

Regional Variety Trials

Partners: Alberta Agriculture, Forestry and Rural Economic Development
Alberta Wheat Commission
Alberta Pulse Growers
St. Paul Municipal Seed Cleaning Plant
County of St. Paul
Smoky Lake County
MD of Bonnyville
Agriculture and Agri-Food Canada
Nutrien Ag Solutions
FP Genetics
SeCan
Canterra Seeds
Alliance Seeds
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Objectives:

1. To detail agronomic characteristics of new varieties and proven varieties in a specific geographic area.
2. To provide information about new varieties to local producers.
3. To conduct these tests yearly to produce long term data.

Background:

Regional Variety Trials (RVTs) have been used as a means of testing superior varieties under different environmental conditions. One of the goals of the RVTs is to help researchers and producers identify varieties that are suitable for each particular environment. Multi-location trials often show genotype x environment interaction due to differential response of genotypes to different environmental conditions. Information on the genotype x environment response obtained through RVT's may be helpful in identifying and selecting high-yielding varieties with specific or broad adaptations to their environmental conditions.

Efficiency in the RVT's depends on selecting a large number of locations within a region with varying environmental conditions and assigning to each location the variety most likely to succeed. It is also essential to assess varieties in the trial in terms of their productivity and quality, and to assess stability in yields across years.

The regional variety trials (RVTs) have been grown in the Lakeland since 1991. Each variety is tested for three years against a common check variety that is kept in the trial long-term. Each year, new varieties are added and older ones are removed from the trial. How a variety does relative to the check variety can be used as a comparison between varieties that are not grown in the trial at the same time.

The information gathered from these trials is important for producers first, to aid in crop variety selection and, second, to improve economic returns. Determining the cereal varieties that are best suited to production in the LARA area will aid producers in making the most economical decisions for their operations.

The data presented in the following tables is a useful tool for comparing varieties to each other. Information should not be used to determine how much a variety will yield, but **rather as a comparison of how one variety will yield in relation to another.** The tables will tell how a certain variety yields statistically compared to another variety.

Methods:

The cereal plots for the Regional Variety Trials were seeded at the LARA Fort Kent Research Site (NE25-61-5-W4), the County of St. Paul (SE 13-60-10-W4) and Smoky Lake County (NW 59-16-30 W4). Agronomic information about the RVTs grown by LARA in 2021 is listed in Table 1. The trials were seeded using the LARA five-row Fabro zero-till small plot seeder. The plots were 1.15m x 6m in area with a 9” row spacing. All trials were seeded to a randomized complete block design with four replications for pulses and three replications for cereals to reduce error.

Soil samples were taken in spring prior to seeding to check soil fertility and a blend fertilizer was side-banded at seeding for optimum yields. Pre-seeding burn-off and in-crop herbicides were utilized for weed control. Notes on lodging and height were taken during the growing season. The plots were harvested using a Wintersteiger small plot combine and information on yield, bushel weight, 1000 kernel weight and protein were recorded.

Although the varieties in the trials are set by the ABCGAC and seed companies, there is opportunity for local input.

Lodging is rated on a scale of 1-9 where 1 is perfectly erect and 9 is completely flat.

Table 1. Regional Variety Trial Agronomic Information, 2021.

Test	Site	# of Variety	Seeding Date	Fertility	Seeding Rate	Harvest Date	Rain (mm)
Barley	Fort Kent	22	13-May-21	284 lbs/ac 90-30-20-5	270 pl/m ²	21-Sep-21	189.7
CPSR Wheat	Fort Kent	12	13-May-21	284 lbs/ac 90-30-20-5	330 pl/m ²	07-Sep-21	189.7
CWRS Wheat	Fort Kent	26	13-May-21	284 lbs/ac 90-30-20-5	330 pl/m ²	07-Sep-21	189.7
Oats	Fort Kent	10	14-May-21	284 lbs/ac 90-30-20-5	300 pl/m ²	21-Sep-21	196.9
Oats	Smoky Lake	10	27-May-21	284 lbs/ac 90-30-20-5	300 pl/my	28-Sep-21	184.4
Triticale	Fort Kent	2	13-May-21	284 lbs/ac 90-30-20-5	310 pl/m ²	09-Sep-21	189.7
Yellow Peas	St. Paul	15	12-May-21	50 lbs/ac 11-52-0-0	88 pl/m ²	23-Sep-21	178.2
Green Peas	St. Paul	5	12-May-21	50 lbs/ac 11-52-0-0	88 pl/m ²	23-Sep-21	178.2
Faba Bean	St. Paul	6	12-May-21	50 lbs/ac 11-52-0-0	44 pl/m ²	23-Sep-21	178.2

Barley

The RVT barley trials were established at two locations, one in the County of St. Paul (SE-13-60-10-W4) and one at the LARA Fort Kent Research Site (NE 25-61-5-W4). Unfortunately, due to the St. Paul site not passing the ARVAC inspection, the data collected from this site cannot be published.

