1	a	11.8	a	63.0	a
25:75 urea:ESN	27.9	a	74.8	a	11.7	a	63.2	a
50:50 urea-ESN	26.5	a	73.6	a	11.9	a	63.1	a
<i>p-value</i>	<i>0.5975</i>	<i>NS</i>	<i>0.3447</i>	<i>NS</i>	<i>0.3877</i>	<i>NS</i>	<i>0.2183</i>	<i>NS</i>
CV %	9.37	%	1.83	%	2.09	%	0.68	%

## Summary

ESN slows the release of nitrogen from the pearl due to a polymer coating. In this trial scenario, the impacts of the polymer coating did not alter the uptake and use of nitrogen by the crop enough to see a measurable difference in yield or protein.

# Increasing percentage of spring-applied nitrogen as Neon Air in spring wheat (Parkland)

This trial was conducted with the agronomic support of ENtegrity Ag Solutions

**Closest Town:** Onoway

**Soil type:** Orthic Dark Gray Chernozem

**Seeding Date:** May 5, 2023

**Harvest Date:** September 9, 2023

**Row Spacing:** 30.5cm (12")

**Variety(s):** AAC Brandon

**Reps:** Four

**Previous Crop:** Canola

**Tillage:** Vertical tillage in spring

**Herbicides: Pre:** Prepass

**In-Crop:** Simplicity™ + Cirpreme™ XC + MCPA

**Seed Treatment:** None

**Foliar Insecticides:** None

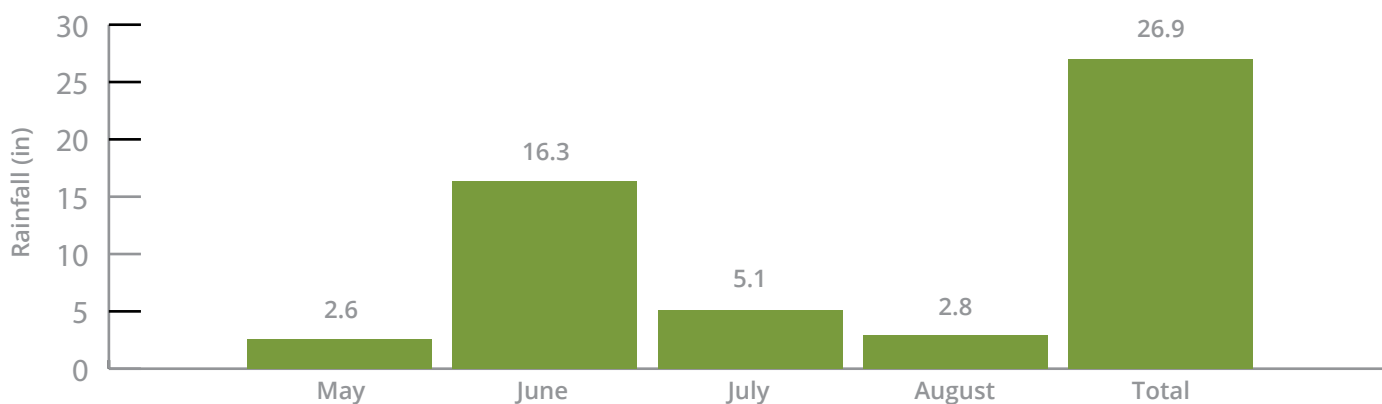
**Foliar Fungicides:** TiMOR®

**Fertilizer:** 85N-30P-20K-11S lbs nutrient/ac

**Irrigation:** None

## Rainfall:

Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Blue J Farms in Stony Plain, Alberta this trial compared the impacts of increasing the percentage of spring-applied nitrogen in the form of Neon Air. The trial was seeded using a John Deere air drill with 12" (30.5cm) row spacings and knife openers. A separate fertilizer blend was mixed for each treatment. All fertilizer was applied through a fertilizer knife band and seed was placed in the side band. Target plant stand of 30 plants ft<sup>2</sup> using a seeding rate of 120 lbs ac<sup>-1</sup>. Treatments were replicated and randomized.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality impacts of increasing percentages of Neon Air as total nitrogen at seeding on spring wheat.

