Battle River Research Group

Farmer-Led Research

# ANNUAL REPORT 2020

www.battleriverresearch.com

Battle River Research Group

# THE STORY OF BRRG RESEARCH AND EXTENSION 2020

# PRESIDENT'S MESSAGE

## Colin Wager

Battle River Research Group is committed to improving agriculture through producer-driven research and providing extension events to farmers in our area. Our goal is to teach farmers new ideas and techniques they can use in their operation.

I find this report hard to write, as once I was elected president, it seemed the next thing that happened was COVID. So, very little travel was done. Two in-person meetings were held with social distancing in place. There was two Zoom-type meetings held, with mixed results. There were many phone calls throughout the summer and are still continuing. There has been group emails to the board and of course text messaging.

One thing that I can say about this year is that our manager Khalil Ahmed has been excellent in the board's almost absence. I can say that we as a board are very grateful to have a person with his knowledge and experience. He is well on his way to surrounding himself with a great team. Part of that team is his wife Nasima Junejo. Together they have found many jobs to bring in work and money to our association. We need to grow our business to ensure that BRRG will be around for many years for our members.

Well done Khalil!!

I would like to say thank you to our BRRG members, our five counties for their support, our corporate supporters and the board.

I am hoping for a bit more of a normal year next year, and many more after that.

Colin Wager

President, BRRG Board of Directors

# BRRG IS GROWING

First of all, I am very thankful to the BRRG board for giving me an opportunity to run this organization.

Although 2020 was a challenging year, I am proud of my team's ability to adopt COVID-19 changes and still be able to seed 45 research trials (over 2,000 research plots) which is almost double compared to the 24 research trials in 2019.

Battle River Research Group has started eight collaborative projects with agricultural colleges (Lethbridge College and Lakeland College), crop commissions (Alberta Wheat Commission, Alberta Barley and Alberta Pulse Growers), industry and other sister associations in the province.

During 2020, we conducted soil health sampling at 22 locations, and we did pest monitoring, a nematode survey and a feed analysis program for producers.

Most of our extension events were virtual – at the beginning of the pandemic in early March, we started with webinars, followed by a virtual field day in July and crop walks in August. The traffic on the BRRG website is skyrocketing – videos and presentations were uploaded so producers can watch anytime.

In 2021, we are planning on getting into on-farm research trials, such as corn silage and soil amendments.

I am very grateful to have some lovely people around me who are always guiding and helping me, including Colin Wager for mentorship, Melvin Thompson for financials, Dale Pederson for equipment repairs and Howard Vincett for giving us prime land for research plots.

It is very good that BRRG is growing, and we will continue to put all our efforts into serving producers in east-central Alberta.

I am confident, we are going to make BRRG GREAT AGAIN!

Regards,

Khalil Ahmed PhD., P. Ag.
Manager
Battle River Research Group

# Battle River Research 2020 — 2024
# STRATEGIC GOALS

1. To find stable funding resources to produce unbiased farm led research and extension program
2. To be a recognized as an effective farmer's association of east central Alberta
3. To deliver relevant and applicable research to regional farmers to enhance Farmer-Led Research through a partnership with regional producers to evaluate technology, practices, and products.
4. Transfer updated knowledge and technology information to Alberta's farmers

## Mission:

Advancing agriculture as an independent, producer-driven resource

## Vision:

Beyond sustainability through innovation in agriculture

# STRATEGIC GOAL 1 | 2020 PROGRESS

**To Build a foundation of Reliable Stable Resources**

## Project Funding

BRRG got funding for 11 projects from CAP programs. We also collaborate on different projects and got funding from Alberta Barley, wheat, and Pulse growers commissions. BRRG generated a revenue of $40000 in 2020

## Partnership

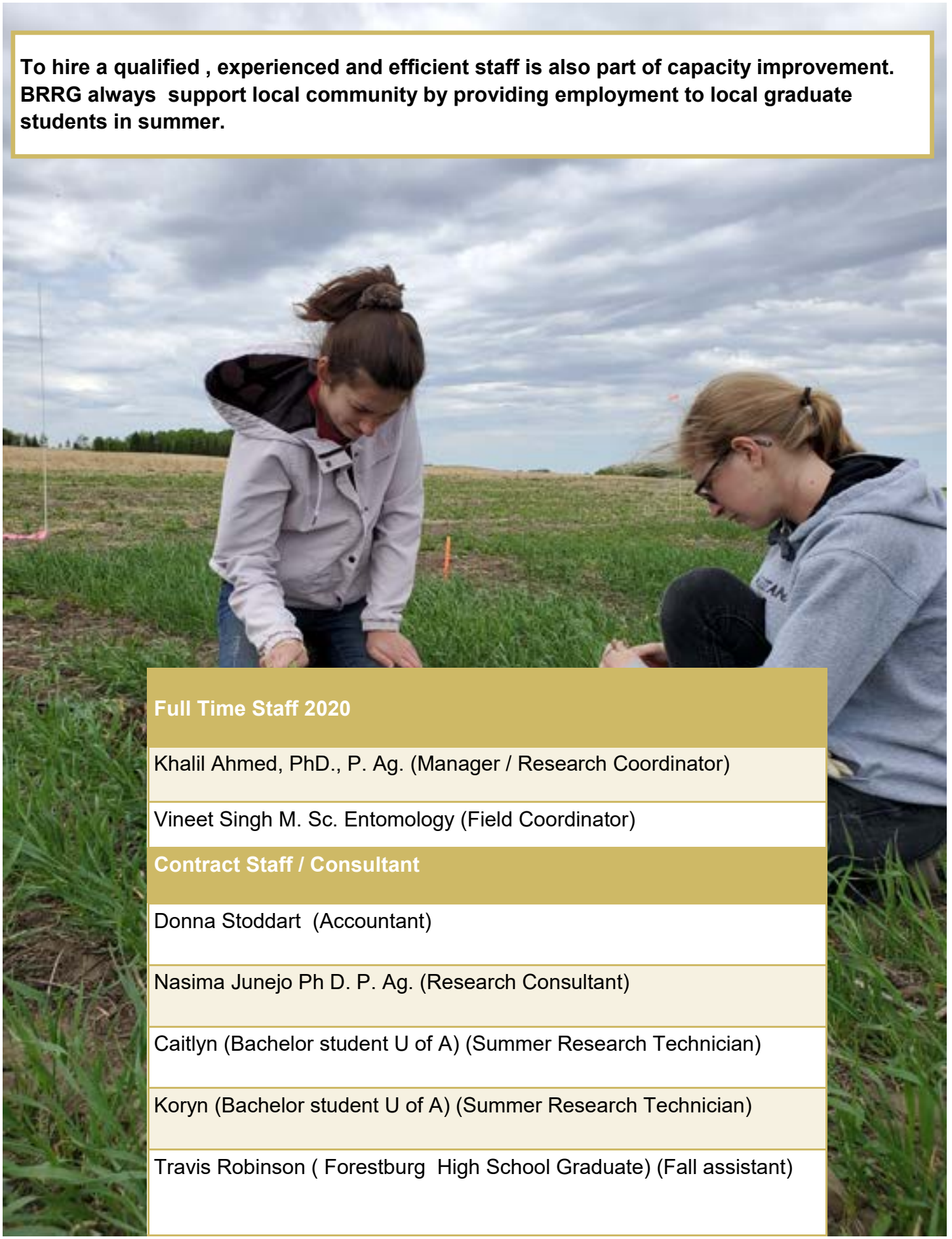
In 2020, we initiated the concept of a research partnership with local producers. We got funding for two Farm Scale Research projects. BRRG decided to continue this partnership in the future. BRRG is providing services for industrial research. In 2020 we did 14 projects for the industrial research.

## Enhance the Research Capacity of Battle River Research Group

- Improved pieces of equipment and research tools.
- Hired and outsourced qualified professionals and specialists and organized webinars and on-call services with them ( see our extension report).
- BRRG Improved tech and gadgets to do an online extension during pandemic




**To hire a qualified , experienced and efficient staff is also part of capacity improvement. BRRG always support local community by providing employment to local graduate students in summer.**



| Full Time Staff 2020 |
| --- |
| Khalil Ahmed, PhD., P. Ag. (Manager / Research Coordinator) |
| Vineet Singh M. Sc. Entomology (Field Coordinator) |
| **Contract Staff / Consultant** |
| Donna Stoddart (Accountant) |
| Nasima Junejo Ph D. P. Ag. (Research Consultant) |
| Caitlyn (Bachelor student U of A) (Summer Research Technician) |
| Koryn (Bachelor student U of A) (Summer Research Technician) |
| Travis Robinson ( Forestburg High School Graduate) (Fall assistant) |

# STRATEGIC GOAL 2 | 2020 PROGRESS

**To be recognized as an effective farmer's association of east central Alberta**

**Battle River Research group supervised by twelve board members Our members are part of councils and municipalities and have knowledge of current farmers issues and research needs.**

# Board of Directors

| Executive 2020 | | |
|---|---|---|
| **President** | **Vice President/Treasure** | **Secretary** |
| Colin Wager | Steven Vincett | Ingrid Brady |
| **Board Member 2020** | | |
| Dale Pederson | Melvin Thompson | Henry Michelson |
| Stan Schulmeister | Alisa Donnelly | Ed Lefsrud |
| Rob Somerville | Brent Christensen | Dave Grover |

# STRATEGIC GOAL 3| 2020 PROGRESS

## Delivered relevant and applicable research to East Central Alberta farmers

**BRRG 2020 Crop Research Overview**

This year, BRRG seeded four small plot research sites (2000 research plots), including cereal canola site, pulse site, long-term project sites and silage sites. We established three experimental fields at Galahad in Flagstaff County, and one at Viking in Beaver County. The sites experienced challenging weather — heavy rain and hail — but we managed to survive and harvested all plots on time.

**Research projects undertaken by Battle River Research Group in 2020**

- Yield and Quality of Annual Crop Mixtures and Alternatives Annual crops for forage production in Alberta.
- Evaluation of Perennial Forage Mixes for Hay /pasture
- Evaluation of the interaction between seed size and seeding depth on canola establishment and yield.
- Managing Malt Genetics for Feed End-use
- Soil Health Benchmarking
- Improvement and adaption of Ranchers technology
- Comparison of Traditional Crop Inputs and Biostimulants Application on Wheat, Canola, and Peas in Alberta
- Ultra Early seeding of Spring Wheat Varieties
- Regional Winter Wheat Trial
- Regional Silage Trial (Oat, Barley, Triticale).

# STRATEGIC GOAL 3| 2020 PROGRESS (cont.)

**Delivered relevant and applicable research to East Central Alberta farmers**

- Regional Cereal Varieties Testing Program (Wheat, Oat, Triticale and Barley).
- Regional Pulse Varieties Testing Program (Yellow Peas, Green Peas, Soyabean, Lentils, Fababean)
- Pest Monitoring, diamond Moth, wheat Midge, Bertha
- Improving and adapting forage and crop production knowledge, technology, and production practices for Ranchers & Farmers
- Assessment of different Nitrogen sources and Method of application on Canola and Wheat yield.
- Effectiveness of Power Coat microbial inoculum in enhancing fertilizer use efficiency by wheat and canola.
- Evaluation of Foliar micronutrient products on yield f Barley, Canola, Peas and Wheat
- Evaluation of different Phos rates on Peas yield and growth.
- Assessment of different types of inoculant on root nodulation and yield of Field Peas.

Please visit our website for each project details.

BRRG did 14 industry trials for

Crop management, Ag-Xplore , Power Rich and KOCH

# REGIONAL VARIETY TRIALS — 2020

The Regional Variety Trials (RVT) Testing Program is coordinated by the Alberta Regional Variety Advisory Committee (ARVAC) and Alberta Agriculture and Forestry (AAF). Variety performance data is collected throughout Alberta and northern British Columbia and compiled by an RTV Coordinator for publication in the Alberta Seed Guide (www.seed.ab.ca). The RVT program is responsible for generating unbiased post-registration information for varieties.

