Regional Variety Trials

Partners: Alberta Agriculture and Forestry
Alberta Wheat Commission
St. Paul Municipal Seed Cleaning Plant
Agriculture and Agri-Food Canada
Nutrien Ag Solutions
Alberta Barley
Alberta Seed Processors
Alberta British Colombia Seed Growers
Alberta Oat Growers Association
Results Driven Agriculture Research

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.

Cereal Regional Variety Trials (RVT) contracted to LARA in 2022
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LARA ran the following RVT trials for the Alberta Regional Variety Advisory Committee (ARVAC) in 2022:

Table 1. LARA RVT Trials, 2022.

Trial	Sites	Number of Entries	Useable Data	Cultivar p-value
CWRS - RVTs	Fort Kent	15 varieties	Yes	0.0001 - Significant
	St Paul		No	
CPSR - RVTs	Ft Kent	9 varieties	Yes	0.0004 – Significant
	St Paul		Yes	0.0703 – Non Significant
Barley - RVTs	Ft Kent	23 varieties	Yes	0.0001 – Significant
	St Paul		Yes	0.0250 – Significant
Oat - RVTs	Ft Kent	10 varieties	No	
	Smoky Lake		No	
Triticale - RVTs	Ft Kent	2 varieties	No	
	St Paul		Yes	0.0435 - Significant
Winter Wheat - RVTs	Ft Kent	6 varieties	No	

ARVAC grants permission to LARA to publish useable data, from single site years, but cautions that single site year data can be misleading and it is highly recommended to refer to compiled RVT data in the Alberta Seed Guide at seed.ab.ca.

Acknowledgement is given to the 2022 RVT funders: Results Driven Agricultural Research (RDAR), Alberta Wheat Commission, Alberta Barley, Alberta Seed Processors, Alberta British Columbia Seed Growers, Alberta Oat Growers Association, and Seed Companies who pay annual entry fees as program entrants.

Canada Western Red Spring (CWRS) Wheat at Fort Kent

The cultivar p-value = 0.0004; height CV = 2.57%, yield CV = 4.18%. Note that AAC Tomkins and AAC Whitehead VB are Canadian Western Hard White Spring Wheat varieties. Please see the compiled data from all ARVAC RVT sites at: https://www.seed.ab.ca/wp-content/uploads/2023/01/rvt2023-1-9.pdf

Table 2. RVT CWRS Data Fort Kent, 2022.

Variety	Yield* CAUTION – 1 SITE YEAR OF DATA
AAC Brandon - Check	100%
AAC Viewfield – Benchmark Check	100% b
AAC Hockley	107% a
AAC Dutton VB (BW1094)	106% a
SY Manness	105% a
AAC Whitehead VB	105% ab
AAC Redstar	103% ab
AAC Hodge VB	102% ab
Rednet	102% ab
AAC Hasler (PT496)	100% b
CDC SK Rush	100% bc
SY Donald	97% bc
PT5003	95% c
AAC Tomkins	95% c
CDC Silas	n/a – seed appeared contaminated

Varieties followed by the same letter are NOT SIGNIFICATLY DIFFERENT, based on a least significant difference (LSD) mean separation at $p<0.05$. For example, AAC Hockley and Rednet have yields that are statistically similar.

Canadian Prairie Spring Red (CPSR) Wheat RVT at Fort Kent

The cultivar p-value = 0.0001; height CV = 4.11%, yield CV = 3.21%. Note that AC Andrew is a Canadian Western Soft White Spring Wheat variety. Please see the compiled data from all ARVAC RVT sites at: https://www.seed.ab.ca/wp-content/uploads/2023/01/rvt2023-1-9.pdf

Table 3. Canadian Prairie Spring Red (CPSR) Wheat Data Fort Kent, 2022.

Variety	Yield* CAUTION – 1 SITE YEAR OF DATA
AAC Brandon - Check	100%
AAC Penhold – Benchmark Check	104%
Accelerate – Benchmark Check	111%
AC Andrew – SWS	117% a
AAC Rimbey	112% ab
AAC Westlock	111% abc
AAC Perform	108% bc
CDC Reign	99% d
Forefront	97% d

Varieties followed by the same letter are NOT SIGNIFICATLY DIFFERENT, based on a least significant difference (LSD) mean separation at $p<0.05$. For example, AC Andrew and AAC Westlock have yields that are statistically similar.

Barley at Fort Kent

The cultivar p-value = 0.0001; height CV = 5.75%, yield CV = 6.26%. Note: only the top 13 out of 23 entries are reported here. This trial is a mixture of feed and malt barley varieties. Please see the compiled data from all ARVAC RVT sites at: https://www.seed.ab.ca/wp-content/uploads/2023/01/rvt2023-1-9.pdf

Table 4. Barley Data Fort Kent 2022.

Variety	Yield* CAUTION – 1 SITE YEAR OF DATA
CDC Copeland – Check	100%
CDC Austenson – Benchmark Check	105%
AAC Synergy – Transition Check	103%
AB Prime	125% a
Esma	121% ab
AB Maximizer (FB20601)	118% abc
RGT Planet	117% abcd
CDC Durango (TR19175)	117% abcd
TR19758	116% abcde
RGT Asteroid	114% bcdef
AB Hague	112% bcdef
AAC Lariat (TR19268)	112% bcdef
AB Standswell (SR18524)	110% cdef
Ibex	109% cdefg
AB Brewnet	107% cdefgh
CDC Renegade	106% defgh

Varieties followed by the same letter are NOT SIGNIFICATLY DIFFERENT, based on a least significant difference (LSD) mean separation at $p<0.05$. For example, AB Prime and TR19758 have yields that are statistically similar.

Barley at St. Paul

The cultivar p-value = 0.0250; height CV = 6.08%, yield CV = 11.73%. Note: only the top 13 out of 23 entries are reported here. This trial is a mixture of feed and malt barley varieties. Please see the compiled data from all ARVAC RVT sites at: https://www.seed.ab.ca/wp-content/uploads/2023/01/rvt2023-1-9.pdf

Table 5. Barely Data St. Paul, 2022.

Variety	Yield* CAUTION – 1 SITE YEAR OF DATA
CDC Copeland – Check	100%
CDC Austenson – Benchmark Check	100%
AAC Synergy – Transition Check	100%
KWS Kellie	113% a
CDC Durango (TR19175)	112% ab
TR19758	109% abc
TR20761	109% abc
Esma	108% abc
AB Prime	107% abcd
AB Maximizer (FB20601)	106% abcde
AB Hague	105% abcdef
RGT Planet	105% abcdef
Cantu	104% abcdef
RGT Asteroid	103% abcdfeg
AAC Lariat (TR19268)	103% bcdefg
AB Standswell (SR18524)	100% cdefgh

Varieties followed by the same letter are NOT SIGNIFICANTLY DIFFERENT, based on a least significant difference (LSD) mean separation at $p<0.05$. For example, KWS Kellie and Cantu have yields that are statistically similar.

Triticale at Fort Kent

The cultivar p-value = 0.0435; height CV = 3.01%, yield CV = 2.29%. Please see the compiled data from all ARVAC RVT sites at: https://www.seed.ab.ca/wp-content/uploads/2023/01/rvt2023-1-9.pdf

Varieties followed by the same letter are NOT SIGNIFICANTLY DIFFERENT, based on a least significant difference (LSD) mean separation at $p<0.05$.

Table 6. RVT Triticale Data Fort Kent, 2021.

Variety	Yield* CAUTION – 1 SITE YEAR OF DATA
Brevis - Check	100%
AB Stampeder	92% a