**Treatment 1:** 100% of nitrogen from urea

**Treatment 2:** 75% of nitrogen from urea and 25% of nitrogen from Neon Air treated urea

**Treatment 3:** 50% of nitrogen from urea and 50% of nitrogen from Neon Air treated urea

## Results

### *In-crop assessment results*

Plant stand assessments were conducted 21 days after seeding. Plant stand ranged from 25.3-27.6 plants/ft<sup>2</sup>. There was no significant difference in plant stand between treatments.

### *Yield results*

No significant differences in yield were seen between any treatments (Table 1). No significant differences were seen in quality except for hard vitreous kernels (HVK).

**Table 1:** Yield, and quality results comparing 100% urea, 75:25 urea- Neon Air, and 50:50 urea: Neon Air as nitrogen on the Canadian Western Red Spring (CWRS) variety AAC Brandon in Stoney Plain, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)		Hard Vitreous Kernels (%)	
<b>100% urea</b>	25.7	a	84	a	15.05	a	63.7	a	76.5	a
<b>75:25 urea- Neon Air</b>	27.6	a	85	a	15.08	a	63.7	a	75.8	b
<b>50:50 urea: Neon Air</b>	25.3	a	85	a	15.05	a	63.8	a	75.5	b
<b>p-value</b>	<b>0.1323</b>	<b>NS</b>	<b>0.2476</b>	<b>NS</b>	<b>0.9931</b>	<b>NS</b>	<b>0.8278</b>	<b>NS</b>	<b>0.0066</b>	<b>**</b>
<b>CV %</b>	6.33	%	2.32	%	2.18	%	0.75	%	0.88	%

## Summary

Neon Air is marketed as a tool to mainly reduce nitrogen volatilization but also provide some protection from denitrification. Under the conditions of the trial, the application of Neon Air at different percentages of total nitrogen at seeding did not have any effect on yield or quality except for HVK. This is likely due to the minimal amount of nitrogen loss through volatilization when urea is banded appropriately.