Variety selection is essential for production management and economic decisions. Every year, RVTs provide regional performance information suitable for each environment on emerging crop varieties as compared to standard and well-established varieties. All breeding lines can perform to their genetic potential.

BRRG collects data on the agronomic performance of new varieties under local agro-climatic conditions of central-east Alberta.

Trial objectives:

1. To provide producers with agronomic data relevant to the local soil and agro-climatic conditions
2. To familiarize local producers with newly registered varieties available to them
3. To contribute local agronomic data to the provincial database

Battle River Research Group is one of the collaborative associations for RVT trials. The following are the accumulated results from BRRG research sites. Yields are expressed as a percentage of the check; this makes the data comparable within varieties tested in regional variety trials hosted by the government of Alberta. The overall results can be found in the Alberta Seed Guide.

BRRG small plot trials are conducted on the most consistent and highest performing land, which allows the differences in varieties to be highlighted instead of other limiting factors such as water, nutrients or other potential deficiencies.

Sites were selected in early spring and soil tested to determine soil fertility by the lab for the region's optimal yield goals. The amount of seed required was calculated using TKW, percent germination and estimated seed mortality. Pre-treated seed varieties were provided by Alberta Agriculture and Forestry.

The pulse, cereal, and flax trials, except soybean, were seeded in the first, second and third week of May 2020, respectively. The grains were planted on pea stubble, and all pulses were seeded on wheat stubble at research sites at Galahad. Recommended herbicides were applied as per Alberta Crop Protection, Blue Book 2020.

**Table 1. List of regional variety trials seeded at BRRG in 2020**

| Crop | #of cultivars | # of replications |
|---|---|---|
| Durum | 10 | 3 |
| Canada Western Red Spring (CWRS) & CWHWS | 32 | 3 |
| Canada Western Special Purpose (CWSP) & CWSWS | 11 | 3 |
| Canada Prairie Spring Red (CPSR) & CNHR | 9 | 3 |
| Triticale | 4 | 3 |
| Oats | 7 | 3 |
| Barley – 2 Row | 21 | 3 |
| Winter Wheat | 10 | 3 |
| Flax | 5 | 4 |
| Green Peas | 6 | 4 |
| Yellow Peas | 13 | 4 |
| Fababean | 7 | 4 |
| Lentil | 6 | 4 |
| Soybean | 11 | 4 |

**Results:**

Results from the BRRG 2020 RVT trials are summarized in Tables 3 to 10. The following yields were estimated and concluded only for the Battle River research site of Flagstaff County. The varieties' performance may be different in other regions. For provincial results, please refer to Alberta Seed Guide 2020.

**Table 2. Yield range according to Alberta seed guide program**

| | Crop | | Check Variety | Yield Category (bu/ac) | | |
|---|---|---|---|---|---|---|
| | | | | Low | Medium | High |
| 1 | Wheat | CWSP | Carberry | >55 | 55-80 | 80 |
| 2 | | CWRS | Carberry | >55 | 55-80 | 80 |
| 3 | | Durum | Strong field | >45 | 45-70 | 70 |
| 4 | Oats | | CDC Dancer | >70 | 70-100 | 100-130 |
| 5 | Barley | | AC Metcalfe | >75 | 75-100 | 100-125 |
| 6 | Flax | | CDC Bethune | >20 | 20-30 | 30-37 |
| 7 | Triticale | | Brevis | >70 | 70-100 | 100-130 |

Ref: Alberta Seed Guide, 2020

# RVT CEREALS

## BARLEY-2020

| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
|---|---|---|---|
| AC METCALFE | 36 | 3839.97 | 100% |
| AAC SYNERGY | 40 | 5105.01 | 110% |
| AB ADVANTAGE | 42 | 5321.91 | 118% |
| AB BREWNET | 39 | 4630.57 | 109% |
| AB TOFIELD | 37 | 5145.96 | 104% |
| AB WRANGLER | 34 | 4664.44 | 96% |
| CDC AUSTENSON | 36 | 4754.17 | 101% |
| CDC CHURCHILL | 33 | 4927.92 | 91% |
| CDC COPELAND | 40 | 4887.14 | 111% |
| CDC COPPER | 31 | 5913.02 | 87% |
| ESMA | 26 | 5378.11 | 73% |
| FB209 | 40 | 5170.65 | 112% |
| KWS CORALIE | 26 | 5468.47 | 72% |
| KWS KELLIE | 26 | 5285.08 | 71% |
| SIRISH | 29 | 5675.93 | 80% |
| TORBELLINO | 28 | 5431.88 | 78% |
| TR16742 | 32 | 4864.58 | 88% |
| TR18647 | 36 | 4803.08 | 101% |
| TR18747 | 38 | 5633.89 | 106% |
| TR18748 | 39 | 5276.69 | 107% |
| TR18749 | 37 | 5729.68 | 102% |

## OATS-2020

| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
|---|---|---|---|
| CDC DANCER | 96 | 4078.76 | 100% |
| AAC DOUGLAS | 109 | 4877.64 | 113% |
| AC MORGAN | 122 | 5253.53 | 127% |
| CDC ENDURE | 104 | 4597.03 | 109% |
| CDC SKYE | 134 | 5897.30 | 139% |
| CFA1502 | 121 | 5330.67 | 126% |
| CS CAMDEN | 110 | 4874.49 | 115% |

| TRITICALE-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| BREVIS | 92 | 5708.63 | 100% |
| T256 | 71 | 4424.19 | 77% |
| T267 | 90 | 5139.51 | 97% |
| TYNDAL | 60 | 3385.08 | 65% |

| FLAX-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| CDC BETHUNE | 40 | 2492.77 | 100% |
| CDC GLAS | 42 | 2645.68 | 105% |
| AAC BRIGHT | 39 | 2445.95 | 97% |
| CDC DORADO | 40 | 2544.94 | 101% |
| FP2573 | 41 | 2590.83 | 103% |

| DURUM-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| STRONGFIELD | 51 | 3524.07 | 100% |
| AAC GOLDNET | 42 | 3067.69 | 83% |
| AAC GRAINLAND | 41 | 2954.60 | 81% |
| AAC STRONGHOLD | 35 | 2418.88 | 68% |
| BRIGADE | 41 | 2965.21 | 81% |
| CDC COVERT | 58 | 4094.27 | 113% |
| CDC DEFY | 32 | 2337.00 | 63% |
| DT591 | 43 | 3096.02 | 84% |
| DT897 | 51 | 3657.09 | 101% |
| TRANSCEND | 33 | 2419.97 | 65% |

| CWSP-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| CARBERRY | 37 | 2709 | 100% |
| AAC BRANDON | 49 | 3688 | 132% |
| AAC CASTLE | 58 | 4296 | 156% |
| AAC PENHOLD | 38 | 2858 | 104% |
| AC ANDREW | 58 | 4269 | 157% |
| CDC REIGN | 55 | 4079 | 150% |
| CS ACCELERATE | 54 | 4163 | 146% |
| HY2068 | 46 | 3344 | 125% |
| LNR15-1741 | 50 | 3748 | 134% |
| PASTEUR | 58 | 4361 | 158% |
| WPB WHISTLER | 82 | 4990 | 221% |

| CWRS-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| CARBERRY | 36 | 2732.8 | 100% |
| AAC BRANDON | 44 | 3300.2 | 122% |
| AAC BROADACRES | 51 | 3833.4 | 143% |
| AAC ELIE | 51 | 3913.5 | 140% |
| AAC MAGNET | 42 | 3192.4 | 117% |
| AAC REDSTAR | 35 | 2673.6 | 98% |
| AAC RUSSELL | 47 | 3587.5 | 131% |
| AAC STARBUCK | 52 | 3975.5 | 143% |
| AAC WARMAN VB | 47 | 3673.1 | 132% |
| AAC WHEATLAND VB | 51 | 3918.2 | 143% |
| BW1069 | 49 | 3723.3 | 137% |
| BW1093 | 39 | 2998.5 | 110% |
| BW5031 | 56 | 4137.9 | 157% |
| BW5044 | 39 | 2999.4 | 109% |
| BW5045 | 43 | 3248.8 | 119% |
| CDC EVOLVE | 65 | 3811.1 | 180% |
| CDC ORTONA | 38 | 2877.6 | 107% |
| CS JAKE | 36 | 2756.3 | 99% |
| CS TRACKER | 31 | 2345.9 | 86% |
| CS11200214-17 | 40 | 3075.4 | 112% |
| DAYBREAK | 41 | 3131.9 | 113% |
| ELLERSLIE | 44 | 3076.1 | 122% |
| LNR15-1405 | 34 | 2504.6 | 95% |
| PT598 | 43 | 3237.3 | 118% |
| PT599 | 45 | 3449.1 | 126% |
| PT652 | 52 | 4113.7 | 145% |
| REDNET | 41 | 3195.4 | 114% |
| SHEBA | 33 | 2510.3 | 93% |
| STETTLER | 31 | 2348.2 | 87% |
| SY GABRO | 38 | 2889.6 | 106% |
| SY STEEL | 38 | 2812.9 | 106% |
| SY TORACH | 45 | 3335.1 | 125% |


| FABA-2020 | | | |
|---|---|---|---|
| Varieties | Yield | Yield | % of check |
| Name | bu/ac | kg/ha | |
| NPZ 16.7610, 01 | 55 | 3723.29 | 100% |
| DL Tesoro, 01 | 63 | 4213.57 | 114% |
| NPZ 16.7601, 01 | 59 | 3965.43 | 107% |
| Snowbird, 01 | 58 | 3886.14 | 105% |
| CDC219-16, 01 | 51 | 3421.14 | 92% |
| Malik, 01 | 39 | 2641.86 | 71% |
| Fabella, 01 | 59 | 3987.14 | 108% |

## LENTILS-2020

| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
|---|---|---|---|
| CDC Lima CL, 01 | 23 | 1553.6 | 100% |
| CDC Nimble, 01 | 31 | 2077.9 | 134% |
| CDC Maxim CL SR, 01 | 22 | 1515.0 | 98% |
| CDC Simmie, 01 | 28 | 1895.4 | 122% |
| CDC Impulse CL, 01 | 34 | 2280.4 | 147% |
| CDC Proclaim, 01 | 33 | 2236.9 | 144% |

## SOYBEAN-2020

| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
|---|---|---|---|
| Renuka R2X, 01 | 17 | 1149.29 | 100% |
| PV 20s0006RR2X , 01 | 13 | 864.29 | 75% |
| Fresno RX2, 01 | 16 | 1051.86 | 92% |
| NSC Redvers RR2X, 01 | 13 | 875.71 | 76% |
| Torro R2, 01 | 25 | 1716.14 | 150% |
| Devo R2X, 01 | 13 | 886.86 | 77% |
| McLeod, 01 | 12 | 823.29 | 72% |
| NSC Watson RR2Y, 01 | 13 | 860.43 | 75% |
| NSC Wynyard RR2X, 01 | 17 | 1176.86 | 103% |
| Amirani R2, 01 | 14 | 927.86 | 81% |
| Nocoma R2, 01 | 16 | 1073.57 | 94% |

| YELLOW PEAS-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| AAC Barrhead | 54 | 3840 | 100% |
| AAC Carver | 61 | 4257.14 | 112% |
| LN4228 | 56 | 4082.86 | 103% |
| CDC Athabasca | 44 | 3197.14 | 81% |
| CDC Spectrum | 61 | 4304.29 | 113% |
| AAC Delhi | 60 | 4250 | 112% |
| CDC Inca | 50 | 3711.43 | 92% |
| CDC Amarillo | 64 | 4614.29 | 119% |
| CDC Ardill | 62 | 4485.71 | 114% |
| CDC Lewochko | 67 | 4825.71 | 124% |
| AAC Profit | 70 | 5032.86 | 129% |
| AAC Lacombe | 56 | 4061.43 | 104% |
| CDC Canary | 79 | 5571.43 | 147% |

| GREEN PEAS-2020 | | | |
|---|---|---|---|
| Varieties Name | Yield bu/ac | Yield kg/ha | % of check |
| Garde | 70 | 4821.43 | 100% |
| CDC Forest | 76 | 4950 | 108% |
| Blueman | 78 | 5385.71 | 111% |
| AAC Comfort | 73 | 4764.29 | 105% |
| CDC Limerick | 69 | 4714.29 | 99% |
| CDC Spruce | 80 | 4940 | 114% |

# YIELD AND QUALITY OF ANNUAL CROP MIXTURES AND ALTERNATIVES ANNUAL CROPS FOR FORAGE PRODUCTION IN ALBERTA

Silages are a vital feed component for cattle producers in Alberta and all around the globe. As an essential feed source, the farmer needs to understand which silage is good to grow according to their region's ecosystem. The annual silage trial is established to determine the adaptability of new silage crop and alternative silage crops in central Alberta.