The RVT Barley trials had 14 varieties that were tested in 2021. The highest yielding variety in Fort Kent was TR19758 was yielding 118 bu/ac followed by Esma, AAC Synergy, and AC Metcalfe which yielded 114 bu/ac. There was a 31 bu/ac difference between the top-yielding variety and the lowest variety. Observations made during the summer were that there was almost no lodging in the Fort Kent Barley in 2021. The average height of the barley plots was 67cm.

The yield data for Fort Kent is shown in the table below.

Table 2. RVT Barley Data Fort Kent, 2021.

Variety	Yeild (bu/ac)	% of AC Metcalfe	TWT (lbs/bu)	TKW (g)	Height (cm)
TR19758	118	104	316.63	54	71
Esma	114	100	303.97	54	64
AAC Synergy	114	100	304.57	53	67
AC Metcalfe	114	100	304.87	51	67
CDC Copeland	111	97	315.76	56	68
KWS Kellie	111	97	305.6	56	57
TR18748	110	97	317.63	56	75
KWS Coralie	110	96	296.9	55	61
AB Wrangler	110	96	313.37	55	75
AB Brewnet	109	96	305.9	53	66
CDC Anderson	109	95	318.43	55	63
CDC Renegade	108	95	313.63	59	82
TR18749	106	93	322	60	79
AB Hauge	105	92	305.41	52	64
AB Prime	105	92	305.5	52	67
TR18747	104	92	311.83	56	72
AB Tofield	103	90	308.23	50	67
RGT Planet	103	90	315.47	55	68
TR17255	102	89	305.83	49	56
AB Cattlelac	100	88	306.63	47	73
Torbellino	98	86	306.47	57	54
TR19175	87	76	314.68	53	60
CV 9.09					

CPSR & CCHNR Wheat

The Canadian Prairie Spring Red (CPSR Wheat) and Canada Northern Hard Red (CCNHR Wheat) were also grown in both Fort Kent (NE-25-61-5-W4) and St. Paul (SE 13-60-10-W4). Unfortunately, due to the site not passing inspection from ARVAC, the data collected from the St. Paul site cannot be published.

Pasteur was the top-yielding variety in Fort Kent yielding 91bu/ac, which is 30% higher than AAC Brandon and 51% higher than Carberry. The lowest yielding variety in the trial was Carberry yielding 60 bu/ac, this was a 31bu/ac difference between the top-yielding variety Pasteur and lowest yielding variety Carberry. The highest protein content from this trial was from AAC Brandon which was 12.6%, the average protein in this trial was 10.6%

The yield data from CPSR & CCHNR wheat from Fort Kent can be shown in the table below.

Table 3. CPSR & CCHNR Wheat Data Fort Kent, 2021.

Variety	Yeild (bu/ac)	% of AAC Brandon	% of Carberry	TWT (lbs/bu)	TKW (g)	Height (cm)	Protien (%)
Pasteur	91	130	151	388.2	36	73	9.5
Accelerate	80	114	132	388.77	32	64	10.8
AC Andrew	76	109	126	384.3	36	67	9.6
AAC Penhold	76	108	126	385.2	40	59	11.1
HY2095	73	104	121	385.67	45	70	10.2
WPB Whistler	73	104	121	397.1	40	65	9.0
HY2082	71	102	118	395.27	41	63	11.2
SY Rorke	71	101	117	401.87	33	70	10.1
LNR15-1741	70	100	116	398.1	35	69	10.6
AAC Brandon	70	100	116	393.53	36	69	12.6
HY2074	69	99	115	397.57	39	74	10.5
HY2090	66	94	109	387.17	45	70	10.7
CDC Reign	64	92	106	403.72	36	76	11.2
Carberry	60	86	100	399.43	39	69	11.8
CV 10.84							

CWRS & CWHWS Wheat

The Canadian Western Red Spring (CWRS) and Canadian Western Hard White Spring (CWHWS) were grown in Fort Kent (NE-25-61-5 W4) and St. Paul (SE 13-60-10 W4). The CWRS and CWHWS wheat trial is the largest trial that LARA manages with 26 varieties in this class. Unfortunately, the County of St. Paul Research site did not pass the ARVAC site inspection. Due to this, the RVT CWRS & CWHWS data collected from the site cannot be published.

The highest yielding variety in the Fort Kent site was AAC Brandon yielding 80 bu/ac followed by CS Resolve at 76 bu/ac. The average height on the wheat was 72 cm tall and the average protein content on the trial was 11.44%. Overall, the trial did well and we are looking forward to growing this trial again in 2022.

The yield data for the CWRS and the CWHWS for Fort Kent are shown in the table below.

Table 4. CWRS & CWHWS Wheat Data Fort Kent 2021.