# Increasing percentage of spring-applied nitrogen as Nitrain 2.0® in spring wheat (Mountain View)

**Closest Town:** Carstairs, Alberta

**Soil type:** Medium textured Orthic Black Chernozem

**Seeding Date:** May 2, 2023

**Harvest Date:** September 27th, 2023

**Row Spacing:** 25.4cm (10"), 3" paired row

**Variety(s):** CDC Hodge VB

**Reps:** Four

**Previous Crop:** Canola

**Tillage:** Spring harrow

**Herbicides:** Pre: Express® SG

In-Crop: AMS + Infinity® FX + Axial® Xtreme

**Seed Treatment:** Vibrance® Quattro

**Foliar Insecticides:** None

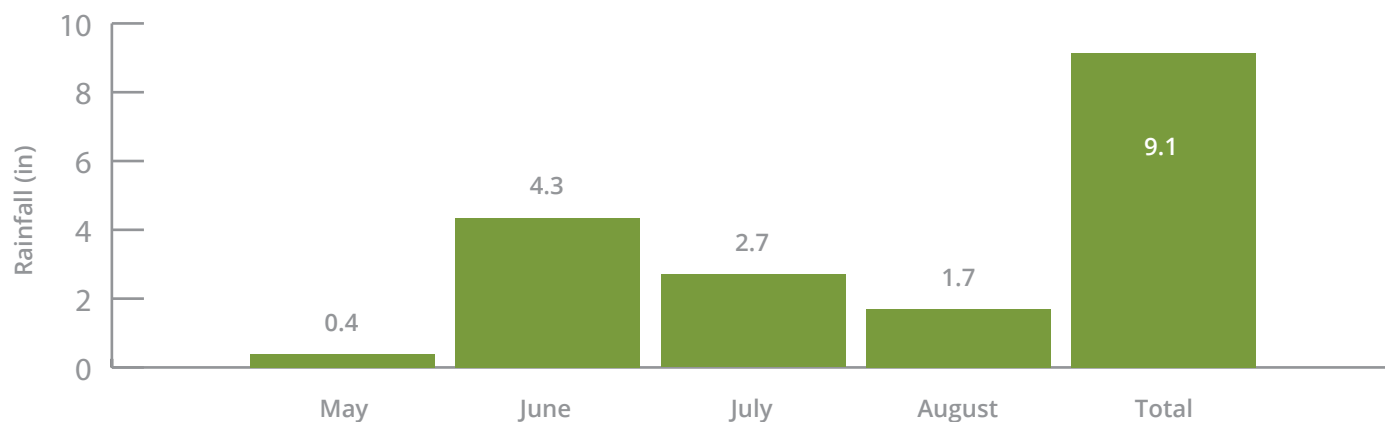
**Foliar Fungicides:** TILMOR®

**Fertilizer:** 92N-50P-11K lbs nutrient/ac

**Irrigation:** None

## Rainfall:

Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Triple H Farms in Carstairs, Alberta this trial compared the impacts of increasing the percentage of spring-applied nitrogen in the form of Nitrain 2.0. The trial was seeded using a 60-ft wide drill with 10" row spacings and 3" openers. Target plant stand of 32 plants ft<sup>2</sup> using a seeding rate of 165 lbs ac<sup>-1</sup>. Treatments were replicated and randomized.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality impacts of increasing percentages of Nitrain 2.0 as total nitrogen at seeding on spring wheat.

**Treatment 1:** 100% of nitrogen from urea

**Treatment 2:** 50% of nitrogen from urea and 50% of nitrogen treated with Nitrain 2.0 treated urea

**Treatment 3:** 25% of nitrogen from urea and 75% of nitrogen treated with Nitrain 2.0 treated urea

## Results

### *In-crop assessment results*

Plant stand assessments were conducted 21 days after seeding. Plant stand ranged from 25-29.8 plants/ft<sup>2</sup>. There was no significant difference in plant stand between treatments.

### *Yield and quality results*

No significant differences in yield were seen between any treatments (Table 1). No significant differences were seen in quality with the exception of hard vitreous kernels (HVK).

**Table 1:** Yield, and quality results comparing 100% urea, 25:75 urea:Nitrain 2.0, 50:50 urea:Nitrain 2.0, and 75:25 urea:Nitrain 2.0 as nitrogen at on the Canadian Western Red Spring (CWRS) variety AAC Hodge VB in Carstairs, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)		Hard Vitreous Kernels (%)	
<b>100% urea</b>	25.0	a	86	a	11.4	a	64.5	a	18.8	a
<b>50:50 urea:Nitrain 2.0</b>	26.3	a	85	a	11.2	a	64.6	a	16.5	bc
<b>25:75 urea:Nitrain 2.0</b>	29.8	a	88	a	11.3	a	64.5	a	15.5	c
<b>100% Nitrain 2.0</b>	26.5	a	86	a	11.2	a	64.6	a	18.0	ab
<b>p-value</b>	<b>0.3527</b>	<b>NS</b>	<b>0.4923</b>	<b>NS</b>	<b>0.5157</b>	<b>NS</b>	<b>0.883</b>	<b>NS</b>	<b>0.0037</b>	<b>***</b>
<b>CV %</b>	14.3	%	2.5	%	1.8	%	0.3	%	9.1	%

## Summary

Nitrain is marketed as a tool to reduce nitrogen volatilization loss for up to 14 days. Under the conditions of the trial, the application of Nitrain 2.0 at different percentages of total urea at seeding did not have any effect on yield or quality with the exception of HVK. The lack of differences between treatments is likely due to the minimal amount of nitrogen loss through volatilization when urea is deep banded.