The purpose of this project is to provide current knowledge about alternative silage production in Alberta. 2020 was the first year of the project establishment. The trials were seeded at Galahad and Viking research sites of BRRG. The trials include variety testing of silage oat, barley, triticale, winter/ spring cereal mix, cereal/pulse mix and alternatives (hybrid rye, forage radish, chicory, brassica, forage turnip, forage kale, millet, sorghum Sudan grass, phacelia, plantain).

The experimental studies were conducted in RCBD (randomized complete block design), assigned with four replications. Glyphosate was used as pre-seed burn-off on research plots. All three trials were seeded on pea stubble. The cereal pulse mix and winter-spring/cereal mix were seeded on May 25, 2020, and the alternative silage trial was seeded last on June 22, 2020. Standard fertilizer rate was applied, i.e., N:P:K:S=54:10:15:10 according to the research site's soil test report.

Several data were collected on each trial, including total precipitation and average daily temperature recorded through the onsite weather monitoring system. Visual assessment was also done on plant lodging. The silage was harvested according to its growth stages in August. A forage harvester was used to harvest cereal-pea mixtures and wheat-spring cereals. Each sample was used to determine percent moisture and quality; dry and wet weight was also recorded.

Yield and feed nutritional values are expressed in Tables 1, 2 and 3. Feed samples of each trial were sent to the lab for quality analyses, including CP (crude protein), TDN (total digestible nutrients), Ca (calcium), P (phosphorus), K (potassium) and Mg (magnesium). The actual yield is expressed in kg/ ha, and feed nutritional values are calculated in percent (%). In alternative forage, rye and millet showed highest dry matter yield as compared to other crops. The nutrient analyses were not significantly different as shown in Table 1. This year, no significant differences were found in dry matter yield of spring cereal mixture and cereal-pulse mixture; however an improvement in crude protein % were estimated in cereal-pulse mixture trials as shown in Figure 1. The economical analysis will be done at the end of the project.

Table 1. Range for yield category, provided in kg per hectare (source: Alberta Seed Guide). Silage crops are reported as average yields in Low, Medium and High in Alberta. This allows for comparison with the check when growing conditions and target yields are anticipated to be of low, medium or high productivity.

| Crop | Low (kg/ha) | Medium (kg/ha) | High (kg/ha) |
|---|---|---|---|
| Oats | < 19770 | 19770 - 27180 | >27180 |
| Triticale | <24710 | 24710 - 30888 | >30888 |
| Barley | <20175 | 20175 - 26900 | >26900 |
| Pulse mixture | <19770 | 19770 – 24710 | >24710 |

Table 2. Average range for feed nutritional value in different type of silages; average quantity is described in percent (Alberta Seed Guide association).

| Nutrient and Mineral | Normal Range % |
|---|---|
| Crude protein (CP) | 10-19 |
| Total digestible nutrients (TDN) | 54-64 |
| Calcium (Ca) | 0.6-1.5 |
| Phosphorus (P) | 0.17-0.33 |
| Magnesium (Mg) | 0.1-0.4 |
| Potassium (K) | 0.5-4.7 |

## Table 3. Alternative Forages-2020

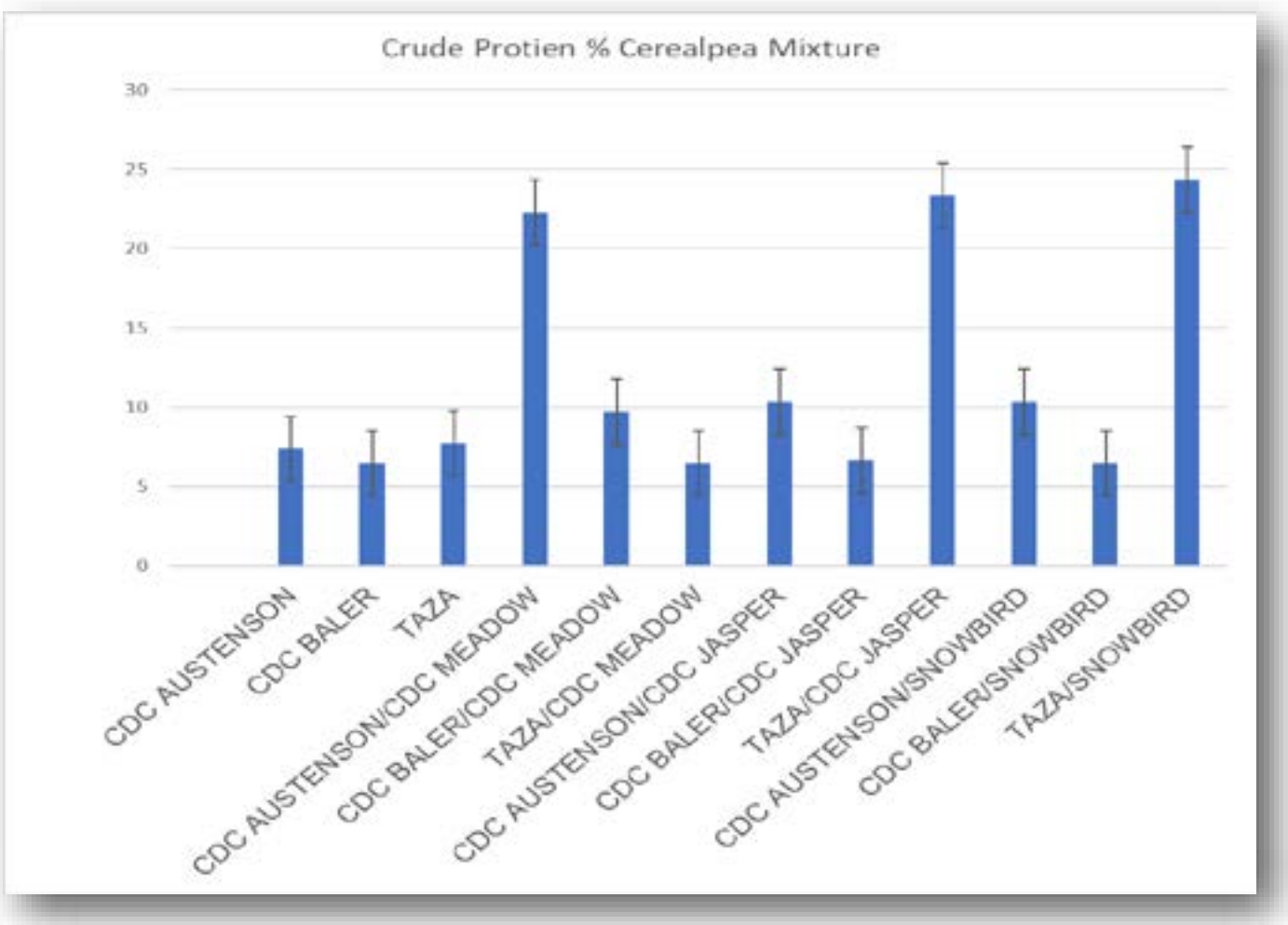
| Varieties | Yield | Feed Nutritional % | | | | | |
|---|---|---|---|---|---|---|---|
| | | CP | TDN | Ca | P | K | Mg |
| | kg/ha | % | % | % | % | % | % |
| CHICORY | 8897.14 | 14.88 | 64.55 | 0.94 | 0.26 | 3.31 | 0.22 |
| FORAGE BBRASSICA | 7653.57 | 12.00 | 59.52 | 1.26 | 0.26 | 2.76 | 0.24 |
| FORAGE KALE | 8032.14 | 13.79 | 67.73 | 2.50 | 0.21 | 3.58 | 0.41 |
| FORAGE RADISH | 7840.43 | 14.26 | 69.07 | 2.14 | 0.26 | 3.11 | 0.47 |
| FORAGE TURNIP | 6300.43 | 12.59 | 62.39 | 1.42 | 0.26 | 2.54 | 0.29 |
| HYBRID RYE | 9155.71 | 17.26 | 64.74 | 1.39 | 0.28 | 5.16 | 0.35 |
| MILLET | 9088.29 | 14.08 | 62.31 | 0.64 | 0.25 | 3.07 | 0.20 |
| PHACELIA | 7379.71 | 13.47 | 62.63 | 2.58 | 0.24 | 3.06 | 0.38 |
| PLANTAIN | 8961.43 | 14.93 | 64.38 | 1.60 | 0.24 | 2.94 | 0.31 |

## Table 4. Cereal-Pulse mixture-2020

| Varieties | Yield | Feed Nutritional % | | | | | |
|---|---|---|---|---|---|---|---|
| | | CP | TDN | Ca | P | K | Mg |
| | kg/ha | % | % | % | % | % | % |
| CDC AUSTENSON | 15011.43 | 7.39 | 59.52 | 0.15 | 0.24 | 1.31 | 0.10 |
| CDC BALER | 7595.43 | 6.48 | 55.7 | 0.23 | 0.19 | 2.0 | 0.08 |
| TAZA | 11706.14 | 7.75 | 60.9 | 0.24 | 0.19 | 1.25 | 0.11 |
| CDC AUSTENSON/CDC MEADOW | 9056.14 | 22.26 | 52.72 | 0.31 | 0.20 | 2.23 | 0.11 |
| CDC BALER/CDC MEADOW | 5120.71 | 9.72 | 58.36 | 0.32 | 0.21 | 1.68 | 0.14 |
| TAZA/CDC MEADOW | 9196.14 | 6.5 | 57.09 | 0.2 | 0.16 | 1.32 | 0.10 |
| CDC AUSTENSON/CDC JASPER | 5778.29 | 10.37 | 55.45 | 0.27 | 0.26 | 1.76 | 0.11 |
| CDC BALER/CDC JASPER | 7182.57 | 6.66 | 55.2 | 0.28 | 0.18 | 2.42 | 0.13 |
| TAZA/CDC JASPER | 9398.57 | 23.36 | 55.26 | 0.26 | 0.13 | 1.46 | 0.10 |
| CDC AUSTENSON/SNOWBIRD | 9351.43 | 10.35 | 56.36 | 0.33 | 0.26 | 1.74 | 0.11 |
| CDC BALER/SNOWBIRD | 3988.50 | 6.48 | 55.7 | 0.23 | 0.19 | 2.0 | 0.08 |
| TAZA/SNOWBIRD | 5811.80 | 24.35 | 56.77 | 0.22 | 0.24 | 1.69 | 0.10 |