Variety	Yeild	abc	% of AAC Brandon	% of Carberry	TWT (lbs/bu)	TKW (g)	Height (cm)	Protien
AAC Brandon	80	a	100	113	400.53	39	74	11.81
CS Resolve	76	ab	96	108	391.9	43	74	10.82
BW1093	76	ab	95	108	387.3	32	67	10.7
SY Torach	75	ab	95	107	395.49	31	64	11.29
AAC Hodge VB	75	ab	95	107	398.93	37	71	10.99
SY Cast	75	ab	94	107	390.33	39	70	11.97
CDC Skrush	75	ab	94	106	389.77	33	75	11.7
AAC Whitehead VB	74	ab	93	106	389.6	43	72	11.34
AAC Broadacres VB	74	abc	93	106	401.07	43	80	10.86
BW5045	74	abc	93	105	393.13	39	75	11.4
PT598 CL	73	a-d	92	104	390.3	38	61	11.52
BW5055	72	a-d	91	103	389.47	33	73	11.67
SY Brawn	72	a-d	91	103	388.43	34	73	11.99
AAC Russell VB	71	bcd	89	101	400.7	40	66	11.47
AAC Redstar	71	b-e	89	101	384.17	36	66	11.62
Carberry	70	b-e	88	100	399.1	39	72	11.4
AAC Viewfield	70	b-e	88	100	404.24	38	69	11.33
Rednet	70	b-e	88	99	404.6	40	86	12.02
SY Crossite	70	b-e	88	99	396.1	42	76	12.18
Ellerslie	70	b-e	88	99	376.3	33	69	10.65
SY Gabro	69	b-e	87	99	394.27	41	77	11.59
AAC Tomkins	69	b-e	87	98	395.07	39	73	11.5
AAC Leroy VB	69	b-e	86	98	399.23	40	78	11.34
AAC Hockley	68	cde	85	96	401.4	36	69	11.43
BW5031 CL VB	67	de	84	95	392.93	43	71	12.15
Sheba	64	e	81	91	393.97	34	72	10.7
CV 5.75								

Triticale

The Triticale trial this year was grown in Fort Kent (NE-25-61-5-W4) and in the County of St. Paul (SE 13-60-10 W4). The RVT triticale is the smallest trial held at LARA consisting of two different varieties. This year the highest yielding variety of Triticale was Brevis yielding 86bu/ac, which is 12 bu/ac higher than AB Stampeder.

Overall, the triticale did well this year and we hope to continue having success growing triticale in the future. The yield from the triticale trial can be seen in table 5.

Table 5. Triticale Data Fort Kent, 2021.

Treatment	Yeild (bu/ac)	% Brevis	TWT (lbs/bu)	TKW (g)	Height (cm)
AB Stampeder	74	86	343.2	51	67
Brevis	86	100	366.33	46	72
CV 3.13					

Oats

The Oats trials this year were grown in Fort Kent (NE 25-61-5-W4) and Smoky Lake (NW 59-16-30-W4). This is the first year that the Regional Variety Trial Oats was in Smoky Lake previously the oats always grew in the MD of Bonnyville and Lac La Biche County. Due to not being able to find a site in Lac La Biche County the RVT Oat was moved to Smoky Lake in 2021.

CS Camden was one of the highest-yielding oat varieties at both the Fort Kent and the Smoky Lake research sites. As seen below, in Fort Kent CS Camden yielded 129 bu/ac, which was 13 bu/ac more than AAC Douglas which was the second-highest yielding variety. In Smoky Lake, CS Camden was one of the top-yielding varieties along with Kallio both yielding 97 bu/ac. There was very little lodge in both oat trials in 2021. The average height of the oat plots was 81 cm at Fort Kent and 70 cm at Smoky Lake.

Table 6. RVT Oats Data Fort Kent, 2021.

Variety	Yeild (bu/ac)	% of OT2129	TWT (lbs/bu)	TKW (g)	Height (cm)
CS Camden	129	176	232.39	46	83
AAC Douglas	116	159	236.77	48	79
Kyron	110	151	243.5	46	93
AC Morgan	109	149	246.8	47	85
CDC Arborg	105	144	243.8	46	88
Kalio	98	135	240.47	44	76
ORE Level 48	93	127	245.13	46	77
CDC Skye	85	116	246.83	45	80
ORE Level 5	85	116	251.23	50	78
OT2129	73	100	287.75	44	69
CV 5.93					

Table 7. RVT Oats Data Smoky Lake, 2021.

Variety	Yeild (bu/ac)	% of OT2129	TWT (lbs/bu)	TKW (g)	Height (cm)
CS Camden	97	116	226.65	45	74
Kalio	97	116	229.33	43	77
AAC Douglas	96	116	220.87	44	72
CDC Arborg	93	112	222.2	45	86
OT2129	83	100	217.2	43	68
ORE Level 48	81	97	217.07	41	74
CDC Skye	78	94	205.17	41	73
Kyron	76	92	229.41	46	71
ORE Level 5	60	72	220.96	46	72
AC Morgan	38	46	245.7	46	38
CV 10.95					