# Increasing percentage of spring-applied nitrogen as SuperU® in durum irrigation (Willow Creek)

This trial was conducted with the agronomic support of FarmWise Inc

**Closest Town:** Barons, Alberta

**Soil type:** Orthic Dark Brown Chernozem on medium textured sediments

**Seeding Date:** May 10, 2023

**Harvest Date:** September 12, 2023

**Row Spacing:** 10" (25.5cm)

**Variety(s):** AAC Stronghold

**Reps:** Four

**Previous Crop:** Yellow Pea

**Tillage:** No-till

**Herbicides:** **Pre:** Roundup Transorb® + Blackhawk®

**In-Crop:** Epic® + Buctril M®

**Seed Treatment:** Teraxxa® F4

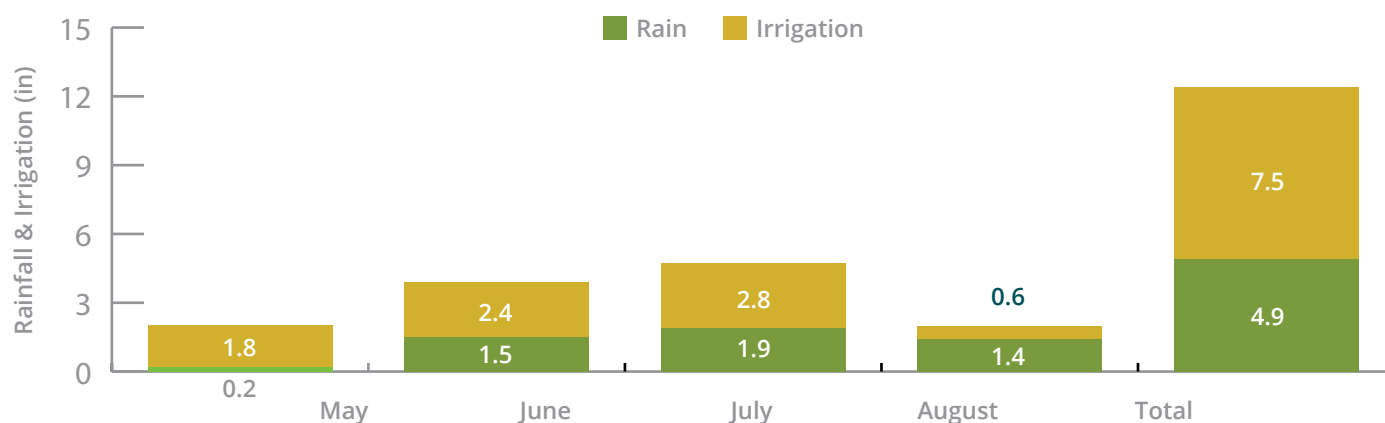
**Foliar Insecticides:** Coragen® MaX

**Foliar Fungicides:** Delaro 325 SC®

**Fertilizer:** 168N-20P-0K-29S lbs nutrient/ac

## Rainfall & Irrigation:

**Total Rainfall (in) and irrigation water applied at trial location from May through August, 2023**



## Introduction

Partnering with Bishop Farms Ltd. in Barons, Alberta, this trial compared the impacts of increasing the percentage of spring applied nitrogen in the form of SuperU® on the durum wheat variety AAC Stronghold. Treatments were compared to an untreated check where all nitrogen was in the urea form. The trial was seeded using a Bourgault Paralink hoe drill with 10" (25.5cm) row spacings and 3/4" openers. Target plant stand of 19 plants ft<sup>2</sup> using a seeding rate of 100 lbs ac<sup>-1</sup>. Treatments were randomized and replicated.