**Table 5. Winter spring/cereal mixture-2020**

| Varieties | Yield | Feed Nutritional % | | | | | |
|---|---|---|---|---|---|---|---|
| | | CP | TDN | Ca | P | K | Mg |
| | kg/ha | % | % | % | % | % | % |
| PRIMA/CDC AUSTENSON | 24075.43 | 9.46 | 61.8 | 0.21 | 0.22 | 1.56 | 0.14 |
| PRIMA/CDC BALER | 16909.29 | 7.1 | 57.53 | 0.22 | 0.2 | 2.19 | 0.12 |
| PRIMA/TAZA | 19247.14 | 7.77 | 58.63 | 0.19 | 0.21 | 1.49 | 0.1 |
| AAC WILDFIRE/CDC AUSTENSON | 22394.71 | 6.66 | 56.02 | 0.26 | 0.15 | 1.41 | 0.11 |
| AAC WILDFIRE/CDC BALER | 17545.71 | 7.04 | 57.95 | 0.19 | 0.23 | 1.96 | 0.11 |
| AAC WILDFIRE/TAZA | 21250.71 | 8.28 | 58.62 | 0.18 | 0.22 | 1.46 | 0.08 |
| BOBCAT/CDC AUSTENSO | 22315.43 | 8.31 | 60.43 | 0.29 | 0.2 | 1.55 | 0.17 |
| BOBCAT/CDC BALER | 18393.57 | 6.79 | 58.64 | 0.18 | 0.22 | 1.86 | 0.13 |
| BOBCAT/TAZA | 21525.71 | 10.42 | 58.1 | 0.21 | 0.28 | 2.07 | 0.12 |
| CDC AUSTENSON | 20234 | 6.87 | 57.97 | 0.2 | 0.2 | 1.91 | 0.12 |
| CDC BALER | 22501 | 6.38 | 55.92 | 0.27 | 0.14 | 1.44 | 0.12 |
| TAZA | 15751.3 | 8.44 | 59.34 | 0.17 | 0.5 | 1.35 | 0.1 |



## Table 6. Regional Silage Oats-2020

| Varieties | Yield | Feed Nutritional % | | | | | |
|---|---|---|---|---|---|---|---|
| | | CP | TDN | Ca | P | K | Mg |
| | kg/ha | % | % | % | % | % | % |
| CDC BALER | 14290.79 | 9.86 | 53.62 | 0.32 | 0.31 | 3.47 | 0.16 |
| AC MORGAN | 14570.47 | 6.26 | 50.79 | 0.26 | 0.24 | 2.9 | 0.12 |
| AC JUNIPER | 15296.07 | 6.59 | 56.68 | 0.27 | 0.35 | 2.38 | 0.11 |
| CDC ARBORG | 15150.76 | 4.96 | 46.98 | 0.32 | 0.24 | 3.14 | 0.12 |
| CDC HAYMAKER | 14132.04 | 6.58 | 53.41 | 0.3 | 0.3 | 3.22 | 0.12 |
| CDC NASSER | 15619.26 | 6.55 | 54.12 | 0.27 | 0.27 | 3.03 | 0.13 |
| CDC SEABISCUIT | 13788.54 | 8.47 | 55.39 | 0.36 | 0.31 | 2.77 | 0.15 |
| CS CAMDEN | 14622.33 | 5.53 | 56.47 | 0.25 | 0.31 | 1.98 | 0.1 |
| MURPHY | 14572.26 | 8.78 | 51.79 | 0.38 | 0.34 | 3.38 | 0.12 |
| ORE 3542 M | 9466.03 | 5.92 | 51.66 | 0.3 | 0.28 | 3.68 | 0.12 |

## Table 7. Regional Silage Triticale-2020

| Varieties | Yield | Feed Nutritional % | | | | | |
|---|---|---|---|---|---|---|---|
| | | CP | TDN | Ca | P | K | Mg |
| | kg/ha | % | % | % | % | % | % |
| TAZA | 19431.14 | 6.34 | 56.16 | 0.2 | 0.21 | 1.63 | 0.09 |
| AAC AWESOME | 20338.57 | 8.94 | 57.97 | 0.22 | 0.23 | 1.43 | 0.09 |
| AAC DELIGHT | 20180.43 | 6.64 | 58.15 | 0.19 | 0.22 | 1.37 | 0.1 |
| AAC PARAMOUNT | 20342.86 | 7.01 | 59.8 | 0.15 | 0.28 | 1.65 | 0.1 |
| AC ANDREW | 18575.71 | 6.03 | 56.98 | 0.17 | 0.2 | 1.64 | 0.06 |
| AC SADASH | 18107.14 | 8.5 | 54.37 | 0.21 | 0.26 | 1.76 | 0.1 |
| KWS ALDERON | 19129 | 5.74 | 61.57 | 0.15 | 0.22 | 1.29 | 0.05 |
| BUNKER | 20398.57 | 6.49 | 59.55 | 0.16 | 0.18 | 1.22 | 0.1 |
| SUNRAY | 17749.71 | 8.46 | 59.35 | 0.18 | 0.24 | 1.73 | 0.09 |
| T256 | 20807.86 | 10.12 | 56.25 | 0.18 | 0.25 | 2.18 | 0.12 |

# MANAGING MALT GENETICS FOR FEED END-USE

The Battle River Research Group is collaborating in a research study with Lakeland College to increase feed barley profitability on Alberta farms. The "Managing Malt Genetics for Feed End-use" project, funded by the Alberta Barley Commission, tested whether growing malt barley varieties for feed end-use could improve yields and profitability. The project was established at Vermilion (Lakeland College) and Forestburg (Battle River Research Group) in 2019.

The research trial investigated three malt varieties (CDC Copeland, AAC Synergy and CDC Bow) and three feed varieties (CDC Austenson, Brahma and Oreana) under low nitrogen (80 lb/ac total N - malt management) and high nitrogen (125 lb/ac total N - feed management). CDC Copeland (reg. in 1999) was included as the large acre malt variety check, while CDC Austenson (reg. in 2009) was the large acre feed variety check.

In 2019, at Forestburg, feeds and malts yielded in similar quantities and the feed variety Oreana had highest yield than all other varieties. No significant differences were observed in the yields of the three malt varieties at Forestburg as compared to feed varieties yields. In 2020, overall barley yield was less than 2019; however, malt varieties production is significantly lower than feed varieties. The Oreana feed barley variety yielded higher than all other varieties at Forestburg in both years of the study.

In both years, higher rates of N improved yield for each variety, but malt varieties were more responsive towards higher N rates as compared to feed as shown in Figure 2. CDC Bow yielded 17% more at higher N rates (140kg/ha). On the other hand, CDC Copeland responded negatively in 2019, and in 2020 we did not record a significant increase in yield (1.3 %).

**Figure 1. Malt and feed varieties yield (bu/ac) comparison for year 0f 2019 and 2020**

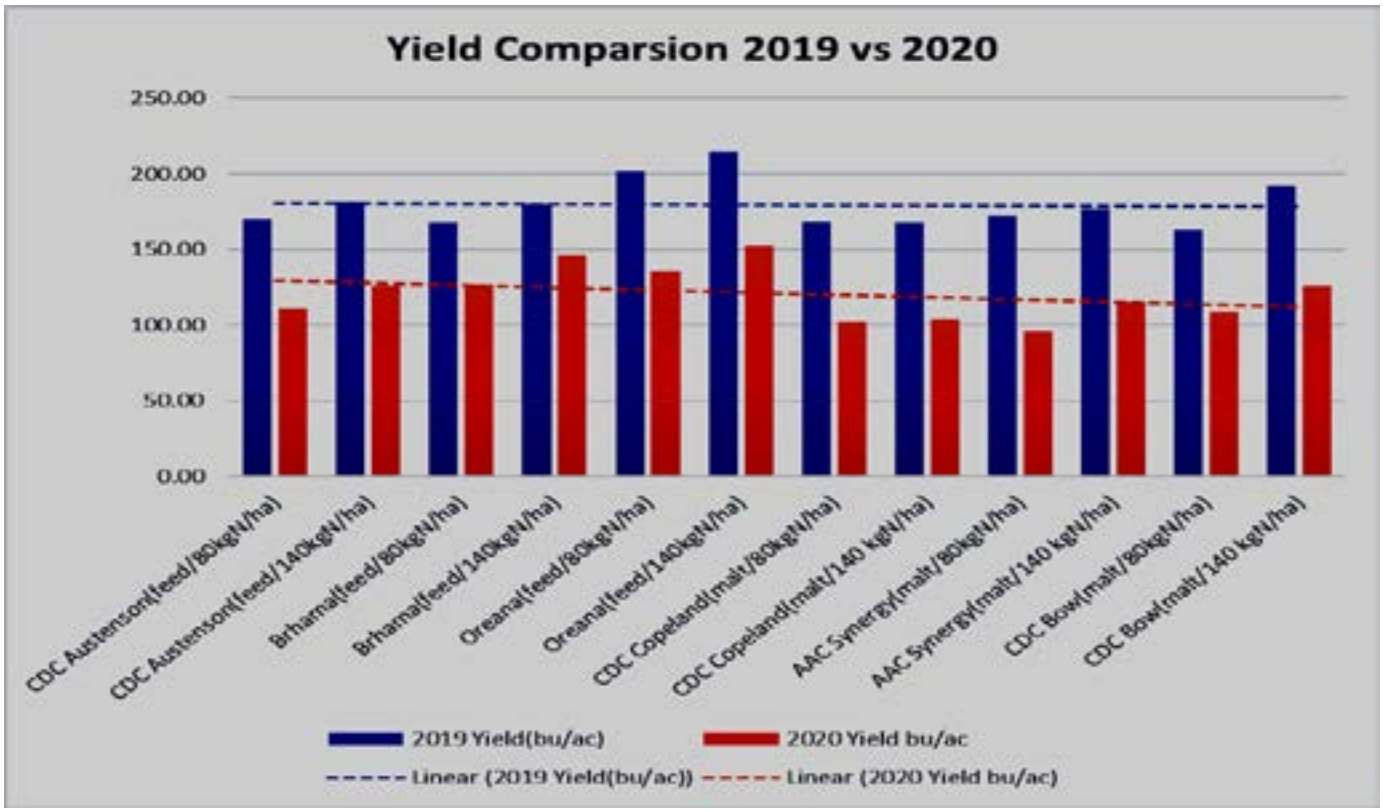
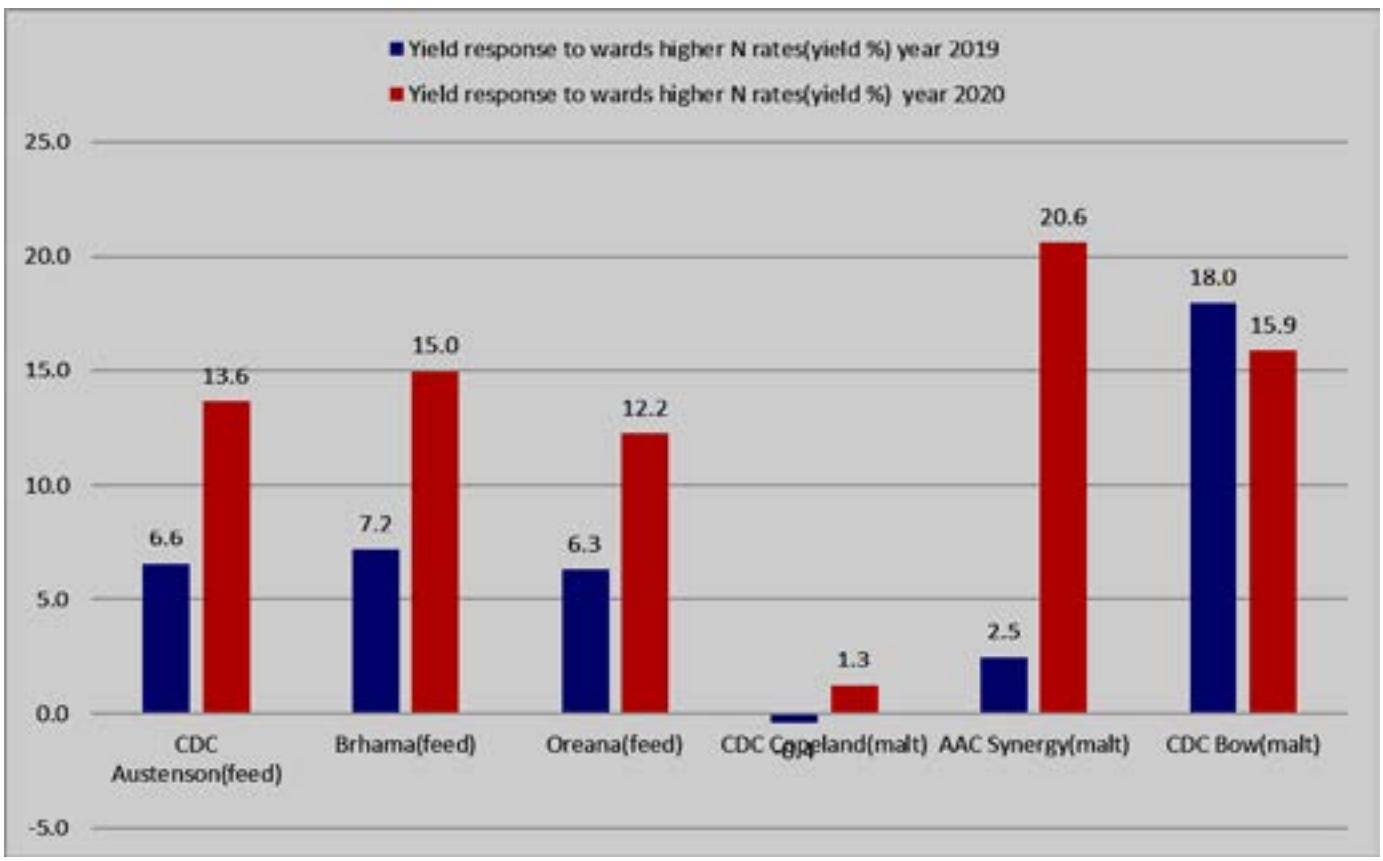



**Figure 2. Barley yield difference towards N rates 80 and 140 kg/ha within each variety.**



# EVALUATION OF THE INTERACTION BETWEEN SEED SIZE AND SEEDING DEPTH ON CANOLA ESTABLISHMENT AND YIELD

The cost of canola seed is getting higher day by day. Producers are always looking for cost-effective seeding options. Development of new canola traits and precision planting equipment may alter seeding rates, depth recommendations and reduced overall seeding expense for canola.

This project was established to investigate the interactions of canola seed size and depth that has not yet been reported. The Canadian Agricultural Partnership program funded the project.

During 2020, the first year of the research, experiments were conducted in several locations across Alberta: Forestburg, Bonnyville and Falher, by Battle River Research Group (BRRG), Lakeland Applied Research Association (LARA), and SARDA Ag Research. The sites were located at Forestburg (BRRG), Fort Kent (LARA) and Falher (SARDA). The duration of the project is 2020-2023. The study aims to provide producers with the ability to improve on-farm production by understanding the interaction between seed size and planting depth on canola establishment and yield.

The study proved highly beneficial in unfavourable weather conditions where increasing planting depth allowed available soil moisture to be reached in the dry season. The following four seed size classes were utilized: 2.0-3.0 (TKW), 4.0-4.6 (TKW), 4.7-4.8 (TKW), and 4.9-5.7 (TKW), and seeded at three different planting depths: 1 cm, 2.5 cm, and 4 cm. The trial was laid in a randomized complete block design (RCBD) with four replications to reduce error.

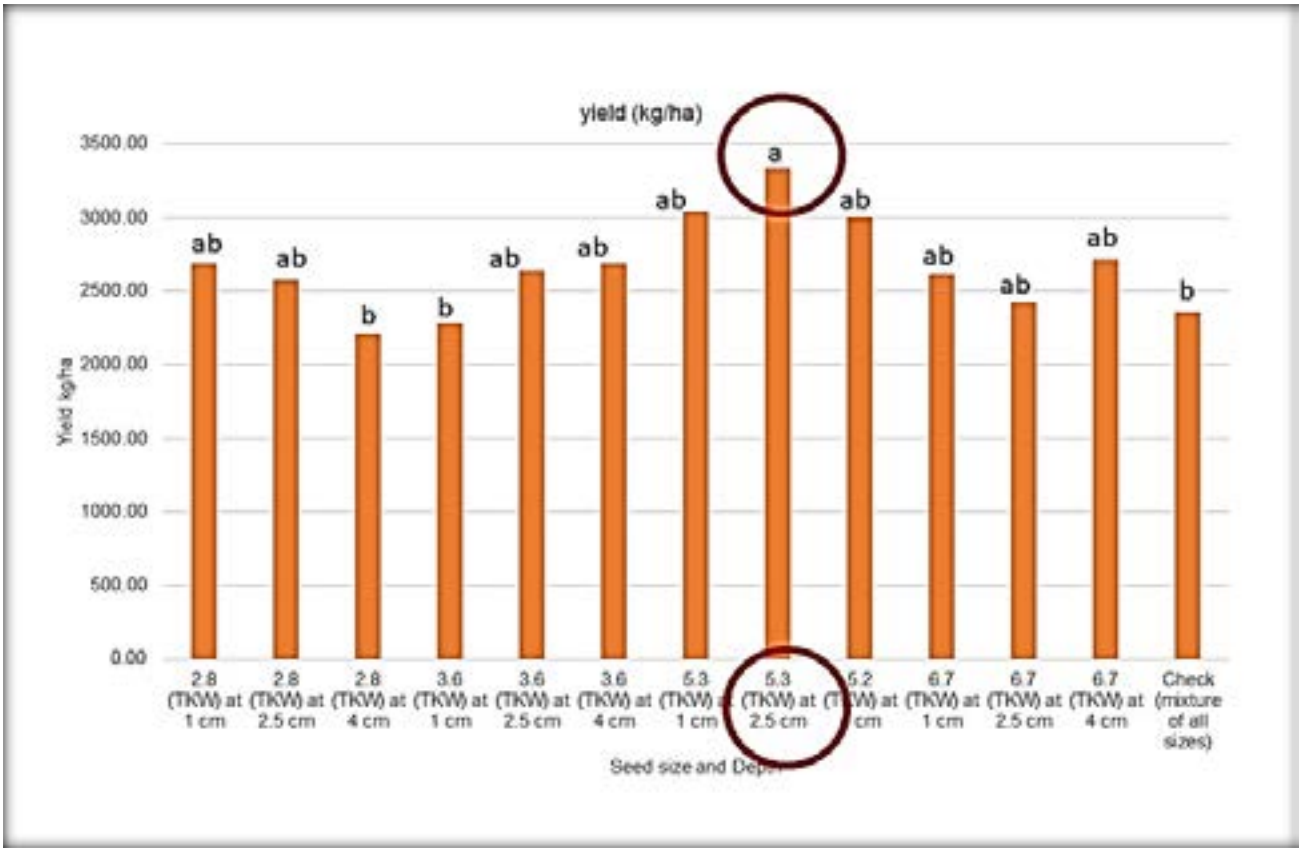
The appropriate fertilizer blend was applied to the research site based on a 100% recommendation. Agronomic characters evaluated included measurement of total precipitation and average daily temperature recorded, soil moisture at the time of seeding, emergence assessed through ½ $m^2$ plant counts, days to flower and maturity, plant height per plot and grain yield. No significant differences were observed in plant emergence and plant height; however, the canola's highest yield was recorded at a depth of 2.5 cm with a seed size of 5.3 (TKW).

References:


Harker, K. N., O'Donovan, J. T., Smith, E. G., Johnson, E. N., Peng, G., Willenborg, C. J., Gulden, R. H., Mohr, R., Gill, K. S. and Grenkow, L. A. 2015. Seed size and seeding rate effects on canola emergence, development, yield, and seed weight. Can. J. Plant Sci. 95: 18

https://www.canolacouncil.org/canola-encyclopedia/plant-establishment/seed-and-fertilizer-placement/

Kenneth E. Lamb and Burton L. Johnson, 2004. Seed Size and Seeding Depth Influence on Canola Emergence and Performance in the Northern Great Plains. Agron. J. 96:454–461




| | Treatment | Plant emergence (plant /m$^2$) | Plant height (cm) | Yield (kg/ha) | Mean Difference Yield |
|---|---|---|---|---|---|
| 1 | 2.8 (TKW) at 1 cm | 37 | 116.30 | 2685.71 | ab |
| 2 | 2.8 (TKW) at 2.5 cm | 43 | 112.50 | 2571.43 | ab |
| 3 | 2.8 (TKW) at 4 cm | 38 | 111.30 | 2214.29 | b |
| 4 | 3.6 (TKW) at 1 cm | 40 | 112.50 | 2285.71 | b |
| 5 | 3.6 (TKW) at 2.5 cm | 39 | 111.00 | 2642.86 | ab |
| 6 | 3.6 (TKW) at 4 cm | 40 | 115.80 | 2685.71 | ab |
| 7 | 5.3 (TKW) at 1 cm | 43 | 114.30 | 3042.86 | ab |
| 8 | 5.3 (TKW) at 2.5 cm | 45 | 116.00 | 3328.57 | a |
| 9 | 5.2 (TKW) at 4 cm | 51 | 111.30 | 3000.00 | ab |
| 10 | 6.7 (TKW) at 1 cm | 40 | 129.00 | 2614.29 | ab |
| 11 | 6.7 (TKW) at 2.5 cm | 52 | 109.80 | 2428.57 | ab |
| 12 | 6.7 (TKW) at 4 cm | 47 | 110.80 | 2714.29 | ab |
| 13 | Check (mixture of all sizes) | 41 | 114.00 | 2357.14 | b |

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).

# COMPARISON OF TRADITIONAL CROP INPUTS AND BIO-STIMULANTS APPLICATION ON WHEAT, CANOLA, AND PEAS IN ALBERTA

Small plot research was conducted to assess the use of commercially available biostimulants products and packages. The study was funded by the Canadian Agricultural Partnership fund (CAP). The duration of the project is 2019-2022. The study was established in central, southern and northern Alberta with the collaboration of BRRG, Farming Smarter and SARDA Ag Research.

The established study's primary objective is to evaluate and compare commercially available biostimulants effects on canola, pea and wheat production. Six soil amendment treatments, including traditional, advanced, traditional + ATP Chemtrition, traditional + Alpine Phazed Nutrition Program, traditional + Stoller Canada Advanced Program and traditional + Penergetic (at seeding & foliar) were applied on wheat, canola and peas. For each crop, treatment was laid out in randomized complete block design (RCBD) with four replications. The applied biostimulants packages did not show any significant differences for each crop at each research site in 2020.

Analysis of variance (ANOVA) was used to determine the statistical significance of fixed factors assessed at $\alpha = 0.05$. Post-hoc mean separation of statistically significant treatments was performed using least significant differences (LSD).

Crop yield varied significantly across study locations (Figure 1), which is expected due to differing growing conditions. The Forestburg location received a late season hailstorm which may have reduced crop yields. Wheat yield was higher for the advanced treatment compared to traditional treatment at the Lethbridge and Falher sites (Figure 3). Other biostimulants treatments did not show a statistically significant difference in wheat yield at these sites. At the Forestburg site, there was no difference in wheat yield among treatments, with the exception of traditional + Stoller treatment that led to lesser yield (Figure 2). Canola yield did not vary significantly across different treatments ($p = 0.87$; Table 1). For field pea, the effect of treatments on yield varied across study locations, as indicated by significant interaction between treatment and location ($p = 0.01$; Table 1). At Lethbridge, there was a significant increase in pea yield with the advanced treatment compared to traditional inputs, traditional + Alpine, traditional + ATP and traditional + Penergetic treatments (Figure 4). Additionally, traditional + Stoller treatment increased pea yield compared to traditional, and traditional + ATP treatments (Figure 3). However, there was no effect of treatments on pea yield at Falher and Forestburg locations (Figure 3).