Due to equipment capabilities, SuperU was applied with the seed at seeding while urea was applied in a side band. Rates of SuperU and urea were adjusted to achieve the correct ratio for each treatment.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality impacts of increasing percentages of SuperU as total nitrogen at seeding on durum wheat.

**Treatment 1:** 100% of nitrogen from urea

**Treatment 2:** 75% of nitrogen from urea and 25% of nitrogen from SuperU

**Treatment 3:** 50% of nitrogen from urea and 50% of nitrogen from SuperU

## Results

### *In-crop assessment results*

Plant stand assessments were conducted 21-28 days after seeding. Although plant stand ranged from 17-14 plants/ft<sup>2</sup>, there was no significant difference in plant stand between treatments.

### *Yield and quality results*

No significant differences in yield were seen between any treatments (Table 1). A significant difference in protein was seen. The check treatment of 100% urea had the lowest grain protein compared to the two treatments containing SuperU.

**Table 1:** Yield, and quality results comparing 100% urea, 75:25 urea-SuperU, and 50:50 urea:SuperU as nitrogen at on the Canadian Western Amber Durum (CWAD) variety AAC Stronghold in Barons, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)	
<b>100% urea</b>	17	a	105.7	a	14.2	b	65.9	a
<b>75:25 urea:SuperU</b>	14	a	105.9	a	14.5	a	65.8	a
<b>50:50 urea:SuperU</b>	15	a	100.0	a	14.6	a	65.4	a
<b>p-value</b>	<b>0.2224</b>	<b>NS</b>	<b>0.3118</b>	<b>NS</b>	<b>0.0168</b>	<b>*</b>	<b>0.1487</b>	<b>NS</b>
<b>CV %</b>	16.7	%	8.0	%	2.78	%	0.56	%

## Summary

SuperU helps protect nitrogen loss from both nitrification and volatilization through stabilization technology. In this trial it is likely that the risk of nitrogen loss was not significant enough to impact yields. However, it is possible that some nitrogen loss mitigation from SuperU may have increased the amount of late-season nitrogen available for uptake and therefore caused a higher level of grain protein in the SuperU treatments.

# Plant Growth Regulators

## Manipulator™ 620 application on spring wheat (Two Hills No.21)

This trial was conducted with the agronomic support of Christine Suominen at Richardson Lamont