Seed protein content was available at this time for only the Lethbridge location, which was found to be statistically similar between treatment for all crops (Table 1). For biomass, wet weight was measured for Lethbridge and Falher locations, while dry weight was measured at Forestburg location. Biostimulants treatments did not significantly affect wet biomass weight at Lethbridge and Falher, and dry biomass weight at Forestburg for any crop (Table 1).

**Table 1. F-values and p-values from analysis of variance for the effect of biostimulant treatments on yield, wet and dry biomass, and seed protein content for wheat, pea and canola.**

| | Wheat | | Canola | | Field pea | |
|---|---|---|---|---|---|---|
| | F-value | p-value | F-value | p-value | F-value | p-value |
| Yield (kg ha$^{-1}$) | | | | | | |
| Treatment | 2.7 | 0.03 | 0.4 | 0.87 | 1.2 | 0.32 |
| Location | 98.0 | <0.001 | 604.9 | <0.001 | 426.1 | <0.001 |
| Trt*Loc | 1.3 | 0.26 | 1.7 | 0.12 | 2.5 | 0.01 |
| Wet biomass (g) [Lethbridge and Falher] | | | | | | |
| Treatment | 0.85 | 0.53 | 1.09 | 0.38 | 1.05 | 0.41 |
| Location | 46.0 | 0.001 | 130.4 | <0.001 | 99.27 | <0.001 |
| Trt*Loc | 0.88 | 0.51 | 0.99 | 0.44 | 1.38 | 0.26 |
| Dry biomass (g) [Forestburg] | | | | | | |
| Treatment | 0.63 | 0.68 | 0.66 | 0.66 | 0.80 | 0.57 |
| Protein [Lethbridge] | | | | | | |
| Treatment | 0.53 | 0.75 | 0.74 | 0.60 | 1.60 | 0.23 |

**Figure 2. Wheat yield for different treatments at various study locations (FB – Forestburg; LB – Lethbridge; FL – Falher).**

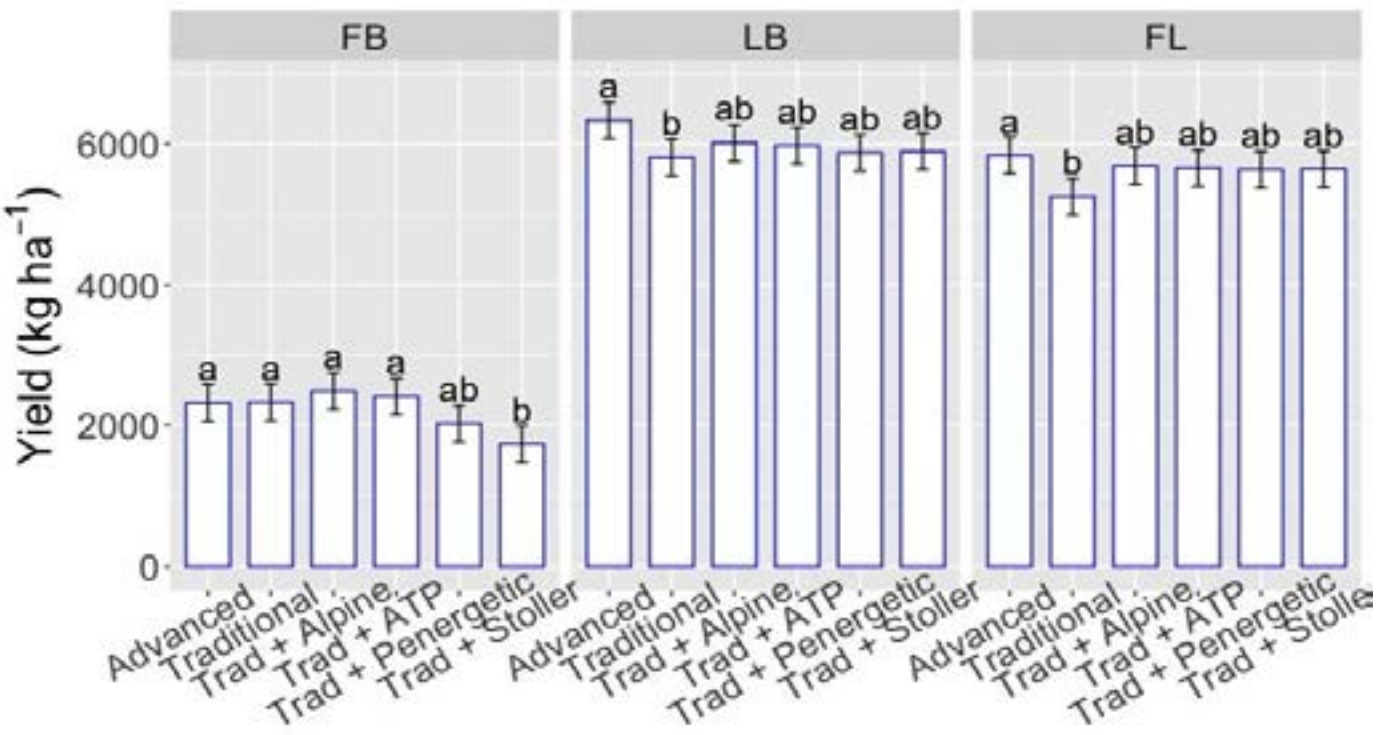
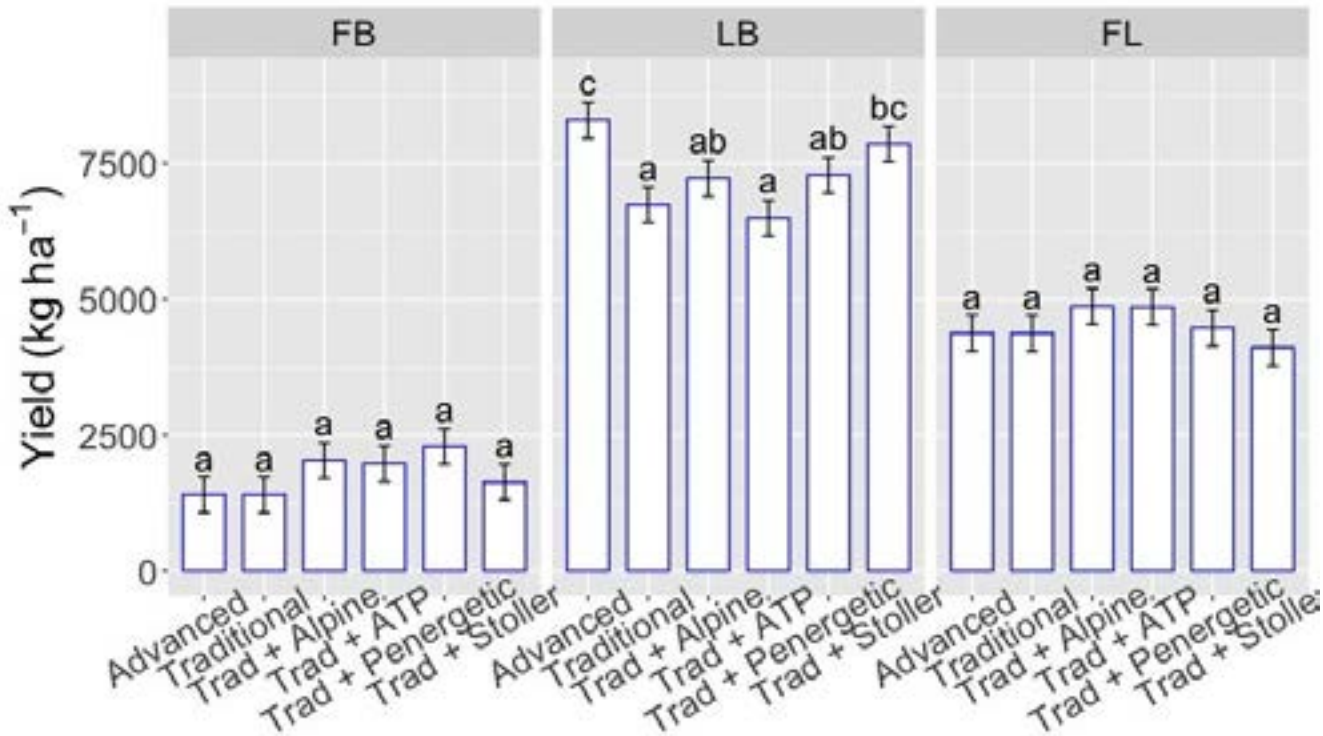


**Figure 3. Pea yield for different treatment at various study locations (FB – Forestburg, LB – Lethbridge, FL – Falher).**




# ULTRA EARLY SEEDING OF SPRING WHEAT VARIETIES

The shorter growing season of spring wheat usually results in limited grain yield in Alberta. Early seeding can be a strategy to help producers lessen the impact of the short growing season on spring wheat. However, the decision of seeding is entirely weather-dependent, such as how early farmers can seed while avoiding the risk of spring frost and operational limitations.

Previous research reported that the ultra-early planting of spring wheat at soil temperatures of 2 to 6 0C can increase yield, improve grain quality, and result in earlier maturity. It may have the extra potential advantage(s), such as reducing herbicide use and diseases with a broader harvesting window (Collier et al., 2020).

Last spring, a research project was initiated to determine the benefits of ultra-early planting of spring wheat in east-central Alberta. The experimental site was established in Forestburg, AB, by the Battle river research group. Two early-maturing spring wheat varieties (AAC Brandon and AAC Connery) were assessed for the impacts of three seeding rates (1.2, 1.75, 2.5 bu/ac) and two seeding dates (April 13, 2019, and May 14, 2019 ). The soil temperatures were recorded at 40C and 70C in April and May, respectively, at the time of seeding.

In 2019, undetermined differences were observed on the yield quantities within seeding dates and seeding rates; however, the AAC Connery yielded more than AAC Brandon. The grain yield was not significantly different within seeding dates and rates.

In 2020, early seeding yielded more than standard date seeding, as shown in figure 2; however, this year, the protein content % of grain was higher in regular date seeding treatments.

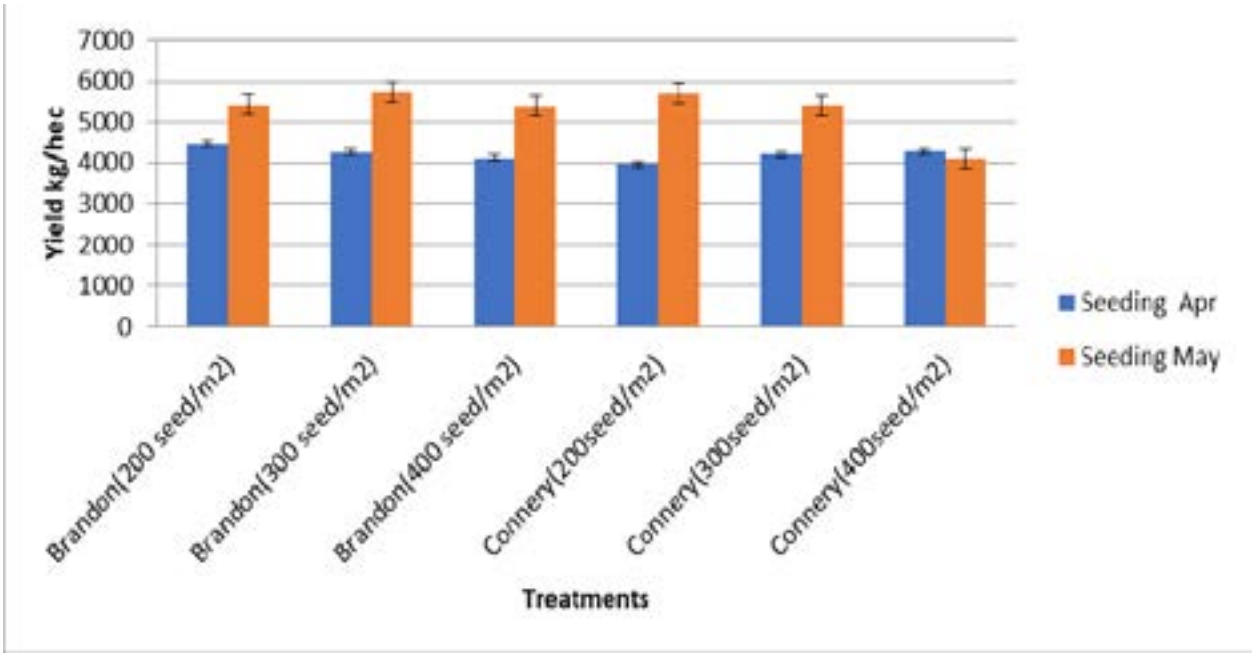
The samples' grade analysis was sent to the SGS lab, but due to wheat midge damage, sample results were not great this year. The highest seeding rate ( 400 seed/m2) produced a higher yield under both seeding dates for AAC Brandon. Though, no significant differences were observed for Connery.