**Closest Town:** Willingdon, Alberta

**Soil type:** Orthic Black Chernozem on coarse textured materials over medium or fine textured till

**Seeding Date:** May 5th, 2023

**Harvest Date:** September 5, 2023

**Row Spacing:** 10" (25.5cm)

**Variety(s):** AAC Wheatland VB

**Reps:** Five

**Previous Crop:** Spring wheat

**Tillage:** Harrowed in the fall

**Herbicides: Pre:** Priority® + Glyphosate

**In-Crop:** Rezuvant™ XL + MCPA Ester

**Seed Treatment:** Rancona® Trio

**Foliar Insecticides:** None

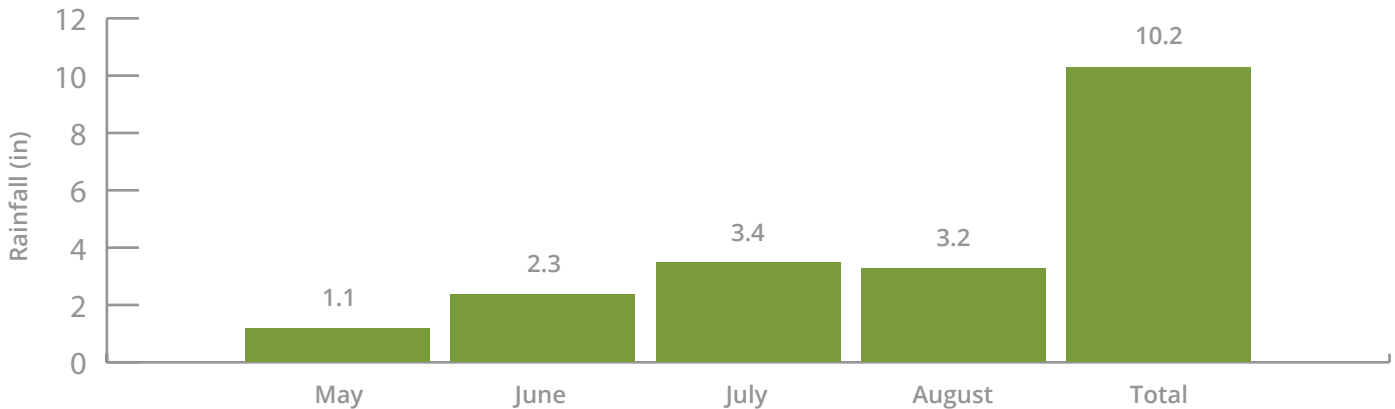
**Foliar Fungicides:** Sphaerex™

**Fertilizer:** 100N-30P-10K-0S

**Irrigation:** None

### Rainfall:

Rainfall (in) at trial location from May through August, 2023



## Introduction

Partnering with Porozni Farms in Willingdon, Alberta, this trial compared plant growth regulator Manipulator application on the CWRS variety AAC Wheatland VB. The trial was seeded using a Seekhawk seeder with 12" (25.5cm) row spacing. Manipulator plant growth regulator applied GS 31-32 using a 120 ft sprayer at 10gal/ac water volume. Treatments were replicated and randomized.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality impacts of plant growth regulator Manipulator application on yield and quality of spring wheat production.

**Treatment 1:** Check

**Treatment 2:** Manipulator™ 620 applied at GS31-32 @ 0.7L/ac

## Results

Likely due to well below-average rainfall in the first half of the growing season and a lack of late season blowing rain, no lodging was observed across the entirety of the trial area throughout the growing season. Therefore, no drone imagery or lodging data was collected.

There was a small but significant difference in plant stand count between the two treatments. Since plant stand counts are taken prior to Manipulator™ 620 application, these differences are not due to PGR application. It is more likely that field variability or sampling locations led to the resulting difference.

Application of Manipulator™ 620 had no effect on yield or quality parameters with the exception of fusarium damaged kernel (FDK) (data not shown). Application of Manipulator™ 620 increased the FDK from 0.09 to 0.10 per cent.

The lack of differences seen in yield and quality indicate that growing conditions at this trial site were not conducive to see a benefit from the application of a PGR.

**Table 1:** Yield, and quality results comparing Manipulator™ 620 to an untreated check on the Canadian Western Red Spring (CWRS) variety AAC Wheatland VB in Willington, Alberta, 2023.

	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)	
No PGR	31.4	a	95.4	a	14.12	a	66.6	a
Manipulator™ 620	27.6	b	99.9	a	14.08	a	66.6	a
<i>p-value</i>	<i>0.0173</i>	<i>*</i>	<i>0.1001</i>	<i>NS</i>	<i>0.7174</i>	<i>NS</i>	<i>1.0000</i>	<i>NS</i>
CV %	18.58	%	4.91	%	4.15	%	0.27	%

## Summary

Application of Manipulator™ 620 had no impact on yield and quality. As no lodging was seen throughout the trial, the absence of difference between treatments is very likely due to low amounts of rainfall earlier in the season. These results support small plot research conducted in Alberta that indicates the benefit of a PGR application is more likely to occur in environments with high lodging potential (Strydhorst, Hall, & Perrott, 2018).

In the Alberta Seed Guide, AAC Wheatland VB has a lodging rating of 'Very Good'. Therefore, it may also be the case that the variety did not lodge due to genetic resistance to lodging rather than because of solely lack of rainfall. However, this does not mean that AAC Wheatland VB would not respond to a PGR application in higher lodging pressure scenarios.

### **References:**

Strydhorst, S., Hall, L., & Perrott, L. (2018). Plant growth regulators: What agronomists need to know. *Crops & Soils*, 51(6), 22-26.

# Variety Comparison Trials

## CDC Go vs AAC Hodge VB vs AAC Viewfield (Foothills County)

This trial was conducted with the support of Megan Koester of Serviceberry Land + Cattle Ltd.

**Farm Name:** Newman Farms

**Closest Town:** Blackie, Alberta

**Soil type:** Orthic Black Chernozem on medium textured till

**Seeding Date:** April 28th, 2023

**Harvest Date:** September 6, 2023

**Row Spacing:** 15" (38cm)

**Variety(s):** CDC Go, AAC Hodge VB and AAC Viewfield

**Reps:** Four

**Previous Crop:** Peas

**Tillage:** None

**Herbicides:** Pre: None

**In-Crop:** Simplicity™ GoDRI™ + MCPA

**Seed Treatment:** None

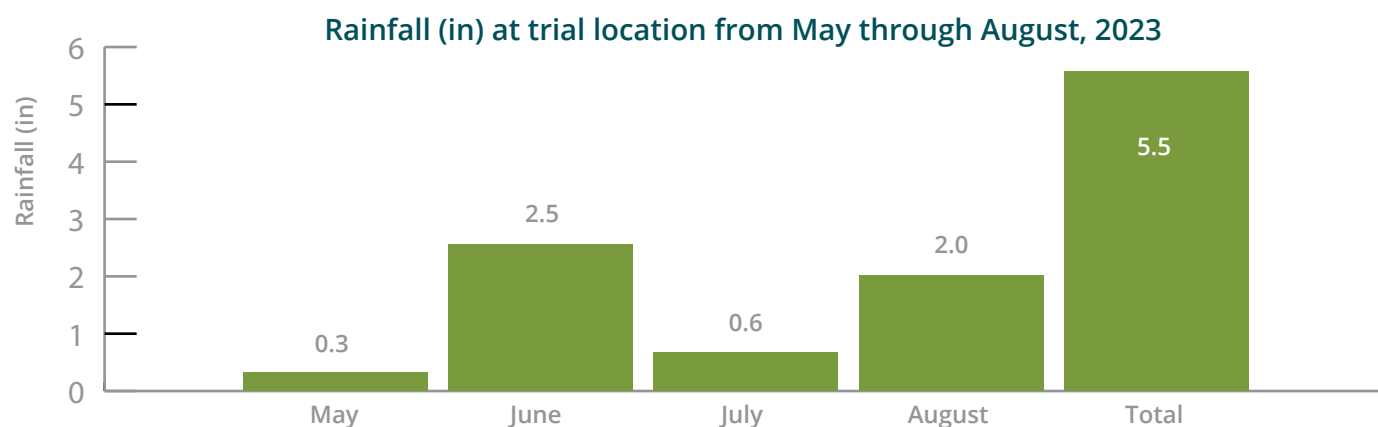
**Foliar Insecticides:** None

**Foliar Fungicides:** None

**Fertilizer:** 80N-35P-0K-0S

**Irrigation:** None

### Rainfall:



## Introduction

Partnering with Newman Farms in Blackie, Alberta, this trial compared three Canadian Western Red Spring (CWRS) Varieties CDC Go (registered in 2004), AAC Viewfield (registered in 2016), and AAC Hodge VB (registered in 2022).

The trial was seeded using a 60-foot SeedMaster UltraSR drill with 38 cm (15") row spacings. Each variety thousand kernel weight was different. Therefore, each variety was seeded at a different rate so that all varieties targeted 32 viable seeds/ft<sup>2</sup>. Treatments were replicated and randomized. Soil conditions at seeding were relatively poor due to lack of moisture. Soil temperature at seeding was 6.3°C.