We have entirely opposite outcomes both year, so we rely upon third-year results to conclude the experiment's outcome.

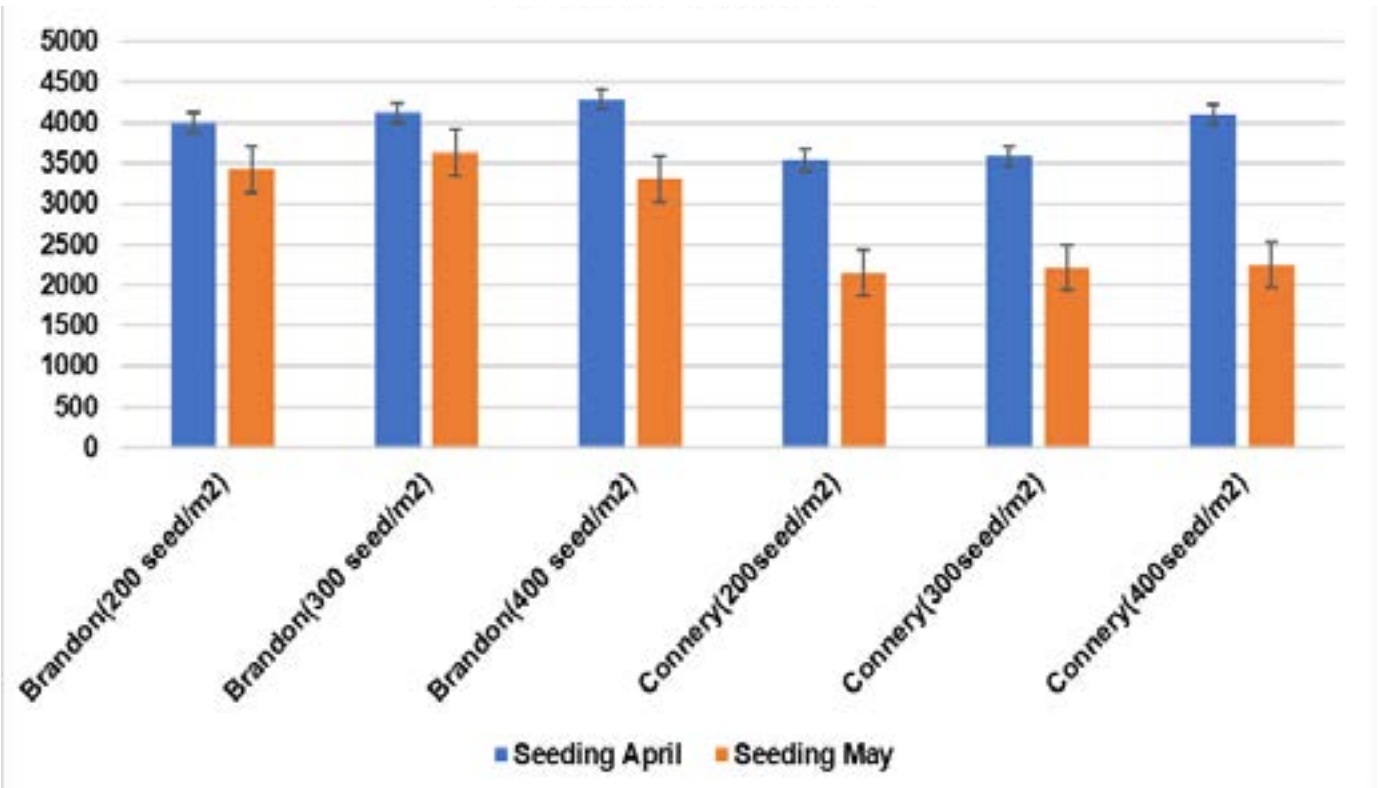
Thanks to the Alberta Wheat Commission and Canadian Agriculture Partnership program for funding this project. References

Collier GRS, Spaner DM, Graf RJ, and Beres BL (2020) The Integration of Spring and Winter Wheat Genetics with Agronomy for Ultra-Early Planting into Cold Soils. Front. Plant Sci. 11: 89.doi: 10.3389/fpls.2020.00089

## Yield kg/ha 2019




## Yield kg/ha 2020



# STRATEGIC GOAL 4 | 2020 PROGRESS

## Transfer unbiased updated Knowledge and technology information with regional producers

### 2020 Extension Overview

Overall, 2020 was a good year for BRRG. Due to COVID-19, we were all stuck and were not able to conduct physical events this year. BRRG took advantage of tech and successfully connected with our producers through webinars, Twitter, YouTube and Facebook. We also set up and opened our research sites for physical visits with safety measures, and arranged a physical crop walk event in 2020.

BRRG did not give up. With webinars and new regional ag services changes, BRRG decided to provide one-on-one consultancy to our producers. In November 2020, we organized our first specialist on-call free consultancy events for producers. With the positive response from our producers, we are continuing with the specialist on-call services in 2021 on a monthly basis with different specialists.

In addition to online events, we set up our research sites for visitors. We uploaded our field videos on our YouTube channel. We also put our publications including: 2019 BRRG At A Glance; Regional Variety Trial 2019; Over the Fence Line 2020 summer newsletter; and, this digital Annual Report 2020. Our publications are sent to all members of BRRG through email.

We also published collaborative articles on Agri News with other associations.

1. Interactive Forage Species Selection Tool for Western Canada (speakers: Karin Schmid & Dianne Wester Lund)
2. As we look at building soil health through regenerative grazing, It starts with a good pasture (speaker: Steve Kenyon)
3. Feed Quality and Lactating Cows (speaker: Barry Yaremcio)
4. Forage Mixture Strategies for Hay and Pasture (speaker: Grant Lastiwka)
5. Farm Cash Webinar 2020
6. On-call consultancy: Specialist on call (Barry Yaremcio)
7. Online Field Day presentations (Annual and Perennials FAQ)
8. Crop walks
9. YouTube videos (silage trials)
10. RVT 2019 (January 2020)
11. BRRG 2019 at a Glance (January 2020)
12. Summer newsletter (June 2020)
13. Annual Report 2020 BRRG ( January 2021)
14. Annual Growers Meeting 2020

**Membership/subscription**

In 2020, BRRG made subscription and membership free for all producers.


Battle River Research Group
Specialist On Call
+1-403-741-6032
Call for free consultations
November 3rd, 2020
9 AM to 3PM
Pre-registration is required
Register at
https://www.battleriverresearch.com
/resources
or call us @780-582-7308


Battle River Research Group
Battle River Research Group
In Person Guided Crop Walk
August 17 —August 18, 2020


Battle River Research Group
DID YOU EXPLORE
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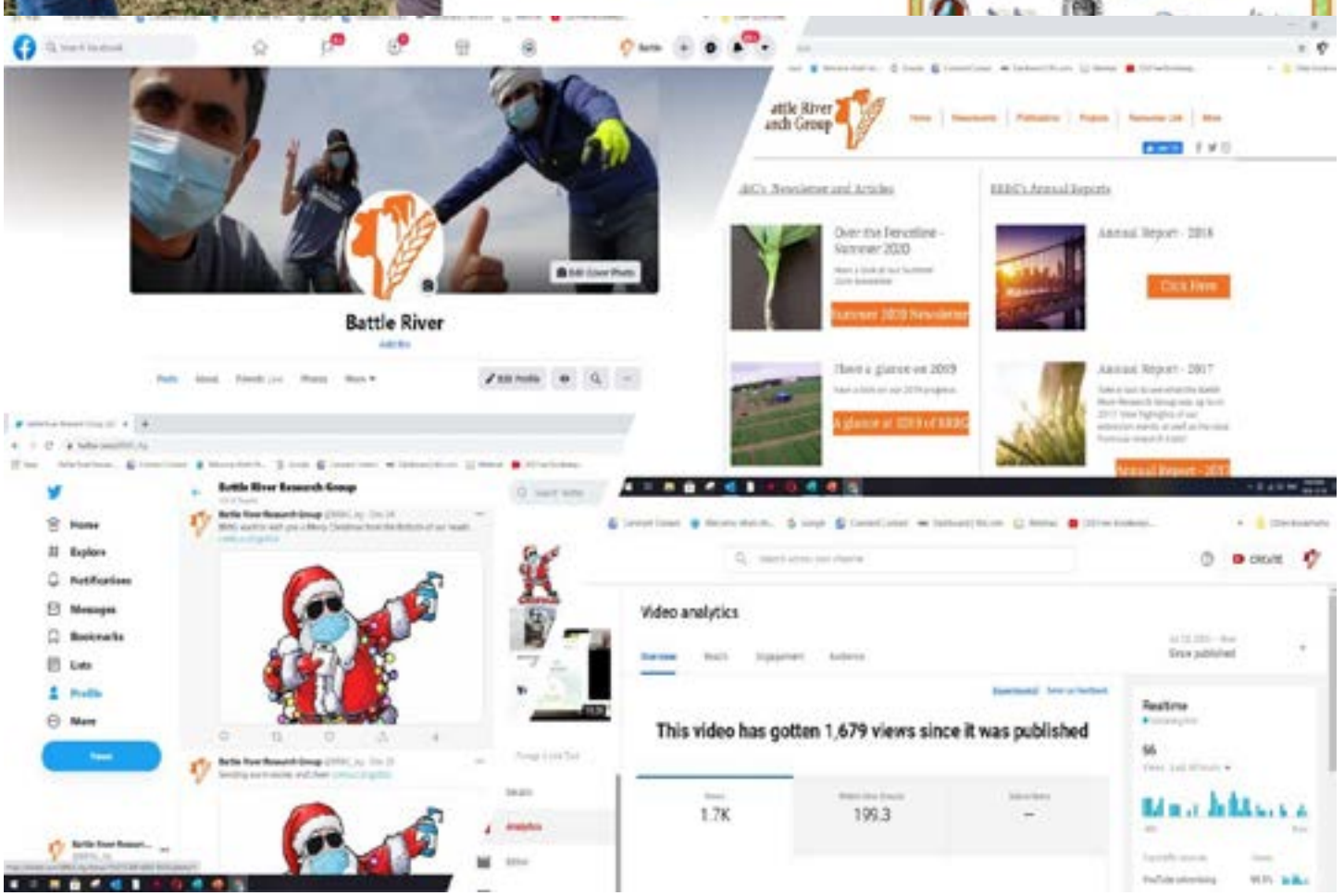

Battle River
Video analytics
This video has gotten 1,679 views since it was published
1.7K
199.3

# WHEAT MIDGE FORECAST 2021

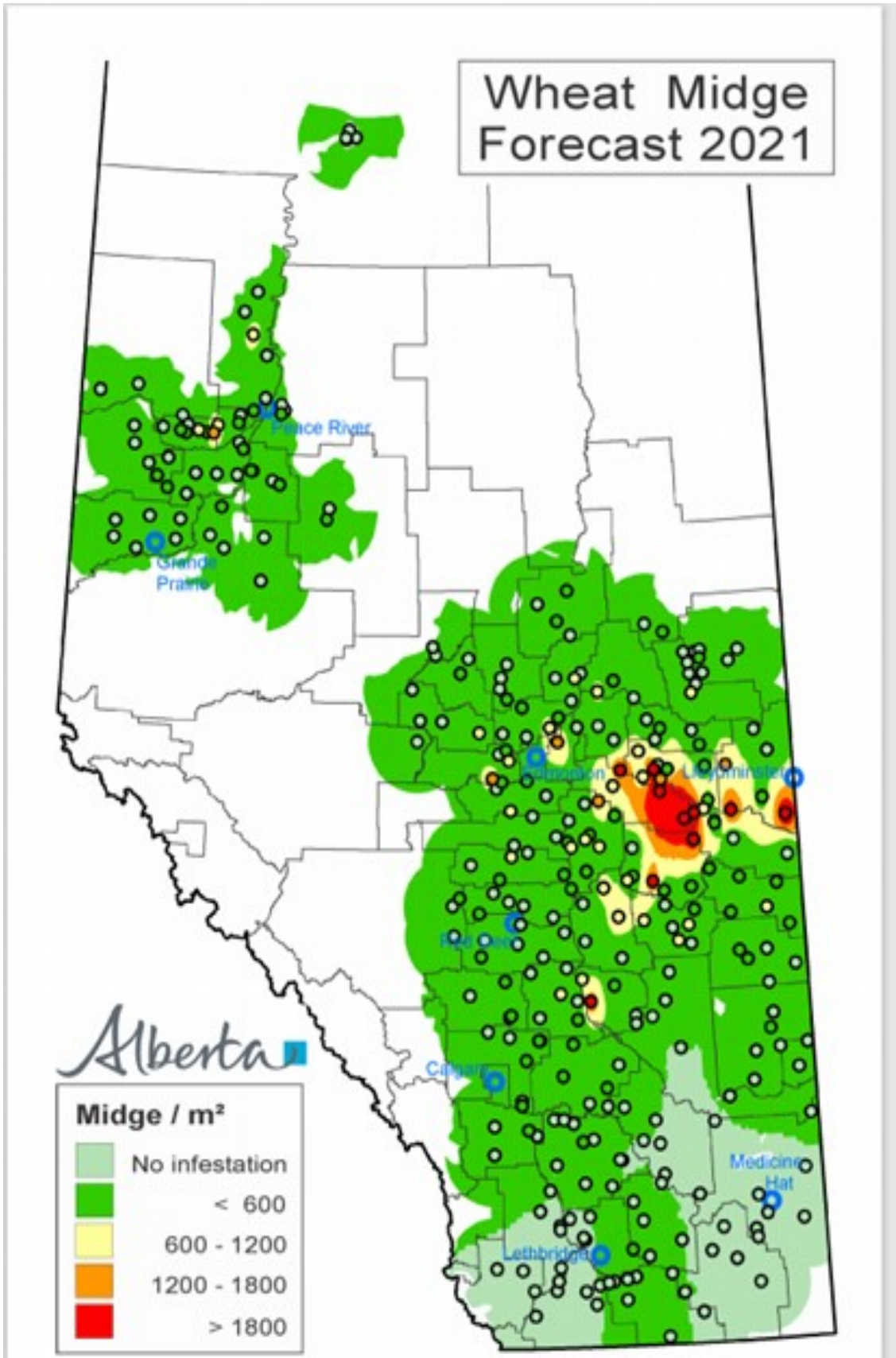
The wheat midge forecast for 2021 shows an increase in wheat midge risk in east-central Alberta. Producers in that area should be considering midge tolerant wheat and other integrated pest management (IPM) strategies to minimize this risk. Wheat midge in both areas will remain a concern in individual fields, especially if there is late seeding and higher than average rainfall in the spring.

Once midge has been established in a wheat field, it unlikely to ever disappear completely. Low-lying and moist areas in fields provide a refuge, enabling the population to survive even when conditions are not favourable in the rest of the field. These low population levels, however, also help sustain a population of natural enemies.

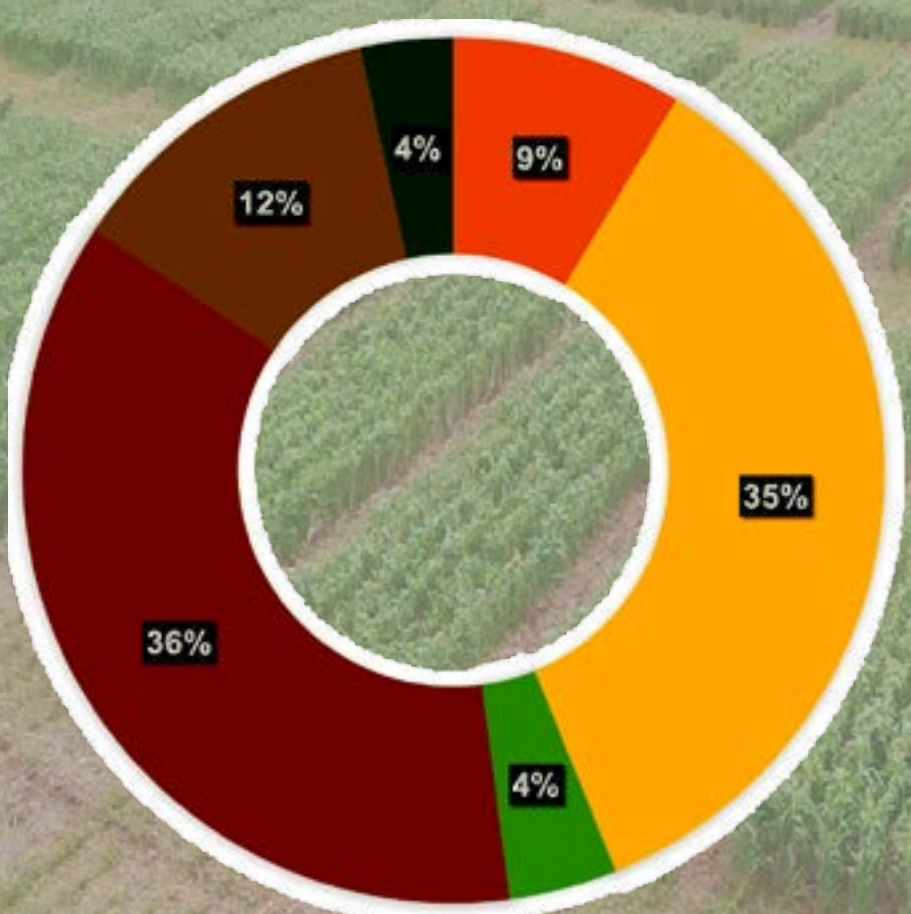
Parasitism of midge larvae by a small wasp species (*Macroglens penetrans*) has been essential in keeping wheat midge populations below the economic threshold in many areas. These beneficial wasps tend to thrive in warm, dry conditions. Parasitoid populations increase and decrease with changes in the midge population, and are very important in moderating Alberta's population levels. Parasitism levels in the 2020 survey samples were very low. Another way to control weed midge is to seed wheat midge tolerant varieties

Alberta Agriculture and Forestry conducted the wheat midge survey with Alberta's applied research associations, including Battle River Research Group. The report is adapted from the Alberta government website, Wheat Midge Forecast | Alberta.ca

| MIDGE TOLERANT VARIETIES | |
|---|---|
| **CWRS** | **CPSR** |
| AAC Alida VB | AC® ENCHANT VB |
| AACAMERON VB | AAC TENACIOUS VB |
| AAC JATHARIA VB | AAC FORAY VB |
| AAC LeRoy VB | **DURUM** |
| AAC PREVAIL VB | AAC MARCHWELL VB |
| AAC RUSSELL VB | CDC CARBIDE VB |
| AAC Starbuck VB | AAC Succeed VB |
| AAC Warman VB | **CNHR** |
| AAC Wheatland VB | AC® UNITY VB |
| AC® FIELDSTAR VB | AC® CONQUER VB |
| CDC TITANIUM VB | CDC Cordon CL Plus VB |
| CDC UTMOST VB | **CWSP** |
| SY Chert VB | KWS® CHARING VB |
| SY479 VB | KWS® SPARROW VB |
| AC® VESPER VB | AAC AWESOME VB |
| AC® SHAW VB | **CWSWS** |
| CDC Adamant VB | AAC INDUS VB |
| CDC HUGHES VB | AC® SADASH VB |
| CDC LANDMARK VB | AAC CHIFFON VB |
| AC® GOODEVE VB | **CWES** |
| | AC® GLENCROSS VB |
| Reference: Midge Tolerant Wheat | |


Wheat Midge
Forecast 2021
Peace River
Grande
Prairie
Edmonton
Lloydminster
Red Deer
Calgary
Medicine
Hat
Lethbridge
Alberta
Midge / m²
No infestation
< 600
600 - 1200
1200 - 1800
> 1800

# 2020 Funding Resources




- Munciplities
- Core Funding
- Commissions
- CAP
- industrial
- rvt/govt project

# We are Thankful to our Sponsors

Canadian Agriculture Partnership Program (CAP)
AB Agriculture & Forestry (AF)
Agricultural Research and Extension Council of Alberta (ARECA)
Farm Rite
Agriculture and Agri-Food Canada (AAFC)
Alberta Barley Commission
Alberta Beef Producers
Alberta Canola Producers Commission
Alberta Wheat Commission
Alberta Pulse Growers
Canola Council of Canada
Alberta Pulse Growers

**Thanks to our many other Sponsors and Advisors who helped in 2020**

Shelley Barkley
Barry Yaremcio
Union Forages
Agriculture and Agri-Food Canada

**Seed and Other Support:**

**Co-Operators**

Vincent Brothers
Grazing School for Women Committee
Battle River Watershed Alliance
Battle River Community Foundation
Battle River Implements
Nutrien Ag Solution Forestburg

**We apologize to anyone we unintentionally omitted**

Battle River Research Group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Alberta


Canada


Alberta Wheat
COMMISSION


Agriculture and
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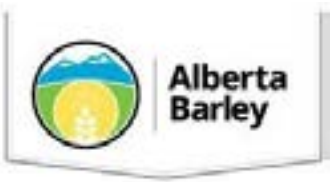
ALBERTA PULSE
GROWERS


ALBERTA BEEF,
FORAGE & GRAZING
CENTRE


Alberta
Barley


FARMCASH
Cash Advance Program


FarmRite


BATTLE RIVER
WATERSHED ALLIANCE


COUNTY OF STETTLER
NO. 6


ARECA
BEAVER COUNTY


COUNTY OF PAINTEARTH
№ 18


CAMROSE
COUNTY


FLAGSTAFF
COUNTY


Nutrien


SINCE 1969
Alberta Beef
Producers


UNION
FORAGE

# BATTLE RIVER RESEARCH GROUP | MEMBESHIPS

The Battle River Research Association (BRRG) came into existence after the amalgamation of the Battle River Forage Association and the Battle River Applied Research Association in 1993. We are in Forestburg, Alberta, allowing us to efficiently serve the east-central region of Alberta.

We serve the counties of Paintearth, Stettler, Camrose, Beaver, and Flagstaff, where our office is located. The Battle River Research Group has three programs to help serve the local producer, including the field Crops Program forage program, extension & Environmental Program.

BRRG Free Membership is open to agricultural producers or other agricultural stakeholders outside East Central Alberta interested in the Association's objectives.

Visit battleriverresearch.com to Become a Member.