## Treatments

### *Trial design goal:*

To determine the yield and grain quality differences between CDC Go, AAC Viewfield, and AAC Hodge VB.

**Treatment 1:** CDC Go

**Treatment 2:** AAC Hodge VB

**Treatment 3:** AAC Viewfield

Other than variety and pounds of seed applied per foot squared to sow an equal amount of seed for each variety per foot squared, all other management factors remained the same

## Results

When interpreting the results, it is important to keep in mind that rainfall conditions this year led to significant drought causing yield impact. It is likely the varieties were not able to perform to their full potential.

### *In-crop assessment results*

Plant stand assessments were conducted 21-28 days after seeding to potential differences in plant stand based on variety. Variety had no effect on the plant stand (Table 1). Plant stands ranged between 27.2 and 28.3 plants/ft<sup>2</sup>.

### *Yield results*

Yields ranged between 54.6 and 58.6 bu/ac. However, there was no statistical difference between yields.

**Table 1:** Yield, and quality results comparing Canadian Western Red Spring (CWRS) varieties CDC Go, AAC Hodge VB, and AAC Viewfield CDC Go in Blackie, Alberta, 2023.

Variety	Plant Stand (plants/ft <sup>2</sup> )		Yield (bu/ac)		Protein (%)		Bushel Weight (lbs/bu)		Severe Midge Damage (%)	
CDC Go	28.1	a	54.6	a	15.9	a	60.0	b	0.065	ab
AAC Hodge VB	28.3	a	55.5	a	15.4	c	61.4	a	0.058	b
AAC Viewfield	27.2	a	58.6	a	15.7	b	61.2	a	0.070	a
<i>p-value</i>	<i>0.6266</i>	<i>NS</i>	<i>0.1933</i>	<i>NS</i>	<i>0.0002</i>	<i>***</i>	<i>0.0162</i>	<i>*</i>	<i>0.0195</i>	<i>*</i>
CV %	7.82	%	5.61	%	1.73	%	1.43	%	10.42	%

Values with the same letter are not significantly different. Significant difference if  $p \leq 0.05$ .





Varieties from left to right – CDC Go, AAC Hodge VB, and AAC Viewfield taken after head emergence. The head emergence of AAC Hodge was noted to be about one week behind the other two varieties.

### **Grain quality results**

Although no differences were seen in plant stand and yield, some quality differences were seen between the varieties.

There were significant differences in protein between all three varieties. AAC Hodge VB had the lowest protein at 15.4%. CDC Go had a protein level of 15.9% while AAC Viewfield was slightly lower at 15.7% protein (Table 1).

AAC Hodge VB and AAC Viewfield had similar bushel weights at 61.4 lbs/bu and 61.2lbs/bu. CDC Go had a significantly lower bushel weight at 60.0 lbs/bu (Table 1).

Significant differences were seen in the amount of midge damage between varieties. AAC Hodge VB had significantly lower damage as compared to AAC Viewfield. Although midge damage in AAC Hodge was slightly lower than CDC Go, the difference was non-significant (Table 1).

Finally, dockage was significantly higher in AAC Viewfield as compared to the other two varieties (data not shown in table). AAC Viewfield had a dockage of 3.00% while CDC Go and AAC Hodge VB ranged between 1.18% and 1.93%. The range between CDC Go and AAC Hodge VB was non-significant.

Additional visual notes on the field trial included a low level of leaf disease, a low level of lodging, and that AAC Viewfield was notably shorter than the other two varieties. AAC Hodge VB also seemed to have a higher occurrence of wheat stem sawfly damage, although data was not collected on these considerations.

## **Summary**

Statistically, varieties displayed no differences in yield. However, some differences in quality were seen including protein, midge damage and test weight. Although midge damage differences were seen, the amounts were not enough to impact grain grade.

Given then low rainfall season and high plant stress, it is unlikely that varietal differences were able to display themselves. More likely, environmental stress limited yield potential.



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